1275

JOB ORDER (SEE INSTRUCTIONS ON REVERSE) — Mar. 30, 1966 — J. O. NO. ~~RDS~~-GJS-413

REQUESTED BY: ~~John L. Broderick~~ Lcff NASA.

AGENCY CODE: ~~124-09-02-14-00~~

ORGANIZATION: High Temperature Materials Branch, AMPD

124-09-16-04-00 Meteoroid Research Group Roc

7/21/67

TITLE: Design, Fabricate, and Installation of a Capacitor Discharge Gun to Accelerate Small Particles to Hypervelocities

4653

Proj No. 4009 8/4/67 LIA

DESCRIPTION AND JUSTIFICATION

DESCRIPTION: The proposed gun will have the capability of accelerating small projectiles (10 to 200 microns) to velocities in the range of 20 km/sec. The gun will operate by rapidly transferring stored electrical energy to a low molecular weight material in the arc gun, thus vaporizing the material to produce a high pressure plasma. As the plasma expands through a nozzle the projectiles, located near the nozzle exit, will be accelerated by drag. The diagnostic instrumentation will include two stations which will determine the projectile velocity and give a gross indication of projectile size. The target will also be instrumented to provide the times of impact and perforation.

JUSTIFICATION: The investigation of the meteoroid hazard dictates a need for an accelerator which can simulate meteoroid impacts in the proper mass and velocity range with known impact conditions, both for testing meteoroid flight detectors and for impact damage studies. The proposed gun will accelerate projectiles in the size range of greatest concern in designing of flight experiments and in reducing spacecraft meteoroid damage. The proposed gun will have unique capabilities of accelerating small projectiles to high velocities with known impact conditions. REA PROJECT 4009 1275 3

RESOURCES	IN-HOUSE MAN HOURS		ESTIMATED RESEARCH AND DEVELOPMENT		
FISCAL YEARS	PROFESSIONAL	TOTAL	IN-HOUSE	OUT-OF-HOUSE	TOTAL
~~1966~~ 68	800	1,000	~~100,000~~		~~100,000~~
1967	7700	10,500	150,000		150,000

COST ESTIMATE		LABOR BREAKDOWN	PROFESSIONAL HOURS	TOTAL HOURS	LABOR COST
POWER	$	RESEARCH	3,000	3,000	15,000
TRAVEL		IRD	3,000	4,000	18,500
STOCK	2,000	ESD	2,000	2,000	9,000
PROCUREMENTS	148,000	FVSD			
		RMFD	500	500	2,250
		MSD		2,000	7,000
LABOR	51,750	PMD			
	$	OTHER			
TOTAL	201,750	TOTAL	8,500	11,500	51,750

ESTIMATED BY: John L. Broderick — CHECKED BY: W. H. Kinard — TIME (MONTHS): ~~15~~ 20 — APPROVED BY DIRECTOR: DK for HLT

FOR FISCAL USE

ESTIMATED COMPLETION DATE	DATE INITIATED	FISCAL CODE	FISCAL	RESEARCH RECORDS CODE
3-68	7-7-66	1	665	23-14-00-N5-V5

ROUTING AND APPROVALS

	INITIALS	DATE		INITIALS	DATE
1. SECTION HEAD			5. RESEARCH RECORDS		7-1-66
2. BRANCH HEAD	~~DMM~~ DMM/KRAW	4/1/66	6. PCA & BUDGET		7-6-66
3. DIVISION CHIEF		4/1/66	7. ASST. DIR. CHIEF, ENG. & TECH. SERVICES		7-7-66
4. Cost Eng Staff		4-15-66	8. ASSOCIATE DIRECTOR	CDD/DK	7-7-66

COPIES TO (ORGANIZATION AND/BUILDING NUMBER)

1. PLANNING, B-1146
2. RESEARCH RECORDS, B-1218
   AMPD Mail Stop 213
   AMPD-HTMB M.S. 214 (2)
5. Cost Eng. Staff 227
6. Resmod for Dev (3)-107
7. ESD (2)-107
8.
9.
10.

JUL 18 1966

NASA 36F 123 (7/64)

62620 ~~61102~~