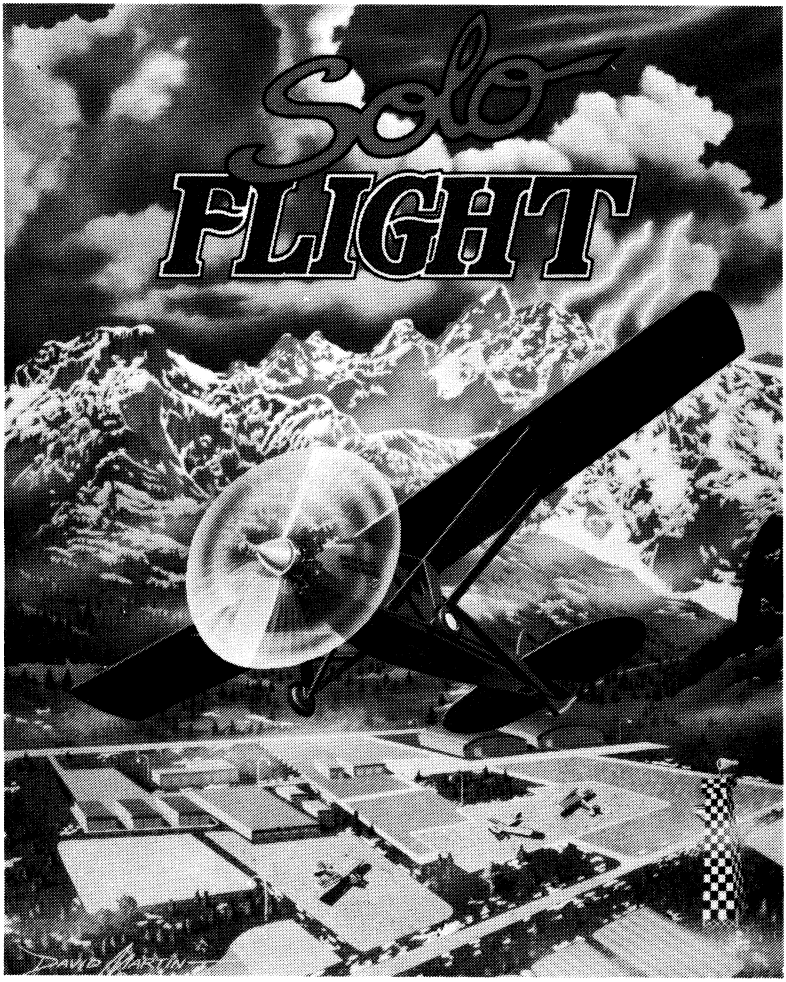


MicroProse Software

SOLO FLIGHT

for MicroProse Software

Instructions by Sid Meier and Bill Stealey

INTRODUCTION

SOLO FLIGHT is an exciting real-time flight simulator which allows you to experience the challenge of piloting your own light plane. In this simulation you must master takeoffs, landings, navigation, instrument flying, emergency procedures, turbulence, and adverse weather conditions. An accurate 3-D view and a complete set of flight instrumentation are available to assist you in flying your aircraft. To test your skills, play the Mail Pilot game — where you race the clock, mechanical failures, and deteriorating weather to complete your delivery schedule in your vintage monoplane.

LOADING THE GAME (Atari)

DISK: Remove all cartridges, insert the game diskette, and turn your computer on. Leave the game diskette in your disk drive while playing the game.

CASSETTE: Turn your computer on while holding down the START key. Place the game cassette in your program recorder, depress PLAY, and hit Return on the computer keyboard. After loading, the game will begin automatically.

SOLO FLIGHT requires 48K of memory.

OPTIONS

Use the OPTION key to select practice FLYING or the MAIL PILOT game. The OPTION key also selects which of three states you wish to fly in. (Kansas, Washington, or Colorado) Use the SELECT key to choose the difficulty level. During Flying practice you may select CLEAR weather (for touch and go practice in the local area), LANDING practice (places the aircraft on short final for landing), WINDY conditions, or IFR (Instrument Flight Rules—low clouds). When playing the Mail Run game you may select from the STUDENT Pilot, PRIVATE Pilot, SENIOR Pilot, or COMMAND Pilot difficulty levels. Press START to continue.

BASIC FLYING

Two controls are used for most basic flying — the control stick or yoke and the throttle. The joystick (yoke) changes the attitude of your aircraft; the throttle affects your speed. Use the joystick to make your plane turn, climb, and dive. Holding the stick to the right causes the plane to bank (tilt) to the right; when the plane is banked right it will turn to the right. Note that when you center the joystick, the plane will remain banked and will continue turning. Bring the plane back to a level attitude by

pushing the stick opposite the direction of bank. Pushing forward (toward your screen) on the stick will cause the nose to go down and your plane will dive. Pulling back on the stick will bring your nose up. The throttle controls the amount of power generated by your engine. Maximum power is required when taking off and climbing, somewhat less power is needed for cruising, and low power is generally sufficient for landing.

Remember that there is a relationship between the pitch attitude (nose up) and the amount of power required to hold level flight. At low airspeeds, significantly more nose up (more pitch or angle of attack) is required for level flight. Many small airplane pilots use pitch to control airspeed and power to control altitude. Jet pilots, on the other hand, are taught to use pitch to establish the right glide path to touchdown. They use the throttle to control airspeed. Both approaches to altitude and airspeed control are correct and both are taking advantage of the interrelationships between pitch attitude, angle of attack, power setting, and airspeed. No change can be made to one of these factors without influencing the others. Generally, when the nose comes up, airspeed goes down, and vice-versa. Power changes can be used to modify the effect of pitch changes. Alternatively, when power is reduced, the nose starts down unless stick back pressure is applied. Power up, and the nose will start back up. To achieve perfect aircraft control on final approach, all of these factors must be taken into account so that constant airspeed and descent rate can be established and maintained to touchdown. Your Solo Flight aircraft has all of these characteristics built in. It will be your job to master them so you can fly and land under all flying conditions.

VIEW

The top half of the flight screen shows your plane and the local terrain highlights. If you are at a low altitude your shadow will be visible on the ground. Airports are black, VOR towers and mountains are white, and farms are grey. If you fly into or above the clouds, ground objects will not be visible. Generally the view is to the front; you may look to the side or behind you using the appropriate commands. (see COMMANDS)

INSTRUMENTS

The bottom half of your screen contains your flight instrumentation. The large dial on the left is your altimeter. Each mark on the dial is 1000 feet for the small hand and corresponds to a complete revolution of the large hand. The large dial on the right is your speed indicator which goes from 0 to 180 knots. The small circle in the middle is your artificial horizon/attitude indicator which indicates your attitude relative to the horizon. The vertical strip in the center is your throttle indicator. Maximum power is at the top, zero power is at the bottom. The four digital indicators at the lower left are very important. The first value is your pitch, positive values indicate your nose is up, negative values mean nose down. Precise control of your pitch is sometimes necessary to achieve the proper climb or dive rate. The next number is the degrees of flaps that are extended. The next value is a digital and alpha directional compass reading. Zero degrees is due North, 90 is East, 180 South and 270 is West. The bottom indication is your Vertical Velocity Indicator (Climb). Positive values indicate you are gaining altitude, negative values indicate you are losing altitude. Your fuel gauge is on

the lower right. The indicator light center left is your temperature warning light. It will flash if your engine is overheating. The two status lamps center right indicate that your landing gear are down and your brakes are applied when illuminated. Your navigational instruments are at the lower right. The two VOR readouts indicate the directional bearing from the VOR stations. The ILS system shows whether your landing approach is high, low, or on the proper altitude relative to your distance from the runway. (see "Instrument Flying" for a further description of these systems) Your elapsed time is displayed at the upper right.

FLIGHT CONTROLS

In addition to control via the joystick, a number or commands may be entered through the keyboard.

THROTTLE: The numbers "0" to "9" control your throttle. Zero is no power, 9 is maximum power.

LANDING GEAR: Press "L" to raise or lower the landing gear.

BRAKES: Press "B" to apply or release the brakes.

FLAPS: Press "F" to control the flaps. You may use 0, 20, or 40 degrees of flaps.

VIEW: Use the left and right arrow keys to look out the right and left windows. Use the down arrow to look behind you. To return to the front view, use the up arrow key. Do not press the Control or Shift key while using these keys.

PAUSE: Press "P" to pause the game. Press any other key to continue.

EMERGENCY: If you wish to create an emergency equipment failure for practice purposes, press the "E" key.

SLIP: Bank your aircraft and press the joystick trigger to put your plane into a sideslip. This maneuver, usually performed by crossing the rudder and ailerons, allows you to slip your plane into the wind to lose altitude without changing the heading of the aircraft.

MAIL PILOT

The mail pilot game tests your flying skill and judgment. Your task is to deliver five bags of mail to their destinations in the least amount of time. Once you have selected the Mail Pilot game, a map will be displayed. Press START to continue to the Mail Pilot screen. On the Mail Pilot screen use the OPTION key to load mail. The destination(s) will be displayed on the screen under "MAIL FOR:". You may load up as much mail as you like, however, each bag adds to the weight of your plane and increases the difficulty of flying. One or two bags is recommended. You may load up on fuel by using the SELECT key. Fuel also adds weight but be sure to load enough to make it to your destination. Your fuel tank has a 64 gallon capacity. When you are ready to begin your journey, press the START key. A map will then be displayed again to help you plan your flight. Take some time here to note which landmarks you will be passing, VOR bearings, nearby airports, etc. This information can be

extremely valuable if conditions change while enroute. When you are ready to take off, press START again. You may also return to the Mail Run screen to load additional mail or fuel by pressing OPTION at this time.

When you arrive at your destination airport and stop your aircraft, your Landing Points are calculated. Points are gained for slow landings (Speed) with gentle touchdowns (Rate). Delivery points are also accumulated based on difficulty level (500 to 2000), state map chosen (Kansas—500; Washington—1000; and Colorado—1500), and time used (0-1000). If you crash, you will be told why. CRASH LANDING indicates you hit the ground too hard or forgot to extend the landing gear; MISSED RUNWAY means you neglected to land on the runway or taxied off the runway; GROUND LOOP indicates you tried to turn your plane too sharply while taxiing; STALLED means you flew too slowly and stalled your plane. Next you will be shown a map and your route will be displayed. Press START to go on to the Mail Pilot screen. Any mail for this airport is automatically unloaded and added to your score. You may now load additional mail or fuel and continue the game. The game ends when five bags have been delivered or when you crash.

As the game progresses, the weather will gradually deteriorate. Winds will get stronger, clouds may come in, and turbulence may develop. At the higher difficulty levels your plane is also prone to mechanical and instrument failure. Your engine may overheat and various instruments may become inoperative. All malfunctions are repaired when you land at an airport.

Scoring is based on landing points, difficulty level, state map chosen, elapsed time, and mail delivered. If the disk is not write protected, high scores will be recorded on the disk. Good Luck.

(Although this is a real time simulation, we have shortened some of the navigation time that would normally be required to fly between the identified airports.)

EMERGENCIES

At the more advanced difficulty levels your aircraft is prone to instrument and mechanical failure. If the temperature light begins to blink, your engine is overheating and will cut out shortly. Find a place to land. Your altimeter, airspeed indicator, digital heading indicator, and VOR indicators may also malfunction and register zero readings. The artificial horizon could also cease functioning. Landing at any airport will repair your aircraft.

Remember, there are three basic rules of flying during an aircraft emergency.

1. Maintain aircraft control.
2. Analyze the situation and take proper action.
3. Land as soon as conditions permit.

Most aircraft emergencies do not require instant reaction, (exclusive an engine failure on takeoff leg). They do require careful planning. Performance and engine instrument failure can be overcome through the use of the remaining instruments. Engine failure can be managed by maintaining sufficient inflight altitude to make a dead stick landing to an emergency airfield along your route of flight. (Your Solo Flight aircraft has approximately a 9 to 1 glide ratio.

The most difficult emergencies are multiple emergencies where problems compound themselves. Losing your attitude indicator in instrument conditions can be one of the most frightening occurences in real flying. Combine this emergency with engine failure and smoke in the cockpit, and the pilot would be happy to use his silk elevator (parachute) to get his body back on the ground in one piece!

Emergency procedures may be practiced through the use of the "E" key. Multiple actuations of the "E" key will cycle the program through all the emergencies possible in the simulation.

WEATHER

The current weather conditions are displayed at the bottom of the screen: wind direction and speed, cloud ceiling in feet, and visibility in miles. Under windy conditions, landing your aircraft becomes tricky, especially if the wind is blowing across the runway. Use less flaps, higher airspeeds, and aircraft slips to compensate for winds. Low clouds often require instrument flying, although you may choose to fly above the clouds.

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 pyramids to fly over. VOR 1/VOR2 bearings for Kansas are:
Wichita — 222/001, Lyons — 252/336, 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 Chelan 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 elevated. Navigational information for Washington:
Portland — 223/001, Salem — 224/278, Kelso — 251/350,
Olympia — 284/344, Seattle (500 feet elevation) — 314/010,
Chelan (1000 feet) — 060/035 — Yakima (500 feet) — 142/059.

COLORADO: Flying between the small airstrips nestled in the Rocky Mountain Valleys of 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 — 184/030, Denver — 098/050,
Boulder (500 feet) — 053/037, Steamboat (2000 feet) — 334/008.

FLYING TIPS

TAKE OFF: Taxi to the end of the runway (throttle 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 (80 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 VVI, retract your landing gear. Above five hundred feet, 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 feet above field elevation. When the ILS becomes active, climb or descend to center yourself on the ILS display. Lower your landing gear, reduce your throttle to 4, and adjust your pitch to maintain a descent rate of —4(00) or —5(00) feet per minute. As you approach the runway, reduce your descent rate by slowly raising the nose of the aircraft. Airspeed control is extremely 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 nose 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 zero descent rate just 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 a 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 is on the runway, cut your power (hit the zero digit on the keyboard) and apply the brakes, (hit "B"). Attempt to stop 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.

1. Don't make sharp or high speed turns while taxiing. Your landing gear struts are delicate and you are liable to ground loop.
2. Don't lose your airspeed and stall when attempting a slow landing. Use your flaps to lower stall airspeed.
3. Plan your route on the map before taking off. A sudden lowering of the clouds or an emergency may hide familiar landmarks or require an immediate landing.
4. Don't run your engine at full power for too long: overheating is likely to occur.
5. Don't overload the aircraft. With a heavy mail and fuel load, your aircraft will be very sluggish. The aircraft will have a hard time taking off from elevated Colorado airports, and will require longer landing distances.

INSTRUMENT FLYING

Instrument flying is the most difficult flying 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 handle the complexities of bad weather. VFR flying is accomplished primarily by looking out the cockpit windscreen and utilizing both the horizon and prominent landmarks to keep the sky up and the 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 information available on his instruments so he can 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 20-30 times a minute.

The instrument crosscheck on your Solo Flight aircraft should focus on the attitude indicator in the center of your panel. This instrument tells the pilot when 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 approach. Banking adds heading problems, and requires both additional nose up (stick back) and additional power.

From the attitude indicator the pilot should scan both the altimeter (left) and the airspeed indicator (right) for the current performance of the aircraft. The heading

indicator and the vertical velocity indicator (VVI), located directly below the altitude indicator, are then scanned. Deviations noted on the altitude indicator are sized by the magnitude of the VVI 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 inadvertantly by the pilot or by turbulence. Note the heading deviation, return to 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 off of VOR 1 and VOR 2) have been read, 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 a 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 a 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 if 270. To find a particular airport in Solo Flight, the pilot should determine its radial intersection from both VORs. He should then intercept 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 (200-500 feet above field elevation) until crossing the missed approach radial, the 067 of VOR 1.

In the more difficult maps, VOR navigation must be used to insure 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

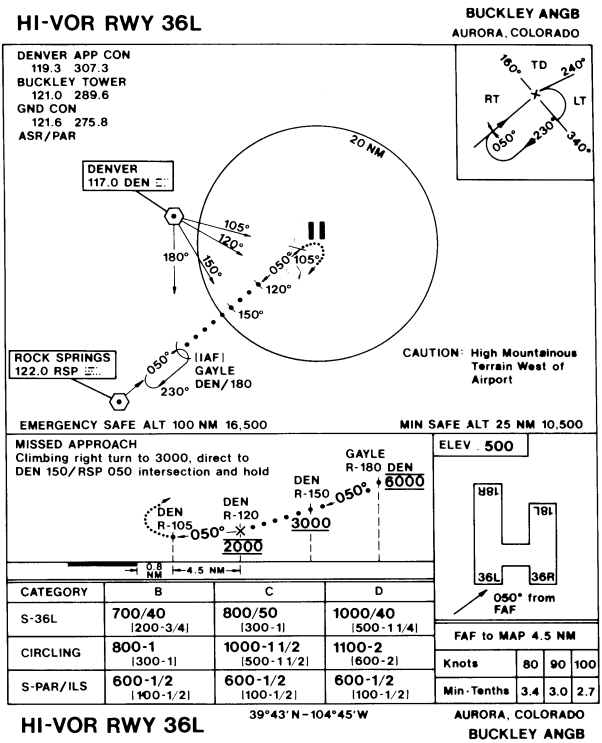
Instrument approaches can be high altitude, low altitude, precision, or non-precision. High altitude approaches consist of a high altitude holding fix, an Initial Approach Fix

(IAF), and a prescribed route for the aircraft to fly to avoid either physical obstructions (i.e. in mountains around Denver)or to avoid heavily traveled approach routes (New York City's Kennedy or Chicago's 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 to a Final Approach Fix (FAF). The pattern often resembles a large teardrop 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 should 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 in. The pilot should descend to arrive at the Minimum Descent Altitude (MDA, 200-500 feet above field elevation) 30-45 seconds prior to MAP (Missed Approach Point). In Solo Flight the MAP 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 conveniently 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 can fly practice high altitude approaches from a high as 9000 feet.)

LOW ALTITUDE APPROACHES are quite similar to high altitude approaches. They are defined with an initial holding fix, a prescribed route from the holding fix to the final approach fix that includes a descent and a turn to approximately the inbound heading to the runway, a Final Approach Fix, and a missed approach point. The difference between a high altitude approach and a low altitude approach is that a low altitude approach is usually accomplished much closer to the airport and at lower airspeeds. The objective of both of these non-precision approaches is to get the aircraft aligned with the runway to make a safe landing if the aircraft can break out of the weather prior to reaching the MAP.

LOW ALTITUDE RADAR/BOX PATTERNS: Both the high and low altitude approaches previously described are penetrations that are used when the aircraft arrives at the destination airport at an altitude above normal final approach altitude. The pilot may also be asked to fly a standard "BOX" pattern for positioning to a VOR final, an ILS final, or a Ground Controlled Approach (GCA). A box pattern is a rectangular approach with one long side of the rectangle defined by the landing runway. A 90 degree turn either left or right after takeoff is "crosswind". Crosswind is used to provide spacing between multiple aircraft. Turning 90 degrees again (to be 180 degrees from runway heading) puts the aircraft on downwind. A 90 degree turn back toward final approach puts the aircraft on base leg. (The aircraft should be configured with gear and flaps by base leg and flown at 10-15 knots above final approach airspeed.) Turning from base leg to final approach can be accomplished by one 90 degree turn to runway heading or by two 45 degree turns. Using two 45 degree turns is called DOGLEG to final. The objective of the box pattern is to position the aircraft on final approach, headed inbound, with enough time to descend to the MDA prior to the MAP! Use the Solo Flight PRACTICE/IFR option to practice box patterns using one VOR for final approach guidance and the second VOR to define a cross radial as the MAP. Your video map will plot your actual course once you have landed at your destination.

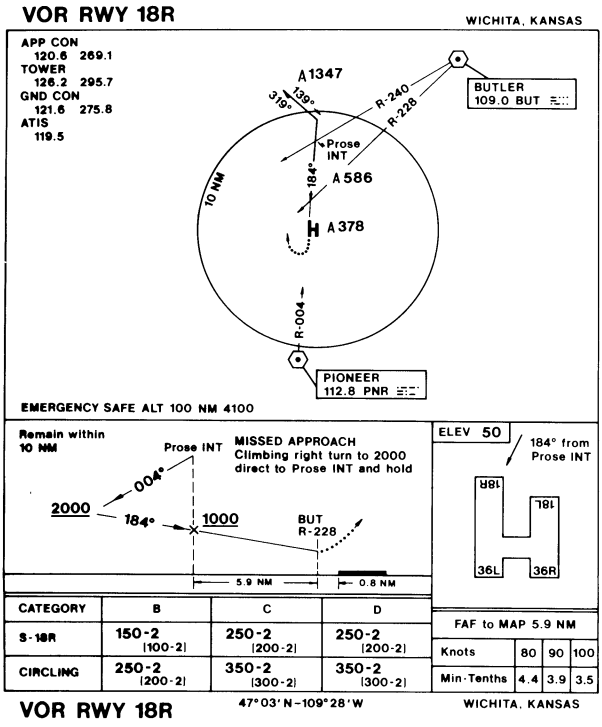
HIGH ALTITUDE APPROACH



CATEGORY	B	C	D
S-36L	700/40 (200-3/4)	800/50 (300-1)	1000/40 (500-1 1/4)
CIRCLING	800-1 (300-1)	1000-1 1/2 (500-1 1/2)	1100-2 (600-2)
S-PAR/ILS	600-1/2 (100-1/2)	600-1/2 (100-1/2)	600-1/2 (100-1/2)

PRECISION APPROACHES: The high and low altitude and box pattern VOR approaches are defined as non-precision approaches because no direct glideslope information (altitude versus distance to runway) is available to the pilot. Precision approaches can be flown in Solo Flight by combining VOR final approach and MAP positioning with Instrument Landing System (ILS) glideslope information. The ILS indicator is located on the right side of the instrument panel, just above the VOR indicators. The horizontal line on the instrument panel represents the correct final approach altitude. The aircraft symbol position indicates the aircraft altitude relative to the proper glideslope. (The glideslope is normally a 3-5 degree descent from the final approach fix to Decision Height. DH is the same as MDA but defined as minimum altitude allowed on the glideslope.) If the aircraft symbol is above the horizontal line, the aircraft is above glideslope. Reduce power slightly and lower the nose to increase the descent rate by 2(00) to 3(00) feet per minute. As the aircraft symbol centers on glideslope, increase power slightly and raise the nose to reestablish the correct —4(00) to —5(00) FPM descent rate. If the aircraft symbol is below the horizontal line,

LOW ALTITUDE APPROACH

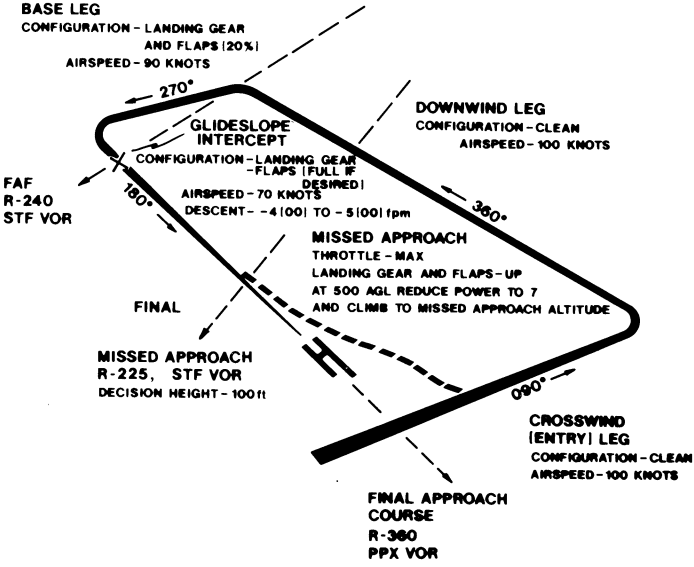


the aircraft is below glideslope. The pilot must reduce his descent rate or climb slightly to reestablish the proper glideslope. Once the aircraft is maintaining the proper glideslope and radial heading, fly down the glideslope until DH or the runway is sighted, which ever occurs first. (If MDA position or DH altitude is reached without the runway in sight with the aircraft in position for a safe landing, advance power and execute a missed approach. Try another approach or go to another airport!!)

ILS is the most accurate automated landing system currently available to pilots in bad weather. Some modern airliners can land in near 0/0 conditions. (0 visibility and 0 ceiling). Your Solo Flight weather minimums are 250 feet ceiling and 1/4 mile visibility. Practice your ILS approaches first in VFR conditions using the FLYING/CLEAR option. Practice IFR using the FLYING/IFR option. With sufficient practice, you will feel confident in your ability to survive when real instrument conditions occur!!

BOX ILS
PATTERN

PORTLAND, OR



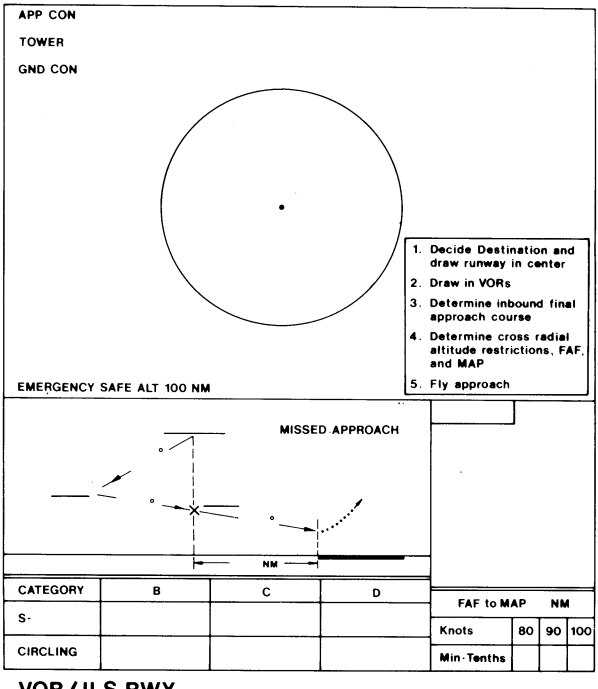
Remember, a good instrument pilot makes only one approach to his landing runway. The adrenalin factor goes up considerably if the pilot has made a number of non-successful approaches, his fuel is getting low, and the nearest alternate is 250 miles away with worse weather!!! The best thing the pilot can do is to do the first approach right — on airspeed, on altitude, and ready to land if he sees the landing runway somewhere around the MAP!!!

DESIGN YOUR OWN INSTRUMENT APPROACH!!

New pilots learn to solo, learn to go cross-country, and then take on the challenge of becoming an instrument pilot. Three instrument approaches are illustrated in your Solo Flight manual. A high altitude approach to Denver, CO, a low altitude approach to Wichita, KS, and an ILS box pattern to Portland, OR. However, Solo Flight gives you the opportunity to build any number of different approaches to any of the 21 airports in the Mail Pilot game!! Once you have constructed your own approach, you can fly it and see the results both from your success in making a landing at the destination airport and in the route displayed on your video map after landing.

DESIGN-YOUR-OWN-APPROACH

VOR/ILS RWY _____



CATEGORY	B	C	D
S-			
CIRCLING			

FAF to MAP	NM		
Knots	80	90	100
Min-Tenths			

VOR/ILS RWY _____

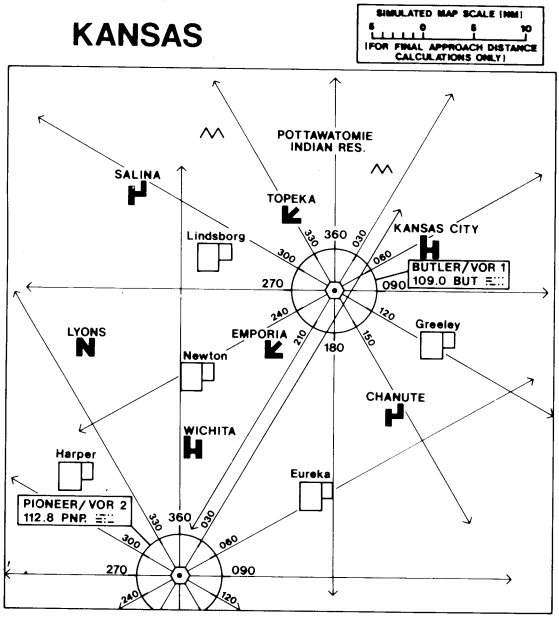
To design your own approach, you will need the following elements:

1. Final approach guidance from/to a VOR on a specified radial.
2. Missed Approach Point (MAP) or Decision Height (ILS) defined by a cross radial or timing from a VOR station. (Altitude for DH).
3. Final Approach Fix (FAF) defined as a cross radial or a VOR station.
4. Initial Approach Fix (IAF) (usually higher and not colocated with the FAF).
5. Route/Descent from the IAF to the FAF.
6. Altitude restrictions on the approach.
7. Holding pattern and holding instructions, if desired.

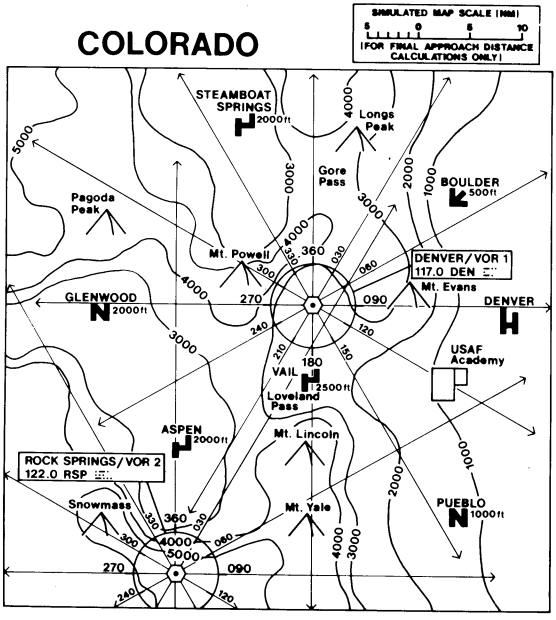
(If you use plastic to cover your Solo Flight maps and approach plates, you can use a favorite pilot tool, the grease pencil, to design your own approaches.)

The approach design must take into account the proximity of the VOR's, terrain clearance needed, and the runway heading. Your local library should be able to provide you with further information on instrument flying skills. Use the examples in the Solo Flight manual to design your own approach on the blank approach plate provided in the manual. Good flying and safe landings to you!!!

KANSAS



COLORADO



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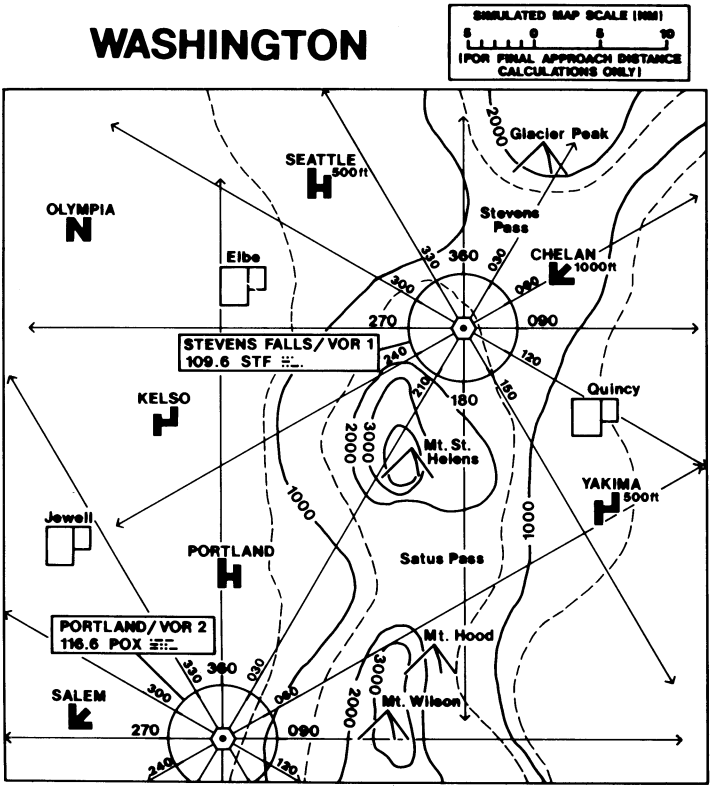

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