



Even when modern flight deck equipment with moving maps is available, and even with multilateration¹ and automatic dependent surveillance–broadcast out supporting air traffic control (ATC), safely navigating an aircraft on the ground is still a critical issue.

Airports are committed to providing sufficient navigation aids to maintain safety at the required level. In addition to lighting systems and the support of controllers, surface markings are of great importance, especially in adverse weather or critical lighting conditions.

Major efforts have been made over the years by the International Civil Aviation Organization (ICAO) to develop standards for visual aids to improve safety for moving aircraft on the ground.

Requirements for visual aids such as lighting, markings and signs can be found in ICAO Annex 14, *Aerodromes*, and ICAO Doc 9157,

Aerodrome Design Manual, Part 4 (Visual Aids). Those documents have detailed specifications for visual aids on runways and taxiways, but few details can be found for aprons (ramps) — for example, markings for aircraft parking stands.

In the absence of precise rules, airports have developed different markings. Despite some harmonization within a country or group of countries, pilots may be confronted with different apron markings almost every time they fly. These markings may differ in shape, size, content and color.

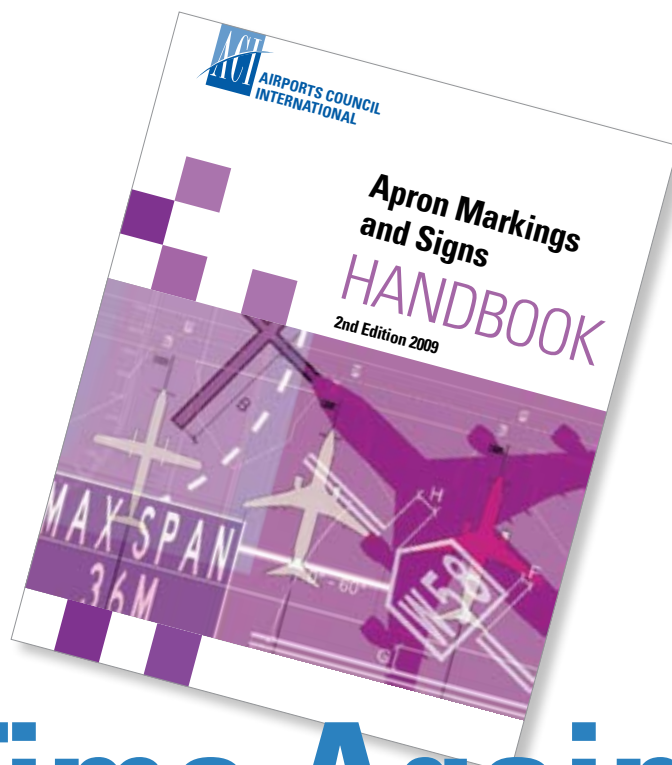
Airports Council International (ACI) has recognized this problem and published in 2001 its first *Apron Surface Markings and Signs* handbook. This handbook has been acknowledged by ICAO, in the remark that “additional guidance on apron markings is given in the ACI/IATA [International Air Transport Association] *Apron Markings and Signs Handbook*, which gives

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A new edition of the airport surface markings and signs handbook furthers standardization among airports.

BY GERHARD GRUBER



Marking Time Again



examples of current best practices,” included in ICAO Doc 9157, Part 4, 2.1.2.

The first edition of this handbook made a significant contribution to safer apron environments, by fostering greater uniformity in the markings and signs provided by airport operators at airports worldwide. Since then, best practices have continued to evolve, and increasingly complex apron management requires more detailed regulations.

Therefore, the ACI Safety and Technical Standing Committee determined that the first edition needed to be revised and requested the work to be done by the ACI Operational Safety Subcommittee.

Within that committee, Vienna International Airport took the lead to redesign the handbook. In particular, the author and his team, Oliver Russ and Dietmar Schreiber, created the text and graphics and coordinated several drafts with



Above, new “alternative aircraft stand” taxi lane markings. Below, old “stand direction” marking.

ACI before extensive industry consultation and request for comments began.

Comprehensive coordination with ICAO was performed via the Visual Aids Working Group of the Aerodromes Panel, where ACI was represented by Jean-Noel Massot of Aéroports de Paris.

The second edition of the handbook was published in 2009 and sent to more than 1,600 ACI member airports in 179 countries.

It has been significantly improved compared to the first edition, now including more markings and their exact dimensions. It is also the first time that markings are shown in any worldwide publication for alternative aircraft stand taxi lanes. Such markings allow operations on an apron taxi lane by either two code-letter C airplanes or one code-letter E or F airplane.² This has been applied and found to be both effective and safe at a number of airports.

The handbook is intended for planners of apron areas, ground staff working on aprons, air traffic controllers, apron controllers and pilots.

The change of surface markings and signs from an old system to the new specification cannot be completed overnight. Depending on size of the airport or budget, it will be done step by step.

In Vienna we took several opportunities to introduce the new specifications, including the construction of new aprons, a scheduled repainting and a complete change of the stand numbering system. Using these opportunities minimized the cost of the project and completed the change of markings within one year.

The author has been involved in developing adequate surface markings for many years. Even before the publication of the first ACI handbook, experiments with various colors, shapes and sizes were made at Vienna International Airport in coordination with airports in neighboring countries.

The author’s activity as a pilot on worldwide routes has been of great assistance in this task. Not a single flight takes place without the author having the camera ready to document both good and bad marking examples.

Over the years, more than 1,000 photos have been taken, which were beneficial in developing the revised handbook. ➤

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Notes

1. Multilateration is a system in which the location of an object is determined by computing the time difference of arrival of a signal from that object to three or more receivers, or simultaneously from three or more transmitters to a receiver in the object.
2. Code-letter C airplanes have a wingspan up to but not including 36 m (118 ft); code-letter E airplanes have a wingspan up to but not including 65 m (213 ft); code-letter F airplanes have a wingspan up to but not including 80 m (262 ft). The reference codes are contained in ICAO Annex 14, Table 1-1.