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B

Office of Special Projects

1965 - 1970

VOLUME FOUR APPENDIXES B, C, & D & ANNEX I

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OFFICE OF SPECIAL PROJECTS

1965 - 1970

VOLUME FOUR APPENDIXES B, C, & D & ANNEX I

OSP-1

by

[redacted]

Approved by:

[redacted]
Director
Science and Technology
June 1973

HISTORICAL STAFF

CENTRAL INTELLIGENCE AGENCY

APPENDIX B - CHRONOLOGY

1958 - 1970

1958

28 February	Air Force Ballistic Missile Division's photo-reconnaissance satellite system with recoverable capsule ordered cancelled by Director, Advanced Research Projects Agency, to make way for a revised, secret project under joint CIA/Air Force management, Project CORONA.
24 March	First technical meeting with prime contractor for CORONA (Lockheed Missile Systems Division) by new joint management personnel, led by Brigadier General Osmond J. Ritland, USAF, and Mr. Richard M. Bissell, Jr., CIA.
1 April	Mr. Richard M. Bissell, Jr., named Special Assistant to the DCI for Planning and Development and given additional duties in the over-all research area for all CIA.
1 April	Advanced Project Facility to support CORONA system integration and testing established in [redacted] building in Palo Alto, California, under Lockheed contract.
15 April	CORONA Project Outline prepared by Mr. R. M. Bissell, Jr., in coordination with ARPA, Air Force and White House.
16 April	White House approval of CORONA received via Brigadier General Andrew J. Goodpaster, Special Assistant to President Eisenhower.
25 April	The DCI, Mr. Allen W. Dulles, approved expenditure of $7 million in FY 1958 from the Agency Reserve for Contingencies, to pay for the CORONA payloads; General Counsel concurrence received.
29 April	Letter contract signed with Lockheed Missile Systems Division for production of first

1958 (cont'd)

	order of CORONA systems (effective date of contract 15 March 1958); LMSD to subcontract camera to Itek and recovery vehicle to General Electric.
5 May	Itek subcontract written with Fairchild Camera and Instrument Company for design, engineering and fabrication of the high acuity panoramic camera (HYAC II) for CORONA.
1 June	[redacted], USAF, appointed Chief, Development Projects Staff, vice [redacted], returned to USAF.
23 June	Initial CORONA Cover Story published to Development Projects Staff, Air Force staff and contractors supporting CORONA; launchings were to be explained as a test series to learn the effects of re-entry.
1 August	The 6593rd Test Squadron (Special) activated by General Order, to deploy to Hickam Air Force Base, Hawaii, for duty in retrieving CORONA recovery vehicle nosecones.
8 August	Revised Project Outline for CORONA prepared by Mr. Richard M. Bissell, Jr., to cover increase in cost estimates.
3 December	Press conference held by Director of ARPA, Dr. Roy W. Johnson, to give out some background information on the configuration and purpose of the DISCOVERER satellite, the name used publicly to cover the CORONA series.

1959

1 January	Mr. Richard M. Bissell, Jr., named Deputy Director for Plans.
6 January	All members of the Ad Hoc Requirements Committee (ARC) cleared for CORONA.

1959 (cont'd)

21 January	First Thor-Agena satellite (without payload) exploded on the pad at Vandenberg.
16 February	Agency air operations under the Development Projects Staff (including both manned and satellite projects) amalgamated with other Agency air activities under the Development Projects Division, DD/P.
28 February	First successful firing of a CORONA booster (no camera payload included); the satellite orbited but damaged antenna prevented obtaining signals except through skin-tracking.
11 March	CORONA Project Outline revised again to extend the project through 1960, adding twelve flights to the eight previously programmed.
1 June	Lieutenant Colonel Charles L. Murphy, USAF, assigned to the A/P Facility in Palo Alto as CORONA Liaison Officer with the contractors and the [redacted]
23 June	Mr. Daniel M. Kelly assigned Chief of the DPD Contracts Branch, vice Mr. George F. Kucera, resigned.
25 June	First CORONA flight with camera payload; failed to orbit.
7 July	Supplement added to CORONA program to cover Project ARGON (Army Map Service geodetic mapping satellite program); approved by White House.
26 July	Second procurement of CORONA systems contracted for with LMSD (eight C Prime camera systems and recovery vehicles).
24 September	Air Force given prime role in military space program; ARPA relinquished supervision of development of CORONA vehicle to Air Force.

1959 (cont'd)

30 November	Advanced Projects Facility at Palo Alto added to the special communications network with direct, secure line to Langley Headquarters.
1960	
30 January	Itek (Lexington, Mass.), and Fairchild Camera and Instrument Company (Oyster Bay, L.I.) added to the secure communications channel to Langley Headquarters.
1 June	[redacted] assigned as Acting Chief, DPD, vice [redacted] returned to USAF.
7 June	Third procurement of CORONA camera systems (six additional C Triple Prime systems) contracted for with LMSD.
29 June	CORONA/DISCOVERER XII with diagnostic payload (no camera) fired; failed to orbit.
8 July	[redacted] named Chief, Security Staff, DPD, vice [redacted] resigned.
10 August	CORONA/DISCOVERER XIII, with diagnostic payload (no camera) successfully launched and retrieved from the Pacific with aid of a frogman and helicopter. First successful recovery of a capsule from outer space on 11 August 1960.
18-19 August	CORONA/DISCOVERER XIV, with CORONA camera payload, retrieved from space after successful orbit. First successful airsnatch of a capsule.
21 September	[redacted] appointed Chief, Contracts Branch, DPD, vice Mr. Daniel M. Kelly, reassigned.

1961

16 February	CORONA Configuration Control Board set up with Air Force and CIA membership to pass on technical changes in the CORONA configuration.
20 March	Fourth procurement of CORONA systems; six additional C Triple Prime dual camera systems with stereo capability (MURAL); contracts ~~initiated separately with LMSD, Itek, and GE.~~
13 June	USIB approved giving intelligence from photo-reconnaissance satellite collection to the British.
6 September	Initial letter of agreement on establishment of a National Reconnaissance Program (NRP) signed by the DDCI, Lieutenant General C. P. Cabell, and the Deputy Secretary of Defense, Mr. Roswell Gilpatric.
20 December	Resolution 1721, UN General Assembly, Session XVI, called on all member states to report on all objects launched into orbit or beyond to the UN Committee on Peaceful Use of Outer Space.

1962

13 January	DISCOVERER XXXVII launched, the last in the series for which an unclassified cover story was handed out to newsmen.
17 February	Mr. Richard M. Bissell, Jr., resigned from his position as Deputy Director for Plans. He was succeeded by Mr. Richard Helms.
19 February	Dr. Herbert Scoville named Deputy Director for Research.
27 February	First CORONA/MURAL satellite launched successfully with use of two cameras to give stereo-photography; recovered 3 March 1962.

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1962 (cont'd)

23 March	DOD Directive S-5200.13, Security Policy for Military Space Programs, issued by Deputy Secretary of Defense Roswell Gilpatric, directing that all details of military space programs be classified.
3 April	Major General Marshall S. Carter, USA, appointed DDCI.
10 April	Mr. Lyman B. Kirkpatrick appointed Executive ~~Director by the DCI, Mr. John A. McCone.~~
15 April D	Development Projects Division's special projects (including CORONA) transferred to the Deputy Director for Research.
18 April	Press informed by Air Force spokesman of issuance of DOD Directive classifying all details of military space programs.
2 May	NRO Agreement signed by Messrs. McCone and Gilpatric; no provision was made for a CIA-designated Deputy Director of NRO, and all funding authority was given to the NRO.
3 May	Dr. Joseph V. Charyk named Director, NRO, by Mr. Gilpatric; Dr. Charyk also wore the hat of Under Secretary of the Air Force. He was confirmed by DOD Directive of 14 June 1962.
10 July	Promulgation of US policy on outer space, including satellite activity, by the National Security Council.
30 July	Office of Special Activities established under the DD/R (including assignment to it of all manned and satellite reconnaissance projects).
1 August	[redacted] named Acting Assistant Director for Special Activities.

1962 (cont'd)

4 September — [redacted] USAF, named Assistant Director for Special Activities; [redacted] then became Deputy Assistant Director for Special Activities.

11 September — Dr. Herbert Scoville, DD/R, agreed with Dr. Charyk (DNRO) to relinquish CIA control of the Satellite Operations Center and to remove it from [redacted] this was accomplished in April 1963.

1963

12 January — Fifth CORONA procurement; 20 additional CORONA J (dual bucket) systems, using the Thrust-Augmented-Thor booster, contracted for with LMSD, Itek, and GE.

23 January — Dr. Eugene G. Fubini named interim DNRO on departure of Charyk (serving also as Deputy Director for Defense Research and Engineering until 1 March 1963).

1 March — Dr. Brockway McMillan named DNRO in addition to his position as Under Secretary of the Air Force.

13 March — An "Agreement between the Secretary of Defense and the Director of Central Intelligence on Management of the National Reconnaissance Program" signed by Messrs. McCone and Gilpatric; it provided for a CIA-designated Deputy Director of NRO.

21 March — Dr. Herbert Scoville nominated as Deputy Director, NRO, by Mr. McCone, and accepted by Deputy Secretary of Defense Gilpatric.

12 April — Satellite Operations Center transferred [redacted] of [redacted] designated as [redacted] liaison at the new

1963 (cont'd)

center, and later was made Chief of SOC [redacted]

14 June — Dr. Herbert Scoville resigned as DD/R and as DDNRO.

15 June — [redacted], USAF, designated Acting DD/R.

30 June — [redacted]

2 July — Mr. Eugene P. Kiefer of OSA was named DDNRO to succeed Dr. Scoville.

5 August — [redacted]

24 August — First launch of a J-1 double recovery CORONA satellite; first bucket retrieved 28 August; second lost due to overtemp.

8 September — [redacted]

1 October — [redacted]

13 November — [redacted]

1964

10 January — [redacted]

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1964 (cont'd)

15 March [redacted]

8 April [redacted]

10 April Air Force CORONA support office [redacted] the AFBMD group at Palo Alto) cancelled and CORONA/DISCOVERER support taken over by [redacted] Commander reporting directly to [redacted]

15 April [redacted]

25 June [redacted]

30 June [redacted]

10 July [redacted]

15 July [redacted]

29 July [redacted]

11 August [redacted]

1964 (cont'd)

[redacted]

18 August [redacted]

31 August [redacted]

31 August [redacted]

1 September Agreement between Mr. McCone and the Deputy Secretary of Defense, Mr. Vance, that no changes were to be made in CORONA contracting procedures until the entire CORONA management problem had been agreed by the NRP Executive Committee as a part of a new NRO Agreement.

12 October [redacted]

30 November [redacted]

1965

23 February [redacted]

26 February DD/S&T sought from the DDCI approval in principal to establish a separate satellite office within DD/S&T to handle all satellite reconnaissance activities (CORONA, [redacted]. Action was held in abeyance until September 1965.

3 March [redacted] named Chief of Systems Analysis Staff, O/DD/S&T.

22 March [redacted]

30 March [redacted]

31 March A contingency plan for accidents or incidents relating to reconnaissance satellites was promulgated by the DNRO.

8 April [redacted]

28 April RAdm. William F. Raborn and Mr. Richard Helms sworn in as the new Director and Deputy Director, respectively, of CIA.

4-22 June [redacted]

29 June The DNRO approved modification of the CORONA system to J-3 (the constant rotator camera). Sixth CORONA procurement of 12 J-3 systems contracted with LMSD, Itek and GE.

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1965 (cont'd)

21 July	Land Reconnaissance Panel of PSAC, constituted to maintain overview of the National Reconnaissance Program, held its first meeting, and was briefed on the competing CIA and Air Force programs for a follow-on search and surveillance satellite system.
13 August	New NRO Agreement for reorganization of the National Reconnaissance Program signed by Admiral Raborn and Deputy Secretary of Defense Cyrus R. Vance; CIA made responsible for sensor of new search system; Executive Committee formalized with added White House membership.
13 August	[redacted]
20 August	[redacted] appointed Chief, Special Projects Staff, DD/S&T, vice [redacted] resigned effective 22 October 1965.
1 September	Mr. James Q. Reber appointed DDNRO by the DCI, vice Mr. E. P. Kiefer, resigned 18 February 1965.
15 September	Office of Special Projects established in the Directorate for Science and Technology; [redacted] appointed Director of Special Projects, and Mr. John N. McMahon, Deputy Director.
15 September	Mr. Huntington D. Sheldon named Director of Reconnaissance, CIA, by Admiral Raborn, on an interim basis.
23 September	[redacted]
1 October	Joint agreement between OSP and OSA on management concept and transfer of resources.

1965 (cont'd)

1 October — Dr. Alexander Flax appointed DNRO vice Dr. Brockway McMillan, resigned.

14 December — [redacted]

1966

26 January — [redacted]

14 February — [redacted]

22 March — [redacted]

19 April — Director of OSP charged with responsibility for nomination of CIA assignees to NRO Staff and their administrative support during their tour of duty at NRO.

26 April — NRP Executive Committee approved management plans for CORONA [redacted]. OSP was assigned responsibility for the CORONA payload, [redacted]

9 May — [redacted]

1966 (cont'd)

16 May	Mr. Huntington D Sheldon, Director of Reconnaissance, CIA, relieved of duties as Special Assistant to the DD/S&T and transferred with his reconnaissance and [redacted] duties to the position of Special Assistant to the Director.
16 May	[redacted] named Assistant DD/S&T.
30 June	Mr. Richard Helms appointed DCI, vice ~~Admiral Raborn~~, retired.
22 June	DNRO directive issued setting forth new CORONA management plan; CIA to have responsibility for CORONA Payload Sub-Assembly Project Office, and the Director, [redacted], to have responsibility of System Project Director.
17 August	[redacted]
29 August	[redacted]
31 August	[redacted]
13 September	[redacted]
26 September	Dr. A. D Wheelon resigned as DD/S&T effective this date, and [redacted] was made Acting DD/S&T.
19 October	Program Controls Branch, OSP chartered to furnish management controls information on all OSP programs.

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1966 (cont'd)

9 December [redacted]

9 December [redacted]

1967

6 January [redacted]

13 January Mr. Huntington D. Sheldon relieved of responsibilities as Director of Reconnaissance, but to continue to support the DCI in the NRP Executive Committee; [redacted] the Acting DD/S&T to act on the DCI's behalf in the management of CIA's NRP projects and in dealing with the DNRO.

20 April [redacted]

5 June [redacted] named Assistant DD/S&T, [redacted]

19 June [redacted]

15 September First J-3 CORONA (constant rotator camera) launched; both film buckets successfully retrieved on 21 and 28 September 1967.

9 November [redacted] DD/S&T, given full responsibility for supporting the DCI in all matters relating to overhead reconnaissance.

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1968

24 January — The 100th CORONA satellite fired from Vandenberg Air Force Base and its two film buckets were successfully retrieved on 1 and 8 February 1968, respectively.

28 February — Planning, Programming and Budgeting Branch, PAD/OSP, established in place of the abolished Program Controls Branch; [redacted] designated Chief.

30 April — [redacted]

13 November — [redacted]

18 December — [redacted]

1969

4 February — [redacted]

21 March — [redacted] resigned as Assistant DD/S&T to work in industry.

1 July — [redacted] appointed DDNRO, vice Mr. James Q. Reber, reassigned.

24 July — [redacted]

29 July — [redacted]

1969 (cont'd)

1 August — CORONA and [redacted] staffs of OSP integrated to form "Photographic Systems Division."

15 August — [redacted]

1 November — [redacted] appointed Assistant DD/S&T.

1970

5 February — The DCI agreed with the stretch-out of the CORONA program to overlap [redacted] a year, and not to purchase any additional CORONA payloads.

13 March — [redacted]

17 April — [redacted]

27 April — [redacted]

21 June — [redacted]

20 July — [redacted]

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1970 (cont'd)

[redacted]

20 July — A Contracts Staff, reporting directly to the Director of Special Projects, established in lieu of the Contracts Branch, PAD, OSP. [redacted] named Chief, Contracts Staff, OSP.

20 July — The position of Chief Scientist under the D/SP established; [redacted] named to the new post in addition to his position as Chief, Design and Analysis Division.

25 July — [redacted]

27 July — [redacted] assigned as Chief, Program Administration Division, OSP, vice Mr. James McDonald, reassigned.

16 September — [redacted] appointed Personnel Officer, OSP.

16 November — [redacted] appointed Director of Special Projects, vice [redacted] retired effective 31 December 1970.

9 December — [redacted]

APPENDIX C - ADMINISTRATIVE ISSUANCES

Tab No.

1. DD/S&T General Notice No. 39, 20 August 1965; [redacted] appointed Chief, Special Projects Staff, DD/S&T, vice [redacted].
2. [redacted]
3. [redacted]
4. [redacted]
5. [redacted]
6. [redacted]
7. [redacted]
8. [redacted]
9. [redacted]
10. [redacted]

Tab No.

11. [redacted]

12. [redacted]

13. [redacted]

14. [redacted]

15. [redacted]

16. [redacted]

17. [redacted]

18. [redacted]

19. [redacted]

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20 August 1965

DIRECTORATE OF SCIENCE AND TECHNOLOGY

GENERAL NOTICE NO. 39

1. Effective 20 August 1965, [redacted] is appointed Chief, Special Projects Staff, DD/S&T, vice [redacted].

2. [redacted] is appointed Special Assistant to the Chief, Special Projects Staff.

[redacted]
Executive Officer
Directorate of
Science and Technology

Distribution: [redacted]

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GROUP I
Excluded from Automatic
Downgrading and
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NOTICE OF REMOVED PAGES

The next 31 pages are not provided because their full text does not contain CORONA, ARGON, LANYARD programmatic information.

APPENDIX D - CHARTS AND TABLES

Tab No.

1. [redacted]

2. [redacted]

3. [redacted]

4. [redacted]

5. [redacted]

6. [redacted]

7. [redacted]

8. [redacted]

9. Evolution of CORONA Camera System Characteristics, Extracted from [redacted], CORONA Fact Book, ~~TS~~/C, Prepared by [redacted] OSP/CORONA.

10. CORONA Photo-Reconnaissance Program, 1958-1970, Compiled from [redacted], Figure 7, ~~TS~~/C, and [redacted], CORONA Fact Book, ~~TS~~/C.

11. CORONA Film Recovery: Buckets Launched, Orbited and Recovered by Years, 1959-1970, ~~TS~~/C.

12. CORONA Film Return History, 1959-1970, ~~TS~~/C.

13. Average Shipment, Transfer, and Processing Time of CORONA Priority Material, ~~TS~~/C.

14. CORONA Coverage of Sino-Soviet Bloc Between December 1969 and June 1970, [redacted], ~~TS/RUFF/TKH~~.

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EVOLUTION OF CORONA SYSTL. CHARACTERISTICS

	C	C'	C'''	M	J-1	J-3
Camera Mfr.	Fairchild	Fairchild	Itek	Itek	Itek	Itek
Units Built	10	10	6	26	52	17
Lens Mfr. Design Type	Itek Tessor, 24-in., f/5.0	Itek Tessor, 24-in., f/5.0	Itek Petzval, 24-in., f/3.5	Itek Petzval, 24-in., f/3.5	Itek Petzval, 24-in., f/3.5	Itek Petzval, 24-in., f/3.5
Camera Type	70° Pan Vertical Recip.	70° Pan Vertical Recip.	70° Pan Vertical Recip.	70° Pan 30° Stereo Recip.	70° Pan 30° Stereo Recip.	70° Pan 30° Stereo Rotating
Exposure Control	Fixed	Fixed	Fixed	Fixed	Fixed	4 selectable
Filter Control	Fixed	Fixed	Fixed	Fixed	Fixed	2 selectable
Primary Film Base	1213/ acetate	1221/ poly-ester	4404/ poly-ester	4404/ poly-ester	3404/ poly-ester	3404;3414/ polyester
Recoverable Vehicles	1	1	1	1	2	2
S/I Subsystem	0/0	0/0	0/0	1/1	2/2	2/1
Time Period	1959-60	1960-61	1961-62	1962-63	1964-69	1967-71

Extracted from [redacted]
CORONA Fact Book prepared by
[redacted], OSP/CORONA.

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CORONA PHOTO-RECONNAISSANCE PROGRAM

1958-1970

(Including ARGON and LANYARD Missions)

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The statistics in the attached compilation were derived from:

[redacted] Figure 7, History of the Office of Special Projects, prepared by [redacted] Executive Officer, OSP, et al (~~TS~~/COR/[redacted].

[redacted] CORONA Project Fact Book, prepared by [redacted] CORONA Staff Officer (~~TS~~/COR).

CORONA PHOTO-RECONNAISSANCE PROGRAM, 1958-1970

Mission No.	Payload Type/No.	Flight Date	Recovery	Comments
-	Thor/Agena test	2/28/59		No capsule flown; orbit confirmed by radar skin track since radio antenna damaged at launch and did not transmit.
-	Biomedical, mechanical specimens	4/13/59		Achieved orbit but incorrect setting of timing device caused the capsule to eject prematurely over Norway. Not found.
-	Biomedical, live specimens	6/3/59		Contained four live black mice; Agena failed to orbit; went down in the Pacific.
9001	C-1	6/25/59		Agena failed to orbit.
9003	C-3	8/13/59		Low temperatures; not recovered; camera failed after transport of .4 lb. of film.
9002	C-2	8/19/59		Retro-rocket malfunction; not recovered; camera failed on revolution 2.
9004	C-4	11/7/59		Agena failure; no orbit.

Extracted from [redacted] and

Msn. No.	Payload/Type No.	Flight Date	Recovery	Comments
9005	C-5	11/20/59		Eccentric orbit; wrong altitude; instrument failure; not recovered.
9006	C-6	2/4/60		Agena failed to orbit.
9007	C-7	2/19/60		Agena failed to orbit.
9008	C-8	4/15/60		Spin rocket failure; not recovered; camera operation okay.
	Diagnostic	6/29/60		Agena failed to orbit; diagnostic.
	Diagnostic	8/10/60	8/11/60	Successful; water pick-up; diagnostic.
9009	C-9	8/18/60	8/19/60	Successful air catch; instrument operation okay.
9010	C-10	9/13/60		Vehicle pitch attitude improper at re-entry; capsule sunk before recovery; camera operation okay.
9011	C'-1	10/26/60		"D" timer malfunction; Agena failed to orbit.
9012	C'-2	11/12/60	11/14/60	Successful air catch; payload broke.
9013	C'-3	12/7/60	12/10/60	Successful air catch; instrument operation okay.

Msn. No.	Payload/Type No.	Flight Date	Recovery	Comments
	RM-1	12/20/60		No SRV installed.
9014	ARGON-1	2/17/61		Orbital programmer failed at rev. 31; instrument failed; still in space; no shutter firings.
	RM-2	2/18/61		No SRV installed.
9015	C'-4	3/30/61		Agena failure; no orbit.
9016	ARGON-2	4/8/61		Recovery attempted on rev. 31 due to loss of control gas; still in space; instrument operation okay.
9018	ARGON-3	6/8/61		Agena failure; power failure and guidance problem causing ocean impact.
9017	C'-5	6/16/61	6/18/61	Successful water pick-up.
9019	C'-6	7/7/61	7/9/61	Successful air catch; instrument failed on rev 22.
9020	ARGON-4	7/21/61		No orbit; Thor guidance destruct.
9021	C'-7	8/3/61		Agena guidance failure.
9023	C'''-1	8/30/61	9/1/61	Recovery on rev 32; instrument okay.

Msn No.	Payload/Type No.	Flight Date	Recovery	Comments
9022	C'''-2	9/12/61	9/14/61	Successful aircatch; recovery on rev 33.
9024	C'''-3	9/17/61		Successful orbit; power failure before recovery; camera operated okay, but quit at 400 cycle failure.
9025	C'''-4	10/13/61	10/14/61	Successful air snatch; suspect Agena power problem caused recovery on rev 18.
9026	C'-8	10/23/61		Second stage Agena failed; went into sea after take-off.
9027	C'-9	11/5/61		Successful orbit; due to gas valve failure no recovery was made; still in space; instrument operation okay.
9028	C'-10	11/15/61	11/16/61	One day operation due to shortage of control gas; instrument operation okay; recovery bucket re-used.
9029	C'''-5	12/12/61	12/16/61	Successful orbit; recovered on rev 64; successful water pick-up; instrument operation okay.
9030	C'''-6	1/13/62		Agena failure; no orbit.

Msn No.	Payload/Type No.	Flight Date	Recovery	Comments
9031	CM-1	2/27/62	3/3/62	Successful orbit; ablative shield recovered intact; air snatched; instrument okay; f/c failed; full spools p/l.
9032	CM-2	4/17/62	4/20/62	Successful orbit; air catch; instrument okay; guidance system operation okay.
9033	CM-3	4/28/62		Successful orbit; operational malfunction on orbital timer, failed to eject chute; chute ejector squibs failed; sunk.
9034	ARGON-5	5/15/62	5/19/62	Successful air recovery; bellows missing; H-timer and shutter timer malfunction; instrument operation okay otherwise.
9035	CM-4	5/29/62	6/1/62	Successful air recovery; no f/c operation; chute strap burned off; 200 miles out of ballpark due to command dump sequence.
9036	CM-5	6/1/62		Successful orbit; chute tore loose, SRV went into ocean; floated 3 minutes, then sank; instrument operation okay.
9037	CM-6	6/22/62	6/25/62	Successful air recovery; chute cords intact; air snatch at 12,000 ft. 1st pass; no known malfunctions.

Msn No.	Payload/Type No.	Flight Date	Recovery	Comments
9038	CM-7	6/27/62	7/1/62	Successful air recovery; first Agena D burned too long causing 3 min. high on period ; instru-operation okay; F/c bad.
9039	CM-8	7/20/62	7/22/62	Successful air recovery; thru normal sequence; f/c full; H-timer malfunction; instrument operation only 14%.
9040	CM-9	7/27/62	7/31/62	Successful air recovery; instrument okay; f/c failed due possibly to metering switch and solenoid quitting.
9041	CM-10	8/1/62	8/5/62	Successful air recovery; instrument operation okay; f/c full.
9044	CM-11	8/28/62	9/1/62	Successful air recovery through normal sequence; instrument operation okay; f/c didn't function properly.
9042	ARGON-10	9/1/62		Successful instrument operation; planned to recover after 65th rev but chute tore from SRV during air pickup; no f/c flown.
9043	CM-12	9/17/62	9/18/62	Successful air recovery; no p/l in f/c; 100 mile perigee and radiation factor involved; instrument operation okay.

Msn No.	Payload/Type No.	Flight Date	Recovery	Comments
9045	CM-13	9/29/62	10/2/62	Successful air recovery; f/c full; water seal on main instrument side failed to close; p/l not cut.
9046	ARGON-9	10/9/62	10/13/62	Successful air recovery; vehicle 70 miles out of apogee; intended for 170 but went 242; shutter timer malfunction.
		10/26/62		Deep probe radiation.
9047	CM-14	11/5/62	11/9/62	Successful air recovery; f/c full; instrument operation perfect.
9048	CM-15	11/24/62	11/29/62	Successful air recovery; f/c failed; instrument operation okay; capsule pickup 32 miles from Honolulu.
9049	CM-16	12/4/62		Successful orbit; during air snatch skyhook tore chute; SRV sank; 2 day orbit due to 80 mile perigee.
9050	CM-17	12/14/62	12/18/62	Successful air recovery; S/I unit full; instrument operation okay.
9051	CM-18	1/7/63	1/11/63	Successful water pickup; instrument operation okay; 1,000 miles out of ballpark; Agena pitch; both antennas burned in half.

Msn No.	Payload/Type No.	Flight Date	Recovery	Comments
9052	CM-20	2/28/63		First TAT; 3rd TAT booster failed to separate; destruct 100 seconds after launch.
8001	LANYARD-1	3/18/63		Second TAT worked perfectly; no orbit due failure pneumatic guidance on Agena booster.
9053	CM-19	4/1/63	4/4/63	Successful air recovery, after 49 revs due Agena power supply problem, 400-cycle inverter failed; instrument okay.
9055	ARGON-12	4/26/63		No orbit achieved; attitude sensors misaligned; perfect launch.
8002	LANYARD-2	5/18/63	5/20/63	Decoder 103 no activate signal; erratic orbit, Agena boost too strong; D-timer 4 seconds slow; recovery after 33 revs.
9054	CM-21	6/12/63	6/16/63	Successful air recovery; mock "P" instrument; instrument operation okay.
9056	CM-22	6/26/63	6/30/63	Normal recovery operation; first "P" instrument; "P" door failed to eject; instrument operation okay.

Msn No.	Payload/Type No.	Flight Date	Recovery	Comments
9057	CM-23	7/18/63	7/22/63	Successful air recovery; lost center foremat closure on slave unit; temperature in orbit was in mid 80's.
8003	LANYARD-3	7/30/63	8/1/63	Successful air recovery; instrument operation only thru rev 23; instrument malfunction.
1001	C-J-1A	8/24/63	8/28/63	Successful air recovery;S/I failure; first J system flown; main instrument operation okay.
	C-J-1B	8/24/63		Tried recovery after 12 days; 400 cycle inverter on Agena failed; S/I intermittent; temperature sensor showed vehicle hot.
9058	ARGON-11	8/29/63	9/2/63	Successful air recovery; instrument operation perfect.
1002	C-J-2A	9/23/63	9/26/63	Successful air recovery; master unit on cassette failed; misadjustment on puck arm; consistant light leaks.
	C-J-2B	9/23/63		Tried to recover on rev 165 but commands failed due to decoder failure in vehicle.
9059	ARGON-6	10/29/63	11/3/63	Successful air recovery; perfect instrument operation; best "A" system flown to date.

Msn No.	Payload/Type No.	Flight Date	Recovery	Comments
9060	CM-24	11/9/63		System became unstable 90 sec. after launch; down at sea.
9061	CM-25	11/27/63		Tried to recover after rev 81 but capsule did not eject properly.
9062	CM-26	12/21/63	12/26/63	Successful air recovery; perfect instrument operation.
1004	C-J-5A	2/15/64	2/18/64	Successful air recovery; instrument operation very good.
	C-J-5B	2/15/64	2/22/64	Successful air recovery; instrument operation good.
1003	C-J-6A	3/24/64		No orbit due to Agena failure (regulated power failure).
	C-J-6B	3/24/64		
1005	C-J-8A	4/27/64		Successful launch and orbit; no power from Agena due to pyro buss failure; slave instrument failed, due to film material breakage.
	C-J-8B	4/27/64		
1006	C-J-9A	6/4/64	6/8/64	Successful air recovery; 2nd door stuck for 2 orbits; instrument operation good.
	C-J-9B	6/4/64	6/12/64	Successful air recovery; instrument operation good.

Msn No.	Payload/Type No.	Flight Date	Recovery	Comments
9065	ARGON-21	6/13/64	6/19/64	Successful air recovery; instrument operation good; cloud coverage 60-70%.
1007	C-J-7A	6/19/64	6/23/64	Successful air recovery; instrument operation good; resolution good.
	C-J-7B	6/19/64	6/27/64	Successful air recovery; instrument operation good.
1008	C-J-10A	7/10/64	7/13/64	Successful air recovery; instrument operation good.
	C-J-10B	7/10/64	7/17/64	Successful air recovery; instrument operation good.
1009	C-J-12A	8/5/64	8/8/64	Successful air recovery; instrument operation good; Agena beacon problem.
	C-J-12B	8/5/64	8/13/64	Successful air recovery; instrument operation good.
9066A	ARGON-22	8/21/64	8/27/64	Successful air recovery; instrument operation good; cloud cover 80%.
1010	C-J-11A	9/14/64	9/18/64	Successful air recovery; instrument operation good.
	C-J-11B	9/14/64	9/23/64	Successful air recovery; instrument operation good.
1011	C-J-3A	10/5/64	10/9/64	Successful air recovery; instrument operation good; drogue chute failed.

Msn No.	Payload/Type No.	Flight Date	Recovery	Comments
1011	C-J-3B	10/5/64		Vehicle battery dropped to 18.5 volts; attempted recover on rev 112, no separation from Agena.
1012	C-J-13A	10/17/64	10/20/64	Successful air recovery; instrument operation good; beacon problem on Agena; S/I failure.
	C-J-13B	10/17/64	10/22/64	Guidance problem on Agena requiring lifeboat recovery; 48% payload retrieved; water impact due to weather.
1013	C-J-15A	11/2/64	11/6/64	Successful air recovery; instrument failed on pass 52; 416 cycles unprogrammed on rev 1; S/I operation normal.
	C-J-15B	11/2/64	11/7/64	Successful air recovery; mission terminated on pass 52; S/I normal.
1014	C-J-16A	11/18/64	11/23/64	Successful air recovery; instrument operation normal; no failures.
	C-J-16B	11/18/64	11/27/64	Successful air recovery; instrument operation normal; no failures.
1015	C-J-17A	12/19/64	12/24/64	Successful air recovery; instrument operation normal (5 day msn); drogue chute failed.
	C-J-17B	12/19/64	12/30/64	Successful air recovery; deactivated for 3 days (1st time); early recovery due pyro battery problem in Agena.

Msn No.	Payload/Type No.	Flight Date	Recovery	Comments
1016	C-J-18A	1/15/65	1/20/65	Successful air recovery; instrument operation normal; recovered approximately 40 miles from estimated point of impact.
	C-J-18B	1/15/65	1/25/65	Successful air recovery; instrument operation normal; zero defects.
1017	C-J-14A	2/25/65	3/2/65	Successful air recovery; instru- operation good; zero defects.
	C-J-14B	2/25/65	3/6/65	Successful air recovery; S/I failure (metering); yaw programmer failure on rev 88, capping shutter.
1018	C-J-19A	3/25/65	3/29/65	Successful air recovery; instrument operation good; S/I programmer failure affecting both instruments.
	C-J-19B	3/25/65	3/31/65	Successful air recovery; instrument operation good.
1019	C-J-4A	4/29/65	5/4/65	Successful air recovery; instrument operation normal.
	C-J-4B	4/29/65		No recovery due to malfunction of vehicle recovery command system programming.
1021	C-J-21A	5/18/65	5/23/65	Successful air recovery; S/I failed rev 79; pan instrument operation normal.
	C-J-21B	5/18/65	5/28/65	Successful air recovery; payload no. 1 instrument came out of rails due torn film; instrument failure.

Msn No.	Payload/Type No.	Flight Date	Recovery	Comments
1020	C-J-20A	6/9/65	6/15/65	Successful air recovery; instrument operation normal.
	C-J-20B	6/9/65	6/16/65	Locked-on attitude jet caused vehicle tumbling, SRV recovered via LIFEBOAT system.
1022	C-J-22A	7/19/65	7/23/65	Successful air recovery; zero defects for A/P Facility.
	C-J-22B	7/19/65	7/28/65	Successful air recovery; cycle counter on slave camera intermittent.
1023	C-J-23A	8/17/65	8/22/65	Successful air recovery; instrument operation normal.
	C-J-23-B	8/17/65	8/26/65	Successful air recovery; operation of master camera intermittent; relay in A/P command box probable cause.
1024	C-J-24A	9/22/65	9/27/65	Successful air recovery; low period orbit due to booster; instrument operation good.
	C-J-24B	9/22/65	10/2/65	Successful air recovery; instrument operation good.
1025	C-JX-28A	10/5/65	10/10/65	Successful air recovery; operation normal.
	C-JX-28B	10/5/65	10/15/65	Successful air recovery; anomalous deployment of main chute, excessive image smear due poor control of vehicle attitude.

Msn No.	Payload/type No.	Flight Date	Recovery	Comments
1026	C-J-25A	10/28/65	11/2/65	Successful air recovery; intermittent center of format switch operation.
	C-J-25B	10/28/65	11/7/65	Successful air recovery; sticky shutter on horizon camera; smeared imagery due to vehicle command.
1027	C-JX-27A	12/9/65	12/10/65	Successful air recovery; instrument operation normal; D-timer switch failure; LIFEBOAT recovery of SRV.
	C-JX-27B	12/9/65	12/11/65	Successful air recovery, but no camera activation on #2 because of vehicle instability.
1028	C-J-26A	12/24/65	12/29/65	Successful air recovery; instrument operation perfect; zero defects.
	C-J-26B	12/24/65	1/2/66	Successful air recovery; index shutter operation abnormal; zero defects otherwise.
1029	C-J-27A	2/2/66	2/7/66	Successful air recovery; stellar shutter frequency overexposed; zero defects otherwise.
	C-J-27B	2/2/66	2/12/66	Successful air recovery; dual framing device inoperative from cut and wrap, rev 81 to rev 134; relay failed to latch at cut and wrap.
1030	C-J-29A	3/9/66	3/14/66	Successful air recovery; v/h stepper switch problem; camera normal.
	C-J-29B	3/9/66	3/19/66	Successful air recovery; v/h stepper switch problem; camera normal.

Msn No.	Payload/Type No.	Flight Date	Recovery	Comments
1031	C-J-30A	4/7/66	4/14/66	Successful air recovery; first 7-day mission segment; Blossom telemetry battery failure.
	C-J-30B	4/7/66	4/18/66	Successful air recovery; slave camera failed; 1st use of Wratten 23A filter on master camera.
1032	C-J-28A	5/3/66		Failed to achieve orbit.
	C-J-28B	5/3/66		
1033	C-J-33A	5/23/66	5/28/66	Successful air recovery; instrument operation normal.
	C-J-33B	5/23/66	6/3/66	Successful air recovery; instrument operation normal.
1034	C-J-31A	6/21/66	6/26/66	Successful air recovery; v/h programmer failed; pressure make-up gas depleted by rev 30.
	C-J-31B	6/21/66	7/1/66	Successful air recovery; flashing light failure.
1036	C-J-32A	8/9/66	8/16/66	Successful air recovery; instrument operation good.
	C-J-32B	8/9/66	8/22/66	Successful air recovery; instrument operation good.
1035	C-J-36A	9/20/66	9/25/66	Successful air catch; instrument operation normal.
	C-J-36B	9/20/66	9/30/66	Successful air catch; v/h programmer failed on rev 157.

Msn No.	Payload/Type No.	Flight Date	Recovery	Comments
1037	C-J-38A	11/8/66	11/12/66	Successful air recovery; instrument operation normal; 2nd PG and 2nd THORAD launch.
	C-J-38B	11/8/66	11/20/66	Successful air recovery; instrument operation normal.
1038	C-J-34A	1/14/67	1/19/67	Successful air recovery; instrument operation normal; high system temperature.
	C-J-34B	1/14/67	1/26/67	Successful air recovery; instrument operation normal; temperature normal.
1039	C-J-39A	2/22/67	2/27/67	Successful air recovery; instrument operation normal; high system temperature.
	C-J-39B	2/22/67	3/5/67	Successful air recovery; instrument operation normal; temperature normal.
1040	C-J-35A	3/30/67	4/4/67	Successful air recovery; side-band link inoperative and UHF employed.
	C-J-35B	3/30/67	4/8/67	Successful air recovery; instrument operation normal.
1041	C-J-40A	5/9/67	5/15/67	Successful air recovery; instrument operation normal.
	C-J-40B	5/9/67	5/23/67	Successful air recovery; pickup 225 n.m. down range due abnormal orbit (Agena velocity meter failure).
1042	C-J-37A	6/16/67	6/22/67	Successful air recovery; instrument operation normal.
	C-J-37B	6/16/67	7/1/67	Water pickup; instrument operation normal; chute events late.

Msn No.	Payload/Type No.	Flight Date	Recovery	Comments
1043	C-J-42A	8/7/67	8/14/67	Successful air recovery;master scan rate erratic after rev 66.
	C-J-42B	8/7/67	8/22/67	Successful air recovery;master instrument failed on rev 228; first 15-day (total) mission.
1101	C-CR-1A	9/15/67	9/21/67	Successful air recovery; first J-3 constant rotator; aft-looking camera incorrectly focused; average temperature low at 49°F.
	C-CR-1B	9/15/67	9/28/67	Successful air recovery.
1044	C-J-41A	11/2/67	11/9/67	Successful air recovery.
	C-J-41B	11/2/67	11/11/67	Successful air recovery.
1102	C-CR-2A	12/9/67	12/15/67	Successful air recovery.
	C-CR-2B	12/9/67	12/23/67	Successful air recovery; total 14-day orbit; experimental tests including use of bi-color filter, polarized filter and tag-on SO-230 film.
1045	C-J-45A	1/24/68	2/1/68	Successful air recovery; loss of telemetry on rev 85.
	C-J-45B	1/24/68	2/8/68	Successful air recovery.
1046	C-J-48A	3/14/68	3/22/68	Successful air recovery.
	C-J-48B	3/14/68	3/30/68	Successful air recovery. First full load SO-230 film; cameras exhibited decrease in performance from rev 9 to end of mission;emultion buildup degraded focus in #2 payload.

Msn No.	Payload/Type No.	Flight Date	Recovery	Comments
1103	C-CR-3A	5/1/68	5/8/68	Successful air recovery.
	C-CR-3B	5/1/68	5/15/68	Successful air recovery. First use of bi-color acquisition; experimental tests included Wratten no. 12 filter, tag-on SO-380 film.
1047	C-J-47A	6/20/68	6/29/68	Successful air recovery.
	C-J-47B	6/20/68	7/5/68	Successful air recovery. Cold booster caused ground track mismatch; Agena/payload incompatibility caused concern but no impact.
1104	C-CR-4A	8/7/68	8/15/68	Successful air recovery.
	C-CR-4B	8/7/68	8/22/68	Successful air recovery. 1st use 3rd generation Petzval lens; excessive pressure in -2 due to pressure-make-up failure; tape recorder failure -2 SRV; experimental tag-on SO-180 film.
1048	C-J-49A	9/18/68	9/28/68	Successful air recovery.
	C-J-49B	9/18/68	10/2/68	Successful air recovery; however film tear caused camera failure.
1105	C-CR-5A	11/3/68	11/11/68	Successful air recovery.
	C-CR-5B	11/3/68	11/21/68	Successful air recovery. 1st full load SO-380 (ultra thin base film); tag-on of SO-121 color film; total 17-day orbit.
1049	C-J-50A	12/12/68	12/19/68	Successful air recovery.
	C-J-50B	12/12/68	12/23/68	Successful air recovery.

capsules retrieved by air snatch.

Msn No.	Payload/Type No.	Flight Date	Recovery	Comments
1106	C-CR-6A	2/5/69	2/10/69	Successful air recovery.
	C-CR-6B	2/5/69	2/14/69	Successful air recovery. 1st operational photography with SO 121 color film; 1st use of digital shift register stored command system; total 9-day orbit.
1050	C-J-43A	3/19/69	3/22/69	Unstable after rev 22 resulted in vehicle yaw of 30° per minute;
	C-J-43B	3/19/69	3/23/69	both capsules retrieved.
1051	C-J-44A	5/2/69	5/9/69	Successful air recovery.
	C-J-44B	5/2/69	5/18/69	Successful air recovery. Good mission.
1107	C-CR-7A	7/24/69	8/2/69	Forward-looking camera failed on rev 1, all photography mono.
	C-CR-7B	7/24/69	8/12/69	Instrument operation normal; both capsules retrieved by air snatch.
1052	C-J-46A	9/22/69	9/29/69	Successful air recovery.
	C-J-46B	9/22/69	10/7/69	Successful air recovery. Last of the J-1 series.
1108	C-CR-9A	12/4/69	12/11/69	Successful air recovery.
	C-CR-9B	12/4/69	12/21/69	Successful air recovery. Experimental tag-on of SO-242 improved color film; total 17-day orbit.
1109	C-CR-10A	3/4/70	3/12/70	Successful air recovery.
	C-CR-10B	3/4/70	3/23/70	Successful air recovery. Total 19-day orbit.

Msn No.	Payload/Type No.	Flight Date	Recovery	Comments
1110	C-CR-11A	5/20/70	5/31/70	Successful air recovery.
	C-CR-11B	5/20/70	6/8/70	Successful air recovery. Splice-in's of 3414 film in both cameras; 1st observation of electrostatic discharge spots; total 19-day orbit.
1111	C-CR-12A	7/23/70	7/30/70	Successful air recovery.
	C-CR-12B	7/23/70	8/10/70	Successful air recovery. 1st full load 3414 film; 1st in-flight focus adjustment test; highest quality imagery to date; electrostatic spotting pattern associated with recovery operations; total 18-day orbit.
1112	C-QR-2A	11/18/70	11/27/70	Successful air recovery.
	C-QR-2B	11/18/70	12/7/70	Successful air recovery. Highest quality imagery to date; visual edge matching used to evaluate in-flight focus adjustment; forward camera of -2 failed during cut and wrap sequence; total 19-day orbit.
1113	C-CR-13A	2/17/71		Failed to achieve orbit.
	C-CR-13B	2/17/71		
1114	C-CR-14A	3/24/71	3/31/71	Successful air recovery; quality exceeded that of any previous C mission.
	C-CR-14B	3/24/71	4/9/71	

Msn. No.	Payload/Type No.	Flight Date	Recovery	Comments
1115	C-CR-15A	9/10/71	9/18/71	Successful air recovery.
	C-CR-15B	9/10/71	9/29/71	Successful air recovery.
1116	C-CR-16A	4/19/72	5/1/72	Successful air recovery.
	C-CR-16B	4/19/72	5/8/72	Successful air recovery.
1117	C-CR-8A	5/25/72	5/27/72	Successful air recovery.
	C-CR-8B	5/25/72	5/31/72	Successful air recovery; camera performed well throughout but solar panels failed to deploy and Agena reaction control system gas leak reduced mission life to six days.

CORONA Film Recovery: Buckets Launched, Orbited, and Recovered by Years

Series	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
C:														
Launched	5	5												
Orbited	3	3												
Recovered	0	1												
C':														
Launched		3	7											
Orbited		2	4											
Recovered		2	3											
C''':														
Launched			5	1										
Orbited			5	0										
Recovered			4	0										
M:														
Launched				17	9									
Orbited				17	7									
Recovered				14	6									
J-1:														
Launched					4	26	26	18	14	10	6			
Orbited					4	24	26	16	14	10	6			
Recovered					2	21	25	16	14	10	6			
J-3 (CR):														
Launched									4	6	6	8	6	4
Orbited									4	6	6	8	4	4
Recovered									4	6	6	8	4	4
TOTAL:														
Launched	5	8	12	18	13	26	26	18	18	16	12	8	6	4
Orbited	3	5	9	17	11	24	26	16	18	16	12	8	4	4
Recovered	0	3	7	14	8	21	25	16	18	16	12	8	4	4

FILM RETURN HISTORY

Year	No. Flts.	System	Film Recovered %	Mission Nos.
1959	5	C	0%	9001-9005
1960	5	C	20%	9006-9010
	3	C'	33%	9011-9013
1961	7	C'	29%	9015,17,19, 21,26-28
	5	C'''	66%	9022-25,29
1962	1	C'''	0%	9030
	17	M	69%	9031-41,43-45, 47-50
1963	9	M	66%	9051-54,56,57, 60-62
	2	J	50%	1001,02
1964	13	J	73%	1003,15
1965	13	J	87.5%	1016-28
1966	9	J	87%	1029-37
1967	7	J	99%	1038-44
	2	CR	100%	1101-02
1968	5	J	97%	1045-49
	3	CR	99%	1103-05
1969	3	J	94%	1050-52
	3	CR	83%	1106-08
1970	4	CR	94%	1109-12
1971	3	CR	66-2/3%	1113-1115
1972	2	CR	100%	1116-1117

Total Flts.	System	Camera Type	Film Payload (Lbs.)
10	C	Mono Camera	40 lbs.
10	C'	Mono Camera	40 lbs.
6	C'''	Mono Camera	40 lbs.
26	M	Stereo Camera	80 lbs.
52	J	Stereo/2 Buckets	160 lbs.
17	CR	Stereo/2 Buckets	160 lbs.

AVERAGE SHIPMENT, TRANSFER, AND PROCESSING TIME OF CORONA MATERIAL (PRIORITY 1 DUPES ONLY)

EVENT	Average Time Required (Hours)
Air Catch to Hawaii	1½
Transfer to Air Force Jet Transport at Hickham Air Force Base	1
Hickham Air Force Base to Travis Air Force Base	5
Delay at Travis for crew change*	1
Travis to [redacted]	5
[redacted]	1½
In - [redacted] - OUT	77
[redacted] to Andrews Air Force Base (OSA Project Aircraft)	3
Andrews Air Force Base to NPIC	1
	96 hrs.

*When de-filming is accomplished at AP, add three additional hours.

~~TOP SECRET~~ RUFF

KH 4 COVERAGE WITHIN THE SINO-SOVIET BLOC FROM MISSION 1103-2 THRU 1110-2 DEC 69 THRU JUN 1970

90%-100% clear, pan

GROUP 1
Excluded from automatic downgrading and declassification

HANDLE VIA
~~TALENT KEYHOLE~~
CHANNELS ONLY

~~TOP SECRET RUFF~~ [redacted]

[redacted]

5 November 1969

MEMORANDUM FOR THE RECORD

SUBJECT: First Section of the History of OSP

1. This document has been reviewed recently by the Office of the Chief, Historical Staff, CIA and was returned to this Office today by [redacted].

2. According to [redacted] the Historical Staff considered this to be a very satisfactory document, but particularly from the technical side and probably subject more to appeal by technically-minded personnel who have some familiarity with the events described.

3. The Historical Staff hopes that the succeeding document covering years since this one was prepared will be able to expand somewhat and give more of a layman's run-down on not only the events described herein, but successive events in OSP's history so that the basic document will, in effect, be "filled out" to make it more meaningful to all who, in the future, may find it necessary to refer to these events.

[redacted]
DDS&T Historian

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

DD/S&T

[redacted]

[redacted]

MEMORANDUM FOR: Deputy Director for Science and Technology

ATTENTION : Chairman, DD/S&T Historical Board

SUBJECT : OSP History

1. The history of the Office of Special Projects has been prepared in accordance with directions received, and a copy is forwarded herewith for inclusion in the "Catalog of DD/S&T Histories."

2. In compliance with existing instructions, the master copy has been retained in this Office.

/s/ John N. McMahon

JOHN N. MCMAHON
Acting Director of Special Projects
DD/S&T

Attachments: a/s

[redacted]

[redacted]

Copy [redacted]

[redacted]

OFFICE OF SPECIAL PROJECTS

HISTORY

[redacted]

HANDLE VIA [redacted]
CONTROL SYSTEM ONLY

TABLE OF CONTENTS

FOREWORD

1. The History is presented in five parts. Each is the work of more than one individual. However, those primarily responsible are as follows:

Part I - [redacted] Executive Officer of the Office of Special Projects until September 1967;

Part II - [redacted] Program Director, CORONA;

Part III - [redacted] Technical Project Administrator, [redacted]

Part IV - [redacted] Technical Project Administrator, [redacted]

Part V - [redacted] Program Management Coordinator, Design and Analysis Division.

Coordination of the above efforts devolved primarily upon [redacted] Editing has been done by [redacted] Acting Chief, Program Controls Branch.

2. Each of the various parts has been reviewed by the pertinent Program Director or Division Chief. The Director and Deputy Director of Special Projects have reviewed the entire History.

INTRODUCTION

The Office of Special Projects (OSP), one of the seven major components of the DD/S&T, has its roots in Agency activity which commenced in 1954, and was officially established as an office on 15 September 1965. Its primary function has been and is to develop and operate systems capable of conducting reconnaissance over denied areas of the globe for the purpose of collecting valuable intelligence through the use of various satellite-borne sensors. During the period since 1958, OSP (and directly related predecessor organizational components) has played a major role in:

1. Development and subsequent operation of the "CORONA" photographic reconnaissance system which was the first Photo satellite to be successful, and which has provided the intelligence community with much significant information since 1960;

[redacted]

3. [redacted]

4. Promoting technical, operational, and analytical expertise to support existing development programs as well as to provide the preliminary analysis and design for future satellite collection systems.

Currently, "CORONA" is operational with improvements still being incorporated; the [redacted] and [redacted] programs are in the early development stages with first flights scheduled in mid-69 and mid-70, respectively. Research and analysis continues in defining follow-on and future systems.

I

ORIGINS

The Office of Special Projects stems from the photographic and electronic reconnaissance programs undertaken by the Central Intelligence Agency since the middle 1950's. The Office is an outgrowth of the mechanisms set up in 1954 in the Office of the DCI to manage U-2 reconnaissance.

Following the Russian shoot-down of the U-2 in May 1960, there was widespread concern over the loss of a prime source of intelligence on which to base national estimates of the Soviet and Communist Chinese countries. To a handful of individuals who knew of the existence of a program to conduct photographic reconnaissance over denied areas through the use of earth satellites, the loss did not seem irretrievable. In April 1958 the White House had authorized the Development Projects Division of the DD/P/CIA to proceed with the development of a photo reconnaissance satellite under the code name "CORONA." In August of 1960, just three months after the 1 May U-2 incident, the first successful air snatch of a satellite

recovery vehicle containing photographic film was accomplished. Indeed this was a most significant event in that it was the first time that any nation had recovered any devise from orbit.

Until the fall of 1965 when the Office of Special Projects was officially constituted, the development and management of the CORONA system was the responsibility of the DD/S&T Office of Special Activities (successor to the DPD/DD/P).

The Deputy Directorate for Science and Technology had been formally established in the summer of 1963, and in August of that year the first DD/S&T established a Systems Analysis Staff (SAS). This small group was tasked to examine the capabilities of present and planned photographic satellite reconnaissance systems. In the course of these studies it became apparent that a number of significant problem areas faced the reconnaissance-oriented intelligence community. Chief among them was the absence of plans for a satellite reconnaissance system which could produce photographic coverage of large sections of the earth at a consistently high resolution.

In February 1964, using personnel from various offices and staffs within the DD/S&T on a part-time basis, the Systems Analysis Staff began a study with the ITEK Corporation to determine the feasibility and potential intelligence value of using several individual

sensors or combinations thereof in a satellite system. The study led to what was then known as the [redacted] camera design capable of producing [redacted] resolution over a wide swath. The Land Reconnaissance Panel (named for its Chairman, Edwin H. Land) favorably endorsed the effort and recommended a program to establish technical feasibility. This approach was approved by the DCI. In July 1964 the [redacted] effort was formally assigned to SAS and a feasibility effort was initiated with ITEK and a number of other companies. About this time, a small group of individuals was also detailed by the DD/S&T to assist on a full-time basis.

[redacted]

[redacted]

[redacted]

It was against this background that a new NRO agreement was signed between CIA and the Department of Defense relative to the conduct of the National Reconnaissance Program. The agreement, made in August 1965, established broad guidelines for the execution of reconnaissance activities. CIA was assigned specifically the responsibility for improvements in the CORONA sensor subsystem and for development of the optical sensor subsystem for the

Follow-On Search System. General reference was made to CIA participating in research and exploratory development for new sensors and providing joint staffing to the NRO.

In late August 1965 a formal request was made to the DCI to establish an Office of Special Projects to carry out the responsibilities outlined in the CIA-DOD agreement. On 15 September 1965 the Executive Director Comptroller approved the Office of Special Projects with a planned authorized T/O of 76 personnel.

The group of individuals who had formed the hard core of the Special Projects Staff, 28 in number, now faced the considerable job of gathering sufficient talent to ensure that Agency responsibilities under the NRO agreement of August 1965 were fully carried out.

The Office faced considerable technical tasks and at the same time engaged in a vigorous recruitment program. During this period OSP worked within the framework of its line responsibility as a member of the DD/S&T organization yet functioned in its NRO responsibilities to the Director of CIA Reconnaissance Programs. It wasn't until 16 January 1967 that these two distinct responsibilities were combined under the DD/S&T.

A number of joint DOD-CIA management and technical groups were formed in this fall period of 1965 to attempt to devise management

plans for the development and operation of CORONA, [redacted] These sessions continued through the spring of 1966 at which time the Executive Committee of the National Reconnaissance Program approved management plans for CORONA and [redacted]

By the end of 1966 there was no doubt in the mind of anyone associated with the intelligence reconnaissance community that OSP had become a structure capable of the management of multi-million dollar programs.

The following pages tell the history of the Office of Special Projects from the perspective of its various major components.

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and directed the detailed procurements on the overt side. These included the booster, the AGENA 2nd stage, control networks, launch facilities, and the basic recovery vehicle development, under the Biomedical Program auspices.

In February 1959 an inert THOR-AGENA was launched, followed by two non-camera-bearing test vehicles. The first camera was flown in June of 1959, but the vehicle did not orbit. In November 1959, the ARPA responsibility was transferred to the Air Force under direction of the Secretary of Defense. By April 1960 camera operation had been accomplished, primarily because of a change from acetate based to polyester based film. A recovery system diagnostic program was instituted, culminating in August of 1960 with the first successful recovery from orbit. Later that month, a camera system was flown and film was recovered. (Attachment A summarizes all CORONA flights from the DISCOVERER series and Programs [redacted] and [redacted] which were USAF cover numbers for the CORONA Program.)

The original CORONA Program was extended without major system modifications (the C'), and the C''' was first flown in August 1961. In September 1961, a National Reconnaissance Office

was formed, combining CIA, Air Force, and Navy strategic reconnaissance assets and was co-chaired jointly by CIA and Air Force. CORONA was considered as a program falling under the NRO purview. Also in late 1961 the development of a dual camera stereo configuration, known as "C MURAL" was undertaken. A Configuration Control Board was established consisting of a representative from the Air Force, the CIA Operation Office at Palo Alto, and CIA Project Headquarters. A member of the NRO Staff joined the Board shortly thereafter. The first CORONA/MURAL System was flown in February 1962.

Direction of the program proceeded under the Configuration Control Board until early in 1964 when the Director, National Reconnaissance Office (D/NRO) began to play an increasingly strong role; and specifically directed that all changes to the payload system be approved by himself, following review by the CCB. The CCB was not formally dissolved, but has not met since approximately March 1964.

During 1964 there was considerable debate and controversy as to the mission and role of responsibility between CIA and the Air Force in the CORONA Program.

In late 1965, a new charter for the NRO was signed by the DCI and Deputy Secretary of Defense and they named a new Director of that organization. Stemming from this new charter, a CORONA Management and Organizational Plan was prepared on 26 April 1966. This plan was approved and became effective on 22 June 1966. It provided that CIA, in addition to being responsible for the development of the improved sensor, be given the responsibility for the total payload and the contracting and technical direction associated with obtaining the cameras, recovery vehicles, providing the payload housing and structure and the functional activities of assembly, test, integration, checkout, and certification of the payload for launch. Additionally, CIA was delegated the responsibility for mission planning, on-orbit camera operations, on-orbit diagnostics of payload, and post-mission analysis and evaluation. The plan continues in force today.

CORONA Configurations and Contractual Obligations

As a result of discussions held early in 1958 with representatives of the Government for the development and production of a photo-reconnaissance system, (then referred to as the CORONA (C) Program) LMSC set up an internal

organization. This organization was then known as Advanced Engineering Test Organization, later known as Advanced Projects (A/P), whose function was to handle the covert side of such a photo-reconnaissance system.

That section of the reconnaissance system to be under the cognizance of A/P was determined to be the photographic payload system to be boosted into orbit by an Agena vehicle with planned recovery of the nose cone containing photographic information. The photographic payload system was to include the following subsystems:

1. One Satellite Recovery Vehicle subsystem (SRV)
2. One reconnaissance camera subsystem
3. All other structures and electrical subsystems necessary for the housing, controlling and interfacing with the recovery and camera subsystems.

[redacted]

[redacted]

CORONA "C"

The Lockheed Corporation (Missiles and Space Division) was given a charter, as Prime Contractor, to develop the payload section and camera system. Lockheed in turn, selected the Itek Corporation as subcontractor to develop and manufacture the camera system. At this time Itek was primarily a lens producing company, consequently, they subcontracted most of the manufacturing work on the C camera to Fairchild.

Lockheed also issued a subcontract to the General Electric Company to develop and manufacture the Recovery Vehicles. The Recovery Vehicle was to be developed and manufactured under the cover of the Biomedical Program. The Douglas "THOR" was selected for the booster because of

availability and capability. Technical direction of the program, while the responsibility of both CIA and the Air Force for their respective hardware, was funneled through the Air Force as agent for both parties.

This organizational structure (See Figure 1) was retained through the C, C' and C''' Systems.

The C camera was a scanning panoramic instrument with an oscillating lens cell. Seventy millimeter film was fed from a supply spool through suitable drive mechanisms to a curved platen area where it was exposed. The exposed film was then fed into a take-up spool in the recovery system. Camera rate and hence velocity over height (V/h) ratio was fixed and prelaunch selected. Image motion control was fixed mechanically to the V/h ratio. Two horizon cameras were used for attitude determination.

The main lens was a 24" focal length f 5.0 high acuity optical system suitable for a 70 mm slit format. Exposure time was preset at 1/500, 1/1000 or 1/200 sec. Time was recorded on the film by photographing the numbers displayed on a system clock known as a Digitote.

The structure was of a thermally shielded conic fairing with three pyro activated ejectable photographic doors, light

tight boots, and harnesses as required. The recovery system used Mark IIA SRV with single parachute, spin rockets, chaff radar detection, and seawater dye marker and was capable of retrieving 20 pounds of film.

The AGENA A served as the second stage and orbital stable platform and the THOR served as the booster.

The C system was designed for an altitude of 100 n. m. with a duration of mission of one day. The ground resolution goal was 20-25 feet.

The C Program contract was awarded to A/P for 12 flight systems and two spares on 25 April 1958, retroactively effective 15 March 1958. Two of the flight camera subsystems were delivered to the Government for storage. The hardware structures for these two flight systems were transferred to Sunnyvale and expended on diagnostic flights. The other ten flight systems were launched with the following results:

Four failed to achieve orbit.

Four failed on orbit and no separations took place.

One capsule separated but was not recovered.

One capsule was successfully recovered.

The first C flight system was launched on 25 June 1959 and the tenth on 13 September 1960.

CORONA "C Prime"

The C Prime camera system was an upgrading of the original C configuration. The changes involved the incorporation of a more capable V/h compensation system and several modifications to the recovery system.

The mission duration was extended to two days, and the SRV's now carried a load of 40 lbs. of film, and redesignated the Mark IV configuration.

The C Prime (C') Program contract was awarded to A/P as of 26 July 1959 for eight flight systems as developed under the C Program with design improvements to increase reliability and photo quality. The quantity of flight systems was later contractually increased from eight to eleven. The subcontract arrangements under the C' Program were the same as those under the C Program. One of the C' flight systems was delivered to the Government for storage. The other ten flight systems were launched with the following results:

Four failed to achieve orbit.

One capsule separated but was not recovered.

Five capsules were recovered.

The first flight system was launched on 26 October 1960 and the tenth on 15 November 1961.

CORONA (C''')

It should be noted at this point that the camera subsystems utilized under the C, C' and C''' Programs were single camera subsystems which furnished only monoscopic photography. Under the M and J Programs, hereinafter discussed, dual camera subsystems were utilized by which stereoscopic photography was obtained.

The C''' camera was a single scanning panoramic instrument with an oscillating element in the optical system. Film was fed from a lightweight supply spool through suitable drive and metering mechanisms to a curved "rail" structure where it remained stationary during exposure. The lens cell scanned to present the image on the film. The film was then fed to a take-up cassette in the recovery subsystem. Image Motion Compensation was accomplished mechanically by causing the lens system to move opposite to the direction of flight during scan and then returned for the next cycle. Two horizon cameras with 90 mm focal length and shutter speed of 1/200 second were used for attitude determination. Velocity over height (V/h) input to the camera was

accomplished by a motorized potentiometer which had ten start and stop levels that were selectable by real time command.

Unperforated thin base 3.5 mil mylar 70 mm film of Type EK SO 221 and 8402 were used. The supply consisted of 40 pounds of film.

The main camera lens was a 24 inch focal length f/3.5 ~~Petzval type system suitable of covering a 70 mm slit format.~~ A Wratten 12 filter was used. Preset slit width exposure times were provided.

Time was recorded on the film by photographing the numbers displayed from the system clock. Time marks of 160 cps were also recorded on the film. Other data information such as fiducials, camera serial number, center of format marker, and shrinkage markers were recorded on the film.

Commands to the camera were stored on-off commands, stored V/h step commands, real time V/h program command, real time and stored recovery commands. Telemetry information consisted of signals as V/h readout, voltage, film footage, light leak sensors, temperature and other operational and diagnostic information.

The payload structure was a thermally shielded conic fairing housing the camera, film supply, light tight boots, harnesses, and instrumentation. There were three optical doors that were blown off during ascent. The SRV was attached to the fairing.

A single recovery system was used, the Mark IV SRV with a dual parachute and a cold gas spin system.

An AGENA served as the second stage and orbital stable platform and a THOR served as the booster stage.

This system was designed to operate at an altitude of 100-110 nautical miles for a duration of four days. Resolution of 130 lines per millimeter was the design goal.

The C Triple Prime (C''') Program contract was awarded to A/P as of 27 June 1960, retroactively effective 7 June 1960, for six flight systems as developed under the C Program with design improvements to increase reliability and photographic quality. The six flight systems were launched with the following results:

One failed to achieve orbit.

One failed on orbit.

Four capsules were recovered.

The first C''' flight system was launched on 30 August 1961 and the sixth on 13 January 1962.

CORONA "Mural"

The Mural (M) Program contract was awarded to A/P as of 9 August 1961, retroactively effective 20 March 1961, for six Photographic Reconnaissance Satellite Systems with dual C''' type camera systems, capable of furnishing stereoscopic photography.

With the advent of the "C Mural" Program, the contractual arrangement was revised such that Lockheed, Itek and General Electric became associate contractors on their respective subsystems. Additionally, all responsibility for the payload section (forward of the AGENA/Payload interface) became a CIA responsibility (See Figure 2). A "Systems Engineering and Technical Direction" (SETD) contract, administered by [redacted] (formally [redacted] was established with Lockheed. The primary purpose of the SETD organization was to guarantee an optimized total system design.

In November 1962, the SETD contract under [redacted] was terminated and a "Systems Engineering" (SE) contract issued under the CIA (See Figure 3). This SE contract continued through August 1964, at which time the development work had been completed on the M, L, and J Systems.

The "M" camera system was a pair of 24 inch focal length panoramic instruments mounted in a 30 degree convergent stereo angle. Seventy millimeter film was fed from a double spool film supply cassette (capacity 80 pounds of film) with one of two film webs going to each instrument through a suitable drive system, rollers, and clamps. The film was panoramically exposed through seventy degrees of lens cell assembly rotation and then fed to a double spool take-up cassette in an SRV. Simultaneous operation of both instruments was required for stereo photography.

Prime attitude information was provided by one Stellar/Index camera utilizing 70 mm film with a 1.5" focal length f 4.5 lens for index (terrain) information and 35 mm film with an 85 mm focal length f 1.8 lens for attitude information. The back-up attitude information is provided by the horizon cameras with a 90 mm focal length f 6.8 lens.

The system was designed for nominal altitudes of 110 nautical miles with mission duration up to four days. Dynamic resolution was 80 to 110 lines per millimeter.

The quantity of flight systems to be furnished under the contract was later increased to twenty-two. The twenty-two flight systems were launched with the following results:

One failed to achieve orbit.

Three capsules separated but were not recovered.

Eighteen capsules were recovered.

The first M flight system was launched on 27 February 1962 and the twenty-second on 26 June 1963.

CORONA "J" and M Follow-On

A contract was awarded on 18 March 1963, retroactively effective 1 July 1962, for the development and production of 20 Photographic Reconnaissance Satellite Systems under the CORONA/J Program. The contractual organization remained as shown in Figure 3. The major difference between the J Program and predecessor C Programs was that the J System included two re-entry capsule subsystems instead of one. These two SRV's increased the film capacity to 160 pounds or 16,000 feet. The system was designed to be "deactivated" or stored on orbit in a passive mode for up to 21 days. The goal was to expose the film supply and load the recovery vehicle at two different time spans for a single launch.

Major redesign of the command and control subsystems was required to accommodate the expanded operational requirements. The V/h programmer capability was also greatly expanded.

As of 23 January 1962, six M systems were added to this contract and, as of 14 June 1965, two of these M systems (M27 and M28) were transferred in an "as is" condition to a follow-on J Program for conversion to the J System configuration. The contracting arrangements under this contract were the same as those under the M Program (Figure 3). The 20 J systems (40 capsules) were launched with results as follows:

One system (two capsules) failed to achieve orbit.

Six capsules were not recovered.

Thirty-two capsules were successfully recovered.

The first J system was launched on 24 August 1963 and the twentieth on 9 June 1965.

The four follow-on M systems (single capsules) were launched with results as follows:

One failed to achieve orbit.

One failed on orbit.

Two capsules were successfully recovered.

The first of the four follow-on M systems was launched on 18 July 1963 and the fourth on 21 December 1963.

Improved Stellar Index (ISI)

A contract was awarded to A/P as of 14 August 1964 to provide equipment and services to integrate an Improved Stellar Index Camera (ISI) as a part of the CORONA J Program. The ISI was furnished by Fairchild Camera and Instrument Company as GFE and after completion of testing, it was returned to Fairchild. The contract was completed in October 1965.

Systems Engineering

A contract for Systems Engineering was awarded to A/P by [redacted] as of 18 August 1964 and by its terms expired 30 April 1966. As of 1 May 1966 LMSC was awarded a small level-of-effort System Integration contract by [redacted]

A follow-on contract for 19 additional J systems and for the conversion of M27 and M28 to the J configuration as JX 27 and JX 28 was awarded on 23 November 1964, retroactively effective 3 March 1964. Figure 3 shows the contractual organization. As of the close of business 30 June 1966, the uncompleted efforts of A/P's Operations and Analysis and Payload Integration under the follow-on J Program were transferred to a separate level-of-effort contract under the CIA. This contract is planned to be renegotiated on an annual

basis. The 19 follow-on J systems and JX 27 and JX 28 (42 capsules in all) were launched with results as follows:

One system (two capsules) failed to achieve orbit.

Forty capsules were successfully recovered.

The first of the follow-on J systems was launched on 18 May 1965 and the twenty-first on 16 June 1967.

In April 1965, Itek commenced work under contract to provide a Pan-Geometry capability for the J-1 cameras. This would allow the mapping and charting community a means to more accurately determine geographic location of targets on the CORONA photography. P. G. consisted of providing rail holes with appropriate lamps so that a reseau could be determined and an IMC trace would be imaged on the pan camera film. Using calibrated data from the cameras, the cartographic community would be able to reconstruct the internal geometry of the camera system. A design goal would be to have the accuracy to provide maps in 1 to 50,000 scale range.

In September 1966 the first CORONA P. G. Mission was flown. The results were generally favorable but the anomalies present were sufficient not to allow the using community to conduct an evaluation as to P. G. useability. The second P. G. flight in November 1966 gave sufficient data on which to base a

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correct scan periods. The J-3 camera subsystems retain the capability for panoramic geometry for mapping and charting. One DISIC system provides prime attitude information plus cartographic capability. Two horizon cameras on each instrument provide back-up attitude information.

Normally 3404 type film is used but a design goal exists to utilize SO 180 (camouflage detection), SO 230 (high speed), SO 340 (night photographic), or SO 380 (ultra thin base). UTB is planned for use on CR-5 and above.

The main lens is a Petzval 24" focal length f3.5 optical system. Exposure time is in-flight selectable to provide one of four slit widths, plus a "failsafe" capability.

Time recording on the film is accomplished by a silicon light pulser (solid state) data head driven by an electronic digital recording clock generator. Additional data is recorded by conditioning of conventional pulsing or switching circuits.

A recoverable tape recorder is used to provide "center of format" times for each frame and other system flight data.

Prime Attitude information is provided on 35 mm film by the DISIC with dual side-looking 3" f1, f2.8 lenses and indexing or cartographic information is provided on 5" film with a

3" f1, f4.5 lens. Back-up attitude information is provided by the horizon cameras with a 55 mm focal length f6.8 lens system.

Commands consist of stored On-Off commands, Real Time Commands, and stored recovery commands. Later J-3 configurations will have a new command system utilizing a digital shift register for increased operational capability.

Telemetry consists of commutated, multiplexed, or continuous data transmitted by the AGENA TM system.

The payload structure consists of a 60 inch diameter instrument barrel DISIC conic section, and fairing. Pyro actuated doors, light tight boots, and miscellaneous items are provided as required.

The recovery systems are two G.E. Mark V SRV's with sink valves, water seals, parachute, beacon, flashing light, etc.

AGENA D serves as the second stage and provides a stable orbital platform for the payload. (THORAD A serves as the booster.)

The system is designed for altitudes of 80 to 200 nm with a mission duration of up to 14 days (A plus B mission). Dynamic resolution of up to 180 lines per millimeter is expected (5 - 6 feet at 90 nm altitude).

Figure 5 shows the envelope for the CORONA configurations.

CORONA Achievements

The fact that CORONA was the first successful operational photographic reconnaissance satellite program has naturally led to a number of "firsts" when the achievements of the total program are listed. Of greater significance,however, are the contributions made from a technical and intelligence standpoint in challenging the unknown and advancing the "state-of-the-art" in photographic reconnaissance and interpretation from orbiting satellites. Starting with the basic substantiation of the feasibility of gathering, via satellite, useful intelligence and geodetic data to the polishing of the exploitation techniques, the CORONA Program has been instrumental in developing the baseline and then adding to the store of knowledge.

The basic unknowns of areas such as the effects of extended duration flights in the environment of space, the effects of space radiation, the behavior of materials and the suppression of electrical discharge were explored within the program. The operational control concepts developed for CORONA lead the way for more sophisticated and complex systems within and outside the program.

In more specific terms, 112 flights, containing 157 capsules have been launched on all phases of the CORONA Program. Of these flights 73 have been successful, recovering 118 of the capsules.

The reliability achieved by the Program particularly in the last four years has been truly outstanding. The reliability figure of .977 has been computed for the major payload system equipment.

As an associated development, the techniques for stellar photography and reduction for attitude determination were part of the CORONA Program. This method is now the standard for obtaining high accuracy attitude data.

The recovery system used today represents an evolutionary process from the first design. It is today a highly reliable subsystem and is the basic system used in all of today's operational programs which require a recovery system.

In all aspects of the technical challenge, data has been gathered adding to the general fund of knowledge and thus permitting the advanced capability systems to proceed with greater confidence of achieving their objectives.

CORONA is, and has been, the "work horse" for photographic intelligence. Figure 6 is a CORONA flight summary showing capsule recoveries and useable coverage in millions of square miles by year. Figure 7 provides a comprehensive compilation of CORONA missions in chronological order, and includes facts and figures reflecting program operations and performance.

CORONA MILESTONES

March 1958	-	CORONA Program Go-Ahead
April 1960	-	1st Camera System Launched
August 1960	-	1st Successful Air Recovery with Film
August 1961	-	1st C''' Flight
February 1962	-	1st Stereo Flight (Mural)
August 1963	-	1st Dual Bucket (C_{J1})
February 1964	-	1st Successful Recovery of 2 Capsules from a Single Launch
September 1967	-	1st Constant Rotator Flight (C_{J3})

ORIGINAL DISCOVERER ORGANIZATION (CONTRACTUALLY)

March 1958 - April 1961 - C, C', C''' Systems

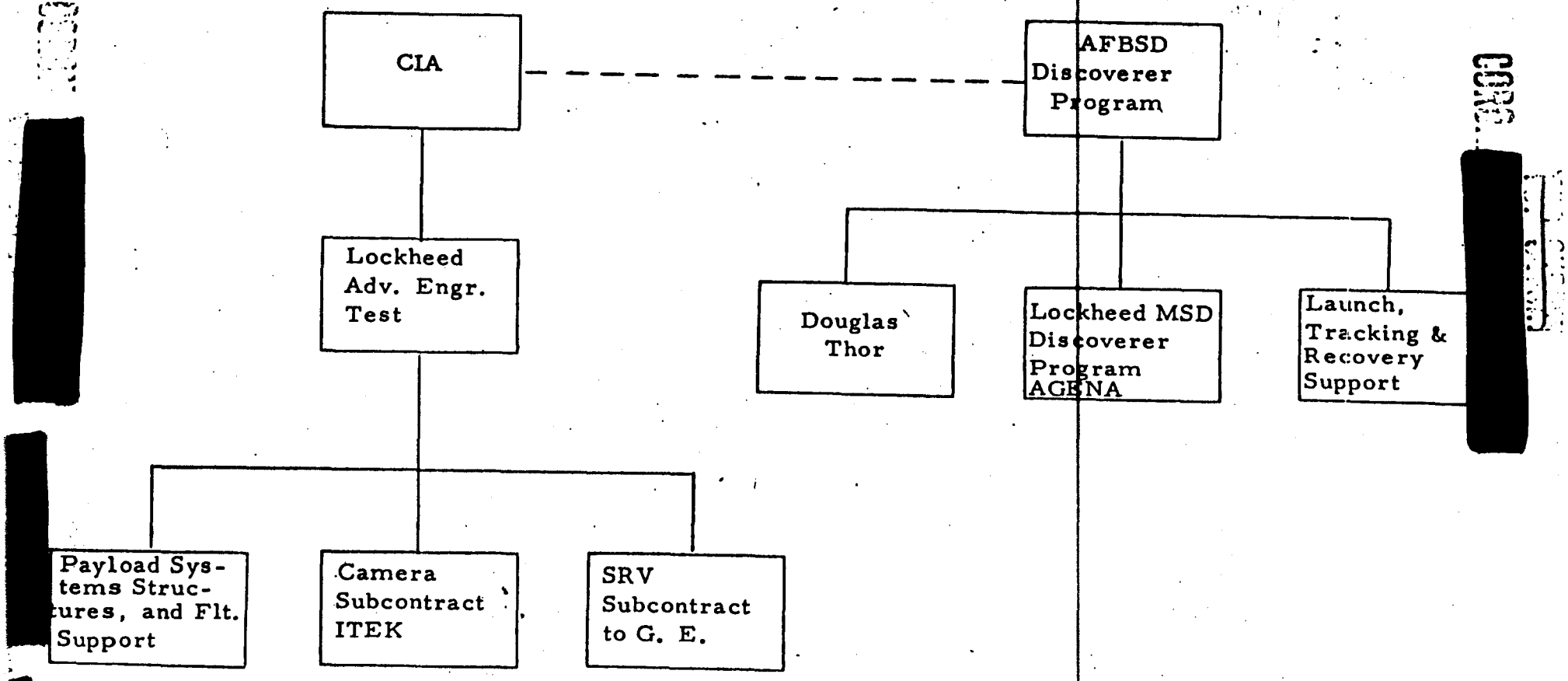

FIGURE 1

CONTRACTUAL ORGANIZATION (CORONA MURAL)

April 1961 - October 1962

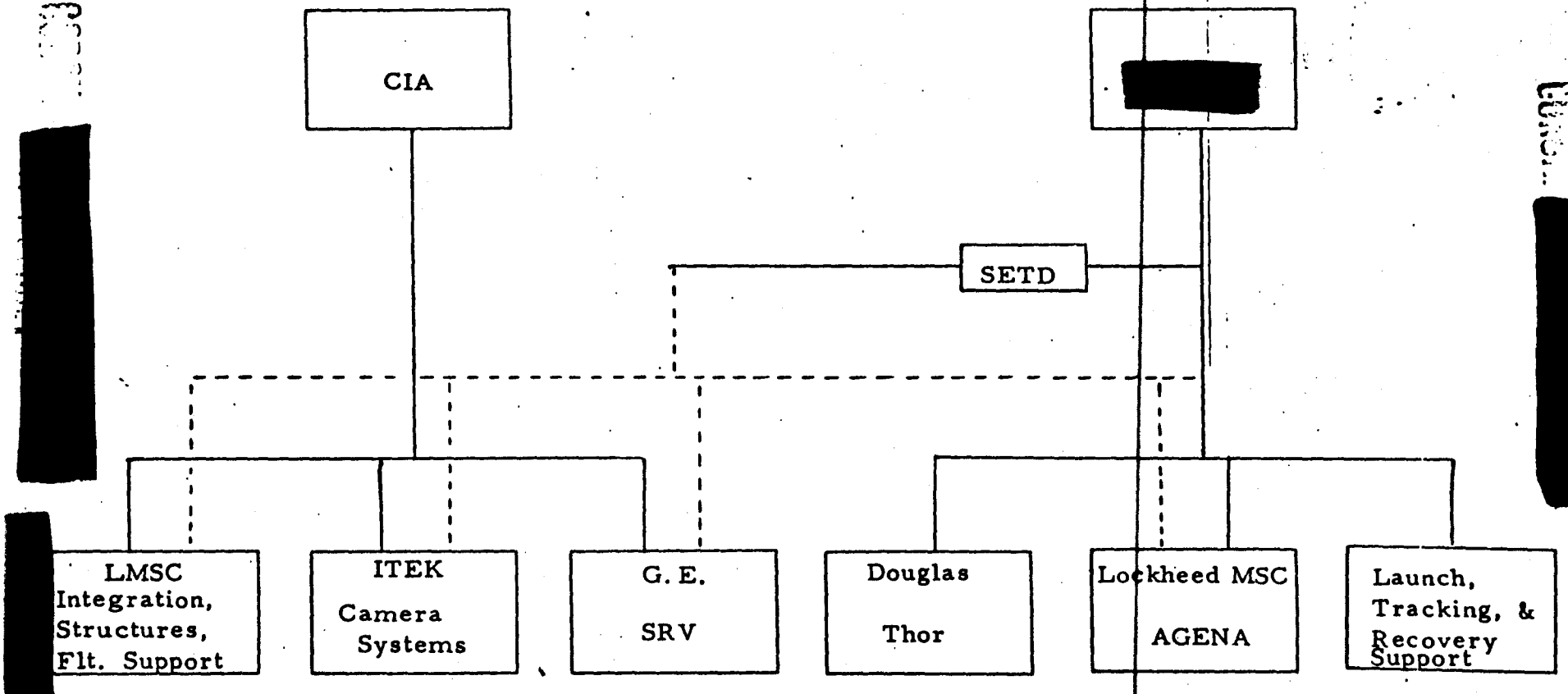

FIGURE 2

CONTRACTUAL ORGANIZATION (M, L, J Programs)

November 1962 - August 1964

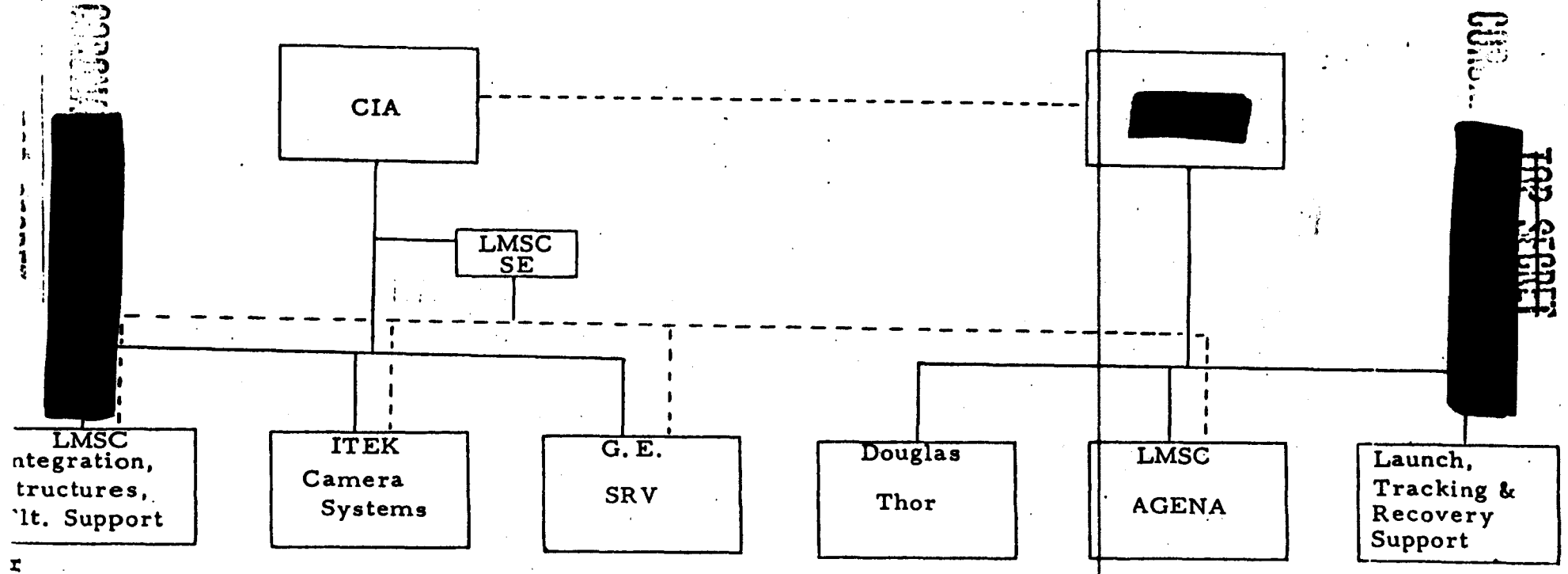

FIGURE 3

CONTRACTUAL ORGANIZATION (J-3 Program)

July 1965

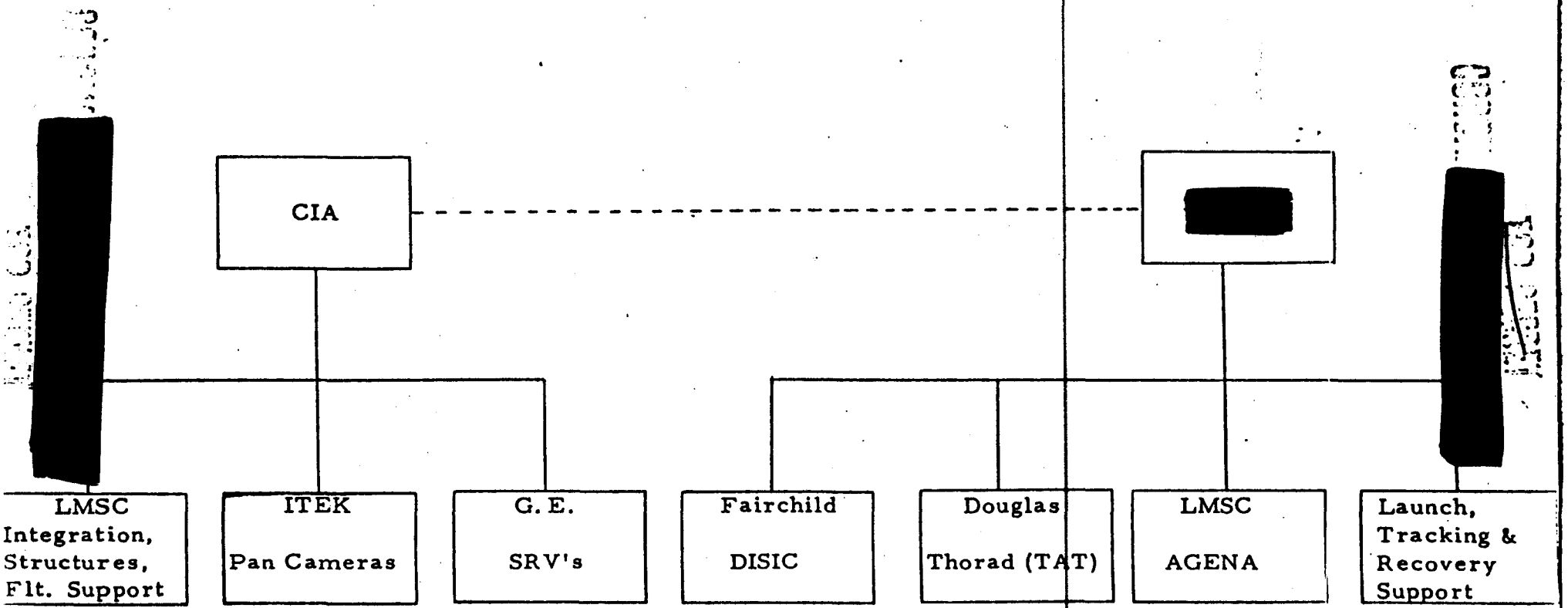

FIGURE 4

INBOARD PROFILES

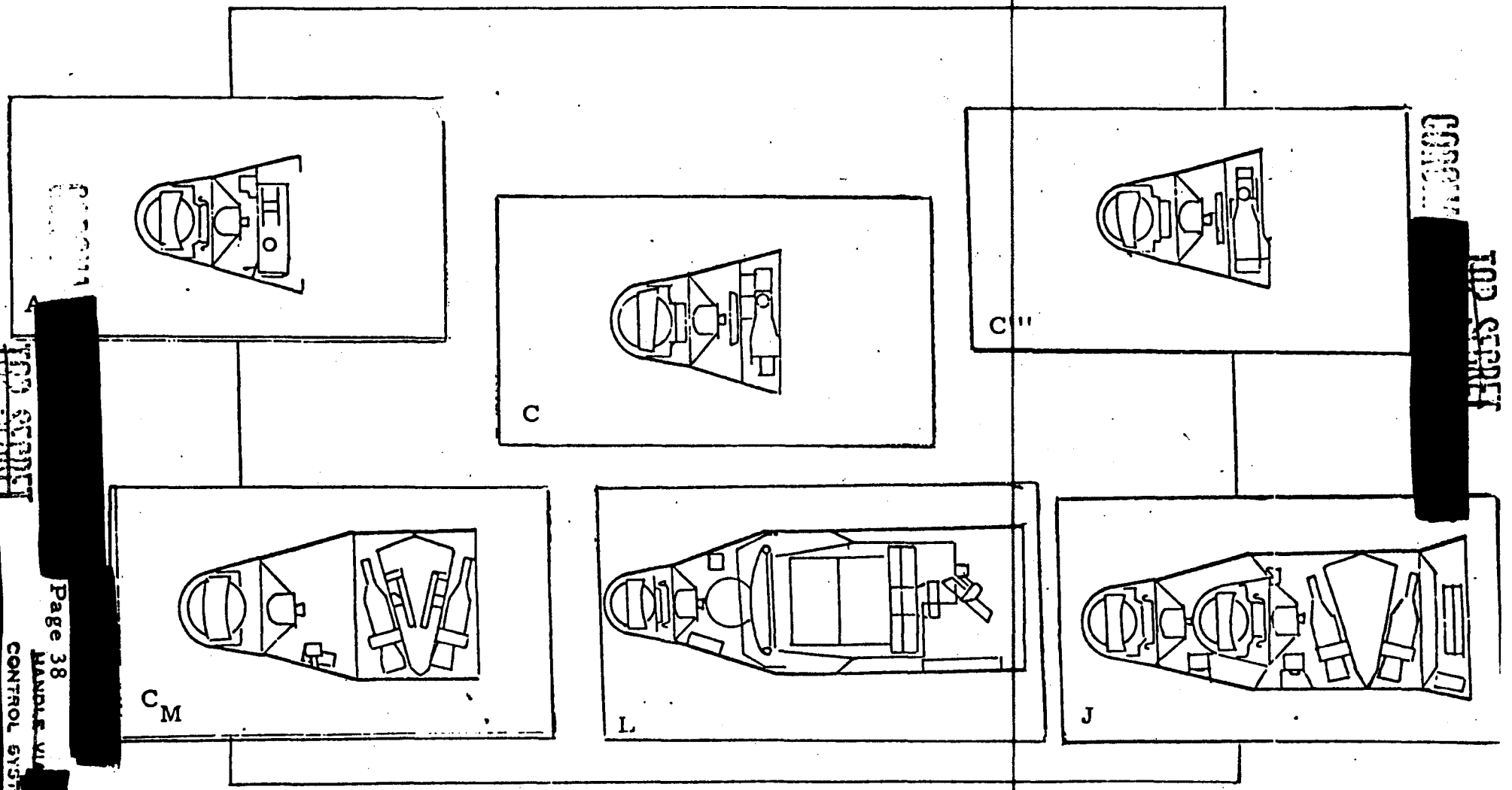

FIGURE 5

CORONA FLIGHT SUMMARY*

	1959	1960	1961	1962	1963	1964	1965	1966	1967
C	5	5							
C'		3	7						
C'''			5	1					
M				17	9				
J Capsules					4	26	26	18	16
Capsules Recovered	0	3	7	14	8	21	25	17	16
Useable Coverage $N.M.^2 \times 10^6$	0	2	12	59	40	85	96	68	64

* Less ARGON and LANYARD Flights

FIGURE 6

PROGRAM PERFORMANCE

PROGRAM FLIGHT NUMBER	VEHICLE NUMBER	THOR NUMBER	DD 250 NUMBER	MISSION NUMBER	INSTR. TYPE	INSTR. NUMBER	SRV NUMBER	INSTR. RECEIVED AT A/P	SHIP TO BASE	WKS AT A/P	DY. AT A/P	TOTAL WEEKS UNTIL FLIGHT	POUNDS PAYLOAD WEIGHT FLOWN	FLIGHT DATE	POUNDS PAYLOAD WEIGHT TRANSM'D	RECOVERY DATE	SUMMARY
1	1022	163												2/28/59			NO CAPSULE FLOWN
2	1018	170			BIO									4/13/59			CAPSULE EJECTED OVER SPITZENBERGEN 4/13/59.
3	1020	174			BIO									6/3/59			AGENA FAILED TO ORBIT.
4	1023	179	002	9001	C	4	102	5/5/59	5/29/59	3 — 3		7 — 2	16	6/25/59	0	NO ORBIT	AGENA FAILED TO ORBIT.
5	1029	192	004	9003	C	7	111	6/5/59	7/23/59	6 — 6		9 — 6	20	8/13/59	0.405		LOW TEMPERATURES. NOT RECOVERED. INSTRUMENT FAILED ON REV (1)
6	1028	200	003	9002	C	6	105	5/18/59	6/3/59	2 — 2		13 — 2	16	8/19/59	0.106		RETRO-ROCKET MALFUNCTION. NOT RECOVERED. INSTRUMENT FAILED ON REV. (2).
7	1031	206	006	9004	C	10	109	6/24/59	7/23/59	4 — 1		19 — 3	10	11/7/59	0	NO ORBIT	AGENA FAILURE. NO ORBIT.
8	1030	212	007	9005	C	9	107	7/25/59	11/7/59	15 — 0		16 — 6	10	11/20/59	0		ECCENTRIC ORBIT. WRONG ALTITUDE. INSTRUMENT FAILURE. NOT RECOVERED.
9	1052	218	008	9006	C	8	113	6/28/59	1/10/60	28 — 0		31 — 4	10	2/4/60	0	NO ORBIT	AGENA FAILED TO ORBIT.
10	1054	223	009	9007	C	13	110	12/7/59	2/4/60	8 — 3		10 — 4	10	2/19/60	0	NO ORBIT	AGENA FAILED TO ORBIT.
11	1055	234	010	9008	C	14	103	1/11/60	2/24/60	6 — 2		13 — 3	16	4/15/60	16		SPIN ROCKET FAILURE. NOT RECOVERED. INSTRUMENT OPERATION O
12	1053	DIAGNOSTIC	014	N/A	N/A									6/29/60	0	NO ORBIT	AGENA FAILED TO ORBIT. DIAGNOSTIC.
13	1057	DIAGNOSTIC	012	N/A	N/A									8/10/60	0	8/11/60	SUCCESSFUL WATER PICK-UP. DIAGNOSTIC.
14	1056	237	011	9009	C	3	101	1/28/60	3/28/60	8 — 4		29 — 0	20	8/18/60	20	8/19/60	SUCCESSFUL AIR CATCH. INSTRUMENT OPERATION O.K.
15	1058	246	013	9010	C	11	106	2/22/60	8/25/60	26 — 3		29 — 1	20	9/13/60	20		VEHICLE PITCH ATTITUDE IMPROPER AT RE-ENTRY. CAPSULE SUNK BEFORE RECOVERY. INSTRUMENT OPERATION O.K.
16	1061	253	015	9011	C'	15	506	6/6/60	9/17/60	14 — 5		20 — 2	20	10/26/60	0	NO ORBIT	"D" TIMER MALFUNCTION. AGENA FAILED TO ORBIT.
17	1062	297	016	9012	C'	17	507	9/12/60	10/17/60	5 — 0		9 — 6	39	11/12/60	1.7 LEADER	11/14/60	SUCCESSFUL AIR CATCH. PAYLOAD BROKE. T/M NO. 34
18	1103	296	017	9013	C'	19	508	10/9/60	10/29/60	2 — 6		8 — 3	39	12/7/60	39	12/10/60	SUCCESSFUL AIR CATCH. INSTRUMENT OPERATION O.K. T/M NO. 37
19	1101	258	N/A	N/A	N/A	N/A	N/A							12/20/60	0		NO SRV INSTALLED (RM-1 PAYLOAD)
20	1104	298	018	9014A	A	3	520	10/18/60	10/21/60	9 — 1		17 — 3	39	2/17/61	39		ORBITAL PROGRAMMER FAILED AT REV. (31). INSTRUMENT STILL IN SPACE, NO SHUTTER FIRINGS.
21	1102	261	N/A	N/A	N/A	N/A	N/A							2/18/61	0		NO SRV INSTALLED. (RM-2 PAYLOAD)
22	1105	300	019	9015	C'	18	509	2/21/61	3/28/61	5 — 0		5 — 2	39	3/30/61	0	NO ORBIT	AGENA FAILURE. NO ORBIT. T/M NO. 39
23	1106	307	020	9016A	A	4	521	11/30/60	3/16/61	15 — 1		18 — 3	39	4/8/61	39		RECOVERY WAS ATTEMPTED (IN REV (31) DUE TO LOSS O GAS. STILL IN SPACE. INSTRUMENT OPERATION O.K.
24	1108	302	022	9018A	A	8	541	4/3/61	5/25/61	7 — 3		9 — 3	39	6/8/61	0	NO ORBIT	AGENA FAILURE. POWER FAILURE AND GUIDANCE PROBLEM OCEAN IMPACT.
25	1107	306	021	9017	C'	16	510	3/7/61	4/17/61	5 — 6		14 — 3	39	6/16/61	39	6/18/61	SUCCESSFUL WATER PICK UP.
26	1109	308	023	9019	C'	20	511	10/18/60	5/15/61	29 — 6		37 — 3	39	7/7/61	28.7	7/9/61	SUCCESSFUL AIR CATCH. INSTRUMENT FAILED ON REV. (2
27	1110	322	024	9020A	A	7	524	4/4/61	6/24/61	11 — 3		15 — 3	39	7/21/61	0	NO ORBIT	NO ORBIT. THOR GUIDANCE DESTRUCT.
28	1111	309	025	9021	C'	21	512	11/13/60	5/20/61	26 — 6		37 — 3	39	8/3/61	0	NO ORBIT	AGENA GUIDANCE FAILURE.
29	1112	323	027	9023	C'''	54	554	6/23/61	8/17/61	7 — 6		9 — 5	39	8/30/61	39	9/1/61	RECOVERY ON REV. (32). INSTRUMENT O.K.
30	1113	310	026	9022	C'''	53	551	5/29/61	7/17/61	7 — 0		15 — 1	39	9/12/61	39	9/14/61	SUCCESSFUL AIR CATCH. RECOVERY ON REV. (33)
31	1114	324	029	9024	C'''	55	552	5/22/61	8/23/61	13 — 2		18 — 5	39	9/17/61	20	NO SEPARATION	SUCCESSFUL ORBIT. POWER FAILURE BEFORE RECOVERY P EVENT. INSTRUMENT O.K. (INSTR. QUIT AT 400 CYCLE FA
32	1115	328	032	9025	C'''	56	555	8/9/61	9/14/61	5 — 1		9 — 2	39	10/13/61	12.8	10/14/61	SUCCESSFUL AIR CATCH SUSPECT AGENA POWER PROBLEM ATTEMPT RECOVERY ON REV. (18)
33	1116	329	028	9026	C'	22	513	3/16/61	7/20/61	18 — 0		31 — 4	39.5	10/23/61	0	NO ORBIT	SECOND STAGE (AGENA) FAILED. WENT INTO SEA AFTER TAKE-OFF.
34	1117	330	033	9027	C'	24	553	5/22/61	9/26/61	18 — 1		23 — 6	39	11/5/61	39		SUCCESSFUL ORBIT DUE TO GAS VALVE FAILURE. NO RECOVERY MA STILL IN SPACE. INSTRUMENT OPERATION O.K.
35	1118	326	037	9028	C'	26	523	8/30/61	10/18/61	7 — 0		11 — 0	39	11/15/61	13	11/16/61	ONE DAY OPERATION DUE TO SHORTAGE OF CONTROL GAS. INSTRUMENT OPERATION O.K. RECOVERY BUCKET RE-USED.
36	1119	325	039	9029	C'''	52	525	11/10/61	11/27/61	2 — 3		4 — 4	38.2	12/12/61	38.2	12/16/61	SUCCESSFUL ORBIT RECOVERED ON REV. (64). SUCCESSFUL WATER PICK-UP, INSTRUMENT OPERATION O.K.
37	1120	327	040	9030	C'''	57	571	11/16/61	12/19/61	4 — 5		8 — 2	38.6	1/13/62	0	NO ORBIT	AGENA FAILURE. NO ORBIT.

FIGURE 7

PROG FLT NO	VEH NO	LOR	DD 250 NO	MISS'N NO	INSTR TYPE	INSTR NO	SRV NO	T/M NO	S/I NO	S/I T/U CASS'T	SUPPLY CASS'T	MAIN T/U CASS'T	ORCG NO	INSTR REC'D AT A/P	SHIP TO BASE	DAYS T /P	TOTAL WEEKS UNTIL FLIGHT	POUNDS PAYLOAD WEIGHT FLOWN	FLIGHT DATE	POUNDS PAYLOAD WEIGHT TRANSF.	NO OF ORBITS	RECOVERY DATE	SUMMA
38	1123	241	041	9031	Cm-1	70-71	581	57	74	N/A	N/A	70-71	7	1/3/62	2/16/62	6 — 2	7 — 6	37.6 - 37.5	2/27/62	75.1	65	3/3/62	SUCCESSFUL ORBIT ABLATIVE SHI RECOVERED INTACT AIR SNATCHED INSTR OK F/C FAILED FULL SPOOLS OF PYL
39	1124	331	042	9032	Cm-2	72-73	584	53	NONE	N/A	N/A	72-73	1	1/15/62	4/5/62	12 — 6	14 — 4	38.4 - 37.8	4/17/62	45.0	33	4/20/62	SUCCESSFUL ORBIT AIR CATCH INSTRUMENT OK GUIDANCE SYSTEM OPERATION OK
40	1125	333	043	9033	Cm-3	74-75	586	52	70	N/A	N/A	74-75	6	1/26/62	4/11/62	10 — 5	13 — 1	39.1 - 39.1	4/28/62	68.8	64	—	SUCCESSFUL ORBIT, (PER MALFUNCTION ON ORBITAL TIMER FAILED TO EJECT CHUTE CHUTE EJECTOR SQUIBS FAILED SUBM.
41	1126	334	044	9034	A-5	A	582	58	N/A	N/A	N/A	N/A	13	5/26/61	4/25/62	47 — 4	50 — 3	39.4	5/15/62	39.4	63	5/19/62	SUCCESSFUL AIR REC'Y BELLOWS MISSING M-TIMER AND SHUTTER TIMER MALFUNCTION INSTR OPER OK EXCEPT THIS.
42	1128	336	045	9035	Cm-4	76-77	585	55	82	N/A	N/A	76-77	9	2/16/62	5/13/62	12 — 2	14 — 4	39.7 - 39.5	5/29/62	79.2	49	6/1/62	SUCCESSFUL AIR REC'Y. NO F/C OPER CHUTE STRAP BURNED OFF 200 MILES OUT OF BALL PARK DUE TO COMM'D DUMP SEQUENCE
43	1127	335	046	9036	Cm-5	78-79	583	44	76	N/A	N/A	78-79	8	3/1/62	5/21/62	11 — 4	13 — 1	40.6 - 40.5	6/1/62	81.1	0	—	SUCCESSFUL ORBIT CHUTE TORE LOOSE SRV WENT INTO OCEAN FLOATED FOR 3 MINUTES THEN SANK INSTR OPER O K
44	1129	339	047	9037	Cm-6	80-81	591	48	88	N/A	N/A	84-85	10	3/21/62	5/30/62	10 — 0	13 — 2	40.1 - 40.2	6/22/62	80.3	50	6/25/62	SUCCESSFUL AIR REC'Y CHUTE CORDS INTACT A/R SNATCH AT 12,000 FT ON FIRST PASS NO KNOWN MALFUNCTIONS
45	1151	340	048	9038	Cm-7	84-85	592	50	80	N/A	N/A	96-97	3	3/20/62	6/13/62	12 — 1	14 — 2	40.1 - 39.9	6/27/62	80.0	63	7/1/62	SUCCESSFUL AIR REC'Y. FIRST AGENA D BURNED TOO LONG CAUSING 3 MINUTES HIGH ON PERIOD. INSTR OPER O K F/C BAD
46	1130	342	049	9039	Cm-8	90-91	593	59	90	N/A	N/A	88-89	13	4/11/62	6/20/62	10 — 0	14 — 2	40.2 - 40.2	7/20/62	19.7	33	7/22/62	SUCCESSFUL AIR REC'Y THRU NORMAL SEQUENCE F/C FULL M-TIMER MALFUNCTION. INSTR OPER ONLY 14 %
47	1131	347	050	9040	Cm-9	82-83	594	56	86	N/A	N/A	86-87	16	4/19/62	7/3/62	10 — 5	14 — 1	39.4 - 39.3	7/27/62	78.7	65	7/31/62	SUCCESSFUL AIR REC'Y INSTRUMENTATION O K F/C FAILED DUE POSSIBLY TO METERING SWITCH AND SOLENOID QUITTING
48	1152	344	051	9014	Cm-10	88-89	595	60	94	N/A	N/A	94-95	5	4/30/62	7/17/62	11 — 1	13 — 2	39.5 - 39.4	8/1/62	78.9	65	8/5/62	SUCCESSFUL AIR RECOVERY THROUGH NORMAL SEQUENCE INSTR OPER O K F/C FULL
49	1153	348	C52	9044	Cm-11	92-93	596	58	84	N/A	N/A	102-103	19	5/19/62	8/24/62	13 — 6	14 — 3	39.4 - 39.3	8/28/62	78.7	65	9/1/62	SUCCESSFUL AIR RECOVERY THROUGH NORMAL SEQUENCE INSTR OPER O K F/C DIDN'T FUNCTION PROPERLY.
50	1132	349	054	9042	A-10	A	600	63	N/A	N/A	N/A	N/A	202	6/22/62	8/6/62	6 — 3	10 — 1	36.3	9/1/62	36.3	65	—	SUCCESSFUL INSTR OPER PLANNED TO RECOVER AFTER 85TH REV BUT CHUTE TORE FROM SRV DURING AIR P/U NO F/C FLOWN
51	1133	350	055	9043	Cm-12	94-95	597	65	100	N/A	N/A	98-99	4	5/16/62	9/1/62	15 — 3	17 — 5	40.2 - 40.2	9/17/62	44.2	17	9/18/62	SUCCESSFUL AIR REC'Y NO P/L ON F/C 100 MILE PERIGEE AND RADIATION FACTOR INVOLVED INSTR OPER O K
52	1154	351	056	9045	Cm-13	96-97	598	64	D-3	N/A	N/A	104-105	11	6/20/62	9/13/62	12 — 1	14 — 3	39.6 - 39.5	9/29/62	66.0	49	10/2/62	SUCCESSFUL AIR REC'Y. F/C FULL WATER SEAL ON MAIN INSTR. SHE FAILED TO CLOSE P/L NOT CUT. PART OF P/L IN S/C
53	1134	352	057	9046	A-9	A	603	66	N/A	N/A	N/A	N/A	10.	3/31/62	9/30/62	26 — 1	27 — 3	38.3	10/9/62	38.3	65	10/13/62	SUCCESSFUL AIR REC'Y VEH WAS 10 MILES OUT OF APOGEE INTENDED FOR 170 WENT 242 MILES SHUTTER TIMER MALFUNCT
54	1401				N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10/26/62	N/A	N/A	—	DEEP PROBE RADIATION.
55	1136	367	058	9047	Cm-14	98-99	599	54	D-5	N/A	N/A	106-107	24	6/25/62	10/23/62	17 — 1	19 — 0	39.8 - 39.6	11/5/62	79.4	65	11/9/62	SUCCESSFUL AIR RECOVERY. F/C FULL INSTRUMENT OPERATION PERFECT.
56	1135	353	059	9048	Cm-15	100-101	601	62	D-7	N/A	N/A	100-101	23	7/10/62	11/12/62	17 — 6	19 — 4	39.4 - 39.4	11/24/62	78.8	81	11/29/62	SUCCESSFUL AIR REC'Y F/C FAILED. INSTR OPER O K PICKED UP CAPSULE 32 MILES FROM HONOLULU
57	1155	361	060	9049	Cm-16	86-87	606	56	D-2	N/A	N/A	116-117	17	9/19/62	11/24/62	9 — 3	10 — 6	39.6 - 39.9	12/4/62	67.0	0	—	SUCCESSFUL ORBIT DURING AIR SNATCH, SKYHOOK TORE PART OF CHUTE CAUSING SRV TO SINK. 2 DAY ORBIT DUE TO 80 MI PERIGEE
58	1156	366	061	9050	Cm-17	102-103	607	70	D-4	N/A	N/A	114-115	18	8/13/62	12/7/62	16 — 4	17 — 4	39.7 - 39.6	12/14/62	79.3	64	12/18/62	SUCCESSFUL AIR RECOVERY. S/I UNIT FULL INSTRUMENT OPERATION O K
59	1157	369	063	9051	Cm-18	104-105	608	69	D-8	N/A	N/A	108-109	21	10/23/62	12/20/62	8 — 2	10 — 6	39.1 - 39.0	1/7/63	78.1	64	1/11/63	SUCCESSFUL WATER PICK UP INSTR OPER O K 1,000 MI OUT OF BALL PARK AGENA PITCH 60TH ANTENNA'S BURNED IN HALF
60	1159	370	064	9052	Cm-20	108-109	610	67	D-6	N/A	N/A	120-121	12	12/8/62	2/13/63	9 — 3	12 — 1	39.3 - 39.5	2/28/63	0	0	—	FIRST TAT. THIRD TAT BOOSTER FAILED TO SEPARAT DESTRUCT 100 SECONDS AFTER LAUNCH.
61	1164	360	065	8001	L-1	03	612	70	S-2	T/L-1	N/A	6	303	11/27/62	3/5/63	14 — 0	15 — 6	72.2	3/18/63	0	0	—	SECOND TAT WORKED PERFECTLY NO ORBIT DUE TO FAILURE OF PNEUMATIC GUIDANCE ON AGENA BOOST
62	1160	376	066	9053	Cm-19	106-107	609	60	D-10	N/A	N/A	118-119	22	9/21/62	2/25/63	22 — 3	27 — 2	38.8 - 38.8	4/1/63	66.7	49	4/4/63	SUCCESSFUL AIR REC'Y HAD TO RECOVER AFTER 49 AGENA PWR SUPPLY PROB 1400 CYCLE INVERTER FAILED
63	1411	372	067	9055	A-12	A	605	54	N/A	N/A	N/A	N/A	205	1/10/63	4/10/63	12 — 6	15 — 1	38.3	4/26/63	0	0	—	NO ORBIT ACHEIVED. ATTITUDE SENSORS MISALIGNED PERFECT LAUNCH
64	1165	364	069	8002	L-2	05	613	58	S-3	T/L-2	N/A	4	302	2/26/63	4/14/63	6 — 5	11 — 4	72.9	5/18/63	0	33	5/20/63	DECODER 103 NO ACTIVATE SIG ERATIC ORBIT AGENA TOO STRONG D-TIMER 4 SEC SLOW REC'Y AFTER 33 RE
65	1161	362	068	9054	M-21	112-113	616	68	D-9	N/A	N/A	110-111	26	12/7/62	4/13/63	18 — 1	26 — 5	39.5 - 39.2	6/12/63	78.7	65	6/16/63	SUCCESSFUL AIR RECOVERY MOCK 'P' INSTRUMENT. INSTRUMENT OPERATION O K
66	1166	381	070	9056	M-22	110-111	611	62	D-11	N/A	N/A	130-131	20	4/15/63	6/1/63	6 — 5	10 — 2	39.5 - 39.4	6/26/63	78.9	65	6/30/63	NORMAL REC'Y OPER FIRST 'P' INSTR FLOWN. 'P' DOOR FAILED TO EJECT. INSTR. OPER. O K.
67	1412	388	071	9057	M-23	120-121	624	55	D-12	T/U-12	N/A	128-129	14	5/1/63	6/16/63	6 — 4	11 — 2	39.1 - 39.1	7/18/63	78.2	64	7/22/63	SUCCESSFUL AIR REC'Y LOST CENTER FOREMAT CLOSU SLAVE UNIT. TEMPERATURE IN ORBIT WAS IN MID 80'S.
68	1167	382	072	8003	L-3	01	614	66	S-4	T/L-6	N/A	7	304	3/7/63	7/8/63	17 — 4	20 — 5	79.1	7/30/63	19.8	32	8/1/63	SUCCESSFUL AIR RECOVERY. INSTRUMENT OPERATION THROUGH REV 31. INSTRUMENT MALFUNCTION
69	1162	377	073	1001	J-1A	114-115	615	69	D-14	T/U-13	S/C-3	T-5	402	4/1/63	8/3/63	17 — 5	20 — 5	81.5	8/24/63	81.5	64	8/28/63	SUCCESSFUL AIR RECOVERY S/I FAILURE FIRST 4 ST FLOWN. MAIN INSTRUMENT OPERATION O K
	1162	377	073	1001	J-1B	114-115	617	01	D-16	T/U-10	S/C-3	T-4	402	4/1/63	8/3/63	17 — 5	20 — 5	81.5	8/24/63	0	0	—	TRIED REC'Y. AFTER 12 DAYS 400 CYCLE INVERTER ON FAILED S/I INTERMITTENT TEMP SEN SHOWED VEH HOT
70	1169	394	074	9058	A-11	A	604	64	N/A	N/A	N/A	N/A	203	9/3/62	8/2/63	47 — 5	51 — 4	38.9	8/29/63	38.9	65	9/2/63	SUCCESSFUL AIR RECOVERY. INSTRUMENT OPERATION PERFECT.
71	1163	383	075	1002	J-2A	116-117	619	69	D-18	T/J-4	S/C-4	T-3	404	4/24/63	8/27/63	17 — 6	21 — 5	81.7	9/23/63	81.0	49	9/26/63	SUCCESSFUL AIR REC'Y. MASTER UNIT ON CASSETTE FAI MISADJUSTMENT IN PUCK ARM CONSISTANT LIGHT LEAK
	1163	383	075	1002	J-2B	116-117	620	60	D-13	T/J-13	S/C-4	T-6	404	4/24/63	8/27/63	17 — 6	21 — 5	82.5	9/23/63	0	165	—	TRIED TO RECOVER ON 165 REVOLUTIONS BUT COMMANDS FAILED DECODER FAILURE IN VEHICLE
72	1801	386	079	9059	A-6	A	602	50	N/A	N/A	N/A	N/A	204	2/21/61	10/8/63	136 — 6	139 — 6	40.1	10/29/63	40.1	65	11/3/63	SUCCESSFUL AIR REC'Y PERFECT INSTR OPER BEST 'A' FLOWN TO DATE DISCONTINUITIES THREE TIMES ON DEC
73	1171	400	078	9060	M-24	128-129	632	48	D-27	T/J-12	N/A	T-23	504	8/10/63	10/30/63	11 — 4	13 — 0	78.7	11/9/63	0	0	—	SYSTEM BECAME UNSTABLE 50 SECONDS AFTER LAUNCH SHARK BAIT
74	1172	406	080	9061	M-25	134-135	637	75	D-26	T/J-21	N/A	T-29	25	9/27/63	11/18/63	7 — 4	8 — 5	37.9 - 37.8	11/27/63	75.7	81	—	TRIED TO RECOVER AFTER 81 REVOLUTIONS (4 DAYS) BUT CAPSULE DID NOT EJECT PROPERLY
75	1168	398	081	9062	M-26	130-131	642	61	D-34	T/J-10	N/A	T-24	306	10/24/63	11/27/63	4 — 6	8 — 2	38.4 - 38.6	12/21/63	77.0	81	12/28/63	SUCCESSFUL AIR RECOVERY. PERFECT INSTRUMENT OPERATION.
76	1174	389	084	1004	J-3A	124-125	629	64	D-29	T/U-20	S/C-7	T-39	505	6/25/63	2/1/64	31 — 4	33 — 4	79.0	2/15/64	79.0	49	2/18/64	SUCCESSFUL AIR RECOVERY. INSTRUMENT OPERATION VERY GOOD
	1174	389	084	1004	J-3B	124-125	628	65	D-42	T/J-6	S/C-7	T-10	505	6/25/63	2/1/64	31 — 4	33 — 4	79.2	2/15/64	79.2	112	2/22/64	SUCCESSFUL AIR RECOVERY. INSTRUMENT OPERATION GOOD
77	1175	396	088	1003	J-6A	126-143	631	105	D-36	T/J-17	S/C-8	T-17	506	7/26/63	3/6/64	32 — 0	34 — 4	78.7	3/24/64	0	0	—	NO ORBIT DUE TO AGENA FAILURE (REGULATED POWER FAILURE).
	1175	396	088	1003	J-6B	126-143	630	103	D-31	T/J-18	S/C-8	T-18	506	7/26/63	3/6/64	32 — 0	34 — 4	78.9	3/24/64	0	0	—	DID NOT ACHEIVED ORBIT.

FIGURE 7 (cont.)

PROGRAM PERFORMANCE

PROG FLT NO	VEH NO	THOR NO	DD 250 NO	MISSN NO	INSTR TYPE	INSTR. NO.	SRV NO.	T/M NO.	S/I NO.	S/I T/U CASSET	SUPPLY CASS.	MAIN T/U CASSET	ORCG NO.	INSTR. RECD A/P	SHIP TO BASE	WKS-DYS AT A/P	TOTAL WEEKS UNTIL FLT	POUNDS PAYLOAD WEIGHT FLOWN	FLIGHT DATE	POUNDS PAYLOAD WEIGHT TRANSF.	NO OF ORBITS TO REC'Y	RECOVERY DATE	SUMMARY
78	1604	395	093	1005	J-8A	146-147	618	120	D-28	T/J-24	S/C-10	T-15	513	1/16/64	4/10/64	12 - 0	14 - 3	78.4	4/27/64	0	0	—	SUCCESSFUL LAUNCH & ORBIT NO POWER FROM AGENA DUE TO PYRO BUSS FAILURE. SLAVE INSTR FAILED
	1604	395	093	1005	J-8B	146-147	635	121	D-40	T/J 26	S/C-10	T-26	513	1/16/64	4/10/64	12 - 0	14 - 3	78.4	4/27/64	0	0	—	DUE TO FILM MATERIAL BREAKAGE
79	1176	403	094	1006	J-9A	148-149	638	107	D-43	T/J - 14	S/C-11	T-21	508	1/27/64	4/26/64	12 - 5	18 - 2	78.5	6/4 /64	78.5	65	6/8/64	SUCCESSFUL AIR RECOVERY. SECOND DOOR STUCK FOR 2 ORBITS. INSTRUMENT OPERATION GOOD.
	1176	403	094	1006	J-9B	148-149	639	104	D-49	T/J-30	S/C-11	T-30	508	1/27/64	4/26/64	12 - 5	18 - 2	78.5	6/4 /64	78.5	128	6/12/64	SUCCESSFUL AIR RECOVERY. INSTRUMENT OPERATION GOOD.
80	1606	408	096	9065	A-21	21	661	61	N/A	N/A	N/A	N/A	525	5/5/64	6/2 /64	12 - 5	14 - 2	39.6	6/13/64	39.6	96	6/19/64	SUCCESSFUL AIR RECOVERY. INSTRUMENT OPERATION GOOD. CLOUD COVERAGE 60-70 %
81	1609	410	095	1007	J-7A	144-145	634	102	D-43	T/J-11	S/C-9	T-11	509	12/30/63	5/13/64	19 - 1	24 - 3	80.1	6/19/64	80.1	65	6/23/64	SUCCESSFUL AIR RECOVERY. INSTRUMENT OPERATION GOOD. RESOLUTION GOOD.
	1609	410	095	1007	J - 7B	144-145	633	110	D-54	T/J-16	S/C-9	T-16	509	12/30/63	5/13/64	19 - 1	24 - 3	78.9	6/19/64	78.9	128	6/27/64	SUCCESSFUL AIR RECOVERY. INSTRUMENT OPERATION GOOD.
82	1177	404	097	1008	J-10A	150-151	640	109	D-48	T/J-15	S/C-12	T-31	514	2/27/64	5/19/64	11 - 4	19 - 0	80.1	7/10/64	80.1	49	7/13/64	SUCCESSFUL AIR RECOVERY. INSTRUMENT OPERATION GOOD.
	1177	404	097	1008	J-10B	150-151	641	112	D-33	T/J-9	S/C-12	T-14	514	2/27/64	5/19/64	11 - 4	19 - 0	80.2	7/10/64	80.2	112	7/17/64	SUCCESSFUL AIR RECOVERY. INSTRUMENT OPERATION GOOD.
83	1605	413	098	1009	J-12A	154-155	646	136	D-58	T/U-23	S/C-15	T-37	517	3/30/64	6/26/64	12 - 4	18 - 2	79.2	8/5/64	69.5	49	8/8/64	SUCCESSFUL AIR RECOVERY. INSTRUMENT OPERATION GOOD AGENA BEACON PROBLEM
	1605	413	098	1009	J-12B	154-155	647	116	D-38	T/J-34	S/C-15	T-34	517	3/30/64	6/26/64	12 - 4	18 - 2	79.4	8/5/64	79.4	128	8/13/64	SUCCESSFUL AIR RECOVERY. INSTRUMENT OPERATION GOOD
84	1603	412	099	9066A	A-22	22	667	71	N/A	N/A	N/A	N/A	526	4/9 /64	8/4 /64	18 - 0	20-3	39.4	8/21/64	39.4	96	8/27/64	SUCCESSFUL AIR RECOVERY. INSTRUMENT OPERATION GOOD. CLOUD COVERAGE 80 %
85	1178	405	100	1010	J-11A	152-153	644	113	D-41	T/J-27	S/C-26	T-27	510	3/12/64	7/14/64	17 - 5	26-3	80.5	9/14/64	80.5	65	9/18/64	SUCCESSFUL AIR RECOVERY. INSTRUMENT OPERATION GOOD.
	1178	405	100	1010	J-11B	152-153	652	118	D-44	T/J-39	S/C-26	T-44	510	3/12/64	7/14/64	17 - 5	26-3	81.5	9/14/64	81.5	144	9/23/64	SUCCESSFUL AIR RECOVERY. INSTRUMENT OPERATION GOOD.
86	1170	421	105	1011	J-03A	160-161	653	119	D-30	T/U-22	S/C-16	T-49	518	5/25/64	8/21/64	12 - 1	18-2	78.8	10/5/64	80.0	65	10/9/64	SUCCESSFUL AIR RECOVERY. INSTRUMENT OPERATION GOOD. DROGUE CHUTE FAILED.
	1170	421	105	1011	J-03B	160-161	654	131	D-57	T/J-8	S/C-16	T-20	518	5/25/64	8/21/64	12 - 1	18-2	78.7	10/5/64	69.3	—	—	VEH BATTERY DROPPED TO 18.5 VOLTS ATTEMPTED RE ON 112 REVOLUTIONS, NO SEPARATION FROM AGENA
87	1179	418	107	1012	J-13A	156-157	651	117	D-51	T/U-20	S/C-5	T-43	507	3/30/64	7/30/64	17 - 3	28-5	79.7	10/17/64	69.3	49	10/20/64	SUCCESSFUL AIR RECOVERY. INSTR OPERATION GOOD BEACON PROBLEM ON AGENA. S/I FAILURE.
	1179	418	107	1012	J-13B	156-157	645	114	D-46	T/J-32	S/C-5	T-32	507	3/30/64	7/30/64	17 - 3	28-5	79.7	10/17/64	38.5	81	10/22/64	GUIDANCE PROBLEM ON AGENA REQUIRING LIFEBOAT REC 48% PAYLOAD RETRIEVED WATER IMPACT DUE TO BEATI
88	1173	420	108	1013	J-15A	158-159	656	127	D-52	T/U-27	S/C-20	T-55	519	4/17/64	9/16/64	21-5	28-3	79.2	11/2/64	59.4	65	11/6/64	SUCCESSFUL AIR REC'Y INSTR'S FAILED ON PASS NO 52 416 CYCLES UNPROGRAMMED ON REV 1 S/I OPER NORMA
	1173	420	108	1013	J-15B	158-159	657	133	D-47	T/J-36	S/C-20	T-40	519	4/17/64	9/16/64	21-5	28-3	79.1	11/2/64	0	81	11/7/64	SUCCESSFUL AIR RECOVERY MISSION TERMINATED ON PA NUMBER 52. S/I OPERATION NORMAL.
89	1180	416	110	1014	J-16A	162	659	128	D-53	T/J-2	S/C-21	T-7	520	6/4/64	10/28/64	20 - 4	23-6	79.1	11/18/64	80.0	81	11/23/64	SUCCESSFUL AIR RECOVERY INSTRUMENT OPERATION NORMAL NO FAILURES IN SYSTEM.
	1180	416	110	1014	J-16B	139	660	132	D-50	T/J-33	S/C-21	T-12	520	8/14/64	11/4/64	11 - 5	13-5	79.4	11/18/64	78.0	145	11/27/64	SUCCESSFUL AIR RECOVERY. INSTRUMENT OPERATIO NORMAL. NO FAILURES IN SYSTEM
90	1607	424	111	1015	J-17A	138	662	129	D-61	T/J- 25	S/C-22	T-33	524	9/30/63	11/16/64	59-0	63-6	78.9	12/19/64	76.0	81	12/24/64	SUCCESSFUL AIR RECOVERY, INSTRUMENT OPERATION NORMAL AFTER (5) DAYS MISSION (DROGUE CHUTE FAILED
	1607	424	111	1015	J-17B	141	663	140	D-58	T/J-38	S/C-22	T-38	524	11/15/63	11/16/64	52-1	57-0	79.0	12/19/64	68.7	175	12/30/64	SUCCESSFUL AIR RECY. DE-ACTIVATED FOR 3 DAYS (1ST TIME EARLY REC'Y DUE TO PYRO BATTERY PROBLEM ON AGE
91	1608	414	112	1016	J-18A	132	665	135	D-55	T/U-21	S/C-23	T-47	523	9/6/63	11/24/64	63-3	70-6	78.7	1/15/65	77.7	81	1/20/65	SUCCESSFUL AIR REC'Y APPROX 40 MILES FROM ESTIMATE POINT OF IMPACT. INSTR OPERATION NORMAL.
	1608	414	112	1016	J-18B	133	666	106	D-59	T/J-28	S/C-23	T-28	523	9/6/63	11/24/64	63-3	70-6	78.5	1/15/65	78.5	159	1/25/65	SUCCESSFUL AIR RECOVERY. INSTRUMENT OPERATION NORMAL. ZERO DEFECTS ON THIS MISSION.
92	1611	432	119	1017	J-14A	140	623	109	D-21	T/J-23	S/C 24	T-25	531	11/15/63	12/21/64	57-2	66-5	79-6	2/25/65	81.2	81	3/ 2/65	SUCCESSFUL AIR RECOVERY. INSTRUMENT OPERATION GOOD. ZERO DEFECTS
	1611	432	119	1017	J-14B	165	625	112	D-60	T/J-25	S/C 24	T-52	531	6/17/64	12/21/64	57-2	66-5	78.7	2/25/65	75.7	145	3/6/65	SUCCESSFUL AIR RECOVERY. S/I FAILURE(METERING) YAW PROGRAMMER FAILURE ON REV 88. CAPPING SHUTT
93	1612	429	115	1018	J-19A	122	668	136	D-20	SP-1	S/C 27	T-51	530	5/20/63	1/13/65	35-0	45-1	79.0	3/25/65	80.5	66	3/29/65	SUCCESSFUL AIR RECOVERY. INSTR OPERATION GOOD. S/I PROGRAMMER FAILURE, EFFECTING BOTH INSTR.
	1612	429	115	1018	J-19B	123	669	108	D-22	T/J-44	S/C27	T-54C	530	5/20/63	1/13/65	35-0	45-1	78.7	3/25/65	77.2	99	3/31/65	SUCCESSFUL AIR RECOVERY. INSTRUMENT OPERATIC GOOD.
94	1614	437	118	1019	J-04A	118	626	138	D-39	T/U-26	S/C-6	T-53	512	5/8/63	1/28/65	90-1	103-1	78.1	4/29/65	78.6	80	5/4/65	SUCCESSFUL AIR RECOVERY INSTRUMENT OPERATION NORMAL
	1614	437	118	1019	J-04B	119	627	139	D-19	T/J-50	S/C-6	T-60C	512	5/8/63	1/28/65	90-1	103-1	78.1	4/29/65	79.6	143	—	NO RECOVERY DUE TO MALFUNCTION OF VEHICLE RECOVERY COMMAND SYSTEM PROGRAMMING
95	1615	438	121	1021	J-21A	166	674	134	D-63	T/J-45	S/C-32	T-59C	529	11/18/64	4/29/65	23-1	25-6	77.9	5/18/65	75.4	81	5/23/65	SUCCESSFUL AIR RECOVERY. S/I FAILED ON FOUR REV INSTRUMENT OPERATION NORMAL.
	1615	438	121	1021	J-21B	167	670	111	D-25	T/J-48	S/C-32	T-58C	529	11/18/64	4/29/65	23-1	25-6	78.5	5/18/65	51.9	161	5/28/65	SUCCESSFUL AIR RECOVERY. PAYLOAD IN NO 1 INSTR C OUT OF RAILS BECAUSE OF TORN FILM CAUSING INST FA
96	1613	444	132	1020	J-20A	136	672	1011	D-67	T/J-13	S/C-28	T-13	901	11/13/64	3/15/65	17-3	29-5	78.3	6/9/65	77.9	97	6/15/65	SUCCESSFUL AIR RECOVERY. INSTRUMENT OPERATION NORMAL
	1613	444	132	1020	J-20B	137	673	107	D-62	T/J-40	S/C-28	T-48	901	11/13/64	3/15/65	17-3	29-5	78.2	6/9/65	28.0	113	6/16/65	TYPE (9) REGULATOR FAILED ON AGENA CAUSING COMPLETE LOSS OF GUIDANCE, RECOVERED BY LIFEBOA
97	1617	446	133	1022	J-22A	168	664	119	D-65	T/J-47	S/C-33	T-61C	516	12/28/64	5/17/65	20-0	29-0	78.9	7/19/65	81.2	65	7/23/65	SUCCESSFUL AIR RECOVERY. ZERO DEF ''S FOR A/I FACILITY
	1617	446	133	1022	J-22B	169	658	129	D-24	T/J-46	S/C-33	T-56C	516	12/28/64	5/17/65	20-0	29-0	78.3	7/19/65	76.7	144	7/28/65	SUCCESSFUL AIR RECOVERY. CYCLE COUNTER ON INSTRUMENT INTERMITTENT.
98	1618	449	134	1023	J-23A	170	621	113	D-17	T/J-43	S/C-31	T-57C	522	1/28/65	6/9/65	18-5	28-5	78.9	8/17/65	79.9	81	8/22/65	SUCCESSFUL AIR RECOVERY. INSTRUMENT OPERATION NORMAL
	1618	449	134	1023	J-23B	171	649	114	D-66	T/J-37	S/C-31	T-42	522	1/28/65	6/9/65	18-5	28-5	78.3	8/17/65	57.7	144	8/26/65	SUCCESSFUL AIR REC'Y INSTR WAS INTERMITTENT RELAY IN A/P COMMAND BOX PROBABLE CAUSE
99	1602	401	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9/1/65	N/A	N/A	N/A	COMPLETE HP VEH NO A/P RANGE SAFETY DESTRUCTED THOR AT T + 37 SECONDS
100	1619	458	136	1024	J-24A	172	622	1005	D-69	T/U-19	S/C-34	T-41	515	3/2/65	8/10/65	23-0	29-1	80.1	9/22/65	81.5	81	9/27/65	SUCCESSFUL AIR RECOVERY LOW PERIOD ORBIT DU TO BOOSTER INSTRUMENT OPERATION GOOD
—	1619	458	136	1024	J-24B	173	643	118	D-64	T/U-24	S/C-34	T-50	515	3/2/65	8/10/65	23-0	29-1	80.2	9/22/65	79.8	161	10/2/65	SUCCESSFUL AIR RECOVERY. INSTRUMENT OPERATION GOOD.

PROGRAM PERFORMANCE [redacted]

PROG FLT. NO.	VEH NO.	THOR NO.	DD 250 NO.	MISSN NO.	INSTR TYPE	INSTR. NO.	SRV NO.	T/M NO.	S/I NO.	S/I T/U CASS'T	SUPPLY CASS'T	MAIN T/U CASS'T	DRCG NO.	INSTR. RECD A/P	SHIP TO BASE	WKS-DYS AT A/P	TOTAL WEEKS UNTIL FLT.	POUNDS PAYLOAD WEIGHT FLOWN	FLIGHT DATE	POUNDS PAYLOAD WEIGHT TRANSF.	NO. OF ORBITS TO RECV	RECOVER DATE	SUMMARY
101	1616	433	138	1025	JX-28A	142	650	115	D-73	TU-18	S/C-30	T-45	521	12/11/63	9/16/65	92-1	94-6	78.9	10/5/65	78.8	81	10/10/65	SUCCESSFUL AIR RECOVERY. OPERATION NORMAL.
	1616	433	138	1025	JX-29B	127	636	130	D-70	TJ-42	S/C-30	T-36	521	7/26/63	9/16/65	114-5	117-3	78.9	10/5/65	78.6	161	10/15/65	SUCCESSFUL AIR RECOVERY ANOMOLOUS DEPLOYMENT OF MAIN CHUTE
102	1620	439	139	1026	J-25A	174	701	1001	D-75	TJ-78	S/C-35	T-65C	502	4/30/65	10/1/65	22-1	26-0	78.6	10/28/65	78.6	81	11/2/65	SUCCESSFUL AIR RECOVERY, INTERMITTANT C.P. SWITCH OPERATION
	1620	439	139	1026	J-25B	175	702	1002	D-72	TJ-62	S/C-35	T-62C	502	4/30/65	10/1/65	22-1	26-0	78.5	10/28/65	77.8	160	11/7/65	SUCCESSFUL AIR RECOVERY, H.O. HAD STICKY SHUTTER
103	1621	448	140	1027	JX-27A	163	648	140	D-71	TJ-19	S/C-29	T-19	532	6/4/64	10/25/65	57-6	64-5	78.8	12/9/65	53.0	17	12/10/65	SUCCESSFUL AIR RECOVERY INSTR OPERATION NORMAL VEH. "D" INER SW FAILURE, LIFEBOAT RECOVERY
	1621	448	140	1027	JX-27B	164	655	141	D-68	TJ-41	S/C-29	T-22	532	6/17/64	10/25/65	56-0	66-4	78.8	12/9/65	0	33	12/11/65	SUCCESSFUL AIR RECOVERY. NO INSTR OPERATION LIFEBOAT RECOVERY.
104	1610	451	141	1028	J-26A	176	703	1003	D-77	TJ-7	S/C-37	T-67C	535	5/26/65	12/2/65	29-1	30-2	78.6	12/24/65	80.3	81	12/29/65	SUCCESSFUL AIR RECOVERY. INSTR OPERATION PERFECT. ZERO DEFECTS
	1610	451	141	1028	J-26B	177	704	1004	D-74	TJ-64	S/C-37	T-64C	535	5/26/65	12/2/65	29-1	30-2	79.3	12/24/65	77.6	144	1/2/66	SUCCESSFUL AIR RECOVERY. INSTR. 200 KC TIMING INTERMITTENT, OTHERWISE ZERO DEFECTS.
105	1623	450	142	1029	J-27A	178	705	1010	D-79	TJ-35	S/C-36	T-69C	540	5/28/65	12/16/65	28-6	31-2	79.9	2/2/66	79.9	81	2/7/66	SUCCESSFUL AIR RECOVERY. ZERO DEFECTS
	1623	450	142	1029	J-27B	179	706	1006	D-76	TJ-66	S/C-36	T-66C	540	5/28/65	12/16/65	28-6	31-2	79.8	2/8/66	79.8	160	2/12/66	SUCCESSFUL AIR RECOVERY. 81 NON OPERATIONAL BETWEEN REV 81 THROUGH 133
106	1622	452	143	1030	J-29A	182	709	1009	D-94	TJ-73	S/C-39	T-71C	533	7/2/65	1/24/66	29-3	35-5	79.1	3/1/66	80.2	81	3/14/66	SUCCESSFUL AIR RECOVERY. STEPPER SWITCH PROBLEM. INSTRUMENT OPERATION NORMAL
	1622	452	143	1030	J-29B	183	710	1012	D-82	TJ-70	S/C-39	T-68C	533	7/2/65	1/24/66	29-3	35-5	79.9	3/9/66	78.8	159	3/19/66	SUCCESSFUL AIR RECOVERY. SAME STEPPER PROBLEM. INSTRUMENT OPERATION NORMAL
107	1627	474	146	1031	J-30A	184	711	102	D-83	TJ-81D	S/C-42	T-81D	537	9/21/65	3/2/66	23-1	28-2	79.7	4/7/66	81.0	113	4/14/66	SUCCESSFUL AIR RECOVERY FIRST 7 DAY A MISSION BLOSSOM T/M BATTERY FAILURE IMPACT 93 NM LO
	1627	474	146	1031	J-30B	185	712	130	D-86	TJ-65	S/C-42	T-78C	537	9/21/65	3/2/66	23-1	28-2	79.9	4/7/66	39.8	177	4/18/66	SUCCESSFUL AIR RECOVERY. SLAVE CAMERA FAILED DURING C & W.
108	1625	465	149	1032	J-28A	180	707	1007	D-81	TJ-67	S/C-38	T-73C	534	7/9/65	4/5/66	38-4	42-4	80.0	5/3/66	0	0	----	FAILED TO ACHIEVE ORBIT.
	1625	465	149	1032	J-28B	181	708	1008	D-80	TJ-5	S/C-38	T-70C	534	7/9/65	4/5/66	38-4	42-4	79-5	5/3/66	0	0	----	FAILED TO ACHIEVE ORBIT.
109	1630	469	150	1033	J-33A	194	717	1017	D-91	TJ-87D	S/C-45	T-87D	543	11/9/65	5/5/66	25-2	27-6	79-6	5/23/66	82.0	82	5/28/66	SUCCESSFUL AIR RECOVERY INSTR OPERATION NORMA
	1630	469	150	1033	J-33B	195	718	107	D-84	TJ-84	S/C-45	T-84C	543	11/9/65	5/5/66	25-2	27-6	79.7	5/23/66	77.3	176	6/3/66	SUCCESSFUL AIR RECOVERY INSTR OPERATION NORMA
110	1626	466	153	1034	J-31A	186	713	1013	D-85	TJ-77B	S/C-41	T-77D	538	10/6/65	5/18/66	27-4	32-3	79.7	6/21/66	79.6	81	6/26/66	SUCCESSFUL AIR RECOVERY. V/H PROGRAMMER FAILUR PMU GAS LEAK OUT BY REV 30
	1626	466	153	1034	J-31B	187	714	1014	D-87	TJ-74	S/C-41	T-74C	538	10/6/65	5/18/66	27-4	32-3	79.7	6/21/66	79.3	161	7/1/66	SUCCESSFUL AIR RECOVERY. FLASHING LIGHT FAILURE.
111	1631	506	154	1036	J-32A	190	715	1015	D-89	TJ-83D	S/C-43	T-83D	511	10/27/65	8/1/66	39-4	40-6	79.5	8/9/66	80.1	115	8/16/66	SUCCESSFUL AIR RECOVERY. INSTRUMENT OPERATIO GOOD
	1631	506	154	1036	J-32B	191	716	1016	D-88	TJ-80	S/C-43	T-80C	511	10/27/65	8/1/66	39-4	40-6	79.3	8/9/66	78.2	212	8/22/66	SUCCESSFUL AIR RECOVERY. INSTRUMENT OPERATIO GOOD.
112	1628	477	164	1035	J-36A	188	723	118	D-95	TJ-75D	S/C-40	T-75D	607	1/26/66	6/21/66	20-6	33-6	79.8	9/20/66	78.9	81	9/25/66	SUCCESSFUL AIR CATCH. INSTR OPERATION NORMAL. NEW OPS. SELECTION CAPABILITY AND O.S.F.O
	1628	477	164	1035	J-36B	189	724	127	D-96	TJ-72	S/C-40	T-72C	607	1/26/66	6/21/66	20-6	33-6	79.8	9/20/66	80.6	160	9/30/66	SUCCESSFUL AIR CATCH. V/H PROGRAMMER FAILED ON REV. 137.
113	1632	507	178	1037	J-38A	198	727	102	D-101	TJ-101D	S/C-46	T99E	544	6/30/66	10/13/66	17-4	18-5	79.7	11/8/66	79.4	.66	11/12/66	SUCCESSFUL AIR RECOVERY. SLV INTERIM PHASE III, SECON PG & SECOND THORAD LAUNCH.
	1632	507	178	1037	J-38B	199	728	135	D-106	TJ-89	S/C-46	T96F	544	6/30/66	10/13/66	17-4	18-5	78.4	11/8/66	78.2	195	11/20/66	SUCCESSFUL AIR RECOVERY. INSTRUMENT OPERATION NORMAL.
114	1629	495	184	1038	J-34A	192	719	115	D-93	TJ-85D	S/C-44	T-85D	542	12/3/65	1/10/67	57-4	58-1	81.0	1/14/67	80.3	81	1/19/67	SUCCESSFUL AIR RECOVERY. INSTRUMENT OPERATION NORMAL. HIGH SYSTEM TEMP, M I P 80
	1629	495	184	1038	J-34B	193	720	134	D-90	TJ-82	S/C-44	T-82C	542	12/3/65	1/10/67	57-4	58-1	80.8	1/14/67	81.5	193	1/26/67	SUCCESSFUL AIR RECOVERY INSTRUMENT OPERATION NORMAL. M I P 80 TEMP NORMAL 1ST FULL 3 SYSTEM
115	1635	493	196	1039	J-39A	206	729	1001	D-103	TJ-79D	S/C-51	T-79D	602	4/8/66	2/16/67	44-3	44-11	80.3	2/22/67	80.76	81	2/27/67	SUCCESSFUL AIR RECOVERY INSTRUMENT OPERATION NORMAL, HIGH SYSTEM TEMP, M I P 83
	1635	493	196	1039	J-39B	207	730	1010	D-100	TJ-76	S/C-51	T-76C	602	4/8/66	2/16/67	44-3	44-11	79.9	2/22/67	79.44	177	3/3/67	SUCCESSFUL AIR RECOVERY INSTRUMENT OPERATION NORMAL, NORMAL SYSTEM TEMP, M I P 83
116	1636	501	200	1040	J-35A	196	721	136	D-78	TJ-89D	S/C-47	T-89D	539	12/17/65	3/26/67	66-2	66-6	79.3	3/30/67	76.28	81	4/4/67	SAR S-BAND LINK INOPERATIVE. UNCLE B/U EMPLOYED M I P 83, TEMP NORMAL
	1636	501	200	1040	J-35B	197	722	113	D-92	TJ-86	S/C-47	T-86C	539	12/17/65	3/26/67	66-2	66-6	79.1	3/30/67	82.12	145	4/8/67	SAR S-BAND LINK INOPERATIVE. UNCLE B/U EMPLOYED M I P 83, TEMP NORMAL
117	1634	508	209	1041	J-40A	208	731	1003	D-105	TJ-99D	S/C-52	T-101E	536	5/20/66	5/4/67	50-0	50-5	88.5	5/9/67	80.14	93	5/15/67	SUCCESSFUL AIR RECOVERY
	1634	508	209	1041	J-40B	209	732	138	D-102	TJ-96	S/C-52	T-98F	536	5/20/66	5/4/67	50-0	50-5	88.2	5/9/67	78.95	215	5/23/67	SAR PICKUP 225 NM DOWN RANGE DUE TO ABNORMAL ORBIT (AGENA VELOCITY METER FAILURE)
118	1633	509	213	1042	J-37A	204	725	129	D-97	TJ-95D	S/C-49	T-95D	528	3/22/65	6/8/67	115-3	116-4	80.5	6/16/67	78.4	97	6/22/67	SUCCESSFUL AIR RECOVERY INSTRUMENT OPERATION NORMAL.
	1633	509	213	1042	J-37B	205	726	1005	D-98	TJ-88	S/C-49	T-88C	528	3/22/65	6/8/67	115-3	116-4	78.1	6/16/67	80.2	143	7/1/67	WATER PICKUP INSTRUMENT OPERATION NORMAL. CHUTE EVENTS LATE.
119	1637	510	216	1043	J-42A	200	735	127R3	D-107	TJ-91D	S/C-48	T-91D	527	8/4/66	7/27/67	51-0	52-4	79.9	8/7/67	79.9	113	8/14/67	SUCCESSFUL AIR RECOVERY. MASTER SCAN RATE ERRATIC AFTER REV 88.
	1637	510	216	1043	J-42B	201	736	112	D-112	TJ-92	S/C-48	T-92C	527	8/4/66	7/27/67	51-0	52-4	80.2	8/7/67	73.2	127	8/22/67	SUCCESSFUL AIR RECOVERY. MASTER INSTRUMENT FAILED ON REV. 888.
120	1641	512	217	1101	CR-1A	302	803	1029	D-3	3	S/C-302	T-305	616	2/14/67	9/10/67	29-6	30-4	79.5	9/15/67	79.5	113	9/21/67	SUCCESSFUL AIR RECOVERY
	1641	512	217	1101	CR-1B	303	804	1028	D-3	6	S/C-302	T-302	616	2/14/67	9/10/67	29-6	30-4	79.8	9/15/67	79.8	97	9/28/67	SUCCESSFUL AIR RECOVERY
121	1639	513	221	1044	J-41A	202	733	1004	D-99	TJ-97D	S/C-50	T-97E	606	7/6/66	10/27/67	68-1	68-6	79.75	11/1/67	79.8	97	11/3/67	SUCCESSFUL AIR RECOVERY
	1639	513	221	1044	J-41B	203	734	130R2	D-101	TJ-94	S/C-50	T-94F	606	7/6/66	10/27/67	68-1	68-6	78.56	11/1/67	78.6	97	11/11/67	SUCCESSFUL AIR RECOVERY

FIGURE 7 (cont)

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