

~~TOP SECRET~~ 010144Z

PRIORITY [REDACTED] INFO PRIORITY [REDACTED] CITE [REDACTED]
[REDACTED]

REF A. 1014

- B. [REDACTED]
- C. [REDACTED]
- D. [REDACTED]

1. FURTHER ANALYSIS OF THE 75-DEGREE EIGHT-DAY EQUALLY SPACED ORBIT OF REF D SHOWED ORBITAL PARAMETER ADJUSTMENTS WERE REQUIRED. TO ALLOW FOR ORBITAL DECAY WE HAD TO INJECT AT A SEVEN-DAY EQUALLY SPACED CONDITION. ANALYSIS SHOWED THAT WITH THIS INITIAL SPACING [REDACTED] CUBA ON THE FIRST DAY TO AVOID GAPS IN COVERAGE.

2. SINCE LATITUDE OF CUBA IS APPROXIMATELY SAME AS ORBITAL INJECTION LATITUDE WE HAD TO ROTATE 105 N. MI PERIGEE TO NORTH TANGENT POINT TO INJECT AT 125 N. MI. THIS GIVES SUFFICIENT ALTITUDE OVER CUBA BUT GIVES NORMAL LOW ALTITUDES OVER PRIMARY TARGET. UNFORTUNATELY, VEHICLE WEIGHT AND POWER CAPABILITIES CAN GUARANTEE ONLY SEVEN DAYS OF ACTIVE LIFE WHEN INJECTING AT THIS ALTITUDE. WEIGHT MARGINS AS FOLLOWS:

MISSION	SECONDARY	WEIGHT
DURATION	PAYLOADS	MARGIN
8 DAYS	[REDACTED]	MINUS 50 LB
8 DAYS	NONE	MINUS 35 LB

Declassified and Released by the N R O
in Accordance with E. O. 12958
on NOV 26 1997

7 DAYS [REDACTED] PLUS 9 LB

3. ORBIT PROBABLY COULD BE ACHIEVED FOR EIGHT DAYS ON FUTURE MISSIONS BY ACCOMPLISHING SOME OR ALL OF THE FOLLOWING ALTERNATIVES

3.1 REMOVAL OF SECONDARY PAYLOADS SUCH AS [REDACTED]

3.2 FLY S-01B VEHICLE (ADDITIONAL 82 LB WEIGHT CAPABILITY)

3.3 LAUNCH FROM FALC-1 (ADDITIONAL 41 LB GAIN)

4. ORBIT PARAMETERS AS FINALLY DEFINED ARE:

PERIGEE HEIGHT 105 NM

PERIGEE LOCATION 75 DEG N. LAT

PERIOD 90.02 MIN

INCL 75 DEG

ACTIVE TIME SECTOR [REDACTED]

FULL COVERAGE OF CUBA IN FIRST FOUR DAYS. GLOBAL COVERAGE REQUIRES EIGHT DAYS.

5. ALTITUDES IN N. MI OVER TARGET AREAS ARE AS FOLLOWS:

	DAY 1	4	8
60 DEG N LAT	108	111	115
40 DEG N LAT	116	122	128
20 DEG N LAT	129	136	143

6. IN VIEW OF THE WEIGHT AND POWER LIMITATIONS AND THE ALTITUDE REQUIREMENTS OF THE EIGHT-DAY 75 DEG ORBIT THAT IT WOULD BE WISE TO INVESTIGATE OTHER CASES. A 70 DEG NINE-DAY EQUALLY SPACED ORBIT OFFERS SEVERAL ADVANTAGES. THE CLOSER ORBIT SPACING YIELDS GAPLESS COVERAGE WITH LOWER ALTITUDES, THE LOWER INCLINATION GIVES BETTER WEIGHT CARRYING POTENTIAL AND THE LOWER PERIGEE SHIFT

RATE RESULTS IN LESS INCREASE IN ALTITUDES LATER IN MISSION.
WE REQUIRE ONLY 110 N MI OVER CUBA ON FIRST DAY TO AVOID GAPS
IN COVERAGE WITH THIS TYPE OF ORBIT. ANALYSIS SHOWED THE
FOLLOWING PERFORMANCE MARGINS:

MISSION DURATION	SECONDARY PAYLOADS	WEIGHT MARGINS
NINE DAYS	[REDACTED]	0 LB
NINE DAYS	NONE	PLUS 9 LB
EIGHT DAYS	[REDACTED]	PLUS 23 LB

IN OTHER WORDS, A NINE-DAY EQUALLY SPACED MISSION WITH BOTH RESEARCH
PAYLOADS IS PRESUMED FEASIBLE.

ALSO APPLY TO THIS ORBIT EXCEPT THAT PALC-1 LAUNCH GAINS PLUS
55 LB ADDITIONAL CAPABILITY.

7. ORBIT PARAMETERS ARE:

PERIGEE HEIGHT 105 N MI

PERIGEE LOCATION 65 DEG N LAT

PERIOD 89.77 MIN

INCLINATION 70 DEG

ACTIVE LIFE NINE DAYS

FULL COVERAGE OF CUBA IN FIRST FIVE DAYS

GLOBAL COVERAGE REQUIRES NINE DAYS.

8. ALTITUDES IN N MI OVER TARGET AREAS ARE AS FOLLOWS:

	DAY 1	DAY 5	DAY 9
60 DEG N LAT	105	103	103

40 DEG N LAT	107	108	110
20 DEG N LAT	115	118	120

9. WE WILL REQUIRE MORE TIME TO EXAMINE YOUR REQUEST FOR 1000-1200 LOCAL TIME COVERAGE YEAR ROUND. WE DID HOWEVER TAKE A PRELIMINARY LOOK AT EXPOSURE WITH A 0.200 SLIT MID-DECEMBER NOON LAUNCH FOR THE 8-DAY 75 DEG ORBIT AND FOUND SLIGHT UNDEREXPOSURE ABOVE 55 DEG ON DAY ONE WHICH WOULD BE NORMAL FOR THIS SLIT AND LAUNCH CONDITION ON ABOUT ANY ORBIT. THE FAR NORTH PERIGEE LOCATION SHOWED OVER-EXPOSURE BELOW 15 DEG SOUTH ON DAY ONE BECAUSE OF HIGH ALTITUDE AND RESULTANT SLOW CYCLE SPEED. BY DAY EIGHT WE WERE STILL UNDER-EXPOSED AT 55 DEG N BUT OVER-EXPOSURE MOVES UP TO EQUATOR.

FAR NORTH EXPOSURE WOULD BE ABOUT THE SAME FOR THE 70 DEG ORBIT BUT BECAUSE OF GENERALLY LOWER ALTITUDES AND FASTER CYCLING RATES, OVER-EXPOSURE AT LOW LATITUDES SHOULD NOT PRESENT A PROBLEM.

10. V/H RAMP MATCHING PRESENTS NO PROBLEM WITH EITHER ORBIT.

11. PRELIMINARY ORBITAL ELEMENTS AND CHECK POINTS FOR EACH ORBIT FOLLOW. THESE DATA WERE GENERATED WITHOUT BENEFIT OF AN ASCENT TRAJECTORY, USING AN ASSUMED INJECTION POSITION BASED ON PAST DATA FROM SIMILAR ORBITS. IT IS BELIEVED THAT THESE DATA SHOULD BE VERY ACCURATE AS FAR AS GENERAL ALTITUDE, ORBIT SPACING AND DECAY BEHAVIOR BUT THERE MAY BE A MORE OR LESS CONSTANT BIAS OF 0.1 TO 0.2 DEGREES OF LONGITUDE IN THE GROUND TRACK PLOTS. LMSC-SV PRESENTLY IS GENERATING THE ASCENT TRAJECTORIES AND WE EXPECT TO HAVE FULL PLANNING EPHEMERIDES FOR EACH ORBIT AT 1600

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GMT ON 2 NOV 64. ALTHOUGH WE DO NOT EXPECT THEM TO, IF THEY DIFFER FROM OUR DATA BY MORE THAN THE PREDICTIONS ABOVE WE WILL TRANSMIT NEW ELEMENTS ON 2 NOV 64.

12. OUR RECOMMENDATION IS IN FAVOR OF THE NINE-DAY 70 DEG ORBIT BY VIRTUE OF VEHICLE CAPABILITY AND ALTITUDE PROFILE. ADDITIONALLY, ITS INITIAL ACQUISITION OF CUBA ON REV 14 IS A LITTLE FARTHER EAST OF THE EAST END OF THE ISLAND RATHER THAN BEING SLIGHTLY INLAND AS IS THE CASE WITH THE 75 DEG ORBIT, SO ITS COVERAGE OF THE ISLAND AND SURROUNDINGS IS BETTER, ALTHOUGH THE 70 DEG NINE-DAY ORBIT DOES REQUIRE FIVE DAYS FOR FULL COVERAGE.

13. THIS ORBIT WILL BE AVAILABLE FOR REQUEST 15-20 WORKING DAYS FROM THE TIME YOU REQUEST IT, PREDICATED UPON MAXIMUM UTILIZATION OF OVERTIME. OTHERWISE 22 WORKING DAYS (NOT INCLUDING WEEKENDS EXCEPT IN LAST SEVEN DAYS) ON A NORMAL EFFORT.

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