Miltech Simulations U-2

Engine Start and Taxi

Ground starting air, generators on line, and out to the runway.

ENGINE START

Parked off the runway with the parking brake set and external power (or battery) on, after the checks above. The air-start unit must be on the stand (EFB Ground tab).

1 CANOPY - CLOSED Click the CANOPY LATCH placard on the right sill (tooltip Closed)

2 MISSION EQUIPMENT - AS REQUIRED MK IV MASTER ON (also the ASARS-2 SSA recorder). SYERS-2A: MK IV MODE STBY starts the boot, 30 s (Realistic 4 min). OBC: DRIFTSIGHT ON, MASTER starts the boot, 30 s (Realistic 90 s), A light flashing; then MODE OFF for the self-test, C light = go. ASARS-2: MK IV MODE STBY starts the radar warm-up (30 s / 12 min) → Mark IV Camera Panel

3 THROTTLE - OFF Throttle below 10 %, right-click it (tooltip THROTTLE IDLE STOP: OFF) or the Increase Cowl Flap 4 key → Engine Start and Cockpit Controls

4 FUEL BOOST PUMP PRIMARY / SECONDARY - PRI ON / SEC ON - FUEL about 19 psi Fuel panel; one pump gives about 15 psi → Fuel System

5 SYS / PERF PAGE - DISPLAY B4 SYS > T1 PERF

6 PARKING BRAKE AND CHOCKS - SET / IN PLACE Secure the aircraft with the parking brake or wheel chocks. In Parking brake mode, pull the T-handle until it reads SET. Chocks are independent of the brake. Use Wheel Chocks Off or Wheel Chocks On on the EFB Ground tab, or click them in the walkaround. In Stall strip mode the T-handle operates the stall strips and the chocks secure the aircraft.

7 GROUND STARTING AIR - APPLY EFB Ground tab, Servicing, Air Supply Unit: Attach, then Apply, or press MIC on the yoke or the throttle grip to have the crew apply it. Needs the parking brake set; Attach brings the air-start unit (ASU) out if it is hidden. The cart drives to its service point and connects the hose; the air comes on once it is connected. N2 rises, ignition is automatic; the starter turns only below 50 % N2. → Electronic Flight Bag (EFB)

8 THROTTLE - IDLE AT 20 % N2 Right-click the throttle again or move it forward. Light-off needs 18 % N2; ground idle is about 60 % N2 / 22 % N1 at sea level.

9 GROUND STARTING AIR - OFF ABOVE 50 % N2 The starter drops out at 50 % N2 by itself and the crew sets the air back to Attached at 52 %; the hose comes off (Off) when neither the brake nor the chocks secure the aircraft, or when you move.

10 ENGINE AND AMAD ALERTS - OFF BY IDLE HYD by about 15 % N2, AMAD / AMAD OIL PRESS LOW at about 38 %, OIL as oil pressure builds, SEC / ENG MODE SECONDARY at 54 %; HYD PRESS LOW and ENG OIL PRESS LOW do not show on a ground start.

Note
Note: The first occurrence of each start alert lights master CAUTION; only a repeat of SEC below 55 % N2 or AMAD below 48 % N2 on the ground is kept off it.

Note
Note: DC GEN, MAIN AC, DC GEN OUT and MAIN AC GEN OUT stay on until the generators are set in AFTER ENGINE START.

Note
Note: There is no START switch. The starter keys (Toggle Starter 1) are the throttle AIRSTART button and do nothing while the emergency start system's ground safety pin is in (on the stand it always is); EMERGENCY START SYS ARM only gives EMER START ARMED there - leave it OFF, cover closed.

Note
Note: Shortcut: the Engine auto-start key, or EFB Aircraft tab > Set up aircraft > Ready for takeoff, powers up and starts the engine for you, without the ground carts.

AFTER ENGINE START

Engine at idle, external power still on. The order keeps the DC buses powered.

1 ENGINE INSTRUMENTS AND ICAW - CHECK SYS > PERF: N2 about 60 %, N1 about 22 %, EGT about 420 C, HYD about 3,000 psi, FUEL about 19 psi; STAT > T1 ICAW. SEAL PRESS OFF clears by itself 20 s after the start.

2 FLIGHT CONTROLS - FREE, FULL TRAVEL Now that hydraulic pressure is up; yoke and pedals follow your controller

3 CANOPY SEAL - ON T-handle on the left console (tooltip Locked); canopy closed. The canopy cannot be opened while it is ON → Engine Start and Cockpit Controls

4 CABIN HEAT - AUTO - SET Knob beside the gear handle: click or wheel, 55-85 F (default 70) → Cabin, Oxygen and Hypoxia

5 MAIN AC GENERATOR - TEST, then NORM Electrical panel (MAIN GEN, AC side). In TEST MAIN AC goes out (generator good, not connected); in NORM it stays lit until external power is off → Electrical and Avionics Power

6 MAIN DC GENERATOR - NORM DC GEN and DC GEN OUT go out - the generator takes the DC buses from external power

7 BATTERY - NORM From EXT PWR (through OFF)

8 EXTERNAL POWER - OFF The main AC generator takes over: MAIN AC and MAIN AC GEN OUT go out; displays ride through the short drop

Caution
Caution: Do not switch EXTERNAL POWER OFF - or release the parking brake, which disconnects the cart - before MAIN DC GENERATOR (or BATTERY) is in NORM. With BATTERY in EXT PWR the DC buses go dead - INS, AVP, UFCD and MFDs lose power and the INS alignment restarts.

9 STANDBY GENERATOR - TEST, then NORM STBY GEN. In TEST: STBY AC GEN ON and the ESS AC lamp (needs 2,500 psi hydraulics)

10 EMERGENCY INVERTER - TEST, then NORM EMER INV. In TEST: EMER INVERTER ON, EMER AC FAIL (with master CAUTION) and the EMER AC lamp

11 TRANSFORMER RECTIFIER - TEST, then NORM XFMR RECT. In TEST: TR ON shows

12 AC AND DC ALERTS - OFF Lamps MAIN AC, ESS AC, EMER AC, DC GEN, MON DC, UTIL BATT LOW out; no generator, TR or inverter rows on ICAW. Reset master CAUTION, L7 ACK. BCCU FAULT on the ground means a battery is low: no takeoff until the batteries are serviced (parked, engine off, BATTERY OFF for a minute)

13 FLIGHT INSTRUMENTS - CHECK PFD and SFD: attitude, heading, both altimeters set (separate baro settings) → Standby Flight Display (SFD)

BEFORE TAXI

Engine running and the AFTER ENGINE START checks done, still stopped with the brakes held.

1 GEAR PINS - REMOVED With the aircraft stopped, remove the main and tail gear pins in the walkaround (one click removes both) or with the EFB Aircraft tab, Set up aircraft. Pogo safety pins stay fitted until the runway crew service. The wheel chocks: Wheel Chocks Off on the EFB Ground tab, or click them in the walkaround. → Electronic Flight Bag (EFB)

Caution
Caution: Fitted pogo pins prevent normal release on the takeoff roll. A stuck pogo can break free after repeated wing rocking in flight. Check that the runway crew has removed the pins before takeoff.

2 MANUAL TRIM POWER - ON Slide on the yoke; OFF stops all stabilizer trim, autopilot trim included

3 PITCH TRIM - CHECK +3.5 AND -1.5, SET +1.0 Yoke PITCH TRIM switch, PFD trim readout; about 1 deg per 3 s; needs hydraulic pressure and MANUAL TRIM POWER → AFCS System (Autopilot)

4 ENG MODE - SEC, CHECK, THEN PRI Engine control panel, left console; in SEC the SEC lamp and ENG MODE SECONDARY come on and N2 follows small throttle movements; both go out in PRI → Engine Start and Cockpit Controls

5 NAV LIGHTS - STEADY Lights panel, left side wall

6 ANTI-COLLISION LIGHTS - ON ANTI-COLL LTS

7 ICAW AND FAULTS - CHECK, CLEAR HIST MFD STAT > ICAW and FAULT; STAT > HIST: L1 CLR, L2 YES → Status Pages (STAT)

8 INS - NAV (N ON THE PFD) Position update only if the GPS has failed (FIX, then NAV/DATA update) → Inertial Navigation System (INS)

9 WINDSHIELD ANTI-FOG - ON Heater panel, right side wall

10 TACAN - AS REQUIRED Channel on the UFCD HOM page (LS3); TACAN knob on the audio volume panel above its stop = ON → Up-Front Control Display (UFCD)

11 MISSION EQUIPMENT - AS REQUIRED MSN RCD ON (no EW threat tone without it), EW CONT; with the ASARS-2 nose MK IV MODE 1-5 preselects radar PWR → Mission Equipment (PME)

12 BRAKES - HOLD, PARKING BRAKE RELEASE Push the PARKING BRAKE handle to release the brake. The wheel chocks don't go with it: take them off first (EFB Ground tab or the walkaround). A ground cart still connected comes off once neither the brake nor the chocks hold the aircraft.

Note
Note: Do not move the aircraft until the INS is in NAV and the SFD attitude is up - moving restarts an unfinished alignment.

TAXI

As soon as the aircraft starts to roll.

1 WHEEL BRAKES - CHECK Either pedal brakes the main wheel; there is no differential braking and no antiskid

2 STEERING - RUDDER PEDALS The tailwheel follows the pedals 0.5 s late, so start turns early. Full pedal holds a 189 ft turn radius up to about 20 kt, fading to about 1.4 deg of wheel by 25 kt

3 FLIGHT INSTRUMENTS - CHECK AND SET PFD attitude and heading, SFD, steering source

Note
Note: At idle the aircraft stays put: about 78 % N2 starts it rolling, then ease the power back to what keeps it rolling.

Note
Note: With the chase car on (EFB Settings tab), the mobile calls "taxi clear" as you start to roll.

Related pages: Engine Start and Cockpit Controls · Chase Car and Ground Support Equipment · Flying the U-2S · Takeoff and Climb

Miltech Simulations U-2. SIMULATION USE ONLY. This documentation describes the simulated aircraft as delivered in the add-on and must not be used for real-world aviation.