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CORRECTIONS, COMMENTS AND/OR PROCUREMENT

**FOR CHARTING ERRORS,
OR FOR CHANGES, ADDITIONS,
RECOMMENDATIONS ON
PROCEDURAL ASPECTS CONTACT:**

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Email Questions to: 9-AMC-Chartsales@faa.gov

Frequently asked questions (FAQ) are answered on our website at <http://aeronav.faa.gov>. See the FAQs prior to contact via toll free number or email.

Request for the creation or revisions to Airport Diagrams should be in accordance with FAA Order 7910.4.

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INOP COMPONENTS

INOPERATIVE COMPONENTS OR VISUAL AIDS TABLE

Landing minimums published on instrument approach procedure charts are based upon full operation of all components and visual aids associated with the particular instrument approach chart being used. Higher minimums are required with inoperative components or visual aids as indicated below. If more than one component is inoperative, each minimum is raised to the highest minimum required by any single component that is inoperative. ILS glide slope inoperative minimums are published on the instrument approach charts as localizer minimums. This table may be amended by notes on the approach chart. Such notes apply only to the particular approach category(ies) as stated. See legend page for description of components indicated below.

(1) ILS, MLS, PAR and RNAV (LPV line of minima)

Inoperative Component or Aid	Approach Category	Increase Visibility
ALSF 1 & 2, MALSR, & SSALR	ABCD	¼ mile

(2) ILS with visibility minimum of 1,800 RVR

ALSF 1 & 2, MALSR, & SSALR	ABCD	To 4000 RVR
TDZL RCLS	ABCD	To 2400 RVR*
RVR	ABCD	To ½ mile

*1800 RVR authorized with the use of FD or AP or HUD to DA.

(3) VOR, VOR/DME, TACAN, LOC, LOC/DME, LDA, LDA/DME, SDF, SDF/DME, GPS, ASR and RNAV (LNAV/VNAV, LNAV and LP lines of minima)

Inoperative Visual Aid	Approach Category	Increase Visibility
ALSF 1 & 2, MALSR, & SSALR	ABCD	½ mile
SSALS, MALS, & ODALS	ABC	¼ mile

(4) NDB

ALSF 1 & 2, MALSR, & SSALR	C	½ mile
MALS, SSALS, ODALS	ABD	¼ mile
	ABC	¼ mile

TERMS/LANDING MINIMA DATA

IFR LANDING MINIMA

The United States Standard for Terminal Instrument Procedures (TERPS) is the approved criteria for formulating instrument approach procedures. Landing minima are established for six aircraft approach categories (ABCDE and COPTER). In the absence of COPTER MINIMA, helicopters may use the CAT A minima of other procedures.

LANDING MINIMA FORMAT

In this example airport elevation is 1179, and runway touchdown zone elevation is 1152.

CATEGORY	A		B		C		D	
	S-ILS 27	1352/24		200		(200-½)		
S-LOC 27	1440/24		288		(300-½)		1440/50 288 (300-1)	
CIRCLING	1540-1		1640-1		1640-1½		1740-2	
	361 (400-1)		461 (500-1)		461 (500-1½)		561 (600-2)	
	MDA	HAA	Visibility in Statute Miles					

Labels: DA, Visibility (RVR 100's of feet), Aircraft Approach Category, HAT/HATH, D, All weather minimums in parentheses not applicable to Civil Pilots, Military Pilots refer to appropriate regulations.

Annotations: Straight-in ILS to Runway 27, Straight-in with Glide Slope Inoperative or not used to Runway 27.

COPTER MINIMA ONLY

CATEGORY	COPTER	
H-176°	680-½	363 (400-½)

Labels: Copter Approach Direction, Height of MDA/DA Above Landing Area (HAL), No circling minimums are provided.

RNAV (GPS) MINIMA EXAMPLE

CATEGORY	A	B	C	D
LPV DA	1540/24		258 (300-½)	
LNAV/VNAV DA	1600/24		318 (400-½)	
LNAV MDA	1840/24		558 (600-½)	
			1840/50 558 (600-1)	
CIRCLING	1840-1		1840-1½	
	545 (600-1)		545 (600-1½)	
			1860-2 565 (600-2)	

NOTE: The **W** symbol indicates outages of the WAAS vertical guidance may occur daily at this location due to initial system limitations. WAAS NOTAMS for vertical outages are not provided for this approach. Use LNAV minima for flight planning at these locations, whether as a destination or alternate. For flight operations at these locations, when the WAAS avionics indicate that LNAV/VNAV or LPV service is available, then vertical guidance may be used to complete the approach using the displayed level of service. Should an outage occur during the procedure, reversion to LNAV minima may be required. As the WAAS coverage is expanded, the **W** will be removed.

RNAV minimums are dependent on navigation equipment capability, as stated in the applicable AFM, AFMS, or other FAA approved document. See AIM paragraph 5-4-5, AC 90-105 and AC 90-107 for detailed requirements for each line of minima.

AIRCRAFT APPROACH CATEGORIES

Aircraft approach category indicates a grouping of aircraft based on a speed of VREF, if specified, or if VREF not specified, 1.3 VSO at the maximum certificated landing weight. VREF, VSO, and the maximum certificated landing weight are those values as established for the aircraft by the certification authority of the country of registry. Helicopters are Category A aircraft. An aircraft shall fit in only one category. However, if it is necessary to operate at a speed in excess of the upper limit of the speed range for an aircraft's category, the minimums for the category for that speed shall be used. For example, an airplane which fits into Category B, but is circling to land at a speed of 145 knots, shall use the approach Category D minimums. As an additional example, a Category A airplane (or helicopter) which is operating at 130 knots on a straight-in approach shall use the approach Category C minimums. See following category limits:

MANEUVERING TABLE

Approach Category	A	B	C	D	E
Speed (Knots)	0-90	91-120	121-140	141-165	Abv 165

TERMS/LANDING MINIMA DATA

CIRCLING APPROACH OBSTACLE PROTECTED AIRSPACE

The circling MDA provides vertical clearance from obstacles when conducting a circle-to-land maneuver within the obstacle protected area. Circling approach obstacle protected areas extend laterally and longitudinally from the centerlines and ends of all runways at an airport by the distances shown in the following tables. The areas are technically defined by the tangential connection of arcs drawn at the radius distance shown from each runway end.

STANDARD CIRCLING APPROACH MANEUVERING RADIUS

Circling approach protected areas developed prior to late 2012 used the radius distances shown in the following table, expressed in nautical miles (NM), dependent on aircraft approach category. The approaches using standard circling approach areas can be identified by the absence of the **C** symbol on the circling line of minima.

Circling MDA in feet MSL	Approach Category and Circling Radius (NM)				
	CAT A	CAT B	CAT C	CAT D	CAT E
All Altitudes	1.3	1.5	1.7	2.3	4.5

C EXPANDED CIRCLING APPROACH MANEUVERING AIRSPACE RADIUS

Circling approach protected areas developed after late 2012 use the radius distance shown in the following table, expressed in nautical miles (NM), dependent on aircraft approach category, and the altitude of the circling MDA, which accounts for true airspeed increase with altitude. The approaches using expanded circling approach areas can be identified by the presence of the **C** symbol on the circling line of minima.

Circling MDA in feet MSL	Approach Category and Circling Radius (NM)				
	CAT A	CAT B	CAT C	CAT D	CAT E
1000 or less	1.3	1.7	2.7	3.6	4.5
1001-3000	1.3	1.8	2.8	3.7	4.6
3001-5000	1.3	1.8	2.9	3.8	4.8
5001-7000	1.3	1.9	3.0	4.0	5.0
7001-9000	1.4	2.0	3.2	4.2	5.3
9001 and above	1.4	2.1	3.3	4.4	5.5

Comparable Values of RVR and Visibility

The following table shall be used for converting RVR to ground or flight visibility. For converting RVR values that fall between listed values, use the next higher RVR value; do not interpolate. For example, when converting 1800 RVR, use 2400 RVR with the resultant visibility of ½ mile.

RVR (feet)	Visibility (statute miles)	RVR (feet)	Visibility (statute miles)
1600	¼	4500	¾
2400	½	5000	1
3200	⅝	6000	1¼
4000	¾		

RADAR MINIMA

	RWY	GS/TCH/RPI	CAT	DA/ MDA-VIS	HAT/ HATH/	CEIL-VIS	CAT	DA/ MDA-VIS	HAT/ HATH/	CEIL-VIS
					HAA				HAA	
PAR (c)	10	2.5°/42/1000	ABCDE	195/16		100				(100-¼)
(d)	28	2.5°/48/1068	ABCDE	187/16		100				(100-¼)
ASR	10		ABC	560/40		463		D	560/50	463 (500-1)
			E	580/60		463				(500-1¼)
	28		AB	600/50		513		C	600/60	513 (600-1¼)
			DE	600-1½		513				(600-1½)
CIR (b)	10		AB	560-1¼		463		C	560-1½	463 (500-1½)
	28		AB	600-1¼		503		C	600-1½	503 (600-1½)
	10, 28		DE	660-2		563				(600-2)

Visibility in Statute Miles ↙

↘ All minimums in parentheses not applicable to Civil Pilots. Military Pilots refer to appropriate regulations.

Radar Minima:

1. Minima shown are the lowest permitted by established criteria. Pilots should consult applicable directives for their category of aircraft.
2. The circling MDA and weather minima to be used are those for the runway to which the final approach is flown- not the landing runway. In the above RADAR MINIMA example, a category C aircraft flying a radar approach to runway 10, circling to land on runway 28, must use an MDA of 560 feet with weather minima of 500-1½.

▲ Alternate Minimums not standard. Civil users refer to tabulation. USA/USN/USAF pilots refer to appropriate regulations.

▲ NA Alternate minimums are Not Authorized due to unmonitored facility or absence of weather reporting service.

▼ Takeoff Minimums not standard and/or Departure Procedures are published. Refer to tabulation.

TERMS/LANDING MINIMA DATA

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GENERAL INFORMATION

This publication is issued every 56 days and includes Standard Instrument Approach Procedures (SIAPs), Standard Instrument Departures (SIDs), Standard Terminal Arrivals (STARs), IFR Take-off Minimums and (Obstacle) Departure Procedures (ODPs), IFR Alternate Minimums, and Radar Instrument Approach Minimums for use by civil and military aviation. The organization responsible for SIAPs, Radar Minimums, SIDs, STARs and graphic ODPs is identified in parentheses in the top margin of the procedure; e.g., (FAA), (FAA-O), (USA), (USAF), (USN). SIAPs with the (FAA) and (FAA-O) designation are regulated under 14 CFR, Part 97. SIAPs with the (FAA-O) designation have been developed under Other Transaction Agreement (OTA) by private providers and have been certified by the FAA. See 14 CFR, Part 91.175 (a) and the AIM for further details. 14 CFR, Part 91.175 (g) and the Special Notices section of the Airport/Facility Directory contains information on civil operations at military airports.

STANDARD TERMINAL ARRIVALS AND DEPARTURE PROCEDURES

The use of the associated codified STAR/DP and transition identifiers are requested of users when filing flight plans via teletype and are required for users filing flight plans via computer interface. It must be noted that when filing a STAR/DP with a transition, the first three coded characters of the STAR and the last three coded characters of the DP are replaced by the transition code. Examples: ACTON SIX ARRIVAL, file (AQN.AQN6); ACTON SIX ARRIVAL, EDNAS TRANSITION, file (EDNAS.AQN6). FREEHOLD THREE DEPARTURE, file (FREH3.RBV), FREEHOLD THREE DEPARTURE, ELWOOD CITY TRANSITION, file (FREH3.EWC).

RNAV DP and STAR. Effective March 15, 2007, these procedures, formerly identified as Type-A and Type-B, will be designated as RNAV 1 in accordance with amended Advisory Circular (AC) and ICAO terminology.

Refer to AC 90-100A U.S. TERMINAL AND EN ROUTE AREA NAVIGATION (RNAV) OPERATIONS and the Aeronautical Information Manual for additional guidance regarding these procedures.

Standard RNAV 1 Procedure Chart Notes

NOTE: RNAV 1

NOTE: DME/DME/IRU or GPS required

Some procedures may require use of GPS and will be identified by a "GPS required" note.

RNAV 1 Procedure Characteristics and Operations

1. Require use of an RNAV system with DME/DME/IRU, and/or GPS inputs.
2. Require use of a CDI, flight director, and/or autopilot, in lateral navigation mode, for flight guidance while operating on RNAV paths (track, course, or direct leg). Other methods providing an equivalent level of performance may be acceptable.
3. RNAV paths may start as low as 500 feet above airport elevation.

PILOT CONTROLLED AIRPORT LIGHTING SYSTEMS

Available pilot controlled lighting (PCL) systems are indicated as follows:

1. Approach lighting systems that bear a system identification are symbolized using negative symbology, e.g., , , .
2. Approach lighting systems that do not bear a system identification are indicated with a negative "0" beside the name.

A star (*) indicates non-standard PCL, consult Directory/Supplement, e.g., .

To activate lights, use frequency indicated in the communication section of the chart with a  or the appropriate lighting system identification e.g., UNICOM 122.8 , , .

<u>KEY MIKE</u>	<u>FUNCTION</u>
7 times within 5 seconds	Highest intensity available
5 times within 5 seconds	Medium or lower intensity (Lower REIL or REIL-off)
3 times within 5 seconds	Lowest intensity available (Lower REIL or REIL-off)

CHART CURRENCY INFORMATION

Date of Latest Revision 09365

The Date of Latest Revision identifies the Julian date the chart was added or last revised for any reason. The first two digits indicate the year, the last three digits indicate the day of the year (001 to 365/6) in which the latest revision of any kind has been made to the chart.



The FAA Procedure Amendment Number represents the most current amendment of a given procedure. The Procedure Amendment Effective Date represents the AIRAC cycle date on which the procedure amendment was incorporated into the chart. Updates to the amendment number & effective date represent procedural/criteria revisions to the charted procedure, e.g., course, fix, altitude, minima, etc.

NOTE: Inclusion of the "Procedure Amendment Effective Date" will be phased in as procedures are amended. As this occurs, the Julian date will be relocated to the upper right corner of the chart.

MISCELLANEOUS

- ★ Indicates a non-continuously operating facility, see A/FD or flight supplement.
- For Civil (FAA) instrument procedures, "RADAR REQUIRED" in the planview of the chart indicates that ATC radar must be available to assist the pilot when transitioning from the en route environment. "Radar required" in the pilot briefing portion of the chart indicates that ATC radar is required on portions of the procedure outside the final approach segment, including the missed approach. Some military procedures also have equipment requirements such as "Radar Required", but do not conform to the same charting application standards used by the FAA.
- Distances in nautical miles (except visibility in statute miles and Runway Visual Range in hundreds of feet). Runway Dimensions in feet. Elevations in feet. Mean Sea Level (MSL). Ceilings in feet above airport elevation. Radials/bearings/headings/courses are magnetic. Horizontal Datum: Unless otherwise noted on the chart, all coordinates are referenced to North American Datum 1983 (NAD 83), which for charting purposes is considered equivalent to World Geodetic System 1984 (WGS 84).

Terrain is scaled within the neat lines (planview boundaries) and does not accurately underlie not-to-scale distance depictions or symbols.

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GENERAL INFO

ABBREVIATIONS

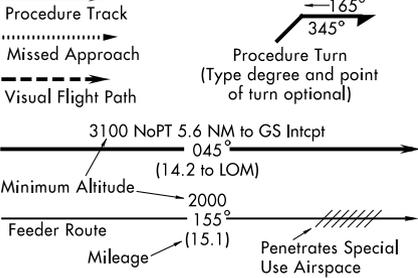
ADF.....	Automatic Direction Finder	LAAS.....	Local Area Augmentation System
AFIS.....	Automatic Flight Information Service	LDA.....	Localizer Type Directional Aid
ALS.....	Approach Light System	Ldg.....	Landing
ALSF.....	Approach Light System with Sequenced Flashing Lights	LIRL.....	Low Intensity Runway Lights
AP.....	Autopilot System	LNAV.....	Lateral Navigation
APCH.....	Approach	LOC.....	Localizer
APP CON.....	Approach Control	LP.....	Localizer Performance
ARR.....	Arrival	LPV.....	Localizer Performance with Vertical Guidance
ASOS.....	Automated Surface Observing System	LR.....	Lead Radial. Provides at least 2 NM (Copter 1 NM) of lead to assist in turning onto the intermediate/final course.
ASR/PAR.....	Published Radar Minimums at this Airport	MAA.....	Maximum Authorized Altitude
ATIS.....	Automatic Terminal Information Service	MALS.....	Medium Intensity Approach Light System
AWOS.....	Automated Weather Observing System	MALSRR.....	Medium Intensity Approach Light System with RAIL
AZ.....	Azimuth	MAP.....	Missed Approach Point
BC.....	Back Course	MDA.....	Minimum Descent Altitude
BND.....	Bound	MIRL.....	Medium Intensity Runway Lights
C.....	Circling	MLS.....	Microwave Landing System
CAT.....	Category	MM.....	Middle Marker
CCW.....	Counter Clockwise	MRA.....	Minimum Reception Altitude
CDI.....	Course Deviation Indicator	N/A.....	Not Applicable
Chan.....	Channel	NA.....	Not Authorized
CR.....	Circling	NDB.....	Non-directional Radio Beacon
CLNC DEL.....	Clearance Delivery	NFD.....	National Flight Database
CNF.....	Computer Navigation Fix	NM.....	Nautical Mile
CTAF.....	Common Traffic Advisory Frequency	NoPT.....	No Procedure Turn Required (Procedure Turn shall not be executed without ATC clearance)
CW.....	Clockwise	ODALS.....	Omnidirectional Approach Light System
DA.....	Decision Altitude	ODP.....	Obstacle Departure Procedure
DER.....	Departure End of Runway	OM.....	Outer Marker
DH.....	Decision Height	PRM.....	Precision Runway Monitor
DME.....	Distance Measuring Equipment	R.....	Radial
ELEV.....	Elevation	RA.....	Radio Altimeter setting height
EMAS.....	Engineered Material Arresting System	RAIL.....	Runway Alignment Indicator Lights
FAF.....	Final Approach Fix	RCLS.....	Runway Centerline Light System
FD.....	Flight Director System	REIL.....	Runway End Identifier Lights
FM.....	Fan Marker	RF.....	Radius-to-Fix
FMS.....	Flight Management System	RLLS.....	Runway Lead-in Light System
GCO.....	Ground Communications Outlet	RNAV.....	Area Navigation
GLS.....	Ground Based Augmentation System Landing System	RNP.....	Required Navigation Performance
GPI.....	Ground Point of Interception	RPI.....	Runway Point of Intercept(ion)
GPS.....	Global Positioning System	RRL.....	Runway Remaining Lights
GS.....	Glide Slope	Rwy.....	Runway
HAA.....	Height above Airport	RVR.....	Runway Visual Range
HAL.....	Height above Landing	S.....	Straight-in
HAT.....	Height above Touchdown	SALS.....	Short Approach Light System
HATH.....	Height Above Threshold	SSALR.....	Simplified Short Approach Light System with RAIL
HGS.....	Head-up Guidance System	SDF.....	Simplified Directional Facility
HIRL.....	High Intensity Runway Lights	SM.....	Statute Mile
HUD.....	Head-up Display	TAA.....	Terminal Arrival Area
IAF.....	Initial Approach Fix		
ICAO.....	International Civil Aviation Organization		
IF.....	Intermediate Fix		
IM.....	Inner Marker		
INT.....	Intersection		

GENERAL INFO

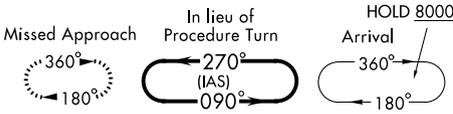
TAC.....	TACAN
TCH.....	Threshold Crossing Height (height in feet Above Ground level)
TDZ.....	Touchdown Zone
TDZE.....	Touchdown Zone Elevation
TDZ/CL.....	Touchdown Zone and Runway Centerline Lighting
TDZL.....	Touchdown Zone Lights
THR.....	Threshold
THRE.....	Threshold Elevation
TODA.....	Take-off Distance Available
TORA.....	Take-off Run Available
TR.....	Track
VASI.....	Visual Approach Slope Indicator
VCOA.....	Visual Climb Over Airport
VDP.....	Visual Descent Point
VGSI.....	Visual Glide Slope Indicator
VNAV.....	Vertical Navigation
WAAS.....	Wide Area Augmentation System
WP/WPT.....	Waypoint (RNAV)

PLANVIEW SYMBOLS

TERMINAL ROUTES

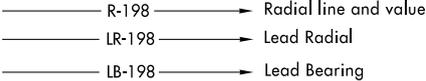
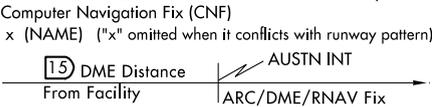
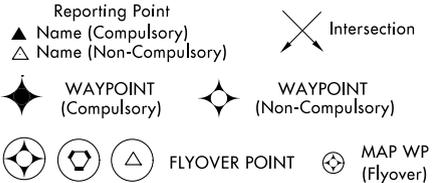


HOLDING PATTERNS



Holding pattern with max. restricted airspeed: (175K) applies to all altitudes. (210K) applies to altitudes above 6000' and including 4000'.
 Arrival Holding Pattern altitude restrictions will be indicated when they deviate from the adjacent leg.
 Limits will only be specified when they deviate from the standard. DME fixes may be shown.

FIXES/ATC REPORTING REQUIREMENTS



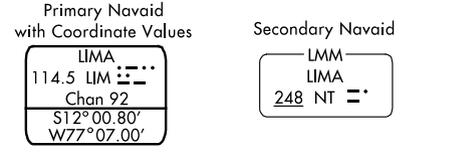
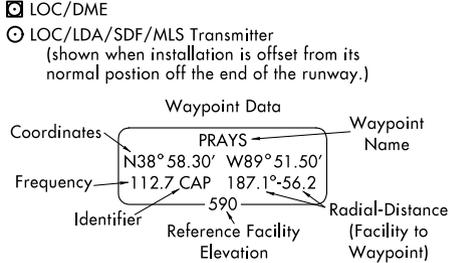
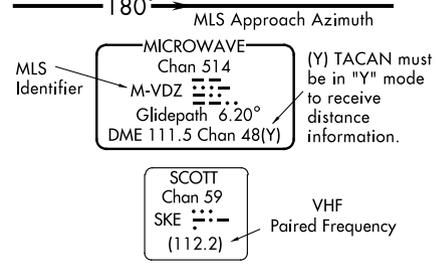
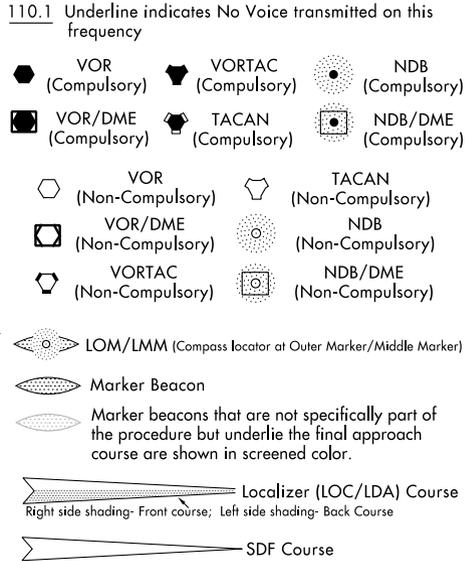
ALTITUDES

5500 Mandatory Altitude	3000 Recommended Altitude
2500 Minimum Altitude	5000 Mandatory Block
4300 Maximum Altitude	3000 Altitude

INDICATED AIRSPEED

175K	120K	250K	180K
Mandatory Airspeed	Minimum Airspeed	Maximum Airspeed	Recommended Airspeed

RADIO AIDS TO NAVIGATION

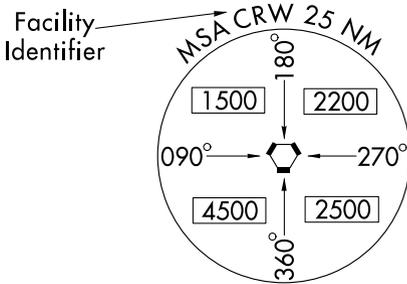


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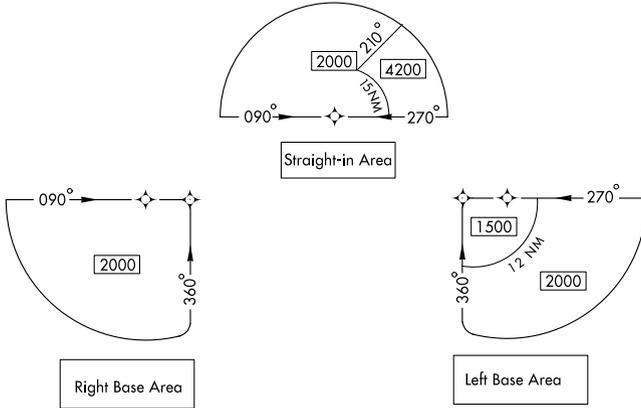
PLANVIEW SYMBOLS

MINIMUM SAFE ALTITUDE (MSA)

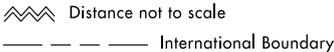
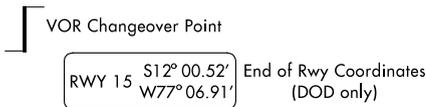


(arrows on distance circle identify sectors)

TERMINAL ARRIVAL AREA (TAA)



MISCELLANEOUS



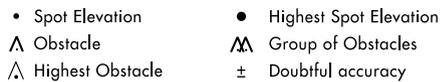
SPECIAL USE AIRSPACE



AIRPORTS



OBSTACLES



LEGEND

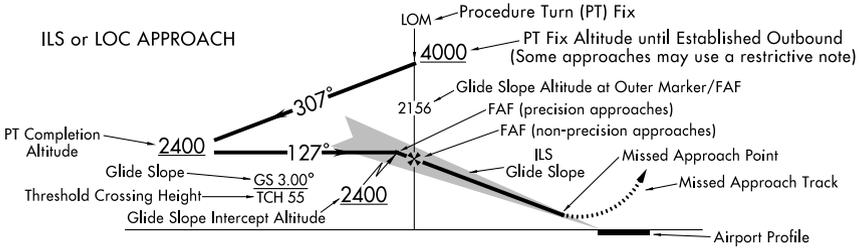
INSTRUMENT APPROACH PROCEDURES (CHARTS)

PROFILE VIEW

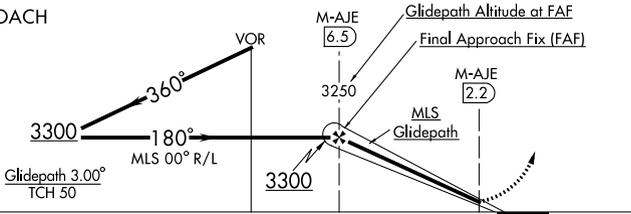
Two different methods are used for vertical guidance:

a. "GS" indicates an electronic glide slope or barometric vertical guidance is present. In the case of an Instrument Landing System (ILS) and Wide Area Augmentation System (WAAS) LPV approach procedures, an electronic signal provides vertical guidance. Barometric vertical guidance is provided for RNP and LNAV/VNAV instrument approach procedures. All ILS, LPV, RNP, and LNAV/VNAV will be in this format $\frac{\leq 3.00^\circ}{TCH 55}$, located in the lower left or right corner.

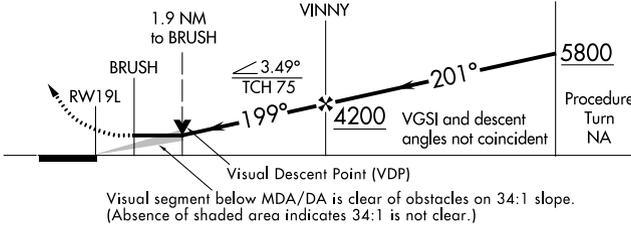
b. Other charts without electronic or barometric vertical guidance will be in this format $\frac{\leq 3.00^\circ}{TCH 55}$, indicating a non-precision vertical descent angle to assist in preventing controlled flight into terrain. On Civil (FAA) procedures, this information is placed above or below the procedure track following the fix it is based on.



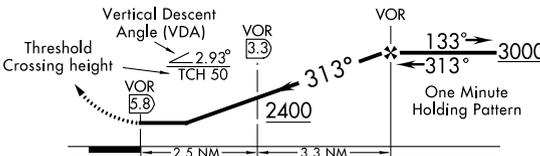
MLS APPROACH



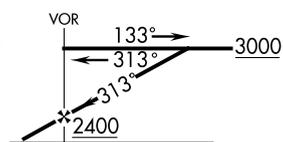
RNAV APPROACH



NON PRECISION



DESCENT FROM HOLDING PATTERN



ALTITUDES

5500	Mandatory Altitude	3000	Recommended Altitude
2500	Minimum Altitude	5000	Mandatory Block Altitude
4300	Maximum Altitude	3000	Mandatory Block Altitude

PROFILE SYMBOLS

	Glide Slope/Glide Path Intercept Altitude and final approach fix for vertically guided approach procedures.		Visual Flight Path
	Visual Descent Point (VDP)		Note: Facilities and waypoints are depicted as a solid vertical line while fixes and intersections are depicted as a dashed vertical line.

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LEGEND

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)**

VOR/DME (Non-Compulsory) **NDB (Non-Compulsory)**

VORTAC (Non-Compulsory) **NDB/DME (Non-Compulsory)**

LMM, LOM (Compass locator) **LOC** **LOC/DME**
(shown when installation is off set from its normal position off the end of the runway.) (DP)

Marker Beacon

Localizer Course

SDF Course

ROUTES

4500 MEA-Minimum Enroute Altitude
***3500 MOCA**-Minimum Obstruction Clearance Altitude

← 270° → Departure Route - Arrival Route
(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



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 W-Warning
P-Prohibited A-Alert
MOA-Military Operations Area

ALTITUDES

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

1500 **12000**
Block Altitude

Altitude change at other than Radio Aids (STAR)

ATC CROSSING ALTITUDES (DP)

5500 (ATC) **2300 (ATC)** **4800 (ATC)**
4300 **1700** **3000**
Minimum required altitude

INDICATED AIRSPEED

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

AIRPORTS

(DP) Civil Military Joint

MISCELLANEOUS

Changeover Point

Distance not to scale (DP)

International Boundary (DP)

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

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

Identifier

Frequency

ORLANDO **ORL** **Chan 59 (Y)**
N28° 32.56' - W81° 20.10' Geographic Position

L-19, H-5 **DME or TACAN Channel**
Enroute Chart Reference

Underline indicates no voice transmitted on this frequency

Coordinates

Waypoint Name

Frequency

PRAYS
N38° 58.30' W89° 51.50'
112.7 CAP 187.1°-56.2

Identifier **590** **Radial-Distance (Facility to Waypoint)**
Reference Facility Elevation

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'

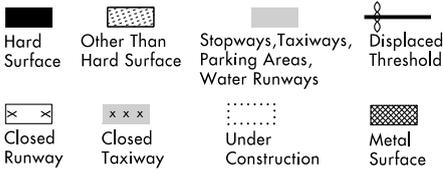
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LEGEND

AIRPORT DIAGRAM/AIRPORT SKETCH

Runways



Helicopter Alighting Areas \oplus \oplus \oplus \triangle \oplus
 Negative Symbols used to identify Copter Procedures landing point..... \ominus \oplus \oplus \triangle \oplus

Runway Threshold elevation.....THRE 123
 Runway TDZ elevation.....TDZE 123
 Runway Slope.....0.8% UP \rightarrow
 (shown when runway slope is greater than or equal to 0.3%)
 \leftarrow 0.3% DOWN

NOTE:
 Runway Slope measured to midpoint on runways 8000 feet or longer.

\square U.S. Navy Optical Landing System (OLS) "OLS" location is shown because of its height of approximately 7 feet and proximity to edge of runway may create an obstruction for some types of aircraft.

Approach light symbols are shown in the Flight Information Handbook.

Airport diagram scales are variable.

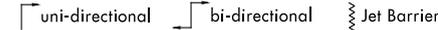
True/magnetic North orientation may vary from diagram to diagram

Coordinate values are shown in 1 or 1/2 minute increments. They are further broken down into 6 second ticks, within each 1 minute increments.

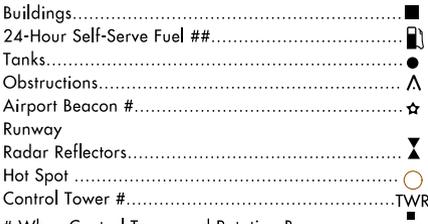
Positional accuracy within ± 600 feet unless otherwise noted on the chart.

NOTE:
 All new and revised airport diagrams are shown referenced to the World Geodetic System (WGS) (noted on appropriate diagram), and may not be compatible with local coordinates published in FLIP. (Foreign Only)

ARRESTING GEAR: Specific arresting gear systems; e.g., BAK12, MA-1A etc., shown on airport diagrams, not applicable to Civil Pilots. Military Pilots refer to appropriate DOD publications.



REFERENCE FEATURES



When Control Tower and Rotating Beacon are co-located, Beacon symbol will be used and further identified as TWR.

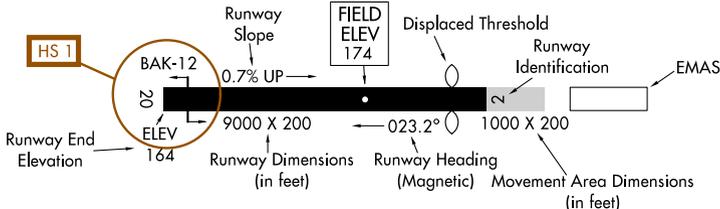
A fuel symbol is shown to indicate 24-hour self-serve fuel available, see appropriate A/FD, Alaska or Pacific Supplement for information.

Runway length depicted is the physical length of the runway (end-to-end, including displaced thresholds if any) but excluding areas designated as stopways.

A \square symbol is shown to indicate runway declared distance information available, see appropriate A/FD, Alaska or Pacific Supplement for distance information.

Runway Weight Bearing Capacity/or PCN Pavement Classification Number is shown as a codified expression.

Refer to the appropriate Supplement/Directory for applicable codes e.g., RWY 14-32 PCN 80 F/D/X/U S-75, D-185, 2S-175, 2D-325



SCOPE

Airport diagrams are specifically designed to assist in the movement of ground traffic at locations with complex runway/taxiway configurations. Airport diagrams are not intended to be used for approach and landing or departure operations. For revisions to Airport Diagrams: Consult FAA Order 7910.4.

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Approach lighting and visual glide slope systems are indicated on the airport sketch by an identifier, e.g., (A2), (V), etc.

A dot "•" portrayed with approach lighting letter identifier indicates sequenced flashing lights (F) installed with the approach lighting system e.g., (A1). Negative symbology, e.g., (A1) with a dot, indicates Pilot Controlled Lighting (PCL).

<p>RUNWAY TOUCHDOWN ZONE AND CENTERLINE LIGHTING SYSTEMS</p> <p>TDZ/CL RUNWAY CENTERLINE LIGHTS TDZL CL TDZL</p>	<p>SHORT APPROACH LIGHTING SYSTEM</p> <p>(A2)</p> <p>SALS/SALSF (High Intensity)</p> <p>SAME AS INNER 1500' OF ALSF-1</p>	<p>OMNIDIRECTIONAL APPROACH LIGHTING SYSTEM</p> <p>(A3)</p> <p>ODALS</p> <p>36 THRESHOLD 1500' SEQUENCED FLASHING LIGHTS LENGTH 1500 FEET</p>
<p>AVAILABILITY OF TDZ/CL will be shown by NOTE in SKETCH e.g. "TDZ/CL Rwy 15"</p>	<p>SIMPLIFIED SHORT APPROACH LIGHTING SYSTEM with Runway Alignment Indicator Lights</p> <p>(A3)</p> <p>SSALR</p> <p>1000' 2400'/3000' GREEN WHITE SEQUENCED FLASHING LIGHTS (High Intensity) LENGTH 2400/3000 FEET</p>	<p>(V)</p> <p>VISUAL APPROACH SLOPE INDICATOR</p> <p>VASI</p> <p>VISUAL APPROACH SLOPE INDICATOR WITH STANDARD THRESHOLD CLEARANCE PROVIDED.</p> <p>ALL LIGHTS WHITE — TOO HIGH FAR LIGHTS RED — ON GLIDE SLOPE NEAR LIGHTS WHITE — ON GLIDE SLOPE ALL LIGHTS RED — TOO LOW</p> <p>VASI 2 VASI 4 VASI 12</p> <p>36 THRESHOLD 36 THRESHOLD 36 THRESHOLD</p>
<p>APPROACH LIGHTING SYSTEM</p> <p>(A)</p> <p>ALSF-2</p> <p>500' 1000' 2400'/3000' GREEN WHITE RED RED WHITE SEQUENCED FLASHING LIGHTS NOTE: CIVIL ALSF-2 MAY BE OPERATED AS SSALR DURING FAVORABLE WEATHER CONDITIONS (High Intensity) LENGTH 2400/3000 FEET</p>	<p>MEDIUM INTENSITY (MALS and MALSF) OR SIMPLIFIED SHORT (SSALS and SSALF) APPROACH LIGHTING SYSTEMS</p> <p>(A4)</p> <p>1000' 1400' GREEN WHITE SEQUENCED FLASHING LIGHTS FOR MALSF/SSALF ONLY LENGTH 1400 FEET</p>	<p>(V3)</p> <p>VISUAL APPROACH SLOPE INDICATOR</p> <p>VASI</p> <p>VISUAL APPROACH SLOPE INDICATOR WITH A THRESHOLD CROSSING HEIGHT TO ACCOMMODATE LONG BODIED OR JUMBO AIRCRAFT.</p> <p>VASI 6 VASI 16</p> <p>36 THRESHOLD 36 THRESHOLD</p>
<p>APPROACH LIGHTING SYSTEM</p> <p>(A1)</p> <p>ALSF-1</p> <p>1000' 2400'/3000' RED GREEN WHITE SEQUENCED FLASHING LIGHTS (High Intensity) LENGTH 2400/3000 FEET</p>	<p>MEDIUM INTENSITY APPROACH LIGHTING SYSTEM with Runway Alignment Indicator Lights</p> <p>(A5)</p> <p>MALSR</p> <p>SAME LIGHT CONFIGURATION AS SSALR.</p>	

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LEGEND

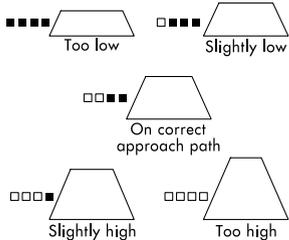
INSTRUMENT APPROACH PROCEDURES (CHARTS) APPROACH LIGHTING SYSTEM - UNITED STATES

Approach lighting and visual glide slope systems are indicated on the airport sketch by an identifier, (A₂), (V) etc.

A dot "•" portrayed with approach lighting letter identifier indicates sequenced flashing lights (F) installed with the approach lighting system e.g., (A₁). Negative symbology, e.g., (A₁), (V) indicates Pilot Controlled Lighting (PCL).

(P) **PRECISION APPROACH PATH INDICATOR**

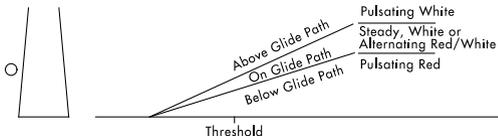
PAPI



Legend: □ White ■ Red

(V₂) **PULSATING VISUAL APPROACH SLOPE INDICATOR**

PVASI



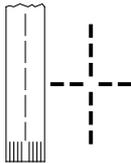
CAUTION: When viewing the pulsating visual approach slope indicators in the pulsating white or pulsating red sectors, it is possible to mistake this lighting aid for another aircraft or a ground vehicle. Pilots should exercise caution when using this type of system.

(V₁) **"T"-VISUAL APPROACH SLOPE INDICATOR**

"T"-VASI

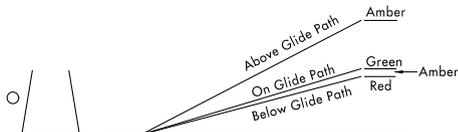


"T" ON BOTH SIDES OF RWY
ALL LIGHTS VARIABLE WHITE.
CORRECT APPROACH SLOPE-
ONLY CROSS BAR VISIBLE.
UPRIGHT "T"- FLY UP.
INVERTED "T"- FLY DOWN.
RED "T"- GROSS
UNDERSHOOT.



(V₄) **TRI-COLOR VISUAL APPROACH SLOPE INDICATOR**

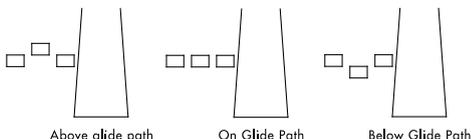
TRCV



CAUTION: When the aircraft descends from green to red, the pilot may see a dark amber color during the transition from green to red.

(V₅) **ALIGNMENT OF ELEMENTS SYSTEMS**

APAP



Painted panels which may be lighted at night.
To use the system the pilot positions the aircraft
so the elements are in alignment.

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MLS FREQ PAIRING

MLS CHANNELING AND FREQUENCY PAIRING TABLE

MLS CHANNEL	VHF FREQUENCY	TACAN CHANNEL	MLS CHANNEL	VHF FREQUENCY	TACAN CHANNEL	MLS CHANNEL	VHF FREQUENCY	TACAN CHANNEL
500	108.10	18X	568	109.45	31Y	636	114.15	88Y
502	108.30	20X	570	109.55	32Y	638	114.25	89Y
504	108.50	22X	572	109.65	33Y	640	114.35	90Y
506	108.70	24X	574	109.75	34Y	642	114.45	91Y
508	108.90	26X	576	109.85	35Y	644	114.55	92Y
510	109.10	28X	578	109.95	36Y	646	114.65	93Y
512	109.30	30X	580	110.05	37Y	648	114.75	94Y
514	109.50	32X	582	110.15	38Y	650	114.85	95Y
516	109.70	34X	584	110.25	39Y	652	114.95	96Y
518	109.90	36X	586	110.35	40Y	654	115.05	97Y
520	110.10	38X	588	110.45	41Y	656	115.15	98Y
522	110.30	40X	590	110.55	42Y	658	115.25	99Y
524	110.50	42X	592	110.65	43Y	660	115.35	100Y
526	110.70	44X	594	110.75	44Y	662	115.45	101Y
528	110.90	46X	596	110.85	45Y	664	115.55	102Y
530	111.10	48X	598	110.95	46Y	666	115.65	103Y
532	111.30	50X	600	111.05	47Y	668	115.75	104Y
534	111.50	52X	602	111.15	48Y	670	115.85	105Y
536	111.70	54X	604	111.25	49Y	672	115.95	106Y
538	111.90	56X	606	111.35	50Y	674	116.05	107Y
540	108.05	17Y	608	111.45	51Y	676	116.15	108Y
542	108.15	18Y	610	111.55	52Y	678	116.25	109Y
544	108.25	19Y	612	111.65	53Y	680	116.35	110Y
546	108.35	20Y	614	111.75	54Y	682	116.45	111Y
548	108.45	21Y	616	111.85	55Y	684	116.55	112Y
550	108.55	22Y	618	111.95	56Y	686	116.65	113Y
552	108.65	23Y	620	113.35	80Y	688	116.75	114Y
554	108.75	24Y	622	113.45	81Y	690	116.85	115Y
556	108.85	25Y	624	113.55	82Y	692	116.95	116Y
558	108.95	26Y	626	113.65	83Y	694	117.05	117Y
560	109.05	27Y	628	113.75	84Y	696	117.15	118Y
562	109.15	28Y	630	113.85	85Y	698	117.25	119Y
564	109.25	29Y	632	113.95	86Y			
566	109.35	30Y	634	114.05	87Y			

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CLIMB/DESCENT TABLE 10042

INSTRUMENT TAKEOFF OR APPROACH PROCEDURE CHARTS RATE OF CLIMB/DESCENT TABLE

(ft. per min)

A rate of climb/descent table is provided for use in planning and executing climbs or descents under known or approximate ground speed conditions. It will be especially useful for approaches when the localizer only is used for course guidance. A best speed, power, altitude combination can be programmed which will result in a stable glide rate and altitude favorable for executing a landing if minimums exist upon breakout. Care should always be exercised so that minimum descent altitude and missed approach point are not exceeded.

CLIMB/ DESCENT ANGLE (degrees and tenths)	ft/NM	GROUND SPEED (knots)											
		60	90	120	150	180	210	240	270	300	330	360	
2.0	210	210	320	425	530	635	743	850	955	1060	1165	1275	
2.5	265	265	400	530	665	795	930	1060	1195	1325	1460	1590	
VERTICAL PATH ANGLE	2.7	287	287	430	574	717	860	1003	1147	1290	1433	1576	1720
	2.8	297	297	446	595	743	892	1041	1189	1338	1486	1635	1783
	2.9	308	308	462	616	770	924	1078	1232	1386	1539	1693	1847
	3.0	318	318	478	637	797	956	1115	1274	1433	1593	1752	1911
	3.1	329	329	494	659	823	988	1152	1317	1481	1646	1810	1975
	3.2	340	340	510	680	850	1020	1189	1359	1529	1699	1869	2039
	3.3	350	350	526	701	876	1052	1227	1402	1577	1752	1927	2103
	3.4	361	361	542	722	903	1083	1264	1444	1625	1805	1986	2166
3.5	370	370	555	745	930	1115	1300	1485	1670	1860	2045	2230	
4.0	425	425	640	850	1065	1275	1490	1700	1915	2125	2340	2550	
4.5	480	480	715	955	1195	1435	1675	1915	2150	2390	2630	2870	
5.0	530	530	795	1065	1330	1595	1860	2125	2390	2660	2925	3190	
5.5	585	585	880	1170	1465	1755	2050	2340	2635	2925	3220	3510	
6.0	640	640	960	1275	1595	1915	2235	2555	2875	3195	3510	3830	
6.5	690	690	1040	1385	1730	2075	2425	2770	3115	3460	3805	4155	
7.0	745	745	1120	1490	1865	2240	2610	2985	3355	3730	4105	4475	
7.5	800	800	1200	1600	2000	2400	2800	3200	3600	4000	4400	4800	
8.0	855	855	1280	1710	2135	2560	2990	3415	3845	4270	4695	5125	
8.5	910	910	1360	1815	2270	2725	3180	3630	4085	4540	4995	5450	
9.0	960	960	1445	1925	2405	2885	3370	3850	4330	4810	5295	5775	
9.5	1015	1015	1525	2035	2540	3050	3560	4065	4575	5085	5590	6100	
10.0	1070	1070	1605	2145	2680	3215	3750	4285	4820	5355	5890	6430	

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CLIMB/DESCENT TABLE 10042

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CORRECTIONS, COMMENTS AND/OR PROCUREMENT

FOR CHARTING ERRORS,
OR FOR CHANGES, ADDITIONS,
RECOMMENDATIONS ON
PROCEDURAL ASPECTS CONTACT:

FAA, AeroNav Products
SSMC-4 Sta. #4445
1305 East West Highway
Silver Spring, MD 20910-3281
Telephone 1-800-626-3677
Email 9-AMC-Aerochart@faa.gov

FOR PROCUREMENT CONTACT:

FAA, AeroNav Products Logistics Group
10201 Good Luck Road
Glenn Dale, MD 20769-9700
Online at <http://aeronav.faa.gov>
Telephone 1-800-638-8972
Fax 301-436-6829
or any authorized chart agent
Email Questions to: 9-AMC-Chartsales@faa.gov

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GENERAL INFORMATION/INSTRUCTIONS

CHANGE NOTICE (CN) FOR UNITED STATES GOVERNMENT

TERMINAL PROCEDURES PUBLICATION

GENERAL : The United States Terminal Procedures are published in 25 Bound Volumes on a 56-day cycle. This CN is published at the mid 28-day point and contains revisions, additions and deletions to the last complete issue of the 24 volumes covering the conterminous U.S. There is no CN published for airports in the states of Alaska, Hawaii, or Pacific Islands.

OPERATIONAL USE OF THE CHANGE NOTICE : During flight planning or in the case of an in-flight diversion, it is imperative that the pilot first consult this CN before making any decision as to which procedures are current at the airport of intended landing. If the airport of intended landing is not listed in the supplementary information or Index of Charts then the airport information in the basic 24 volumes has not changed.

INDEX OF TERMINAL PROCEDURES : All civil airports which have revised, added or deleted procedures are listed alphabetically by city in the Index. In addition to the airport name, the Index includes the CN page number, the current procedure designation, the affected page and volume number in the last issue of the 24 conterminous US volumes and an indicator whether the procedure is new, has been deleted, or replaces an existing procedure.

EFFECTIVE DATES: All procedures in this CN are effective on the dates shown on the front cover unless indicated otherwise in the Index, i.e., if the procedure revision is effective on a date other than the CN publication date, this will be noted in the Index instructions by "Effective (date)". This will also be shown on the planview of the affected Chart(s)

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