

ABSTRACT



Scientific Atlanta

The high standards of equipment availability demanded by today's commercial and industrial users of satellite communications equipment have resulted in a cost-benefit approach to product development. In this paper, the results of such an approach-as applied to several lines of Scientific Atlanta products-indicate that attractive MTBF and MTTR can be achieved with commercial products at reasonable cost.

In this paper, an overview of current Scientific Atlanta digital and video satellite-communications products is followed by the design and manufacturing techniques used to achieve high availability. A case study using the Marisat terminal manufactured for Comsat General shows measured availability data for this nonredundant commercial product.

This cost-benefit approach to reliability, which permeates all phases of product development, includes design, parts selection, workmanship, and proof of quality. Traditional cost drivers are examined and compared with commercial alternatives. For example, mil spec parts are compared-in both quality factor and cost-with burned in commercial parts with some interesting results.

Manufacturing techniques are examined to determine the efforts of intangibles, such as special training and reliability incentives, upon availability. Special system burn-in and inspection techniques are shown to add significantly to total availability.

Actual results of the approach are also presented. The Marisat terminal, which transmit/receives both voice and data, has achieved actual MTBF (based upon over 200 terminals installed) of over 16,000 hours for data communications and over 5,000 hours for all modes of operation. Comparisons of predicted versus actual MTBF confirm the value of the techniques discussed.