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BYE-61767-92

TS [ ]

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SUBJECT
SEJ NRL SECONDARY P/L
FOR MIS-7106

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From: Director, Naval Research Laboratory, Washington, D. C. 20390

To: Commanding Officer, National Reconnaissance Office (SS-7)

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Subj: NRL Secondary Payloads for Launch of Mission 7106 ~~(TS)~~

Ref: (a) NRO ltr BYE-52635-67 (TS) dated 5 Sept 1967 to NRL

Encl: (1) Preliminary Satellite Data ~~(TS)~~
(2) Proposed Configuration - Front End ~~(TS)~~
(3) Proposed Configuration - Aft Rack ~~(TS)~~
(4) On Orbit Weight Summary for Mission 7106 ~~(TS)~~

1. The following information is provided in reply to reference (a). As provided on previous Poppy Program launches, the Naval Research Laboratory requests the following secondary payloads be included on the launch of Mission 7106. These payloads are to be used as an R&D support effort for future Poppy Programs. The information obtained will be used to evaluate and determine optimal utilization of new and sophisticated components under consideration for future missions. In addition, the information will be used in thermal design evaluation and for the measurement of drag effects as related to [redacted] in [redacted] All of these payloads will be handled on a non-interference basis with the primary payloads. Reference is made to enclosure (1) showing present work status of the secondary payloads. Many problems have been eliminated on these payloads because of simplicity and satellite configurations and packaging have been greatly simplified. With several payloads, PL 169 in particular, the majority of effort will be applied by personnel not associated with the Poppy Program. Experimental work in analyzing orbit performance will be independent of the primary operational payloads.

2. Enclosures (1) through (4) are included to provide a brief summary of NRL satellites configured for Mission 7106 and show the launch vehicle "on orbit" weight capability.

3. The following is a brief description of the mission of each secondary payload. They are listed in order of decreasing priority. Handle via

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(b) PL 168 (Thr[redacted]valuation)

~~TOP SECRET~~ [redacted] This payload [redacted] valuation of several thresholder designs. The information o[redacted] will be used in comparing standard and new sophisticated receiving and thresholding systems for future payloads. This payload will collaborate with PL 167 [redacted]

(c) PL 166 [redacted]

(d) PL 169 (Ranging Experiment II)

This payload is a navigational satellite experiment similar to PL 159 launched on Mission 7105, but with improved system accuracy. As a secondary experiment, several methods of passive temperature control used on this payload will be examined and evaluated.

(e) PL 157C (Temperature Satellite)

This is one of the satellites removed from the Mission 7105 launch because of weight limitations. It is a 16-inch diameter spherical satellite and weighs approximately 32 pounds. The optically black satellite will be used to measure the equilibrium temperature of a classical "black body" in space and determine the effectiveness of optical surveillance devices in detecting "black body" objects.

(f) PL 148C (Dodecahedron)

This is one of the satellites removed from the Mission 7105 launch because of weight limitations. The satellite, in launch configuration, is a 10¼-inch diameter sphere and weighs approximately 32 pounds. The satellite will be used to provide a high visibility tracking target with the dodecahedron configuration providing a large target size relatively independent of illumination and observation angles where twelve 100-feet self-extendable tape antennas are deployed.

(g) PL's 170A and 170B (Dual Calsphere Drag Experiment) Handle via Byeman ~~Talent Keyhole~~ Control Systems Jointly

PL 170A is a lightweight 10¼-inch diameter polished aluminum sphere and PL 170B is a similar gold plated sphere. The purpose of the exp[redacted] check theoretical predictions as to the magnitude [redacted]ic co-efficient of spheres with differing surface chemistry. These are passive satellites and contain no electronics.

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SATELLITE DATA

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RSR

P/L NO	TYPE	SIZE	LOCATION ON VEHICLE	WT. ON LAUNCH PAD	WT. IN ORBIT	SEPARATION SEQUENCE	SEPARATION VELOCITY	C.G. Z AXIS	CG_{1-3} CG_{2-4}	I_z	I_{1-3} I_{2-4}	
—	—	—	—	#	#	SEC.	FT/SEC.	IN.	IN.	SLUG-FT²	SLUG-FT²	
161	3 AXIS GRAVITY GRADIENT	27" MULTIFACE	FRONT END (−Z)	275	267	T+10	1.20	ON ℄ WITHIN ±	19" ±1" FROM AFT FLANGE	$3\frac{3}{8} \pm \frac{1}{4}$	$4\frac{3}{8}^{\pm\frac{1}{4}}$	
162	" "	"	FRONT END (+Z)	"	"	T+10	1.24	"	"	"	"	
163	" "	"	FRONT END (+Y)	"	"	T+30	0.20	"	"	"	"	
164	" "	"	FRONT END (−Y)	"	"	T+30	0.24	"	"	"	"	
169	RANGING EXPERIMENT II	18"×41"×10"	AFT RACK TRAY 3	110	110	T	1.5	ON ℄ WITHIN ½"	4" ± ℄ ABOVE TRAY	$3\frac{3}{4}^{\pm\frac{1}{4}}$	1-2: $\frac{3}{4}$ 2-4: 3	
148C	SURCAL DODECAHEDRON	$10\frac{1}{2}$" DIA. SPHERE	AFT RACK TRAY 2	32	30	T+20	1.5	ON ℄	$\frac{1}{2}^{\pm\frac{1}{2}}$" BELOW P/L ℄	0.1	0.1	
156B	SURCAL LONG ROD	4"×6"×9"	AFT RACK TRAY 2	8	6	T+20	4.0	ON ℄	$3\frac{1}{2}$" ± ℄ ABOVE TRAY	0.03	1-3: .02 2-4: .03	
157C	TEMPERATURE SATELLITE	16" DIA SPHERE	AFT RACK TRAY 6	36	33	T	1.5	ON ℄ WITHIN ½"	3" ± ℄ BELOW P/L ℄	0.15	0.15	
166	R&D EXP I	20" DIA. SPHERE	FRONT END ON ℄	80	75	T+90	AS REQ'D TO SEP. 167-68	ON ℄	1" ±1 ABOVE P/L ℄	0.7 ±.1	0.6 ±.1	
167	R&D EXP II	17"×20"×10"	AFT RACK TRAY 1	60	60	T+60	0.5	ON ℄ WITHIN 1"	3" ± ℄ ABOVE TRAY	0.5 ±.1	0.5 ±.1	
168	R&D EXP III	17"×20"×10"	AFT RACK TRAY 1	60	60	T+120	0.5	ON ℄ WITHIN 1"	3" ± ℄ ABOVE TRAY	0.5 ±.1	0.5 ±.1	
170A	CALSPHERE I	$10\frac{1}{2}$" DIA. SPHERE	AFT RACK TRAY 2	4	2	T+60	1.0	ON ℄	1" BELOW P/L ℄	0.01	0.01	
170B	CALSPHERE II	$10\frac{1}{2}$" DIA. SPHERE	AFT RACK TRAY 2	4	2	T+120	1.0	ON ℄	1" BELOW P/L ℄	0.01	0.01	
				1494	1446	7 EVENTS						

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SEPT 67

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161	275			
162	275			
163	275			
164	275	1100		
166	80		20"	Front end
167	60		Cube	Aft Rack
168	60	200	Cube	Aft Rack.
169	110			
- 157 C	36			
- 148 C	32		1180	F End
- 156 B	8		314	A Rack
170 A	4			
170 B	4	194		
		1494		

2706	1460 #	
Mod. PIC Gdaytes	138 #	35-45 Capability
P-11	402 #	3494
NRC PICs	1494 #	51 Excess
Total	3494	

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