

## 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

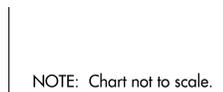
#### 3.2.1 Relative Positioning

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.

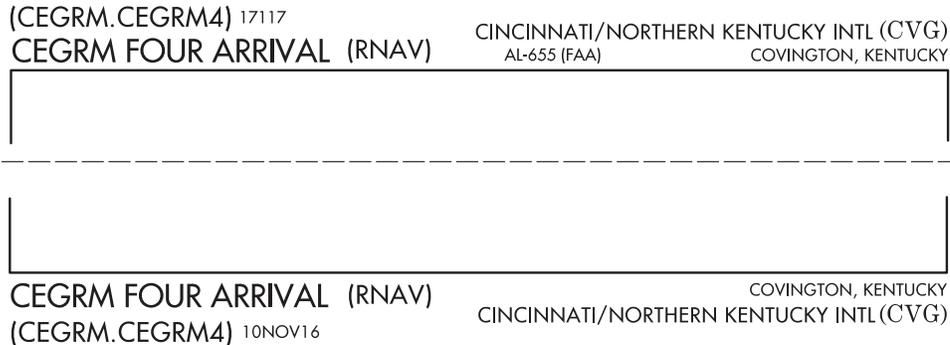
#### 3.2.5 Placement of Identification and Notes

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.

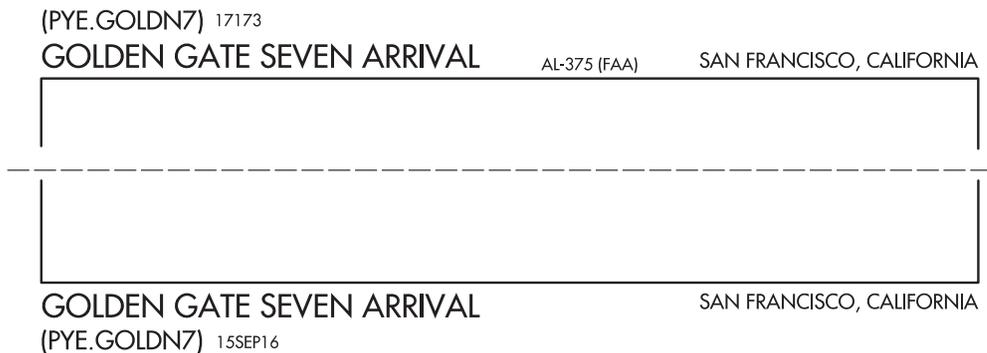
### 3.3 MARGIN DATA

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 14](#).

### 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 shall be preceded by the series code “AL” and dash followed by the abbreviated name of the appropriate authority for the procedure, placed inside parenthesis; e.g.; AL-000(USA); AL-000(USAF); AL-000(USN); AL-000 (FAA).

### 3.3.5 Airport Name and Identifier

The airport name, extracted verbatim from the authoritative database, immediately followed by the FAA airport identifier shown in parenthesis, shall be shown at the top and bottom margins. Airports outside the contiguous United States will be shown with both the FAA airport identifier followed by the ICAO airport identifier. 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 14](#).

### **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 Communications Information**

APP CON and ATIS or AFIS (AK) are the only communications information shown unless additional communications are specifically requested on the procedure source form and preceded with the command CHART. When other communications are requested on the procedure source document, they will be listed in the following sequence: CENTER, APP CON, ATIS (to include D-ATIS, AFIS, AWOS/ASOS), GND CON, TOWER (CTAF).

##### **3.4.2.2.1 Standard Communications**

###### **3.4.2.2.1.1 Approach Control (APP CON)**

Approach Control shall be shown by name and abbreviated; e.g., “Name APP CON”. Multiple APP CON frequencies may be charted when published in the source database, though additional communications shall not exceed one VHF and one UHF primary frequency.

###### **3.4.2.2.1.2 Automatic Terminal Information Service (ATIS)**

Automatic Terminal Information Service shall be shown by the letters “ATIS” followed by the specific frequency. If the service is digital and listed as D-ATIS in the authoritative source database, “D-ATIS” shall be shown followed by the specific frequency.

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 airport location identifier of the airport/s providing the ATIS shall be shown, e.g., APA ATIS 124.25. Airports located outside the contiguous U.S. will also include the ICAO identifier, e.g., MRI/PAMR. Multiple ATIS are ordered alphabetically by identifier.

#### 3.4.2.2.1.3 (AK) Automated Flight Information Service (AFIS)

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

#### 3.4.2.2.2 Additional Communications

Additional Communications will only be shown when specifically requested on the procedure source form and preceded with the command CHART and will be listed in the below sequence. Additional communications, as identified, shall not exceed one VHF and one UHF primary frequency for each of the following:

- CENTER (part-time APP CON)
- APP CON
- ATIS (D-ATIS) (AFIS)
- AWOS/ASOS
- GND CON
- TOWER (CTAF)

#### 3.4.2.2.2.1 Automated Weather Systems (ASOS/AWOS)

Automated Weather Systems (AWOS/ASOS) shall be 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 airport location identifier of the airport/s providing ASOS or AWOS shall be shown, e.g., HGR ASOS 118.325. Airports located outside the contiguous U.S. will also include the ICAO identifier, e.g., MRI/PAMR. Multiple ATIS will ordered alphabetically by identifier.

When available, ATIS or AFIS will be the only weather frequencies published.

**Figure 3.6 Area STAR Communications Example**

```
AUSTIN APP CON
127.225 317.65
AUS D-ATIS
124.4
EDC AWOS-3
118.825
HYI ATIS
120.825
RYW ASOS
119.375
```

### 3.4.2.2.3 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 3.7 Non-Continuous Operation Depiction**

JUNEAU TOWER★  
118.7 (CTAF) 278.3

### 3.4.3 Flyover Symbology

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. Airport names will be extracted verbatim from the authoritative database.

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.

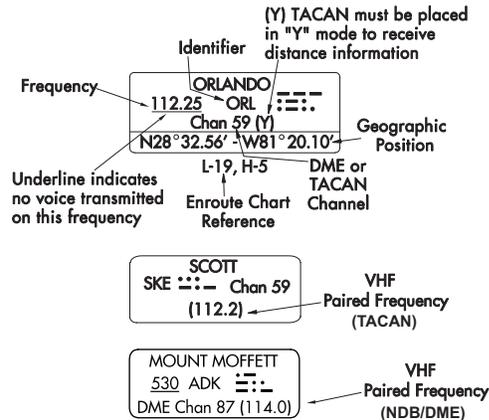
#### 3.4.6.2 Frequencies Without Voice

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

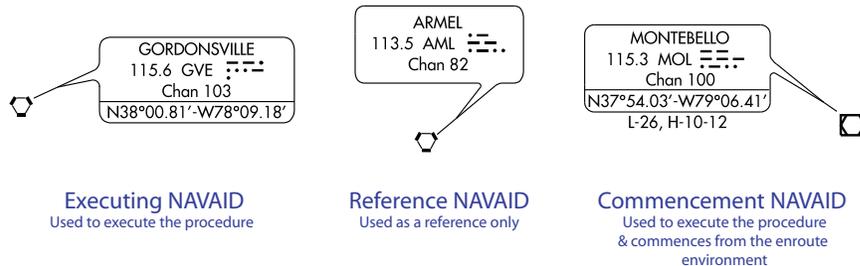
### 3.4.6.3 Symbolization and Identification of NAVAIDS

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 3.8 NAVAID Symbolization**



**Figure 3.9 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).

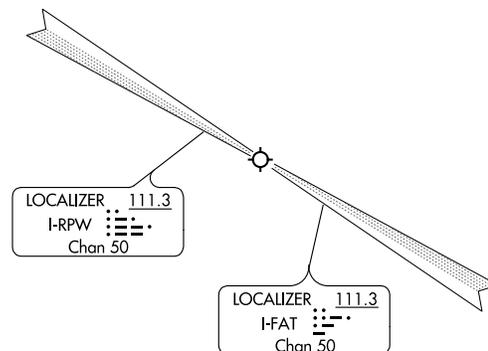
### 3.4.6.5 Geographic Coordinates

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. The back course, when shown, shall be identified as "BACK COURSE" positioned along and parallel to the course.

**Figure 3.10 ILS Localizer Course**



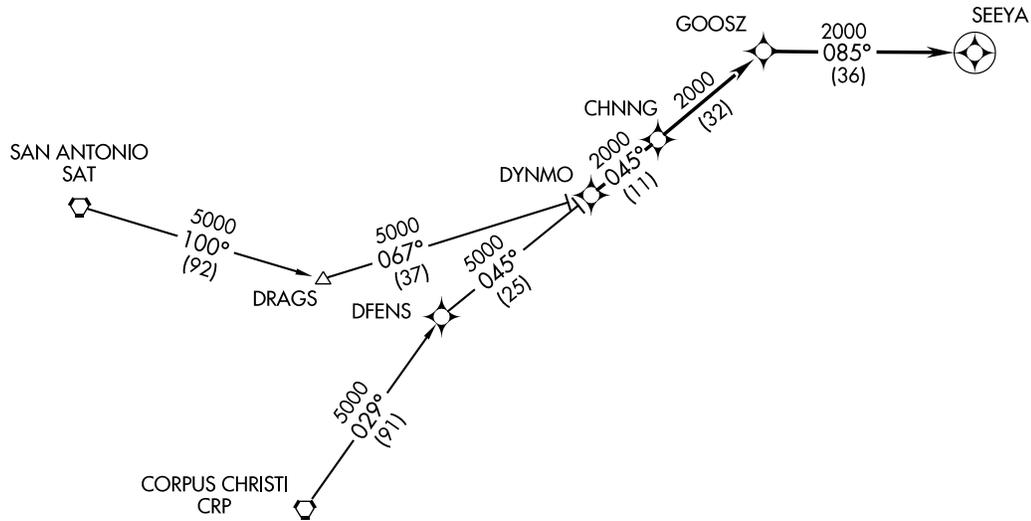
Simplified Directional Facilities (SDF) shall be shown in accordance with the above, as illustrated in [Appendix 1](#).

### 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 3.11 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 3.1 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. Waypoints will be depicted with the symbol and five letter identifier only.

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

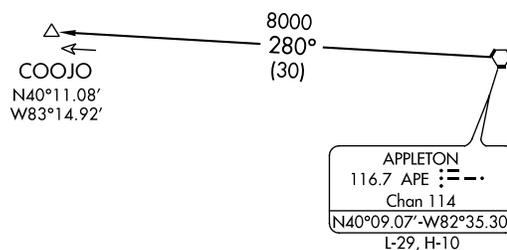
Named DME fixes shall be identified by the placement of small open arrowheads (.12 in length) pointing to the fix from the VHF/UHF NAVAID forming the fix. These open arrowheads shall be positioned adjacent to the fix, along and parallel to the route or radial.

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.

**Figure 3.12 Named DME Fix**

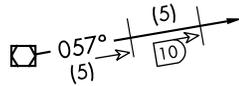


#### 3.4.8.3 Un-named DME

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.

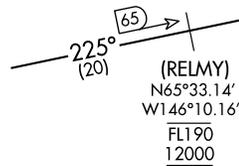
Type size and style for the DME mileage shall be 7 point, expressed in whole miles except when less than one mile and when specified by the procedure source document.

**Figure 3.13 Unnamed DME Fix**



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

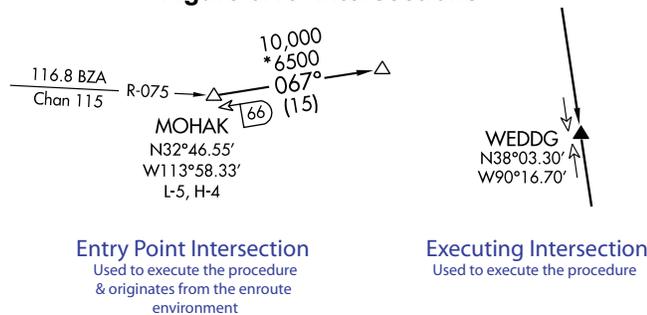
**Figure 3.14 Un-Name DME Fix with Colocated CNF**



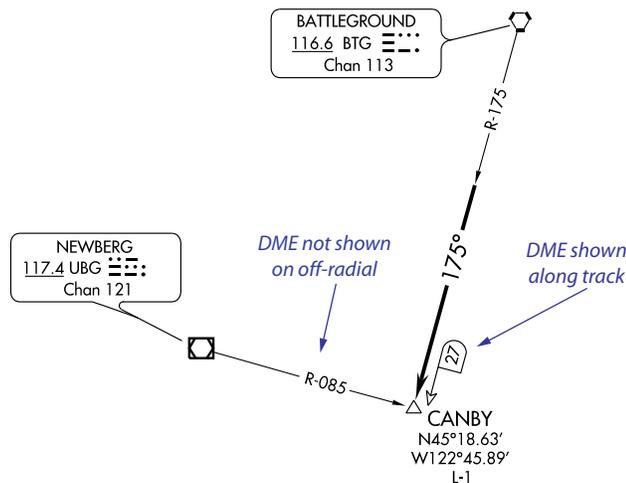
### 3.4.8.4 Intersections

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

**Figure 3.15 Intersections**



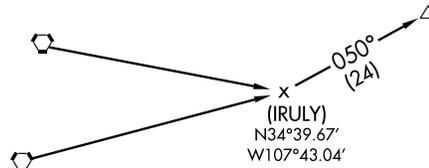
**Figure 3.16 Off-Radial DME**



### 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 3.17 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**

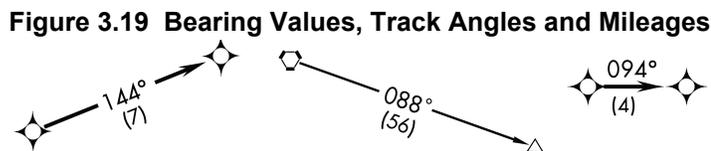
All route data shall apply to both RNAV and NAVAID STARs unless otherwise stated.

**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 along each segment as space permits, including after the final fix in the arrival. 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**

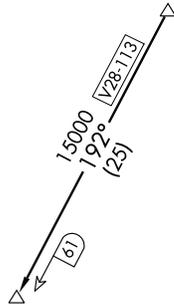
Nautical mile distances (mileages) between primary NAVAIDs, intersections, fixes, and waypoints along the route shall be shown rounded to the nearest whole nautical mile, within parentheses, normally below the route symbol. Type size shall be 8 pt.



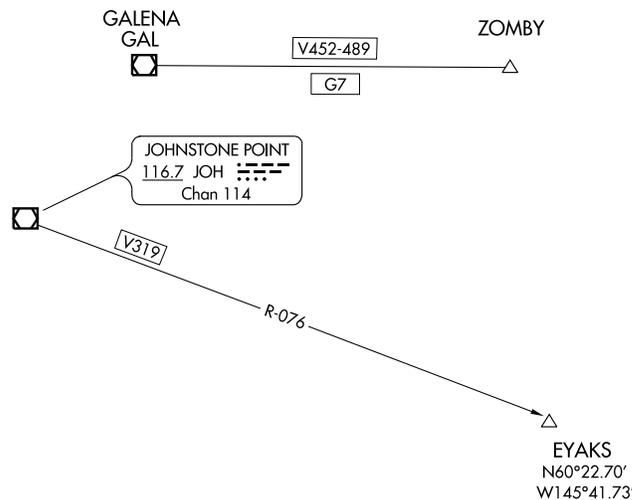
**3.4.10.3 Airways/Routes (Coincidental and Noncoincidental)**

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 3.20 Coincidental Routes**



**Figure 3.21 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 3.2](#) 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 3.2 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 <u>12000</u> ”.	<u>12000</u>
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 <u>12000</u> ”.	<u>12000</u>
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 <u>15000</u> <u>12000</u> ”.  Block altitudes may be worded as ‘Cross above 12000 and below 15000’ or ‘Expect clearance to cross above 12000 and below 15000’.	<u>15000</u> <u>12000</u>

#### 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 3.3](#) below.

**Table 3.3 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.	<u>170K</u>
Mandatory Speed	Mandatory airspeeds shall be depicted as a number with a line above and below. Cross at 170K will be shown as depicted.	<u>170K</u>

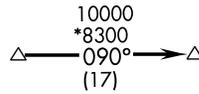
#### 3.4.10.6 Paired Restrictive Airspeeds and Altitudes

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

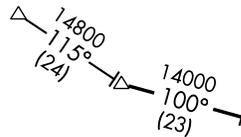
**3.4.10.7 MEA, MOCA, etc**

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 3.22 MEA and MOCA Depiction**



**Figure 3.23 MEA Change Depiction**



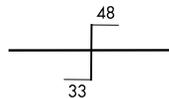
Other requested altitudes such as MAA, MRA, etc., will be shown above the MEA preceding by their identifier, e.g., MAA FL450, MRA18000. Type size shall be 8 pt.

**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.

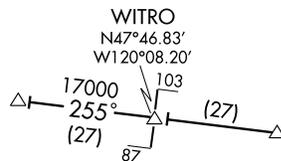
**Figure 3.24 Changeover Point**



**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 3.25 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**

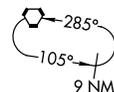
Holding patterns shall be shown using a 2 weight (.006") racetrack-type symbol broken for 7 pt bearings with arrowheads indicating direction of turns. If the inbound leg of the hold is coincident with an arrival or transition track (i.e. same value), the inbound bearing, 2 weight (.006") line, and arrowhead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

**Figure 3.26 Holding Patterns**



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

**Figure 3.27 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 3.28 Non-RNAV Holding Patterns**



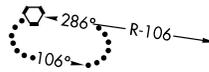
If a nautical mile leg length or DME leg length is requested on the procedure source document for a non-RNAV hold, they shall be shown as illustrated below.

**Figure 3.29 Holding Patterns with Leg Length**



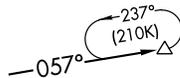
Holding patterns associated with lost communications shall be shown using the dotted line pattern instead of a solid line.

**Figure 3.30 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 3.31 Holding Patterns with Maximum Restricted Airspeeds**

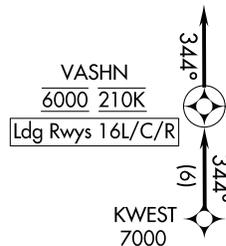


All supplemental information (i.e. distances, speeds, etc) shall be 7 pt.

**3.4.10.11 Terminus Identification Box**

A Terminus Identification Box will be shown at each of the STAR terminus points when requested on the procedure source document. Type size shall be 8 pt. enclosed in a 3 weight (.006") box.

**Figure 3.32 Terminus Identification Box**



References:

- [Appendix 16](#) - Terminus Identification Box - Runway Terminus
- [Appendix 17](#) - Terminus Identification Box - Airport Terminus

**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.

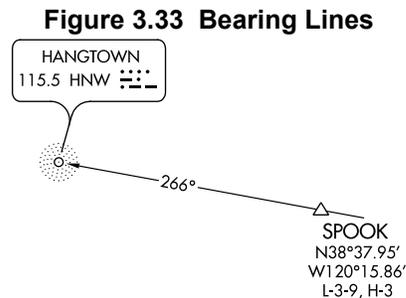
When a radial line overlies a course/route/transition line, the radial value (i.e. R-322) shall be shown above the heavier weight line, adjacent to the NAVAID.

### 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.

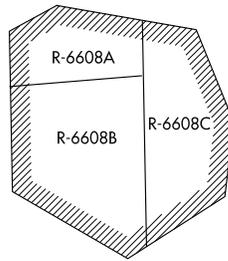
Special Use Airspace shall be portrayed by a 2 weight (.006") diagonal line pattern, .10" in width, positioned so as to have the lines in a NE to SW direction. In no case will the portrayal of Special Use Airspace obliterate the functional procedural data. Should an area be too small to portray the specified 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 3.34 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 3.35 Air Defense Identification Zone (ADIZ) Boundary**



#### 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. The foot symbol (') will always be used to indicate "feet" or "ft" in all notes, e.g., 500'.

When multiple runway ends are listed for the same line of information, they will be listed in numerical order from 1 to 36. When parallel runways are listed they will be listed in the order left, center, right, e.g., 1R, 16L/C/R, 19L.

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. Operational notes that apply to only a specific portion of the procedure will be charted on the page that graphically depicts the portion of the procedure addressed in the note.

**3.4.15.1 PBN/Equipment Requirements Note Box**

When indicated on the procedure source document, an Equipment and/or PBN Requirements notes box 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 neat-line, and finally to where space allows. Type size shall be 8 point text enclosed in a 3 weight (.006") box. When more than one PBN Requirement Note is specified on the procedure source document, the notes will be stacked within the same box.

**Figure 3.36 PBN Requirements Note Box**



When the procedure source document indicates both a PBN requirement note and an equipment requirement note, two stacked boxes will be shown. PBN Requirements notes will be listed in the first box. Equipment Requirements will be listed in the second box.

**Figure 3.37 PBN/Equipment Requirements Note Box**



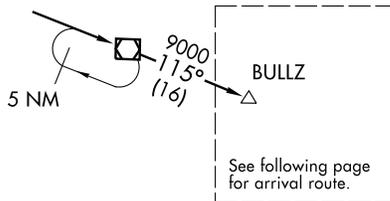
References:

[Appendix 13](#) - PBN/Equipment Requirements Note Box

**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 3.38. Box size is not fixed but shall be of a size to encompass the standard note and terminating point.

**Figure 3.38 Continuation Box**



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

References:

[Appendix 15](#) - 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.

**Figure 3.39 RNAV Transition Text**

ARRIVAL ROUTE DESCRIPTION  
KEESH TRANSITION (KEESH.ANTHM3)  
KEMAN TRANSITION (KEMAN.ANTHM3)  
NUSMM TRANSITION (NUSMM.ANTHM3)

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 3.40 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.

When Arrival procedures are the same for parallel runways, they will be listed in the order left, center, right, e.g., 18L/C/R. When multiple runway ends are shown for the same arrival procedure, they will be listed in numerical order from 1 to 36.

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](#).

When procedures are the same for parallel runways, they will be listed in the order left, center, right, e.g., 18L/C/R. When multiple runway ends are shown for the same procedure, they will be listed in numerical order from 1 to 36.

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