RTCA
1140 Connecticut Avenue, NW, Suite 1020
Washington, DC 20036-4001 USA

A New Guidance System for Approach and Landing

Volume 1 of 2

RTCA DO-148
December 18, 1970

Prepared by: SC-117

Copies of this document may be obtained from

RTCA, Inc.

Telephone: 202-833-9339
Facsimile: 202-833-9434
Internet: www.rtca.org

Please visit the RTCA Online Store for document pricing and ordering information.

FOREWORD

This report was prepared by Special Committee 117 of the Radio Technical Commission for Aeronautics (RTCA). It was approved by RTCA on December 18, 1970.

RTCA is an association of aeronautical organizations of the United States from both government and industry. Dedicated to the advancement of aeronautics, RTCA seeks sound technical solutions to problems involving the application of electronics and telecommunications to aeronautical operations. Its objective is the resolution of such problems by mutual agreement of its member organizations.

The findings of RTCA are in the nature of recommendations to all organizations concerned. As RTCA is not an official agency of the Government of the United States, its recommendations may not be regarded as statements of official government policy unless so enunciated by the government organization or agency having statutory jurisdiction over any matters to which the recommendations relate.

Copies of this document may be obtained from the

RTCA Secretariat
Suite 655
1717 H Street, N. W.
Washington, D. C. 20006

- - -

Volume I	.....	$10.00
Volume II	.....	$20.00

- - -

The above prices include parcel postage in the U. S. For handling and first class mail in U. S., add $1.00 for Vol. I, $1.75 for Vol. II, or $2.75 when ordering both. Outside the U.S., RTCA will invoice for class of mail specified.

- - -

Payment may be made either in cash or by check or money order payable to RTCA. Please refer to the document number, DO-148, or to the title, or both.

VOLUME ONE

TABLE OF CONTENTS

A NEW GUIDANCE SYSTEM FOR APPROACH AND LANDING

SECTION I

INTRODUCTION

The membership of RTCA Special Committee 117 was comprised of over 465 U. S. and world experts on aircraft operations and instrument landing systems from both government and industry. This Committee, which represented perhaps the largest body of knowledge on landing system technology ever assembled in a focused effort, has completed a task of major proportions. It is a distillation of operational and technical requirements, current and prospective technology, system and economic analyses, which have resulted in recommendations for a new Microwave Scanning Landing Guidance System (LGS). The work, representing a three-year effort by this large international group of government and industry experts, is the basis for a larger task, that of achieving national and international agreement on a New Guidance System for Approach and Landing. The continuation of this effort will require the cooperation of many, but now leadership and financial resources must be provided by government agencies. A series of specific actions which need to be pursued are listed under RECOMMENDATIONS FOR FOLLOW-ON ACTIONS.

The system which has emerged, a major single concept with two end branches (a single judgment on conventional scanning versus Doppler scanning was not possible without further experimentation), is a highly flexible building-block system which promises to meet the needs of minimum-requirement general aviation users on the one hand, and full-scale all-weather automatic landing and multiple closely spaced runway environments on the other. It is a modular concept which does not appear to penalize either end of the spectrum to satisfy the other end. The signal-in-space created appears to be able to meet the broadest possible spectrum of operational needs -- both civil and military.

The recommended LGS provides for guidance information that may be expected to have a high order of integrity, both in terms of accuracy throughout the system coverage and the reliability of the information transmitted and detected. The coding and processing methods were selected to inherently provide a high level of protection against generation of false guidance information and a capability for monitoring to preclude undetected failures.