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Advisory Circular

Subject: INDEX OF AVIATION TECHNICAL
STANDARD ORDERS

Date: 5-13-86
Initiated by: AWS-110

AC No: 20-110C
Change:

1. PURPOSE. This advisory circular (AC) describes the public procedure the Federal Aviation Administration (FAA) will use to develop and issue Technical Standard Orders (TSO's) for aeronautical products to be used on civil aircraft. The AC presents an index of the FAA TSO's which contain minimum performance standards for specified materials, parts, processes, and appliances used on civil aircraft. In addition to the current listing of TSO's in Appendixes 1 and 2, Appendix 3 of the AC contains a listing of TSO's being proposed and for which a notice of availability has been published in the Federal Register.

2. CANCELLATION. Advisory Circular 20-110B, Index of Aviation Technical Standard Orders, dated April 12, 1984, is canceled.

3. RELATED FAR SECTIONS. Federal Aviation Regulations (FAR), Part 21, Subpart O.

4. BACKGROUND. On June 2, 1980, by Amendment 21-50 to FAR 21, the FAA adopted a new public procedure for issuing TSO's for specified materials, parts, processes, and appliances used on civil aircraft, relocated the substance of Subpart A of FAR 37 to Subpart O of FAR 21, and revoked the remainder of FAR 37. Amendment 21-50 became effective on September 9, 1980.

5. PUBLIC PROCEDURE. The following is the public procedure the FAA will use to develop and issue final TSO's for specified articles used on civil aircraft:

a. The FAA will continue to develop proposed TSO's and will use, by reference in the TSO, documents prepared and issued by organizations such as the Radio Technical Commission for Aeronautics (RTCA) and the Society of Automotive Engineers (SAE). Notices of RTCA meetings and invitations will continue to be published in the Federal Register to allow public participation at the early stages of document development.

b. Documents prepared and issued by an organization that are incorporated by reference in proposed or final TSO's will be available to any interested person only from that organization.

c. Any person may request the Administrator to revise or issue a new TSO by submitting a description of the revision sought or a description of the new article for which a TSO is requested.

d. The FAA will use several methods to ensure that the public is afforded early opportunities to take part in the TSO decisionmaking process. Proposed TSO's are normally distributed to the public for comment through the use of mailing lists. Any individual or organization can request to be placed on the TSO mailing list. A notice of availability for comment of all proposed TSO's is published in the Federal Register, and a copy of the final TSO is mailed to all persons on the mailing list.

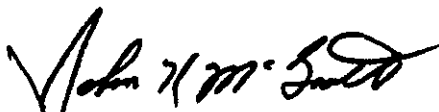
e. Any person wishing to submit comments on a proposed TSO will be given 90 days from its issuance date to do so. All comments received on or before the closing date for comments will be considered by the Administrator before issuing a final TSO. Late comments may also be considered as long as no additional expense or delay in processing the TSO is incurred.

f. All comments submitted will be available, both before and after the closing date for comments, for examination by interested persons. Comments are located in the FAA Headquarters Building (FOB-10A), Room 335, 800 Independence Avenue, SW., Washington, D.C. 20591, between 8:30 a.m. and 4:30 p.m., Monday thru Friday.

g. Copies of all proposed and final TSO's will also be available at FAA Headquarters in the Office of Airworthiness, Aircraft Engineering Division (AWS-100), and at all FAA Regional Aircraft Certification Offices (ACO's). Final TSO's will not be published in the Federal Register.

6. INDEX OF TSO's. For the reader's convenience, the index of TSO's is presented both in numerical sequence (Appendix 1) and in subject matter (Appendix 2). The proposed TSO's for which a notice of availability has been published are contained in Appendix 3. All TSO standards contained in FAR 37 Subpart B as of September 9, 1980, are current under the TSO revision program, unless Appendixes 1 and 2 of this AC show a more current revision letter.

7. HOW TO OBTAIN TSO's. To obtain a copy of any of the TSO's listed in Appendixes 1, 2, and 3, write to: Federal Aviation Administration, Office of Airworthiness, Aircraft Engineering Division (AWS-100), 800 Independence Avenue, SW., Washington, D.C. 20591. Indicate in your request whether you desire to have your name placed on our mailing list to receive future issuances of the TSO's, notices for public comment on proposed TSO's, or copies of proposed TSO's.



John K. McGrath
Acting Director of Airworthiness

APPENDIX 1
Index of TSO's in Numerical Sequence

<u>TSO Number</u>	<u>Subject Title</u>	
TSO-C1b	Cargo and Baggage Compartment Smoke Detection Instruments	
* TSO-C2c - 10/19/83	Airspeed Instruments	*
* TSO-C3c - 10/19/83	Turn and Slip Instrument	*
TSO-C4c	Bank and Pitch Instruments (Indicating Gyro-Stabilized Type) (Gyroscopic Horizon, Attitude Gyro)	
* TSO-C5d - 10/19/83	Direction Instrument, Non-magnetic (Gyrosocopically Stabilized)	*
TSO-C6c	Direction Instrument, Magnetic (Gyro-Stabilized Type)	
TSO-C7c	Direction Instrument, Magnetic Non-stabilized Type (Magnetic Compass)	
* TSO-C8c - 10/19/83	Vertical Velocity Instrument (Rate-of-Climb)	*
TSO-C9c	Automatic Pilots	
TSO-C10b	Aircraft Altimeter, Pressure Actuated Sensitive Type	
TSO-C11d	Fire Detectors (Thermal Sensing and Ionization Sensing Types)	
TSO-C12c	Liferafts (Twin Tube)	
* TSO-C13e - 4/23/86	Life Preservers	*
TSO-C14a	Aircraft Fabric, Intermediate Grade; External Covering Material	
TSO-C15c	Aircraft Fabric, Grade A; External Covering Material	
TSO-C16	Air-Speed Tubes (Electrically Heated)	

* Denotes New or Revised TSO

<u>TSO Number</u>	<u>Subject Title</u>	
TSO-C17a	Fire Resistant Aircraft Sheet and Structural Material	
TSO-C19b	Portable Water-Solution Type Fire Extinguishers	
TSO-C20	Combustion Heaters	
TSO-C21a	Special Aircraft Turnbuckle Assemblies and/or Turnbuckle Safetying Devices	
TSO-C22f	Safety Belts	
* TSO-C23c - 4/25/84	Personnel Parachute Assemblies	*
TSO-C25a	Aircraft Seats and Berths (Type I Transport, 6g Forward Load)	
* TSO-C26c - 5/18/84	Aircraft Wheels and Wheel-Brakes Assemblies,* with Addendum I	
TSO-C27	Twin Seaplane Floats	
TSO-C28	Aircraft Skis	
TSO-C30b	Aircraft Position Lights	
* TSO-C31d - 4/30/84	High Frequency (HF) Radio Communication Transmitting Equipment Operating Within the Radio Frequency Range of 1.5 to 30 Megahertz	*
* TSO-C32d - 4/30/84	High Frequency (HF) Radio Communication Receiving Equipment Operating Within the Radio Frequency Range of 1.5 to 30 Megahertz	*
* TSO-C34d - 4/19/84	ILS Glide Slope Receiving Equipment Operating within 328.6 to 335.4 Megahertz	*
TSO-C35d	Airborne Radio Marker Receiving Equipment	
* TSO-C36c - 3/21/84	ILS Localizer Receiving Equipment	*

* Denotes New or Revised TSO

<u>TSO Number</u>	<u>Subject Title</u>	
* TSO-C37c - 8/3/81	VHF Radio Communications Transmitting Equipment Operating Within 117.975 to 136.000 Megahertz	*
* TSO-C38c - 8/3/81	VHF Radio Communications Receiving Equipment Operating Within 117.975 to 136.000 Megahertz	*
TSO-C39a	Aircraft Seats and Berths	
* TSO-C40b - 8/3/81	VOR Radio Receiving Equipment Operating Within the Radio Frequency Range of 108-118 Megahertz	*
* TSO-C41d - 5/6/85	Airborne Automatic Direction Finding (ADF) Equipment	*
TSO-C42	Propeller Feathering Hose Assemblies (Rubber and Wire Braid Construction)	
* TSO-C43a - 8/18/83	Temperature Instruments	*
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-C50c - 1/31/83	Audio Selector Panels and Amplifiers	*
TSO-C51a	Aircraft Flight Recorder	
TSO-C52a	Flight Directors	

* Denotes New or Revised TSO

<u>TSO Number</u>	<u>Subject Title</u>	
TSO-C53a	Fuel and Engine Oil System Hose Assemblies (Rubber or Tetrafluoroethylene Tube and Wire Braid Construction)	
TSO-C54	Stall Warning Instruments	
TSO-C55	Fuel and Oil Quantity Instruments (For Reciprocating Engine Aircraft)	
* TSO-C56a - 4/12/84	Engine-Driven Direct Current Generators/ Starter-Generators	*
* TSO-C57a - 1/31/83	Aircraft Headsets and Speakers	*
* TSO-C58a - 1/31/83	Aircraft Microphones (For Air Carrier Aircraft)	*
TSO-C59	Airborne Selective Calling Equipment (For Air Carrier Aircraft)	
* TSO-C60a - 8/3/81	Airborne Loran-A and Loran-C Receiving Equipment Operating within the Radio Frequency Ranges of 1800-2000 Kilohertz and 90-110 Kilohertz Respectively	*
* TSO-C62c - 9/12/84	Aircraft Tires, with Addendum I	*
* TSO-C63c - 8/18/83	Airborne Weather and Ground Mapping Pulsed Radars	*
TSO-C64	Oxygen Mask Assembly Continuous Flow, Passenger (For Air Carrier Aircraft)	
* TSO-C65a - 8/18/84	Airborne Doppler Radar Ground Speed and/or Drift Angle Measuring Equipment (For Air Carrier Aircraft)	*
* TSO-C66b - 8/3/81	Distance Measuring Equipment (DME) Operating within the Radio Frequency Range of 960-1215 Megahertz	*
TSO-C67	Airborne Radar Altimeter Equipment (For Air Carrier Aircraft)	

* Denotes New or Revised TSO

<u>TSO Number</u>	<u>Subject Title</u>	
* TSO-C68a - 8/18/83	Airborne Automatic Dead Reckoning Computer Equipment Utilizing Aircraft Heading and Doppler Ground Speed and Drift Angle Data (For Air Carrier Aircraft)	*
* TSO-C69a - 6/3/83	Emergency Evacuation Slides, Ramps, and Slide/Raft Combinations	*
* TSO-C70a - 4/13/84	Liferafts (Reversible and Nonreversible)	*
TSO-C71	Airborne Static ("DC to DC") Electrical Power Converter (For Air Carrier Aircraft)	
TSO-C72b	Individual Flotation Devices	
TSO-C73	Static Electrical Power Inverter	
TSO-C74c	Airborne ATC Transponder Equipment	
TSO-C75	Hydraulic Hose Assemblies	
TSO-C76	Fuel Drain Valves	
* TSO-C77a - 7/20/81	Gas Turbine Auxiliary Power Units	*
TSO-C78	Crewmember Demand Oxygen Masks	
TSO-C79	Fire Detectors (Radiation Sensing Type)	
TSO-C80	Flexible Fuel and Oil Cell Material	
TSO-C84	Cockpit Voice Recorder	
TSO-C85	Survivor Locator Lights	
TSO-C87	Airborne Low-Range Radio Altimeter	
* TSO-C88a - 8/18/83	Automatic Pressure Altitude Reporting Code Generating Equipment	*
TSO-C89	Oxygen Regulators, Demand	
TSO-C90a	Cargo Pallets, Nets, and Containers	

* Denotes New or Revised TSO

Appendix 1

<u>TSO Number</u>	<u>Subject Title</u>	
* TSO-C91a - 4/29/85	Emergency Locator Transmitter (ELT) Equipment	*
TSO-C92b	Ground Proximity Warning-Glide Slope Deviation Alerting Equipment	
TSO-C93	Airborne Interim Standard Microwave Landing System Converter Equipment	
* TSO-C94a - 8/12/81	Omega Receiving Equipment Operating within the Radio Frequency Range of 10.2 to 13.6 Kilohertz	*
* TSO-C95 - 8/18/83	Mach Meters	*
* TSO-C96 - 6/22/82	Anticollision Light System	*
TSO-C97	Lithium Sulfur Dioxide Batteries	
* TSO-C99 - 6/27/84	Protective Breathing Equipment	*
* TSO-C100a - 3/15/85	Child Restraint Systems	*
* TSO-C102 - 4/2/84	Airborne Radar Approach and Beacon Systems for Helicopters	*
* TSO-C103 - 4/12/84	Continuous Flow Oxygen Mask Assembly (For Non-Transport Category Aircraft)	*
* TSO-C104 - 6/22/82	Microwave Landing Systems (MLS) Airborne Receiving Equipment	*
* TSO-C105 - 6/13/84	Optional Display Equipment for Weather and Ground Mapping Radar Indicators	*
* TSO-C109 - 12/9/85	Airborne Navigation Data Storage System	*
* TSO-C110 - 12/2/85	Airborne Passive Thunderstorm Detection Systems	*
* TSO-C112 - 2/5/86	Air Traffic Control Radar Beacon System/ Mode Select (ATCRBS/Mode S) Airborne Equipment	*

* Denotes New or Revised TSO

APPENDIX 2
Index of TSO's By Subject Matter

<u>Subject Title</u>	<u>TSO Number</u>
<u>Air Conditioning</u>	
Combustion Heaters	TSO-C20
<u>Auto Flight</u>	
Automatic Pilots	TSO-C9c
<u>Airborne Auxiliary Power</u>	
Gas Turbine Auxiliary Power Units	TSO-C77a
<u>Communications</u>	
<u>Amplifiers</u>	
Audio Selector Panels and Amplifiers	TSO-C50c
<u>Microphones</u>	
Aircraft Headsets and Speakers	TSO-C57a
Aircraft Microphones (Except Carbon)	TSO-C58a
<u>Selective Calling Equipment</u>	
Airborne Selective Calling Equipment (For Air Carrier Aircraft)	TSO-C59
<u>VHF</u>	
VHF Radio Communications Transmitting Equipment Operating Within 117.975 to 136.000 Megahertz	TSO-C37c
VHF Radio Communications Receiving Equipment Operating Within 117.975 to 136.000 Megahertz	TSO-C38c

Subject Title TSO Number

HF

High Frequency (HF) Radio Communication
Transmitting Equipment Operating within the
Radio Frequency Range of 1.5 to 30 Megahertz TSO-C31d

High Frequency (HF) Radio Communication
Receiving Equipment Operating within the
Radio Frequency Range of 1.5 to 30 Megahertz TSO-C32d

Voice Recorders

Cockpit Voice Recorder TSO-C84

Electrical Power

Airborne Static ("DC to DC")
Electrical Power Converter (For Air
Carrier Aircraft) TSO-C71

Engine-Driven Direct Current
Generators/Starter-Generators TSO-C56a

Lithium Sulfur Dioxide Batteries TSO-C97

Static Electrical Power Inverter TSO-C73

Equipment/Furnishings

Aircraft Fabrics

Aircraft Fabric Intermediate Grade;
External Covering Material TSO-C14a

Aircraft Fabric, Grade A; External
Covering Material TSO-C15c

Special Aircraft Turnbuckle Assemblies
and/or Turnbuckle Safetying Devices TSO-C21a

Child Restraint Systems TSO-C100a

<u>Subject Title</u>	<u>TSO Number</u>
<u>Seats, Berths, and Safety Belts</u>	
Aircraft Seats and Berths (Type I Transport, 6g Forward Load)	TSO-C25a
Aircraft Seats and Berths	TSO-C39a
Safety Belts	TSO-C22f
<u>Fire Protection</u>	
<u>Fire Detection</u>	
Fire Detectors (Thermal Sensing and Ionization Sensing Types)	TSO-C11d
Fire Detectors (Radiation Sensing Type)	TSO-C79
<u>Fire Extinguishers</u>	
Portable Water-Solution Type Fire Extinguishers	TSO-C19b
<u>Fire Resistant Material</u>	
Fire Resistant Aircraft Sheet and Structural Material	TSO-C17a
<u>Fuel</u>	
<u>Flowmeters</u>	
Fuel Flowmeters	TSO-C44a
<u>Fuel and Oil Cell Material</u>	
Flexible Fuel and Oil Cell Material	TSO-C80
<u>Fuel Hose Assemblies</u>	
Fuel and Engine Oil System Hose Assemblies (Rubber or Tetrafluoroethylene Tube and Wire Braid Construction)	TSO-C53a
<u>Fuel Valves</u>	
Fuel Drain Valves	TSO-C76

<u>Subject Title</u>	<u>TSO Number</u>
<u>Hydraulic</u>	
<u>Hose Assemblies</u>	
Hydraulic Hose Assemblies	TSO-C75
<u>Environmental Protection Equipment</u>	
<u>Air-Speed Tubes</u>	
Air-Speed Tubes (Electrically Heated)	TSO-C16
<u>Weather and Radar Equipment</u>	
Airborne Passive Thunderstorm Detection Systems	TSO-C110
Airborne Radar Approach and Beacon Systems for Helicopters	TSO-C102
Airborne Weather and Ground Mapping Pulsed Radars	TSO-C63c
<u>Instruments</u>	
<u>Detectors</u>	
Cargo and Baggage Compartment Smoke Detection Instruments	TSO-C1b
Carbon Monoxide Detector Instruments	TSO-C48
<u>Flight Instruments</u>	
Airborne Low-Range Radio Altimeter	TSO-C87
Airborne Radar Altimeter Equipment (For Air Carrier Aircraft)	TSO-C67
Aircraft Altimeter, Pressure Actuated Sensitive Type	TSO-C10b
Aircraft Flight Recorder	TSO-C51a
Airspeed Instruments	TSO-C2c
Automatic Pressure Altitude Reporting Code Generating Equipment	TSO-C88a

<u>Subject Title</u>	<u>TSO Number</u>
Bank and Pitch Instruments (Indicating Gyro-Stabilized Type) (Gyroscopic Horizon, Attitude Gyro)	TSO-C4c
Direction Instrument, Magnetic (Gyro-Stabilized Type)	TSO-C6c
Direction Instrument, Magnetic Non- stabilized Type (Magnetic Compass)	TSO-C7c
Direction Instrument, Non-Magnetic (Gyroscopically Stabilized)	TSO-C5d
Electric Tachometer, Magnetic Drag (for Air Carrier Aircraft)	TSO-C49a
Flight Directors	TSO-C52a
Maximum Allowable Airspeed Indicator Systems	TSO-C46a
Vertical Velocity Instrument (Rate-of-Climb)	TSO-C8c
Stall Warning Instruments	TSO-C54
Temperature Instruments	TSO-C43a
Turn and Slip Instruments	TSO-C3c
<u>Engine Instruments</u>	
Fuel and Oil Quantity Instruments (For Reciprocating Engine Aircraft)	TSO-C55
Manifold Pressure Indicating Instruments	TSO-C45
Pressure Instruments - Fuel, Oil, and Hydraulic	TSO-C47
<u>Landing Gear</u>	
Aircraft Skis	TSO-C28
Aircraft Tires, with Addendum I	TSO-C62c
Aircraft Wheels and Brakes, with Addendum I	TSO-C26c

<u>Subject Title</u>	<u>TSO Number</u>
Twin Seaplane Floats	TSO-C27
<u>Lights</u>	
Aircraft Position Lights	TSO-C30b
Anticollision Light System	TSO-C96
<u>Navigation Equipment</u>	
Airborne ATC Transponder Equipment	TSO-C74c
Airborne Automatic Dead Reckoning Computer Equipment Utilizing Aircraft Heading and Doppler Ground Speed and Drift Angle Data (For Air Carrier Aircraft)	TSO-C68a
Airborne Distance Measuring Equipment (DME) Operating within the Radio Frequency Range of 960-1215 Megahertz	TSO-C66b
Air Traffic Control Radar Beacon System/Mode Select (ATCRBS/Mode S) Airborne Equipment	TSO-C112
Airborne Doppler Radar Ground Speed and/or Drift Angle Measuring Equipment (For Air Carrier Aircraft)	TSO-C65a
Airborne ILS Glide Slope Receiving Equipment Operating within 328.6 to 335.4 Megahertz	TSO-C34d
Airborne ILS Localizer Receiving Equipment	TSO-C36d
Airborne Interim Standard Microwave Landing System Converter Equipment	TSO-C93
Airborne Loran-A Receiving Equipment Operating Within the Radio Frequency Range of 1800-2000 Kilocycles (For Air Carrier Aircraft)	TSO-C60a
Airborne Omega Receiving Equipment	TSO-C94a

<u>Subject Title</u>	<u>TSO Number</u>
Airborne Radio Receiving and Direction Finding Equipment	TSO-C35d
Airborne Automatic Direction Finding (ADF) Equipment	TSO-C41d
Airborne Navigation Data Storage System	TSO-C109
Airborne Weather and Ground Mapping Pulsed Radars	TSO-C63c
Optional Display Equipment for Weather and Ground Mapping Radar Indicators	TSO-C105
Microwave Landing Systems (MLS) Airborne Receiving Equipment	TSO-C104
VOR Radio Receiving Equipment Operating Within the Radio Frequency Range of 108-118 Megahertz	TSO-C40b
<u>Oxygen</u>	
<u>Crewmembers</u>	
Crewmember Demand Oxygen Masks	TSO-C78
Protective Breathing Equipment	TSO-C99
<u>Passenger</u>	
Oxygen Mask Assembly Continuous Flow, Passenger (For Air Carrier Aircraft)	TSO-C64
Continuous Flow Oxygen Mask Assembly (For Non-Transport Category Aircraft)	TSO-C103
<u>Regulators</u>	
Oxygen Regulators, Demand	TSO-C89
<u>Propellers</u>	
Hose Assemblies	
Propeller Feathering Hose Assemblies (Rubber and Wire Braid Construction)	TSO-C42

<u>Subject Title</u>	<u>TSO Number</u>
<u>Structure</u>	
Containers, Pallets, Nets	
Cargo Pallets, Nets, and Containers	TSO-C90a
<u>Survival Equipment</u>	
Ground Proximity Warning	
Ground Proximity Warning-Glide Slope Deviation Alerting Equipment	TSO-C92b
Locator Transmitter	
Emergency Locator Transmitter (ELT) Equipment	TSO-C91a
Rafts/Slides/Life Preservers/Parachutes	
Emergency Evacuation Slides	TSO-C69a
Individual Flotation Devices	TSO-C72b
Life Preservers	TSO-C13e
Life Rafts (Twin Tube)	TSO-C12c
Liferafts (Reversible and Nonreversible)	TSO-C70a
Personnel Parachute Assemblies	TSO-C23c

APPENDIX 3
Index of Proposed TSO's by Subject Matter

Notice of availability of the following proposed TSO's has been published in the Federal Register for public comment:

<u>Revised TSO's</u>	<u>TSO Number</u>
Powerplant Fire Detection Instruments (Thermal and Flame Contact Types)	TSO-C11e
Aircraft Altimeter, Pressure Actuated Sensitive Type	TSO-C10c
Bank and Pitch Instruments (Indicating Gyro-Stabilized Type, Gyroscopic Horizon, Attitude Gyro)	TSO-C4d
VHF Radio Communication Transmitting Equipment Operating within the Radio Frequency Range 117.975 to 136.000 Megahertz	TSO-C37d
VHF Radio Communication Receiving Equipment Operating within the Radio Frequency Range 117.975 to 136.000 Megahertz	TSO-C38d
Individual Flotation Devices	TSO-C72c
 <u>NEW TSO's</u>	
A-C Generators	TSO-C98
Overspeed Warning Instruments	TSO-C101
Air Data Computer	TSO-C106
Nickel Cadmium Vented Rechargeable Aircraft Batteries (Non-Sealed, Maintainable Type)	TSO-C107
General Aviation Flight Recorder	TSO-C111