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CHRONOLOGY OF SELECTED SATELLITE SYSTEMS (16 AUGUST 1993)

May 45	-	Werner Von Braun reviewed German views on the potential of rocket launched space satellites
3 Oct 45	-	USN Bu[illegible]er proposal to develop a space satellite
Mar-May 46	-	RAND satellite study
Feb 47	-	RAND satellite reconnaissance study
Sep 47	-	USAF formed. USAF starts satellite study
Dec 50	-	First satellite components contract
Apr 51	-	RAND satellite reconnaissance feasibility study (Project Feedback) and another study on weather satellites
May 53	-	USAF's ARDC assumes responsibility for space systems
Jun 53	-	ARDC takes responsibility for direction of RAND Feedback study
Dec 53	-	ARDC'S Project 409-40 starts and gives the advanced reconnaissance space system the name Weapon System WS-117L
Jan 54	-	Project 1115 acquires the unclassified designator Advanced Reconnaissance System (ARS). Engineering project MX-2226 identified it's activity as an Air Force and RAND enterprise.
Mar 54	-	RAND final report on Project Feedback study
27 Nov 54	-	ARDC System Requirement No. 5 issued to develop a reconnaissance satellite system

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Nov 54	-	CIA begins AQUATONE program to build a covert reconnaissance aircraft, the U-2. LAC gets the contract to build it at the "Skunk Works" in Burbank, CA.
16 Mar 55	-	USAF General Operational Requirement 80 established a requirement for an advanced reconnaissance satellite (WS-117L)
Jul 55	-	An AF proposal called "World Series" featuring an Atlas first stage and Aerobee-Hi was proposed as a Scientific Satellite Program for IGY in 1956, but received scant support because of conflict with WS-117L.
29 Jul 55	-	U-2 makes first test flight
Oct 55	-	Responsibility for WS-117L transferred from WADC to WDD in Los Angeles
Apr 56	-	WS-117L Development Plan issued which was based on use of Atlas booster
10 Jun 56	-	LMSC, RCA and Martin begin competition study for WS-117L contract
04 Jul 56	-	U-2 makes first flight over USSR including Moscow
Aug 56	-	WS-117L first funded
Oct 56	-	Lockheed Aircraft Co. (LAC) wins WS-117L contract. The effort is called Pied Piper. LMSC's proposal is based on Atlas booster and upper stage using B-58 Hustler engine. The upper stage would later be named Agena. WS-117L components defined as: A-Air Frame; B-Propulsion; C-Auxiliary Power; D-Guidance and Control; E-Visual Space Systems; F-Ferret Space Systems; G-Infrared Space Systems; H-Command, Control and Communications; I-Data Processing; K-Personnel; L-Biomedical Recovery

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Jun 57	-	RAND published a reconnaissance satellite recovery study
4 Oct 57	-	Sputnik launched by Soviet Union. Space Age begins.
24 Oct 57	-	Thor missile successfully completes a 2,645 NM flight test. Atlas would not have a successful range test until 28 Nov 1958.
29 Oct 57	-	Second Story approved by SECDEF. It proposed a covert satellite reconnaissance system using Thor as booster.
5 Dec 57	-	WS-117L "cancelled"
6 Jan 58	-	LAC proposes using Thor and Agena upper stage
22 Jan 58	-	NSC Action 1846 assigned highest priority for development of an operational reconnaissance satellite
7 Feb 58	-	President assigns CIA responsibility for developing a covert recoverable satellite system
7 Feb 58	-	ARPA formed. Assumes control of DoD space programs
Feb 58	-	LMSC begins Thor/Agena development
Mar 58	-	CORONA program begins. Terminated Jun 72.
Mar 58	-	DISCOVERER program begins
May 58	-	Sentry program begins (E-SERIES, I.E., E-1, E-2, E-3, etc). Sentry name changed to SAMOS in Aug 59

- E-1 program (RO) begins 1956, terminated Feb 61.
- E-2 program (RO) begins 1958, terminated Sep 61.
- E-3 program (RO) begins Sep 58, terminated Dec 59.

~~SECRET~~ **HANDLE VIA BYEMAN CONTROL SYSTEM ONLY**

- E-4 program (REC) begins Sep 58, cancelled in 1959, reinstated Oct 60 and completed Jan 62

- E-5 program (REC) begins Sep 58, cancelled Jun 59, reinstated Sep 59 and terminated Dec 61

- E-6 program (REC) begins Jul 60 (evolved from E-5) with last flight Mar 62

1956 F-Series (FERRET) programs begin using Atlas as a booster

- F-1 program begins 1956, terminated Jan 61

- F-2 program begins 1956, payloads moved to Thor in Oct 60

1956 G-Series programs begin at LMSC. Program evolves and includes designator changes: 117L/Midas--LMSC Nr 564--239A--461--266--949--647--DSP

Sep 58 - Director ARPA orders USAF to quit using WS designator for US satellites

Nov 58 - DoD announces that the names of Program 117L satellites are Discoverer, Sentry and Midas. Discoverer is a scientific satellite concerned with biomedical recoveries from space.

28 Nov 58 - First successful full-range flight of 6,325 miles for Atlas missile

Jan 59 Discoverer issues public statement that it is a scientific (biological recovery) satellite system

28 Feb 59 - Discoverer I launched, fails

Aug 59 - Sentry name changed to sAMOS

23 Sep 59 - DoD returns control of Discoverer, Samos and Midas from ARPA to USAF

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1 May 60	-	Gary Powers shot down in U-2 over Sverdlovsk, USSR
5 Jul 60	-	USIB issues requirements for denied area information
10 Aug 60	-	First successful Discoverer (13) launch and bucket return. No film
18 Aug 60	-	First film return by Discoverer 14
25 Aug 60	-	First space reconnaissance photographs shown to President. Camera designators for different Corona systems would be KH-1, 2, 3, 4, 4A, 4B, 5 and 6.
11 Oct 60	-	First SAMOS launch. Program product designators would be 2100, 2200, 2400
11 Nov 62	-	Eleventh and final SAMOS launched
27 Apr 64	-	With launch of Discoverer 38, the program is ended. [38 launch attempts]
25 May 72	-	Final Corona launch [136 launch attempts]

Approved for Release: 2022/06/27 C05139127

LISTING OF NRO HISTORIES AND RELATED MATERIALS

1. 1990 History activities:

- Harvey Cohen, former head of SAFSP-3, has just finished for Art Davis [redacted] a "monograph" on the BYEMAN Control System from it's inception to the present. (b)(3)

- MGen (Ret) David Bradburn and Col (Ret) John Copley, former head of SAFSP, SAFSP SIGINT head, respectively, are currently in the draft stage of writing a history of the NRO's SIGINT satellite programs that were developed and operated from the beginning of the space age through 1975. This history includes Programs A, B and C systems. [SAFSS "commissioned" two researchers at NSA in 1975 to write their organization's space history volume, "The NSA in Space". This history is from the beginning of the space age to 1975. It also included information about the types of encryption boxes NSA placed on each NRO satellite.]

- William Griego, SAFSP contractor, wrote an abbreviated history of the NRO/NRP in July 1992, which emphasized world and national events that have affected the NRO. The period involved is from the beginning of the space reconnaissance programs to the present. It contains a listing of all satellite program launches and Directors of the NRO and Programs A, B, C and D.

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

- It is understood, but not yet verified, that Col Frank Labelle, NRO Staff, may be conducting a history of NRO management, possibly using [redacted] as the person in charge.

- Cols Fritz Oder, Paul Wortman and Jim Fitzpatrick (all Col's Ret) completed the histories of CORONA and GAMBIT in 1988 and 1991 respectively. It is possible that their draft HEXAGON history is also finished but SAFSP only has a final draft.

- Donald E Welzenbach and [redacted] CIA History Staff, wrote a 1992 Secret NoForn, history, "The CIA and Overhead Recconnaissance", which is about IDEALIST (U-2), OXCART (A-12/SR-71), TAGBOARD (D-20 drone on SR-71/B-52) and other concepts that never became real systems. These aircraft, for part of their histories, were the responsibility of Program D, NRO. (b)(3)

2. The histories created in the 1980s, either documents or films, about the NRO are:

- Merton E Davies and [redacted] wrote an unclassified "history", in 1988, titled, "RAND's Role in the Evolution of Balloon and Satellite Observation Systems and Related US Space Technology". It covers the period from 1945 till 1959, when the "security curtain" came down regarding space reconnaissance activities. Col Fred Riccardi and William L Griego reviewed the piece about half a dozen times until it contained only unclassified materials. RAND was not the only organization that had ideas of the feasibility of space and the potential using space systems for reconnaissance, but it was a significant player. (b)(3)

- Donald E Welzenbach, CIA/DDS&T historian, wrote a chapter of a CIA history, titled, "Project HEXAGON, saved by SALT", in 1986. It is 37 pages long.

- SAFSP directed a history of the HEXAGON Mapping Camera System be written. It was written by MG (Barney) Barnett, Itek, and was assisted by about 20 researchers, both contractors and government. It was finished in 1982, because the mapping camera program was finished but HEXAGON would still be flying until 1986. This is a superb document and includes many interesting photos, summaries and program narrative.

- In 1985 Perkin Elmer wrote, "A History of the HEXAGON Program," which indicates that Corporation's role in the development and operation of HEXAGON.

[redacted]

- A contractor wrote for SAFSP, "ITEP/TUT Program Historical Report", 31 July 1981. This activity is unique and one example of the variety of activities SAFSP has initiated and carried to operational status.

- A film on HEXAGON was produced in the early 1980s. SAFSP was the producer and director of this film which has been rerecorded on VCR. This and the next cited film are fine examples of capturing the events in the evolution of SAFSP programs in a changing world. (b)(1) (b)(3)

- A film on GAMBIT was produced in the early 1980s. SAFSP was also the producer and director on this film. See comments directly above.

[redacted]

3. The following is a list of histories, both in draft and completed form, created in the 1970s and 1960s:

- Completed:

- "SAFSP Project 770 (STRAWMAN) Description and History," 31 December 1971. More a programmitic document than a real history. But STRAWMAN information is scarce.

- ESL wrote a document for ACDA, "Application of a Collection System to Arms Control Verification (U)", Nov 1970. The program it tries to justify for continuation is STRAWMAN. This a great improvement over the previous document. (b)(1) (b)(3)

- Two notebooks of 1970s and 1980 documents showing the development and demise of the SAFSP Manned Space Optimization Progran, 23 January 1979. These were the Manned Spaceflight Engineers or USAF Military Astronauts.

- General Tighe's 16 page answer to the question, "What Was the Contribution of the HEXAGON System to the DIA?" Some of the information he provides in his answer on the value of HEXAGON products0 needs to be in an SAFSP history. This was a 1977 document.

- SAFSP's "Program Summary Report", 1960-1967, Vol I, is of the initial GAMBIT Missions 40XX not the 43XXs. There were 38 40XX missions and later 54 43XX missions. The 40XX rode on Atlas and the 43XX on Titan 3B.

- Robert Perry, now deceased, wrote quite a few volumes about the NRO, mostly the early imagery programs. Some of them were completed as listed below but he left quite a few more in draft form. His final written historical materials contain events no later than 1974 and go back to 1945. His completed materials were reviewed by Maj Gen(Ret) Holley, a history professor at Duke University and advisor/researcher for

Doctrine/Concepts Division on the Air Staff. As a historian he was not pleased with Perry's works. Since his time others have written about the same systems in the 1980s and 1990s.

- The completed volumes:
  - A History of Satellite Reconnaissance
  - Vol I - CORONA, Oct 1973
  - Vol IIA - SAMOS, Oct 1973, Programs E-1, -2, -3, -4, P-35 (DMSP)
  - Vol IIB - SAMOS, Oct 1973, Programs E-5, -6 and CORONA's LANYARD
  - Vol IIIA - GAMBIT, Jan 1974

    -Vol IIIB - HEXAGON, Nov 1973
- The drafts:
  - Recce Satellite R&D: Capabilities in Readout, Crisis Reconnaissance and Very HighResolution
  - SIGINT, ELINT, and COMINT: The Beginning
  - Project UPWARD: The NRO and NASA [The NRO tries to help NASA regarding imagery systems NASA required for surveying or landing on the moon.]
  - Management of the NRP, 1960-1965

4. CORONA Histories: Since several CORONA histories have been written and it may be disclosed as DISCOVERER in May 1994 the following are those that we are aware of on the West Coast.

- Perry's Vol I, CORONA, Oct 1973
- CIA/DDS&T CORONA Program History, 19 May 1976, 5 volumes

- Oder, Worthman, Fitzpatrick, "The CORONA Story", Dec 1988

- There was a circa 1975 Studies in Intelligence article, originally classified Secret and later upgraded to SI/TK on CORONA. [I believe this is the one where the DNRO is mentioned just once.]

I believe the people working with [redacted] and the group who are trying to gather all CORONA histories may have several more such histories. We do not. (b)(3)

Bill Griego

POINT PAPER ON GRIEGO SAFSP HISTORY PROJECT

1. The history work of General Bradburn and Bill Griego/GSRC have quite different objectives. To show this a format will be used to show the comparisons or differences.

2. General Bradburn and John Copley History Work:

a. "Charter": NRO SIGINT Systems History

b. Time Frame of History: 1945 through 31 Dec 1975

c. "Progress Report": I'm guessing, based on my discussions with the General, his final draft is being reviewed. He is interviewing former DNRO's, SAFSP Directors and other big guns at NSA and DoD (e.g. SECDEF Bill Perry). He is scheduled to be finished this summer and stated he would turn over his records/files to me as the History Archivist of SAFSP. He has also offered to let me read his draft.

3. Bill Griego /GSRC History Work: Includes [redacted] (who helped write the NRO Introductory History by GSRC which was distributed to all the SPOs of SAFSP) and [redacted]/Archivist-Administrator. (b)(3)

a. "Charter": The history of the organization SAFSP from its beginning (including events from 1945) to the present, including the reorganization from Programs A, B, and C into the SIGINT and IMINT functional arrangement. The purpose of this history is to capture for the American people, who will get to read the document when it is ultimately declassified, the contributions to the nation, indeed the world, by the activities of SAFSP. The history will capture the culture and heritage of this covert intelligence collection group which is largely overlooked because of security and the low key approach to conducting business, all the while being chartered with the highest national priority because of the importance of the Presidentially mandated mission.

The history will be in two parts. The first part is a volume on the management, operations and conduct of Program A, SAFSP, considering the world environment (cold war/ICBM and other strategic systems buildup), the requirements from USIB, the perspectives of each of the SAFSP Directors, based on interview with those still alive, and the directions they received from the DNRO, and the interfaces of SAFSP with the blue AF, CIA, NSA, the Services and the major contractors.

The second part will deal separately with the other SAFSP organizational elements. A major part will deal with the IMINT programs -- [redacted] HEXAGON, GAMBIT and (GAMBITcubed), CORONA and SAMOS. CORONA and HEXAGON were joint Program A/Program B efforts. The SIGINT programs, especially from 1975 to the present based on the multiplicity of such programs since the end of the Bradburn history, including the restructuring into the low and high altitude constellations and consolidation/reorganization of mission ground stations. History needs to be written (b)(1) (b)(3)

about activities that supported SAFSP activities such as AFSCF/CSTC, AFSPPF, Hawaiian Recovery Test Group, R&D efforts, [redacted] MOL, ZEUS/DAMON Shuttle payloads, etc. Tactical support activities, ITEP/RTIP and other mobile vans, SOCOMM and Contracting and other support to other covert space or covert aircraft or covert naval projects need to be written about in history because they were supported by SAFSP. SAFSP has had a variety of involvements with foreign governments, some of which can be written at the BYEMAN level. None, or almost none of the section will be in General Bradburn's history. (b)(1) (b)(3)

The Griego history effort will also involve making a film/VCR of SAFSP historical activities and the gathering of photos, VCRs, mementos and actual space hardware. The latter activity, begun by others, is to ultimately place in the Smithsonian a HEXAGON (Big Bird as the media called it) and a KH-7 or KH-8 (an early or later GAMBIT).

(The overlap that the Griego history work has with General Bradburn's work is in the interview of the former SAFSP Directors. Griego is interviewing them from their overall tenure and their responsibilities and responsibilities for all of SAFSP, not just SIGINT.)

b. Time Frame of History: From the beginning of the Organization (including some events from 1945) to now. [as previously stated above]

c. "Progress Report" - General Walker was presented with the Griego/GSRC history proposal. He agreed that Griego/GSRC should proceed to do the SAFSP history. [As can be determined from above it is distinctly different from the General Bradburn activity]. General Walker also said he wanted to see what hardware [redacted] A trip there is being planned with the intended objective to inventory all hardware there and to take lot of pictures to see what we have. The intent would to take steps to have a HEXAGON or GAMBIT, or both at some future date presented to the Smithsonian Air Space Museum. [redacted] has already been interviewed for this effort. Some of the space system films that are archived have been reviewed and a copy of the GAMBIT history has been found. Several copies of the HEXAGON history are available on film and VCR. A film on the [redacted] has also been found. Just yesterday I learned from [redacted] NRO security boss at CSTC, that all their NRO films have been sent to El Segundo for historical archiving. The immediate planning is to make plans to interview the rest of the SAFSP Directors during April and May 1994. (b)(1) (b)(3) (b)(3) (b)(3)

Bill Griego
[redacted]

HISTORIES/RELATED STUDIES BY GSRC

Writing:

- Abbreviated history on a classified space program
- Briefing based on above abbreviated history
- Participant on a security history/monograph with Harvey Cohen
- An open source compilation of actual photographs or drawings of classified US space satellites
- A compilation of misinformation in open source information about certain US space launches since 1980

Reviewing/Retrieving/Archiving/Storage/Some Writing:

- Provided information and review for accuracy and security on two films made for two space programs that had been ended
- Participant/reviewer/editor on [redacted]/Itek history on a particular classified space project (b)(3)
- Reviewed Rand's 40th Anniversary History for accuracy and security seven times. The history was about Rand's role in the evolution of balloon and satellite observation systems.
- Researcher/archivist for David Bradburn on a classified history of selected space projects
- Archivist/researcher on three space project histories written by F W Oder, P Worthman and J Fitzpatrick, plus review for accuracy and security.
- Provided information to [redacted] for his classified satellite history for OSD regarding the Strategic Arms Competition with the Soviets
- Provider of historical information for 30th Anniversary Reunion and celebration for an Air Force organization
- Provided review and comments to Don Welzenbach on two histories, one being an airplane project and the other a space project
- An open source review of a special classified space launch

- An up-to-date compilation of all launches of selected US space programs

- Provider of information to various users of US classified space history for their training courses such as: [redacted] [redacted] and various other contractors

- Participant in group charged with storage of space vehicles with view of possible future display of hardware at government facilities or museums (b)(3)

- Provided information (and copies of it's classified history) for a comprehensive review of information on a particular project with view to possible declassification

Writing for Others:

- An open source review and briefing of ten foreign nation's efforts to either build their own reconnaissance satellites or their possible awareness of other nations similar systems

- An open source history and chronology of the US space defense program from its inception through 1990

- An open source chronology and narrative of US radar technology efforts for US space defense activities and SDI from 1960 to 1990

- An open source chronology and narrative on US ground based laser technology efforts for US space defense and SDI to 1990

On 9 March 1961, Charyk allocated $35 million in FY62 funds as an initial increment for Project 102, scheduled to launch four F-2s in 1962 and four F-3s in 1963.[4]

The new Project 102 required names for each payload more specific than F-2 and F-3. To accomplish this, Copley and his counterpart, LtCol Edwin J. Istvan of the Air Force Office of Missiles and Space (SAFMS) staff, devised a system that identified payloads by the type of output data they produced (a digital data stream or a wide-bandwidth analog signal) and by the radio frequency bands that they intercepted. The frequency band configurations were numbered 1, 2, or 3, and the term "digital" was adopted for payloads with digital output and "analog" for those with analog output. For example, Group 2D provided radio frequency coverage from 0.059 to 0.130, 2.5 to 3.2, and 8.2 to 12.4 GHz and produced a digital data stream as the output, whereas Group 2A provided a wide-bandwidth analog output covering the same frequency bands. Payloads with digital output were EOB and general search (GS) collectors. Their output was a 10-kilobit digital data stream. Payloads with wideband analog output collected technical intelligence (TI) to determine the fine-grain characteristics of radars of the highest priority. Their output bandwidth was 6 MHz and they utilized the analog magnetic instrumentation equipment (AMIE) wideband helical scan video recorder developed by RCA for on-orbit recording.

As a further cost-saving measure, the third SAMOS E-1/F-1 Agena vehicle, 2103, with the E-1 photo components removed, was redesignated 2301 and reconfigured for launch on a Thor booster. The F-1 payload became Group 0, the first of the Project 102 Thor-boosted launches.

Although it was conducted as part of the SAMOS Program, Project 102 had much more in common with DISCOVERER, which was the cover name for the "black" CORONA photo recovery project. They both used the same Thor/Agena launch configuration and had many common subsystems, they were both under contract to LMSC, and administration of the "white" elements of DISCOVERER had been transferred to the SAMOS office on 9 September 1960.

It soon became clear that operating Project 102 as part of the SAMOS office required duplication of most functions of the DISCOVERER office except for payload operation. As a result, in April 1961 BGen Robert E. Greer moved Project 102 from SAFSP to the nearby DISCOVERER office, both of them located at the Air Force El Segundo complex. This essentially meant that Maj Copley and his secretary [redacted] moved in with Col Lee Battle and the DISCOVERER development team. The arrangement worked out very well with Copley handling the SIGINT payloads and Capt Bill Johnson handling the photo payloads. Most other subsystems were common to both programs, and from external observation it was impossible to tell the difference between a SIGINT and a photo launch. There was a difference in the security classification of the payloads. The photo payloads were developed and operated using the CIA's covert ("black") CORONA security

(b)(3)

~~Top Secret~~

[redacted]

~~NOFORN ORCON~~

Handle via BYEMAN-TALENT-KEYHOLE-COMINT Control Channels Jointly

The SIGINT Satellite Story

by

Major General David D. Bradburn, US Air Force (Retired)
Colonel John O. Copley, US Air Force (Retired)
Raymond B. Potts, National Security Agency (Retired)
[redacted] National Security Agency (Retired)

(b)(3)

~~Top Secret~~

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December 1994
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~~SECRET~~ **WORKING PAPER**

MEMORANDUM FOR GENERAL SCANLAN AND LT COL YOUNG

4 March 1996

SUBJECT: SAFSP History Project, Past, Present and Planning

1. The purpose of this memorandum is to state what has been done in the past, what is presently being done and what needs to be done to finish the SAFSP History GSRC is working on. As of now Program A, NRO (SAFSP) does not have an organizational history. Program B, NRO (ODE) as part of CIA's DDS&T, has a history as part of the 12 volume history of DDS&T, I am so informed. Program C, NRO (SPAWAR) has an NRO Program C, Organizational Manual and the History of the POPPY Satellite System, written in 1978. [Some of the organizational names have changed.]

2. GSRC has done much work already on assembling materials and finished some materials for the history and needs to do some more to finish the history.

a. The final chronological writing of the management history which is in notes which are in some of the 24 safes at A-5 Building in El Segundo, which contain SAFSP history archival materials will begin when the safes arrive on the East Coast. These notes were generated from reading other histories and other archival materials .

b. We have a working outline which we have been using for almost a year. It is enclosed here.

c We have interviewed all the Generals except General Scanlan. These interviews have been transcribed. The interviews are in a separate binder.

d. We have a set of hypotheses/trends which should emerge from SAFSP's activities since 1960. These are included. Cargill Hall, an AF historian writes that sometimes your initial hypotheses do not pan out and you find out other trends you hadn't expected.

e. Lt Col Randy Cohen, now an archivist in MS&O, has provided me a complete listing of all launches, in all sorts of detail from Sputnik to date including all NRO launches. Since I "commissioned" him to start such a listing when he was a Captain at SAFSP in El Segundo he has allowed me to use his materials and SPO Director lists. GSRC has also worked up some launch and failure related lists. A sample listing of 1995 launches

including NRO ones is included in the enclosure, " An Introductory History of the NRP/NRO" by GSRC.

f. We have working lists of various bibliographies, glossaries and contractors. etc.

g. The materials in the 24 safes being shipped from the West Coast contain materials from normal SP programs and staff elements. They also include information on "special" programs and others like MSE Manned Spaceflight Engineers), the BYEMAN aspects of MILSTAR and MOL and more. See Justification of Tasks and A Proposal for a History of SAFSP documents.

3. A detailed timelines chart which states GSRC shall provide a draft in four months and a finished product in one year is included.

4. (Enclosed are documents created during the last year and the Introductory History which was written in 1992.)

William L. Griego
GSRC

(b)(3)

~~SECRET~~ **WORKING PAPER**

Timetable for Completion of SAFSP History

1 March to 30 June 1996 - Review archivable history material in 24 safes, in GSRC custody in Building A-5, Aerospace Corporation, El Segundo, CA , which is to be shipped from there to the East Coast, and use information from them for inclusion in the SAFSP history.

30 June 1996 - four months after start date. Completion of rough draft of chronological history of SAFSP, focusing on Directors' perspective. Submission of rough drafts on bibliography and glossaries. Finish editing of Generals' interview transcriptions. Submit transcript to remaining Generals who have not reviewed their initial transcript .

July 1996 - Peer review of draft SAFSP history by Cargill Hall, USAF historian and [redacted] Rand Corporation, historian (worked with SECDEF's historian and at Harvard University.) Continue writing and archiving. (b)(3)

August 1996 - Review comments on rough draft of SAFSP draft history. Start rewrite of draft SAFSP history.

September 1996 - Receive Generals' comments on transcripts. Re-interview some Generals further if necessary.

October 1996 - Submit final draft of SAFSP history to same persons or others specified by contract sponsor. Finalize volume containing Generals' interviews (if they agree to publication.)

November/December 1996 - Utilize government and Aerospace technical editors and artist to formal final copy. Insert pictures and graphs and tables. Submit final copy of volume on Generals' inteviews.

January/February 1997 - Review final product of SAFSP history. Distribute copies to relevant individuals and offices and organizations.

~~SECRET~~ **HANDLE VIA BYEMAN CONTROL SYSTEM ONLY**

SP-1			
Robert Greer		30 Jun 65	
John Martin	1 Jul 65	30 Jul 69	
William King	1 Aug 69	31 Mar 71	
Lew Allen	1 Apr 71	19 Jan 73	
David Bradburn	20 Jan 73	31 Jul 75	
John Kulpa	1 Aug 75	Mar 83	
Ralph Jacobson	Mar 83	28 Feb 87	
Nathan Lindsay	1 Mar 87		
SP-2			
Col Berg		31 Aug 64	
BGen John Martin	1 Sep 64	30 Jun 65	
BGen Berg	1 Jul 65	30 Sep 65	
[redacted]			
Col L.S. Norman	1 Sep 68	31 Jul 69	
[redacted]			(b)(3)
Col Frank Buzard	3 Qtr 71	4 Qtr 72	
Col David Parrish	4 Qtr 72		
Col Les McChristian	Jan 83		
Col Richard Randazzo			
Col Donald Hard		Feb 87	
Col David Raspet	Feb 87		
SP-7/CORONA			
Col Lee Battle			
Col Roy Worthington			t o P - 1 6 2 Termination from start of P-241
Col Paul Heran		6 Feb 66	
Col C.L. Murphy	7 Feb 66	26 May 68	
[redacted]			
SP-7/HEXAGON			
Col Frank Buzard	30 Apr 66	3 Qtr 71	
Col R.H. Krumpe	3 Qtr 71	25 Aug 73	
Col Ray Anderson	26 Aug 73		
Col Les McChristian			
Col Larry Cress			(b)(3)
[redacted] GAMBIT			(b)(1) (b)(3)
Col William King		31 Aug 66	
Col R.O. Smith	1 Sep 66	30 Sep 68	
[redacted]			
Col Lee Roberts			
Col Les McChristian			
Col Larry Cress			

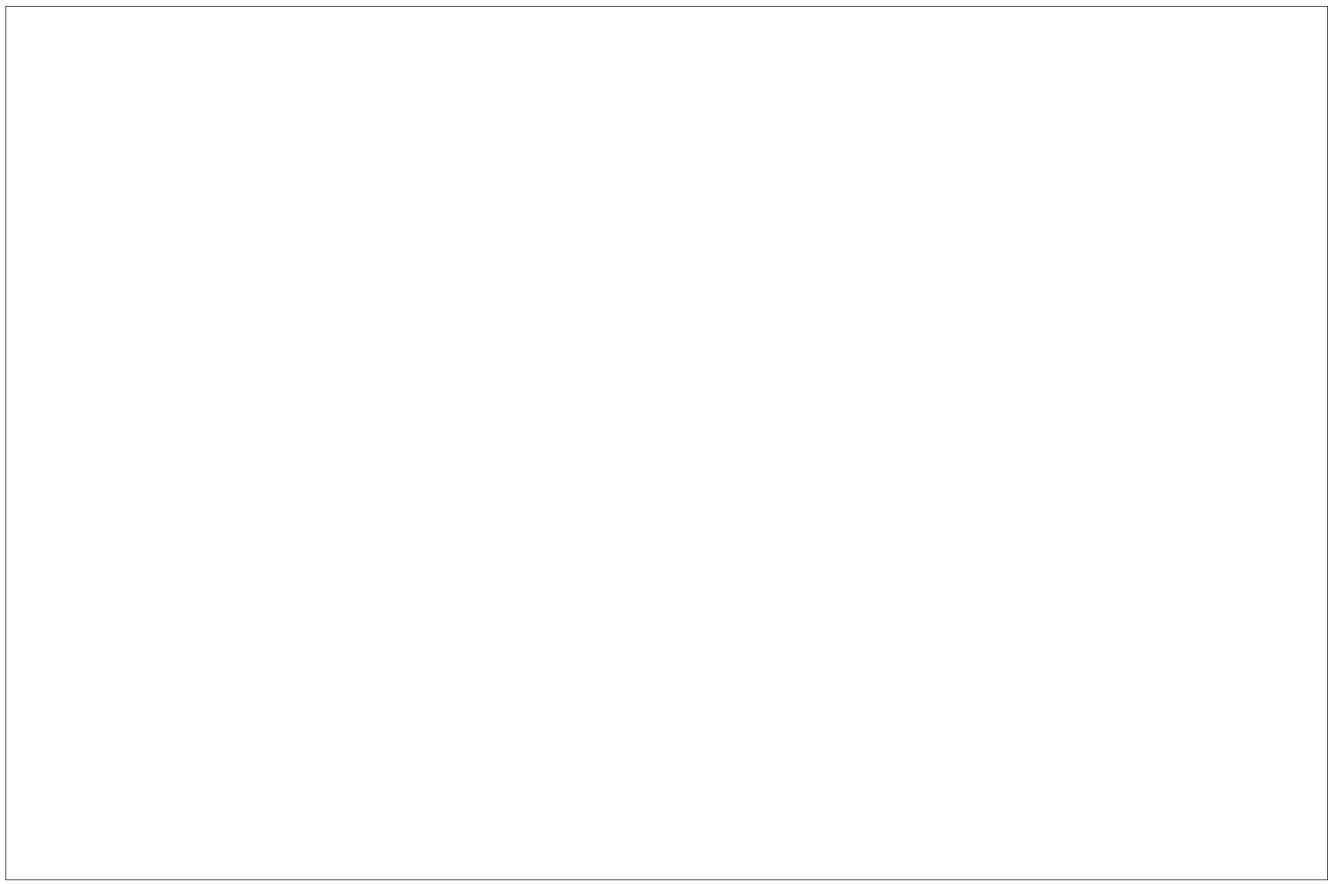
SP-6

Capt Frank Gorman USN		3 Qtr 65
Col Lew Allen	3 Qtr 65	Jul 68
Capt R.K. Geiger USN	Jul 68	2 Qtr 69
[redacted]		
Col Ralph Jacobson	3 Qtr 73	24 Jul 75
[redacted]		

(b)(3)

[redacted]

(b)(1)
(b)(3)



(b)(1)
(b)(3)

DNRO	From	To
Dr. Joseph V. Charyk	6 Sep 61*	1 Mar 63
Dr. Brockway McMillan	1 Mar 63	1 Oct 65
Dr. Alexander H. Flax	1 Oct 65	17 Mar 69
Dr. John L. McLucas	17 Mar 69	20 Dec 73
Mr. James W. Plummer	21 Dec 73	28 Jun 76
Dr. Charles W. Cook (Acting)	28 Jun 76	8 Aug 76
Mr. Thomas C. Reed	9 Aug 76	7 Apr 77
Dr. Charles W. Cook (Acting)	7 Apr 77	3 Aug 77
Dr. Hans Mark	3 Aug 77	8 Oct 79
Dr. Robert J. Hermann	8 Oct 79	
Mr. Edward C. Aldridge, Jr.		

DDNRO		
Dr. Herbert Scoville, Jr.	13 Mar 63	15 Jun 63
Mr. Eugene Kiefer	2 Jul 63	18 Feb 65
James Q. Reber	2 Sep 65	30 Jun 69
F. Robert Naka	1 Jul 69	31 Aug 72
Robert D. Singel	18 Sep 72	29 Jul 74
Charles W. Cook	15 Jul 74	
Donald L. Haas	9 Dec 79	

Director, NRO Staff		
B/G R. D. Curtin	25 Apr 60	1 Jul 62
Col/B/G John L. Martin	1 Jul 62	3 Aug 64
B/G James T. Stewart	3 Aug 64	1 Feb 67
B/G Russell A. Berg	1 Feb 67	19 Jun 69
B/G Lew Allen, Jr.	20 Jun 69	20 Aug 70
Col Edwin F. Sweeney	21 Aug 70	31 May 71
Col/B/G David D. Bradburn	1 Jun 71	7 Jan 73
Col/B/G John E. Kulpa	8 Jan 73	30 Sep 74
Col Harold P. Wheeler	1 Oct 74	17 Mar 76
B/G William L. Shields, Jr.	18 Mar 76	12 Jun 78
Mr. Jimmie D. Hill	12 Jun 78	

* On September 6, 1961, Dr. Charyk was named Assistant for Reconnaissance and was delegated full authority for management of the NRP. On May 2, 1962, the SecDef and DCI signed an Agreement establishing the position of DNRO. On Jun 14, 1962, the DepSecDef formally designated Mr. Charyk as the DNRO.

	From	To
DCI		
Mr. Allen W. Dulles	26 Feb 53	28 Nov 61
Mr. John A. McCone	28 Nov 61	28 Apr 65
V/Adm William F. Raborn	28 Apr 65	26 Apr 66
Mr. Richard Helms	30 Jun 66	2 Feb 73
Mr. James R. Schlesinger	2 Feb 73	2 Jul 73
Mr. William E. Colby	4 Sep 73	29 Jan 76
Mr. George Bush	30 Jan 76	20 Jan 77
Mr. E. H. Knoche (Acting)	21 Jan 77	8 Mar 77
Adm Stansfield Turner	9 Mar 77	27 Jan 81
Mr. William J. Casey	28 Jan 81	
Program A		
M/G Robert E. Greer	20 Sep 60	30 Jun 65
B/G John L. Martin	1 Jul 65	31 Jul 69
B/G William G. King	1 Aug 69	31 Mar 71
B/G Lew Allen	1 Apr 71	31 Jan 73
B/G David D. Bradburn	22 Jan 73	31 Jul 75
B/G/M/G John E. Kulpa, Jr.	1 Aug 75	
Program B		
Mr. Richard Bissel (Res)	6 Sep 61	Mar 62
Dr. Herbert Scoville, Jr. (Res)	Mar 62	14 Jun 63
Dr. Albert D. Wheelon (S&T)	14 Jun 63	23 Sep 66
Col/G/G Ledford		27 Sep 65
Mr. Huntington D. Sheldon	27 Sep 65	13 Jan 67
Mr. Carl Duckett	13 Jan 67	28 May 76
Mr. Leslie C. Dirks	1 Jun 76	

Note: Dr. Bissel and Dr. Scoville were the Deputies for Research in DDS&T and as such did not use the title Director, Program B; during that time Colonel Ledford was designated as Director, Program B. Beginning with Dr. Wheelon, oversight of satellite reconnaissance activities at CIA was brought directly under the DDS&T and designated the CIA Reconnaissance Program. Mr. Dirks has returned to the title Director, Program B.

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~~SECRET~~ **WORKING PAPER**

Chronology of
Selected Satellite Systems
and Some Management Aspects

May 45 - Werner Von Braun reviewed German views on the potential of rocket launched space satellites

03 Oct 45 - USN BuAer proposal to develop a space satellite

Mar-May 46 - RAND satellite study

Feb 47 - RAND satellite reconnaissance study

Sep 47 - USAF formed. USAF starts satellite study

Dec 50 - First satellite components contract

Apr 51 - RAND satellite reconaissance feasibility study (Project Feedback) and another study on weather satellites

May 53 - USAF's ARDC assumes responsibility for space systems

June 53 - ARDC's Project 409-40 starts and gives the advanced reconnaissance space system the name Weapon System WS-117L (WS-117L)

Jan 54 - Project 1115 acquires the unclassified designator Advanced Reconnaissance System (ARS), and an engineering project MX-2226, identified it's activity as an Air Force and RAND enterprise

Mar 54 - RAND final report on Project Feedback study

27 Nov 54 - ARDC System Requirement No. 5 issued to develop a reconnaissance satellite system

Nov 54 - CIA begins Aquatone program to build a covert reconnaissance aircraft, the U-2. LAC gets the contract to build it at the "Skunk Works" in Burbank, CA

16 Mar 55 - USAF General Operational Requirement 80 established a requirement for an

advanced reconnaissance satellite [WS-117l]

Jul 55 - An AF proposal called "World Series" featuring an Atlas first stage and Aerobee-Hi proposed as a Scientific Satellite Program for IGY in 1956, but received scant support because of conflict with WS-117L

29 Jul 55 - U-2 makes first test flight

Oct 55 - Responsibility for WS-117L transferred from WADC to WDD in Los Angeles

Apr 56 - WS-117L Development Plan issued which was based on use of Atlas booster

10 Jun 56 - LMSC, RCA and Martin begin competition study for WS-117L contract

04 Jul 56 - U-2 makes first flight over USSR including Moscow

Aug 56 - WS-117L first funded

Oct 56 LAC wins WS-117L contract. The effort is called Pied Piper. LMSC's proposal based on Atlas booster and upper stage using B-58 Hustler engine. The upper stage would later be named Agena.

[WS-117L components defined as: A-Air frame; B-Propulsion; C-Auxiliary Power; D-Guidance and Control; E-Visual Space Systems; F-Ferret Space Systems; G-Infrared Space Systems; H-Command and Control and Communications; I-Data processing; K-Personnel; L-Biomedical Recovery]

Jun 57 - RAND published a reconnaissance satellite recovery study

04 Oct 57 - Sputnik launched by Soviet Union. Space Age begins

24 Oct 57 - Thor missile successfully completes a 2,645 NM flight test. Atlas would not have a successful range test until 28 Nov 58

29 Oct 57 - Second Story approved by SECDEF. It proposed a covert satellite reconnaissance system using Thor as booster.

05 Dec 57 - Reconnaissance satellite recovery part of WS-117L "cancelled"

06 Jan 58 - LAC proposes using Thor and Agena upper stage

22 Jan 58 - NSC Action 1846 assigned highest priority to development of an operational satellite reconnaissance satellite

07 Feb 58 - President assigns CIA responsibility for developing a covert recoverable satellite system. Its codeword is CORONA.

07 Feb 58- ARPA formed. Assumes control of DoD space programs

Feb 58 - LMSC begins Thor/Agena development

Mar 58 - CORONA program begins. It is terminated in Jun 72.

Mar 58 - Discoverer program begins. It is "terminated" after Discoverer - 38 launch on 27 Apr 64

May 58 - Sentry program begins [E-series of WS-117L, i.e. E-1, E-2, E-3, E-4, E-5, and E-6. Sentry named changed to SAMOS in Aug 59]

E-1 program, Readout (RO) method, begins 1956, terminated Feb 61. 2 launch attempts.

E-2 program (RO) begins 1958, terminated Sep 61. 1 launch attempt.

E-3 program (RO) begins Sep 58, terminated Dec 59

E-4 program, Recovery (REC) method, begins Sep 58, cancelled in 1959, reinstated Oct 60 and program completed Jan 62.

E-5 program (REC) begins Sep 58, cancelled Jun 59, reinstated Sep 59 and terminated Dec 61. 3 launch attempts.

E-6 program (REC) begins Jul 60 (evolved from E-5) with last flight Mar 62. 5 launch attempts.

There were a total of 11 SAMOS launch attempts.

F-1 program begins 1956, terminated Jan 61

F-2 program begins 1956, payloads moved to Thor in Oct 60

G-series programs begin in 1956 by LMSC. Program evolves and includes designator changes: 117L/Midas -- LMSC Nr 564--239A--461--266--949--647--DSP

Sep 58 - Director ARPA orders USAF to quit using WS (Weapon System) designator for US satellites

Nov 58 - DoD announces names of Program 117L satellites are Discoverer, Sentry and Midas. Discoverer is a scientific satellite concerned with biomedical recoveries from space

28 Nov 58 - First successful full-range flight of 6,325 miles for Atlas missile

Jan 59 - Discoverer public statement states it is a scientific (biological recovery) satellite system

28 Feb 59 - Discoverer 1 launched. Flt fails

Aug 59 - Sentry named changed to SAMOS

23 Sep 59 - DoD returns control of Discoverer, Samos and Midas from ARPA to USAF

01 May 60 - Gary Powers shot down in U-2 over Sverdlovsk, USSR

05 Jul 60 - USIB issues requirements for denied area information

10 Aug 60 - First successful Discoverer (13) launch and bucket return. No film contained in bucket, just diagnostic instrumentation

18 Aug 60 - First space reconnaissance photographs returned.

25 August 1960 - The space reconnaissance photographs shown to President. He directs space reconnaissance photography be accorded strictest security protection. Keyhole subcompartment added to the Talent Control System formed for U-2 imagery. Also he receives results of review that space reconnaissance imagery programs are worth

receives results of review that space reconnaissance imagery programs are worth pursuing. He directs that SAMOS be removed by regular AF chain of command and placed under streamlined management approach, which includes covert aspects to it, and which are used by the U-2 and CORONA program.. Also directs that plannig proceed to create an office to consolidate the nation's space reconnaissance activities. Essentially the National Reconnaissance Program was established on this date.

Camera designators for different CORONA systems would be KH-1, 2, 3, 4, 4A, 4B, 5 ,6. Some project names for these variants are MURAL, ARGON, LANYARD.

31 Aug 60 - SAFMS (later named SAFSS) and SAFSP are established by SAF Special Orders 115.1 and 116.1. The Director of SAFSP (Secretary of th the Air Force SAMOS Project) will report directly to SAF bypassing ARDC and Hq USAF staffs.

11 Oct 60 - First SAMOS launch Program product designators would 2100, 2200, 2400

29 May 61 - Hq USAF Office Instruction 25-5, "Basic Policy Concerning SAMOS" issued at the Secret level notified regular AF elements closing down any public releases and all operational aspects regarding SAMOS. Lastly SAMOS would bbstill exist in AF budget line and would be continued to be known as an R&D effort for developing various satellite reconnaissance techniques.

06 Sep 61 - NRO formally established. The Offfice would include besides the Director, his staff (SAFSS), a Comptroller, and Programs A, B, C and D.

21 Nov 61 - SAFSP name changed to Secretary of the Air Force Special Projects.)

Early 1962 - BYEMAN codeword given to NRO by CIA/SSC for the name of its overall control system. The codeword would be restricted mostly to government agencies until about 1968 when it was fully released to contractors. Materials were handled at the Secret/Special Handling level referred as Secret S/H in the interim.

11 Nov 62 - Eleventh and final SAMOS launch. (11 launch attempts)

27 Apr 64 - With launch of Discoverer 38 program is ended. [39 launch attempts]

25 May 72 - Final CORONA launch [146 launch attempts, of which 10 were non-mission related]

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