PILOT OPERATING HANDBOOK FOR
ROCKWELL TURBO COMMANDER 690B

This manual was compiled for unique and exclusive use with Rockwell Turbo Commander 690B from VENEAVIONES SIMULATIONS GROUP. The information herein contained is derived from multiple sources, and is not subject to revision. This manual shall not be used for training or real-life purposes, and must be used only for Flight Simulator 2004. Veneaviones Simulations Group will not provide any support for Flight Simulator 2002 users.
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*This data is not suitable for real-world purposes.*
ABOUT VENEAVIONES

Thank you for your download of this airplane, the Rockwell Turbo Commander 690B. We would like to express our gratitude in your confidence for downloading it but also would like to assure you hours and hours of enjoinment and fun.

Veneaviones Simulations Group has put a lot of efforts, passion, time, sweat (and tears sometimes) in order to come up with this airplane for the all blessed Flight simulator community around the world, trying to – humbly – contribute with all others magnificent authors who also made theirs efforts, emotions, time, sweat and why not, tears.

Knowing that this is just our second project as a team, we were trying to do our best to bring up a quality product in the freeware figure so all of you will be able to share our joy and pride.

The 690B has been designed using specs from original factory engineering drawings, manuals and technical advice and support of Veneaviones Simulations Group.

Let us introduce the so honorable people that form and helped Veneaviones Simulations Group. A multinational-melting pod people with one real thing in common: The Flight Simulation.

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ABOUT THE TURBO COMMANDER 690B

The Turbo Commander was developed from the Aero Commander light twins, and it was based on the 680FLP. The prototype first flew on Dec. 31st, 1964 and the initial model entered production in year 1965 as the 680T. The evolution of this model continued; and when North American Rockwell took over Aero Commander, the name Hawk Commander was briefly applied to the series until 1971. By this time, Rockwell was already developing the 690, which had first flown on March 3rd, 1968. The 690 was developed through the Jetprop Commander 840 and 980, which were produced by Gulfstream, when acquired Rockwell's General Aviation Division in 1981. These were followed by the 1000 model. Production was finally ended in 1985.

STANDARD AIRCRAFT SPECIFICATIONS

<table>
<thead>
<tr>
<th>Engines:</th>
<th>Garrett TPE 331-5-251K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceiling:</td>
<td>31,000 feet</td>
</tr>
<tr>
<td>Rate of Climb:</td>
<td>3000 feet/minute</td>
</tr>
<tr>
<td>Operational Airspeeds:</td>
<td>120 - 250 kts</td>
</tr>
<tr>
<td>Electrical:</td>
<td>Two 28 VDC generators, 110 VAC</td>
</tr>
<tr>
<td>Fuel Load:</td>
<td>384 US gallons</td>
</tr>
<tr>
<td>Fuel Type:</td>
<td>Jet A,B JP4,5,8</td>
</tr>
<tr>
<td>Standard Fuel Burn: Normal Cruise Speed</td>
<td>between 60 and 90 gallons per hour</td>
</tr>
</tbody>
</table>

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REFERENCE INFORMATION

It is important that you understand the fact that this model has been created for entertainment purposes only. This simulation can’t substitute the real flight training. Therefore, the data herein shown is not suitable for real-world purposes.

OPERATING LIMITATIONS

| WEIGHTS |
|-----------------|---------------|
| Maximum Takeoff Weight | 10.325 Lbs. |
| Empty Weight | 6.830 Lbs. |
| Useful Load | 3.495 Lbs. |

NOTE:
- Maximum takeoff and landing weights may be additionally restricted due to altitude, temperature and field length.
- To adjust fuel load, click Fuel and Load on the Aircraft menu.

REFERENCE AIRSPEEDS

| $V_{MO}$ | Maximum Operating Speed | 246 KIAS |
| $V_{LO}$ | Maximum Gear Operating Speed | 201 KIAS |
| $V_{LE}$ | Maximum Landing Gear Extension Speed | 201 KIAS |
| $V_A$ | Maximum Airspeed for Turbulence | 148 KIAS |
| $V_{FE}$ | Maximum Airspeed for Flap Extension (1/2) | 180 KIAS |
| $V_{FE}$ | Maximum Airspeed for Flap Extension (Full) | 140 KIAS |
| $V_{YSE}$ | Single Engine Best Rate of Climb | 123 KIAS |
| $V_{XSE}$ | Single Engine Best Angle of Climb | 113 KIAS |
| $V_{SSE}$ | Single Engine Clean Stall | 95 KIAS |
| $V_{MC}$ | Maximum Control Speed (Airborne) | 83 KIAS |
| $V_{SO}$ | Stall in Dirty | 75 KIAS |

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NORMAL PROCEDURES

The Turbo Commander 690B depicts as close as possible several systems which attempts to simulate real-life procedures. Therefore, we kindly ask you to read carefully this section before flying the 690B for the first time.

A. Interior Visual Inspection:
1. Cabin Compartment: Secure
2. Aircraft Documents: Check and on Board
3. Landing Gear Control Lever: Down and Latched
4. Engine Control Switches: Off
5. Overhead Panel Switches: As Required
6. Battery Switch: On
7. Parking Brakes: Set
8. Fuel Quantity: Check
9. Trim Tabs: Set (at zero indication)
10. Lights and Ice Protection Heat: Check. If Night, IFR or Flight into icing conditions are anticipated, the following must be physically or visually Check for proper operation:
   * Left Pitot Heat
   * Right Pitot Heat
   * Static Source Heat
   * Left and Right Landing Lights
   * Left and Right Vent Heats
   * Instrument Panel Lights

CAUTION:
- Ground Operation of Ice Protection Electric Heaters **must**

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B. External Visual Inspection:

NOTE:

- External visual inspection (walk around) **must**

1. Upper Wing Surface: Check fuel caps and general condition. (This may be accomplished by standing in the main door opening).
2. OAT Probe: Check
3. Entry Door and access ladder: Check
4. Left Pitot Head: Check
5. Left Windshield and Wiper: Check
6. Nose Gear, Doors and Wheel Well: Check
7. Radome: Check
8. Right Windshield and Wiper: Check
9. Right Pitot Head: Check
10. Emergency Exit: Secure
11. Static Port: Check Clear
12. Right Engine: Check prop and spinner (rotation and condition).
13. Oil Quantity, Cap and Access Door: Check

*This data is not suitable for real-world purposes*
1. Right Wing: Check leading edge, ice protection boot and stall warning vane, landing light, fuel vent and wing tip condition.
2. Aileron and Fixed tab: Check
3. Outboard Flap: Check
4. Tailpipe: Check condition and clear
5. Right Wheel Well: Check
6. Right Strut, Wheel and Brake: Check condition and wear
7. Fuel Sump and Vents: Drain and Check
8. Battery Vents: Clear
9. Inboard Flap and Hinge Fairing: Check
10. Right Fuselage Static Ports: Clear
11. Oxygen: Check pressure, Shutoff Valve and secure access door.
12. Antennas: Secure
13. Empennage: Check Vertical and Horizontal Ice Protection Boots, Elevators, Rudder, Tabs and Tail Cone.

NOTE:
- Attempt to move rudder. Resistance to movement by the internal controls lock should be encountered. If there is no resistance, rudder control system may have been damaged by the wind.
14. Left Static Ports: Check
15. RAM Air Outlet: Check
16. Environmental System Compartment and Access Door: Check and Secure
17. Battery Vents: Clear
18. Baggage Compartment: Check that Baggage and Baggage door are secure
19. Inboard Flap and Hinge Fairing: Check
20. Oil Quantity, Cap and Access Door: Check
21. Left Engine: Check prop and spinner (rotation and condition), listen for unusual noises as prop is hand rotated.
22. Left Strut, Wheel and Brake: Check condition and wear
23. Left Wheel Well: Check
24. Hydraulic Quantity, Cap, and Access Door – CHECK.
NOTE:

- Flaps must be retracted and system pressure zero for an accurate hydraulic quantity check.

C. Removing and Placing Dust Covers and Locks:
To place and / or removing dust cover and locks, you must activate the function called “Tail hook Up / Down”, which is available in the “Assignments” menu of “Settings” of your Flight Simulator 2004.

Once assigned a key (in this example, “F10” was assigned to the function).
Click OK and start your flight with the 690B.
Now, every time you wish to remove or place dust covers and locks, you must verify that
engines are off and activate the tail hook up / down function (in this example is by pressing F10). The result must be as shown in the picture.

In case that you accidentally forgot to remove locks and covers before starting engines there is a “safety” mode, which removes automatically all locks and covers once left engine starts.

D. Before Starting Engines

NOTE:
- After completing inspections the following must be accomplished:
  1. Battery Switch: On
  2. Aircraft Lightning: As Required
  3. Cabin Door: Closed and Locked

NOTE:
- Verify that “Door Open” light in warning panel is off. If not, observe that door is properly closed.
  4. Flight Controls: Free and Full Travel
  5. Environmental System Controls: Check the Following Items:
     a. Bleed Select Switch Normal.
     b. Depressurize Switch Normal.
     c. Max Flow Switch Normal.
     d. Mode Selector Switch Normal.
     e. Auto Temperature Selector as Required.
     f. Pressurization Instruments.

NOTE:
- Cabin can pressurize on ground if Bleed Air is on if Cabin Depress Circuit Breaker is tripped:

CAUTION:
- Cooling Unit Damage may result if Environmental System is operated on ground with Ground Blower Inoperative.
  8. Landing Gear Control Lever: Down and Latched

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NOTE:
- Minimize Electrical Load prior to starting engines. All non-essential equipment should be off.

8. Generator Switches: Off, while starting engine, annunciators should be illuminated.

CAUTION:
- Generator Switch of engine being started must be in off position.

9. Annunciator Panel: Test
10. Hydraulic Pressure: 470 to 605 PSI.
11. Fuel Counter: As Required
12. Fuel Quantity: Check
13. Parking Brakes: Set (verify annunciator light is on)
14. Prop Sync. Switch: Off
15. Flap Control Lever: Up

E. Starting Engines

CAUTION:
- If Engine is going to be restarted within 10 to 45 minutes after shutdown, observe engine compressor and slowly move propeller until compressor rotates one half (1/2) Revolution. Propeller tip will move approximately six (6) inches. This should be done approximately ten (10) minutes prior to restart.

2. Battery Switch: On
3. Anti – Collision Light Switch: On
4. Inter Turbine Temperature: BELOW 300°C

1. Maximum ITT for initiating start is 300°C. ITT may be reduced by motoring the engine with fuel and ignition systems off.

2. Condition Levers: “LO RPM” Position
3. Power Levers: “FLT IDLE” Position
4. Fuel Valve: “ON” Position
5. Propellers: Clear
6. Engine Control Switch: “GND – START RUN”. As start is initiated, check engine instruments.
1. Inter Turbine Temperature: Monitor (starting at 1149ºC)

**CAUTION:**

- Limit Starter Duty Cycle to three periods of operation of 60 seconds each, separated by a five-minute off period. Cycle may be repeated after starter has cooled for 30 minutes.
- As soon as the Engine Control Switch is placed in GND – START – RUN position, and propellers start turning, Pilot’s hand should move to the condition lever for that engine. Condition lever should be guarded for the remainder of the start. If RPM stops increasing prior to 40 percent or if ITT is approaching 1149ºC and rising rapidly, immediately place condition lever to ENGINE OFF position and then place engine control switch to ENG. OFF. If ITT exceeds 1149ºC, engine may damage.

2. Oil Pressure: Check (50 PSI Minimum at 70 percent RPM)

**CAUTION:**

- If Oil pressure is not indicated within 10 seconds after light off, shut down engine.

3. Fuel Pressure: 25 PSI minimum

4. Hydraulic Pressure: 900 to 1075 PSI

5. Vacuum Gauge: Check, should indicate in the green arc


7. Repeat Steps from 8 to 16 for starting second engine.


9. Oil Temperature +55ºC **MINIMUM**

**NOTE:**

- Do not exceed 106 percent. If this limit is exceeded, proceed immediately to move power lever to ground idle and shut down engine. Engine must be removed if this limit is exceeded.
F. Before Taxi
1. Overhead Switches: As required
2. External and Internal lights: As required

NOTE:
- Landing light annunciator illuminates when landing lights are on.
3. Avionics: Set for takeoff
4. NAV / COM Equipment: As required
5. Flight Instruments: Check
6. Engine Instruments: Check
7. Environmental System: Check
   a. Bleed Selector Switch: Normal
   b. Depressurization Switch: Normal
   c. Max Flow Switch: As required

CAUTION:
- Selection of environmental functions on the ground is not recommended unless the ground blower is known to be operating. Visually observe a current increase on cabin altimeter for blower operation. Severe overheating and damage of ducts, heat exchanger, and cooling unit is possible.
   d. Mode Selector Switch: Auto
   e. Auto Temp. Control: As required

G. Before Takeoff
1. Flight Controls: Free and Full Travel.
2. Trim Tabs: Set for Takeoff
5. Engine Instruments: Check
6. Max. Flow Switch: Normal
7. Prop Sync Switch: Off
8. Flaps Control Lever: Up
9. Condition Lever: “HI RPM” Position
H. Lineup

1. Ice Protection: As Required: When the temperature is -5ºC, or below and there is visible moisture present, all appropriate ice protection must be turned on as follows:
   a. Rudder Heat.
   c. Propeller Heat.

CAUTION:
- Do not operate Ice Protection heat when ambient temperatures are above +5º C.
- Do not operate boots during Takeoff and landing.


3. Condition Levers: “HI RPM” Position (96.5 to 97.5 Percent)

4. Power Levers: ADVANCE to maximum power (99.0 to 100.5 percent RPM). Observe 717.5 HP and / or 923ºC limit(s). Predicted horsepower and fuel flow should be attained.

5. Engine Instruments: Check.

I. Takeoff

1. Takeoff and Climb Speed: Attain.

2. Landing Gear Control Lever: Up

J. Climb

1. Climb Speed: 139 KIAS (to 5000 Feet.). Scheduled climb speed thereafter: minus 1KT per 1000 Ft. (above 5000 Feet).

2. Power Levers: As Required. A climb at Maximum Recommended Climb Power (MRCP) may be made at 717.5 HP / 905ºC ITT at 96 percent RPM.

3. Condition Levers: As Required.

4. Prop Sync Switch: As Required.

5. Ice Protection: As Required.
K. Cruise
1. Power Levers: As Required. The Maximum Recommended Cruise Power (MRCP) 717.5 HP / 905°C ITT at 96 percent RPM.
2. Condition Levers: As Required.

NOTE:
- Do not reduce engine RPM below 96 percent during flight.
- If severe turbulence is encountered during flight and can’t be avoided, the following procedure is recommended:
  - Avoid control action which could give rapid changes in attitude, altitude or airspeed; whenever possible, achieve steady flight conditions prior to entry into turbulence. Flaps should be full retracted and autopilot disengaged.
  - Slow to $V_A$ Speed, keep pilot control movements to a minimum and fly a straight course through the turbulence as far as practicable concentrating on attitude and disregarding altitude.

CAUTION:
- Failure to slow to $V_A$ can result in structural damage or loss of the airplane due to the magnitude of gust loads, or loss of control.

3. Ice Protection: As Required.

L. Descent
1. Cabin Differential: Check Zero
2. Max. Flow Switch: Normal
3. Hydraulic Pressure: Check. Normal pressure varies between 900 and 1075 Psi.
4. Ice Protection: As Required.

M. Before Landing
2. Prop Sync Switch: Off.
4. Gear Safe Lights: 3 Green
NOTE:
- It may be necessary to reduce the airspeed to less than 180 KIAS to allow the main landing gear to complete its extension cycle. Landing gear extension may be initiated at 201 KIAS.

1. Flaps: As Required.

NOTE:
- Limiting airspeed for flap selection and operation:
  - One Half Flaps (20º): 180 KIAS.
  - Full Flaps (20º): 140 KIAS.

N. Go-Around
1. Power Levers: ADVANCE to maximum power, 99.0 to 100.5 percent RPM. Observe 717.5 HP and / or 923 ºC limit(s).
2. Climb Speed: Attain. Best rate of climb speed is 99 KIAS.
3. Flaps: Retract.
4. Landing Gear: Retract (when definitely climbing). Accelerate to twin engine climb speed and perform the takeoff and climb checklist.

O. Landing
1. Touchdown: Confirmed.

NOTE:
- Full Reverse is limited to 500 HP at or above 95% RPM, with speed less than 90 KIAS and OAT below +32º C.
- Reduce max allowed airspeed 2 knots for each one degree above 32º C.
- Reduce reverse thrust proportionately as aircraft speed decreases.
- Partial Reverse may be used above 90 KIAS.

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NOTE:
- Do not use reverse thrust to a full stop with brakes applied. Use reverse thrust with caution when landing on dirt or snow covered runways. If this occurs, discontinue reverse immediately. Damage to propeller blades may occur if reverse is used on gravel or similar surfaces.

P. After Landing
1. Power Levers: As Required.
2. Condition Levers: “LO RPM” Position
4. Ice Protection Switches: All OFF.

Q. Shutdown
1. Parking Brakes: Set
2. Power Levers: “GND Idle” Position. Operate at taxi power for at least 3 minutes (including taxi time), prior to shutdown.
3. Generator Switch: OFF (for engine to be shutdown).

NOTE:
- Turning engine control switch OFF before turning generator switch OFF will unnecessarily break and make generator line and field relay contacts, thereby reducing contact service life.
6. Remaining Engine: Shutdown by repeating steps from 2 to 5.

CAUTION:
- Do not open the cabin door until the left propeller stops rotating.
7. Overhead Switches: As Required.
8. Power Levers: “FLT Idle” Position
9. Battery Switch: OFF.
10. Control Locks, Pitot, Covers, Engine Dust Covers and Wheel Chocks: Install; Allow a minimum of 10 minutes to cool down before installing engine dust covers.