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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR FORCE SYSTEMS COMMAND
ANDREWS AIR FORCE BASE, WASHINGTON, D.C. 20331



FEB 14 1972

REPLY TO: SDNJ
ATTN OF:

SUBJECT: VTOL

TO: SD/General Schultz

1. With the understanding of what high thrust-to-weight buys in aerial combat together with the technical feasibility of providing such high thrust-to-weights the idea has been apparent for some time that VTOL could be a viable approach for future interceptor, fighter or fighter bomber aircraft. In the past year officers in the Air Force and Navy with this thought in mind informally asked industry if such a fighter type vehicle would make sense and how would it compare with a conventional STOL type fighter. These thoughts combined with the recent idea of large weight savings achievable by omitting the landing gear further suggests the possibility of thrust-to-weight increases for VTOL vehicles over V/STOL or even STOL aircraft.
2. On 1 November 1971, it came to my attention that the Boeing Company would propose to the Navy (or anybody else) a tail sitter VTOL with a gross weight of less than 19,000 pounds, more than 28,000 pounds of thrust and 6,000 pounds of fuel. Using the limited data available in November preliminary performance comparisons were accomplished which revealed that the VTOL would be quite competitive with the LWF and possibly superior in certain critical areas.
3. On 2 November 1971 the conclusions drawn from these very preliminary comparisons were informally presented to the Assistant DCS/Systems and DCS/Development Plans. On 15 November 1971 the Navy sent a letter to qualified Aerospace contractors soliciting "imaginative ideas" pertaining to a V/STOL sensor aircraft and a V/STOL high performance fighter-attack vehicle compatible with the Sea Control Ship Concept. On 29 December 1971 Boeing responded with the VTOL high performance fighter previously described. The Navy is expected to announce its selection on VTOL or V/STOL on 15 February 1972. On 6 January 1972 Boeing provided a briefing, to Colonel Hal Hester and myself at AFSC, on the VTOL Fighter Concept and provided a suggested study plan to perform necessary analysis and trade-offs toward defining a concept of operations and further design resolution. Cost of the Boeing study plan varied between \$45K and \$240K depending upon what was desired. Later in January, Colonel Hester (using Boeing information) requested funds from the DCS/Development Plans for the purpose of generating sufficient trade-off data in an effort to see how attractive the VTOL fighter (or interceptor) may be for future force consideration. No FY 72 funds were made available.

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4. Meanwhile in late December 1971 and early January 1972 Boeing provided more detailed VTOL performance estimates. These estimates were used to crank out an Advanced Energy Maneuverability comparison of the VTOL versus the LWF. These comparisons show that the VTOL (based upon Boeing aerodynamic and weight data) is competitive and in some ways possibly superior to the LWF. On 9 February 1972 these estimates plus other information pertaining to the Boeing VTOL were brought to the attention of the Directorate of General Purpose and Airlift/Development Plans (by Colonel Hal Hester) in another effort to pry loose some study funds for trade-offs to refine the design concept and define a concept of operations. As yet no FY 72 funds have been made available.

5. Despite the apparent shortage of funds it is still my view that the Air Force should put some money on the line. Reason: Further and more complete trade-offs may very likely reveal that after certain mission dependent thresholds in thrust-to-weight are crossed the VTOL, in fact, becomes superior to a STOL or conventional LWF design. At this point, without these studies we do not know if such decision thresholds exist or whether or not the Boeing VTOL, its derivatives, or any other feasible VTOL designs have cracked these thresholds - providing, of course, they exist.

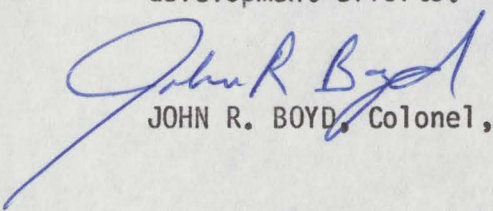
6. Such ideas together with the superb performance attributed to the VTOL suggests that the Boeing Bird or possibly other VTOLS can or already have crossed such possible thresholds. If so, the motivation to push development of the VTOL (possibly at the expense of the LWF) would be enormous.

7. As a consequence of the above rationale and the impact a high performance VTOL (developed by the Navy) could have on Air Force fighter programs, I urgently recommend study funds (roughly \$150K - \$200K) be made available to:

(1) Investigate the performance potential of high thrust-to-weight VTOL vis-a-vis conventional STOL and LWF designs.

(2) Explore the time phasing of such a VTOL design in relation to the F-15 and LWF.

8. Clearly, the results of these studies will enable the Air Force to properly judge the merits of VTOL vis-a-vis STOL or other conventional designs and to determine if the Air Force should recast future fighter development efforts.


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