[redacted]

9046A

[redacted]

To: Distribution

October 17, 1962

From: [redacted]

Subject: A-9, FLIGHT 1134, SPACE IRRADIATION EXPERIMENT

Introduction:

Film experiments were installed in the capsule of Flight 1134 to study orbit irradiation and the effectiveness of the experimental aluminum-silver irradiation shield.

Space experiments were orbited from 10-10-62 to 10-13-62 (4 days in orbit). Perigee was 129 nautical miles. Apogee was 242 nautical miles and occurred at 60 degrees south latitude. Space experiments consisting of SO-102, 130, 206 and 132 film types per pack were recovered and subsequently reduced to irradiation dose values.

Figure I shows the location, within the recovery capsule, of film packs identified A - J inclusive.

Table I shows the film density and dose (in roentgen) as a function of film type and pack location within the recovery capsule. Development agrees with [redacted] intermediate processing standard.

Irradiation Data Summary:

1. 28 Roentgen was the highest dose recorded in the capsule and occurred on SO-102 in Pack E located outside the experimental shield.

2. 19 Roentgen produced a density of 1.62 in SO-102 film.

3. 1 Roentgen (approximate) was the highest dose recorded in the capsule and occurred on SO-102 in Pack F located inside the experimental aluminum-silver irradiation shield.

4. 1 Roentgen produced a density of 0.21 in SO-102 film.

Conclusions:

1. The experimental aluminum-silver irradiation shield installed in the capsule reduced the total irradiation dose to a level that is acceptable for all film types tested. 0.40 is the maximum acceptable film fog level which has been used by LMSC as a working aim point.

2. All samples of film types SO-130, 206 and 132 had fog levels that were acceptable (below 0.4) without the benefit of the experimental shielding in the capsule.

[redacted]

SPECIAL NOTES

General Description of Experimental Irradiation Shield Configuration.

The experimental irradiation shield consisted of the following materials and thicknesses:

1. 1/4 inch thick aluminum plate inside the aft cover.
2. Two 1/8-inch thick aluminum plates riveted together and located continuously around the sides of the recovery capsule. The inner surface of the aluminum shield was surfaced with 0.020 inches of silver tape.
3. The nose end of the capsule was shielded with 0.020 inches of silver.

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[redacted] TABLE I [redacted]

IRRADIATION TEST DATA - FLIGHT "A" 1134

Max. Fog Density Vs Dose[3] (Roentgen) - - - - - 10/10/62

Film Sample Number	SO - FILM TYPE											
	102			130			206			132		
	Film Density Fog	Density Corr. to Inter. Proc.	Dose R	Film Density Fog	Density Corr. to Inter. Proc.	Dose R	Film Density Fog	Density Corr. to Inter. Proc.	Dose R	Film Density Fog	Density Corr. to Inter. Proc.	Dose R
Process Control[1]	0.08	0.08	0	0.07	0.07	0	0.07	0.07	0	0.06	0.06	0
Radiation Control	0.07	0.07	0	0.07	0.07	0	0.07	0.07	0	0.06	0.06	0
A	Data rejected* 0.13 - - 0.33 - - - - - -			0.07	0.07	-	0.08	0.08	-	0.06	0.06	-
B	0.28-0.9	0.44-1.4	32-25	Data rejected** 0.26 - - 0.43 - - - - -			0.14	0.14	-	0.10	0.10	-
C	0.12	0.20	-	0.08	0.08	-	0.09	0.09	-	0.07	0.07	-
D	0.85-0.23	1.25-0.38	3-23	Data rejected** 0.13 - - - - 0.10 - - - - -			0.14	0.14	-	0.10	0.10	-
E	0.27-1.02	0.44-1.62	3.5-28	0.40	0.40	20	0.20	0.20	-	0.11	0.11	-
Process Control[2]	0.08	0.08	0	0.08	0.08	0	0.08	0.08	0	0.07	0.07	0
F	0.12	0.21	1	0.08	0.08	-	0.08	0.08	-	0.07	0.07	-
G	0.11	0.16	-	0.07	0.07	-	0.08	0.08	-	0.06	0.06	
H	Data rejected** 0.12 - - 0.21 - - - - -			0.22	0.22	-	0.09	0.09	-	0.06	0.06	-
I	0.10	0.13	-	0.07	0.07	-	0.07	0.07	-	0.06	0.06	-
J	0.11	0.14	-	0.07	0.07	-	0.07	0.07	-	0.06	0.06	-

* Data rejected due to accidental exposure to white light during film pack disassembly.
** " " " " incorrect processing.

1) Process control for samples A-E inclusive plus radiation control.
2) Process control for samples F-J inclusive.
3) Dose computed using Eastman Kodak Co. calibration data

[redacted] [redacted]

Prepared	[redacted]	DATE 10-8-62	LOCKHEED AIRCRAFT CORPORATION MISSILE SYSTEMS DIVISION	Page 1	TEMP	PERM
Checked	'FIGURE 1		TITLE Location of Radiation (Bucket) Patch Test Envelopes, A-9	Model A-9, 1134		
Approved				Report No.		

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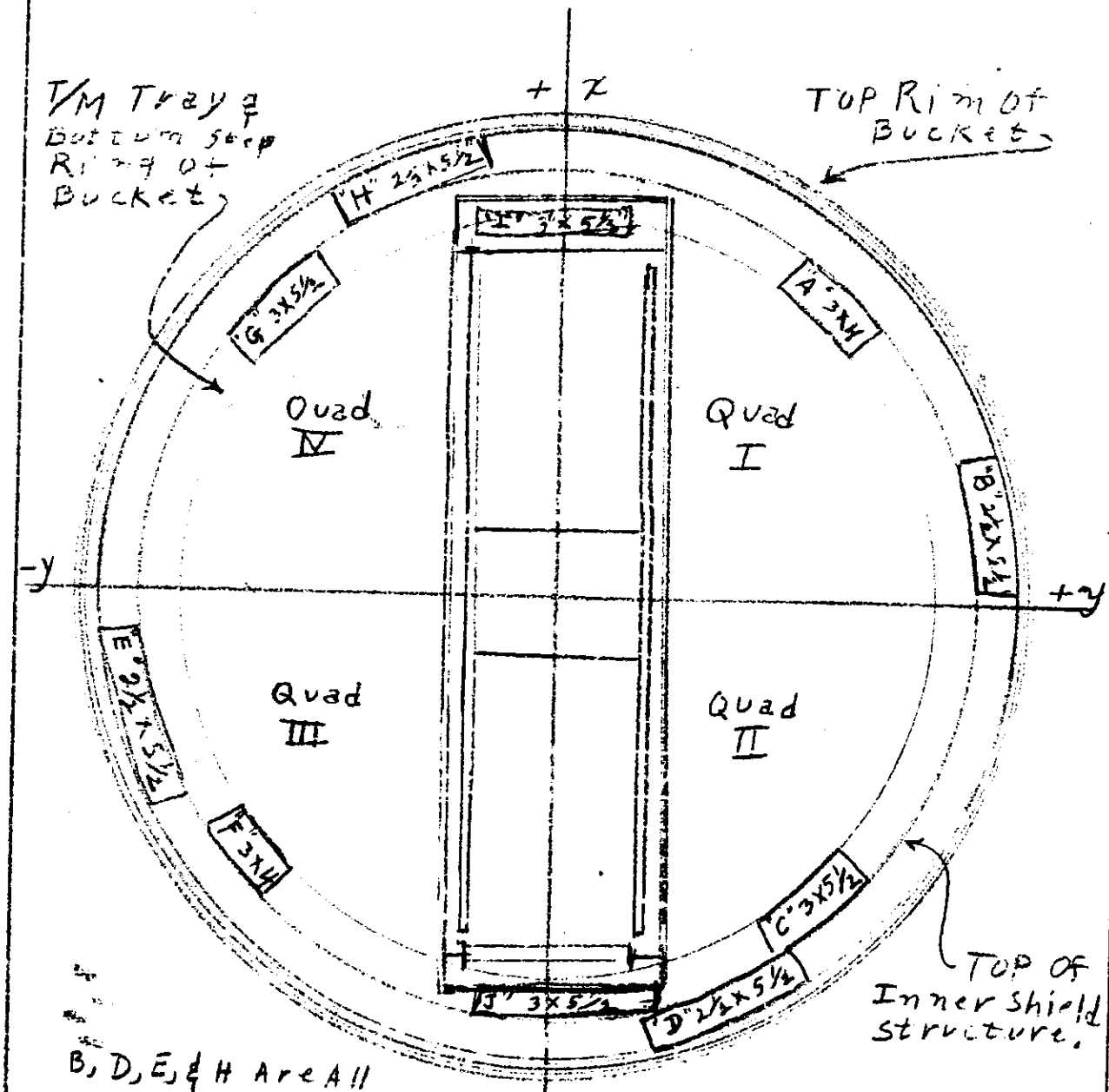
View FWd, or Looking Down Into Open Bucket on Ground.



B, D, E, & H Are All Above (Aft) of Inner Shield Plate.

A, C, F, G, I, & J are Inside (Fwd of) Inner shield Plate & Inner Shield Structure.

NOTE:
10 Locations Are Arranged For Symmetric For weight & Balance, As Near Specified Locations As Possible.

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