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PROPOSAL FOR STUDY TASK

Task 3: Study the utilization of tape recording of inertial navigation outputs of a specific system and make recommendations for further usage.

STATEMENT OF THE PROBLEM

1. The Interpreter's Need:

A photo interpreter does his best work not by simply examining the photographs but by projecting himself into the scene and walking around down on the ground. Whatever helps him to move along rapidly is good, and whatever slows him down or distracts his attention is bad. Orientation is an important factor and he must always know where he is, or he will be slowed down. A good map is crucial to his continual orientation, and the presentation should provide a minimum of interruption to his concentration on the ground scene.

2. The Presentation:

A map of the mission, immediately at hand, showing the ground track and coverage and annotated with frame numbers and time would be a great improvement over present techniques. How to present such a map in a timely manner is the purpose of the proposed study. Timeliness is basic. The map should be immediately available when the interpreter first scans through the film.

An initial review indicates that the
has the ingredients necessary for a good map presentation to be prepared and to be available to the interpreter at the time the processed film is received at the Center.

3. The Resulting Procedure:

As seen at the present time, the preparation of an annotated map would probably entail the following general procedures:

a. From mission planning information, the Center will collect the necessary maps and prepare a mission map.

b. The mission recorder in the vehicle will record during the mission a mark on magnetic tape at the moment an exposure is made. Corresponding to this mark there will be recorded:

Latitude

Longitude

Elapsed time

Heading

Roll angle

Pitch angle

Ground speed

Angular rate (V/H)

Drift angle

Mission and camera identification

c. On completion of a mission, the information on the mission tape will be transcribed onto a computer tape and the computer tape sent immediately to the Center.

d. At the Center, the map prepared from mission planning data will be loaded into the [redacted] plotter and the computer tape loaded into the computer. STATOTHR

e. The computer will command the plotter to plot the nadir points of the exposures on the map.

f. The ground coverage, frame number, time and scale will be annotated on the map.

g. The map will be reproduced, a copy provided each interpreter, and an additional copy provided to

h. will review his copy of the mission film and annotate the map for cloud cover, visibility, and corrections of ground track or coverage.

i. The original map will be corrected and further annotated. Copies will be prepared for distribution to other users, and for further analysis of the mission photos at the Center.

STATEMENT OF WORK

A study is proposed to determine feasibility and procedures for use of the tape recorded inertial navigation outputs of the for the preparation of mission maps for the interpreter. The study will encompass the following:

Review the form of the recording of the INS output on the original tape, the error content of the recorded data, the error content of the recording process and the frequency or point density of the data. Review the chronological sequence of events in reproduction of a computer tape from the original. Estimate elapsed time up to the point at which the computer tape is available to the computer. Examine possibilities of reducing elapsed time.

Review present computer programming considerations and examine the possibilities of initiating preparation of programs and trials of the utilization system during the development of the acquisition systems.

Review the anticipated total number of position point plots and the rapidity of plotting by the [redacted] machine driven by the computer commands. Determine the estimated total elapsed time for preparation of ground track plots. Examine the possibility of including ground coverage plots as part of the ground track plots and of recording these plots on maps, automatically by the [redacted] machine.

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Examine the possibility of preparing mission maps from mission planning data. Examine the possibility of using these maps on the [redacted] machine for recording the mission ground track and coverage. Investigate the techniques by which the Interpreters will use the mission maps and the annotations which would be most useful. Investigate the possibility of automatically recording the data on the ground track and coverage plots.

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Investigate potential usage of the mission map for recording cloud cover, errors in track and coverage, annotations of mission data, and subsequent publication of annotated mission maps and distribution to user groups.

Submit a report of the findings and recommendations.