ACTIVITIES OF THE JOINT FIBER OPTIC WORKING GROUP
(JFOWG)

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Summary

It is only in the last year that deployment to the US military has occurred of a large scale production, airborne platform extensively utilizing optical fiber for data networking. This will launch the military into still broader application of optical communications to meet its ever increasing bandwidth needs. For over twenty years, the copper wiring experts have been meeting as a Wiring Action Group to identify reliability, maintainability, and availability issues. For the last five years, a sister group, the Fiber Optics Working Group, has been meeting to address similar issues, but focused on optical communications. This paper will provide background on the JFOWG and clarify the benefits that it brings to the US Navy.

Introduction

The US military is recognized around the world as being the most advanced military service in the history of mankind. What people commonly think of when they consider this military is the war fighter, the service men and women typically seen in uniform performing their mission. They next think of their near equipment which continually is being updated to provide the latest in technology to allow the war fighter to perform their ever changing mission.

What is often overlooked though is the long logistics "tail" that makes all this possible. Logistics includes a lot of things. First, it is necessary to get them the equipment that they will use. Next is necessary to provide whatever that equipment needs such as fuel as well as provisions for their own personal needs. It is also necessary to provide all the support equipment and repair parts needed to repair the equipment whenever it breaks or is suspected of not working properly. Unfortunately, express carriers such as FEDEX do not deliver spare parts in remote places of the world where our fleet operates. This can be an especially huge task when the one considers the increasing complexity of the equipment being deployed. A final consideration is training. With the complexity and sophistication of the equipment used by the military ever increasing, the training must keep up. It ranges from the instructions to operate the equipment to the instructions necessary to teach the fleet maintainers the skills they need to be able repair the equipment.

Purpose

By 2001, the US Navy had completed a trade study between copper and glass communications and had decided to use optical networking on their latest aerospace platform, the F/A-18 upgrade to the E and F versions. This was to become the first full, large scale...
deployment of optical fiber for military aerospace application. Rather than waiting for issues to arise, Rear Admiral Cook proactively chartered the NAVAIR Fiber Optic Working Group in June of 2001 to "address naval aviation fiber optics policies, procedures, standards, and guidelines" (Figure 1). It was focused on reducing total ownership cost for aircraft carrying optical networking by focusing on improving its reliability and maintainability and by promoting and establishing where appropriate commonality standards for implementation, training, and support.

As pressure continues to be put on the defense resources available to support the infrastructure of the military, the services continually look for opportunities for synergies across services. In November of 2005, cooperation between the Air Force and Navy had increased to a new level where it was evident that the Fiber Optic Working Group was no longer just a Navy activity. Consequently, the group was renamed the Joint Fiber Optic Working Group (JFOWG) to clarify what it had become.

Accomplishments

The accomplishments of a working group are not always easy to quantify. A group of people have been coming together once or twice a year since the inception of the JFOWG in 2001. Fleet maintainers and trainers have met with engineers and technicians responsible for support equipment and research and development of new systems. Program management engineers who are responsible for purchasing new equipment have also attended. Also, miscellaneous vendors have participated either in open sessions or on selected topics. The foci of these discussions have been on reducing the overall logistics issues and costs by utilizing the available resources (which typically means limited cost). Unfortunately, a lot of these accomplishments either go undocumented or are proprietary and can not be shared.

Two most significant accomplishments can fortunately be shared. First and most notable is the institution of a standard label for fiber optic cables and avionics boxes on US Navy aircraft (Figure 2). Having such a label makes it easy to identify boxes that require the extra handling to achieve a good optical connection and the cables in runs containing fiber which require the proper handling. Second, the recent revision of the NAVAIR 01-1A-505-4 Technical Manual was extensively rewritten and the general maintenance procedures for fiber optics like inspection and cleaning as well as the terminology of fiber optics was added. This is the maintenance "bible" for fleet maintainers which is repeatedly used. With this revision, it also got adopted by the Air Force and has become T.O. 1-1A-14-4.

Conclusion

The Joint Fiber Optic Working Group has had over a five year life supporting the improvement of the reliability, maintainability, supportability, and productivity of the military aerospace fleet. It has found synergy with the copper equivalent of this group, the Joint Services Wiring Action Group (JSWAG), which continues to provide a critical service to the fleet after over twenty years. As long as the US military continues to deploy advanced technology which has an ever increasing appetite for bandwidth, and as long as the equipment must be maintained, the JFOWG will continue to provide a unique value.

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Abstract

The Joint Fiber Optic Working Group (JFOWG) provides the US military services utilizing optical fiber for aerospace networking with a forum for identification and resolution of transition issues. This paper discusses its purpose and accomplishments.