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ORD-0789-76

12 May 1976

MEMORANDUM FOR: TCT

FROM: Charles Adkins, OTD/ORD

SUBJECT: Bird Camera Development

1. The final camera design has been completed and tested. This camera, Camera No. 3, has undergone extensive ground tests, including vibration, and was flown six times during the Oklahoma tests listed in Table 1. This camera, which uses the Minox lens, has a weight of 35 grams including timer, film, and batteries. The total flight weight, including harness, is 39.5 grams. A primary feature of this design is a focal plane flattener which permits accurate positioning of the film in the focal plane and a reduction in motor torque and probability of jamming. Furthermore, ultrathin base film works well in this design so that more pictures (200 black and white, 140 color) per roll are possible. The shutter speed has been shortened to 1/1400 of a second.

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2. The production schedule calls for five additional cameras (Cameras 4 through 8) to be made by 1 June 1976. About one week will be required for performance and reliability tests. By 15 June 1976 these five cameras will be ready for flight tests. By the end of June, six cameras of the new design (Nos. 3-8) and two cameras of the old design will be ready for demonstrational use.

3. A meeting was held with [redacted] Chief/APSD/NPIC, to discuss various films and processing techniques. Also at the meeting were [redacted] and [redacted] of the same division. The flight films and data sheets were left with them for review. Subsequently, a [redacted] of APSD called and a second meeting was held to discuss possible approaches for selecting films and processing techniques for both color and black and white. An additional meeting has been scheduled between NPIC and Kodak to get Kodak's recommendation. At this time, it is agreed that a series of tests will be conducted with the new camera and several film selections in order to determine the proper film and processing technique. Recommendations will also be made regarding trade-offs between shutter speed, film speed, and film resolution.

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These film tests and/or recommendations will be integrated into the camera tests in early June and verified by flight tests in the later part of June. Analysis of the flight tests to date by NPIC supports the original estimate of 1.5- to 2-inch resolution at 100 feet altitude.

4. The [redacted] lens has been assembled and tested in comparison with the new Camera No. 3 design. Both lens systems have field flatteners. The [redacted] lens is an F2.5 lens (about a stop faster), has about the same resolution in the center, and has slightly better resolution at the edge of the field of view. Its major advantage is the faster stop which would allow for faster shutter speed or resolution. As time permits, a camera will be designed for this lens and ground tests will be conducted to verify performance.

5. Table 2 shows the schedule for camera manufacturing, tests, and film selection.

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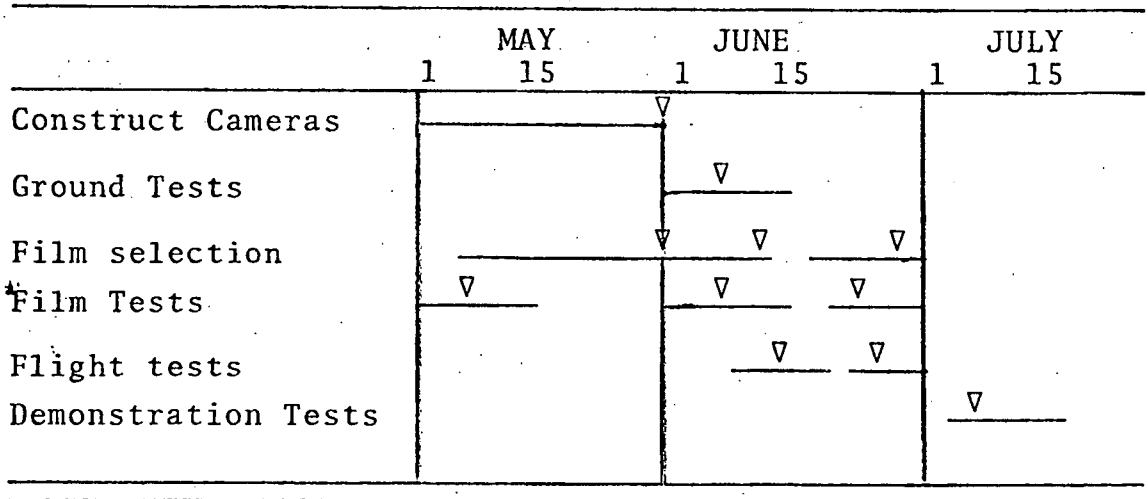
TABLE 1
FLIGHT TESTS

DATE	PLACE	NO. FLIGHTS	NO. FILM ROLLS
1/23/76		5	4
3/29/76		2	1
3/30/76		4	2
3/31/76		4	4
4/23/76	OKLA	10	5
5/1/76	OKLA	4	4
TOTALS		29 Flights	20 Rolls

TABLE 2
MILESTONE SCHEDULE



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