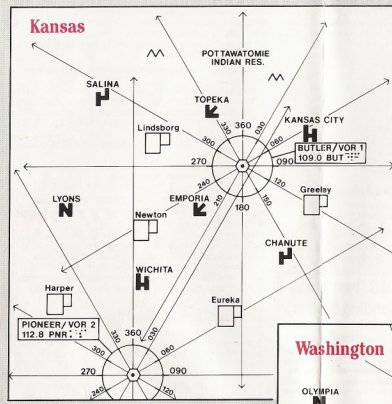
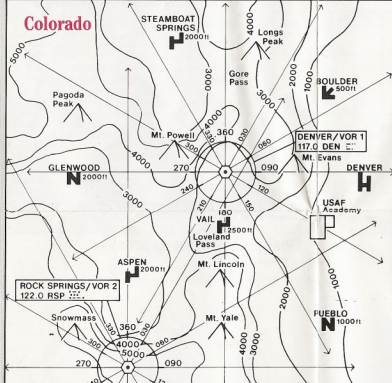




State Maps
KANSAS: Kansas is a nice flat state, ideal for novice flyers. Wichita and Kansas City have airports with long, wide runways. There are also many nice cornfields and mysterious Indian legends to fly over. VOR 1/VOR 2 bearings for Kansas are: Wichita – 222/001, Lyons – 232/036, Emporia – 225/022, Chanute – 154/052, Salina – 295/353, Topeka – 330/016, Kansas City – 065/036.

WASHINGTON/OREGON: Washington has a mountain range separating the coastal cities from Cleland and Yakima. Some of the mountains are up to 4000 feet high although the two mountain passes can be traversed at 2000 – 2500 feet. Three of the Washington airports are also excellent. Navigational information for Washington: Portland – 223/001, Salem – 224/278, Kelso – 251/330, Olympia – 284/344, Seattle 500 feet elevation – 314/000, Cheilan (1000 feet) – 060/035, Yakima (500 feet) – 142/059.

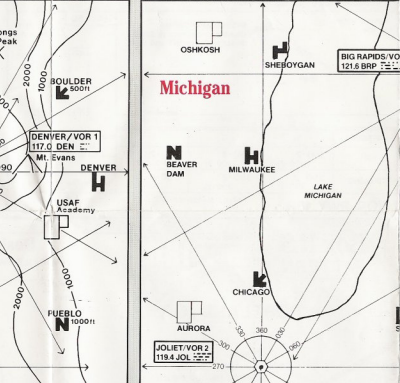
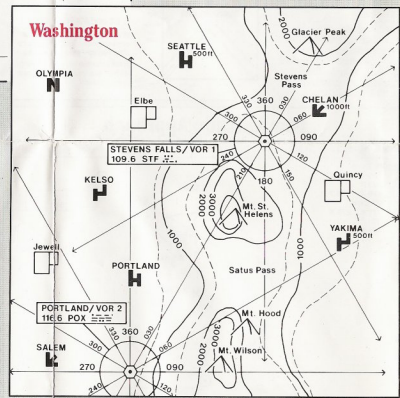
COLORADO: Flying between the small airstrips nestled in the Rocky Mountain valleys (Colorado is the ultimate challenge for a mail pilot: Aspen (2000 feet elevation) – 223/001, Pueblo (1000 feet) – 143/074, Glenwood (2000 feet) – 264/343, Vail (2500 feet) – 384/030, Denver – 098/050, Boulder (500 feet) – 053/037, Steamboat (2000 feet) – 314/008.



Flying Tips
Take Off
 This is the end of the runway (Beltie 2 3). Stop and turn to face down the runway. Set takeoff flaps, (normally 20°). Apply maximum power (9). When your speed reaches 85 knots (50 with 20 degrees of flaps) pull back on the stick until your pitch is plus 8-9 degrees. When you are safely airborne, with a positive V_R, retract your landing gear. Above five hundred feet, retract your flaps. (Notice that your lift is decreased as flaps are raised. Additional pitch is required to maintain the same climb rate.) When you reach your desired cruising altitude, reduce power and level off.

Landing
 Landing your airplane is probably the most difficult skill to master. As you approach the destination airport, line the aircraft up with the desired runway as early as possible. Approach the airport at 1000 to 1500 above field elevation. When the ILS becomes active, climb or descend to center your position on the ILS display. Lower your landing gear, reduce your throttle to 1, and adjust your pitch to maintain a descent rate of 4-6 (1000 to 5000 feet per second) to reach 20 to 30 percent descent as the wheels touch the runway. Be careful however, if you flew a low dragged in approach.

Solo FLIGHT

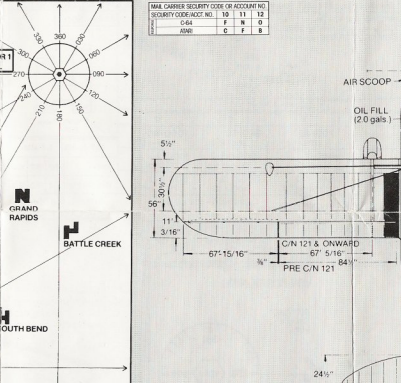
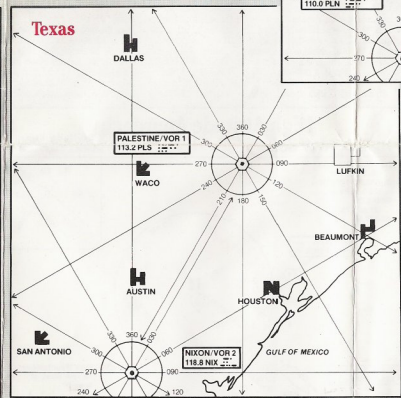


critical. Too much airspeed and the aircraft will float off the other end of the runway or not stop in the available runway. Too little airspeed, and the aircraft will stall during the flare and touchdown. With 20% flaps, the aircraft should be flown down final at approximately 70 knots. With no flaps, increase final airspeed by 10 knots. Full flaps allow a 10 knot reduction in final airspeed and are handy for short field takeoffs and landings.

If you end up high on final, reduce power, lower full flaps, and lower your rate to maintain 65-70 knots. A slip into the wind may also allow the aircraft to get rid of excess altitude. To slip, align the aircraft with the landing runway, bank into the prevailing wind, and hold top rudder. (Top rudder is available by holding down the fire button on the joystick.)

If you are coming in too low, apply a little more throttle and increase your pitch. This is known as a dragged in approach and is not safe. If your aircraft lost power during a dragged in final, the aircraft would sink into the earth shortly after power loss, with no chance to glide to the runway.

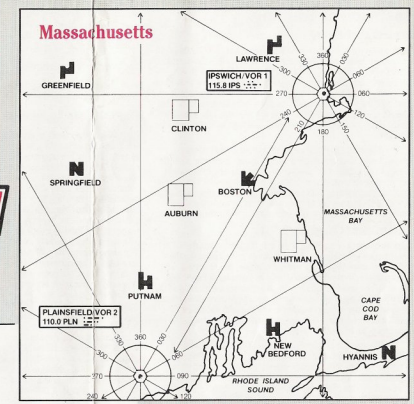
Just before you touch down, pull back slightly on the stick to reduce your descent rate. Smoothly reduce power and attempt to reach 20 to 30 percent descent as the wheels touch the runway. Be careful however, if you flew a low dragged in approach.



The high pitch attitude and power settings required for such an approach means that power reduction may result in an over rapid airspeed loss and stall before the aircraft touches down. With the proper glide slope, raising the nose and reducing the power in the flare will result in a 10 knot reduction of airspeed from final approach airspeed to touchdown speed and a zero sink rate at touchdown in Pilot talk, that landing has been "greased." Once the aircraft before the end of the runway (On some of the shorter runways this will be difficult unless you fly a short field approach full flaps, 10 knots low on airspeed and land very close to the approach end of the runway.)

Being able to land your aircraft under any conditions at any airport in the world is part of the thrill of being a great pilot. Practice your landings well and don't be afraid to "take it around" if the landing does not look right. Remember, the only good landings are those you can walk away from! (Use the Practice/Landing Option if you are having trouble with landings.)

CAUTIONS: Take heed of the following cautions, especially at the advanced difficulty levels.



MICHIGAN: Flying near the Great Lakes may seem boring – until you experience rapidly shifting winds along the coastline, or land/water generated logjams!

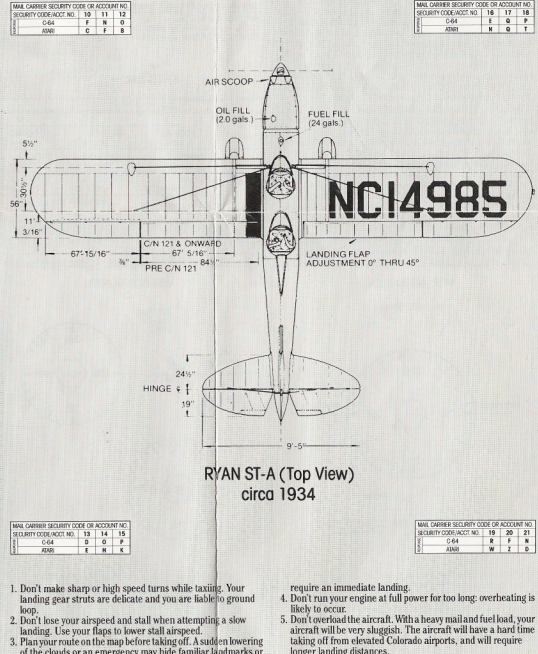
VOR 1/VOR 2 Navigational bearings are: Battle Creek 178/58, Beaver Dam 238/338, Chicago 234/358, Grand Rapids 204/38, Milwaukee 246/357, Sheboygan 275/2, South Bend 194/72.

MASSACHUSETTS: The "Bay State" is a heavily wooded and gradually rolling landscape. Flyers should beware of wind and weather changes caused by Atlantic ocean air meeting the coastline.

VOR 1/VOR 2 Navigational Bearings are: Boston 219/30, Greenfield 272/341, Hyannis 168/56, Lawrence 304/21, New Bedford 194/72, Putnam 253/358, Springfield 252/340.

TEXAS: Texas is a state of great distances, flat lands, and high winds. Be aware you're confident with your crosswinds landings skill before failing the mail in Texas.

VOR 1/VOR 2 Navigational Bearings are: Austin 223/358, Beaumont 121/60, Dallas 313/358, Houston 171/60, San Antonio 283/286, Tyler 21/26, Waco 263/1.



Instrument Training

Instrument Flying

Instrument flying is the most difficult thing that pilots accomplish. Instrument pilots must be able to accomplish all of the normal duties of VFR flying — from takeoffs, to cross-country flying, to landings — and be able to do it all in the clouds. VFR flying is accomplished primarily by looking out the cockpit windshield and utilizing both the horizon and prominent landmarks to keep sky and ground. A pilot oriented geographically. Take away the horizon and the prominent landmarks, and the challenge increases by 400%.

Good Instrument flying requires a superior instrument cross-check, situation awareness, navigation planning, and the ability to quickly absorb, analyze, and react to the information received in the instrument cross-check. Additionally, instrument procedures including VOR navigation, ILS techniques, high and low altitude instrument approaches, must be understood and practiced for the pilot to survive the challenge of instrument flying.

Instrument Crosscheck

The instrument crosscheck is the way the pilot scans the cockpit, available instruments to be able to make the continual small changes to aircraft attitude, power setting, and navigational direction required for safe instrument flight. The crosscheck is used for one scan, small changes are made, and the scan is begun again. No one instrument can consume an inordinate amount of time in the crosscheck, and the pilot should be continuously scanning. An excellent instrument pilot will scan his indicators 20 times a minute.

The instrument crosscheck on your SOLO FLIGHT aircraft should focus on the attitude indicator in the center of your panel. The instrument tells the pilot where he is banked (and which direction) and indicates the pitch of the aircraft. Keeping the wings level enables that pilot to fly a navigational heading or an instrument heading. Banking adds loading problems, and requires both additional nose up (stick back) and additional power.

From the attitude indicator the pilot should scan both the altimeter and the airspeed indicator for the current performance of the aircraft. The digital heading indicator and digital climb indicator (similar to a WV), located directly below the attitude indicator, are then scanned. Deviations noted on the attitude indicator are sized by the magnitude of the climb indication. Small vertical velocity deviations can be eliminated by small corrections in pitch accomplished by returning the scan to the attitude indicator and making a small pitch change through elevator input. (Stick forward or backward).

Heading deviations noted during the crosscheck of the heading indicator are usually the result of bank added inadvertently by the pilot or by turbulence. Note the heading deviation, then return the attitude indicator, establish a bank angle, and monitor the heading indicator until a lead point (usually 2-4 degrees) from the desired heading is reached. Roll out on the desired heading, monitoring the attitude indicator.

Once the pilot can keep the aircraft under control, i.e. flying straight and level, he can begin to scan the navigation instruments located on the right bottom of the instrument panel. Once the indications (radials of VOR and VOR 2) are understood, return the crosscheck to the attitude indicator as you analyze the VOR information.

VOR Navigation

VOR navigation is based on a series of ground stations that send out radio signals. These signals are received by instruments in the cockpit and decoded and read as bearing to a particular VOR station. There is no range information associated with VOR navigation. Precise positioning is based on either radial triangulation or on radial course guidance, with timing from a known VOR station. The entire United States, and most foreign countries have very complete VOR systems where any point can be defined as an intersection point between multiple VOR stations. In SOLO FLIGHT, each airport is defined as a radial intersection. (A radial bearing is a number from 0 to 360 that if the aircraft was turned and flown on heading 180 degrees from the radial bearing, the flight path would be inbound to the VOR station).

North of the VOR station is radial 360. East is 090. South is 180, and West is 270. To find a particular airport in SOLO FLIGHT, the pilot should determine its radial intersection from both VORs. He should then intersect a radial outbound from one of the VORs and fly until the cross radial from the other radial is reached. For example, in the Kansas map, the Kansas City airport is located on the 036-degree radial of VOR 2 with the end of the main runway on the 067 radial of VOR 1. To find the airport in the weather, the instrument pilot could establish himself on the 036 degree radial of VOR 2, heading 036, and descend to missed approach altitude (200-300 feet above field elevation) until crossing the missed approach radial, the 067 of VOR 1.

In the more difficult weather, VOR navigation must be used to ensure that the SOLO FLIGHT aircraft does not run into the

mountain ranges in the particular state. After each approach has been flown, the program will plot your course on the video map. The SOLO FLIGHT pilot can then review his actual flight path with the one he was trying to fly.

Instrument Approaches

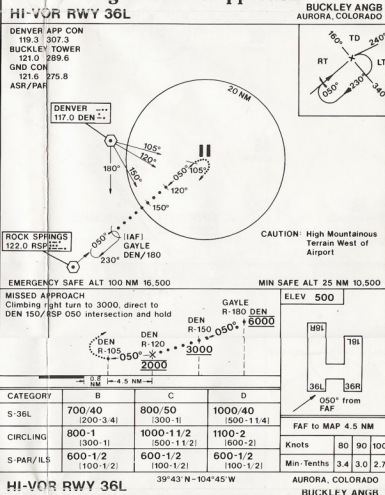
Instrument approaches can be high altitude, low altitude, precision, or non-precision.

High Altitude Approaches

High Altitude Approaches consist of a high altitude holding fix, an Initial Approach Fix (IAF), a prescribed route for the aircraft to fly to avoid other physical obstructions (i.e., in mountains around Denver) or to avoid heavily traveled approach routes (New York City's Kennedy and O'Hare). The aircraft will penetrate (when cleared by approach control) by reducing power, descending at constant airspeed, and turning to intercept a radial inbound final approach fix (FAF). The pilot often resembles a large target that uses the VOR as the pointed end of the teardrop. The final approach fix is a geographic position aligned with the approach runway usually 5 to 10 miles from the airport.

The aircraft would be configured for landing and headed inbound on a heading approximately that of the landing runway. The route from the FAF to the runway is usually a straight line. The pilot should descend to arrive at the Minimum Descent Altitude (MDA, 200-300 feet above field elevation) 30-45 seconds prior to MAP (Missed Approach Point). In SOLO FLIGHT the MDP is defined by a crossing radial from the VOR not providing final approach guidance. The MAP can also be defined by using timing from the VOR to the approach end of the runway at constant airspeed.) If the runway is in sight at or prior to the MAP and the aircraft is consistently aligned with the runway, the pilot can land. If these conditions are not met, the pilot should advance power, go around, and try the approach again, or go to a different airport. (Your SOLO FLIGHT aircraft is a simulated 1930 vintage monoplane with a service ceiling of approximately 9000 feet. The SOLO FLIGHT aircraft can fly practice high altitude approaches from as high as 9000 ft).

High Altitude Approach



MINIMUM DESCENT ALTITUDE (MDA) OR ALTITUDE (A) NO. 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65 67 69 71 73 75 77 79 81 83 85 87 89 91 93 95 97 99 101 103 105 107 109 111 113 115 117 119 121 123 125 127 129 131 133 135 137 139 141 143 145 147 149 151 153 155 157 159 161 163 165 167 169 171 173 175 177 179 181 183 185 187 189 191 193 195 197 199 201 203 205 207 209 211 213 215 217 219 221 223 225 227 229 231 233 235 237 239 241 243 245 247 249 251 253 255 257 259 261 263 265 267 269 271 273 275 277 279 281 283 285 287 289 291 293 295 297 299 301 303 305 307 309 311 313 315 317 319 321 323 325 327 329 331 333 335 337 339 341 343 345 347 349 351 353 355 357 359 361 363 365 367 369 371 373 375 377 379 381 383 385 387 389 391 393 395 397 399 401 403 405 407 409 411 413 415 417 419 421 423 425 427 429 431 433 435 437 439 441 443 445 447 449 451 453 455 457 459 461 463 465 467 469 471 473 475 477 479 481 483 485 487 489 491 493 495 497 499 501 503 505 507 509 511 513 515 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