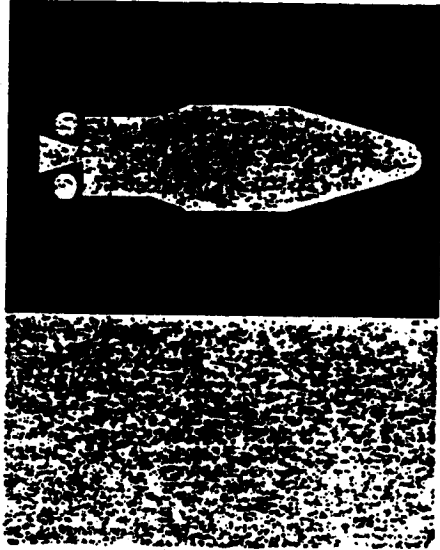


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SAMOS

RECONNAISSANCE SYSTEMS
SATELLITE RECONNAISSANCE SYSTEMS

PHOTOGRAPHIC
ELECTRONIC

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

DEVELOPMENT AGENCY
UNITED STATES AIR FORCE

604018

SECRET

AF 59 000 17335

SAMOS SYSTEM ELEMENTS



PAYLOAD

VISIA
FERRET

VEHICLE

- AIRFRAME
- PROPULSION
- GUIDANCE AND CONTROL
- VEHICLE TELEMETRY
- VEHICLE COMMAND EQUIPMENT
- ORBIT CONTROL SYSTEM

TRACKING AND ACQUISITION STATION

- VEHICLE TRACKING
- TELEMETRY
- COMMAND
- DATA ACQUISITION

RECOVERY FORCE

- DATA ACQUISITION

SATELLITE LAUNCH

- LAUNCH
- ASSEMBLY AND CHECKOUT
- GROUND SUPPORT EQUIPMENT

SATELLITE TEST CENTER

- SYSTEM CONTROL CENTER
- DATA DISPLAY AND ASSESSMENT
- DATA DISTRIBUTION TO USERS

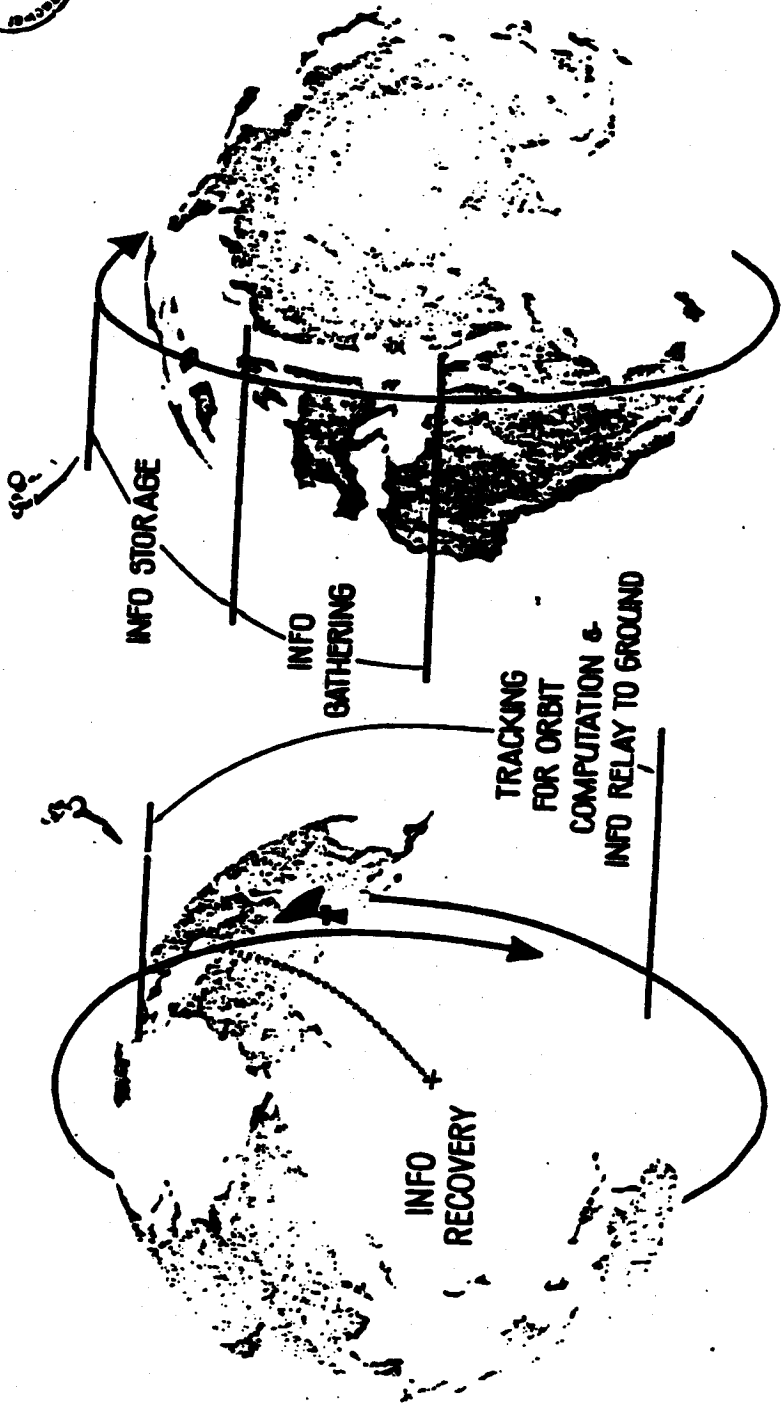
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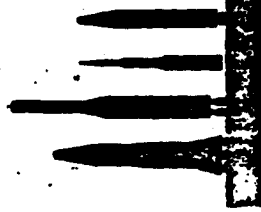
SAMOS CONCEPT

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



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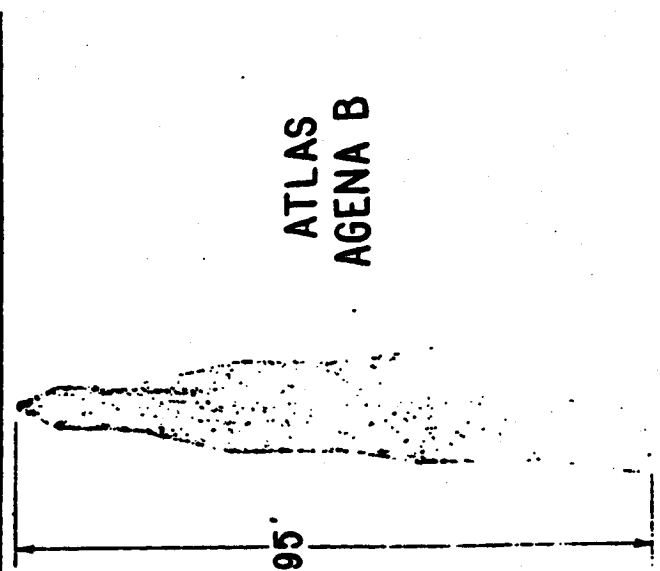
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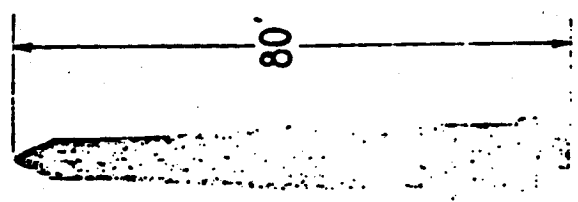
[Handwritten signature]

CONFIDENTIAL

TYPICAL SIZE AND WEIGHT



ATLAS
AGENA B



THOR
AGENA B

AGENA B	EMPTY WEIGHT 1,400	AGENA B	EMPTY WEIGHT 1,400
	LAUNCH WEIGHT 16,150		LAUNCH WEIGHT 19,800
THOR	EMPTY WEIGHT 8,830	ATLAS	EMPTY WEIGHT 14,150
	LAUNCH WEIGHT 107,170		LAUNCH WEIGHT 258,130
TOTAL BOOSTER AND AGENA		TOTAL BOOSTER AND AGENA	
WEIGHT AT LAUNCH	123,320 LBS	WEIGHT AT LAUNCH	277,930 LBS

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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 \rightarrow 3' OR LESS
 - ELECTROMAGNETIC: SIMPLE DIGITAL \rightarrow COMPLEX DIGITAL & ANALOG
 - ACTIVE LIFE: 1 WEEK \rightarrow 4 MONTHS \rightarrow 1 YEAR
- THE DEVELOPMENT PROGRAM WILL INCLUDE FAILURES IN THE COURSE OF THE DEVELOPMENT EFFORT

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INTELLIGENCE REQUIREMENTS FOR SAMOS

PRIORITY I



PHOTOGRAPHIC - LOCATION OF OPERATIONAL ICBM SITES

PRIORITY II

- A. PHOTOGRAPHIC - DESCRIPTIVE INFORMATION ON HIGH PRIORITY TARGET LIST ITEMS
- B. ELINT - ANTI-BALLISTIC MISSILE RADARS, MISSILE TELEMETRY, EARTH TO SATELLITE TRANSMISSIONS

PRIORITY III

- A. PHOTOGRAPHIC - TECHNICAL CHARACTERISTICS OF HIGH PRIORITY LIST ITEMS
- B. ELINT - OTHER RADARS, SUCH AS EARLY WARNING, AAA, GCI, SHORAN, SAM

PRIORITY IV

COMINT - TO THE EXTENT DEVELOPMENT PROVES FEASIBLE

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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

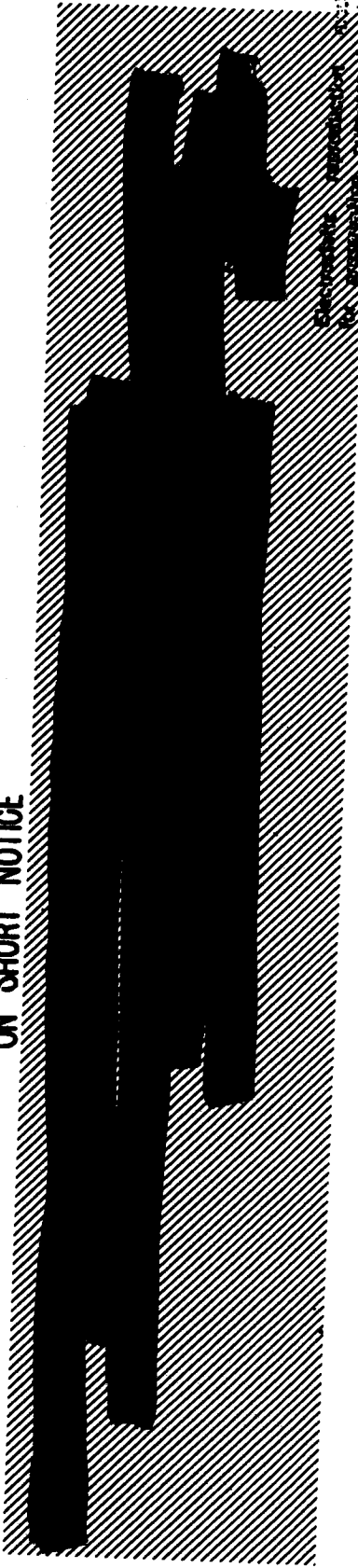
E-2 (LIMITED SEARCH CAPABILITY)
1ST FLT - APR '61

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-5
1ST FLT - SEPT '61



Information reported to the Library for replacement of a deteriorating manuscript.

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

"DESCRIPTIVE" INFORMATION - 5' "RECOGNIZABILITY"

- 2ND PRIORITY - COVERAGE OF HIGHEST PRIORITY TARGET CATEGORY & SUSPICIOUS LOCATION LAUNCH & CONTROL OF THESE - MISSION ON SHORT NOTICE



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SECRET

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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 RECON-
NAISSANCE 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

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EXAMPLE OF TARGET THAT MAY BE IDENTIFIED AT DIFFERENT GROUND RESOLUTION

100 ft

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

20 ft

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.

10 ft

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.

5 ft

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.

1 ft

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



SECRET

CHARACTERISTICS PHOTO PAYLOAD SYSTEMS

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

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SECRET

AT 10 0000 2-64

VISUAL SENSORS CAPABILITIES



E-1 COMPONENT TEST PAYLOAD	E-2	E-5	E-6
TERRAIN FEATURES & COMMUNICATION CENTERS	IDENTIFY FEATURES & COMPLEXES	LEVEL OF MILITARY ACTIVITY	IDENTIFY FEATURES & COMPLEXES
AIRFIELDS	LARGE AIRCRAFT	IDENTIFY AIRCRAFT	LARGE AIRCRAFT
HARBOR FACILITIES & SHIPPING	SUBS - PIERS - SUPPORTING FACILITIES	IDENTIFY TYPES & USES ie, SHIPBOARD MISSILE FACILITIES	SUBS - PIERS SUPPORTING FACILITIES
LOCATE INDUSTRIAL COMPLEXES	IDENTIFY INSTALLATIONS	IDENTIFY MATERIAL PRODUCTION	IDENTIFY INSTALLATIONS
SUSPECT CONSTRUCTION OF MISSILE SITES	LOCATE MISSILE SITES	IDENTIFY TYPE OF MISSILE SITE	LOCATE MISSILE SITES
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	FIRST FLIGHT - JAN 62 7 FLIGHTS PROBABLY A PANORAMIC CAMERA 24" TO 36" FOCAL LENGTH

SECRET

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SECRET

FERRET SENSORS CAPABILITY



F-1

F-2

F-3

RECOGNITION OF CONVENTIONAL
GROUND, NAVAL & AIRBORNE
RADAR SIGNALS

RECOGNITION OF KNOWN AND
SUSPECTED SIGNALS

FINE LOOKS AT SIGNALS
DISCOVERED BY GENERAL
COVERAGE SYSTEM

LOCATION WITHIN 150 N.M.
CIRCLE

IMPROVED LOCATION ACCURACY

LOOKS AT GIVEN SIGNALS
FROM HORIZON-TO-HORIZON

[REDACTED]

[REDACTED]

FREQUENCY COVERAGE SAME
AS GENERAL COVERAGE SYSTEM

ONETIME COVERAGE OF 60%
-70% OF SOVIET BLOC

COVERAGE OF ENTIRE SOVIET
BLOC EVERY FIVE DAYS

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

~~SECRET~~

SAMOS OUTPUTS



READOUT

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

PER MINUTE OF READOUT - 800 8Q MILES 90 FT
 OF 35 M PRIMARY RECORD = 12 - 9 1/2" X 18" PHOTOS

PHOTO E-2 (20')



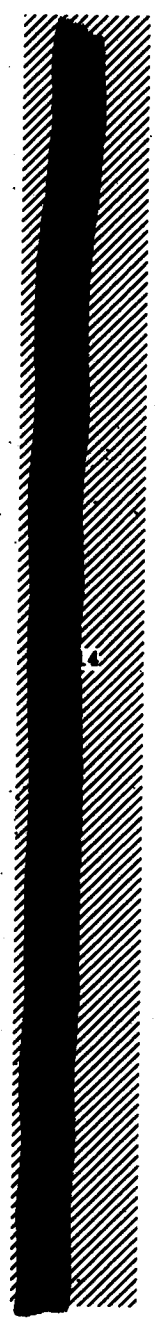
RECOVERY

PHOTO E-5 (5')

PER MISSION - 4.9 MILLION 8Q N MI

E-6 (8')

PER MISSION - 9.0 MILLION 8Q N MI

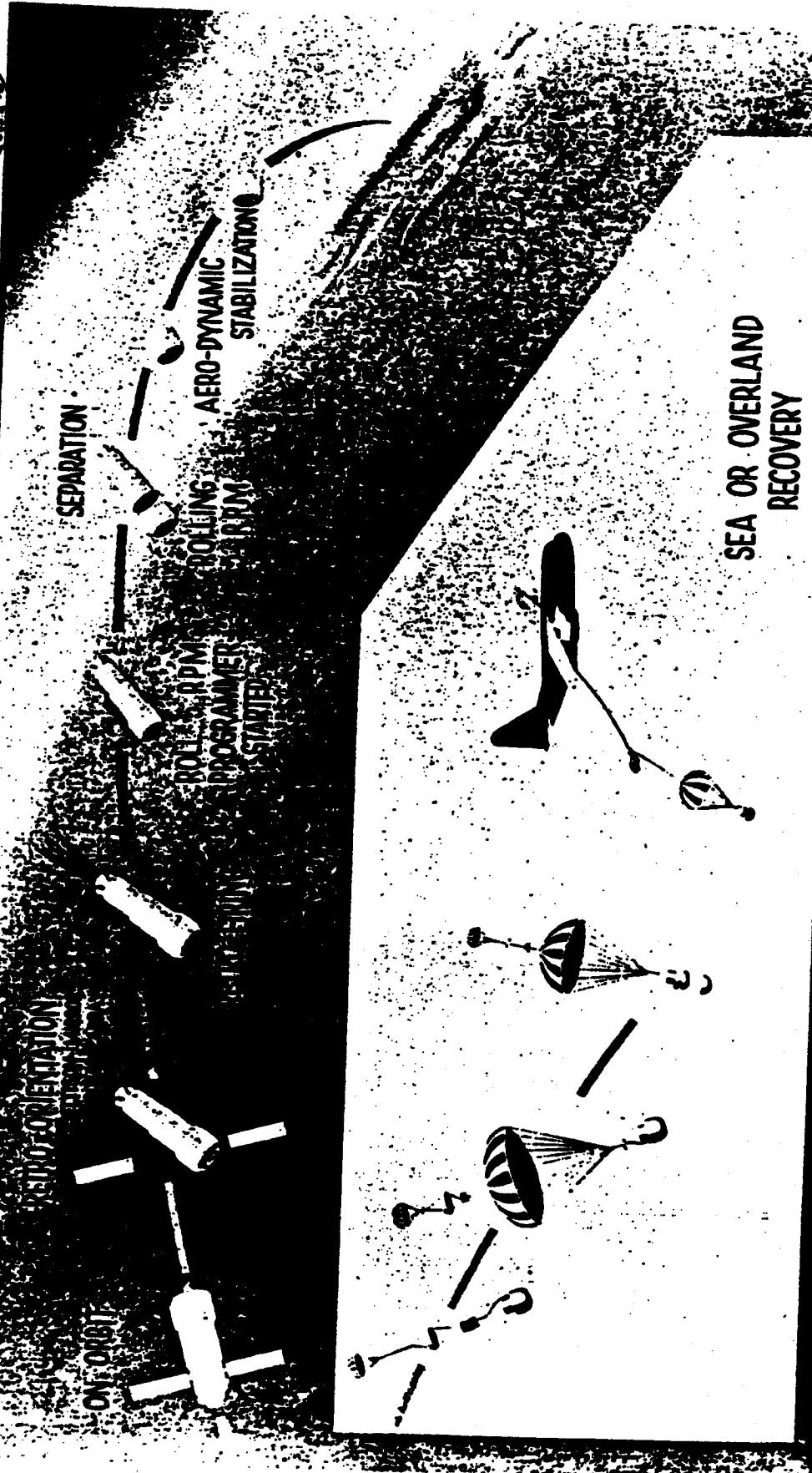


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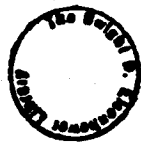
SECRET

SAMOS E5 RECOVERY SEQUENCE

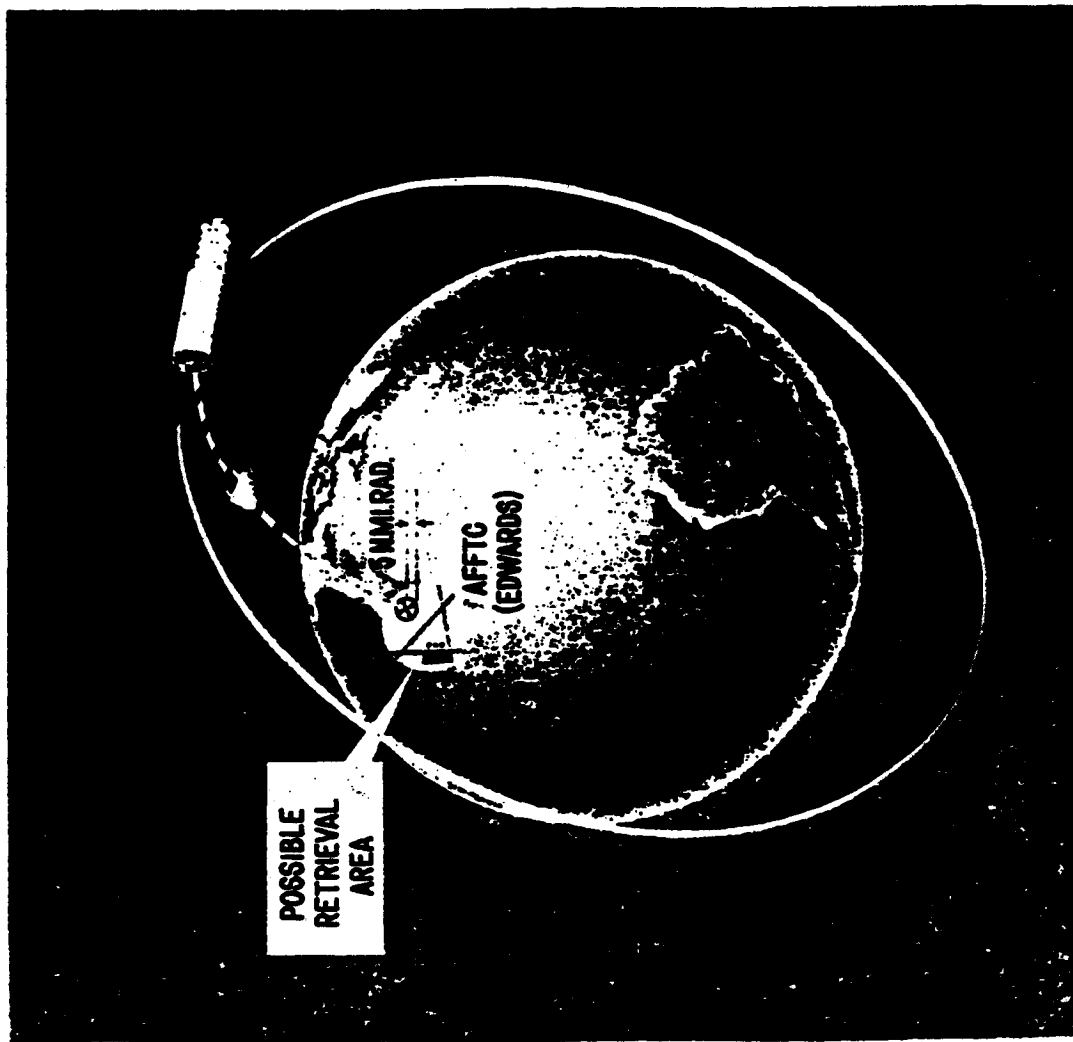


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SAMOS E-6 — A NEW APPROACH



RELIABILITY (SHORT LIFE)

LARGE AREA COVERAGE

HIGH RESOLUTION

EARLY CAPABILITY

PRECISE OVERLAND RETRIEVAL

BROADENED CONTRACTOR BASE

COMPATIBLE WITH DATA

PROCESSING EQUIPMENT

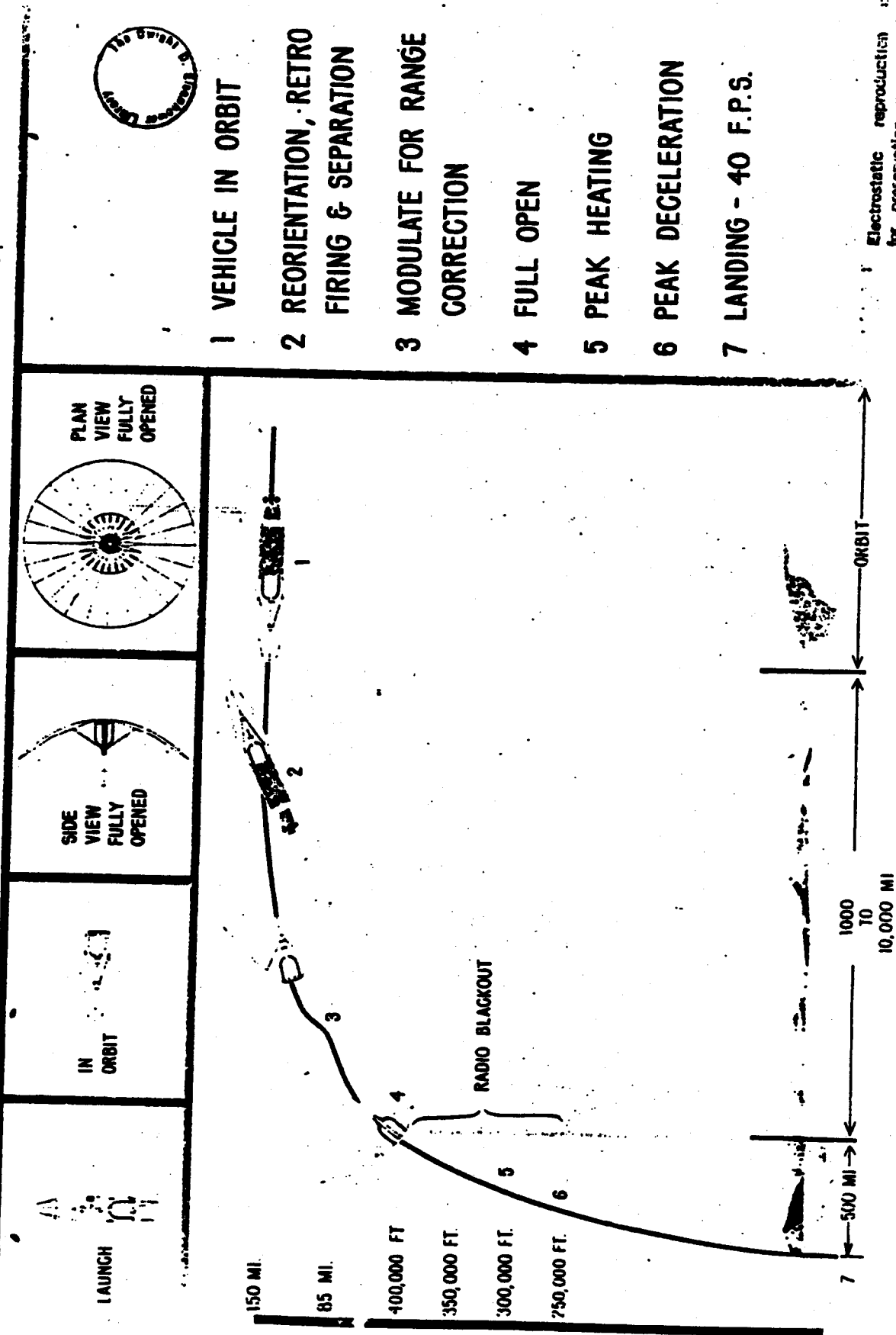
UTILIZE EXISTING GROUND FACILITIES

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AL 60 0000 25881

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.

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SAMOS E-6 - TYPICAL LIFT RE-ENTRY SEQUENCE



1 VEHICLE IN ORBIT

2 RETRO-ROCKET FIRING AND SEPARATION

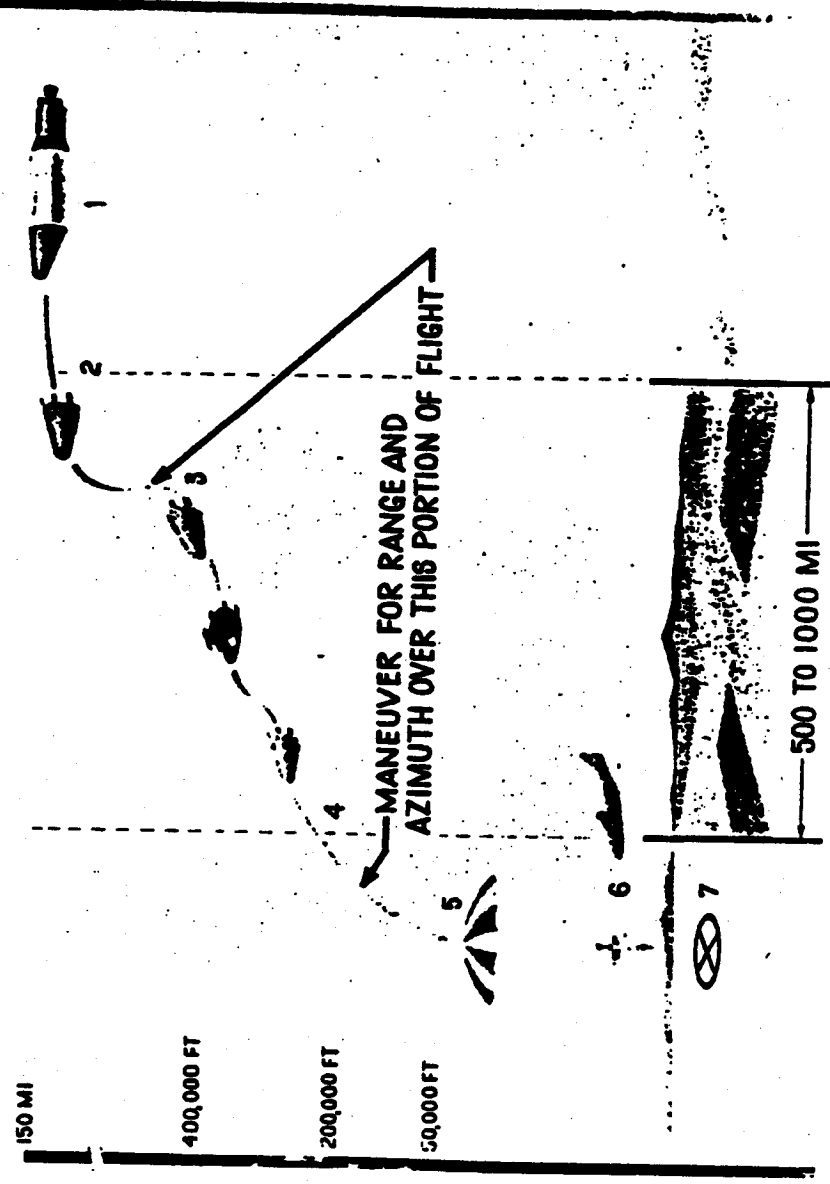
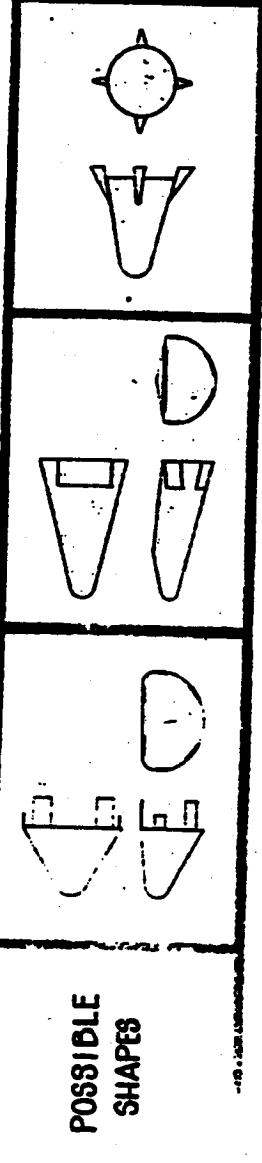
3 RE-ENTRY AND RADIO BLACK-OUT-START RANGE AND AZIMUTH CORRECTIONS

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.



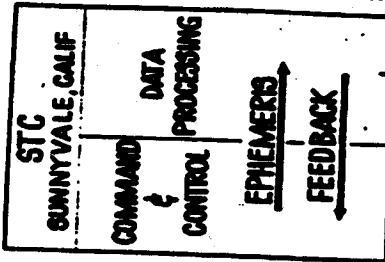
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INTERIM READOUT R & D DATA FLOW



SECURITY CONTROLLED
WITHIN R & D FACILITIES



35 MM PRIMARY RECORD
AND FERRET MAGNETIC TAPE
VIA ARMED FORCES OR SPECIAL COURIER

TRACKING DATA VIA 100 W/M TT

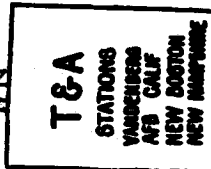
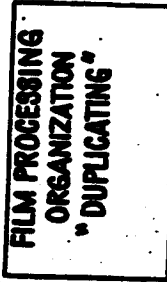
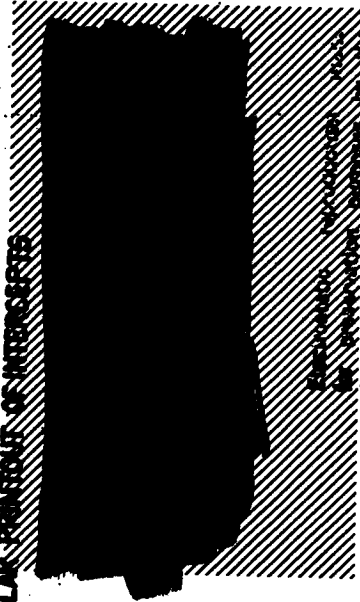


PHOTO-RECONSTRUCTED & TITLED TRANSPARENCIES & PRIMARY RECORDS (SINGLE MASTERS FOR SUBSEQUENT DUPLICATION)



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&
DISTRIBUTION
TO USERS

FERRET TABULAR FRONTEND OF INTERSECTS



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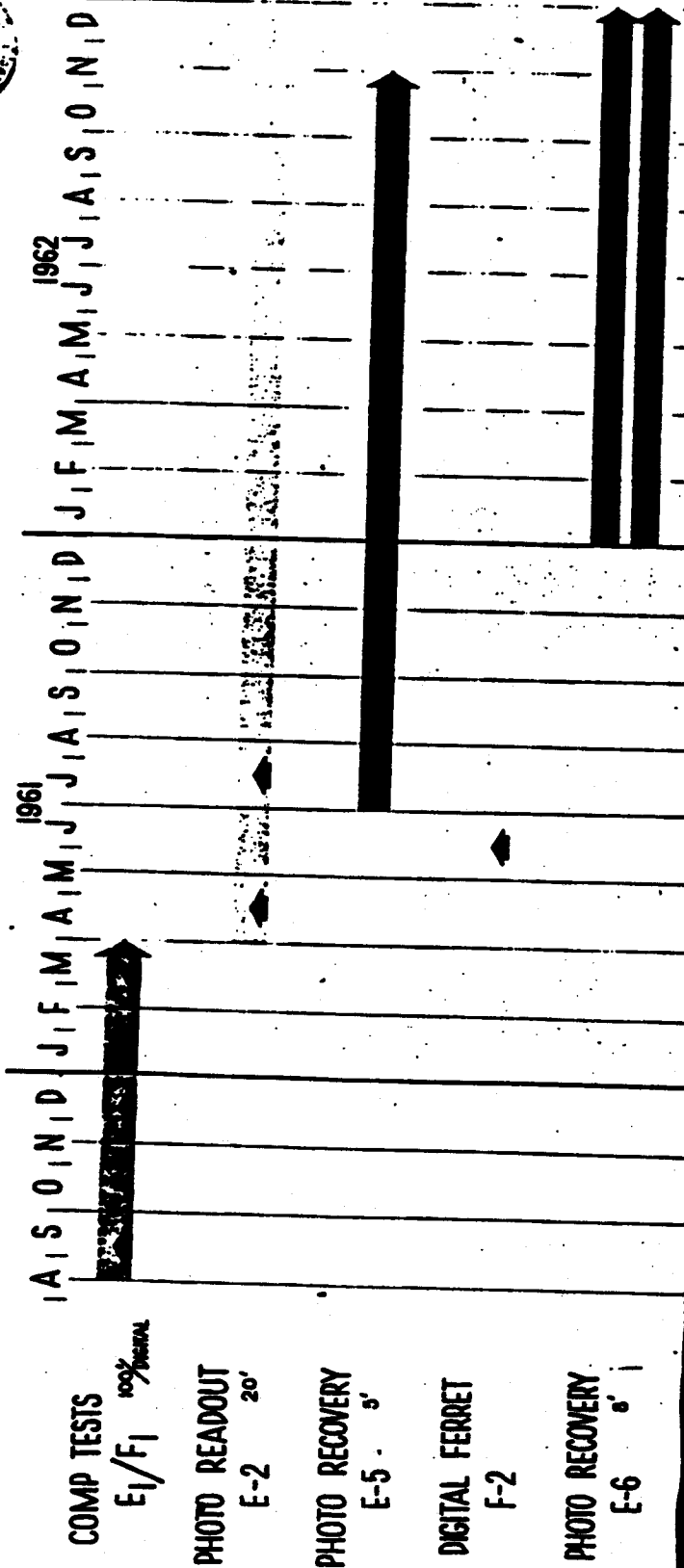
SECRET

SECRET

SAMOS LAUNCH SCHEDULE

11 AUG 60 DEV PLAN

AI 60 0000 21843



COMP TESTS
E1/F1 100% Digital

PHOTO READOUT
E-2 20'

PHOTO RECOVERY
E-5 5'

DIGITAL FERRET
F-2

PHOTO RECOVERY
E-6 5'

SECRET

* DIAGNOSTIC FLIGHTS
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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

● 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



~~SECRET~~