Reference List and How to Obtain Reference Materials

How to obtain reference material:

1. FAA Material:
   - FAA FARs are available on CD ROM for $99 at the Summit Aviation WEB site: http://www.summitaviation.com/ The CD ROM is $99.
   - TSO's (Technical Standard Orders) may be obtained from the FAA Aircraft Certification Service, Aircraft Engineering Division, Technical Programs/Continued Airworthiness Branch (AIR-120), 800 Independence Avenue, SW, Washington, D.C. 20591. If you have difficulty locating one call the AIR-100 secretary at (202) 267-9897.
   - ACs (Advisory Circulars). Copies of some ACs may be obtained free of charge from the U.S. Department of Transportation, Subsequent Distribution Office, Ardmore East Business Center, 3341 Q 75th Avenue, Landover, MD 20785. Other AC's may be purchased from the Superintendent of Documents, P. O. Box 371954, Pittsburgh, PA l5250-7954. Make check or money order payable to the Superintendent of Documents.
   - Many of the FAA ACs and TSOs related to avionics are on the AIR-100 WEB page at: http://www.faa.gov/avr/air/air100/100home.htm

1. FARs and JARs (Joint Aviation Regulations) CD entitled "JAA Documents on CD-ROM" can be obtained from: *(note: make sure to ask for the one that contains BOTH the JARs AND the FARs)*
   WESTWARD Digital Limited
   37 Windsor Street
   Cheltenham, GLOS, GL52 2DG
   UK
   FAX: + 44 1242 584139
2. SAE reference material can be obtained via the SAE WEB page: http://www.sae.org or call (412) 776-4970 or email publications@sae.org. Snail mail requests and checks should be sent to: Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096-0001
3. RTCA Minimum Operations Performance Standards (MOPS) documents can be obtained by calling RTCA at (202) 833-9339 or on the internet at www.rtca.org or by mailing a request and a check to RTCA, Inc., 1140 Connecticut Avenue, NW, Suite 1020, Washington, D.C. 20036-4001. Also see: http://www.rtca.org
4. See Microsoft WEB page for the Microsoft design philosophy and user interface guidelines. This type of documentation has proven useful in many domains for both designers, to ensure internal and external consistency of products, and users who are attempt to understand the logic (or philosophy) of systems (for ex. what conditions a particular color, icon, or control is used under). WEB page: http://www.microsoft.com/win32dev/uiguide
5. The FAA's Human Factors Team report on WEB: www.faa.gov/avr/afshome.htm
6. ICAO documents are available from International Civil Aviation Organization, 1000 Sherbrooke Street W, Suite 400, Montreal, Quebec, Canada H3A2R2.
7. ARINC documents are available from Aeronautical Radio, Inc., 2551 Riva Road, Annapolis, Maryland 21401-7465.

REFERENCE MATERIAL

Source	Number	Title	Date
FAA	§ 121.305	Flight and navigational equipment	
ARINC	Characteristic 751	Gate-Aircraft Terminal Environment Link (Gatelink) - Aircraft Side	January 199 4
ARINC	Specification 618	Air-Ground Character Oriented Protocol Specification	January 199 3
ARINC	Specification 429-1 4	Mark 33 Digital Information Transfer System (DTIS), dated	March 1993
ARINC	Specification 620-1	Data Link Ground System Standard and Interface Specification	January 199 4
ARINC	Specification 619	ACARS Protocols for Avionic End Systems	December 1 993
ARINC	Characteristic 702-4	Flight Management Computer, including Supplement 5	February 19 92
ARINC	Specification 631-1	Aviation Packet Communications Functional Description	January 199 3
ARINC	Specification 622-1	ATS Data Link Applications Over ACARS Air-Ground Network	November 1 993
ARINC	Characteristic 745-2,	Automatic Dependent Surveillance	June 1993.
ARINC	Characteristic 741,	Aviation Satellite Communication System	
ARINC	Characteristic 740-1	Multiple-Input Cockpit Printer	June 1988
ARINC	Characteristic 724B-2,	Aircraft Communications Addressing and Reporting System	November 1 993
FAA	§ 135.149	Equipment requirements: General	
FAA	§ 135.159	Equipment requirements: Carrying passengers under VFRat night or under VFR over-the-top conditions	
FAA	§ 135.163	Equipment requirements: Aircraft carrying passengers under IFR	
FAA	§ 23.1301 (3.651 and 3.652)	Equipment: Function and installation	
FAA	§ 23.1303 (3.655(a))	Flight and navigation instruments	
FAA	§ 23.1305 (3.655(b))	Powerplant instruments	
FAA	§ 23.1309	Equipment, systems, and installations	
FAA	§ 23.1311	Electronic display instrument systems	
FAA	§ 23.1321 (3.661 and 3.662)	Instruments: Arrangement and visibility	
FAA	§ 23.1322	Warning, caution, and advisory lights	
FAA	§ 23.1323 (3.663)	Airspeed indicating system	
FAA	§ 23.1331 (3.668)	Instruments using a power source	
FAA	§ 23.1335 (3.669)	Flight director systems	
FAA	§ 23.1351 (3.681, 3.682, and 3.685)	Electrical Systems and Equipment: General	
FAA	§ 23.1357 (3.6903.691, and 3.692)	Circuit protective devices	
FAA	§ 23.1365 (3.693)	Electric cables and equipment	
FAA	§ 23.1367 (3.694	Switches	

	and 3.695)		
FAA	§ 23.1381 (3.696 and 3.697)	Instrument lights	
FAA	§ 23.1431 (3.721)	Electronic equipment	
FAA	§ 23.1501 (3.735 and 3.737)	Operating Limitations and Information: General	
FAA	§ 23.1501 (3.735 and 3.737)	Operating Limitations and Information: General	
FAA	§ 23.1529	Instructions for Continued Airworthiness	
FAA	§ 23.1541 (3.755)	Markings and Placards: General	
FAA	§ 23.1543 (3.756)	Instrument markings: General	
FAA	§ 23.1545 (3.757)	Airspeed indicator	
FAA	§ 23.1549 (3.759)	Powerplant and auxiliary power unit instruments	
FAA	§ 23.1551 (3.760)	Oil quantity indicator	
FAA	§ 23.1553 (3.761)	Fuel quantity indicator	
FAA	§ 23.1555 (3.762)	Control markings	
FAA	§ 23.1559	Operating limitations placard	
FAA	§ 23.1581 (3.777)	Airplane Flight Manual and Approved Manual Material:	
FAA	§ 23.1583 (3.761 and 3.778)	General Operating limitations	
FAA	§ 23.771 (3.381)	Pilot compartment	
FAA	§ 23.773 (3.382)	Pilot compartment view	
FAA	§ 23.777 (3.3841)	Cockpit controls	
FAA	§ 23.901 (3.411)	Powerplant: Installation	
FAA	§ 91.205	Powered civil aircraft with standard category U.S. airworthiness certificates: Instrument and equipment requirements	
FAA	§ 23.1326	Pitot heat indication systems.	
FAA	§ 23.1326	Pitot heat indication systems.	
FAA	§ 23.1337 (3.6.71,3.672,3.673, 3.674)	Powerplant instruments installation	
FAA	§ 23.1337 (3.6.71,3.672,3.673, 3.674)	Powerplant instruments installation.	
FAA	§ 23.1353 (3.683)	Storage battery design and installation.	
FAA	§ 23.1353 (3.683)	Storage battery design and installation.	
FAA	§ 23.1359	Electrical system fire protection	
FAA	§ 23.1359	Electrical system fire protection	
FAA	§ 23.1361	Master switch arrangement	
FAA	§ 23.1361	Master switch arrangement	
FAA	AC 20-115B	Software (RTCA, Inc., Document RTCA/DO-178B) (Free)	Jan 11, 1993
FAA	AC 20-136	Protection of Aircraft Electrical/Electronic Systems Against the Indirect Effects of Lightning (Free)	
FAA	AC 20-88A	Guidelines on the Marking of Aircraft Powerplant Instruments (Displays)	
FAA	AC 21-16C(D?)	Radio Technical Commission for Aeronautics Document DO-160C(D?) (Free)	
FAA	AC 23-15	Small Airplane Certification Compliance Program	
FAA	AC 23-8A and AC 23-8A, Change 1	Flight Test Guide for Certification of Part 23 Airplanes	

FAA	AC 23.1309-1C	Equipment, Systems, and Installations in Part 23 Airplanes	June 3,1992 Aug. 5, 1992
FAA	AC 23.1311-1	Installation of Electronic Display Instrument Systems in Part 23 Airplanes	June 11, 1993
FAA	AC 25-11	Transport Category Airplane Electronic Display Systems (Free)	July, 1987
FAA	AC 25-15	Approval of Flight Management Systems in Transport Category Airplanes	
FAA	AC 25.1309-1A	System Design and Analysis	
FAA	AC 25.1523-1	Minimum Flightcrew	
FAA	AC 25.703-1	Takeoff Configuration Warning Systems	
FAA	AC 25.773-1	Pilot Compartment View Design Considerations	
FAA	CFR Part 25.1322		
	TSO-C112	Air Traffic Control Radar Beacon System/Mode Select (ATCRBS/Mode S) Airborne Equipment, dated	February 5, 1986.
FAA	TSO C113	Airborne Multipurpose Electronic Displays	Oct. 1986
ICAO	Annex 10-Volume II. Doc. 9524	FANS/4, Special Committee on Future Air Navigation Systems.	
ICAO	Doc 9578-AN/935, second edition	ATN Manual	November 1 9, 1993
RTCA	DO-236	Minimum Aviation System Performance Standards: Required Navigation Performance (RNP) for Area Navigation	January 1997
RTCA	DO-160D	Environmental Conditions and Test Procedures for Airborne Equipment	
RTCA	DO-178A/B	Software Considerations in Airborne Systems and Equipment Certification	
RTCA	D0-181A	Minimum Operational Performance Standards for Air Traffic Control Radar Beacon System/Mode Select (ATCRBS/Mode S) Airborne Equipment	January 14, 1992.
RTCA	D0-218	Minimum Operational Performance Standards for Mode S Aircraft Data Link Processor, dated.	August 27, 1993
RTCA	DO-219,	Minimum Operational Performance Standards (MOPS) for Two-Way Data Link (TWDL) Communications,	August 27, 1993.
SAE	ARP 4791	Human Engineering Recommendations for Data Link Systems.	
SAE	AIR 1093	Numeral, Letter and Symbol Dimensions for Aircraft Instrument Displays	
SAE	ARP 1068B	Flight Deck Instrumentation, Display Criteria and Associated Controls for Transport Aircraft	
SAE	ARP 1161	Crew Station Lighting—Commercial Aircraft	
SAE	ARP 1782	Photometric and Colorimetric Measurement Procedures for Airborne Direct View CRT Displays	
SAE	ARP 1834/A	Fault/Failure Analysis for Digital Systems and Equipment	
SAE	ARP 1874	Design Objectives for CRT Displays for Part 25	
SAE	ARP 1874	Design Objectives for CRT Displays for Part 25 (Transport) Aircraft	
SAE	ARP 268G	Location and Actuation of Flight Deck Controls for Transport Aircraft	
SAE	ARP 4032	SAE Human Engineering Considerations in the Application of Color to Electronic Aircraft Displays	

SAE	ARP 4032	Human Engineering Considerations in the Application of Color to Electronic Aircraft Displays	
SAE	ARP 4067	Design Objectives for CRT Displays for Part 23 Aircraft	
SAE	ARP 4101	Flight Deck Layout and Facilities	
SAE	ARP 4101	Flight Deck Layout and Facilities	
SAE	ARP 4102	Flight Deck Panels, Controls and Displays	
SAE	ARP 4102	Flight Deck Panels, Controls, and Displays	
SAE	ARP 4102/10A	Collision Avoidance Systems	
SAE	ARP 4102/4	Flight Deck Alerting System	July, 1988
SAE	ARP 4102/7	Electronic Display Symbology for EADI/PFD	July, 1988
SAE	ARP 4102/7	Electronic Displays	
SAE	ARP 4102/7	Electronic Displays	
SAE	ARP 4102/8	Flight Deck, Heads Up Displays	
SAE	ARP 4103	Flight Deck Lighting for Commercial Aircraft	
SAE	ARP 4103	Flight Deck Lighting for Commercial Transport Aircraft	
SAE	ARP 4105	Abbreviations and Acronyms for Use on the Flight Deck (Revision A)	
SAE	ARP 4153	Human Interface Criteria for Collision Avoidance Systems in Transport Aircraft	
SAE	ARP 4155	Human Interface Design Methodology for Integrated Display Symbology	
SAE	ARP 4155A	Human Interface Design Methodology for Integrated Display Symbology	
SAE	ARP 4256	Design Objectives for Liquid Crystal Displays for Part 25 (Transport) Aircraft	
SAE	ARP 4260	Photometric and Colorimetric Measurement Procedures for Airborne Flat Panel Displays (When Released)	
SAE	ARP 4297	Integration Procedures for the Introduction of New Systems to the Cockpit	
SAE	ARP 450D	Flight Deck Visual, Audible, and Tactile Signals	
SAE	ARP 4754	Certification Considerations for Highly-Integrated or complex Aircraft Systems	
SAE	ARP 4754	Certification Considerations for Highly Integrated or Complex Aircraft Systems.	
SAE	ARP 4761	Guidelines and Methods for Conducting the Safety Assessment Process on Civil Airborne Systems and Equipment	
SAE	ARP 4761	Guidelines and Methods for Conducting the Safety Assessment Process on Civil Airborne Systems and Equipment	
SAE	ARP 5365	Draft-E (or later version), Human Interface Criteria for Cockpit Display of Traffic Information	
SAE	ARP 571C	Flight Deck Controls and Displays for Communication and Navigation Equipment for Transport Aircraft	
SAE	ARP 926A/B	Fault/Failure Analysis Procedure	
SAE	AS 425C	Aerospace Standard on Nomenclature and Abbreviations for Use on the Flight Deck	December, 1985
SAE	AS 8034	Minimum Performance Standard for Airborne Multipurpose Electronic Displays	

General/ Other References

- Engineering Data Compendium, Human Perception and Performance, edited by Kenneth Boff and Janet Lincoln
- A Guide for the Approval of GPS Receiver Installation and Operation, FAA-P-8000-3, AFS 400 1096, DOT-VNTSC-FAA-96-18
- Guidelines for the Design of GPS and LORAN Receiver Controls and Displays, DOT/FAA/RD-95/1, DOT-VNTSC-FAA-95-7 (Huntley, 1995)
- FAA Human Factors and Operations Checklist for Standalone GPS Receivers (TSO C129 A1)
- NASA-STD-3000 Man-System Integration Standards
- Human Factors Design Guide, DOT/FAA/CT-96/1
- Human Factors for Flight Deck Certification Personnel, DOT/FS/AA/RD-93/5, DOT-VNTSC-FAA-93-4
- Billings, Aviation Automation
- Wiener, Human Factors in Aviation
- Hawkins, Human Factors in Flight
- Woods, et.al., Behind Human Error
- Military Standard 1472D, Human engineering design criteria for military systems, equipment, and facilities, 1989

Other references:

- List of documents available electronically (contact Kathy Abbott if you want a copy of any of these) 747_ats.doc is a Boeing document (non-proprietary) that describes air traffic requirements as it relates to future air navigation systems.
- tm109171.doc is a NASA report describing a design philosophy for the High Speed Civil Transport. Don't let its title for the HSCT deter you - most of the philosophy is generic and would be useful for you to examine.
- evalques.doc is a draft set of evaluation questions that might be asked of an applicant. We are developing this set of questions in aircraft certification as part of our effort to better address human performance. Comments and questions are welcome.
- Charlie Scanlon is the NASA point of contact on research on presentation of weather information in the flight deck. He can be reached at 757-864-2034.
  - The NASA Aviation Safety research Program has a URL at: http://www.hq.nasa.gov/office/aero/oastthp/programs/avsaf/avsafpro.htm

Advisory Circulars

2. AC 20-DC Draft 1.1 (or later version) Guidelines for Design Approval of Aircraft Data Communications Systems
5. AC 90-xx Draft Guidance for Use of Traffic Information Service

Technical Standard Orders

TSO-C129a Airborne Supplemental Navigation Equipment using the Global Positioning System

Radio Technical Commission for Aeronautics (RTCA)

1. Minimum Aviation System Performance Standards (MASPS) for Automatic Dependent Surveillance Broadcast (ADS-B), RTCA Special Committee 186
2. Guidance for Initial Implementation of Cockpit Display of Traffic Information, RTCA Special Committee 186, Working Group 3, RTCA Paper No. 275-97/SC-186-101
3. DO-239, Minimum Operational Performance Standards for Traffic Information Service (TIS) Data Link Applications

Other regulatory references:

Section 21.21 (2) "For an aircraft, that no feature or characteristic makes it unsafe for the category in which the certification is requested."

8. Other related material.

a. International Organization for Standardization (ISO) Standards; ISO 7498 - Basic Reference Model. This document can be obtained from the American National Standards Institute (ANSI), 11 West 42nd Street, New York, NY 10036.

b. International Telecommunication Union (ITU) Radio Regulations. This document may be obtained from the ITU in Geneva, Switzerland.

c. Air Transport Association of America (ATA) Information Transfer Subcommittee, Human Factors Requirements for Data Link, dated June 18, 1992.

9. Current industry and FAA datalink activities. Industry and FAA are currently working technical issues and developing documents for recognition by the FAA in advisory material. The draft versions of these documents contain material relevant to data communications systems and applications. Relevant material has been included in the body of this AC to allow for timely implementation of data communications systems and the applications and to minimize the implications of applying these documents to follow-on design approvals. The FAA intends to refer to these documents by reference only in future advisory material pertaining to the design approval of data communications systems and applications. This paragraph includes a summary of current industry activities.

- Flight Standards Service is planning to issue two documents to implement recommendations of the C/SOIT. Draft AC 120.COM will provide criteria for operational authorization. Draft Order 8400.DL will define the roles and responsibilities of FAA organizations involved in the implementation of data communications systems and applications for operational use.
- FAA/Joint Aviation Authority (JAA) 25.1309 Systems Design and Analysis Harmonization Working Group/ARAC Working Group is revising § 25.1309 of 14 CFR, the Joint Airworthiness Requirements (JAR) and associated AC 25.1309-1A and Advisory Material Joint (AMJ) 25.1309.
- RTCA SC-162 is developing a MOPS for ATN avionics.
- RTCA SC-189 and EUROCAE WG53 are developing guidelines for developing operational context, safety assessment, and performance requirements methodology for airborne data communications.
- RTCA SC-180 and EUROCAE WG 46 are developing guidelines for airborne systems and equipment to address increased complexity in hardware designs resulting from micro-circuit technology. RTCA and EUROCAE are planning to develop design assurance techniques that will consider errors in hardware designs for avionics systems.
- SAE Systems Integration Requirements Task Group (SIRT) is developing guidelines for systems development and supporting processes, which include the safety assessment, requirements validation, design verification, configuration management, process assurance, and certification.
- SAE S-18 is developing a handbook which provides tools and detailed information on safety assessments.

RESEARCH PAPER REFERENCES

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