Aeronav vs. Jeppesen: IFR Charting Compared

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Intent of this seminar

- No advocacy
- Straight comparison
  - Where the product shines
  - Where the product falls short
- How do you buy it?
  - Packaging
  - Cost
  - Paper
  - Electronic

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Scope of this seminar

- We assume State of California coverage
- We will cover
  - Approach charts
  - Airport charts
- We will not cover
  - En route charts
  - Departure and arrival charts
  - Preface and end matter
    - With some exceptions
- Time limitations
  - Let us know other detail you want

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Buying Aeronav on paper

- Terminal Procedures Publication
  - Perfect bound
  - 4-hole loose leaf flip-up (and 4-ring binder)
- 56-day AIRAC cycle based
  - Entire book is replaced
- 28-day mid-cycle bound change notice
  - Replacement pages
  - No one buys this ($0.85)
- California TPP requires two volumes
  - SW-2 Northern California ($5.95)
  - SW-3 Southern California ($5.95)
- California En Route charts (minus Sierras)
  - L1/L2 ($5.25)
  - L3/L4 ($5.25)

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Buying Aeronav electronically

- Content is free
- Pay for the packaging
- Ubiquitous
  - aeronav.faa.gov
  - flightaware.com
  - aopa.org
  - airnav.com
  - All iPad apps
- Panel avionics
  - Garmin FliteCharts
    - GNS 530, GTN 750, G500, G600, G1000, GMX 200

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Buying Jeppesen on paper

- Airway Manual
  - California coverage in one product
    - Terminal charts
    - En route charts
    - Area charts
  - Standard revision service
    - One-year subscription ($163.00)
    - Initial full content
    - Mailed 14-day changes inserted by hand
  - Express service
    - Standard service, smaller coverage area
  - "Trip kit"
    - One time (no updates) full content ($56.00)

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Buying Jeppesen electronic

- Various coverages to save money
  - Full US
  - Western US
  - California ($130.00)
- Products
  - JeppView 5-install for panel avionics
    - G1000, G500, G600, GNS 530, GTN 750, GMX 200
    - Extra installs can go on PC, tablet
  - JeppView 4-install for PCs, tablets
  - Mobile FliteDeck IFR 1-install for iPad
    - Announced at AirVenture, ostensible ForeFlight competitor: Full US ($299.00)

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Paper product sequence

Aeronav

1. Legends
2. Appendices
3. Terminal charts
   - State
     - STARs
     - City
       - Airport
         - Approaches
         - Airport Diag
         - SIDs/ODPs

Jeppesen

1. Introduction
2. En route/area
3. Terminal charts
   - State
     - City
       - Airport
         - STARs
         - SIDs/ODPs
         - Specials
         - Airport Diag
         - Approaches

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Paper product sequence

Aeronav

- Appendices are important
  - Minimums, alternates, radar
  - Cross-referenced with A and T
- INDEX is your friend
  - Find all charts related to an airport
- STARs are shared by multiple airports
  - Sort before airports

Jeppesen

- Pages within airport sequenced
  - 10-3, 10-9, 11-1
  - Approaches sorted by final guidance, runway
- 14-day updates packaged in this sequence
  - So you can apply update in 1 pass

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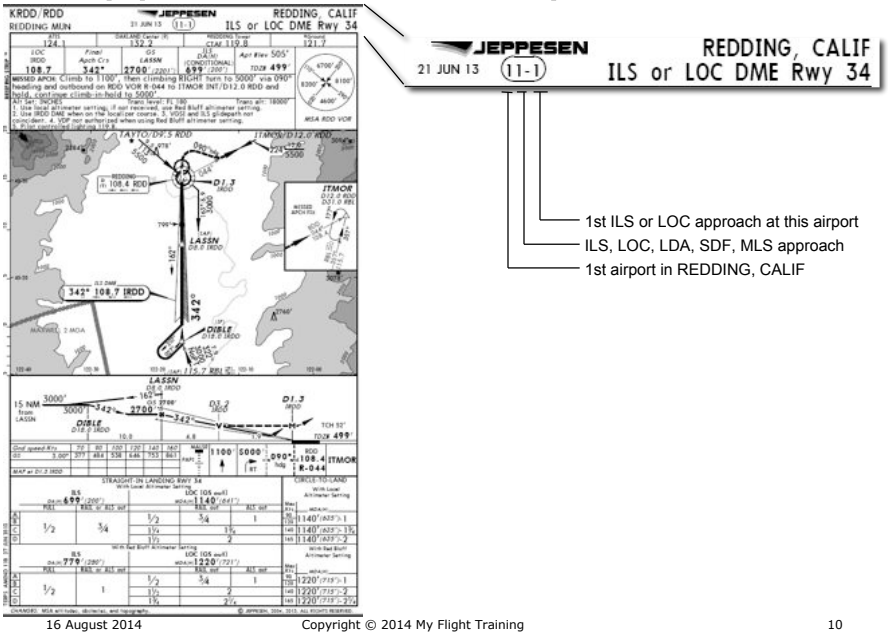
Jeppesen chart sequence



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Sourcing and legal authority

- Aeronav and Jeppesen publish
  - Standard Instrument Approach Procedure (SIAP) charts
    - These are published as amendments to FAR 97 and are regulatory as specified in FAR 91.175(a).
    - Source
      - ICAO "state"
      - United States
        - FAA or DoD
      - Identified in chart amendment text
  - "State" text is reproduced verbatim
    - Missed approach procedure
    - Chart notes

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Approach chart title

- The instrument approach chart title names
  - the navigation aid(s) providing guidance on the final approach segment
  - whether straight-in or circling minimums are depicted on the chart
- Titles same except for punctuation
  - Jeppesen renders solidus as space
    - VOR DME vice VOR/DME

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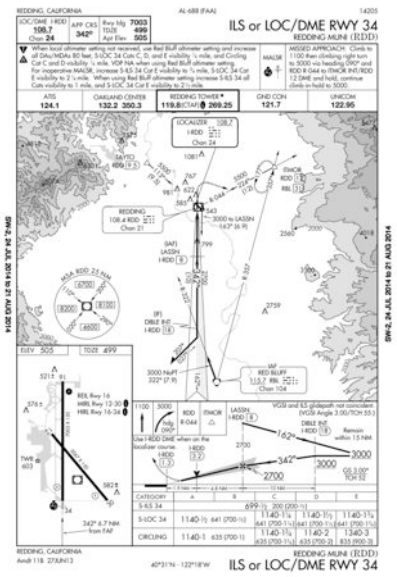
Approach chart title



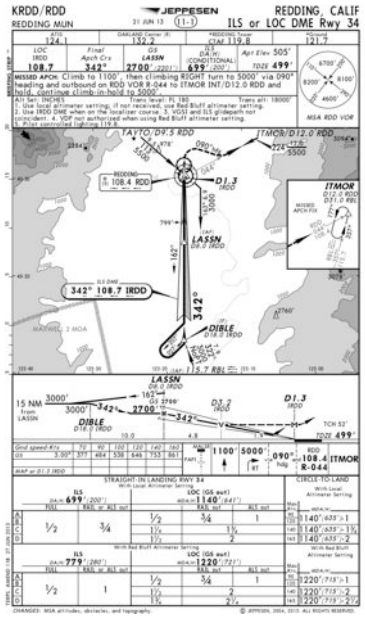


Chart amendments

- Chart issue/effective date
  - Any change including typography
    - Aeronav: Julian date
    - Jeppesen: **dd-mmm-yy** issue date
- Chart procedure change date
  - Track, altitudes, minimums, notes
- Chart amendment number
  - Assigned by FAA
  - Same on both

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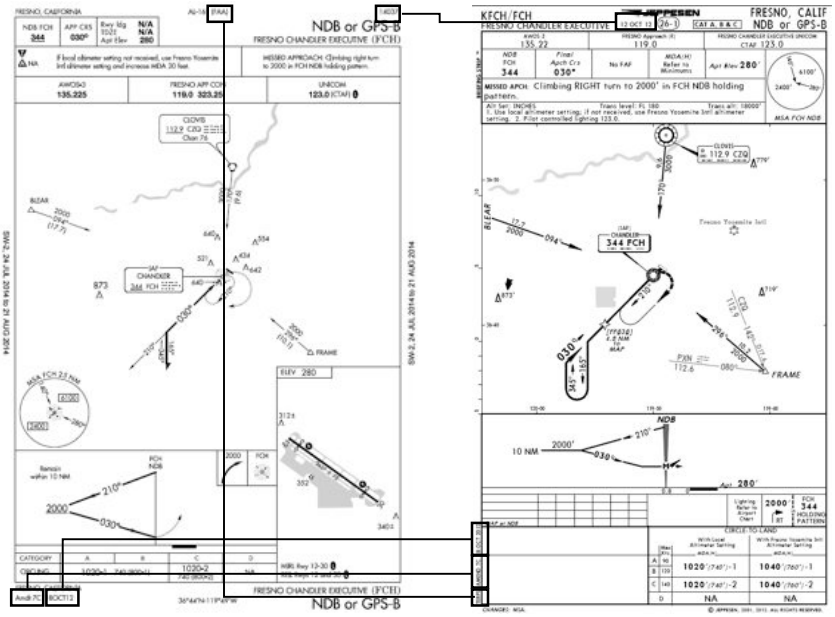
Chart amendments



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Briefing strip

- DOT Volpe human factors initiative
  - Jeppesen jumped first
  - Then NACO
  - All old-format charts gone (I believe)
- Avionics setup
  - Communications: order of use
    - Jeppesen shows radar, part-time facilities
  - Navigation: frequency, course, ident
- Differences
  - Landing data, lighting systems, MSA
    - Find these elsewhere on chart

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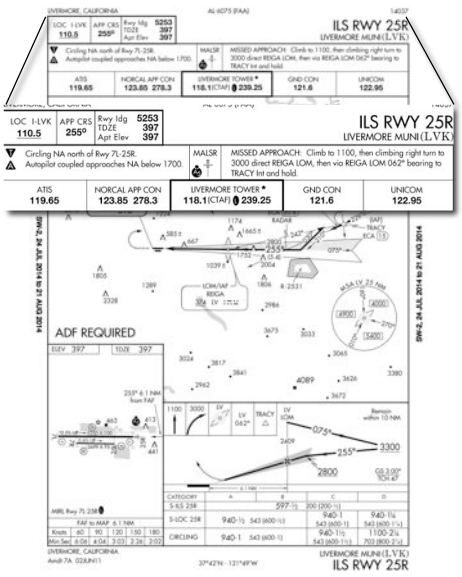
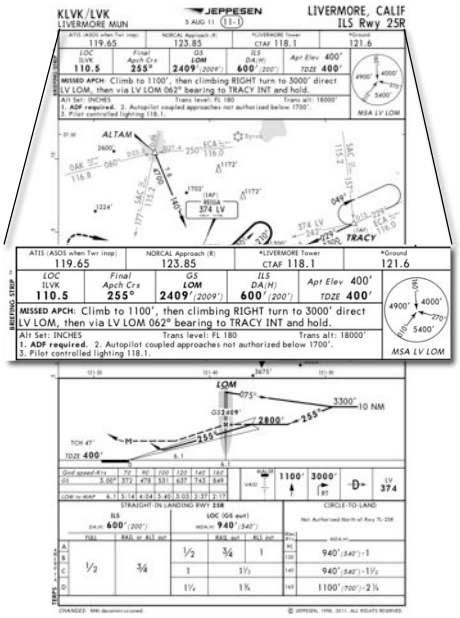
Briefing strip





Planview

Aeronav

- Planview doesn't shrink
- Not-to-scale features
  - Scale rings
    - Feeder facilities
    - En route facilities
    - May be deprecated
  - Scale breaks
  - Inset boxes
- MSA circle overlay

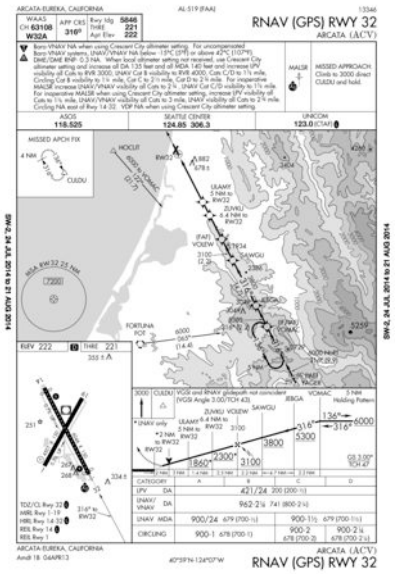
Jeppesen

- Planview gets squeezed by hypertrophic minimums table
- Always to-scale
  - Inset boxes
- Lat-lon edge scale
- No MSA overlay
  - In briefing strip

Planview

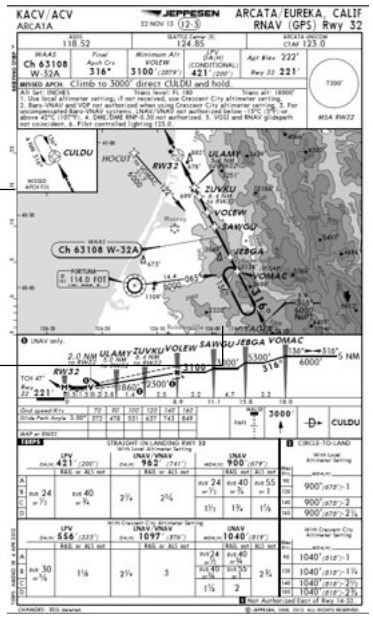
Inset box missed approach

MSA circle



Inset box missed approach

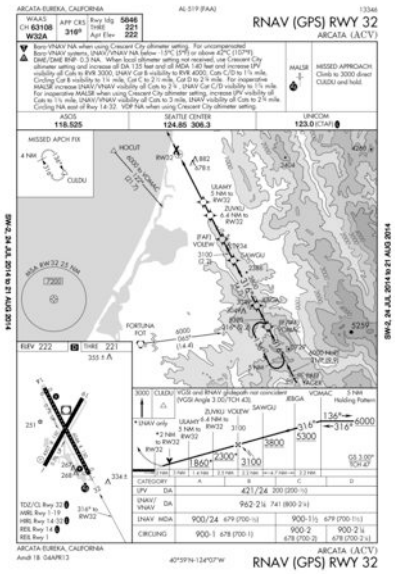
Latitude/ longitude scale

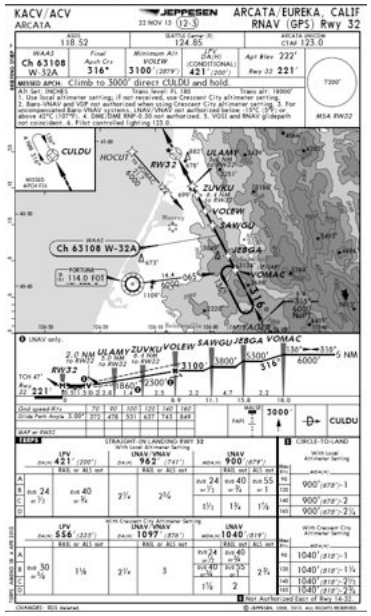


Terrain contours, high points

- Terrain contour charting criteria
  - Planview terrain rises 4000 HAA
  - Terrain < 6 nm ARP rises 2000 HAA
- Spot elevations
  - Very inconsistent
  - Criteria for charting unknown
  - Various symbols
  - Highest point distinguished by type size or bold arrow

Terrain contours, high points





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Profile view

Aeronav

- Constant rate of descent track
  - May falsely imply constant rate achieves crossing altitudes
    - Not true outside FAF
- GS/TCH
- VDA
- Remote notes for LNAV

Jeppesen

- Descent track
  - Precision
    - Feathers for ILS, MLS, LPV GS/GP
  - Non-precision
    - LOC track dashed
- PFAF not charted
  - No lightning bolt
- GS/TCH
- VDA
- Remote notes for LNAV

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Missed approach profile

Aeronav
- All minimums misses
  - Not shown!
- Best minimum
  - Solid-to-dashed up-turning arrow
- Worse minimums
  - Fix over threshold
  - MAP not charted
  - FAF to MAP row in timing table

Jeppesen
- All misses shown
  - Upward-turning arrow for each
  - RNAV can have 3
- Non-precision MAP
  - Marked **M**
  - Fix
  - Timing table
  - GPS MAP

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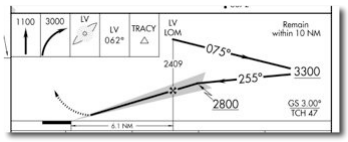
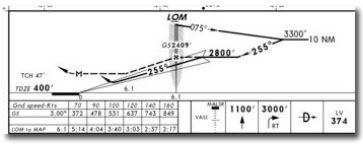
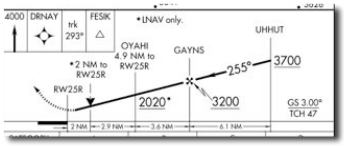
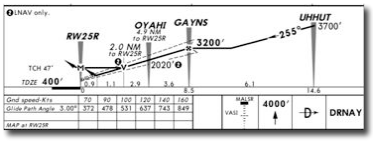
Missed approach profile









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Profile view altitudes

Aeronav
- 2000 minimum
- 2000 maximum
- 2000 mandatory
- 2000 recommended
- NP FAF
  - Maltese cross
  - Glideslope alt
- P FAF
  - Lightning bolt

Jeppesen
- 2000 minimum
- 2000 MAXIMUM
- 2000 MANDATORY
- 2000 RECOMMENDED
- NP FAF
  - Maltese cross
  - Glideslope alt
- P FAF
  - Not charted

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Profile view runway depiction

Aeronav
- Straight-in runway data
  - In briefing strip
    - Landing distance
    - TDZE or THRE
    - Airport elevation
  - In airport sketch
    - Runway length
    - TDZE or THRE
    - Airport elevation
  - Not in profile

Jeppesen
- Runway lengths
  - Nowhere on chart
  - Consult airport diagram
- Airport elevation
  - Briefing strip
- TDZE or Rwy
  - Briefing strip
  - Profile runway depiction
  - Rwy marks THRE

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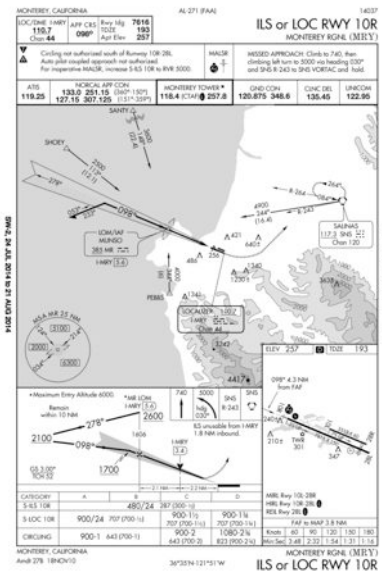
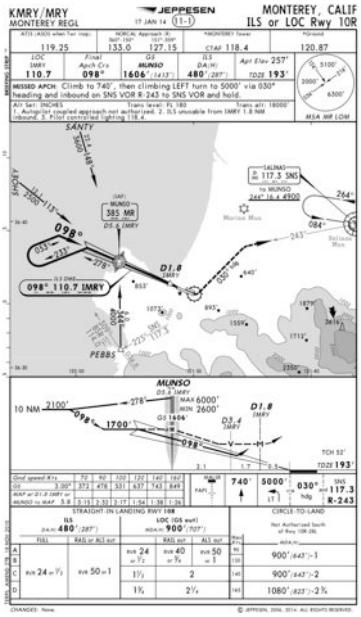
Profile view





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Descent/timing table

- Provides timing from FAF to MAP
  - By groundspeed
  - Required for non-precision approaches where timing is a MAP option
- May be only way of identifying MAP
  - If no fix or station at MAP
  - Distance FAF to MAP is shown

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Timing/descent table

Aeronav

- Timing FAF to MAP required or optional:
  - Below airport sketch
    - FAF to MAP dist
    - Selected groundspeeds
    - Time FAF to MAP
- Timing not authorized:
  - Table omitted
  - RNAV, DME

Jeppesen

- Always provided
  - Unused rows left blank
  - Four rows
    1. Selected groundspeeds
    2. Glideslope or glidepath vertical speed
    3. Vertical descent angle (VDA) vertical speed
    4. Time FAF to MAP

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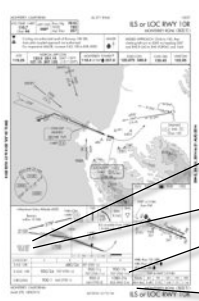
Timing/descent table



GS 3.00°
TCH 52

FAF to MAP 3.8 NM					
Knots	60	90	120	150	180
Min:Sec	3:48	2:32	1:54	1:31	1:16

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)	R/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
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

Gnd speed-Kts	70	90	100	120	140	160
GS 3.00°	372	478	531	637	743	849
MAP at D1.8 IMRY or						
MUNSO to MAP 3.8	3:15	2:32	2:17	1:54	1:38	1:26

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Airport sketch

Aeronav
- Mini depiction of airport
  - Same graphic as A/FD
- Depicts
  - arrival of final approach segment
  - obstructions
  - runway lengths
  - lighting
  - elevations
- Declared distances
  - D references A/FD

Jeppesen
- None
- Elsewhere on chart
  - Elevations
  - Approach lighting
  - VGSI
- Refer to airport diagram page
  - Lighting
  - Runway lengths
  - Obstructions

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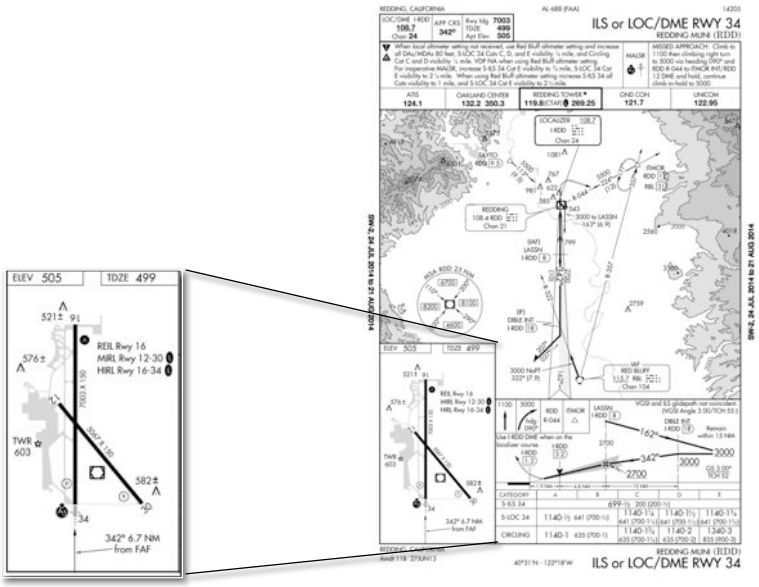
Airport sketch



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Minimums

Aeronav
- Best to worst, top to bottom
- Multiple tables for optional minimums
  - DME minimums
  - Stepdown fixes
- Pilot must compute and apply minimum penalties for
  - Inoperative components
  - Remote altimeter sources

Jeppesen
- Best to worst, left to right
- Multiple tables for optional minimums
  - DME minimums
  - Optional stepdowns
- Penalty minimum columns computed
  - Inoperative components
  - INOP override notes
  - Remote altimeter sources
  - Unless space limited

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Minimums

CATEGORY	A	B	C	D
LPV DA	421/24 200 (200-½)			
LNAV/VNAV DA	962-2¼ 741 (800-2¼)			
LNAV MDA	900/24 679 (700-½)		900-1½ 679 (700-1½)	
CIRCLING	900-1 678 (700-1)		900-2 678 (700-2)	900-2¼ 678 (700-2¼)

TERPS — STRAIGHT-IN LANDING RWY 32 — With Local Altimeter Setting

	LPV DA/H 421′ (200′) RAIL or ALS out		LNAV/VNAV DA/H 962′ (741′) RAIL or ALS out		LNAV MDA/H 900′ (679′) RAIL out	ALS out		CIRCLE-TO-LAND With Local Altimeter Setting Max Kts	MDA/H
A								90	900′ (678′)-1
B	RVR 24 or ½	RVR 40 or ¾	2¼	2¾	RVR 24 or ½	RVR 40 or ¾	RVR 55 or 1	120	900′ (678′)-2
C					1½	1¾	1⅞	140	900′ (678′)-2¼
D								165	

With Crescent City Altimeter Setting

	LPV DA/H 556′ (335′) RAIL or ALS out		LNAV/VNAV DA/H 1097′ (876′) RAIL or ALS out		LNAV MDA/H 1040′ (819′) RAIL out	ALS out		Max Kts	With Crescent City Altimeter Setting MDA/H
A								90	1040′ (818′)-1
B	RVR 30 or ⅝	1⅛	2¼	3	RVR 24 or ½	RVR 40 or ¾	2¾	120	1040′ (818′)-1¼
C					RVR 40 or ¾	RVR 55 or 1		140	1040′ (818′)-2½
D					1⅞	2		165	1040′ (818′)-2¾

1 Not Authorized East of Rwy 14-32.

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Inoperative components

- Jeppesen
  - Applies all standard inoperative penalties from the TPP INOP table
  - Applies INOP table overrides from the chart notes
  - Applies remote altimeter source penalties
  - Sometimes runs out of room
    - Remote notes used
  - Can squeeze out the plan view

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Inoperative components

(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, LP, LNAV lines of minima)

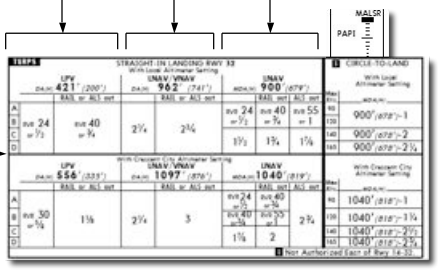
Inoperative Visual Aid	Approach Category	Increase Visibility
ALSF 1 & 2, MALSR, & SSALR	ABCD	½ mile
SSALS,MALS, & ODALS	ABC	¼ mile

(4) NDB

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

Baro-VNAV NA when using Crescent City altimeter setting. For uncompensated Baro-VNAV systems, LNAV/VNAV NA below -15°C (5°F) or above 42°C (107°F). DME/DME RNP- 0.3 NA. When local altimeter setting not received, use Crescent City altimeter setting and increase all DA 135 feet and all MDA 140 feet and increase LPV visibility all Cats to RVR 3000, LNAV Cat B visibility to RVR 4000, Cats C/D to 1⅞ mile, Circling Cat B visibility to 1¼ mile, Cat C to 2½ mile, Cat D to 2¾ mile. For inoperative MALSR increase LNAV/VNAV visibility all Cats to 2¾ , LNAV Cat C/D visibility to 1⅞ mile. For inoperative MALSR when using Crescent City altimeter setting, increase LPV visibility all Cats to 1⅞ mile, LNAV/VNAV visibility all Cats to 3 mile, LNAV visibility all Cats to 2¾ mile. Circling NA east of Rwy 14-32. VDP NA when using Crescent City altimeter setting.

- Precision 1/4 mile penalty inoperative MALSR
- Non-precision 1/4 mile penalty inoperative RAIL
  - Converts MALSR to MALS
  - Converts SSALR o SSALS
- Non-precision 1/2 mile penalty inoperative MALSR



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Airport diagram

Aeronav
- Full-page diagram
  - Same as A/FD full-page diagrams (selected airports)
- Lat/lon
- Taxiways (gray)
  - Designators
- Runways (black)
  - Lengths
  - Slopes
  - Magnetic direction

Jeppesen
- Location (page #)
  - Dedicated (10-9)
  - Reverse of 1st approach (e.g., 11-1)
  - Large airport multi-page (10-9, 10-9A)
- Airport diagram
- Runway data
- Takeoff minimums
- Departure procedures
- Alternate minimums

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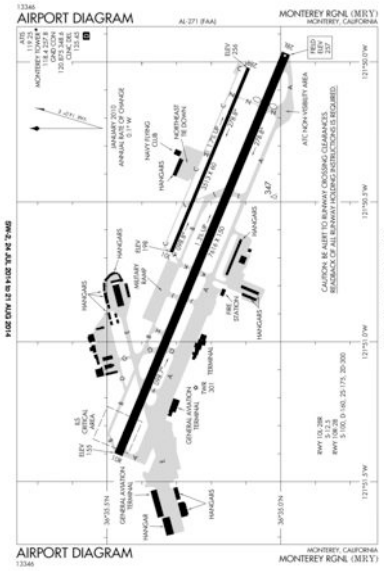
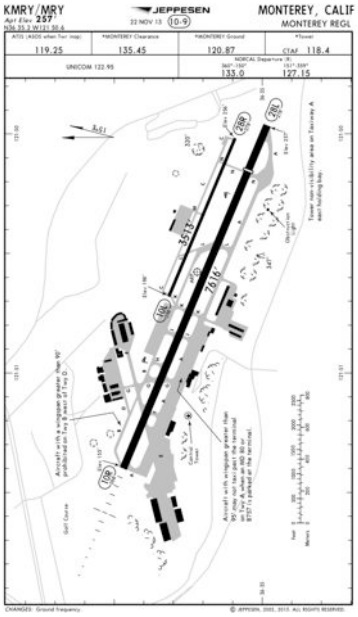
Airport diagram





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Runway data

- Magnetic direction
- Slope (Aeronav)
- Declared distances (Aeronav D)
  - Runway length
  - Displaced thresholds
  - Landing distance available
  - Landing distance at glideslope RPI
- Lighting (Jeppesen)
  - Edge
  - VGSI
  - ALS
  - PCL

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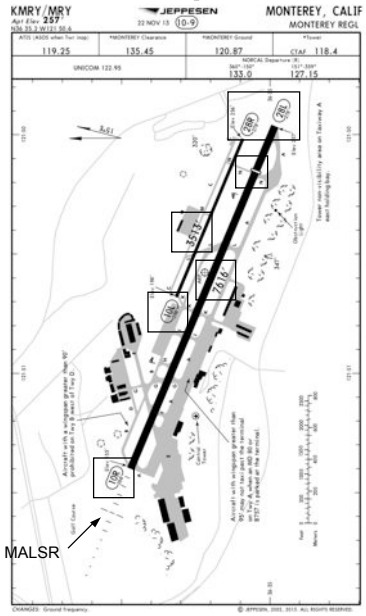
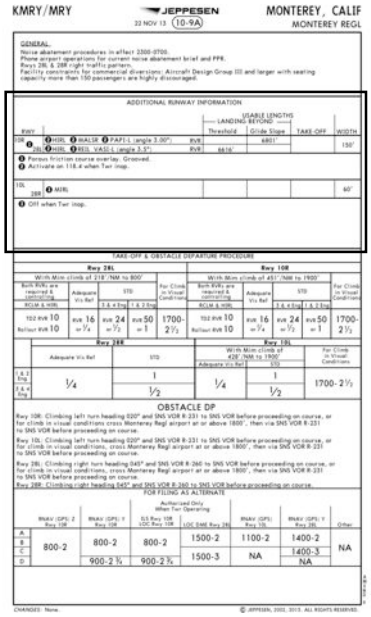
Runway data





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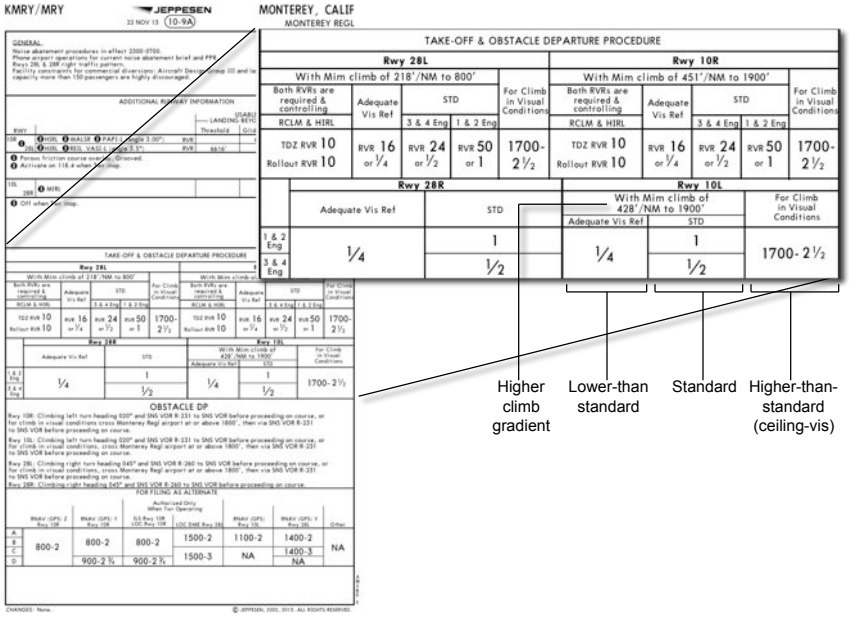
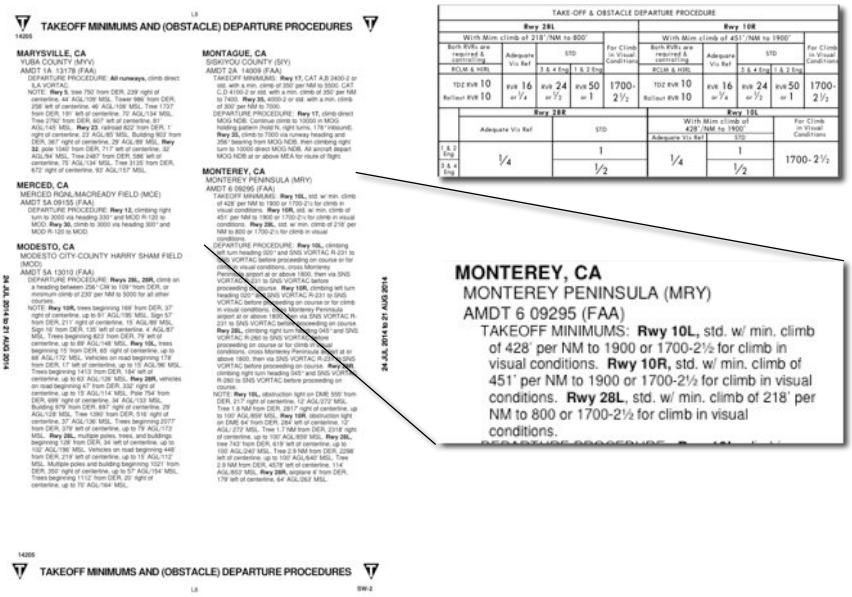
Takeoff minimums

- Aeronav cross-references via ▽T
  - Else, standard takeoff minimums:
    - 1/2 sm: 3-, 4-engine aircraft
    - 1 sm: 1-, 2-engine aircraft
- Jeppesen
  - For each runway
    - Lower-than-standard (commercial ops)
    - Standard
    - Higher-than standard (ceiling-vis)
    - NA (not authorized for IFR departure)

Takeoff minimums



Takeoff minimums



Departure procedures

- Aeronav cross-references via T
  - Absence of T means standard departure procedure
- Jeppesen airport chart
  - Blank box means standard departure procedure
- Both reference graphical ODPs in many new cases (especially RNAV)
- Departure procedure and takeoff minimums must be read in tandem

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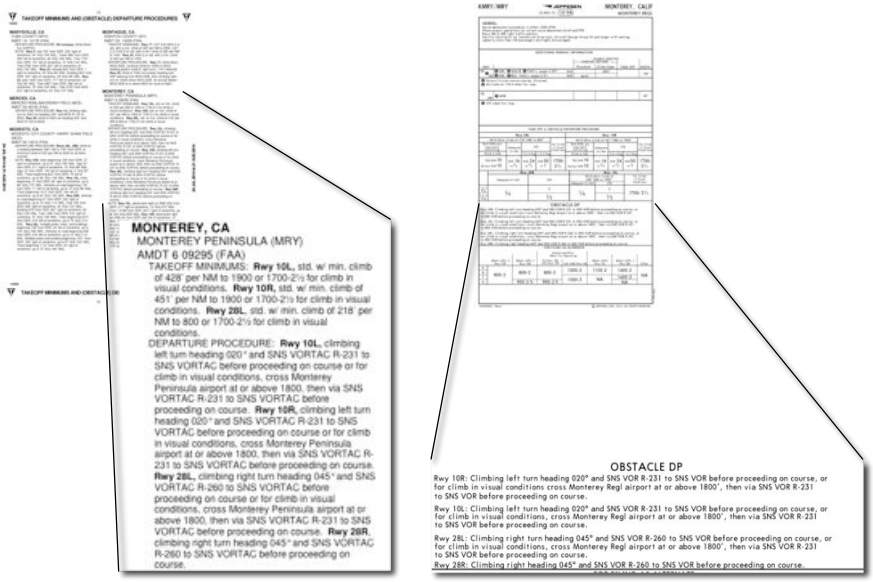
Departure procedures



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Alternate minimums

Aeronav

- Approach chart notes:
  - No icon: standard
  - ⚠NA: this approach not authorized
  - ⚠: refer to TPP Section M for non-standard overrides
- Section M:
  - Footnote structure
  - Notes, limitations
  - Non-standard mins
    - By category
    - By approach

Jeppesen

- Airport chart
  - Standard
  - Non-standard
  - Not authorized
  - All merged
  - Notes, limitations appear above column

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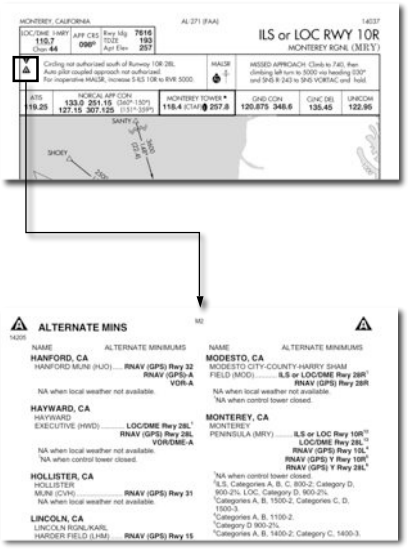
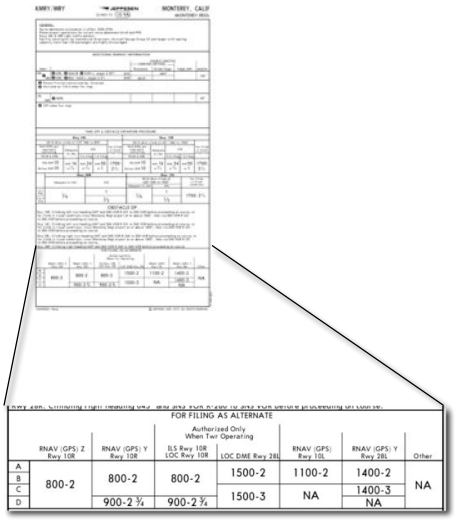
Alternate minimums





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Summary

- Similarities
  - Symbology
  - Briefing strip
- Distinctions
  - Cost, updating, ease of interpretation
- Aeronav
  - Airport sketch
  - Plan view size
- Jeppesen
  - No remote tables, appendices
  - All standard, non-standard minimums interpolated

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Recommendations

- Whichever charting system you use
  - Know how to find information
    - Sequence of charts
    - Chart-to-chart cross references
    - Glossaries, legends, tables
  - Know how to update it
    - Revision system
    - Amendment numbering

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References

- Aeronautical Chart Users Guide, 12th Ed., FAA, `aeronav.faa.gov`.
- Terminal Procedures Publication, SW-2, FAA.
- Introduction to Jeppesen Navigation Charts, Jeppesen Sanderson, `www.jeppesen.com`.

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