SAFMS ROUTING AND REMARKS SHEET - For Internal use only & to be filed w/doc

DATE	ACTION	INFO
DIRECTOR		
DEP DIR		
EXECUTIVE		
Maj. Van Mater		
CWO. De Haro		
ASST FOR PGMS		
ASST FOR ELEC		
ASST FOR INST		
ASST FOR PHOTO		
ASST FOR SYS ENG		
AFBMC		
Col Runyon		
Col Dorfman		
RETURN TO		
FILE		

MEMO FOR RECORD:

Pls read, Initial + Circulate, return to Sgt Hester.

Col Istvan

Maj Howard 9/14

Maj James

Maj Sides

Col Martin

~~SECRET~~

AL 60 0000 25834

"SAFUS Presentation to NSC
25 August 1960"

[redacted]

SAMOS

NATIONAL SATELLITE RECONNAISSANCE SYSTEM

PHOTOGRAPHIC
ELECTRONIC

REQMTS PROVIDED BY:
UNITED STATES INTELLIGENCE BOARD
-SATELLITE INTELLIGENCE REQMTS COMMITTEE

DEVELOPMENT AGENCY
UNITED STATES AIR FORCE

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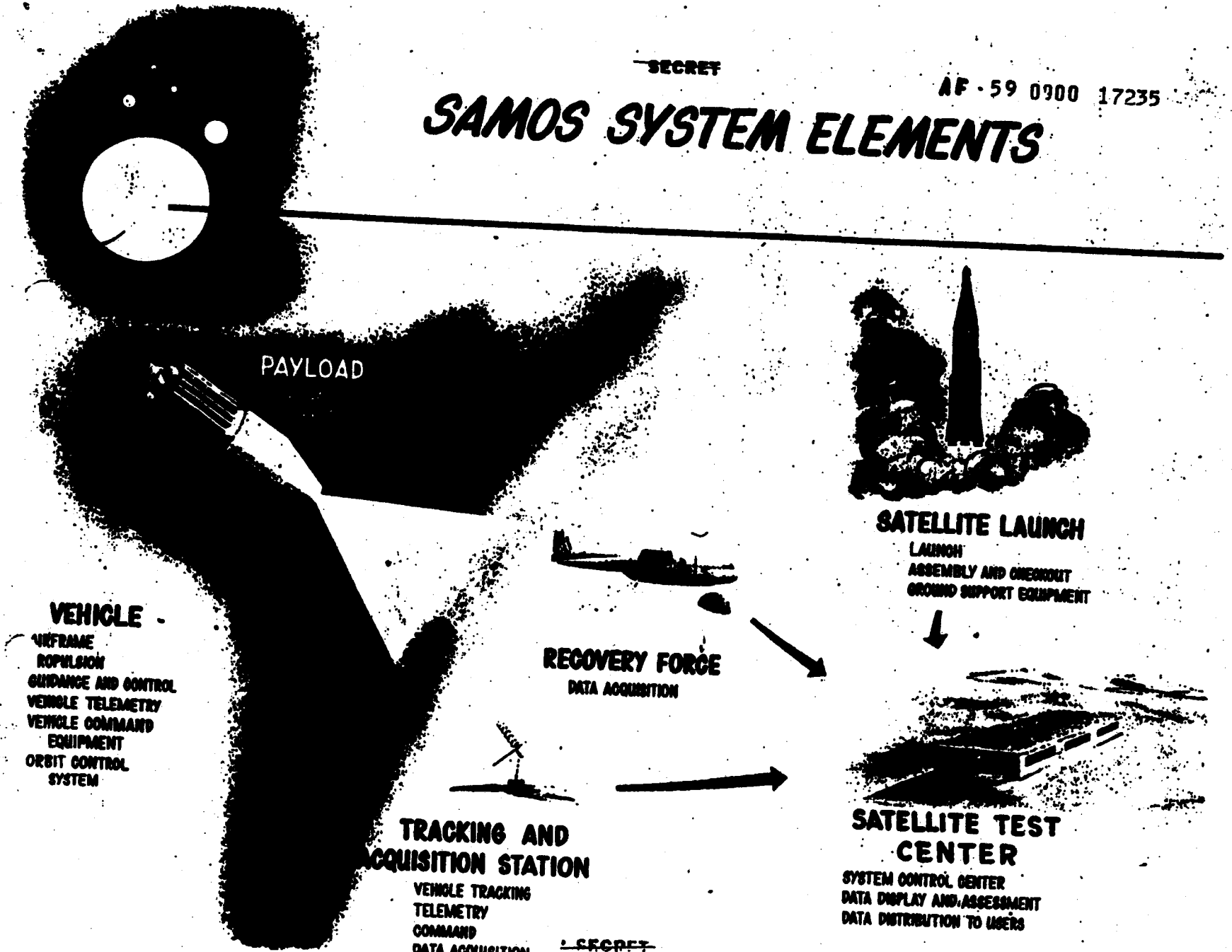
604018

#105

~~SECRET~~

AF-59 0900 17235

SAMOS SYSTEM ELEMENTS



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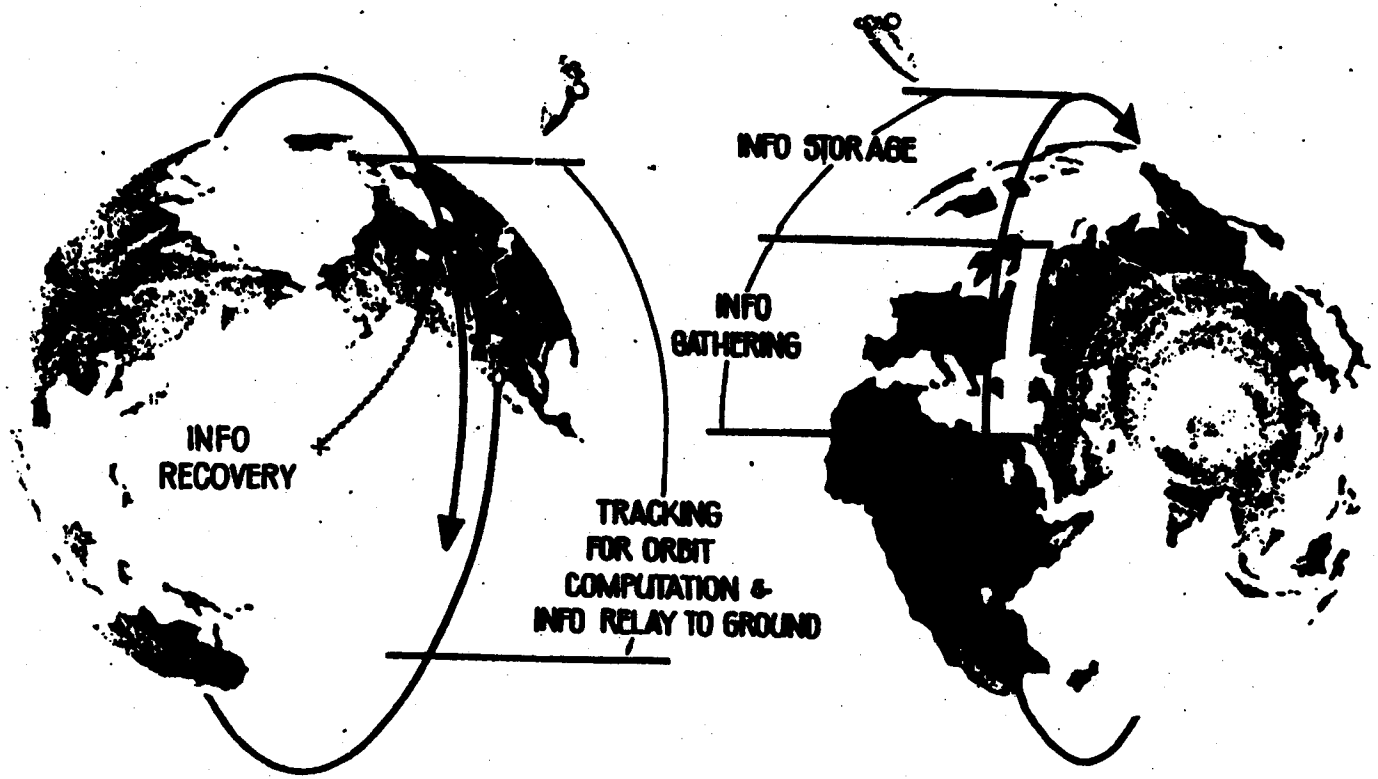
SAMOS CONCEPT

150-300 S.MI. ALTITUDE - PHOTO & ELECTRONIC



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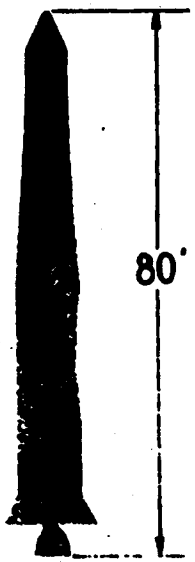
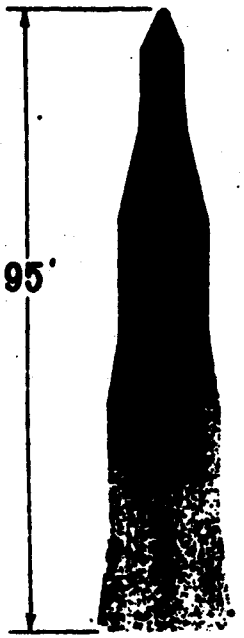
TYPICAL SIZE AND WEIGHT

THOR
AGENA B

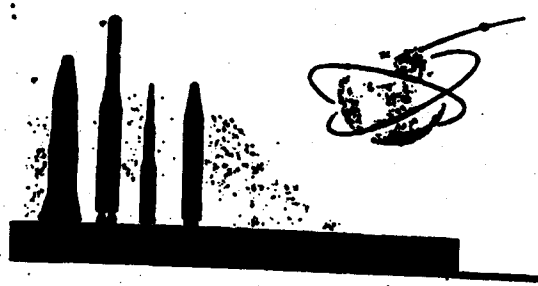




ATLAS
AGENA B

AGENA B	EMPTY WEIGHT	1,400
	LAUNCH WEIGHT	16,150
THOR	EMPTY WEIGHT	8,830
	LAUNCH WEIGHT	107,170
TOTAL BOOSTER AND AGENA WEIGHT AT LAUNCH		123,320 LBS

AGENA B	EMPTY WEIGHT	1,400
	LAUNCH WEIGHT	19,800
ATLAS	EMPTY WEIGHT	14,150
	LAUNCH WEIGHT	258,130
TOTAL BOOSTER AND AGENA WEIGHT AT LAUNCH		277,930 LBS



SAMOS

- A SATELLITE RECONNAISSANCE SYSTEM IS COMPLEX WITH MANY ADVANCED DEVELOPMENTS REQUIRED, BUT IT CAN BE MADE TO WORK

- DEVELOPMENT PROGRESSION REQUIRED DUE TO PRESENT STATE-OF-THE-ART LIMITATIONS:

  PHOTOGRAPHIC: 20' GROUND RESOLUTION ___✓ 3' OR LESS

  ELECTROMAGNETIC: SIMPLE DIGITAL _____✓ COMPLEX DIGITAL & ANALOG

  ACTIVE LIFE: 1 WEEK ___✓4 MONTHS _____✓ 1 YEAR

- THE DEVELOPMENT PROGRAM WILL INCLUDE FAILURES IN THE COURSE OF THE DEVELOPMENT EFFORT

INTELLIGENCE REQUIREMENTS FOR SAMOS

PRIORITY I

[redacted]-LOCATION OF OPERATIONAL ICBM SITES

PRIORITY II

A. [redacted]-DESCRIPTIVE INFORMATION ON HIGH PRIORITY TARGET LIST ITEMS

B. [redacted]-ANTI-BALLISTIC MISSILE RADARS, MISSILE TELEMETRY, EARTH TO SATELLITE TRANSMISSIONS

PRIORITY III

A. [redacted]-TECHNICAL CHARACTERISTICS OF HIGH PRIORITY LIST ITEMS

B. [redacted]-OTHER RADARS SUCH AS EARLY WARNING, AAA, GCI, SHORAN, SAM

PRIORITY IV

[redacted]-TO THE EXTENT DEVELOPMENT PROVES FEASIBLE

SECRET

SECRET

OUTLINE REQUIREMENTS
USIB - 6 JULY '60

PHOTOGRAPHIC

"GENERAL SEARCH" - 20' "RECOGNIZABILITY"

- 1ST PRIORITY - TO LOCATE SUSPECTED ICBM LAUNCH SITES BETWEEN NOW & END OF 1962

  REPETITIVE SEARCH - ONCE EACH MONTH INITIALLY

E-2 (LIMITED SEARCH CAPABILITY) 1ST FLT - APR. '61

E-6 1ST FLT - JAN '62

"DESCRIPTIVE" INFORMATION - 5' "RECOGNIZABILITY"

- 2ND PRIORITY - COVERAGE OF HIGHEST PRIORITY TARGET CATEGORY & SUSPICIOUS LOCATION

  LAUNCH & CONTROL OF THESE - MISSION ON SHORT NOTICE

E-6 1ST FLT - SEPT '61

"TECHNICAL CHARACTERISTICS" - BETTER THAN 5' "RECOGNIZABILITY"

- 3RD PRIORITY - HIGH RESOLUTION COVERAGE TO DETERMINE TECHNICAL CHARACTERISTICS OF HIGHEST PRIORITY TARGETS BY THE END OF 1962

SECRET

OUTLINE REQUIREMENTS
USIB - 6 JULY '60

PHOTOGRAPHIC

"GENERAL SEARCH" - 20' "RECOGNIZABILITY"

- 1ST PRIORITY - TO LOCATE SUSPECTED ICBM LAUNCH SITES BETWEEN NOW & END OF 1962

  REPETITIVE SEARCH - ONCE EACH MONTH INITIALLY

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"TECHNICAL CHARACTERISTICS" - BETTER THAN 5' "RECOGNIZABILITY"

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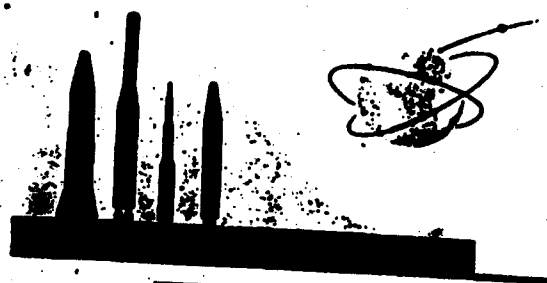

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OUTLINE REQUIREMENTS

USIB · 6 JULY 60

ELINT/COMINT

LESS PRIORITY AND VALUE THAN PHOTOGRAPHIC RECONNAISSANCE. BUT SHOULD BE CARRIED ON WITH HIGHEST PRIORITY SHORT OF INTERFERING WITH PHOTOGRAPHY

IN VIEW OF THE UNCERTAINTIES OF A FULLY DEVELOPED ELECTRONIC RECONNAISSANCE SYSTEM, THERE IS A RELUCTANCE TO SPECIFY DETAILED REQUIREMENTS FOR THE SHORT TERM

MOST IMPORTANT IS THE SEARCH FOR EMISSIONS ASSOCIATED WITH ANTI-BALLISTIC MISSILE SYSTEMS

SECRET

EXAMPLE OF TARGET THAT MAY BE IDENTIFIED AT DIFFERENT GROUND RESOLUTION

CITIES, FORESTS, RAIL ALIGNMENT, INDUSTRIAL COMPLEXES, MAJOR MILITARY INSTALLATIONS, AND LARGE BODIES OF WATER.

COMPONENTS OF MILITARY INSTALLATIONS, AIRBASE RUNWAYS, SUBMARINE BASES, MAJOR SURFACE TO AIR MISSILE SITES, ATOMIC ENERGY INSTALLATIONS, BALLISTIC MISSILE SITES, SURFACED SUBMARINES, LARGE AIRCRAFT AND MISSILE LAUNCHING PADS, IDENTIFICATION OF MAJOR SOVIET NAVAL FORCES.

LARGE AIRCRAFT AND KNOWN MISSILE CARRYING SUBMARINES, LOCATING SPECIAL WEAPONS, ABOVE GROUND ICBM AND IRBM FACILITIES, CAPACITY OF MILITARY STORAGE FACILITIES, IDENTIFICATION OF NAVAL SHIPS BY TYPES.

DETAILED INFORMATION ON MOST MILITARY AND INDUSTRIAL INSTALLATIONS, ALL AIRCRAFT, GROUND FORCES EQUIPMENT AND DISPOSITION, LARGE MISSILES, AAA SITES, STRUCTURAL SHIPBOARD CONFIGURATIONS, LEVELS OF MILITARY ACTIVITY.

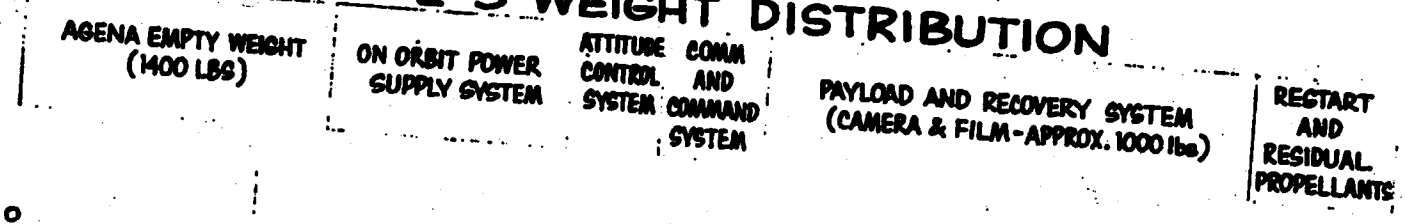
DETAILED TECHNICAL INFORMATION ON AIR, NAVAL AND GROUND FORCES EQUIPMENT AND INDUSTRIAL PRODUCTION PROCESSES.

ORBITAL CAPABILITY

VEHICLE	WEIGHT ON ORBIT AT 150 N. MILES ALTITUDE:	WEIGHT ON ORBIT AT 261 N. MILES ALTITUDE:
THOR & AGENA B	2800 LBS	2600 LBS
ATLAS & AGENA B	6500 LBS	6200 LBS

SYSTEM	WEIGHT ON ORBIT AT 150 N. MILES ALTITUDE:	WEIGHT ON ORBIT AT 261 N. MILES ALTITUDE:
E-5	5700 LBS	4300 LBS
E-1 / F-1		4100 LBS
F-2		4400 LBS
F-3		4900 LBS
E-2		

E-5 WEIGHT DISTRIBUTION



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CHARACTERISTICS PHOTO PAYLOAD SYSTEMS

SYSTEM	DATA RETRIEVAL METHOD	RESOLUTION	SWATH WIDTH	OPERATING LIFE	MAX DAILY COVERAGE MILLION SQ N MI	TOTAL COVERAGE MILLION SQ N MI
E-1	READOUT	100′	87 N MI	10 DAYS	.57 (1 STA)	5.7
E-2	READOUT	20′	14.5 N MI	4 MOS	.033 (2 STA)	4.0
E-5	RECOVERY	5′	53 N MI	15-30 DA	0.6	4.9
E-6	RECOVERY	8′	200 N MI	5 DA	3.0	14.0

[redacted]

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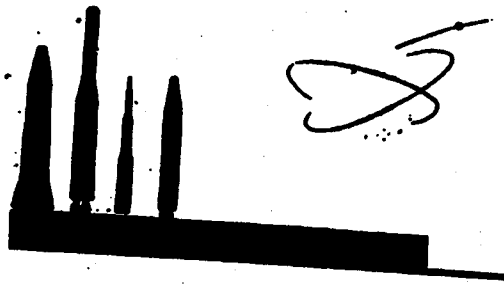
VISUAL SENSORS CAPABILITIES

E-1 COMPONENT TEST PAYLOAD	E-2	E-5	E-6	HIGH RESOLUTION ADVANCED SYSTEM
TERRAIN FEATURES & COMMUNICATION CENTERS	IDENTIFY FEATURES & COMPLEXES	LEVEL OF MILITARY ACTIVITY	IDENTIFY FEATURES & COMPLEXES	ARCHITECTUAL FEATURES TECHNICAL EMPLOYMENT
AIRFIELDS	LARGE AIRCRAFT	IDENTIFY AIRCRAFT	LARGE AIRCRAFT	TECHNICAL CHARACTERISTICS
HARBOR FACILITIES & SHIPPING	SUBS-PIERS-SUPPORTING FACILITIES	IDENTIFY TYPES & USES ie. SHIPBOARD MISSILE FACILITIES	SUBS-PIERS SUPPORTING FACILITIES	TECHNICAL CHARACTERISTICS
LOCATE INDUSTRIAL COMPLEXES	IDENTIFY INSTALLATIONS	IDENTIFY MATERIAL PRODUCTION	IDENTIFY INSTALLATIONS	IDENTIFY
SUSPECT CONSTRUCTION OF MISSILE SITES	LOCATE MISSILE SITES	IDENTIFY TYPE OF MISSILE SITE	LOCATE MISSILE SITES	IDENTIFY TECHNICAL MISSILE CHARACTERISTICS
FIRST FLIGHT - SEP 60 3 FLIGHTS STRIP CAMERA 6" FOCAL LENGTH	FIRST FLIGHT- APR. 61 3 FLIGHTS STRIP CAMERA 36" FOCAL LENGTH	FIRST FLIGHT- SEPT. 61 7 FLIGHTS PANORAMIC CAMERA 66" FOCAL LENGTH	[redacted]	



FERRET SENSORS CAPABILITY

F-1

RECOGNITION OF CONVENTIONAL GROUND, NAVAL & AIRBORNE RADAR SIGNALS

LOCATION WITHIN 150 N.M. CIRCLE

FREQUENCY COVERAGE OF S AND X BAND

ONETIME COVERAGE OF 60% -70% OF SOVIET BLOC

1ST FLIGHT SEPT. 60 -3 FLTS. (IN COMBINATION WITH E-1)

F-2

RECOGNITION OF KNOWN AND SUSPECTED SIGNALS

IMPROVED LOCATION ACCURACY

FREQUENCY COVERAGE FROM 59 TO 18,000 MC/S

COVERAGE OF ENTIRE SOVIET BLOC EVERY FIVE DAYS

1ST FLT. JUNE-61
2 FLTS.

F-3

"FINE" LOOKS AT SIGNALS DISCOVERED BY GENERAL COVERAGE SYSTEM

"LOOKS" AT GIVEN SIGNALS FROM HORIZON-TO-HORIZON

FREQUENCY COVERAGE SAME AS GENERAL COVERAGE SYSTEM

WIDE BAND WIDTH (6 MC/S) RECORDING OF ALL SIGNALS

1ST FLIGHT WILL BE SCHEDULED

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SAMOS OUTPUTS

READOUT

READOUT TIME { VAFB STA ONLY – 25 MIN PER DAY
VAFB & NEW BOSTON STA – 53 MIN PER DAY

PHOTO E-2 (20') — PER MINUTE OF READOUT – 800 SQ MILES 90 FT OF 35 M PRIMARY RECORD = 12 – 9½" X 18" PHOTOS

ELINT F-2 (DIGITAL) — 10,000 INTERCEPTS

RECOVERY

PHOTO E-5 (5') — PER MISSION – 4.9 MILLION SQ N MI

E-6 (8') — PER MISSION – 9.0 MILLION SQ N MI

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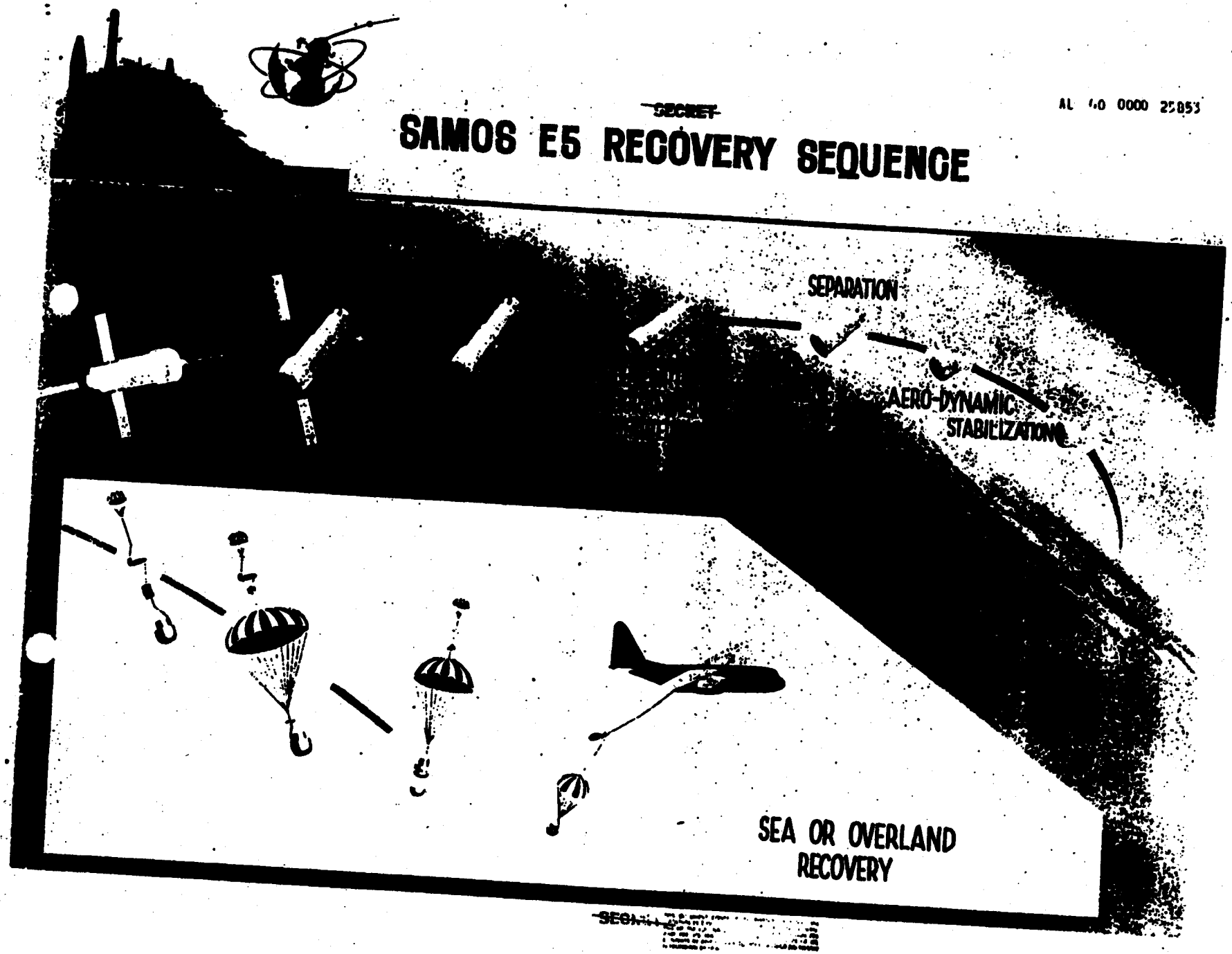
AL 40 0000 25053

SAMOS E5 RECOVERY SEQUENCE



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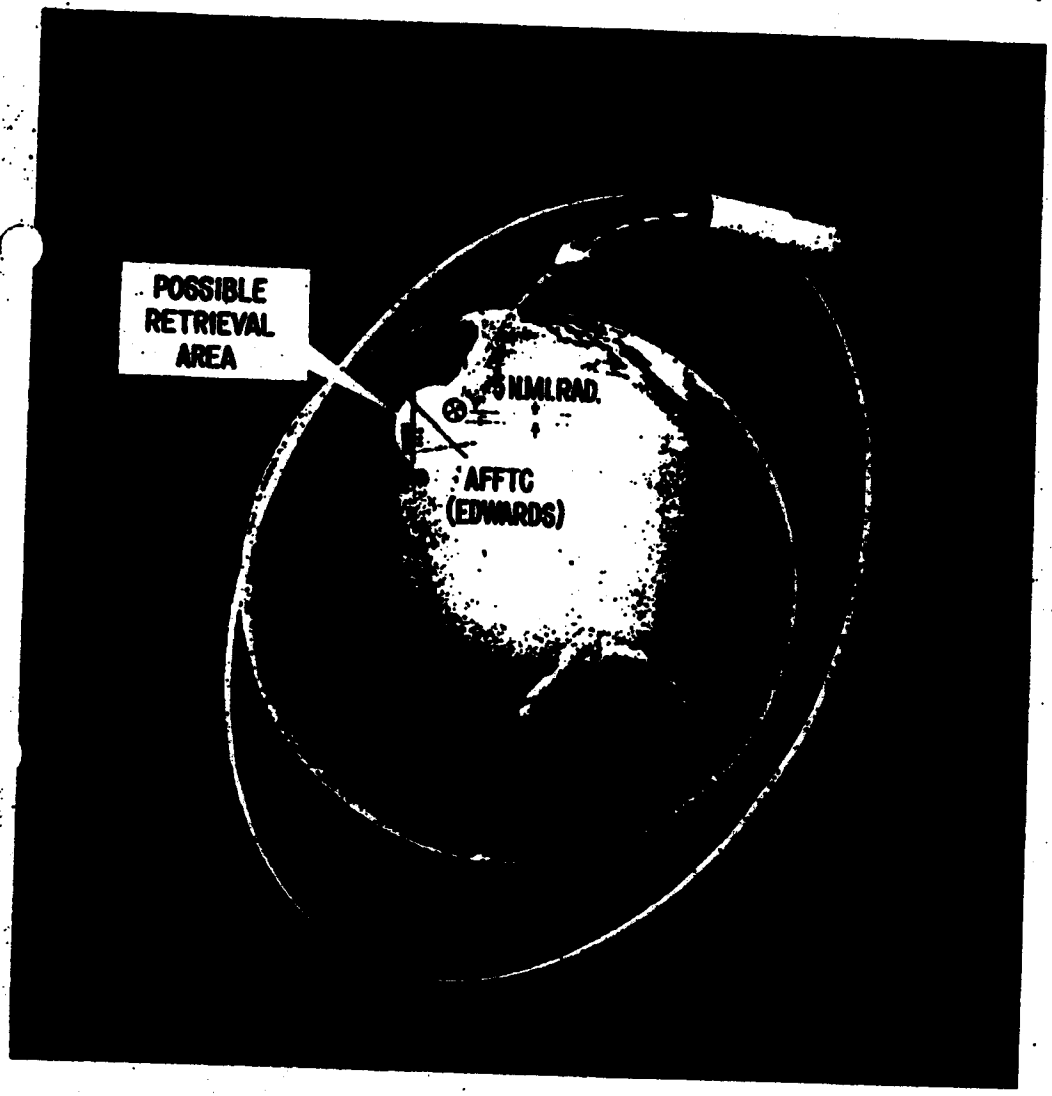
SAMOS E-6 — A NEW APPROACH



- RELIABILITY (SHORT LIFE)
- LARGE AREA COVERAGE
- HIGH RESOLUTION
- EARLY CAPABILITY
- PRECISE OVERLAND RETRIEVAL
- BROADENED CONTRACTOR BASE
- COMPATIBLE WITH DATA PROCESSING EQUIPMENT
- UTILIZE EXISTING GROUND FACILITIES

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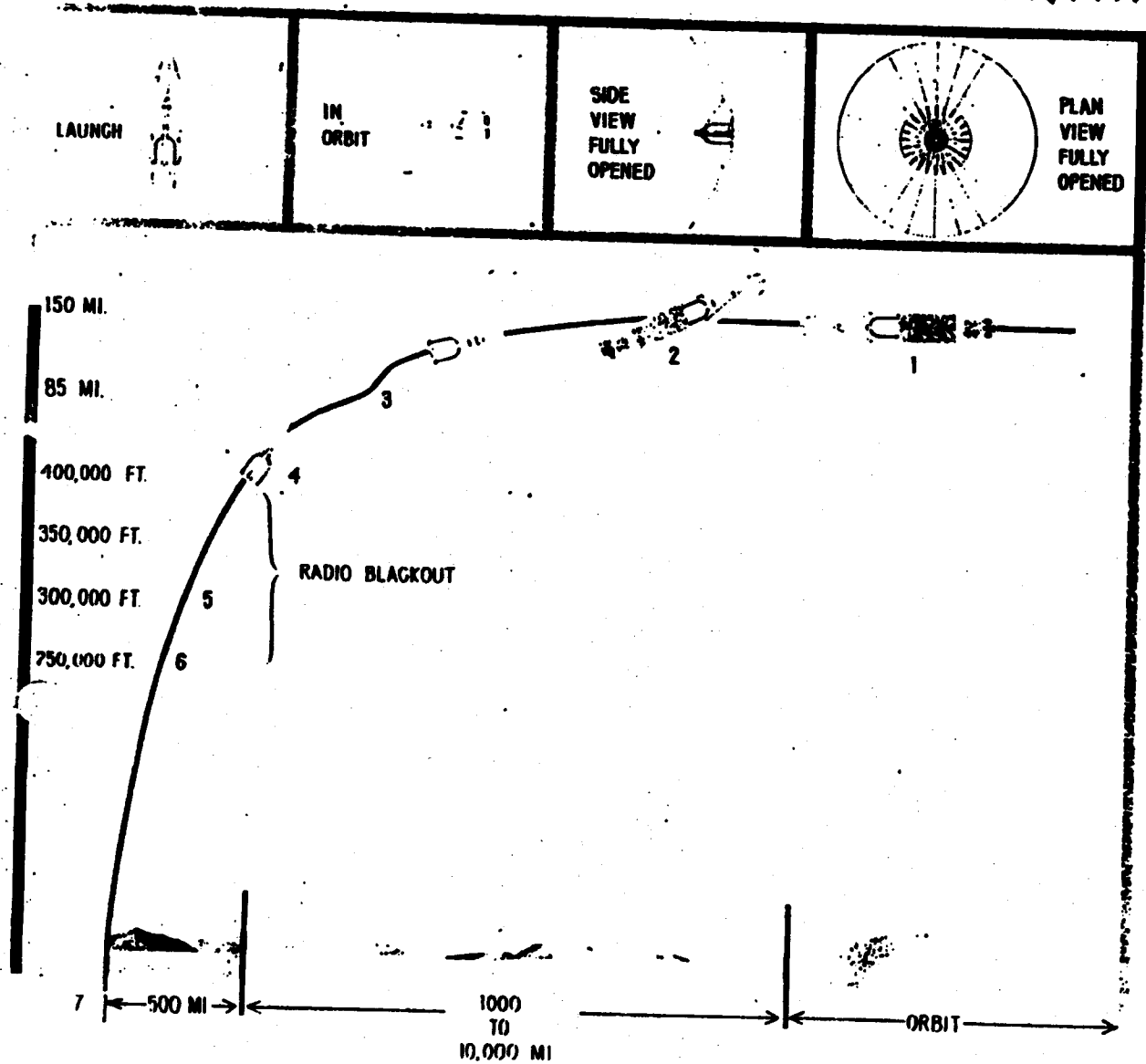
SAMOS E-6 – DRAG BRAKE RE-ENTRY SEQUENCE



1 VEHICLE IN ORBIT

2 REORIENTATION, RETRO FIRING & SEPARATION

3 MODULATE FOR RANGE CORRECTION

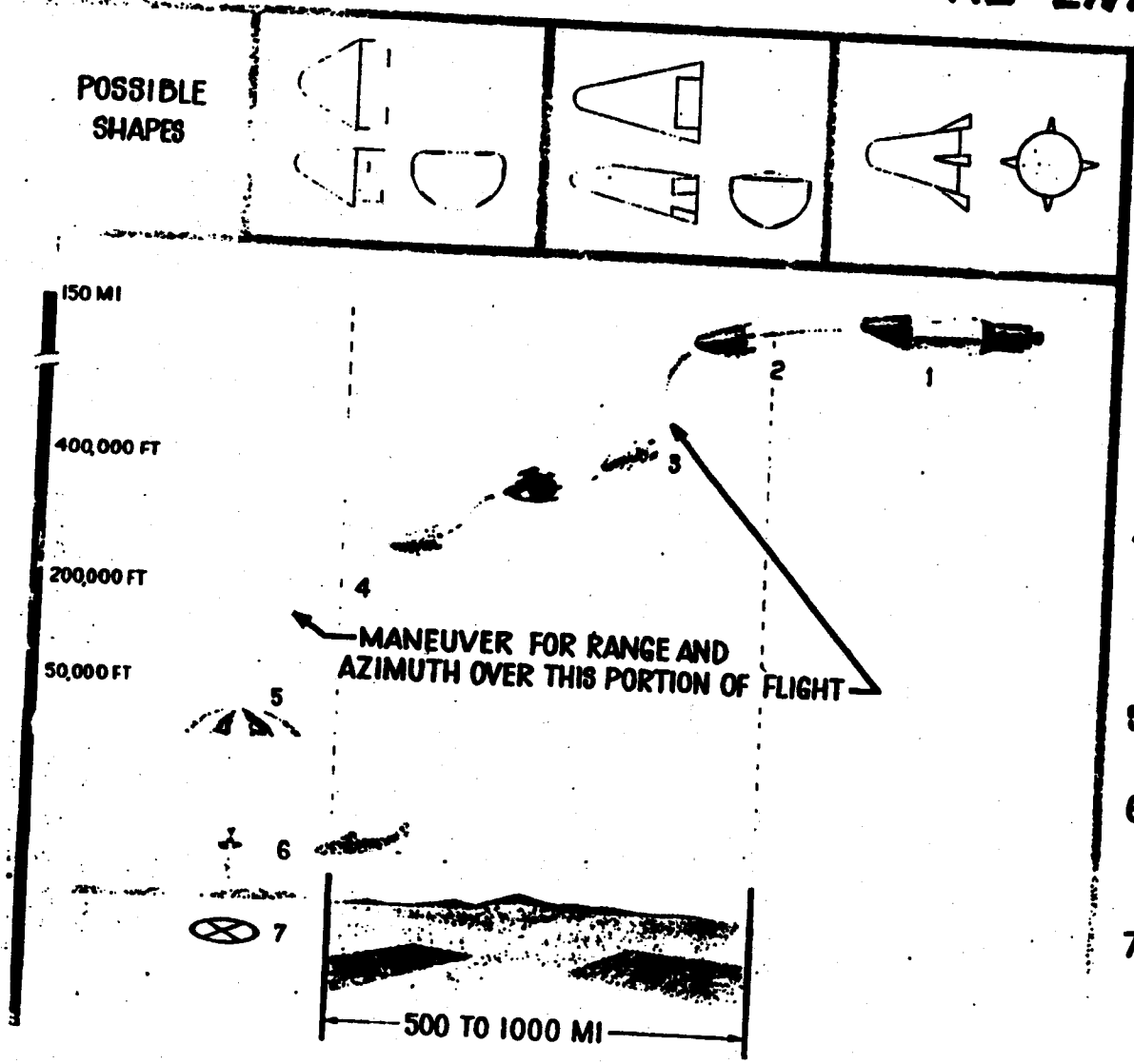
4 FULL OPEN

5 PEAK HEATING

6 PEAK DECELERATION

7 LANDING - 40 F.P.S.

SAMOS E-6 – TYPICAL LIFT RE-ENTRY SEQUENCE



1 VEHICLE IN ORBIT

2 RETRO-ROCKET FIRING AND SEPARATION

3 RE-ENTRY AND RADIO BLACK-OUT-START RANGE AND AZIMUTH CORRECTIONS

4 POST-BLACKOUT-MACH 15 COMMUNICATE FOR TERMINAL GUIDANCE

5 PARACHUTE OPEN-MACH 0.6 TO 1.0

6 AIR PICKUP ATTEMPT POSSIBLE

7 IMPACT – 25 F.P.S.

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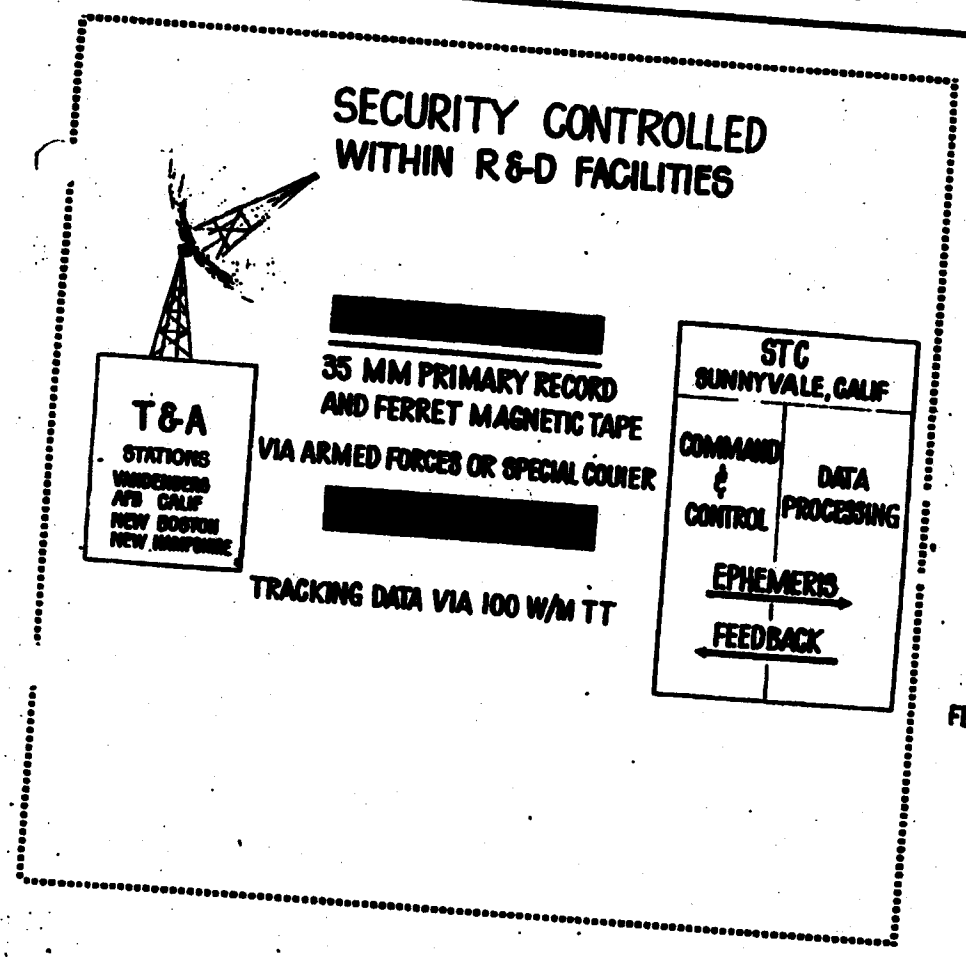
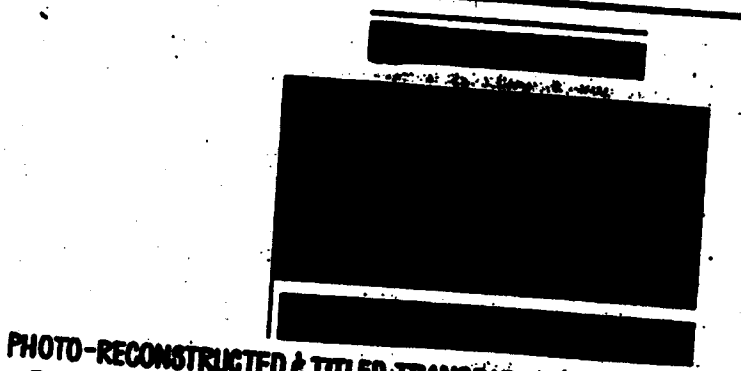
INTERIM READOUT R&D DATA FLOW





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SUMMARY

ELEMENTS OF SAMOS RESEARCH AND DEVELOPMENT PROGRAM

- RECOVERY
  - E-5 PHOTO 5' RESOLUTION — 7
  - E-6 PHOTO 8' RESOLUTION — 7
  - DIAGNOSTIC RECOVERY — 4
- READOUT
  - COMPONENT TESTS PHOTO-ELINT E-1/F-1 — 3
  - E-2 PHOTO 20' RESOLUTION — 2
  - F-2 ELINT DIGITAL — 1

24 PLUS 5 UNASSIGNED ATLAS/AGENA(THRU 1962)

- SPECIAL COMPONENT TESTS
- LAUNCHINGS FROM PT. ARGUELLO
- TRACKING STATIONS
  - VANDENBERG AND NEW BOSTON, INCL. READOUT
  - HAWAII AND ALASKA VHF ONLY
- CONTROL - SATELLITE TEST CENTER - SUNNYVALE
- DATA PROCESSING
  - DEVELOPMENT LABORATORY - DENVER
  - INTERIM PROCESSING OF R&D TAKE - SUNNYVALE
- RECOVERY CENTER - HAWAII

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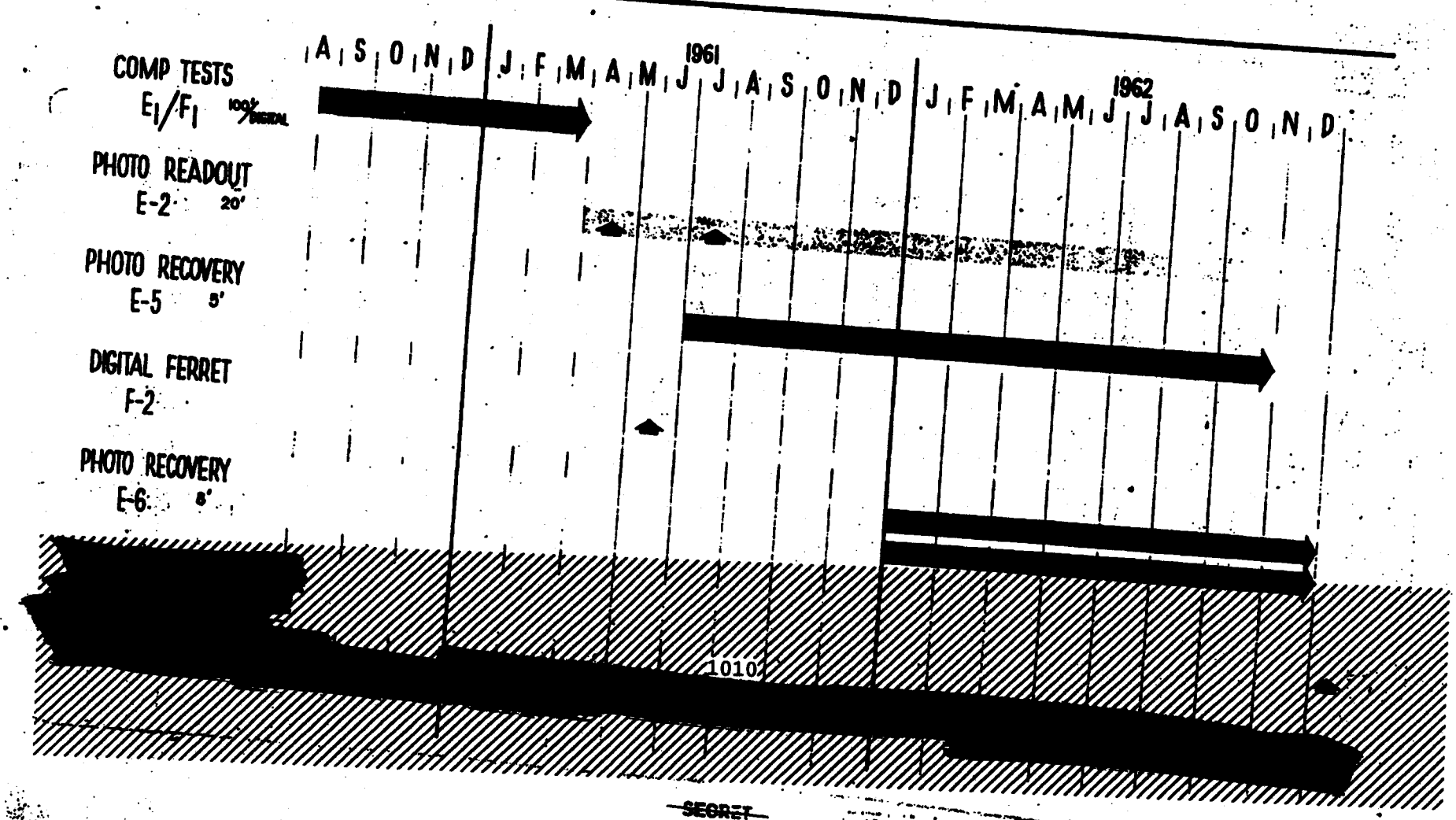
~~SAMOS~~ LAUNCH SCHEDULE

~~11 AUG 60 DEV PLAN~~

AL 60 0000 2-84



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* DIAGNOSTIC FLIGHTS

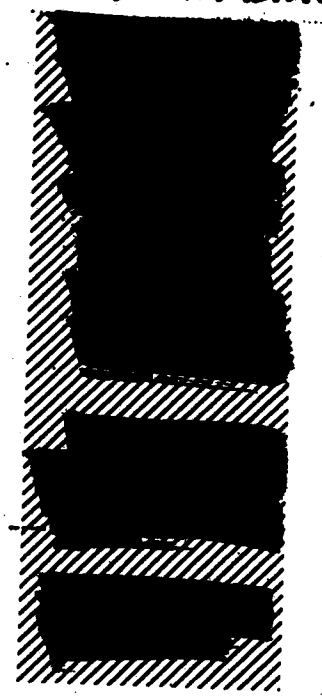
CONFIDENTIAL

SAMOS FUNDING STATUS
(IN MILLIONS)

REALIGNMENT OF PRESENT PROGRAM.
TECHNICAL DIRECTION AND SYSTEM INTEGRATION FOR PRESENT PROGRAM.
TOTAL PRESENT PROGRAM FOR FY 1961.
NEW RECOVERY PROGRAM.
ADDITIONAL BACK-UP TECHNICAL EFFORT.
ADDITIONAL BOOSTERS & AGENAS FOR FLEXIBILITY.
AGENA GROUND SUPPORT EQUIPMENT FOR NEW STANDS.
TOTAL ADDITIONAL PROGRAM

TOTAL REVISED FY 61 SAMOS PROGRAM

FY 1961 FUNDING REQUIREMENTS



CONFIDENTIAL

BACKGROUND

DEVELOPMENT UNDERTAKEN BY U.S. AIR FORCE IN 1956

FEASIBLE ONLY WITH THE DEVELOPMENT OF LARGE BOOSTERS RESULTING FROM BALLISTIC MISSILE PROGRAM

ORIGINALLY ORIENTED TOWARD A "READOUT" DATA RETRIEVAL TECHNIQUE

- ELECTRONIC WIDE BAND LINK - VEHICLE TO GROUND
- PHYSICAL RECOVERY OF PACKAGE FROM ORBIT DID NOT APPEAR TO BE WITHIN STATE OF THE ART

REORIENTED AUGUST 1960 TOWARD "RECOVERY" DATA RETRIEVAL TECHNIQUE

- PHYSICAL RECOVERY TECHNIQUES HAVE BECOME A FACT AND OFFER A BETTER AND MORE ECONOMICAL SOLUTION TO UNITED STATES INTELLIGENCE BOARD INTELLIGENCE REQUIREMENTS

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NATIONAL SECURITY COUNCIL DIRECTIVE

1 SEPTEMBER 1960

REORIENT PROGRAM TO HIGHEST PRIORITY FOR RECOVERABLE, HIGH RESOLUTION, CONVERGENT STEREO PHOTOGRAPHY

- LAND RECOVERY AS SOON AS POSSIBLE
- COMPETENCE TO IDENTIFY WITH CERTAIN MISSILE SITES BOTH IN CONSTRUCTION AND AFTER COMPLETION
- COMPETENCE TO STUDY STATE OF READINESS, TYPE OF ACTIVITY AND TYPE OF MISSILE

REDUCE ELECTRONIC READ-OUT EFFORT TO LOWER PRIORITY-SUBSTANTIALLY CUT BACK GROUND-BASED ELECTRONIC READ-OUT SYSTEM

CONTINUE FERRET (ELECTRONIC) PROGRAM WITH PRIORITY LOWER THAN PHOTOGRAPHY

PROGRAM TO BE MANAGED WITH DIRECT LINE OF COMMAND - SECRETARY OF DEFENSE TO SECRETARY OF THE AIR FORCE TO GENERAL OF THE AIR FORCE OPERATIONAL CHARGE OF PROGRAM