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A Guideline for Application of High-Density Fiber Optic Interconnects to Aerospace Platforms

RATIONALE

No further development of products for inclusion in this document are expected.

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FOREWORD

This document details various aspects of a Generation II high-density fiber optic interconnect system and related interface and installation hardware concepts for aircraft applications. The currently utilized Generation I fiber optic interconnect hardware, represents an extension or duplication of existing aircraft electrical cabling and connector technology to fiber optic media. It is therefore desirable to consider at the outset guidelines for an advanced high density interconnect system based on emerging technology concepts so that avionics interconnect systems can accommodate growth as the technology matures. This high-density interconnect will represent a revolutionary advance in interconnect systems based on optical fiber's unique performance characteristics. The concept should be compatible with all advanced aerospace system concepts including "fly-by-light", broadband multimedia networks such as passenger entertainment systems, advanced avionics computer interconnects (e.g. optical backplanes) and "smart structures". The vision is to attain a "mobile vehicle information distribution system" analogous to the "premises distribution systems" provided for buildings where all elements of a fiber optic interconnect are designed for compatibility and interchangeability.

This guideline addresses industry and government concerns with the affordability of first generation of interconnect hardware in order to provide solutions for improved second-generation hardware. This second-generation hardware should take into account advanced commercial network and "fly-by-light" systems implementation as well as recent technology advances by the commercial photonics industry. It is proposed that existing and planned industry wide consortia and working groups be used to provide input for this interconnect system for future military and aerospace applications since expertise from many disciplines and diverse organizations is required to arrive at workable solutions. It is also proposed that the automotive community participate in this effort to gain the economy-of-scale which can be achieved by possible dual-use aerospace/automotive application. Contributions and suggestions have been supplied by attendees of the AS-3C meetings held from October 1992 through April 1999.

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