



**Federal Aviation
Administration**

UNITED STATES GOVERNMENT SPECIFICATIONS

**FLIGHT INFORMATION PUBLICATION
STANDARD TERMINAL ARRIVAL (STAR)
CHARTS**

**IACC 14
26 October 2015**

Prepared by the Interagency Air Cartographic Committee (IACC)

**UNITED STATES GOVERNMENT SPECIFICATIONS
FOR THE
FLIGHT INFORMATION PUBLICATION STANDARD TERMINAL ARRIVAL (STAR)
CHARTS**

26 October 2015

These specifications have been developed by the Interagency Air Cartographic Committee (IACC), composed of representatives of the Department of Defense and the Federal Aviation Administration, for use in the preparation of the United States Government Flight Information Publication Standard Terminal Arrival (STAR) Charts. These specifications shall be complied with, without deviation, until such time as they are amended by formal IACC action.

Changes to these specifications will be provided when necessitated by new requirements or through development action of the IACC.

Questions of interpretation that arise in the use of these specifications shall be referred to the Chair, Interagency Air Cartographic Committee.

FAA/Aeronautical Information Services/Products

DoD/NGA/MSRF

FAA/Aeronautical Information Services/Data

DoD/NGA/SFA

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CHANGES APPLIED TO CURRENT EDITION

REQUIREMENT DOCUMENT

- a. RD 756 - Charting of Procedure Effective Dates on DPs, STARS and CFVPs
- b. RD 758 - Charting of Screened Airports on STARS

EDITORIAL CHANGE

- a. None applied in this edition.

CHANGES APPLIED TO 28 JULY 2015

REQUIREMENT DOCUMENT

- a. RD 746 - Addition of Bottom Altitudes to STAR Procedures

EDITORIAL CHANGE

- a. None applied in this edition.

CHANGES APPLIED TO 13 JULY 2015

REQUIREMENT DOCUMENT

- a. RD 745 - Air Defense Identification Zone (ADIZ) Symbology in TPPs

EDITORIAL CHANGE

- a. None applied in this edition.

CHANGES APPLIED TO 27 OCTOBER 2014

REQUIREMENT DOCUMENT

- a. None applied in this edition

EDITORIAL CHANGE

- a. EC 14-16 - Final Product Print Color Variation

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AMENDMENT OF SPECIFICATIONS

1. PROCEDURE

- a. Recommendations for amendments to specifications from the Department of Defense shall be directed to:

National Geospatial-Intelligence Agency
7500 GEOINT Drive
Springfield, VA 22150-7500

- b. Recommendations for amendments to specifications from the Federal Aviation Administration shall be directed to:

Federal Aviation Administration /
Aeronautical Information Services
SSMC-4 Sta # 4445
1305 East-West Highway
Silver Spring, MD 20910

2. AMENDMENT SYSTEM

- a. Change to the specifications will be issued at the effective date of the latest Requirement Document (RD) and / or Editorial Change (EC).
- b. The Specification will be dated, indicated along the upper margin of each page, to reflect the most current change.

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CHAPTER 1 GENERAL

1.1 PURPOSE AND SCOPE

1.1.1 Purpose

The purpose of these specifications is to provide appropriate guidelines to effect uniformity and standardization of content and portrayal techniques in the preparation and production of charts for use by both civil and military pilots operating in the National Airspace System.

1.1.2 Scope

A Standard Terminal Arrival (STAR) is a preplanned instrument flight rule (IFR) air traffic control arrival procedure published for pilot use in graphic and textual form. STARs reduce pilot/controller workload and air-ground communications, minimizing error potential in delivery and receipt of clearances. These specifications shall be used in the preparation of STAR Charts.

1.2 REQUIREMENTS

1.2.1 General

STAR Charts shall be prepared for all civil, military, and civil/military airports for which STAR procedures have been established and designated.

1.2.2 Quality and Accuracy

The highest standard of accuracy in plotting, reproduction, and currency of information contained therein, shall be maintained.

Although the digital chart files are compiled in accordance with these specifications, the final product may vary slightly in appearance due to differences in printing techniques/processes and/or digital display technique.

1.2.3 Color

STAR Chart information and supplemental textual material, as required, shall be prepared for a one color presentation. All information, textual and graphics, shall be in solid color, unless otherwise specified.

1.2.4 Scale

STAR charts generally shall be depicted 'not to scale' due to the great distances involved on many procedures and route segments. The portrayal may be distorted, but angular integrity should be maintained whenever possible. A 'to scale' depiction may be used only if the layout permits and readability is assured.

1.2.5 Projection

Projection shall be Lambert Conformal Conic or Polyconic.

1.2.6 Horizontal Reference

Charts referenced to horizontal datum other than North American Datum 1983 (NAD 83) will show a note; e.g., Horizontal Datum: WGS 72, indicating the datum used, in 7 pt. type, centered above the bottom neatline in the planview.

1.2.7 Symbolization

Symbolization shall be in accordance with the Aeronautical Information/Chart Symbols included in [Appendix 1](#).

The symbols contained in these specifications have been developed for use in the preparation of U.S. Government Aeronautical Charts.

These symbols have been developed through the United States Government Inter-Agency Air Cartographic Committee (IACC) and its supporting technical groups for the purpose of standardization of the aeronautical symbols portrayed on charts and publications used by both military and civil aviation.

The configuration of the symbols contained herein shall be adhered to. The size and line weights, specified and/or indicated herein, should also be adhered to, but may be varied when absolutely necessary.

1.2.8 Type Styles

The use of capital letters is intended, unless otherwise stated as C/L (capital and lower case letters).

All type, unless otherwise specified, shall be Futura Medium, as indicated on the various Appendices.

Type sizes specified herein shall be adhered to. However, and only in those areas of extreme congestion, or where a specified type size would create unnecessary congestion, the size of type may be reduced to the next smaller size.

1.3 SPECIFICATION APPENDICES

Appendices are included within these specifications for use in layout, format and content. Appendices do not necessarily reflect all possible operational content.

CHAPTER 2 FORMAT AND LAYOUT

2.1 FORMAT

The STAR procedure, including all textual and type data, shall normally be aligned with true North at the top of the page. Predominantly extensive East-West procedures shall be depicted in a landscape format in which North shall be toward the left side of the page. In such cases, the text will be oriented consistent with the geographic procedure and a North arrow shall be shown. The North arrow may be placed in any open space.

Figure 2.1 North Arrow



STAR Charts shall be arranged so that the planview of procedure is shown in the upper portion of the chart with the remaining lower portion containing the textual description of the procedure. These sections will be separated by a 6 weight (.012") line, so that the textual description will be “boxed” as illustrated in [Appendix 6](#). The box can be adjusted to accommodate the size of the description.

2.2 LAYOUT

Size and dimensions shall be annotated in [Appendix 2](#) and [Appendix 3](#).

Information shall be presented in textual, tabulated and graphic form, normally printed to read parallel to the top edge of the publication.

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CHAPTER 3 CONTENT

3.1 GENERAL

A STAR is a preplanned instrument flight rule (IFR) air traffic control arrival procedure. STAR Charts are designed to provide the pilot with all electronic aid information, together with procedural and other pertinent data required to execute the procedure. The chart portrayal shall be limited to one procedure.

3.2 COMPILATION

3.2.1 Relative Positioning

Cartographic judgment must be exercised in plotting the STAR procedure, mindful of the intent of the STAR program and the needs of the user. All turns, altitudes, NAVAIDs, including radio aids used in the formation of fixes germane to the procedure, shall be positioned on the graphic in their relative geographic location.

3.2.2 Scale

Every effort should be made to chart in relative geographic position. A ‘to scale’ graphic may be possible but, due to distances involved on some route segments, such a depiction may be the exception rather than the rule. On each chart so affected, a general statement as follows shall be shown along the bottom border line of the planview, using 7 pt. type. "NOTE: Chart not to scale."

Figure 3.1 Chart Not to Scale Note



3.2.3 Displacement

All information shall be plotted to indicate its true (or relative in not-to-scale presentation) geographic location. If a NAVAID symbol is found to obliterate an airport symbol, the airport symbol shall be shifted enough to be completely clear of the NAVAID.

3.2.4 Alignment

The STAR procedure shall normally be aligned with true north at the top of the page. Exceptions to this shall be for predominately extensive east/west procedures which may be aligned with north to the left of the page. In such cases, the textual descriptions or type data shall read with the graphic procedure. East/West textual descriptions will be “boxed” wherever they are positioned in the planview. The box may be adjusted to accommodate the size of the description.

3.2.5 Placement of Identification and Notes

Identification and data notes shall be positioned adjacent to, or as near the symbol as possible, except when such placement would result in the obliteration of other detail, the information may be leadered.

3.3 MARGIN DATA

Margin data is defined as that information required to be shown between the borderline of the STAR Chart and the trim. The margin data below is required to be shown positioned as illustrated.

Figure 3.2 Margin Information - Single Airport (Top and Bottom)

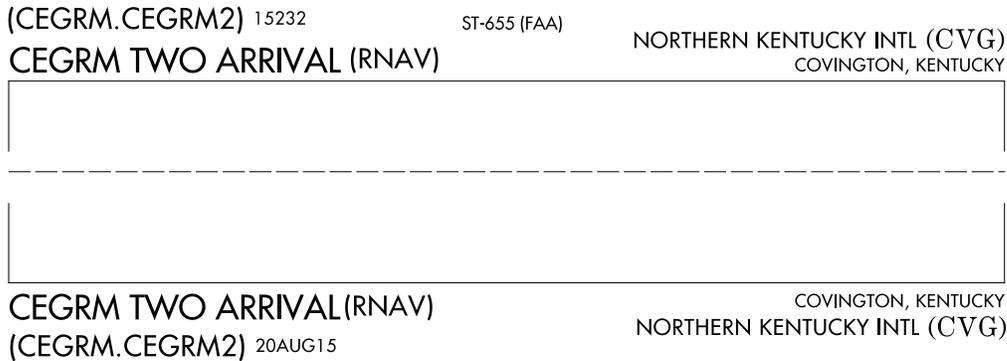
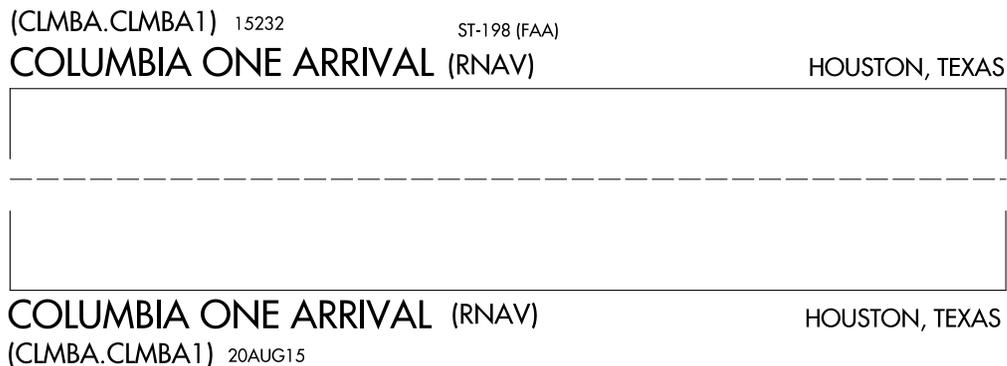


Figure 3.3 Margin Information - Area STAR (Top and Bottom)



References:

[Appendix 4](#) - Margin Data

3.3.1 Procedural Designation

The arrival procedure name, number, type, and computer code assigned by the authority establishing the procedure, e.g. CEGRM ONE ARRIVAL (RNAV)(CEGRM.CEGRM1) shall be shown.

To distinguish between the number zero and the letter O within the computer code, a slash shall be shown through the zero.

3.3.1.1 Type

Type indicates either no entry or (RNAV).

3.3.1.2 Split Graphics

If it is necessary to break a STAR into a two page graphic, the STAR name and form will be followed by a subtitle identifying the area being depicted. The subtitle will be 10 pt. C/L. e.g. Transitions Routes, Arrival Routes. See [Appendix 12](#).

3.3.2 Julian Date

The Julian date, which reflects a chart revision of any type, will be placed above the top neatline, adjacent and to the right of the computer code. If no computer code exists, the Julian date will be left justified above the procedure name.

3.3.3 Procedure Effective Date

The AIRAC date of the last procedural revision will be placed below the bottom neatline, adjacent and to the right of the computer code. If no computer code exists, the procedure effective date will be left justified below the procedure name.

3.3.4 Chart Reference Number

The Chart reference number consists of "ST" -, followed by the chart number, followed by the abbreviated name of the appropriate authority for the procedure, placed in parenthesis; e.g.; ST-0000 (FAA), ST-0000 (USAF).

The chart number is a one to five digit number assigned by the charting proponent.

3.3.5 Airport Name and Identifier

The FAA airport identifier shall be shown in parenthesis immediately following the airport name. Airports outside the contiguous United States will be shown with both the FAA designated identifier followed by the ICAO location indicator as shown. When more than one airport is served by the STAR procedure, the airport/s name and identifier shall be omitted.

Figure 3.4 Airport Name and Identification Examples

Contiguous US = PHOENIX SKY HARBOR INTL (PHX)
 Outside the Contiguous US = TED STEVENS ANCHORAGE INTL (ANC) (PANC)

3.3.6 Location

The geographic location, consisting of the city and state name associated with the airport/s.

3.4 PLAN VIEW

References:

[Appendix 2](#) - Page Layout

[Appendix 3](#) - East West Page layout

3.4.1 General

The chart shall encompass the area required to effectively show the arrival routing, including transitions from the appropriate enroute structure.

One procedure shall be shown on each chart.

All routes, turns, altitudes, NAVAIDs, facilities forming intersections and fixes, and those facilities/fixes terminating or beginning the arrival route shall be shown in the graphic depiction.

In congested areas the lightning bolt type leader lines may be used to reference the information to its correlating point.

Figure 3.5 Lightning Leader



A single page will be used whenever possible. However, when not feasible, an additional page(s) can be used. The first page typically will show the Transition Routes up to and including the common point which commences the arrival route segment. The arrival routes will be shown on the following page. See [Appendix 12](#).

3.4.2 Communications

3.4.2.1 General

Communications information, when available, shall be shown in the upper left corner, as indicated on the Appendices, in such a manner so as not to interfere with significant items of the procedure. When necessary, communications information may be shown in the upper right corner. Type size shall be 7 pt.

The typical format for communications is the name on one line followed by the frequency(ies) underneath it. All data shall be justified left or right as appropriate to the corner placement.

3.4.2.2 Terminal Communications

Terminal communication information, when available, and identified by the formulating agency, shall be shown by name; e.g., “Name APP CON”. Terminal Communications shall be abbreviated.

3.4.2.3 Hours of Operation

Hours of operation shall not be shown. A star, as illustrated in the example below, shall be used to indicate tower, ATIS or AFIS operates non-continuously.

Figure 3.6 Non-Continuous Operation Depiction

JUNEAU TOWER★
118.7 (CTAF) 278.3

3.4.2.4 Additional Communications

Additional communications, as identified, shall not exceed one VHF and one UHF primary frequency for each of the following:

Table 3.1 Additional Communications

Automatic Terminal Information Service	(ATIS)
Automatic Flight Information Service (AK Only)	(AFIS)
Ground Control	GND CON
Tower	(TWR)
Center	(only when there is no terminal facility or APP CON involved)

Table 3.1 Additional Communications (Continued)

Flight Service Station	(RADIO)
Common Traffic Advisory Frequency	(CTAF)
Automated Weather Observing System	(AWOS/ASOS)

When available, ATIS or AFIS will be the only weather frequency/s published.

3.4.2.5 Automatic Terminal Information Service (ATIS)

Automatic Terminal Information Service shall be shown by the letters “ATIS” followed by the specific frequency/s.

When the service is provided on one frequency for both arrival and departure information, the single frequency shall be shown; e.g., ATIS 111.8.

When service is provided on more than one frequency for both arrival and departure information, both (or all) frequencies shall be shown; e.g., ATIS 113.9 124.2.

When the service provided is either arrival and/or departure on different frequencies, only the arrival frequencies shall be shown; e.g., ATIS ARR 112.7.

When more than one airport is served by the STAR procedure, the name of the airport/s providing the ATIS shall be shown. Multiple ATIS will ordered alphabetically, e.g., MERRILL FIELD ATIS 124.25.

3.4.2.6 (AK) Automated Flight Information Service (AFIS)

Automated Flight Information Service shall be shown by the letters “AFIS” followed by the specific frequencies.

3.4.2.7 Automated Weather Systems (ASOS/AWOS)

Automated Weather Systems (AWOS/ASOS) shall show by the system type, followed by the level and the frequency; e.g., AWOS-3 124.65 or ASOS 118.975. If full time ATIS is available, it will be the only weather frequency published.

When more than one airport is served by the STAR procedure, the name of the airport/s providing ASOS or AWOS shall be shown, e.g., ORANGE COUNTY ASOS 118.325.

3.4.3 Flyover Symbolology

Fixes, reporting points, intersections, NAVAIDs, and waypoints designated as flyover on RNAV STARs will be shown as indicated in [Appendix 1](#). Points used as holding fixes will be shown as flyby (without the circle around the symbol) unless they are designated elsewhere in the procedure as having flyover designation.

On STAR procedures serving more than one airport, a point may be designated as a flyover on one of the arrival routes, and as a flyby for another. When a point on the same chart has both designations, it will be charted as a flyby.

3.4.4 Compulsory Reporting Points

Fixes, reporting points, intersections, NAVAIDs, and waypoints designated as compulsory will be designated as indicated in [Appendix 1](#).

3.4.5 Airports

All airport/s of destination shall be shown, symbolized as either civil, military, or civil/military as shown in [Appendix 1](#).

On STAR procedures serving more than one airport, all airports shown shall be identified by name using 7 pt. type.

When an airport(s) not served by the procedure is requested for charting on the procedure source document, it shall be shown using a screened color.

3.4.6 Radio Aids to Navigation (NAVAIDs)

3.4.6.1 General

NAVAIDs used in the procedure, including transitions and those shown only to establish fixes, intersections, etc., shall be shown, positioned in their relative geographical location with the following exception: NAVAIDs that are located beyond the established limits of the chart area shall be brought, or moved within the neatline of the planview, retaining magnetic bearing and distance relationship. Mileage and bearing values, etc., shall, however, be accurate.

In congested areas, where a box depiction is not feasible, NAVAIDs that are located beyond the established limits of the chart area and used to establish fixes, intersections, etc., shall be identified by using a 2 weight (.006") radial line with the facility identifier, frequency and channel number positioned along and parallel to the radial line.

3.4.6.2 Frequencies Without Voice

Frequencies without voice capability, except TACAN, shall be underlined using a 2 weight (.006") line, the length of the frequency numbers.

3.4.6.3 Symbolization and Identification of NAVAIDS

NAVAIDs shall be appropriately symbolized and identified in 7 pt. type. The following information as appropriate for the type of NAVAID in the order listed shall be enclosed within an identification box: name, frequency, identifier, morse code, channel number and paired VHF frequency.

Figure 3.7 NAVAID Symbolization

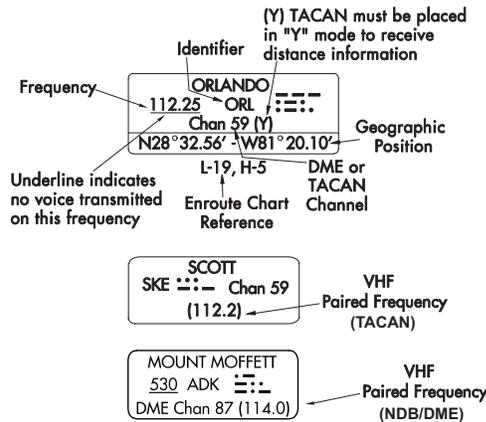
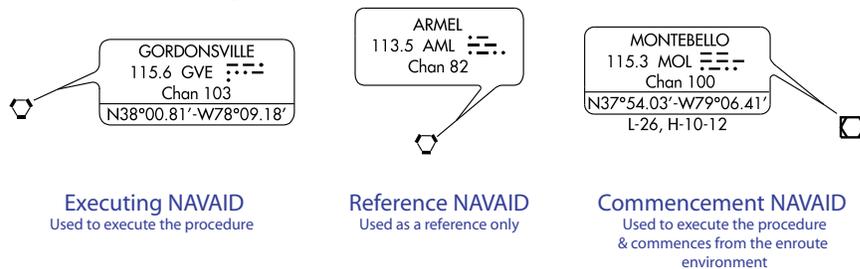


Figure 3.8 NAVAID Use Identification



The appropriate and applicable Enroute (High and/or Low) Chart number/s required for enroute operations, shall be positioned beneath the radio aid to navigation box, using 7 pt. type for the transition entry points or the commencement NAVAID of the basic STAR where no transitions exist.

- High Altitude Chart Reference - H-1, H-2, etc.
- Low Altitude Chart Reference - L-1, L-2, etc.
- Low-High Altitude Chart Reference - L-17, H-4, etc.
- Pacific Low Altitude Chart Reference - P-1, P-2, etc.
- Multiple Chart Formats - L-11, H-1-2; L-12-13, H-1; L-1-2, H-3-4

3.4.6.3.1 Frequency Protection Range (T)

A capital letter (T) in parentheses shall be shown within the facility identification box following the frequency to indicate the frequency protection range (usable range at 12,000', 25NM) of such radio aids to navigation.

3.4.6.3.2 Leader Lines

The leader line shall extend from the data box to and without touching the appropriate NAVAID.

3.4.6.3.3 Line Weight

Line weight for boxes and leader lines shall be 3 weight (.006").

3.4.6.3.4 NAVAID Boxes

Boxes shall be of a size consistent with the informational data contained therein.

3.4.6.4 “Y” Mode NAVAIDS

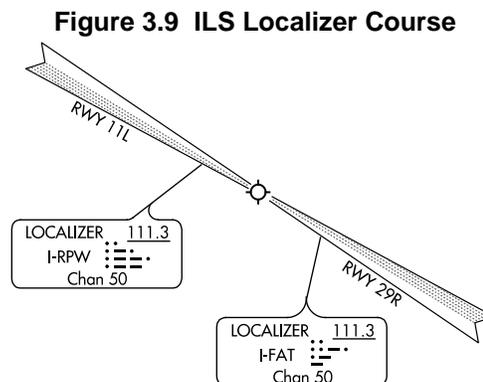
NAVAIDs with a DME, when the DME operates in the “Y” mode, the “Y” will be enclosed in parenthesis and positioned immediately following the channel number, e.g., Chan 00(Y).

3.4.6.5 Geographic Coordinates

Geographic coordinates (in degrees, minutes, and hundredths of minutes) shall be shown within the box for those NAVAIDs used to execute the procedure. NAVAIDs used strictly for fix make-up, or not flown to or from in the procedure, will not include geographic coordinates.

3.4.6.6 Instrument Landing System (ILS) Localizer Course

The Instrument Landing System (ILS) Localizer Course, either the front, back, or both courses, shall be shown when identified on the procedure source document. The fan symbol shall emanate from the appropriate airport symbol in its correct magnetic orientation. Since no specific localizer position is being portrayed, the NAVAID box shall point to the fan. Runway numbers associated with the localizer course shall also be shown when multiple localizer symbols are shown. The back course, when shown, shall be identified as "BACK COURSE" positioned along and parallel to the course.



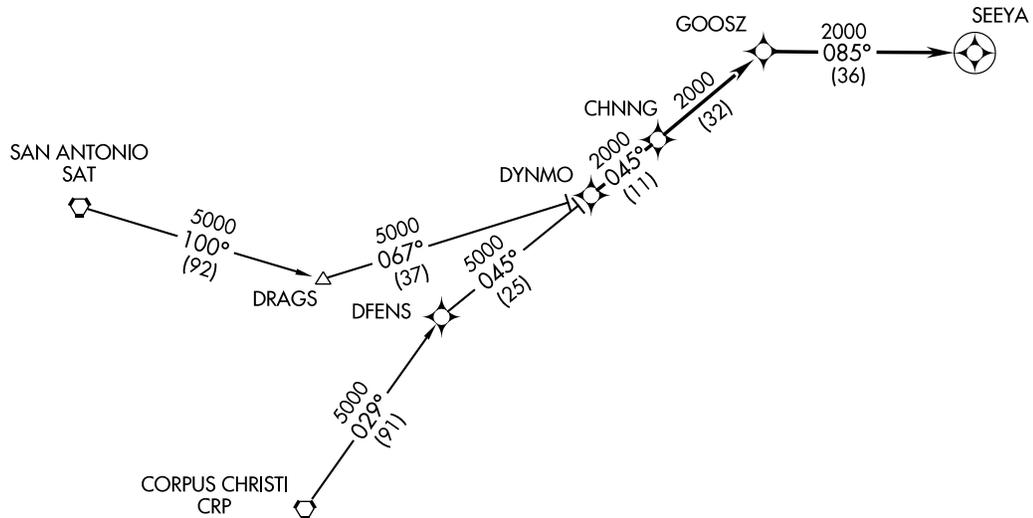
Simplified Directional Facilities (SDF) shall be shown in accordance with the above, as illustrated in [Appendix 1](#).

3.4.7 RNAV STARs

3.4.7.1 RNAV Waypoints

Waypoints that are intended only for use by onboard database navigation systems, and have an ATC function shall be charted. The assigned five letter waypoint name will be charted adjacent to the waypoint icon in 8 point type. When a waypoint is created at the same geolocation as an existing fix, NAVAID, or reporting point, the waypoint symbol will not be charted. Only the existing fix, NAVAID, or reporting point and its associated data will be shown.

Figure 3.10 Waypoint Depiction



3.4.7.2 NAVAIDs

NAVAIDs on RNAV STARs shall show only the applicable NAVAID symbol, with NAVAID name and three letter identifier, in 8 point type. NAVAID data shall not be boxed. Coordinates and enroute charting references will not be shown.

3.4.7.3 Leg Types

On RNAV STARs, leg type abbreviations VA = Heading (Vector) to Altitude, FM = Fix to Manual Termination, VM = Vector to Manual Termination, DF = Direct to Fix, CF = Course to Fix, TF = Track to Fix, shown on the 7100-3 and the 7100-4 will be charted as follows:

Table 3.2 Leg Types

7100-3	7100-4	Charting
VA	Heading	No waypoints and no mileage shown, heading shown (i.e.92), no mileage shown.
FM	Track	No waypoint at termination of leg and no mileage shown, heading (i.e. 92).
VM	Heading	No waypoint at termination of leg and no mileage shown, heading (i.e. 92).
DF	Direct	No course and mileage shown, waypoint at termination of leg
CF	Course	Course shown, mileage shown only if first leg, waypoint at termination of leg
TF	Track	Course and mileage shown, waypoints at beginning and termination of leg

3.4.8 DME Fixes, Intersections, Computer Navigation Fixes (CNF) and VOR/DME RNAV Waypoints

3.4.8.1 General

DME fixes, intersections (with both compulsory and non compulsory reporting function), CNFs and waypoints described in the STAR shall be shown and illustrated as described in [Appendix 1](#). Identification shall be by name in 8 point type. Geographic coordinates (in degrees, minutes and hundredths of minutes) shall be shown beneath the name of those, intersections/reporting points and CNFs used to execute the procedure. The identification of the applicable Enroute Chart(s) (Low and High Altitude) required for enroute operations shall be positioned beneath the geographic coordinates of each transition entry or commencement intersection or fix.

On RNAV STARs, intersections/fixes shall be symbolized as above, but shall only show the five letter identifier.

References:

[Appendix 1](#) - Legend

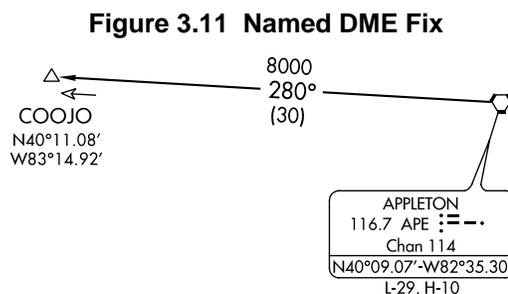
3.4.8.2 Named DME Fixes

Named DME fixes shall be identified by the placement of small open arrowheads (.12 in length) pointing to the fix from the VHF/UHF NAVAID forming the fix. These open arrowheads shall be positioned adjacent to the fix, along and parallel to the route or radial.

These open arrowheads will be supplemented with an open "D" attached to the shaft of the DME arrowhead, with the DME mileage centered therein when the mileage from the NAVAID is not obvious.

Fixes/Intersections with multiple DMEs will only depict the DMEs from NAVAIDs that also form transition, arrival or lost communication routes.

Type size and style for the DME mileage shall be 7 pt expressed in whole miles except when less than one mile and then specified on the procedure source document.

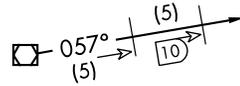


3.4.8.3 Un-named DME

Un-named DME fixes shall be shown by a 2 weight (.006"), .2" long, centered across the appropriate radial or route line, supplemented by the open arrow and "D" symbol described above. The associated mileage figure for RADAR fixes shall be positioned adjacent to the line symbol and shall be identified in nautical miles.

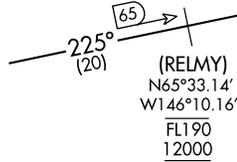
Type size and style for the DME mileage shall be 7 point, expressed in whole miles except when less than one mile and when specified by the procedure source document.

Figure 3.12 Unnamed DME Fix



If a CNF is colocated with a DME fix the “x” symbol will not be shown.

Figure 3.13 Un-Name DME Fix with Colocated CNF



3.4.8.4 Intersections

Intersections are points in space formed by two or more NAVAIDs.

Figure 3.14 Intersections

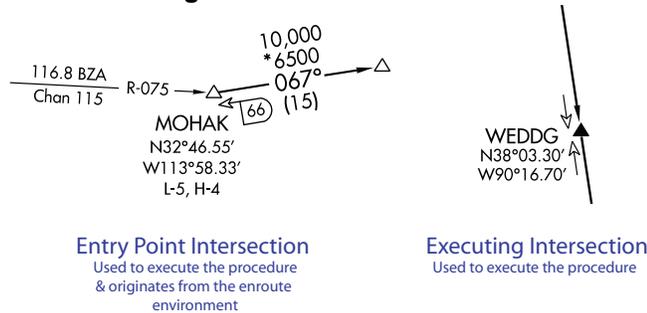
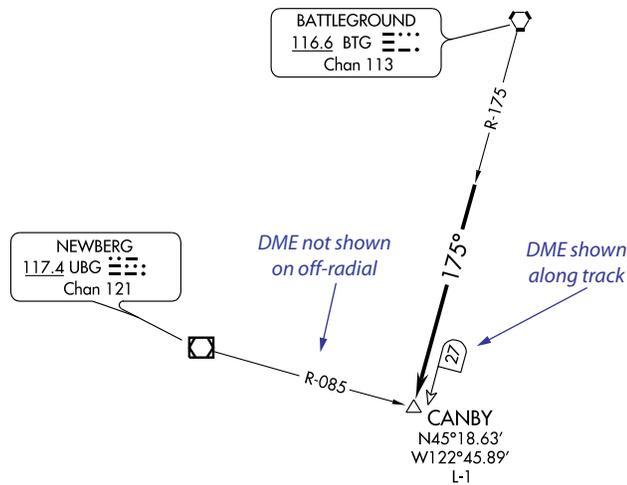


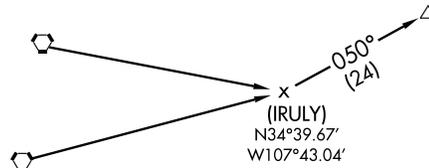
Figure 3.15 Off-Radial DME



3.4.8.5 Computer Navigation Fix (CNF)

A CNF shall be shown with the symbol “x” at a dog-leg of the route when defined as part of the procedure. The 5-character CNF name shall be shown in parentheses.

Figure 3.16 CNF Example



3.4.8.6 VOR/DME Area Navigation (RNAV) Waypoints

Only area navigation waypoints as designated and identified for use on STAR procedures shall be shown.

When a waypoint is created at the same geolocation as an existing fix, NAVAID or reporting point, then the waypoint symbol will not be charted. Only the fix, NAVAID or reporting point and its associated data will be shown.

3.4.8.6.1 VOR/DME Waypoint Data

RNAV waypoints, as designated, shall be identified by name; coordinates (degrees, minutes, and hundredths of minutes to nearest hundredths of a minute; e.g., N38°58.30' W89°51.50'; the frequency and identifier; e.g., 115.8 ABC, and the radial (to tenths) and distance (to tenths) from the referenced radio aid to navigation; e.g., 187.1° - 56.2; and the station elevation.

The radial value shall be shown using three digits, plus the tenths when designated, and the degree (°) sign.

When the waypoint and reference facility are colocated, the radial and distance of the reference facility shall be shown; e.g., 000° - 000.

The station (reference facility) elevation shall be shown immediately below the identification box, aligned with and breaking the bottom line. Elevation value shall always be in three (or more) digits; e.g., 001, 099, 999, 1999. Sea Level shall be shown as 000.

Waypoint identification data shall be in 7 point type and enclosed within a 3 weight (.006") identification box.

Identification boxes shall be of a size consistent with the informational data contained therein.

A 3 weight (.006") leader line shall be shown from the data box to, but without touching, the waypoint symbol.

3.4.9 Routes

Arrival, lost communications and transition routes shall be shown, broken for all symbols and for the insertion of bearing values or RNAV track angles. Directional arrowheads shall be positioned on the routes, near, but not touching the symbol.



Transition routes, as designated, shall be shown emanating from the entry facility/fix to a common point or fix from which a single STAR commences. Transition routes with a name differing from the initial facility/fix, and therefore not identified, shall be identified by name, positioned adjacent to the transition route symbol.

3.4.10 Route Data

All route data shall apply to both RNAV and NAVAID STARs unless otherwise stated.

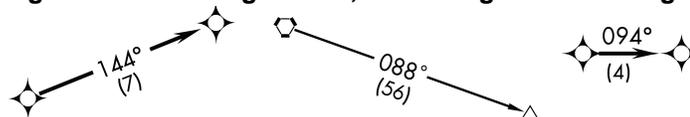
3.4.10.1 Magnetic Bearing/RNAV Track Values

Magnetic bearing or RNAV track values shall be shown in three digits (to the nearest degree) positioned on and breaking the route or transition line. A degree sign shall be shown with all headings. Type size shall be 9 pt. When a route or track line would be obliterated by placement of the heading value, it may be placed above or below the line, as space permits.

3.4.10.2 Mileages

Nautical mile distances (mileages) between primary NAVAIDs, intersections, fixes, and waypoints along the route shall be shown rounded to the nearest whole nautical mile, within parentheses, normally below the route symbol. Type size shall be 8 pt.

Figure 3.18 Bearing Values, Track Angles and Mileages



3.4.10.3 Airways/Routes (Coincidental and Noncoincidental)

When the arrival or transition route coincides with an airway/route, and is identified in the procedure, the airway/route identification shall be shown, using 7 point type, enclosed in a 2 weight (.006") box. When an airway/route is requested that is not coincident with an arrival or transition route, it will be shown with a 2 weight (.006") line in the same way, except non-RNAV will provide a radial, RNAV will not.

Figure 3.19 Coincidental Routes

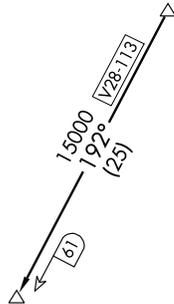
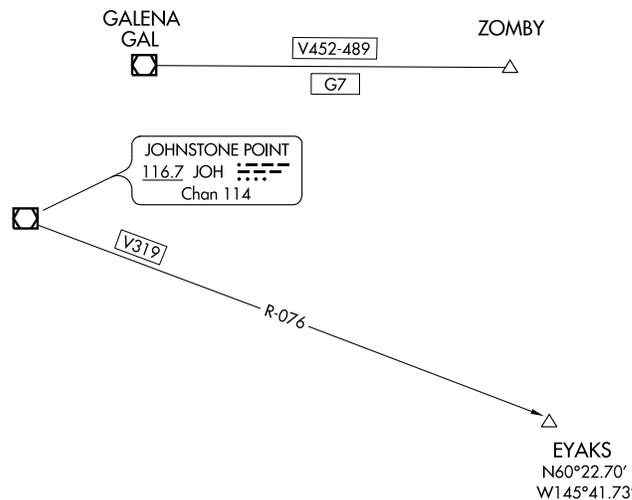


Figure 3.20 Non-Coincidental Routes



3.4.10.4 Restrictive Altitudes

Restrictive altitudes along the arrival route shall be shown using 8 point type.

Altitude values shall not include commas (15000).

Minimum, Maximum and Mandatory Altitudes shall be shown and be clearly identified with the fix to which they apply. The use of an overscore (line above text) and underscore (line below text) on altitudes of the procedure shall be as appropriate to the wording of the procedure, as depicted in the [Table 3.3](#) below.

Restrictive altitudes at NAVAIDs, fixes and waypoints along the arrival/transition route shall be shown, when specified by appropriate authority, without annotation and adjacent to the point with which they are associated and in accordance with established minimum/maximum/mandatory altitude charting conventions.

Table 3.3 Minimum, Maximum and Mandatory Altitudes

Type	Description	Example
Minimum Altitude	Minimum altitudes shall be depicted as an underlined number. This is an MSL altitude, vertical to a geographic location below which an aircraft may not descend. Cross at or above 12000 will be show as depicted. Expect clearance to cross at or above an altitude will be shown as “Expect <u>12000</u> ”.	<u>12000</u>
Maximum Altitude	Maximum altitudes shall be depicted with a line above it. This is an MSL altitude, vertical to a geographic location, above which an aircraft may not be flown. Cross at or below 12000 will be show as depicted. Expect clearance to cross at or below an altitude will be shown as “Expect $\overline{12000}$ ”.	$\overline{12000}$
Mandatory Altitude	Mandatory altitudes shall be depicted as a number with a line above and below. This is an MSL altitude, vertical to a geographic location which an aircraft must maintain. Cross at an altitude will be shown as depicted. Expect clearance to cross at an altitude will be shown as “Expect $\overline{\underline{12000}}$ ”.	$\overline{\underline{12000}}$
Block Altitude	Block altitudes shall be depicted as the combination of Minimum and Maximum altitudes as depicted. Expect clearance for a block altitude will be shown as “Expect $\overline{\underline{15000}}$ $\underline{12000}$ ”. Block altitudes may be worded as ‘Cross above 12000 and below 15000’ or ‘Expect clearance to cross above 12000 and below 15000’.	$\overline{\underline{15000}}$ $\underline{12000}$

3.4.10.5 Restrictive Airspeeds

Restrictive airspeeds along the procedure track shall be shown using 8 point type. The use of an overscore (line above the text) and underscore (line below the text) on airspeeds of the procedure shall be as appropriate to the wording of the procedure, as depicted in [Table 3.4](#) below.

Table 3.4 Restrictive Airspeeds

Type	Description	Example
Minimum Speed	Minimum airspeeds shall be depicted as an underlined number. Cross at or above 170K will be shown as depicted.	<u>170K</u>
Maximum Speed	Maximum airspeeds shall be depicted as a number with a line above it. Cross at or below 170K will be shown as depicted.	$\overline{170K}$
Mandatory Speed	Mandatory airspeeds shall be depicted as a number with a line above and below. Cross at 170K will be shown as depicted.	$\overline{\underline{170K}}$

3.4.10.6 Paired Restrictive Airspeeds and Altitudes

Paired restrictive altitudes and airspeeds shall be depicted individually as above. The are positioned side-by-side when space allows.

3.4.10.7 MEA, MOCA, etc

MEA, MOCA, etc., as designated and specified on the procedure source document shall be shown, normally above the route heading, using 8 pt. type. MOCA shall be preceded by a 9 pt. asterisk. A "T" shaped symbol, as illustrated in the appendices, shall be used to designate a change in MEA when established at points other than NAVAIDs.

Figure 3.21 MEA and MOCA Depiction

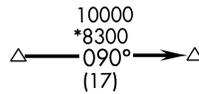
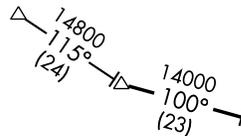


Figure 3.22 MEA Change Depiction



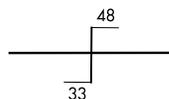
Other requested altitudes such as MAA, MRA, etc., will be shown above the MEA preceding by their identifier, e.g., MAA FL450, MRA18000. Type size shall be 8 pt.

3.4.10.8 Changeover Points (COPs)

Changeover Points shall be shown when specified on the procedure source document.

The heavy bar of the symbol shall be centered on and at a 90° angle to the route. When aligned with the route data, the symbol shall be positioned so that the short top line shall be parallel with the route and "point" to the right; the short bottom line shall also be parallel to the route and "point" to the left.

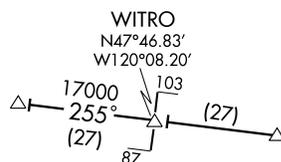
Figure 3.23 Changeover Point



3.4.10.8.1 Colocated Changeover Point and Fix

When a COP is located at a fix, except when colocated with a DME fix, the COP symbol shall be broken for the fix symbol. When colocated with a DME fix, the COP shall be offset from the fix. The COP symbol shall not touch the fix symbol.

Figure 3.24 Changeover Point Located at a Reporting Point



3.4.10.8.2 Mileages on COP

Mileage figures from the COP to the next and preceding VHF/UHF NAVAID shall be positioned .02" above or below the short "pointer lines" of the symbol, parallel with the route using 7 pt. type. However, in areas where this placement is not in the best interest of clarity, the mileage figures may be centered .02" from ends of the short "pointer lines" of the symbol, parallel with the route.

When the COP is located at a reporting point or a DME fix, the changeover mileage figure shall be omitted, provided there is no intervening mileage breakdown point between the changeover point and the NAVAID.

3.4.10.9 Explanatory Notes

Appropriate explanatory notes may be shown, as required, positioned along the arrival or transition route using 8 point C/L type and punctuations.

3.4.10.10 Holding Patterns

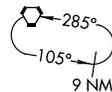
Holding patterns shall be shown using a 2 weight (.006") racetrack-type symbol broken for 7 pt bearings with arrowheads indicating direction of turns. If the inbound leg of the hold is coincident with an arrival or transition track (i.e. same value), the inbound bearing, 2 weight (.006") line, and arrowhead may be eliminated.

Figure 3.25 Holding Patterns



RNAV holding patterns shall include a 2 weight (.006") "tick mark" and 7 pt leg length.

Figure 3.26 RNAV Holding Patterns



Non-RNAV holding patterns will include a holding radial when the pattern is not coincident with the arrival or transition track. Exception shall be when the holding involves an NDB or LOM which do not provide radials.

Figure 3.27 Non-RNAV Holding Patterns



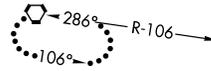
If a nautical mile leg length or DME leg length is requested on the procedure source document for a non-RNAV hold, they shall be shown as illustrated below.

Figure 3.28 Holding Patterns with Leg Length



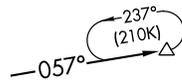
Holding patterns associated with lost communications shall be shown using the dotted line pattern instead of a solid line.

Figure 3.29 Lost Communication Holding Pattern



Maximum restricted airspeeds, when requested on the procedure source document, shall be depicted within the holding pattern symbol, with the restricted airspeed in parentheses, as shown in [Appendix 1](#). As restricted airspeeds, 210K applies to altitudes above 6000 feet to and including 14000 feet and 175K applies to all altitudes.

Figure 3.30 Holding Patterns with Maximum Restricted Airspeeds



All supplemental information (i.e. distances, speeds, etc) shall be 7 pt.

3.4.11 Radial Lines

Those radials that are associated with the arrival route, intersections, reporting points and mileage fixes shall be shown and identified.

Radial lines shall be shown by 2 weight (.006") arrowed line emanating from the facility with the value positioned on and breaking the arrowed line, preceded by the letter "R". Radial values shall be in three digits; e.g., R-000. A degree sign shall not be shown with radial values. Type size shall be 7 pt. Lead Radials, when identified on the procedure source document, shall be additionally identified from the letters "LR" preceding the numbered value; e.g., LR-053.

Radial lines shall stop just short of the applicable intersection or fix so as not to be in conflict or interfere with the route depiction.

In congested areas, radial values may be placed in a clear area and related to the radial by a 1 weight (.005") arrowed line.

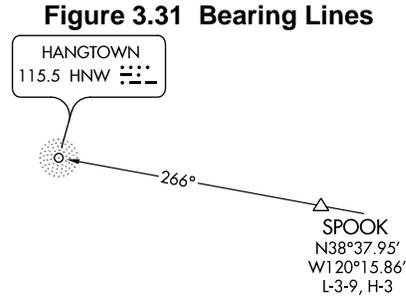
When a radial line overlies a course/route/transition line, the radial value (i.e. R-322) shall be shown above the heavier weight line, adjacent to the NAVAID.

3.4.12 Bearing Lines

Those bearings associated with the arrival route, intersections, and mileage fixes shall be shown and identified.

Bearing lines shall be shown by a 2 weight (.006") arrowed line from the fix to the NAVAID, with the value positioned on and breaking the arrowed line. Bearing values shall be in three digits. A degree sign shall be shown with all bearing values. Type size shall be 7 pt.

Bearing lines shall be shown through the applicable reporting point or fix and broken for symbol so as not to be in conflict or interfere with the route depiction.



In congested areas, values may be placed in a clear area and related to the bearing line by 1 weight (.005") arrowed line.

3.4.13 Special Use Airspace (SUA)

Special Use Airspace shall be shown only when requested by the formulating agency.

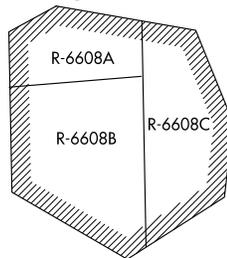
Special Use Airspace shall be portrayed by a 2 weight (.006") diagonal line pattern, .10" in width, positioned so as to have the lines in a NE to SW direction. In no case will the portrayal of Special Use Airspace obliterate the functional procedural data. Should an area be too small to portray the specified width, the width shall be proportionately reduced in size to adequately portray the area. In "not to scale" depictions, SUA may be resized but shall remain in its relative position to the rest of the portrayal.

SUA outer boundaries shall be depicted by a 3 weight (.006") line.

SUA internal boundaries shall be depicted by a 1 weight (.005") line to separate the individual SUA areas.

Special Use Airspace shall be identified by the designated number and/or name of the area; e.g., P-1234, R-1235, YUKON 1 MOA, etc., using 7 point type.

Figure 3.32 Special Use Airspace



3.4.14 Air Defense Identification Zone (ADIZ)

When designated on the procedure source document, ADIZ boundaries that all within the area of coverage of the STAR chart shall be shown.

ADIZ boundaries shall be portrayed by a 4 weight line (0.010"). The diameter of the dots is .015". The width of the symbol is .05". Identification shall be placed within or along the boundary. In no case, will the portrayal of the ADIZ obliterate the functional procedural data.

Figure 3.33 Air Defense Identification Zone (ADIZ) Boundary

CONTIGUOUS U.S. ADIZ

3.4.15 Notes

Operational notes, when requested by the formulating agency, shall be shown. Notes shall be prefaced with "NOTE:". Exception will be for specific note categories such as TURBOJET VERTICAL NAVIGATION PLANNING INFORMATION, CAUTION, LANDING ALL RUNWAYS, etc.

Type size for notes shall be 8 pt. C/L. Acronyms (DME, RADAR, VORTAC) shall be in all caps.

Combine and locate notes in a single area to the greatest extent possible. Preferred location shall be in the lower left of the planview, moving clockwise when the lower left is not feasible. Notes that pertain to a specific fix, NAVAID, or waypoint shall be located adjacent to that point.

When multiple graphic pages are required, operational notes that apply to the entire procedure, or all transitions, will be charted on the page that contains the common point and common portion of the procedure. Notes that apply to a specific transition(s) will be charted on the continuation page that contains the transition(s).

3.4.15.1 **Bottom Altitude Note**

When requested on the procedure source document, a boxed bottom altitude(s) note shall be shown on the top right corner of the planview. When planview configuration does not allow this positioning, placement may vary to the top left corner, then along the top neatline, and finally to where space allows. Type size shall be 9 point bold text enclosed in a 3 weight (.006") box. When more than one bottom altitude is specified on the source document, the altitudes will be stacked within the same box.

References:

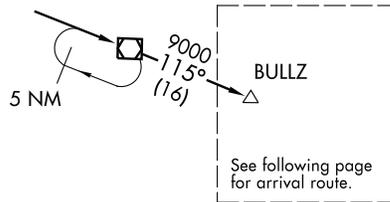
[Appendix 14](#) - STAR with Single Bottom Altitude Note

[Appendix 15](#) - STAR with Multiple Bottom Altitude Notes

3.4.16 Continued Arrival Route

When a multiple page graphic is being used, the common point will be depicted in a 2 weight (.006") dashed box with the a 7 point directing the user to the graphic on the following page as shown in Figure 3.34. Box size is not fixed but shall be of a size to encompass the standard note and terminating point.

Figure 3.34 Continuation Box



Additionally, the note “(CONTINTUED ON FOLLOWING PAGE)” in 9 pt type shall be shown preferably at the bottom of the chart.

References:

[Appendix 13](#) - Multiple Graphic STAR (3 Pages)

3.5 ARRIVAL ROUTE TEXTUAL DESCRIPTION

3.5.1 General

The heading “ARRIVAL ROUTE DESCRIPTION” and the arrival route text shall be printed below the planview. The preferred type size is 9 pt, C/L. If this does not accommodate the text, 8 pt may be used. Transition, arrival and lost communication description headings shall be in capital letters and underscored.

When the description is of such length that the provisions of the above paragraph cannot be met, then the following page shall be used for the complete textual description. A note; i.e., "(NARRATIVE ON FOLLOWING PAGE)" in 9 pt. type shall be shown preferably at the bottom of the chart. The following page shall have the same marginal information as its associated arrival chart. The heading "ARRIVAL ROUTE DESCRIPTION" shall be centered inside the upper border in 9 pt. type.

3.5.2 Text

3.5.2.1 **Transition Text (RNAV and non-RNAV)**

For RNAV charts, transition text will consist of the transition name and associated computer code (caps/underscored). There shall be no following narrative, but instead, any restraint or restriction type notes specific to the transition, as provided on the procedure source document, shall be shown in parentheses.

Figure 3.35 RNAV Transition Text

ARRIVAL ROUTE DESCRIPTION

BOULDER CITY TRANSITION (BLD.MAIER5)

CORKR TRANSITION (CORKR.MAIER5)

HECTOR TRANSITION (HEC.MAIER5): (TURBOJET only)

NAVHO TRANSITION (NAVHO.MAIER5)

PRFUM TRANSITION (PRFUM.MAIER5)

For non-RNAV charts, transition text will begin with the name and computer codes as outlined above. A narrative, created by the charting proponent, will follow. The narrative will describe all turns, altitudes, radials, bearings and facilities/fixes needed to guide the user from the entry point to the common facility/fix. The end of the transition(s) text will use a “Thence....” format to lead into the arrival text.

Figure 3.36 Non-RNAV Transition Text

ARRIVAL ROUTE DESCRIPTION

CYPRS TRANSITION (CYPRS.LEENA4): From over CYPRS INT via MGO R-295 to MCKEY INT, then via BSR R-131 to DAISY INT, and SXC R-287 to SXC VORTAC. Thence....

DAISY TRANSITION (DAISY.LEENA4): From over DAISY INT via SXC R-287 to SXC VORTAC. Thence....

FELLOWS TRANSITION (FLW.LEENA4): From over FLW VORTAC via FLW R-123 to SADDE INT, then via FIM R-148 to PAROL INT, and SXC R-310 to SXC VORTAC. Thence....

When multiple transitions exist, they shall be arranged alphabetically by transition name.

3.5.2.2 Arrival Text

A description of the arrival procedure (common point to the terminating fix/facility/landing area) will be written verbatim as provided by the procedure source document. Exception will be MEAs shown within parentheses and nautical mile distances. These will be considered graphic instructions and not included in the written description.

If transitions exist on the non-RNAV STAR, the arrival text shall begin with “....” to represent a lead-in from the transition text. See [Appendix 5](#).

On both RNAV and non-RNAV charts, if the common arrival text is further broken down into multiple landing descriptions, the “thence....” format may be used if necessary.

3.5.2.3 Lost Communication Text

Lost communication procedure(s) will be written verbatim following the arrival text if provided by the procedure source document. Exception will be holding instructions provided within parentheses (e.g., hold E, right turns, 270 degrees inbound). These will be considered graphic instructions and not included in the written description. See [Appendix 6](#).

APPENDIX 1 LEGEND

00000
LEGEND

LEGEND

STANDARD TERMINAL ARRIVAL (STAR) CHARTS DEPARTURE PROCEDURE (DP) CHARTS

Applies to both STAR and DP Charts unless otherwise noted.

RADIO AIDS TO NAVIGATION

VOR (Compulsory)	VORTAC (Compulsory)	NDB (Compulsory)
VOR/DME (Compulsory)	TACAN (Compulsory)	NDB/DME (Compulsory)
VOR (Non-Compulsory)	TACAN (Non-Compulsory)	NDB (Non-Compulsory)
VOR/DME (Non-Compulsory)	NDB/DME (Non-Compulsory)	
VORTAC (Non-Compulsory)		

LMM, LOM (Compass locator)
 Marker Beacon

LOC (shown when installation is offset from its normal position off the end of the runway.) (DP)
 LOC/DME

Localizer Course
 SDF Course

(T) indicates frequency protection range (STAR)
 (Y) TACAN must be placed in "Y" mode to receive distance information

ORLANDO Example:
 Frequency: 112.25 (T) ORL Chan 59 (Y) N28°32.56' W81°20.10'
 L-19, H-5 DME or TACAN Channel Reference
 Underline indicates no voice transmitted on this frequency
 Geographic Position

PRAYS Example:
 Coordinates: N38°58.30' W89°51.50'
 Frequency: 112.7 CAP 187.1°-56.2
 Identifier: 590 Reference Facility Elevation Radial-Distance (Facility to Waypoint)

FIXES/ATC REPORTING REQUIREMENTS

Reporting Points
 N00°00.00'
 W00°00.00'

(75) → DME Mileage (when not obvious)

▲ Fix-Compulsory and
 △ Non-Compulsory Position Report

→ DME fix

WAYPOINT (Compulsory) WAYPOINT (Non-Compulsory)

FLYOVER POINT

X Computer Navigation Fix (CNF)
 N00°00.00'
 W00°00.00'

ROUTES

4500 MEA-Minimum Enroute Altitude
 *3500 MOCA-Minimum Obstruction Clearance Altitude
 ← 270° → (65) Mileage between Radio Aids, Reporting Points, and Route Breaks

Transition Route
 R-275 Radial line and value
 Lost Communications Track

V12 J80 Airway/Jet Route Identification
 DP Holding Pattern STAR Holding Pattern

(IAS) (IAS)
 Holding pattern with max. restricted airspeed (175K) applies to all altitudes (210K) applies to altitudes above 6000' to and including 14000'

SPECIAL USE AIRSPACE

R-352 R-Restricted
 P-Prohibited W-Warning
 A-Alert
 MOA-Military Operations Area

ALTITUDES

5500 Mandatory Altitude (Cross at)
 2300 Minimum Altitude (Cross at or above)
 4800 Maximum Altitude (Cross at or below)

1500
1200 Block Altitude

→ Altitude change at other than Radio Aids (STAR)

INDICATED AIRSPEED

175K Mandatory Airspeed 120K Minimum Airspeed 250K Maximum Airspeed

AIRPORTS

(DP) Civil Military Joint Civil-Military

Airports not served by the procedure shown in screened color (STAR)

Civil Military Joint Civil-Military

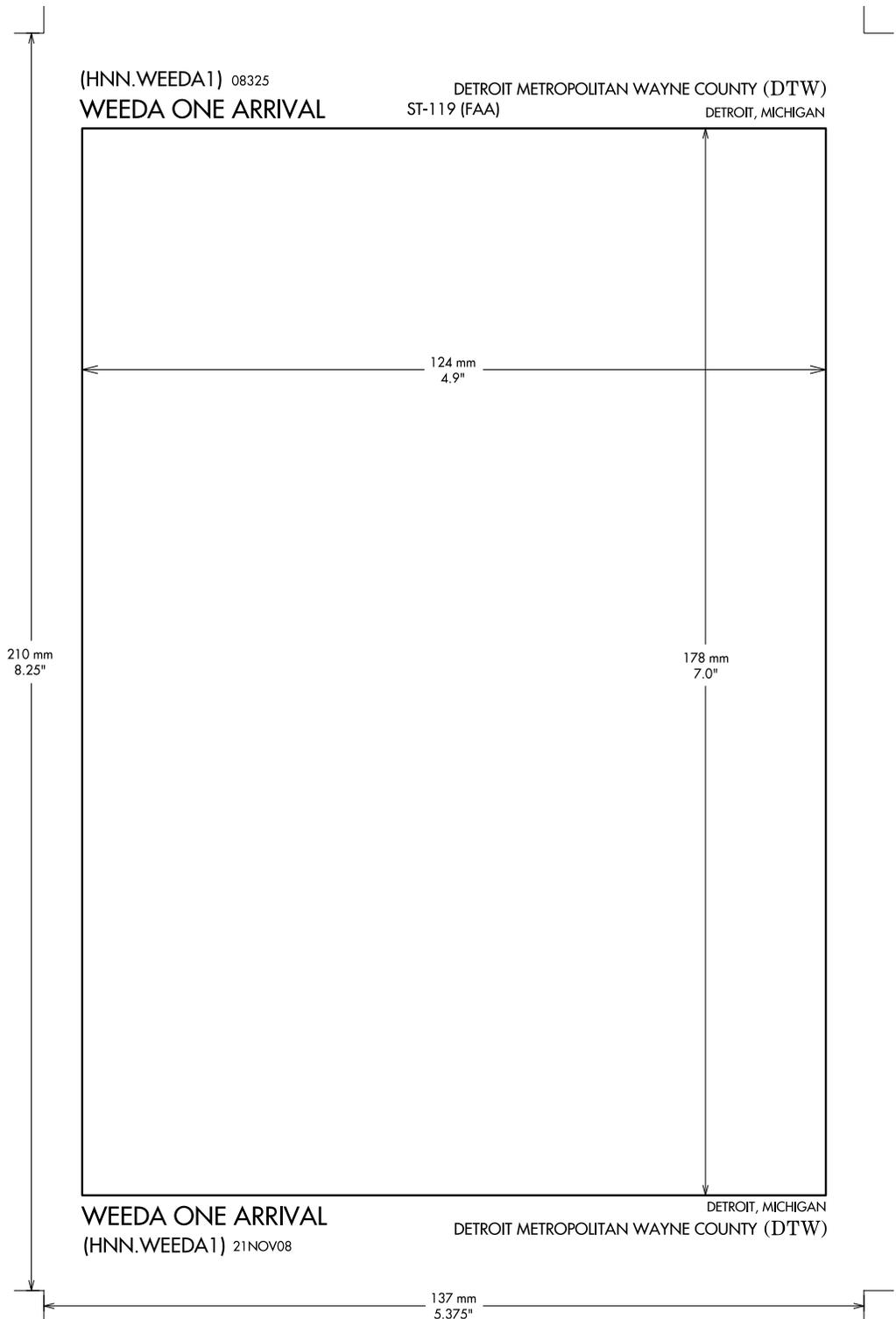
MISCELLANEOUS

Changeover Point
 Distance not to scale (DP)
 International Boundary (DP)
 Air Defense Identification Zone

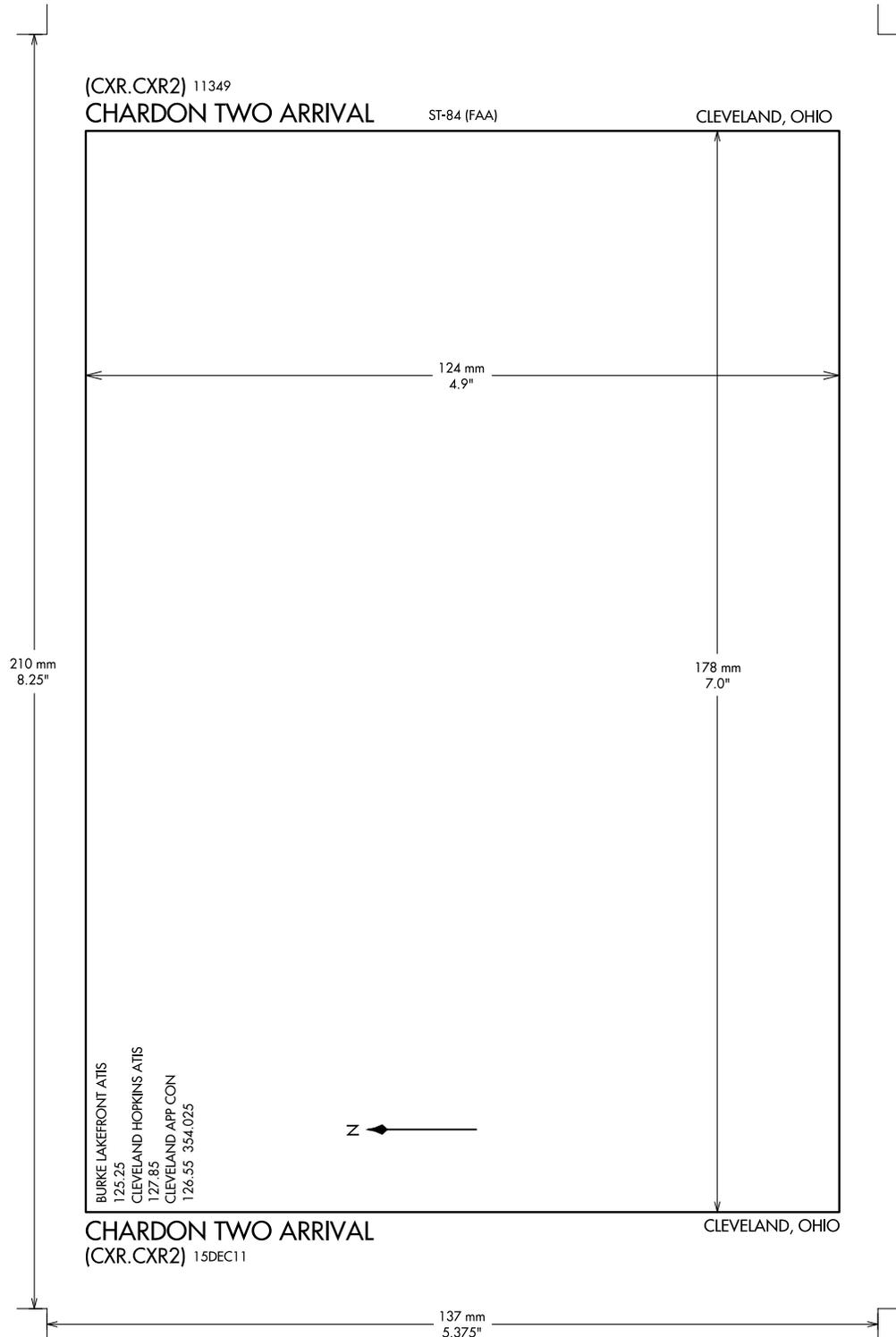
Takeoff Minimums and (Obstacle) Departure Procedures entry published. (DP)

LEGEND

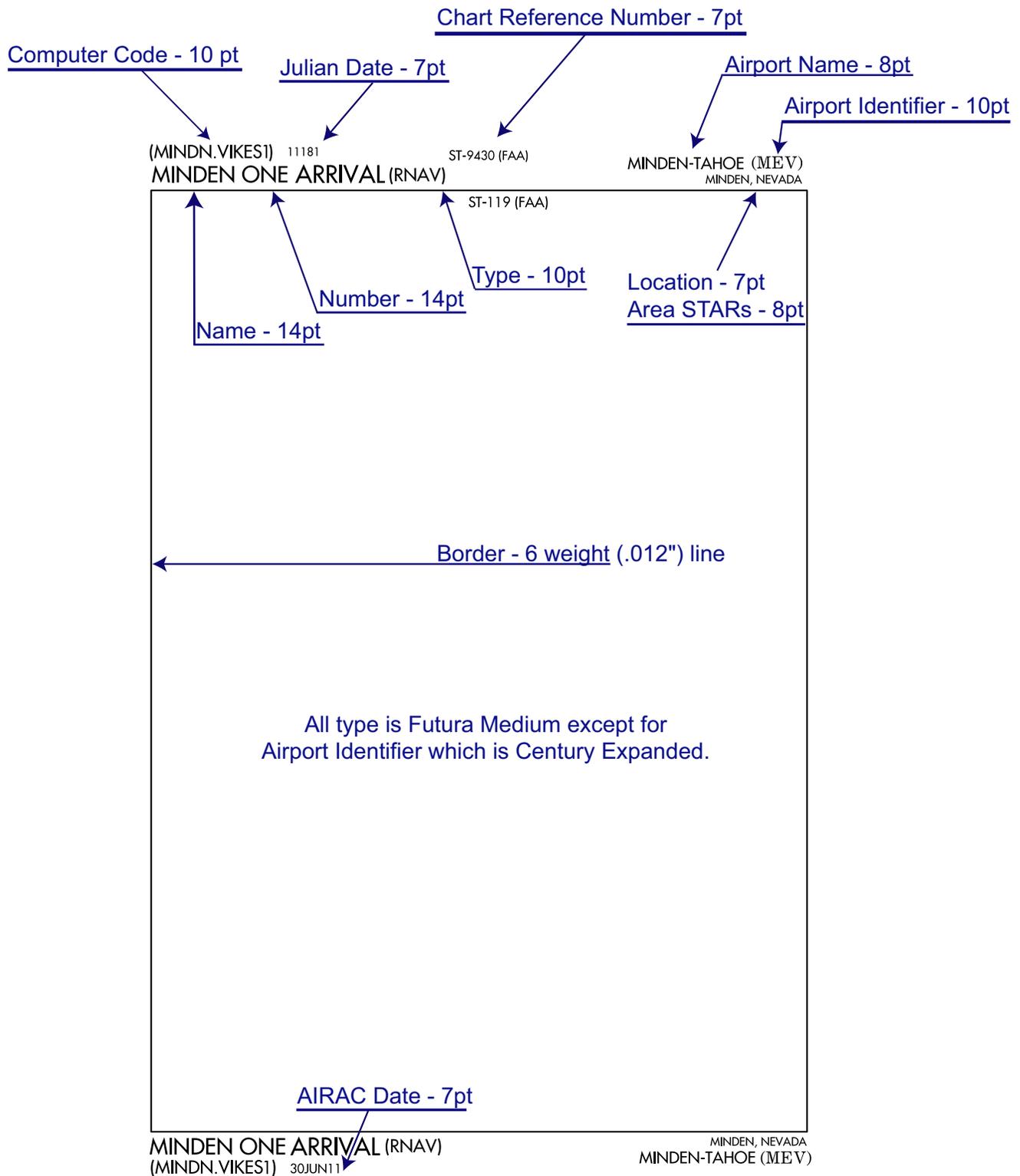
APPENDIX 2 PAGE LAYOUT



APPENDIX 3 EAST WEST PAGE LAYOUT



APPENDIX 4 MARGIN DATA

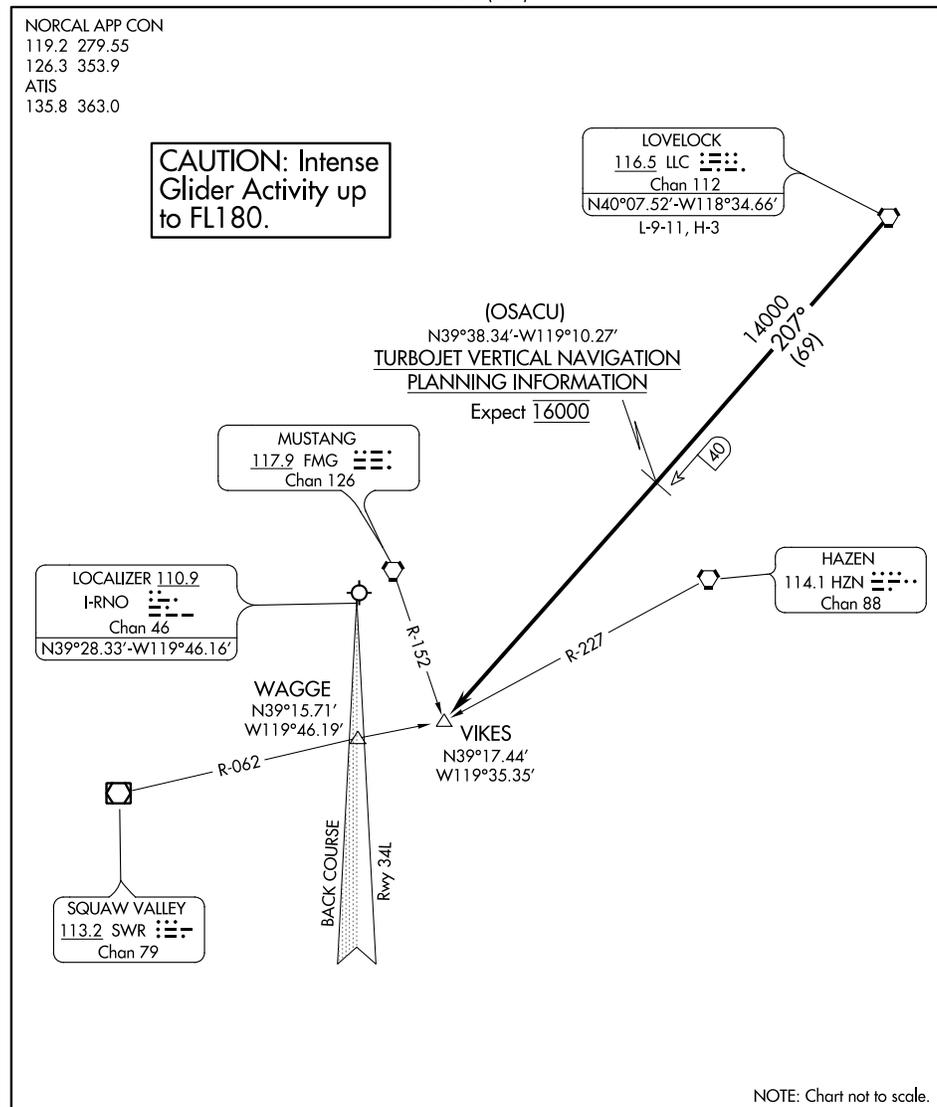


APPENDIX 6 STAR WITH ARRIVAL ONLY

(LLC.VIKES1) 12320
VIKES ONE ARRIVAL

ST-346 (FAA)

RENO/TAHOE INTL
RENO, NEVADA



From over LLC VORTAC via LLC R-207 to VIKES INT/DME, then radar vectors to the LOCALIZER BACK COURSE I-RNO.

LOST COMMUNICATIONS:

Proceed via the VIKES-WAGGE terminal route and execute the LOC/DME BC RWY 34L approach to Reno/Tahoe Intl.

VIKES ONE ARRIVAL
(LLC.VIKES1) 23APR98

RENO, NEVADA
RENO/TAHOE INTL

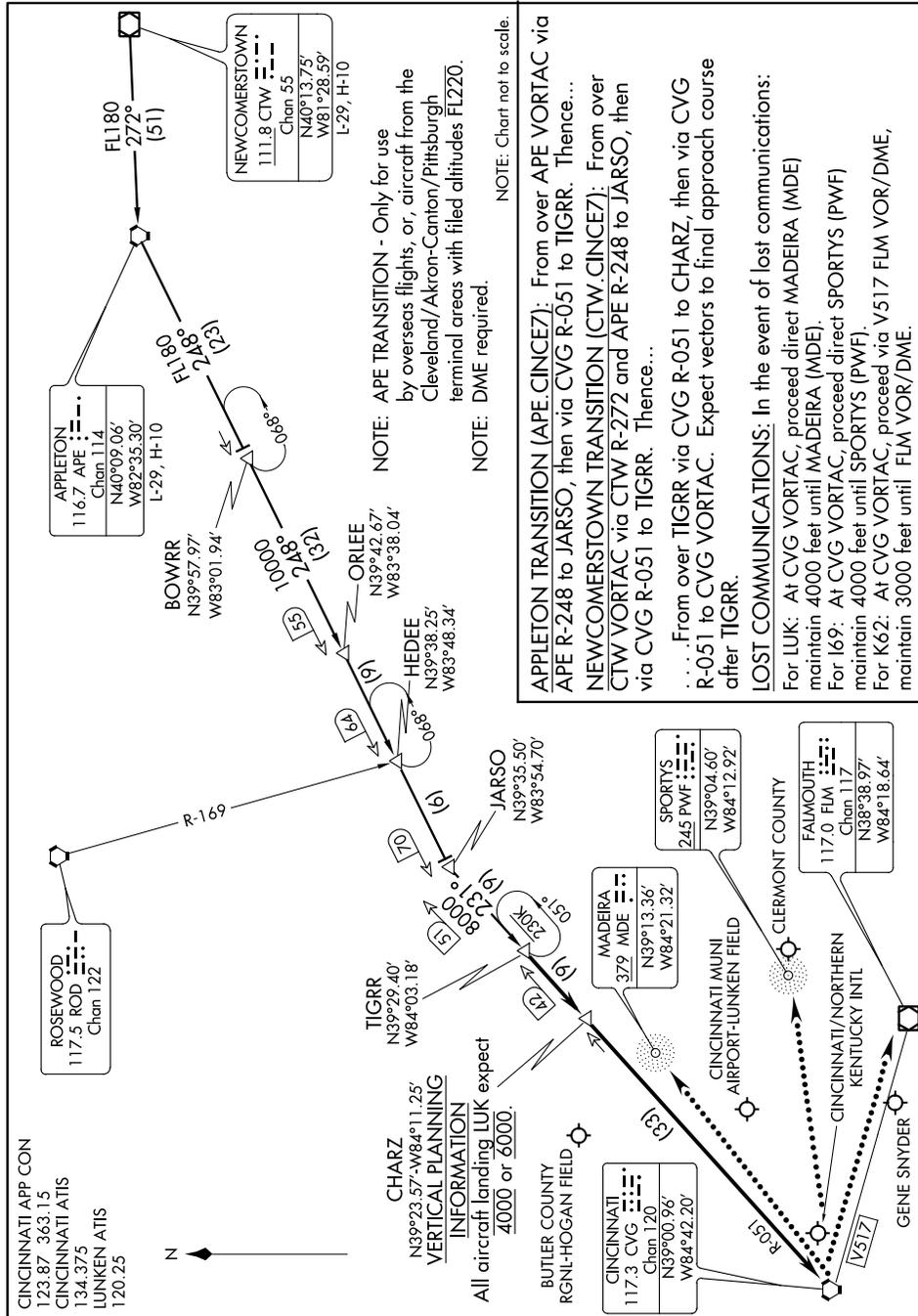
APPENDIX 7 STAR WITH EAST-WEST ORIENTATION

(TIGRR.CINCE7) 15008

ST-655 (FAA)

CINCE SEVEN ARRIVAL

CINCINNATI, OHIO



(TIGRR.CINCE7) 03APR14

CINCINNATI, OHIO

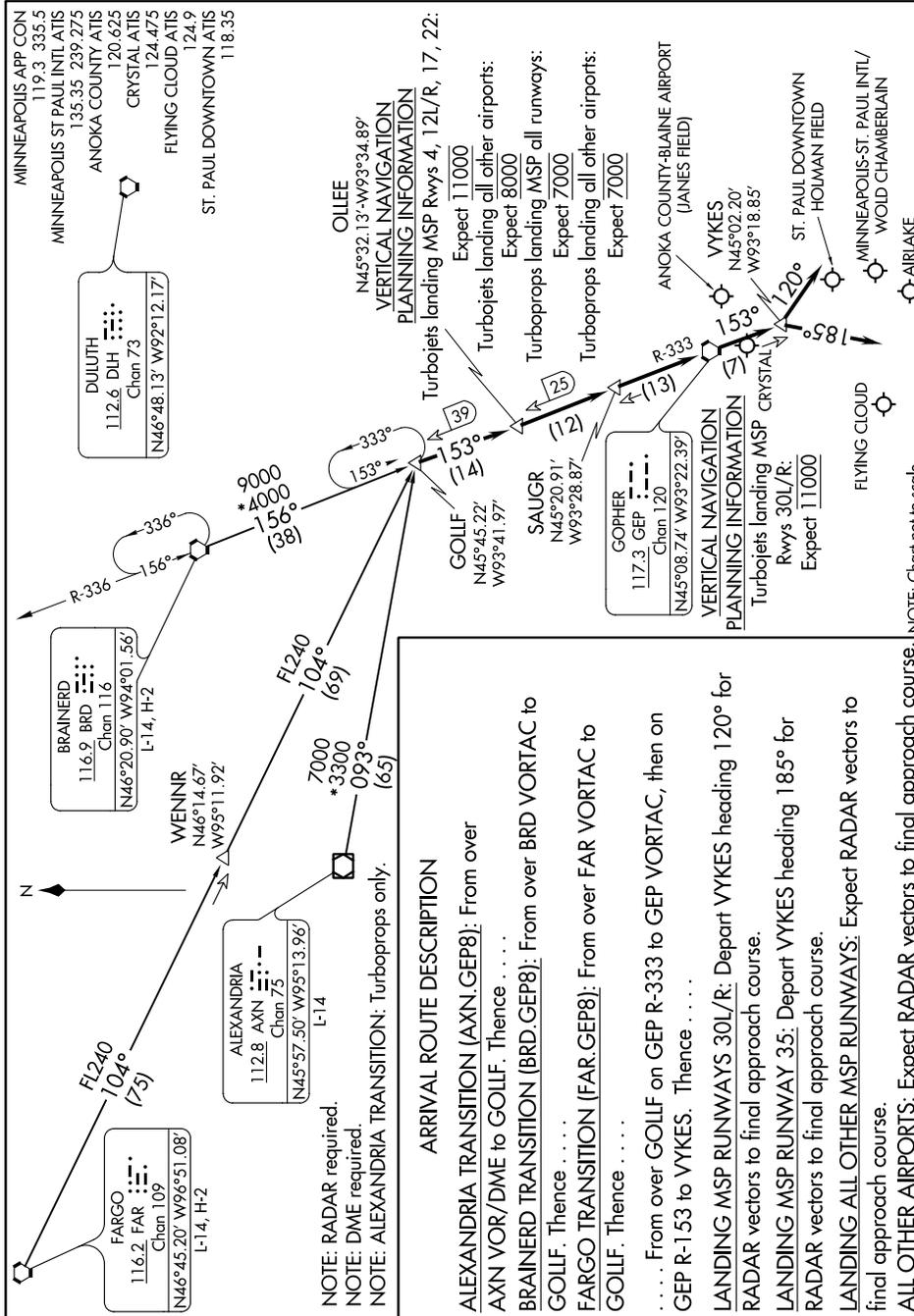
APPENDIX 8 AREA STAR

(GEP.GEP8) 15232

GOPHER EIGHT ARRIVAL

ST-264 (FAA)

MINNEAPOLIS, MINNESOTA



GOPHER EIGHT ARRIVAL

(GEP.GEP8) 20AUG15

MINNEAPOLIS, MINNESOTA

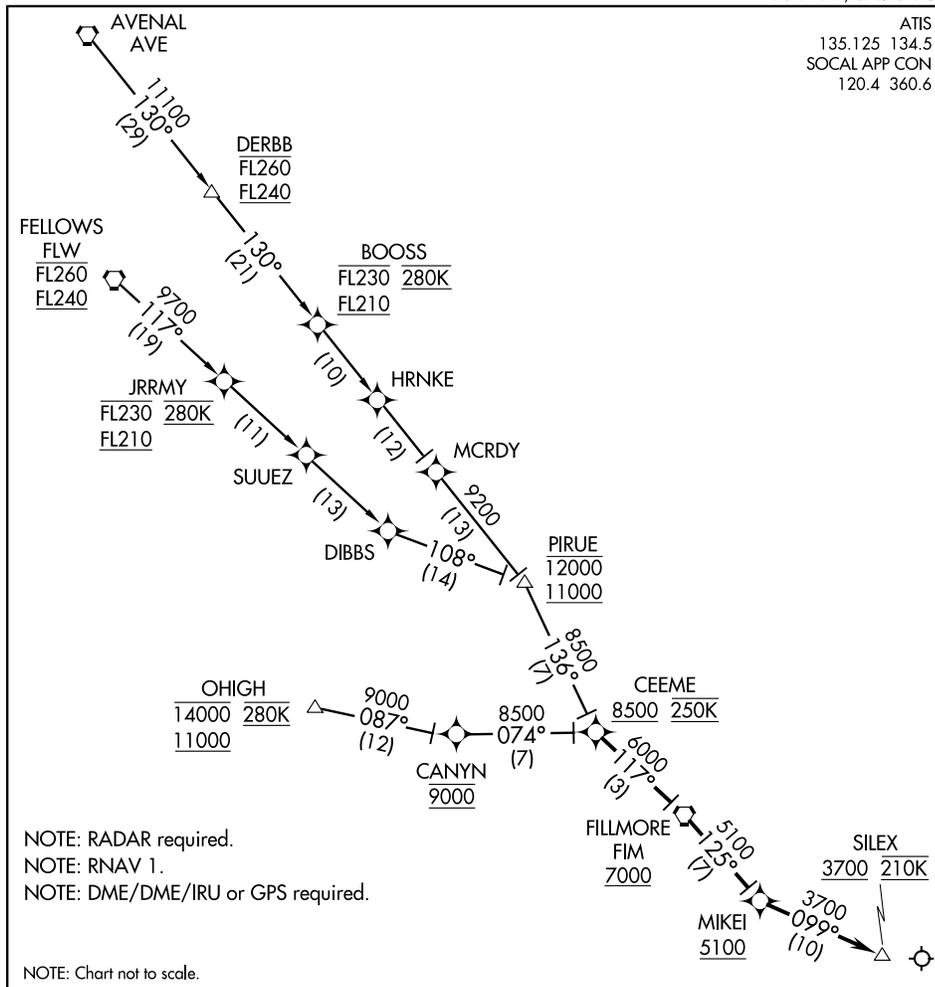
**APPENDIX 9
RNAV STAR**

(CEEME.CEEME2) 13346

CEEME TWO ARRIVAL (RNAV) ST-67 (FAA)

BOB HOPE (BUR)
BURBANK, CALIFORNIA

ATIS
135.125 134.5
SOCAL APP CON
120.4 360.6



ARRIVAL ROUTE DESCRIPTION

AVENAL TRANSITION (AVE.CEEME2)

DERBB TRANSITION (DERBB.CEEME2)

FELLOWS TRANSITION (FLW.CEEME2)

OHIGH TRANSITION (OHIGH.CEEME2)

From CEEME on track 117° to cross FIM VORTAC at/above 7000, then on track 125° to cross MIKEI at/above 5100, on track 099° to cross SILEX at/above 3700 and at 210K. Expect ILS or LOC Z RWY 8 approach.

LOST COMMUNICATIONS

Join the Burbank ILS or LOC Z RWY 8 approach at SILEX.

CEEME TWO ARRIVAL (RNAV)

(CEEME.CEEME2) 12DEC13

BURBANK, CALIFORNIA
BOB HOPE (BUR)

APPENDIX 10
STAR WITH CONTINUED PAGE (CONTINUED)

(BARET.BARET5) 15008

ST-373 (FAA)

BARET FIVE ARRIVAL

SAN DIEGO, CALIFORNIA

ARRIVAL ROUTE DESCRIPTION

IMPERIAL TRANSITION (IPL.BARET5): From over IPL VORTAC on IPL R-258 and MZB R-076 to BARET INT. Thence

NEEDLES TRANSITION (EED.BARET5): From over EED VORTAC on EED R-208 to SHADI INT, then on JLI R-040 to SALTN INT, then on PGY R-027 to CARUL INT, then on JLI R-177 to BARET INT. Thence

PARKER TRANSITION (PKE.BARET5): From over PKE VORTAC on PKE R-227 to SHADI INT, then on JLI R-040 to SALTN INT, then on PGY R-027 to CARUL INT, then on JLI R-177 to BARET INT. Thence

TWENTYNINE PALMS TRANSITION (TNP.BARET5): From over TNP VORTAC on TNP R-179 to MOMAR INT, then on JLI R-040 to SALTN INT, then on PGY R-027 to CARUL INT, then on JLI R-177 to BARET INT. Thence

. . . .LANDING SAN RWY 9: From BARET INT on PGY R-043 to PGY VORTAC, then on PGY R-270 to IFSOX, then on OCN R-162 to SARGS INT. Expect ILS Rwy 9 approach to SAN or LOC/DME-B to NZY.

. . . .LANDING SAN RWY 27 and NZY: From BARET INT on PGY R-043 to IFHEJ, then on I-UBR localizer to VYDDA INT. Expect LOC Rwy 27 approach to SAN or LOC/DME-A to NZY.

LOST COMMUNICATIONS: In the event of lost communications, North Island arrivals shall execute the TACAN Rwy 29 or TACAN Rwy 36.

BARET FIVE ARRIVAL

SAN DIEGO, CALIFORNIA

(BARET.BARET5) 08JAN15

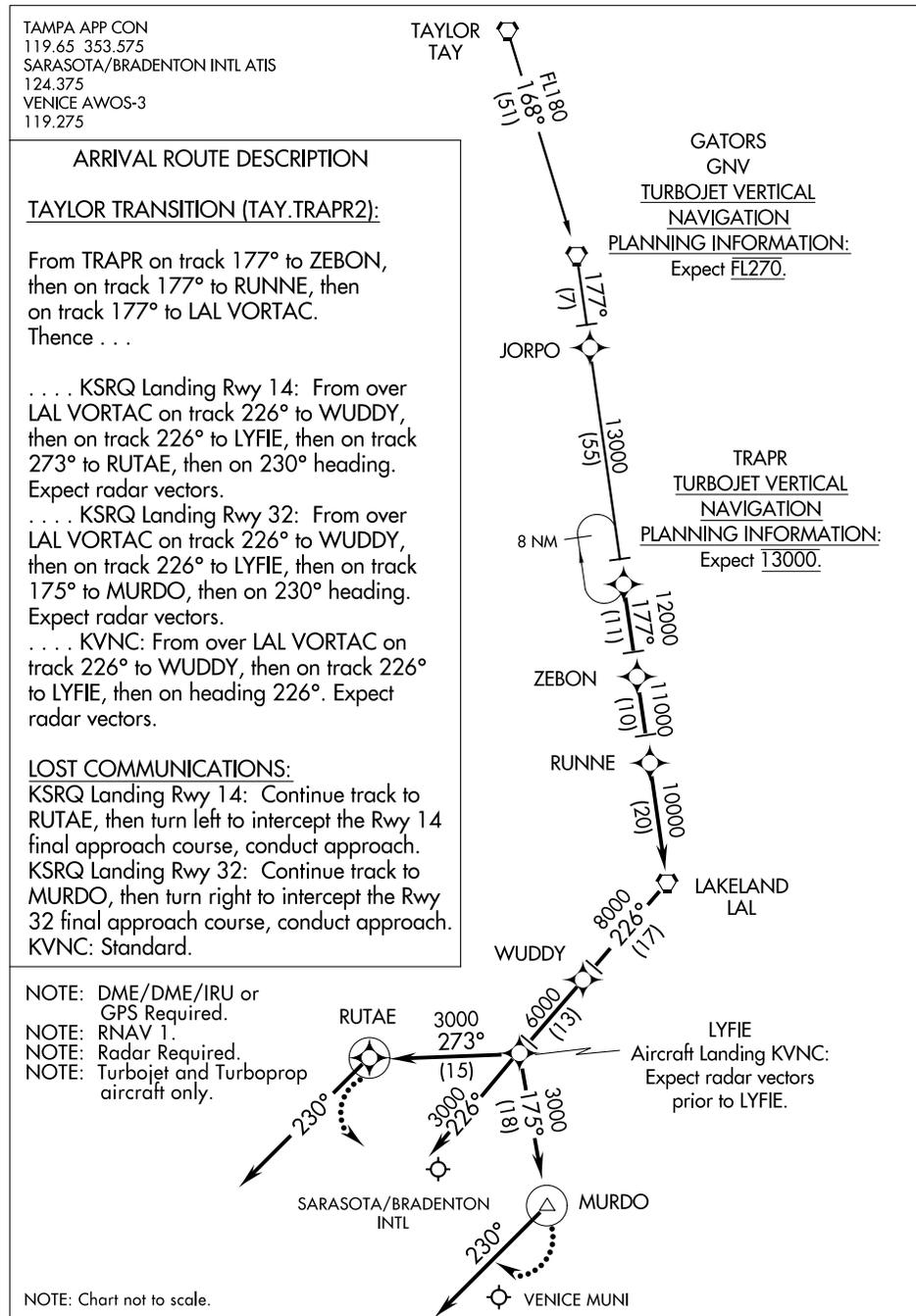
APPENDIX 11 STAR WITH OFFSET TEXT BOX

(TRAPR.TRAPR2) 13178

ST-640 (FAA)

TRAPR TWO ARRIVAL (RNAV)

SARASOTA/BRADENTON, FLORIDA



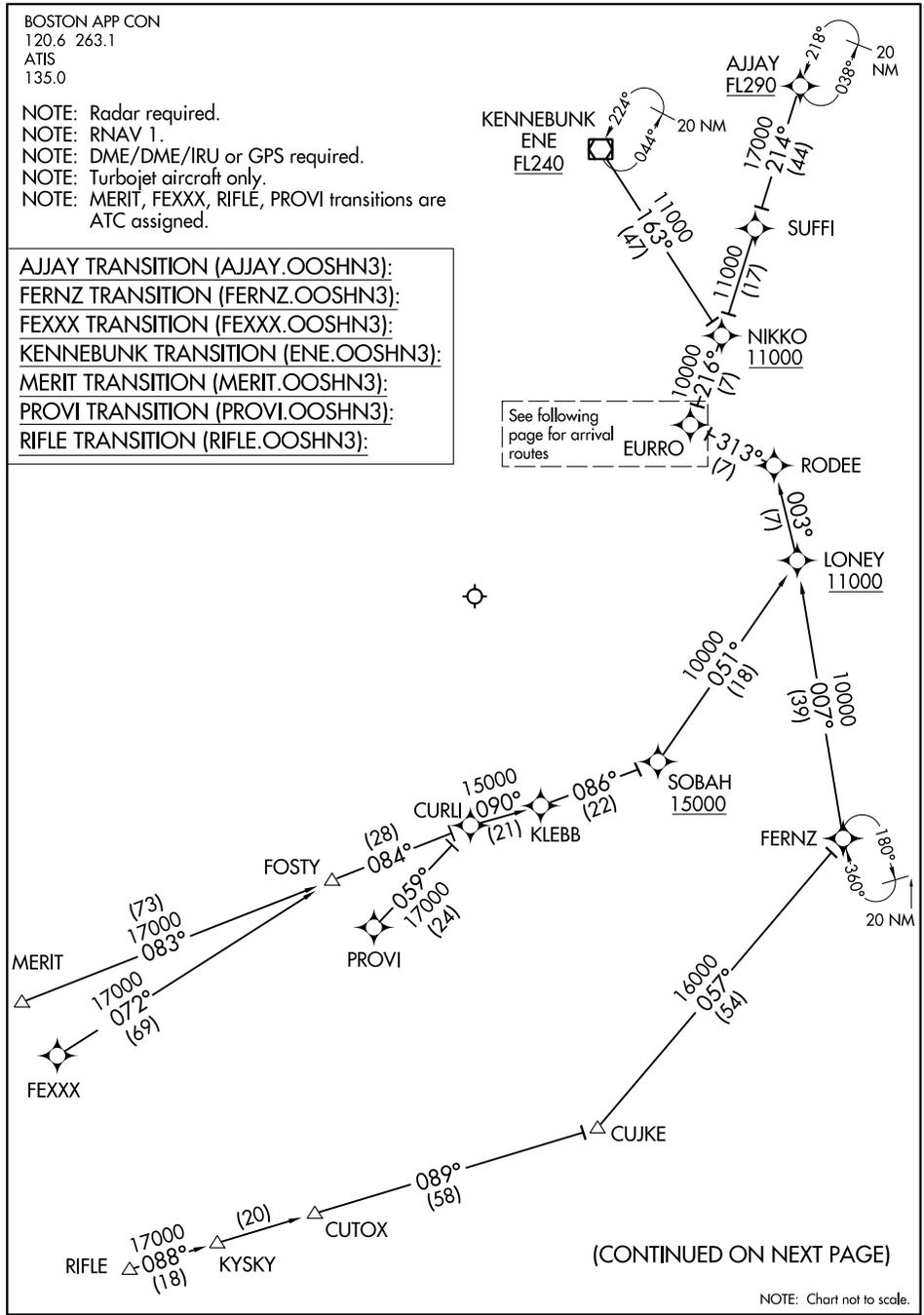
TRAPR TWO ARRIVAL (RNAV)

SARASOTA/BRADENTON, FLORIDA

(TRAPR.TRAPR2) 05MAY11

APPENDIX 12 MULTIPLE GRAPHIC STAR (2 PAGES)

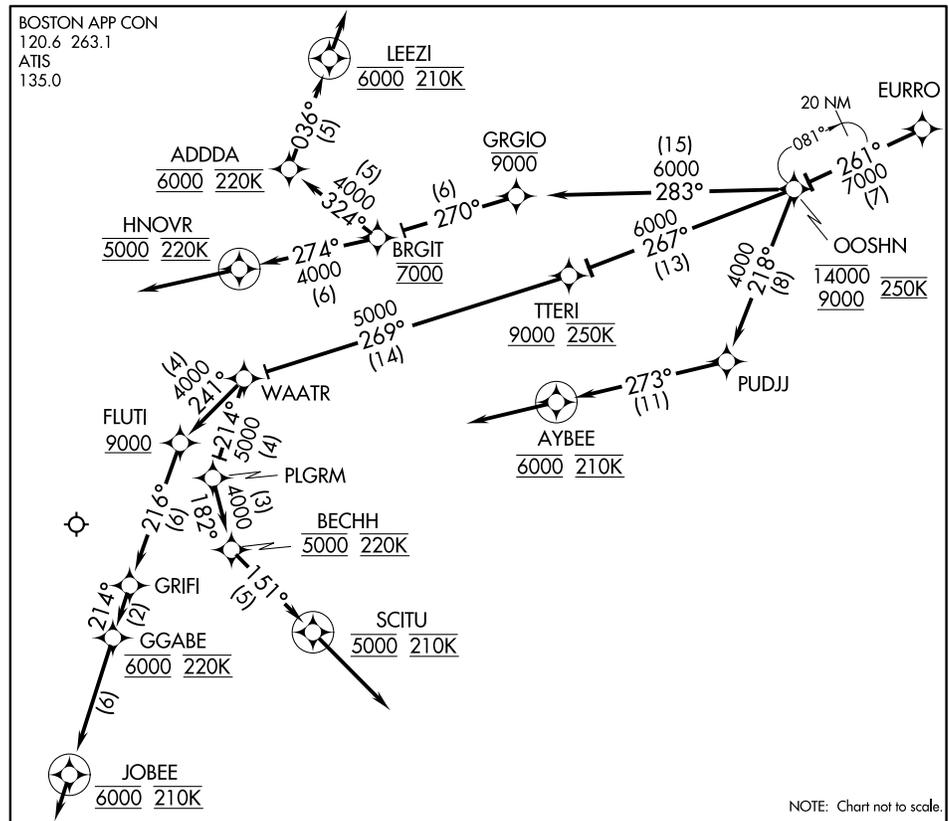
(EURO.OOSH3) 14317 ST-58 (FAA)
GENERAL EDWARD LAWRENCE LOGAN INTL (BOS)
OOSH3 THREE ARRIVAL (RNAV) Transition Routes BOSTON, MASSACHUSETTS



OOSH3 THREE ARRIVAL (RNAV) Transition Routes BOSTON, MASSACHUSETTS
(EURO.OOSH3) 13NOV14 GENERAL EDWARD LAWRENCE LOGAN INTL (BOS)

**APPENDIX 12
MULTIPLE GRAPHIC STAR (2 PAGES) (CONTINUED)**

(EURRO.OOSH3) 14317 ST-58 (FAA) GENERAL EDWARD LAWRENCE LOGAN INTL (BOS)
OOSH3 THREE ARRIVAL (RNAV) Arrival Routes BOSTON, MASSACHUSETTS



ARRIVAL ROUTE DESCRIPTION

From over EURRO on track 261° to cross OOSH3 between 9000 and 14000 and at 250K.

Landing Rwy 4L/R: From OOSH3 on track 267° to cross TTER1 at or above 9000 and at 250K, then on track 269° to WAATR, then on track 241° to cross FLUTI at or above 9000, then on track 216° to GRIFI, then on track 214° to cross GGABE at 6000 and at 220K, then on track 214° to cross JOBEE at 6000 and at 210K, then on track 214°. Expect radar vectors to final approach course.

Landing Rwy 15R: From OOSH3 on track 283° cross GRGIO at or below 9000, then on track 270° to cross BRGIT at 7000, then on track 274° to cross HNOVR at 5000 and at 220K, then on track 274°. Expect radar vectors to final approach course.

Landing Rwy 22L/R: From OOSH3 on track 283° to cross GRGIO at or below 9000, then on track 270° to cross BRGIT at 7000, then on track 324° to cross ADDDA at 6000 and at 220K, then on track 036° to cross LEEZI at 6000 and at 210K, then on track 036°. Expect radar vectors to final approach course.

Landing Rwy 27: From OOSH3 on track 218° to PUDJJ, then on track 273° to cross AYBEE at 6000 and at 210K, then on track 273°. Expect radar vectors to final approach course.

Landing Rwy 32, 33L: From OOSH3 on track 267° to cross TTER1 at or above 9000 at 250K, then on track 269° to WAATR, then on track 214° to PLGRM, then on track 182° to cross BECHH at 5000 and at 220K, then on track 151° to cross SCITU at 5000 and at 210K, then on track 151°. Expect radar vectors to final approach course.

OOSH3 THREE ARRIVAL (RNAV) Arrival Routes BOSTON, MASSACHUSETTS
 (EURRO.OOSH3) 13NOV14 GENERAL EDWARD LAWRENCE LOGAN INTL (BOS)

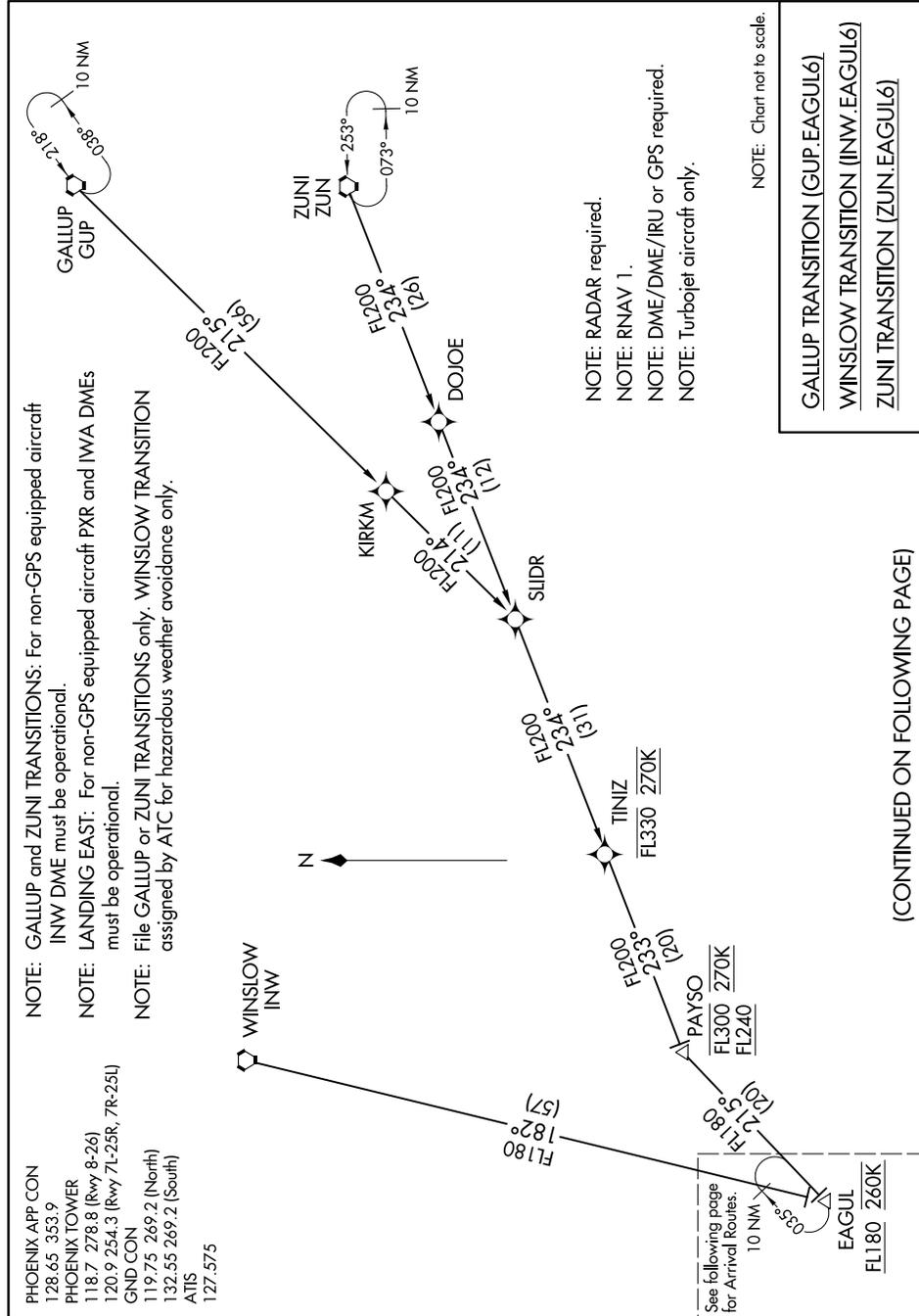
APPENDIX 13
 MULTIPLE GRAPHIC STAR (3 PAGES)

(EAGUL.EAGUL6) 14261

ST-322 (FAA)

EAGUL SIX ARRIVAL (RNAV) Transition Routes

PHOENIX SKY HARBOR INTL (PHX)
 PHOENIX, ARIZONA



EAGUL SIX ARRIVAL (RNAV) Transition Routes

PHOENIX, ARIZONA
 PHOENIX SKY HARBOR INTL (PHX)

(EAGUL.EAGUL6) 18SEP14

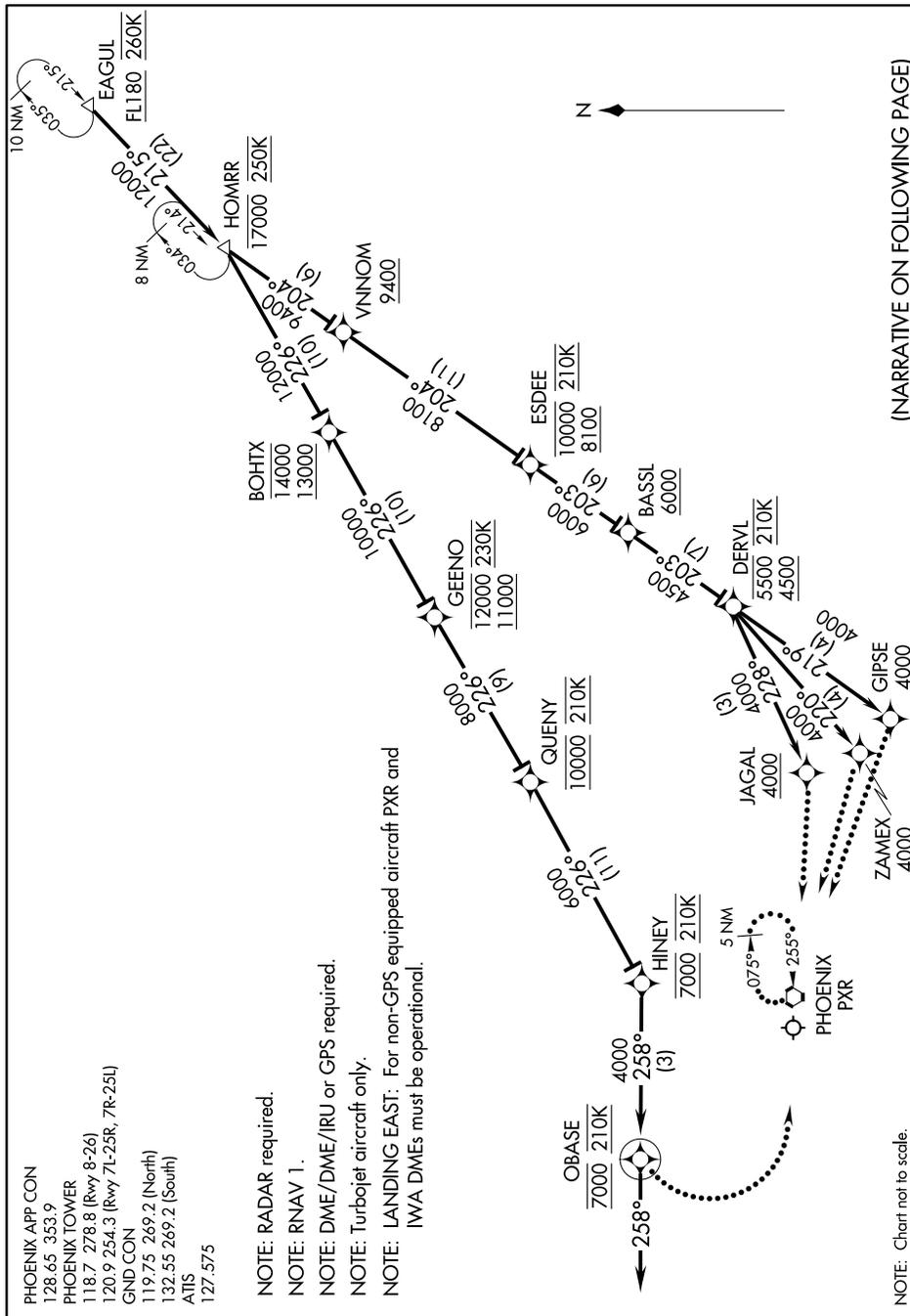
APPENDIX 13
MULTIPLE GRAPHIC STAR (3 PAGES) (CONTINUED)

(EAGUL.EAGUL6) 14261

ST-322 (FAA)

EAGUL SIX ARRIVAL (RNAV) Arrival Routes

PHOENIX SKY HARBOR INTL (PHX)
PHOENIX, ARIZONA



EAGUL SIX ARRIVAL (RNAV) Arrival Routes
(EAGUL.EAGUL6) 18SEP14

PHOENIX, ARIZONA
PHOENIX SKY HARBOR INTL (PHX)

APPENDIX 13
MULTIPLE GRAPHIC STAR (3 PAGES) (CONTINUED)

(EAGUL.EAGUL6) 14261

ST-322 (FAA)

PHOENIX SKY HARBOR INTL (PHX)
PHOENIX, ARIZONA**EAGUL SIX ARRIVAL (RNAV)**

ARRIVAL ROUTE DESCRIPTION

From EAGUL on track 215° to cross HOMRR at or below 17000 at 250K.

LANDING RUNWAYS 7L, 7R, 8: From HOMRR on track 226° to cross BOHTX at/above 13000 and at/below 14000, then on track 226° to cross GEENO at/above 11000 and at/below 12000 and at 230K, then on track 226° to cross QUENY at 10000 and at 210K, then on track 226° to cross HINEY at 7000 and at 210K, then on track 258° to cross OBASE at 7000 and at 210K, then on track 258°. Expect RADAR vectors to final approach course.

LANDING RUNWAY 25L: From HOMRR on track 204° to cross VNNOM at/above 9400, then on track 204° to cross ESDEE at/above 8100 and at/below 10000 and at 210K, then on track 203° to cross BASSL at/above 6000, then on track 203° to cross DERVL at/above 4500 and at/below 5500 and at 210K, then on track 219° to cross GIPSE at/above 4000. Expect ILS or LOC RWY 25L approach or RADAR vectors to final approach course.

LANDING RUNWAY 25R: From HOMRR on track 204° to cross VNNOM at/above 9400, then on track 204° to cross ESDEE at/above 8100 and at/below 10000 and at 210K, then on track 203° to cross BASSL at/above 6000, then on track 203° to cross DERVL at/above 4500 and at/below 5500 and at 210K, then on track 220° to cross ZAMEX at/above 4000. Expect RNAV (GPS) Y RWY 25R approach or RADAR vectors to final approach course.

LANDING RUNWAY 26: From HOMRR on track 204° to cross VNNOM at/above 9400, then on track 204° to cross ESDEE at/above 8100 and at/below 10000 and at 210K, then on track 203° to cross BASSL at/above 6000, then on track 203° to cross DERVL at/above 4500 and at/below 5500 at 210K, then on track 228° to cross JAGAL at/above 4000. Expect ILS or LOC RWY 26 approach or RADAR vectors to final approach course.

LOST COMMUNICATIONS

LANDING RUNWAY 7L: After OBASE turn left, intercept and execute RWY 7L ILS approach. If unable, proceed direct PXR VORTAC and hold, maintain 9000.

LANDING RUNWAY 7R: After OBASE turn left, intercept and execute RWY 7R ILS approach. If unable, proceed direct PXR VORTAC and hold, maintain 9000.

LANDING RUNWAY 8: After OBASE turn left, intercept and execute RWY 8 ILS approach. If unable, proceed direct PXR VORTAC and hold, maintain 9000.

LANDING RUNWAY 25L: At GIPSE, intercept and execute RWY 25L ILS approach. If unable, proceed direct PXR VORTAC and hold, maintain 9000.

LANDING RUNWAY 25R: At ZAMEX, intercept and execute RWY 25R RNAV (GPS) approach. If unable, proceed direct PXR VORTAC and hold, maintain 9000.

LANDING RUNWAY 26: At JAGAL, intercept and execute RWY 26 ILS approach. If unable, proceed direct PXR VORTAC and hold, maintain 9000.

EAGUL SIX ARRIVAL (RNAV)

(EAGUL.EAGUL6) 18SEP14

PHOENIX, ARIZONA
PHOENIX SKY HARBOR INTL (PHX)

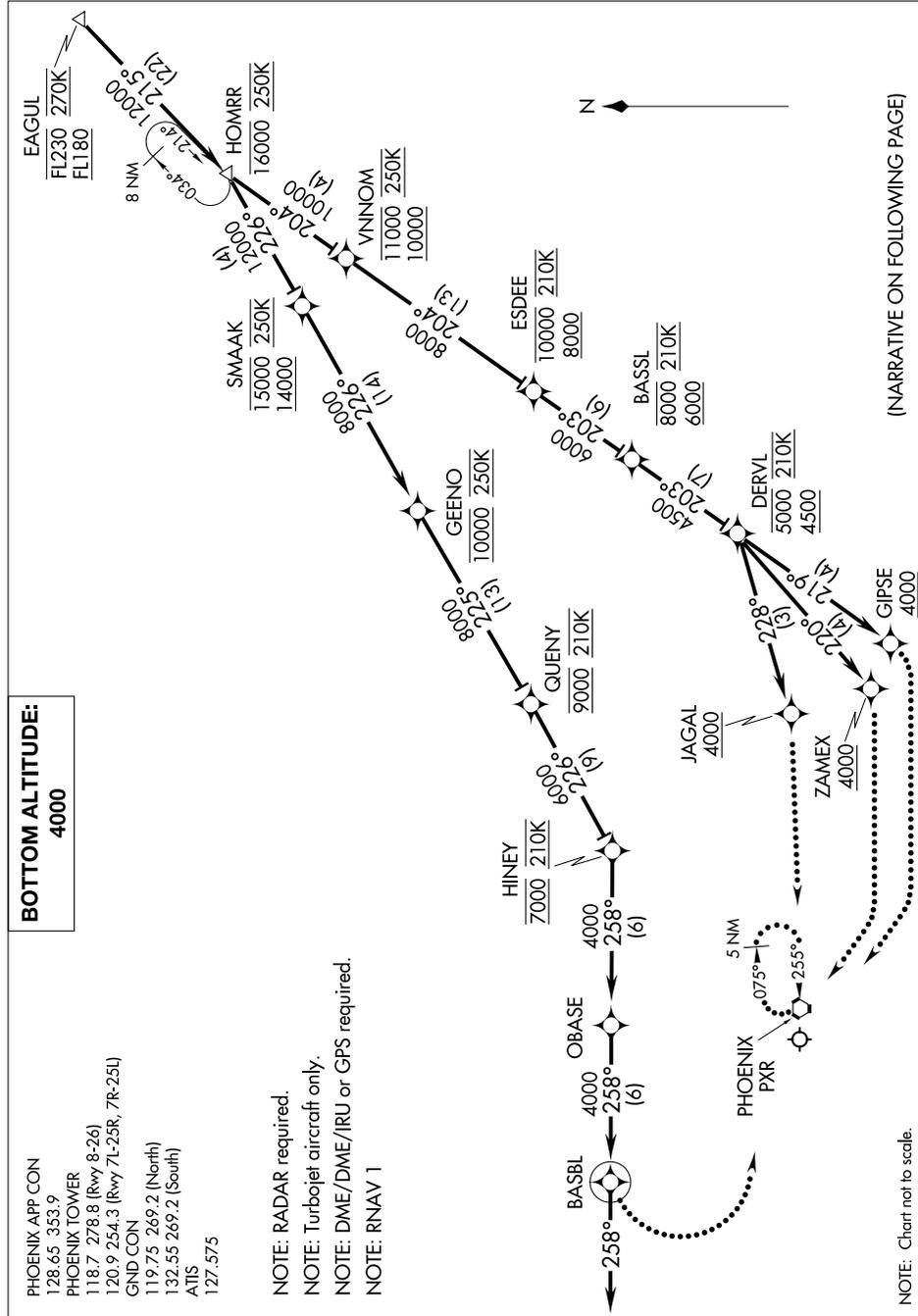
APPENDIX 14
STAR WITH SINGLE BOTTOM ALTITUDE NOTE

(EAGUL.EAGUL5) 00000

ST-322 (FAA)

EAGUL FIVE ARRIVAL (RNAV) Arrival Routes

PHOENIX SKY HARBOR INTL
PHOENIX, ARIZONA



EAGUL FIVE ARRIVAL (RNAV) Arrival Routes

(EAGUL.EAGUL5) 00XXXX

PHOENIX, ARIZONA
PHOENIX SKY HARBOR INTL

**APPENDIX 15
STAR WITH MULTIPLE BOTTOM ALTITUDE NOTES**

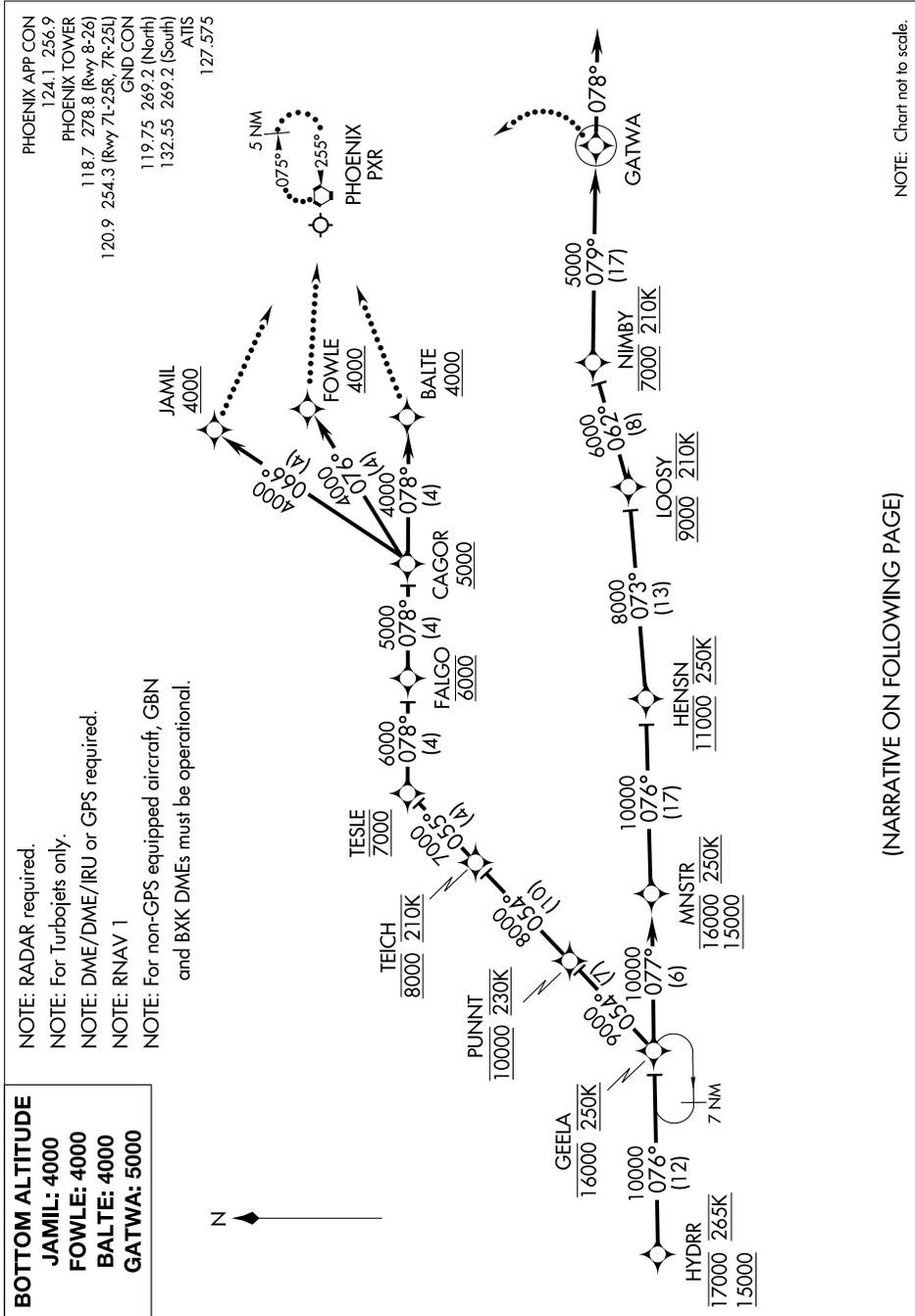
(GEELA.GEELA6) 00000

ST-322 (FAA)

GEELA SIX ARRIVAL (RNAV)

Arrival Routes

PHOENIX SKY HARBOR INTL
PHOENIX, ARIZONA



GEELA SIX ARRIVAL (RNAV)

Arrival Routes

(GEELA.GEELA6) 00XXX00

PHOENIX, ARIZONA
PHOENIX SKY HARBOR INTL

(NARRATIVE ON FOLLOWING PAGE)

NOTE: Chart not to scale.

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