

Figure 1. Lift Vector.

Angle of bank ϕ	Load factor n
0°	1.0
10°	1.015
30°	1.154
45°	1.414
60°	2.000
70°	2.923
80°	5.747
85°	11.473
90°	∞

Load factor chart

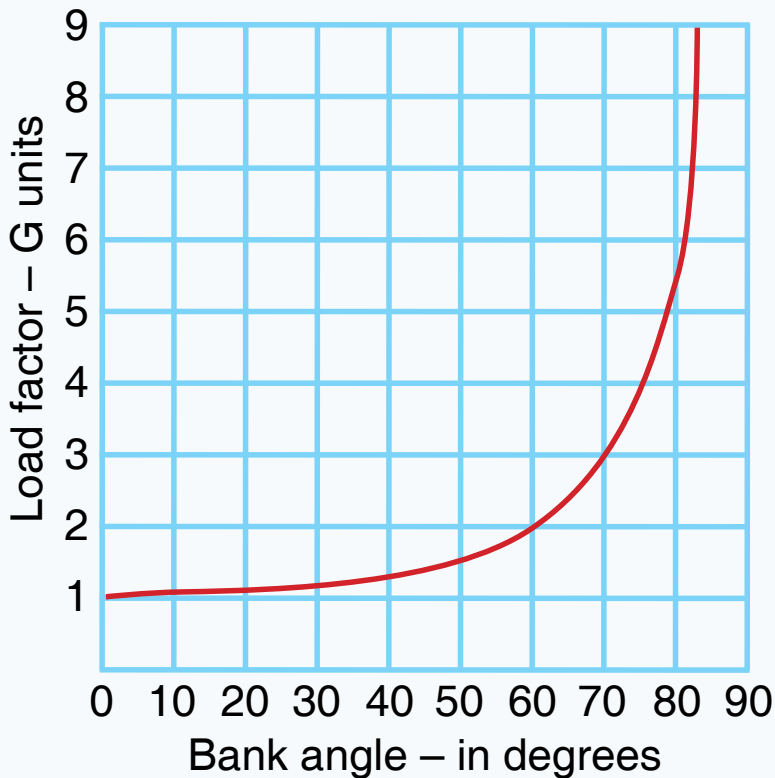


Figure 2. Load Factor Chart.

Figure 3. Altimeter.



1



2



3



Figure 4. Airspeed Indicator.



Figure 5. Turn Coordinator.



Figure 6. Heading Indicator.

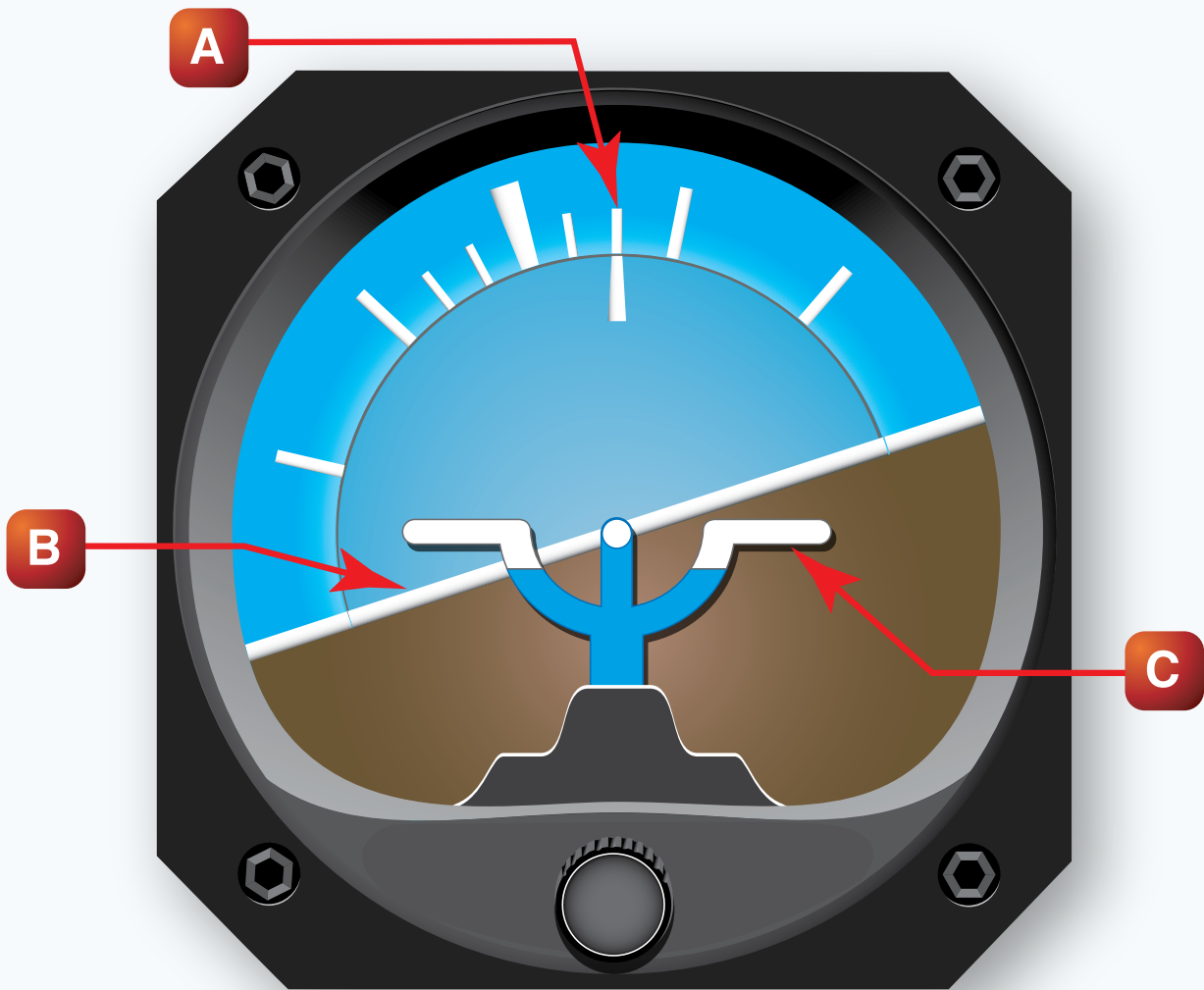
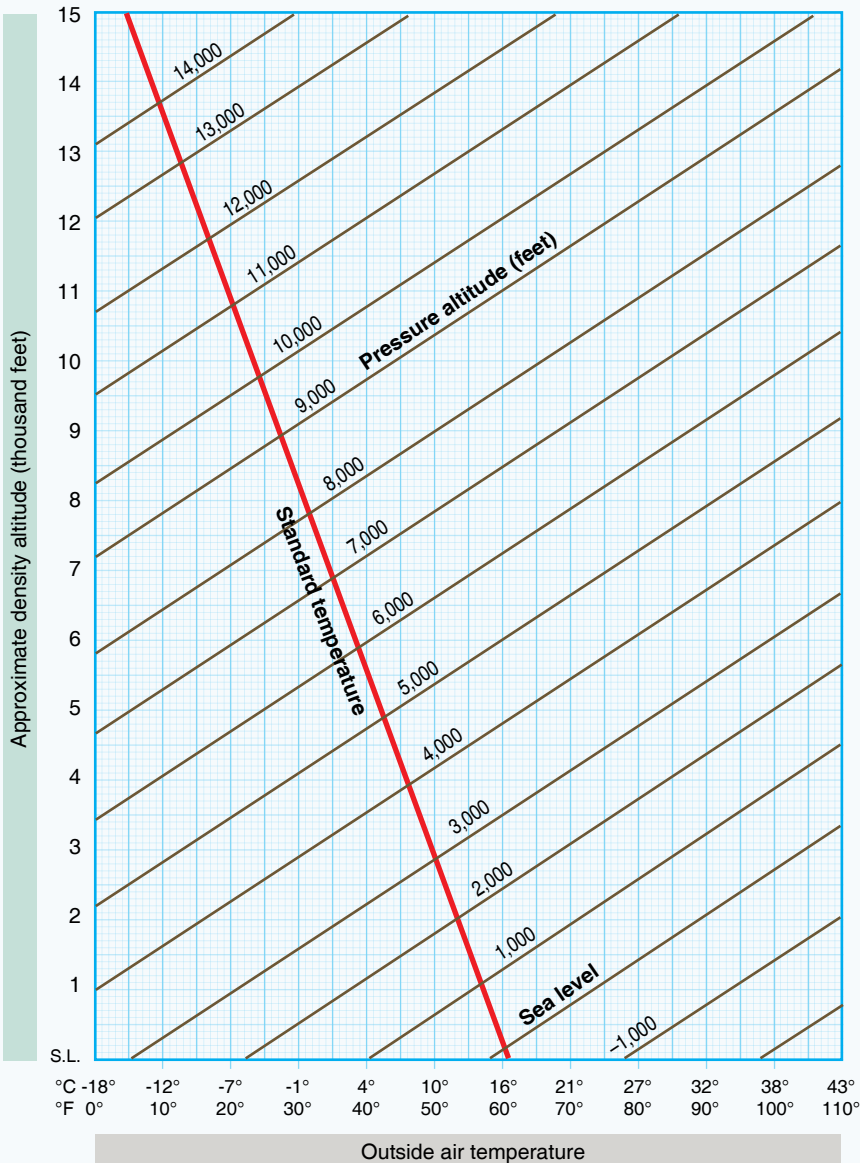


Figure 7. Attitude Indicator.

DENSITY ALTITUDE CHART



Altimeter setting ("Hg)	Pressure altitude conversion factor
28.0	1,824
28.1	1,727
28.2	1,630
28.3	1,533
28.4	1,436
28.5	1,340
28.6	1,244
28.7	1,148
28.8	1,053
28.9	957
29.0	863
29.1	768
29.2	673
29.3	579
29.4	485
29.5	392
29.6	298
29.7	205
29.8	112
29.9	20
29.92	0
30.0	-73
30.1	-165
30.2	-257
30.3	-348
30.4	-440
30.5	-531
30.6	-622
30.7	-712
30.8	-803
30.9	-893
31.0	-983

Figure 8. Density Altitude Chart.

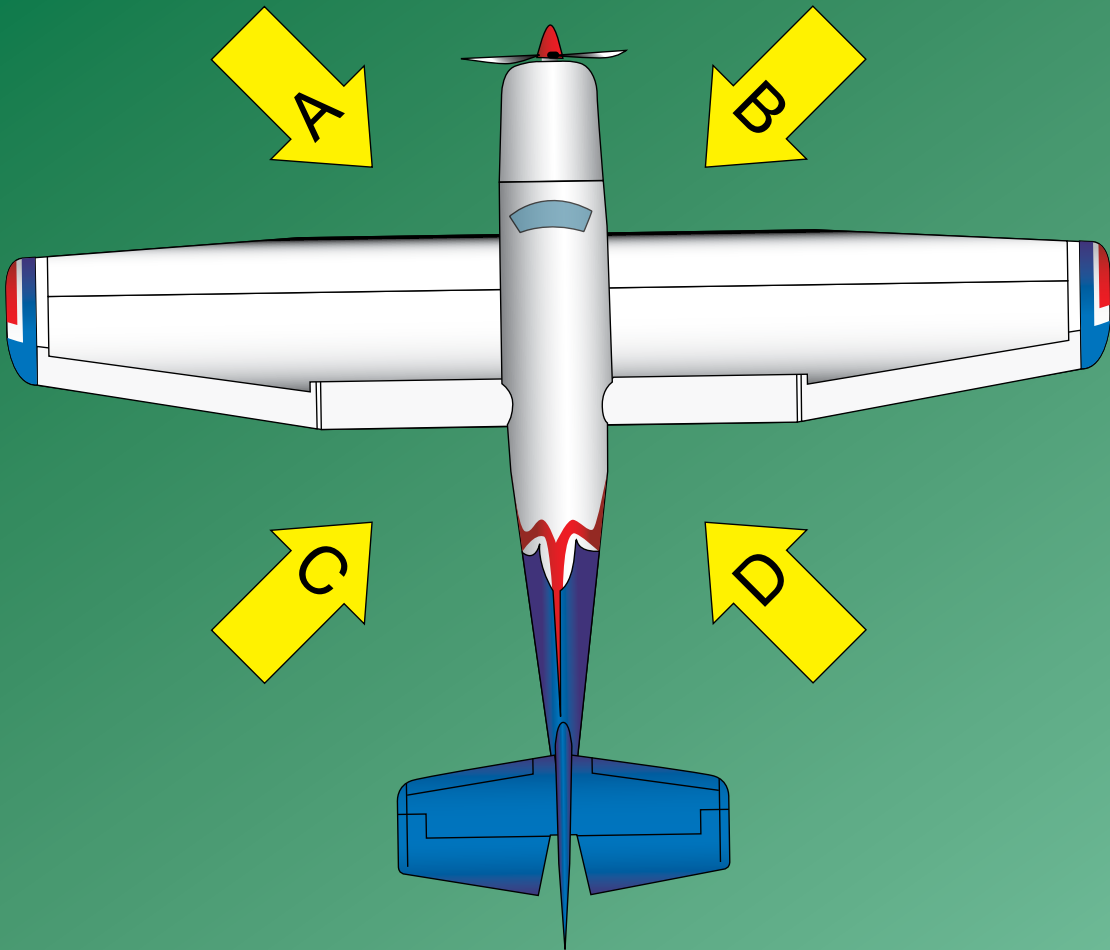


Figure 9. Control Position for Taxi.

METAR KINK 121845Z 11012G18KT 15SM SKC 25/17 A3000

METAR KBOI 121854Z 13004KT 30SM SCT150 17/6 A3015

METAR KLAX 121852Z 25004KT 6SM BR SCT007 SCT250 16/15 A2991

SPECI KMDW 121856Z 32005KT 1 1/2SM RA OVC007 17/16 A2980 RMK RAB35

SPECI KJFK 121853Z 18004KT 1/2SM FG R04/2200 OVC005 20/18 A3006

Figure 12. Aviation Routine Weather Reports (METAR).

UA/OV KOKC-KTUL/TM 1800/FL120/TP BE90/SK BKN018-TOP055/OVC072-
TOP089/CLR ABV/TA M7/WV 08021/TB LGT 055-072/IC LGT-MOD RIME 072-089

Figure 14. Pilot Weather Report.

TAF

KMEM 121720Z 1218/1324 20012KT 5SM HZ BKN030 PROB40 1220/1222 1SM TSRA OVC008CB
FM122200 33015G20KT P6SM BKN015 OVC025 PROB40 1220/1222 3SM SHRA
FM120200 35012KT OVC008 PROB40 1202/1205 2SM-RASN BECMG 1306/1308 02008KT BKN012
BECMG 1310/1312 00000KT 3SM BR SKC TEMPO 1212/1214 1/2SM FG
FM131600 VRB06KT P6SM SKC=

KOKC 051130Z 0512/0618 14008KT 5SM BR BKN030 TEMPO 0513/0516 1 1/2SM BR
FM051600 18010KT P6SM SKC BECMG 0522/0524 20013G20KT 4SM SHRA OVC020
PROB40 0600/0606 2SM TSRA OVC008CB BECMG 0606/0608 21015KT P6SM SCT040=

Figure 15. Terminal Aerodrome Forecasts (TAF).

FB WBC 151745

DATA BASED ON 151200Z

VALID 1600Z FOR USE 1800-0300Z. TEMPS NEG ABV 24000

FT	3000	6000	9000	12000	18000	24000	30000	34000	39000
ALS			2420	2635-08	2535-18	2444-30	245945	246755	246862
AMA		2714	2725+00	2625-04	2531-15	2542-27	265842	256352	256762
DEN			2321-04	2532-08	2434-19	2441-31	235347	236056	236262
HLC		1707-01	2113-03	2219-07	2330-17	2435-30	244145	244854	245561
MKC	0507	2006+03	2215-01	2322-06	2338-17	2348-29	236143	237252	238160
STL	2113	2325+07	2332+02	2339-04	2356-16	2373-27	239440	730649	731960

Figure 17. Winds and Temperatures Aloft Forecast.

Figure 18. Weather Depiction Chart.

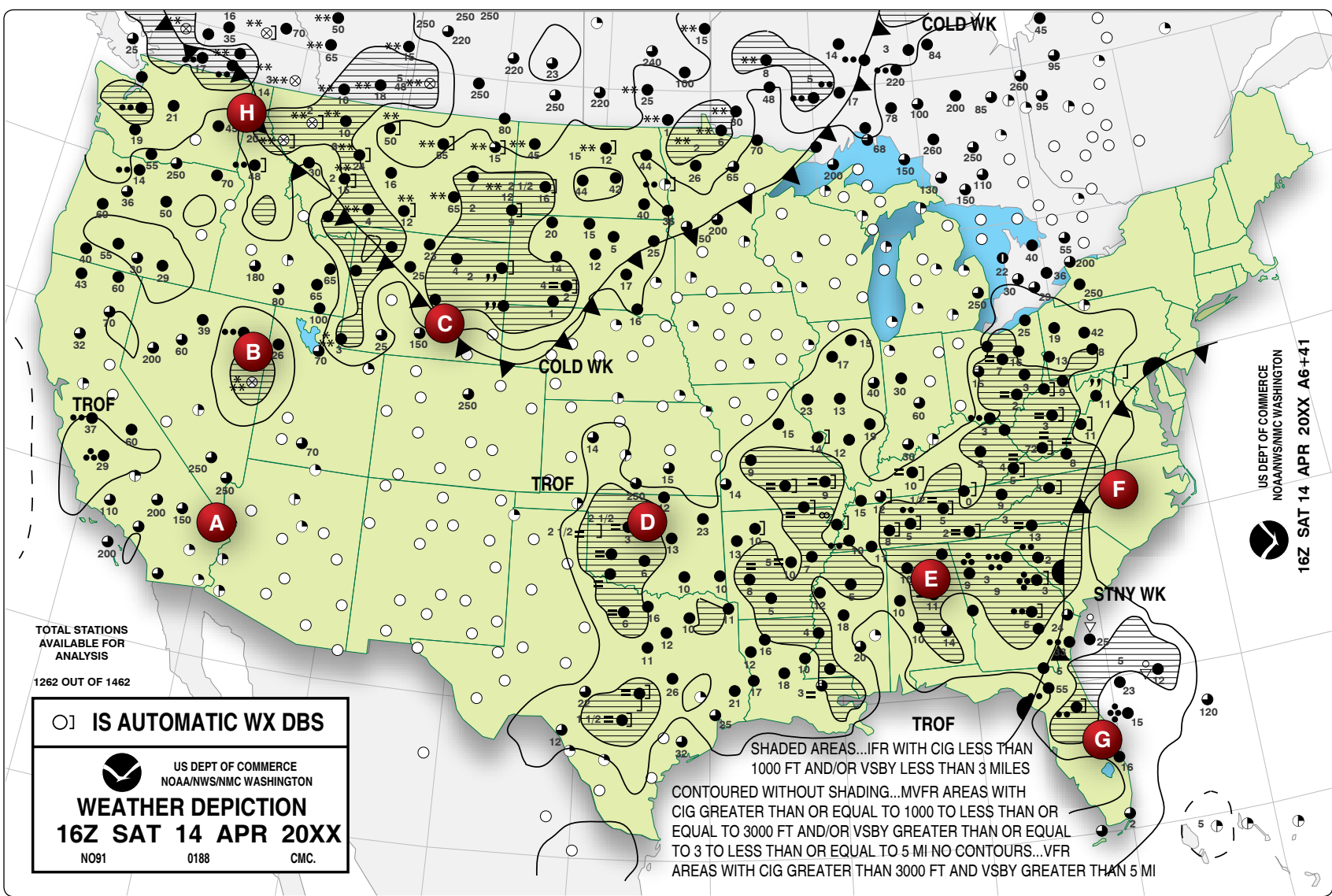
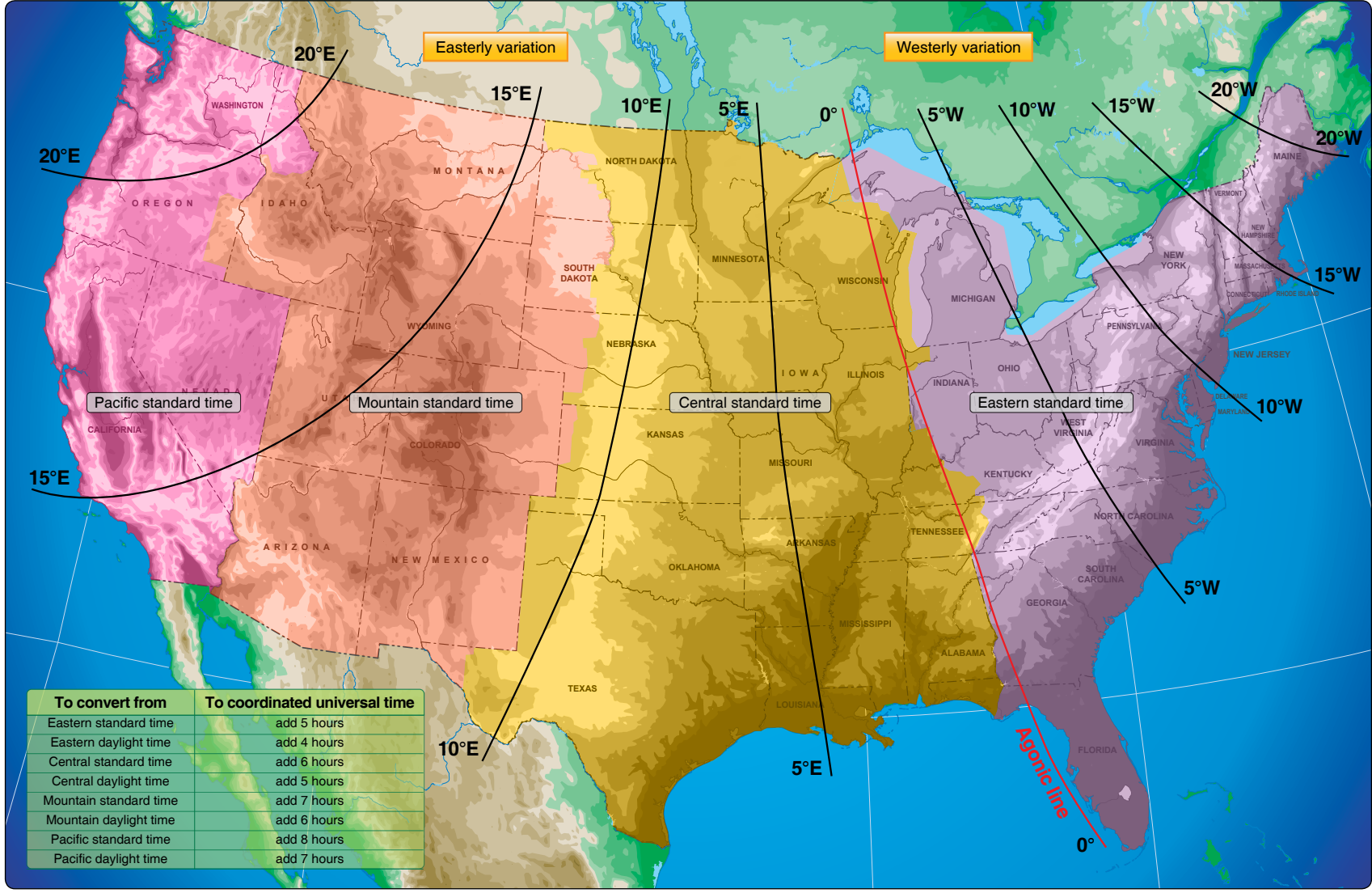




Figure 19. Low-Level Significant Weather (SIGWX) Prognostic Charts.

Figure 27. Time Conversion Table.



To convert from	To coordinated universal time
Eastern standard time	add 5 hours
Eastern daylight time	add 4 hours
Central standard time	add 6 hours
Central daylight time	add 5 hours
Mountain standard time	add 7 hours
Mountain daylight time	add 6 hours
Pacific standard time	add 8 hours
Pacific daylight time	add 7 hours



Figure 28. VOR.

1



2



3



Figure 82. Altimeter.

COEUR D'ALENE-PAPPY BOYINGTON FLD (COE) 9 NW UTC-8(-7DT)

N47°46.46' W116°49.18'

GREAT FALLS

2320 B S4 FUEL 100, JET A OX 1, 2, 3, 4 Class IV, ARFF Index A NOTAM FILE COE

H-1C, L-13B

RWY 05-23: H7400X100 (ASPH-GRVD) S-57, D-95, 2S-121, 2D-165 HIRL 0.6% up NE IAP

RWY 05: MALSRL (NSTD). PAPI(P4R)—GA 3.0° TCH 56'.

RWY 23: REIL. PAPI(P4R)—GA 3.0° TCH 50'.

RWY 01-19: H5400X75 (ASPH) S-50, D-83, 2S-105, 2D-150

MIRL 0.3% up N

RWY 01: REIL. PAPI(P2L)—GA 3.0° TCH 39'. Rgt t/c.

RWY 19: PAPI(P2L)—GA 3.0° TCH 41'.

RUNWAY DECLARED DISTANCE INFORMATION

RWY 01: TORA-5400 TODA-5400 ASDA-5400 LDA-5400

RWY 05: TORA-7400 TODA-7400 ASDA-7400 LDA-7400

RWY 19: TORA-5400 TODA-5400 ASDA-5400 LDA-5400

RWY 23: TORA-7400 TODA-7400 ASDA-7400 LDA-7400

AIRPORT REMARKS: Attended Mon-Fri 1500-0100Z†. For after hrs fuel-self svc avbl or call 208-772-6404, 208-661-4174, 208-661-7449, 208-699-5433. Self svc fuel avbl with credit card. 48 hr PPR for unscheduled ops with more than 30 passenger seats call arpt manager 208-446-1860. Migratory birds on and invof arpt Oct-Nov. Remote cntl airstrip is 2.3 miles west AER 05. Arpt conditions avbl on AWOS. Rwy 05 NSTD MALSRL, thld bar extends 5' byd rwy edge lgts each side. ACTIVATE MIRL Rwy 01-19, HIRL Rwy 05-23, REIL Rwy 01 and Rwy 23, MALSRL Rwy 05—CTAF. PAPI Rwy 01, Rwy 19, Rwy 05, and Rwy 23 opr continuously.

WEATHER DATA SOURCES: AWOS-3 135.075 (208) 772-8215.

HIWAS 108.8 COE.

COMMUNICATIONS: CTAF/UNICOM 122.8

RCO 122.05 (BOISE RADIO)

Ⓡ SPOKANE APP/DEP CON 132.1

AIRSPACE: CLASS E svc continuous.

RADIO AIDS TO NAVIGATION: NOTAM FILE COE.

(T) VORW/DME 108.8 COE Chan 25 N47°46.42' W116°49.24' at fld. 2320/19E. HIWAS.

DME portion unusable:

220°-240° byd 15 NM

280°-315° byd 15 NM blo 11,000'.

POST FALLS NDB (MHW) 347 LEN N47°44.57' W116°57.66' 053° 6.0 NM to fld.

ILS 110.7 I-COE Rwy 05 Class ID. Localizer unusable 25° left and right of course.

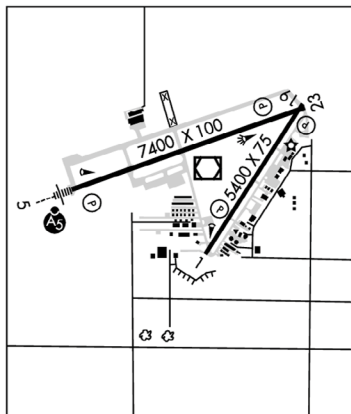


Figure 31. Chart Supplement.

Useful load weights and moments

Baggage or 5th seat occupant	
ARM 140	
Weight	<u>Moment</u> 100
10	14
20	28
30	42
40	56
50	70
60	84
70	98
80	112
90	126
100	140
110	154
120	168
130	182
140	196
150	210
160	224
170	238
180	252
190	266
200	280
210	294
220	308
230	322
240	336
250	350
260	364
270	378

Occupants			
Front seats ARM 85		Rear seats ARM 121	
Weight	<u>Moment</u> 100	Weight	<u>Moment</u> 100
120	102	120	145
130	110	130	157
140	119	140	169
150	128	150	182
160	136	160	194
170	144	170	206
180	153	180	218
190	162	190	230
200	170	200	242

Usable fuel		
Main wing tanks ARM 75		
Gallons	Weight	<u>Moment</u> 100
5	30	22
10	60	45
15	90	68
20	120	90
25	150	112
30	180	135
35	210	158
40	240	180
44	264	198

Auxiliary wing tanks ARM 94		
Gallons	Weight	<u>Moment</u> 100
5	30	28
10	60	56
15	90	85
19	114	107

*Oil		
Quarts	Weight	<u>Moment</u> 100
10	19	5

*Included in basic empty weight.

Empty weight~2,015

MOM/100~1,554

Moment limits vs weight

Moment limits are based on the following weight and center of gravity limit data (landing gear down).

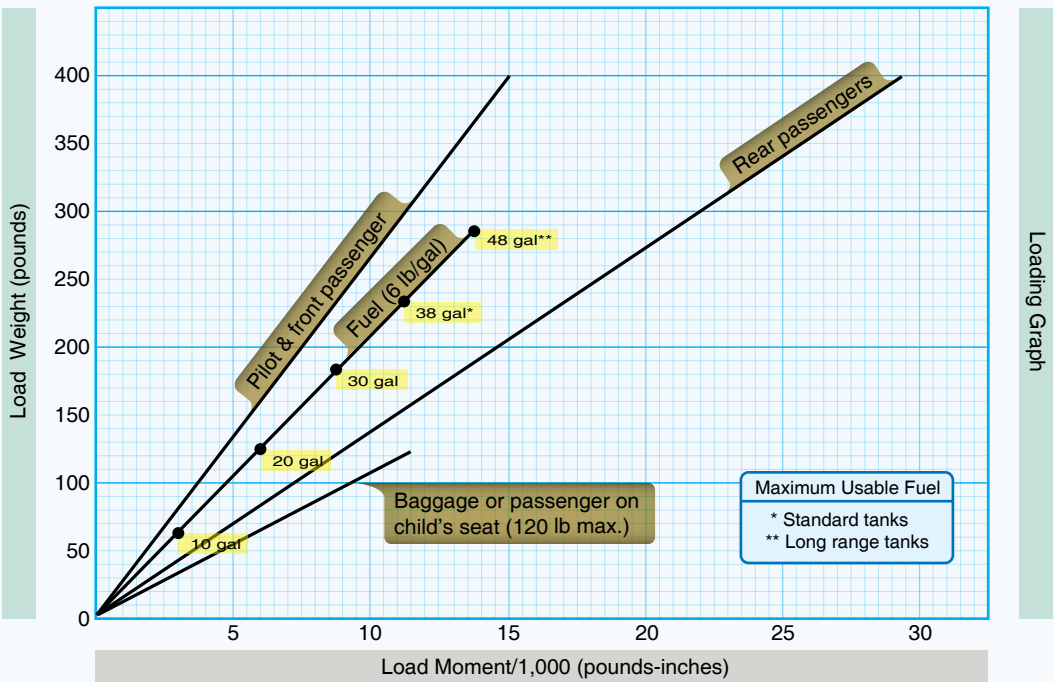
Weight condition	Forward CG limit	AFT CG limit
2,950 lb (takeoff or landing)	82.1	84.7
2,525 lb	77.5	85.7
2,475 lb or less	77.0	85.7

Figure 32. Airplane Weight and Balance Tables.

Moment limits vs weight (continued)

Weight	Minimum Moment 100	Maximum Moment 100	Weight	Minimum Moment 100	Maximum Moment 100
2,100	1,617	1,800	2,500	1,932	2,143
2,110	1,625	1,808	2,510	1,942	2,151
2,120	1,632	1,817	2,520	1,953	2,160
2,130	1,640	1,825	2,530	1,963	2,168
2,140	1,648	1,834	2,540	1,974	2,176
2,150	1,656	1,843	2,550	1,984	2,184
2,160	1,663	1,851	2,560	1,995	2,192
2,170	1,671	1,860	2,570	2,005	2,200
2,180	1,679	1,868	2,580	2,016	2,208
2,190	1,686	1,877	2,590	2,026	2,216
2,200	1,694	1,885	2,600	2,037	2,224
2,210	1,702	1,894	2,610	2,048	2,232
2,220	1,709	1,903	2,620	2,058	2,239
2,230	1,717	1,911	2,630	2,069	2,247
2,240	1,725	1,920	2,640	2,080	2,255
2,250	1,733	1,928	2,650	2,090	2,263
2,260	1,740	1,937	2,660	2,101	2,271
2,270	1,748	1,945	2,670	2,112	2,279
2,280	1,756	1,954	2,680	2,123	2,287
2,290	1,763	1,963	2,690	2,133	2,295
2,300	1,771	1,971	2,700	2,144	2,303
2,310	1,779	1,980	2,710	2,155	2,311
2,320	1,786	1,988	2,720	2,166	2,319
2,330	1,794	1,997	2,730	2,177	2,326
2,340	1,802	2,005	2,740	2,188	2,334
2,350	1,810	2,014	2,750	2,199	2,342
2,360	1,817	2,023	2,760	2,210	2,350
2,370	1,825	2,031	2,770	2,221	2,358
2,380	1,833	2,040	2,780	2,232	2,366
2,390	1,840	2,048	2,790	2,243	2,374
2,400	1,848	2,057	2,800	2,254	2,381
2,410	1,856	2,065	2,810	2,265	2,389
2,420	1,863	2,074	2,820	2,276	2,397
2,430	1,871	2,083	2,830	2,287	2,405
2,440	1,879	2,091	2,840	2,298	2,413
2,450	1,887	2,100	2,850	2,309	2,421
2,460	1,894	2,108	2,860	2,320	2,428
2,470	1,902	2,117	2,870	2,332	2,436
2,480	1,911	2,125	2,880	2,343	2,444
2,490	1,921	2,134	2,890	2,354	2,452
			2,900	2,365	2,460
			2,910	2,377	2,468
			2,920	2,388	2,475
			2,930	2,399	2,483
			2,940	2,411	2,491
			2,950	2,422	2,499

Figure 33. Airplane Weight and Balance Tables.



Notes: 1. Lines representing adjustable seats show the pilot or passenger center of gravity on adjustable seats positioned for an average occupant. Refer to the Loading Arrangements diagram for forward and aft limits of occupant CG range.

2. Engine Oil: 8 qt = 15 lb at -0.2 Moment/1,000

Note: The empty weight of this airplane does not include the weight of the oil.

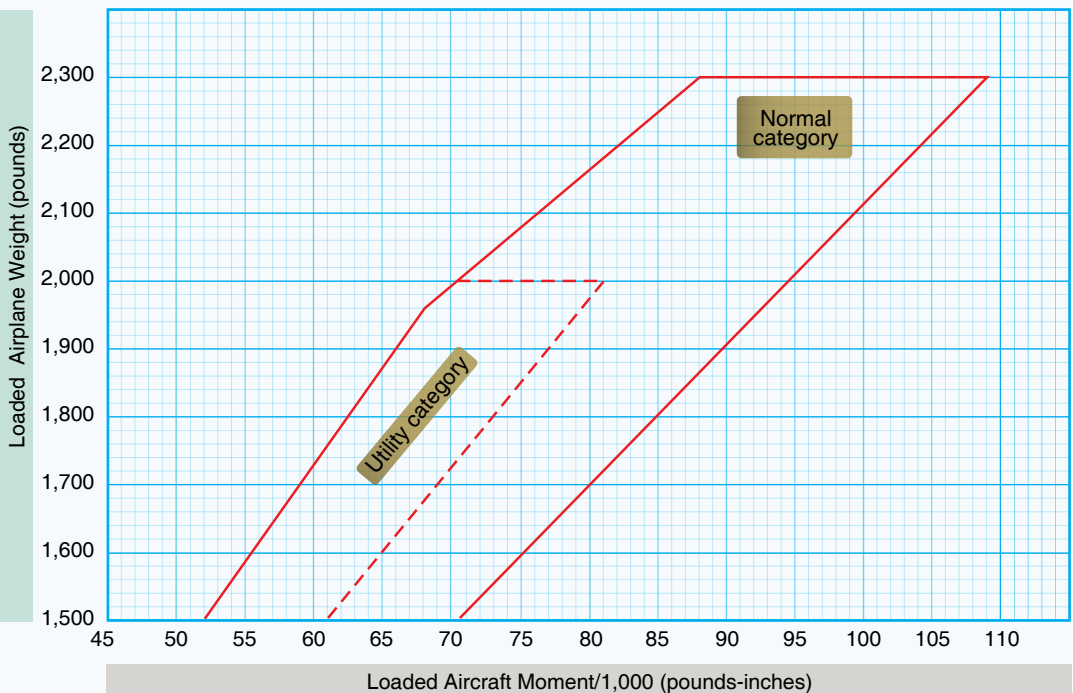


Figure 34. Airplane Weight and Balance Graphs.

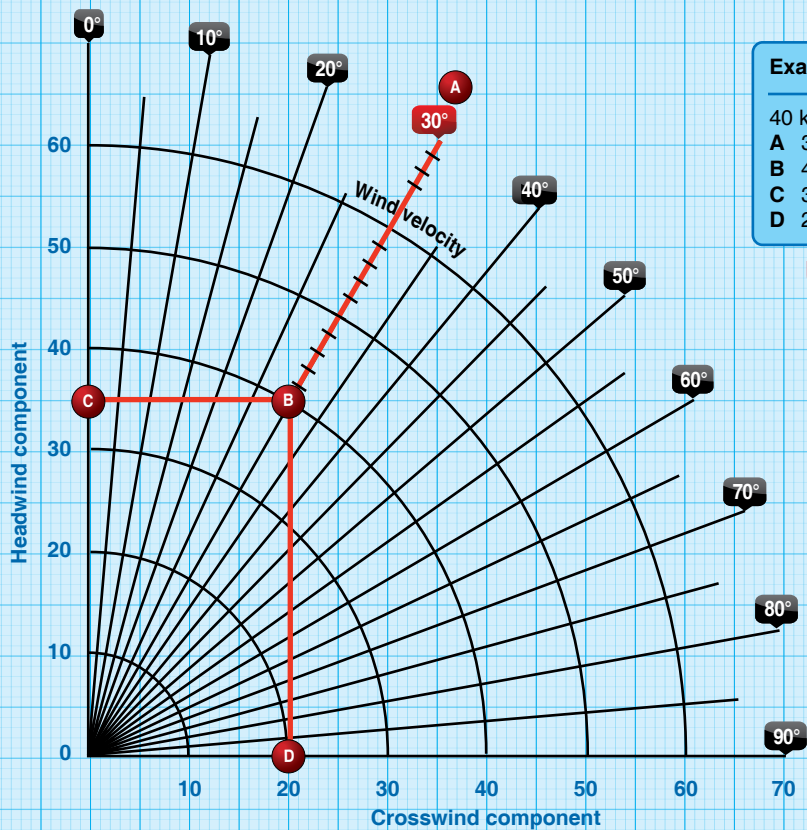
Figure 35. Airplane Power Setting Table.

Cruise power settings

65% Maximum continuous power (or full throttle 2,800 pounds)

Press ALT.	ISA -20 °C (-36 °F)								Standard day (ISA)								ISA +20 °C (+36 °F)							
	IOAT		Engine speed	MAN. press	Fuel flow per engine		TAS		IOAT		Engine speed	MAN. press	Fuel flow per engine		TAS		IOAT		Engine speed	MAN. press	Fuel flow per engine		TAS	
	Feet	°F	°C	RPM	IN HG	PSI	GPH	KTS	MPH	°F	°C	RPM	IN HG	PSI	GPH	KTS	MPH	°F	°C	RPM	IN HG	PSI	GPH	KTS
SL	27	-3	2,450	20.7	6.6	11.5	147	169	63	17	2,450	21.2	6.6	11.5	150	173	99	37	2,450	21.8	6.6	11.5	153	176
2,000	19	-7	2,450	20.4	6.6	11.5	149	171	55	13	2,450	21.0	6.6	11.5	153	176	91	33	2,450	21.5	6.6	11.5	156	180
4,000	12	-11	2,450	20.1	6.6	11.5	152	175	48	9	2,450	20.7	6.6	11.5	156	180	84	29	2,450	21.3	6.6	11.5	159	183
6,000	5	-15	2,450	19.8	6.6	11.5	155	178	41	5	2,450	20.4	6.6	11.5	158	182	79	26	2,450	21.0	6.6	11.5	161	185
8,000	-2	-19	2,450	19.5	6.6	11.5	157	181	36	2	2,450	20.2	6.6	11.5	161	185	72	22	2,450	20.8	6.6	11.5	164	189
10,000	-8	-22	2,450	19.2	6.6	11.5	160	184	28	-2	2,450	19.9	6.6	11.5	163	188	64	18	2,450	20.3	6.5	11.4	166	191
12,000	-15	-26	2,450	18.8	6.4	11.5	162	186	21	-6	2,450	18.8	6.1	10.9	163	188	57	14	2,450	18.8	5.9	10.6	163	188
14,000	-22	-30	2,450	17.4	5.8	10.5	159	183	14	-10	2,450	17.4	5.6	10.1	160	184	50	10	2,450	17.4	5.4	9.8	160	184
16,000	-29	-34	2,450	16.1	5.3	9.7	156	180	7	-14	2,450	16.1	5.1	9.4	156	180	43	6	2,450	16.1	4.9	9.1	155	178

Note: 1. Full throttle manifold pressure settings are approximate.
 2. Shaded area represents operation with full throttle.



Example:

- 40 knots wind at 30° angle
- A 30° angle between wind and runway
- B 40 knots total wind velocity
- C 35 knots headwind component
- D 20 knots crosswind component

Use plastic overlay

Figure 36. Crosswind Component Graph.

Associated conditions:

Power	Retarded to maintain 900/ft on final approach
Flaps	Down
Landing gear	Down
Runway	Paved, level, dry surface
Approach speed	IAS as tabulated
Braking	Maximum

Weight pounds

2,950
2,800
2,600
2,400
2,200

Speed at 50 ft

Speed at 50 ft	kts	MPH
70	80	
68	78	
65	75	
63	72	
60	69	

Example:

OAT	25 °C (77 °F)
Pressure altitude	3,965 feet
Weight	2,814 lb
Wind component	9.0 knots (headwind)
Ground roll	1,080 feet
Total over 50 feet obstacle	1,700 feet
Approach speed	68 knots (78 mph)

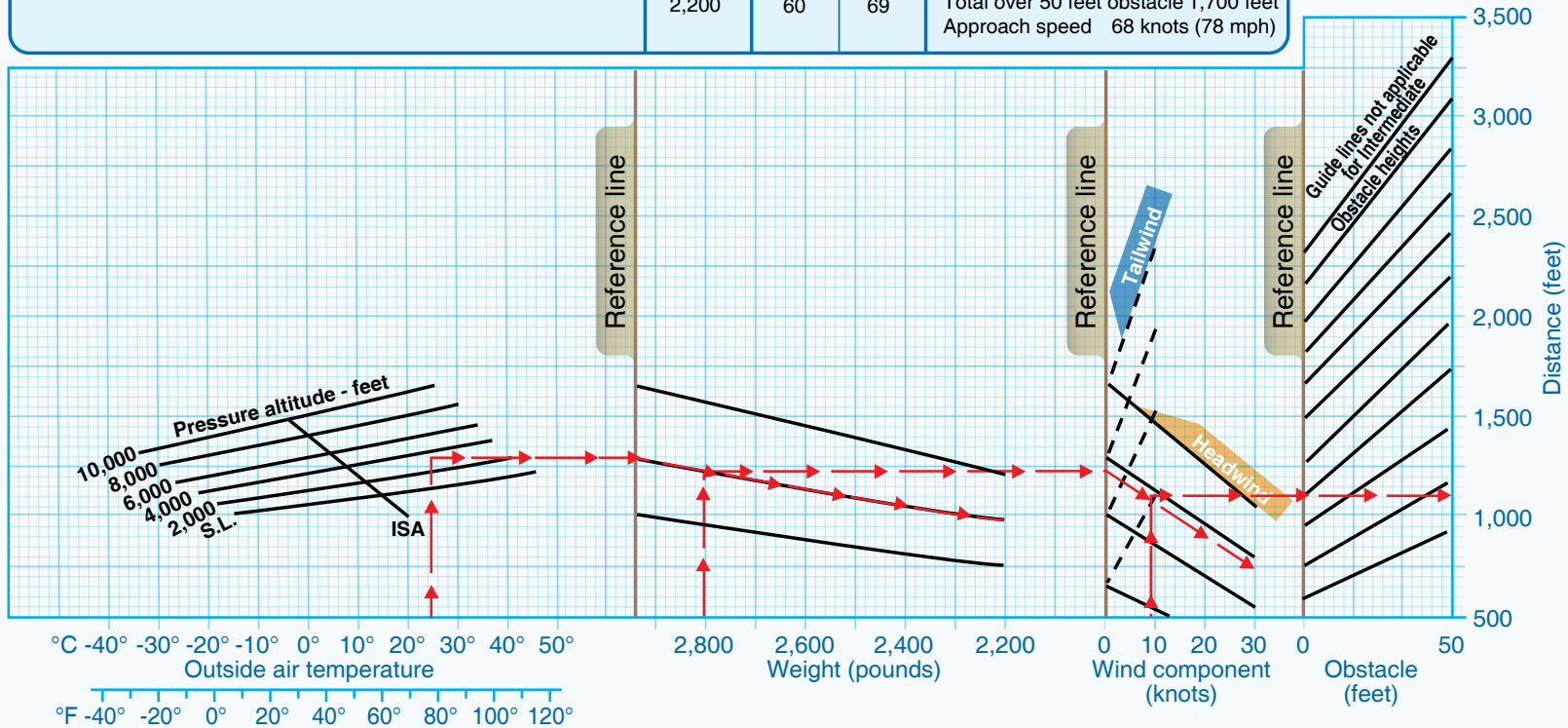


Figure 37. Airplane Landing Distance Graph.

Figure 38. Airplane Landing Distance Table.

Landing distance

Flaps lowered to 40° – Power off
Hard surface runway – Zero wind

Gross weight lb	Approach speed, IAS, MPH	At sea level & 59 °F		At 2,500 feet & 50 °F		At 5,000 feet & 41 °F		At 7,500 feet & 32 °F	
		Ground roll	Total to clear 50 feet OBS	Ground roll	Total to clear 50 feet OBS	Ground roll	Total to clear 50 feet OBS	Ground roll	Total to clear 50 feet OBS
1,600	60	445	1,075	470	1,135	495	1,195	520	1,255

NOTE:

1. Decrease the distances shown by 10% for each 4 knots of headwind.
2. Increase the distance by 10% for each 60 °F temperature increase above standard.
3. For operation on a dry, grass runway, increase distance (both “ground roll” and “total to clear 50 feet obstacle”) by 20% of the “total to clear 50 feet obstacle” figure.

Total landing distance to clear a 50 feet obstacle

Total takeoff distance to clear a 50 feet obstacle

Weight 1,500 lb – Zero wind – Rotor pre-rotated to 450 rpm – Smooth hard surface runway

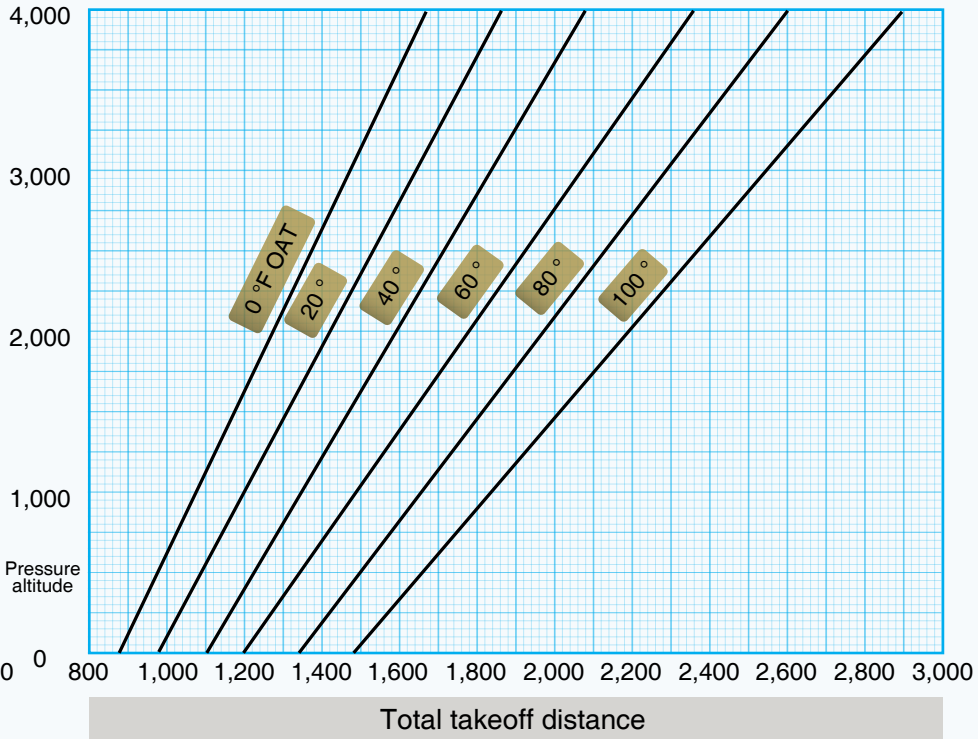
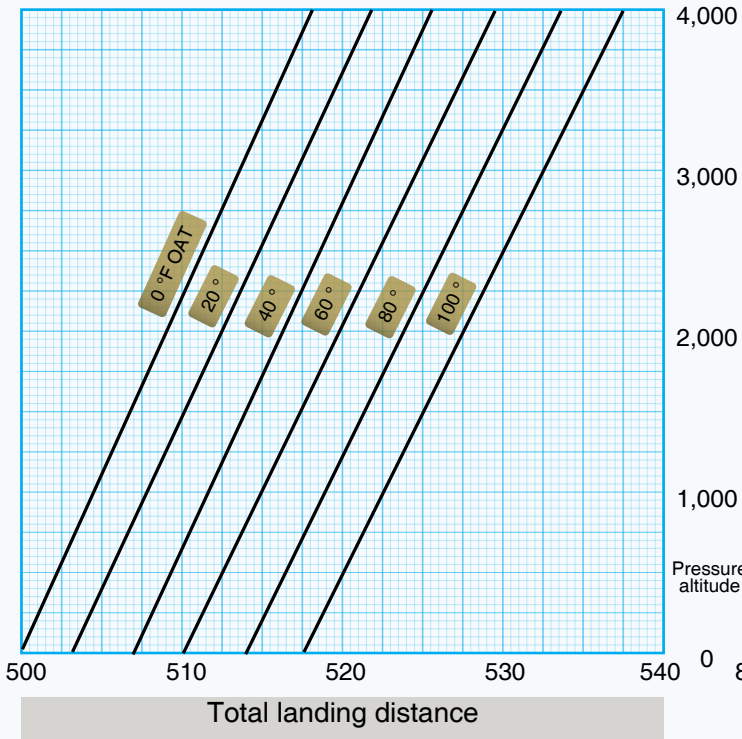


Figure 39. Gyroplane Takeoff and Landing Graphs.

Example:

OAT 15 °C (59 °F)
 Pressure altitude 5,650 feet
 Takeoff weight 2,950 lb
 Headwind comp. 9.0 knots

Ground roll 1,375 feet
 Total distance over a 50 feet obstacle 2,300 feet
 Takeoff speed at Lift-off 66 knots (76 mph)
 50 feet 72 knots (83 mph)

Associated conditions

Power	Full throttle 2,600 rpm
Mixture	Lean to appropriate fuel pressure
Flaps	Up
Landing gear	Retract after positive climb established
Cowl flaps	Open

Weight pounds**Takeoff speed**

Weight pounds	Lift-off		50 ft	
	kts	MPH	kts	MPH
2,950	66	76	72	83
2,800	64	74	70	81
2,600	63	72	68	78
2,400	61	70	66	76
2,200	58	67	63	73

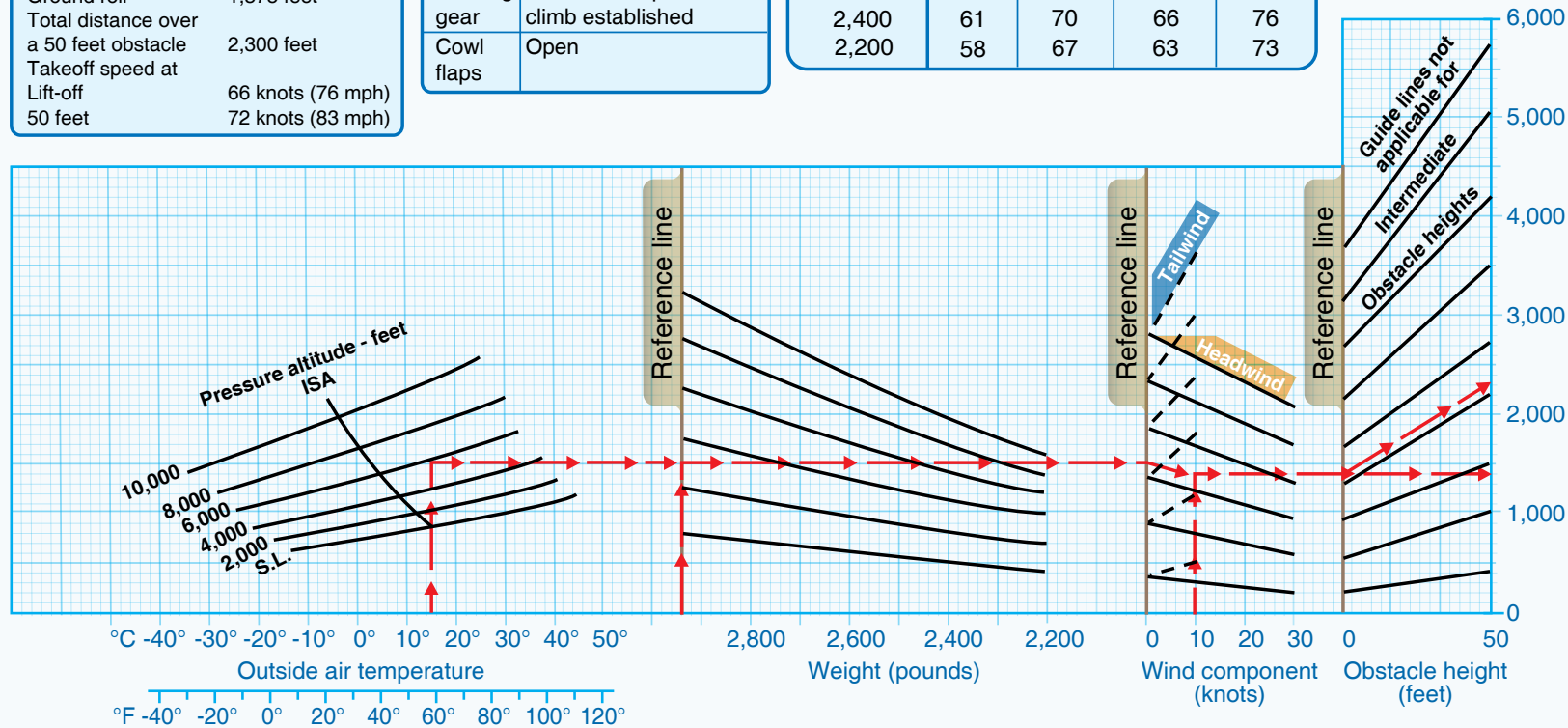


Figure 40. Airplane Takeoff Distance Graph.

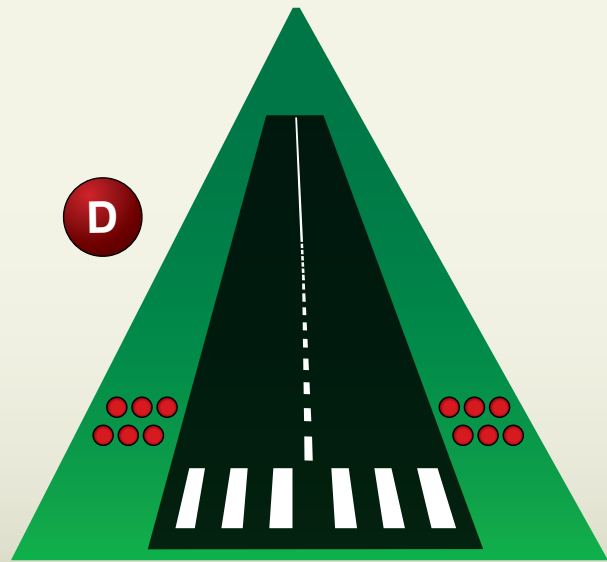
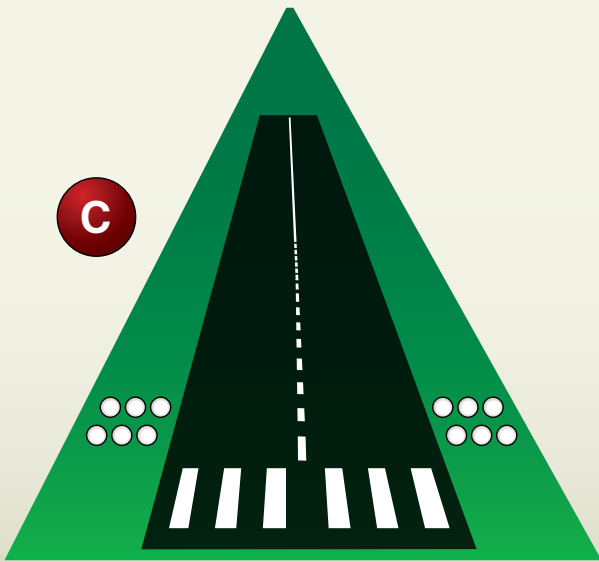
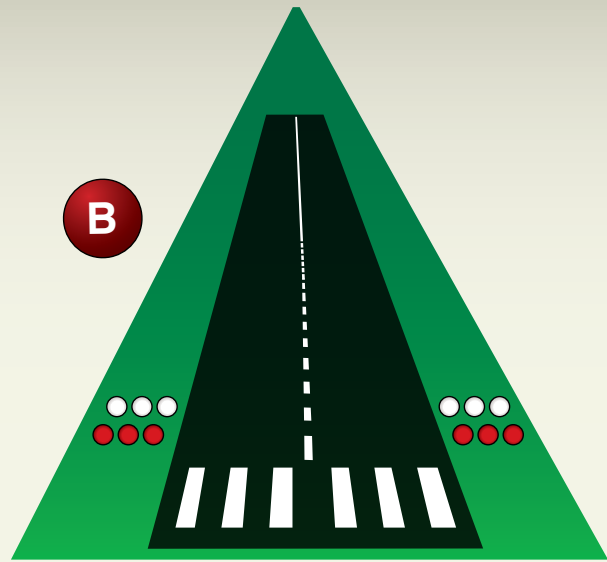
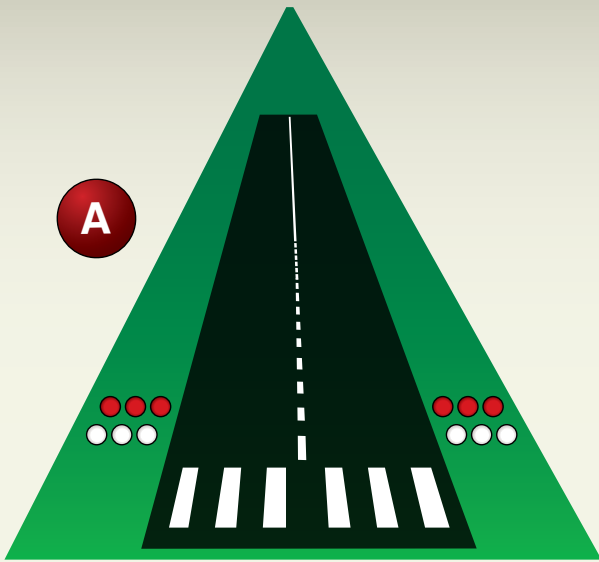


Figure 47. VASI Illustrations.

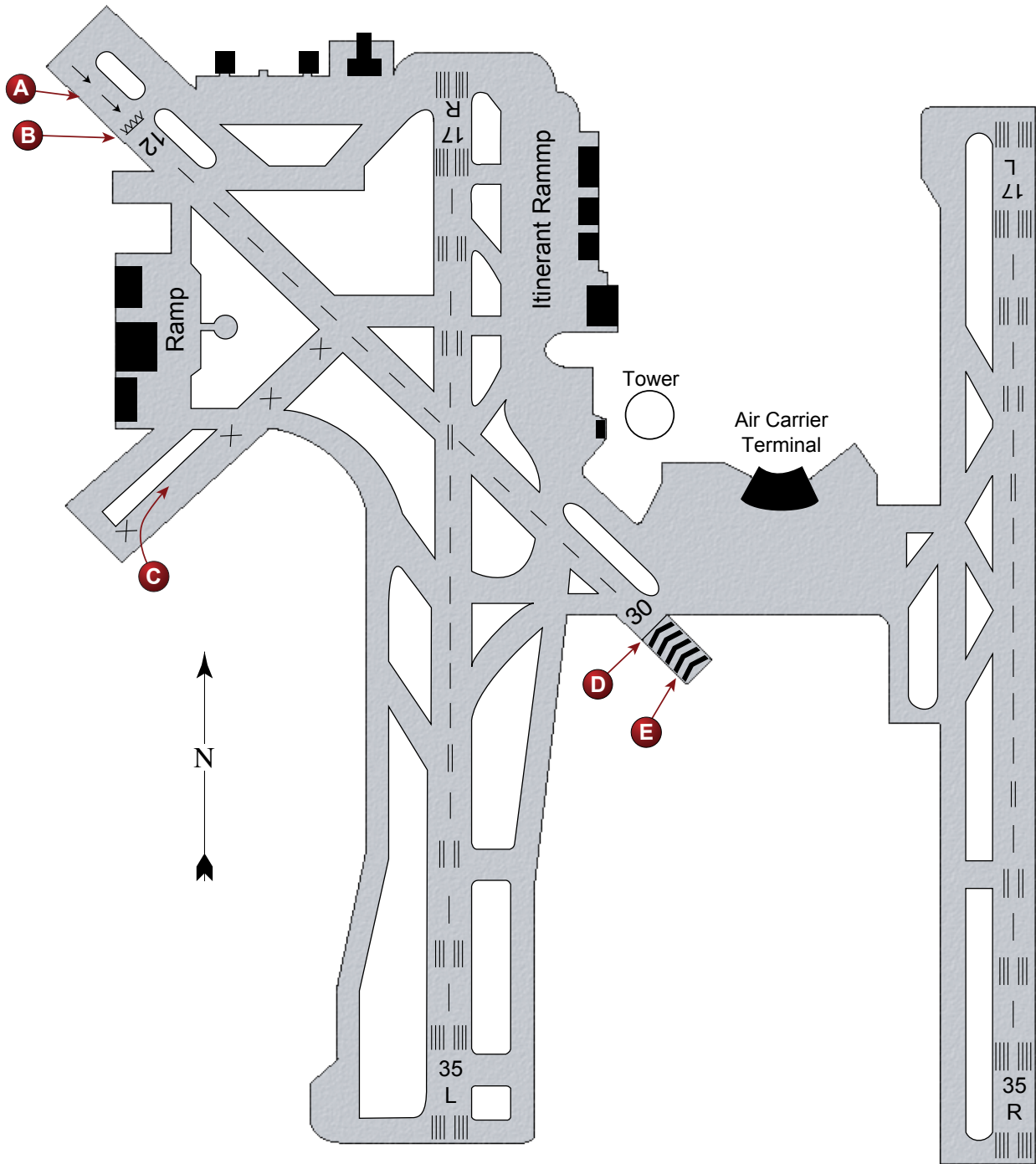


Figure 48. Airport Diagram.

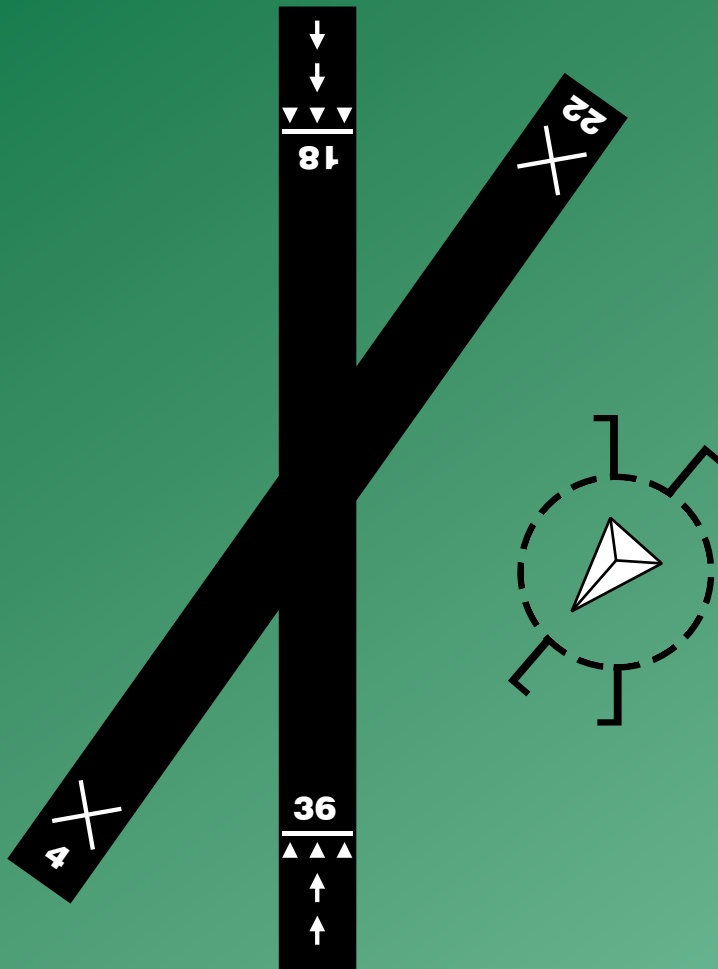


Figure 49. Airport Diagram.

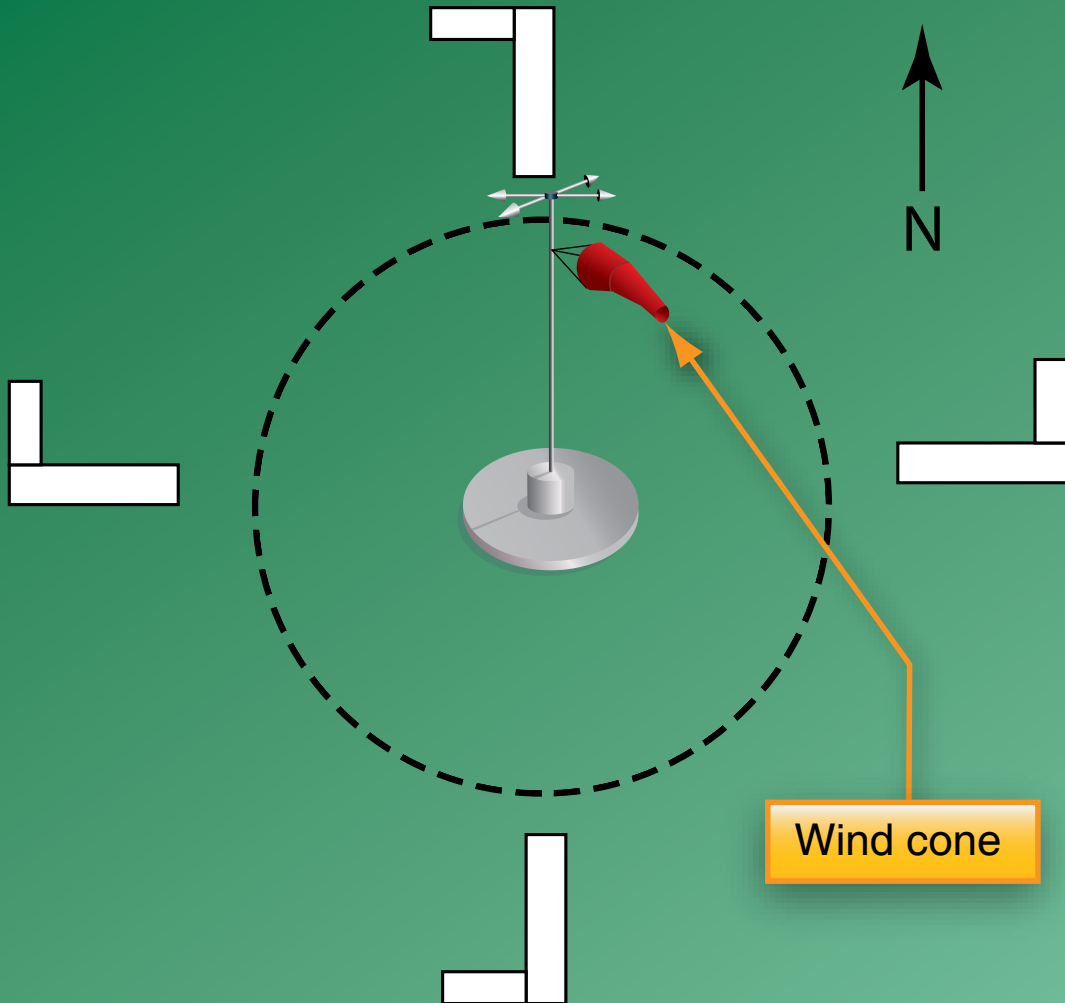


Figure 50. Wind Sock Airport Landing Indicator.

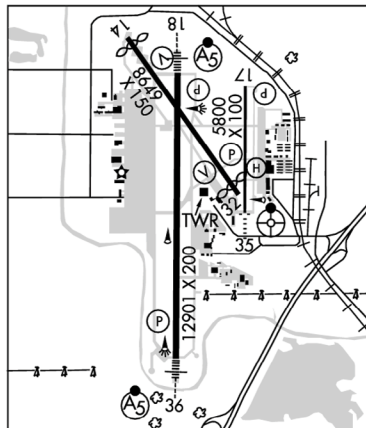
LINCOLN (LNK) 4 NW UTC-6(-5DT) N40°51.05' W96°45.55'

1219 B S4 FUEL 100LL, JET A TPA—See Remarks ARFF Index—See Remarks

NOTAM FILE LNK

RWY 18-36: H12901X200 (ASPH-CONC-GRVD) S-100, D-200, 2S-175, 2D-400 HIRL**RWY 18:** MALSR. PAPI(P4L)—GA 3.0° TCH 55'. Rgt tfc. 0.4% down.**RWY 36:** MALSR. PAPI(P4L)—GA 3.0° TCH 57'.**RWY 14-32:** H8649X150 (ASPH-CONC-GRVD) S-80, D-170, 2S-175, 2D-280 MIRL**RWY 14:** REIL. VASI(V4L)—GA 3.0° TCH 48'. Thld dsplcd 363'.**RWY 32:** VASI(V4L)—GA 3.0° TCH 50'. Thld dsplcd 470'.

Pole. 0.3% up.

RWY 17-35: H5800X100 (ASPH-CONC-AFSC) S-49, D-60 HIRL 0.8% up S**RWY 17:** REIL. PAPI(P4L)—GA 3.0° TCH 44'.**RWY 35:** ODALS. PAPI(P4L)—GA 3.0° TCH 30'. Rgt tfc.**RUNWAY DECLARED DISTANCE INFORMATION****RWY 14:** TORA-8649 TODA-8649 ASDA-8649 LDA-8286**RWY 17:** TORA-5800 TODA-5800 ASDA-5400 LDA-5400**RWY 18:** TORA-12901 TODA-12901 ASDA-12901 LDA-12901**RWY 32:** TORA-8649 TODA-8649 ASDA-8286 LDA-7816**RWY 35:** TORA-5800 TODA-5800 ASDA-5800 LDA-5800**RWY 36:** TORA-12901 TODA-12901 ASDA-12901 LDA-12901

AIRPORT REMARKS: Attended continuously. Birds invof arpt. Rwy 18 designated calm wind rwy. Rwy 32 apch holdline on South A twy. TPA-2219 (1000), heavy military jet 3000 (1781). Class I, ARFF Index B. ARFF Index C level equipment provided. Rwy 18-36 touchdown and rollout rwy visual range avbl. When twr clsd MIRL Rwy 14-32 preset on low ints, HIRL Rwy 18-36 and Rwy 17-35 preset on med ints. ODALS Rwy 35 operate continuously on med ints, MALSR Rwy 18 and Rwy 36 operate continuously and REIL Rwy 14 and Rwy 17 operate continuously on low ints. VASI Rwy 14 and Rwy 32, PAPI Rwy 17, Rwy 35, Rwy 18 and Rwy 36 on continuously.

WEATHER DATA SOURCES: ASOS (402) 474-9214. LLWAS**COMMUNICATIONS:** CTAF 118.5 ATIS 118.05 UNICOM 122.95

RCO 122.65 (COLUMBUS RADIO)

(R) APP/DEP CON 124.0 (180°-359°) 124.8 (360°-179°)**TOWER** 118.5 125.7 (1130-0600Z±) **GND CON** 121.9 **CLNC DEL** 120.7**AIRSPACE:** CLASS C svc 1130-0600Z± ctt **APP CON** other times CLASS E.**RADIO AIDS TO NAVIGATION:** NOTAM FILE LNK.**(H) VORTACW** 116.1 LNK Chan 108 N40°55.43' W96°44.52' 181° 4.4 NM to fld. 1370/9E**POTTS NDB (MHW/LOM)** 385 LN N40°44.83' W96°45.75' 355° 6.2 NM to fld. Unmonitored when twr clsd.**ILS** 111.1 I-OCZ Rwy 18. Class IB OM unmonitored.**ILS** 109.9 I-LNK Rwy 36 Class IA LOM POTTS NDB. MM unmonitored. LOM unmonitored when twr clsd.**COMM/NAV/WEATHER REMARKS:** Emerg frequency 121.5 not available at twr.**LOUP CITY MUNI** (ØF4) 1 NW UTC-6(-5DT) N41°17.20' W98°59.41'

2071 B FUEL 100LL NOTAM FILE OLU

RWY 16-34: H3200X60 (CONC) S-12.5 MIRL**RWY 34:** Trees.**RWY 04-22:** 2040X100 (TURF)**RWY 04:** Tree. **RWY 22:** Road.**AIRPORT REMARKS:** Unattended. For svc call 308-745-1344/1244/0664.**COMMUNICATIONS:** CTAF 122.9**RADIO AIDS TO NAVIGATION:** NOTAM FILE OLU.**WOLBACH (H) VORTAC** 114.8 OBH Chan 95 N41°22.54' W98°21.22' 253° 29.3 NM to fld. 2010/7E.**MARTIN FLD** (See SO SIOUX CITY)**OMAHA**

L-10H, 12H

For	N	30	60	E	120	150
Steer	0	27	56	85	116	148
For	S	210	240	W	300	330
Steer	181	214	244	274	303	332

Figure 58. Compass Card.

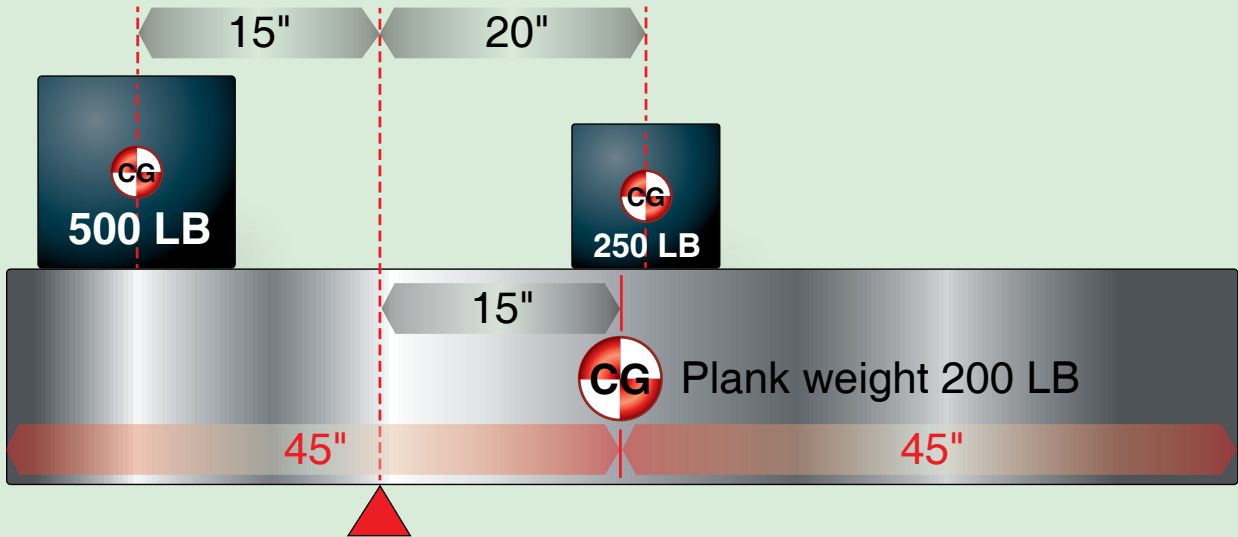


Figure 60. Weight and Balance Diagram.

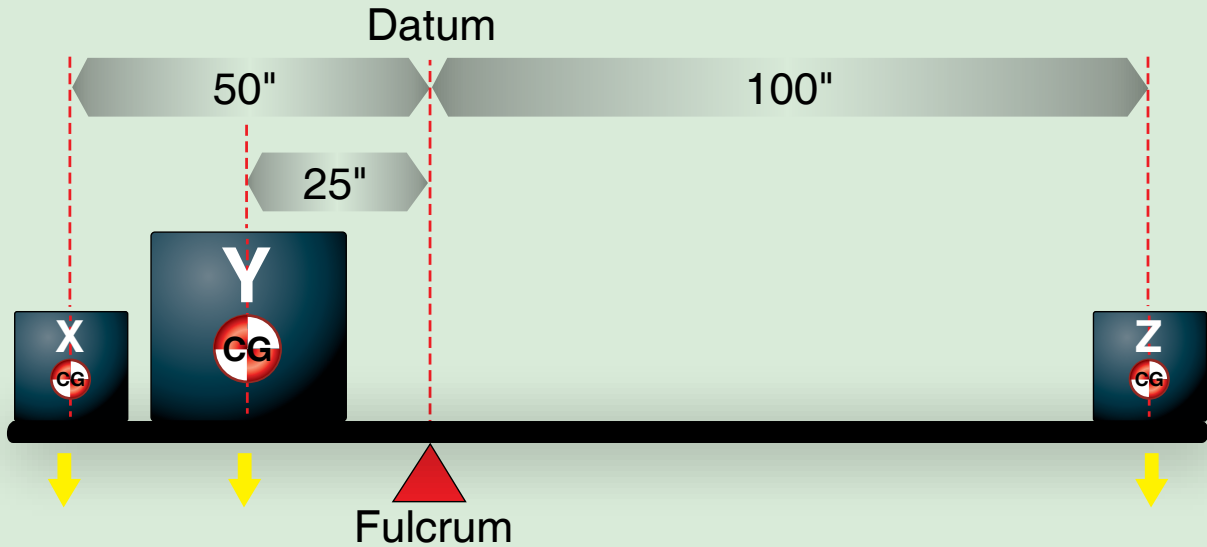


Figure 61. Weight and Balance Diagram.

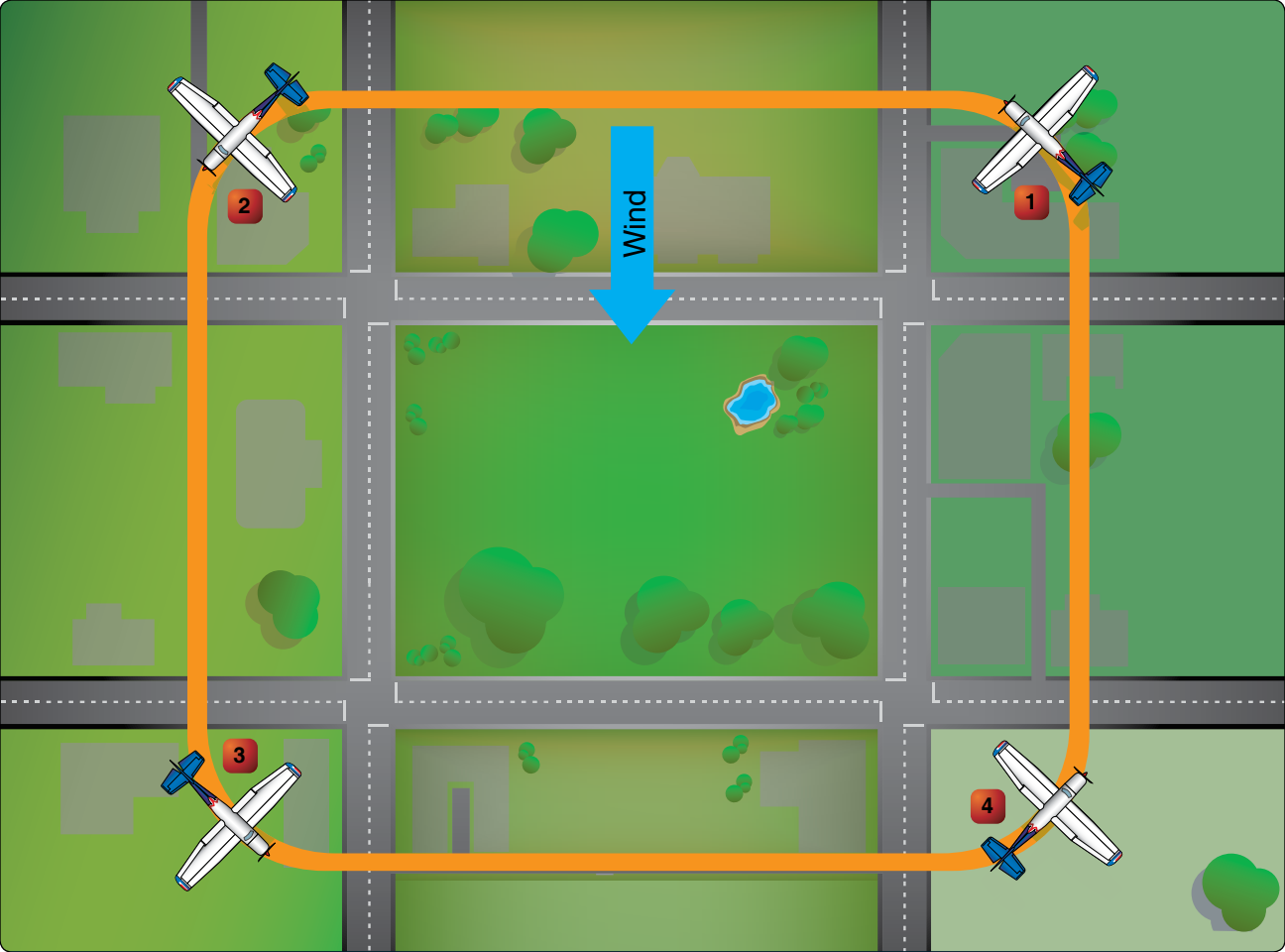


Figure 62. Rectangular Course.

TOLEDO

TOLEDO EXECUTIVE (TDZ) 6 SE UTC-5(-4DT) N41°33.90' W83°28.93'

623 B S4 FUEL 100LL, JET A OX 1, 3 NOTAM FILE TDZ
RWY 14-32: H5829X100 (ASPH-GRVD) S-63, D-85, 2S-107 MIRL

RWY 14: REIL. PAPI(P4L)—GA 3.0° TCH 34'. Thld dsplcd 225'.

Tower.

RWY 32: VASI(V4L)—GA 3.0° TCH 43'. Thld dsplcd 351'. Road.

RWY 04-22: H3799X75 (ASPH) S-63, D-85, 2S-107 MIRL

RWY 04: REIL. PAPI(P4L)—GA 3.5° TCH 35'. Thld dsplcd 100'.

Road.

RWY 22: REIL. PAPI(P4L)—GA 3.0° TCH 25'. Thld dsplcd 380'.

Railroad.

AIRPORT REMARKS: Attended Mon-Fri continuously, Sat-Sun
1300-0100Z†. Parallel twy Rwy 04-22 and Rwy 14-32 35' wide.
Seagulls on and invof arpt. Ldg fee. ACTIVATE MIRL Rwy 04-22
and Rwy 14-32, REIL and PAPI Rwy 04, Rwy 22, Rwy 14 and VASI
Rwy 32—CTAF.

WEATHER DATA SOURCES: ASOS 121.575 (419) 838-5034.

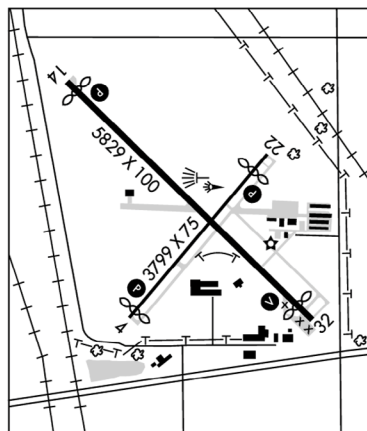
COMMUNICATIONS: CTAF/UNICOM 123.05

Ⓡ APP/DEP CON 126.1 CLNC DEL 125.6

RADIO AIDS TO NAVIGATION: NOTAM FILE CLE.

WATERVILLE (L) VOR/DME 113.1 VVW Chan 78 N41°27.09'

W83°38.32' 048° 9.8 NM to fld. 664/2W.



DETROIT
H-106, L-28J
IAP

TOLEDO EXPRESS (TOL) 10 W UTC-5(-4DT) N41°35.21' W83°48.47'

683 B S4 FUEL 100LL, JET A OX 3 LRA Class I, ARFF Index B NOTAM FILE TOL

RWY 07-25: H10599X150 (ASPH-GRVD) S-100, D-174, 2S-175, 2D-300, 2D/2D2-550

HIRL CL

RWY 07: ALSF2. TDZL. Trees.

RWY 25: MALSR. VASI(V4L)—GA 3.0° TCH 51'. Trees. 0.3% up.

RWY 16-34: H5599X150 (ASPH-GRVD) S-100, D-174, 2S-175,

2D-300 MIRL

RWY 16: REIL. PAPI(P4L)—GA 3.0° TCH 48'. Trees.

RWY 34: REIL.

RUNWAY DECLARED DISTANCE INFORMATION

RWY 07: TORA 10599 TODA 10599 ASDA 10599 LDA 10599

RWY 16: TORA 5599 TODA 5599 ASDA 5599 LDA 5599

RWY 25: TORA 10599 TODA 10599 ASDA 10599 LDA 10599

RWY 34: TORA 5599 TODA 5599 ASDA 5599 LDA 5599

ARRESTING GEAR/SYSTEM

RWY 07 ←BAK-12 BAK-12 →RWY 25

AIRPORT REMARKS: Attended continuously. Fuel and svc avbl
1300-0500Z†. Birds on and invof arpt. Twy A west of Rwy 16 and
the ramp between Twy B9 and B13 not visible from twr. Twy D
intersection of Twy D1, heavy acft use minimal power to reduce
foreign object damage on Air National Guard ramp. Customs:
Sat-Sun req must be made prior to 2200Z† on Fri, phone 419-259-6424.

WEATHER DATA SOURCES: ASOS (419) 865-8351.

COMMUNICATIONS: ATIS 118.75 UNICOM 122.95

Ⓡ APP/DEP CON 126.1 (360°-179°) 134.35 (180°-359°) 123.975

TOWER 118.1 GND CON 121.9 CLNC DEL 121.75

AIRSPACE: CLASS C svc continuous etc APP CON

RADIO AIDS TO NAVIGATION: NOTAM FILE CLE.

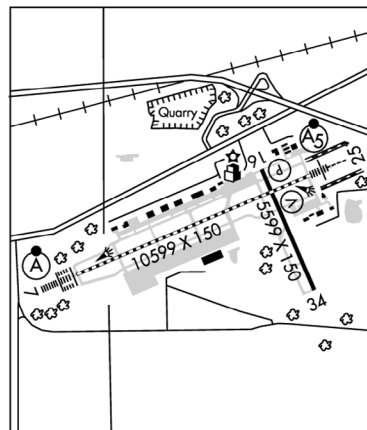
WATERVILLE (L) VOR/DME 113.1 VVW Chan 78 N41°27.09' W83°38.32' 319° 11.1 NM to fld. 664/2W.

TOPHR NDB (LOM) 219 TO N41°33.21' W83°55.27' 074° 5.5 NM to fld. Unmonitored. NOTAM FILE TOL.

ILS 109.7. I-TOL Rwy 07. Class IE. LOM TOPHR NDB.

ILS 108.7 I-BQE Rwy 25. Class IA. LOC unusable 0.4 NM inbound. ILS unmonitored when twr clsd.

ASR



DETROIT
H-106, L-28J
IAP, AD

SEAGATE HELISTOP (6T2) 00 N UTC-5(-4DT) N41°39.25' W83°31.88'

650 NOTAM FILE CLE

HELIPAD H1: H50X50 (CONC)

HELIPORT REMARKS: Unattended. ACTIVATE orange perimeter lgts—CTAF. Helipad H1 NSTD 1-box (2 VASIS). Helipad
H1 not marked with "H." Helipad H1 perimeter lgts.

COMMUNICATIONS: CTAF/UNICOM 123.05

DETROIT

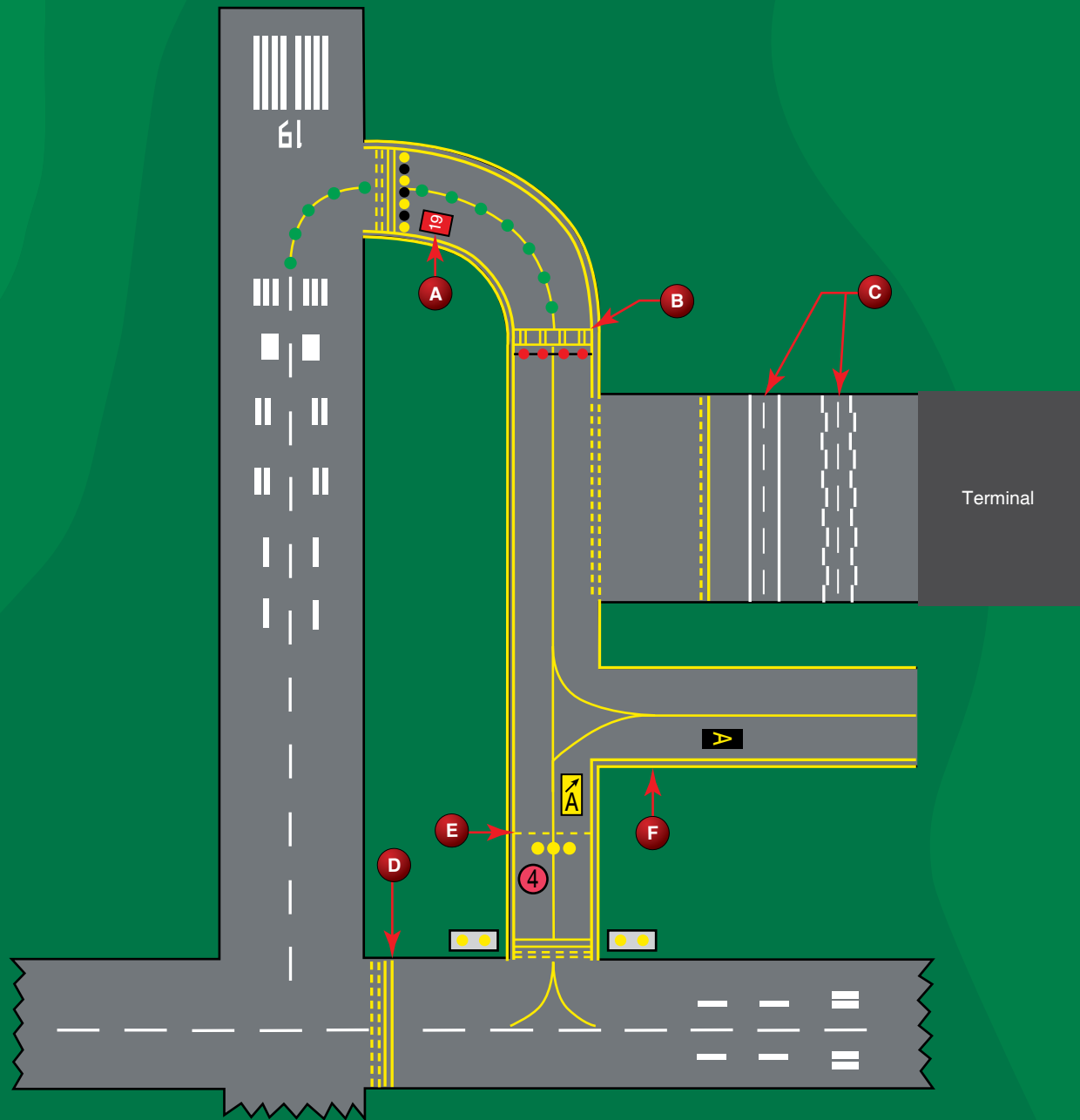
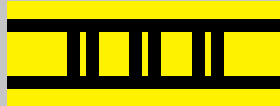


Figure 64. Airport Markings.

A

4-22



H

B

4-APCH

TERM →

I

C

ILS

22 →

J

D



B →

K

E

B

4

L

F

22

HS-1

M

G



N

Figure 65. U.S. Airport Signs.

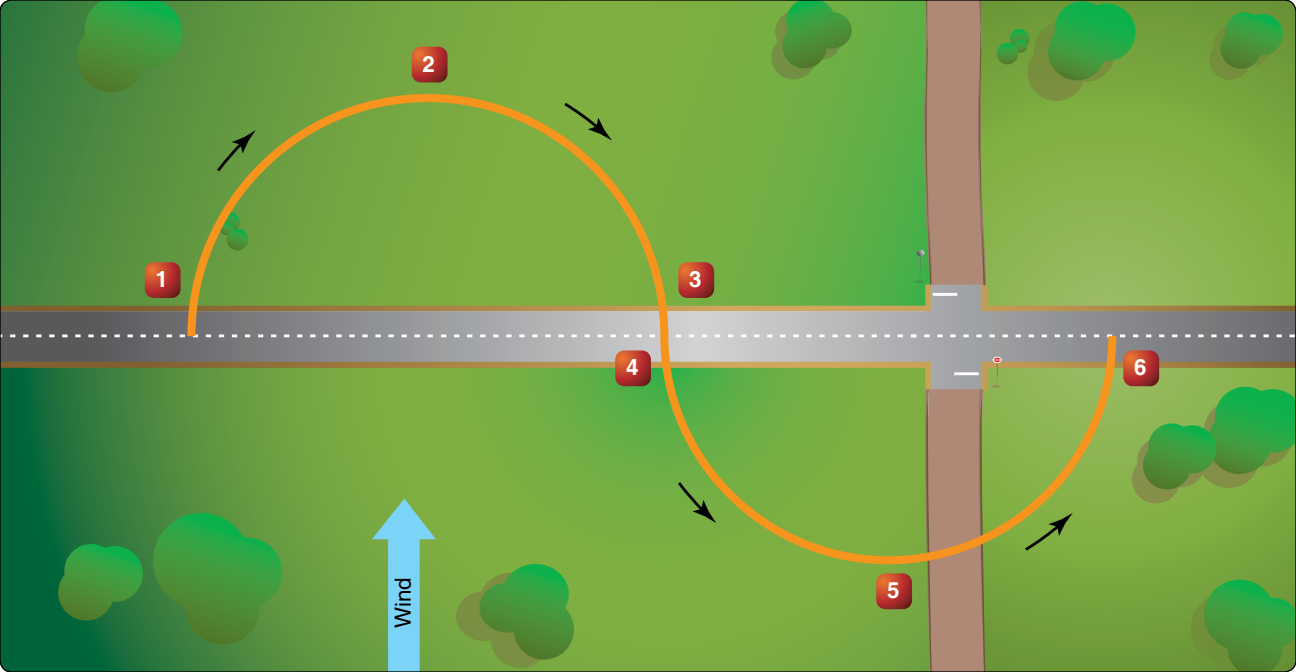


Figure 66. S-Turn Diagram.

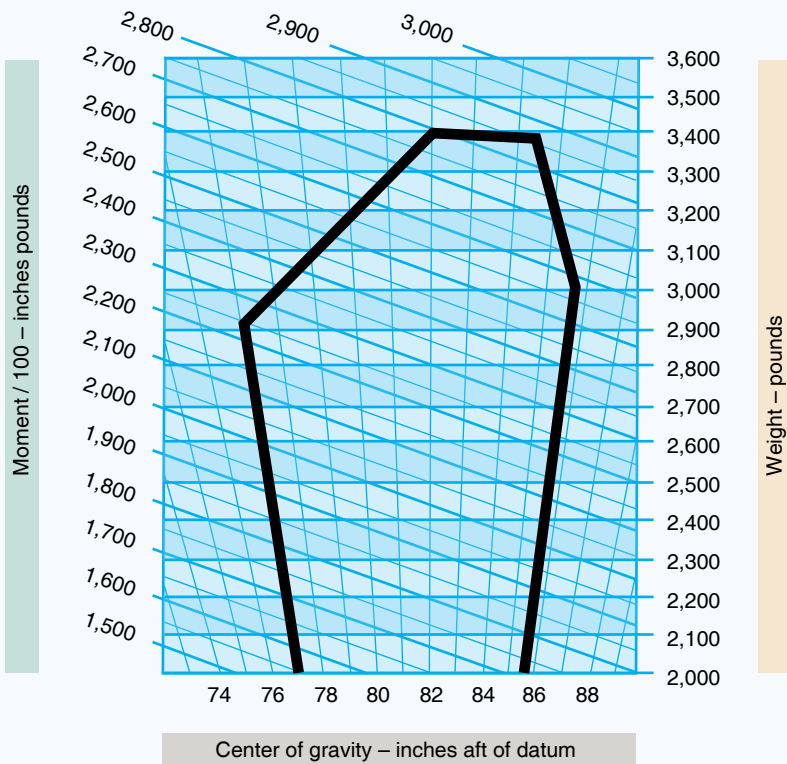
Empty Weight Data		
*Oil is included in empty weight	Empty Weight (pounds)	Empty Weight Moment (/100)
	Certificated Weight	2,110

Fuel					
ARM 75 inches					
Gallons	Weight (pounds)	Moment (in-lb)	Gallons	Weight (pounds)	Moment (in-lb)
5	30	23	45	270	203
10	60	45	49	294	221
15	90	68	55	330	248
20	120	90	60	360	270
25	150	113	65	390	293
30	180	135	70	420	315
35	210	158	75	450	338
40	240	180	80	480	360

Occupants				
Front seats		Rear seats		
ARM 85 inches		Weight (pounds)	Fwd Position ARM 111 inches	Alt Position ARM 136 inches
Weight (pounds)	Moment (in-lb)		Moment (in-lb)	Moment (in-lb)
120	102	120	133	163
130	111	130	144	177
140	119	140	155	190
150	128	150	167	204
160	136	160	178	218
170	145	170	189	231
180	153	180	200	245
190	162	190	211	258
200	170	200	222	273

Baggage	
ARM 150	
Weight (pounds)	Moment (in-lb)
10	15
20	30
30	45
40	60
50	75
60	90
70	105
80	120
90	135
100	150
110	165
120	180
130	195
140	210
150	225
160	240
170	255
180	270
190	285
200	300
210	315
220	330
230	345
240	360
250	375
260	390
270	405

Gross Weight Moment Limits



NOTE: All moments are equal to

$$\frac{\text{weight} \times \text{arm}}{100}$$

Figure 67. Weight and Balance Chart.

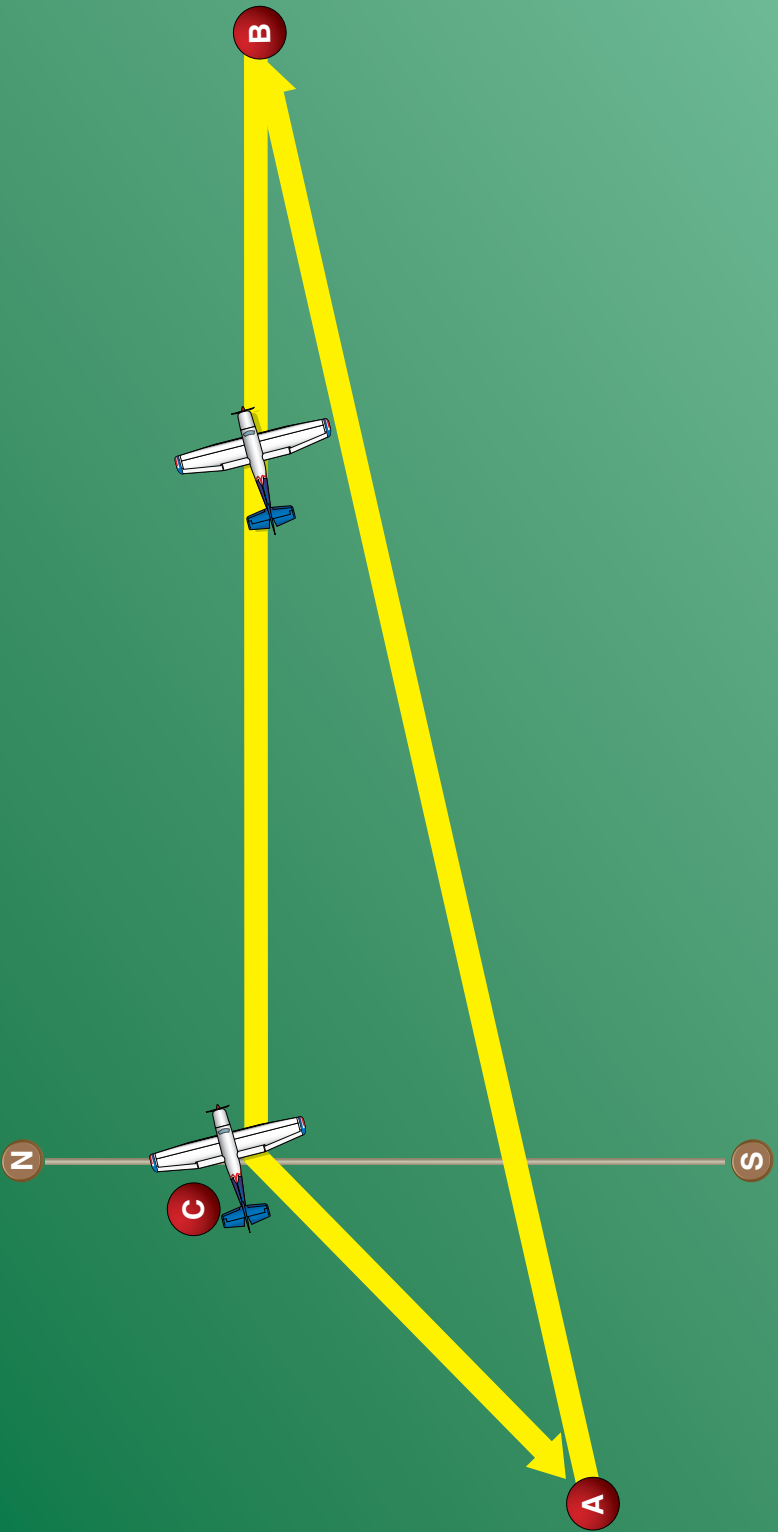
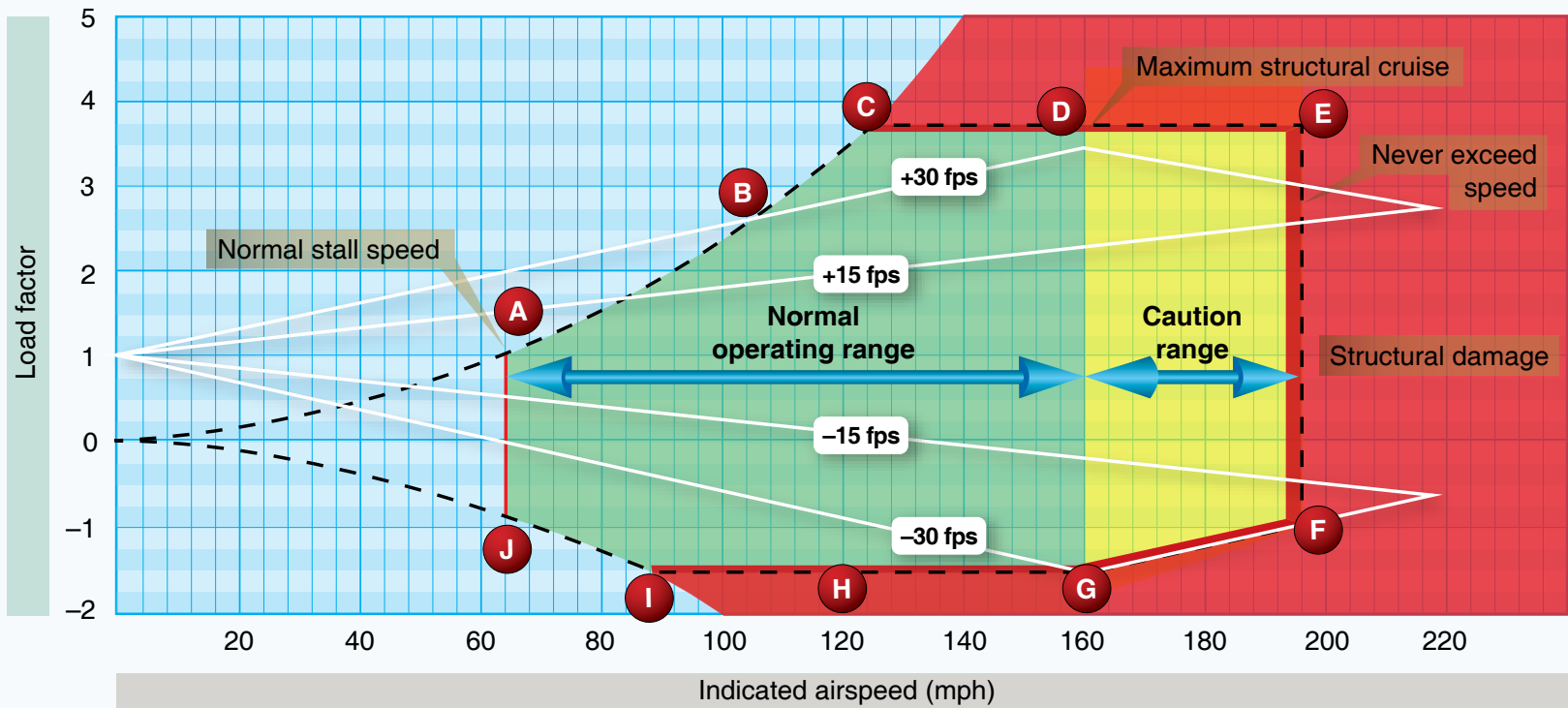


Figure 68. Wind Triangle.

Figure 72. Velocity vs. G-Loads.



PIERRE RGNL (PIR) 3 E UTC -6(-5DT) N44°22.96' W100°17.16'

OMAHA

1744 B S4 FUEL 100LL, JET A OX 1, 2, 3, 4 Class I, ARFF Index A NOTAM FILE PIR

H-21, L-12H

RWY 13-31: H6900X100 (ASPH-GRVD) S-91, D-108, 2S-137, 2D-168 HIRL

IAP

RWY 13: REIL. PAPI(P4L)-GA 3.0 ° TCH 52'.

RWY 31: MALSR. PAPI(P4L)-GA 3.0 ° TCH 52'.

RWY 07-25: H6881X150 (ASPH-GRVD) S-91, D-114, 2S-145, 2D-180 HIRL 0.6% up W

RWY 07: REIL. PAPI(P4L)-GA 3.0 ° TCH 47'. Tank.

RWY 25: REIL. PAPI(P4L)-GA 3.0 ° TCH 54'.

RUNWAY DECLARED DISTANCE INFORMATION

RWY 07: TORA-6881 TODA-6881 ASDA-6830 LDA-6830

RWY 13: TORA-6900 TODA-6900 ASDA-6900 LDA-6900

RWY 25: TORA-6881 TODA-6881 ASDA-6881 LDA-6881

RWY 31: TORA-6900 TODA-6900 ASDA-6900 LDA-6900

AIRPORT REMARKS: Attended Mon-Fri 1100-0600Z†, Sat-Sun

1100-0400Z†. For attendant other times call

605-224-9000/8621. Arpt conditions unmonitored during

0530-1000Z†. Numerous non-radio acft operating in area. Birds

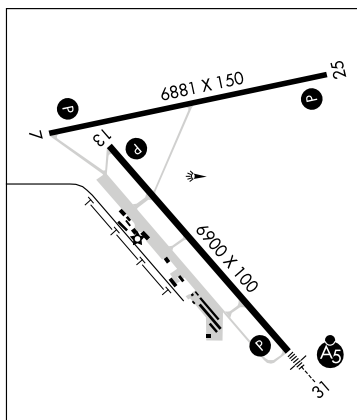
on and in/ov arpt and within a 25 NM radius. No line of sight between rwy ends of Rwy 07-25. ARFF provided for part 121 air carrier ops only. 48 hr PPR for unscheduled acft ops involving acft designed for 31 or more passenger seats call 605-773-7447 or 605-773-7405. Taxiway C is 50' wide and restricted to acft 75,000 pounds or less. ACTIVATE HIRL Rwy 13-31 and Rwy 07-25, MALSR Rwy 31, REIL Rwy 07, Rwy 13 and Rwy 25, PAPI Rwy 07, Rwy 25, Rwy 13 and Rwy 31-CTAF 122.7. NOTE: See Special Notices Section-

Aerobatic Practice Areas.

WEATHER DATA SOURCES: ASOS 119.025 (605) 224-6087. HIWAS 112.5 PIR.**COMMUNICATIONS:** CTAF 122.7 UNICOM 122.95

RCO 122.2 (HURON RADIO)

(R) MINNEAPOLIS CENTER APP/DEP CON 125.1
RADIO AIDS TO NAVIGATION: NOTAM FILE PIR.
 (L) VORTACW 112.5 PIR Chan 72 N44°23.67' W100°09.77' 251° 5.3 NM to fld. 1789/11E. HIWAS.
 ILS/DME 111.9 I-PIR Chan 56 Rwy 31. Class IA ILS GS unusable for coupled apch blo 2,255'. GS unusable blo 2135'.

**PINE RIDGE** (IEN) 2 E UTC -7(-6DT) N43°01.35' W102°30.66'

CHEYENNE

3333 B NOTAM FILE IEN

H-5B, L-12G

RWY 12-30: H5000X60 (ASPH) S-12 MIRL 0.7% up SE

IAP

RWY 12: P-line.

RWY 30: PAPI(P2L)-GA 3.0 ° TCH 26'. Fence.

RWY 06-24: H3003X50 (ASPH) S-12 0.7% up NE

RWY 24: Fence.

AIRPORT REMARKS: Unattended. Rwy 06-24 CLOSED indef. MIRL Rwy

12-30 and PAPI Rwy 30 opr dusk-0530Z†, after 0530Z†

ACTIVATE-CTAF.

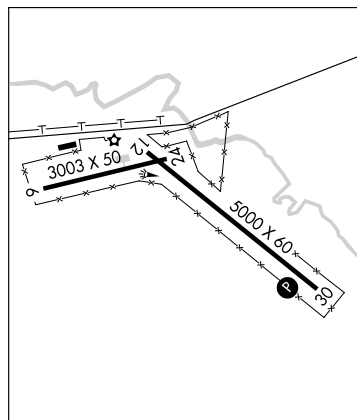
WEATHER DATA SOURCES: ASOS 126.775 (605) 867-1584.**COMMUNICATIONS:** CTAF 122.9

DENVER CENTER APP/DEP CON 127.95

RADIO AIDS TO NAVIGATION: NOTAM FILE RAP.

RAPID CITY (H) VORTAC 112.3 RAP Chan 70 N43°58.56'

W103°00.74' 146° 61.3 NM to fld. 3160/13E.



SIoux CITY N42°20.67' W96°19.42' NOTAM FILE SUX OMAHA
 (L) VORTAC 116.5 SUX Chan 112 313 ° 4.4 NM to Sioux Gateway/Col Bud Day Fld. 1087/9E. HIWAS. L-121
 VOR unusable:
 280°-292° byd 25 NM 306°-350° byd 20 NM blo 3,000'
 293°-305° byd 20 NM blo 4,500' 350°-280° byd 30 NM blo 3,000'
 293°-305° byd 35 NM
 RCO 122.45 122.1R 116.5T (FORT DODGE RADIO)

SIoux CITY

SIoux GATEWAY/COL BUD DAY FLD (SUX) 6 S UTC -6(-5DT) N42°24.16' W96°23.06' OMAHA
 1098 B S4 FUEL 100LL, 115, JET A OX 1, 2, 3, 4 Class I, ARFF Index—See Remarks H-5C, L-121
 NOTAM FILE SUX IAP, AD

RWY 13-31: H9002X150 (CONC-GRVD) S-100, D-120, 2S-152,
 2D-220 HIRL

RWY 13: MALS. VASI(V4L)—GA 3.0 ° TCH 49'. Tree.

RWY 31: MALS. VASI(V4L)—GA 3.0 ° TCH 50'.

RWY 17-35: H6600X150 (ASPH-PFC) S-65, D-80, 2S-102,
 2D-130 MIRL

RWY 17: REIL. VASI(V4R)—GA 3.0 ° TCH 50'. Trees.

RWY 35: PAPI(P4L)—GA 3.0 ° TCH 54'. Pole.

LAND AND HOLD SHORT OPERATIONS

LANDING	HOLD SHORT POINT	DIST AVBL
RWY 13	17-35	5400
RWY 17	13-31	5650

ARRESTING GEAR/SYSTEM

RWY 13 ←BAK-14 BAK-12B(B) (1392')
 BAK-14 BAK-12B(B) (1492') →RWY 31

AIRPORT REMARKS: Attended continuously. PAEW 0330-1200Z ‡ during inclement weather Nov-Apr. AER 31-BAK-12/14 located (1492') from thld. Airfield surface conditions not monitored by arpt management between 0600-1000Z ‡ daily. Rwy 13-BAK-12/14 located (1392') from thld. All A-gear avbl only during ANG flying ops. Twr has limited visibility southeast of ramp near ARFF bldg and northeast of Rwy 31 touchdown zone. Rwy 31 is calm wind rwy. Class I, ARFF Index B. ARFF Index E fire fighting equipment avbl on request. Twy F unlit, retro-reflective markers in place. Portions of Twy A SE of Twy B not visible by twr and is designated a non-movement area. Rwy 13-31 touchdown and rollout rwy visual range avbl. When twr clsd, ACTIVATE HIRL Rwy 13-31; MIRL Rwy 17-35; MALS Rwy 13; MALS Rwy 31; and REIL Rwy 17—CTAF.

WEATHER DATA SOURCES: ASOS (712) 255-6474. HIWAS 116.5 SUX. LAWRs.

COMMUNICATIONS: CTAF 118.7 ATIS 119.45 UNICOM 122.95

SIoux CITY RCO 122.45 122.1R 116.5T (FORT DODGE RADIO)

Ⓡ SIoux CITY APP/DEP CON 124.6 (1200-0330Z ‡)

Ⓡ MINNEAPOLIS CENTER APP/DEP CON 124.1 (0330-1200Z ‡)

SIoux CITY TOWER 118.7 (1200-0330Z ‡) GND CON 121.9

AIRSPACE: CLASS D svc 1200-0330Z ‡ other times CLASS E.

RADIO AIDS TO NAVIGATION: NOTAM FILE SUX.

SIoux CITY (L) VORTAC 116.5 SUX Chan 112 N42°20.67' W96°19.42' 313° 4.4 NM to fld. 1087/9E.
 HIWAS.

NDB (MHW) 233 GAK N42°24.49' W96°23.16' at fld.

SALIX NDB (MHW/LOM) 414 SU N42°19.65' W96°17.43' 311° 6.1 NM to fld. Unmonitored.

TOMMI NDB (MHW/LOM) 305 OI N42°27.61' W96°27.73' 128° 4.9 NM to fld. Unmonitored.

ILS 109.3 I-SUX Rwy 31 Class IT. LOM SALIX NDB. ILS Unmonitored when twr clsd. Glide path unusable coupled approach (CPD) blo 1805'.

ILS 111.3 I-OIQ Rwy 13 LOM TOMMI NDB. Localizer shutdown when twr clsd.

ASR (1200-0330Z ‡)

SNORE N43°13.96' W95°19.66' NOTAM FILE SPW. OMAHA
 NDB (LOM) 394 SP 121° 6.8 NM to Spencer Muni.

SOUTHEAST IOWA RGNL (See BURLINGTON)

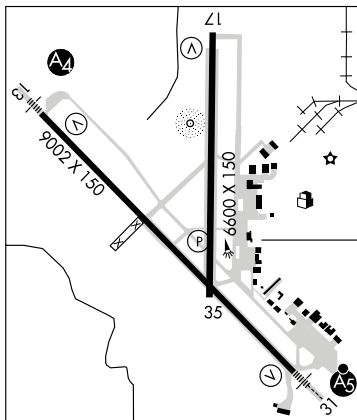


Figure 79. Chart Supplement.

CRAWFORD (99V) 2 W UTC -7(-6DT) N38°42.25' W107°38.62'

DENVER

6470 S2 OX 4 TPA-7470(1000) NOTAM FILE DEN

L-9E

RWY 07-25: H4900X20 (ASPH) LIRL (NSTD)

RWY 07: VASI (NSTD). Trees. **RWY 25:** VASI (NSTD) Tank. Rgt tfc.

RWY E-W: 2500X125 (TURF)

RWY E: Rgt tfc.

RWY W: Trees.

AIRPORT REMARKS: Attended continuously. Rwy 07-25 west 1300' only 25' wide. Heavy glider ops at arpt. Land to the east tkf to the west winds permitting. 100LL fuel avbl for emergency use only. Pedestrians, motor vehicles, deer and wildlife on and invof arpt. Unlimited vehicle use on arpt. Rwy West has +15' building 170' from thld 30' left, +10' road 100' from thld centerline. +45' tree 100' L of Rwy 07 extended centerline 414' from rwy end. -8' to -20' terrain off both sides of first 674' of Rwy 25 end. E-W rwy occasionally has 6 inch diameter irrigation pipes crossing rwy width in various places. Rwy 07 has 20' trees and -10' to 20' terrain 20' right of rwy first 150'. E-W rwy consists of +12 inch alfalfa vegetation during various times of the year. Arpt lgts opr dusk-0800Z±. Rwy 07 1 box VASI left side for local operators only or PPR call 970-921-7700 or 970-921-3018. Rwy 07-25 LIRL on N side from Rwy 25 end W 3800'. Rwy 07 1300' from end E 300'. No thld lgts Rwy 07-25 3800' usable for ngt ops.

COMMUNICATIONS: CTAF/UNICOM 122.8

RADIO AIDS TO NAVIGATION: NOTAM FILE MTJ.

MONTRSE (H) VORW/DME 117.1 MTJ Chan 118 N38°30.39' W107°53.96' 033° 16.9 NM to fld. 5713/12E.

CREEDE

MINERAL CO MEM (C24) 2 E UTC -7(-6DT) N37°49.33' W106°55.79'

DENVER

8680 NOTAM FILE DEN

H-3E, L-9E

RWY 07-25: H6880X60 (ASPH) S-12.5, D-70, 2D-110

RWY 07: Thld dsplcd 188'.

RWY 25: Road.

AIRPORT REMARKS: Unattended. Elk and deer on and invof arpt. Glider and hang glider activity on and in vicinity of arpt. Mountains in all directions. Departure to NE avoid over flight of trailers and resident homes, climb to 200' above ground level on centerline extended prior to turn. Acft stay to right of valley on apch and/or departure route. 2' cable fence around apron.

COMMUNICATIONS: CTAF 122.9

RADIO AIDS TO NAVIGATION: NOTAM FILE DEN.

BLUE MESA (H) VORW/DME 114.9 HBU Chan 96 N38°27.13' W107°02.39' 158° 38.1 NM to fld. 8730/14E.

CUCHARA VALLEY AT LA VETA (See LA VETA)

DEL NORTE

ASTRONAUT KENT ROMINGER (8V1) 3 N UTC -7(-6DT) N37°42.83' W106°21.11'

DENVER

7949 NOTAM FILE DEN

H-3E, L-9E

RWY 06-24: 6050X75 (ASPH) 1.1% up SW

RWY 03-21: 4670X60 (TURF-DIRT)

RWY 21: Mountain.

AIRPORT REMARKS: Unattended. Wildlife on and invof arpt. Unlimited vehicle access on arpt. Mountainous terrain surrounds arpt in all directions.

COMMUNICATIONS: CTAF 122.9

RADIO AIDS TO NAVIGATION: NOTAM FILE ALS.

ALAMOSA (H) VORTACW 113.9 ALS Chan 86 N37°20.95' W105°48.93' 298° 33.7 NM to fld. 7535/13E.

1



2



3



Figure 82. Altimeter.