

SECTION VI

WORKING SESSIONS ON THE PROPOSED REVISION

Contrails

WORKING SESSION ON THE PROPOSED REVISION

GROUP 1: Discussion of the Proposed Revision from a Design Standpoint
(Session Moderator: Tim Sweeney)

SUMMARY

In this session, the goal was to determine the effects of the proposed revision on the designer in his efforts to develop a vehicle with good flying qualities. The goal as such was not met, but a consensus was reached on a number of elements in the proposed revision. The changes to the roll response requirements, the transients and the deletion of references to surface displacement were all considered improvements. The addition of wording about sidestick controls was not considered to be of any help and the proposed change to "Levels of flying qualities," paragraph 1.5, was not considered a good change and many were concerned about the potential for confusion if it were implemented. Much of the rest of the discussion centered on the philosophy of specifications and how they are applied; the remaining problem areas not dealt with in the proposed change and on misinterpretations or misunderstandings of the specification and proposed changes.

The opinion was offered that the specification was merely a listing of lessons learned and that it provided little design guidance. This opinion is fairly accurate and it was pointed out that the "Mil Prime" format should clarify this once and for all, since they are to have sections in the handbook tabulating specific lessons learned and are explicitly not intended to provide design guidance. It was agreed that design approaches are, and should remain, the contractors' prerogative in systems development. A question was raised concerning how the specification was used by the government and by the contractors. Most agreed that the use varies with the particular procurement, whether new or off-the-shelf for example, and with the individual contractor. It was pointed out that in preliminary design, performance, not flying qualities is foremost and therefore flying qualities considerations have a second order effect on the overall configuration. Another question was raised concerning whether the specification applies to Class I aircraft since attempts at compliance would undoubtedly drive costs up. That situation may be academic however, since recent Class I aircraft acquisitions have been of off-the-shelf models, but it is a valid point that strict implementation of MIL-F-8785B could represent an unwarranted expense and technical complexity for a simple aircraft. The "Mil Prime" format offers a real opportunity to deal with this situation in an efficient manner, simplifying the task of specification compliance (at the option of the buyer) for systems where the risk is low.

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A great deal of time was spent on the problems with MIL-F-8785B which the proposed change did not address. On some of these, there was a consensus in the group that improvement should be considered for the proposed amendment. Examples of these are: that some of the requirements on modal parameters are very difficult and may be unnecessary to meet at very high altitudes (60000⁺ feet); that the upset transients (at least the excursions) more properly apply to category A flight phases only; that the terminology we apply to the various envelopes creates communication problems especially with the operational people and finally, that the gradient change at high load factors for structural protection was not allowed by the wording of the proposed revision.

In addition to the above, there were a number of complaints by individuals on various aspects of the specification. One person felt that all qualitative requirements should be deleted since they constituted open-ended compliance situations which had proven costly in his experience. Another decried the extensive parameterization in the spec and asked if task-oriented requirements could be developed to reduce it. This was countered by an individual who felt that pilot-in-the-loop requirements could not be made to work in a specification. It was also mentioned that the critical pilot-in-the-loop task may not be known until after the vehicle has been flown and tactics developed. This was the experience on the A-10 aircraft. One group member added that the same task may necessitate different requirements for different parts of the flight envelope. The question of configurations to which the level one requirements apply was brought up again. The specific instance involves a pilot-assist mode which is required to achieve level one performance in certain flight phases. The question centers around the fact that since the mode is a selectable configuration paragraph 3.1.5 could be interpreted as requiring compliance with level one spec values with it ON and OFF. It was requested that, as a minimum, clarification material be added to the background document.

There was some confusion concerning the proposed change to the section on permissible flight envelope where some individuals thought that this envelope could be smaller than the service or operational envelopes. It was shown that the wording of 3.1.10.3.3 (which was not changed) strongly implies that permissible flight envelope boundaries are outside those of the service flight envelope and that this is the intended relationship.

This working group was attended by a good mix of industry and government personnel. The above summary represents the workshop findings and recommendations within the limits of memory and note taking capability. A list of attendees and their affiliations is attached.

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List of Attendees

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ATTENDEES

<u>NAME</u>	<u>AFFILIATION</u>
R. J. Woodcock	AFFDL/FGC
T. D. Lewis	AFFDL/FGL
J. T. Clay	Beech Aircraft Corp
Paul P. Shipley	Rockwell Space
Donald E. Johnston	Systems Technology Inc
C. F. Anderson	Lockheed Calif Co
Ralph Smith	SRL
J. E. Buckley	McAIR
J. E. Kremowski	Fairchild Republic Co
Ray Kostanty	Northrop Corp
Ron Anderson	AFFDL/FGC
Frank Carlson	Boeing
Brian W. VanVliet	AFFDL/FGC
Marty Moul	NASA/LRC