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Free Flight Action Plan Update 1

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April 2, 1998

Free Flight Steering Committee

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Foreword

This report was prepared as an update to the earlier document entitled *Free Flight Action Plan* published by RTCA on August 15, 1996. It is intended to provide the current status of free flight initiatives as compiled by the RTCA Free Flight Steering Committee. The Free Flight Steering Committee was formed under the auspices of RTCA, Inc. at the request of the FAA and in response to the *Final Report of RTCA Task Force 3, Free Flight Implementation*.

The objectives of the Free Flight Steering Committee are:

- To establish an agreed-to implementation strategy and milestones;

- To periodically review government and industry progress in meeting implementation commitments, via the use of appropriate metrics; and

- To identify new free flight implementation opportunities as well as events/situations that are inhibiting progress and review actions that are taken.

As a private, not-for-profit corporation, RTCA, Inc. addresses operational concepts, requirements, and industry standards for aviation. The organization's mission is to advance the art and science of aviation, and aviation electronic systems, for the benefit of the public. Volunteers from the entire aviation community help develop RTCA products. These products include consensus-based recommendations addressing the implementation of new operational capabilities, performance standards, as well as technical guidance documents and special topic reports that focus on the application of electronics technology to meet the aviation community's needs. RTCA conducts essentially all its work while functioning as a Federal Advisory Committee.

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Free Flight Action Plan
Joint Goals Statement

The overall guiding principles for moving toward mature Free Flight were developed over a 2 year period by an RTCA sponsored Select Committee on Free Flight involving both industry and Government representatives and by RTCA's Task Force 3 on Free Flight implementation. Task Force 3 approximately 250 representatives from the Federal Aviation Administration (FAA) and the aviation community. In October 1995, the task force published the following guiding principles:

- Ensure that the transition to Free Flight will not compromise safety.
- Expand the Free Flight definition to include strategic flight planning and ground phases of operation.
- Emphasize initiatives that give users a high return on investment.
- Ensure that the transition to Free Flight is benefits-driven.
- Emphasize the need for collaborative planning.
- Emphasize procedural improvements with proven technology.
- Consider end-to-end impact and benefits when planning improvements.
- Address human factors issues during all stages of development.
- Assess benefits when possible prior to implementation.
- Utilize modeling and analysis to anticipate operational impacts on the National Airspace System (NAS) users and service providers.
- Accommodate users with various levels of equipage during the transition to Free Flight.

The FAA and industry agree with the guiding principles. The joint Government/Industry Free Flight Steering Committee (referred to as the "Steering Committee" hereafter) shall agree to use these principles in deliberations and preparation of further recommendations on the implementation of Free Flight.

Free Flight Action Plan
Introduction

Background

On April 20, 1995, the FAA Administrator David Hinson, asked RTCA to "form a new task force, led by an appropriate representative from the civilian aviation community to develop consensus regarding Free Flight implementation." The task force completed its work in October 31, 1995, and produced a report, *Final Report of RTCA Task Force 3 Free Flight Implementation*, that further defined the Free Flight operational concept, evaluated the Free Flight architecture and technology needs, and identified an incremental transition to Free Flight.

Free Flight is an innovative concept born out of the need for increased user flexibility with operating efficiencies and increased levels of capacity and safety to meet growing demand for air transportation. This new concept of operation recognized the need to rethink the traditional notions of traffic flow management, air traffic separation services, and the classification of airspace itself. The Free Flight concept asserts that significant benefits can be achieved by concentrating on 1) removal of constraints and restrictions to flight operations, 2) better exchange of information and collaborative decision making among users and service providers, 3) more efficient management of airspace and airport resources, and 4) tools and models to aid air traffic service providers.

Free Flight Defined

Free Flight is defined as:

> A safe and efficient flight operating capability under instrument flight rules in which the operators have the freedom to select their path and speed in real time. Air traffic restrictions are imposed only to ensure separation, to preclude exceeding airport capacity, to prevent unauthorized flight through special use airspace, and to ensure safety of flight. Restrictions are limited in extent and duration to correct the identified problem. Any activity which removes restrictions represents a move toward Free Flight.

Task Force 3 expanded on this definition to include:

> This suggests that each user is granted both maximum flexibility and guaranteed safe separation. The goal is not only to "Optimize" the system but to open the system for each user to "self-optimize."
> Self-optimization is the key to understanding the extent of Free Flight's reach as well as Free Flight's challenges. Free Flight is not limited to airspace--its spatial constraints are chock to chock, but Free Flight reaches into a flight's prehistory by providing increased flexibility in flight planning.

In the broadest sense, Free Flight is the unrestricted opportunity for all to use the limited airspace in a manner that is efficient, effective and equitable. Future airspace capacity and management must support the Free Flight concept to enhance safety, promote air commerce, minimize delays, while accommodating projected air traffic growth.

Collaboration on Implementation

The FAA has committed to a safe transition to Free Flight. The shared leadership between the FAA and the industry through the Government/Industry Free Flight strategy with the proper focus of activities and investments. Steering Committee will develop and carry forward the agreed-to implementation

Achieving Free Flight requires shared Government/Industry responsibility for implementing the actions necessary to achieve the joint goals associated with Free Flight and for measuring progress toward those goals. It also requires that government and industry reach consensus on system performance standards, transition strategies, and implementation milestones. Without mutual agreement on investment timing, neither the FAA nor industry will be able to move forward and attain the benefits that Free Flight promises.

Incremental Approach to Implementation

There is no doubt that changes to the NAS, the cockpit, and operations centers are necessary to implement Free Flight. The challenge before the Steering Committee is to develop a plan to implement Free Flight in a way that is technically feasible, affordable, and operationally sound. It is recognized that Free Flight will be implemented and mature over time.

Free Flight is characterized by many as being "benefits-driven" and "time-phased," or evolutionary. The Task Force 3 report illustrates an incremental evolution for near-, mid-, and far-term timeframes. This evolution represents an aggressive approach that takes advantage of technology and requires expedited establishment of requirements and standards, completion of prototype and operational testing, and progress toward acquisition and implementation phases of development. The incremental approach and the actions required to achieve it must reflect a balance between user needs and expected resource availability for both the FAA and the users.

Early Benefits

While an incremental approach to Free Flight is suggested, the aviation community cannot afford to wait for long-term development initiatives to produce benefits. Studies have estimated that the annual cost of delays to airlines are significant, reaching billions of dollars. Incremental development is expected to yield incremental benefits. In fact, there is considerable evidence that significant benefit to airspace users and service providers is achievable from near-term actions. The Task Force 3 report identified potential benefits associated with the transition increments along the Free Flight path. The reductions in delay and the improvements in operating efficiency inherent in Free Flight will translate directly into air quality benefits by reducing fuel burned on the airport, in the terminal area and en route.

The implementation strategy developed by the Steering Committee emphasizes what can be done in the near term and provides significant benefits at low cost and low implementation risk by using proven technologies. The implementation of the Free Flight concept must provide improved capabilities in the near term while simultaneously evolving the ATM system toward the full Free Flight concept.

Near term improvements must focus on expeditiously eliminating current air traffic restrictions, developing and implementing improved procedures to increase user flexibility and system capacity, and fielding existing capabilities that are ready for deployment or integration in existing NAS or user systems. Longer term improvements focus on evolving the ATM system through incremental improvements in automation and infrastructure that are designed to lead to the longterm vision of mature Free Flight. This combined strategy offers both near-term improvements and the long-term objective of substantially improved ATM system capabilities.

Introduction to Free Flight Action Items

The following pages contain actions planned or underway in response to the RTCA Task Force 3 recommendations contained in *Free Flight Implementation.* The tables are organized by Task Force 3 recommendation, grouped in near-term, midterm, and far-term segments as identified by Task Force 3. The first column contains the **RTCA recommendation** and its identifying number or letter, as defined in *Free Flight Implementation.* The recommendation is followed by **FAA/Industry initiative(s)**. These initiatives have been developed by the FAA and industry and reflect new and ongoing initiatives necessary to implement the recommendation. Wherever possible, a **start** and **complete** date are listed. The fifth column updates the reader as to the **status** of each initiative. Funding information is also provided, when known. The use of To-Be-Determined (**TBD**) applies either to a start or complete date where there is uncertainty. Some initiatives are ongoing, meaning that there is no completion date. If a status or funding block is blank, no information was available at the time this update was published.

The FAA Office is the organizational element that has responsibility for the majority of initiatives. The industry lead is to represent the industry in implementing the recommendation. Points of Contact are the FAA and industry representatives who are expected to know the status of work being accomplished, and are not necessarily those who are performing the work. Their phone numbers are also identified.

The FAA and industry points of contact have additional responsibilities. The FAA point of contact is responsible for keeping the Free Flight Steering Committee aware of FAA budget changes that have an impact on the implementation schedule of initiatives within a particular recommendation. Both the FAA and industry points of contact are responsible for identifying changes in initiative schedules and for keeping the action plan up to date.

Some of the recommendations have notes attached that relate to the initiatives.

Updated information on each initiative will be published at the following website: www.faa.gov./freeflight/index.htm