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WASHINGTON, D.C. 20505*Col-1*

19 September 1967

**DD/S&T
FILE COPY**

Capt. William H. Craven
Office of Chief of Naval Operations
Op 03 R Navy Department
Washington, D. C.

Dear Capt. Craven:

The following is a sanitized version of the status report received 18 Sept from the MUDDY HILL project team and is passed on for your information:

1. Four operational missions and thirteen test flights have now been flown out of present site. We have had aircraft, sensor, navigation, computer and commo problems as evidenced by the number of test flights necessary to fly the four ops sorties. The aircraft systems have not operated with any kind of consistency. Weather was probably responsible for most of the poor IR sensor performance. Cloud cover during the day keeps the temperature differences low, and the rain and high humidity attenuate the infrared energy resulting in the lack of contrasting targets which makes photo-interpretation difficult. In addition the forest canopy and its shadows mask targets.
2. The aircraft has greater capability than has been shown so far. In the next few weeks we hope to have better capability or to know what our capability is for this environment. The following paragraphs summarize the equipment status.
3. As expected, the forward looking infrared (FLIR) sensitivity is weather limited; but it has improved across the board recently with helium purging. The vertical cursor has been deliberately disabled in order to better follow roads and trails. (The vertical cursor was obscuring or confusing the faint roads and trails.) A cross hair type cursor

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should be more effective for future systems. The display in the cockpit has not helped the pilots to follow trails. The detection range for trails and similar faint targets is not great enough for the velocity of the aircraft. (The problem of following a trail in rough, forested terrain is not the same as staying on Interstate 30 in Texas.) Recommend more night testing in similar environment to that of ops for future systems. A FLIR with greater detection range, a red display (to minimize loss of crew's night vision), roll stabilization, and an attitude reference is needed by pilots for acquiring roads and staying on them.

4. The D-5 infrared scanner has the same weather limitation as the FLIR. In addition we have had high electronic interference on occasion on the aft D-5, which has resulted in noise on the v/h control, poor contrast and washed out areas in the image, and continuous false alarm from the hot spot marker.

It is believed the forward D-5, which will be re-installed in the aircraft on 17 Sept will aid in diagnosing the problem. (Although MUDDY HILL is equipped with two D-5 scanners in a stereo mount, the forward D-5 has been out of operation while awaiting parts.) The new coated window and cold shield, anticipated at the field in about 2 weeks, should give improved contrast.

5. The low light level TV with a 1/4 to 1/2 moon is an excellent navigation aid for the navigator in the nav position. He can check his IP or get ground mapping fixes. The value of the low light level TV in the cockpit is questionable at this time. For example, with the TV at 10 degrees depression angle for use by the pilot to fly the aircraft, everything below the horizon is black. This gives the pilot a false contour and no depth perception. For the pilot to use it to fly hilly terrain at a 1000 ft may be a mistake. However, detection of enemy forces in open areas is good as noted by being able to detect individual trees at 30 degrees depression angle; but in forested

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areas there is little contrast and the shadows, trees, and trucks are hard to distinguish. The spare low light level TV tube is installed and should be ready for test 18 Sept, the azimuth control was disabled to prevent camera drift. The pilots' display was too bright and with the red filter there is considerable loss of resolution.

6. The tail system has not been tested here due to altitude and crew limitations. On future low altitude missions we plan to put another man in the bow to read out targets. Up to now the bow observer has been too busy helping the pilot stay on the road.

7. The VERDAN computer still has program problems. Incorrect course and range is presented for destinations 1, 2, and 3 while in the LORAN mode. Auto slew and release mode works in reverse sometimes but we do not yet have enough data to analyze the difficulty. The LN-15 interface has a data transfer timing problem. The auto bombing system does not work. The LN-15 has had four good flights in free inertial but we still have unsynchronized data transferral in the integrated mode. Next flight test will be 18 Sept.

8. The ASN-25 nav system has had problems associated with the MF 1 compass. On the last flight the LN-15 inertial reference heading was used for the ASN-25 and the results were excellent.

9. The LORAN set has been working well lately but continues to lose lock during HF transmissions and when lightning is in the area.

10. The Doppler nav system has been the most reliable system we have.

11. The commo system has had many problems. The UHF and HF are now working but the VHF is AACP. The internal communications system has had many wiring and mike problems but appears okay now.

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12. The ECM vector sector system receives X band signals from the right aircraft engine but this is no problem. The TRIM 7 has worked well.

13. The TFR has worked well on most of our flights. In the SIT mode it appears that the antenna is scanning at an angle to the aircraft boresight.

Very truly yours,

[Redacted Signature]

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