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RDZSDH, ARDC, Det #1, 17 May 1958, Subj: (U) Requirements for Automatic Operation of F-108, GOR-114

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Hq Air Research and Development Command, Detachment #1, Wright-Patterson Air Force Base, Ohio

TO: Director of Requirements, Headquarters USAF, Washington 25, D. C.

1. The following is submitted in reply to the request for information in paragraph 3 of AFDRQ Indorsement, dated 5 June 1958, to basic correspondence:

a. Reference Paragraph 3.a. - The AFCS portion of the MG-10 in the F-102A is operational in all aircraft which have been brought up to the 459th configuration. The auto-attack and automatic instrument landing and approach system modes have proven satisfactory.

b. Reference paragraph 3.b. - All the features and modes listed in paragraph 2.b. (referenced indorsement) are being incorporated in the MB-5 AFCS for the F-101B airplane. In flight testing to date, yaw damping, all attitude hold, coordinated turns, and auto pitch trim have proved to be satisfactory. A technical design deficiency within the Central Air Data Computer has prevented mach hold and altitude hold from being satisfactory. A fix has not been ascertained for this deficiency. Recent flight tests have demonstrated satisfactory performance both of auto-load factor limiting and of angle of attack limiting in the command signal limiter. Flight test to prove the compatibility of the command signal limiter of the MB-5 AFCS and the pitch control system of the manual flight control system is scheduled to begin this month. The automatic instrument landing and approach system, to date, has only been marginally satisfactory because of looseness of glide slope following of the beam. Modifications are anticipated to correct this marginal condition. Automatic attack and automatic ground control intercept flight testing has not started, but is scheduled to begin in August 1958 and to end in June 1959.

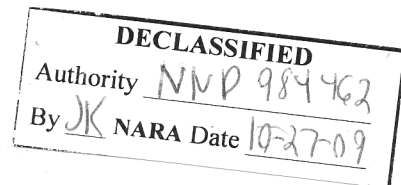
c. Reference paragraph 3.c. - The AFCS portion of the MA-1 aircraft and weapon control system is currently under development. The automatic navigation features of the MA-1 system with the computer tied into the autopilot has been satisfactorily flight tested by Hughes Aircraft Company using an F-102A test bed. Development of the pilot assist mode of the MA-1 is progressing satisfactorily and will be operational in all tactical F-106A/B aircraft. This mode provides heading and attitude hold for the pilot and permits "beep trimming" to effect small corrections. The F-106 turn coordinator provides

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zero side-slip in all turns except when operating in the "direct" mode, which eliminates all of the stability augmentation from the system. Flight testing of the MA-1 AFGS tied into the F-106A airframe is presently getting underway and the complete system, including auto-attack, automatic instrument landing and approach system, auto-navigation, and data link tie-in, is presently programmed to be qualified during the third quarter of CY 1959. Provisions for the AFGS boxes are incorporated in all F-106A/B systems and will be installed on a retrofit basis as they become available. Agreement with ADC has been reached to accept the initial F-106A/B into the operational inventory with only the manual and pilot assist modes activated since the system will afford ADC a capability in excess of that in existence although lacking some of the automatic features.

2. An early decision with regards to the recommendation contained in paragraph 4 of the basic correspondence is required to facilitate completion of subcontracting of the flight control subsystem.

FOR THE COMMANDER:

Incl: n/c

JOHN L. McCOY
Colonel, USAF
Asst Director of Systems Management

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