

HANDLE VIA BYEMAN SYSTEM ONLY  
**SECRET/DORIAN**

---

**ADVANCED MOL PLANNING**

---

BIN: BIF-055-38568-69

Paragraph Set 1 of 3 Sets

Paragraph 1 of ~~5~~ Paragraphs  
60

MOL

**SECRET/DORIAN**  
HANDLE VIA BYEMAN SYSTEM ONLY

NRO APPROVED FOR RELEASE 1 JULY 2015

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

---

MISSIONS AND SYSTEMS

---

34568-69
21 <del>5</del> 60

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

**~~SECRET/DORIAN~~**

MISSIONS AND OBJECTIVES (POTENTIALLY MANNED ORBITAL OPERATIONS)

MISSION CATEGORY	SPECIFIC MISSION	MISSION OBJECTIVES				
		ACCESS TIME	NIGHT CAPABILITY	RESOLUTION	COVERAGE (N. MI.)	
					POINT TARGET	AREA TARGET
FAST RESPONSE ↓ READOUT	CRISIS MANAGEMENT ● POINT COVERAGE ● AREA COVERAGE	6 TO 24 HRS 24 HRS	NEEDED NEEDED	2' 2' TO 10'	3 X 3	400 X 200
	STRATEGIC WARNING	1 TO 3 DAYS	WINTER ONLY	2'	3 X 3	
	TACTICAL WAR	2 TO 12 HRS	NEEDED			400 X 200
	OCEAN SURVEILLANCE	12 HRS	NEEDED	5' TO 10' (IDENTIFY)		ALL OCEANS
STRATEGIC	SURVEILLANCE	1 MONTH	NO		3 X 3	
	TI	1 TO 2 MOS	NO		2 X 2	
	GENERAL SEARCH	1 TO 2 MOS	NO	2' TO 4'		4,000 X 3,000
	ARMS CONTROL	5 TO 20 DA	NO	10'		4,000 X 3,000
		-	NO			
OTHER	PRECISE TARGETING	-		50' ACCURACY		
	COMMAND POST					

OTHER MISSIONS TO BE EXAMINED: MAINTENANCE/REPAIR SYNCHRONOUS, OFFENSE, SIGINT, ABM, GEODESY, ASTRONOMY (NASA BAILED MOL TO NASA).

38568-69
31 55 60

**~~SECRET/DORIAN~~**  
 HANDLE VIA BYEMAN SYSTEM ONLY

HANDLE VIA BYEMAN SYSTEM ONLY

**~~SECRET/DORIAN~~**

MISSION/SENSOR VALUE IN RECON MISSIONS

38568-69
49 <del>55</del> 60

SURVEILLANCE, ARMS CONTROL, SEARCH MISSIONS (AND TI OTHER [REDACTED] PHOTO)

● TO DATE, REGULAR PHOTO OKAY FOR SURFACE FEATURES

● ENEMY MAY DENY US SURFACE FEATURES IN POST 1975

● VISUAL CAMOUFLAGE



● LWIR

● LASER

● DECOYS

● MULTI-SPECTRAL

● MAN VIEWED

● ACTIVITY DURING WINTER NIGHT

● RADAR

IMAGE ENHANCEMENT

● DESIRE NON-SURFACE FEATURES ALSO

● UNDERGROUND (SILOS, MINES, TUNNELS)

● LWIR

● MFG AND NUCLEAR PLANTS  
(HEAT OR GAS EFFLUENTS)



● IR SPECTROMETER

● SIGINT

FAST RESPONSE MISSIONS (CRISIS MANAGEMENT, TACTICAL WAR, STRATEGIC WARNING)

● DATA PERISHABLE (2 TO 24 HRS) READOUT

● LWIR

● ENEMY ALREADY OPERATES UNDER NITE BLANKET



● DEGRADED VISIBLE FILM MODE

● NIGHT RECON CAPABILITY MOST DESIRABLE

● LASER RECON

● SIGINT CUEING

● RADAR

OCEAN SURVEILLANCE

● DETECT, LOCATE (TRACK)

WORLDWIDE

● IDENTIFY, CLASSIFY

SHIPS



RADAR-DETECT/LOCATE/CLASSIFY

● USE AS ELEMENT IN OASIS

VISIBLE } AID IN CLASSIFICATION  
IR }

● ALL SENSORS ON D MODULE, EXCEPT RADAR (RADAR ON RADAR MODULE OR COMBINED D/RADAR MODULE)

**~~SECRET/DORIAN~~**  
HANDLE VIA BYEMAN SYSTEM ONLY

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

TECHNICAL INTELLIGENCE

- BASIC D MISSION (VISIBLE)

<u>RESOLUTION</u>	<u>1975-70" OPTICS</u>	<u>1980- [REDACTED] OPTICS</u>	<u>1985- [REDACTED] OPTICS</u>
[REDACTED]	80N. MI PERIGEE	110N. MI PERIGEE	150N. MI CIRCULAR*
		65N. MI. PERIGEE	--

\*MAJOR BOOSTER IMPACT TO FLY [REDACTED] OPTICS (P/L  
MODULE WEIGHT OVER 40,000 LBS)

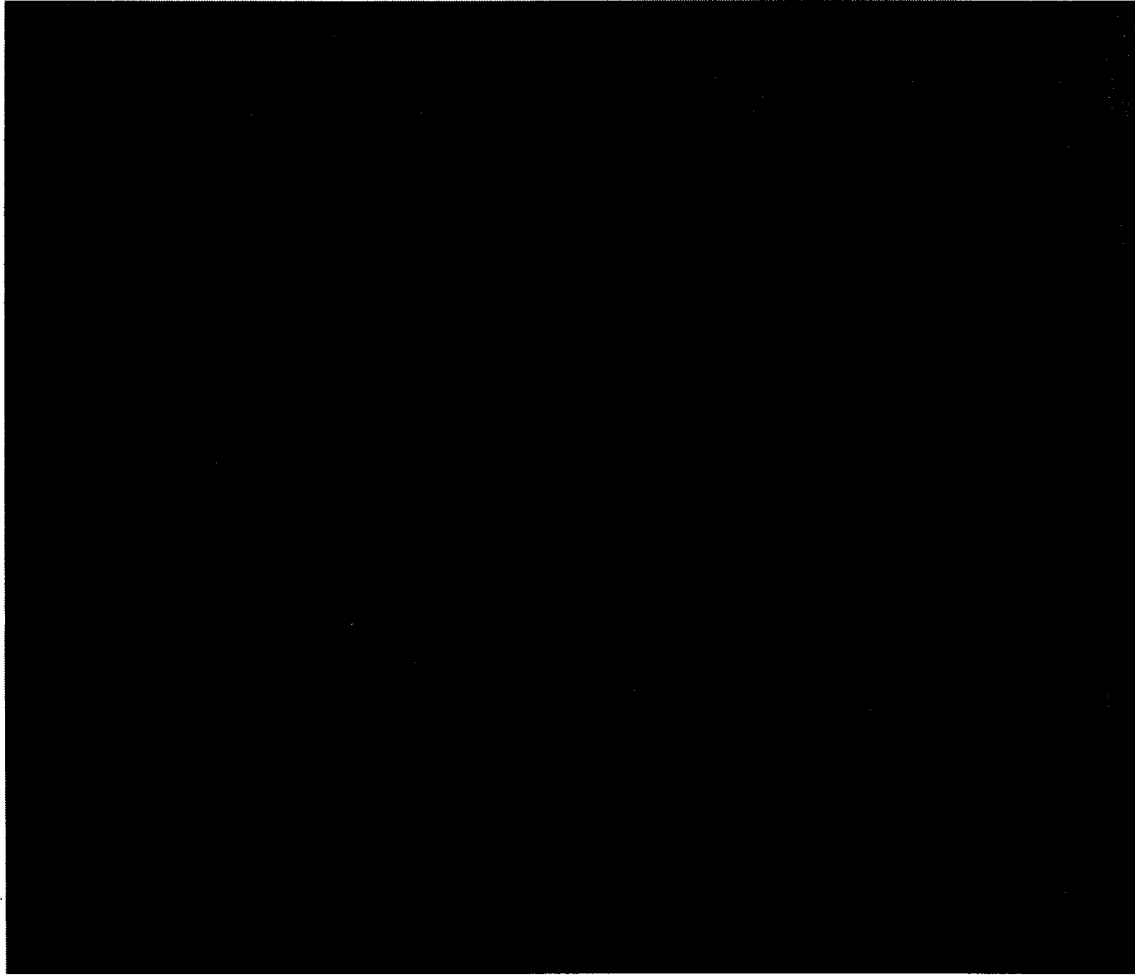
- USE MAIN OPTICS WITH OTHER SENSORS (E. G. LWIR, MULTI - SPECTRAL)

38568-69
5960

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

NRO APPROVED FOR  
RELEASE 1 JUL 2011

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY



38568-69
6 of 60

10.

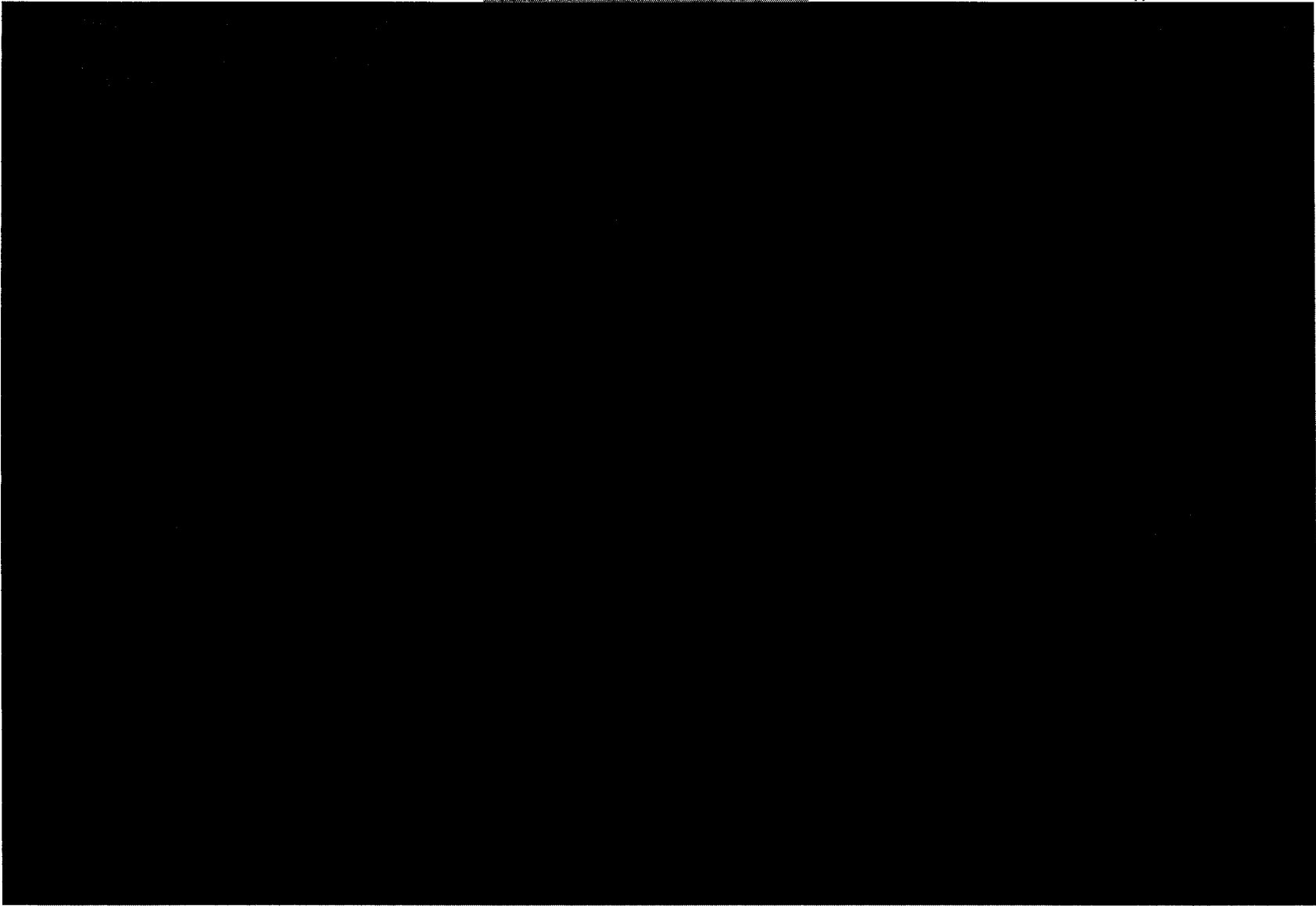
~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

NRO APPROVED FOR  
RELEASE 1 JULY 2011

~~HANDLE~~ VIA BYEMAN SYSTEM ONLY  
~~SECRET/DORIAN~~

38568-69

7460

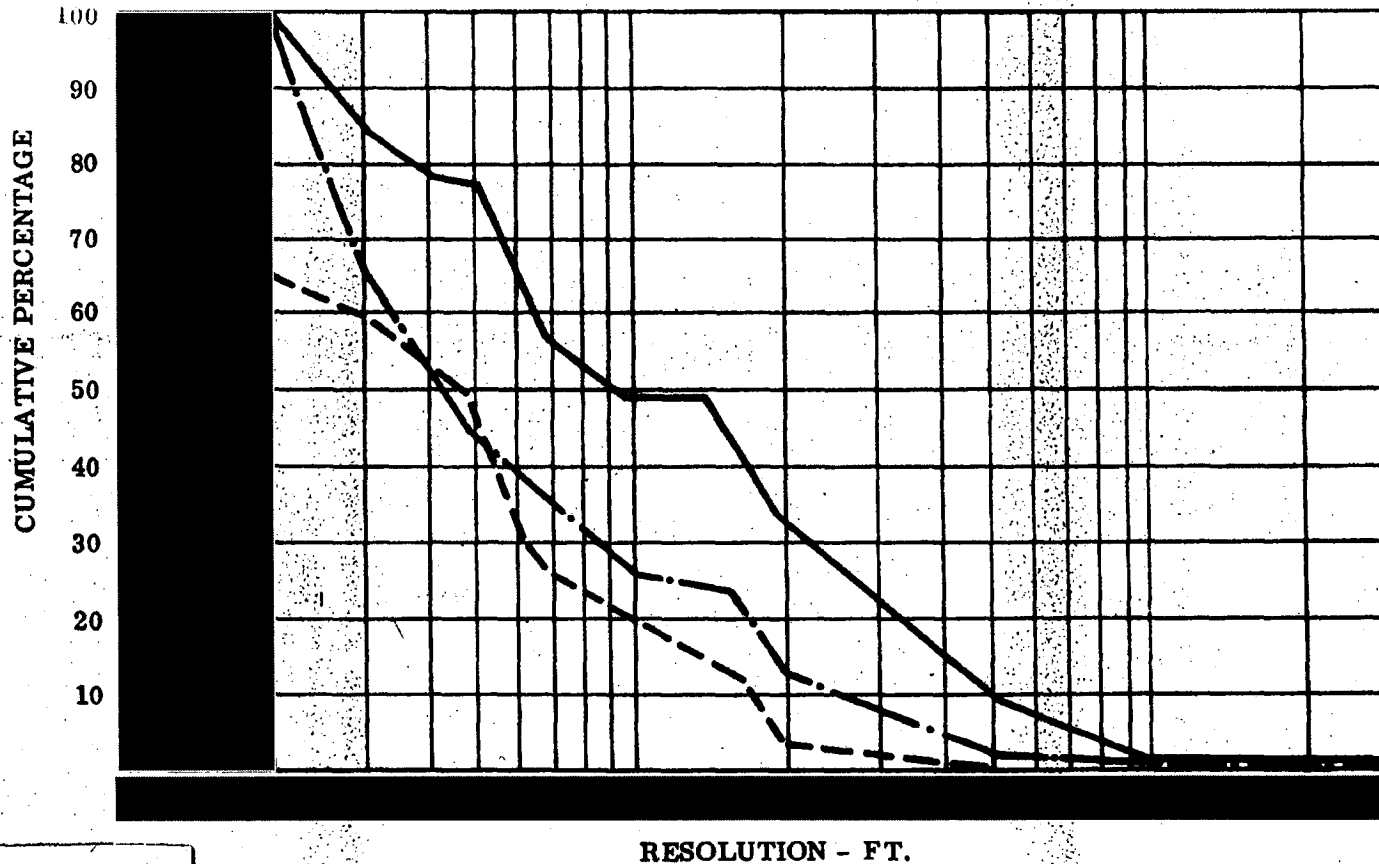


~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

- RESOLUTION - USAF STRIKE - FEBA TO 800 N. MI (316 T)
- - - RESOLUTION - USA INDIRECT FIRE - FEBA TO 320 N. MI (211 T)
- - - RESOLUTION - USAF PLANNING - FEBA TO 800 N. MI (206 T)



38568-69  
1 8 60

TACTICAL OPERATIONS SYSTEMS REQUIREMENTS

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY



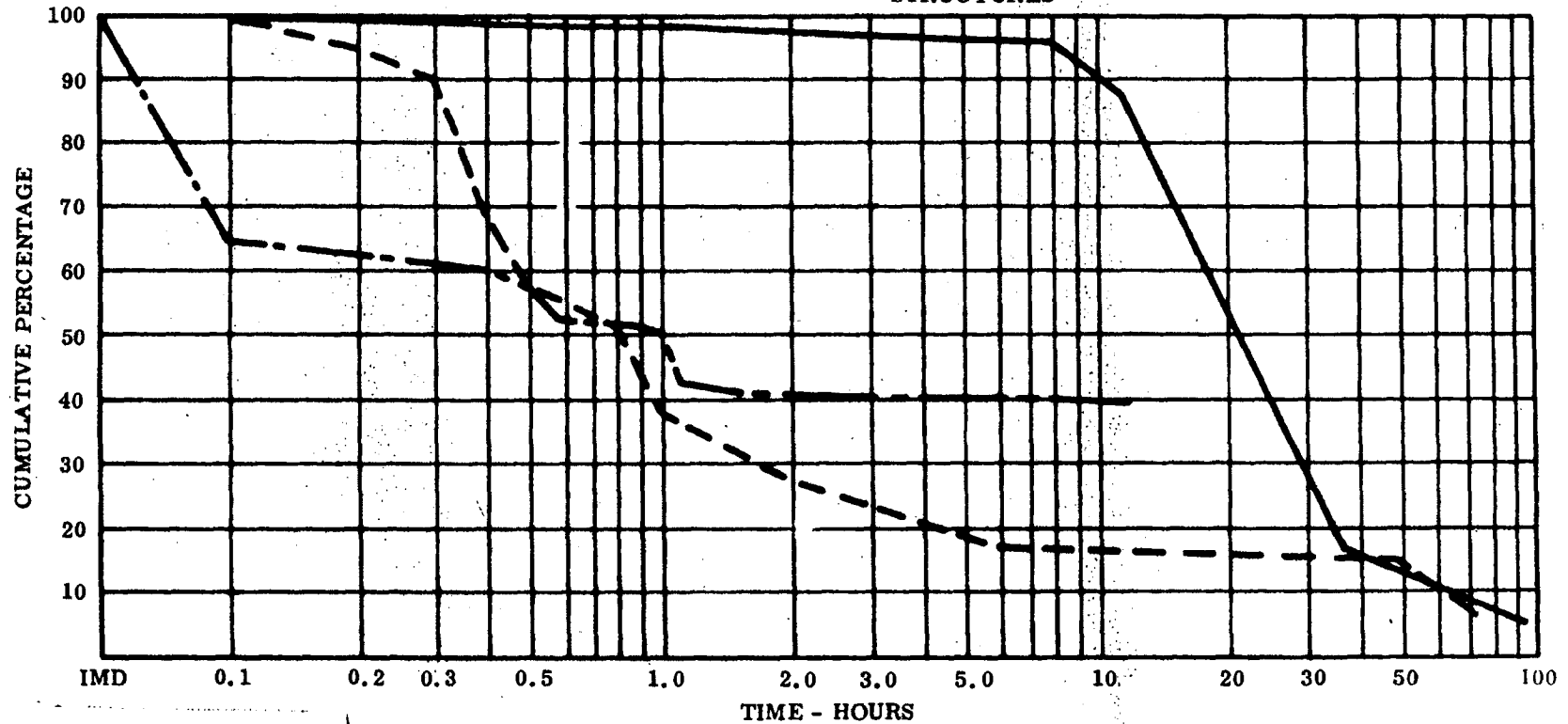
~~SECRET/DORIAN~~

TACTICAL OPERATIONS SYSTEM REQUIREMENTS

TARGET CATEGORIES: EASTERN EUROPE SCENARIO

DATA LIFE - USAF PLANNING —————  
PRESENTATION TIMELINESS - USAF STRIKE - - - - -  
COVERAGE INTERVAL - USAF STRIKE - - - - -

PERSONNEL  
WEAPONS  
ELECTROMAGNETIC EMITTERS }  
AIR FIELDS } 198 P  
NUCLEAR STORAGE } 636 S  
TRANSPORTATION } 834  
STRUCTURES }

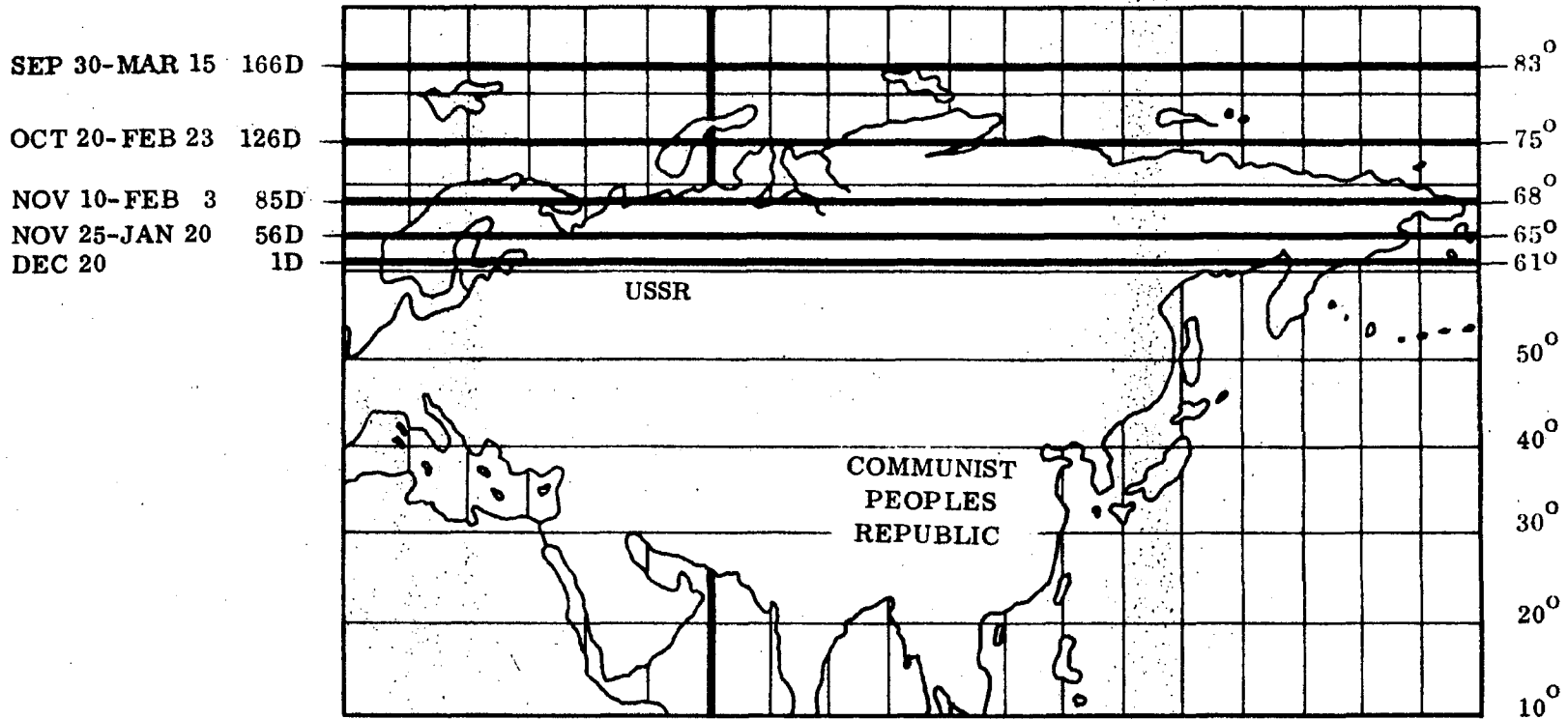


38569-69  
9460

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

WINTER DAYS OF 5° SUN OR LESS



38568-69  
10/60

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

HANDLE VIA BYEMAN SYSTEM ONLY  
~~SECRET/DORIAN~~

ARMS CONTROL OBJECTIVES

- DETECT CONSTRUCTION OR EXISTENCE OF NEW MISSILE
  - SILO CONSTRUCTION
  - BUILDINGS, EQUIPMENT
  - VEHICLES FOR SUPPLY
  - FINISHED SILOS AND/OR COVERS (STATUS)
  
- RESOLUTION REQUIRED 10' TO 20'
  
- MUST PENETRATE EXTREME NORTHERN LATITUDES
  - CLOUD, FOG OR NITE MOST OF YEAR, CAMOUFLAGE (NATURAL/ARTIFICAL)



METALLIC  
DEVICES



RADAR

38568-69
11/60

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

ARMS CONTROL CHARACTERISTICS

- SYNTHETIC APERTURE AT [REDACTED]
- [REDACTED]
- 10' RESOLUTION
- MODEST RF POWER ≈ [REDACTED]
- WEIGHT [REDACTED] LBS
- COMPLEX PROCESSOR [REDACTED]
- DATA RATE RQMTS [REDACTED]
- STORAGE RQMTS - [REDACTED]
- COVERAGE
  - [REDACTED]
  - 10' RESOLUTION → 20 N. MILE SWATH PER BEAM → 14 DAY COVERAGE
  - [REDACTED]
- POSSIBLE COMPATIBILITY WITH OCEAN SURVEILLANCE
- ANCILLARY SMALL OPTICS SENSOR
  - VISIBLE FILM
  - IR
  - MULTI-SPECTRAL

35568 - 69
12 of 60

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

38568-69  
13 / 60

KEY OCEAN SURVEILLANCE MISSION OBJECTIVES

	1975	1980	1985
DETECTION & TRACKING SURFACED TARGETS SIZE/SWATH  LOC. ACC.			
CLASSIFICATION	CRUDE SIGN. ANAL. TARGET SORTING FOR TGT. AMB. RES.	YES - GROSS CLASS. DISTINCTIVE TARGETS	YES - EXTENSIVE
IDENTIFICATION	NO	YES	YES
COVERAGE LATITUDES FREQUENCY	POSSIBLY ALL EVERY 12 HOURS	ALL CONTINUOUS	ALL CONTINUOUS
DETECTION & TRACKING OF SUBS SIZE DEPTH LOC. ACCUR.			
ALL WEATHER	YES	YES FOR SURFACE NO FOR SUBS	YES FOR SURFACE NO FOR SUBS
DAY / NIGHT	YES	YES FOR DET/TRK YES FOR CLASS. NO FOR IDENT. AT NIGHT	YES FOR DET/TRK YES FOR CLASS. YES FOR IDENT.
RESPONSE TIME DATA USE			

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

TYPICAL LARGE RADAR FOR OCEAN SURVEILLANCE

- NON COHERENT

- SIDE-LOOKING

- RESOLUTION
    - ANT. DIMEN.
    - INPUT POWER MAX.
    - RF XMTR POWER AVG
    - WEIGHT - LBS.

- FORWARD-LOOKING MECH. SCAN

- RESOLUTION
    - ANT. DIMEN.
    - INPUT POWER MAX.
    - RF XMTR AVG
    - WEIGHT - LBS.

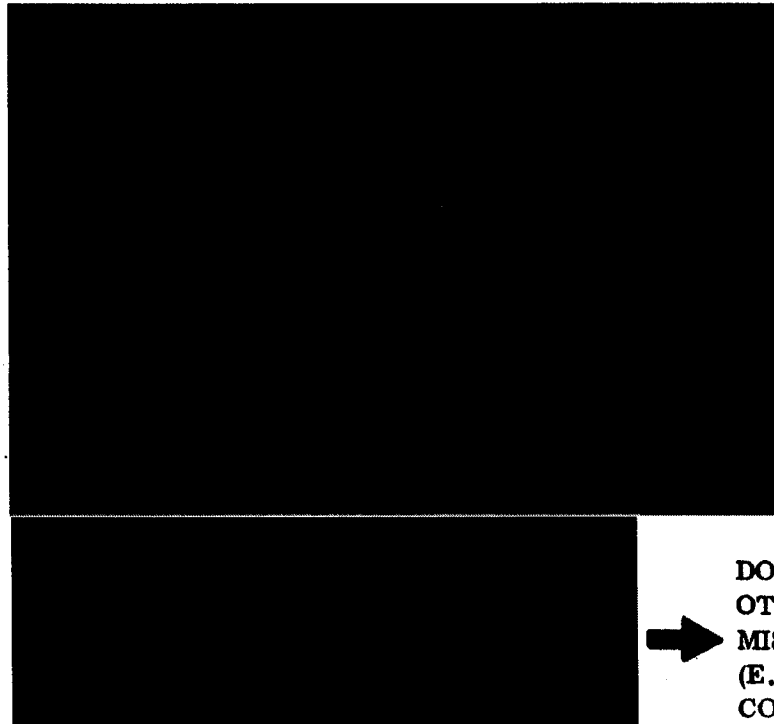
- SYNTHETIC APERTURE

- PHASED-ARRAY

- RESOLUTION
    - LENGTH
    - POWER INPUT
    - RF XMTR AVG
    - WEIGHT - LBS

- DETECTION AND TRACKING - NON COHERENT OR SYNTHETIC APERTURE

- CLASSIFICATION - SYNTHETIC APERTURE ONLY



DOES  
OTHER  
MISSIONS  
(E. G. ARMS  
CONTROL)

38508-69
14960

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

HANDLE VIA BYEMAN SYSTEM ONLY  
~~SECRET/DORIAN~~



38568-69
15760

OPTICAL SEARCH SYSTEMS

OBJECTIVES

- CRISIS - LIMITED SEARCH
  - AREA TYPICALLY 50,000 N. MI<sup>2</sup> PER DAY
  - ONE DAY REPEAT OVER CRISIS
- GENERAL SEARCH
  - 6 X 10<sup>5</sup> N. MI PER DAY (20 DAYS TO COVER RUSSIA/CHINA)
  - STEREO
- 2' TO 4' RESOLUTION

OPTICS

- 2 COUNTER ROTATING STEREO OPTICS
- 
- 
- FILM RESUPPLY EVERY 2 MONTHS
- ELECTRONIC R. O. - OF SELECTED PORTIONS
- 150 N. MI. ALTITUDE

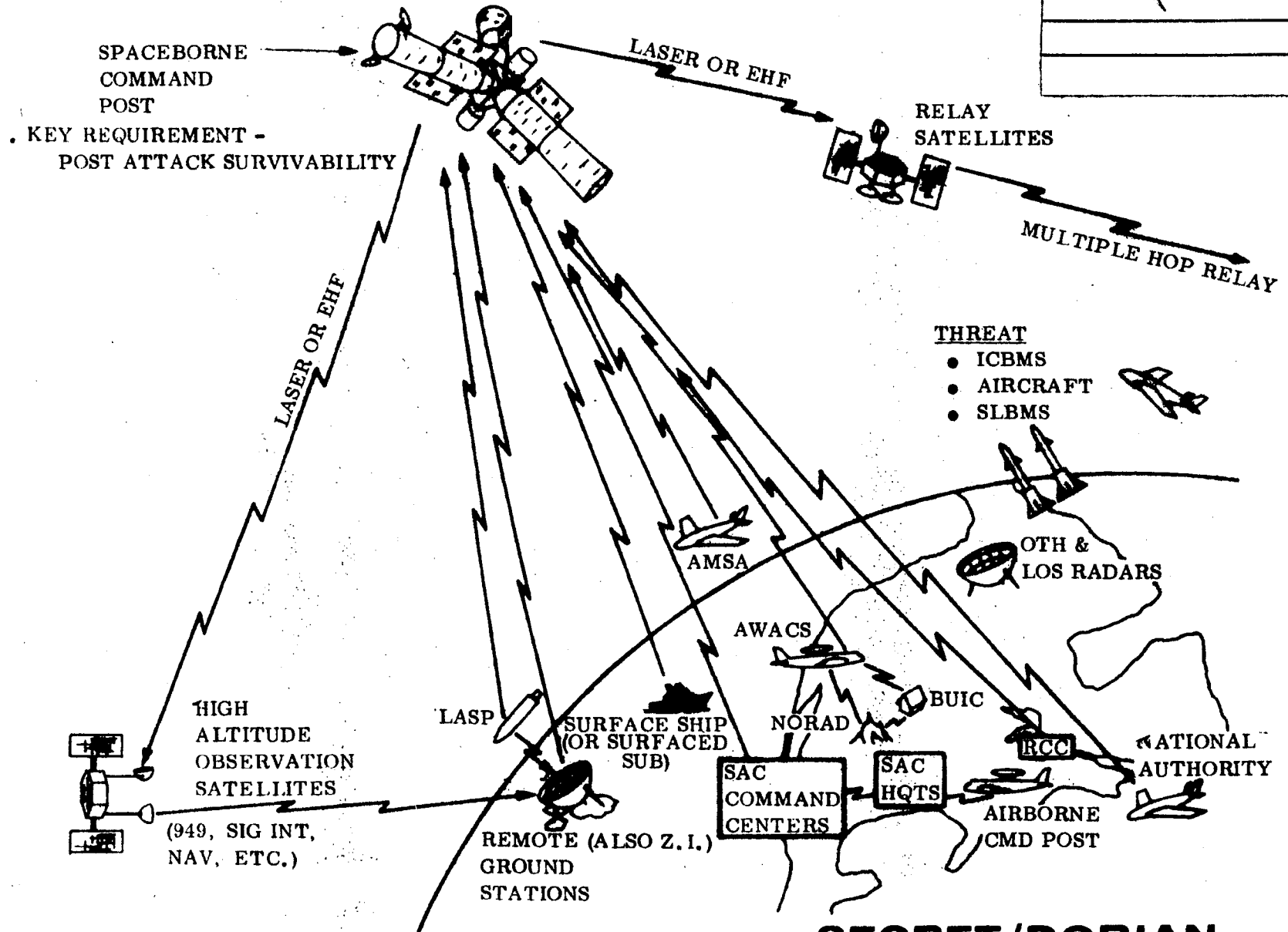
SMALL MODULE ON RADAR MODULE (OR DORIAN MODULE)

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

32505-09
16460



~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY



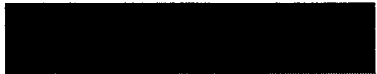
HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

38568-69
17460

14

SPACEBORNE COMMAND POST CHARACTERISTICS

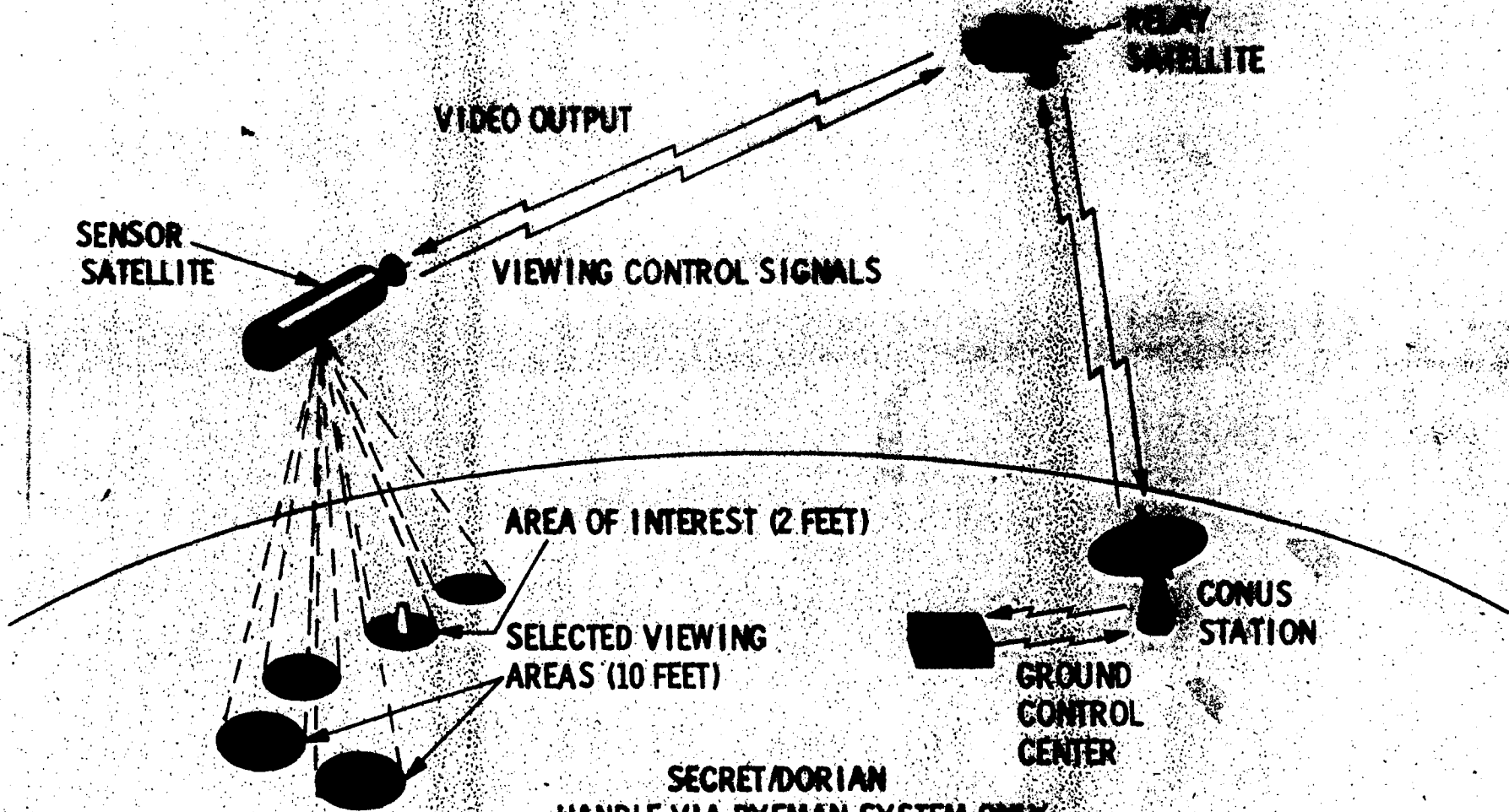
	12 MAN STATION	40 MAN STATION
CAPABILITY	LIKE EC 135 AIRBORNE CMD POST	LIKE C5A AIRBORNE CMD POST
WEIGHT	165000 LB	470,000 LB
VOLUME	13,400 FT <sup>3</sup>	37,200 FT <sup>3</sup>
POWER	10 KW (SOLAR ARRAYS)	25 KW (SOLAR OR  )
CONFIGURATION	CYLINDER	3 MATED CYLINDERS
RESUPPLY (INCLUDING PERSONNEL TRANSFER VEHICLES)	70,000 LB/2MO.	230,000 LB/2 MO
MANEUVERABILITY	1000 FT/SEC	1000 FT/SEC
FUNCTIONS		
• SELF DEFENSE	YES	YES
• WIDE BAND DATA PROCESSING	NO	YES
• STATUS MONITORING	YES	YES
• COMMUNICATIONS	YES	YES
• INFORMATION ANALYSIS	LIMITED	YES
• STRATEGIC/TACTICAL DECISION MAKING	LIMITED	YES
• FORCE CONTROL	LIMITED	YES

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

38568-69
18960

GLO CONCEPT - REAL-TIME MANUAL CONTROL (FROM GROUND)



~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

### GLO FEATURES

- DAILY TARGET ACCESS
  - REAL-TIME SELECTION BY OPERATOR. RESOLUTION ZOOM TO 2'
- PROTRACTED VIEW OF TARGET
  - IMAGE STABILIZED BY OPERATOR -- STEREO, MOTION DETECTION AVAILABLE
- MISSION CONTROL
  - HARD COPY OF IMAGES AVAILABLE DURING TARGET PASS
  - MISSION PLAN CAN BE UPDATED ON A "PER PASS" BASIS
- GROUND CONTROL CENTER
  - RECORDS ALL RAW VIDEO DATA
  - PROVIDES IMAGE MANIPULATION FUNCTIONS (CONTRAST ENHANCEMENT, DEROTATION, ETC) FOR SATELLITE WEIGHT SAVINGS, EASE OF EQUIPMENT UPDATE
- EXTENSION OF MOL-PROVEN TECHNIQUES
  - APPLIES MAN IN MOL PATTERN TO MAXIMIZE MISSION PERFORMANCE
  - COUPLES VIDICONS (FOCUS-PROJECTION-SCAN TYPE) TO MOL - DEVELOPED OPTICAL SYSTEMS FOR IMAGE SENSING
  - UTILIZES CONTINUOUS RELAY LINK TO AVOID STORING VIDEO DATA

38668-69

19760

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

MULTI-MISSION USING RADAR MODULE\*

(150 TO 200 N. MI CIRCULAR ORBIT)

MISSION \ SENSOR	HIGH POWER NON COHERENT RADAR	HIGH POWER SYNTHETIC APERTURE RADAR	SMALL OPTICS
OCEAN SURVEILLANCE (FEEDS INTO OASIS TRACKING)	DETECT/LOCATE - 2 N. MI AZ RESOL - 50' RANGE RESOL	DETECT/LOCATE - [REDACTED] RESOLUTION - WIDE SWATH CF ASSEY - [REDACTED] RESOLUTION - NARROW SWATH	CLASSIFY/IDENTIFY [REDACTED] DAYTIME RESOLUTION
ARMS CONTROL			
FAST RESPONSE (CRISIS, TACTICAL, STRATEGIC WARNING)		ALL WEATHER, PLUS SYNERGISTIC TO OPTICAL DATA FROM D MISSION MODULE	
STANDAR RECON (SEARCH, SURVEILLANCE, T1)			

\*CAN HAVE COMBINED D/RADAR MODULE  
 D BIG OPTICS FOR OCEAN SURVEILLANCE CLASSIFICATION [REDACTED]

35568-69  
 21/60

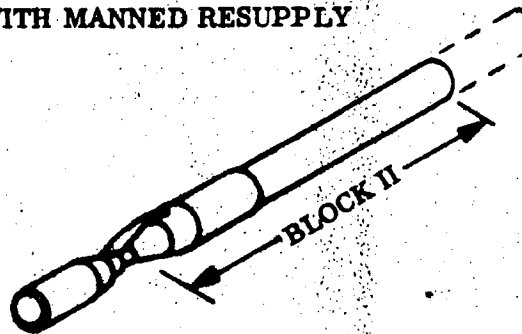
~~SECRET/DORIAN~~  
 HANDLE VIA BYEMAN SYSTEM ONLY

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

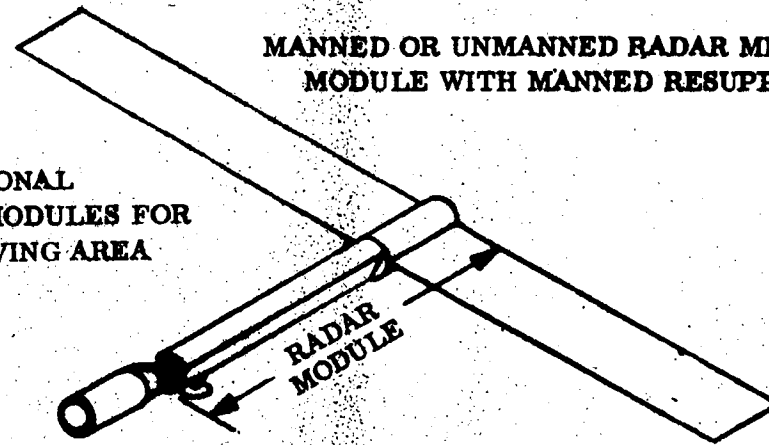
OPTIONS FOR RECON MISSION MODULES

MANNED OR UNMANNED  
DORIAN MISSION MODULE  
WITH MANNED RESUPPLY

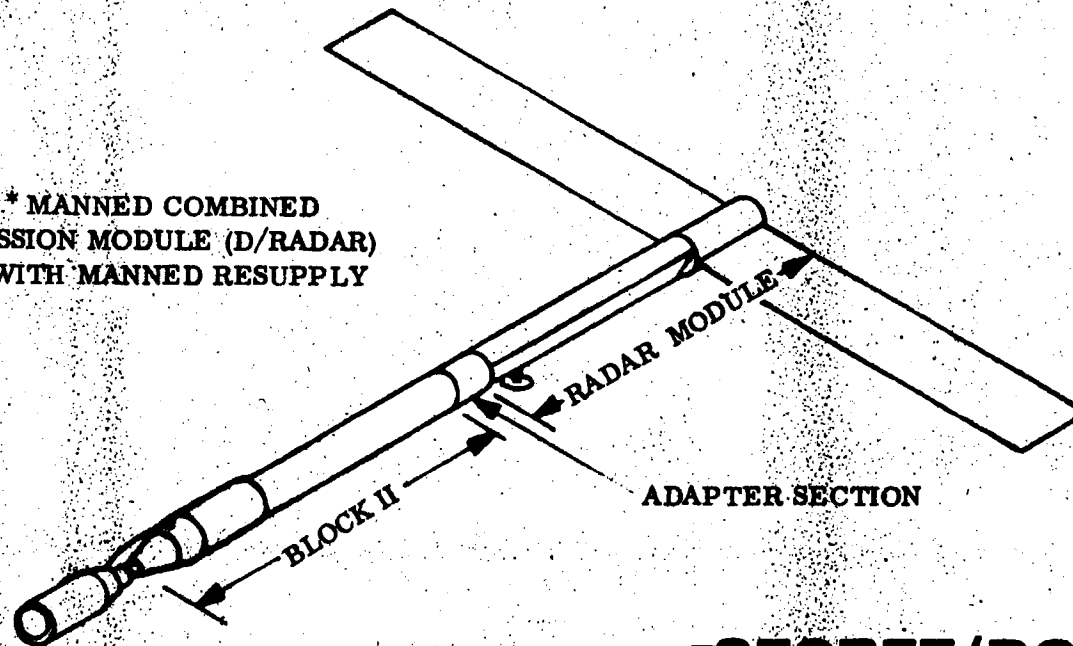


OPTIONAL  
RESUPPLY MODULES FOR  
ADDED LIVING AREA

MANNED OR UNMANNED RADAR MISSION  
MODULE WITH MANNED RESUPPLY



\* MANNED COMBINED  
MISSION MODULE (D/RADAR)  
WITH MANNED RESUPPLY



\*CAN ADD NUCLEAR POWER MODULE OR OPTICAL SEARCH MODULE

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

MULTI-MISSION D MISSION MODULE (70" D MAIN OPTICS)  
ORBIT - 70 N. MI (NITE) X 230 N. MI - DAILY REPEAT

MISSION		SENSOR		3404 FILM F/7	FAST FILM, 0.1 SEC EXPOSURE, ADD INTENSIFIER	LWIR	LASER FOR ILLUM	TV TUBE		MULTI SPECTRAL 0.5 TO 0.9 μ	MANNED VIEWING (IMAGE ENHANCEMENT) NEAR IR	SIGINT CUEING
		CLASS	SPECIFIC					FPS	IG			
FAST RESPONSE (POINT TARGET)	CRISIS MANAGEMENT				NIGHT 6' TO 10'	DAY/NITE 7' PATCH**		DAY 2.5' (GLO)	NITE			X
	TACTICAL											
	STRATEGIC WARNING											
SLOW RESPONSE (POINT TARGET)	SURVEILLANCE											
	ARMS CONTROL											
	TI											
SLOW RESPONSE (LARGE AREA)	GENERAL SEARCH	SEPARATE OPTICS	DAY 2' TO 4'									
FAST RESPONSE (LIMITED AREA)	LIMITED SEARCH											

\*CAN TIME SHARE BIRD FOR TI AS NEEDED

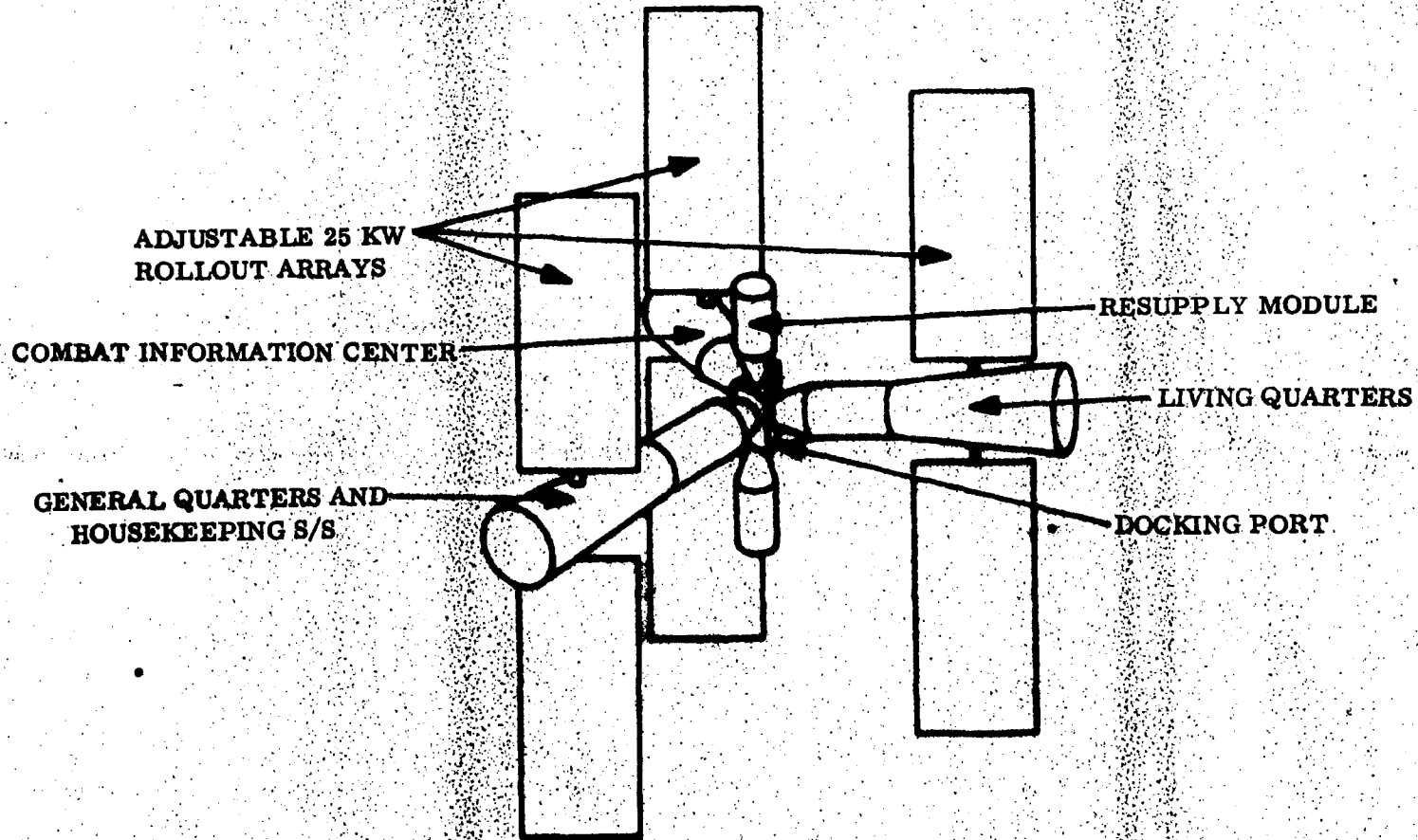
\*\*EQUIVALENT TO 20° PER CYCLE (KELL FACTOR OF 0.7) PHOTOS SHOWS GOOD INTERPRETABILITY

~~SECRET/DORIAN~~

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

SYNCHRONOUS ALTITUDE  
COMMAND POST



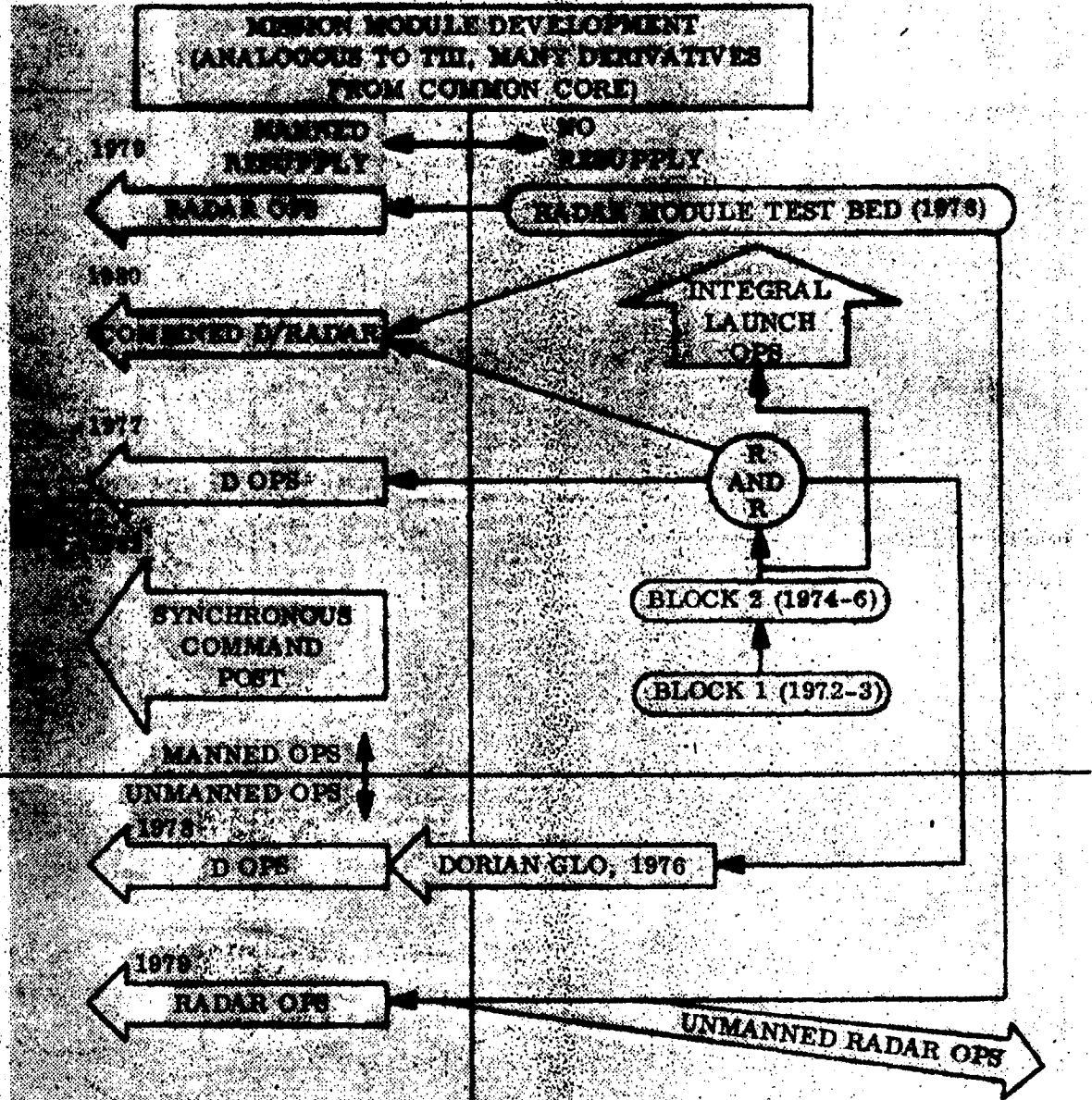
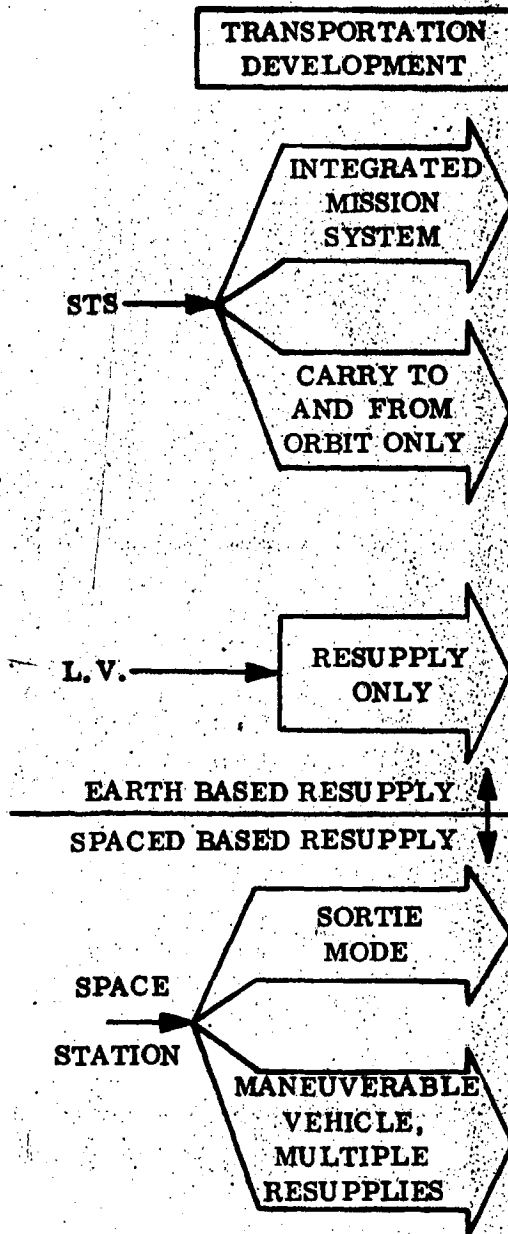
~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

MOL GROWTH ROADMAP

(COST OF MANNED MISSION OPS WILL DETERMINE UTILIZATION)



~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

1977



HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

TYPICAL ROLE OF MAN IN MILITARY SPACE OPERATIONS

LOGISTIC OPS (EVA) ▶ BAY EVERY 3 TO 6 MONTHS FOR 5 YEAR MISSION MODULE LIFE

- ADJUST/CALIBRATE BIG OPTICS, BIG RADAR, SENSITIVE READOUT DEVICES (LASER SCANNER, BRIDGE), ETC.
- RESUPPLY EXPENDABLES: PROPELLANT, FILM, DEVELOPERS, CRYOGENICS (POWER OR IR SENSOR)
- REPLACE MECHANISMS: DRIVES OF ALL TYPES (FILM, DEVELOPERS, MECHANICAL SCAN RADAR, TRACKING MIRROR, OPTICAL DOORS, CONTROL MIRRORS, ATT CONT SENSORS, SOLAR ARRAY, ETC), THRUSTORS, COATINGS ON MIRRORS, GUIDANCE PACKAGES, COMPUTERS, HIGH POWER RADAR TUBES, ETC.
- ADD SMALL SENSORS AS DEVELOPED/NEEDED (E.G. NEW OPTICAL DETECTORS, SENSITIVE RADAR RECEIVERS, SIGINT RECEIVERS, NEW FILMS, ETC)
- AID INITIAL DEPLOYMENT, ALIGNMENT OF BIG OPTICS, BIG RADAR ▶ EVENTUALLY MAKE BIG MIRRORS IN SPACE

ORBITAL MISSION OPERATIONS

- SELECT/INSERT APPROPRIATE SENSOR FROM MANY (SOMETIMES UNPREDICTABLE, E.G. NITE MODE ▶ ARTIFICIAL ILLUM
- PROVIDE BEST IMC FOR LONG EXPOSURE NITE MODE (VS NON-OPERABLE) OR MULTI-SPECTRAL
- COARSE/FINE MODE DISPLAYS ▶ SELECT SMALL AREA TO POINT FINE SENSOR ▶ [REDACTED] RADAR (NOISY)
- PROVIDE IMAGE ENHANCEMENT BY FILTER ADJUSTMENT (BETTER PIX INTERPRETATION WITH MANUAL VIEWING)
- SCREEN DATA (PICTURE/RADAR) SENT TO GROUND ▶ REDUCE BANDWIDTH REQUIREMENTS
- MANIPULATE SENSOR CHANGE DAY TO NITE MODE (CHANGE FILM, CHANGE FOCAL LENGTH, EXPOSURE TIME, ETC)
- [REDACTED]
- BROAD ACROSS THE BOARD OPS ▶ DECISION MAKING, MAN/COMPUTER/DISPLAY INTERACTION, ETC.

- GE SIMULATION EXPERIMENT

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

TYPICAL OVERALL SYSTEM TRADEOFFS

- REASONABLE COMBINATIONS OF

MODULES

- DORIAN
- RADAR
- SEARCH MODULE
- DORIAN/RADAR
- COMMAND POST



OPERATIONS

- MANNED OR UNMANNED
- ORBITAL
- RESUPPLY OR NOT
- SPACE OR GROUND
- RESUPPLY



POWER

- SOLAR
- NUCLEAR
- FUEL CELLS

- POTENTIAL INCOMPATIBLE COMBOS ▶ DIFFERENT MODAL RATE/NODAL POSITION (STATION AND MODULE)
- COORBITAL MISSION MODULES [REDACTED] ▶ MULTIPLE RESUPPLY FOR 1 LOGISTIC VEHICLE
- TIME LINE ANALYSIS MODULES/MISSIONS/SENSORS ▶ NO. OF MEN AND MODULES REQUIRED
- ROLE OF EVA IN LOGISTIC/MAINTAINENCE
- DESIGN FOR MAINTAINABILITY/CALIBRATION
- CONTINUOUS VS INTERMITTENT MANNING (E. G. ONLY WINTER MONTHS ▶ NIGHT OPS)
- RESUPPLIED D (MAN/UNMANNED) ▶ CAN USE FILM/R.O. (NO DIELECTRIC TAPE, TV, SOLID STATE)
- READOUT RATES FOR COMBINED MISSION MODES
- OPERATIONAL COST
  - COST PER RESUPPLY LAUNCH AND MODE OF RESUPPLY -- GROUND OR SPACE
  - FREQUENCY OF RESUPPLY ▶ ALTITUDE, MULTIPLE OR SINGLE RESUPPLY, MANNED VS UNMANNED, ETC.
  - NUMBER OF MODULES IN ORBIT (TARGET ACCESS TIME)
  - LIFETIME/CAPABILITY OF MODULE

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

SYSTEM COST PROJECTIONS

- COMPUTERIZED COST MODEL AVAILABLE
  - GE/MSD + GE/TEMPO DEVELOPED UNMANNED SPACECRAFT VERSION,  
+ 15% MATCH ON TRIAL ESTIMATES
  - COSTS FOR CARRYING MAN BASED ON RAND CORP. STUDY
  
- PROJECTS SYSTEM COSTS FROM PREDICTABLE ELEMENTS
  - WEIGHT
  - COMPLEXITY FOR KEY SYSTEM SUB-CATEGORIES
  - STATE OF DEVELOPMENT
  
- BEING USED TO EVALUATE COST SENSITIVITY OF ALTERNATE CONCEPTUAL APPROACHES  
FOR SAME MISSION

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

NRO APPROVED FOR  
RELEASE 1 JULY 2001

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

---

DORIAN MISSION MODULE TECHNOLOGY

---

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

OPTICAL SENSORS WITH READOUT  
FOR FAST RESPONSE MISSIONS (CRISIS, TACTICAL, STRATEGIC WARNING)

- FILM WITH LASER SCANNER

➔ BEST RESOLUTION AND PROVIDES  
SEARCH CAPABILITY

- DIELECTRIC TAPE

- SOLID STATE PHOTOMOSAIC ARRAY

- TV TUBE (RBV, FPS, ETC.)

- PHOTOPLASTIC RECORDING

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

IMAGE STABILIZATION BY MAN

- MAN'S CAPABILITY TO STABILIZE DRIFTING IMAGE DEMONSTRATED ON PICTORAL (MOL SIMULATOR) AND LINE-TYPE (OSCILLOSCOPE) IMAGES
  - REACH RATES UNDER [REDACTED] WITHIN 2 SECONDS FROM STARTING RATES AS HIGH AS [REDACTED]
  - STABILIZE TO AVERAGE RATES OF APPROXIMATELY [REDACTED]
- IMAGE INTENSIFIER + MAN WILL PROVIDE ABILITY TO TRACK LOW LIGHT LEVEL TARGETS FOR MAXIMUM RESOLUTION PERFORMANCE

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

SELECTED SCENE CONDITIONS

DAY			NIGHT		
SOLAR ALTITUDE	APPARENT LUMINANCE (FT-LAMBERTS)	APPARENT MODULATION	LUNAR ALTITUDE	APPARENT LUMINANCE (FT-LAMBERTS)	APPARENT MODULATION
60°	800	.36	FULL MOON 60°	$2.5 \times 10^{-3}$	.36
6°	160	.10	6°	$5 \times 10^{-4}$	.10
0°	16	.10	HALF MOON 60°	$2.5 \times 10^{-4}$	.30
-6°	0.16	.10	6°	$5 \times 10^{-5}$	.10
			SOLAR ALTITUDE	APPARENT LUMINANCE (FT-LAMBERTS)	APPARENT MODULATION
			NO MOON -12°	$1.2 \times 10^{-5}$	.10
			-18°	$8 \times 10^{-6}$	.20
			-90°	$4 \times 10^{-6}$	.25

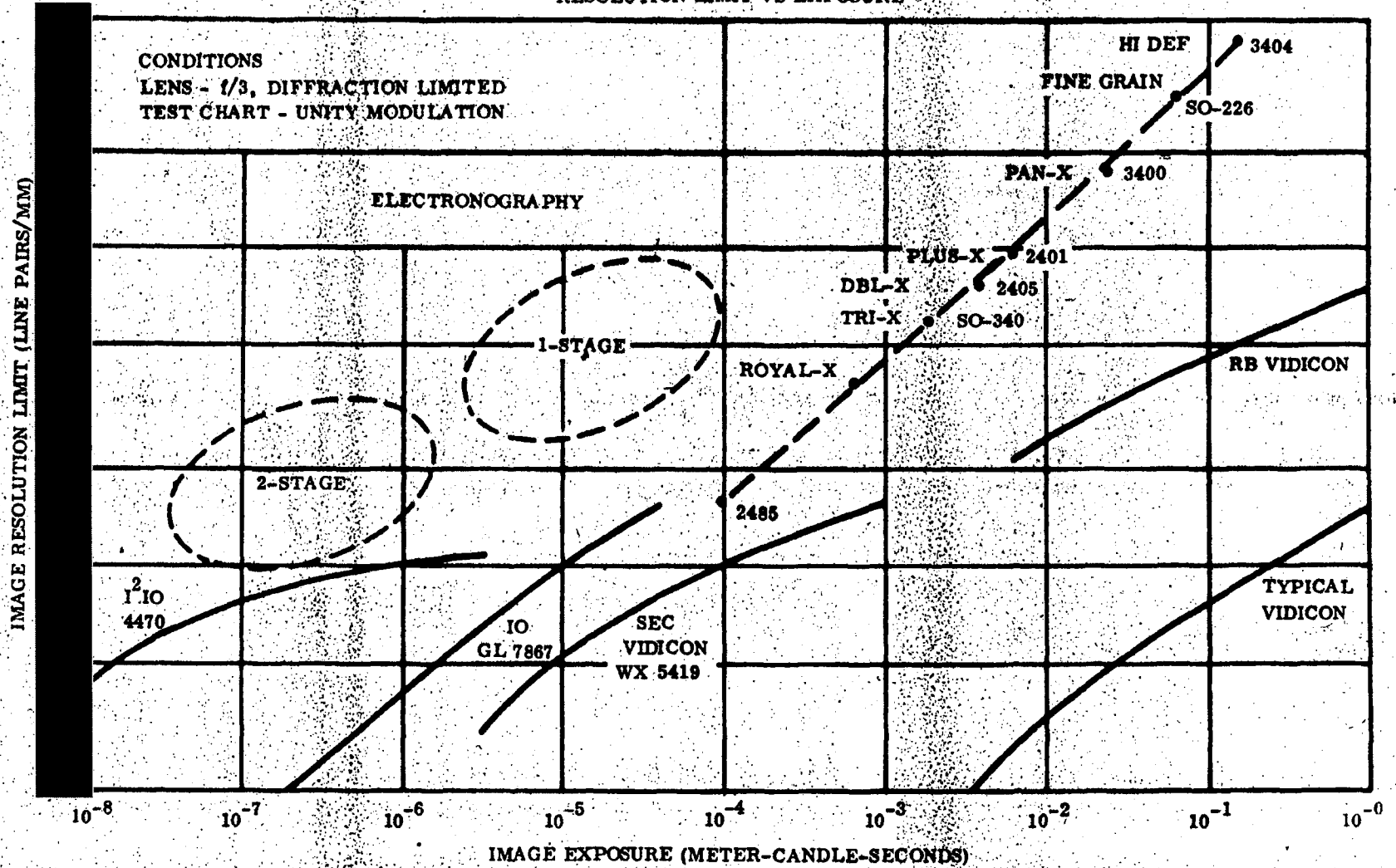
- ASSUMPTIONS: 1. TARGET - TRIBAR CHART, DIFFUSE REFLECTANCE PAIR IS .234/.078. INTRINSIC CONTRAST = 3.0
2. ATMOSPHERE - TYPICAL CLEAR WEATHER (PAM)
3. SENSOR - PHOTO FILM (EXTENDED RED)  
 FILTER (WRATTEN #8)  
 PHOTOCATHODE (S-25)  
 SENSITIVITY (400  $\mu$ a/LUMEN)

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

SENSOR COMPARISON -  
RESOLUTION LIMIT VS EXPOSURE



~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY



HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

27

DAY/NIGHT FILM PERFORMANCE

REGIME	APPARENT LUMINANCE (FT-LAMBERTS)	LENS SPEED (T-STOP)	IMAGE EXPOSURE (AV. M. C. S)	OVERALL IMAGE RES (LP/MM)	EXPOSURE TIME (SEC)	NADIR GRD (FT/LP)
DAYLIGHT	800	5.6	0.125	[REDACTED]	0.0018	[REDACTED]
	160	↓	0.025		0.0018	
	16	↓	0.005		0.0036	
MOONLIGHT*	$2.5 \times 10^{-3}$	2.5	$1 \times 10^{-5}$		0.093	
	$2.5 \times 10^{-4}$	↓	$2.5 \times 10^{-6}$		0.23	
NO MOONLIGHT**	$5 \times 10^{-5}$	↓	$1.25 \times 10^{-6}$		0.057	
	$4 \times 10^{-6}$	↓	$2.5 \times 10^{-7}$		0.144	

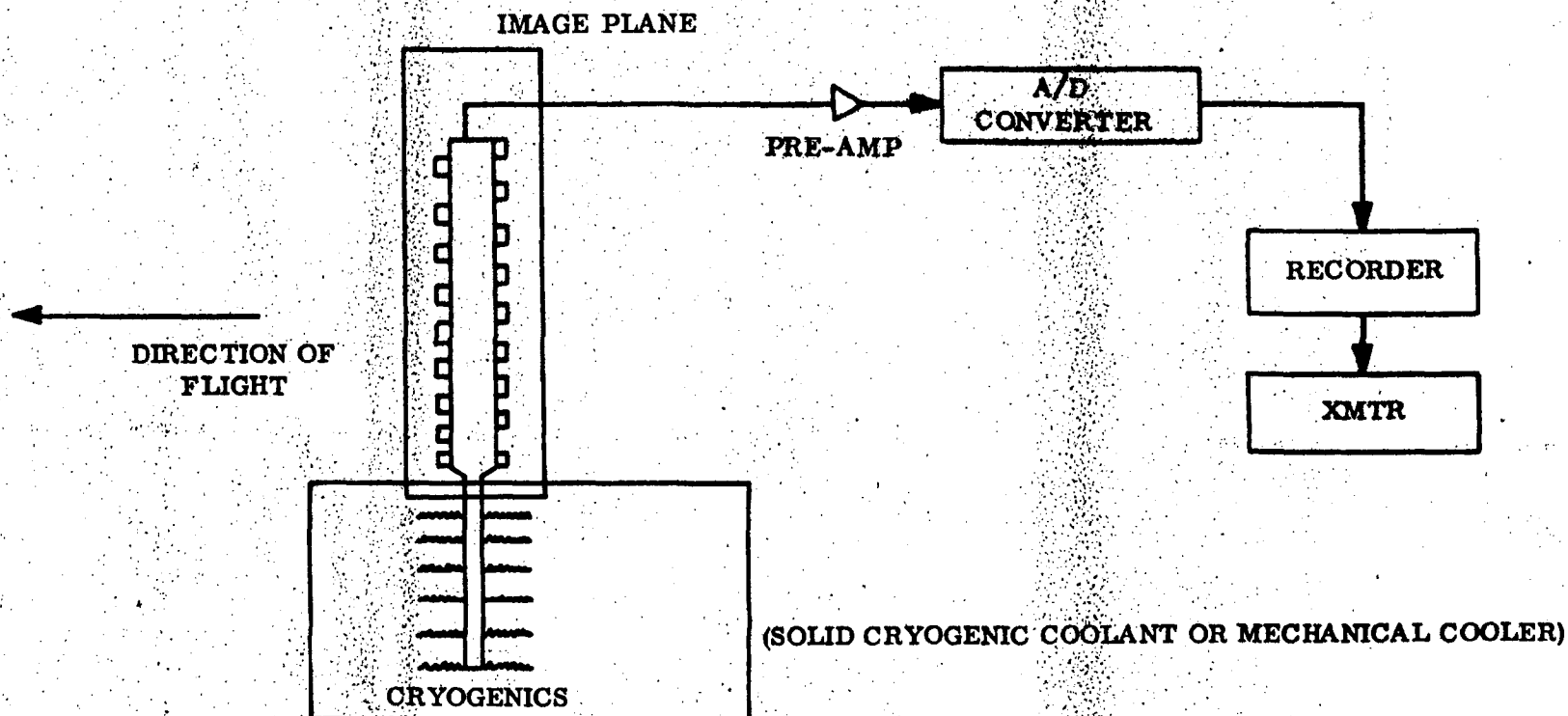
\*1 STAGE INTENSIFIER ► 50-GAIN

\*\*2 STAGE INTENSIFIER ► 1000

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~



- Ge: Hg
- 1560 ELEMENTS
- 10.6 TO 12.6  $\mu$
- 0.1°C  $\Delta T$  CAPABILITY

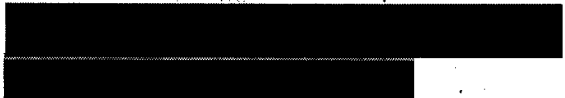
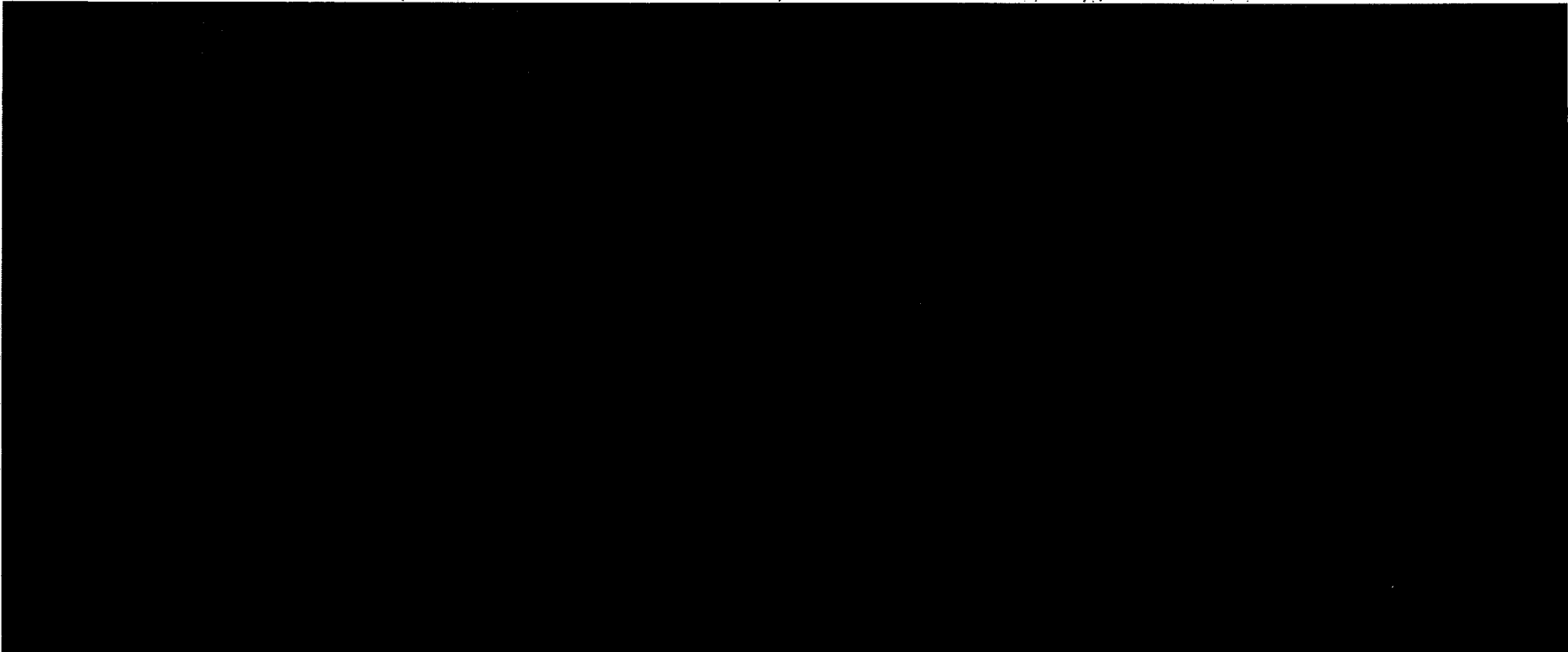
SCHEMATIC IR SENSOR CONFIGURATION

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

NRO APPROVED FOR  
RELEASE 1 JUL 1975

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

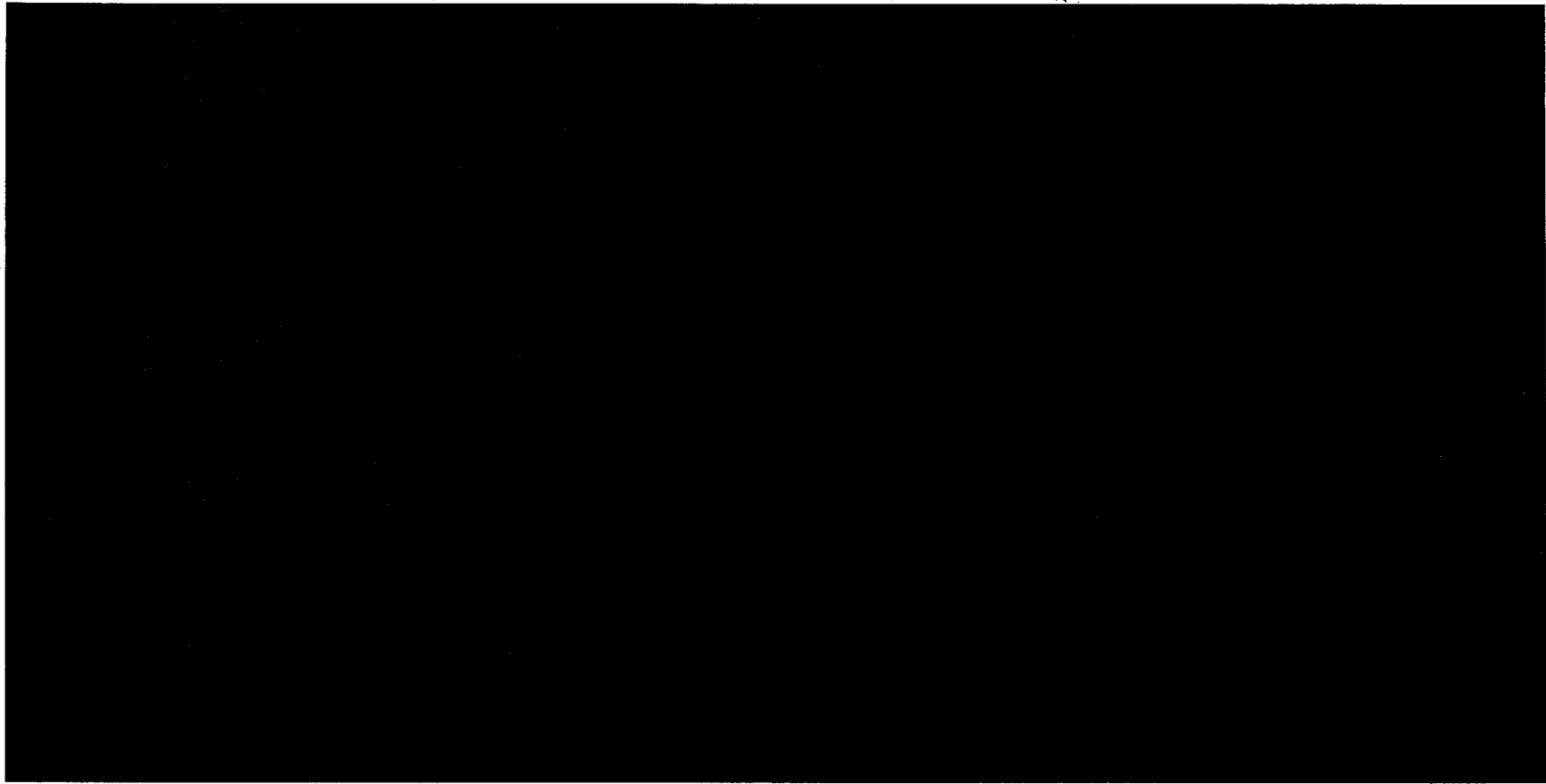


MOL-INFRARED MODIFICATION

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

NRO APPROVED FOR  
RELEASE 1 JULY 2011

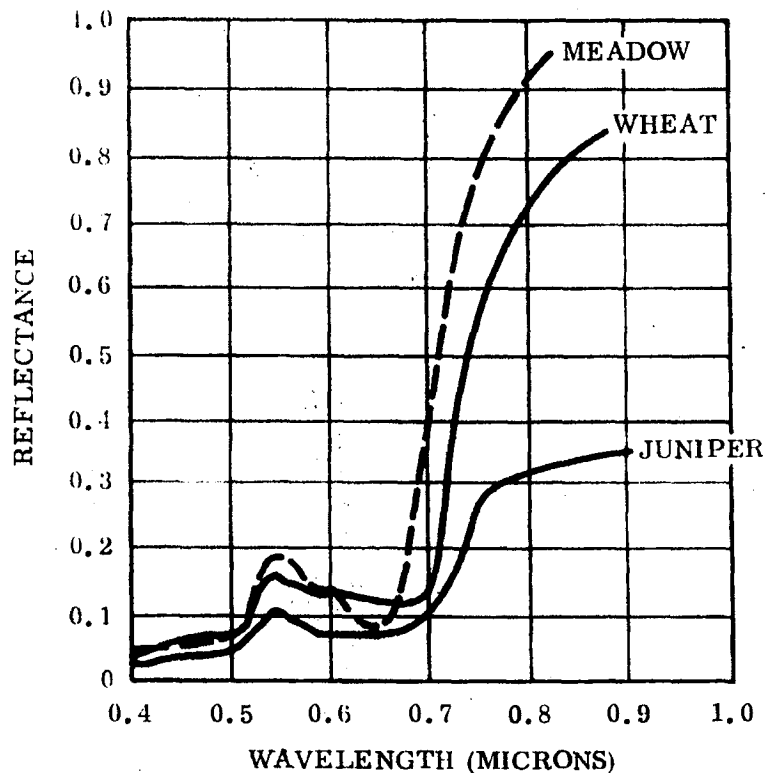
HANDLE VIA BYEMAN SYSTEM ONLY  
~~SECRET/DORIAN~~



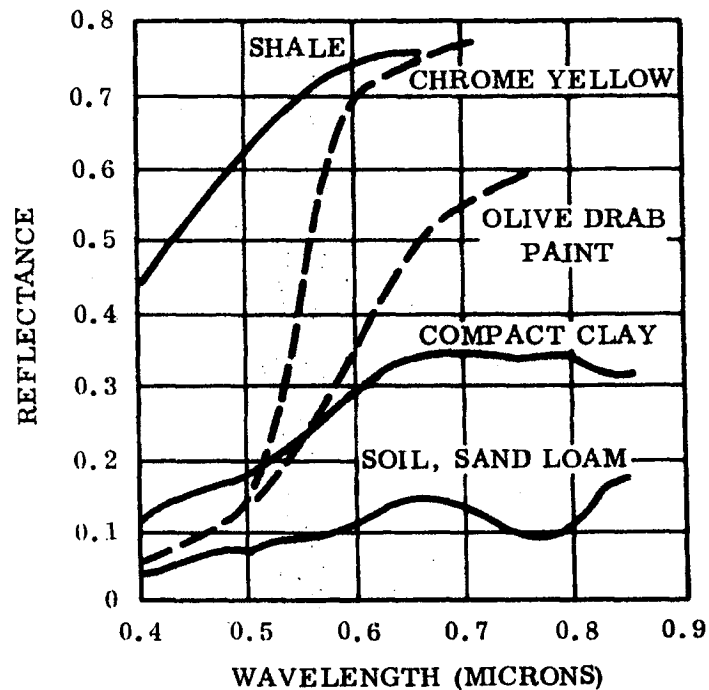
~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~



SPECTRAL REFLECTIVITY OF VEGETATION

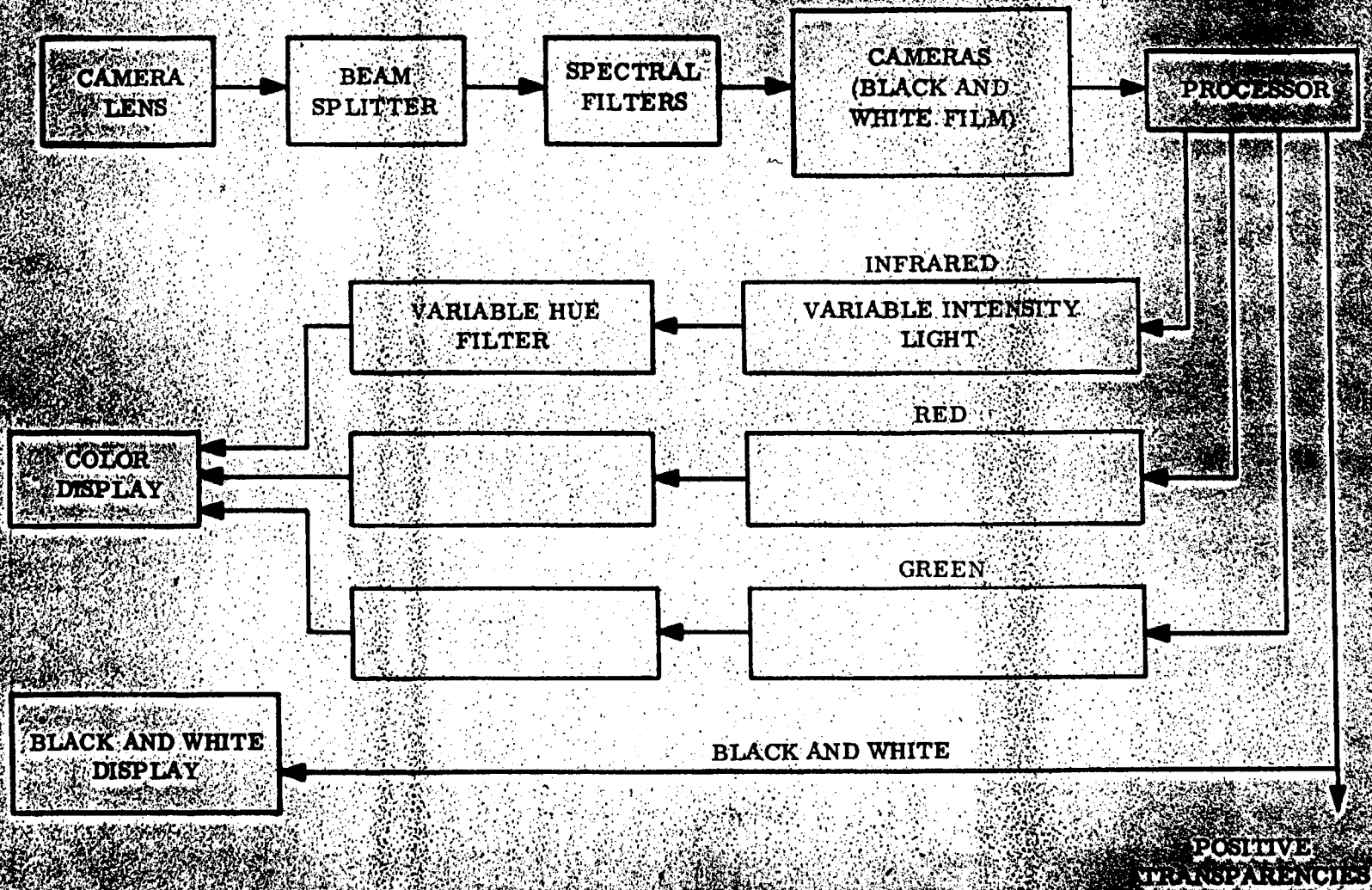


SPECTRAL REFLECTIVITY  
OF INERT MATERIAL AND PAINT

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

HANDLE VIA BYEMAN SYSTEM ONLY

**SECRET/DORIAN**



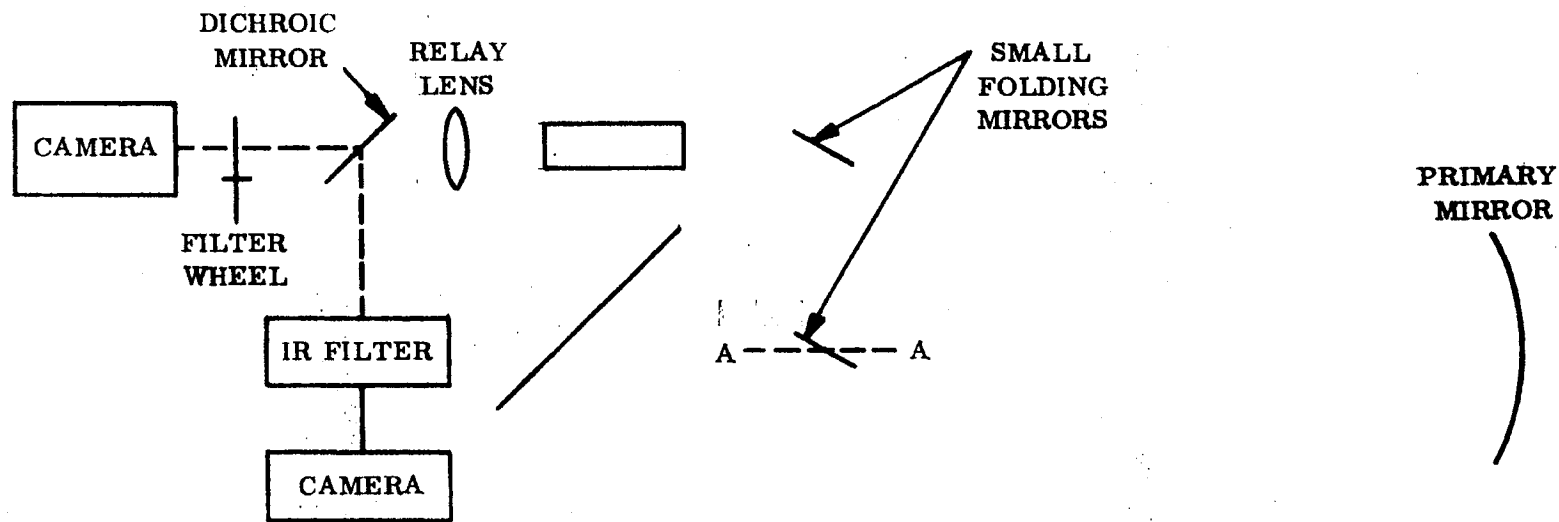
MULTISPECTRAL SYSTEM BLOCK DIAGRAM

**SECRET/DORIAN**

HANDLE VIA BYEMAN SYSTEM ONLY

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~



EXAMPLE OF MULTISPECTRAL SENSING IMPLEMENTATION

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

RESOLUTION USING CANDIDATE FILMS

FILM		AERIAL EXP. INDEX	FILTER FACTOR*	STATIC RESOLUTION**		MOTION BLUR	RESULTANT RESOLUTION
NAME	NUMBER			LP/MM	INCHES	INCHES	INCHES
INFRARED CHANNEL							
IR	5.424	125					
CANDIDATES FOR RED AND GREEN CHANNELS							
HI. DEF.	3404	3.5					
PAN-X	3400	20					
PLUS-X	3401	64					
FINE RESOLUTION CHANNEL							
HI. DEF.	3404	3.5	1				

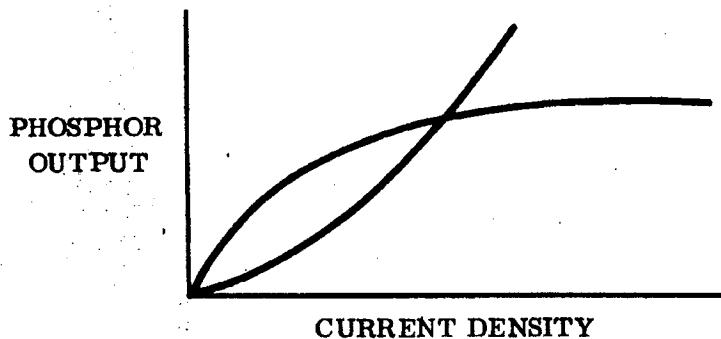
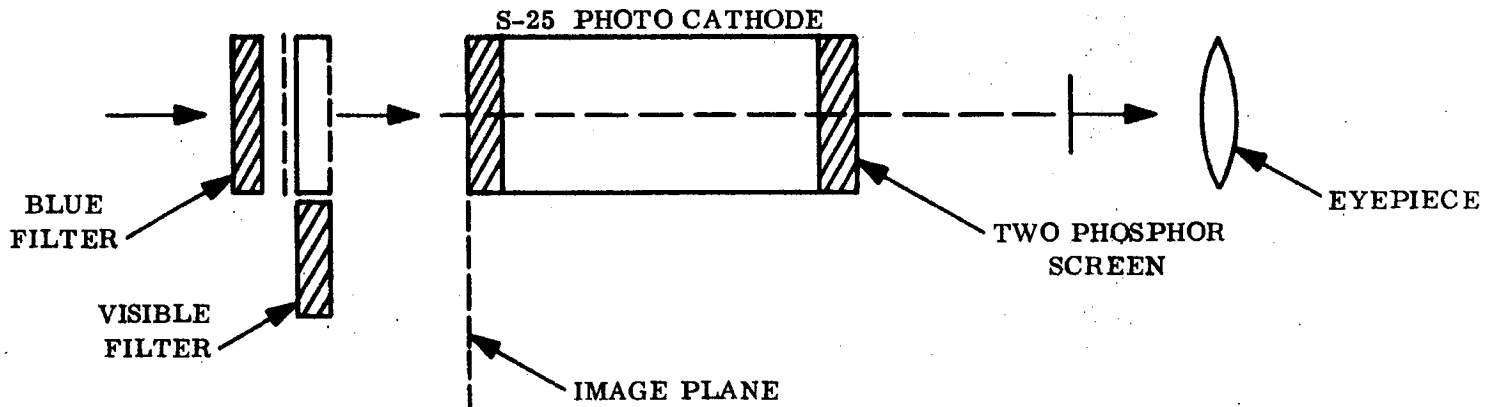
\*NOT INCLUDING EFFECT OF CORRECTOR LENS  
 \*\*RESOLUTION FOR 2:1 CONTRAST; CONTRAST ENHANCEMENT NOT INCLUDED  
 \*\*\*MAN'S TRACKING CAN PROVIDE BETTER IMC GIVING [REDACTED] RESOLUTION

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY



~~SECRET/DORIAN~~

NEAR-IR IMAGE ENHANCEMENT FOR FLIGHT CREW



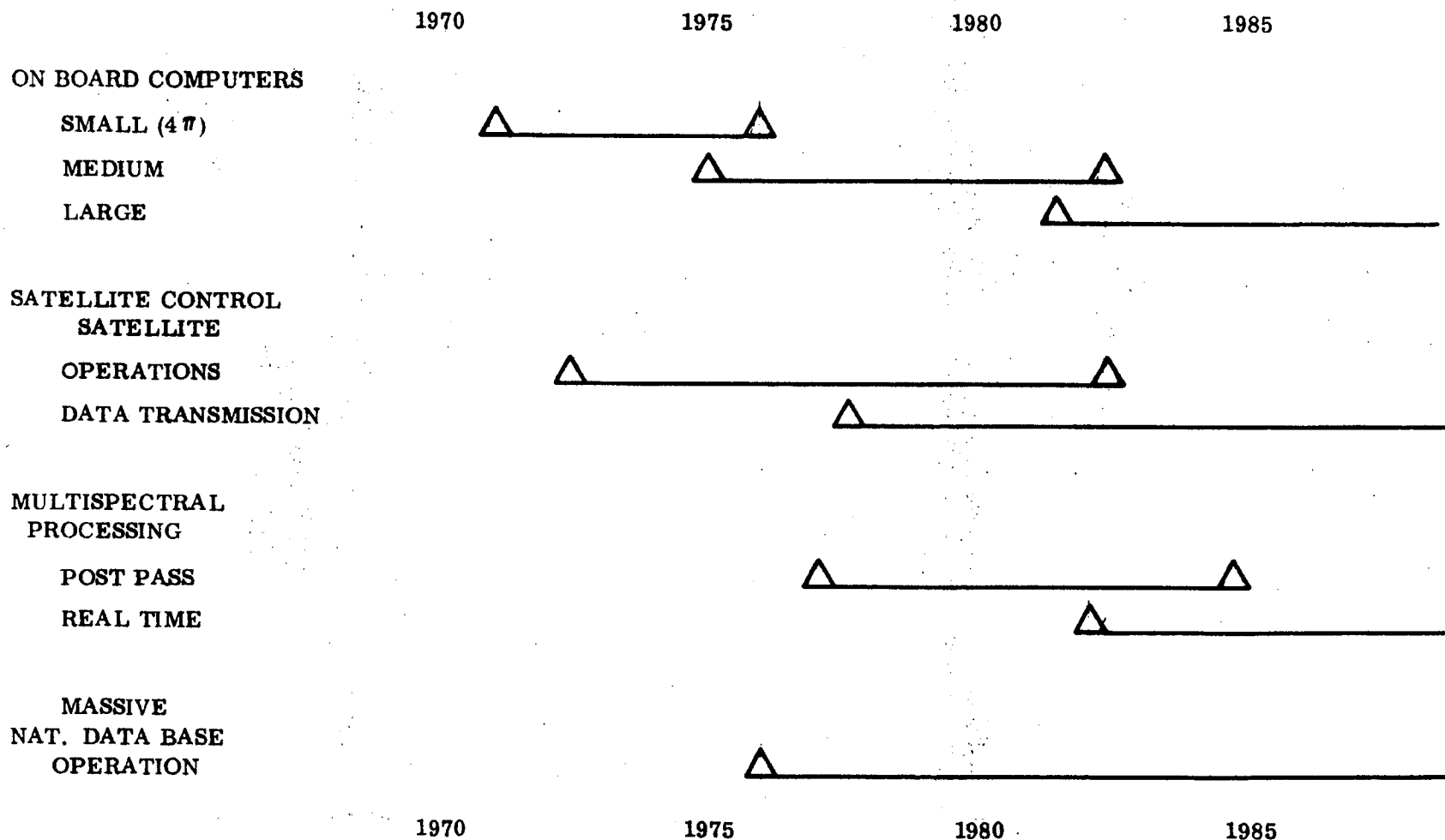
- TWO PHOSPHOR IMAGE INTENSIFIER
- SPECTRAL PLUS INTENSITY CONTRAST
- GAMMA CONTROL
- ADAPT GAMMA TO THE TARGET

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

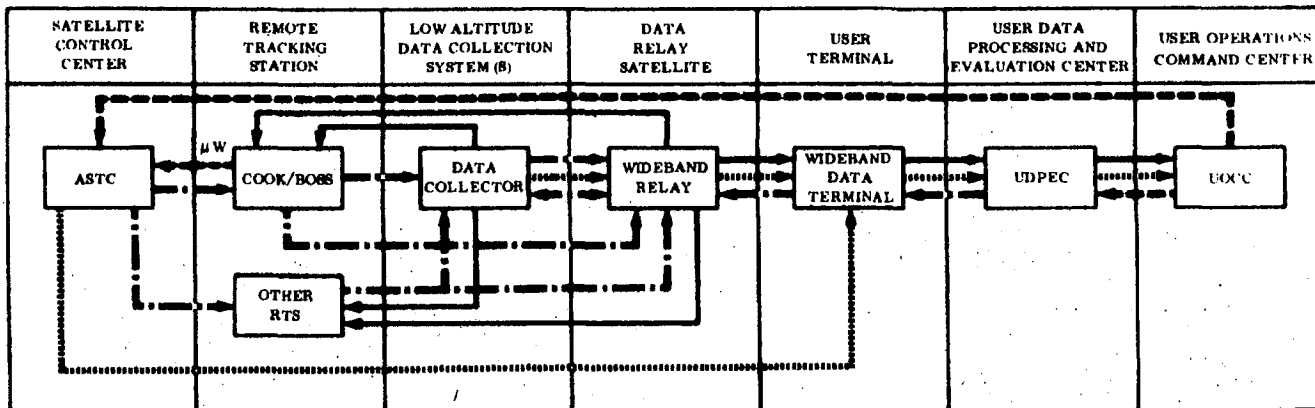
INFORMATION SYSTEM ADVANCES



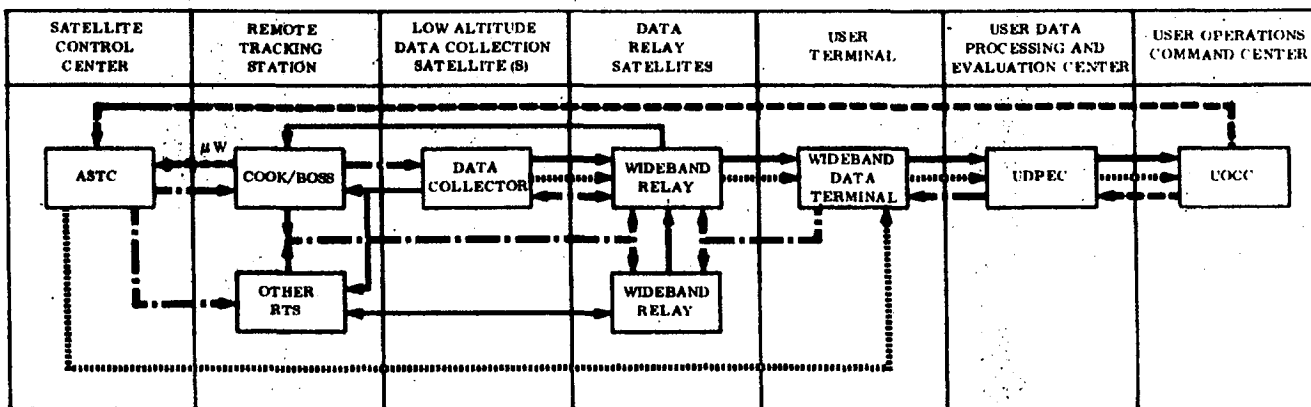
~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~



a) INITIAL INFORMATION SYSTEM



b) ADVANCED INFORMATION SYSTEM

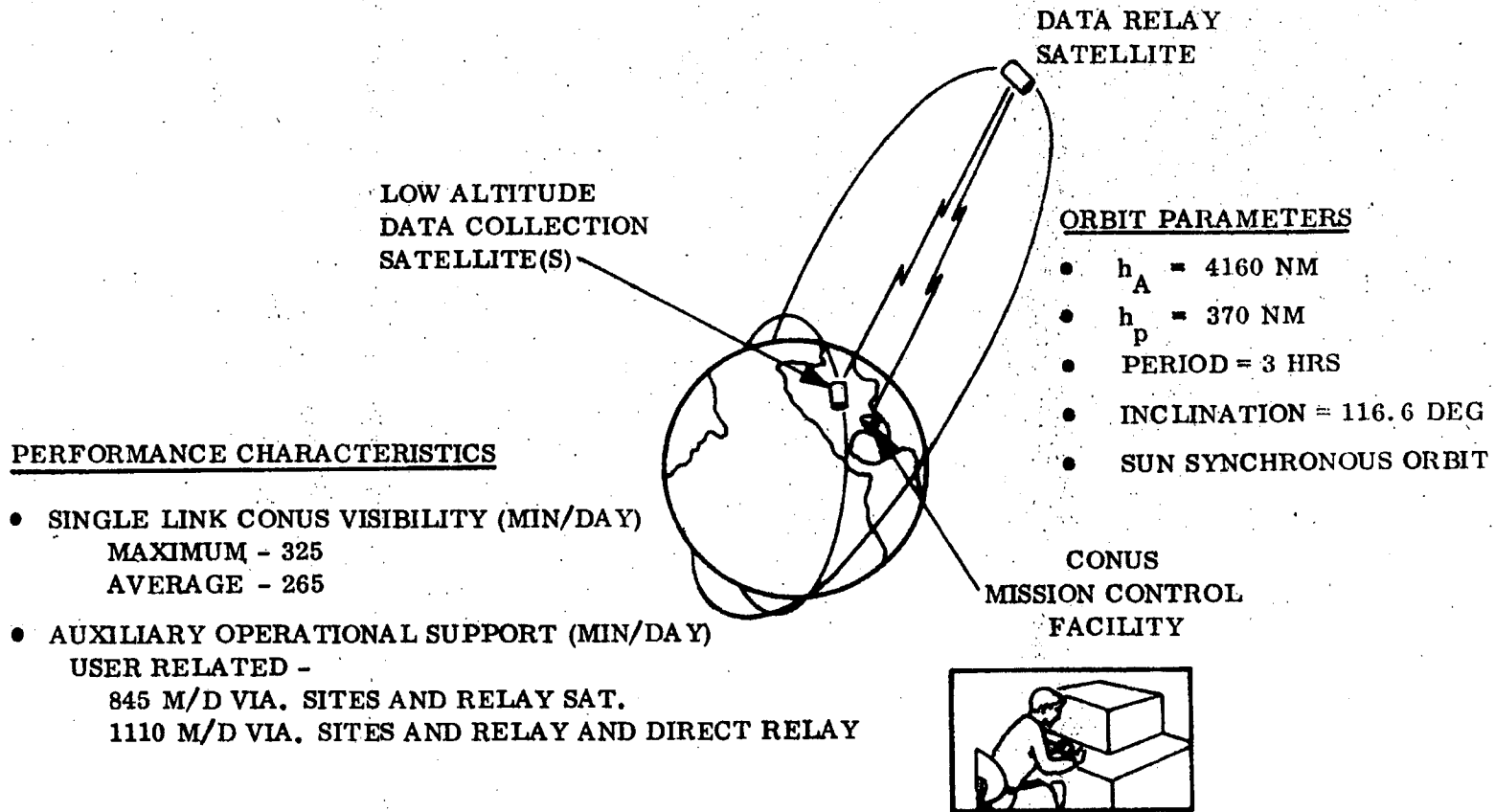
SPACEBORNE INFORMATION SYSTEM  
FUNCTIONAL INTERRELATIONSHIPS

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

TYPICAL DATA RELAY SATELLITE CONCEPT



PERFORMANCE CHARACTERISTICS

- SINGLE LINK CONUS VISIBILITY (MIN/DAY)  
MAXIMUM - 325  
AVERAGE - 265
- AUXILIARY OPERATIONAL SUPPORT (MIN/DAY)  
USER RELATED -  
845 M/D VIA. SITES AND RELAY SAT.  
1110 M/D VIA. SITES AND RELAY AND DIRECT RELAY

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

NRO APPROVED FOR  
RELEASE 1 JULY 2015

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

---

DORIAN SYSTEM BLOCK II

---

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

MOL BLOCK II IMPROVEMENTS

GROUND RULES

- TECHNICAL INTELLIGENCE MISSION
- MANNED FLIGHTS
- TWO FLIGHTS/YEAR
- FIRST FLIGHT ON JULY 1974
- MINIMUM PERTURBATION ADD-ONS
- LESS THAN 1,000 POUNDS ADDED WEIGHT

IMPROVEMENTS (STATE-OF-THE-ART AS OF JAN. 1970, LABORATORY  
DEMONSTRATED-READY FOR D&D)

- INFRARED/MULTISPECTRAL
- UV ASTRONOMY
- [REDACTED]
- ATS SCENE RECORDING/TRANSMISSION
- MAIN OPTICS SCENE TRANSMISSION
- HIGH/MEDIUM RESOLUTION READ-OUT
- GEODETIC TARGETTING

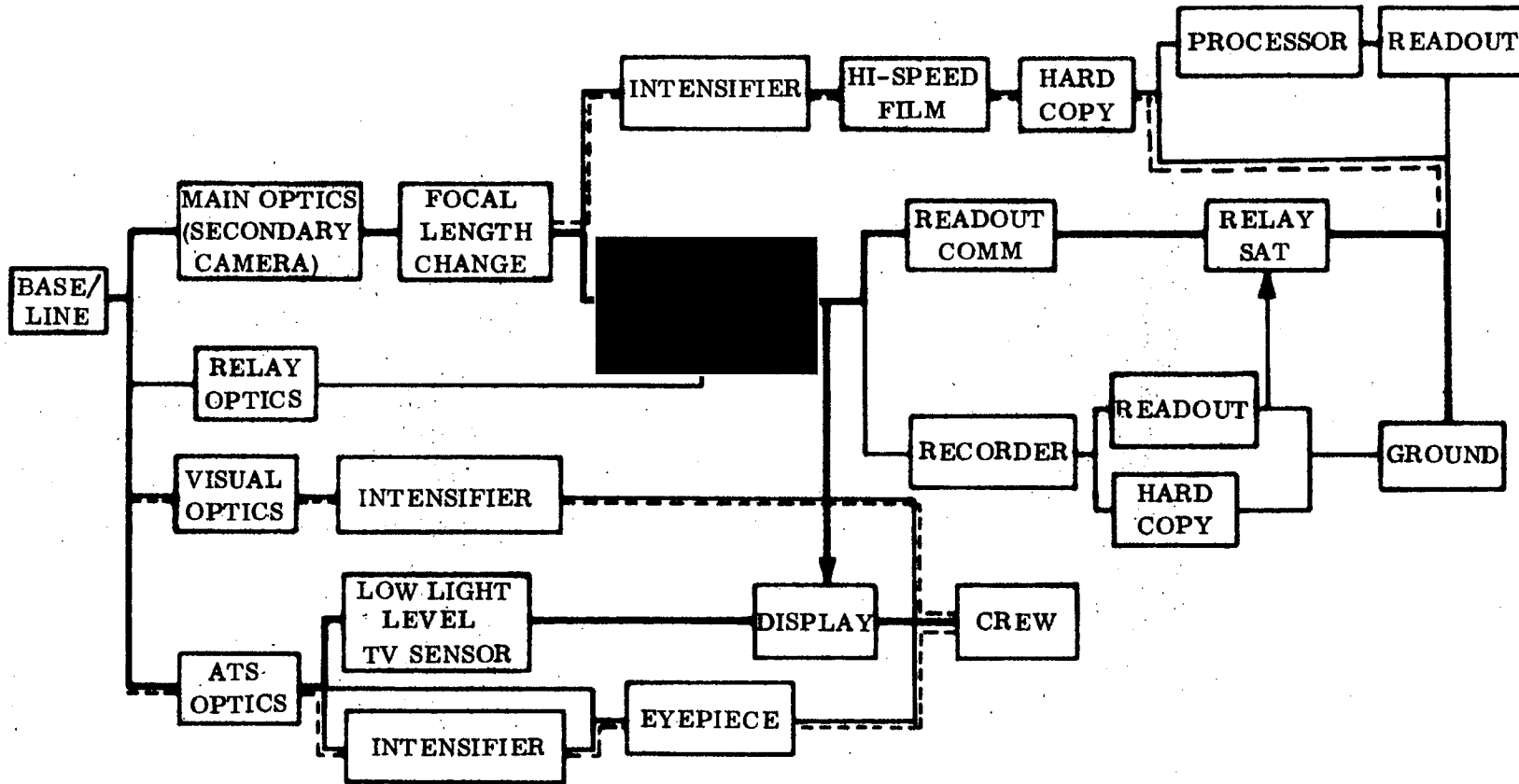
IMPROVEMENTS PREVIOUSLY REPORTED

- EXTENDED DURATION
- EK PERFORMANCE
- FLY LOW MISSION

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

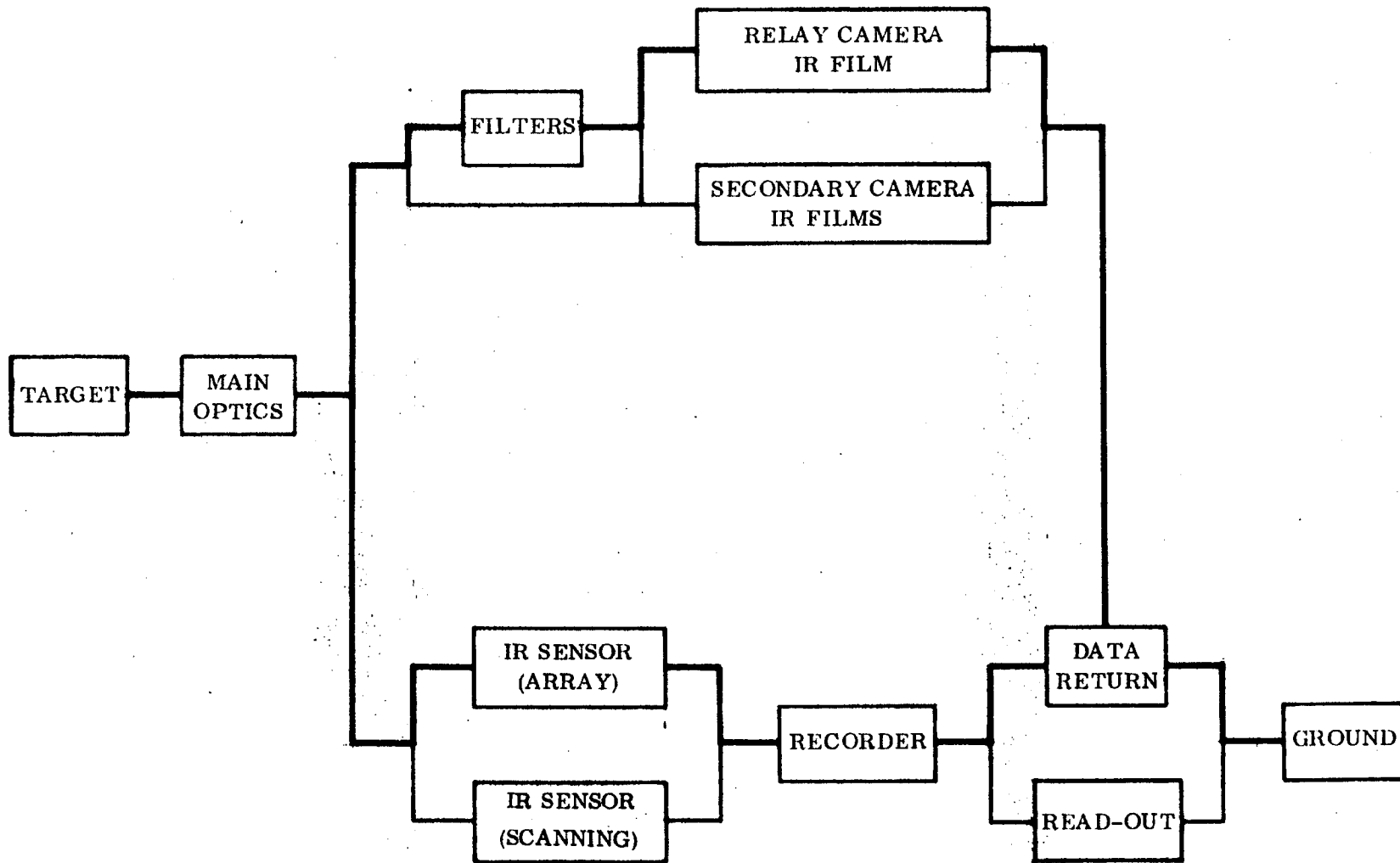


LOW LIGHT LEVEL OPTION MAP

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~



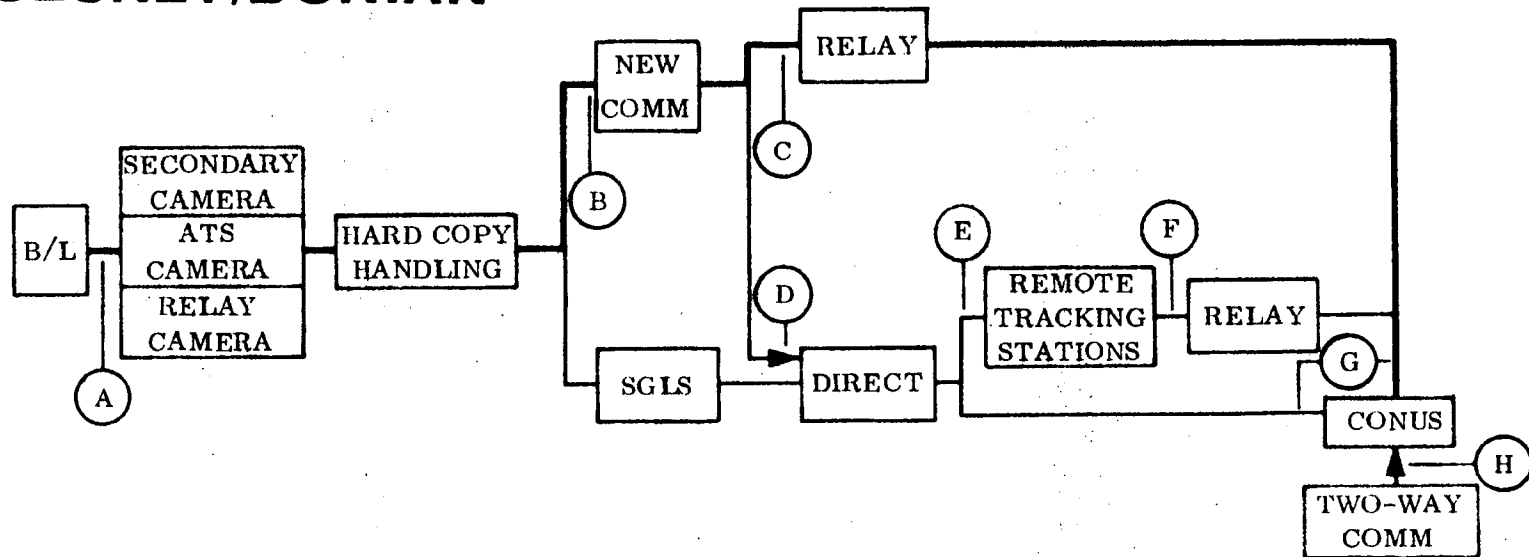
INFRARED/MULTISPECTRAL

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY



HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~



- A: • FILM HANDLING AND SOURCE SELECTION
- LASER SCANNER
- TI AND/OR MEDIUM RESOLUTION ANALYSIS
- SUPPORTS FUTURE USE OF ELECTRONIC (TV) SCANNING OMEGA (Ω)

- B: • ENCRYPTION
- BANDWIDTH COMPRESSION
- WIDE BAND COMMUNICATION

- C: • STEERABLE ANTENNA
- INTER-SATELLITE COMMUNICATION
- MEDIUM DATA RATIO
- RELAY SATELLITE CAPABILITY
- D: • HIGH DATA RATES (STEERABLE ANTENNAS)

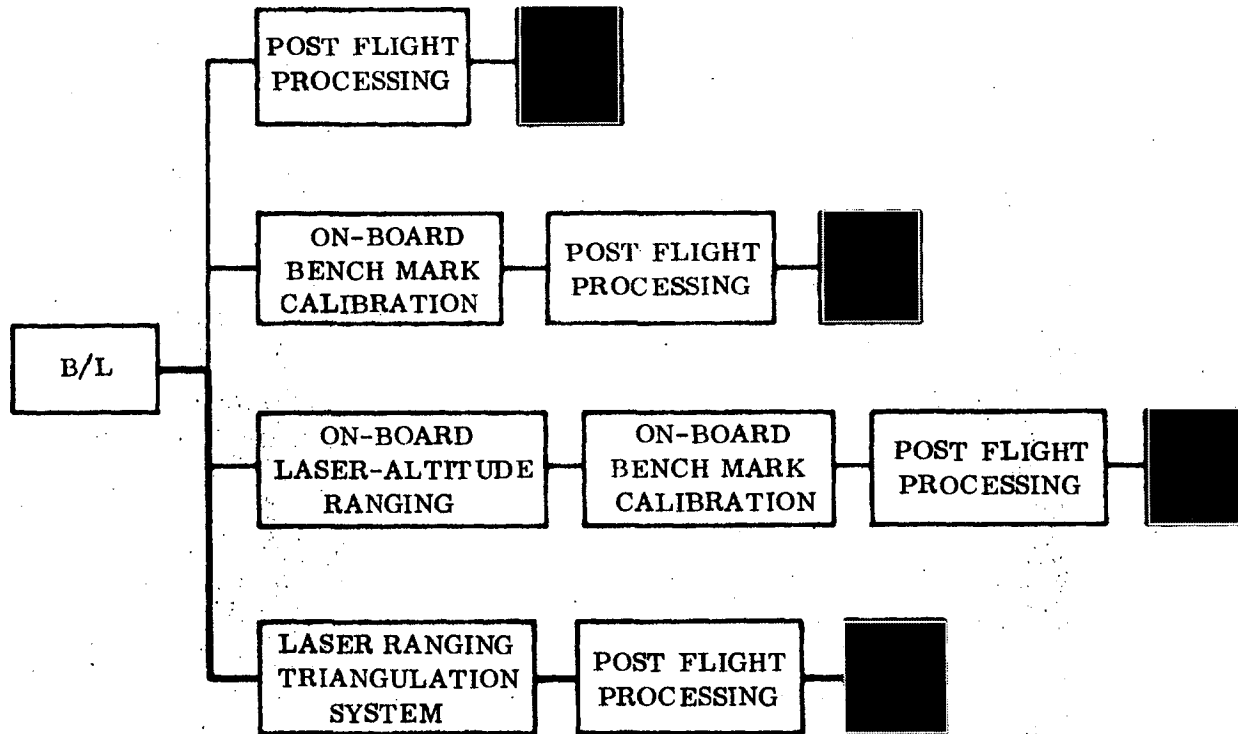
- E: • STORAGE EQUIPT (TAPE)
- GROUND STA DEVEL
- F: • GROUND LINK AND/OR SATELLITE LINKS
- G: • DESCRIPTION
- RECONSTRUCTION
- STORAGE EQUIPT (TAPE)
- H: • COMMAND UP-LINK

HIGH/MEDIUM RESOLUTION READOUT

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

HANDLE VIA BYEMAN SYSTEM ONLY

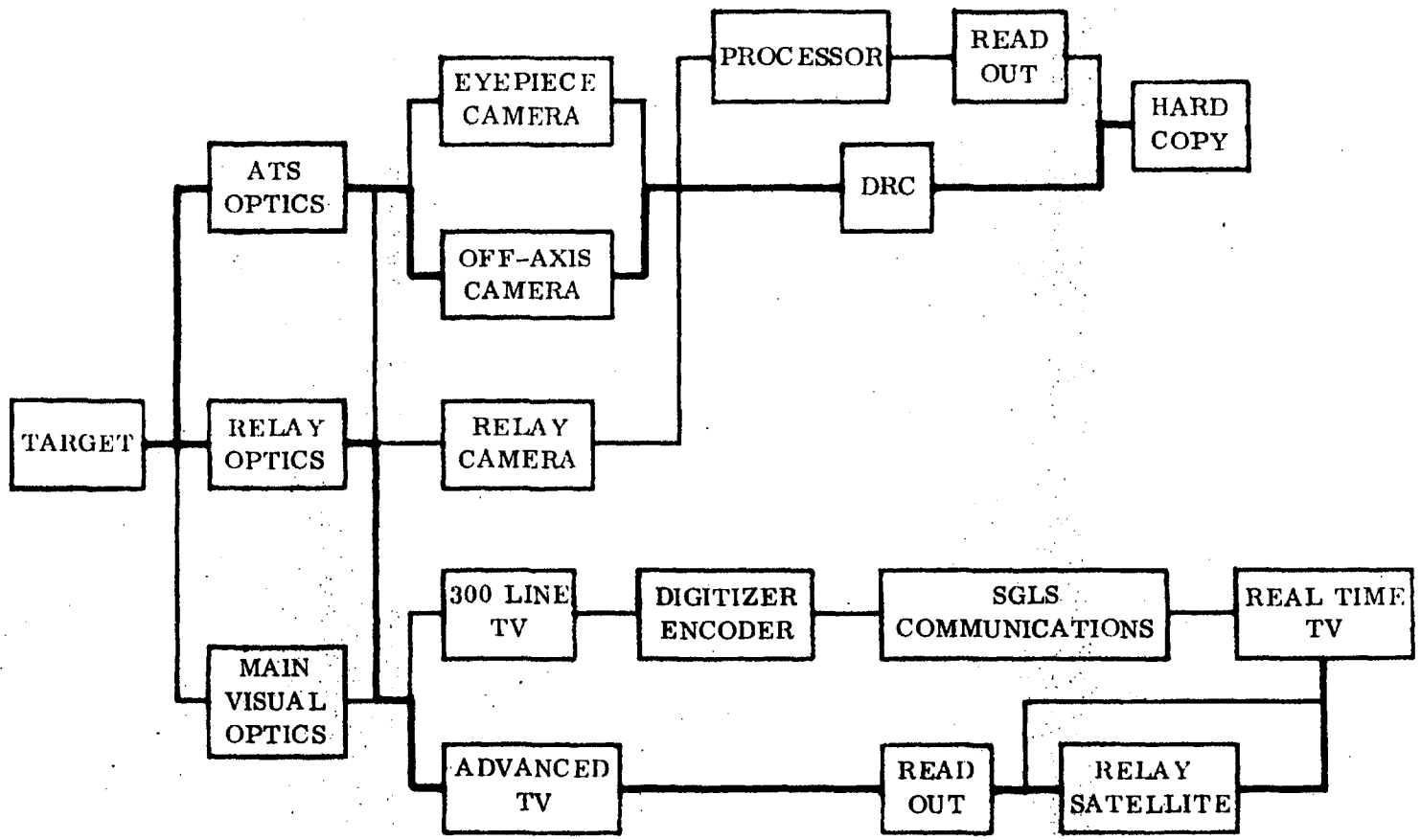
~~SECRET/DORIAN~~



GEODETTIC TARGETTING

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

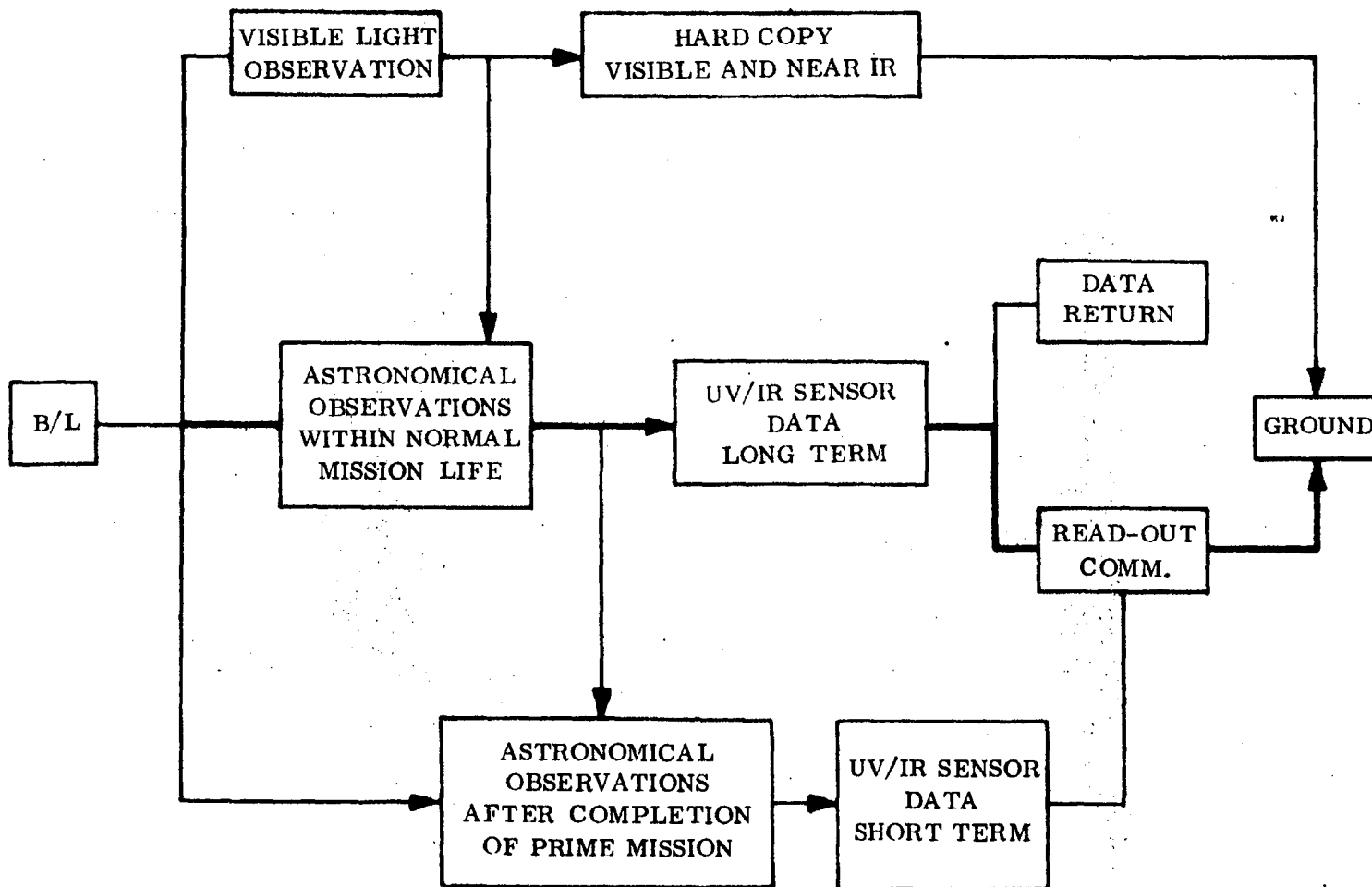


ATS/MO IMAGE TRANSMISSION RECORDING

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~



ASTRONOMY (UV/IR)

~~SECRET/DORIAN~~

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

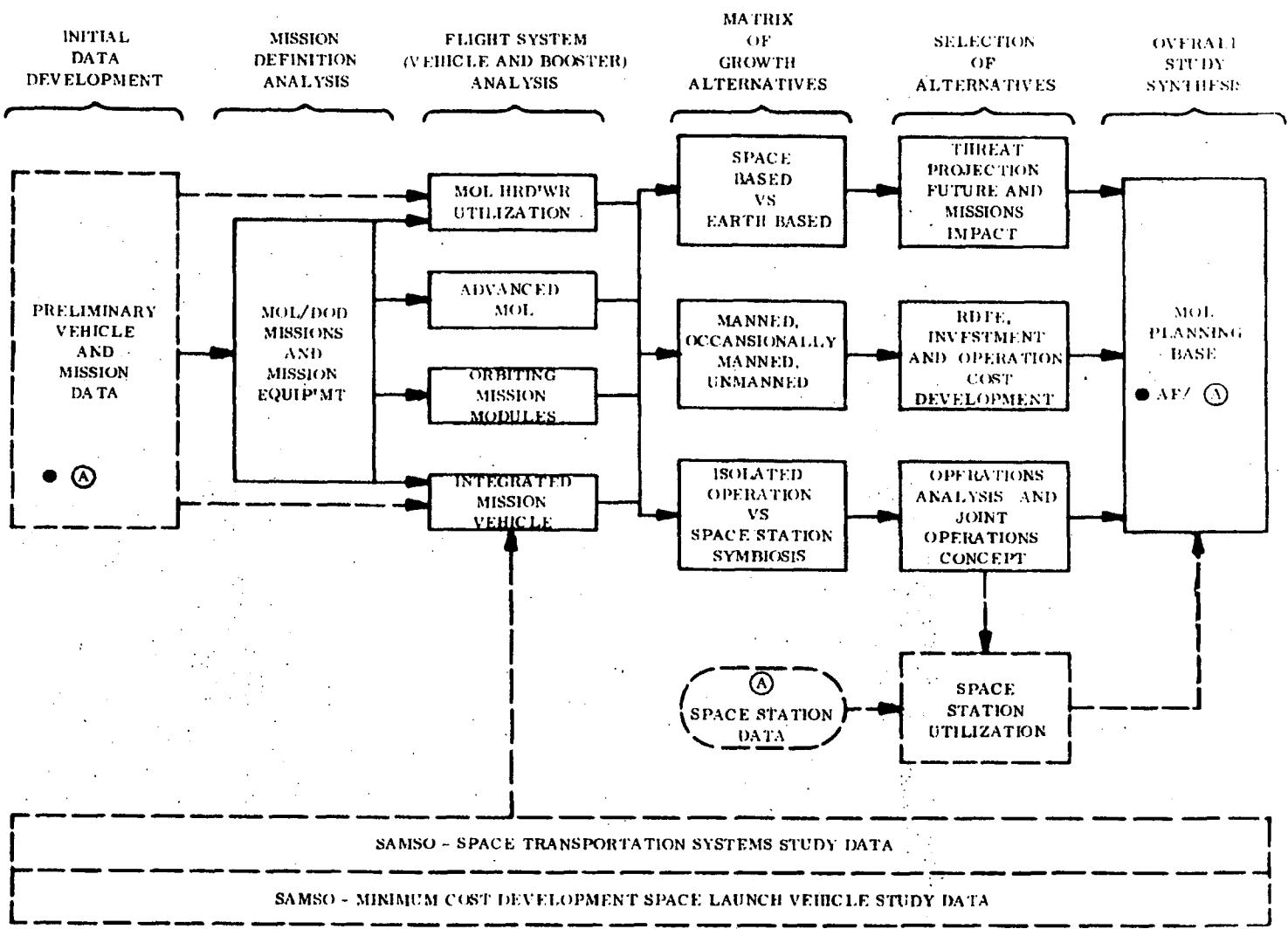
BLOCK II OPTION IMPLEMENTATION

FLIGHT #6 (JULY 1974)	FLIGHT #7	FLIGHT #8 (JULY 1975)	FLIGHT #9
<p><u>WT.</u></p> <p><u>BASELINE MISSION</u></p> <ul style="list-style-type: none"> <li>• [REDACTED] RESOLUTION TI</li> </ul> <p>605# <u>FAR IR</u></p> <ul style="list-style-type: none"> <li>• [REDACTED] RESOLUTION SUPPORTING B/L TI</li> </ul> <p>62# [REDACTED]</p> <p>87# <u>HIGH/MEDIUM RES. READ-OUT</u></p> <ul style="list-style-type: none"> <li>• DATA LINK TO GROUND</li> </ul> <p>20# <u>EK IMPROVEMENTS</u></p> <ul style="list-style-type: none"> <li>• RELAY CAMERA PHOTOS</li> </ul> <p>Δ WT = 774#</p>	<p style="writing-mode: vertical-rl; transform: rotate(180deg);">SAME AS FLIGHT #6</p>	<p><u>WT.</u></p> <p>774# <u>FLIGHT 6 AS BASELINE</u></p> <p>90# <u>GEODETTIC TARGETTING</u></p> <ul style="list-style-type: none"> <li>• [REDACTED] CEP</li> </ul> <p>15# <u>ATS SCENE RECORDING</u></p> <ul style="list-style-type: none"> <li>• OFF-AXIS CAMERA PHOTOS</li> </ul> <p>10# <u>MAIN OPTICS SCENE TRANSMISSION</u></p> <ul style="list-style-type: none"> <li>• TV BY DATA LINK TO GROUND</li> </ul> <p>10# <u>MULTISPECTRAL</u></p> <p>Δ WT = 899#</p>	<p style="writing-mode: vertical-rl; transform: rotate(180deg);">SAME AS FLIGHT #8</p>

~~SECRET/DORIAN~~  
 HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

PROPOSED STUDY CONTENT/FLOW

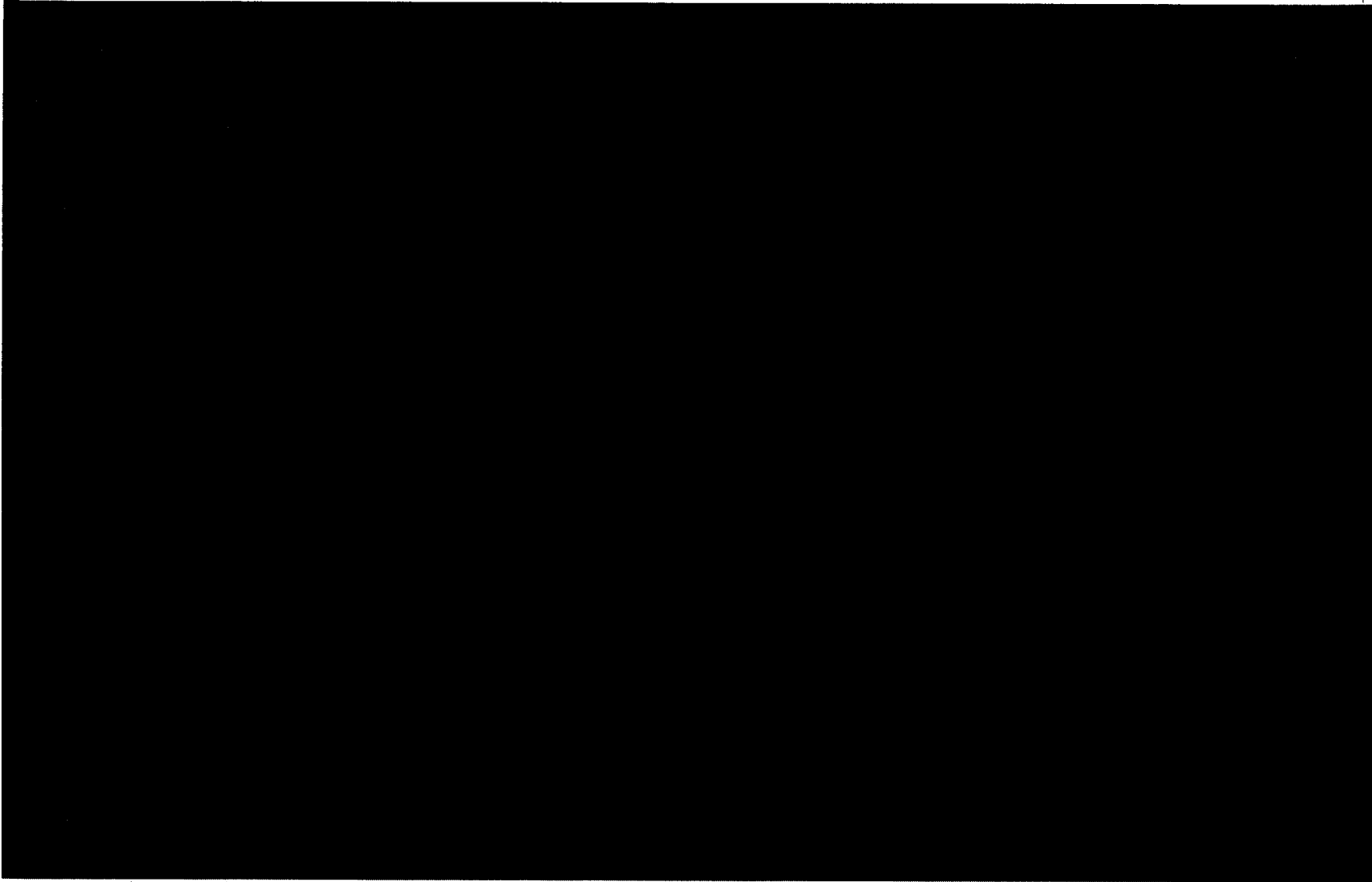


~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

NRO APPROVED FOR  
RELEASE 1 JULY 2015

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET~~/DORIAN



~~SECRET~~/DORIAN  
HANDLE VIA BYEMAN SYSTEM ONLY

NRO APPROVED FOR  
RELEASE 1 JULY 2015

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~



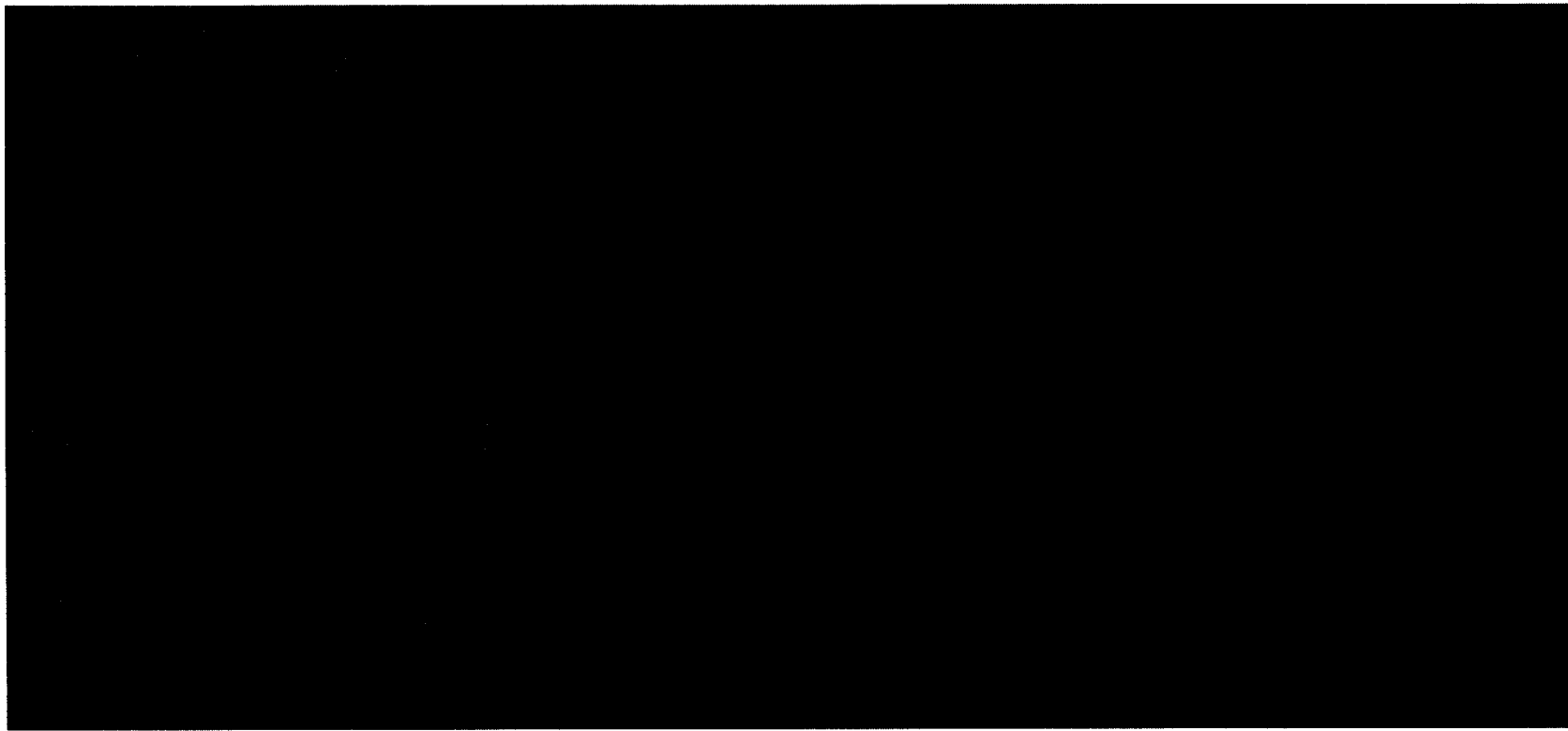
PHOTOGRAPHIC EXAMPLE OF CONTRAST ENHANCEMENT

~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY



NRO APPROVED FOR  
RELEASE 1 JULY 2015

HANDLE VIA BYEMAN SYSTEM ONLY  
~~SECRET/DORIAN~~



~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

NRO APPROVED FOR  
RELEASE 1 JULY 2015

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

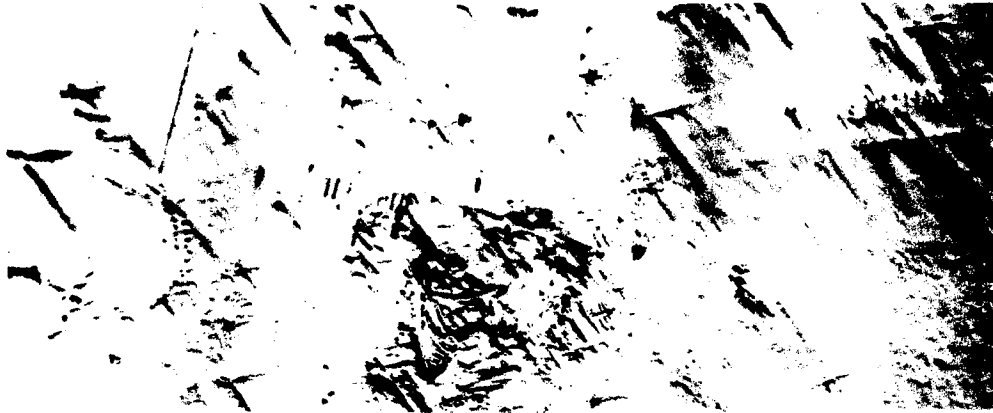


~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY

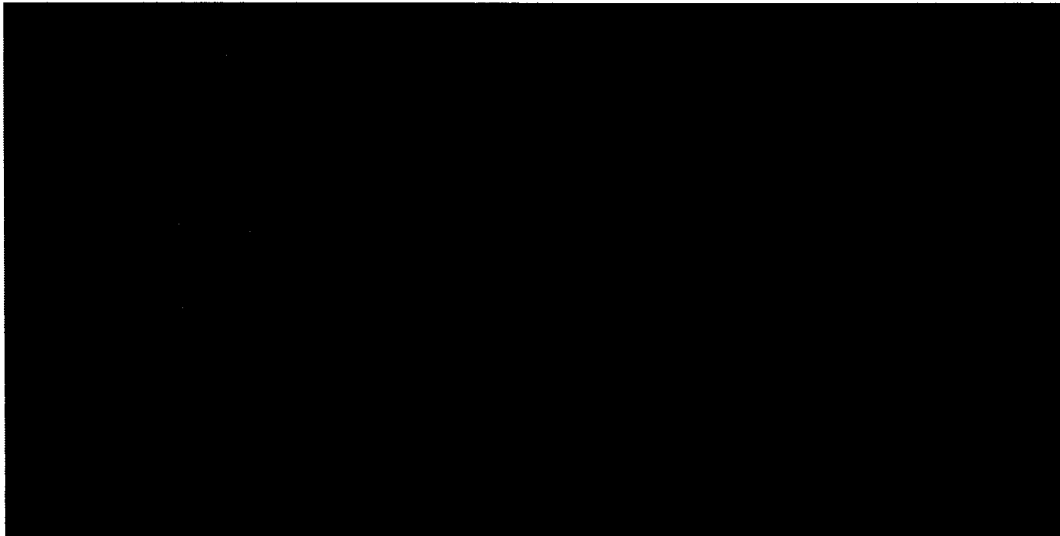
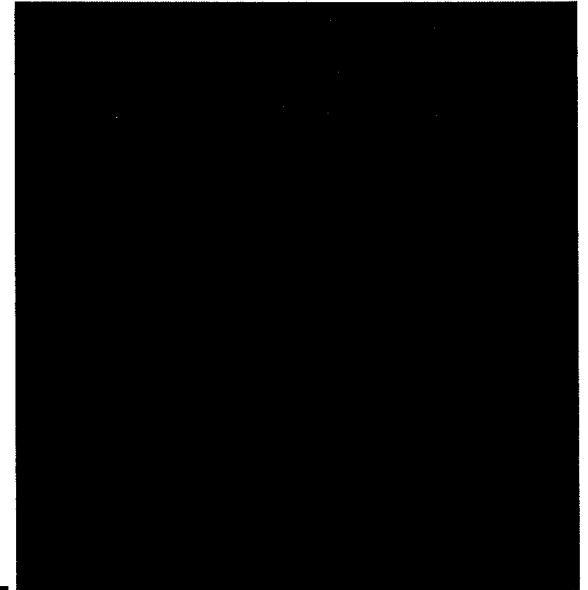
HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~

ARCTIC SCENES



VISUAL



VISUAL

~~SECRET/DORIAN~~

HANDLE VIA BYEMAN SYSTEM ONLY

NRO APPROVED FOR  
RELEASE 1 JULY 2015

HANDLE VIA BYEMAN SYSTEM ONLY

~~SECRET/DORIAN~~



~~SECRET/DORIAN~~  
HANDLE VIA BYEMAN SYSTEM ONLY