FAA-CT-8080-5G

# Airman Knowledge Testing Supplement for Flight Instructor, Ground Instructor, and Sport Pilot Instructor

U.S. Department of Transportation
Federal Aviation Administration

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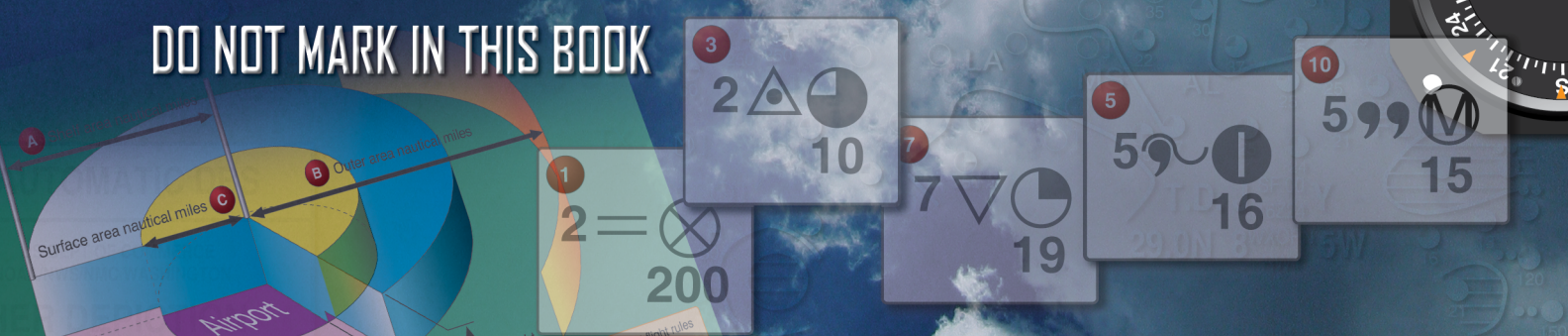

# Airman Knowledge Testing Supplement for Flight Instructor, Ground Instructor, and Sport Pilot Instructor

# 2016

U.S. Department of Transportation
**FEDERAL AVIATION ADMINISTRATION**
Flight Standards Service

# Preface

This testing supplement supersedes FAA-CT-8080-5F, Airman Knowledge Testing Supplement for Flight Instructor, Ground Instructor, and Sport Pilot Instructor, dated 2014. This Airman Knowledge Testing Supplement is designed by the Federal Aviation Administration (FAA) Flight Standards Service. It is intended for use by Airman Knowledge Testing (AKT) Organization Designation Authorization (ODA) Holders and other entities approved and/or authorized to administer airman knowledge tests on behalf of the FAA in the following knowledge areas:

FOI Fundamentals of Instructing
BGI Ground Instructor–Basic
AGI Ground Instructor–Advanced
FIA Flight Instructor–Airplane
FRH Flight Instructor–Helicopter
FRG Flight Instructor–Gyroplane
FIG Flight Instructor–Glider
AFA Flight Instructor–Airplane (Added Rating)
HFA Flight Instructor–Helicopter (Added Rating)
GFA Flight Instructor–Gyroplane (Added Rating)
AFG Flight Instructor–Glider (Added Rating)
MCI Military Competence Instructor

SIA Flight Instructor–Sport Pilot–Airplane
SIB Flight Instructor–Sport Pilot–Balloon
SIG Flight Instructor–Sport Pilot–Glider
SIL Flight Instructor–Sport Pilot–Lighter-Than-Air (Airship)
SIP Flight Instructor–Sport Pilot–Powered Parachute
SIR Flight Instructor–Sport Pilot–Gyroplane
SIW Flight Instructor–Sport Pilot–Weight-Shift Control

Comments regarding this supplement, or any AFS-630 publication, should be sent, in email form, to the following address:

AFS630comments@faa.gov

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**LESSON** Ground reference maneuvers **STUDENT** _____ **DATE** / /

**A** _____ To develop the student's skill in planning and following a pattern over the ground compensating for wind drift at varying angles.

**B** _____ Use of ground references to control path
Observation and control of wind effect
Control of airplane attitude, altitude, and heading

**C** _____

| | |
|---|---|
| Preflight discussion | :10 |
| Instructor demonstrations | :25 |
| Student practice | :45 |
| Postflight critque | :10 |

**D** _____ Chalkboard for preflight discussion
IFR visor for maneuvers reviewed

**E** _____ Preflight—discuss lesson objective. Diagram "S" turns, eight along a road, and rectangular course on a chalkboard.

Inflight—demonstrate elements.
Demonstrate following a road, "S" turns, eights along a road, and rectangular course, coach student practice.

Postflight—critique student performance and make study assignment.

**F** _____ Preflight—discuss lesson objective and resolve questions.

Inflight—review previous maneuvers including power-off stalls and flight at minimum controllable airspeed.
Perform each new maneuver as directed.

Postflight—ask pertinent questions.

**G** _____ Student should demonstrate competency in maintaining orientation, airspeed within 10 knots, altitude within 100 feet, and headings within 10 degrees, and in making proper correction for wind drift.

FIGURE 1.—Lesson Plan.

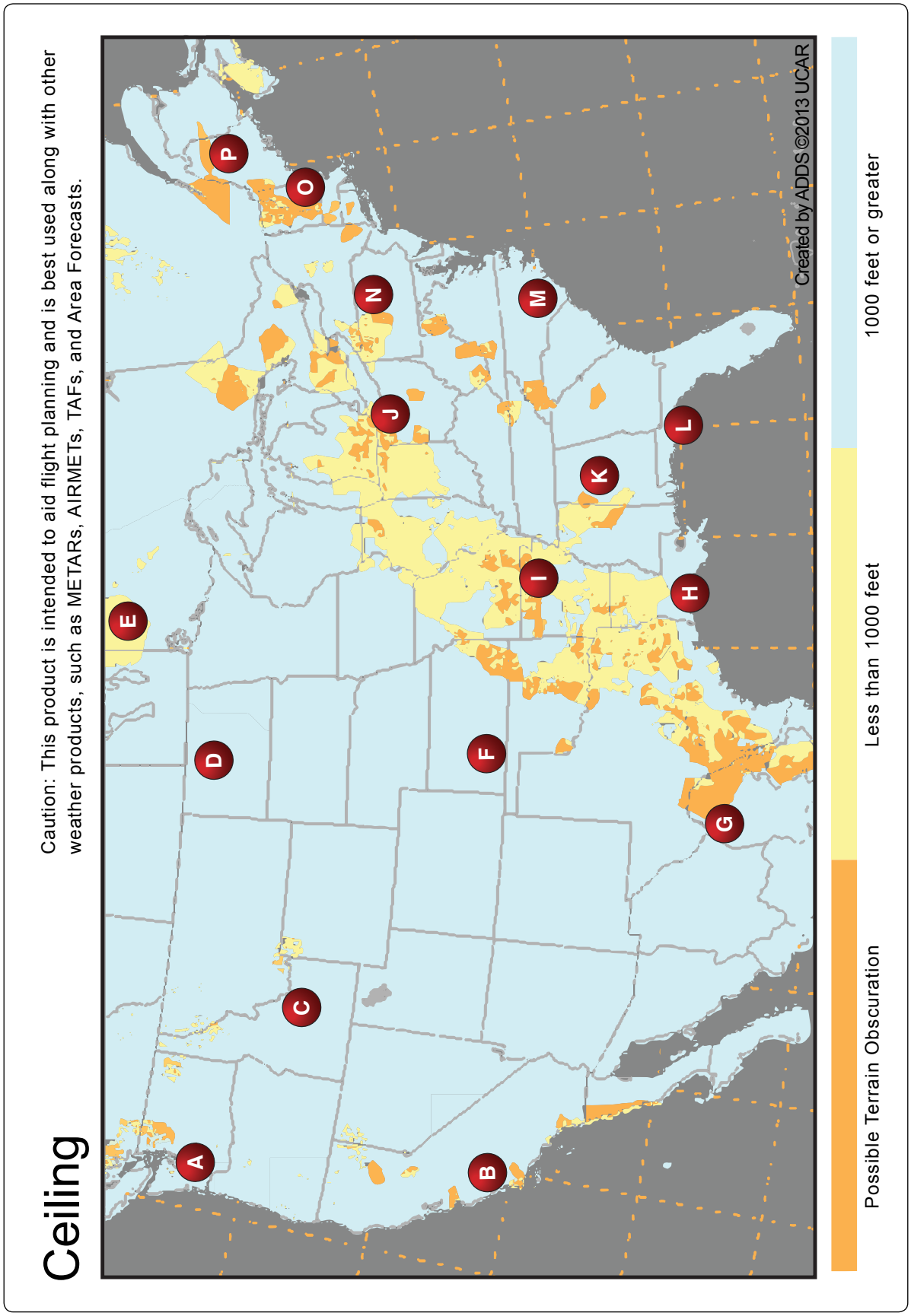



FIGURE 2.—CONUS Display of CVA Ceiling Analysis.

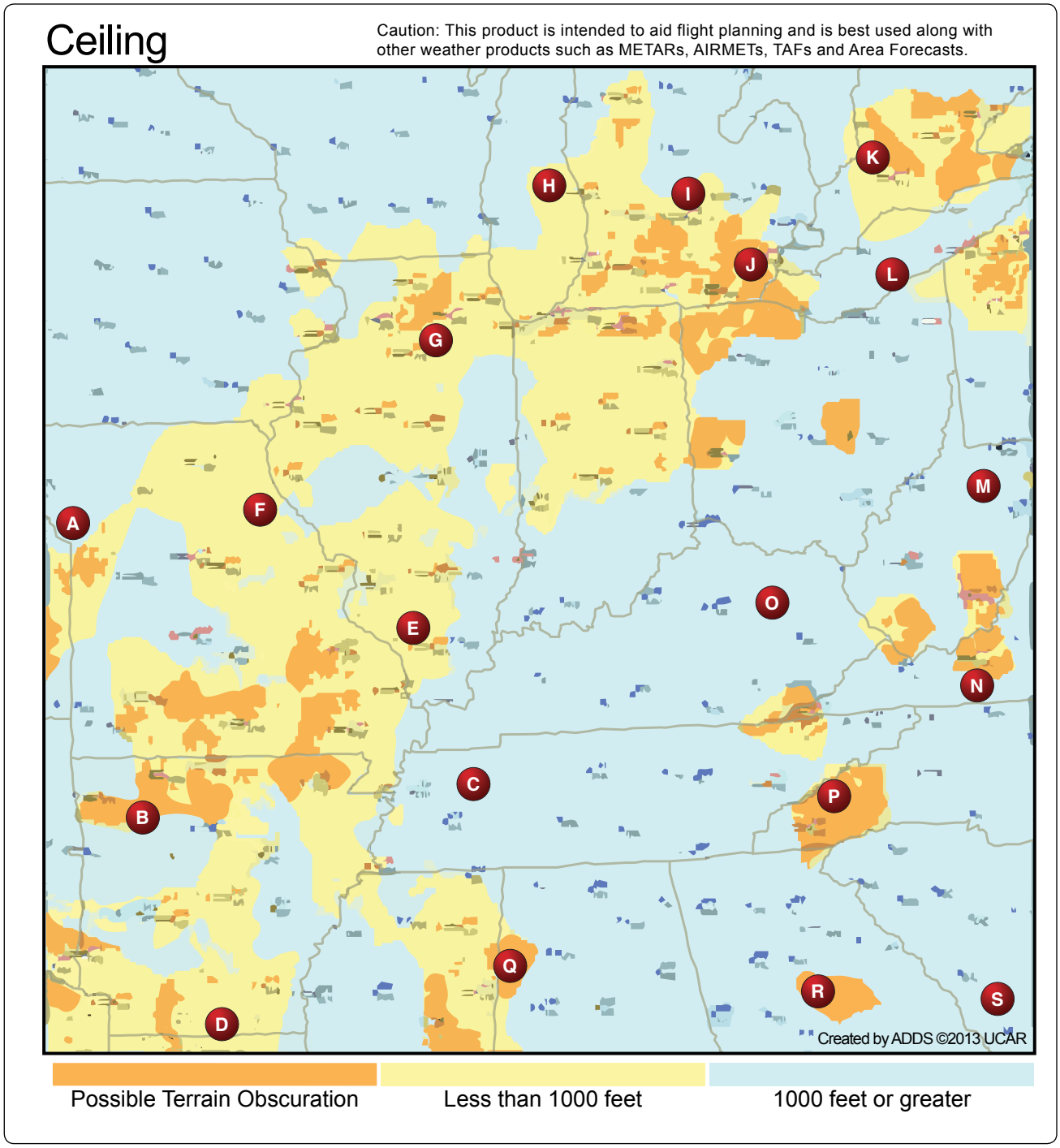



FIGURE 2A.—Regional Display of CVA Ceiling Analysis.

METAR KAMA 301651Z 05016KT 5/8SM R04/3000FT BR OVC007 11/9 A3013 RMK DZB26DZE40

METAR KAUS 301651Z 12008KT 4SM -RAHZ BKN010 BKN023 OVC160 21/17 A3005 RMK RAB25

METAR KBRO 301655Z 15015G20KT 7SM SCT020 SCT130 TCU OVC250 29/19 A2997 RMK RAB19RAE25

METAR KDAL 301649Z 00000KT 3SM BRHZ OVC009 22/17 A3010

METAR KFTW 301654Z 09004KT 1/2SM HZFU VV006 21/17 A3010

METAR KTYR 301650Z AUTO 08004KT 3SM BR SCT015 24/19 A2999

FIGURE 3.—Aviation Routine Weather Reports (METAR).

UA/OV KOKC-KTUL/TM 1800/FL120/TP BE90//SK BKN0
18-TOP055/OVC072-TOP089/CLR ABV/TA M7/WV 08021/
TB LGT 055-072/IC LGT-MOD RIME 072-089

FIGURE 4.—Pilot Weather Report.

| TAF | |
|---|---|
| KMEM | 121720Z 121818 20012KT 5SM HZ BKN030 PROB40 2022 1SM TSRA OVC008CB<br>FM2200 33015G20KT P6SM BKN015 OVC025 PROB40 2202 3SM SHRA<br>FM0200 35012KT OVC008 PROB40 0205 2SM-RASN BECMG 0608 02008KT BKN012<br>BECMG 1012 00000KT 3SM BR SKC TEMPO 1214 1/2SM FG<br>FM1600 VRB06KT P6SM SKC= |
| KOKC | 051130Z 051212 14008KT 5SM BR BKN030 TEMPO 1316 1 1/2SM BR<br>FM1600 18010KT P6SM SKC BECMG 2224 20013G20KT 4SM SHRA OVC020<br>PROB40 0006 2SM TSRA OVC008CB BECMG 0608 21015KT P6SM SCT040= |

FIGURE 5.—Terminal Aerodome Forecasts (TAF).

```
BOSC  FA  241845
SYNOPSIS AND VFR CLDS/WX
SYNOPSIS VALID UNTIL 251300
CLDS/WX VALID UNTIL 250700...OTLK VALID 250700-251300
ME NH VT MA RI CT NY LO NJ PA OH LE WV MD DC DE VA AND CSTL WTRS
.
SEE AIRMET SIERRA FOR IFR CONDS AND MTN OBSCN.
TS IMPLY SEV OR GTR TURB SEV ICE LLWS AND IFR CONDS.
NON MSL HGTS DENOTED BY AGL OR CIG.
.
SYNOPSIS...19Z CDFNT ALG A 16NE ACK-ENE LN...CONTG AS A QSTNRY
FNT ALG AN END-50SW MSS LN. BY 13Z...CDFNT ALG A 140ESE ACK-HTO
LN...CONTG AS A QSTNRY FNT ALG A HTO-SYR-YYZ LN. TROF ACRS CNTRL
PA INTO NRN VA. ...REYNOLDS...
.
OH LE
NRN HLF OH LE...SCT-BKN025 OVC045. CLDS LYRD 150. SCT SHRA. WDLY
        SCT TSRA. CB TOPS FL350. 23-01Z OVC020-030. VIS 3SM BR. OCNL-
        RA. OTLK...IFR CIG BR FG.
SWRN QTR OH...BKN050-060 TOPS 100. OTLK...MVFR BR.
SERN QTR OH...SCT-BKN040 BKN070 TOPS 120. WDLY SCT-TSRA. 00Z
        SCT-BKN030 OVC050. WDLY SCT-TSRA. CB TOPS FL350. OTLK...VFR
        SHRA.
.
CHIC FA 241945
SYNOPSIS AND VFR CLDS/WX
SYNOPSIS VALID UNTIL 251400
CLDS/WX VALID UNTIL 250800...OTLK VALID 250800-251400
ND SD NE KS MN IA MO WI LM LS MI LH IL IN KY
.
SEE AIRMET AIERRA DOR IFR CONDS AND MTN OBSCN.
TS IMPLY SEV OR GTR TURB SEV ICE LLWS AND IFR CONDS.
NON MSL HGTS DENOTED BY AGL OR CIG.
.
SYNOPSIS...LOW PRES AREA 20Z CNTRD OVR SERN WI FCST MOV NEWD INTO
LH BY 12Z AND WKN. LOW PRES FCST DEEPEN OVR ERN CO DURG PD AND
MOV NR WRN KS BORDER BY 14Z. DVLPG CDFNT WL MOV EWD INTO S CNTRL
NE-CNTRL KS BY 14Z. ...SMITH..
.
UPR MI LS
WRN PTNS...AGL SCT030 SCT 030 SCT-BKN050. TOPS 080. 02-05Z BECMG CIG
        OVC010 VIS 3-5SM BR. OTLK...IFR CIG BR.
ERN PTNS...CIG BKN020 OVC040. OCNL VIS 3-5SM -RA BR. TOPS FL200.
        23Z CIG OVC010 VIS 3-5SM -RA BR. OTLK...IFR CIG BR.
.
LWR MI LM LH
CNTRL/NRN PTNS...CIG OVC010 VIS 3-5SM -RA BR. TOPS FL200
        OTLK...IFR CIG BR.
.
SRN THIRD...CIG OVC015-025. SCT -SHRA. TOPS 150. 00-02Z BECMG CIG
        OVC010 VIS 3-5SM BR. TOPS 060. OTLK...IFR CIG BR.
.
IN
NRN HALF...CIG BKN035 BKN080. TOPS FL200. SCT -SHRA. 00Z CIG
        BKN-SCT040 BKN-SCT080. TOPS 120. 06Z AGL SCT-BKN030. TOPS 080.
        OCNL VIS 3-5SM BR. OTLK...MVFR CIG BR.
SRN HALF...AGL SCT050 SCT-BKN100. TOPS 120. 07Z AGL SCT 030
        SCT100. OTLK...VFR
```

FIGURE 6.—Aviation Area Forecast (FA).

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+7 | 2332+02 | 2339-04 | 2356-16 | 2373-27 | 239440 | 730649 | 731960 |

FIGURE 7.—Winds and Temperatures Aloft Forecast (FB).

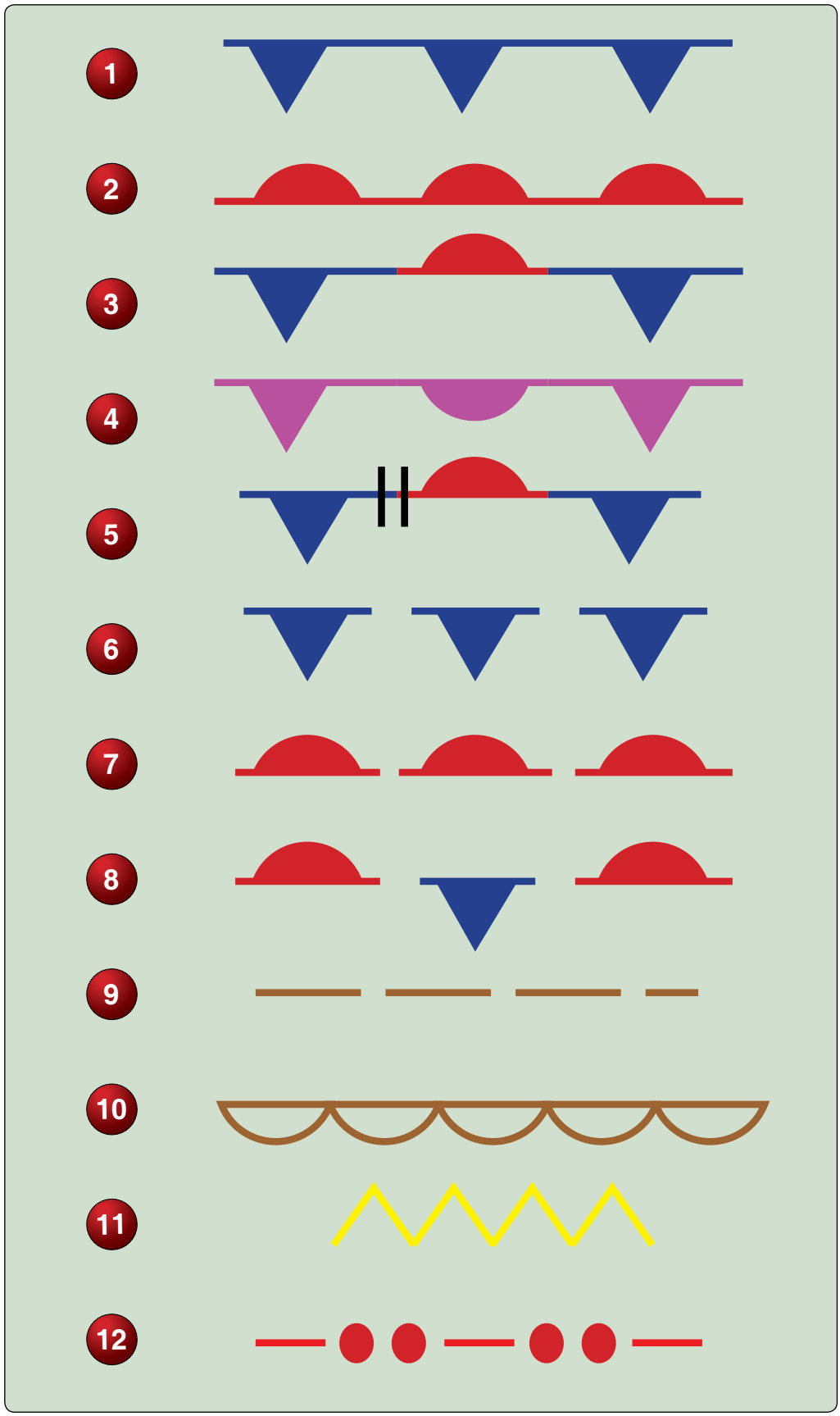



FIGURE 8.—Surface Analysis Chart Symbols.

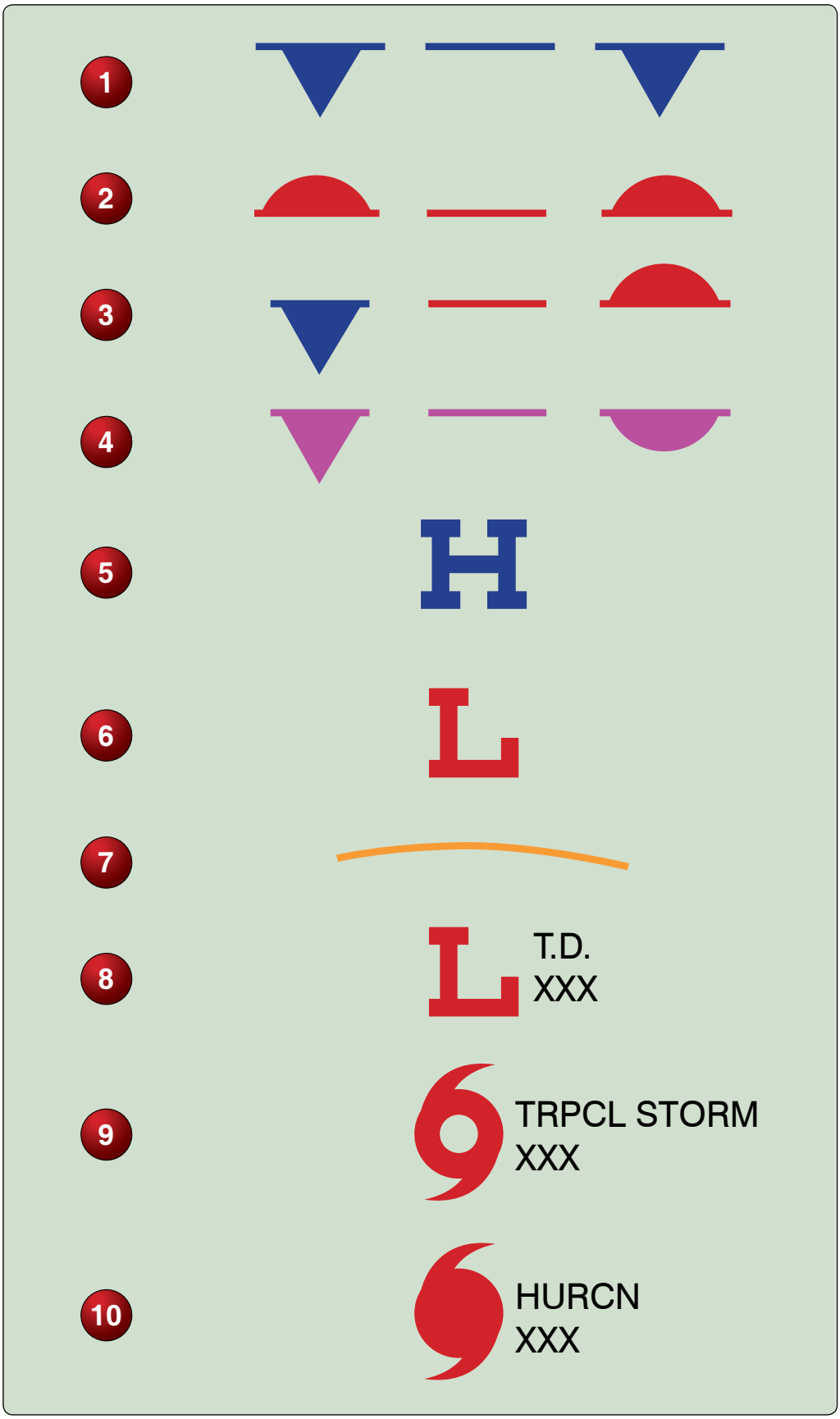



FIGURE 9.—Surface Analysis Chart Symbols.

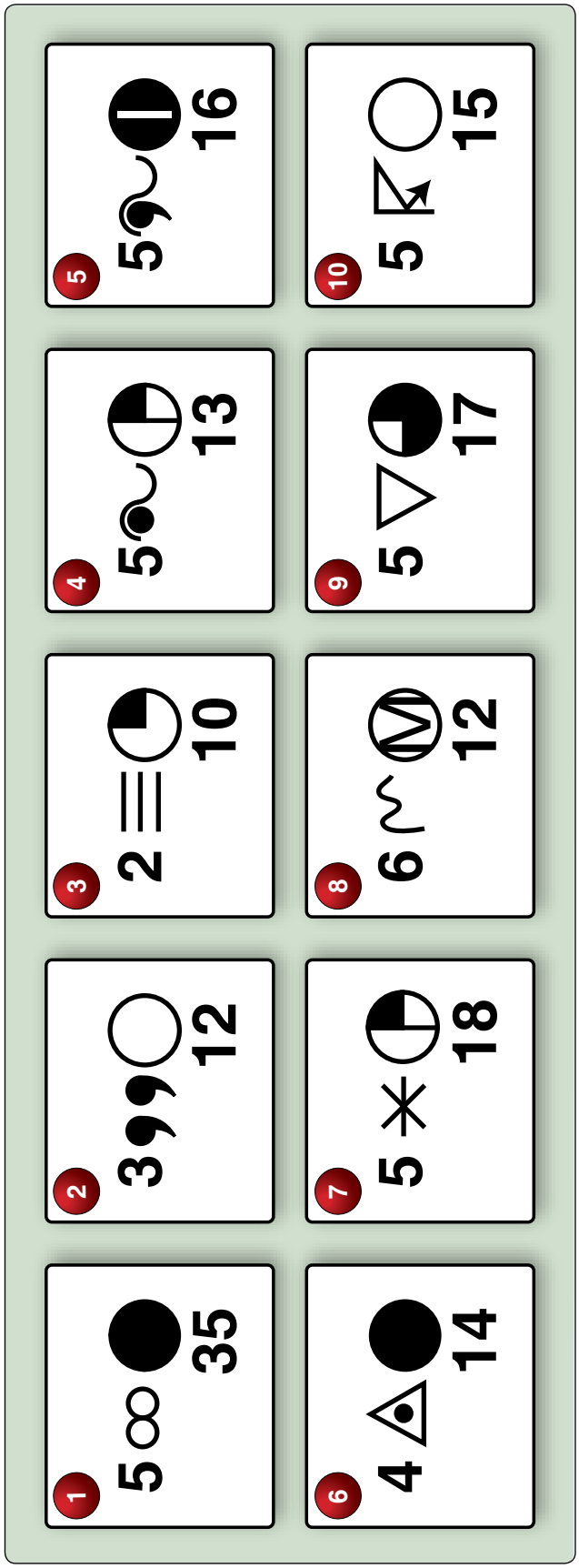



FIGURE 10.—Weather Depiction Chart Symbols.

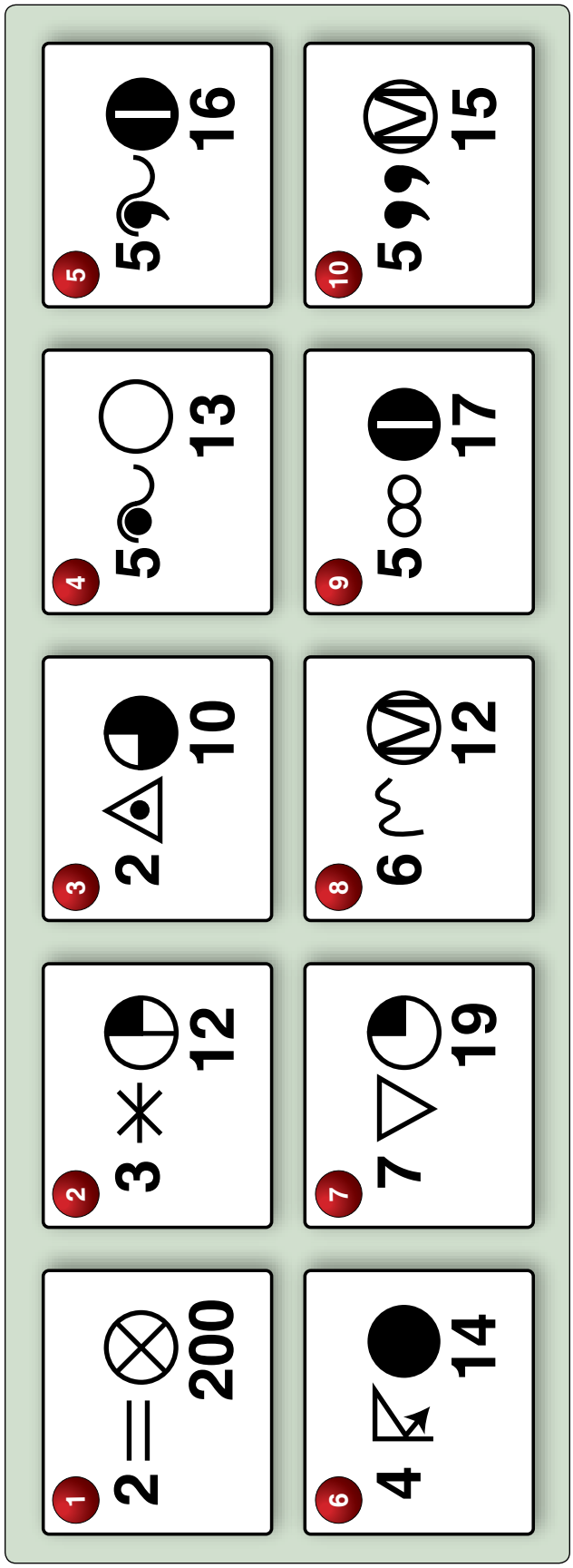



FIGURE 11.—Weather Depiction Chart Symbols.

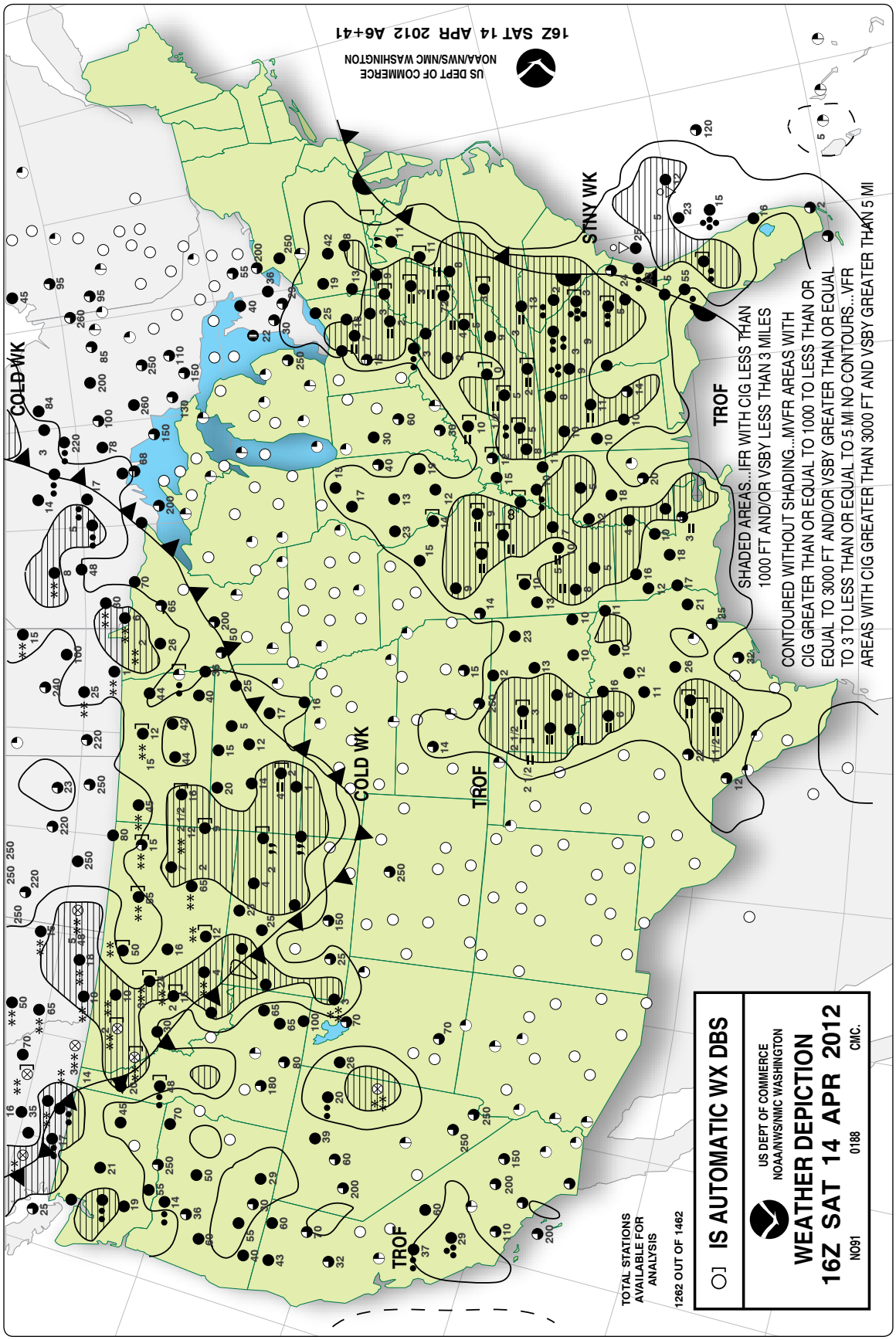



FIGURE 12.—Weather Depiction Chart.

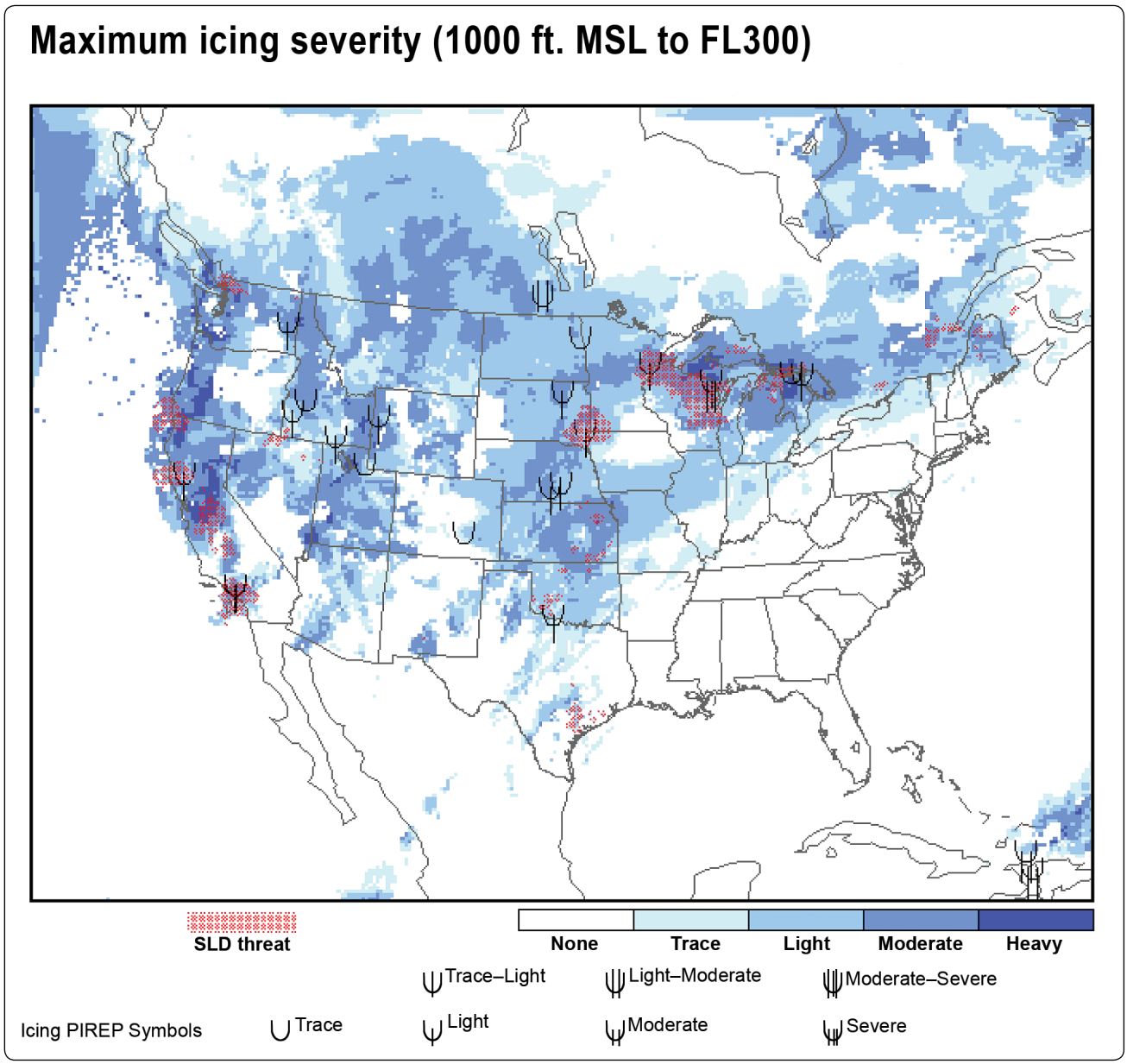



FIGURE 13.—CIP/FIP Icing Severity Plus Supercooled Large Droplets (SLD)–Max Example.

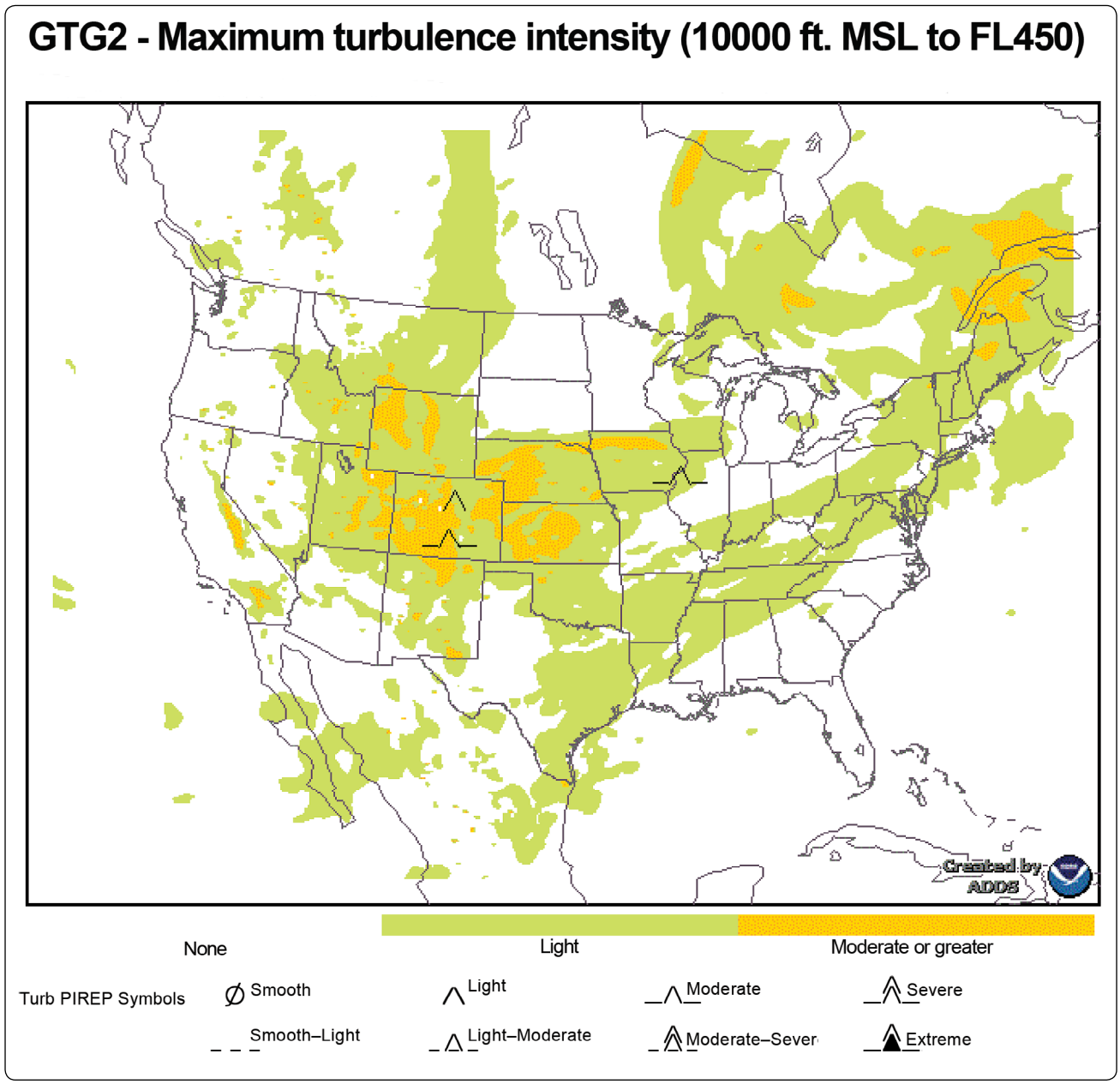



FIGURE 13A.—GTG Composite Example.

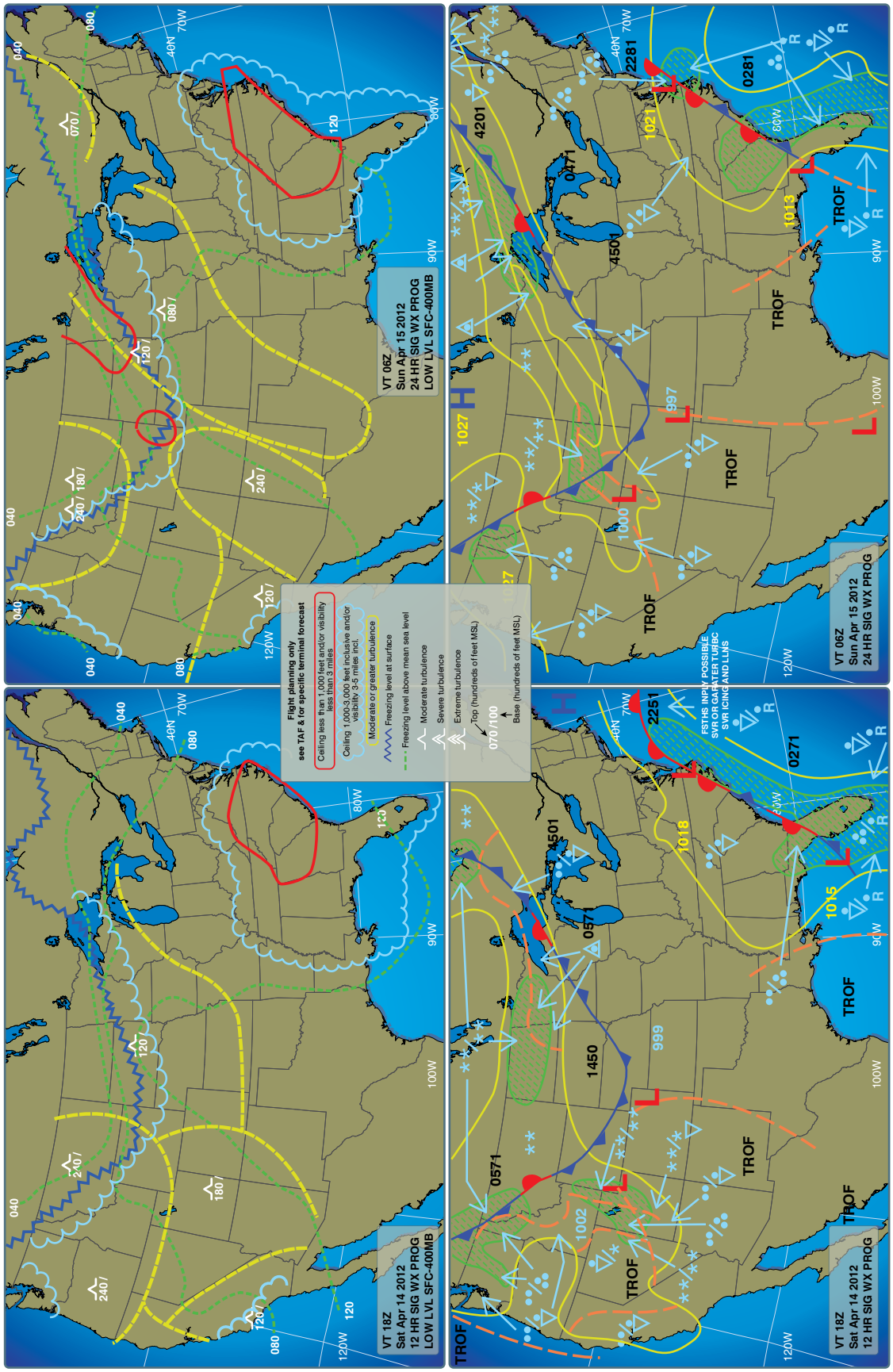



FIGURE 14—Low-Level Significant Weather (SIGWX) Prognostic Charts.

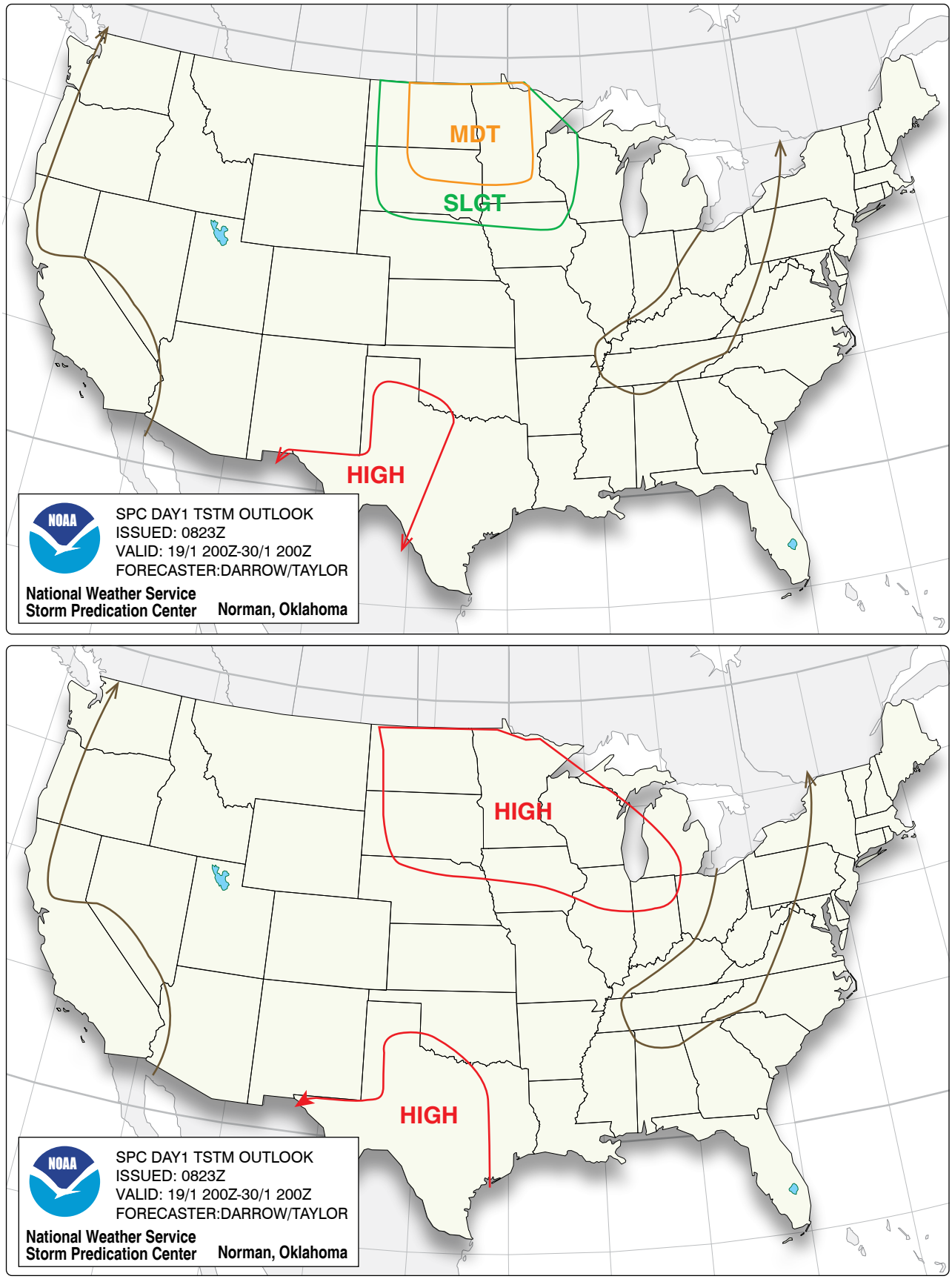



FIGURE 15.—Day 1 Categorical Convective Outlook.

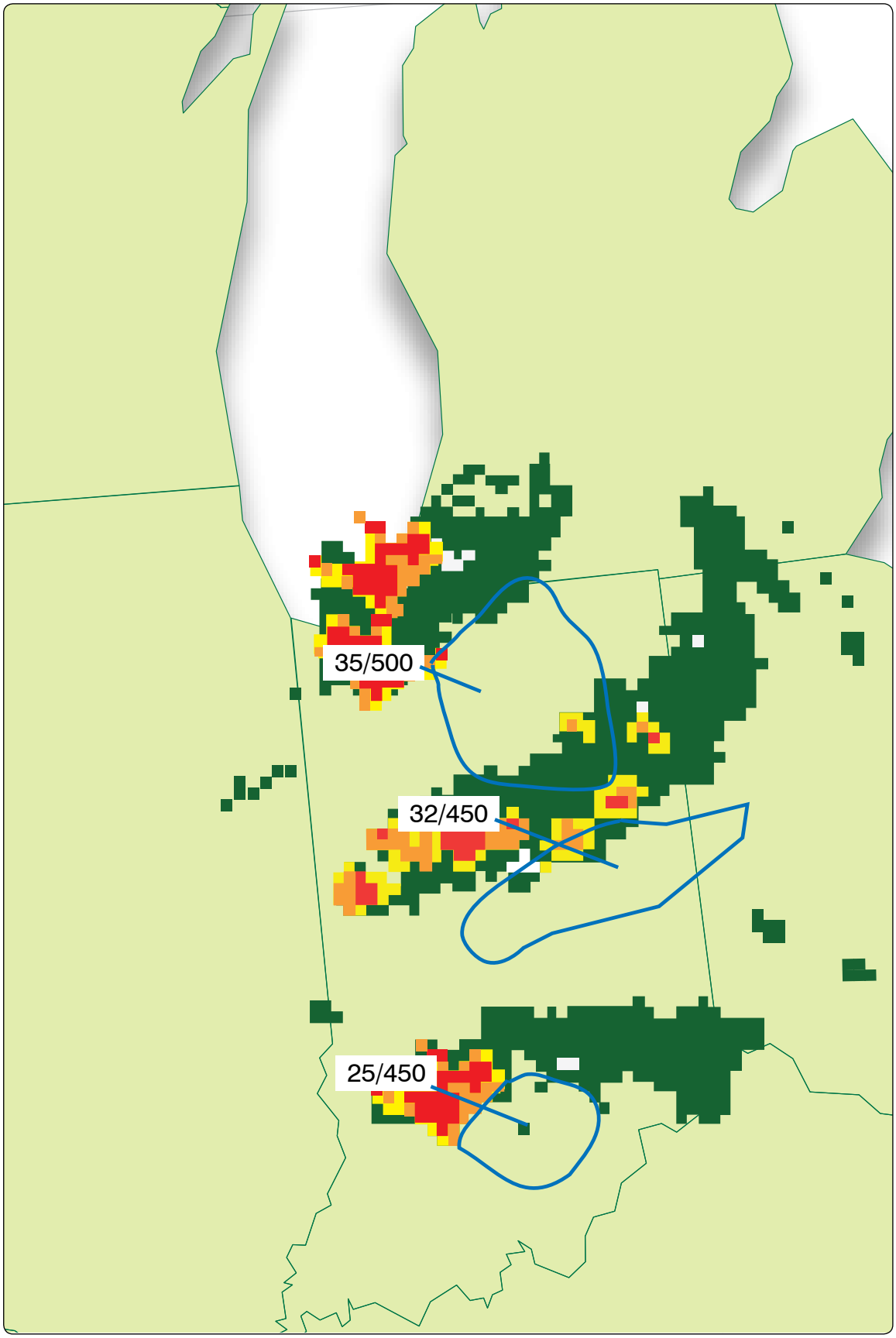



FIGURE 16.—Convective Weather Forecast.

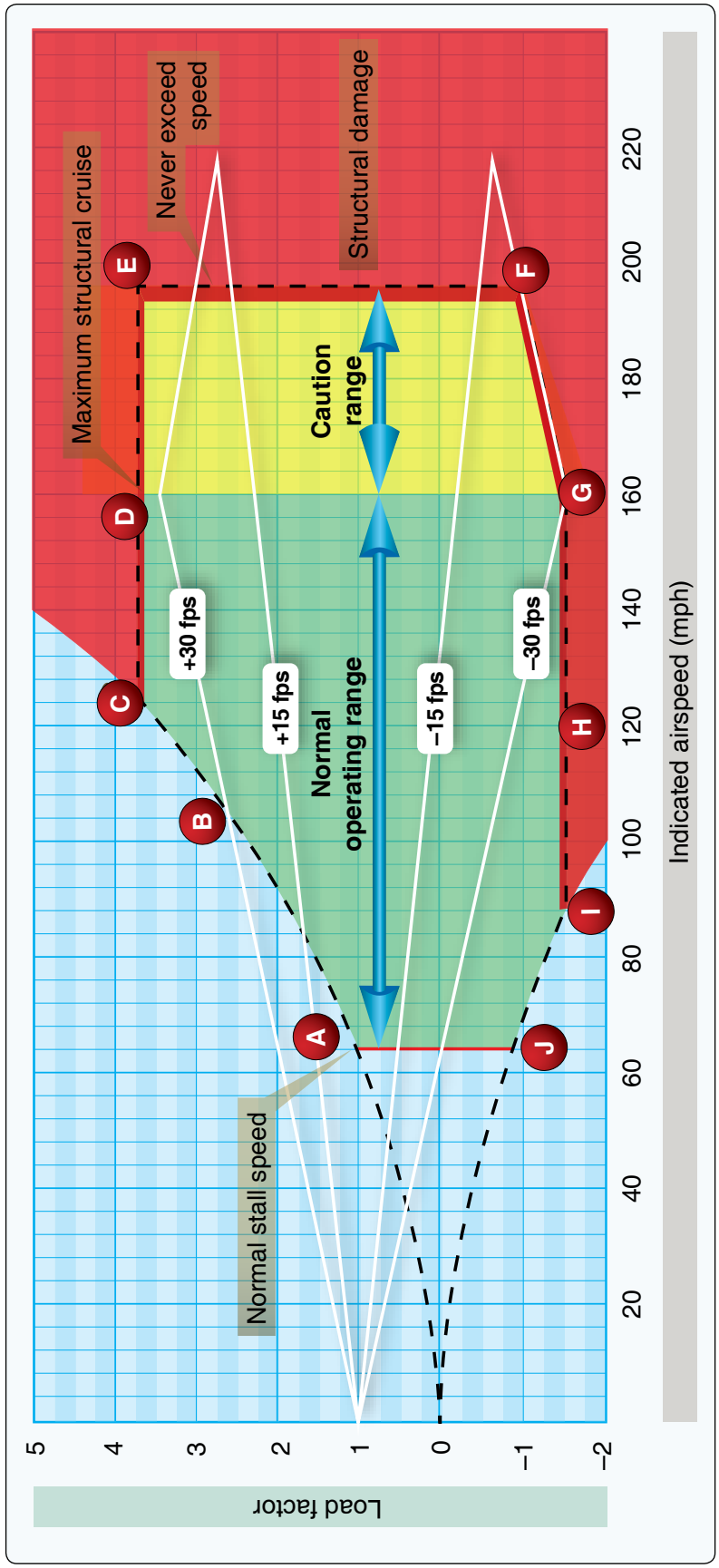



FIGURE 17.—Velocity/Load Factor Chart.

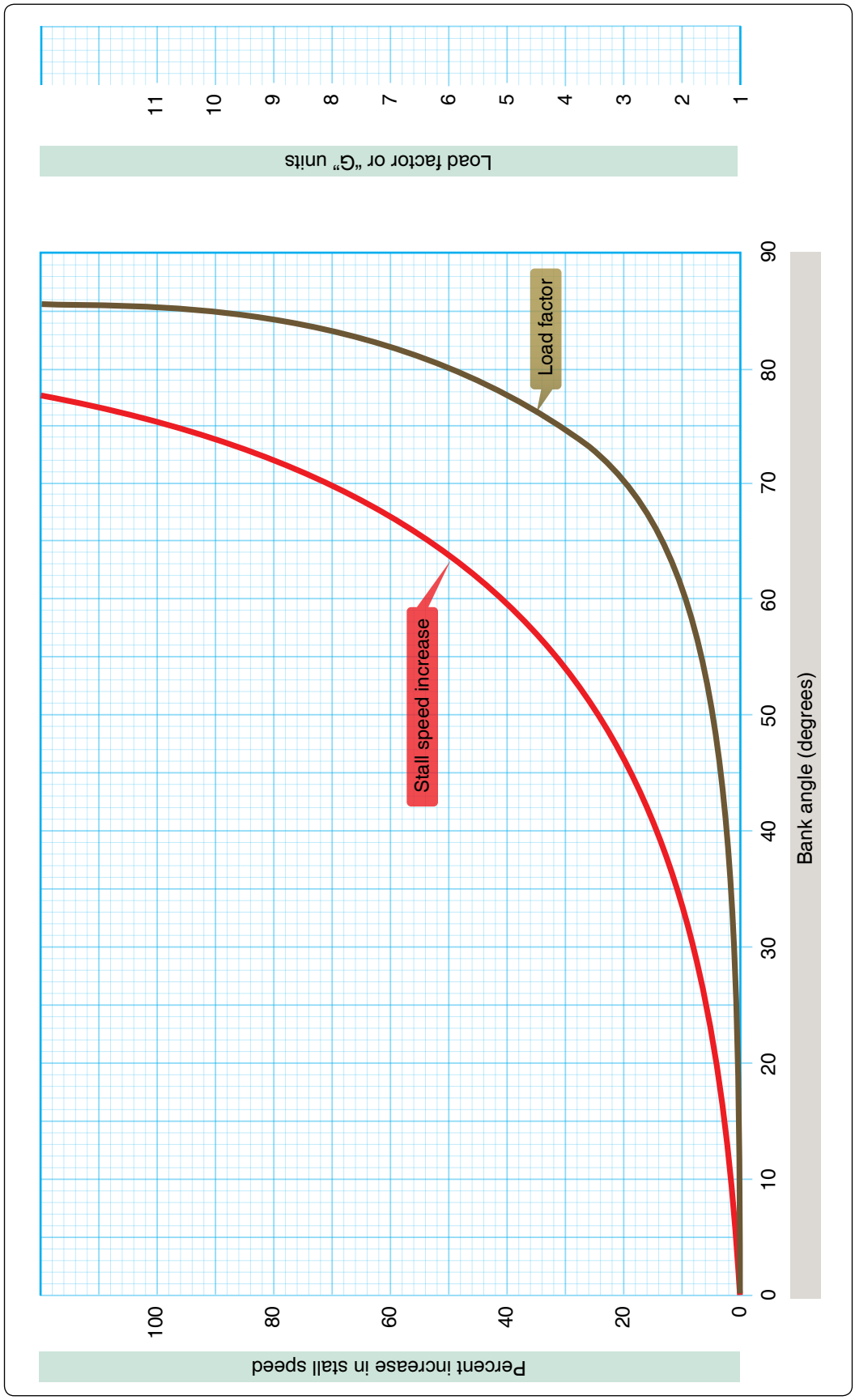



FIGURE 18.—Stall Speed vs. Load Factor.

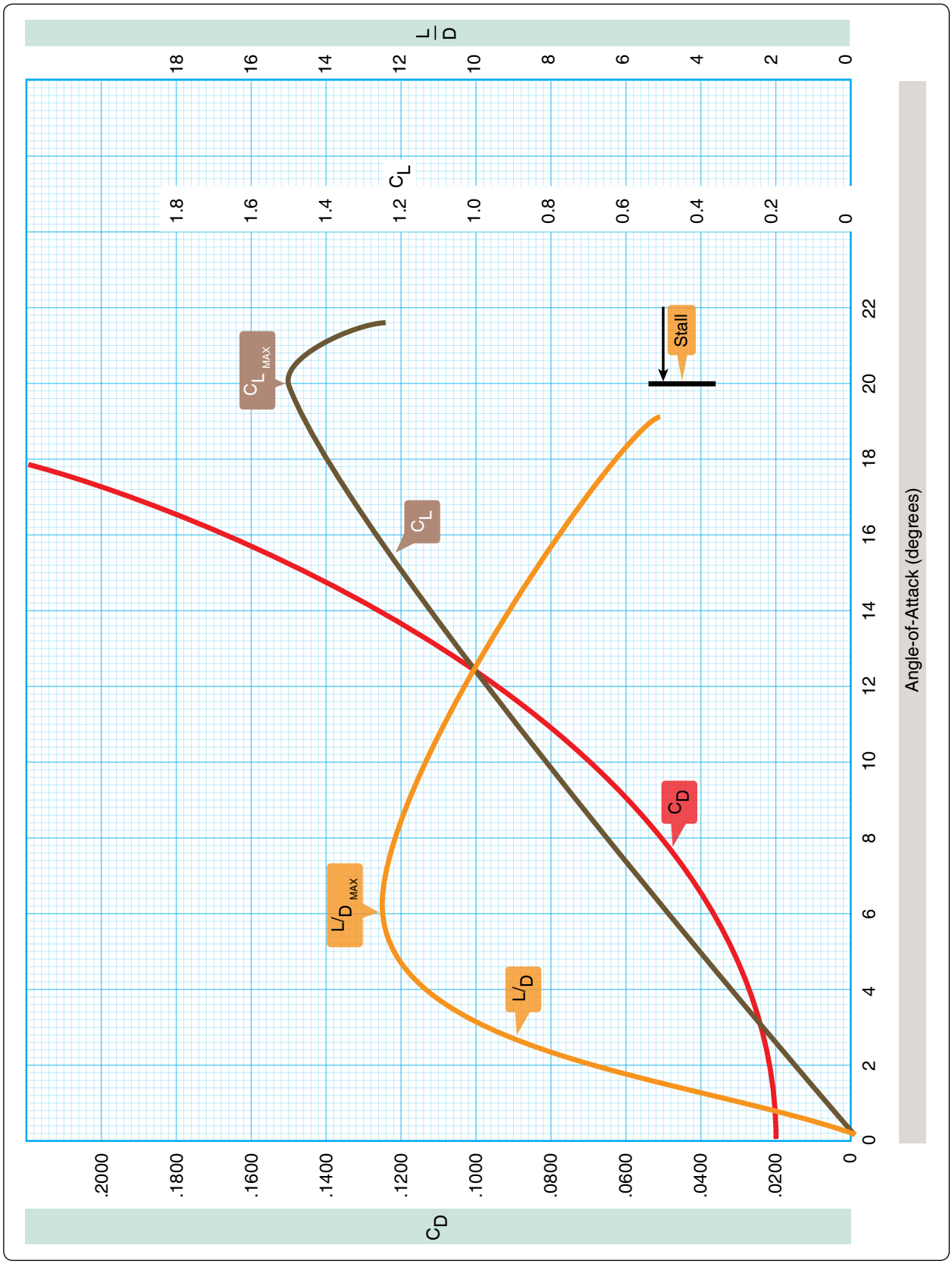



FIGURE 19.—Angle-of-Attack vs. Lift

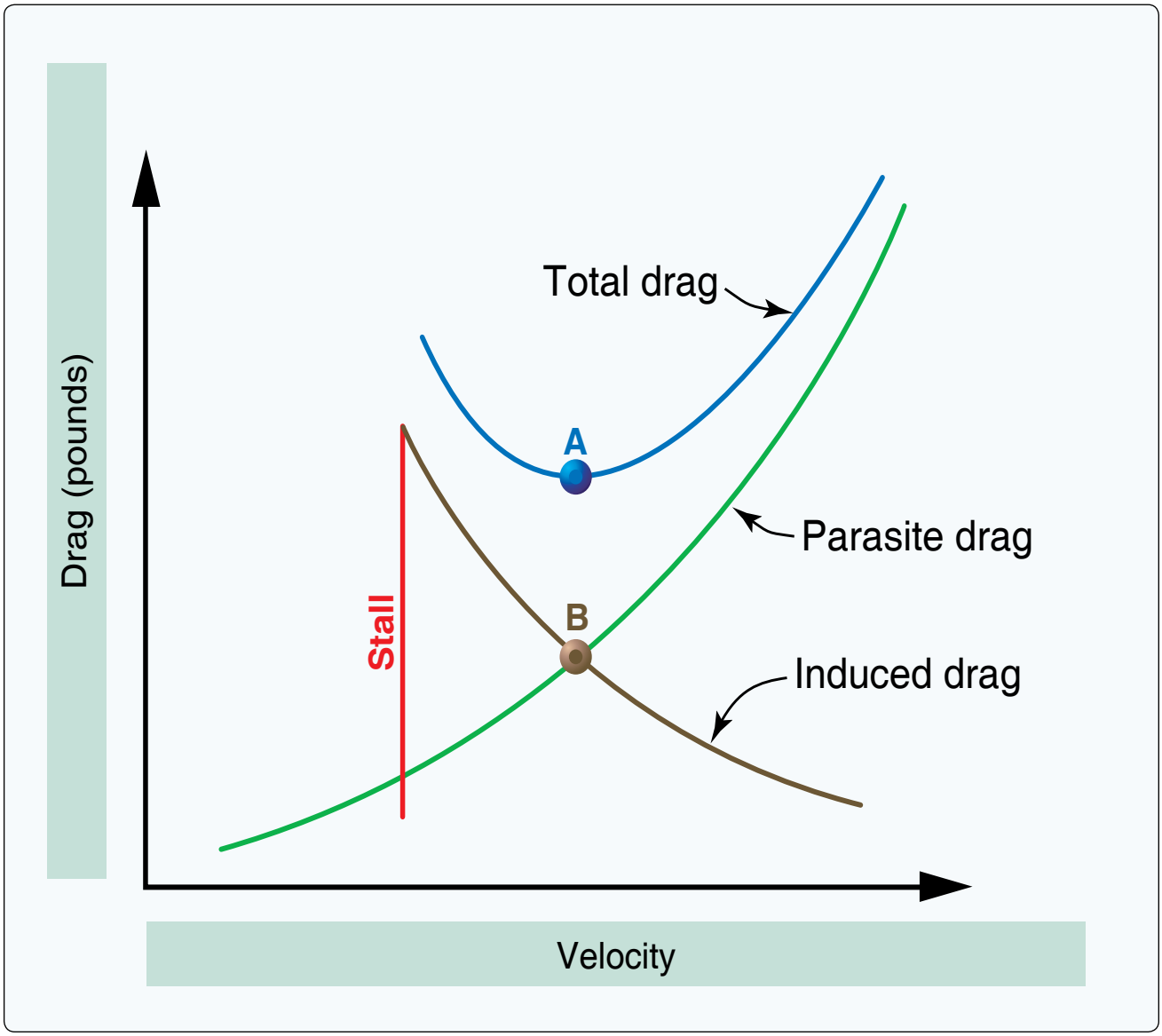



FIGURE 20.—Drag Chart.

| Aircraft / Wing span | 1 / 40' | 2 / 35' | 3 / 48' | 4 / 30' | 5 / 33' | 6 / 36' | 7 / 36' | 8 / 36' | 9 / 52' | 10 / 57' | 11 / 51' | 12 / 75' | 13 / 59' | 14 / 49' | 15 / 117' | 16 / 32' |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average wing chord | 6' | 5' | 6' | 6' | 4' | 4' | 4' | 4' | 10.5' | 4.5' | 5' | 3' | 4' | 2' 7" | 13' | 5' |

FIGURE 21.—Aspect Ratio.

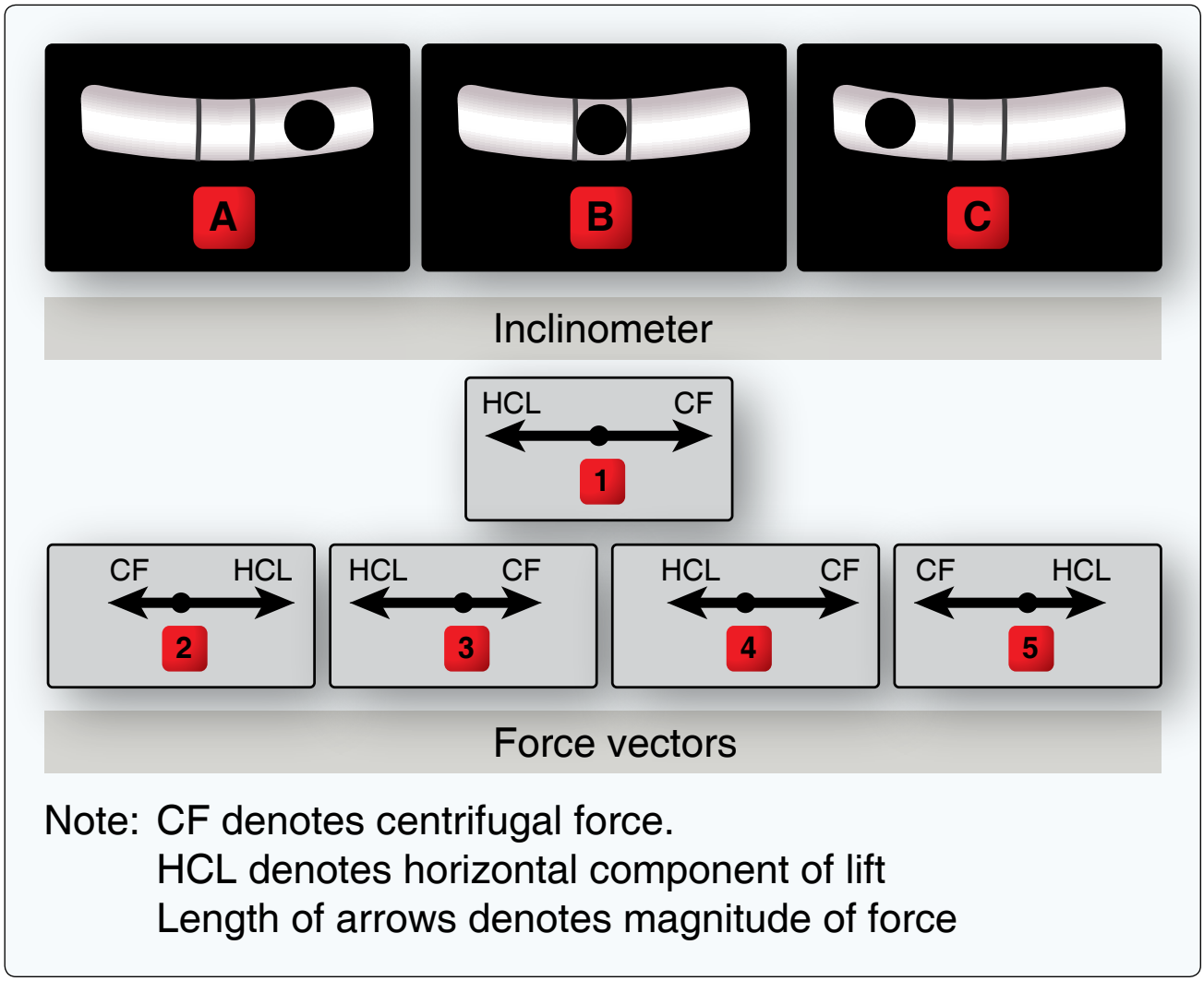



FIGURE 22.—Force Vectors.

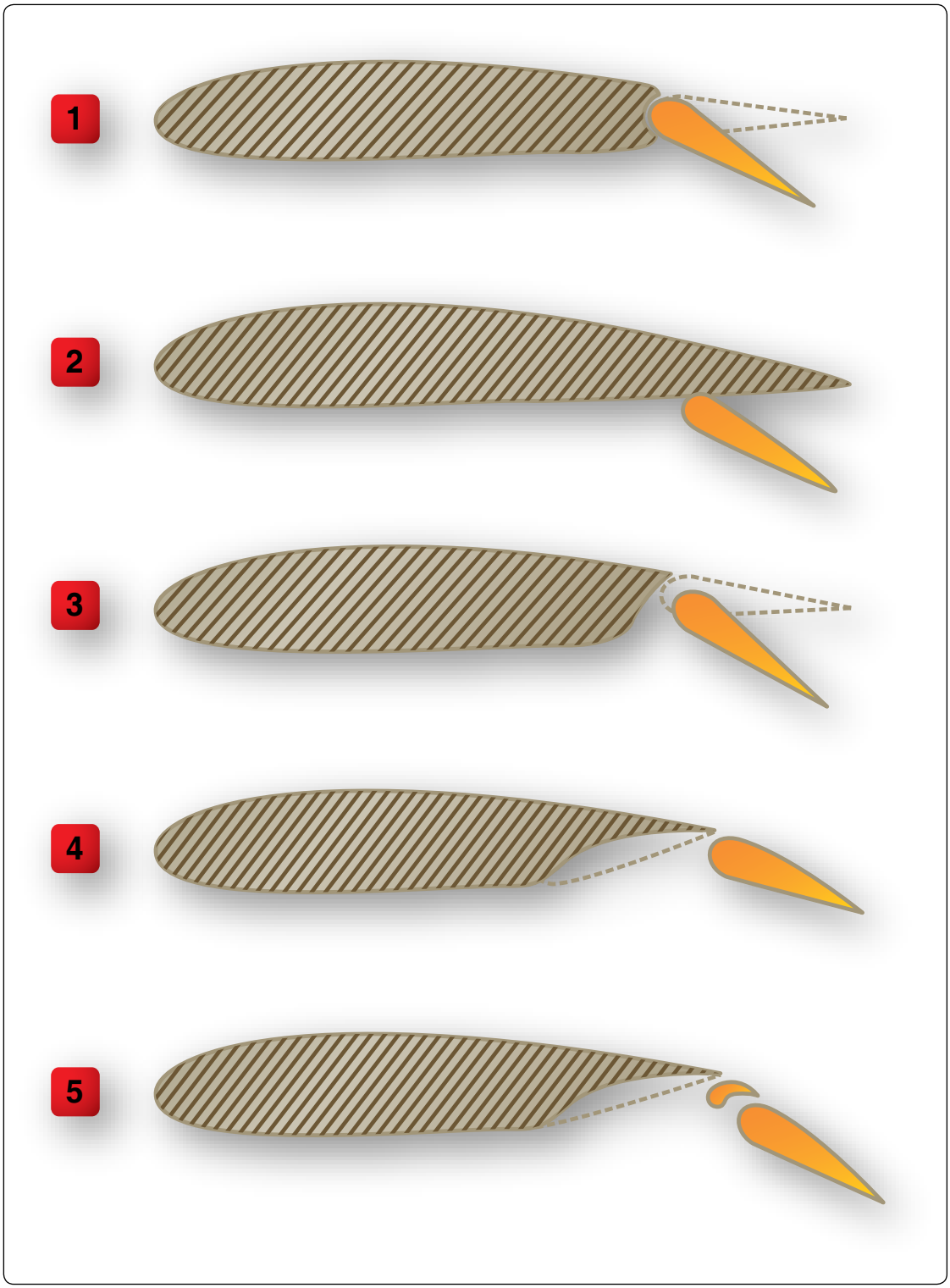
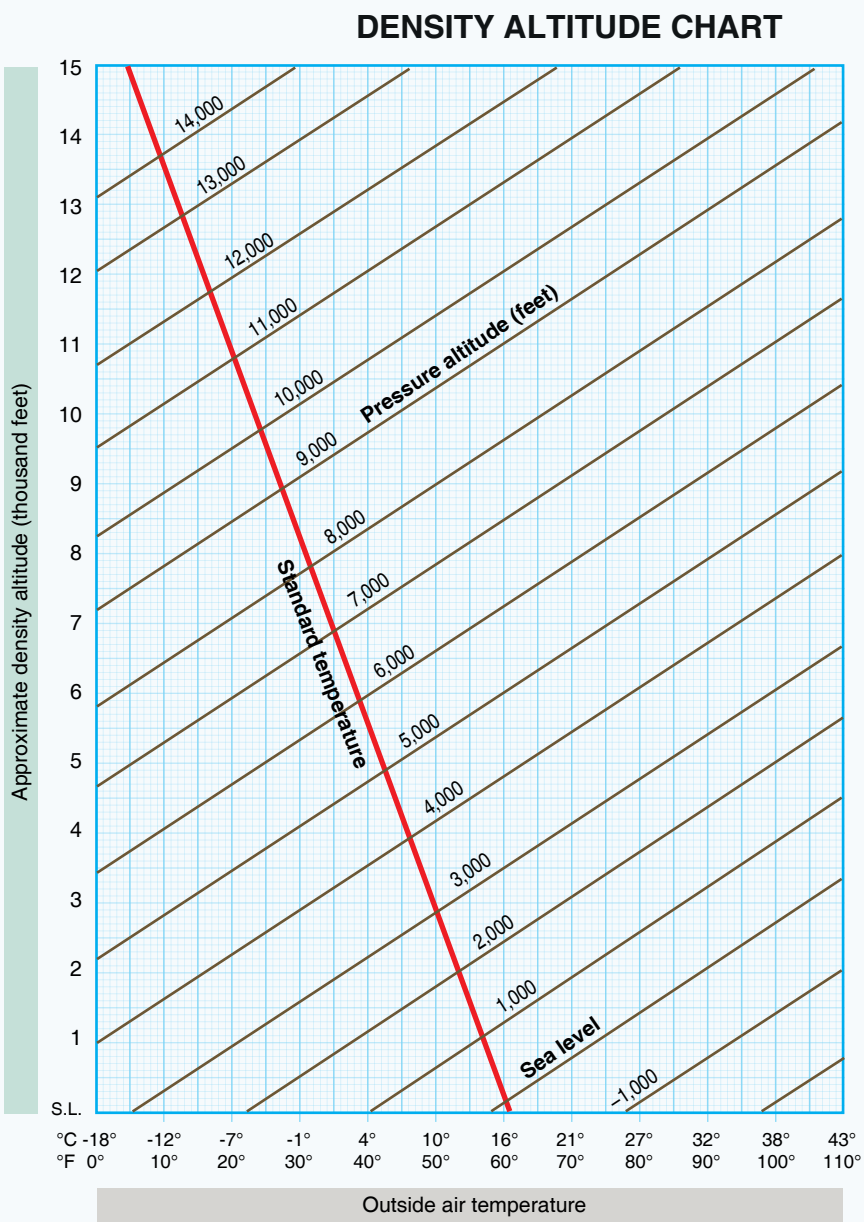



FIGURE 23.—Wing Flap Diagrams.




| 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 24.—Density Altitude Chart.

## Airspeed calibration—Normal system

| Flaps 0° | | Flaps 15° | | Flaps 45° | |
|---|---|---|---|---|---|
| KIAS | KCAS | KIAS | KCAS | KIAS | KCAS |
| 80 | 84 | 70 | 79 | 70 | 76 |
| 100 | 102 | 80 | 86 | 80 | 84 |
| 120 | 122 | 90 | 94 | 90 | 93 |
| 140 | 141 | 100 | 103 | 100 | 102 |
| 160 | 161 | 110 | 112 | 110 | 111 |
| 180 | 181 | 120 | 121 | 120 | 120 |
| 200 | 201 | 130 | 131 | 130 | 129 |
| 220 | 221 | 140 | 141 | 140 | 138 |
| 240 | 242 | 150 | 151 | | |

KIAS—indicated airspeed in knots
KCAS—calibrated airspeed in knots

## Stall speeds—KCAS

4,600 lb gross weight

| Configuration | Angle of bank | | | |
|---|---|---|---|---|
| | 0° | 20° | 40° | 60° |
| Gear and flaps up | 84 | 87 | 97 | 119 |
| Gear down and flaps 15° | 80 | 83 | 92 | 113 |
| Gear down and flaps 45° | 76 | 79 | 87 | 108 |

FIGURE 25.—Airspeed Calibration Stalls/Speeds Chart.

## Takeoff data

Takeoff distance with 10° flaps from hard-surfaced runway

| Gross weight LB | KIAS at 50 feet | Head wind KTS | At sea level & 15 °C | | At 2,500 feet & 10 °C | | At 5,000 feet & 5 °C | | At 7,500 feet & 0 °C | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Ground roll | Total to clear 50' OBS | Ground roll | Total to clear 50' OBS | Ground roll | Total to clear 50' OBS | Ground roll | Total to clear 50' OBS |
| 2200 | 55 | 0 | 345 | 680 | 405 | 770 | 480 | 885 | 580 | 1040 |
| | | 15 | 205 | 460 | 245 | 525 | 295 | 615 | 365 | 725 |
| | | 30 | 100 | 275 | 120 | 320 | 155 | 380 | 195 | 460 |
| 2600 | 60 | 0 | 500 | 915 | 585 | 1045 | 705 | 1230 | 855 | 1470 |
| | | 15 | 310 | 635 | 370 | 735 | 455 | 870 | 560 | 1055 |
| | | 30 | 165 | 395 | 200 | 465 | 255 | 565 | 325 | 695 |
| 3000 | 64 | 0 | 695 | 1210 | 820 | 1405 | 990 | 1675 | 1205 | 2045 |
| | | 15 | 450 | 855 | 535 | 1005 | 660 | 1215 | 815 | 1505 |
| | | 30 | 250 | 555 | 310 | 665 | 390 | 820 | 500 | 1030 |

Note: Increase distances 10% for each 14 °C above standard temperature for particular altitude.

FIGURE 26.—Takeoff Data Chart.

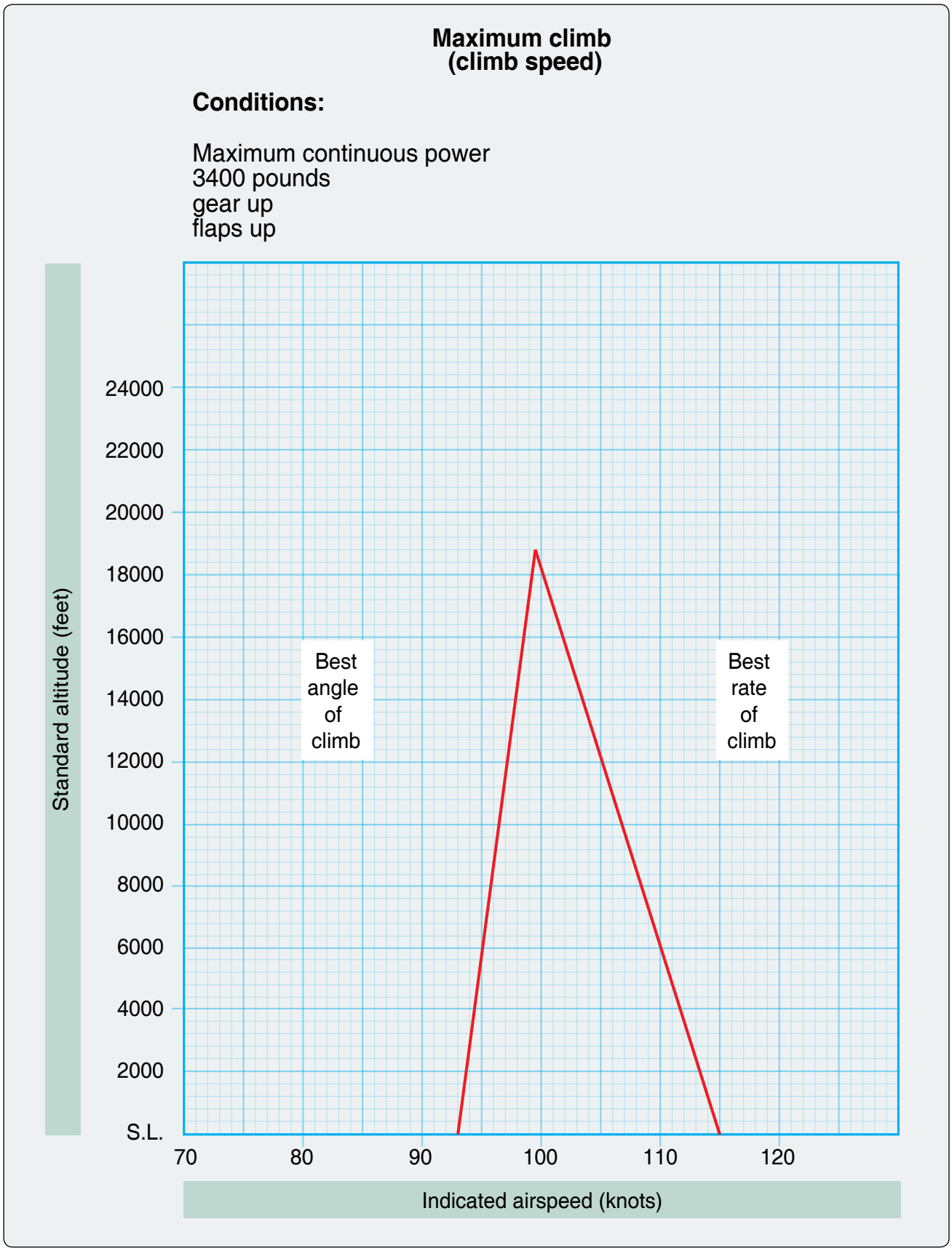



FIGURE 27.—Maximum Climb Chart.

## Short-field takeoff distance

**Conditions:**
1. Power—FULL THROTTLE and 2700 rpm before releasing breaks.
2. Mixtures—LEAN for field elevation.
3. Cow flaps—OPEN.
4. Wing flaps—UP.
5. Level, dry, hard-surface runway.

**Note:**
1. Increase total distance 8% for operation on dry, sod runway.
2. Decrease total distance 7% for each 10 knots of headwind.
3. Increase total distance 5% for each 2 knots of tailwind.

| Weight LB | Takeoff to 50 foot obstacle speed KIAS | Pressure altitude feet | 20 °C | | 30 °C | | 40 °C | |
|---|---|---|---|---|---|---|---|---|
| | | | Ground roll feet | Total distance to clear 50' OBS | Ground roll feet | Total distance to clear 50' OBS | Ground roll feet | Total distance to clear 50' OBS |
| 5500 | 82 | Sea level | 1390 | 1760 | 1490 | 1890 | 1590 | 2020 |
| | | 1,000 | 1530 | 1950 | 1640 | 2080 | 1760 | 2230 |
| | | 2,000 | 1680 | 2150 | 1810 | 2300 | 1940 | 2470 |
| | | 3,000 | 1860 | 2380 | 2000 | 2550 | 2150 | 2750 |
| | | 4,000 | 2060 | 2650 | 2220 | 2850 | 2380 | 3070 |
| | | 5,000 | 2280 | 2950 | 2460 | 3190 | 2640 | 3450 |
| | | 6,000 | 2530 | 3310 | 2730 | 3590 | 2950 | 3900 |
| | | 7,000 | 2830 | 3750 | 3160 | 4190 | 3410 | 4570 |
| | | 8,000 | 3280 | 4420 | 3540 | 4840 | 3830 | 5330 |
| | | 9,000 | 3690 | 5170 | 4000 | 5730 | 4330 | 6420 |
| | | 10,000 | 4150 | 6140 | 4500 | 6980 | 4880 | 8130 |
| 5100 | 78 | Sea level | 1160 | 1470 | 1240 | 1570 | 1330 | 1680 |
| | | 1,000 | 1280 | 1620 | 1370 | 1730 | 1470 | 1850 |
| | | 2,000 | 1400 | 1780 | 1500 | 1910 | 1610 | 2040 |
| | | 3,000 | 1550 | 1960 | 1660 | 2100 | 1780 | 2260 |
| | | 4,000 | 1710 | 2180 | 1840 | 2340 | 1970 | 2510 |
| | | 5,000 | 1890 | 2410 | 2030 | 2590 | 2180 | 2790 |
| | | 6,000 | 2090 | 2690 | 2250 | 2890 | 2420 | 3120 |
| | | 7,000 | 2330 | 3010 | 2510 | 3250 | 2700 | 3520 |
| | | 8,000 | 2600 | 3400 | 2800 | 3690 | 3030 | 4010 |
| | | 9,000 | 2920 | 3890 | 3270 | 4360 | 3530 | 4760 |
| | | 10,000 | 3390 | 4580 | 3660 | 5030 | 3960 | 5560 |
| 4700 | 75 | Sea level | 960 | 1220 | 1020 | 1300 | 1090 | 1380 |
| | | 1,000 | 1050 | 1340 | 1120 | 1430 | 1200 | 1520 |
| | | 2,000 | 1150 | 1460 | 1230 | 1560 | 1320 | 1670 |
| | | 3,000 | 1270 | 1610 | 1360 | 1720 | 1460 | 1840 |
| | | 4,000 | 1400 | 1770 | 1500 | 1900 | 1610 | 2030 |
| | | 5,000 | 1540 | 1960 | 1650 | 2100 | 1780 | 2250 |
| | | 6,000 | 1700 | 2170 | 1830 | 2330 | 1970 | 2500 |
| | | 7,000 | 1890 | 2410 | 2030 | 2590 | 2190 | 2790 |
| | | 8,000 | 2100 | 2700 | 2260 | 2910 | 2440 | 3140 |
| | | 9,000 | 2350 | 3040 | 2540 | 3290 | 2730 | 3570 |
| | | 10,000 | 2620 | 3430 | 2830 | 3730 | 3060 | 4060 |

FIGURE 28.—Short-Field Takeoff Distance Chart.

## Glide distance

**Conditions:**

| | |
|---|---|
| Gear | UP |
| Flaps | UP |
| Cowl flaps | CLOSED |
| Propeller | FULL HIGH PITCH (low rpm) |
| Glide speed | 122 KIAS |

**Notes:** 1. Increase glide distance approximately 10% for each 10 knots of tailwind

2. Decrease glide distance approximately 10% for each 10 knots of headwind

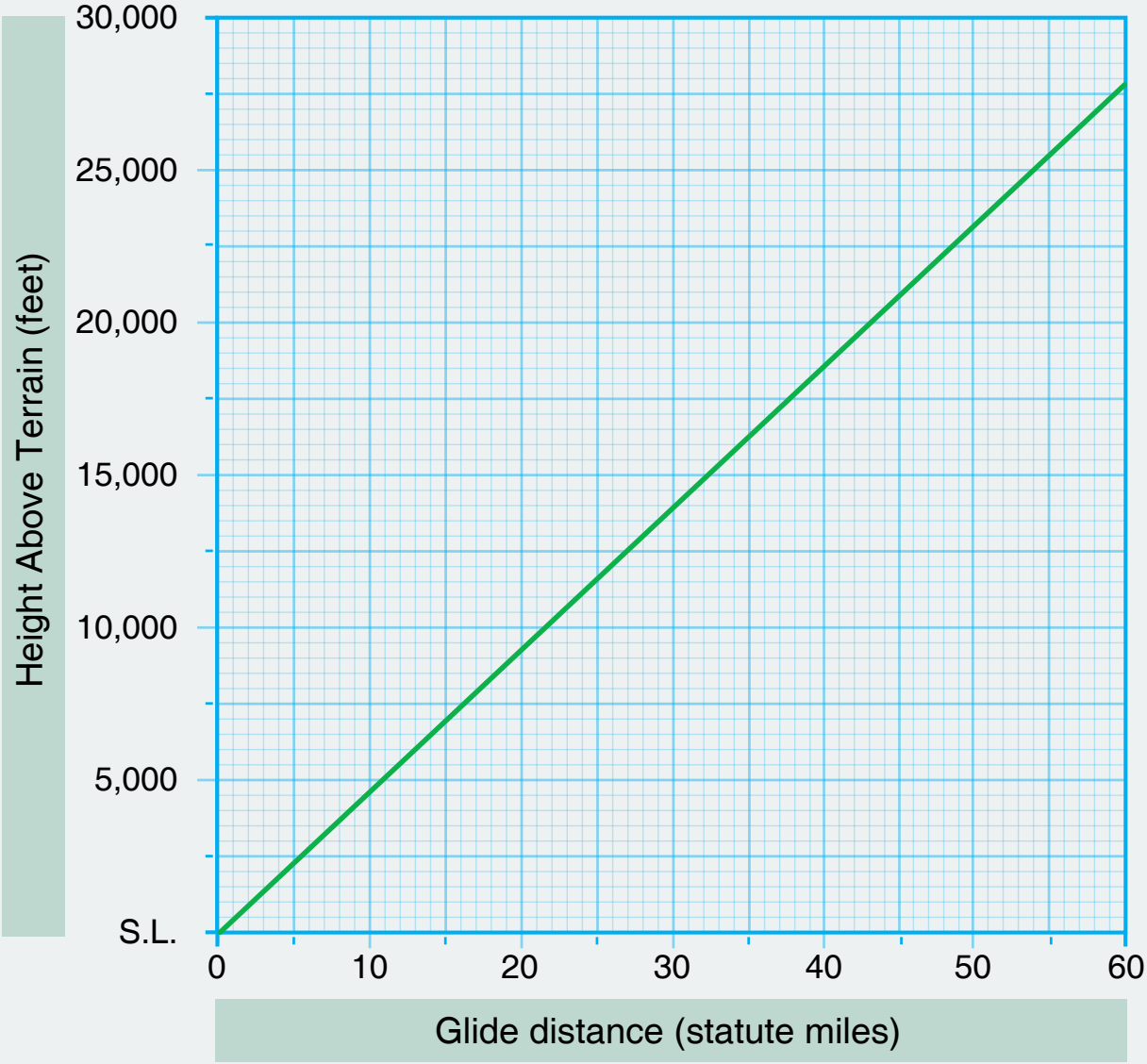



FIGURE 29.—Glide Distance Chart.

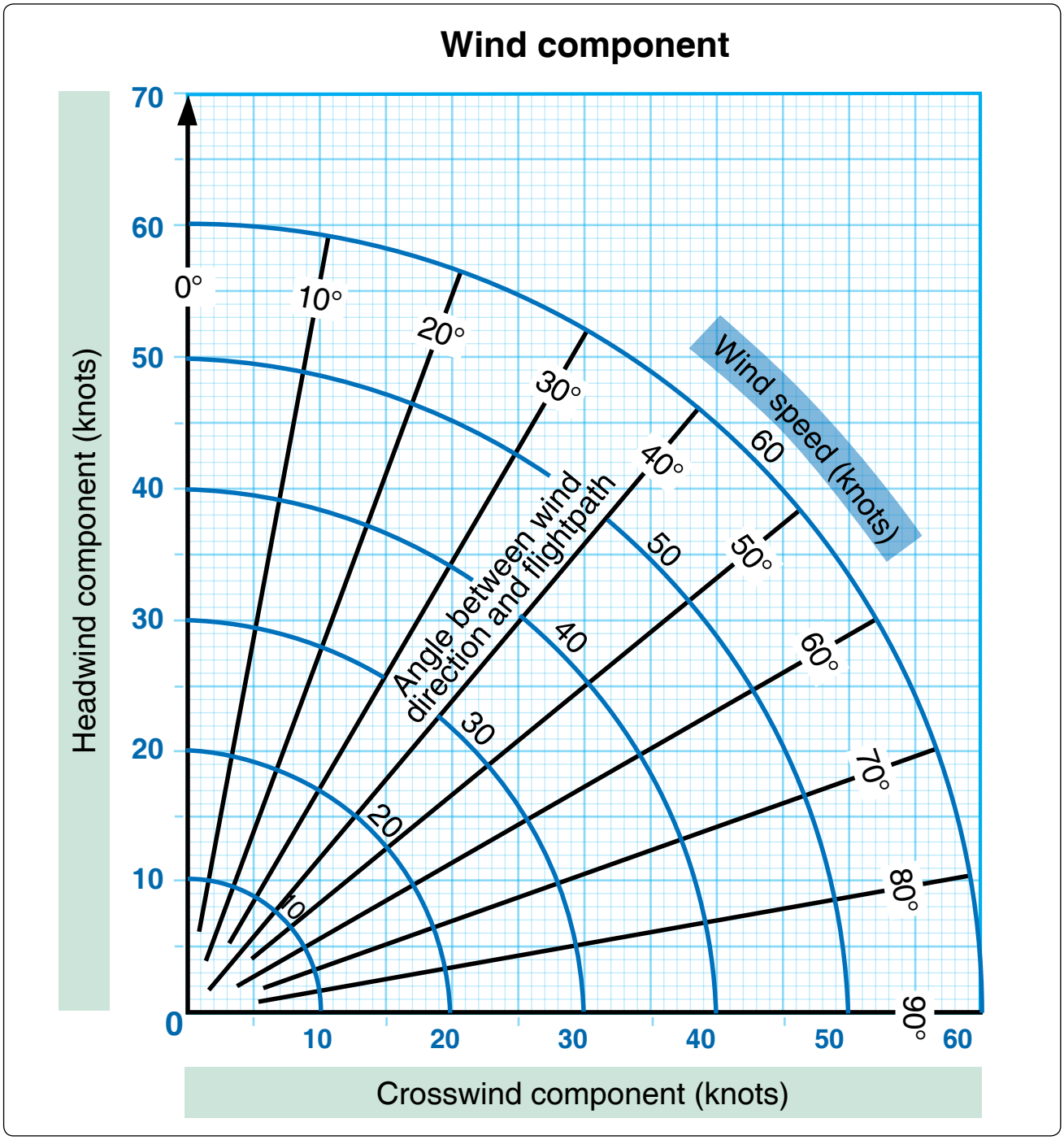



FIGURE 30.—Wind Component Chart.

## Landing distance

**Conditions:**

| | |
|---|---|
| Power | As required to maintain 800 ft/min descent on approach |
| Flaps | DOWN |
| Runway | PAVED, LEVEL, DRY SURFACE |
| Approach speed | IAS as TABULATED |
| **Note:** | Ground roll is approximately 53% of total landing distance over a 50-foot obstacle. |

**Example:**

OAT ..... 27 °C
Pressure altitude ..... 4000 feet
Landing weight ..... 3200 pounds
headwind ..... 10 knots

Total landing distance over a 50-foot obstacle ..... 1475 feet
Ground roll (53% of 1475) ..... 782 feet
IAS approach speed ..... 87 mph IAS

| Weight pounds | IAS approach speed (assumes zero instr. error) | |
|---|---|---|
| | mph | knots |
| 3400 | 90 | 78 |
| 3200 | 87 | 76 |
| 3000 | 84 | 73 |
| 2800 | 81 | 70 |
| 2600 | 78 | 68 |
| 2400 | 75 | 65 |

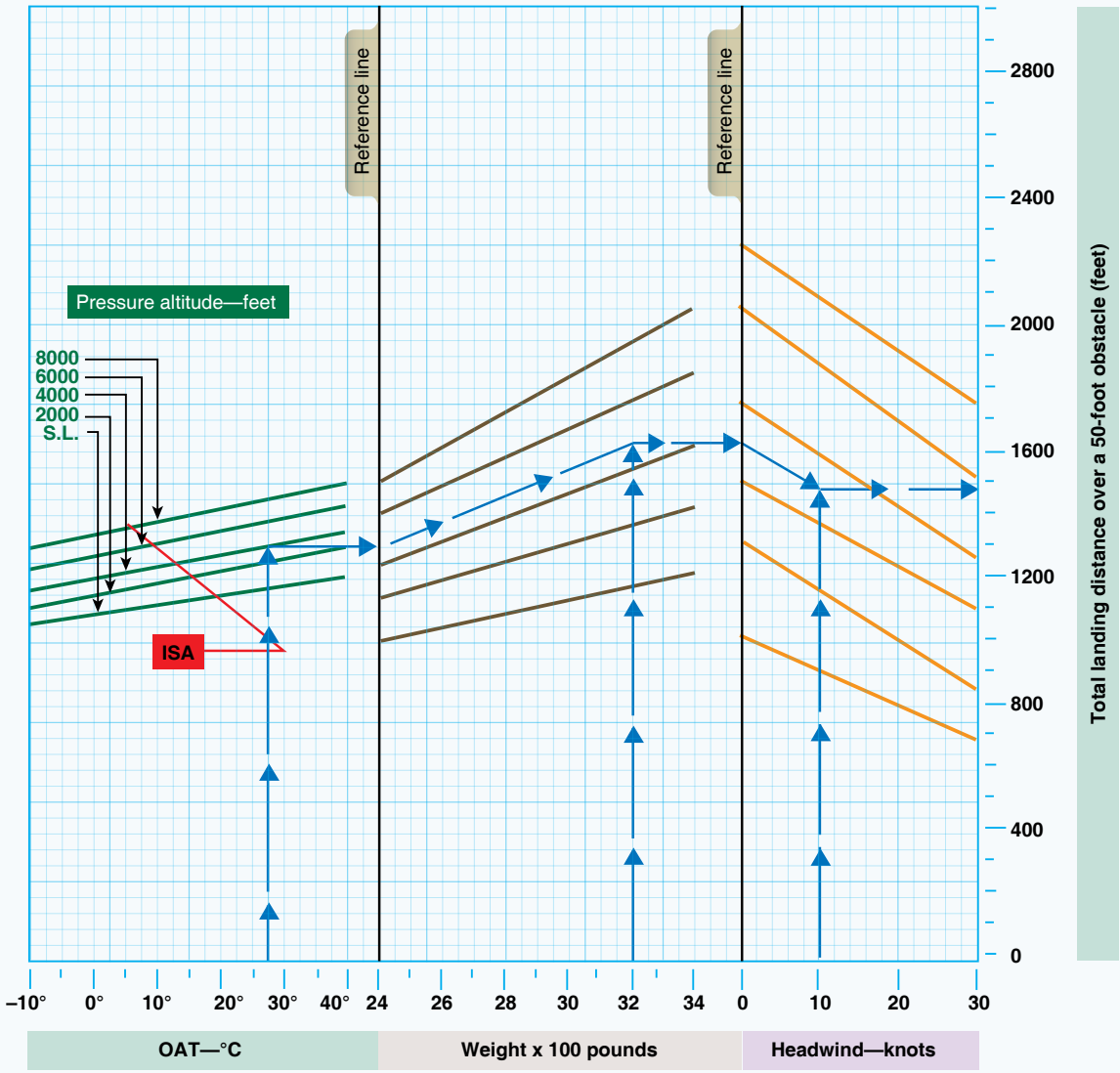



FIGURE 31.—Landing Distance Chart.

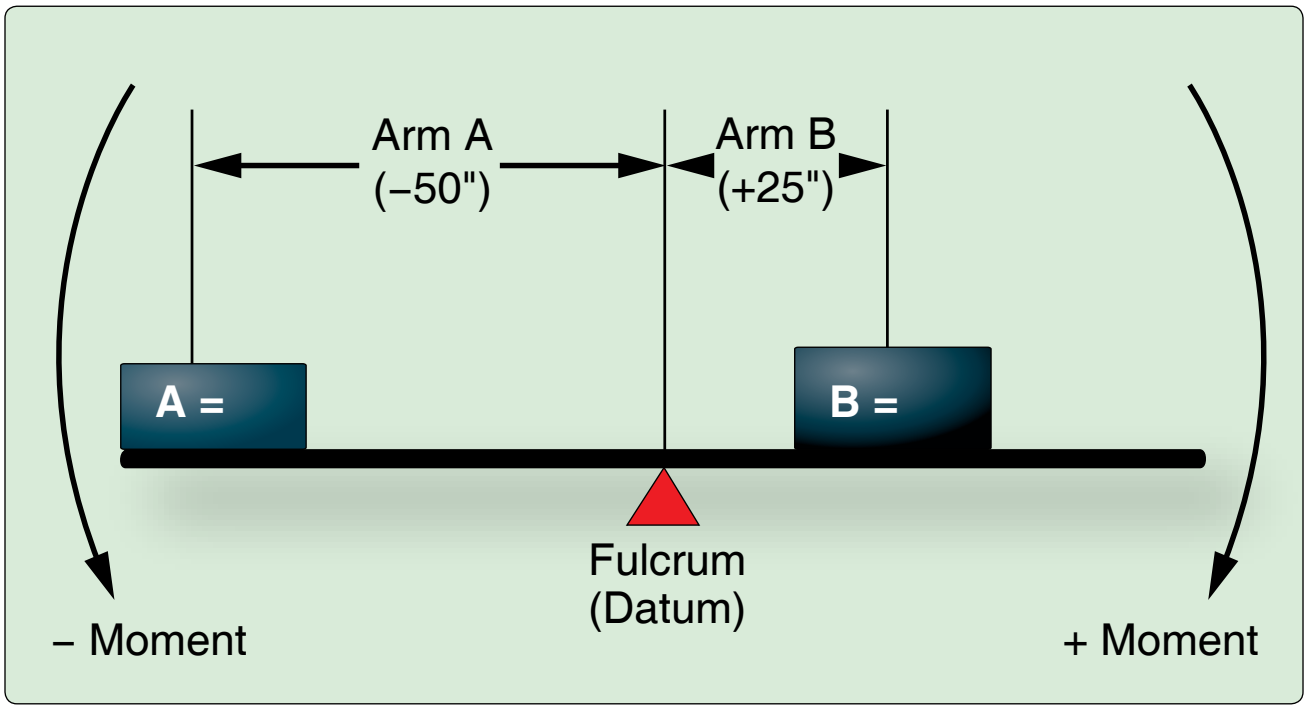



FIGURE 32.—The Law of the Lever.

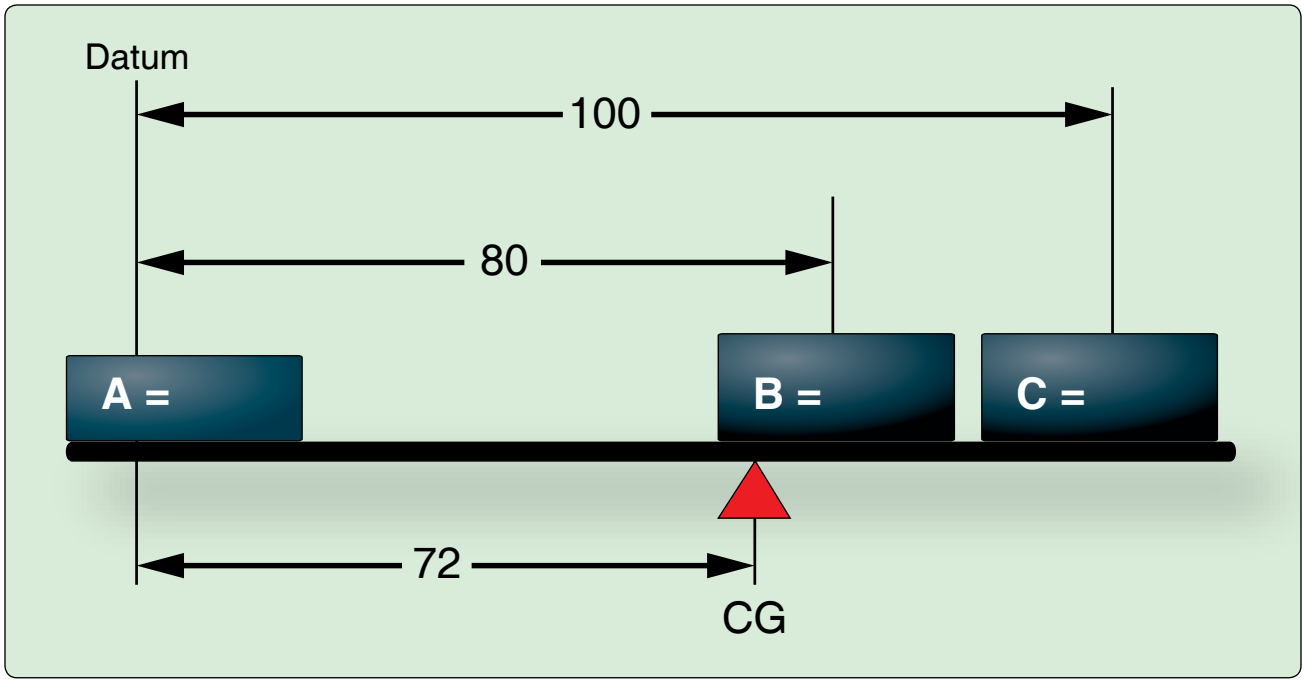



FIGURE 33.—Moving the CG of a Board by Shifting the Weights.

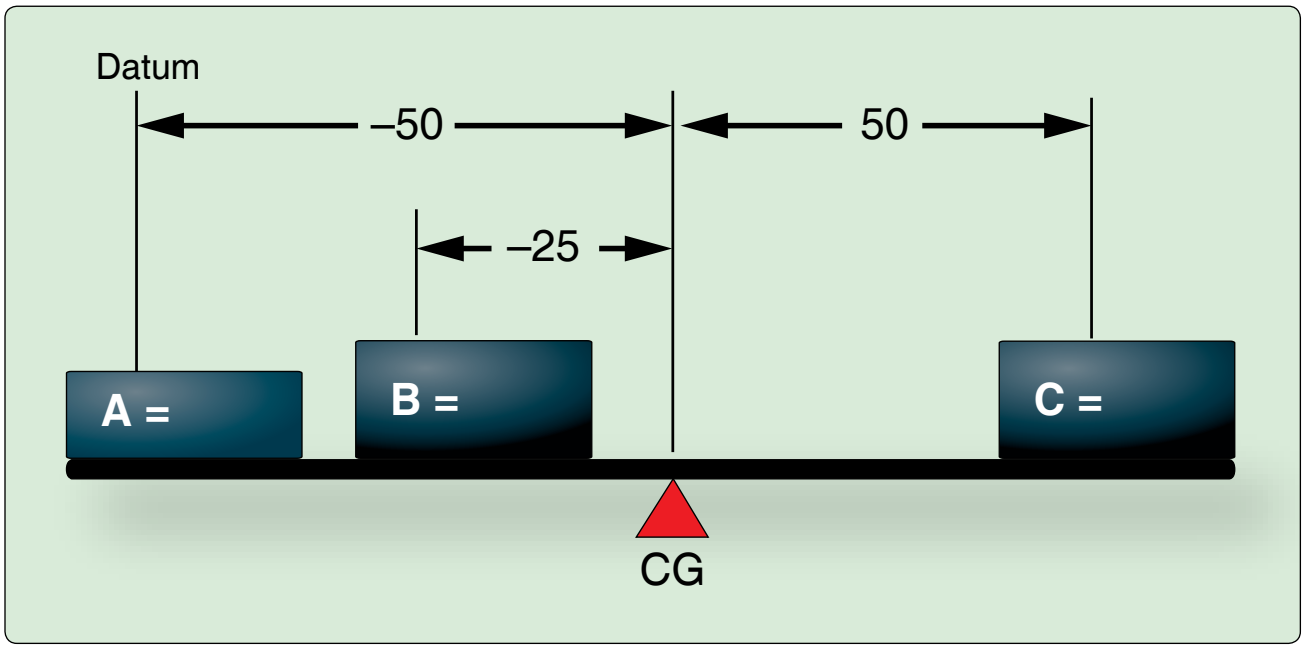



FIGURE 34.—Placement of Weight B to Cause the Board to Balance About Its Center.

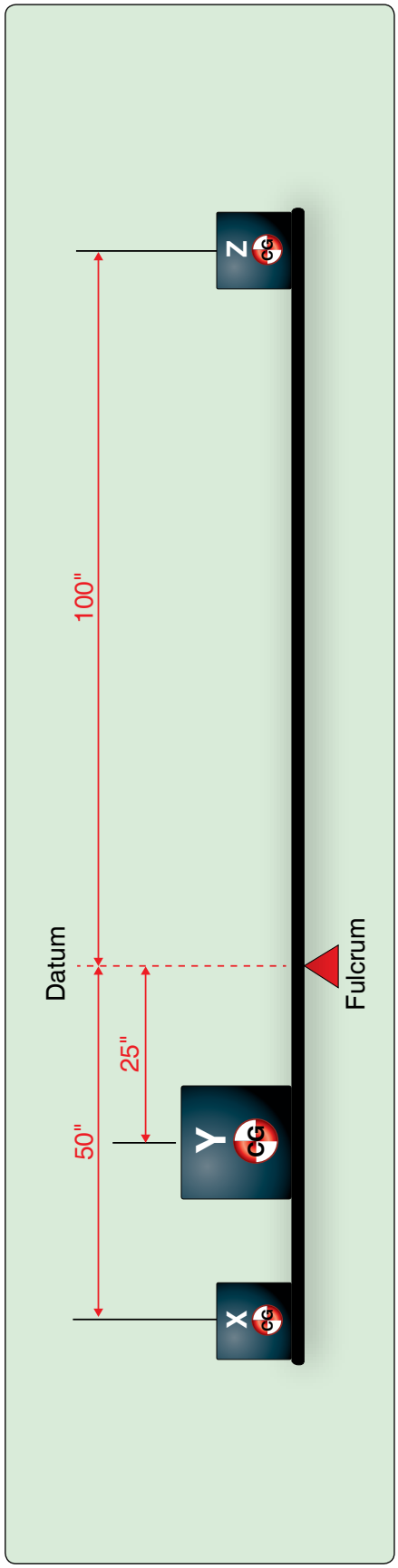



FIGURE 35.—Weight and Balance Diagram.

| Empty Weight Data | | |
|---|---|---|
| *Oil is included in empty weight | Empty Weight (pounds) | Empty Weight Moment (/100) |
| Certificated Weight | 2110 | 1652 |

| 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 | | | Fwd Position ARM 111 inches | Aft Position ARM 136 inches |
| Weight (pounds) | Moment (in-lb) | Weight (pounds) | 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 |

NOTE: All moments are equal to

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

**Gross Weight Moment Limits**

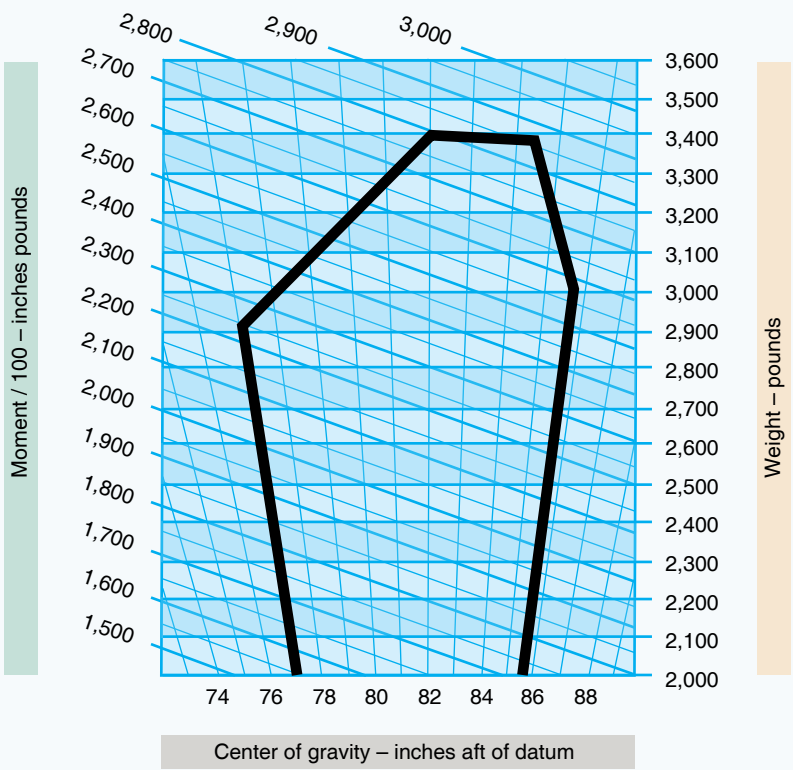



FIGURE 36.—Weight and Balance Chart.

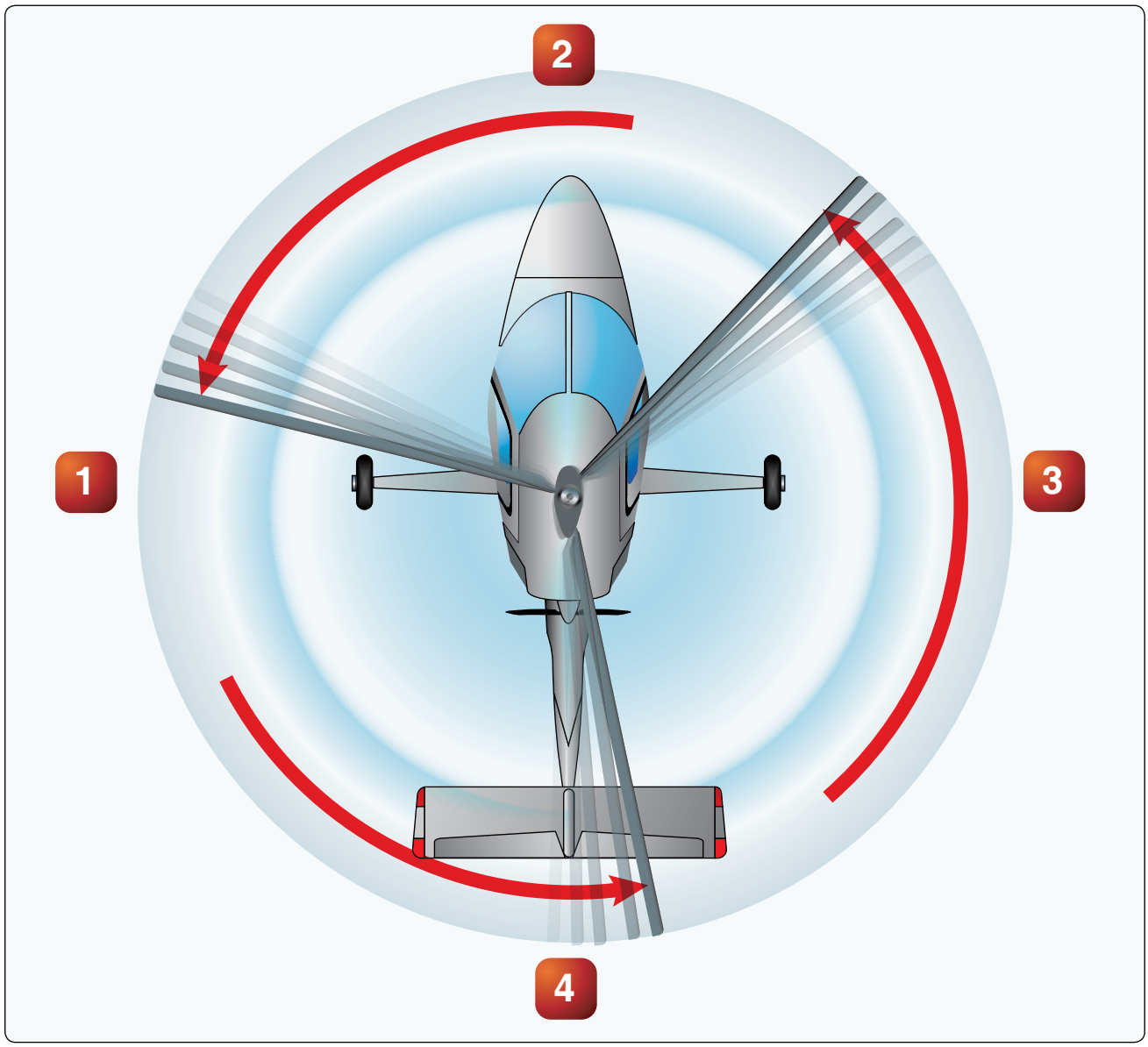



FIGURE 37.—Rotor Blade Positions.

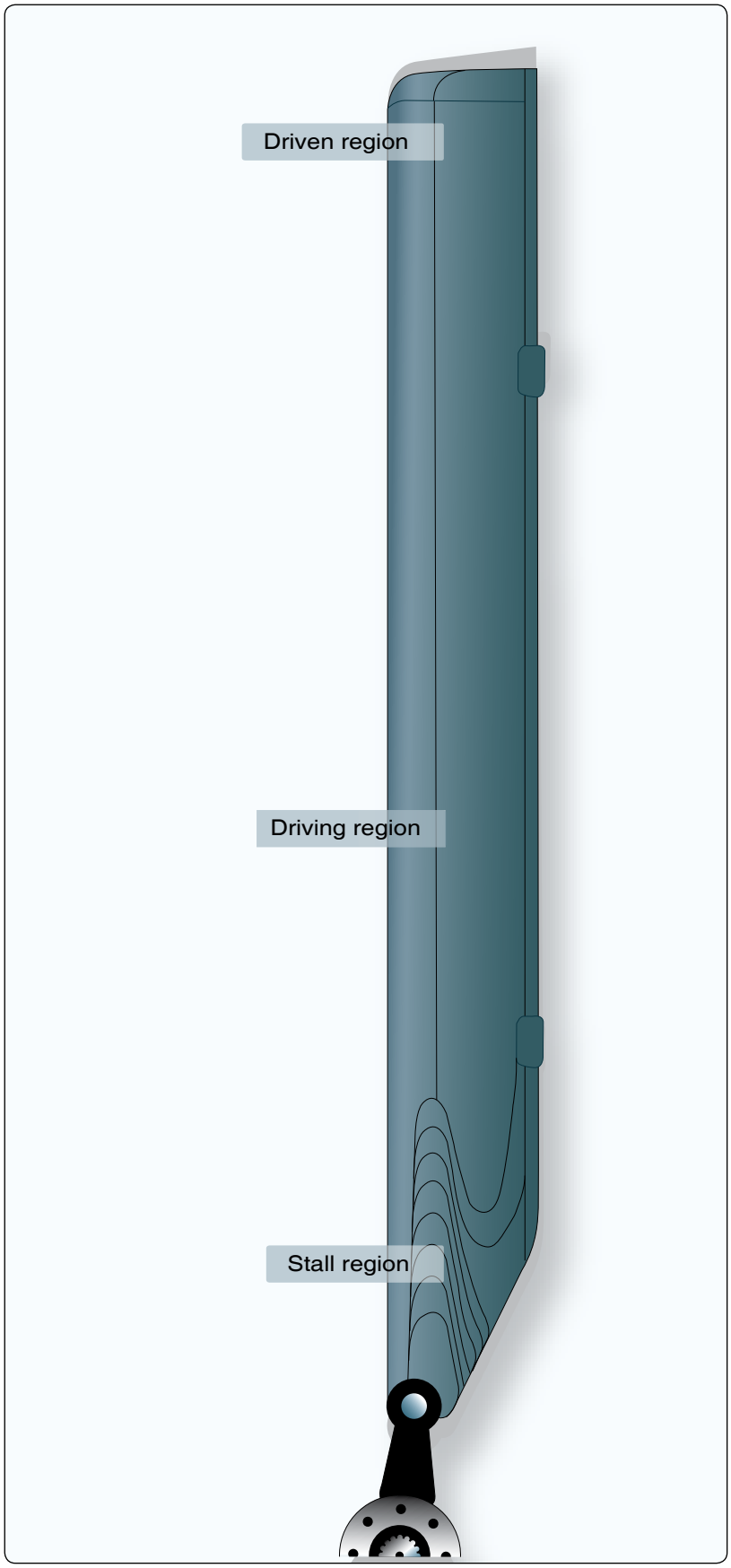



FIGURE 37A.—Rotor Blade.

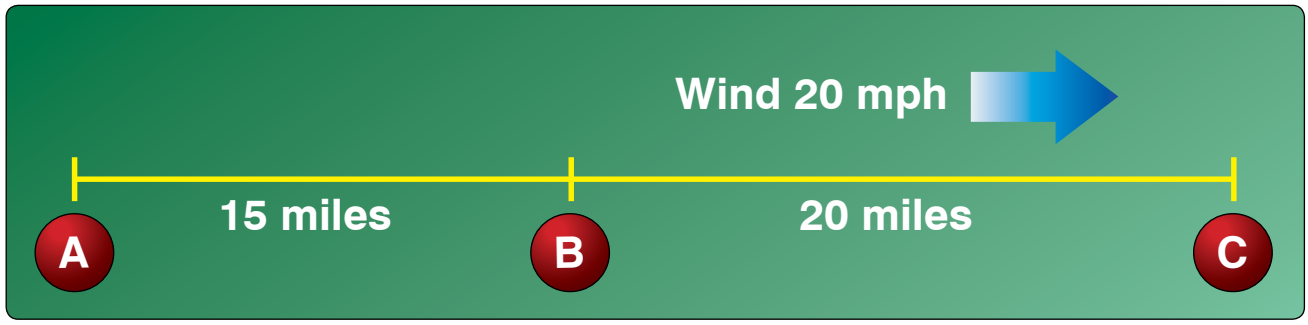



FIGURE 38.—Cross-Country.

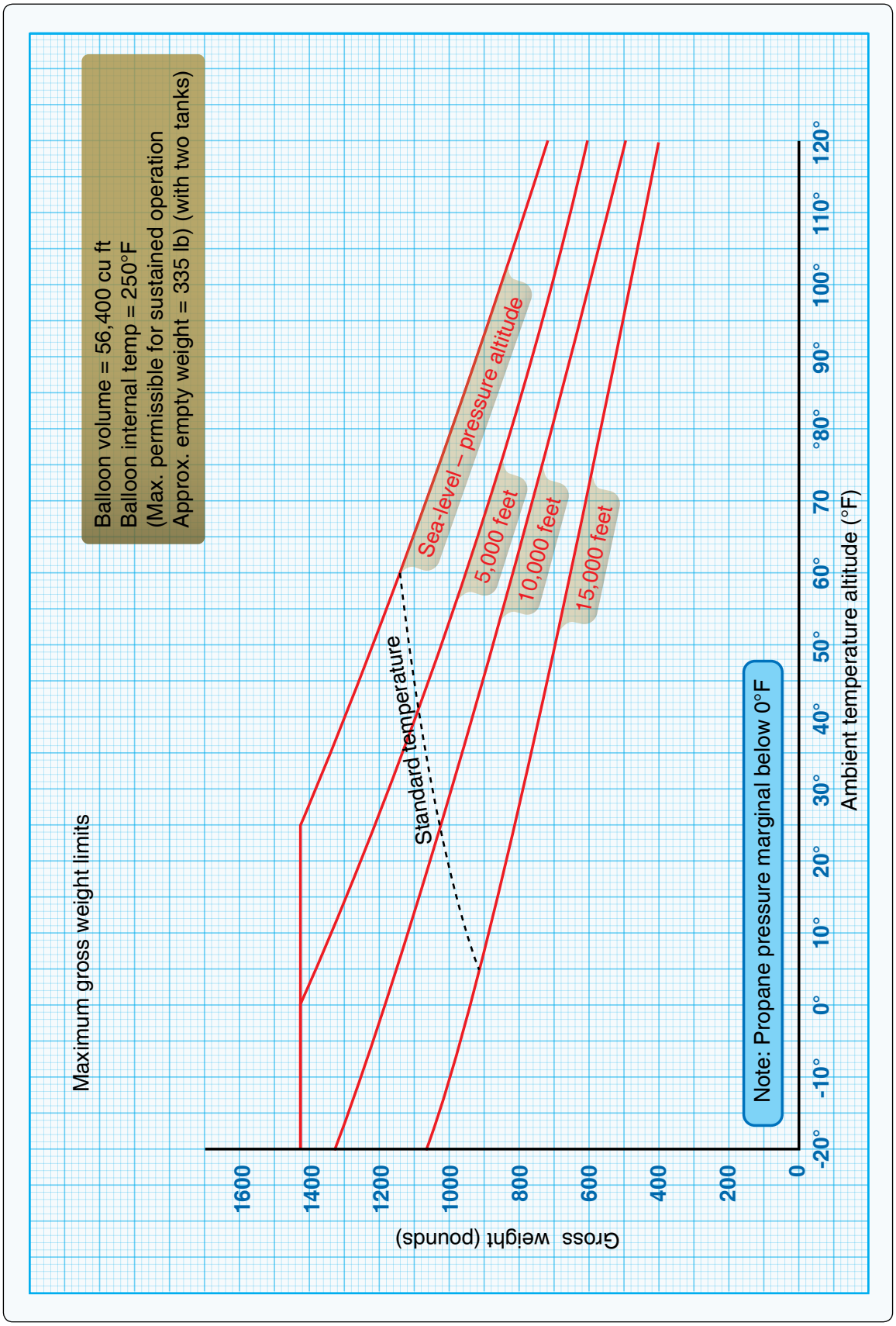



FIGURE 39.—Balloon Performance Graph.

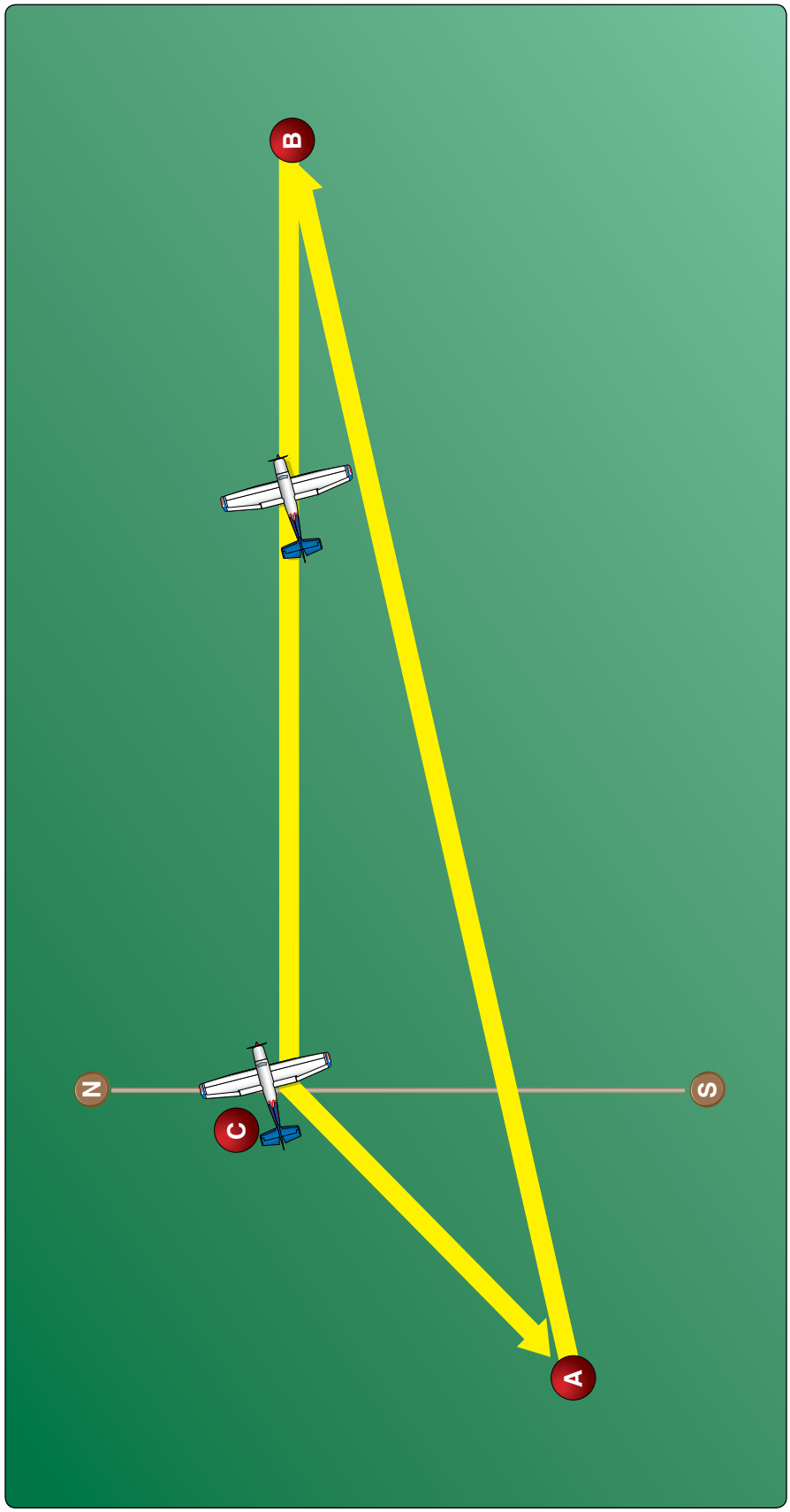



FIGURE 40.—Wind Triangle.

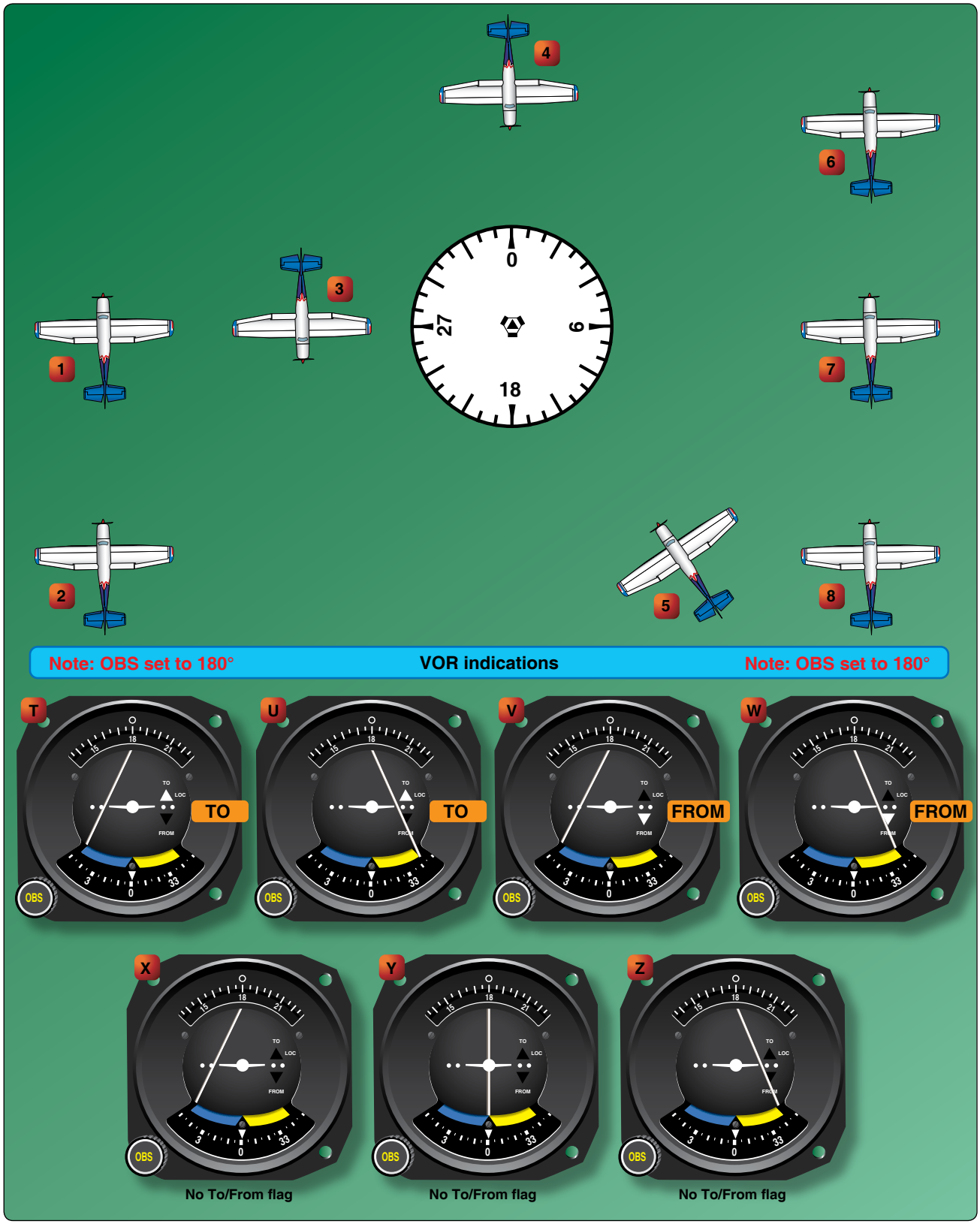



FIGURE 42.—VOR Indicators.

FIGURE 44.—Sectional Chart Excerpt.
*NOTE: Chart is not to scale and should not be used for navigation. Use associated scale.*

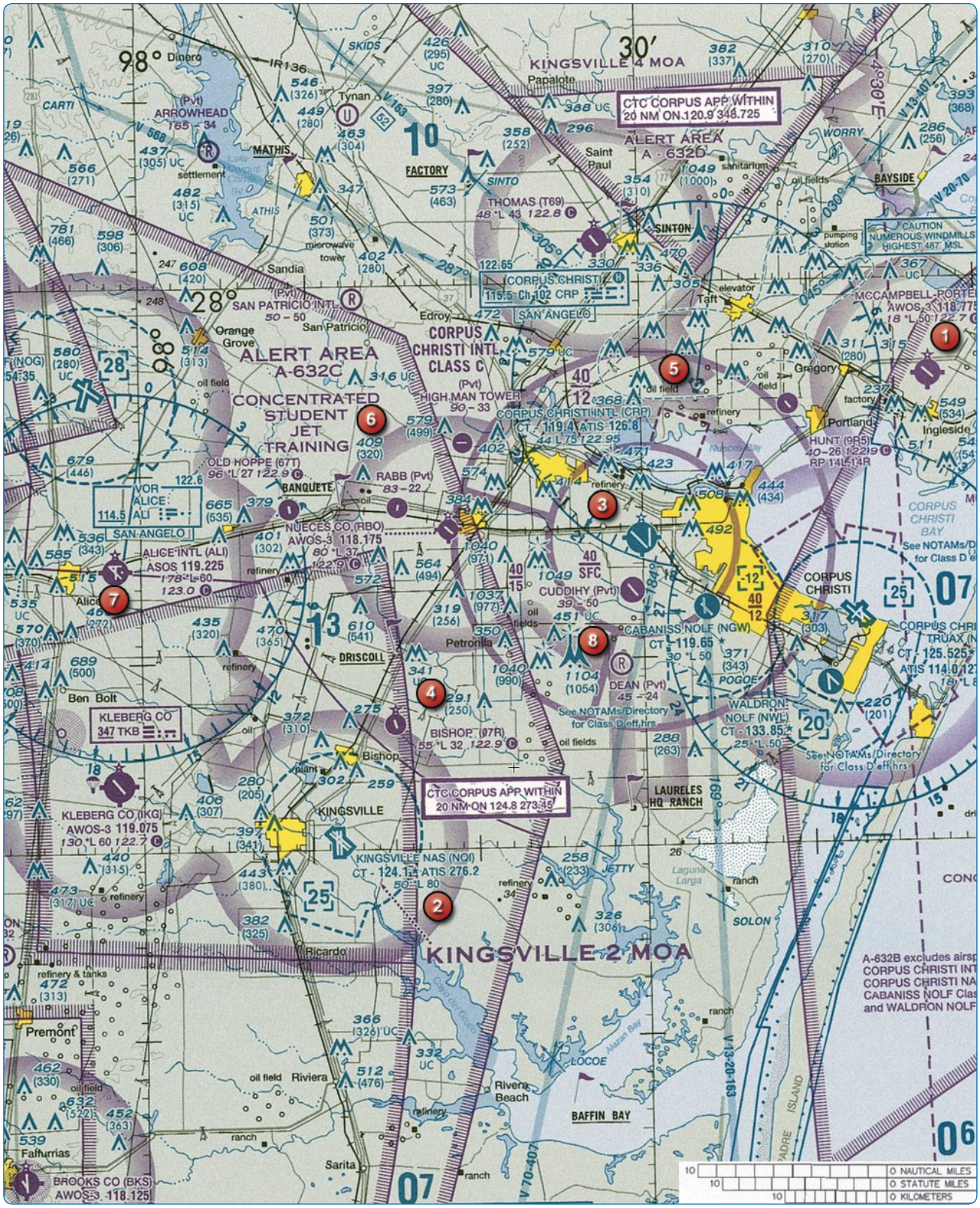



FIGURE 45.—Sectional Chart Excerpt.
*NOTE: Chart is not to scale and should not be used for navigation. Use associated scale.*

FIGURE 46.—Sectional Chart Excerpt.
*NOTE: Chart is not to scale and should not be used for navigation. Use associated scale.*

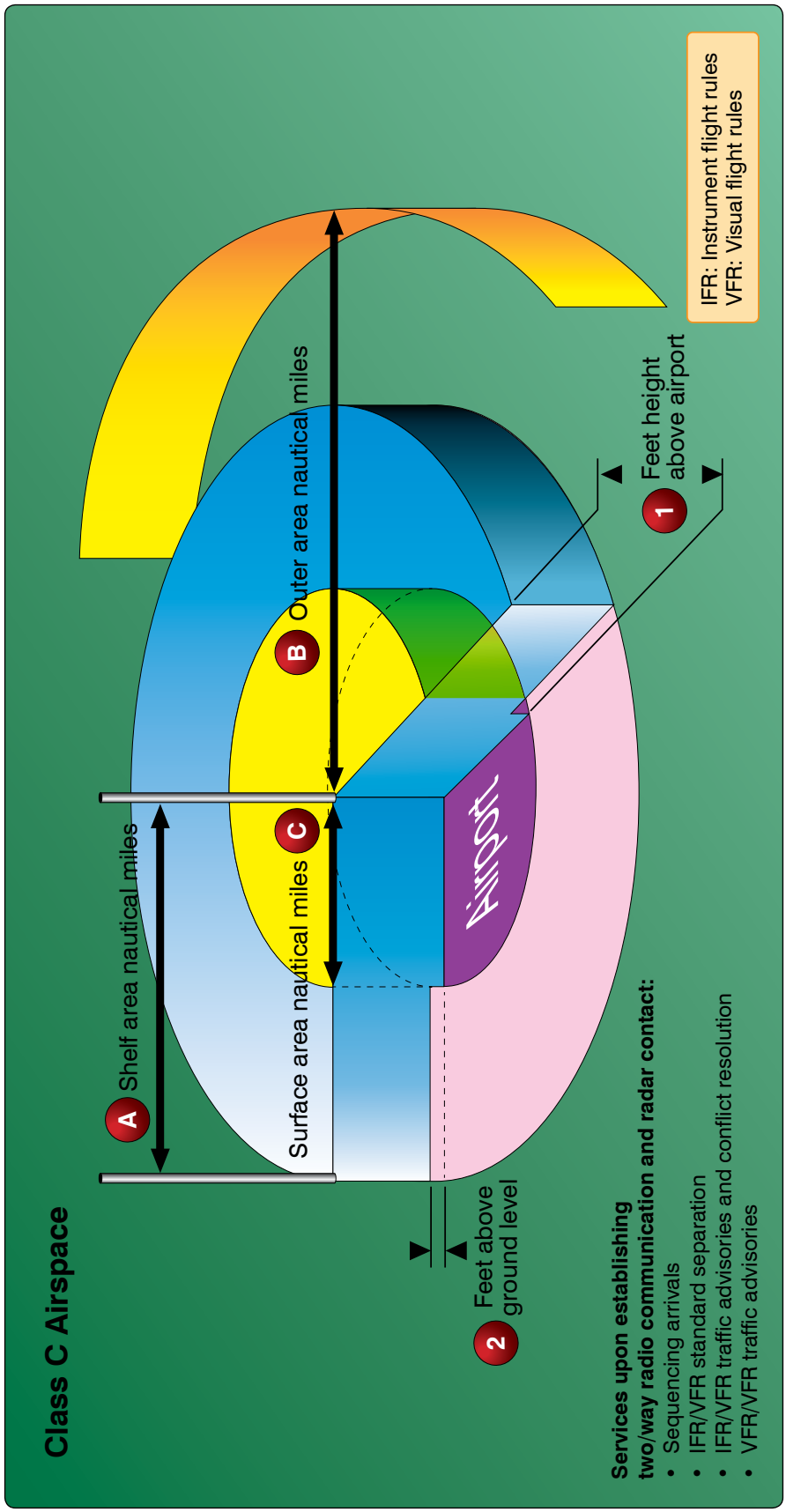



FIGURE 47.—Class C Airspace Diagram.

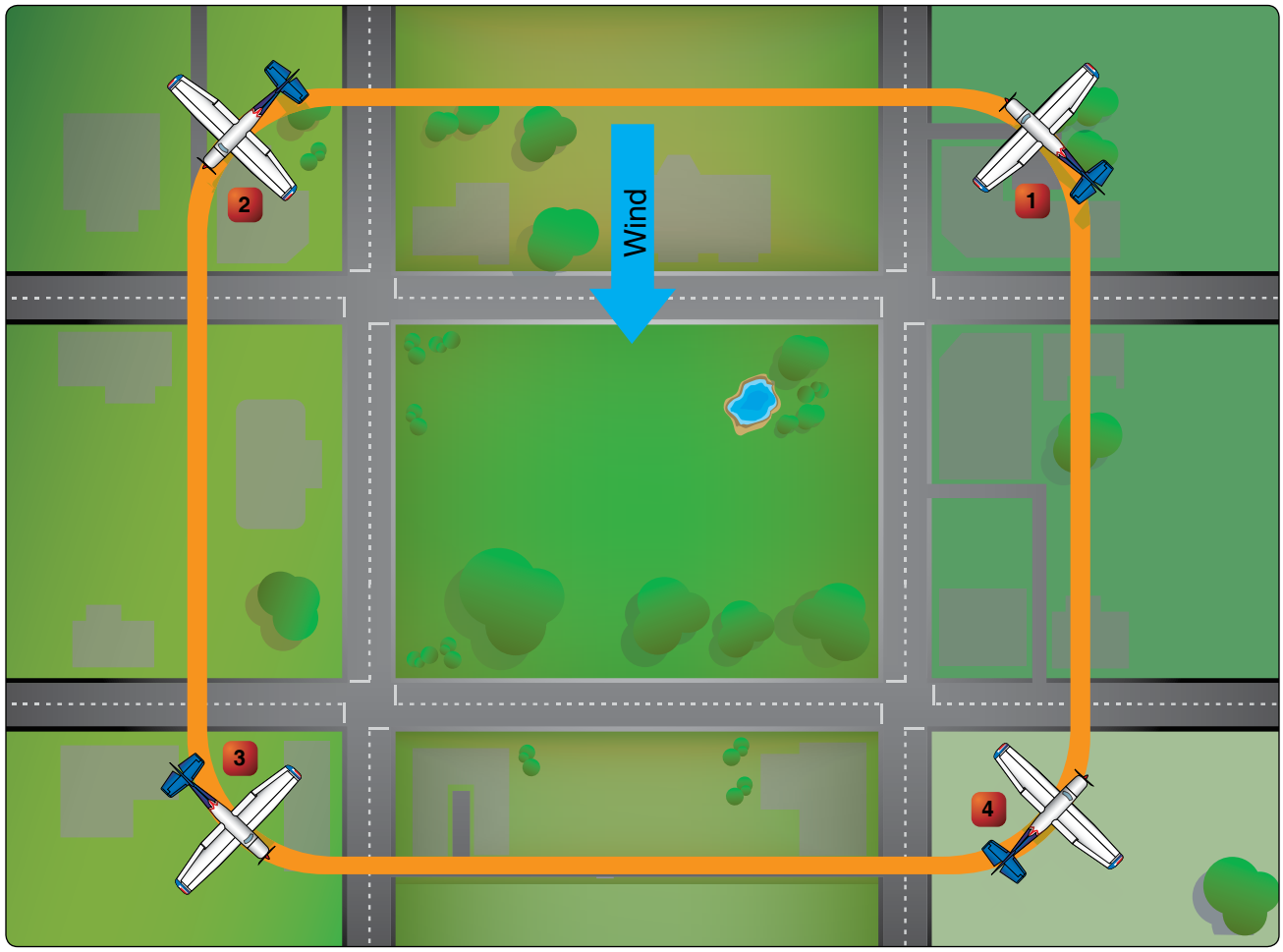



FIGURE 48.—Rectangular Course.

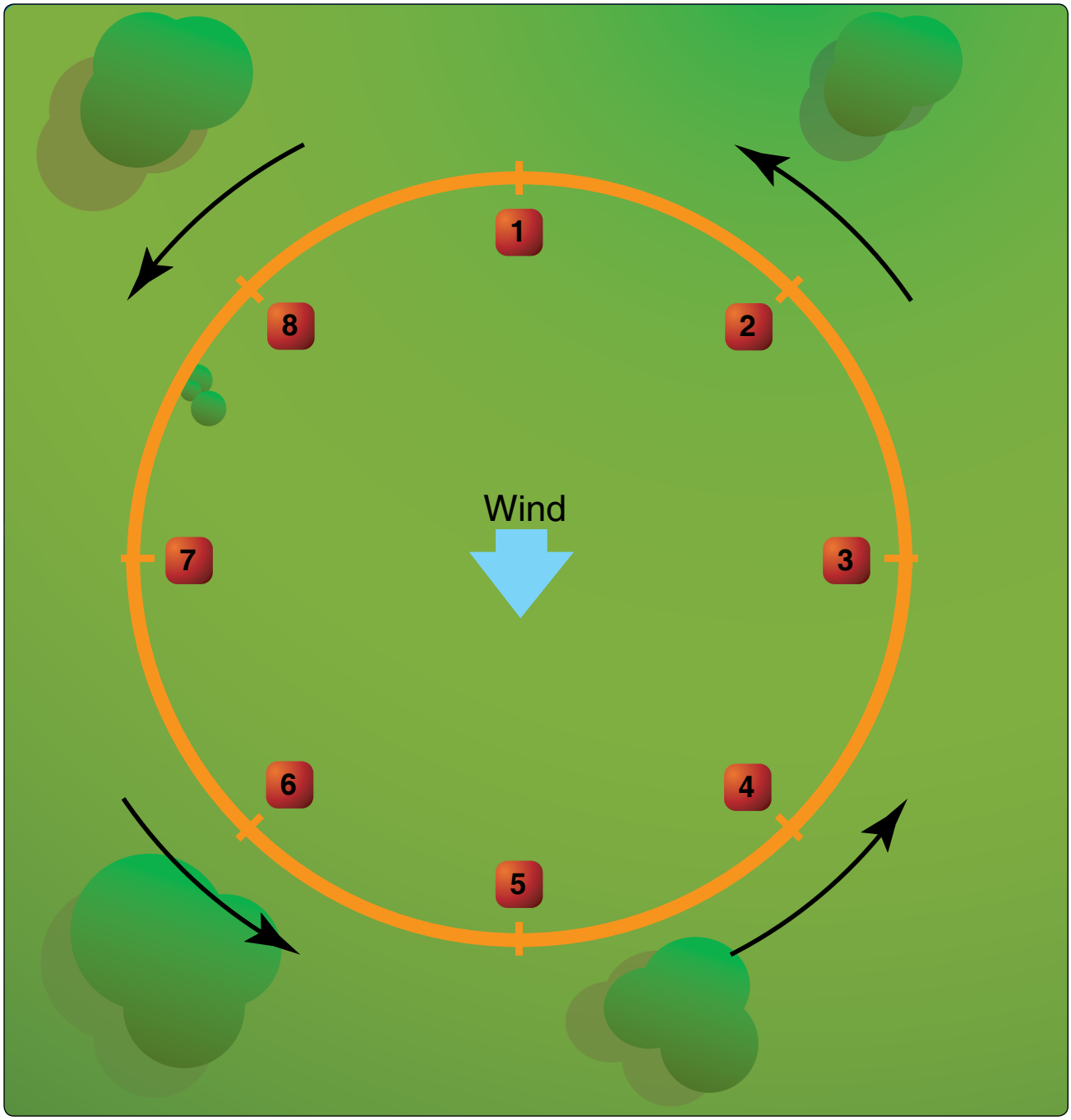



FIGURE 49.—Ground Track Maneuver Diagram.

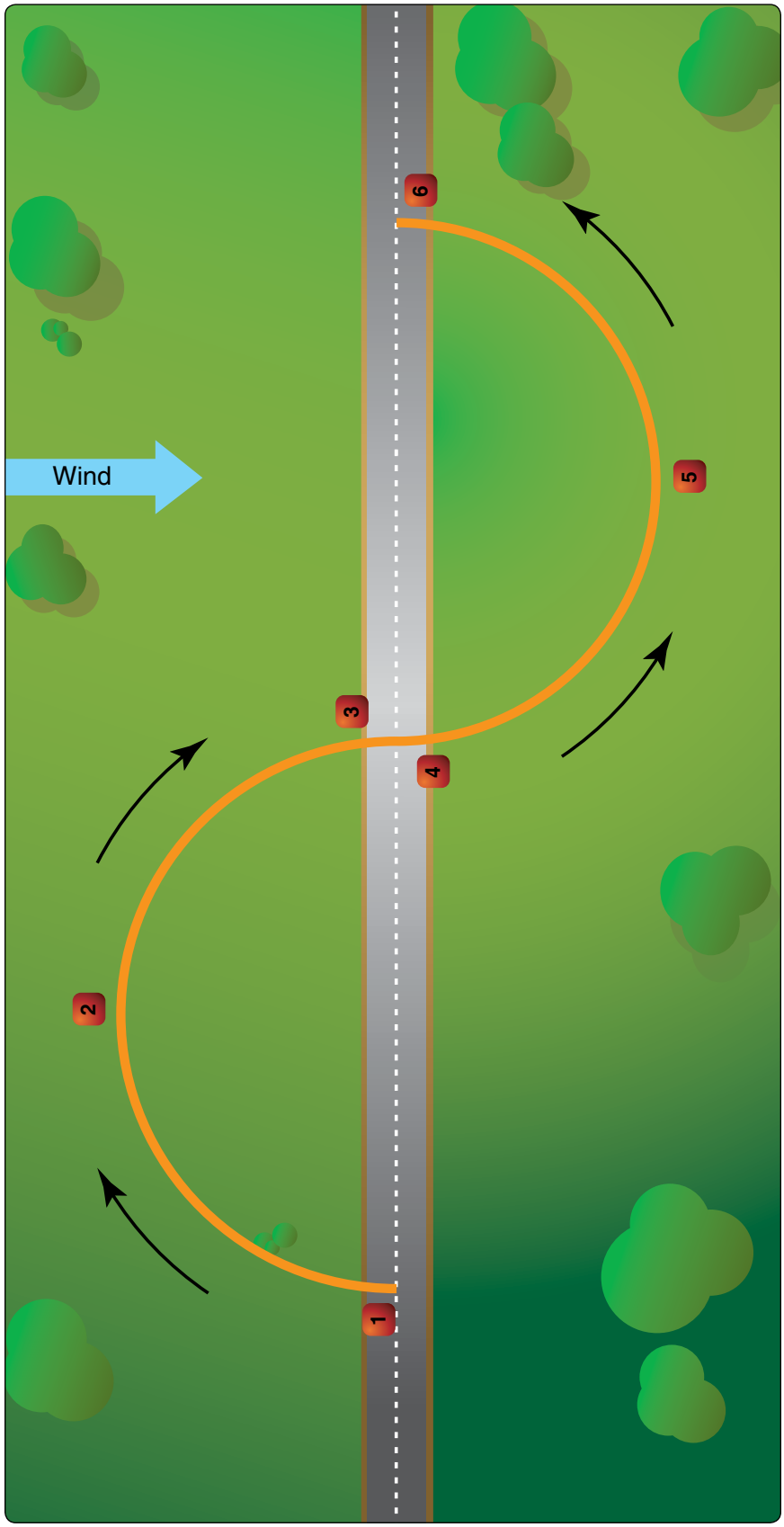



FIGURE 50.—S-Turn Diagram.

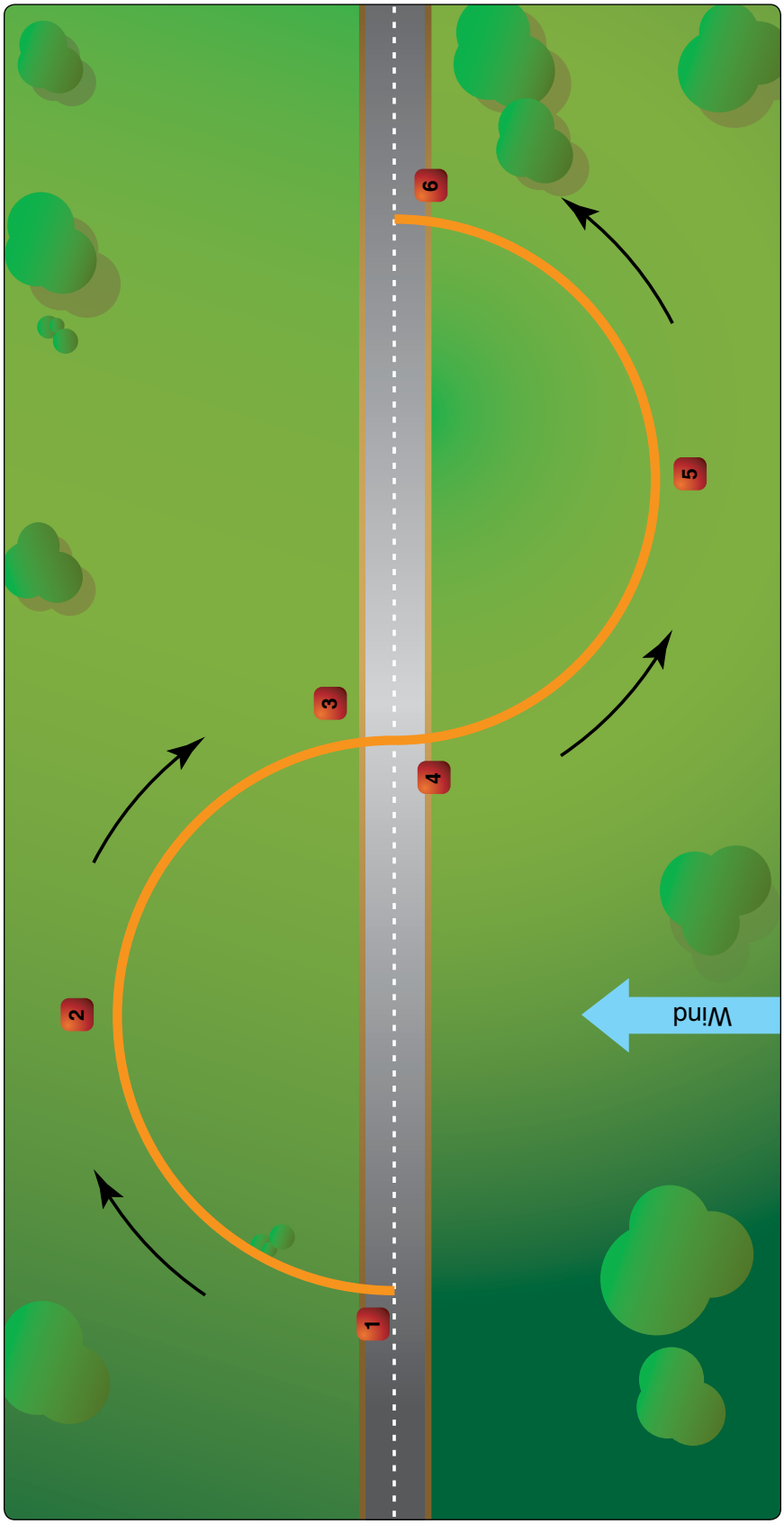



FIGURE 51.—S-Turn Diagram.

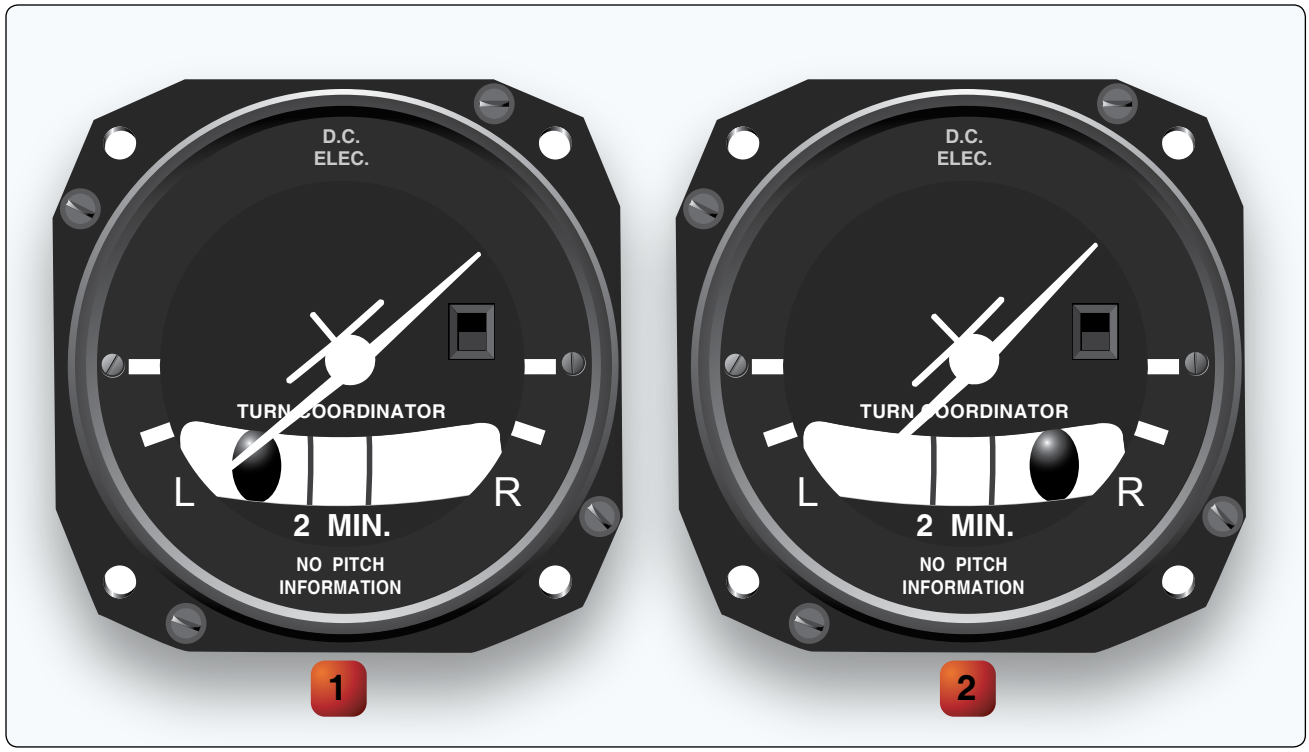



FIGURE 52.—Turn-and-Slip Indicators.

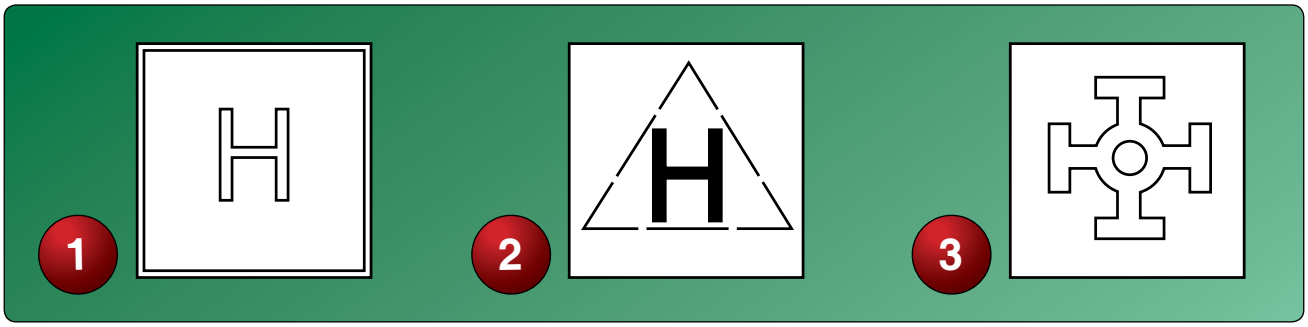



FIGURE 53.—Heliport Markings.

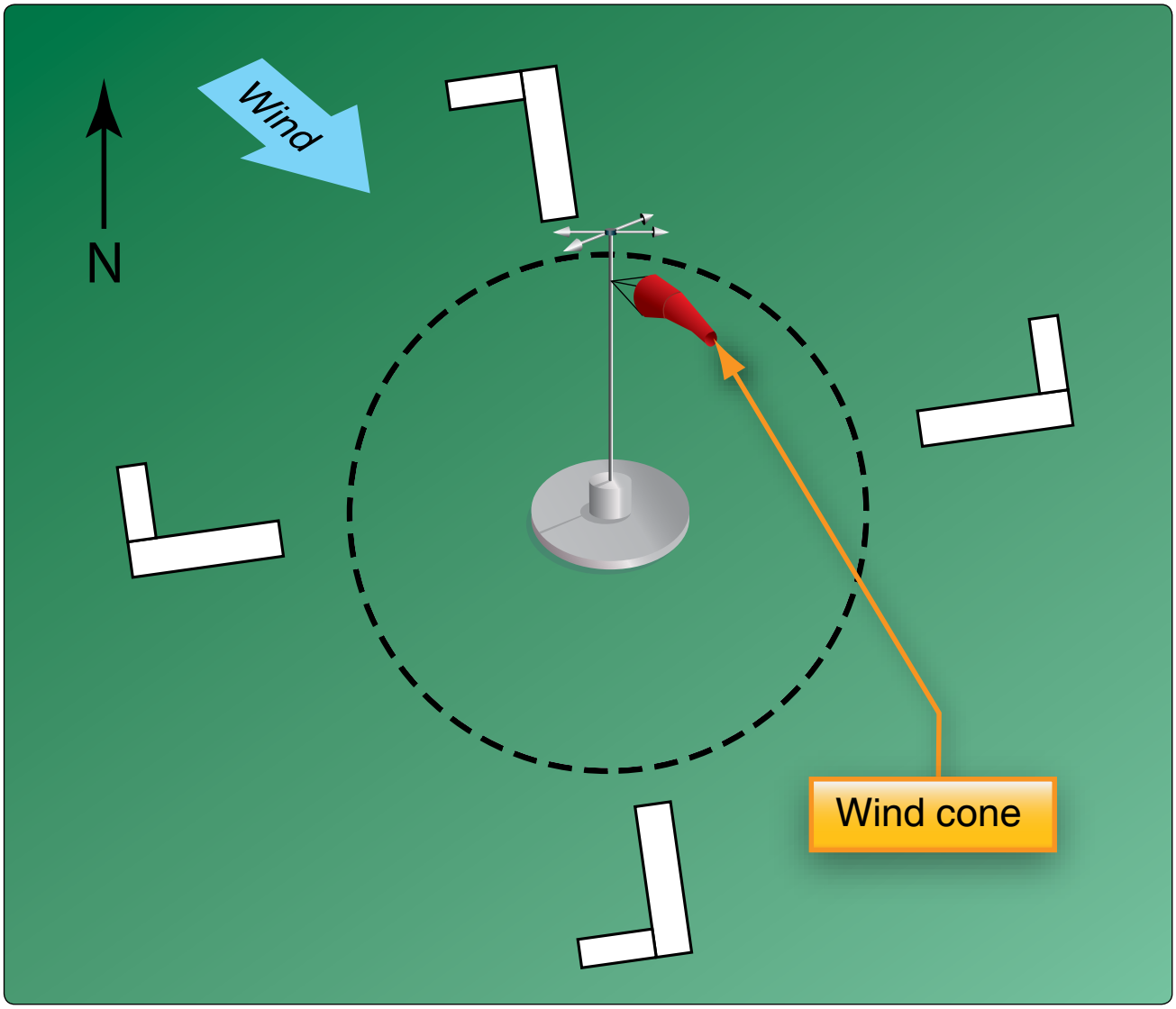



FIGURE 54.—Traffic Pattern Indicator.

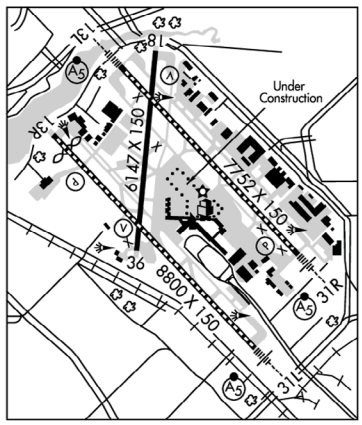
**DALLAS LOVE FLD** (DAL) 5 NW UTC−6(−5DT) N32°50.83′ W96°51.11′ **DALLAS–FT. WORTH COPTER H–6H, L–17C, A IAP, AD**

487 B S4 **FUEL** 100LL, JET A OX 1, 2, 3, 4 LRA Class I, ARFF Index B
NOTAM FILE DAL

**RWY 13R–31L:** H8800X150 (CONC–GRVD) S–100, D–200, 2S–175, 2D–350 HIRL CL
**RWY 13R:** PAPI(P4R)—GA 3.0° TCH 52′. Thld dsplcd 490′. Rgt tfc.
**RWY 31L:** MALSR. TDZL. Building.

**RWY 13L–31R:** H7752X150 (CONC–GRVD) S–100, D–200, 2S–175, 2D–350 HIRL CL
**RWY 13L:** MALSR. TDZL.
**RWY 31R:** MALSR. PAPI(P4L)—GA 3.0° TCH 49′. Pole. Rgt tfc.

**RWY 18–36:** H6147X150 (ASPH) S–50, D–74, 2S–93, 2D–138 HIRL
**RWY 18:** VASI(V4L)—GA 3.0° TCH 52′. Tree. Rgt tfc.
**RWY 36:** VASI(V4L)—GA 3.0° TCH 52′. REIL. Rgt tfc.




**RUNWAY DECLARED DISTANCE INFORMATION**

| | | | | |
|---|---|---|---|---|
| **RWY 13L:** | TORA–7752 | TODA–7752 | ASDA–7752 | LDA–7752 |
| **RWY 13R:** | TORA–8800 | TODA–8800 | ASDA–8800 | LDA–8310 |
| **RWY 18:** | TORA–6147 | TODA–6147 | ASDA–6147 | LDA–6147 |
| **RWY 31L:** | TORA–8800 | TODA–8800 | ASDA–8000 | LDA–8000 |
| **RWY 31R:** | TORA–7752 | TODA–7752 | ASDA–7752 | LDA–7752 |
| **RWY 36:** | TORA–6147 | TODA–6147 | ASDA–6147 | LDA–6147 |

**AIRPORT REMARKS:** Attended continuously. Birds on and invof arpt. Ldg Rwy 18 & takeoff Rwy 36 not authorized to acft over 60,000 lbs gross weight unless crosswind NW–SE rwys exceed acft safe operating capability. Rwy 13R, 13L, 31L and Rwy 31R runway visual range touchdown avbl. Noise sensitive areas all quadrants, noise abatement procedures in effect for fixed and rotary wing tfc, for information call arpt ops 214–670–6610. Private pilot certificate or better required to takeoff or land. No student solo flights permitted. Twy K clsd thru traffic. Twy L clsd indef. PAPI Rwy 31R unusable byd 7° either side of centerline. Flight Notification Service (ADCUS) available.

**WEATHER DATA SOURCES:** ASOS (214) 904–0251.

**COMMUNICATIONS: D–ATIS** 120.15 (214) 358–5355 **UNICOM** 122.95
**DALLAS RCO** 122.3 (FORT WORTH RADIO)
Ⓡ **RGNL APP CON** 125.2 (South) 124.3 (North)
**LOVE TOWER** 123.7 118.7 **GND CON** 121.75 **CLNC DEL** 127.9
Ⓡ **RGNL DEP CON** 124.3 (North Props) 125.2 (South Props) 125.125 118.55 (Turbojets)

**AIRSPACE: CLASS B** See VFR Terminal Area Chart.

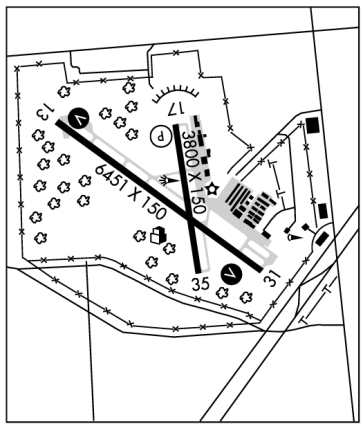
**RADIO AIDS TO NAVIGATION:** NOTAM FILE FTW.
**COWBOY (H) VORW/DME** 116.2 CVE Chan 109 N32°53.42′ W96°54.24′ 128° 3.7 NM to fld. 450/6E.
**ILS/DME** 111.5 I–DAL Chan 52 Rwy 13L. Class IT. LOC unusable byd 20° right of centerline.
**ILS/DME** 111.1 I–DPX Chan 48 Rwy 13R. Class IT. LOC unusable beyond 25° right side of course.
**ILS/DME** 111.1 I–LVF Chan 48 Rwy 31L. Class IB. LOC unusable byd 20° right of course.
**ILS/DME** 111.5 I–OVW Chan 52 Rwy 31R. Class IE. Glide slope unusable for coupled apchs blo 636′ MSL.

**DALLAS EXECUTIVE** (RBD) 6 SW UTC−6(−5DT) N32°40.85′ W96°52.09′ **DALLAS–FT. WORTH COPTER H–6H, L–17C, A IAP, AD**

660 B S4 **FUEL** 100LL, JET A OX 1, 2 NOTAM FILE RBD

**RWY 13–31:** H6451X150 (ASPH–CONC) S–35, D–60, 2D–110 MIRL
**RWY 13:** REIL. VASI(V4L)—GA 3.0° TCH 50′. Trees.
**RWY 31:** LDIN. VASI(V4L)—GA 3.0° TCH 47′. Road.

**RWY 17–35:** H3800X150 (ASPH–CONC) S–35, D–60, 2D–110 MIRL
**RWY 17:** REIL. PAPI(P4R)—GA 3.0° TCH 43′. Tree.
**RWY 35:** REIL. Tree.




**AIRPORT REMARKS:** Attended 1400–2300Z‡. 24 hr FBO. Fuel avbl 24 hr with major credit card. Birds on and invof arpt. Asphalt at rwy intersection. When twr closed ACTIVATE LDIN Rwy 31 and VASI Rwy 13 and Rwy 31–CTAF. PAPI Rwy 17 opr continuously.

**WEATHER DATA SOURCES:** ASOS (214) 330–5317. LAWRS.

**COMMUNICATIONS: CTAF** 127.25 **ATIS** 126.35 **UNICOM** 122.95
Ⓡ **RGNL APP/DEP CON** 125.2
**EXECUTIVE TOWER** 127.25 (1300–0300Z‡) **GND CON** 119.475
**CLNC DEL** 118.625

**AIRSPACE: CLASS D** svc 1300–0300Z‡ other times CLASS G.

**RADIO AIDS TO NAVIGATION:** NOTAM FILE FTW.
**MAVERICK (H) VORW/DME** 113.1 TTT Chan 78 N32°52.15′ W97°02.43′ 136° 14.3 NM to fld. 540/6E.
**ILS** 108.5 I–RBD Rwy 31. Class IE. Unmonitored when tower closed.

FIGURE 55.—Chart Supplements U.S. (formerly Airport/Facility Directory).

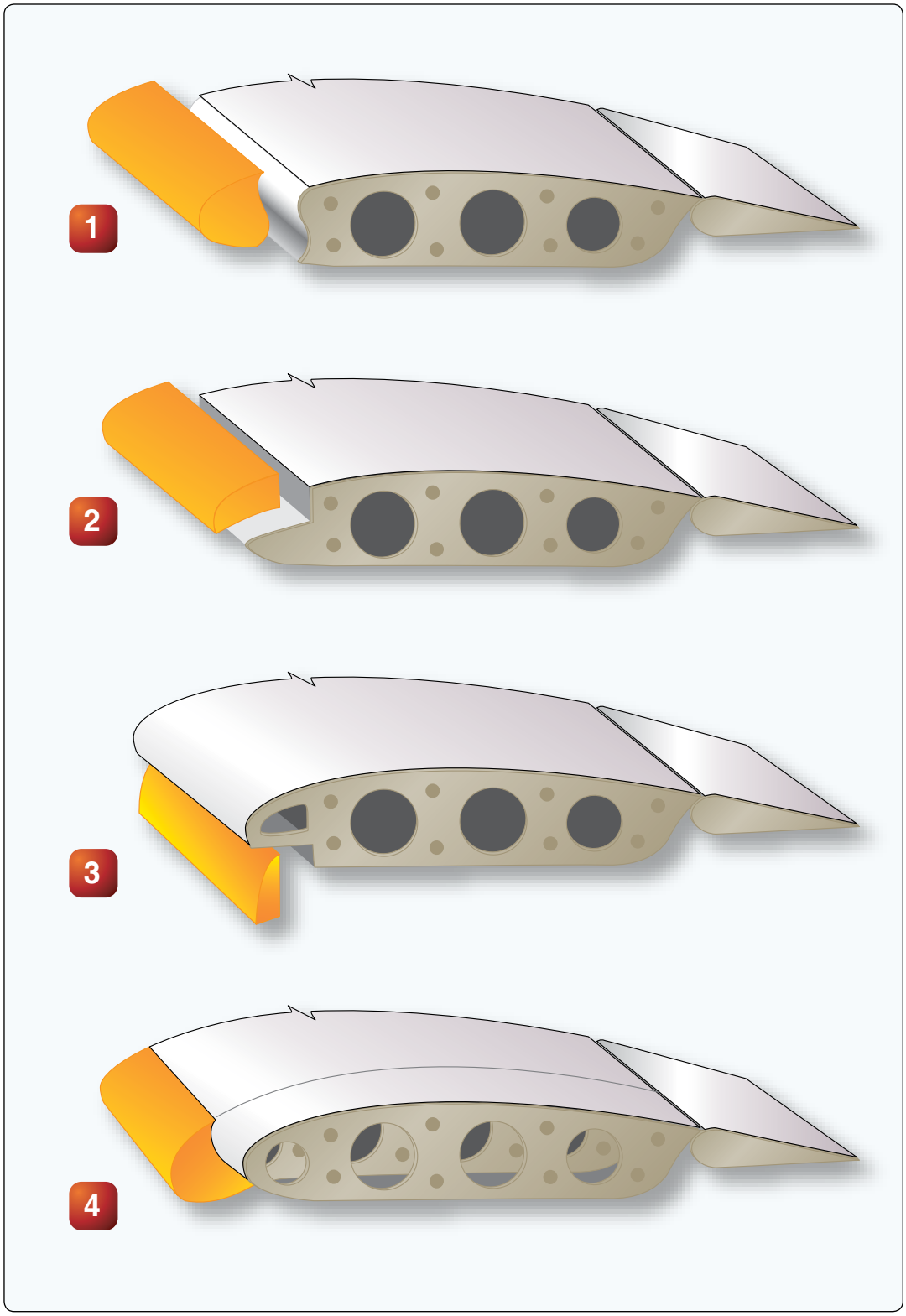
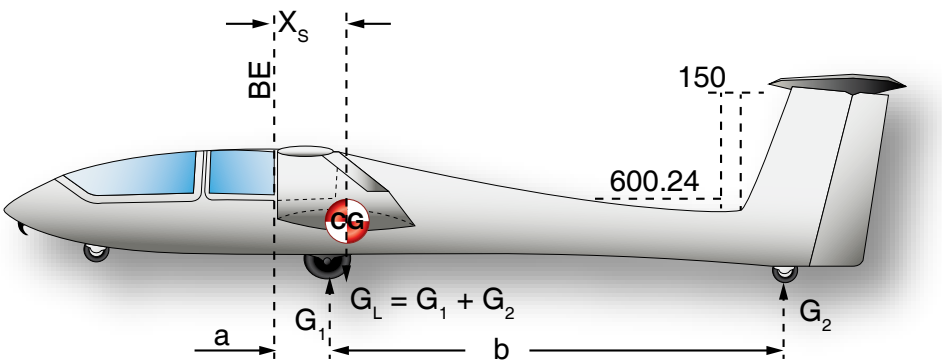



FIGURE 56.—Leading Edge High Lift Devices.

| Empty Weight | | Range of CG behind Datum | | | |
|---|---|---|---|---|---|
| | | Forward | | Aft | |
| kg | lbs | mm | inches | mm | inches |
| 360 | 794 | 758 | 29.84 | 773 | 30.43 |
| 365 | 805 | 748 | 29.45 | 769 | 30.28 |
| 370 | 816 | 739 | 29.09 | 765 | 30.12 |
| 375 | 827 | 729 | 28.70 | 761 | 29.96 |
| 380 | 838 | 720 | 28.35 | 757 | 29.80 |
| 385 | 849 | 711 | 27.99 | 753 | 29.65 |
| 390 | 860 | 703 | 27.68 | 749 | 29.49 |
| 395 | 871 | 694 | 27.32 | 745 | 29.33 |
| 400 | 882 | 686 | 27.01 | 742 | 29.21 |

The weight of the non-lifting parts is the sum of the fuselage, tailplane, and maximum load in the fuselage and must not exceed 400 kgs (882 lbs). Otherwise, the maximum load permitted in the fuselage must be correspondingly decreased.




Datum Line: Front edge of the wing at the root rib.

FIGURE 57.—Glider Center of Gravity.

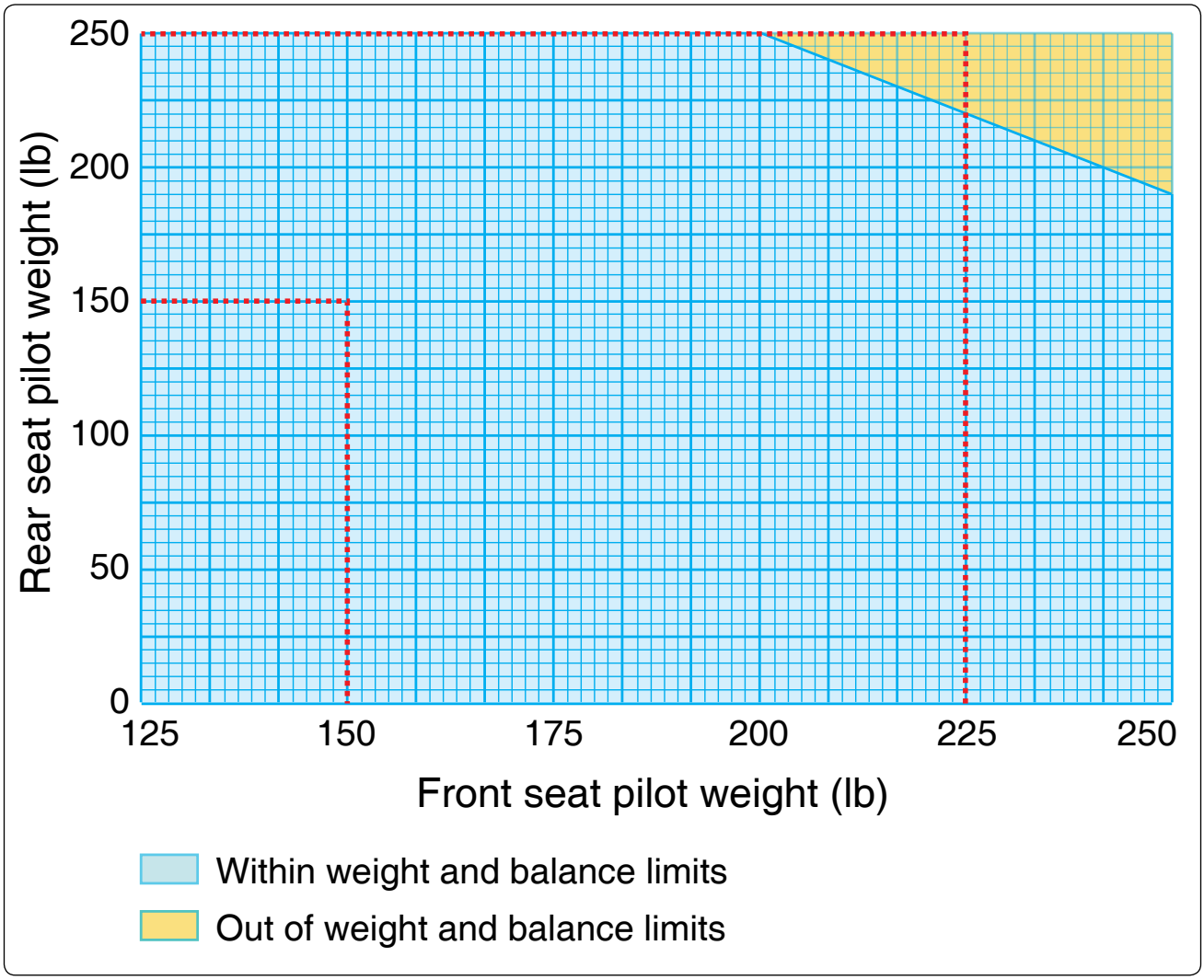



FIGURE 58.—Weight and Balance Envelope.