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AIR FORCE BALLISTIC MISSILE DIVISION
HEADQUARTERS
AIR RESEARCH AND DEVELOPMENT COMMAND
UNITED STATES AIR FORCE
Air Force Unit Post Office, Los Angeles 45, California

REPLY TO ATTN OF: WDSMC/Maj Hale/2413

SUBJECT: Message, Subject: (U) Discoverer IV Launch Cancellation, Personal From General Wade to General Ritland — 9 JUL 1959

TO: General Ritland

1. The Wade message specifies an IRSS communications circuit which was marginal in operation during the Discoverer IV Launch attempt, 23 June 1959. The purpose of the circuit is to permit coordination by the Radar Control Officer (RADCO) of three radars, a Mk 51 gun director (used for initial aiming of the radars), and the radar plotting boards. The radar plotting boards are located directly in view of the RADCO in the ICC building. These automatic boards receive radar outputs from the three radars. The communications circuit allows the RADCO to alert and program the radar and gun director functions and verify by conversations with the radar operators the validity of the radar outputs appearing on the radar plotting boards.

2. Since the installation of the IRSS, there have been two conference circuit intermittent operation difficulties which have plagued the IRSS system. These are conference net two and conference net four. These circuits have been under intense examination for the last 45 days, in an attempt to improve their operation. Improvement efforts include development of a special laboratory prototype conference circuit which was applied to conference circuit two, the most important and poorest functioning of the two circuits. This "quick-fix" provided a partial solution to the intermittent operation of conference circuit two and has been under observation at every testing opportunity. It was believed that if this circuit was proved in, the problems with conference circuit two and four would be solved. Peculiarly, each of these conference circuits had periods of operation which were quite satisfactory. However, during "all systems" checks, additional loading of the circuits with monitoring positions laid on during "minimum mandatory requirements" meetings at Vandenberg, which violated the basic design of the circuits, reduced the talking quality to less than acceptable levels.

3. Following the communications failure on 23 June, a fresh unpressured approach to the conference circuit two and four problems was undertaken by a transmission engineer from Kellogg. This engineer examined the terminal units, at the radars and other locations, and discovered these terminal units to be wired in accordance with an improperly reproduced (or originally drawn) wiring diagram. The circuit or drawing error was sufficiently subtle to escape notice during engineering drawings checks, and the physical circuits also worked well during individual circuit checks, prior to installation in a conference system of circuits. The network circuit produced was such that an acceptable operation was possible until heavy loads were placed on the system. The fault has been corrected and is under further observation.

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4. As indicated in the Wade message, the cause was a basic engineering deficiency. Kellogg recognized this and provided expert assistance from their resources, including the personal attention of the circuit designer, in an attempt to solve this problem. However, even in a minor engineering difficulty of this sort a solution is difficult to achieve when observation and study of circuitry is impeded by systems checks and exercises that preclude undivided attention to such problems.

5. The Wade to Ritland message has been quoted verbatim to Kellogg (copy attached) with appropriate added remarks designed to assist the home plant in providing the quality of engineering required in this and future systems.

JAMES T. JOHNSON
Colonel, USAF
Director, Materiel
DEP COMDR, RESOURCES

2 Atch
1. Cy TWX C364 (C)
   dtd 25 Jun 59
   Wade to Ritland
2. Cy TWX WDSM 6-60-E (C)
   dtd 30 Jun 59

Cy 1 of 5
WDSM-E-R.3-59