TC 20

TECHNICAL REPORT

RAPPORT TECHNIQUE

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Aerospace — Standards for electronic instruments and systems

Aéronautique et espace — Normes d'instruments et de systèmes électroniques

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The main task of technical committees is to prepare International Standards. In exceptional circumstances a technical committee may propose the publication of a Technical Report of one of the following types:

— type 1, when the required support cannot be obtained for the publication of an International Standard, despite repeated efforts;

— type 2, when the subject is still under technical development or where for any other reason there is the future but not immediate possibility of an agreement on an International Standard;

— type 3, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example).

Technical Reports of types 1 and 2 are subject to review within three years of publication, to decide whether they can be transformed into International Standards. Technical Reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

ISO/TR 10201, which is a Technical Report of type 3, was prepared by Technical Committee ISO/TC 20, *Aircraft and space vehicles.*

This second edition cancels and replaces the first edition (ISO/TR 10201 : 1989), which has been updated.

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Avant-propos

L'ISO (Organisation internationale de normalisation) est une fédération mondiale d'organismes nationaux de normalisation (comités membres de l'ISO). L'élaboration des Normes internationales est en général confiée aux comités techniques de l'ISO. Chaque comité membre intéressé par une étude a le droit de faire partie du comité technique créé à cet effet. Les organisations internationales, gouvernementales et non gouvernementales, en liaison avec l'ISO participent également aux travaux. L'ISO collabore étroitement avec la Commission électrotechnique internationale (CEI) en ce qui concerne la normalisation électrotechnique.

La tâche principale des comités techniques est d'élaborer les Normes internationales. Exceptionnellement, un comité technique peut proposer la publication d'un rapport technique de l'un des types suivants:

— type 1, lorsque, en dépit de maints efforts, l'accord requis ne peut être réalisé en faveur de la publication d'une Norme internationale;

— type 2, lorsque le sujet en question est encore en cours de développement technique ou lorsque, pour toute autre raison, la possibilité d'un accord pour la publication d'une Norme internationale peut être envisagée pour l'avenir mais pas dans l'immédiat;

— type 3, lorsqu'un comité technique a réuni des données de nature différente de celles qui sont normalement publiées comme Normes internationales (ceci pouvant comprendre des informations sur l'état de la technique, par exemple).

Les rapports techniques des types 1 et 2 font l'objet d'un nouvel examen trois ans au plus tard après leur publication afin de décider éventuellement de leur transformation en Normes internationales. Les rapports techniques du type 3 ne doivent pas nécessairement être révisés avant que les données fournies ne soient plus jugées valables ou utiles.

L'ISO/TR 10201, rapport technique du type 3, a été élaboré par le comité technique ISO/TC 20, *Aéronautique et espace*.

Cette deuxième édition annule et remplace la première édition (ISO/TR 10201 : 1989), dont elle constitue une mise à jour.

Aerospace — Standards for electronic instruments and systems

Introduction

ISO/TC 20, *Aircraft and space vehicles*, established a Working Group (WG 2) to evaluate the status and future needs for standards in the field of aerospace electronic instruments and systems. One of the first tasks of WG 2 was to develop a comprehensive list of standards currently being used by countries which manufacture, operate, or regulate the operation and manufacture of aerospace products. This list can then serve as a basis for identifying voids and future needs for standards.

The list provided has been repeatedly circulated to TC 20 members and liaison organizations to obtain the most complete and current information, as well as an indication of how widely these standards are being applied.

Responses indicate that these standards have wide recognition and application by a majority of the countries most actively involved in the manufacture and operation of aircraft. TC 20 has also coordinated with international, regional and national standards bodies which are active in developing widely recognized avionics standards.

The list is divided into four categories:

1) Communications systems

2) Navigation and guidance systems

3) Flight management systems, cockpit controls/displays and instruments

4) Miscellaneous and general applications.

Each category comprises a list of the appropriate standards developed and issued by the various organizations.

The list is as complete and accurate as possible at this time. It is recognized, however, that this information will change. TC 20 therefore intends to update the list every eighteen months before the TC 20 plenary meetings.

Aéronautique et espace — Normes d'instruments et de systèmes électroniques

Introduction

Le comité technique ISO/TC 20, *Aéronautique et espace*, a créé un groupe de travail (GT 2) pour dresser un état de la normalisation actuelle et des besoins futurs en matière d'instrumentation et de systèmes électroniques pour l'aéronautique et l'espace. L'une des premières tâches du GT 2 a été d'établir une liste complète des normes actuellement utilisées par les pays fabriquant ou exploitant les produits aéronautiques, ou réglementant leur fabrication et leur exploitation. Cette liste peut servir de base dans l'identification des manques et des besoins futurs en matière de normes.

La liste établie a été diffusée plusieurs fois aux membres du TC 20 et aux organismes avec lesquels ce comité entretient une liaison, de façon à la compléter et à la mettre à jour, d'une part, et à connaître également dans quelle mesure ces normes sont mises en application, d'autre part.

Les réponses indiquent que ces normes sont bien connues et bien utilisées par une majorité des pays les plus activement impliqués dans la fabrication et l'exploitation des aéronefs. Le TC 20 a également coordonné ses travaux avec ceux des organismes internationaux, régionaux et nationaux s'occupant activement de la mise au point de normes d'électronique aérospatiale.

La liste est divisée en quatre catégories:

1) Systèmes de communication

2) Systèmes de navigation et de guidage

3) Systèmes de gestion de vol, commandes et consoles de visualisation au poste de pilotage et instrumentation

4) Divers et applications générales.

Chaque catégorie comprend une liste des normes appropriées élaborées et publiées par les différents organismes.

La liste est aussi complète et aussi précise que possible à la date d'aujourd'hui. L'information ne cessant toutefois d'évoluer, le TC 20 a donc prévu de remettre la liste à jour dix-huit mois avant chaque réunion plénière du comité technique.

1 Communications systems
Systèmes de communication

1.1 FAA

TSO-C57	Aircraft Headsets and Speakers
TSO-C58	Aircraft Microphones
TSO-C31c	High Frequency (HF) Radio Communication Transmitting Equipment operating with the radio frequency of 1.5 to 30 megacycles
TSO-C32c	High Frequency (HF) Radio Communication Receiving Equipment operating within the radio frequency range of 1.5 to 30 megacycles
TSO-C37b	VHF Radio Communications Transmitting Equipment operating within the radio frequency range of 118-136 megacycles
TSO-C38b	VHF Radio Communications Receiving Equipment operating within the radio frequency range of 118-136 megacycles
TSO-C50c	Audio Selector Panels and Amplifiers
TSO-C59	Airbone Selective Calling Equipment (for air carrier aircraft)
TSO-C91	Emergency Locator Transmitters

1.2 ARINC (AEEC)

412	Audio Systems
538B	Hand-Held Microphone
559A-2	Mark 2 Airborne HF/SSB
560	Airborne Passenger Address Amplifier
566A-7	Mark 3 VHF Transceiver
596-4	Mark 2 Airborne Selcal System
597-5 (8/90)	ARINC Communications Addressing and Reporting System
714-5	Airborne Selcal System
715-3	Airborne Passenger Address Amplifier
716-7 (7/87)	Airborne VHF Communications Transceiver
719-5	HF Single Sideband System
724-8 (7/87)	Mark 2 ARINC Communications Addressing and Reporting System
724A	Mark 2 Enhanced ACARS Avionics
740-1 (6/88)	Multiple Input Cockpit Printer

1.3 RTCA

DO-136-68	Universal Air-Ground Digital Communication System Standards
DO-163-76	Minimum Performance Standards — Airborne High Frequency Radio Communications Transmitting and Receiving Equipment operating within the radio frequency of 1.5 to 30 megahertz
DO-169-79	VHF Air-Ground Communication Technology and Spectrum Utilization
DO-170-80	Audio Systems Characteristics and Minimum Performance Standards Aircraft Microphones (except carbon), Aircraft Headsets and Speakers, Aircraft Audio Selector Panels and Amplifiers
DO-186-84	Minimum Operational Performance Standards for Airborne Radio Communications Equipment operating within the radio frequency range of 117.975-137.000 MHz

DO-203-89	Minimum Operational Performance Standards for Mode S Airborne Data Link Processor
DO-205-90	Design Guidelines and Recommended Standards to Support Open Systems Interconnection for Aeronautical Mobile Digital Communications. Part 1 — Internetworking
DO-206-90	Minimum Aviation System Performance Standards for Radiodetermination Satellite Service (RDSS)

1.4 EUROCAE

1/WG4/65	MPS for radio survival beacons functioning on VHF MPS pour balises de survivance fonctionnant en VHF
ED-18	Audio systems characteristics and MPS for aircraft microphones
ED-23A	MPS for airborne VHF communication equipment operating in the frequency range 117.975-137.000 MHz MPS pour le matériel de bord de communications VHF fonctionnant dans la gamme de fréquence 117,975-137,000 MHz (Récepteur-Émetteur)
ED-25	MPS for experimental AEROSAT L-band avionics MPS pour équipement de bord expérimental AEROSAT en bande L

1.5 SAE

1.6 IEEE

1.7 ICAO

1	Annex 10 — Aeronautical Telecommunications, 1985, Amendments 1-68
2	Volume I, Part 1 — Equipment and Systems; Part 2 — Radio Frequencies
3	Volume II — Communications Procedures

1.8 ISO

2 Navigation and guidance systems
Systèmes de navigation et de guidage

2.1 FAA

TSO-C34d	ILS Glide Slope Receiving Equipment
TSO-C35d	Airborne Radio Marker Receiving Equipment
TSO-C36c	Airborne ILS Localizer Receiving Equipment
TSO-C40a	VOR Radio Receiving Equipment operating within the radio frequency range of 108-118 megacycles (for air carrier aircraft)
TSO-C41c	Airborne Radio Receiving and Direction Finding Equipment
TSO-C60	Airborne Loran A Receiving Equipment operating within the radio frequency range of 1800-2000 kilocycles (for air carrier aircraft)
TSO-C63b	Airborne Weather Radar Equipment
TSO-C65	Airborne Doppler Radar Ground Speed and/or Drift Angle Measuring Equipment (for air carrier aircraft)
TSO-C66b	Airborne Distance Measuring Equipment (for air carrier aircraft)
TSO-C67	Airborne Radar Altimeter Equipment (for air carrier aircraft)
TSO-C68	Airborne Automatic Dead Reckoning Computer Equipment utilizing aircraft heading and doppler-obtained ground speed and drift angle data (for air carrier aircraft)
TSO-C74c	Airborne ATC Transponder Equipment
TSO-C87	Airborne Low Range Radio Altimeter

TSO-C88	Automatic Pressure Altitude Digitizer Equipment
TSO-C92b	Ground Proximity Warning Glide Slope Deviation Alerting Equipment
TSO-C93	Airborne Interim Standard Microwave Landing System Converter Equipment
TSO-C94	Airborne OMEGA Receiving Equipment
TSO-C104	MLS Airborne Receiving Equipment
TSO-C106	Air Data Computer Minimum Performance Standard

2.2 ARINC (AEEC)

424-9 (3/90)	Area Navigation System Data Base
537-57	High Range Pulse Altimeter
552A-72	Radio Altimeter
561-11-75	Air Transport Inertial Navigation System — INS
568-8 (4/87)	Mark 3 Airborne Distance Measuring Equipment
569-60	Heading and Attitude Sensor (HAS)
570-3 (6-86)	Mark 3 Airborne ADF System
571-2-74	Inertial Sensor System (ISS)
572-1-71	Mark 2 Air Traffic Control Transponder
575-3-71	Mark 3 Subsonic Air Data System (Digital) DADS
576-69	Mark 4 Subsonic Air Data System (All Digital Outputs) DADS
577-1-75	Audible Warning System
578-4 (10/88)	Airborne ILS Receiver
579-2 (8/89)	Airborne VOR Receiver
580-76	Mark 1 OMEGA Navigation System
581-70	Mark 1 Area Navigation System
582-5-74	Mark 2 Area Navigation System
587-4-73	Air Transport Time/Frequency Collision Avoidance System
594-4 (3/84)	Ground Proximity Warning System
595-75	Barometric Altitude Rate Computer
599-1 (7/85)	Mark 2 OMEGA Navigation System
603-1 (11/85)	Airborne Computer Data Loader
704-5 (10/83)	Inertial Reference System
705-5 (4/85)	Attitude and Heading Reference System
706-4 (1/88)	Subsonic Air Data System
707-5-84	Radio Altimeter
708-5 (1/88)	Airborne Weather Radar
709-5-82	Airborne Distance Measuring Equipment
709A-87	Mark 6 Airborne Precision Distance Measuring Equipment (DME)
710-8-85	Airborne ILS Receiver
711-8 (7/87)	Airborne VOR Receiver
712-6-85	Airborne ADF Receiver

718-4 (12/89)	ATC Transponder (ATCRBD/DABS)
723-3 (1/88)	Ground Proximity Warning System
727-1-87	Airborne Microwave Landing System
730-3-82	Airborne Separation Assurance System
738-86	Air Data and Inertial Reference System (ADIRS)
741-0 (3/89)	Aviation Satellite Communications System (SATCOM), Part 2
741-1	Aviation Satellite System, Part 1, Aircraft Installation Standards
743 (3/90)	Airborne Global Positioning System Receiver

2.3 RTCA

DO-52-53	Calibration Procedures for Signal Generators used in the testing of VOR and ILS Receivers
DO-56-54	VOR Test Signals
DO-62-54	Calibration Procedures — Test Standard Omni-Bearing Selector Test Sets
DO-117-63	Standard Adjustment Criteria for Airborne Localizer and Glide Slope Receivers
DO-143-70	Minimum Performance Standards — Airborne Radio Marker Receiving Equipment Operating on 75 MHz
DO-144-70	Minimum Operational Characteristics — Airborne ATC Transponder
DO-148-70	Vol. I and II, A New Guidance System for Approach and Landing
DO-152-72	Minimum Operational Characteristics — Vertical Guidance Equipment Used in Airborne Volumetric Navigation Systems
DO-154-73	Recommended Basic Characteristics for Airborne Radio Homing and Alerting Equipment for use with Emergency Locator Transmitters (ELT)
DO-155-74	Minimum Operational Performance Standards — Airborne Low Range Radar Altimeters
DO-158-75	Minimum Performance Standards — Airborne Doppler Radar Navigation Equipment
DO-161A-76	Minimum Performance Standards — Airborne Ground Proximity Warning Equipment
DO-164A-79	Minimum Performance Standards — Airborne Omega Receiving Equipment
DO-166-77	Vol. I and II, Microwave Landing System (MLS) Implementation
DO-172-80	Minimum Operational Performance Standards for Airborne Radar Approach and Beacon Systems for Helicopters
DO-173-80	Minimum Operational Performance Standards for Airborne Weather and Ground Mapping Pulsed Radars
DO-174-81	Minimum Operational Performance Standards for Optional Equipment which displays Non-Radar Derived Data on Weather and Ground Mapping Radar Indicators
DO-177-81	Minimum Operational Performance Standards for Microwave Landings System (MLS) Airborne Receiving Equipment
DO-179-82	Minimum Operational Performance Standards for Automatic Direction Finding (ADF) Equipment
DO-180A-90	Minimum Operational Performance Standards for Airborne Area Navigation Equipment Using a Single Collocated VOR/DME Sensor Input
DO-181-83	Minimum Operational Performance Standards for Air Traffic Control Radar Beacon System/Mode Select (ATCRBS/Modes) Airborne Equipment
DO-182-82	Emergency Locator Transmitter (ELT) Equipment Installation and Performance
DO-183-83	Minimum Performance Standards Emergency Locator Transmitters Automatic Fixed-ELT (AF) Automatic Portable-ELT (AP) Automatic Deployable-ELT (AD) Survival-ELT(s) operating on 121.5 and 243.0 MHz
DO-184-83	Traffic Alert and Collision Avoidance System (TCAS) I Functional Guidelines
DO-185-84	Vol. I and II, Minimum Operational Performance Standards for Traffic Alert and Collision Avoidance Systems (TCAS) Airborne Equipment

DO-187-84 Minimum Operational Performance Standards for Airborne Area Navigation Equipment using multi-sensor inputs

DO-189-85 Minimum Operational Performance Standards for Airborne Distance Measuring Equipment (DME) operating within the radio frequency range of 960-1215 MHz

DO-190-86 Minimum Operational Performance Standards for Airborne Area Navigation Equipment using Omega/VLF inputs

DO-191-86 Minimum Operational Performance Standards for Airborne Thunderstorm Detection Equipment

DO-192-86 Minimum Operational Performance Standards for Airborne ILS Glide Slope Receiving Equipment operating within the radio frequency range of 328.6-335.4 MHz

DO-194-86 Minimum Operational Performance Standards for Airborne Area Navigation Equipment using Loran-C inputs

DO-195-86 Minimum Operational Performance Standards for Airborne ILS Localizer Receiving Equipment operating within the radio frequency range of 108-112 MHz

DO-196-86 Minimum Operational Performance Standards for Airborne VOR Receiving Equipment operating within the radio frequency range of 108-117.95 MHz

DO-197-87 Minimum Operational Performance Standards for an Active Traffic Alert and Collision Avoidance System I (Active TCAS I)

DO-198-88 Minimum Operational Performance Standards for Airborne MLS Area Navigation Equipment

DO-202-88 Report of Special Committee 159 on Minimum Aviation System Performance Standards (MASPS) for Global Positioning System (GPS)

DO-204-88 Minimum Operational Performance Standards for 406 MHz Emergency Locator Transmitters (ELT)

2.4 EUROCAE

1/WG7/70 MPS for airborne 75 MHz marker beacon receiving equipment
MPS pour le matériel de réception de bord de radio bornes 75 MHz

1/WG9/71 MPS for airborne secondary surveillance radar transponder apparatus
MPS pour le matériel transpondeur de bord de radar secondaire

1/WG9/71 Amendment No. 1. Measurement Procedures to 1/WG9/71
Modificatif nº 1 (méthodes de mesure) à la MPS pour le matériel transpondeur de bord de radar secondaire (1/WG9/71)

1/WG7C/74 MPS for airborne Doppler radar ground speed and/or drift angle measuring equipment
MPS pour l'équipement de bord radar doppler (mesurant la vitesse sol et la dérive)

2/WG7C/74 MPS for airborne automatic dead reckoning computer equipment utilizing aircraft heading and Doppler obtained velocity vector data
MPS pour le calculateur de bord automatique de navigation à l'estime utilisant les données vectorielles du cap de l'aéronef et de la vitesse obtenue par doppler

ED-22B MPS for airborne VOR receiving equipment
MPS pour les ensembles de réception de bord VOR

ED-26 MPS for airborne altitude measuring and coding systems
MPS pour systèmes de mesure et de codage d'altitude (matériel de bord)

ED-27 MOPR for airborne area navigation systems based on VOR and DME as sensors
MOPR pour les systèmes de navigation de surface (matériel de bord) utilisant les capteurs VOR et DME

ED-28 MPS for airborne area navigation computing equipment based on VOR and DME as sensors
MPS pour les calculateurs de bord de navigation de surface utilisant les capteurs VOR et DME

ED-29 MPS for airborne OMEGA navigation equipment
MPS pour l'équipement de bord de navigation OMEGA

ED-30 MPS for airborne low range radio (radar) altimeter equipment
MPS pour les radioaltimètres (ou altimètres radar) de bord à courte portée

ED-36A MOPR for microwave landing system (MLS) (airborne receiving equipment)
MOPR du système d'atterrissage hyperfréquences (MLS) (ensembles récepteurs de bord)

ED-38	MPS for airborne weather, ground mapping and assisted approach radars (including surface-based transponder beacon system characteristics) MPS pour radars de bord utilisés pour la météorologie, le repérage au sol et l'aide à l'approche (comprenant les caractéristiques des balises émettrices-réceptrices installées au sol)
ED-39	MOPR for airborne area navigation systems based on two DME as sensors MOPR pour les systèmes de bord de navigation de surface utilisant deux capteurs DME
ED-40	MPS for airborne computing equipment for area navigation system using two DME as sensors MPS pour calculateur de bord de système de navigation de surface utilisant deux capteurs DME
ED-43	MOPR for the SSR transponder and the altitude measurement and coding system MOPR du transpondeur SSR et des systèmes de mesure et de codage d'altitude
ED-46A	MPS for airborne ILS receiving equipment (localizer) MPS pour récepteurs ILS de bord (alignement de piste)
ED-47A	MPS for airborne ILS receiving equipment (glide path) MPS pour récepteurs ILS de bord (alignement de descente)
ED-51	MPS for airborne automatic direction finding equipment MPS pour radiocompas de bord
ED-52	MPS for ground conventional and Doppler VHF omnirange (C VOR and D VOR) equipment MPS de l'équipement sol radiophares omnidirectionnel VHF classique et doppler (VOR C et VOR D)
ED-53A	MOPS for microwave landing system (MLS) (ground equipment) MOPS pour les systèmes d'atterrissage hyperfréquences (MLS) (équipement sol)
ED-54	MOPR for distance measuring equipment interrogators (DME/N and DME/P) operating within the radiofrequency range 960-1 215 MHz (airborne equipment) MOPR pour les interrogateurs DME/N et DME/P fonctionnant dans la gamme de 960-1 215 MHz (équipement de bord)
ED-57	MPS for distance measuring equipment (DME/N and DME/P) (ground equipment) MPS pour l'équipement de mesure de distance (DME/N et DME/P) (équipement sol)
ED-58	MOPS for area navigation equipment using multi-sensor inputs (airborne equipment) MOPS pour l'équipement de navigation de surface utilisant des capteurs multiples (équipement de bord)

2.5 SAE

AS-791	Remote-Servoed Air Data Instruments (Turbine-Powered Subsonic Aircraft)
AS 8002	Air Data Computer, Minimum Performance Standard
AS-8003	Minimum Performance Standards for Automatic Pressure Altitude Reporting Code Generating Equipment
AS-8009	Pressure Altimeter Systems

2.6 IEEE

172-83	IEEE Standard Definitions of Navigation Aid Terms
173-59	Standards on Navigation Aids: Measurements
292-69	IEEE Specification Format for Single-Degree-of-Freedom Spring-Restrained Rate Gyros (reaffirmed 1986)
293-69	IEEE Test Procedure for Single-Degree-of-Freedom Spring-Restrained Rate Gyros (reaffirmed 1986)
337-72	IEEE Standard Specification Format Guide and Test Procedure for Linear, Single-Axis, Pendulous, Analog Torque Balance Accelerometer (reaffirmed 1978)
517-74	IEEE Standard Specification Format Guide and Test Procedure for Single-Degree-of-Freedom Rate-Integrating Gyros (reaffirmed 1988)
529-80	IEEE Supplement for Strapdown Applications to IEEE Standard Specification Format Guide and Test Procedure for Single-Degree-of-Freedom Rate-Integrating Gyros (reaffirmed 1988)
647-81	IEEE Standard Specification Format Guide and Test Procedure for Single-Axis Laser Gyros

2.7 ICAO

1	Circular 139, 3rd Edition, 1983 — Aviation Use of OMEGA
2	Circular 165, Issue #1, 1981 — Microwave Landing System (MLS)
3	Circular 195, 1985 — Airborne Collision Avoidance Systems
4	Circular 212, 1988 — Secondary Surveillance Radar Mode S Data Link

2.8 ISO

3 Flight management systems, cockpit controls/displays and instruments
Systèmes de gestion de vol, commandes et consoles de visualisation au poste de pilotage et instrumentation

3.1 FAA

TSO-C2c	Airspeed Indicator (Pitot Static)
TSO-C3b	Turn-and-Slip Indicator
TSO-C4c	Bank and Pitch Instruments (indicating gyro-stabilized type) (Gyroscopic horizon, attitude gyro)
TSO-C5c	Direction Instrument, non-magnetic, gyro-stabilized type (directional gyro)
TSO-C6c	Direction Instrument, magnetic (gyro-stabilized type)
TSO-C7c	Direction Instrument, magnetic, non-stabilized type (magnetic compass)
TSO-C8c	Rate of Climb Indicator, pressure actuated (vertical speed indicator)
TSO-C9c	Automatic Pilots
TSO-C10b	Aircraft Indicator, Altimeter, Pressure Actuated, Sensitive Type
TSO-C43	Temperature Indicators
TSO-C44a	Fuel Flowmeters
TSO-C45	Manifold Pressure Indicating Instruments
TSO-C46a	Maximum Allowable Airspeed Indicator Systems
TSO-C47	Pressure Instruments — Fuel, Oil and Hydraulic
TSO-C48	Carbon Monoxide Detector Instruments
TSO-C49a	Electric Tachometer Magnetic Drag (for air carrier aircraft)
TSO-C52a	Flight Directors
TSO-C54	Stall Warning Instruments
TSO-C55	Fuel and Oil Quantity Instruments (for reciprocating engine aircraft)
TSO-C113	Airborne Multi-Purpose Electronic Displays

3.2 ARINC (AEEC)

420-1-71	Standby Attitude Indicator
577-1-75	Audible Warning System
585-2-78	Electronic Chronometer System (draft 7)
594-4-84	Ground Proximity Warning System

601-81	Control/Display Interfaces
701-1-83	Flight Control Computer System
702-3-82	Flight Management Computer
703-2-83	Thrust Control Computer
705-5-85	Attitude and Heading Reference System
723-3 (1/88)	Ground Proximity Warning System
725-2-84	Electronic Flight Instruments (EFI)
726-1-81	Flight Warning Computer System
731-2-83	Electronic Chronometer
739-1 (6/90)	Multi-Purpose Control and Display Unit
741 (6/90)	Flight Data Recorder

3.3 RTCA

3.4 EUROCAE

ED-41	MPS for airborne fuel quantity gauging systems MPS pour les systèmes de bord de jaugeage de carburant
ED-42	MPS for fuel flowmeter systems to aircraft standards MPS pour débimètre de carburant d'aéronef

3.5 SAE

AS 391C	Airspeed Indicator (Pitot Static) (Reciprocating Engine Powered Aircraft)
AS 392C	Altimeter, Pressure Actuated Sensitive Type
AS 394A	Rate of Climb Indicator, Pressure Actuated (Vertical Speed Indicator)
AS 396B	Bank and Pitch Instruments (Indicating Stabilized Type) (Gyro-Scopic Horizon, Attitude Gyro)
AS 397A	Direction Instrument, Non-Magnetic, Stabilized Type (Directional Gyro)
AS 398A	Direction Instrument, Magnetic, Non-Stabilized Type (Magnetic Compass)
AS 399A	Direction Instrument, Magnetic (Stabilized Type)
AS 402A	Automatic Pilots
AS 403A	Stall Warning Instrument
AS 404B	Electric Tachometer: Magnetic Drag (Indicator and Generator)
AS 405B	Fuel and Oil Quantity Instruments
AS 406	Flight Directors (Turbine-Powered Subsonic Aircraft)
AS 407B	Fuel Flowmeters
AS 408B	Pressure Instruments — Fuel, Oil and Hydraulic (Reciprocating Engine Powered Aircraft)
AS 411A	Manifold Pressure Indicating Instruments
AS 412A	Carbon Monoxide Detector Instruments
AS 413B	Temperature Instruments (Reciprocating Engine Powered Aircraft)
AS 414A	Temperature Instruments (Turbine Powered Subsonic Aircraft)
AS 415	Altimeter, Pressure, Compensated (Turbine Powered Subsonic Aircraft)

AS 416	Directional Indicating System (Turbine Powered Subsonic Aircraft)
AS 418A	Maximum Allowable Air-Speed Instruments (Reciprocating Engine Powered Aircraft)
ARP 419	Automatic Pilot Installations
AS 420B	Flight Directors (Reciprocating Engine Powered Aircraft)
ARP 426	Compass System Installations
ARP 427	Pressure Ratio Instruments
AS 428	Exhaust Gas Temperature Instruments
AS 429	Rate of Climb (Vertical Speed) Indicator, Pressure Actuated (Turbine Powered Subsonic Aircraft)
AS 431A	True Mass Fuel Flow Instruments
AS 432A	Tachometer Instruments (Indicator and Generator)
ARP 435	Overspeed Warning Instrument (Turbine Powered Subsonic Aircraft)
AS 436	Mach Meters (Turbine Powered Subsonic Aircraft)
AS 437	Maximum Allowable Air Speed Instruments (Turbine Powered Subsonic Aircraft)
AS 439	Stall Warning Instrument (Turbine Powered Subsonic Aircraft)
AS 440	Automatic Pilots (Turbine Powered Subsonic Aircraft)
AS 443	Compass, Magnetic, Non-Stabilized Type (for turbine powered, subsonic aircraft)
AS 445	Fuel and Oil Quantity Instruments (Turbine Powered Subsonic Aircraft)
AS 793	Total Temperature Measuring Instruments (Turbine Powered Subsonic Aircraft)
ARP 794	Airstream Deviation Instrument (ADI)
ARP 1088	Aircraft Indicating Systems
AS 1162	Attitude Instruments, Pitch and Roll. Part I: Minimum Performance Standard for Equipment; Part II: Performance and Test Procedures
ARP 1874	Design Objectives for CRT Displays for Part 25 (Transport) Aircraft
ARP 4067	Design Objectives for CRT Displays for Part 23 Aircraft
ARP 4101	Flight Deck Layout and Facilities
ARP 4101/2	Pilot Visibility from the Flight Deck
ARP 4101/4	Flight Deck Environment
ARP 4101/5	Aircraft Circuit Breaker and Fuse Arrangement
ARP 4102	Flight Deck Panels, Controls, and Displays
ARP 4102/1	On Board Weight and Balance System
ARP 4102/2	Automatic Braking System (ABS)
ARP 4102/3	Flight Deck Tire Pressure Monitoring System (TPMS)
ARP 4102/4	Flight Deck Alerting System (FAS)
ARP 4102/5 Sec. I	Primary Flight Controls by Electrical Signaling
ARP 4102/5 Sec. III	Engine Controls by Electrical or Fiber Optic Signaling
ARP 4102/6	Communications and Navigation Equipment
ARP 4102/7	Electronic Displays
ARP 4102/8	Flight Deck, Head-Up Displays
ARP 4102/10	Collision Avoidance System

ARP 4102/11A	Airborne Windshear Systems
ARP 4103	Flight Deck Lighting for Commercial Transport Aircraft
ARP 4104	Design Objectives for Handling Qualities of Transport Aircraft
ARP 4105	Nomenclature and Abbreviations for Use on the Flight Deck
ARP 4107	Aerospace Glossary for Human Factors Engineers
AS 8001	Minimum Performance Standard for Bank & Pitch Instruments
AS 8004	Minimum Performance Standard for Turn and Slip Instruments
AS 8005	Minimum Performance Standard Temperature Instruments
AS 8007	Minimum Safe Performance over Speed Warning Instruments
AS 8010A	Minimum Performance Standard, Aviator's Breathing Oxygen Purity Standard
AS 8016	Vertical Velocity Instrument (Rate-of-Climb)
AS 8019	Airspeed Instruments
AS 8021	Minimum Performance Standard for Direction Instrument, Non-Magnetic (gyroscopically stabilized)
AS 8034	Minimum Performance Standards for Airborne Multipurpose Electronic Displays

3.6 IEEE

3.7 ICAO

DOC 9051	Airworthiness Technical Manual — Second Edition, 1987 — Performance Specifications and Testing of Mach Meters

3.8 ISO

268 : 1980	Aircraft -- Mechanical and electromechanical indicators — General requirements (confirmed 1990) Aéronefs — Instruments de bord mécaniques et électromécaniques — Caractéristiques générales (confirmée en 1990)

4 Miscellaneous and general applications
Divers et applications générales

4.1 FAA

TSO-C187	Multi-Sensor Systems

4.2 ARINC (AEEC)

404A-74	Air Transport Equipment Cases and Racking
406A-72	Airborne Electronic Equipment Standardized Interconnections and Index Pin Codes (Pinformation Report)
407-1-61	ARINC Synchro System Manual (Combined Issue of Report 407 and 407-1 "ARINC Synchro Signal Practices")
408A-76	Air Transport Indicator Cases and Mounting
413A-76	Guidance for Aircraft Electrical Power Utilization and Transient Protection
414-68	General Guidance for Equipment and Installation Designers
419-3-84	Digital Data System Compendium
421-71	Guidance for Standard Subdivision of ATA Spec 100 Numbering Systems for Avionics
422-72	Guidance for Modification Status Indicators and Avionics Service Bulletins
424-9 (3/90)	Area Navigation System Data Base

429-12 (7/90)	Mark 33 Digital Information Transfer Systems (DITS)
542-66	Airborne Oscillographic Flight Data Recorder
557-64	Airborne Voice Recorder
573-7-74	Aircraft Integrated Data System Mark 2 (AIDS)
574-73	Passenger Announcement, Entertainment and Service Multiplex System (PAX)
591-72	Quick Access Recorder for AIDS System (QAR)
592-73	Airborne Passenger Entertainment Tape Reproducer
600-7-87	Air Transport Avionics Equipment Interfaces
602-1-82	Test Equipment Guidance
602A-85	Test Equipment Guidance
603-1-85	Airborne Computer Data Loader
604-1 (10/88)	Guidance for Design and Use of Built-In-Test Equipment (BITE)
605-85	Users' Guide for ARINC 616 Avionics Subset of ATLAS Language
606-85	Guidance for Electrostatic Sensitive Device Utilization and Protection
607-86	Design Guidance for Avionic Equipment
608-87	Standard Modular Avionics Repair and Test (SMART™) System
609-87	Design Guidance for Aircraft Electrical Power Systems
610-87	Guidance for Design and Integration of Aircraft Avionics Equipment in Simulators
612-86	BITE Glossary
616-3-85	Avionics Subset of ATLAS Language
626-1 (6/87)	Standard ATLAS Subset for Modular Test
629 (3/90)	Multi-Transmitter Data Bus, Part 1, Technical Description
717-8 (10/88)	Flight Data Acquisition and Recording System
720-1-80	Digital Frequency/Function Selection (DFS)
722-80	Projection Video System
728-79	Avionics Refrigeration Cooling System (ARCS)
729-1-81	Analog and Discrete Data Converter System (ADDCS)
732-82	Mark 2 Airborne Passenger Audio Entertainment Tape Reproducer
737-85	On-Board Weight and Balance System

4.3 RTCA

DO-97-59	Aircraft Electronic Equipment Minimum Performance Standards — Their Purpose and Application
DO-127-65	Standard Procedure for the Measurement of Radio Frequency Radiation from Aviation Radio Receivers operating within the radio frequency range of 30-890 MC/s
DO-160C-89	Environmental Conditions and Test Procedures for Airborne Equipment
DO-167-77	Airborne Electronics and Electrical Equipment Reliability
DO-175-81	Minimum Operational Performance Standards for Ground-Based Automated Weather Observation Equipment