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**United States of America
and
Chile**

Memorandum of Cooperation NAT-I-3422 between the Federal Aviation Administration Department of Transportation United States of America and the Directorate General for Civil Aeronautics Ministry of Defense Republic of Chile (with annex). Washington, 11 July 1997 and Santiago, 11 July 1997

Entry into force: *11 July 1997 by signature, in accordance with article X*

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**États-Unis d'Amérique
et
Chili**

Mémorandum de coopération NAT-I-3422 entre l'Administration fédérale de l'aviation du Département des transports des États-Unis d'Amérique et la Direction générale de l'aéronautique civile du Ministère de la défense de la République du Chili (avec annexe). Washington, 11 juillet 1997 et Santiago, 11 juillet 1997

Entrée en vigueur : *11 juillet 1997 par signature, conformément à l'article X*

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[ENGLISH TEXT – TEXTE ANGLAIS]

**MEMORANDUM OF COOPERATION
NAT-I-3422
BETWEEN THE
FEDERAL AVIATION ADMINISTRATION
DEPARTMENT OF TRANSPORTATION
UNITED STATES OF AMERICA
AND THE
DIRECTORATE GENERAL FOR CIVIL AERONAUTICS
MINISTRY OF DEFENSE
REPUBLIC OF CHILE**

WHEREAS, the Federal Aviation Administration (FAA) of the Department of Transportation of the United States of America and the Directorate General for Civil Aeronautics (DGAC) of the Ministry of Defense of the Republic of Chile have as a common purpose the promotion and development of technical cooperation in civil aviation between the two countries; and

WHEREAS, the Administrator of the FAA is authorized to develop, modify, test, and evaluate systems, procedures, facilities and devices to meet the needs for safe and efficient systems in civil aviation, and to enter into cooperative agreements to achieve this objective; and

WHEREAS, such cooperation will encourage and promote the development of civil aeronautics and safety of air commerce in the U.S. and abroad;

NOW THEREFORE, the FAA and the DGAC, collectively referred to herein as the parties, agree to undertake joint programs in accordance with the following terms and conditions.

ARTICLE I--OBJECTIVE

A. This Memorandum of Cooperation (MOC) establishes the terms and conditions for mutual cooperation in the promotion and development of civil aviation. For this purpose the parties may, subject to the availability of appropriated funds and necessary resources, provide personnel, resources, and related services to cooperate to the extent called for in the annexes and appendices to this MOC.

B. This objective may be achieved by cooperation in any of the following areas:

1. The exchange of information regarding programs and projects, research results or publications.

2. The execution of joint analyses.
3. The coordination of research and development programs and projects and their execution based on shared effort.
4. The exchange of scientific and technical staff.
5. The exchange of specific equipment and systems for research activities and compatibility studies.
6. The joint organization of symposia or conferences.
7. Reciprocal consultations with the aim of establishing concerted action in appropriate international bodies.

ARTICLE II--IMPLEMENTATION

A. This MOC shall be implemented through technical annexes and appendices, which shall form part of this MOC when mutually agreed by both parties.

B. Representatives from the FAA and the DGAC shall meet periodically to discuss proposals for new cooperative activities. A joint review of the status of ongoing activities, which are the subject of annexes and appendices to this MOC, shall be conducted at such intervals as mutually agreed by the parties.

C. The designated offices for the coordination and management of this MOC, and where all requests for services under this MOC should be made, are:

1. For the FAA:
Joan Bauerlein
Director, International Aviation
Federal Aviation Administration (AIA-1)
800 Independence Ave., S.W.
Washington, D.C. 20591
United States
Telephone: (202) 267-3213
Facsimile: (202) 267-5032
2. For the DGAC:
Gen. Brig. Area Gonzalo Miranda
Director General
A Miguel Claro, 1314
Clasificador 3; Correo 9
Santiago, Chile
Telephone: [56] (2) 204-7676
Facsimile: [56] (2) 209-0532

ARTICLE III--EXCHANGE OF PERSONNEL

The parties may exchange technical personnel as required to pursue the activities described in the annexes and appendices. All such exchanges shall be

in accordance with the terms and conditions set forth in those annexes and appendices and this MOC. Such personnel shall perform work as mutually agreed by the parties in the annexes or appendices. Such personnel may be from the FAA, the DGAC, or supporting Government agencies or contractors, as mutually agreed.

ARTICLE IV--EQUIPMENT AND LOAN ARRANGEMENTS

Equipment may be loaned by one party to the other under the annexes or appendices to this MOC. The following general provisions shall apply to all loans of equipment unless otherwise specified in the annexes or appendices:

A. The lender shall, at its own expense, transport any equipment to the borrower's designated location and identify its value.

B. The borrower shall assume custody and possession of said equipment upon its delivery to the designated receiving point.

C. Upon completion of use or expiration or termination of the pertinent appendix, annex or this MOC, the borrower shall return the equipment to the lender at the borrower's expense. The equipment shall remain in the custody of the borrower until returned to the lender's designated receiving point.

D. The borrower shall be responsible for installing the equipment at the borrower's location.

E. The lender and borrower shall cooperate in securing any export licenses and other documents required for the shipment of the equipment.

F. The lender shall assist the borrower in locating sources of supplies for common items and parts peculiar which are not readily available to the borrower.

G. The borrower shall place and install equipment in accordance with the agreed program plan, as shown in the annex or appendix.

H. During the period of the loan, the borrower shall operate and maintain equipment in proper condition, ensure the continued operability of the equipment, and permit inspection by the lender at any reasonable time.

I. In the event of loss or damage of any equipment loaned under this MOC and for which the borrower assumed custody and possession, the borrower shall compensate the lender for the value (as identified by the lender in paragraph I of this Article) of the lost or damaged equipment.

J. Any equipment exchanged under this MOC shall be solely for research or developmental purposes and shall not be used in any way whatsoever for active civil aviation or other operational use.

K. Any transfers of technology, equipment or other items pursuant to this MOC shall be subject to the applicable laws and policies of the parties.

ARTICLE V--FUNDING

A. Unless otherwise specified in the annexes or appendices to this MOC, each party shall assume the cost of work to be done by it, in accordance with specific tasks identified in the annexes and appendices.

B. MOC number NAT-I-3422 has been assigned by the FAA to identify this cooperative program and shall be referenced in all correspondence related to this MOC.

ARTICLE VI--RIGHTS

Except as required by applicable law, neither party shall release any information or material pertinent to the tasks or related to the agreed program to third parties other than contractors or subcontractors engaged in the program.

ARTICLE VII--LIABILITY

The DGAC, on behalf of the Government of Chile, agrees to defend any suit brought against the Government of the United States, the FAA, or any instrumentality or officer of the United States arising out of work performed under this MOC or its annexes and appendices. The DGAC, on behalf of the Government of Chile, further agrees to hold the United States, the FAA, or any instrumentality or officer of the United States harmless against any claim by the Government of Chile, or by any agency thereof, or by third persons for personal injury, death, or property damage arising out of work performed under this MOC or its annexes and appendices.

ARTICLE VIII--AMENDMENTS

This MOC or its annexes or appendices may be amended by mutual consent of the parties. The details of any such amendment shall be memorialized in a document signed by both parties.

ARTICLE IX--RESOLUTION OF DISAGREEMENTS

Any disagreement regarding the interpretation or application of this MOC or its annexes and appendices shall be resolved by consultations between the parties and shall not be referred to any international tribunal or third party for settlement.

ARTICLE X--ENTRY INTO FORCE AND TERMINATION

A. This MOC shall enter into force on the date of the last signature and shall remain in force until terminated.

B. This MOC or its annexes or appendices may be terminated at any time by either party by providing sixty (60) days notice in writing to the other party. Termination of this MOC shall not affect existing obligations of the parties under Articles V, VI, VII, and IX. Each party shall have one hundred twenty (120) days to close out its activities following termination of this MOC or its annexes or appendices. Termination of this MOC also shall terminate all annexes and appendices subsequently concluded by the parties pursuant to this MOC.

ARTICLE XI--SIGNATURE IN COUNTERPARTS

To facilitate execution, this MOC or its annexes or appendices may be executed in as many counterparts as may be required. It shall not be necessary that the signature of or on behalf of each party appear on each counterpart, but it shall be sufficient that the signature of or on behalf of each party appear on one or more of the counterparts. All counterparts shall collectively constitute a single agreement.

ARTICLE XII--AUTHORITY

The FAA and the DGAC agree to the provisions of this MOC as indicated by the signature of their duly authorized representatives.

FEDERAL AVIATION ADMINISTRATION
DEPARTMENT OF TRANSPORTATION
UNITED STATES OF AMERICA

DIRECTORATE GENERAL FOR
CIVIL AERONAUTICS
MINISTRY OF DEFENSE
REPUBLIC OF CHILE

By: Joan Bauerlein
Joan Bauerlein
Title: Director, Office of
International Aviation
Date: 11 July 1997

By: Aerea Gonzalo Miranda A.
Gen. de Brig. Aerea Gonzalo Miranda A.
Title: Director General of Civil Aeronautics
Date: 11 Jul 97

ANNEX 1
TO
MEMORANDUM OF COOPERATION NAT-I-3422
BETWEEN THE
FEDERAL AVIATION ADMINISTRATION
DEPARTMENT OF TRANSPORTATION
UNITED STATES OF AMERICA
AND THE
DIRECTORATE GENERAL OF CIVIL AERONAUTICS
MINISTRY OF DEFENSE
REPUBLIC OF CHILE
DEVELOPMENT OF GLOBAL NAVIGATION SATELLITE
SYSTEMS TECHNOLOGIES

ARTICLE I--PURPOSE

This Annex 1 to Memorandum of Cooperation NAT-I-3422 (the MOC) sets forth the terms, conditions, and specific objectives under which the Federal Aviation Administration (FAA) and the Directorate General of Civil Aeronautics (DGAC) of the Republic of Chile shall cooperate in the research and development of a seamless, interoperable Global Navigation Satellite System (GNSS) for civil aviation. Both parties intend to realize the benefits that satellite navigation, with its increased accuracy, availability, and integrity, can bring to their Air Traffic Management (ATM) systems while decreasing reliance on more expensive and difficult to maintain ground-based navigation systems. The FAA and DGAC agree to coordinate activities, within the constraints of national budgets and resources, and share appropriate information resulting from related studies, tests, and analyses.

ARTICLE II--OBJECTIVES

Using the Global Positioning System (GPS) as the foundation, the FAA and the DGAC shall pursue cooperative efforts to achieve the following objectives:

A. Validate GNSS as an enroute, terminal area, and non-precision approach aid.

B. Determine the augmentation needed to enable GPS to be used as a primary means of navigation for operations in Chile.

C. Investigate using a Wide Area Augmentation System (WAAS) in Chilean-controlled airspace and evaluate the performance of a WAAS in extreme southern latitudes near the limits of INMARSAT transponder coverage.

D. Investigate using Local Area Augmentation System (LAAS) technology to realize CAT 1/2/3 capability at appropriate Chilean airports and to supplement a WAAS where necessary.

E. Investigate using GPS pseudolites and kinematic carrier phase tracking in support of establishing GPS as a primary navigation aid for Category 1/2/3 precision approaches.

F. Explore the initiation of in-service data collection arrangements with US and Chilean air carriers to validate GPS accuracy data for all phases of flight, including en-route, precision approach, non-precision approach, and ground movement.

G. Share raw and processed (i) data collected from investigations, experiments, trials, and flight tests by the FAA and DGAC; (ii) data on present and future GPS performance, availability, orbital characteristics, signal coverage, and system accuracy; and (iii) data on GNSS modeling, tests, and development activities.

H. Exchange information on the development of standards and procedures for the certification of GNSS technologies.

ARTICLE III--SCOPE OF WORK

A. The work conducted under this Annex shall be concerned with performance, testing, and evaluation of the GPS and GPS augmentations, leading to implementation of a seamless operational GNSS that is interoperable with FAA systems. The purpose of this Annex may be achieved by working in any of the following areas:

1. Basic GPS-The FAA and DGAC shall analyze the potential uses and benefits of using the basic GPS Standard Positioning Service to its full capability within Chile and explore efforts to expand the umbrella of GPS benefits to the entire South American continent.

2. WAAS-The FAA and DGAC may conduct joint studies through the FAA's National Satellite Test Bed by performing data collection and analysis regarding wide area augmentation operational performance. Emphasis shall be placed on determining the feasibility of adopting this technology/service for operational use in Chile. Specific areas of work may include:

- a. Satellite ephemeris determination using an increased baseline;

- b. Strengths and weaknesses of WAAS performance at low mask angles and under low latitude atmospheric conditions;
- c. Communication reliability and performance from remote WAAS reference sites using both conventional and satellite communications;
- d. Data collection and analysis of WAAS operational performance in the southern latitudes to support the reduction of separation between aircraft; and
- e. Use of WAAS accuracy corrections to support Category 1 precision approach operations in southern latitudes.

3. LAAS-The FAA and DGAC may perform studies on LAAS capabilities with a view to implementing this technology in the Chilean aviation in the appropriate circumstances.

4. ATM Support-The FAA may assist the DGAC with the development of procedures and standards, including those related to certification and flight inspection, needed to implement a GNSS-based air traffic management system in Chile.

B. In the event resources and budgets constrain cooperative activities in these matters, the FAA may provide the DGAC with information on industry representatives that may be available to assist the DGAC in its GNSS research and development work.

ARTICLE IV--IMPLEMENTATION

A. Specific cooperative activities under this Annex shall be specified in sequentially numbered appendices which shall become part of this Annex when signed by the Parties.

B. Each appendix shall contain a description of the cooperative work to be performed by the FAA and DGAC, including schedules, tasks, personnel, responsible organizations, other resources required to accomplish the work, and the estimated cost of the work.

C. Representatives from the FAA and the DGAC shall periodically discuss potential new GNSS-related program activities. Joint reviews of the program status of ongoing activities shall be conducted as agreed upon by both parties.

D. The participation of each party in cooperative activities under this MOC is subject to the availability of appropriated or other funds and the personnel and other resources necessary to the work to be performed.

ARTICLE V--POINTS OF CONTACT

A. The designated officers for the coordination and management of this Annex are:

1. For the FAA: Theodore H. Davies, Manager
Research and Acquisitions International Div.
(AAR-300)
Office of Aviation Research
Federal Aviation Administration
800 Independence Avenue, S. W.
Washington, D.C. 20591
United States
Telephone: (202) 267-7894
Facsimile: (202) 267-5071
2. For the DGAC: General Brigada de Aerea Gonzalo Miranda A.
Director General
Dirección General de Aeronautica Civil
A Miguel Claro, 1314
Clasificador 3; Correo 9
Santiago, Chile
Telephone: [56] (2) 204-7676
Facsimile: [56] (2) 209-0532

B. The designated officers for the technical coordination of work to be carried out under this Annex are:

1. For the FAA: Mr. James C. Johns
GPS Product Team Lead (AND-730)
Federal Aviation Administration
800 Independence Avenue, S.W.
Washington, D.C. 20591
United States
Telephone: (202) 358-5464
Facsimile: (202) 358-5486
2. For the DGAC: José Manuel Sánchez
Sub-Director of Projects and Organizational
Development
Dirección General de Aeronautica Civil
A Miguel Claro, 1314
Clasificador 3; Correo 9
Santiago, Chile
Telephone: [56] (2) 204-7676
Facsimile: [56] (2) 209-0532

C. The project officers designated above shall generally manage cooperative activities performed under this Annex. Participation in either FAA or DGAC pro-

grams may be delegated by the project officers to authorized program personnel, as appropriate.

ARTICLE VI--FUNDING

Each party shall bear the costs associated with the work it performs under this Annex. The funds required to support activities under this Annex shall be described in appendices to this Annex. Such funds may be limited due to limitations of national budgets and resources. Each appendix shall set forth the specific and detailed financial arrangements concerning the activities described in that appendix.

ARTICLE VII--RIGHTS IN DATA

A. For the purposes of this Annex, "proprietary information" shall mean information received by one party from the other which qualifies for non-disclosure under the U.S. Freedom of Information Act, 5 U.S.C. 552, and/or which is marked as follows:

PROPRIETARY INFORMATION -- DO NOT DISCLOSE

This information is proprietary to

(name of contractor, or owner)

and shall not be disclosed outside

of the Government. See Annex 1 to

Memorandum of Cooperation NAT-I-3422

B. Unless otherwise agreed in writing between the parties, the exchange of proprietary information shall be subject to the following terms and conditions:

1. For a period of five (5) years from the date of receipt, all proprietary information shall be maintained in confidence with the same degree of care as each party normally uses in the protection of its own proprietary information of like kind, but in no case with any less degree than reasonable care. At the end of such five (5) year period, all proprietary information shall be returned to the party who provided the proprietary information, except under such conditions as the parties may agree in writing. Proprietary information received from third parties to this Annex, under conditions of disclosure and use more restrictive than those enumerated in this Annex, shall continue to be subject to those conditions under which they were provided by such third parties to any party to this Annex. Nothing in this Annex shall diminish or compromise rights held by third parties in proprietary information. Each party further agrees not to use any proprietary

information received from the other except for the purposes contemplated by this Annex.

2. All tangible information, including drawings, specifications, and other information submitted hereunder and any software or hardware exchanged by one party to the other shall remain the property of the submitting party.

3. The receiving party shall not disclose any proprietary information unless it first complies with all applicable laws and regulations pertaining thereto, including but not limited to, laws restricting the export of technical data or computer software.

C. Except as may be mutually agreed to by the parties to this Annex, all intellectual property, including patents, copyrights, trade secrets, and all technical data, and computer software developed by the DGAC (or its subcontractors) in performing any activities under this Annex shall be the property of the DGAC (or the appropriate subcontractor), and all technical data, and computer software developed by the FAA in performing any activities under this Annex shall be the property of the FAA. Agreements with subcontractors shall include such terms and conditions as may be necessary to give effect to this Article VII. Each party shall grant to the other a worldwide, paid-up, nontransferable, irrevocable license to use the intellectual property, technical data, or computer software for government purposes. Each party agrees to execute such further documents as may be necessary or appropriate to give effect to the foregoing.

ARTICLE VIII--ENTRY INTO FORCE AND TERMINATION

This Annex shall enter into force on the date of the last signature and shall remain in force until terminated in accordance with Article X of the MOC. Termination of this Annex shall terminate all appendices subsequently concluded by the parties pursuant to this Annex.

ARTICLE IX--AUTHORITY

The FAA and the DGAC agree to the provisions of this Annex as indicated by the signatures of their duly authorized representatives.

FEDERAL AVIATION ADMINISTRATION
DEPARTMENT OF TRANSPORTATION
UNITED STATES OF AMERICA

DIRECTORATE GENERAL OF
CIVIL AERONAUTICS
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