CORRECTION SHEET

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A NEW GUIDANCE SYSTEM FOR APPROACH AND LANDING

— Volume Two —
(SC-117 Committee Reports)

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Prepared by SC-117

RADIO TECHNICAL COMMISSION FOR AERONAUTICS

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A NEW GUIDANCE SYSTEM

FOR

APPROACH AND LANDING

VOLUME TWO
(SC-117 Committee Reports)

Document No. 148
December 18, 1970

Prepared by:
RTCA SC-117

FOREWORD

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PART ONE

TENTATIVE OPERATIONAL REQUIREMENTS

RTCA PAPER 19-69/SC117-46

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RADIO TECHNICAL COMMISSION FOR AERONAUTICS

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Paper 19-69/SC117-46
January 27, 1969

TENTATIVE OPERATIONAL REQUIREMENTS

FOR A NEW GUIDANCE SYSTEM FOR APPROACH AND LANDING

SECTION I

INTRODUCTION

The objective of Special Committee 117 is the "development of a precision guidance system concept for approach and landing, and an associated signal structure. This concept and signal structure shall satisfy, to the maximum extent possible, the various operational needs of the several classes of users."

It is recognized that the services required during the approach and landing phase of flight represent only a part of the total air traffic control and navigation system; however, a new precision guidance system for approach and landing is considered to be one focal point in the evolution of a new system.

Consideration of the total air traffic control and navigation system problem is not within the scope of SC-117, but any new universal, precision approach and landing guidance system must interface technically with the present air navigation and traffic control system, and with any foreseeable evolutionary changes to the system.

The timing and method of introduction of any new system is critical. It is assumed that, following an RTCA system recommendation and completion of a verification phase, some implementers will purchase hardware in the 1972-75 period to meet special needs, such as V/STOL applications, certain military requirements, and perhaps certain applications of new-system elements at difficult sites. Broader implementation, perhaps first of low-cost limited-capability systems at smaller airports, and other uses, would phase in slowly over a decade or more. It is estimated that initial

operational availability of the complete new system (full capability) would occur in approximately 1975, and that the phase-in period of the system would be likely to stretch from the 1973-75 period through at least 1980-85.

Ideally, a new system should not be dependent on any ground elements, but it is considered that such a system is not presently achievable. Therefore, a combination ground/airborne system is expected to result from these operational requirements. The choice of where a function is performed, i.e., on the ground or in the aircraft, will alter the character of the system considerably. For example, as an aid in formulating a system concept, it is considered necessary that the simplest, low-cost application of the system will require the ground generated signal to be amenable to detection and use by simple hardware in the aircraft. However, for the more complex applications, it is conceptually acceptable, and in some cases desirable, that the computation and execution or use of such functions as complex flight paths, flare maneuvers, variable GPIP, and distance/distance rate be accomplished in the aircraft. The final choice of the degree of complexity between ground and airborne elements should result from operational/technical trade-offs as well as cost considerations.

NOTE: In the initial consideration of operational requirements, the Committee did not consider the technical feasibility of the requirements nor the costs for the services, although it recognized that any final statement of requirements must be tempered by both. The Committee considers that a thorough analysis of the requirements in technical and economic terms is essential and that the final statement of requirements will reflect the practical facts of technical feasibility, cost/effectiveness, and the problems of implementation.