

# INOP COMPONENTS

02276

## 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, and PAR

Inoperative Component or Aid	Approach Category	Increase Visibility
ALSF 1 & 2, MALSR, & SSALR	ABCD	1/4 mile

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

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

### (3) VOR, VOR/DME, VORTAC, VOR (TAC), VOR/DME (TAC), LOC, LOC/DME, LDA, LDA/DME, SDF, SDF/DME, GPS, RNAV, and ASR

Inoperative Visual Aid	Approach Category	Increase Visibility
ALSF 1 & 2, MALSR, & SSALR	ABCD	1/2 mile
SSALS, MALS, & ODALS	ABC	1/4 mile

### (4) NDB

ALSF 1 & 2, MALSR, & SSALR	C	1/2 mile
MALS, SSALS, ODALS	ABD ABC	1/4 mile 1/4 mile

## CORRECTIONS, COMMENTS AND/OR PROCUREMENT

### FOR CHARTING ERRORS CONTACT:

National Aeronautical Charting Office, FAA  
N/ACC1, SSMC-4, Sta. #2335  
1305 East-West Highway  
Silver Spring, MD 20910-3281  
Telephone Toll-Free (800) 626-3677  
Internet/E-Mail: 9-AMC-Aerchart@FAA.gov

### FOR CHANGES, ADDITIONS, OR RECOMMENDATIONS ON

### PROCEDURAL ASPECTS:

Contact Federal Aviation Administration, ATA 110  
800 Independence Avenue, SW  
Washington, DC 20591  
Telephone Toll Free 1-(866) 295-8236

### TO PURCHASE CHARTS CONTACT:

FAA, National Aeronautical Charting Office,  
Distribution Division, AVN-530  
6303 Ivy Lane, Suite 400  
Greenbelt, Maryland 20770  
Telephone Toll Free (800) 638-8972  
9-AMC-NACOWebmaster@FAA.gov

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

# INOP COMPONENTS

02276

# 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 minimums of other procedures. The standard format for RNAV minima and landing minima portrayal follows:

### RNAV (GPS) MINIMA

CATEGORY	A	B	C	D
LPV DA	1540/24 258 (300-½)			
LNAV/VNAV DA	1600/24	318 (400-½)		1600/40 318 (400-¾)
LNAV MDA	1840/24 558 (600-½)		1840/50 558 (600-1)	1840/60 558 (600-1 ¼)
CIRCLING	1840-1 545 (600-1)		1840-1½ 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, and as outlined below.

### GLS (Global Navigation Satellite System (GNSS) Landing System)

The GLS (NA) minima line will be removed from existing RNAV (GPS) approach charts when LPV minima is published.

### LPV (An Approach Procedure with Vertical Guidance (APV) based on WAAS lateral and vertical guidance)

Must have WAAS avionics approved for LPV approach.

### LNAV/VNAV (Lateral navigation/Vertical navigation)

Must have either:

- a.) WAAS avionics approved for LNAV/VNAV approach, or
- b.) A certified Baro-VNAV system with an IFR approach approved GPS, or
- c.) A certified Baro-VNAV system with an IFR approach approved WAAS, or
- d.) An approach certified RNP-0.3 system.

Other RNAV systems require special approval.

#### NOTES:

1. LNAV-VNAV minima not applicable for Baro-VNAV equipment if chart is annotated "Baro-VNAV NA" or when below the minimum published temperature, e.g., Baro-VNAV NA below -17°C(2°F).
2. DME/DME based RNP-0.3 systems may be used only when a chart note indicates DME/DME availability; e.g., "DME/DME RNP-0.3 Authorized." Specific DME facilities may be required; e.g., "DME/DME RNP-0.3 Authorized. ABC, XYZ required."

### LNAV (Lateral navigation)

Must have IFR approach approved GPS, WAAS, or RNP-0.3 system. Other RNAV systems require special approval.

NOTE: DME/DME based RNP-0.3 systems may be used only when a chart note indicates DME/DME availability; e.g., "DME/DME RNP-0.3 Authorized." Specific DME facilities may be required; e.g., "DME/DME RNP-0.3 Authorized. ABC, XYZ required."

#### LANDING MINIMA FORMAT

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

	DH Visibility (RVR 100's of feet)		Aircraft Approach Category HAT		
CATEGORY	A	B	C	D	
Straight-in ILS to Runway 27 S-ILS 27	1352/24		200		(200-½)
Straight-in with Glide Slope Inoperative or not used to Runway 27 S-LOC 27	1440/24	288	(300-½)	1440/50	288 (300-1)
CIRCLING	1540-1 361 (400-1)	1640-1 461 (500-1)	1640-1½ 461 (500-1½)	1740-2	561 (600-2)
	MDA	HAA	Visibility in Statute Miles		

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

# TERMS/LANDING MINIMA DATA

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## COPTER MINIMA ONLY

CATEGORY	COPTER		
H-176°	680-1/2	363	(400-1/2)

Copter Approach Direction

Height of MDA/DH Above Landing Area (HAL)

No circling minimums are provided

## RADAR MINIMA

						Visibility (RVR 100's of feet)	
PAR (c)	10	2.5°/42/1000	ABCDE	195/16	100	(100-3/4)	
(d)	28	2.5°/48/1068	ABCDE	187/16	100	(100-3/4)	
ASR	10		ABC	560/40	463	(500-3/4)	D 560/50 463 (500-1)
			E	580/60	463	(500-1 1/4)	
	28		AB	600/50	513	(600-1)	C 600/60 513 (600-1 1/4)
			DE	600-1 1/2	513	(600-1 1/2)	
CIR (b)	10		AB	560-1 1/4	463	(500-1 1/4)	C 560-1 1/2 463 (500-1 1/2)
	28		AB	600-1 1/4	503	(600-1 1/4)	C 600-1 1/2 503 (600-1 1/2)
	10, 28		DE	660-2	563	(600-2)	

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

Visibility in Statute Miles

### 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 500-1 1/2.

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

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

**V** Take-off Minimums not standard and/or Departure Procedures are published. Refer to tabulation.

## 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

### RVR/ Meteorological Visibility Comparable Values

The following table shall be used for converting RVR to meteorological visibility when RVR is not reported for the runway of intended operation. Adjustments of landing minima may be required - see Inoperative Components Table.

RVR (feet)	Visibility (statute miles)	RVR (feet)	Visibility (statute miles)
1600.....	1/4	4000.....	3/4
1800.....	1/2	4500.....	7/8
2000.....	1/2	5000.....	1
2400.....	1/2	6000.....	1 1/4
3200.....	5/8		

# TERMS/LANDING MINIMA DATA

## CLIMB TABLE

## RATE OF CLIMB TABLE

A rate of climb table is provided for use in planning and executing takeoff procedures under known or approximate ground speed conditions.

(ft. per min.)

REQUIRED GRADIENT RATE (ft. per NM)	GROUND SPEED (KNOTS)						
	30	60	80	90	100	120	140
200	100	200	267	300	333	400	467
250	125	250	333	375	417	500	583
300	150	300	400	450	500	600	700
350	175	350	467	525	583	700	816
400	200	400	533	600	667	800	933
450	225	450	600	675	750	900	1050
500	250	500	667	750	833	1000	1167
550	275	550	733	825	917	1100	1283
600	300	600	800	900	1000	1200	1400
650	325	650	867	975	1083	1300	1516
700	350	700	933	1050	1167	1400	1633

REQUIRED GRADIENT RATE (ft. per NM)	GROUND SPEED (KNOTS)					
	150	180	210	240	270	300
200	500	600	700	800	900	1000
250	625	750	875	1000	1125	1250
300	750	900	1050	1200	1350	1500
350	875	1050	1225	1400	1575	1750
400	1000	1200	1400	1600	1700	2000
450	1125	1350	1575	1800	2025	2250
500	1250	1500	1750	2000	2250	2500
550	1375	1650	1925	2200	2475	2750
600	1500	1800	2100	2400	2700	3000
650	1625	1950	2275	2600	2925	3250
700	1750	2100	2450	2800	3150	3500

## CLIMB TABLE

# GENERAL INFO

## 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), (USA), (USAF), (USN). SIAPs with the (FAA) designation are regulated under 14 CFR, Part 97. See 14 CFR, Part 91.175 (a) and the AIM for further details. 14 CFR, Part 91.175 (g) and the Special Notice section of the Airport/Facility Directory contain information on operations at civil 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).

### 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"  besides 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 , , .

KEY MIKE	FUNCTION
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

FAA procedure amendment number  Orig 99365  Date of latest change  
 Amdt 1 00365 

The Chart Date identifies the Julian date the chart was added to the volume 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 addition or change was first published.

The Procedure Amendment Number precedes the Chart Date, and changes any time instrument information (e.g., DH, MDA, approach routing, etc.) changes. Procedure changes also cause the Chart Date to change.

### MISCELLANEOUS

★ Indicates a non-continuously operating facility, see A/FD or flight supplement.

# Indicates control tower temporarily closed UFN.

"Radar required" on the chart indicates that radar vectoring is required for the approach.

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).

# GENERAL INFO

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## ABBREVIATIONS

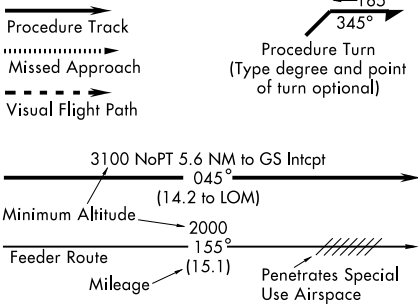
ADF.....	Automatic Direction Finder	MALSR.....	Medium Intensity Approach Light System with RAIL
ALS.....	Approach Light System	MAP.....	Missed Approach Point
ALSF.....	Approach Light System with Sequenced Flashing Lights	MDA.....	Minimum Descent Altitude
APP CON.....	Approach Control	MIRL.....	Medium Intensity Runway Lights
ARR.....	Arrival	MLS.....	Microwave Landing System
ASOS.....	Automated Surface Observing System	MM.....	Middle Marker
ASR/PAR.....	Published Radar Minimums at this Airport	N/A.....	Not Applicable
ATIS.....	Automatic Terminal Information Service	NA.....	Not Authorized
AWOS.....	Automated Weather Observing System	NDB.....	Non-directional Radio Beacon
AZ.....	Azimuth	NFD.....	National Flight Database
BC.....	Back Course	NM.....	Nautical Mile
C.....	Circling	NoPT.....	No Procedure Turn Required (Procedure Turn shall not be executed without ATC clearance)
CAT.....	Category	ODALS.....	Omnidirectional Approach Light System
CCW.....	Counter Clockwise	OM.....	Outer Marker
Chan.....	Channel	R.....	Radial
CLNC DEL.....	Clearance Delivery	RA.....	Radio Altimeter setting height
CNF.....	Computer Navigation Fix	RAIL.....	Runway Alignment Indicator Lights
CTAF.....	Common Traffic Advisory Frequency	RCLS.....	Runway Centerline Light System
CW.....	Clockwise	REIL.....	Runway End Identifier Lights
DH.....	Decision Height	RNAV.....	Area Navigation
DME.....	Distance Measuring Equipment	RNP.....	Required Navigation Performance
ELEV.....	Elevation	RPI.....	Runway Point of Intercept(ion)
FAF.....	Final Approach Fix	RRL.....	Runway Remaining Lights
FM.....	Fan Marker	Rwy.....	Runway
FMS.....	Flight Management System	RVR.....	Runway Visual Range
GCO.....	Ground Communications Outlet	S.....	Straight-in
GPI.....	Ground Point of Interception	SALS.....	Short Approach Light System
GPS.....	Global Positioning System	SSALR.....	Simplified Short Approach Light System with RAIL
GS.....	Glide Slope	SDF.....	Simplified Directional Facility
HAA.....	Height above Airport	TAA.....	Terminal Arrival Area
HAL.....	Height above Landing	TAC.....	TACAN
HAT.....	Height above Touchdown	TCH.....	Threshold Crossing Height (height in feet Above Ground level)
HIRL.....	High Intensity Runway Lights	TDZ.....	Touchdown Zone
IAF.....	Initial Approach Fix	TDZE.....	Touchdown Zone Elevation
ICAO.....	International Civil Aviation Organization	TDZ/CL.....	Touchdown Zone and Runway Centerline Lighting
IM.....	Inner Marker	TDZL.....	Touchdown Zone Lights
INT.....	Intersection	VASI.....	Visual Approach Slope Indicator
LDA.....	Localizer Type Directional Aid	VDP.....	Visual Descent Point
Ldg.....	Landing	VGSI.....	Visual Glide Slope Indicator
LDIN.....	Lead in Light System	WP/WPT.....	Waypoint (RNAV)
LIRL.....	Low Intensity Runway Lights		
LOC.....	Localizer		
LR.....	Lead Radial. Provides at least 2 NM (Copter 1 NM) of lead to assist in turning onto the intermediate/final course.		
MALS.....	Medium Intensity Approach Light System		

## GENERAL INFO

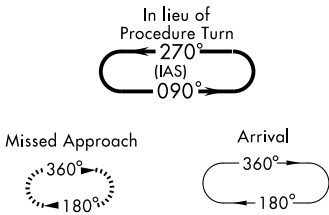
## INSTRUMENT APPROACH PROCEDURES (CHARTS)

### PLANVIEW SYMBOLS

#### TERMINAL ROUTES



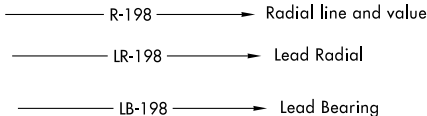
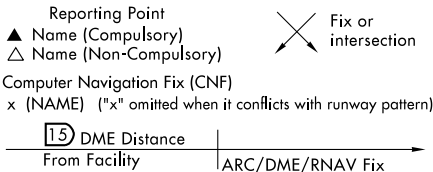
#### HOLDING PATTERNS



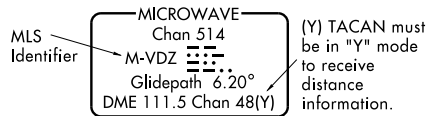
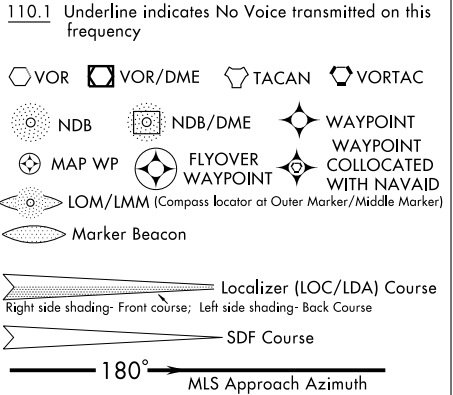
Holding pattern with max. restricted airspeed: (175K) applies to all altitudes. (210K) applies to altitudes above 6000' and including 14000'.

Limits will only be specified when they deviate from the standard. DME fixes may be shown.

#### REPORTING POINT/FIXES

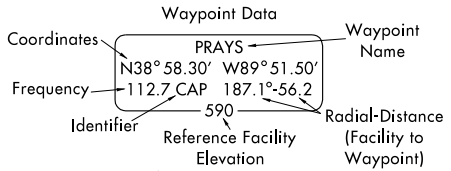


#### RADIO AIDS TO NAVIGATION

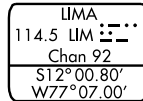


#### LOC/DME

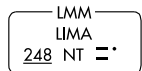
LOC/LDA/SDF/MLS Transmitter (shown when installation is offset from its normal position off the end of the runway.)



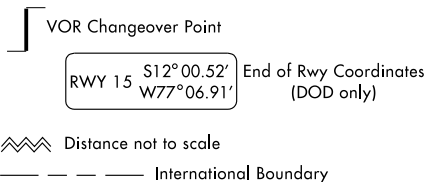
#### Primary Navaid with Coordinate Values



#### Secondary Navaid



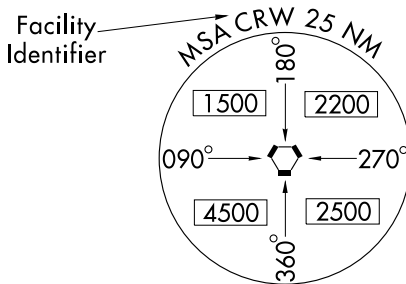
#### MISCELLANEOUS



## INSTRUMENT APPROACH PROCEDURES (CHARTS)

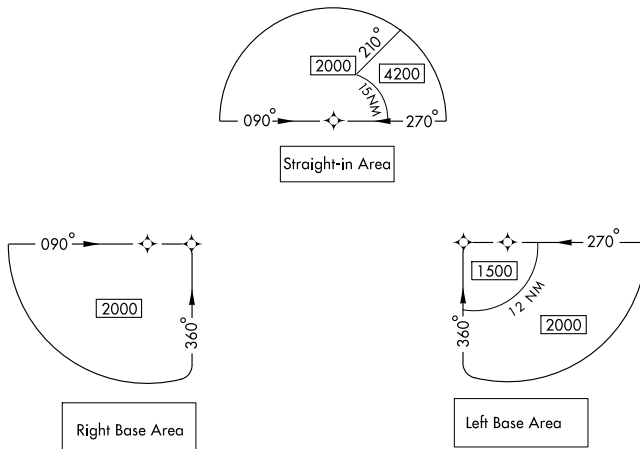
## PLANVIEW SYMBOLS

## MINIMUM SAFE ALTITUDE (MSA)



(arrows on distance circle identify sectors)

## TERMINAL ARRIVAL AREA (TAA)



## SPECIAL USE AIRSPACE



R-Restricted

W-Warning

P-Prohibited

A-Alert

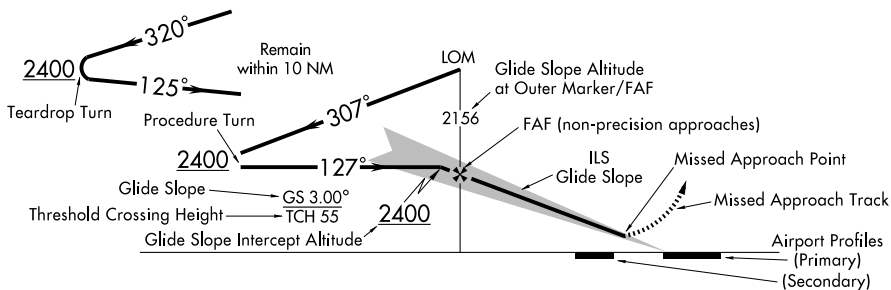
## OBSTACLES

- Spot Elevation
- Highest Spot Elevation
- ▲ Obstacle
- ▲▲ Group of Obstacles
- △ Highest Obstacle
- ± Doubtful accuracy

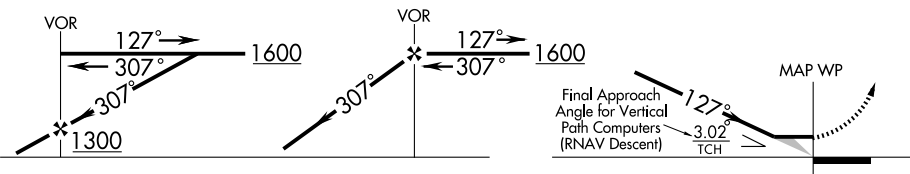


INSTRUMENT APPROACH PROCEDURES (CHARTS)

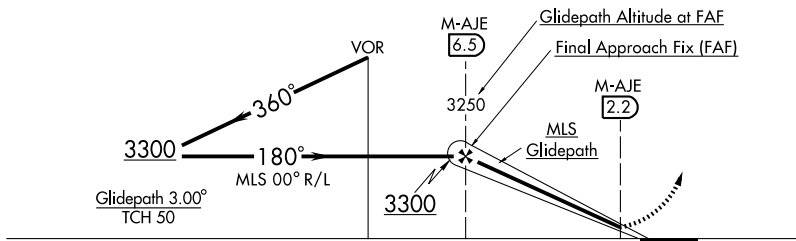
PROFILE



DESCENT FROM HOLDING PATTERN



MLS APPROACH



FACILITIES/FIXES

FM  
IM  
MM  
NDB  
OM  
VOR  
VORTAC  
TACAN  
WP

FIX  
INT

ALTITUDES

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










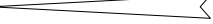




PROFILE SYMBOLS

✱ Final Approach Fix (FAF) (for non-precision approaches)  
↘ Glide Slope/Glide Path Intercept Altitude and Final Approach Fix for precision approaches. Unless otherwise indicated, the non-precision final approach altitude is to be maintained until the next fix.  
▼ Visual Descent Point (VDP)  
- - -> Visual Flight Path

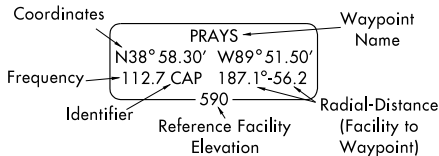
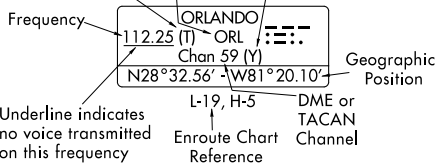
# LEGEND

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

### RADIO AIDS TO NAVIGATION

-  VOR
-  VOR/DME
-  VORTAC
-  WAYPOINT
-  FLYOVER WAYPOINT
-  NDB (Non-directional Radio Beacon)
-  LMM, LOM (Compass locator)
-  Marker Beacon
-  Localizer Course
-  SDF Course
-  TACAN
-  NDB/DME
-  LOC/DME
-  LOC

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





Reporting Points  
 N00° 00.00'  
 W00° 00.00'

- ▲ Name (Compulsory)
- △ Name (Non-Compulsory)

→ DME fix

x Mileage Breakdown/  
 Computer Navigation Fix (CNF)  
 N00° 00.00'  
 W00° 00.00'


 75 → DME Mileage (when not obvious)

 Distance not to scale

### 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

 (IAS) Holding Pattern

 Changeover Point

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

### SPECIAL USE AIRSPACE



- R-Restricted
- W-Warning
- P-Prohibited
- A-Alert

### ALTITUDES

5500  
Mandatory Altitude

2300  
Minimum Altitude

4800  
Maximum Altitude




2200  
Recommended Altitude



MCA (Minimum Crossing Altitude)

→ Altitude change at other than Radio Aids

### AIRPORTS

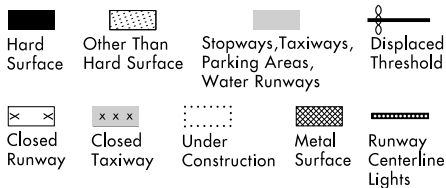
-  Civil
-  Military
-  Joint Civil-Military

### NOTES

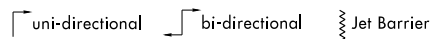
- All mileages are nautical.
- # Indicates control tower temporarily closed UFN.
- ★ Indicates a non-continuously operating facility, see A/FD or flight supplement.
- All radials, bearings are magnetic.
- All altitudes/elevations are in feet-MSL.
- MRA- Minimum Reception Altitude.
- MAA- Maximum Authorized Altitude.
- (NAME2.NAME) - Example of DP flight plan Computer Code.
- (NAME.NAME2) - Example of STAR flight plan Computer Code.
- SL-0000 (FAA) - Example of a chart reference number.
- ▼ Take-Off Minimums not standard and/or Departure Procedures are published.

AIRPORT DIAGRAM/AIRPORT SKETCH

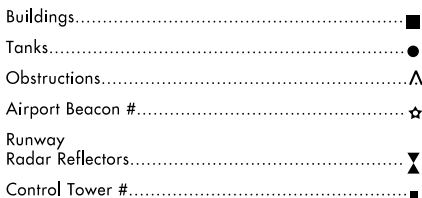
Runways



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.



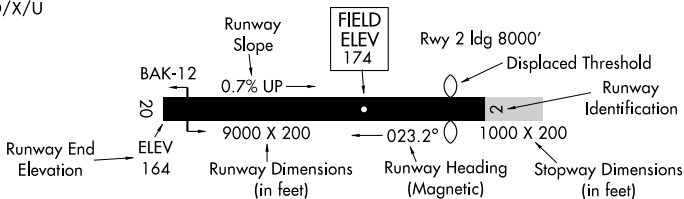
REFERENCE FEATURES



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

Runway length depicted is the physical length of the runway (end-to-end, including displaced thresholds if any) but excluding areas designated as stopways. Where a displaced threshold is shown and/or part of the runway is otherwise not available for landing, an annotation is added to indicate the landing length of the runway; e.g., Rwy 13 ldg 5000'.

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 S75, T185, ST175, TT325 PCN 80 F/D/X/U



SCOPE

Airport diagrams are specifically designed to assist in the movement of ground traffic at locations with complex runway/taxiway configurations and provide information for updating Computer Based Navigation Systems (I.E., INS, GPS) aboard aircraft. Airport diagrams are not intended to be used for approach and landing or departure operations. For revisions to Airport Diagrams: Consult FAA Order 7910.4B.

Helicopter Alighting Areas ⊕ ⊕ ⊕ ⊕ ⊕  
 Negative Symbols used to identify Copter Procedures landing point..... ⊖ ⊕ ⊕ ⊕ ⊕

Runway TDZ elevation.....TDZE 123  
 — 0.3% DOWN  
 Runway Slope.....0.8% UP →  
 (shown when runway slope exceeds 0.3%)

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

⊕ 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)

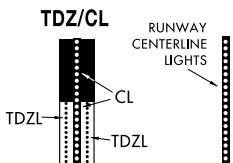
# LEGEND

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

Each approach lighting system indicated on Airport Diagrams will bear a system identification indicated in legend.

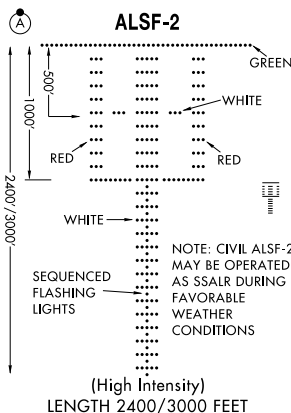
A dot "•" portrayed with approach lighting letter identifier indicates sequenced flashing lights (F) installed with the approach lighting system e.g., (A<sub>1</sub>). Negative symbology, e.g., (A<sub>1</sub>), (V) indicates Pilot Controlled Lighting (PCL).

### RUNWAY TOUCHDOWN ZONE AND CENTERLINE LIGHTING SYSTEMS

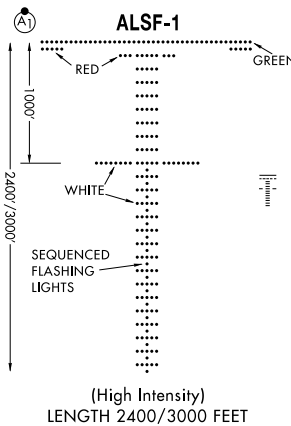


AVAILABILITY of TDZ/CL will be shown by NOTE in SKETCH e.g. "TDZ/CL Rwy 15"

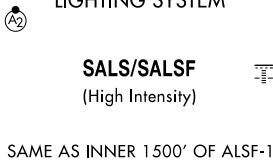
### APPROACH LIGHTING SYSTEM



### APPROACH LIGHTING SYSTEM

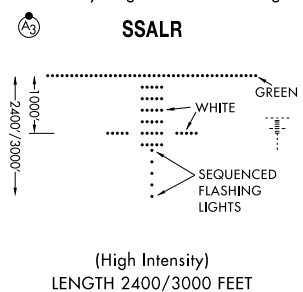


### SHORT APPROACH LIGHTING SYSTEM

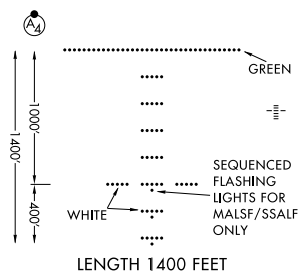


SAME AS INNER 1500' OF ALSF-1

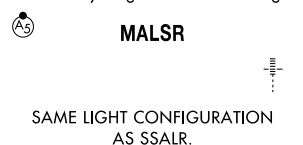
### SIMPLIFIED SHORT APPROACH LIGHTING SYSTEM with Runway Alignment Indicator Lights



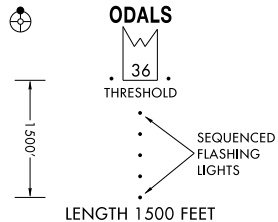
### MEDIUM INTENSITY (MALS and MALSF) OR SIMPLIFIED SHORT (SSALS and SSALF) APPROACH LIGHTING SYSTEMS



### MEDIUM INTENSITY APPROACH LIGHTING SYSTEM with Runway Alignment Indicator Lights



### OMNIDIRECTIONAL APPROACH LIGHTING SYSTEM ODALS

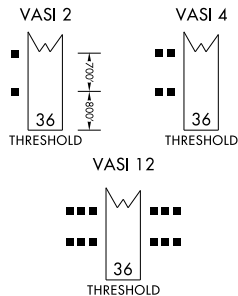


### VISUAL APPROACH SLOPE INDICATOR

**VASI**

VISUAL APPROACH SLOPE INDICATOR WITH STANDARD THRESHOLD CLEARANCE PROVIDED.

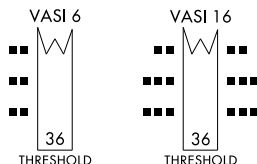
ALL LIGHTS WHITE — TOO HIGH  
 FAR LIGHTS RED — ON GLIDE SLOPE  
 NEAR LIGHTS WHITE — ON GLIDE SLOPE  
 ALL LIGHTS RED — TOO LOW



### VISUAL APPROACH SLOPE INDICATOR

**VASI**

VISUAL APPROACH SLOPE INDICATOR WITH A THRESHOLD CROSSING HEIGHT TO ACCOMMODATE LONG BODIED OR JUMBO AIRCRAFT.



# LEGEND

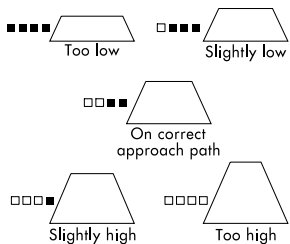
# LEGEND

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

Each approach lighting system indicated on Airport Diagrams will bear a system identification indicated in legend.

A dot "●" portrayed with approach lighting letter identifier indicates sequenced flashing lights (F) installed with the approach lighting system e.g., (A<sub>1</sub>). Negative symbology, e.g., (A<sub>1</sub>), (V) indicates Pilot Controlled Lighting (PCL).

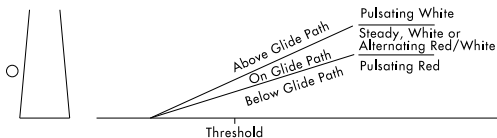
(P) **PRECISION APPROACH  
PATH INDICATOR**  
**PAPI**



Legend: □ White ■ Red

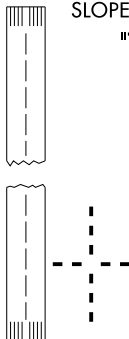
(V<sub>2</sub>) **PULSATING VISUAL APPROACH  
SLOPE INDICATOR**

**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.

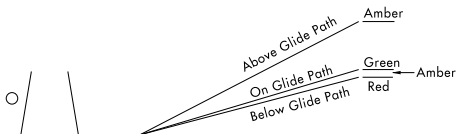
(V<sub>1</sub>) **"T"-VISUAL APPROACH  
SLOPE INDICATOR**  
**"T"-VASI**



"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.

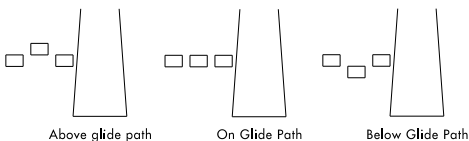
(V<sub>4</sub>) **TRI-COLOR VISUAL APPROACH  
SLOPE INDICATOR**

**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.

(V<sub>5</sub>) **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.

# LEGEND

## 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			

# DESCENT TABLE 99028

## RATE OF DESCENT TABLE

A rate of descent table is provided for use in planning and executing precision 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.

ANGLE OF DESCENT (degrees and tenths)	FEET /NM	GROUND SPEED (knots)											
		30	45	60	75	90	105	120	135	150	165	180	
2.0	210	105	160	210	265	320	370	425	475	530	585	635	
2.5	265	130	200	265	330	395	465	530	595	665	730	795	
VERTICAL PATH ANGLE	2.7	287	143	215	287	358	430	501	573	645	716	788	860
	2.8	297	149	223	297	371	446	520	594	669	743	817	891
	2.9	308	154	231	308	385	462	539	616	693	769	846	923
	3.0	318	159	239	318	398	478	557	637	716	796	876	955
	3.1	329	165	247	329	411	494	576	658	740	823	905	987
	3.2	340	170	255	340	425	510	594	679	764	849	934	1019
	3.3	350	175	263	350	438	526	613	701	788	876	963	1051
	3.4	361	180	271	361	451	541	632	722	812	902	993	1083
3.5	370	185	280	370	465	555	650	740	835	925	1020	1110	
4.0	425	210	315	425	530	635	740	845	955	1060	1165	1270	
4.5	475	240	355	475	595	715	835	955	1075	1190	1310	1430	
5.0	530	265	395	530	660	795	925	1060	1190	1325	1455	1590	
5.5	580	290	435	580	730	875	1020	1165	1310	1455	1600	1745	
6.0	635	315	475	635	795	955	1110	1270	1430	1590	1745	1950	
6.5	690	345	515	690	860	1030	1205	1375	1550	1720	1890	2065	
7.0	740	370	555	740	925	1110	1295	1480	1665	1850	2035	2220	
7.5	795	395	595	795	990	1190	1390	1585	1785	1985	2180	2380	
8.0	845	425	635	845	1055	1270	1480	1690	1905	2115	2325	2540	
8.5	900	450	675	900	1120	1345	1570	1795	2020	2245	2470	2695	
9.0	950	475	715	950	1190	1425	1665	1900	2140	2375	2615	2855	
9.5	1005	500	750	1005	1255	1505	1755	2005	2255	2510	2760	3010	
10.0	1055	530	790	1055	1320	1585	1845	2110	2375	2640	2900	3165	
10.5	1105	555	830	1105	1385	1660	1940	2215	2490	2770	3045	3320	
11.0	1160	580	870	1160	1450	1740	2030	2320	2610	2900	3190	3480	
11.5	1210	605	910	1210	1515	1820	2120	2425	2725	3030	3335	3635	
12.0	1260	630	945	1260	1575	1890	2205	2520	2835	3150	3465	3780	