

ORDER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

7100.9C

11/14/01

SUBJ: STANDARD TERMINAL ARRIVAL

1. PURPOSE. This order provides guidance and standardization for developing and managing the Standard Terminal Arrival (STAR) program.

2. DISTRIBUTION. This order is distributed in Washington headquarters at the division level of Flight Standards, branch level of Air Traffic, the offices of Airport Safety and Standards and Communications, Navigation, and Surveillance Systems, the National Flight Procedures Office (NFPO); the Regulatory Standards and Compliance Division at the Mike Monroney Aeronautical Center; regional Flight Standards and Air Traffic Divisions (ATD), all Air Traffic field offices and facilities, and special military and public addresses.

3. CANCELLATION. This order cancels Order 7100.9B, Standard Terminal Arrival, dated June 18, 1993, and Order 7100.11A, Flight Management System Procedures Program, dated May 22, 1996.

4. EFFECTIVE DATE. November 1, 2001.

5. BACKGROUND. The STAR program was developed to reduce pilot/controller workload and air/ground communications by providing a preplanned arrival procedure published in graphic and/or textual form. STAR's should be simple, understandable, and applicable to current air traffic control (ATC) radar/nonradar operations. This order provides guidelines that standardize the publication of STAR procedures.

6. EXPLANATION OF CHANGES. This order is revised to include area navigation (RNAV) criteria and to update responsible offices and activities for processing STAR requests. Proponent responsibilities for canceling and requesting STAR's were added. References to applicable terminal instrument procedures orders were added where appropriate. Applicable sections from Order 7100.11A are also included in this order.

7. DEFINITIONS. See appendix 1.

8. RELATED PUBLICATIONS.

- a. Order 1050.1, Policies and Procedures for Considering Environmental Impacts.
- b. Order 7130.3A, Holding Pattern Criteria.

- c. Order 7350.2, Air Traffic Operational Coding System.
- d. Order 7350.7, Location Identifiers.
- e. Order 7400.2, Procedures for Handling Airspace Matters.
- f. Order 8260.3, United States Standard for Terminal Instrument Procedures.
- g. Order 8260.19, Flight Procedures and Airspace.
- h. Order 8260.43, Flight Procedures Management Program.
- i. Order 8260.44, Civil Utilization of Area Navigation Departure Procedures.
- j. Order 8260.46, Instrument Departure Procedure Program.
- k. Notice 7110.217, Departure Procedures/Standard Terminal Arrival Route Transition to the North American Route Program.
- l. Notice 7210.360, Noise Screening Procedures Criteria for Certain Air Traffic Actions Above 3,000 Feet.
- m. ARINC Specification 424, Navigation System Databases.

9. FORMS USED.

- a. Form 7100-4, Standard Terminal Arrival; computer generated.
- b. Form 7110-3, Standard Terminal Arrival (continuation sheet); computer generated.
- c. Form 8260-2, Radio Fix and Holding Data Record; computer generated.

10. STAR CANCELLATION/REQUESTS.

a. Cancellation. STAR's may be canceled by ATC or the Department of Defense (DOD), as appropriate. A proponent recommendation for cancellation shall be made to the appropriate ATC facility.

b. Procedure Requests. STAR's are typically requested by the responsible air route traffic control center (ARTCC) servicing the terminal area approach control for the area/airport(s) affected, the terminal radar approach control facility, or another proponent; i.e., user organization, operators, airport authorities, regional and headquarters Air Traffic offices, etc. These requests shall be routed to the Regional Airspace Procedures Team (RAPT) (when established) for action in accordance with Order 8260.43. (Use the information contained in appendix 2 for guidance on procedure development.)

11. RESPONSIBILITIES.

a. Proponents shall:

Submit requests for STAR's to the RAPT in conjunction with a notification to the ARTCC's and ATC facility providing terminal approach control service to the airport(s). If the RAPT has not been established, submit the request to the controlling ARTCC.

(1) Provide expected benefits and a description of the STAR, including the proposed ground track with navigational aids (NAVAID)/fixes, waypoints, and altitudes; or

(2) Request assistance in development of the proposed STAR from the ARTCC or ATC facility providing terminal approach control service to the airport(s).

b. ATC. When assisting a proponent or initiating a STAR, the ARTCC and ATC facility providing terminal approach control service shall:

(1) Form a team with appropriate representation of involved parties; i.e., ATC management, National Air Traffic Controllers Association, Flight Procedures Office (FPO), lead carrier/operator, airport authorities, etc. Team composition should depend on the STAR complexity.

(2) Determine preliminary operational feasibility and verify derived significant benefits. Evaluate the ability to utilize the STAR and associated transitions to complement the North American Route Program.

(3) When requested, provide the proponent with information pertaining to traffic flows and operational constraints; i.e., arrival/departure routes, minimum instrument flight rules (IFR) altitudes, airspace boundaries, sector requirements, and standard operating procedures (SOP).

Note-

When an ATC facility proposes the development of a STAR, they should attempt to obtain a "lead operator" to ensure flyability, proper database coding, and assist in procedure development.

(4) If using a design tool such as the Terminal Area Route Generation, Evaluation, Traffic Simulation tool, provide Automated Radar Terminal System (ARTS) data and identify required video map requirements. ARTS data should be provided during all phases of the design process as necessary; i.e., design, testing, implementation, etc.

(5) Coordinate with other ATC facilities affected by the procedure concerning letters of agreement, handoff procedures, controller notifications, SOP's, etc.

(6) Review automation requirements; i.e., Host Computer System (HCS), ARTS, update cycles, moratoriums, coding options, etc., and coordinate with adjacent facilities regarding HCS automation changes.

(7) Serve as the focal point for all proponents ATC related coordination and provide assistance in resolving problems identified during the development process.

(8) Conduct a noise screening. The Air Traffic Noise Screening Model (ATNS) should be used for this purpose (see ATNS Version 2.0 User Manual, FAA-AEE-99-01, dated January 1999).

(9) Ensure the proposed procedure meets the requirements of the National Environmental Policy Act in compliance with Order 1050.1. Close coordination is required with the terminal procedures specialist and regional air traffic environmental specialist to ensure compliance with applicable environmental policies.

(10) Name all fixes and waypoints in a STAR. Coordinate with the servicing ARTCC to obtain the five-letter pronounceable names. Complete Form 8260-2 in accordance with Order 8260.19 for each fix/waypoint being established, modified, or canceled. Include worksheets as part of the STAR request package, as appropriate.

(11) Depict a STAR using a visual flight rules (VFR) sectional chart(s).

(12) Complete and forward the applicable Federal Aviation Administration (FAA) forms, environmental checklist, VFR sectional chart(s), and other appropriate documents to the appropriate ATD. The applicable form for a conventional STAR is Form 7100-4 and applicable forms for an RNAV STAR are Form 7100-4 and Form 7100-3.

(13) Conduct, as a minimum, a biennial review of existing STAR's for accuracy, simplicity, standardization, obsolescence, and adherence to criteria in this order and the latest edition of Orders 8260.3 and 8260.19. Forward changes or updates to the ATD.

c. The regional ATD shall:

(1) Ensure coordination with affected air traffic facilities was completed.

(2) Review each new or revised STAR to ensure accuracy and compliance with the provisions of this order.

(3) Forward the original, signed procedure and two additional copies of Form 7100-4 and attached graphic portrayal, plus two copies of applicable Forms 8260-2, environmental checklist, VFR sectional chart(s) depicting the STAR, and other appropriate documents to the FPO.

(4) After the FPO and NFPO review and flight check, forward the STAR package to the National Flight Data Center (NFDC) for an effective date and publication in the National Flight Data Digest (NFDD).

(5) Ensure biennial reviews by each facility.

d. The FPO shall:

(1) Review the STAR package for completeness. The review must also include evaluation for impact by current or proposed obstacle evaluations/airport airspace analysis, facilities and equipment, national change proposals, or other applicable projects. The FPO shall contact the submitting ATC facility to resolve any problems found during the review. ATC shall be responsible for additional coordination of changes identified during the review process.

(2) Facilitate review of the proposal and subsequent action by the RAPT, if appropriate.

(3) Transmit the STAR package to the NFPO.

e. The NFPO shall:

(1) Review the STAR for obstacle clearance, minimum en route IFR altitude (MEA), and bearing/distance between fixes/waypoints.

(2) Forward the STAR to Flight Inspection Central Operations for coordination of the flight inspection.

(3) Forward documentation of satisfactory flight inspection and completed Forms 7100-4 and 8260-2 to the requesting regional ATD for further processing.

f. The NFDC shall:

(1) Assign an effective date and publish the narrative description via the NFDD which authorizes charting and publication of the STAR.

(2) Verify waypoint names are not duplicated.

(3) Coordinate data errors, conflicts, and suggestions with the regional ATD.

(4) File and maintain the original signed copy of the forms in the National Repository.

(5) When notified that a public procedure has been canceled, reinstate waypoint names for future use.

12. ACCURACY VERIFICATION AND RESPONSIBILITIES. ATC facilities shall take the following action whenever errors are discovered in the NFDD or when reviewing a STAR:

a. Notify the NFDC and NFPO of charting errors by the fastest means available. The NFDC will take appropriate action.

b. Errors that affect safety of flight shall be identified to the appropriate ARTCC for Notice to Airman D action.

13. MILITARY PROCEDURES.

a. Military STAR's are generally handled and published in the same manner as civil STAR's. The FAA develops STAR's at joint-use airfields. All military-use STAR's are published as individual charts by the National Aeronautical Charting Office for publication in the Terminal Procedures Publication and duplicated in DOD Flight Information Publications.

Note—

Military STAR's/STAR transition(s) shall be named in accordance with the criteria outlined in this order.

b. FAA requires that all military STAR's be coordinated with the RAPT and FAA ATC facilities that have jurisdiction of the affected airspace. The ARTCC or regional ATD shall assist the military in coordinating procedures and in obtaining computer codes to ensure that the procedures are properly interfaced with the National Airspace System.

Note—

If the RAPT is not established, coordinate with the FAA ATC facilities.

c. When military STAR's affect airspace under the jurisdiction of FAA facilities, those facilities/ARTCC's shall maintain copies of the STAR.

d. After agreement between military services and FAA ATC, military STAR's shall be processed the same as civil STAR's with the FAA facility acting as the focal point for the military.



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Director of Air Traffic

APPENDIX 1. DEFINITIONS, ABBREVIATIONS, AND ACRONYMS

ARTCC	Air Route Traffic Control Center
ARTS	Automated Radar Terminal System
ATC	Air Traffic Control
ATD	Air Traffic Division
ATIS	Automated Terminal Information System
AWO	All Weather Operations
AWOS	Automated Weather Observation System
DF Direct to Fix	A segment following a flyover waypoint, climb to altitude, or radar vector, in which the aircraft's track is direct to the next waypoint.
DOD	Department of Defense
DME	Distance Measuring Equipment
FAA	Federal Aviation Administration
FICO	Flight Inspection Central Operations
Fix	A generic term used to define a predetermined geographical position used for route definition. A fix may be a ground-based navigational aid (NAVAID), a waypoint, or defined by reference to one or more radio NAVAID's.
FLIP	Flight Information Publications
Flyby Waypoint	A flyby waypoint requires the use of turn anticipation to avoid overshoot of the next flight segment.
Flyover Waypoint	A flyover waypoint precludes any turn until the waypoint is overflown and is followed by an intercept maneuver of the flight segment.
FMS	Flight Management System
FPNM	Feet Per Nautical Mile
FPO	Flight Procedures Office

GPS	Global Positioning System
HCS	Host Computer System
IFR	Instrument Flight Rules
KTS	Knots
Lead Carrier/Operator	An air carrier or operator that has agreed to serve as the focal point for the development of STAR's at a specific airport. The lead carrier/operator agrees to help develop the STAR and ensure flyability by all aircraft expected to use the STAR.
LOA	Letter of Agreement
MEA	Minimum En Route IFR Altitude
MSL	Mean Sea Level
NATCA	National Air Traffic Controllers Association
NAVAID	Navigational Aid
NFDD	National Flight Data Digest
NFDC	National Flight Data Center
NFPO	National Flight Procedures Office
NOTAM	Notice to Airmen
NM	Nautical Mile
NRP	North American Route Program
Proponent	The originator of a STAR requirement. This may include an individual, user group, ATC, NFPO, or other appropriate government agency.
RAPT	Regional Airspace Procedures Team
RNAV	Area Navigation
RNP	Required Navigation Performance
SIAP	Standard Instrument Approach Procedure

Significant Benefits	Tangible or intangible advantages resulting from the implementation of a STAR such as fuel savings from reduced flight tracks and time, reduced inter/intra facility coordination, reduced communication between ATC and pilots, increased flexibility of airspace management and sectorization due to more predictable ground tracks, or other similar benefits to users or ATC.
SOP	Standard Operating Procedures
STAR	Standard Terminal Arrival - A preplanned rule IFR ATC arrival procedure published for pilot use in graphic and/or textual form. STAR's provide transition from the en route structure to an outer fix or an instrument approach fix/arrival waypoint in the terminal area.
STAR Transition	A published segment used to connect one or more en route airways/jet routes to the basic STAR.
TARGETS	Terminal Area Route Generation, Evaluation, Traffic Simulation
TERPS	Terminal Instrument Procedures
TF Track to Fix	A course between waypoints that is intercepted and acquired as the flight track to the following waypoint. Applies to flyby and flyover waypoints.
TPP	Terminal Procedures Publication
TRACON	Terminal approach control facility
Waypoint	A predetermined geographical position used for route/instrument approach definition, progress reports, published VFR routes, visual reporting points or points for transitioning and/or circumnavigating controlled and/or special use airspace, that is defined relative to a VORTAC station or in terms of latitude/longitude coordinates.

APPENDIX 2. GUIDELINES FOR DESIGN OF STANDARD TERMINAL ARRIVALS (STAR) AND STAR TRANSITIONS

1. GENERAL.

- a. A STAR must be simple and easily understood. Use only navigational aids (NAVAID), fixes, or waypoints essential to control air traffic.
- b. STAR's/STAR transitions should be developed to accommodate as many different types of aircraft as possible.
- c. A STAR/STAR transition shall commence at an en route fix; e.g., NAVAID, intersection, distance measuring equipment (DME) fix, or waypoint. Avoid the depiction of low-altitude NAVAID's, waypoints, and fixes on high-altitude charts.
- d. A STAR may serve multiple airports.
- e. An airspeed restriction may be depicted for local flow procedures provided it is applicable at least 75 percent of the time. If more than one airspeed restriction per procedure is needed, it shall be coordinated with the users and approved by the region.
- f. A STAR should be compatible with local air traffic control (ATC) standard operating procedures (SOP), and traffic flow management procedures. Concentrated visual flight rules traffic routes to/from Classes B and C airspace shall be determined and avoided to the extent possible.
- g. A STAR terminates at an initial approach fix for a standard instrument approach procedure (SIAP); however, a STAR may terminate at a point in space defined by a waypoint. A STAR terminating at a point in space is supported by air traffic vectors with lost communications instructions provided. When required, the National Flight Procedures Office (NFPO) shall coordinate the incorporation of a STAR waypoint on the appropriate SIAP.
- h. Use notes when limitations are necessary; e.g., services to be provided in conjunction with the procedure, designated aircraft equipment capability, etc.

Example—

“FOR USE BY /E, /F, /G, and /R (RNP-2.0) EQUIPPED AIRCRAFT ONLY,” etc.
Do not include items of an ATC clearance in notes.

i. STAR procedures may be developed, within the criteria prescribed in this order and Order 8260.3, for aircraft using navigation systems based on conventional NAVAID's; e.g., very-high-frequency (VHF) omnidirectional range/DME; or area navigation (RNAV) systems capable of point-to-point flight; e.g., Global Positioning System (GPS), or Flight Management System (FMS).

j. Holding patterns referred to in the text and narrative shall be clearly depicted on the graphic display.

k. A STAR shall not be established solely for the purpose of noise abatement; however, existing noise abatement procedures should be incorporated into a basic STAR/STAR transition.

l. Crossing altitude assignments should be established for traffic separation and/or obstacle clearance.

m. A minimum en route altitude (MEA) will be established for each segment of an arrival in accordance with Order 8260.3, paragraph 1718. Enter the appropriate MEA information, verified by the NFPO, on Form 7100-4 (narrative portion and the graphic portrayal). The MEA of each segment shall not be higher than the preceding segment. MEA's will provide obstacle clearance, as specified in Order 8260.3, paragraph 1720, for primary areas, and paragraph 1721, for secondary areas. In mountainous areas, obstacle clearance may be reduced to 1,000 feet when necessary to achieve compatibility with the associated instrument approach procedural altitude with approval of the NFPO.

2. STAR's Based on Conventional NAVAID's.

a. DME arcs should be avoided and used only to achieve an operational advantage.

b. For procedure design and obstacle clearance criteria, see Order 8260.3, chapter 17.

3. RNAV STAR's.

a. An RNAV STAR/STAR transition must be designed with waypoints. It is recommended that the waypoints be designed as flyby waypoints. Flyover waypoints should only be used when operationally required. This provision does not preclude the use of a navigation facility as a fix in a STAR.

b. Waypoints contained in an RNAV STAR/STAR transition may be assigned crossing altitudes and speeds to optimize the decent and deceleration profiles. Altitudes and speed assignments must be designed, coordinated, and approved by the lead carrier/operator and ATC facilities that have jurisdiction for the airspace affected.

c. Waypoints used in an RNAV STAR/STAR transition must be named utilizing a five-letter pronounceable name. Facilities with three-letter location identifiers may also be used in an RNAV STAR/STAR transition.

d. An RNAV STAR/STAR transition may be designed to mirror image or overlay the vector procedures from an en route fix/post to a point in space or to a SIAP fix. This design extends the STAR procedure into the terminal airspace. The point in space should be strategically designed to provide the controller with vector options for multiple runway use combinations.

e. Procedures should be designed using the fewest number of waypoints, including the use of existing fixes where possible.

f. For RNAV STAR procedure design; i.e., minimum leg length and maximum turn angles, and obstacle assessment criteria (i.e., widths of primary/secondary areas), use appropriate sections of Order 8260.44, Civil Utilization of Area Navigation Departure Procedures. Use Level 2 criteria from Order 8260.44. RNAV STAR's developed using Level 2 criteria shall be annotated for use by /E, /F, /G, and /R (RNP-2.0) equipped aircraft only. Order 8260.44 affords the procedure designer flexibility in the following areas:

- (1) Waypoints; i.e., flyby and flyover.
- (2) Leg types; i.e., direct to fix and track to fix.

Note 1—

Because of the wide range of possible STAR configurations and the flexibility afforded in Order 8260.44, the procedure designer must ensure close and complete coordination is obtained from ATC and users.

g. Procedures should be designed using seamless path construction.

h. RNAV STAR segments should not exceed 260 miles. This is to ensure the geodesic path does not exceed the protected airspace for a great circle path.

i. Waypoint altitude crossing assignments should be defined as "at or above," "at or below," or altitude windows (at or below/at or above) to the greatest extent possible. RNAV waypoints may also be assigned "at" altitudes or "expect" altitudes. However, expect altitude assignments will require additional clearances from the controller to the flight crew. (See Form 7100.3 for examples.)

j. Use as few altitude assignments as necessary.

Note–

RNAV capabilities vary between aircraft navigational systems (GPS/FMS). Coordination with the Flight Procedures Office/all weather operations during the design process is recommended to facilitate compatibility with all users.

4. RNP RNAV: Reserved.

5 Descent Gradients and Deceleration Segments.

a. STAR procedures should be designed to standardize descents from the high altitude en route stratum down to the terminal environment with a descent gradient of 318 feet per nautical mile (FPNM) or 3 degrees. Below 10,000 feet mean sea level (MSL), the maximum descent should be 330 FPNM or approximately 3.1 degrees.

Note–

Based on ATC SOP's, RNAV procedure designs may require descent gradients that exceed the 330 FPNM, although not desirable; RNAV procedure development and implementation is achievable, however pilot speed interventions may be required. Deceleration leg lengths may need to be increased to compensate for high descent gradients.

b. In addition to using the recommended descent gradient identified in paragraph 5a, the procedure designer must also allow for deceleration at any waypoint that has a speed restriction. As a general guideline, deceleration considerations should add 1 nautical mile (NM) for each 10 knots (KTS) of speed reduction required.

Example–

An RNAV STAR begins at waypoint ALPHA at 17,000 feet MSL and 310KTS and requires the aircraft to descend to and cross waypoint BRAVO at 9,000 feet MSL and 240KTS. The minimum leg length between ALPHA and BRAVO would be computed as follows:

$$(17,000 - 9,000)/318 = \text{Minimum leg length using a 3-degree descent gradient}$$

$$8,000/318 = 25.157\text{NM}$$

plus

$$(310 - 240)/10 = \text{Deceleration segment}$$

$$70/10 = 7\text{NM}$$

$$25.157 + 7 = 32.157 \text{ (rounded to 32.2NM)}$$

c. As a minimum, STAR's should account for the deceleration necessary to slow to 240KTS at 10,000 feet MSL. If the procedure ends within 20 miles of a landing runway, the procedure should also account for a deceleration from 240KTS to 200KTS.

d. When connecting a STAR to a SIAP the designer should ensure a seamless lateral and vertical transition from the STAR to the SIAP. The STAR and SIAP should connect to one another in such a way as to maintain the overall descent and deceleration profiles.

6. STAR Naming and Identification.

a. A STAR/STAR transition should, where possible, be named to correspond with the fix name where the procedure commences. An RNAV only STAR should be named to correspond with a waypoint name contained in the procedure and will include the term RNAV in the name. All waypoints and identifiers used shall comply with the provisions of Orders 7350.2, Air Traffic Operational Coding System, and 7350.7, Location Identifier Handbook. Do not use names, which imply direction as a part of the name, (e.g., north, east, south, west, etc.). Do not duplicate STAR names and avoid the use of similar sounding STAR names.

b. Number each original STAR procedure "one;" e.g., "BOJID One RNAV Arrival." (an RNAV only STAR). Number subsequent revisions in numerical sequence through "nine" and then start over at "one." Renumber STAR's only when procedural changes are made. Procedural changes are changes that affect the actual procedure (e.g., fix, course, altitude, etc.). Minor editorial changes do not require renumbering of the STAR and include changes in facility frequencies, variation changes, etc.

c. STAR computer codes will be assigned by using the "NAVAID" three-letter identifier; "intersection" or "waypoint" (five-letter name) where the STAR commences. The identifier/name is shown twice, separated by a dot and suffixed with a numeral (1 through 9).

Examples-

The Knox Two Arrival begins at the Knox VORTAC; the computer code is OXI.OXI2.
The Blunt Seven RNAV Arrival begins at BLUNT waypoint; the computer code is BLUNT.BLUNT7.

d. STAR transition computer codes are similarly assigned. A STAR transition code is assigned by using the NAVAID identifier or intersection/waypoint name marking the beginning of the transition, followed by a dot, followed by the identifier/name of the STAR.

Examples-

The Ft. Wayne transition to the Knox Two Arrival begins at the Ft. Wayne VORTAC; the computer code is FWA.OXI2. The DINTY transition to the SADDE Four RNAV Arrival begins at the DINTY waypoint; the computer code is DINTY.SADDE4.

7. Fix and Holding Pattern Criteria.

a. STAR fixes and associated holding patterns should be published on en route low-altitude and high-altitude charts when they are used for en route ATC. Fixes and holding patterns should be published on arrival charts when they are used for the control of arrival traffic into a specified area.

b. A published holding pattern depicted at a fix on a low/high altitude en route chart or area chart shall be published on any STAR chart that depicts the same fix.

c. Publish only one holding pattern at each fix depicted on any of the specified charts.

Note—

Refer to Order 8260.19, Flight Procedures and Airspace, for depicting magnetic variance of holding patterns and point-to-point navigation for RNAV versus conventional NAVAID's.

7. Communications.

a. The minimum frequency requirement for depiction is one VHF and one ultra high frequency (UHF) (where available) for the Automated Terminal Information System/Automated Weather Observation System at each airport served by STAR, plus one VHF and one UHF (where available) approach control frequency. The maximum number of additional frequencies shall not exceed one VHF and one UHF for tower and ground control. Include one VHF and one UHF air route traffic control center frequency only when there is no terminal facility involved.

b. Control frequencies shall not be included in the arrival text.

APPENDIX 3. FAA FORM 7100-4 INSTRUCTIONS

ITEM	DESCRIPTION
1. Transition name(s)	Name of each transition.
2. Transition routes	Name of each route.
a. From fix/NAVAID	Fix/waypoint/navigational aid (NAVAID) where each transition begins.
b. To fix/NAVAID	Fix/waypoint/NAVAID where each transition ends.
c. Via transition route	Description of each transition route.
d. MEA	Minimum en route altitude (MEA) along transition route. By definition, this altitude also encompasses the minimum reception altitude. If transitions share a common segment, ensure the MEA for that segment is the same for each transition. If it is the intention to have different MEA's on a common segment, note this in block 8, Remarks.
e. MOCA	Minimum obstruction clearance altitude (MOCA) along the transition route.
f. MAA	Maximum authorized altitude (MAA) along the transition route.
	<p>Note— The MOCA and MAA are listed on the form as an aid to the controller. Do not publish them on the graphical portrayal as they could confuse the pilot and have an adverse human factors impact on the safety and efficiency of the standard terminal arrival (STAR) route.</p>
g. Distance	Enter distances between fixes on the transition route in miles and hundredths of a mile; e.g., 78.65 nautical miles. Charting agencies round as necessary to publish the information.
h. Transition computer code	Enter computer identification code per appendix 2, paragraph 6.

ITEM	DESCRIPTION
3. Arrival route description	Provide a textual description of the STAR. Include only information pertinent to the arrival procedure. In parenthesis, include any MEA and/or MOCA that is/are desired; e.g., (MEA 5,000; MOCA 2,500).
4. Lost communications procedures	Enter lost communications procedure, if required, to be included in the textual description. Leave blank when procedures are the same as shown in 14 Code of Federal Regulations 91.185.
5. Procedural data notes	Any information that is to appear in note form on the graphic depiction; e.g., distance measuring equipment required, airspeed restrictions, etc.
6. Communications	Enter name of radio communications to be charted; e.g., Automated Terminal Information System, Automated Weather Observation System, terminal approach control, etc. Specify frequency only if different than what is currently published for the facility or unique to the procedure.
7. Fixes, waypoints, and/or holding patterns	Enter only NAVAID's/intersections/waypoints for which charting is requested that are not included in the textual description of the STAR (block 3) or STAR transition route (block 2). Ensure the accompanying Form 8260-2 contains charting instructions for holding patterns supporting the STAR.
8. Remarks	Any additional charting instructions. This block should be restricted to "need to know" information that, while not procedural in nature, is important to the safe conduct of the procedure. Procedural data notes not to be charted may be added here by Flight Inspection Central Operations or air route traffic control center) for controller information. Enter airport magnetic variance.
9. Airports served	List all airports, city, and two-letter state code served by the STAR.
10. Arrival name	Enter name of STAR.

ITEM	DESCRIPTION
11. Number	Enter STAR number (spell out).
12. STAR computer code	Enter computer identification code per appendix 2, paragraph 6.d.
13. Superseded number	STAR number superseded by this procedure.
14. Dated	Date of superseded procedure.
15. Effective date	Effective date of the new STAR procedure (assigned by National Flight Data Center).
16. Graphic portrayal for charting guidelines.	Include an up-to-date, clear graphic depiction of the procedure. Do not include a text write-up of transitions or arrival route. Graphic may be attached as separate sheet.
17. Other pertinent data	Use this space for additional comments to assist the charting agency.
18. Reason for submitted changes	List reasons for revising the procedure; e.g., relocation of NAVAID's, sector boundary, realignment of airways, etc.

From FIX/NAVAID		To FIX/NAVAID	Via Transition Route	MEA	MOCA	MAA	DIST	Transition Computer Codes
(a) 1. WILMS VORTAC		(b) CENTR	(c) WYPNT	(d) 10,000	(e)	(f)	(g) 33.00	(h) WILMS.CENTR1
(2) Transition Routes 2. POWEL VORTAC		CENTR	NAMED	11,000			49.00	POWEL.CENTR1

1 Bearings, headings, courses and radials are magnetic
2 Distances are in nautical miles
3 Altitudes are minimum altitudes unless otherwise indicated

STAR – Standard Terminal Arrival

US Department of Transportation
Federal Aviation Administration

(1) Transition Name(s):
1. WILMS 2. POWEL

(3) Arrival Route Description: FROM CENTR, THENCE TURNN, THENCE CROSS, THENCE LEFTT, THENCE DWNWD, THENCE EXTND, DEPART EXTND TRACK 085, FOR VECTORS TO FINAL APPROACH COURSE.

(4) Lost Communications Procedure:

(5) Procedural Data Notes: WILMS TRANSITION: EXPECT TO CROSS WYPNT AT 12,000 FEET, CROSS JEFFY AT 220 KTS, CROSS LEFTT AT 210 KTS, EXPECT TO CROSS LEFTT AT 6,000 FEET, CROSS EXTND AT 190 KTS.
POWEL TRANSITION: EXPECT TO CROSS NAMED AT 12,000 FEET, CROSS JEFFY AT 220 KTS, CROSS LEFTT AT 210 KTS, EXPECT TO CROSS LEFTT AT 6,000 FEET, CROSS EXTND AT 190 KTS.

(6) Communications: CHART: TWR, ATIS AND REGIONAL APPROACH CONTROL 125.8, 118.1, 306.95

(7) Fixes and/or Holding Patterns: CHART: CROSS

(8) Remarks: NOTE: CHART NOT TO SCALE. FOR /E, /F, /G, AND /R (RNP-2) EQUIPPED AIRCRAFT ONLY. RADAR REQUIRED. MAGNETIC VARIANCE ANYTOWN MUNI: 9.5° W

(9) Airports Served

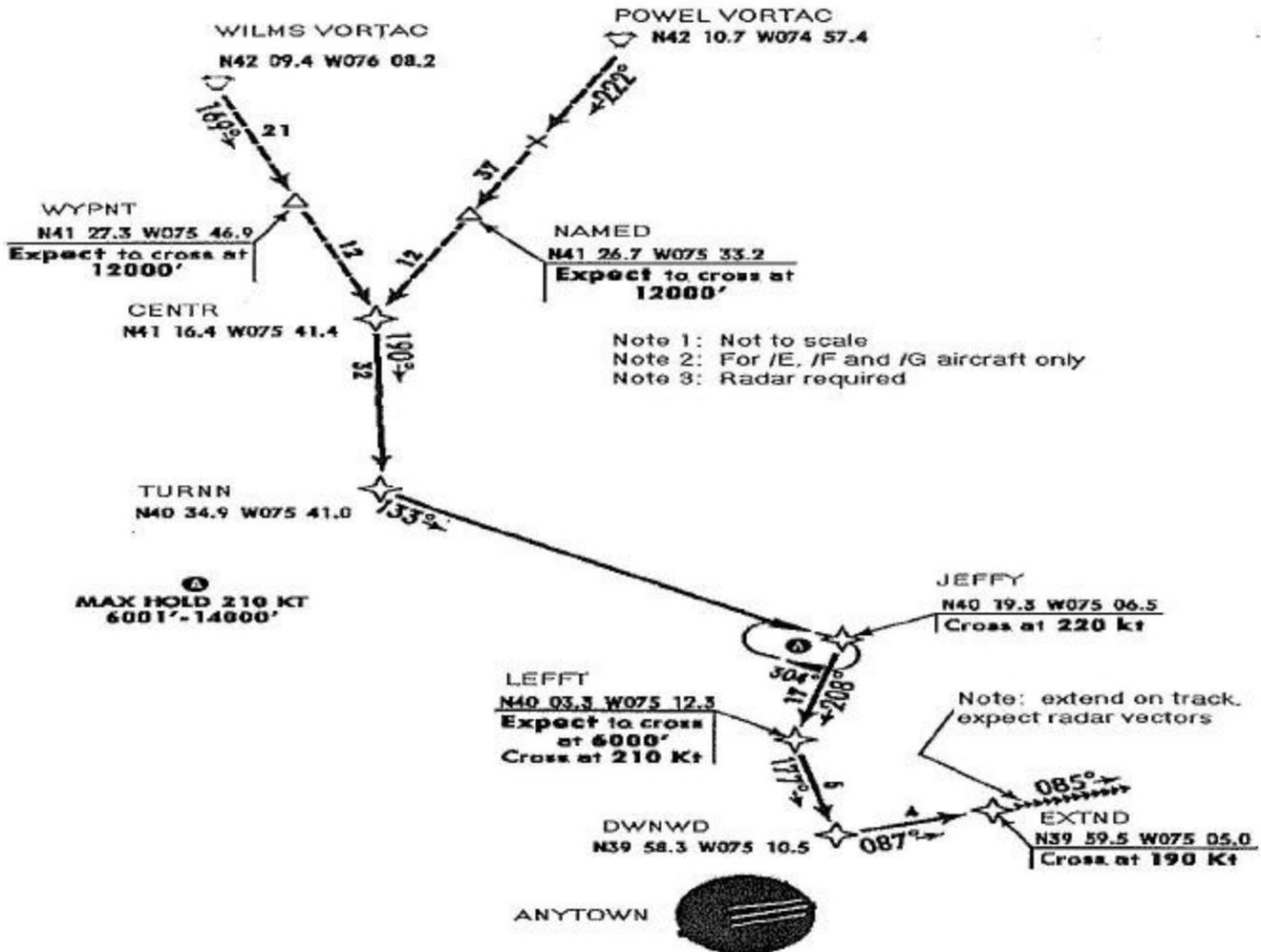
Airport Name	ANYTOWN MUNI	City/State	ANYTOWN, OK
Airport Name		City/State	
Airport Name		City/State	
Airport Name		City/State	

(10) Arrival Name
CENTR

(11) Number ONE	(12) STAR Computer Code CENTR.CENTR1	(13) Superseded Nr. 01 JAN 01	(14) Dated 01 JAN 01	(15) Effective Date 01 APR 01
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FAA FORM 7100-4 (6-3) SUPERSEDES PREVIOUS EDITION

(16) Graphic Portrayals for Charting Guidelines:



(17) Other Pertinent Data:

(18) Reasons for Changes Submitted:

Developed By	Name (Typed and Signed), Title and Organization		DATE
Approved	FIFO		
	Reg. ATD		

APPENDIX 4. FORM 7100-3 INSTRUCTIONS

ITEM	DESCRIPTION
1. Waypoint/NAVAID	Enter the name of the waypoint in one of the following formats: (1) five-letter pronounceable name; or (2) three-letter facility identification plus facility type; e.g., XYZ VORTAC.
2. Latitude/Longitude	Express the latitude/longitude in degrees, minutes, seconds, and hundredths of a second. Example- 352414.56N/0763228.12W.
3. C (chart)	Enter "Y" for yes, if a waypoint is to be charted. Enter "N" for no, if a waypoint does not require charting. Any waypoint, requiring a change in altitude, speed, or direction (heading), including a waypoint where a turn begins and/or ends, requires charting.
4. Flyby/Flyover	Enter "FB" to indicate a flyby or "FO" to indicate a flyover waypoint. The type will normally be determined by operational or obstacle requirements.
5. Leg type	Enter the two-letter code for leg type as follows: "F" or "DF." Note- If the proponent and/or the air traffic control facility are not familiar with the ARINC 424 leg types, leave this column blank.
6. TC (true course)	Enter the true course to the nearest hundredths of a degree. The charting agency will round as necessary for publication.
7. DIST (distance)	Enter the distance to the nearest hundredth of a nautical mile. The charting agency will round as necessary for publication.
8. Altitude	Enter the minimum, mandatory, or maximum altitude in 100-foot increments or flight levels in 1,000-foot increments and label each altitude/flight level as "at/above," "at," or "at/below," as appropriate.

ITEM	DESCRIPTION
9. Speed	Enter the minimum, maximum, or mandatory airspeed(s) in indicated airspeed in knots (KIAS). Label each speed restriction as "at/above," "at," or "at/below," as appropriate. Note- The Flight Management System automatically reduces the airspeed to 240KIAS when descending below 10,000 feet mean sea level and it is not necessary to indicate this altitude.
10. Remarks	Enter any pertinent information that would clarify a data entry; e.g., airspeed restriction is required by air traffic, expect to cross at 6,000 feet, etc.
11. Airport name	Self explanatory.
12. City and state	Self explanatory.
13. Name	Enter name of standard terminal arrival (STAR).
14. Number	Enter STAR number (spelled out).
15. STAR Computer Code	Enter computer identification code per appendix 2, paragraph 6d.
16. Superseded Nr.	STAR number superseded by this procedure.
17. Dated	Date of superseded procedure.
18. Effective date	Effective date of the new STAR procedure (assigned by National Flight Data Center).



US Department of Transportation
Federal Aviation Administration

SID - (Standard Instrument Departure) (Continuation)
 STAR - (Standard Terminal Arrival) (Continuation)

- 1 Bearings, headings, courses and radials are magnetic
- 2 Distances are in nautical miles
- 3 Altitudes are minimum altitudes unless otherwise indicated

Continuation

FMS FIX/ NAVAID	LATITUDE/LONGITUDE	C	FLY BY/OVER	LEG TYPE	TC	DIST	ALTITUDE	SPEED	REMARKS
WILMS	N420924.40 W0760812.20	Y	FB	TF	169.25	21.40			WILMS.CENTR1
WYPNT	N412718.30 W0754654.90	Y	FB	TF	169.25	12.25			Expect to cross at 12,000'
CENTR	N411624.40 W0754124.40	Y	FB	TF	190.40	32.30	At 12,000		
TURNN	N403454.90 W0754100.00	Y	FB	TF	133.00	65.00			
JEFFY	N401918.30 W0750630.50	Y	FB	TF	208.00	17.20		At 220	
LEFFT	N400318.30 W0751218.30	Y	FB	TF	177.30	5.10		At/below 210	Expect to cross at 6,000'
DWNWD	N395818.30 W0751030.50	Y	FB	TF	087.45	4.10			
EXTND	N395930.50 W0750500.00	Y	FB		085.40			At 190	
POWEL	N421042.70 W0745724.40	Y	FB	TF	222.00				POWEL.CENTR1
NAMED	N412642.70 W0753312.20	Y	FB	TF	222.00				Expect to cross at 12,000'
CENTR	N411624.40 W0754124.40	Y	FB	TF	190.40	32.30	At/above 12,000		
TURNN	N403454.90 W0754100.00	Y	FB	TF	133.00	65.00			
JEFFY	N401918.30 W0750630.50	Y	FB	TF	208.00	17.20		At 220	
LEFFT	N400318.30 W0751218.30	Y	FB	TF	177.30	5.10		At/below 210	Expect to cross at 6,000'
DWNWD	N395818.30 W0751030.50	Y	FB	TF	087.45	4.10			
EXTND	N395930.50 W0750500.00	Y	FB		208.00	17.20		At 190	

City & State
Anytown, OK

Airport Name
Anytown Muni
Name
CENTR.RNAV
Number
ONE
Computer Code
CENTR.CENTR1
Superseded Nr
Dated
1/1/01
Effective Date
4/1/01

 US Department of Transportation Federal Aviation Administration	<input type="checkbox"/> SID – (Standard Instrument Departure) (Continuation) <input checked="" type="checkbox"/> STAR – (Standard Terminal Arrival) (Continuation)	1 Bearings, headings, courses and radials are magnetic 2 Distances are in nautical miles 3 Altitudes are minimum altitudes unless otherwise indicated
Airport Name	City & State	
Name	Number	Computer Code
	Superseded Nr	Dated
		Effective Date

FAA FORM 7100-3 (6-65) CONTINUATION SHEET