The 15th Annual ASC Technical Conference, which was held in cooperation with ASTM Committee D-30 at Texas A&M University on September 24–27, 2000, successfully brought together experts from the field of composite materials to present recent research findings and share technical insights. Don Oplinger played an important role in making this conference a notable achievement for the composite technical community by organizing several sessions. These included a Workshop on Bonded Joints and Assemblies in Aircraft, which began with a Plenary lecture entitled “Bonding in Aircraft from 1965 to Present—Successes and Failures,” by Dr. L. J. Hart-Smith. Don also worked with Dr. T. K. O’Brien to organize several sessions on delamination.

Unfortunately, Don was unable to attend the ASC Conference, because he passed away on June 12, 2000. For those of us who had the pleasure of working directly with Don over the years, his loss was a great setback. We had come to rely on his technical expertise, which he shared openly and with much personal sacrifice. Don’s energy and technical insights supported many accomplishments by the composite engineering community, helping to extend the state-of-the-art documented in numerous technical books, reports and journal articles. He has been active in MIL Handbook—17b Guidelines Committee since 1987 and had been a member of ASC since 1985. Don was coeditor of Fibrous Composites in Structural Design, Plenum Press, and has 35 publications in refereed Journals and conference proceedings. He was the recipient of the 1999 AGATE Award in recognition of his leadership, outstanding service and dedication to the revitalization of the General Aviation industry.

Don started work in industry in 1955 and was a pioneer for some of the earliest composite aerospace applications in work with the E. I. Du Pont Company and AVCO Corporation. From 1969 to 1991, he worked at the Army Materials Technology Lab on composite engineering methods, which included bonded and bolted joints, and project support. In 1991, he came to the Federal Aviation Administration (FAA) and worked at the William J. Hughes Technical Center as a FAA Program Manager for research in standard composite test methods, structural joints and damage tolerance. In recent years, Don was closely associated with the increased use of bonded composite joints in certified aircraft products, particularly for general aviation and rotorcraft.

Don’s efforts to organize the 2000 ASC/ASTM Workshop on Bonded Joints and Assemblies in Aircraft started more than a year before the conference. The joint FAA research efforts of engineers from industry, academia and the FAA, which Don had helped to define and execute, motivated this workshop. Don wanted to provide an opportunity for others to learn of the work achieved to date and was anxious to gain further insights from the technical community who attended the ASC Conference. Had he lived to see the event, Don would have been pleased to see how well the workshop was received by those in attendance. He would also be happy to know that there was a lively technical interchange between presenters and participants, which went beyond the time of the workshop culminating into this special issue of the Journal.

In addition to Don’s technical skills, his friendship and encouragement will be equally missed. Don showed an unselfish desire to help his fellow human beings in whatever way he could. In the words of Don’s wife, Gloria, and daughters, Susan and Barbara, “there was no finer man.”

The current issue of the Journal includes four peer-reviewed papers based on the presentations at the Workshop. The papers deal with the analysis, design, testing, characterization, and failure of bonded composites.

In the first paper, Kim and Kedward present a methodology for the design of bonded lap joints under combined loading. The developed closed-form solutions provide a tool for identifying the influence of manufacturing tolerances on joint behavior and are well suited for parametric design studies on joint performance.

Krueger, Paris, O’Brien, and Minguet present a methodology for determining the fatigue life of bonded composite structures based on fatigue characterization data and geometric nonlinear finite element analyses. The methodology offers a significant potential for predicting cumulative fatigue life in composite structures.
In the third paper, Tomblin, Harter, Seneviratne, and Yang address the lack of readily available in situ property data for thick bondline adhesive joints. Their results point to the significance of load eccentricity and peel stresses in modeling adhesive joints. They also recommend that thick adherends be used when comparing different adhesive systems for apparent shear strength and that thin adherends should be used for qualitative tests only.

The final paper by Huang, Yang, Tomblin, and Harter focuses on the stress and failure analyses of adhesive-bonded composites using ASTM D3165 standard. Their results indicate that the 2% of overlap length offset on the standard specimen geometry is effective in evaluating failure.

A paper on the effects of surface preparation on Mode I testing of adhesively bonded joints by Bardis and Kedward was included in the January 2002 issue of the Journal (Vol. 24, No. 1, pp. 30–37). Their research is directed at enhancing the reliability of composite bonded assemblies that are subjected to long-term loading and varying environmental exposure. The Double Cantilever Beam and an adapted version of a composite wedge tests were shown to be effective in evaluating surface preparation methods that affect bond strength.

The remaining peer-reviewed papers based on presentations at the Workshop on Bonded Joints and Assemblies in Aircraft will appear in a subsequent issue of the Journal.