

F-14B - Normal Procedures: Prestart - Start

Based on the 01-F14AAP-1 NATOPS Flight Manual F-14B

In blue, those items that can be omitted when in a hurry.

In violet, items not implemented yet on the Sim

7.4.2 Prestart — Pilot

- 1. External electrical power — ON. Press Mic Button ICS to call Ground Crew to provide Ground Electrical Power.
- If the Cockpit is too dark, now you can activate interior lighting on the Right Console. Also activate flashlight with LALT+L
- Turn on the UHF-1 radio and tune the ATC Frequency.
- Press Mic Button UHF-1 (on the Throttle) and contact ATC to request permission to start-up the engines.
- Once permission is granted, turn on the Position Lights and activate the Lights Switch on the Throttle, to indicate crew is on plane.
- Oxygen — Turn OXYGEN switch ON (forward).
- 12. Starter air — ON. Press Mic Button ICS to call Ground Crew to connect Air Supply.
- 2. If wings are NOT in Over Sweep (OV SW):
 - a. Circuit Breakers WING SWEEP DRIVE NO. 1 and WG SWP DRIVE NO 2/MANUV FLAP (LE1, LE2) on pilot left knee panel — Pull to ensure that the electrical command of the wings does not interfere with the emergency mode. Not modeled in Sim.
 - b. Emergency WINGSWEEP handle — Extend and Match Commanded Position (square cursor) with Actual Wing Position bar (rightmost on the Sweep Indicator)

NOTE: If wings are in OV SW, do not extend handle.
- On the Sim, we have to instruct Jester to proceed with the Startup. Bring him up with “A” and select Start Up.



- 3. ICS — Check. Set the ICS to HOT MIC, to be able to communicate with the Ground Crew even if the Canopy is closed. The RIO will test the Inter-Communicator. If you can hear him, acknowledge by bringing up Jester (“A”) and select “Loud & Clear”. The RIO will then proceed with his own Checklist.
- 4. Landing gear indicator and transition light — Check gear position indication down and transition light off.
- 5. MASTER TEST switch — Check. Right click to cycle the knob OUT or IN. When out, left click will turn it clockwise one position. When pushed in it will begin the selected test. We will run three Tests:

a. LTS (LightS Test). Check that all warning, caution, and advisory lights illuminate. The brightness of the ACM panel and the indexer lights should be set during the test. The DATA LINK switch (on RIO cockpit) must be ON to check the DDI lights.



b. FIRE DETection / EXTinguishing. L and R FIRE lights illuminate to verify continuity of respective system. The green GO light (on the MT panel) will illuminate verifying continuity through the four squib lines, that 28 Vdc is available at the left and right fire switches, and that the fire extinguisher containers are pressurized.

c. INSTRuments. Check for the following responses after 5 seconds:

- (1) RPM — 96 percent.
- (2) EGT — 960 °C. Initiates engine over temperature alarm L STALL and R STALL warning lights flash.
- (3) FF — 10,500 Pph.
- (4) AOA (units) — 18 ± 0.5 Reference and indication
- (5) Wing sweep — $45^\circ \pm 2.5^\circ$. Program, command, and position.
- (6) FUEL QTY — $2,000 \pm 200$ Pounds (both cockpits).

- (7) Oxygen quantity — 2 Liters. Not implemented yet.
- (8) L and R FUEL LOW lights — Illuminated (both cockpits).

d. MASTER TEST switch — OFF.



- 6. Ejection seats — Arm by clicking on handle on top of the Seat.
- 7. CANOPY handle — Close with LCTL + C or let the RIO to do it after you have armed the Seat.
- 8. ACM panel — Set the following:
 - a. Gunrate — Set and Check Rounds Remaining.
 - b. SW COOL — OFF.
 - c. MSL PREP — OFF.
 - d. MSL MODE — NORM.
 - e. Station loading status windows — Check. Verify proper indication consistent with external store loading condition.



- 9. EMERG STORES JETT pushbutton light — Out. The MASTER CAUTION light and the EMERG JETT caution light illuminate when the EMERG STORES JETT pushbutton is activated (not implemented on Sim)

7.4.3 Engine Start — Pilot.

Although the engines cannot be started simultaneously, either engine can be started first. The following procedure establishes starting the right engine first.

- On the Air-condition controls (Right Console), the AIR SOURCE should be at OFF until external air is disconnected, to avoid bleed air duct contamination.

Bleed Left & Right Hydraulics:

Plane captain will bleed FLT and COMB HYD systems during steps 1 and 3 (interaction with Ground Crew not modeled on Sim)

- 1. ENG CRANK switch — L (left engine).
- 2. ENG CRANK switch — OFF.
- 3. ENG CRANK switch — R (right engine).
- 4. ENG CRANK switch — OFF.

Check Emergency Hydraulic System:

- 5. EMERG FLT HYD switch — Cycle to test.
 - a. EMERG FLT HYD switch — LOW. Check that ON flag is displayed in EMER FLT LOW hydraulic pressure window. Verify control (move the stick & rudder) over horizontal tail and rudder control surfaces as viewed on surface position indicator.
 - b. EMERG FLT HYD switch — HIGH. Check that ON flag is displayed in EMER FLT HI hydraulic pressure window. Verify control surfaces now operate at a higher surface deflection rate.
 - c. EMERG FLT HYD switch — AUTO (LOW). Check that OFF flags are displayed in both EMER FLT HI and LOW hydraulic pressure windows.



Start Right Engine:

- Confirm that the HYD TRANSFER PUMP switch is at SHUTOFF.
- 6. ENG CRANK switch — R (right engine). Place the crank switch to the R position. The switch is solenoid held until automatically re-leased to the neutral (OFF) position at the starter cutout speed of approximately 49- to 51-percent rpm.



Manual deselect of the switch to OFF will interrupt the crank mode at any point in the start cycle. Oil pressure and flight hydraulic pressure rise will become evident at 20-percent rpm.

- 7. Right throttle — Move to IDLE at no less than 20-percent RPM, by clicking on the Throttle handle.

Advancing the R throttle from OFF to IDLE automatically actuates the ignition system. An immediate indication of fuel flow (≈ 300 to 350 pph) will be exhibited and light-off (EGT rise) should be achieved within 5 to 15 seconds. Peak



starting temperatures will be achieved in the 40- to 50-percent rpm range. After a slight hesitation, the EGT will return to normal. Exceeding 890°C constitutes a hot start. During the initial starting phase, the nozzle should expand to a full-open (100-percent) position.

- 8. R GEN advisory light — OUT. The right generator should automatically pick up the load on the left and right main AC buses as indicated by the R GEN light going out at approximately 59-percent rpm.
- 9. R FUEL PRESS advisory light — OUT. The fuel-pressure lights should go off by the time the engine achieves idle rpm.



- 10. Idle engine instrument readings — Check.
 - a. RPM — 62 to 78 percent.
 - b. EGT — 500 °C (nominal).
 - c. FF (Fuel Flow) — 950 to 1,400 Pph (nominal).
 - d. NOZle position — 100 Percent.
 - e. OIL Pressure — 25 to 35 psi (nominal) (15 psi minimum).
 - f. FLT HYD PRESS — 3,000 psi.
- 11. External power — Disconnect. Ask Ground Crew to disconnect Ground Electric Power (using the ICS Mic Button on the Throttle, remember to have HOT MIC to hear crew response)

Check Hydraulic System:

- 12. ENG CRANK switch L — (left engine). DO NOT MOVE the Left Throttle. Verify that the COMB dial reaches 3,000 psi, then return switch to neutral. (On the Sim it's misspelled COMP)
- 13. HYD TRANSFER PUMP switch — NORMAL. This tests that the Hydraulic transfer pump will operate from FLT (right) side to maintain the COMBined pressure between 2,400 to 2,600 psi.
- 14. HYD TRANSFER PUMP switch — SHUTOFF.



Start Left Engine:

- For a Cross-bleed Start, ask the Ground Crew to disconnect the Air Supply. The engine start steps are the same, though you may need to increase right throttle a bit in order to get enough air bleed
- 15. Repeat steps 6 through 10, but for LEFT engine:

- ENG CRANK switch – L (left engine)
- Left Throttle – Move to Idle at 20% RPM
- L GEN light – Out
- L FUEL PRESS light – Out
- Idle engine instruments reading - Check



- 16. Starter air — Disconnect if not already done so.

- 17. AIR SOURCE switch — L ENG, R ENG, then BOTH ENG. Verify cockpit airflow in the three positions. Leave in BOTH.
- 18. HYD TRANSFER PUMP switch — NORMAL.

7.4.4 After Engine Start — Pilot.

- Contact Jester (key “A”) to indicate him the level of INS alignment that you desire: GO NOW, COARSE, MIN WPN LAUNCH or FINE:



- 1. STAB AUG switches — All ON.



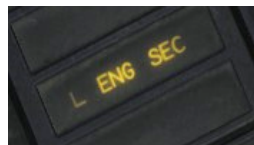
Emergency Generator Test:

- 2. MASTER TEST Switch — Set to EMERG GEN. to test the Emergency Generator. (not implemented yet)
- 3. MASTER RESET pushbutton — Depress.
- 4. MASTER TEST switch — OFF.
- 5. MASTER RESET pushbutton — Depress. STAB AUG switches should not disengage.
- 7. Controls and displays — ON. Turn on VDI, HUD & HSD. Select HSD Mode to TID so you can check the advance of the INS Alignment process:



Augmenter Fan Temperature Control Test:

- 8. AFTC — Check:
 - a. L ENG MODE SELECT switch — SEC. L ENG SEC light illuminates; RPM drops, left NOZ indicator pointer below zero. (not modeled yet)
 - b. Advance Left throttle to ensure engine response.
 - c. L ENG MODE SELECT switch — PRI. L ENG SEC light goes out, left NOZ indicator to 100 percent.
 - d. Repeat for R ENG.
- 9. EMERGENCY WING SWEEP handle — Over SWEEP. If wings are not in over sweep, move the wings to 68° using wing sweep emergency handle in raised position. Then raise handle to full extension and hold until HZ TAIL AUTH caution light goes out and OVER flag appears on wing sweep indicator. Move handle to full aft OV SW and stow.
- 10. WING SWEEP MODE switch — AUTO. (On Hotas)
- 11. WING SWEEP DRIVE NO. 1 and WG SW DR NO. 2/MANUVFLAP circuit breakers — IN (LE1, LE2).
- 12. WING/EXT TRANS switch — OFF.
- 13. COMM / NAV / GEAR / DISPLAYS — ON.
 - a. UHF function selector — T/R + G or BOTH.
 - b. TACAN function selector — T/R.
 - c. ARA-63 power switch — ON.
 - d. Display control switches — ON.
 - e. Radar altitude — ON. Turn knob clockwise to Turn ON, keep turning to set warning altitude.
- 14. Pitch Trim — Set to 000 using the Trim Hat on Hotas.
- 15. Standby gyro — Uncage by clicking the knob. Rotate to adjust the horizon.
- 16. MASTER RESET pushbutton — Depress.



OBC (On Board Check) Systems Check:

- 18. MASTER TEST switch — Select OBC Test, don't start it yet.
- 19. AUTOPILOT switch — ENGAGE.
- 20. OBC — Initiate the Test by Right clicking the Knob (coordinate with RIO and plane captain).

The following systems are automatically exercised during the 1.5 minutes required to complete the OBC tests. (Not implemented)

a. The AICS self-test turns on hydraulic power and exercises the ramps through full cycle STOW — EXTND — STOW. During the test, the respective RAMP light illuminates until the ramp return to the fully stowed position and the hydraulics are shut off. A failure is indicated by an INLET light and/or OBC readout. (not implemented yet)

b. AUTO THROTTLE. This test is a computer self-test with output commands inhibited to prevent throttle movement.

- 21. Speedbrake switch — EXT, then RET. Cycle speedbrake switch to EXT, release, and check for partial extension. Select EXT again, checking indicator for transition for full extension. Select RET and check indicator for an indication of full retraction. Check for stabilizer position fluctuation during speedbrake extension and retraction to verify integrated trim operation.
- 22. REFUEL PROBE switch — ALL EXT, then RET. Cycle the probe to the extend position, noting illumination of the probe light with switch-probe position disparity. Check probe nozzle head for condition. Retract probe and again check that transition light goes out when fully retracted and doors closed.
- 23. WSHLD AIR switch — Cycle.
- 24. MASTER TEST switch & OBC — OFF. If engaged, verify that autopilot disengages automatically (not implemented in Sim, disengage manually).



- 25. WING/EXT TRANS switch — OFF.
- 26. Trim — Adjust the trim manually over its full range to check operation. Set 000.

Note: For CV operations, omit steps 27 through 50.



Test Wing Sweep System:

- 27. EMERGENCY WING SWEEP handle — Move the emergency WING SWEEP handle to 68°, right click to put it down, hit Master Reset button. On the stick select Wings in AUTO, the Wings will then move forward until 20°. Stow handle with a right click and click its cover down. HZ TAIL AUTH light illuminates coming out of OVSW. Light goes out when OVSW stops are removed.
- 28. MASTER RESET pushbutton — Depress. The WING SWEEP warning and advisory lights go out and the AUTO and MAN modes are enabled.
- 29. External lights — Check (prior to night flight).
- 30. Flaps and slats — Down. Check for full deflection of the flaps and slats to the down position and automatic activation of the outboard spoiler module. Check for 3° TEU stabilizer position.



Flight Surfaces Test:

- 31. Flight controls — Cycle. Complete full cycle sweep of longitudinal, lateral, directional, and combined longitudinal-lateral controls while checking for full authority on surface position indicator. Check that all spoilers extend at the same rate with slow lateral stick deflections and extend to full up position. Observe the following:
 - a. Pitch control — 36° TEU (Trailing Edge Up) to 9° TED (Trailing Edge Down) horizontal tail (33° to 12° without ITS: Integrated Trim System).
 - b. Lateral control — 24° total differential tail.
 - c. Directional control — $\pm 30^\circ$ rudder.
 - d. Longitudinal/Lateral combined — 35° TEU to 15° TED horizontal tail.
 - e. Spoilers — 55°
- 32. DLC (Direct Lift Control) — Check. Verify horizontal tail shift with DLC input on the Stick's DLC thumbwheel.
- 33. ANTI SKID SPOILER BK switch — SPOILER BK.
- 34. Spoilers and throttles — Check that the Spoilers raise.
- 35. ANTI SKID SPOILER BK switch — OFF.
- 38. AUTOPILOT switch — ENGAGE.
- 42. Flaps and slats — UP.
- 43. Maneuver flaps — Down, with the DLC Thumbwheel.
- 44. WING SWEEP MODE switch — MANually drive them back to 50° (using the Throttle's Sweep Hat)
- 45. Maneuver flaps — Crack up.
- 46. WING SWEEP MODE switch — BOMB. Check maneuver flap automatic retraction.
- 47. EMERGENCY WING SWEEP handle — Move to 68° and raise the handle (with right click), wait for the HZ TAIL AUTH light to go off (about 8 seconds)
- 48. EMERGENCY WING SWEEP handle — Move to Over Sweep
- 49. WING SWEEP MODE switch — AUTO.
- 50. MASTER RESET pushbutton — Depress.



Note: CV checklist resumes.

Anti-Skid BIT Test (in conjunction with Ground Crew):

- 51. ANTI SKID SPOILER BK switch — BOTH.
 - Ensure alignment is complete before releasing parking brake.
 - Release Parking Brake
 - Hold wheel brakes ON. The Ground crew would go to the front wheel well and run the Anti-skid BIT test.
- 53. ANTI SKID SPOILER BK switch — OFF.
- Re-Engage Parking Brake
- 54. Radar altimeter — BIT. Depress SET knob; check that radar altitude displays 100 feet and indicator green light is illuminated. Release knob and pointer should display 0 feet; warning tone signal (both cockpits) and ALT LOW light illuminated momentarily.
- 55. Displays — Check.
- 56. Tacan — BIT. The BIT button allows you to test the TACAN radio. Click on it and the test is run, takes 20 seconds and then illuminates Green (GO) or red (NO GO)
- 57. ARA-63 — BIT. (Not functional)
- 58. HUD—VIDEO — BIT. (Not implemented)
- 59. Altimeter — SET/RESET mode. Barometric setting and error determined. Check in RESET mode. Right Click Reset knob and hold, to clear Flag.
- 60. Compass — Check. Validate IMU heading on alignment on VDI, HSD, and BDHI. Cross-check with known references and standby compass. (Not implemented)
- 61. Flight instruments — Check.

7.4.4.1 Final Checker (Ashore)

- 1. NOSE STRUT switch — Kneel, Check Launch Bar DN.



- 2. Hook — DOWN (left click on it), Check RATS Advisory Light On, Then Up.



- 3. LAUNCH BAR switch — Cycle. (on the far left vertical panel)



- 4. NOSE STRUT switch — EXT.

7.4.4.2 Final Checker (on Carrier)

- 1. Hook — DOWN on Director's Signal; Check RATS Advisory Light illuminates, then UP
- 2. Nosewheel steering — Cycle OFF, Then ON