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Recommendations for Future Collision Avoidance Systems

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FOREWORD

This report was prepared by Special Committee 147 (SC-147) and approved by the RTCA Program Management Committee (PMC) on March 21, 2012.

RTCA, Incorporated is a not-for-profit corporation formed to advance the art and science of aviation and aviation electronic systems for the benefit of the public. The organization functions as a Federal advisory committee, and develops consensus-based recommendations on contemporary aviation issues. RTCA's objectives include but are not limited to:

- coalescing aviation system user and provider technical requirements in a manner that helps government and industry meet their mutual objectives and responsibilities;

- analyzing and recommending solutions to the system technical issues that aviation faces as it continues to pursue increased safety, system capacity and efficiency;

- developing consensus on the application of pertinent technology to fulfill user and provider requirements, including development of minimum operational performance standards for electronic systems and equipment that support aviation; and

- assisting in developing the appropriate technical material upon which positions for the International Civil Aviation Organization and the International Telecommunication Union and other appropriate international organizations can be based.

The organization's recommendations are often used as the basis for government and private sector decisions as well as the foundation for many Federal Aviation Administration Technical Standard Orders and several advisory circulars.

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1 INTRODUCTION

This document examines operational and technical performance issues observed in the current TCAS II as well as issues anticipated to emerge in the future as NextGen changes affect the airspace. It explores potential changes to address these issues, and addresses their maturity. The report comments on additional research and development that would be required, either to better characterize the issue, to develop solutions, or both.

Both issues and solutions are presented in two major categories:

a) Issues affecting the current TCAS II and changes that could be made to that system without substantial redesign. These are termed “near-term” changes, but their development, certification and implementation could take as long as 6 years.
b) Issues anticipated in the future, and changes that would require either substantial redesign or that might use entirely new sources of surveillance data. These changes are termed “far term” and would take more than 10 years. Some far term solutions may be required to address near term issues.

Performance issues and solutions do not neatly map one-to-one. In other words, one solution might address several issues; or several solutions might address parts of one issue. The report presents tables to help the reader map solutions to issues. Finally, recommendations are presented for the solutions deemed most promising and deserving of high research priority.

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