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GAMBIT HEXAGON

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BYE-7643-73
Copy 3
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Wes:

1. Per our discussion, I provide the following data on the reliability of the various programs. As I said, "G" has been the most unreliable of the photo programs to date.

2. Attached are summary data on the programs that you might find interesting. Some summary statistics are more useful, however.

3. There are several ways to look at program reliability. The easiest (but not necessarily the most reliable) is to look at capsules (i.e. RV's) launched vs. capsules recovered. In this context, the following data is interesting:

<u>Program</u>	<u>Capsules Launched</u>	<u>Capsules Recovered</u>	<u>% Recovered</u>
CORONA	193	156	80
GAMBIT	90	80	88
HEXAGON	16	15	94
CORONA (1963 on)	147	132	90

4. The above is interesting in that HEXAGON, on this basis, is the most reliable to date. GAMBIT looks better than CORONA if you use all the CORONA data. This isn't really fair, however, since CORONA started the space age and had lots of booster problems that GAMBIT did not have. Comparing "C" and "G" on a more reasonable basis (i.e. 1963 on), "C" is slightly better than "G."

5. A more useful way to look at reliability, however, is in terms of how much film has been returned. Doing this for the three programs yields the data shown in Tables 1 and 2. Table 1 looks at the percentage of film either not returned or catastrophically imaged (i.e. useless) due directly to the camera system itself. On this basis, GAMBIT has been the more unreliable program. Table 2 looks at all failures (camera, booster, Agena, etc.) on the same basis. The only failures not included are lost film due to RV's being lost. That is, Table 2 is aimed at either launch or on-orbit failures. Again, GAMBIT is the worst of the three.

CIA

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TABLE 1

Program Reliability Based on Film Return
(Camera Failures Only)

<u>Program</u>	<u>Total Film Launched</u>	<u>Launches</u>	<u>Film Not Returned</u>	<u>% Not Returned</u>
CORONA*	2,176,000	68	88,000	4
GAMBIT	445,000	75**	30,000	10
HEXAGON	880,000	4	12,000	1.4

* 1963 on.

**61 single-bucket, 14 dual-bucket.

TABLE 2

Program Reliability Based on Film Return
(All Failures Except RV's)

<u>Program</u>	<u>Total Film Launched</u>	<u>Launches</u>	<u>Film Not Returned</u>	<u>% Not Returned</u>
CORONA*	2,176,000	68	128,000	5.8
GAMBIT	445,000	75*	50,000	16.3
HEXAGON	880,000	4	62,000	7.0

* 1963 on.

**61 single-bucket, 14 dual-bucket.

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HEXAGON PERFORMANCE

	1971	1972
Launches	1	3
Capsules Launched	4	12
Capsules Recovered	3	12

ANOMALIES:

- 1202 HEXAGON Film break, one camera, mono RV-3 and RV-4 (1972)
1203 HEXAGON Film fold, one camera, RV-3 mono (1972)

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GAMBIT, HEXAGON
IRONA PERFORMANCE

	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
	C	C&C	C&C	M	MLA	J-1	J-1	J-1	J-1	J-1&3	J-1&3	J-3	J-3	J-3
Launched	5	8	12	21	11	14	13	9	9	8	6	4	3	2
Capsules Launched	5	8	12	21	13	26	26	18	18	16	12	8	6	4
Capsules Orbited	3	5	11	20	11	24	26	16	18	116	12	8	4	4
Capsules Recovered	0	5	7	12	8	21	25	16	18	16	12	8	4	4

ANOMALIES: (Other than recovery or launch failure)

9012	C'	Film broke (1960)
9034	ARGON	Timer failure (1962)
9039	MURAL	Timer failure, 2-day mission (1962)
9046	ARGON	Shutter timer failure (1962)
8002	LANYARD	Decoder failure (1963)
1013	J-1	Both cameras failed Rev 52 (1964)
1021	J-1	One camera failed Rev 102, caused by film (1965)
1027	J-1	Timer failure, cameras not activated on bucket 2 (1965)
1031	J-1	One camera failed, bucket 2 (1966)
1048	J-1	Film tear, bucket 2 on one camera (1968)
1050	J-1	Vehicle unstable after Rev 22 (1969)
1107	J-3	One camera failed on Rev 1, all mono (1969)
1112	J-3	One camera failed during cut-and-wrap sequence (1970)

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AMBIT PERFORMANCE

	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
	$\frac{G}{G}$	$\frac{G}{G}$	$\frac{G}{G}$	$\frac{G \& G}{G \& G}$	$\frac{G \& G}{G \& G}$	$\frac{G}{G}$	$\frac{G}{G}$	$\frac{G}{G}$	$\frac{G}{G}$	$\frac{G}{G}$
Launched	4	10	9	15	10	8	6	5	4	4
Capsules Launched	4	10	9	15	10	8	8	10	8	8
Capsules Orbited	4	8	8	15	9	8	8	10	8	6
Capsules Recovered	4	7	8	15	9	7	8	8	8	6

ANOMALIES: (Other than recovery or launch failures)

4001	G	Distorted Image (1963)
4005	G	Unstable yaw, Rev 2 (1964)
4009	G	Severe warp (1964)
4014	G	Unstable after Rev 7 (1964)
4015	G	Stuck mirror (1965)
4019	G	Power failure (1965)
4021	G	Vehicle unstable (1965)
4023	G	Vehicle unstable--recovered Rev 18 (1965)
4302	G ³	Severe out-of-focus (1966)
4034	G	Outer shield failed to eject (1966)

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