# ACROJET™

**LOADING INSTRUCTIONS**
**CBM 64/128**: Connect cassette player as per user manual and rewind cassette on label side. Turn on the computer and press **SHIFT** and **RUN/STOP** keys together. Press **PLAY** on the cassette player and the program will load and run automatically.
**SPECTRUM**: Type **LOAD""** and press **ENTER**. Press **PLAY** on your tape recorder.
**AMSTRAD**: Press **CTRL** and small **ENTER** and then press **PLAY** on your tape recorder.

When loading is finished pressing any key will advance you to the Hall of Fame.
If you do not press a key, the demonstration starts automatically. Pressing any key during the demonstration returns you to the title screen.

**WGSP HALL OF FAME**
The World's Greatest Sport Pilot (WGSP) Hall of Fame posts scoring records for the top Pentathlon and Decathlon flyers, as well as best scores in single events.
Press any key to leave this screen and continue.

**CTRL c Reset**: If you hold down the **CTRL** key and press the **C** key, all names and scores are cleared from the WGSP Hall of Fame. You have "cleared the record books" and are ready to start fresh. (Spectrum users press **'C'** only.)

**PILOT REGISTRATION**
Here you register for an event by selecting either the Decathlon (all ten events), the Pentathlon (any five events), a single event, or an "Unlimited" event (a single event where you control the activity, time limit, and judging).
Control Stick Up/Down moves the highlight cursor up and down the screen. The competition currently selected is indicated by a "*".
Control Stick Left/Right changes the highlighted selection.
**Type to Enter Your Name**: When you're finished press RETURN once. Each name is limited to eight characters, including blank spaces.
**Fire Button** exits the screen.

**UNLIMITED EVENT SELECTION**
This screen only appears if you have selected an "unlimited" event.
Control Stick Up/Down moves the highlight cursor up and down the screen.
Control Stick Left/Right changes/erases the highlighted selection.
**Event Name**: You can type up to 20 characters, including blank spaces. When you're finished press RETURN once.
**Adjust Difficulty Factor**: You can adjust the difficulty rating for the event with the control stick, or by typing a new value. Difficulty factors range from 1.0 (for the easiest event) to 3.0 (for the hardest). Type the appropriate digits in the highlighted space.
**Timed vs. Untimed**: If you select a timed event, the time it takes to complete the event becomes an important part of the score. If you select an untimed event, the judge's opinion is a large part of your score.
**Course Layout**: You can select any course by number.
**Fire button** exits the screen.

**EVENT SELECTION**
If you are flying the Pentathlon, select any five events. If you are flying the Decathlon, you must fly all ten. If you select fewer, other events will be selected for you.
The arrows on the sides indicate events selected, the highlight cursor can be moved up and down to select/deselect different events.
Control Stick Up/Down moves the highlight cursor up and down the screen.
Control Stick Left/Right selects or removes an event. You can also select an event by typing its number (type 0 for event 10, + for item 11 - the normal defaults).
**IMPORTANT**: You must de-select an event before selecting a new event.

**FLIGHT CLEARANCE**
You can select the level of weather difficulty and jet performance.
Control Stick Up/Down moves the highlight cursor up and down the screen.
Control Stick Left/Right changes/erases the highlighted selection.
**Difficulty**: The lowest level is intended for novices, it allows you to roll on and off the runway without damage, and to fly through pylons without damage.
**Jet Performance**: At the highest level controls are realistically sensitive, at lower levels the controls have less sensitivity, giving you more time to perceive mistakes and correct them.
The higher the weather and performance factors, the more challenging the game, and the more points you are awarded for that event.
**Ground or Airborne Start**: Ground start means every event begins at takeoff and ends at landing. Airborne start means that all events start airborne, and all events but landing competitions can be finished airborne. Airborne starts allow beginners to try events without having to master takeoffs and landings. However, in addition to appropriate score adjustments for an airborne start, an extra 12% points penalty applies whenever you use an airborne start.
**F3 - See Standings**: View the competition standings so far. Pressing any key returns you to flight clearance. **(CAPS SHIFT & 3 - SPECTRUM, KEY 3 - AMSTRAD.)**
**F5 - See Hall of Fame**: View the "record books". Pressing any key returns you to flight clearance. **(CAPS SHIFT & S - SPECTRUM, KEY 5 AMSTRAD.)**

**Fire Button** exits the screen and begins your flight (once the controls are unlocked, see below).

**DIGITAL CONTROLS LOCK**
**IMPORTANT**: You must unlock the controls!
Your AcroJet has a sophisticated microelectronic controls lock. The lock will display a colour (the colour appears as a text message in most versions).
**YOU MUST RESPOND WITH THE CORRECT THREE-DIGIT LOCK CODE.**
Find the correct code, type the three digits, and press RETURN. If you do not enter the correct code, your AcroJet will not perform correctly.
**Fire Button** exits the screen. Don' t press it until you're positive you have the correct lock code.

**UNLIMITED JUDGING**
When each pilot finishes an unlimited event, the contestant's performance can be judged. Contestants can judge each other, or a separate judge can watch all the contestants, each select a score, and then input their average score.
Type judging score: The judges give a score between 1.0 and 9.9.
If an event is not judged, enter 9.9 for each contestant.
If an event was timed and judged, do NOT judge the contestant's time. Comparative times are automatically included in scoring of all timed events. Judging is based purely on the quality of performance, never on duration.
**Fire Button** exits the screen.

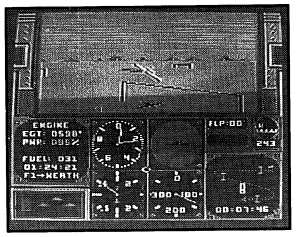
**SCORING RECAP**
This appears after every contestant's flight, and shows the score for that event. If the competition is over, pressing any key will display the final standings. Otherwise, you have the following options:
**F5 - See Hall of Fame**: View the "record books". Pressing any key will return you to flight clearance. **(CAPS SHIFT & S - SPECTRUM, KEY 'S' - AMSTRAD.)**
**Fire Button** exits the screen.

**COMPETITION STANDINGS**
Each contestant's scores are in separate columns. The contestant who just finished flying has his column highlighted. In addition to contestant scores, at the far right you can see the scores of a real USAF Fighter Pilot, to give you a point of reference and comparison.
If the competition is over, pressing any key displays the WGSP Hall of Fame.
**F5 - See Hall of Fame**: This allows you to view the "record books". If the competition is over, this is the next screen anyway. **(CAPS SHIFT & S - SPECTRUM, KEY 'S' - AMSTRAD.)**
**Fire Button** exits the screen. Press it when you're done.

**ACROJET CONTROLS**
**Control Stick Forward: Dive.** This lowers the elevators, which pushes the tail of your plane upward. In normal flight this results in a dive.
**Control Stick Back: Climb:** This raises the elevators, which pushes the tail of your plane downward. In normal flight this results in a climb.
**Control Stick Left or Right: Bank.** This deflects the ailerons, causing your plane to bank and turn in the appropriate direction.
**Control Stick Button: Skip**. Pressing the controls tick button while you push the stick left or right banks the plane with "opposite rudder". The result is a faster descent while you continue flying forward, or straight nose tracking during an aileron roll.
Viewing. The **W, A, S** and **Z** keys change your viewing direction. **"W"** shows the normal forward view, **"A"** shows the view to the left of the plane, "**S**" the view to the right, and "**Z**" the view to the rear.
**0-9: Throttle.** Press **0** to completely close your throttle, which turns off the engine. Press **1** through **9** to set your throttle, from lowest power **(1)** to highest **(9)**. Higher power causes your plane to fly faster, but be careful your engine doesn't overheat (exceed an EGT reading of 700 degrees C).
**F: Flaps**. Press **F** to change your flaps settings. Flaps can be either up (0 degrees), partly lowered (20 degrees), or completely lowered (40 degrees). In general, flaps add lift and permit slower landing speeds.
**L: Landing Gear**. Press **L** to raise and lower your landing gear. Landing gear must be lowered for a safe landing, and raised for safe flying.
**B: Landing Gear Brakes**. Press **B** to brake your landing gear wheels. This slows you on the runway. This is especially valuable if you land too fast, or too far down the runway.
**Space Bar: Speed Brakes**. Press the **Space Bar** to extend and retract your speed brakes. When speed brakes are extended your airspeed slows significantly.
**F1: Engine/Weather CRT.** Press **F1** to switch the left CRT between engine readout and weather in formation. **(CAPS SHIFT & 1 - SPECTRUM, KEY "1" - AMSTRAD.)**

**SOFTWARE CONTROLS**
**CTRL R**: Hold down CTRL and press **R** to end the competition. **(SHIFT & R - SPECTRUM.)**
**CTRL V**: Volume Control - hold down **CTRL** and press **V** to turn the sound on and off.
**RUNSTOP RESTORE**: Hold down **RUNSTOP** and press **RESTORE** to reset the entire program to the start again (all records are blanked). (C64 only.)

**ACROJET COCKPIT INDICATORS**




**Outside View**
The forward view shows the famous Thunderbird "in the slot" 3-D perspective - as if you were flying directly behind the AcroJet. The left, right, and rearward views show the terrain to the left, right and rear of the AcroJet, respectively.
When your AcroJet loops, at the very top the screen flashes white and your view shifts to a position behind the plane's new direction.
**ENGINE/WEATHER CRT**
This display can be toggled between engine data and weather data.
**Exhaust Gas Temperature (EGT)**: Indicates in degrees Centigrade the temperature of your jet engine exhaust. Temperatures over 650 degrees Centigrade are dangerous, and should never be maintained for more than 5 minutes.
**Engine Power**: Indicates the percentage of engine thrust power. This changes with your throttle setting. A reading of 0% means the engine is off.
**Speed Brakes**: "S.BRAKE" indicates that speed brakes are slowing the plane.
**Fuel Remaining**: Number of gallons of fuel remaining on board.
**Wind**: Direction the wind is blowing from, as a compass heading. On the following line the wind speed is given in knots (1 kt = 1.136 mph).
**Ceil**: Altitude of the lowest clouds, above which the ground becomes invisible.
**Vis**: Maximum horizontal visibility underneath the ceiling.
**Clock**: This real-time clock shows your flight time in hours, minutes, and seconds.
**CRT Change Prompt**: This indicates what key to press to change the CRT between engine readouts and weather information.

**LANDING GEAR**
**Landing Gear Brakes Indicator**: This shows red when the landing gear brakes are on, green when the brakes are off.
**Landing Gear Indicators**: The upper indicators are lighted when the landing gear is up, the lower indicators are lighted when the landing gear is down.

**CENTRAL DASHBOARD**
**Altimeter**: This indicates your plane's altitude above sea level. The small hand indicates altitude in thousands of feet, the large hand indicates altitude in hundreds of feet.
**VVI (Vertical Velocity Indicator)**: This indicates the rate of altitude change, in thousands of feet per minute. The upper half of the indicator shows a positive vertical velocity, the bottom half shows a negative vertical velocity.
**Airspeed Indicator**: This shows the airspeed in miles per hour. Redline airspeed is 346 mph (a higher airspeed causes uncontrolled flight, as your controls are stalled and ineffective).
**Flaps Indicator**: This shows whether flaps are up (0 degrees), half lowered (20 degrees), or fully lowered (40 degrees).
**Magnetic Compass**: This indicates the direction you are flying.
**Compass Heading Indicator**: This also indicates the direction of flight, but with greater precision. A heading of 0/360 is North, 90 is East, 180 is South, and 270 is West.
**TO (Airfield Beacon Heading)**: This readout shows the compass heading to fly to reach the airfield. Turning and flying the heading indicated takes you directly to the airfield. This instrument is not available in some versions of AcroJet.

**AEROBATICS CRT**
This computerised display dynamically updates a map of the event and your position, as well as elapsed time.
**Course Map**: This is a miniature map of the event, showing the pylons, ribbons and airstrip. The dotted line indicates the course you should fly, the flashing dot indicates your current position. If you are outside of the aerobatics area the flashing dot for your position becomes inaccurate.
**Event Timer**: The minutes and seconds clock beneath the map shows the time elapsed in the event.

**BASIC MANOEUVRES**
**Climbing & Diving**
Nose Down by pushing forward on the control stick. Your AcroJet will start to dive.
Nose Up by pulling back on the control stick ("backpressure").
**TURNING**
**Bank Left** by pushing the stick left. Ailerons and rudders are automatically coordinated at your control stick.
Bank Right by pushing the stick right. Ailerons and rudders are automatically coordinated at your control stick.
**SLIPS & ROLLS**
Slips allow you to lose altitude faster.
**Slip Left**: Press the joystick button while pushing the stick left. Your AcroJet rolls left.
**Slip Right**: Press the joystick button while pushing the stick right. Your AcroJet rolls right.
To roll with your nose tracking straight ahead, press the joystick button while pushing the stick either right or left. To maintain level flight while rolling you need to adjust your angle of attack.

**TAKEOFF**
First warm up your engine by setting minimum thrust (press **1**). Next, make sure you have plenty of runway straight ahead. If you don't, taxi at low speed to the end of the runway and turn around. Keep your taxi speed under 25mph, otherwise a turn while taxiing may cause your wingtip to lift. This results in crashing the plane.
Now begin your takeoff by setting "half flaps" (press **F** once - your flaps indicator should read 20 degrees). Next open the throttle to maximum (press **9**). Release the landing gear brakes (press **B**). Watch your airspeed indicator. When it reaches 65 mph "rotate" your nosewheel up off the ground with a brief pull on the stick. At 75 mph pull back on the stick briefly to start climbing. Once you're a few hundred feet off the ground raise your landing gear (press **L**) and raise your flaps to 0 degrees (press **F** twice).

**LANDING**
Landing is much harder than takeoff. The following is a simple approach suitable for beginners:
First, set up for a "Final" approach by flying northward toward the runway. Fly at 750' and 100 mph speed with half flaps (flaps at 20 degrees) and landing gear down. Now begin your gliding descent, which is flown at a 3-5 degrees angle downward at 85 mph. Cut your engine power by setting the throttle to **3** or **4** (press that key) and push the stick forward just a TINY bit. Control your descent by adjusting your throttle - more power will slow the descent, less power will increase your descent. You may find the speed brakes useful (press the **Space Bar**). The most common mistake when landing is constant fiddling with the joystick - the plane will fly itself if you let it!
As you get over the runway at low altitude level out and cut your speed further. Your goal is to touchdown the two rear wheels at 75 mph and nearly zero descent velocity. Hitting the runway with a descent velocity greater than .5 thousand feet/minute (.5 down on your VVI) can cause damage or a crash. Once you've touched down cut the power and hit the landing gear brakes (press **B**).

## AERODYNAMICS & BASIC FLIGHT

**Lift**: Pressure differential between the air above the wing (low pressure) and the air beneath the wing (high pressure). The high pressure beneath the wing forces the plane upwards ("lifts" the plane), keeping you airborne.
**Pitch**: This common term refers to the angle your plane points up or down, relative to level flight. A plane diving has pitch down of 1 degree to 90 degrees; climbing it has a pitch up of 1 degree to 90 degrees. To change your pitch, simply push the stick forward or pull it back.
**Angle of Attack**: To maintain level flight a pilot needs to make fine adjustments to the amount of lift generated. He does this by tilting the wings slightly upward to downward in relation to the direction of flight. This "tilt" is termed the "angle of attack".
If the plane appears to be flying level but the VVI indicates you are gaining or losing altitude, briefly push the stick forward or back to change your angle of attack.

## BASIC AEROBATIC MANOEUVRES

**Aileron Roll**: This is a 360 degrees roll right or left. To perform this manoeuvre you push the stick fully to the right or left. To maintain a constant heading, hold the fire button down to simulate a coordinated, unloaded roll. Since this can result in altitude loss on the BD-5J, you should start the roll with 10 degrees to 20 degrees pitch up, to provide a rate of climb sufficient to compensate for the roll's altitude loss. After rolling about 330 degrees, you should prepare to centre the wings level to the horizon.
**Loop**: This is the basic "over the top" manoeuvre. The plane's nose is raised to vertical and past it, resulting in inverted flight in the opposite direction. Then the plane flies a downward arc, returning to the position where it started.
**Immelmann Turn**: The manoeuvre begins with the upside of the loop, flown until you are flying level and inverted, on a heading 180 degrees from your starting direction. Next you roll either right or left 180 degrees back to level flight. Depending on the tightness of the loop, an Immelman will add about 1500' to 2000' to your altitude.
**Split-S Turn**: This turn is the downside counterpart of the Immelmann. You start with a half roll to inverted position, then perform the downside of the loop until you are flying level on a heading 180 degrees from your starting direction. You will lose considerable altitude during this manoeuvre.

## ACROJET COMPETITION EVENTS

All AcroJet competitions are timed. Serious competitors should select a ground start. The clock starts when their aircraft crosses the spot line on the runway. It stops when the aircraft stops on the ground again. A landing must include crossing the spot line on the airstrip, going from south to north. This means all landings are headwind landings (landing from north to south results in a tailwind landing, since the prevailing winds are from the north).
Many of the events leave you at low altitude travelling fast. Therefore, you may wish to end with a short, steep climb before flying the "final" to touchdown. This helps reduce speed and line up for a good approach. Unfortunately, it also takes a little extra time.
**Airborne Starts**: You begin at 250' flying over the airstrip. When the plane crosses the spot line on the strip the timer begins. When the event is finished, flying over the spot line again from south to north ends the event.
**Landing Events**: Landing events (spot landing and simulated flame-out) always require you to finish on the ground, even if you start airborne. In addition you are scored on how close you come to the spot line.
**Checkpoints**: Each event has a number of "checkpoints" you must pass to successfully complete it. Each checkpoint is listed in the requirements section for the event. In the air you'll see the edge of the screen flash blue briefly each time you complete a checkpoint.
**Missed Checkpoints**: You must pass the checkpoints in proper order. If you miss a checkpoint, you can come around and try it again, continuing the event from there.
**Crashes**: If you crash during an event, you get a small partial score for the checkpoints you passed. If you crash in the Pentathlon or Decathlon, you are allowed to fly the remaining events.
**IMPORTANT NOTE**: The airstrip diagram on the cockpit map is much larger than the real airstrip for legibility reasons. When flying by the cockpit map, guide yourself by the CENTRE spotline of the airstrip, NOT the edges.

**Pylon Race**
**Difficulty Factor: 1.0**
**Requirements:** After leaving the airstrip, the contestant must pass outside of the pylons in order: SE pylon first, then SW pylon, NW pylon, NE pylon, and finally the SE pylon again; then the contestant must return to the airstrip.

**Slalom Race**
**Difficulty Factor: 1.5**
**Requirements:** After leaving the airstrip, the contestant must fly around the pylons from north to south in order: NW first, then NE, SW, SE and NW again; then the contestant must return to the airstrip.

**Ribbon Cut**
**Difficulty Factor: 1.7**
**Requirements:** After leaving the airstrip, the contestant must cut both 3" ribbons; then the contestant must return to the airstrip. Ribbons need not be cut in any particular order, nor from any specific direction.

**Inverted Ribbon Cut**
**Difficulty Factor: 2.4**
**Requirements:** After leaving the airstrip, the contestant must cut both 3" ribbons while flying inverted: then the contestant must return to the airstrip. Ribbons need not be cut in any particular order, nor from any specific direction.

**Ribbon Roll**
**Difficulty Factor: 2.2**
**Requirements:** After leaving the airstrip, the contestant must pass under one gate in level flight, perform a complete 360 degrees roll, and pass under the other gate in level flight; then the contestant must return to the airstrip. Gates can be passed in either direction.

**Under Ribbon Race**
**Difficulty Factor: 2.0**
**Requirements:** After leaving the airstrip, the contestant must pass under the three gates in proper order: First the NE gate from east to west, then the W gate from west to east, and finally the SE gate from east to west; then the contestant must return to the airstrip. The contestant must pass UNDER the gate ribbon - cutting the ribbon is an unsuccessful pass.

**Loop**
**Difficulty Factor: 2.5**
**Requirements:** After leaving the airstrip, the contestant must fly through the gate, do a loop over the gate, and fly through the gate again; then the contestant must return to the airstrip.

**Spot Landing**
**Difficulty Factor: 1.8**
**Requirements:** After leaving the airstrip, the contestant must climb to at least 2,000' and land again on the airstrip from south to north. Scoring is based on where the wheels touch the runway. In a perfect score the wheels first touch at the spot line. There is a points penalty for first touching further north, and a double penalty for first touching further south. Note that the plane will invariably roll after the touch point, as it brakes to a stop. The final stopping point has NO effect on the score, provided the plane remains on the runway.

**Cuban Eight**
**Difficulty Factor: 3.0**
**Requirements:** After leaving the airstrip, the contestant must fly west through the west gate, half loop to cross above the gate, half roll on the descent to fly through the east gate, half loop to cross above that gate, and conclude with a half roll to fly west through the west gate again; then the contestant must return to the airstrip.

**Flameout Landing**
**Difficulty Factor: 2.0**
**Requirements:** After leaving the airstrip, the contestant must climb to at least 2,000', set the engine to idle (press 0) while over the airstrip heading north, and glide to a landing on the airstrip. Landing requirements and scoring are the same as the Spot Landing, except that any use of the engine after it is turned off results in a very low score.

**The Unlimited**
This event allows you to select your own course. You decide what race or aerobatic manoeuvres are required.
This means you can decide what aerobatics and/or racing paths are required. You decide the difficulty factor for the event too. The event can be timed or untimed, as you wish.
In the unlimited you and your friends can judge each other, rating performance on a scale from 1.0 to 9.9. In an event that is timed but not judged, always give contestants a judging score of 9.9. Note that an event can be both timed and judged if you wish.
If you start an unlimited event airborne, any time you cross the spot line from south to north during the event, it will immediately end.

**Scoring**
In all events a pilot is awarded a small consolation score for flying it correctly and finishing intact. You get a higher score for completing more difficult events. Additional bonuses are added for flying in more difficult weather conditions, and flying with more realistic aircraft performance. However, the dominant factor going into a high score is time. There are, of course, exceptions. In the landing events (Spot Landing and Flame-out Landing) distance between the touchdown point and the spot line is critical to your score.
In the unlimited event with judging, the opinion of the judges can have a very significant effect, especially if the event is not timed. In a timed and judged event, the timer is slightly more important than the judges' decision.
Finally, in any event flown from an airborne start, time scores are adjusted for the starting and ending conditions. In addition, pilots flying from an airborne start suffer an extra penalty to their score. If you crash or land without completing the event you score a small amount. If you fly the event wrong you can keep trying until you do it correctly. The only penalty is time lost. However, keep an eye on your fuel.

**The WGSP Pentathlon and Decathlon**
The WGSP (World's Greatest Sport Pilot) AcroJet competition is a sum of any five events or all ten events. Since event scores are adjusted for difficulty, flying the more difficult events can result in the highest Pentathlon score.

| LOCK COLOUR CODE | UNLOCK CODE |
|---|---|
| Azure | 459 |
| Beige | 741 |
| Burgundy | 025 |
| Crimson | 817 |
| Emerald | 356 |
| Flame | 283 |
| Gold | 992 |
| Indigo | 538 |
| Jade | 464 |
| Lavender | 170 |
| Lemon | 076 |
| Magenta | 205 |
| Maroon | 751 |
| Olive | 428 |
| Ocher | 847 |
| Peach | 384 |
| Rose | 162 |
| Scarlet | 630 |
| Sienna | 974 |
| Tangerine | 913 |
| Turquoise | 290 |
| Umber | 578 |
| Violet | 024 |
| Viridian | 757 |
| White | 681 |

**LADEANWEISUNGEN**
**CBM 64/128 Kassette:** SHIFT - und RUN/STOP - Tasten gleichzeitig drücken. PLAY - Taste auf Kassettenrekorder betätigen und Bildschirmanweisungen folgen.

**ISTRUZIONI DI CARICAMENTO**
**Cassetta CBM 64/128:** Premi contemporaneamente i tasti SHIFT e RUN/STOP. Premi PLAY sulla piastra di registrazione e segui i solleciti dello schermo.