INTRODUCTION

The following procedures provide an amplified listing which applies to the SR-71A/B aircraft.

Symbol Coding

1. Steps without special notations apply to the forward cockpit of all aircraft.

(2.) Steps with an enclosed number apply to the aft cockpit of the SR-71A.

▲3. Steps preceded by the ▲ symbol apply to both cockpits of all aircraft.

T 4. Steps preceded by a T apply to the forward cockpit of all aircraft as well as the aft cockpit of the SR-71B.

(T5.) Steps with an enclosed T and step number apply to the aft cockpit of SR-71A/B.

(T) 6. Steps preceded by an enclosed T apply only to the aft cockpit of the SR-71B.

The same system is used for abbreviated checklists which are provided separately for the Pilot and RSO. Interior Preflight checklists are provided for each crew position. From Starting Engines on, checklists are common.

CREW COORDINATION

Crew coordination is paramount to mission success and safety of flight. Communication between crewmembers should be continuous when accomplishing checklists. Verbal coordination between crewmembers is required prior to:

a. Going off interphone.

b. Going off aircraft oxygen system or opening faceplate.

c. Changing the programmed mission or steering reference points, changing the pilot's ANS distance display mode (DP/TURN), or changing navigational system mode.

d. Changing the attitude reference.

e. The pilot pressing the indicator and warning lights test button.

f. Autopilot engagement or disengagement (including KEAS HOLD, MACH HOLD, and AUTO NAV).

g. Change of fuel panel settings or fuel crossfeed or transfer operation.

The RSO must monitor aircraft attitude, altitude, and airspeed and advise the pilot if a potentially dangerous situation exists. This is particularly important during critical phases of flight involving substantial changes in aircraft attitude, altitude, and speed.

It may be advantageous to use the interphone system HOT MIC feature for crew communication during some flight phases.

PREPARATION FOR FLIGHT

FLIGHT RESTRICTIONS

Refer to Section V for operating restrictions and limitations.

FLIGHT PLANNING

Refer to Appendix I.

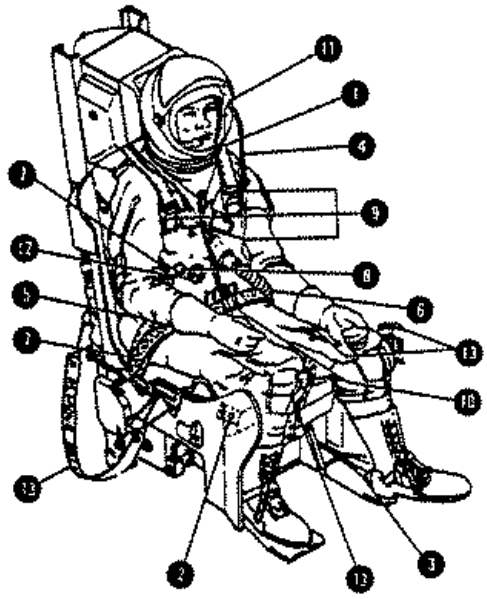
TAKEOFF AND LANDING DATA

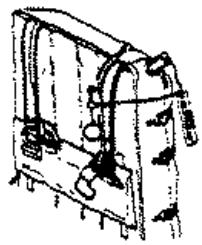
Refer to Appendix I.

WEIGHT AND BALANCE

For detailed loading information, refer to Handbook of Weight and Balance data.

PERSONAL EQUIPMENT HOOKUP - Pressure Suit





1 REMOVE PIN FROM PARACHUTE

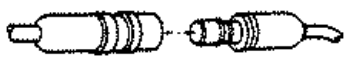
2 CHECK EMERGENCY OXYGEN PRESSURE

3 HOOK UP SPURS

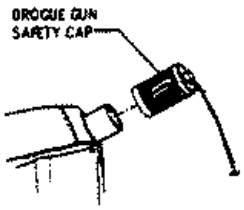
CAUTION

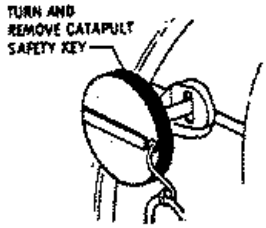
Foot spurs must be attached and removed from foot retractors carefully. When removing spurs, the foot retractors must be fully retracted. Stamping and kicking feet to engage or disengage the foot retractors will damage the return cables.

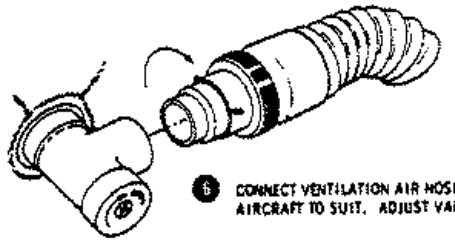
5 CONNECT SURVIVAL KIT (TYPICAL 2 PLACES)



4 CONNECT COMMUNICATION CORD

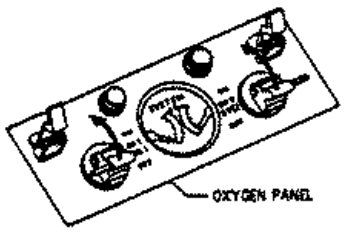






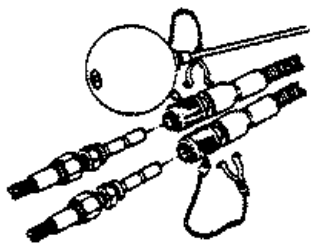
6 CONNECT VENTILATION AIR HOSE FROM AIRCRAFT TO SUIT. ADJUST VALVE.

13 REMOVE:
SCRAMBLE HANDLE GUARD
SECONDARY EJECTION T-HANDLE SAFETY PIN
EJECT D-RING SAFETY PIN
CANOPY JETTISON HANDLE SAFETY PIN
DROGUE GUN SAFETY CAP
CATAPULT SAFETY KEY



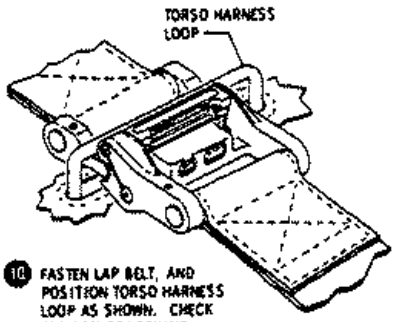
11 TURN OXYGEN ON AND CHECK FLOW-CLOSE FACE PLATE

12 CHECK SUIT INFLATION AND BREATHING FOR BOTH SYSTEMS, USING SYSTEM ON-OFF SWITCHES ON OXYGEN PANEL

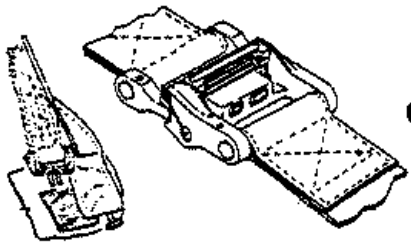


7 CONNECT AND LOCK NO. 1 AND NO. 2 OXYGEN HOSES

8 CHECK ACCESSIBILITY OF EMERGENCY OXYGEN ACTUATOR (GREEN APPLE)



10 FASTEN LAP BELT, AND POSITION TORSO HARNESS LOOP AS SHOWN. CHECK FOR SECURE LOCKING.

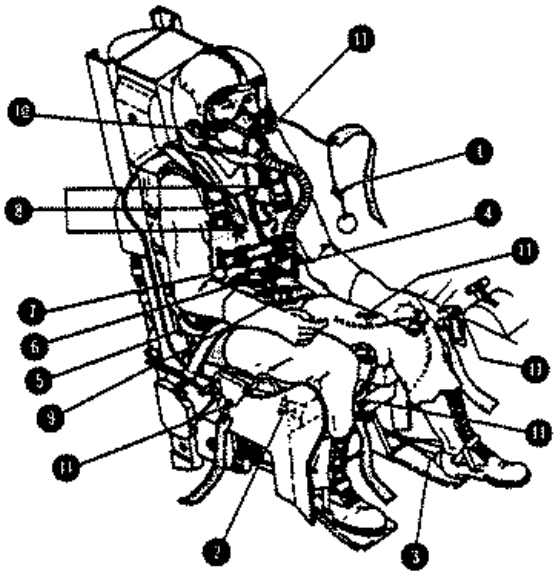


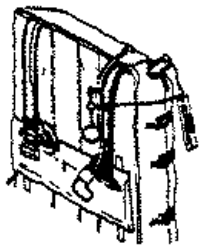
9 CONNECT TWO PLACES TO SECURE CREW MEMBER TO PARACHUTE. CHECK FOR SECURE LOCKING. ATTACH RADIO BEACON CONTROL TO VELCRO PATCH.

F302-71(3)(b)

Figure 2-1 (Sheet 1 of 2)

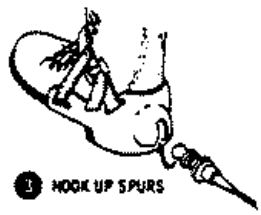
PERSONAL EQUIPMENT HOOKUP - Shirt Sleeve Flight





1 REMOVE PIN FROM PARACHUTE

2 CHECK EMERGENCY OXYGEN PRESSURE

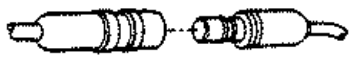


3 HOOK UP SPURS

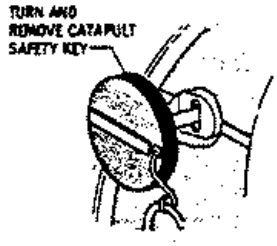
CAUTION

Foot spurs must be attached and removed from foot retractors carefully. When removing spurs, the foot retractors must be fully retracted. Stomping and kicking feet to engage or disengage the foot retractors will damage the return cables.

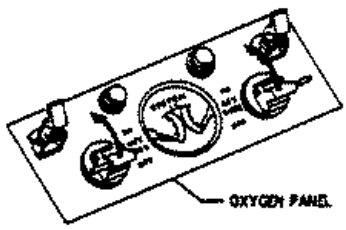
5 CONNECT SURVIVAL KIT (TYPICAL 2 PLACES)



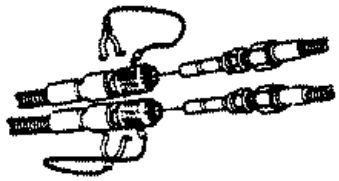
4 CONNECT COMMUNICATION CORD



11 REMOVE:
SCRAMBLE HANDLE GUARD
SECONDARY EJECTION T-HANDLE SAFETY PIN
EJECT D-RING SAFETY PIN
CANOPY JETTISON HANDLE SAFETY PIN
DROGUE GUN SAFETY CAP
CATAPULT SAFETY KEY

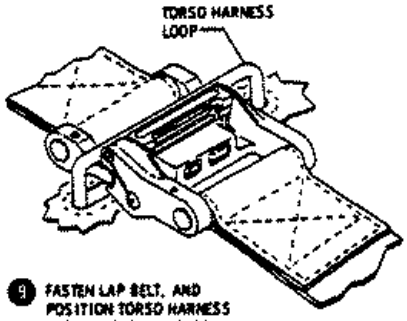


10 TURN ON OXYGEN, HOOK UP MASK AND CHECK FLOW OF BOTH SYSTEMS.

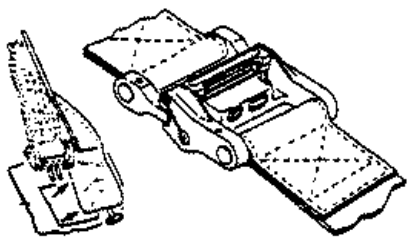


6 NO. 1 AND NO. 2 OXYGEN HOSES PROPERLY ROUTED, CONNECTED AND LOCKED

7 CHECK ACCESSIBILITY OF EMERGENCY OXYGEN ACTUATOR (GREEN APPLE)



9 FASTEN LAP BELT, AND POSITION TORSO HARNESS LOOP AS SHOWN. CHECK FOR SECURE LOCKING.



8 CONNECT TWO PLACES TO SECURE CREW MEMBER TO PARACHUTE. CHECK FOR SECURE LOCKING. ATTACH RADIO BEACON CONTROL TO VELCRO PATCH.

P800-7 (4A01)

Figure 2-1 (Sheet 2 of 2)

Before each flight, check takeoff and anticipated landing gross weights and weight-and-balance clearance (Form 365F or local substitute). Note weight and moment values programmed for CG mode selector box.

NOTE

Recommended weight and/or c.g. limits can be exceeded by seemingly normal loading arrangements. Check loading documents carefully.

AIRCRAFT STATUS

Refer to AF Form 781 for engineering, servicing, and equipment status.

PREFLIGHT CHECK - SR-71A/B

EXTERIOR INSPECTION

Because it is not practical for the flight crew to perform an exterior inspection while wearing pressure suits, the exterior inspection should be accomplished by other qualified personnel.

BEFORE ENTERING COCKPIT - SR-71A/B

▲1. Ejection seat and canopy pins -Installed

▲2. Circuit breakers - Checked in (set).

If any DAFICS computer circuit breakers are open, those in the aft cockpit should be reset approximately one minute prior to resetting those in the front cockpit.

▲3. Canopy handles - Checked.

Fwd cockpit - Locked forward.
Aft cockpit - Aft position.

4. Mode selector reference moment setting - Checked.

▲5. Publications - Checked.

FRONT COCKPIT INTERIOR CHECK - SR-71A/B

Check personal equipment hookup. (See Figure 2-1). Hookup will be performed by personal equipment personnel.

Left Console - Pilot

1. Throttle restart arming switch - NORM.
2. Liquid oxygen quantity indicators -Check SYS 1, SYS 2, and STANDBY.
   a. LOX QTY selector switch - SYS 1, IND 1.
   b. LOX quantity gage - Check both full.
   c. LOX QTY selector switch - STANDBY, IND. 1.
   d. LOX quantity gage - Check No. 1 full.
   e. LOX QTY selector switch - SYS 1, IND 1.
3. Light rheostat switches - Checked.
4. Thunderstorm lights switch - As desired.

   At night, use of these lights can facilitate the P.E. Hookup.
5. Emergency ICS switch - OFF. (Trainer only)
6. Standby oxygen system switches -OFF.
7. Control transfer panel lights - All on. (Trainer only)

Cycle control transfer switches if needed to obtain control in the forward cockpit and illuminate all four transfer lights.

8. UHF radio - ON and set.

   a. Mode - INT.

   b. VOL - Nearly full clockwise.

   c. PWR - Set.

   d. Frequency - Set.

   e. Function select - Set.

9. Oxygen control panel - Set.

10. Aft bypass position lights - Checked.

    Press to test.

11. L and R aft bypass switches -CLOSE.

12. EGT trim switches - AUTO.

13. Map projector controls - Set.

14. Throttles - OFF.

15. Throttle friction lever - Set.

16. Throttle restart switch - Cycle to OFF.

    Slide the switch to the forward bypass open and then to the restart position. Check that the MANUAL INLET and CAUTION lights illuminate. Return the switch to OFF.

17. TEB counters - 16.

Instrument Panel - Pilot

1. Cockpit pressure dump switch - OFF.

2. Bay Air switch - ON.

3. Manifold temperature switch - AUTO.

4. Landing/Taxi light switch - OFF.

5. Suit heat rheostat - OFF.

6. Face heat rheostat - Set.

   Use face heat at all times. Adjust for comfort.

   CAUTION

   - Do not use the HIGH face heat position when equipped with the PPG (glass) visor except for emergency heating. Continuous use of the HIGH position may delaminate the visor.

   - The face heat switch should not be set above 5 with the visor raised, or the faceplate may be damaged.

7. Cockpit temperature control rheostat - 12 o'clock position.

   Cockpit temperature control may have to be adjusted for varying ambient conditions.

8. Temperature indicator selector switch - R BAY.

9. L and R refrigeration switches - OFF.

10. Cockpit temperature mode selector and override switch - AUTO.

11. Defog switch - CLOSED.

12. Brake switches - Set.

    a. Set ANTI-SKID ON, or ALT STEER & BRAKES, respectively, depending on whether the left or right engine is to be started first.

    b. Set WET/DRY switch DRY.

13. Indicators and warning lights test button - Press.

    a. Spike and forward bypass position indicators full counterclockwise, (0 inches and 100% open).

b. LN_2 and LOX quantity indicators decrease to zero.

c. All cockpit caution and warning lights illuminate.

d. Gear warning tone sounds in headset.

e. All CIP indicator needles decrease to zero.

f. Fuel quantity indicator needle moves to zero. The c.g. indicator indicates 14%.

g. The annunciator panel C.G. warning light remains illuminated until c.g. indicator needle is above 17%.

14. Fuel derich switch - ARM.

15. Landing gear lever - DOWN.

16. Cabin altimeter - Field elevation.

17. Standby attitude indicator - Erecting.

If required, pull the cage knob to erect the instrument, then release the knob. The instrument will erect and then seek 7° nose-down and 0° roll (if the aircraft is level).

NOTE

A jitter of $\pm 1/2^{\circ}$ in the pitch axis is acceptable and may occur at any pitch angle.

18. Angle of attack indicator - Checked.

Check OFF flag out of view and AOA indicates zero.

19. Drag chute control - Checked in, light off.

Verify that the drag chute handle is in the full forward detent JETTISON position and that the DRAG CHUTE UNSAFE annunciator light is not illuminated.

WARNING

The red marking on the drag chute handle shaft must not be visible.

20. Compressor inlet temperature (CIT) gage - Checked.

Check needles together and ambient temperature indicated.

21. Airspeed/Mach Meter - Checked.

a. Limit hand setting - 460 KIAS.

b. Airspeed indication - 60 knots or less.

c. Mach number indication - Right half of window blanked. Disregard Mach reading in left half of window.

22. RSO EJECTED light - Press to test.

23. Compressor inlet pressure (CIP) gage - Checked.

L and R needles and reference pointer together and indicating barometric pressure.

24. APW switch - PUSHER/SHAKER.

With ANS, INS, or TACAN selected on the Display Mode Selector switch, the ADI glide slope pointer should deflect to the lowest dot on the glide slope displacement scale. The pointer may fluctuate if there is fuselage motion in the pitch axis.

25. Spike and forward bypass position indicators - Checked.

    a. Spikes - 0 in. aft.

    b. Forward bypass - Open 100%.

26. Accelerometer - Reset.

27. L and R spike and forward bypass controls - Cycle, then AUTO.

    Check knobs for security. Check that the MANUAL INLET and CAUTION lights are on when not in AUTO.

28. L and R restart switches - Cycle to RESTART ON, then off, individually.

    Check operation of the MANUAL INLET light when in RESTART ON.

29. Projector - Checked.

    a. Verify proper loading.

    b. Check controls and lights.

    c. Illumination as desired.

30. Surface limiter release handle - Pulled, and SURFACE LIMITER caution light off.

31. Pitot heat switch - OFF.

    Check that the PITOT HEAT caution light is on.

32. Windshield rain removal and de-ice switch - OFF.

33. Trim power switch - ON.

34. A, B and M CMPTR RESET switches - Normal (Guard down).

35. Clock - Set.

36. Altimeter - Set.

NOTE

It is possible to rotate the barometric set knob through full travel so that the 10,000-foot pointer is 10,000 feet in error. Check that the 10,000-foot pointer is reading correctly.

37. Vertical velocity indicator - Checked.

    Check for zero indication.

38. TACAN control transfer switch - CONT illuminated (SR-71A).

    Press to obtain control in the forward cockpit.

39. Engine instruments - Checked.

40. Igniter purge switch - Off.

41. Liquid nitrogen quantity gages -Checked.

42. Forward transfer switch - OFF.

43. Emergency fuel shutoff switches - Fuel on (guards safety wired down).

44. Fuel dump switch - OFF (guard down).

45. Battery - BAT.

46. Emergency ac bus switch - NORM.

47. Generators - OFF.

48. Instrument inverter switch - NORM.

    Place switch to TEST and check that INST INVERTER ON light illuminates, then set to NORM.

Right Console - Pilot

1. PVD - OFF.

2. ILS power switch - ON.

3. SAS - OFF.

4. SAS lights - Test.

   All SAS panel warning lights should illuminate when the test switch is depressed including the DAFICS BIT TEST and FAIL lights.

5. Autopilot - OFF.

   Press the right console A/P OFF switch and check that the A/P OFF light is on.

6. TACAN mode selector - T/R.

7. Interphone control panel - Set.

8. IGV Lockout switches - NORM.

9. Cockpit pressure selector switch - Set.

   Select either the 10,000 or 26,000 foot setting. The 26,000 foot setting is normally desired.

10. VHF radio - TR and set.

    a. Mode select switch - As desired.

    b. Frequency control/Emergency select switch - PRE or MAN.

    c. Frequency - Set.

    d. Volume control - Nearly full clockwise.

11. Canopy seal - OFF.

TRAINER AFT COCKPIT INTERIOR CHECK

<u>Left Console - Instructor Pilot</u>

1. Thunderstorm lights switch - As desired.

   At night, use of these lights can facilitate the P.E. Hookup.

2. Light rheostat switches - Checked.

3. Throttle restart arming switch - NORM.

4. UHF modulator/demodulator (Modem) control - Set.

    a. Code selector switches - Set.

    b. Range address switch - Set.

5. Oxygen control panel - Set.

6. HF radio - OFF and set.

7. Interphone control panel - Set.

8. UHF radio - ON and set.

9. INS - Check aligning.

    a. Check present position.

    b. Function switch - NORM or STOR HDG.

NOTE

INS must be in NAV to obtain a valid mag heading.

    c. Check/enter desired DP's.

    d. Adjust INS segment lights as desired.

10. Aft bypass position lights - Checked.

    Press to test.

11. L and R aft bypass switches - FWD CONT.

12. EGT trim switches - HOLD & FWD CONT.

13. Map projector controls - Set.

14. Throttles - OFF.

15. Throttle friction lever - Set.

16. Throttle restart switch - Cycle to OFF.

    Check that the MANUAL INLET and CAUTION lights are on and the SPIKE DOOR transfer light on the control transfer panel is on when the throttle restart switch is not in the OFF position.

17. Emergency ICS switch - OFF.

18. UHF TRANS switch - Set.

19. Control transfer panel - Cycle to forward control.

    Verify lights illuminate when aft cockpit has control and then transfer to forward control.

20. Cockpit air handle - Off (forward).

<u>Instrument Panel - Instructor Pilot</u>

1. Indicators and warning lights test button - Press.

    a. Spike and forward bypass position indicators full counterclockwise (0 inches and 100% open).

    b. LOX quantity indicators decrease to zero.

    c. All cockpit caution and warning lights illuminate.

    d. Gear warning tone sounds in both headsets.

    e. All CIP indicator needles decrease to zero.

    f. Fuel quantity indicator needle moves to zero. The c.g. indicator indicates 14%.

2. Brake switch - OFF.

3. Landing gear switch - OFF.

4. Fuel derich switch - ARM.

5. Drag chute switch - OFF, light off.

    Check that the yellow dot in the end of the switch is visible with the guard down and the DRAG CHUTE UNSAFE annunciator light is not illuminated.

6. Airspeed/Mach Meter - Checked.

    a. Limit hand setting - 460 KIAS.

    b. Airspeed indication - 60 knots or less.

    c. Mach number indication - Right half of window blanked. Disregard Mach reading in left half of window.

7. Liquid oxygen quantity indicators -Check SYS 1, SYS 2 and STANDBY.

    Coordinate with forward cockpit to check System 1 and Standby system.

8. Clock - Set.

9. Cabin altimeter - Field elevation.

10. Accelerometer - Reset.

11. Compressor inlet pressure (CIP) gage - Checked.

    L and R needles and reference pointer together and indicating barometric pressure.

12. Compressor inlet temperature (CIT) gage - Checked.

    Check needles together and ambient temperature indicated.

13. Spike and forward bypass position indicators - Checked.

    a. Spikes - 0 in. aft.

b. Forward bypass - Open 100%.

14. L and R spike and forward bypass controls - Cycle, then AUTO.

    Check knobs for security. MANUAL INLET and CAUTION lights will not illuminate when knobs are not in AUTO unless aft cockpit has SPIKE DOOR transfer light illuminated on control transfer panel.

15. L and R restart switches, - Cycle to RESTART ON, then off, individually.

    Check that the MANUAL INLET and CAUTION lights are on and the SPIKE DOOR transfer light on the control transfer panel is on when in RESTART ON.

16. Projector - Checked.

    a. Verify proper loading.

    b. Check controls and lights.

    c. Illumination as desired.

17. Surface limiter release handle - Pulled, and SURFACE LIMITER caution light off.

18. APW switch - CONT FWD.

19. Defog switch - CLOSED.

20. Trim power switch - ON.

21. Drag chute emergency deploy switch - Stowed and safetied.

22. A, B, and M CMPTR RESET switches - Normal (Guard down).

23. Standby attitude indicator - Erecting.

    If required, pull the cage knob to erect the instrument, then release the knob. The instrument will erect and then seek 7° nose down and 0° roll (if the aircraft is level).

NOTE

A jitter of $\pm 1/2^{\circ}$ in the pitch axis is acceptable and may occur at any pitch angle.

24. Air refuel switch - OFF.

25. Altimeter - Set.

NOTE

It is possible to rotate the barometric set knob through full travel so that the 10,000-foot pointer is 10,000 feet in error. Check that the 10,000-foot pointer is reading correctly.

26. Vertical velocity indicator - Checked.

    Check for zero indication.

27. Engine instruments - Checked.

28. Forward transfer switch - OFF.

29. Fuel dump switch - OFF (guard down).

30. Emergency fuel shutoff switches - Fuel on (guards safety wired down).

Right Console - Instructor Pilot

1. SAS - OFF.

2. SAS lights - Test.

    All SAS panel warning lights should illuminate when the test switch is depressed including the DAFICS BIT TEST and FAIL lights.

3. Autopilot - OFF.

    Press the right console A/P OFF switch and check that the A/P OFF light is on.

4. TACAN mode selector - T/R.

5. Temperature indicator selector switch - R BAY.

6. Cockpit pressure selector switch - Set.

   Select either the 10,000 or 26,000 foot setting. The 26,000 foot setting is normally desired.

7. Face heat rheostat - Set.

   Use face heat at all times. Adjust for comfort.

   CAUTION

   - Do not use the HIGH face heat position when equipped with the PPG (glass) visor except for emergency heating. Continuous use of the HIGH position may delaminate the visor.
   - The face heat switch should not be set above 5 with the visor raised, or the faceplate may be damaged.

8. ANS - Checked, MAG set.

   a. DATA Switch - TEST

      Press DISPLAY push-button switch to display data.

   b. Check mission tape number and Star Catalog number.

   c. DATA Switch - As required.

      Check Control and Display Panel readouts. Check mission modifications as required.

   d. MAG/GRID push-button switch - MAG.

9. ANS DATA Switch - NORMAL

   Press DISPLAY push-button switch to display selected data.

10. IFF - Set.

11. ILS power switch - ON.

12. MRS power switch - ON.

    Check green ON illuminated, red FAIL not illuminated.

13. Canopy seal - OFF.

AFT COCKPIT INTERIOR CHECK - SR-71A

Left Console - Aft Cockpit

1. Cockpit air handle - Off (forward).

2. Light rheostat switches - Set.

3. HF radio - OFF and set.

4. UHF radio - On and set.

   a. Mode - INT.

   b. Vol - Nearly full clockwise.

   c. PWR - Set.

   d. Frequency - Set.

   e. Function select - Set.

   f. UHF TRANS switch - Set.

5. Interphone control panel - Set.

6. INS - Check aligning.

   a. Check present position.

   b. Function switch - NORM or STOR HDG.

   NOTE

   INS must be in NAV to obtain a valid mag heading on BDHI and HSI.

   c. Check/enter desired DP's.

d. Adjust INS segment lights as desired.

7. DEF systems - Off.

System A: System A power ON legend not illuminated.
System H: Warmup and standby lights extinguished and the mode switch MAN and AUTO legends off.

WARNING

Assure that the System H Mode Indicator lights for the H LO and H HI bands are extinguished. System H transmitter radiation while on the ground is hazardous to personnel if antenna hoods are not installed.

System M: System M power ON legend not illuminated.

8. UHF modulator/demodulator (Modem) control - Set.

a. Code selector switches - Set.

b. Range address switch - Set.

9. Oxygen control panel - Set.

10. DEF gating generator switch - Guard down.

This switch is nonfunctional.

Instrument Panel - Aft Cockpit

1. TACAN CONT transfer switch light -Off

2. TACAN mode selector - T/R.

3. IFF - Set.

4. G-Band Beacon switch - OFF.

5. RCD display brightness control - Full clockwise.

6. Egress lights - Press to test.

Press to test the ALERT, PILOT EJECTED and BAILOUT lights.

7. Cockpit pressure selector switch - Set.

Select either the 10,000 or 26,000-foot position. The 26,000-foot position is normally set.

8. Face heat rheostat - Set.

Use face heat at all times. Adjust for comfort.

CAUTION

- Do not use the HIGH face heat position when equipped with the PPG (glass) visor except for emergency heating. Continuous use of the HIGH position may delaminate the visor.

- The face heat switch should not be set above 5 with the visor raised, or the faceplate may be damaged.

9. Camera exposure control - Checked and set.

a. Rotate the exposure dial full clockwise to align the 90° index with the first high reflectivity dot.

b. Set the briefed sun angle value.

NOTE

If the 90° index does not align with the first high reflectivity dot in the full clockwise position, the dial is not correctly installed. The corresponding electrical value on the sun dial will be incorrect.

10. Attitude indicator - Checked and set.

a. Check indicator movement and set zero pitch angle.

b. Attitude Reference Selector - ANS.

11. V/H indicator M pointer - Set.
12. Liquid oxygen quantity indicators - Check.
13. Clock - Set.
14. BDHI No. 1 needle select switch - ADF.
15. BDHI heading select switch - INS.

NOTE

INS must be in NAV to obtain a valid mag heading on BDHI and HSL

Viewsight Control Panel - Aft Cockpit

1. V/H select switch - BUS.
2. Map drive switch - Set.
3. Map rate control - Set.
4. MAP/DATA film select switch -Set.

Right Console - Aft Cockpit

1. Canopy seal - OFF.
2. OBC Power switch - Off.
3. ANS - Checked, MAG set.
   a. Check mission tape number.
   b. Normal Display - Check C&D panel readouts.
   c. Mission modifications - Check as required.
   d. MAG/GRID push-button switch - MAG.
4. Sensor power switches - STP then OFF (ON extinguished).
   a. RADAR
   b. ELINT
   c. RCDR
   d. LH and RH TECH
   e. TERRAIN
5. NAV RCDR power switch - ON.
6. MRS power switch - ON.
7. V/H power switch - ON.
8. VWSGT power switch - ON.
9. EXPOS power switch - ON.
10. Map projector - Checked.
    a. Verify proper loading.
    b. Check controls and lights.
    c. Illumination as desired.
11. LAMP TEST - Press to test.

    Check all instrument panel and console lights.
12. Left and right technical camera CONT switches - A (Auto).
13. FMC switches - V/R.
14. V/H SOURCE - NAV.

AFT COCKPIT CHECK (SOLO FLIGHT) - SR-71A/B

NOTE

Abbreviated checklists are not supplied for this procedure.

Before flight, check the following items in the rear cockpit. The trainer aircraft shall be flown solo only from the front cockpit.

1. Lap belt, shoulder harness and all personal leads - Secured.
2. All circuit breakers - In.

WARNING

For the SR-71B:

- The following controls in the aft cockpit can override the forward cockpit:

  Aft bypass switches
  EGT Trim switches
  Throttle restart switch
  Brake switch
  Landing gear switch
  Drag chute switch
  Restart switches
  APW switch
  Air refuel switch
  Trim switches

- Trim power must be ON in both cockpits to enable the trim system.

- Fuel forward transfer switches, fuel dump switches, and emergency fuel shutoff switches must be off in both cockpits to turn the respective systems off.

Left Console - SR-71A/B (Solo)

1. Cockpit air handle - On (aft).
2. Panel, instrument, and thunderstorm light switches - OFF.
3. (T) Throttle restart arming switch - CUT-OUT.
4. UHF modulator/demodulator (Modem) control - Set.
5. Oxygen control panel - Sys 1 and 2 ON.
6. HF radio control panel - Set.
7. Interphone control panel - Set.
8. UHF radio - BOTH, frequency set.
9. INS - Checked, set to NAV.
   a. Check present position.
   b. Check alignment complete (NAV RDY light flashing).
   c. Check/enter desired DP.
   d. Set FUNCTION switch to NAV.

NOTE

INS must be in NAV to obtain a valid mag heading.

SR-71A:

10. DEF systems - Off.
11. (T) L and R aft bypass switches - FWD CONTROL.
12. (T) EGT trim switches - HOLD & FWD CONT.
13. (T) Throttle friction - OFF.
14. (T) Emergency ICS panel - OFF.
15. (T) UHF TRANS switch - OFF.

    Check UHF TRANS switch off to provide UHF-1 with ADF and external mode operating capability.
16. (T) Control transfer panel - Set (lights OFF).

Instrument Panel - SR-71A (Solo)

1. TACAN - T/R, frequency set.
2. IFF - NORMAL, modes and codes set.
3. Cockpit pressure switch - 26,000 FT.
4. Face heat switch - OFF.
5. UHF TRANS switch - OFF.

   Check UHF TRANS switch off to provide UHF-1 with ADF and external mode operating capability.

Instrument Panel - SR-71B (Solo)

1. Brake switch - OFF.
2. Landing gear switch - OFF; guard safety wired.
3. Drag chute switch - OFF.
4. S/P BAILOUT switch - OFF.
5. L and R spike and forward bypass controls - AUTO.
6. L and R restart switches - OFF.
7. APW shaker - CONT FWD.
8. Defog switch - CLOSED.
9. Trim power switch - ON.
10. Emergency chute deployment handle - Stowed and safetied.
11. A, B, and M CMPTR RESET switches - Normal (Guard down).
12. Bearing select switch - TAC/ADF.
13. Display mode select switch - ILS APCH.
14. Air refuel switch - OFF.
15. Forward transfer switch - OFF.
16. Fuel dump switch - OFF (guard down).
17. Emergency fuel shutoff switches - Fuel on (guards safety wired down).

Right Console - SR-71A/B (Solo)

(T) 1. SAS - ON.
(T) 2. Autopilot - OFF.
(T) 3. TACAN - T/R, frequency set.
(T) 4. Cockpit pressure switch - 26,000 FT.
(T) 5. Face heat switch - OFF.
6. ANS - Checked and set.

SR-71A:

7. Sensor power - OFF.
(T) 8. IFF - NORMAL, modes and codes set.
(T) 9. ILS panel - ON, frequency set.
10. MRS power switch - ON.

Check green ON illuminated, red FAIL not illuminated.

11. Canopy seal - ON.

After the engines are started, the canopy seal will inflate and remain inflated until engine shutdown.

Close rear cockpit canopy and lock externally immediately prior to engine start.

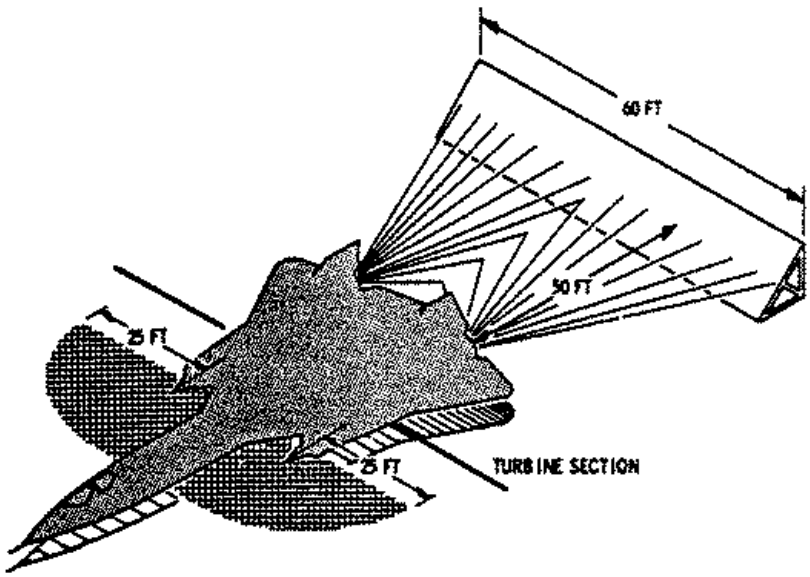
CAUTION

Leave the rear cockpit canopy open until just before engine start to maintain adequate cooling in the equipment bays. Close the front cockpit canopy followed by the rear cockpit canopy immediately prior to engine start.

DANGER AREAS - Engine Operation

WARNING

THE ENGINE TURBINE SECTION AND NACELLE INTAKE AND EXHAUST AREAS CAN BE DANGEROUS. KEEP CLEAR.
ENGINE NOISE CAN DAMAGE HEARING PERMANENTLY. DURING ENGINE RUNUP, USE EAR PLUGS AND MUFFS WITHIN 400 FEET DURING AFTERBURNER OPERATION AND WITHIN 200 FEET DURING MILITARY POWER OPERATION.



ESTIMATED JET WAKE DIAGRAMS

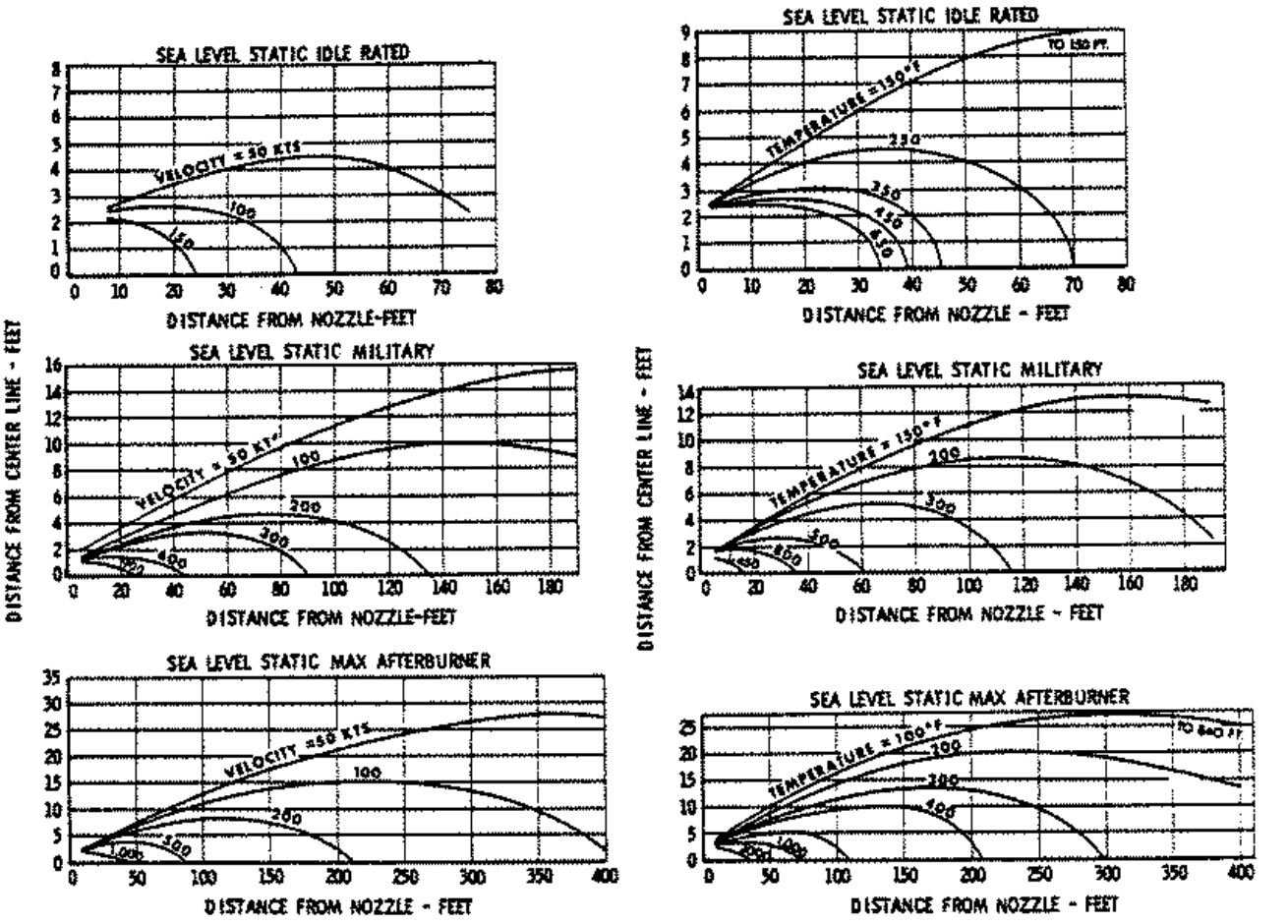


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Figure 2-2 (Sheet 1 of 2)

SECTION II

DANGER AREAS - EMF Radiation

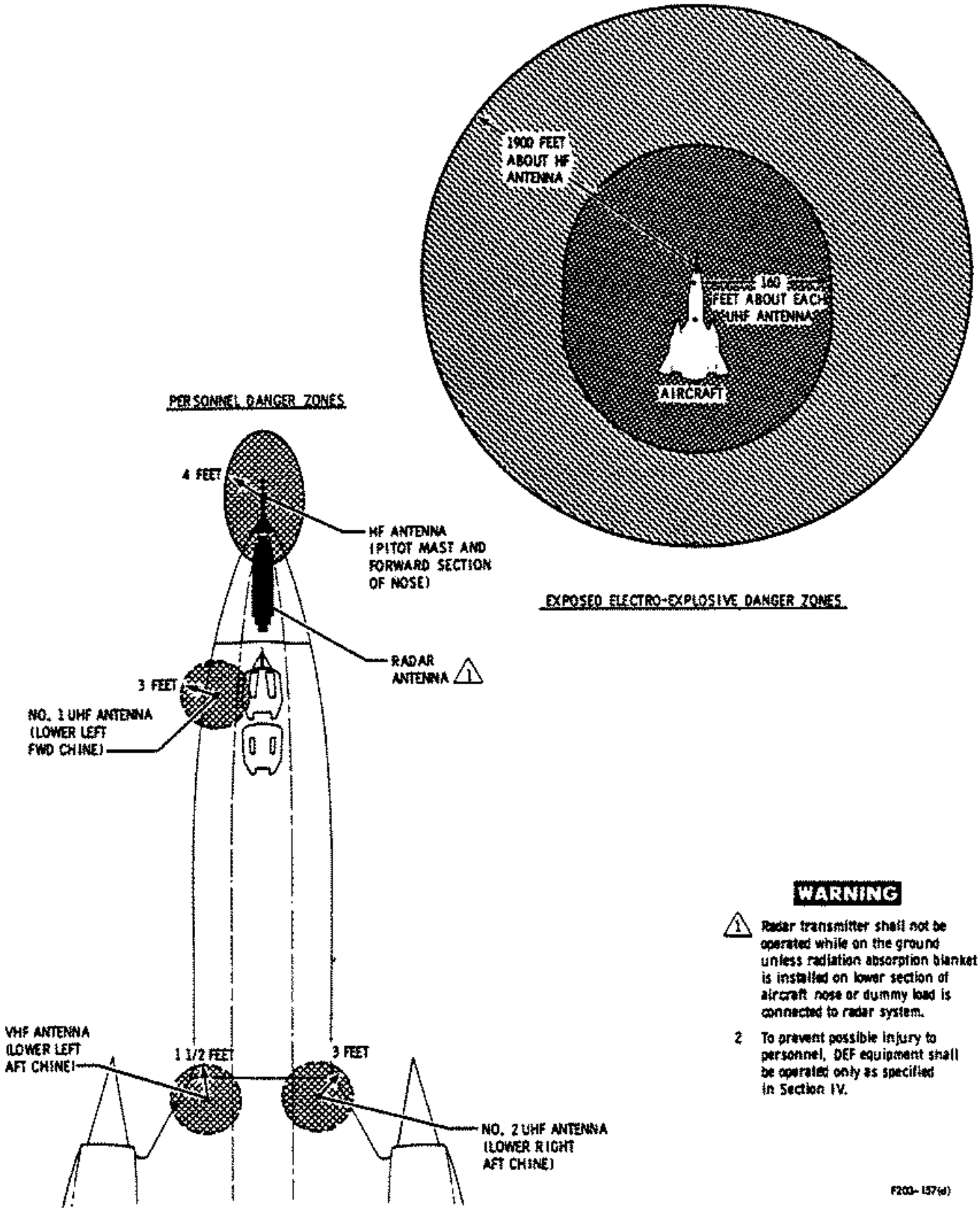


Figure 2-2 (Sheet 2 of 2)

All subsequent checklists apply to both cockpits of the SR-71 A/B.

NOTE

Pilot and RSO (or IP) coordination is required. RSO (or IP) reads -Pilot responds. Alphabetized items need not be read.

STARTING ENGINES

▲1. Interphone - Checked.

Check CALL, HOT MIC, and normal functions (and emergency ICS in SR-71B).

▲2. BAILOUT light - Checked.

Coordinate ALERT and BAILOUT light illumination with switch position. Return switch to OFF (guard down).

▲3. Triple display indicator - Check.

a. Altitude - Within ±200 feet of pressure altimeter indication when altimeter is set at 29.92 inches Hg. Maximum difference between TDI's, fwd and aft cockpits, 100 feet.

b. Airspeed - 75 to 110 KEAS.

c. Mach - 0.11 to 0.2 normal.

▲4. Fuel quantity indicating system - Checked.

a. Individual tank quantities - Check. (within 550 lb between cockpits)

b. Sum of individual tank quantities - Check. (within 780 lb of TOTAL)

c. TOTAL fuel quantity - Check. (within 850 lb between cockpits)

▲5. Indicated and corrected computed c.g. - Within 0.5% MAC.

Check indicated c.g. reading between cockpits and compute c.g. with manual computer.

NOTE

While on the ground, c.g. computed using the manual c.g. computer should be corrected as follows to allow for the effect of level rather than flight attitude (with normal fuel distribution per T.O. 1-1B-40).

Total Fuel	Correction to MAC for computed c.g.*
Full tanks	-0.3%
70,000	-0.4%
65,000	-0.55%
60,000	-0.7%
55,000	-0.85%
55,000 (tank 6 empty)	-0.5%
50,000	-1.0%
45,000	-1.2%
45,000 (tank 6 empty)	-0.8%
40,000	-1.4%
35,000	-1.2%
30,000 (tank 6 empty)	-1.0%
25,000 (tank 6 empty)	-1.0%
20,000 (tank 6 empty)	-1.0%

*In level attitude, computed c.g. is aft of actual c.g. (The c.g. gage should read actual c.g.).

NOTE

When tank 6 is not full, use tank 6A and 6B scale. Fuel distribution must be obtained from mission loading form.

One minute before starting engines:

▲6. No. 1 and No. 2 oxygen systems - ON and checked.

Sys 1 and Sys 2 oxygen supply levers both latched ON and pressure checked.

▲7. Baylor bar - Latched and locked.

8. Exterior light switches - ON.

   a. FUS & TAIL switch - BRT.

   b. TAIL LT switch - STEADY.

   c. ANTI - COLLISION switch - ANTI-COLLISION.

9. Brake switch - Setting checked.

   Set ALT STEER & BRAKES if the right engine is to be started first.

10. First engine - Start.

    Although either engine can be started first, it is recommended that the left engine be started first (and shut down first) for odd numbered flights. Start the right engine first for even numbered flights. This enables a flight control system check to be made on alternate single-hydraulic systems immediately after starting.

    Ground personnel using interphone equipment will observe exhaust nozzle and nacelle inspection panels during start.

    WARNING

    Determine intake and exhaust areas are clear of personnel and ground equipment. Check fire guard(s) standing by.

    CAUTION

    - Before starting an engine, assure wheels are chocked. There is no parking brake.
    - Do not move control stick until at least 1500 psi can be maintained on the A or B hydraulic system.

    NOTE

    The crewchief will call the pilot when the starting unit is connected, and the pilot will instruct the crewchief to turn the unit on after verbally confirming that the engine combustion chamber drain valves are open and fuel is draining from each engine.

    a. Pilot - Signal for engine rotation.

    b. Throttle - IDLE at first indication of rpm increase.

       When necessary, an alternate technique of advancing the throttle at 1000 rpm may be used.

    c. Fuel flow - Checked for increase.

    d. IGV lights - Off.

    NOTE

    With pressurization of the engine fuel hydraulic system during start, the IGV position light must be extinguished (IGV cambered); if not, discontinue the start and determine the cause.

    e. Ignition - Verify within 15 seconds when using gas engine cart or within 20 seconds when using 3AG1100 air turbine starter. If no ignition indicated by an rpm increase and a rise in EGT within the allowable time, move throttle to off and continue cranking engine for 30 seconds at 1000 rpm.

CAUTION

- In case of a false start, use Clearing Engine procedure, this section.
- When using the 3AG1100 air turbine starter, do not exceed 5 seconds steady-state cranking operation between 1370 and 1470 rpm. Resonant frequency of the air turbine is in this range. No problems are encountered accelerating through this range, providing the transition period is less than 5 seconds.

f. Ground starting unit - Signal for disconnect at 3200 rpm.

g. If 565°C is exceeded, move throttle to OFF. If 649°C is exceeded, do not attempt to restart the engine.

NOTE

If the engine does not accelerate smoothly to idle rpm, but appears to "hang" in the 2600 to 2800 rpm range, retard the throttle to OFF and then quickly return it to IDLE. This "double clutching" procedure momentarily leans the fuel/air mixture and positions the flame front correctly in the burner cans so the engine can accelerate normally to idle rpm.

h. Idle rpm - Checked.

Engine idle speed is 3975 ± 50 rpm below 60C (140°F).

CAUTION

- When using the MA-1A carts (or equivalent) abort start if Idle rpm is not obtained after 90 seconds.
- When using the shelter airstart system, abort start if Idle rpm is not obtained after 120 seconds.

i. Engine and hydraulic instruments - Check normal indications.

(1) EGT - 350° to 565°C (start limit).

(2) Fuel flow - 4600 to 6300 lb/hr. A lower indication is evidence of heat sink system malfunction. If this occurs, shutdown and request investigation of circulating systems.

(3) Oil pressure - 35 psi minimum.

CAUTION

Discontinue start if oil pressure rise is not observed by the time IDLE rpm is obtained.

(4) Hydraulic system pressures - Checked.

(5) CIP should decrease to slightly below ambient.

Two minutes after engine start:

11. Flight controls - Steady neutral position.

Confirm with maintenance that the control surfaces arrive at a steady neutral position.

WARNING

Abort flight if maintenance detects surface movement without stick or rudder inputs.

12. Flight control system - Checked.

With nosewheel steering disengaged, individually check each axis for full deflection and freedom of travel in both directions. Confirm correct deflection and normal response by ground crew observation using the sequence: nose up, nose down, left roll, right roll, nose left, nose right.

If the right engine was started first and the elevon up travel is restricted, the pusher piston may be extended. Inform maintenance of the restriction, wait until the mixer access panel is removed, and then overpower the restriction. Check the flight control system after the left engine start.

If a restriction to rudder travel is felt and a force of approximately 10 pounds overpowers the restriction, the cause may be an extended rudder servo limiter piston due to the nonoperating engine. The rudders must be checked after the second engine is started to insure that the rudders are not restricted.

If nosewheel steering will not disengage, rudder control will be severely restricted in-flight with the gear down.

NOTE

Rapid control surface deflection while near idle rpm may result in temporary illumination of an A or B HYD warning light. The light should extinguish when flow demands diminish and normal pressure is restored.

13. Second engine - Start.

Use the same sequence as for items a thru i of step 11.

If the right engine was started first and the elevon up travel was restricted, check the flight control system after left engine start.

If a restriction to rudder travel occurred after the first engine start and a force of approximately 10 pounds overpowered the restriction, check the rudders again to insure that the rudders are not restricted. If a restriction to rudder travel occurs again, a flight control system problem exists.

14. TEB counters - Checked.

15. Generators - On (NORM), and lights off.

Check R and L GEN OUT lights extinguish.

NOTE

With transfer of electrical power while on the ground, the DAFICS will undergo ground re-initialization indicated by momentary illumination of the A, B, and M CMPTR OUT caution lights, OFF flags in both TDIs, and TDI resynchronization to 55,000 ft., Mach 2.0, and 300 KEAS. If DAFICS indications are abnormal, notify maintenance.

16. Generator Bus Tie light - Off.

17. External power -Disconnected.

Signal ground crew to disconnect.

T 18. Fuel system - Checked.

a. Check all pump, tank empty, crossfeed and pump release lights are on when TEST is pressed.

b. Press the crossfeed switch to obtain OPEN.

Illumination of the OPEN portion of the switch confirms crossfeed is on.

c. Press pump switches 1 through 6 ON in sequence.

d. Press ON an additional tank containing fuel.

e. Press pump release switch and check that the manually selected tank is released.

f. Press crossfeed switch OFF.

g. Tanks 1, 3, & 6 (or 5) boost pump lights on.

19. Left and right forward bypass - Both confirmed open.

    Ground crew confirms doors open.

T 20. Spike and forward bypass position indicators - Check.

    a. Spikes - 0 in. aft.
    b. Forward bypass - 100% open.

T 21. Brakes - Normal & alternate systems checked, set ANTI SKID ON.

    Pump brakes and check normal feel while crew chief visually confirms brake actuation on both trucks. Normal feel does not necessarily indicate braking action. Perform the check both in ANTI SKID ON and ALT STEER & BRAKE. While applying moderate brake pressure, cycle the brake switch and check for a slight pedal movement (thump) and small position change when shifting between hydraulic systems. The absence of the thump indicates only one braking system available.

    Pause slightly while passing through the ANTI SKID OFF position and observe the ANTI-SKID OUT light illuminated. If the light does not illuminate, there may be an electrical/switch failure and only one braking system may be available.

    With S/B R-2695, check the antiskid disconnect feature of the trigger switch. With the brake switch in ANTI SKID ON and/or ALT STEER & BRAKE, check the ANTI-SKID OUT annunciator caution light illuminates while the trigger is depressed and extinguishes when the trigger is released.

    Set ANTI SKID ON at the conclusion of the check.

NOTE

If both engines must be shut down temporarily after start and it is necessary to retain ANS alignment, insure that ground air and power are connected and on, and turn generators off before shutting down the second engine.

CLEARING ENGINE

Cool the engine and remove trapped fuel and vapor as follows:

1. Throttle - OFF.

CAUTION

Allow a minimum of 1 minute for fuel drainage and coast down before motoring engine.

2. Starter - Engage and motor engine for at least 30 seconds and until EGT is below 150°C.

    Signal ground crew to motor engine at 1000 rpm. Crew chief will advise pilot when engine is clear and ready for start.

CAUTION

Do not motor the engine with the fuel shut off switch in the fuel off position except in an emergency. Damage to the engine may result with the engine fuel-hydraulic system off.

NOTE

If an electrical power interruption has occurred, cycle the MRS power switch off (light extinguished) then ON to assure reestablishment of MRS operation. Fuel boost pump circuit breakers should also be checked after electrical power interruption.

AFT TOWING - ENGINE OPERATING

Aft towing of the aircraft with engines running is permitted with:

a. Engines at idle.

b. 120,000 pounds gross weight or less.

c. Interphone communications maintained between the pilot and tow operation observer.

d. All braking accomplished by the tow tractor.

WARNING

The pilot shall not use aircraft braking except in an emergency.

e. Aircraft steering accomplished by a ground crewmember, using a nose wheel tow bar.

WARNING

Do not move the rudder pedals during hookup of the nose steering linkage at completion of towing.

BEFORE TAXIING

(T1) IFF - STBY.

(T2) HF - On.

Refer to Danger Areas, Figure 2-2, for extent of danger to personnel and exposed electro-explosive devices.

WARNING

Do not transmit on ground until safe to do so.

(T3) INS - Checked, set to NAV

Check alignment complete (NAV RDY light flashing)

NOTE

INS must be in NAV to obtain a valid mag heading on BDHI and HSI.

T 4. DAFICS Preflight BIT - Check.

a. SAS channel engage switches - ON.

b. SENSOR/SERVO lights - Checked off.

c. Cycle controls in pitch, roll and yaw and check for abnormal control surface oscillation or vibration.

d. Autopilot pitch and roll engage switches - ON.

e. Control stick trigger switch - Depress.

Check autopilot disengagement.

(T) f. Aft cockpit SAS channel engage switches - ON.

(T) g. AFCS control - Transfer to aft cockpit.

Check AFCS transfer light illuminated in aft cockpit.

(T) h. SAS Lights - Off.

Check SENSOR/SERVO lights remain off.

(T) i. Cycle aft cockpit controls in pitch, roll and yaw and check for abnormal control surface oscillation or vibration.

(T) j. Aft cockpit autopilot pitch and roll engage switches -ON.

Check autopilot disengagement.

Ⓣ l. AFCS control - Transfer to forward cockpit.

m. Autopilot pitch and roll engage switches - ON.

(T) k. Aft cockpit control stick trigger switch - Depress.

Check autopilot disengagement.

(T) l. AFCS control - Transfer to forward cockpit.

m. Autopilot pitch and roll engage switches - ON.

n. Forward cockpit switch positions for DAFICS PREFLIGHT BIT - Set.

- ATT REF SELECT switch - INS
- KEAS HOLD switch - ON
- HEADING HOLD switch - ON

o. DAFICS PREFLIGHT BIT switch - ON.

The BIT TEST light illuminates steady green while the test is running. The BIT TEST light also illuminates when the function selector on the maintenance analyzer panel is not in the OFF position.

The PREFLIGHT BIT check can be terminated manually (once it is initiated) by stopping any DAFICS computer.

Pressure from A hydraulic system is required to engage the DAFICS PREFLIGHT BIT. Low pressure or flow from A, B, L or R hydraulic system will cause the DAFICS preflight BIT to fail.

If the DAFICS PREFLIGHT BIT switch will not engage, recheck:

1) CSC/NWS switch - Released.
2) ATT REF SELECT switch - INS
3) APW switch - PUSHER/SHAKER
4) SPIKES & FWD BYPASS doors - AUTO
5) RESTART switches - Off
6) Throttle Restart switch -Off
7) SAS channel engage switches - ON
8) AUTOPILOT PITCH & ROLL engage switches - ON
9) KEAS HOLD switch - ON
10) HEADING HOLD switch -ON

NOTE

If at BIT completion the FAIL light, any SENSOR light, any SERVO light, or any CMPTR OUT light illuminates, notify maintenance.

After one minute:

p. Check BIT TEST light flashing green, sensor and servo lights extinguished, BIT FAIL light extinguished, and OFF Flags in both TDI's. The CIP barber pole reads zero.

q. Check autopilot pitch and roll engage switches, KEAS HOLD switch, and HEADING HOLD switch-Off. AUTOPILOT OFF and SAS OUT lights illuminated.

The flashing BIT TEST light and SAS OUT light indicates that the SAS is still in the ground test mode.

r. Check DAFICS PREFLIGHT BIT switch - OFF (guard down).

s. SENSOR/SERVO recycle switches - Press one of the six.

Pressing one of the six SENSOR/SERVO recycle switches resets the DAFICS system to the flight mode. Check SENSOR/SERVO lights, BIT TEST light, and SAS OUT lights are out. Check both spikes have returned to the full forward position

NOTE

Rapid control surface deflection while near idle rpm may result in temporary illumination of an A and/or B HYD warning light. The light should extinguish when flow demands diminish and normal pressure is restored.

11. Shotgun cartridge - Checked.

Confirm left and right cartridges engaged.

12. Fuel derich system - Both checked and rearmed.

a. Set both engines 400 rpm above idle speed.

b. Actuate the derich test switch until 860°C EGT is exceeded with LEFT and then RIGHT selected.

When the EGT indications exceed 860°C:

c. Verify that the EGT gage warning lights are on and that the Fuel Derich lights are on.

d. Note that engine speeds decrease between 50 and 400 rpm.

e. Cycle the fuel derich switch to REARM then ARM.

Verify that each engine returns to 400 rpm above idle, and EGT indications are normal.

f. Reset the throttles to IDLE.

13. Air refueling system and drag chute doors - Checked.

a. Air refuel switch - AIR REFUEL.

Check READY light on. Confirm doors open and light on, toggles unlatched.

b. Air refuel switch - MAN O'RIDE. Confirm door open, and light on, toggles latched.

c. Actuate stick trigger, confirm toggles retract.

d. Air refuel switch - OFF. Confirm light off, door closed.

e. Confirm with ground crew that drag chute doors are locked. A paddle indicator on the drag chute door should be flush with the fuselage contour when viewed from alongside the cockpit at the level of the crew station.

(T14.) ANS mode - Set.

The ANS is normally placed in the INERTIAL ONLY mode.

▲15. ANS - Checked.

a. Pilot set display mode select switch to ANS. Check true heading under HSI lubber line and programmed true course in HSI course window.

b. RSO check ANS heading against INS heading. Check for proper DP code and coordinates, and crosscheck command course and distance to DP with pilot.

c. Pilot check bearing select switch in both positions for normal operation of bearing pointer and DME.

d. Pilot and RSO check for normal attitude indications in both attitude reference select switch positions.

e. Pilot check standby attitude indicator.

▲16. INS - Checked.

a. Pilot set display mode select switch to INS, bearing select switch to NORMAL.

b. RSO set BDHI SEL HEADING and NO. 1 NDL switches to INS. Display distance to DP on Inertial Control Panel (Data switch set to STRG, distance is in left display).

c. Confirm INS DP bearing and distance are the same in both cockpits.

▲17. Ejection seat and canopy pins -Removed.

▲18. Canopy - Closed and locked.

Visually check engagement of canopy hooks.

CAUTION

To prevent overheating the ANS, the RSO canopy must not be closed and locked prior to the pilot's canopy unless the cockpit air handle is off (forward).

NOTE

Severe cockpit fogging may occur if cold cockpit temperature control settings are selected unless the RSO's cockpit air handle is off.

▲19. Canopy seal switch - ON.

(T20.) Cockpit air handle - On (aft).

21. L and R refrigeration switches - ON.

Minimize the time between locking the aft canopy and activation of a ship air-conditioning system. A delay increases the possibility of overheating equipment.

T 22. CANOPY UNSAFE, L and R AIR SYS OUT and CKPT AIR OFF caution lights - Off.

The RSO should recycle the cockpit air shutoff lever if the CKPT AIR OFF caution light is illuminated.

23. Ground air - Disconnect.

Signal ground crew for disconnect. Confirm the BAY AIR OFF light extinguishes.

(24.) OBC Power switch - ON.

25. PVD - On and set.

Up to 25 seconds may be required before laser line is visible.

a. Set ROLL to index.

b. Set PITCH to index or as desired.

c. Set intensity as desired.

d. Set SCALE to NORM or as desired.

WARNING

Do not look directly into the laser beam.

(T) 26. Angle of Attack indicator -Checked.

Check OFF flag out of view and AOA indicates zero.

T 27. Periscope - Checked.

T 28. Nosewheel steering - Engaged and checked.

Nose should swing as rudder pedals are moved slightly. Nosewheel STEER ON light should illuminate.

29. Panels and gear pins - Secured and removed.

Crewchief confirms all panels and doors secured. Crewchief disconnects interphone and displays landing gear downlock pins.

(30.) OBC self test - Completed, OPR/STP light on.

CAUTION

If installed, the Optical Bar Camera must always be operated in the standby or operate modes while in flight; if shut down, the optical bar may be damaged.

TAXIING

Observe crewchief for signal.

CAUTION

Taxi and turn at low speed to minimize side loads on the landing gear. Fast taxiing should also be avoided to prevent excessive brake and tire heating and wear.

T 1. Braking and nosewheel steering - Checked.

When clear of obstacles disengage nosewheel steering and check individual brake operation on L and R systems, and for dragging brakes. Release pedal pressure before changing hydraulic systems. Engage NWS and check steering operation.

NOTE

Rudder pedal feedback, due to nosewheel castering, indicates that nosewheel steering has not disengaged. The STEER ON light also remains on.

T 2. Turn-and-slip indicator - Checked.

Check turn needle deflection in the direction of turn and ball free in race.

T 3. SAS lights - Checked.

Check SAS control panel for PITCH, ROLL, or YAW SENSOR lights during turns or braking. Attempt to reset SENSOR lights. All SENSOR lights should be out prior to takeoff.

(T4) ANS - As desired.

If the ANS is in the INERTIAL ONLY mode and NAVIGATE/ASTRO INERTIAL mode is desired for takeoff, place the ANS in NAVIGATE/ASTRO INERTIAL.

BEFORE TAKEOFF

▲1. Pilot's ANS distance display mode - DP/TURN.

(Ta) ANS DATA switch - TEST.

Press DISPLAY push-button switch to display data.

(Tb) DP/TURN push-button switch - As desired.

RSO will coordinate the pilot's desired ANS distance display mode.

2. Flight instruments - Set for takeoff.

a. Display Mode Select switch - Set.

b. Attitude Reference Select switch - INS.

c. For instrument departure, tune and identify TACAN station.

d. HSI Course Select knob - Set.

3. Engine run - Lockout and EGT trim checked.

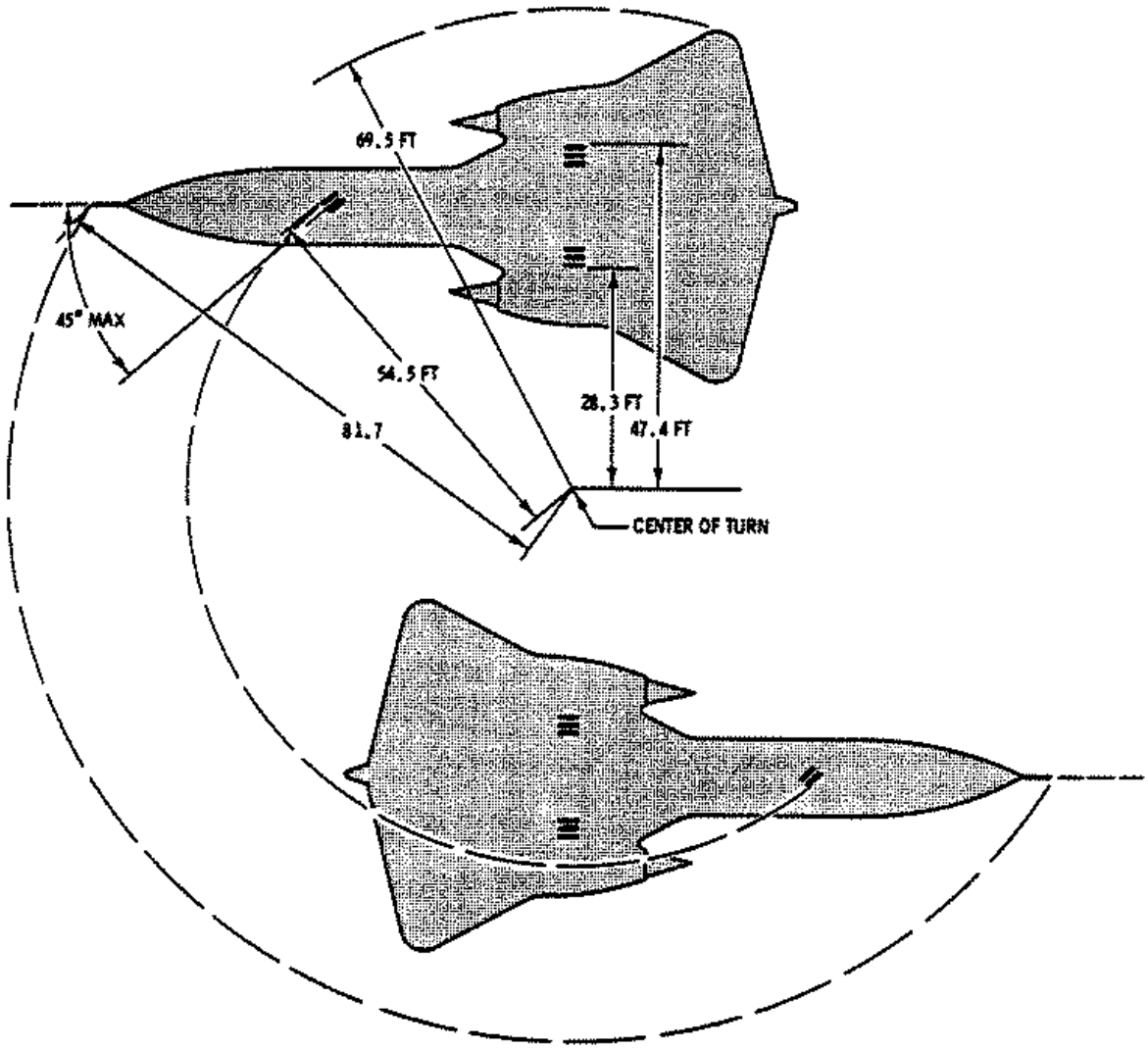
a. Wheels - Chocked.

b. Brakes - Apply.

c. IGV switches - LOCKOUT.

SECTION II

MINIMUM TURNING RADIUS



NOTE

101.9 MINIMUM RUNWAY WIDTH REQUIRED FOR 180-DEGREE TURN (MAIN GEAR WHEELS ON EDGE OF RUNWAY AT START OF TURN).

FZ03-56(5)

Figure 2-3

One engine at a time, with AUTO EGT selected:

d. Throttle - Military.

Move the throttle smoothly to the Military stop, observing ENP and EGT. EGT should increase and ENP indication should move toward zero. An EGT gage COLD flag will appear when the throttle reaches the Military position if EGT is below the nominal trim band.

NOTE

Automatic trimming does not occur until the throttle is positioned at or above the Military position.

e. Throttle - Retard approximately one-half inch aft of the Military position and return to Military rapidly. This removes hysteresis from the fuel control linkage. Hold the military power throttle setting for at least 30 seconds to allow MRS recording of engine parameters.

Note EGT gage COLD/HOT flag operation. If the throttle is retarded before EGT reaches the nominal trim band, disappearance of the COLD flag while the throttle is retarded confirms normal operation of the automatic EGT trim system permission circuit.

f. IGV light - Off.

The IGV position light should remain off.

g. IGV switch - NORM (as EGT approaches the nominal trim band).

h. IGV light - On.

The IGV position light should illuminate immediately when IGV NORM is selected, indicating an IGV shift to the axial position. The nozzle should open slightly at IGV shift.

NOTE

- Do not takeoff if the IGV position light fails to illuminate.
- An inoperative IGV lockout which is detected during the before takeoff trim check does not require aborting the flight.
- The engine IGV light should not illuminate on rpm increase with its IGV switch in the LOCKOUT position. With IGV NORM selected, the engine IGV light should illuminate during rpm increase (approximately 300 to 800 rpm below the Military rpm schedule) and extinguish when the guide vanes reach the cambered position as the throttle is retarded to idle.

i. EGT trim - As required.

Check automatic EGT trims to within the nominal band shown by Figure 2-4.

If a HOT flag appears and EGT approaches an overtemperature condition, retard the throttle, select manual EGT control, downtrim as required, then recheck trim at Military in AUTO EGT.

If no HOT or COLD flag is observed and EGT is normal at Military power, downtrim EGT momentarily in manual control, then select AUTO EGT. At Military, the COLD flag should appear temporarily, and the engine should retrim to the AUTO EGT deadband range.

If Auto EGT is unusable, trim manually as shown in Figure 2-4.

j. RPM - Check engine speed vs the schedule shown by Figure 2-4.

k. Engine and inlet instruments - Check.

EGT Auto Trim Check Schedule

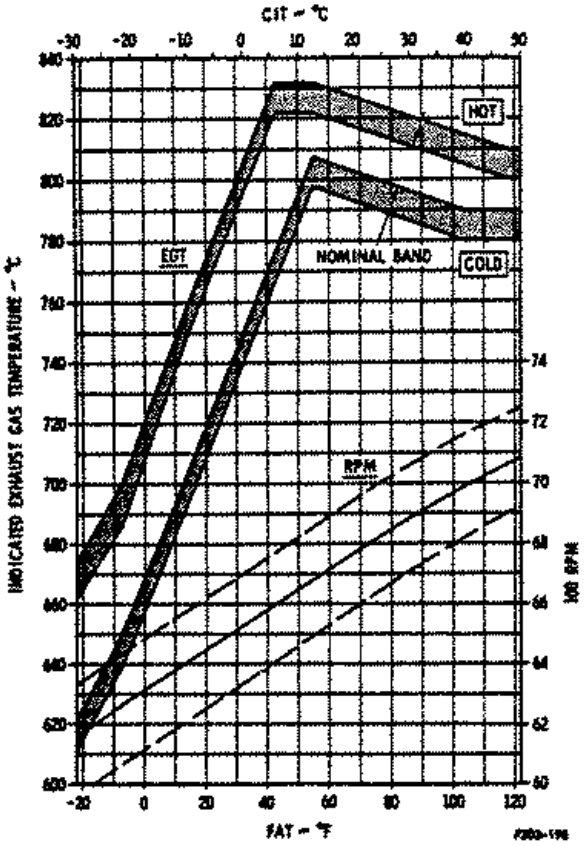


Figure 2-4

Check engine instruments for normal indications. Note ENP and fuel flow values (for engine comparison), and oil pressure values. Note L and R CIP; CIP indication should be less than at idle.

4. EGT trim switches - HOLD or AUTO

During cold temperature ground operations, engine surge (compressor stall) may occur at or above military power if EGT goes above the nominal trim band.

With EGT trim in AUTO, EGT uptrim starts when the throttle is advanced to the military position and continues until EGT increases into the deadband. Even if an engine was previously trimmed within the deadband, thermal lag results in a slight EGT overshoot when readvancing the throttle to military.

a. To avoid compressor stalls on takeoff when outside air temperature is below 15°C (59°F), position EGT trim to HOLD after stabilized in military power within the nominal EGT operating band. Select automatic trim, if desired, after takeoff.

Engine surge should not occur when ambient temperature is above 15°C (59°F).

If compressor stalls occur during engine run, retard throttle and downtrim EGT. Refer to Exhaust Gas Temperature Limits, Ground Operation, Section V.

b. Throttle - Retard smoothly to IDLE.

Check that ENP indication is normal during power reduction.

NOTE

After retarding from Military power to IDLE, do not readvance the throttle for at least ten seconds (for the engine to stablize at idle rpm). Otherwise, stall and dieout may occur. The stall may be inaudible, but dieout is indicated by decreasing rpm and, particularly, by increasing EGT. If dieout occurs, move the throttle to OFF to prevent overtemperature. The engine may be restarted as soon as a starter is available; accomplish Clearing Engine checklist. The stall and dieout occur only during ground static operation and is more likely when relatively high ambient temperatures exist.

c. IGV light - Off.

The IGV light should extinguish.

NOTE

If cockpit fog is encountered, increase cockpit temperature. Twelve-to-one o'clock auto-temperature control rheostat positions are normally sufficient.

T 5. Flight controls and trim settings -Check.

Cycle and check hydraulic pressure. Recheck trim settings zero.

▲6. Fuel sequencing - Checked.

a. Check tanks 1, 3, and 6 or 5 ON, depending on fuel load, and quantities decreasing. If less than full load, check tank 4 increasing.

NOTE

To check tank 3 pump operation, if no decrease in tank 3 fuel quantity has been noted, transfer fuel or increase left engine rpm.

▲7. CG - Checked.

Takeoff c.g. must be forward of 22%. (To check the c.g. which will occur in the flight attitude, increase the indicated c.g. value by the amount of the hand-held c.g. computer correction.) When the takeoff fuel load is above 70,000 pounds, the c.g. should be no further forward than 20%. With less than 70,000 pounds of fuel, c.g. should not be aft of 20% while level, to allow for the aft c.g. shift during takeoff.

NOTE

- A supersonic leg with less than a full fuel load may require manual control of the fuel system to achieve a desirable supersonic c.g.
- Press the Tank 5 or Tank 4 boost pumps on before transferring fuel forward. Otherwise, with crossfeed off, a reduction in fuel flow to approximately 3600 lb per hour will occur on the right side. This is less than the desired value for normal operation of the fuel heat sink system. Release the tank after completing fuel transfer.

T 8. Forward transfer - OFF.

T 9. Fuel Derich switch - ARM.

▲10. No. 1 and No. 2 oxygen systems - ON and pressure checked.

Verbally confirm oxygen latched ON with normal pressure.

▲11. Baylor bar - Latched and locked.

12. Brake switches - DRY or WET, and ANTI SKID ON.

Use the DRY position for a RCR of 21 or more. Wet runway conditions shall be assumed to exist and the WET position used if RCR is less than 21. If RCR is not available, assume a wet runway condition if moisture is visible on the runway, particularly as evidenced by glare or reflections.

▲13. Takeoff data - Review.

a. Acceleration Check.

b. Refusal speed.

c. Rotation speed.

d. Takeoff speed.

e. Single-engine speed.

NOTE

If a tire cooling period has been required, do not takeoff until ground crew signals that tire condition is satisfactory.

14. Pitot heat switch - ON and checked.

Ground crew confirms heat on.

15. Battery switch - Checked BAT.

16. Instrument inverter switch - Checked NORM.

(T17) INS altitude - Update.

Update the INS altitude to the sustained or mid-altitude expected after takeoff, i.e. enter A/R altitude, or if climbing immediately to cruise conditions enter 35,000 or 40,000 feet.

18. VHF radio antenna cover - Removed.

Ground crew displays cover to pilot.

TAKEOFF

(T1) IFF - NORMAL

Set proper mode and code.

2. SAS - Engaged, lights off.

a. Channel engage switches - ON.

b. SENSOR/SERVO lights - Check off.

c. BIT TEST light - Check off.

WARNING

The SAS is non-functional while in the ground test mode. DAFICS will not operate normally until the system is reset. Failure to press a SENSOR/SERVO recycle switch after the DAFICS Preflight BIT is complete will cause the DAFICS to remain in the ground test mode.

(T)3. Aft cockpit SAS - ON.

Channel engage switches all ON.

NOTE

For normal operations, all SAS channel engage switches should remain ON in both cockpits for entire flight regardless of which cockpit has AFCS control.

(T)4. AFCS control - Transfer to other cockpit.

Check AFCS transfer light illuminated in cockpit not previously in control.

(T)5. SAS Lights - Off.

Check SENSOR/SERVO lights remain off.

(T)6. AFCS control - As desired.

WARNING

In the SR-71B, only the positions of the SAS channel engage switches in the cockpit that has the AFCS transfer light illuminated on the control transfer panel effect the SENSOR/SERVO and SAS OUT caution lights. No warning is displayed if the SAS channel engage switches are not ON in the cockpit that does not have AFCS control. If the SAS engage switch(es) are OFF in the cockpit that does not have AFCS control, transferring AFCS control to that cockpit results in loss of SAS until the SAS switch(es) are engaged.

▲7. Warning and caution lights - Checked.

Any amber caution lights (autopilot, cockpit air, etc.) which remain on must be justified by an intentional and acceptable operating situation. Do not start a takeoff if any red warning lights are on.

▲8. Circuit breakers - Checked.

9. Tank 4 boost pump switch - Press on.

▲10. Compass - Checked.

Check INS and standby compass against runway heading. Start ANS runway heading alignment when required.

11. Nosewheel steering -Engaged.

Confirm STEER ON light illuminated.

Refer to Figure 2-5 for illustration of the typical sequence of events during takeoff.

a. Brakes - Release when IGV lights illuminate (approximately 6000 rpm) as the throttles are advanced.

CAUTION

The tires may skid if the brakes are held at high thrust.

NOTE

Abort takeoff if IGV position lights fail to illuminate with Military rpm during engine acceleration.

b. At Military power - Check engine instruments for values at or approaching those observed during trim.

(1) Tachometer.
(2) EGT.
(3) Nozzle Position.
(4) Oil Pressure.

c. Throttles - Advance to mid afterburner range for A/B ignition, then smoothly advance to maximum afterburner.

CAUTION

- To prevent overspeed, afterburners must not be ignited before engines reach Military rpm.
- Abort the takeoff if an afterburner fails to ignite within 3 seconds.
- Advancing the throttle will result in momentary nozzle excursion, and engine transient speed oscillation may approach 250 rpm.

d. Maximum A/B - Check engine instruments.

Exact readout of these instruments is time consuming. The readouts should be anticipated and needle position checked against a clock position. If there is any indication of deficient engine performance during throttle advancement, abort the takeoff. If possible, any abort decision should be made before the aircraft has reached high speed. Refer to takeoff performance data in the Appendix. Directional control should be maintained with nosewheel steering up to nosewheel lift-off speed.

e. Acceleration - Check.

Check KIAS against computed acceleration check speed at selected acceleration check distance. Refer to takeoff performance data in the Appendix.

NOTE

Failure of the IGV lights to remain illuminated during takeoff results in inability to develop full rated thrust; unless a more serious malfunction is indicated, the takeoff may be continued if the acceleration check speed has been reached satisfactorily.

ROTATION TECHNIQUE

In general, the tires are more vulnerable to blowouts during takeoff than at landing because of the higher groundspeeds and gross weights involved. Wing lift quickly relieves the gear load as the nose is raised. Apply smooth, constant back pressure 15 to 25 knots below computed rotation speed. Lift the nosewheel off at rotation speed, using the rotation rate required to leave the ground at computed takeoff speed. Depending on gross weight, normal takeoff attitude is 8° to 10°

TAKEOFF - Typical

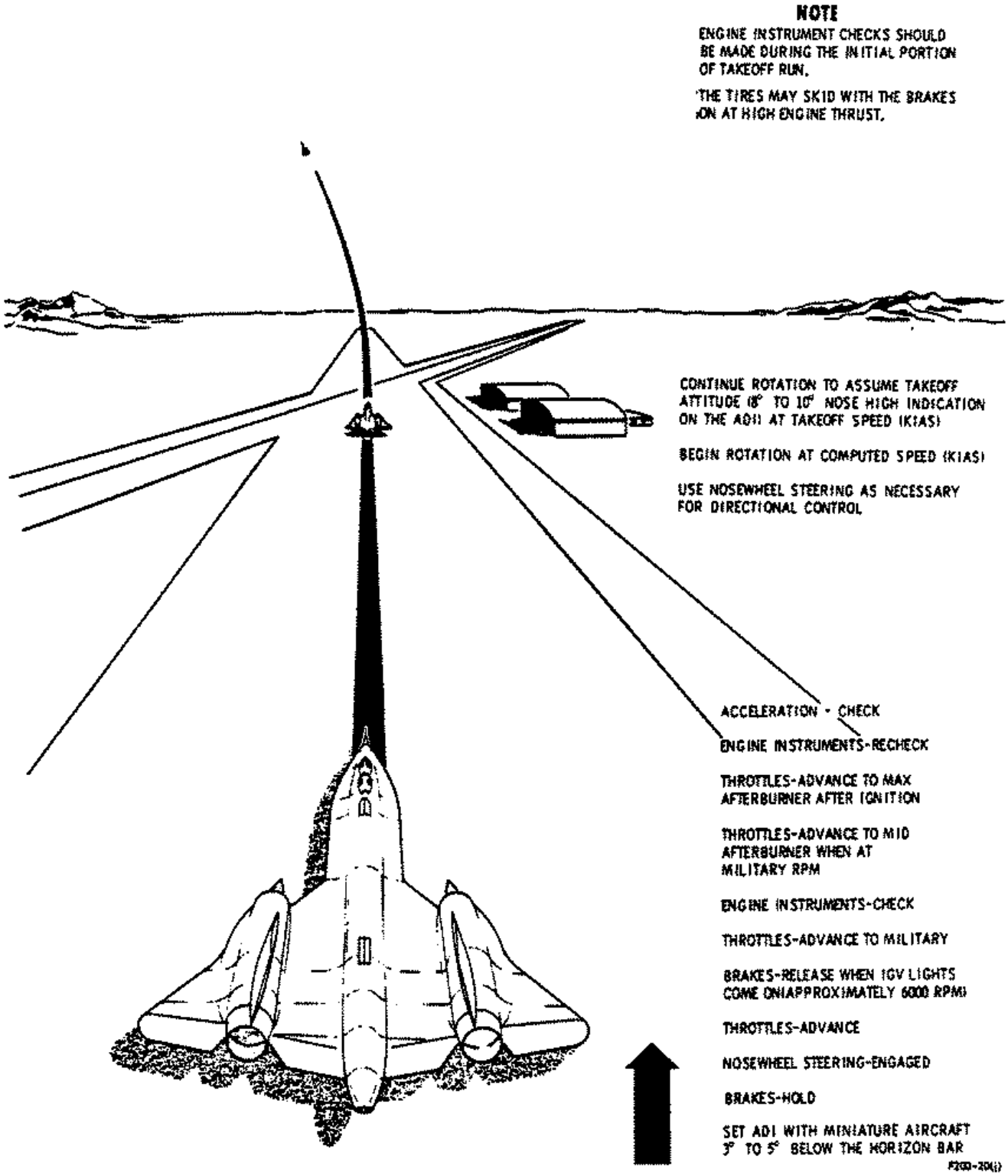


Figure 2-5

nose high indication on the ADI. The transition from start of rotation to takeoff requires approximately 5 seconds when using the normal takeoff technique. Refer to Takeoff Speed Schedule in Part II of the Appendix for rotation and takeoff speeds.

Premature nosewheel liftoff should be avoided because the unnecessary drag extends the ground run and may result in excessive tire loads.

NOTE

AOA indicates zero at airspeeds less than 100 KEAS and actual AOA at higher airspeeds.

CROSSWIND TAKEOFF

The aircraft weathervanes into the wind during crosswind takeoffs when the nosewheel lifts off and nosewheel steering is no longer available. Rudder pressure must be held to counteract the crosswind. A definite correction must be made as the aircraft breaks ground. Apply lateral control as necessary for wings-level flight. Both the directional and lateral control applications are normal and no problems should be encountered when taking off during reasonable crosswind conditions.

AFTER TAKEOFF

When definitely airborne:

1. Landing gear lever - UP.

   Gear retraction requires 12 to 16 seconds.

WARNING

- Single engine operation is critical immediately after takeoff. Increasing airspeed and decreasing angle of attack have greater benefits than gaining altitude at a maximum rate. Single engine flight capability is presented in Part II of the Appendix. With gear down, the minimum safe speed out of ground effect is approximately 30 knots greater than in ground effect.
- Immediately depress the control stick trigger switch to deactivate APW System stick pusher operation if a false stick pusher warning occurs. If the stick pusher is not deactivated by the trigger, use a pull force of 30 to 35 pounds in addition to normal stick forces to overcome the stick pusher spring. Use pitch trim to relieve stick force.

After gear retraction is completed and single engine flying speed is obtained, establish climb power as desired. A military power climb conserves fuel.

2. Engine instruments - Check.

At Mach 0.5:

3. Surface limiter - Engaged, SURFACE LIMITER light off.

   Rotate handle counterclockwise and release to engage limiters.

4. Attitude Reference - ANS (pilot).

   The RSO will crosscheck attitude sources before the pilot selects the opposite reference. This is especially critical for night or instrument flight conditions.

NOTE

The RSO should vigilantly monitor attitude during takeoff/climb out and crosscheck his attitude indicator references by alternately selecting ANS/INS. He will notify the pilot immediately if any abnormal attitude is suspected.

5. EGT trim switches - AUTO

CLIMB

NOTE

If the cockpit air handle was positioned OFF for takeoff, wait until a safe altitude out of the moist air before positioning the handle to on. Approximately 5000 feet above ground level should be sufficient.

Normal climb is 400 KEAS until Mach 0.90 is intercepted, then hold Mach 0.90.

WARNING

If moderate turbulence is encountered, reduce airspeed to 300 - 350 KEAS while subsonic. Climb at 400 KEAS if supersonic, or decelerate to subsonic speeds at 350 KEAS if the climb cannot be continued. Refer to Section VII, Operation in Turbulence.

NOTE

The pilot must advise the RSO of autopilot engagement or disengagement and the mode(s) affected.

1. PUMP REL switch - Press, Tank 4 released, light out.

During climb at maximum power when the right-hand shut-off float switches in tank 1 have been actuated because of tank depletion or flight attitude, illumination of the L and/or R FUEL PRESS warning light(s) (a fuel low pressure warning) may occur if tank 4 is released. At maximum power, do not release tank 4 at low altitude.

T 2. Altimeter - Set.

Set 29.92 as required.

(3.) Sensor power - As briefed.

All sensor power switches except DEF may be turned on at this time. The RCD or IPD power switch ON legend should illuminate when Radar power is applied. The OBC should be in STBY before takeoff.

Sensor warmup times are:

RADAR	-	6 min.
RCD	-	1 to 3 min.
EIP/EMR	-	2 min.
TECH	-	20 to 40 sec.

Ensure TECHs and radar in AUTO or MANUAL modes as required.

(T) 4. HF radio - Retune (618-T-only).

Recycle HF tuning to in-flight antenna impedance by momentarily placing freq control knob off-frequency, then back to original position. Recycle antenna coupler by keying transmitter.

WARNING

Rf energy from the HF radio during tuning or transmission has caused erroneous light and instrument indications.

(5.) DEF system power - As briefed.

Depress DEF System A power switch to illuminate the ON legend. After two minutes warm-up, the S (standby) legend should illuminate.

Depress the DEF F/H power switch. The W (warm-up) legend illuminates immediately. In approximately five minutes, the W legend extinguishes and the S (standby) legend illuminates.

Depress the DEF M power switch to illuminate the W and ON legends. After three minutes warmup, the W legend extinguishes.

(6.) DEF systems - Checked.

Refer to the DEF System Procedures, Section IV.

CAUTION

To avoid DEF system damage due to overheating, do not exceed the transmission time periods scheduled for the checks while testing in the manual mode below FL 500.

NOTE

These tests can be finished after transonic acceleration if the system warm-up time requirement does not allow earlier completion.

(7.) G-band Beacon switch - As required.

Attitude Control

Each crew member must be aware of attitude reference operating characteristics and be alert for failures. The RSO should select INS attitude reference when the pilot has ANS selected, and vice versa. The pilot should crosscheck attitude with the standby attitude indicator. The RSO should periodically cross check attitude reference sources by alternately selecting INS and ANS.

If the ANS nav-ready signal is lost, the pilot's ANS REF annunciator caution light illuminates, and the RSO's ANS FAIL annunciator caution light illuminates. If the pilot's ATT REF select switch is in ANS: the autopilot disengages, the DAFICS ANR light flashes (flashing DAFICS Preflight BIT FAIL light), the PVD is inhibited, and the power OFF flag appears in the ADI. If the RSO's ATT IND switch is in ANS, the power OFF flag appears in the attitude indicator.

If the INS is operating in the attitude mode, the pilot's INS REF annunciator caution light illuminates. If the pilot's DISPLAY MODE SEL switch is in any position other than ANS, the course warning flag comes into view.

If the INS platform fails, the pilot's INS REF annunciator caution light illuminates. If the pilot's ATT REF SELECT switch is in INS: the autopilot disengages, the DAFICS ANR light flashes (flashing DAFICS Preflight BIT FAIL light), the PVD is inhibited, and the power OFF flag appears in the ADI. If the RSO's ATT IND switch is in INS, the power OFF flag appears in the attitude indicator.

ACCELERATION

The TDI is the primary speed and altitude reference for acceleration to, during, and for deceleration from supersonic flight. The pilot should crosscheck TDI indications with the pitot-static instruments. The RSO should monitor altitude, attitude, and speed. Crosscheck navigation system ground speed against aircraft speed indications.

SUPERSONIC AIRSPEED SCHEDULES

The optimum supersonic airspeed is 450 KEAS while climbing between Mach 1.25 and

NORMAL EVENTS AFTER TAKEOFF OR REFUELING DURING TRANSITION TO SUPERSONIC CRUISE

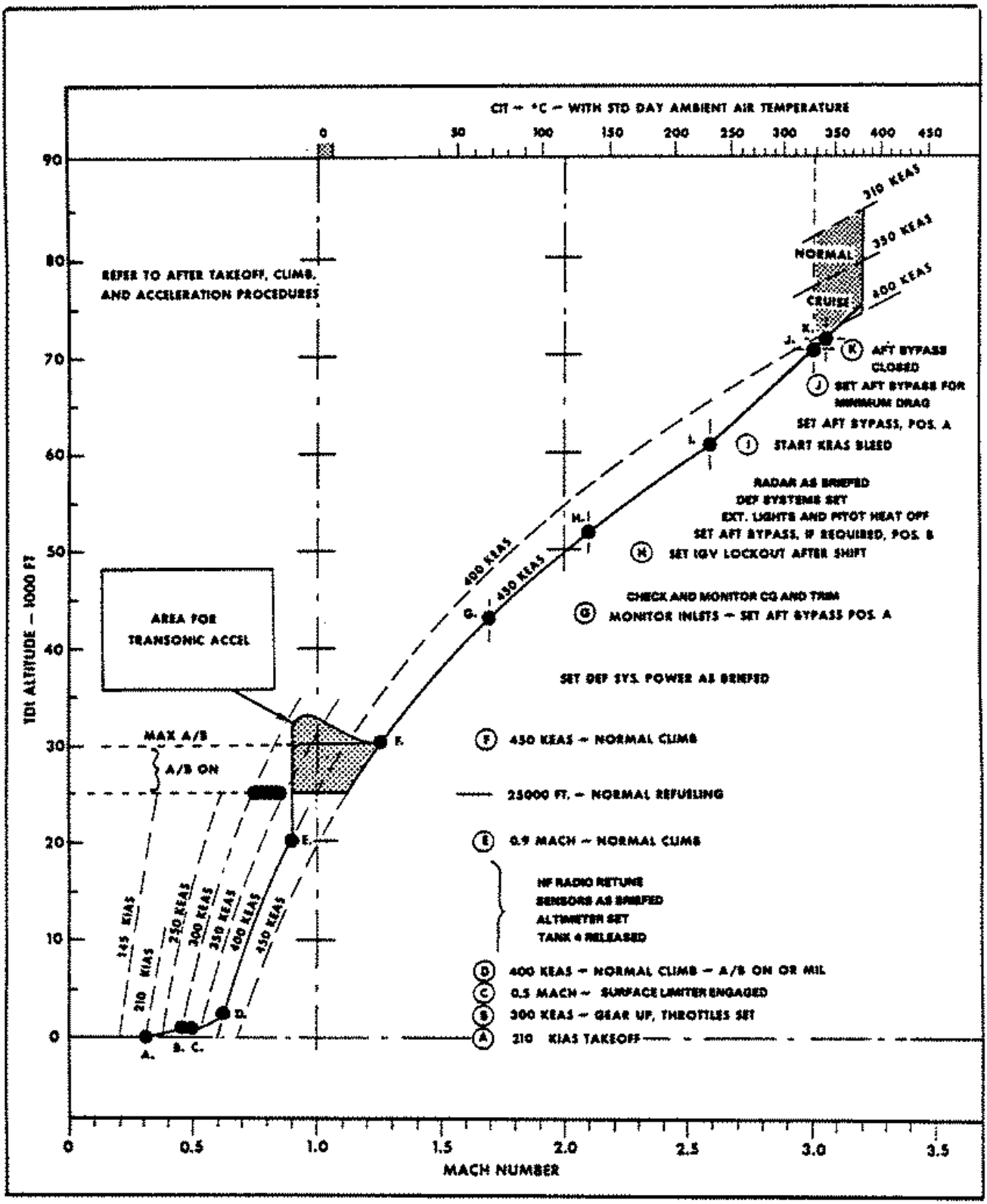


Figure 2-6

Mach 2.6. Lower airspeeds such as 400 or 375 KEAS may be used, as when turbulence is encountered, but performance is considerably degraded.

TRANSONIC ACCELERATION PROCEDURE

Transonic acceleration is accomplished at either a level altitude or during a climb-and-descent maneuver.

NOTE

The climb-and-descent acceleration is recommended for best specific range (NM per pound of fuel used).

Level Acceleration

A level acceleration to intercept the supersonic climb speed schedule can be made at refueling altitude, normally 25,000 feet. When ambient temperatures are near or lower than standard, less time and distance are required to intercept the climb speed schedule than the climb-and-descent procedure. The total range penalty is small under these conditions.

Start the acceleration with minimum afterburner. Complete course changes while subsonic so that the additional power required for turning will not diminish the power available for transonic acceleration. Set maximum power at Mach 0.9. Gently increase pitch to climb attitude near 430 KEAS. A smooth technique is required, as 450 KEAS is only slightly more than Mach 1.1 at 25,000 feet and is still within the critical thrust/drag speed range which begins near Mach 1.05.

WARNING

Airspeed may increase rapidly after Mach 1.1 is reached. Reduce power (below Military, if necessary) to avoid high airspeeds. Do not use excessive load factors to prevent exceeding 450 KEAS.

The procedure can be used at another altitude; however, when lower, the transition to 450 KEAS climb attitude must be made in the unfavorable speed range from Mach 1.05 to 1.10. At higher altitudes, the transition through this speed range can be completed before starting the climb, but less thrust is available. If ambient temperature increases, thrust decreases and the time, fuel and distance penalty for using the level acceleration procedure is greater.

Climb-And-Descent Acceleration

The climb-and-descent procedure requires less fuel to intercept the climb speed schedule than the level acceleration when ambient temperatures are warmer than standard.

NOTE

The climb-and-descent procedure is recommended for best specific range (NM per pound of fuel used) at all temperatures.

WARNING

Although angle of attack increases during the subsonic climb, pitch attitude must decrease to avoid dangerous flight conditions. Failure to monitor and control attitude, speed, and angle of attack can result in approach to pitch-up conditions.

Start the acceleration with minimum afterburner power. Intercept 0.9 Mach. Set maximum afterburner at 30,000 feet for the remainder of the acceleration, observing the 300 KEAS restriction. At 33,000 feet, increase speed to at least Mach 0.95. This speed is slightly above the start of the drag rise region. Make a smooth transition to establish a 2500 to 3000 fpm rate of descent.

SUPERSONIC ACCELERATION PROCEDURE

1. Throttles - A/B

   Use minimum or maximum afterburner, as desired.

   Intercept Mach 0.90 and climb at that speed until starting the transition to the supersonic schedule.

   If the pitch autopilot is used during subsonic climb, the Mach Hold function must be engaged to climb at constant Mach.

   Refer to appendix Figure A1-4 for approximate differences between IAS and EAS indications. At Mach 0.9, correct airspeed indications at 30,000 feet are 324 KEAS and 347 KIAS. The TDI can be monitored by comparing TDI Mach with indicated Mach.

At start of transonic acceleration:

2. Throttles - Maximum A/B.

   Advance both throttles smoothly to maximum power and advise the RSO.

   Use either the level acceleration procedure or the climb-and-descent procedure.

NOTE

- The Auto-Nav feature of the autopilot is normally used if the roll autopilot is engaged.
- If the autopilot KEAS hold mode is used, engage the pitch autopilot and stabilize KEAS for a few seconds before engaging KEAS hold.

After reaching speeds above Mach 1.25 when operating without the automatic EGT control engaged, trim as necessary to maintain nominal EGT as shown in Figure 2-4. EGT must not exceed 830°C below 40°C CIT and 805°C above 40°C CIT. Maintain EGT between 775 and 805°C after climb is established.

At Mach 1.7:

3. Inlet parameters - Monitor.

   Monitor spike and forward door positions and CIP.

4. Aft bypass controls - Set.

   Normally set Position A at Mach 1.7, but wait until the forward bypass doors move out of full closed to set the aft bypass.

5. C.G. and trim - Monitor.

NOTE

- Manual boost pump selection for the purpose of shifting c.g. is not normally necessary with a full fuel load. With reduced fuel loads, manual control of the fuel system may be required to achieve a desirable supersonic c.g. position. (See Cruise Fuel Management, this section.) The c.g. normally moves aft 1% per 5000 lb of fuel used until the right-hand shutoff switch in tank 1 operates.
- While at maximum power with high fuel flows, press tank 5 (or tank 4) boost pumps on before using fuel forward transfer to prevent an R FUEL PRESS warning. Release the tank after completing fuel transfer.

At IGV shift (CIT limit is 150°C):

6. IGV switches - LOCKOUT.

CAUTION

Decelerate to 125°C CIT or less (approximately Mach 2.0) if the IGV lights are not extinguished upon reaching 150°C CIT (approximately Mach 2.2 with ambient temperature near standard).

The IGV lights should extinguish on completion of IGV shift at 85° to 115°C CIT (approximately Mach 1.7 to 2.3, depending on ambient temperature). The lights must be out at 150°C CIT. When the guide vanes shift, forward bypass opening will increase and fuel flow and thrust will decrease. The engines may not shift simultaneously due to tolerances in fuel control schedules.

NOTE

If the IGV lights extinguish (IGV shift to cambered) while below the normal shift range, land when practical.

7. Aft bypass controls - Position B, if required.

   a. Set Position B when the lights extinguish if forward bypass opening exceeds 20%. Drag increases noticeably if the forward bypass schedules in excess of 20% open.

   b. Monitor forward bypass door position. Shift the aft bypass from position B to A when the forward bypass approaches closed. Allowing the forward bypass doors to schedule less than 5% open with the aft bypass doors in position B reduces inlet stability and increases the probability of an unstart without appreciably increasing overall inlet efficiency.

8. Exterior lights - Off.

   a. Anticollision/fuselage lights switch - OFF.

   b. TAIL LT switch - Off (center position).

9. Pitot heat switch - OFF.

(10) DEF systems - Set and checked.

NOTE

Set DEF system operating conditions as briefed when above FL 500.

(11) Radar - As briefed.

At FL 600:

(T12) IFF - Mode C OUT.

This prevents automatic altitude reporting.

At Mach 2.6:

13. Aft bypass controls - Set position A, when required.

Shift from the B to the A position when the forward bypass approaches closed.

Allowing the forward bypass doors to schedule less than 5% open with the aft bypass doors in position B reduces inlet stability and increases the probability of an unstart without appreciably increasing overall inlet efficiency.

14. KEAS bleed - Monitor.

For normal climb at 450 KEAS, decrease KEAS 10 knots per 0.1 Mach number increase above Mach 2.6.

NOTE

The minimum pitch trim indication to be expected at Mach 2.6 is +0.5°. At higher Mach, the minimum limit depends on KEAS, aircraft weight and c.g. Assure trim is at or above 0° except for the specific high Mach, high KEAS conditions at 25% c.g. depicted on Figure 6-7. Check the c.g. if less nose-up trim is indicated.

(T15) INS altitude - Update as required.

Update the INS altitude to the mid-leg altitude between level off and start of descent.

At Mach 3.0:

16. Aft bypass controls - Set.

Maintain position A or use the CLOSE setting for cruise near Mach 3.0. If the forward doors are not closed with position A selected, maintain position A for best performance.

The optimum setting for cruise near Mach 3.0 may be determined by setting the aft doors to CLOSE individually. If drag increase on the closed side is noted, cruise with aft bypass in position A.

At Mach 3.05:

17. Aft bypass controls - Set CLOSE.

Set CLOSE position for cruise above Mach 3.05.

CRUISE

Cross-check the TDI altitude, KEAS, and Mach displays with IAS, indicated Mach, and altimeter, periodically, to detect discrepancies in the TDI. If Mach number appears to be inaccurate, make appropriate adjustments so that flight limits will not be exceeded.

The checklist Mach-KEAS-Altitude Relationship chart and the Mach-Airspeed-Temperature Conversion chart can be used to check the TDI and ANS true airspeed. Indicated spike position vs. the TDI and indicated Mach provides another cross-check on Mach number, as spike position is based on DAFICS Mach output.

WARNING

In the SR-71B, no warning is displayed if the SAS channel engage switches are not ON in the cockpit that does not have AFCS control. If the SAS engage switch(es) are OFF in the cockpit that does not have AFCS control, transferring AFCS control to that cockpit results in loss of SAS until the SAS switch(es) are engaged. Verbally confirm the position of the SAS channel engage switches before transferring AFCS control.

Flight will not be extended into night or IFR conditions if the pilot's standby attitude indicator and either the ANS or INS reference for the ADI are inoperative or erroneous. Climb and penetration through overcast is permitted. If already operating in night or IFR conditions, land when practical.

Pitot Static Reference - Subsonic Operation

The pressure altimeter is the primary altitude reference for subsonic flight operation; to fly an assigned altitude, use the altimeter correction card.

IFF Mode C uses DAFICS (TDI) altitude for automatic altitude reporting.

Operation at Supersonic Speeds

Avoid sustained operation at speeds between Mach 2.5 and 2.7 when convenient. This area is normally more susceptible to inlet duct roughness than higher or lower speeds. Refer to Climb, Section VI.

Autopilot Operation, Cruise or Climb

Manual trim in the yaw and roll axes may be used while the roll autopilot is engaged in Heading Hold or Auto Nav modes to minimize track error (course hang-off). When only attitude-hold mode (pitch or roll autopilot) is engaged, use the trim wheel on the function selector panel to adjust attitude. (Manual trim inputs at this time will only cause control transients.) If Mach hold is desired, engage the pitch autopilot and stabilize the aircraft at the desired Mach before engaging the Mach hold mode.

Optimizing Trim

Trim should be optimized during cruise to minimize drag. With the autopilot on, match fuel flows then apply yaw trim as needed to center the turn-and-slip ball. The periscope may be used to visually confirm rudder trim symmetry. With the roll autopilot engaged, check for off-center displacement of the roll autopilot alignment needle. "Beep" roll trim in the direction of needle displacement until the needle is centered. It may be necessary to repeat the procedure if KEAS or Mach changes.

The max range loss factors for rudder, sideslip, or c.g. deviation (based on symmetrical power and supersonic cruise) are:

rudder: 1° - 3 nm 2° - 12 nm

sideslip: 1° - 12 nm 2° - 48 nm

c.g.: 50 nm/% c.g. fwd of 25% MAC

Turning, in Auto Nav Mode

While in the Auto Nav mode, anticipate turn entry. Use manual stick inputs, if necessary, to avoid excessive roll rates and bank angles. It is unlikely that the stick shaker warning will be encountered during the roll-in to a normal turn. If shaker warning occurs while rolling into a steep turn, manually reduce the roll rate.

Steep Turns

The pitch autopilot can be used for turns with bank angles up to 45°. Pitch and roll attitude must be monitored when making steep turns.

C.G. Crosscheck

Since center of gravity control is important for optimum cruise performance and safety, crosscheck the c.g. indication with pitch trim and, occasionally, by computation.

During climb, the c.g. normally moves aft approximately 1% per 5000 pounds of fuel used and can be expected to reach 24% to 25% when the fuel in tank 1 reaches the right-hand shutoff setting. This should occur near the level-off point in a supersonic flight profile after air refueling to full tanks. After right-hand shutoff, the automatic sequencing provides a center of gravity which will approach 25%. This minimizes elevon deflection and trim drag during supersonic operation. If c.g. should exceed 25%, transfer fuel forward (C.G. annunciator panel warning light illuminates when c.g. reaches 25.3 to 25.6%). During subsonic mission legs, successive forward transfers may be necessary to keep the c.g. forward of the subsonic aft limit (22%).

NOTE

The optimum supersonic c.g. position may not be reached automatically with a partial fuel load. Manual fuel management may be required.

Fuel Management

Maintain c.g. forward of the center of gravity limit by using forward transfer. Forward transfer should also be used for an electrical system or SAS emergency.

Select fuel crossfeed OPEN any time tanks 5 and 6 are empty with both engines operating normally, and any time the FUEL QTY LOW caution light or an L or R FUEL PRESS warning light illuminates. Even though symmetrical thrust conditions exist, the use of crossfeed during afterburner operation can result in mismatched fuel flow indications of as much as 7000 lb per hour, due to fuel crossflow through the fuel heat sink system.

With crossfeed closed, should fuel flows to the engines be mismatched, c.g. may move out of the desired range. If the right fuel flow is higher, c.g. will not move aft as fast as the normal schedule and if the left fuel flow is higher, the converse is true. If fuel flows are mismatched, c.g. should be closely monitored as the full capabilities of the transfer system may be needed to obtain optimum c.g.

Manual aft transfer is provided to augment the automatic aft transfer system. Manual aft transfer is only effective if tank 5 is less than full.

The following three methods are designed to move the c.g. aft. Early manual fuel management is especially important with a less-than-full fuel load during supersonic acceleration. Manual aft transfer has a lower rate of c.g. movement than Method a only, being equal to 71% of Method a rate.

Method a

Press tank 1 on to override the RHSO until the fuel level in tank 1 reaches 3000 pounds.

CAUTION

Do not manually select tank 1 with less than 3000 pounds remaining in that tank. The forward pumps would be operating without fuel cooling and lubrication.

Method b

Pressing tank 2 on and opening the crossfeed valve is effective until tank 3 is empty. The rate of c.g. movement of this method will vary depending on the amounts of fuel remaining in tanks 1 and 2.

NOTE

Using this method eliminates automatic aft transfer. Increased aft c.g. movement can be obtained by depressing the manual aft transfer switch once tank 5 starts to operate.

Method c

Depressing the manual aft transfer switch is the primary means for moving the c.g. aft when tank 2 and 5 are supplying fuel during normal fuel sequencing.

NOTE

With the crossfeed valve open and only one forward tank supplying fuel, the c.g. may move forward.

Engine Operation

Exhaust gas temperature and engine speed limits vary with compressor inlet temperature. Refer to Engine Operating Limits, Section V. When encountered, slow fluctuations in EGT, fuel flow and rpm should be reported for maintenance evaluation; however, fluctuations of ±1% are expected and are not detrimental to engine operation. Random fluctuations of ±4% are expected in nozzle position indication and are not detrimental to engine operation.

EFFECT OF ASYMMETRIC ENGINE FUEL FLOW ON AUTOMATIC CG SCHEDULING

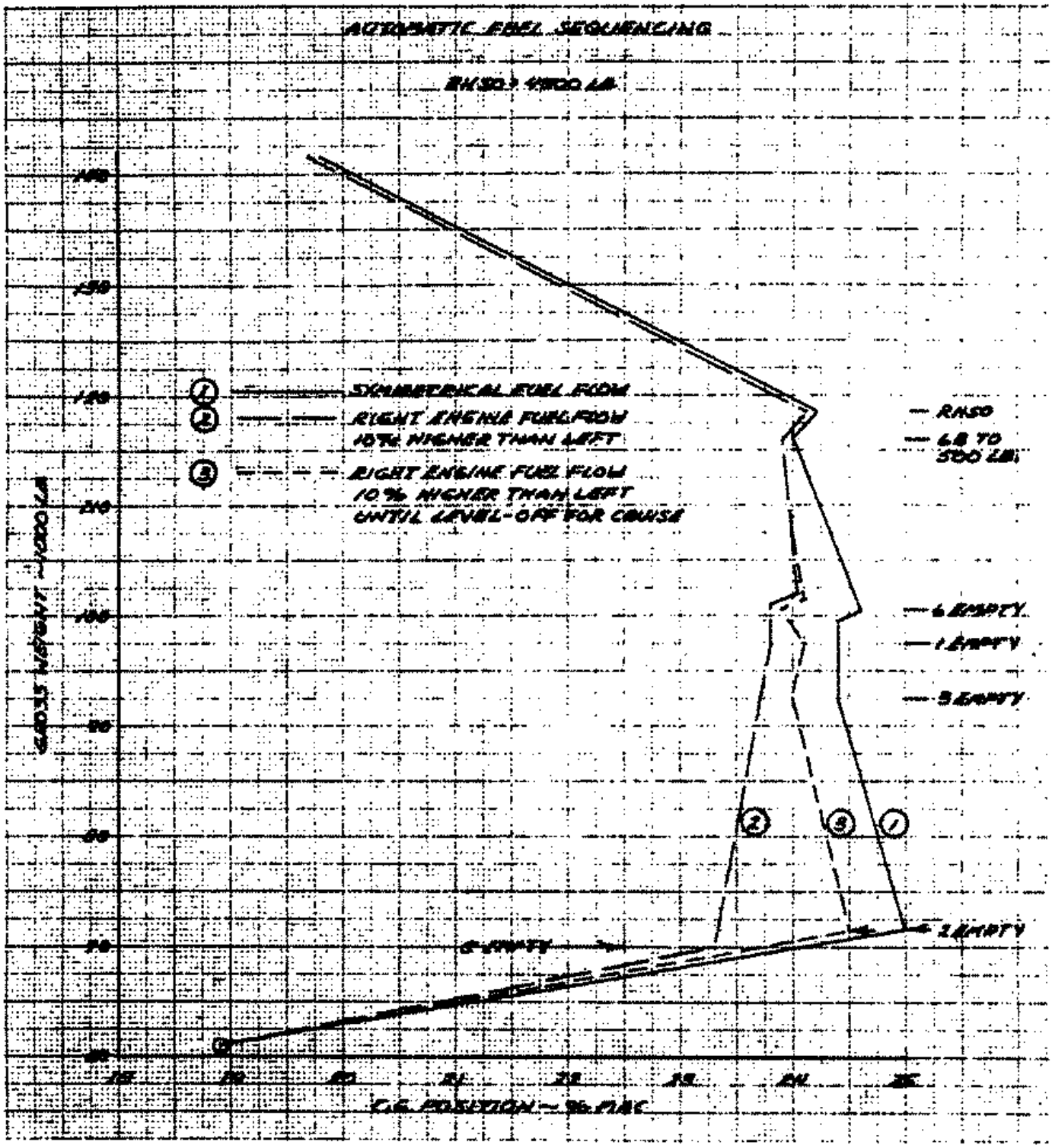


Figure 2-8

EFFECT OF AUTOMATIC AND MANUAL FUEL MANAGEMENT ON C.G. SHIFT RATE*

TANKS ON	PROCEDURE	Percent of Base C.G. Aft Shift Rate
1-3-6 to RHSO	HANDS OFF (NO ALTERNATE AVAILABLE)	+100%** (Base Rate)
HANDS OFF 1-3-6 after RHSO, >3000 lb in tank 1	 Press on tank 1 Press on tank 2, open crossfeed Open crossfeed Tank 5 on after tank 6 is empty	-19% +100% +67% +41% +35%
1-3-6 after RHSO <3000 lb in tank 1, before tank 5 on	HANDS OFF Press on tank 1 (See Note) Press on tank 2, open crossfeed Open crossfeed	+7% +100% +67% +41%
tank 5 on, before tank 2 on	HANDS OFF Press on tank 2, open crossfeed Open crossfeed Press on tank 2 Press on tank 2, manual aft transfer held on Press on tank 2, open crossfeed, manual aft transfer held on	+0.8% +11.3% -28.8% -28.8% +34.6% +49.7%
tank 2 on, before tank 4 on	HANDS OFF Open crossfeed Manual aft transfer held on Open crossfeed, manual aft transfer held on	+3.3% -14.1% +92.0% +29.7%

* Based on nominal, matched fuel flow consumption to each engine.

** This rate, which is 1% of C.G. movement for every 5000 lbs of fuel consumption, is used for comparison throughout all stages of tank sequencing. A (+) or (-) sign indicates that the C.G. is moving aft or fwd.

Note: Do not manually select tank 1 with less than 3000 lbs remaining in that tank. The forward pumps would be operating without fuel cooling and lubrication.

Figure 2-9

Effect of Engine Thrust Variation with EGT

For a given level of thrust, higher throttle settings and increased fuel flow are required as EGT is decreased, because combined burning efficiency of the engine and AB decreases with lowered EGT. Full throttle ceilings are therefore reduced. The degradation in thrust for all throttle settings, at Mach 3.2 and 80,000 feet, is approximately 1.3 percent per 10°C of EGT decrease. The trend is the same for other flight conditions.

Effect of RPM Suppression on Maximum Thrust

As EGT decreases, the engine nozzle opens to maintain scheduled rpm. At high Mach and maximum power, the nozzle may open fully and any EGT decrease will result in rpm suppression below schedule. When this occurs, engine speed will suppress approximately 50 rpm for each 10°C of EGT decrease. The airflow through the engine decreases due to the suppressed rpm, leading to a higher inlet bypass requirement and opening of the forward bypass doors. At Mach 3.2 this results in a thrust degradation and drag increase of approximately 3.5 percent per 10°C of EGT decrease for each engine. If Mach number decreases as a result of the change in thrust and drag, the spikes schedule more forward and the forward bypass doors open further. Performance will deteriorate rapidly under these cumulative effects. Cruise EGT should be maintained between 775°C and 805°C to avoid this situation.

Crew Comfort

Pressure suit ventilation air temperature tends to increase and flow decreases while approaching the end of long cruise periods at maximum speed. The increase in temperature is associated with increasing fuel manifold temperature as tank 3 empties and the quantity remaining is exposed to high skin temperatures. This results in less cooling of the engine bleed air as it passes through the fuel-air heat exchangers in the environmental control system. Comfortable suit vent temperatures are restored as soon as tank 2 is scheduled on.

If uncomfortably warm suit vent temperatures are encountered, insure that the suit heat rheostat in the forward cockpit is OFF. Each crewmember can open his air controller valve to increase flow through the suits. If this is not sufficient, the pilot can manually select the tank 2 boost pumps on if the condition can be associated with depletion of tank 3. The c.g. indication must be monitored and kept within limits. Premature use of tank 4 is not recommended as an alternate to using tank 2 fuel.

PRIOR TO DESCENT

▲1. Pilot's ANS distance display mode - DP/TURN.

   a. Display Mode Select Switch - ANS.

   b. Bearing Select switch - NORMAL.

   (Tc) ANS DATA switch - TEST.

   Press DISPLAY push-button switch to display data.

   (Td) DP/TURN push-button switch - As desired.

   RSO will coordinate the pilot's desired ANS distance display mode and will read the backset from DP or distance to turn, as applicable, over interphone.

2. IGV switches - LOCKOUT checked.

3. LN_2 quantity - Checked.

   Check total liquid nitrogen quantity. If not sufficient for normal descent, refer to Fuel Tank Pressurization emergency procedure, Section III.

4. Inlet Controls - AUTO & CLOSE.

   Inlet spike and forward bypass controls will be placed in AUTO and the aft

bypass controls set at CLOSE unless manual inlet procedures are used. Refer to Section III, Figure 3-5 for manual inlet schedule.

(T5) INS altitude - Update as required.

Update to the after descent condition (air refueling, penetration or field elevation).

DESCENT

1. For inlet(s) in manual control, restart(s) - ON.

2. Throttles - 720°C EGT to Military.

   Slowly retard both throttles to 720°C EGT to Military. 720°C EGT results in approximately 10 nm less descent distance than Military.

   Expect a fuel vapor trail to occur while the afterburner fuel lines clear.

   NOTE

   - Pause at minimum A/B approximately 5 seconds if retarding from a high power setting.
   - If 720°C EGT is selected, monitor EGT, RPM, and nozzle position. Expect EGT to decrease as Mach decreases. 700°C EGT should hold rpm at the Military schedule and maintain nozzle governing.

   With IGV lockout inoperative:

   a. Set Military.

   For inlet(s) in restart:

   b. Set 720°C EGT to Military.

   For inlet(s) in restart with IGV lockout inoperative:

   c. Set Military.

   Refer to Schedule for Manual Inlet Control, Section III.

3. Airspeed - 365 KEAS (350 minimum).

   Maintain cruise altitude while decelerating, or maintain cruise Mach number while descending, until approximately 365 KEAS. If KEAS hold is desired, engage the pitch autopilot and stabilize the aircraft at the desired KEAS for a few seconds before engaging KEAS hold. Maintain 350 KEAS minimum while decelerating to reduce the probability of unstart and minimize the possibility of engine stall or flameout.

4. Fuel tank pressure - Monitor.

   Descend so that minimum tank pressure (-0.5) is not exceeded.

At Mach 2.5:

5. Throttles - Set 6900 rpm.

   Retard throttles simultaneously. Some throttle misalignment may be required. An rpm decrease of 400-500 rpm can be expected from Mach 2.5 to 1.3. Maintain at least 6500 rpm while above Mach 2.0.

   With IGV lockout inoperative:

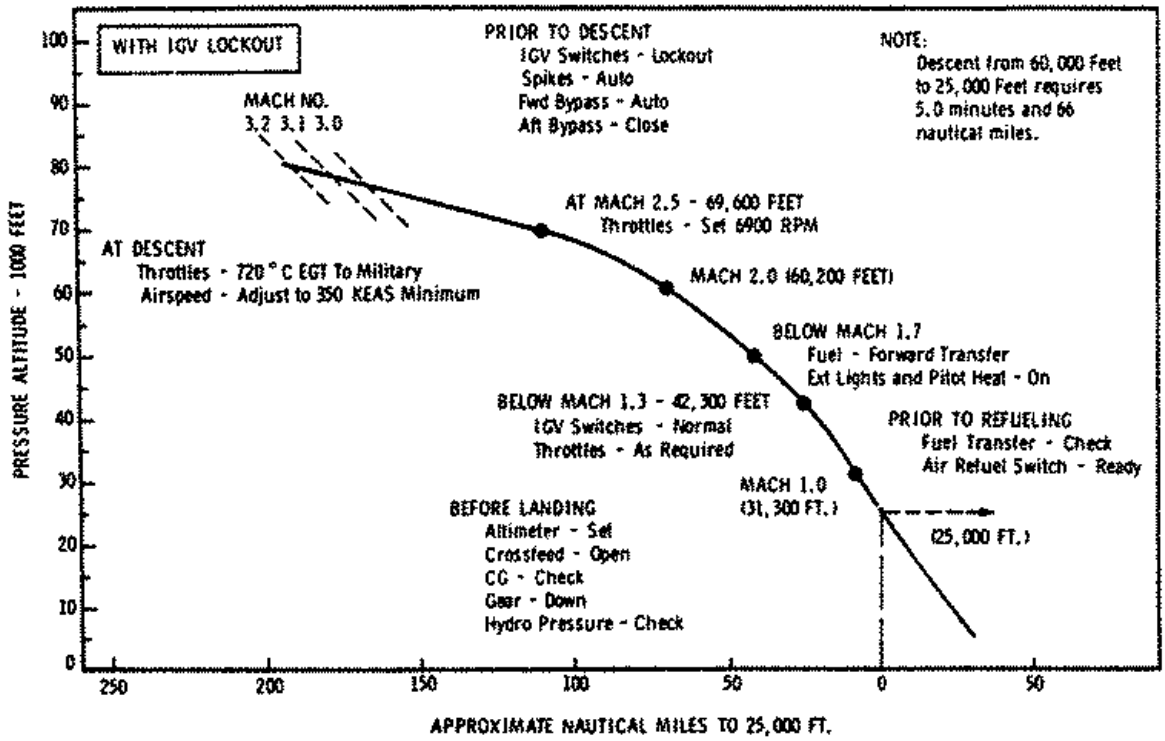
   a. Set 720°C EGT and maintain 700°C EGT minimum.

      This procedure will increase descent distance approximately 25 - 30 nm. Maintain at least 700°C EGT while above Mach 1.3 to hold the military rpm schedule and maintain nozzle governing. ENP greater than 70% open will result in less than military rpm; in this event, advance the throttle as necessary to maintain military rpm. Maximum rpm occurs near 100°C CIT, as during climb. Mild compressor stalls may be encountered when near 85°C CIT (approximately Mach 1.8) as the IGV and internal bleeds shift.

   For inlet(s) in restart:

SECTION II

DESCENT PROFILE



350 KEAS DESCENT

ALT	DISTANCE (NM) CRUISE MACH 3.2	3.15	3.1	3.0	2.9	2.8	2.6	2.4	PROFILE CHECK 350 KEAS DIST	IAS	ETE
84K	238	232	226								
82K	236	229	223	211							
80K	234	227	220	208	198	187			234	422	:15.5
78K	231	224	218	206	195	184					
76K	228	221	215	204	193	182	165		196	440	:14.0
74K	225	218	212	202	191	180	162				
72K			209	200	189	177	159	141			
70K				198	187	175	157	139	148	437	:12.0
68K					185	173	154	136			
66K						171	151	134			
64K						169	149	132	120	432	:11.0
62K							147	130			
60K								128	106	428	:10.0
55K									92	422	:09.5
50K									80	416	:08.5
45K	WITH LOCKOUT W/O LOCKOUT								71	409	:08.0
40K	720° EGT ABOVE M2.5 MIL PWR ABOVE M2.5								63	401	:07.5
35K	6900 RPM AT M2.5 720° EGT BELOW M2.5 (700° MIN)								56	391	:06.5
30K									50	376	:06.0
25K									40	370	:05.0

NOTE

1. Distance and time includes 40 NM L/O prior to ARCP.
2. Add 35 NM for each IGV not locked out.
3. Subtract 25 NM for each restart on.
4. Subtract 30 NM for each inlet in restart w/o lockout.
5. Subtract 51 NM and :06 to FL 310 (IAF).
6. Subtract 40 NM and :05 to FL 250 (IAF).
7. Subtract 25 NM and :03 to FL 160.
8. Subtract 1 NM for each 10° of turn in descent.
9. 5500-6100 RPM below M 1.0.

F203-315(c)

Figure 2-10

b. Set 6500 rpm.

If the forward bypass doors are nearly full open (for any reason) and the engine internal bleeds shift before rpm is reduced, engine stall and flameout are possible.

Refer to Schedule for Manual Inlet Control, Section III.

For inlet(s) in restart with IGV lockout inoperative:

c. Set 6500 rpm. At Mach 2.0, set idle.

Refer to Schedule for Manual Inlet Control, Section III.

CAUTION

If protracted or non self-clearing stalls are encountered, follow procedures in Section III, Compressor Stall In Descent. Use restart and retard throttle to Idle on the affected engine only. Restarts on between Mach 2.5 and 1.3 near Military rpm may result in compressor stall. Check aft bypass doors closed.

At FL 600:

(T6) IFF Mode C - Set as briefed.

(7.) DEF systems - As required.

The DEF systems may be turned off if descending to land, or placed in standby. If the systems are turned off, check that all System H automatic and manual mode legends and the W and S legends are off. Avoid operating System H below FL 500. The other systems should be in standby before reaching FL 500.

NOTE

System H can be maintained in the standby mode below FL 500 if immediate availability of the system is desirable. In this event, perform an automatic self test each half hour with transmit modes selected. Shut down the system when immediate availability is not required.

Below Mach 1.7:

8. Fuel forward transfer switch -On.

Transfer fuel to obtain c.g. within subsonic limits. Check tank 1 fuel quantity increasing.

9. Pitot heat switch - ON.

10. Exterior lights - On.

a. Anticollision/fuselage lights switch - ANTICOLLISION.

b. TAIL LT switch - STEADY.

Below Mach 1.3:

11. Inlet controls - Checked.

Check spike and forward bypass controls AUTO and aft bypass controls at CLOSE unless manual inlet control procedures are required.

12. IGV switches - NORMAL.

De-energizing the IGV Lockout System restores the engine to maximum thrust capability. The IGV should shift to axial and IGV lights illuminate if RPM is above 5500-6000 rpm. (See Figure 1-11.)

13. Throttles - As required.

Adjust descent profile as required. Reduce rate of descent, if necessary, to avoid low fuel tank pressure below FL 400.

When the desired c.g. is obtained:

14. Fuel forward transfer switch -OFF.

15. Crossfeed switch - Set.

    Crossfeed OPEN should be selected if immediate penetration for landing is to be accomplished, if tanks 5 and 6 are empty, or if the FUEL QTY LOW light illuminates.

AIR REFUELING DATA CARD			
TKR TCS			
AREA			
ARCP			
DP #			
TRACK			
ARCT			
ALT BLOCK			
A/R ALT			
A/A TAC			
HF FREQ			
Prim. UHF			
Backup			
EXT. CODE			
ON LOAD			
FULL TANK CG			
MISSED A/R ALT	DP CH	DP CH	DP CH
BINGO FUEL			
PLANNED RES			

Figure 2-11

AIR REFUELING

The pitot-static flight instruments will be used for tanker rendezvous and in-flight refueling procedures. Check that the altimeter is set at 29.92 in. Hg.

Air Refueling Data Card

Air refueling data is recorded on checklist cards similar to Figure 2-11.

Pilot Director Lights (On Tanker)

For the KC-135, refer to Figures 2-12 and 2-13. Receiver director lights are located on the bottom of the tanker fuselage between the nose gear and the main gear. They consist of two rows of lights, the left row for elevation and the right row for boom telescoping.

The elevation lights consist of five colored panels with green strips, green triangles, and red triangles to indicate relative position. Two illuminated letters, D and U for down and up movement, respectively, indicate elevation corrections. Background lights are located behind the panels. The elevation lights are controlled by boom elevation during contact.

KC-10 pilot director lights, Figure 2-14, are similar to the KC-135 director lights. The KC-10 elevation director lights consist of a green square, amber triangles, red triangles, and amber D and U letters. The lights are controlled by boom elevation plus boom elevation rate during contact.

The colored panels which indicate KC-135 boom telescoping are not illuminated by background lights. An illuminated white panel between each colored panel serves as a reference. The letters A for aft and F for forward are visible at the ends of the boom telescoping panel. Figure 2-13 shows the panel illumination at various boom nozzle positions within the boom envelope. When contact is made, the lights are controlled by boom extension. There are no lights to indicate azimuth; however, a yellow line on the tanker indicates the centerline.

KC-135 AIR REFUELING BOOM LIMITS

NOTE
Tanker automatic disconnect occurs at boundary of gray areas.

CAUTION
Tanker auto-disconnect limits do not apply when receiver using manual boom latching

Also see T.O. 1-1C-1

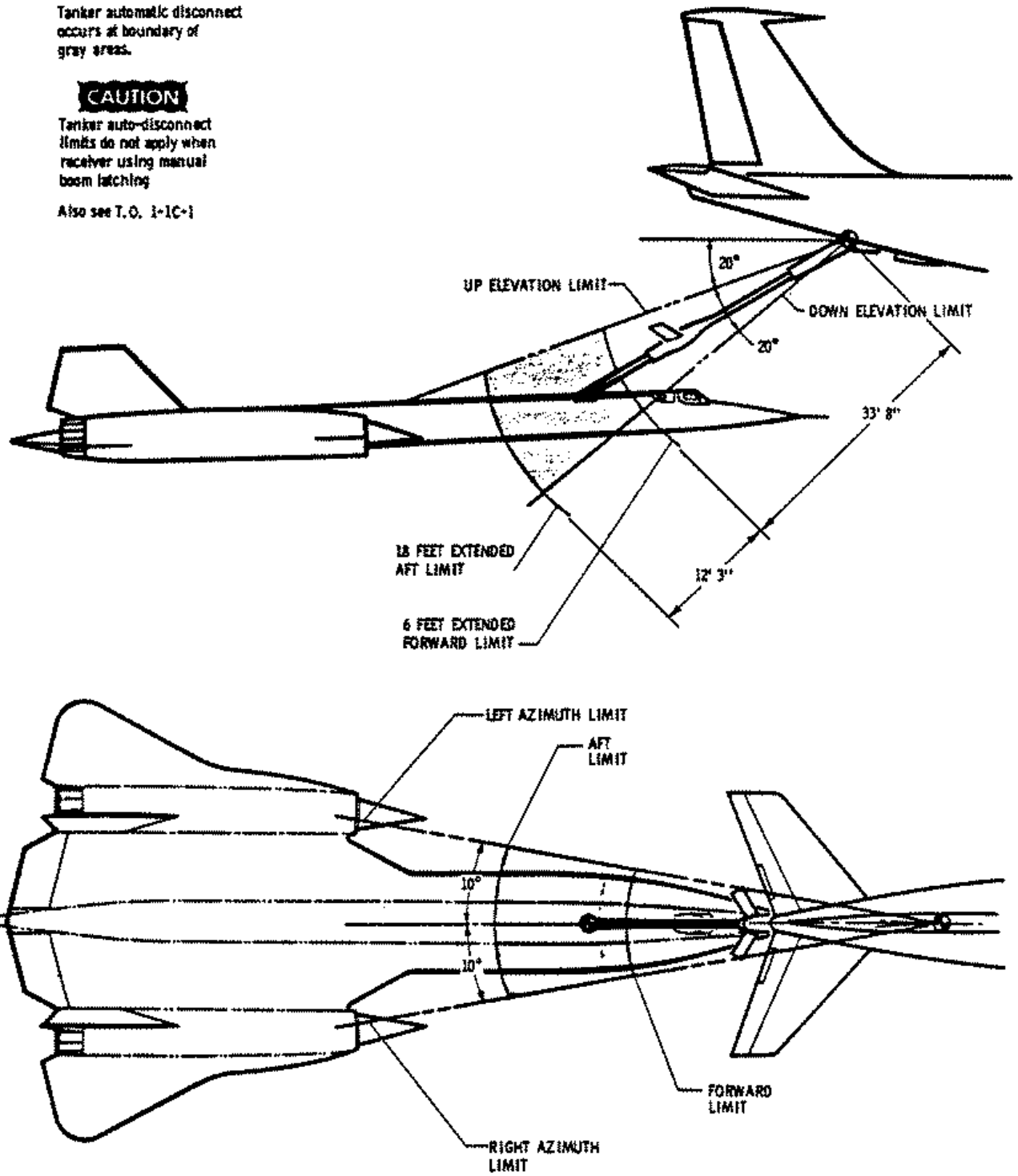


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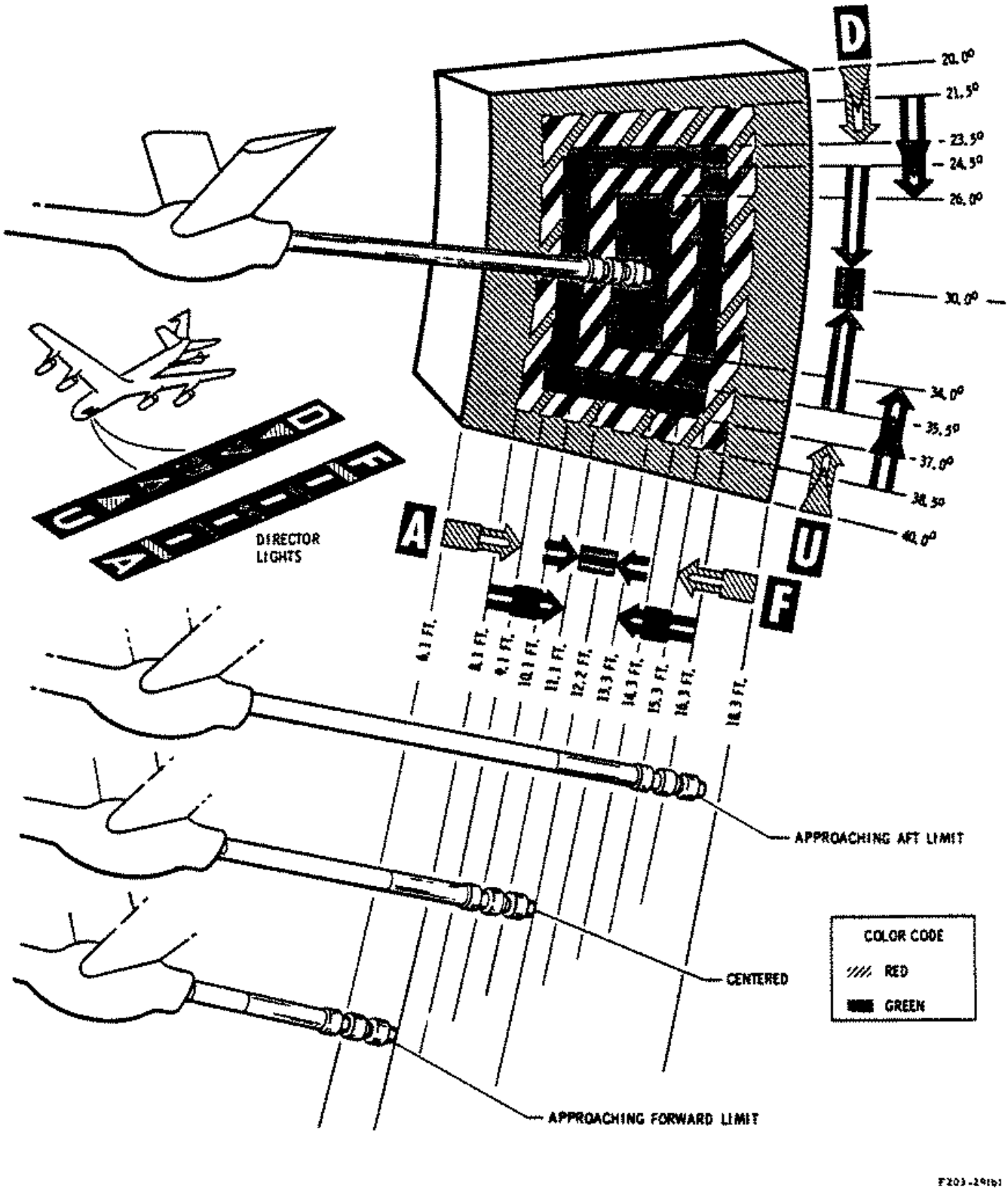
Figure 2-12

RECEIVER DIRECTOR LIGHTS AND ILLUMINATION PROFILE (KC-135)
(Also see T.O. 1-1C-1)



F203-2910-1

Figure 2-13

single engine air refueling procedures, see Section III, Single Engine Air Refueling.

BREAKAWAY PROCEDURE

Any tanker or receiver crewmember, if an emergency arises, will transmit on the air refueling frequency the tanker aircraft call sign followed by "breakaway, breakaway, breakaway." The boom operator may signal breakaway by rapidly flashing the receiver director lights. The receiver pilot will actuate the A/R DISC trigger. Retard throttles and drop aft and down until the entire tanker is in sight.

WARNING

The pilot should use care not to overrun the tanker. If overrunning does occur, under no conditions should a turn be made until breakaway has been completed.

Breakaway Signal

To visually signal emergency breakaway, the tanker turns on the rotating beacon and rapidly flashes the director lights.

AIR REFUELING ALTERNATE PROCEDURE

If L hydraulic pressure is lost, R pressure may be utilized for refueling by moving the brake switch to ALT STEER & BRAKE.

Normal and manual boom latching air refueling procedures apply with ALT STEER & BRAKE selected.

CAUTION

Do not leave the brake switch in ALT STEER & BRAKE after refueling. R hydraulic pressure may be lost also if L system fluid loss is due to a malfunction of the steering or refueling system.

MANUAL BOOM LATCHING

A manual refueling procedure may be used if the signal amplifier fails. This procedure requires manual control of the refueling boom latches. The refueling boom latches are open with the air refuel switch in MAN O'RIDE and the A/R DISC trigger on the control stick grip depressed. The receiver pilot can usually feel the boom nozzle bottom in the receptacle. The READY light will extinguish when the boom nozzle is properly seated; then the pilot should latch the boom in the receptacle by releasing the trigger switch. When latching the boom manually:

1. Air refuel switch - MAN O'RIDE, READY light on.

2. Trigger switch - Press and hold.

After nozzle is seated in receptacle and READY light is off:

3. Trigger switch - Release.

When refueling is completed:

4. Trigger switch - Press and hold until boom is clear.

   READY light illuminates when boom is not seated. DISC light will not illuminate.

Subsequent procedures are the same as after normal refueling.

CAUTION

- If the A/R DISC trigger switch is released when the nozzle is not in the bottom of the receptacle (READY light is off), it is possible for the nozzle to damage or break the extended nozzle latches, preventing any further refueling.

- The boom limit switches are deactivated when using manual boom latching. The receiver pilot must initiate disconnect before exceeding the boom limits since the boom operator will be unable to release the nozzle latches. KC-10 boom operators can still use the Independent Disconnect System.

NOTE

There will not be a pressure disconnect when using manual boom latching, but the refuel manifold accepts tanker pressure with ample margin after tanks shut off automatically. The fuel vent manifold releases excess tank pressure if the tank shutoff valves malfunction.

RADIO SILENCE REFUELING PROCEDURE

Radio silence air refueling can be conducted if the following procedures are observed and both crews are experienced in normal air refueling procedures. The method, time, and place of rendezvous, and amount of fuel to be transferred, must be coordinated.

a. Air refueling checks will be completed before moving to the precontact position.

b. Before contact, maneuver as directed by tanker director lights. A steady red light indicates a large correction and a flashing red light indicates a small correction in the direction indicated by the red director lights. When contact is made, boom interphone may be used.

AIR REFUELING VISUAL SIGNALS

The following visual signals will be used for radio communication failure or radio silence.

Signals From Tanker

With boom in trail:

a. Ten foot extension of the probe means that the tanker is ready for contact.

When the ready signal is received, move from the observation position and stabilize in the precontact position, then move to the contact position.

b. Full extension of the probe means that the tanker is ready for contact but that he is in manual control, without disconnect control capability.

Close and open the Air Refueling door to acknowledge this signal.

NOTE

Boom interphone is inoperative when the tanker is in manual operation.

c. Full retraction of the boom indicates that offload has been completed.

Boom stowed:

a. Full retraction of the probe means that the tanker air refueling system is inoperative.

b. Five foot extension of the probe indicates that there is an air refueling system malfunction.

Check the air refueling system.

Director lights off:

A request to disconnect is signalled by turning the director lights off. Return to the precontact position after disconnecting.

Director lights flashing:

The BREAKAWAY command is signalled by turning the lower rotating beacon on and rapid flashing of the director lights.

Signal From Receiver

Cycle the Air Refueling Door:

Cycling the A/R door while in the precontact position indicates that the Manual Boom Latching procedure will be used. The tanker should signal acknowledgement by full extension of the refueling probe with the boom in trail, and then retract the probe to the ready position.

CAUTION

During manual boom latching, the receiver pilot must initiate all disconnects. KC-10 boom operators can still use the Independent Disconnect System.

Rock wings (daytime) and turn rotating beacon on/off at ten second intervals:

This signal indicates that the receiver must refuel. If not at a scheduled time or place for refueling (when the boom operator might not be in place) take a position where the signals are visible from the tanker cockpit.

FUEL DUMPING

Fuel dumping provides a means of reducing gross weight rapidly. The nominal dump rate is 2500 pounds per minute for both FUEL DUMP and EMER switch positions, but the rate varies with the amount of fuel remaining and the number of boost pumps operating.

Normally, fuel is dumped in the automatic fuel sequence. An additional tank can be selected in each tank group to increase the dump rate.

To dump fuel:

1. Fuel dump switch - FUEL DUMP.

   All tanks containing fuel will empty in the normal usage sequence except tank 1. Tank 1 will dump automatically with the other tanks until its fuel level reaches approximately 4700 pounds, depending on aircraft attitude (see Fig. 1-36), then it will stop. The other tanks will continue dumping until the fuel level in tank 4 reaches 3700 pounds (again depending on aircraft attitude), then normal dumping is terminated automatically regardless of the fuel quantities remaining in the other tanks.

2. C.G. - Monitor.

   Transfer fuel as necessary to maintain c.g. within limits. At heavy weight, with more than 40,000 pounds of fuel remaining, consider pressing tank 2 on manually to avoid any abnormal forward c.g. condition during dumping. Crossfeed can also be used and will tend to shift c.g. aft.

3. Fuel quantity - Monitor total and tank 4.

   a. Tank 1 dumping should terminate automatically when 4700 pounds remain in that tank.

   b. All dumping should terminate automatically when 3700 pounds remain in tank 4.

When the desired fuel quantity remains:

4. Fuel dump switch - OFF.

To dump fuel when tank 4 contains less than 4000 pounds, or if the FUEL DUMP switch position is inoperative:

5. Fuel dump switch - EMER.

   Selection of the fuel dump switch emergency position overrides the stop-dump feature of the normal dump system.

6. Fuel quantities - Monitor tanks 1 and 4.

WARNING

Emergency fuel dumping must be terminated by positioning the dump switch to OFF (or FUEL DUMP), or all tanks will empty.

When tank 1 is below 5000 pounds:

7. Fuel crossfeed switch - Press to OPEN.

When the desired fuel quantity remains:

8. Fuel dump switch - OFF.

BEFORE PENETRATION

The pitot-static flight instruments will be used when subsonic.

1. Display mode selector switch - Set.

T 2. Defog switch - Set.

T 3. Altimeter - Set.

(4.) DEF systems power - Off.

(5.) Sensor operate switches -STP.

(6.) Sensor power switches -Off.

(7.) V/H power switch - Off.

(8.) Exposure power switch - Off.

(9.) G-band Beacon switch - OFF.

NOTE

Do not shut down the MRS.

(T10.) INS altitude - Update.

Update to the field elevation.

PENETRATION

1. Crossfeed switch - OPEN.

CAUTION

Leave crossfeed open to assure fuel supply to both engines during landing and possible go-around operations.

2. Brake switches - DRY or WET, and ANTI SKID ON.

Use the DRY position for a RCR of 21 or more. Wet runway conditions shall be assumed to exist and the WET position used if RCR is less than 21. If RCR is not available, assume a wet runway condition if moisture is visible on the runway, particularly as evidenced by glare or reflections.

(T) a. Brake switch - OFF.

Below Mach 0.5:

3. Surface limiter control handle - Pulled, SURFACE LIMITER light out.

Pull and rotate the surface limiter handle 90 degrees to disengage the surface limiters, lock the handle, and extinguish the SURFACE LIMITER caution light.

▲4. UHF power selector - Set.

Set power 4 or lower, if making an ILS approach.

WARNING

ILS reception can be affected by UHF transmission at high power settings.

T 5. Defog switch - Set.

To dissipate fog in the windshield area, hold the defog switch OPEN for several seconds to provide hot air to the windshield, then select HOLD.

NOTE

Fog usually occurs in the rear cockpit first.

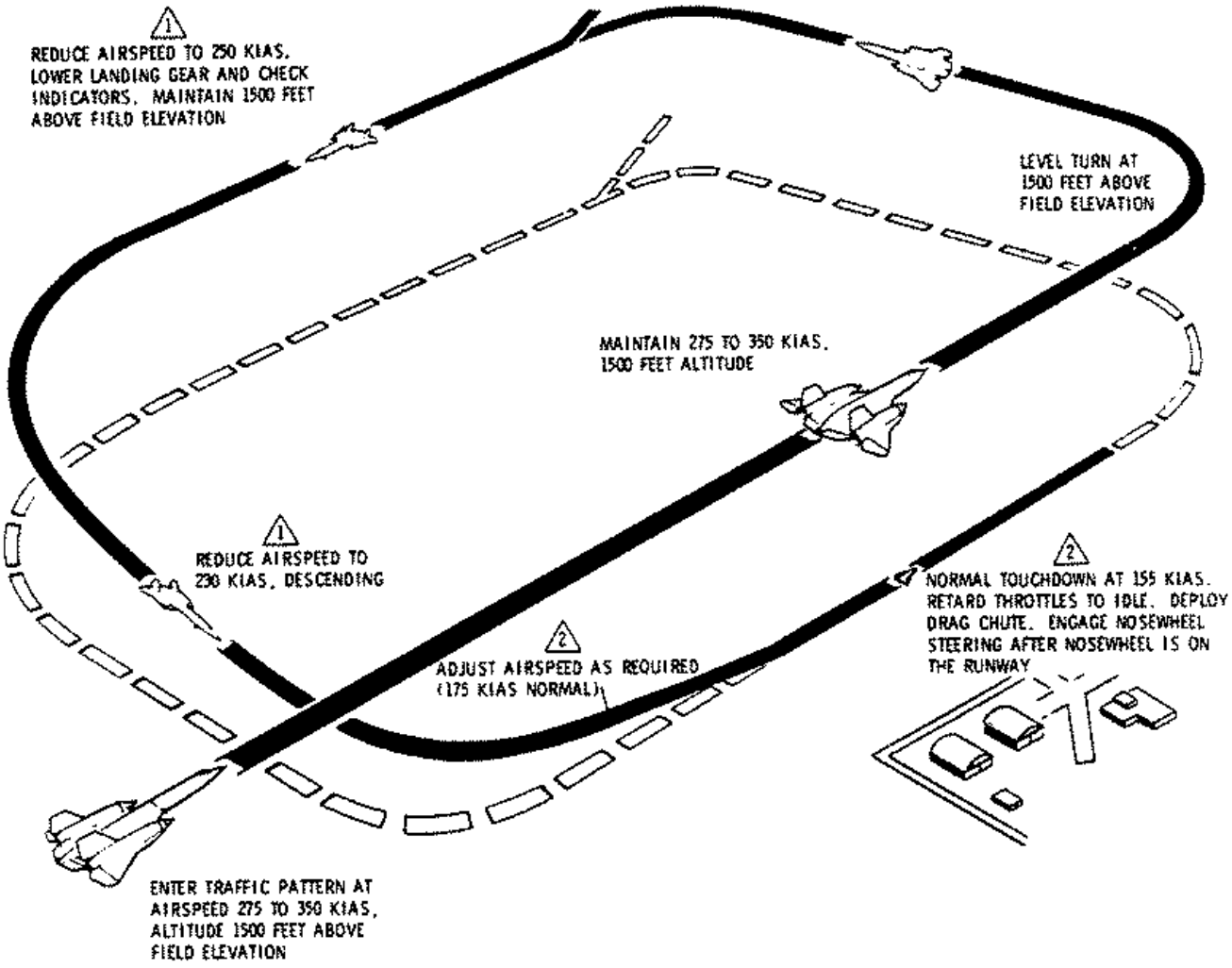
6. Landing light switch - On

BEFORE LANDING

Figure 2-16 depicts a typical landing pattern. At heavy weights, increase airspeed if necessary to maintain angle of attack less than 8 degrees for turns to base leg and 9 degrees for turns to final approach.

The design landing weight is 68,000 pounds with 10 fps sink rate. When landing at higher weights is required, the following speed and sink rate schedule applies.

LANDING PATTERN - Typical



NOTE

1. For aircraft over 100,000 lbs. (more than 40,000 lb. fuel remaining), maintain 275 KIAS on downwind leg and 250 KIAS on base leg; and use an angle of attack of approximately 10.5° for final approach and landing.

2. Increase normal speed for final approach (175 KIAS) and landing (155 KIAS) by 1 knot per 1000 lb of fuel over 10,000 lb remaining. For maximum performance, the minimum landing speed is 10 KIAS less than the speed determined by this rule. See Appendix figure A2-15. The minimum final approach speed is 20 KIAS above the intended landing speed.

Figure 2-16

NORMAL LANDING SPEED SCHEDULES

Approx Fuel Remaining	Final Approach KIAS	Landing Speed KIAS	Max Sink Rate Allowable
10,000 lb or less	175	155	10 fps (600 fpm)
20,000 lb	185	165	9 fps (540 fpm)
25,000 lb	190	170	8.7 fps (522 fpm)
30,000 lb	195	175	8.5 fps (510 fpm)
40,000 lb	205	185	7.75 fps (465 fpm)
With over 40,000 lb remaining, observe Section V landing sink rate limits.			

Figure 2-17

CAUTION

When feasible, routine full stop landings should be made with no more than 10,000 pounds of fuel.

For heavyweight landings: With over 40,000 lb of fuel remaining, use the normal final approach speed schedule and maximum performance landing speed (10 KIAS less than normal landing speed). See Figure 2-17. Use the maximum performance landing technique for stopping.

NOTE

Maximum performance landing speeds result in touchdown angles of attack 1/2 to 1 degree greater than for normal landing speeds.

▲1. Approach and landing speeds -Computed.

Final approach and landing speeds are based on weight. Angle of attack will be approximately 10 degrees for a normal final approach.

Use the maximum performance landing speed schedule when conditions such as wet runway or short field length require minimum roll after touch down.

▲2. Center of gravity - Checked.

Transfer fuel as necessary to maintain subsonic c.g. limits. CG forward of 17% reduces load factor limits. If cg is forward of 17%, insure that no more than half the fuel remaining is in tank 1.

3. Landing gear lever - DOWN and checked.

Check gear warning lights.

CAUTION

Do not extend the landing gear more than 10 times each flight.

NOTE

- Normal gear extension time is 12 to 16 seconds.
- When at heavy weights, gear extension may be delayed until after turn to final approach course, if desired.

4. Hydraulic pressure - Checked.

5. Right refrigeration switch - OFF.

The pilot's R AIR SYS OUT caution light illuminates. Monitor E and R Bay temperatures and suit vent flow for adequate flow from the operating refrigeration unit. Turn the right refrigeration system on and the left refrigeration system off if flow is inadequate.

(T6) Cockpit air handle - OFF

Place the cockpit air handle in the forward (valve closed) position to prevent cockpit fogging. The pilot's CKPT AIR OFF caution light illuminates.

NOTE

Refrigeration system shutoff and cockpit air shutoff are not normally required for low approaches.

7. Annunciator panel - Checked.

NOTE

Lowering the vision splitter during night landings reduces glare from reflections off the inside of the windshield.

NORMAL LANDING

Touchdown is made with the throttles in IDLE, and at approximately 9.5 degrees angle of attack. (Due to ground effect, angle of attack is nearly the same as for final approach.) Pitch angle is approximately 10.5 degrees, with the nose almost on the horizon. A high rate of sink will develop if airspeed becomes excessively low on final approach, and result in a hard landing.

NOTE

- Throttle movement should follow the quadrant curvature so that the hidden ledge at the IDLE position can prevent inadvertent engine cutoff.
- With cockpit air on, sudden fogging can occur when the throttles are retarded during the landing flare. Use the Cockpit Fog emergency procedure in this event.

NOTE

- Angle of attack at touchdown must not exceed 14 degrees to avoid scraping the tail.

Use the maximum performance landing touchdown speed when wet or slippery runway conditions exist which degrade braking capability.

AFTER TOUCHDOWN

1. Drag chute - Deploy.

Deploy the chute when the main gear is on the runway and angle of attack is 10 degrees or less.

CAUTION

Deploying the drag chute at greater than 10 degrees angle of attack may result in the chute canopy contacting the runway and receiving scuff damage.

Pull the drag chute handle straight aft to the limit of its travel (approximately one inch).

WARNING

Avoid resting the hand on or near the drag chute handle after pulling it aft for normal deployment. Otherwise, the chute will be jettisoned if the handle is pushed forward inadvertently when the chute opens.

The initial forces caused by chute opening normally approximate one-half "g" deceleration. See Section VI, Figure 6-11.

If the chute does not deploy normally in approximately five seconds, turn the chute handle 90 degrees counterclockwise and pull aft, approximately six inches, to the limit of its travel.

NOTE

The drag chute switch in the aft cockpit of the SR-71B must be OFF to deploy from the forward cockpit; otherwise, the handle in the forward cockpit is inoperative.

Start the nose down at touchdown. Excessive nose gear loads may result on contact if a high angle of attack is maintained until airspeed is too low for positive control of attitude.

2. Nosewheel steering - Engage.

Engage nosewheel steering when the nosewheel is on the runway. Steering will not engage until the rudder pedals and nosewheel are aligned and aircraft weight is on any one gear.

Illumination of the nosewheel steering STEER ON light is a positive indication that steering has engaged.

It may be necessary to move the rudder pedals through a small range on each side of neutral to assure alignment with the nosewheel castering angle. In a crosswind, engagement will probably require momentarily moving the pedals in a direction opposite to that desired for steering.

Although the steering system includes a holding relay in the engagement circuit, the recommended method for positive engagement is to hold the nosewheel steering (CSC/NWS) button on the control stick depressed until steering is engaged. The button may be released after engagement.

Nosewheel steering is released by pressing and releasing the button a second time (whether actually engaged or not). If steering is inadvertently released, depress the button again and reengage steering as before.

3. Brakes - Checked.

Check for normal brake operation by light application prior to jettisoning the drag chute.

Anti-skid braking is available when aircraft weight is on at least one main gear; however, delay braking until the nosewheel is on the runway.

The normal performance procedure should be used on a dry runway or on a grooved runway with braking equivalent to a dry runway. (Refer to Wet/Slippery Runway Landings, this section, if landing on a runway where braking may be degraded). Apply brakes as required. Light braking is sufficient if the drag chute deploys normally. If the drag chute does not deploy, moderate braking force is necessary at normal landing weight.

4. Drag chute - Jettison.

Push the drag chute handle fully forward from the deploy position to jettison the chute.

The drag chute is normally jettisoned at or above 55 KIAS when on a dry runway or with equivalent braking action available; however, do not jettison the chute if the crosswind component exceeds 12 knots or if braking action is unsatisfactory.

(T) a. Drag chute switch - OFF.

WARNING

In the SR-71B, if the aft cockpit deploys the drag chute and the forward cockpit handle remains stowed, returning the aft cockpit drag chute switch to OFF will jettison the drag chute.

CAUTION

If the drag chute is not jettisoned, the elevons should not be moved during taxiing as the shroud lines may jam between the inboard elevons and fuselage and cause structural damage.

NOTE

The drag chute can not be jettisoned after using the emergency deployment system.

CROSSWIND LANDING

Refer to Landing Gear System, Crosswind Limits in Section V. Also refer to the Crosswind Component chart in the Appendix, Figure A2-1.

Runway alignment on final approach can be maintained by crabbing and/or dropping one wing. Remove any crab before touchdown, and use the wing-low technique to align the aircraft with the runway and prevent side drift.

Reduce sink rate to a minimum to accomplish a smooth touchdown. As crosswind components increase, sink rate must be minimized due to the increased side loads imposed on the landing gear.

CAUTION

It is essential to remove all crab before touchdown to minimize scuffing damage to the tires.

Crosswind Condition With Dry or Grooved Runway

Touchdown and try to remain on the upwind side of the runway. This provides more runway space on the downwind side, and puts the crosswind and runway "crown" effects in opposition. Deploy the drag chute early in the landing roll, as for a normal landing, but lower the nosewheel first and engage steering if the crosswind component is over 15 knots.

The chute's tendency to pull the aircraft off the runway in a crosswind decreases as speed is reduced, and the effect is easily controllable with nosewheel steering. Keep the stick forward to improve nosewheel steering effectiveness. Increasing rudder deflection and/or increasing elevon differential is required as speed decreases.

Do not shut down either engine when on a dry runway, or on a grooved runway which provides equivalent braking.

Crosswind Condition With Slippery Runway

For landing on a slippery runway with a crosswind, start the nose down immediately on landing and engage nosewheel steering before deploying the drag chute. After the nose is lowered, use lateral stick deflection and/or rudders to increase directional control. Use roll inputs in the same direction as rudder/nosewheel steering. This also increases braking on that side when combined with neutral or aft stick.

With a slippery runway, shutdown of one engine to assist in stopping is permissible if required due to drag chute failure. Shutdown the upwind engine when under 100 KIAS, and select ALT STEER & BRAKE if continuing on the right engine alone. Shutdown is not recommended if barrier engagement is available.

The nosewheel steering system provides adequate control in allowable crosswinds on slippery runways, even with damaged main gear tires. However, be careful not to overcontrol the aircraft and start a lateral skid. The nosewheel steering force can be very large and this force, combined with the reduced side reaction force capability of the main gear tires, may cause the main gear tires to "break away" and slide. The nosewheel steering force reaches a maximum at a 13-1/2 degree angle between the tires and the ground track. This corresponds to 6

degrees rudder deflection with the aircraft heading along the ground track.

WET/SLIPPERY RUNWAY LANDINGS

When landing on a runway where degraded braking is expected (i.e., on a wet runway without grooves), select the WET anti-skid braking mode. When crosswind is not a factor, use the maximum performance touchdown speed schedule and lower the nose while deploying the drag chute. Apply maximum braking as soon as the nosewheel is on the runway and engage nosewheel steering. Frequent anti-skid cycling may be felt. Retain the drag chute if stopping distance is critical. The chute can be jettisoned if a control problem or a lateral skid develops.

If the drag chute fails to deploy, use moderate up-elevon to increase drag and the load on the main gear. The WET anti-skid mode provides the best braking capability with or without the drag chute unless tire failure has occurred; in this event, it may be necessary to complete the stop with anti-skid OFF and the wheels locked. Refer to Flat Tire Landing emergency procedure, Section III. If the chute fails, shutdown of one engine is permissible when under 100 KIAS if required to assist in stopping, but shutdown is not recommended if barrier engagement is available.

Icy Runway Procedure

Use the same techniques as for the Wet/Slippery Runway landing.

MAXIMUM PERFORMANCE LANDING

Use the maximum performance schedule whenever minimum landing distance is desirable. Maximum performance touchdown speed is 10 KIAS less than normal touchdown speed. Start drag chute deployment as soon as the main gear is on the runway and angle of attack is 10 degrees or less.

WARNING

Do not deploy the chute in flight.

CAUTION

Deploying the drag chute at greater than 10 degrees angle of attack may result in the canopy contacting the runway and receiving scuff damage.

Lower the nose and apply maximum braking as soon as the nosewheel is on the runway. Engage nosewheel steering. Retain the drag chute. One engine may be shutdown after touchdown to reduce thrust and shorten the landing roll.

WARNING

Do not shutdown both engines, as it may result in the loss of brakes. Nosewheel steering will be lost when engine speed decays.

MINIMUM ROLL

Reduce fuel weight to 5000 pounds, if possible, and use the maximum performance landing procedure.

HEAVYWEIGHT LANDING

Landings with more than 40,000 pounds of fuel remaining should be avoided, but can be accomplished if necessary. Use normal final approach speeds, but do not exceed 11 degrees angle of attack. Use the maximum performance touchdown speed schedule and observe touchdown rate of sink limits from Section V. When touchdown speed is less than the chute deploy limit speed (210 KIAS), lower the nose and deploy the drag chute as soon as the main gear is on the runway. If touchdown speed is higher than 210 KIAS, hold the nose off until 210 KIAS is reached, then lower the nose and deploy the drag chute. To minimize the possibility of tire

GO AROUND - Typical

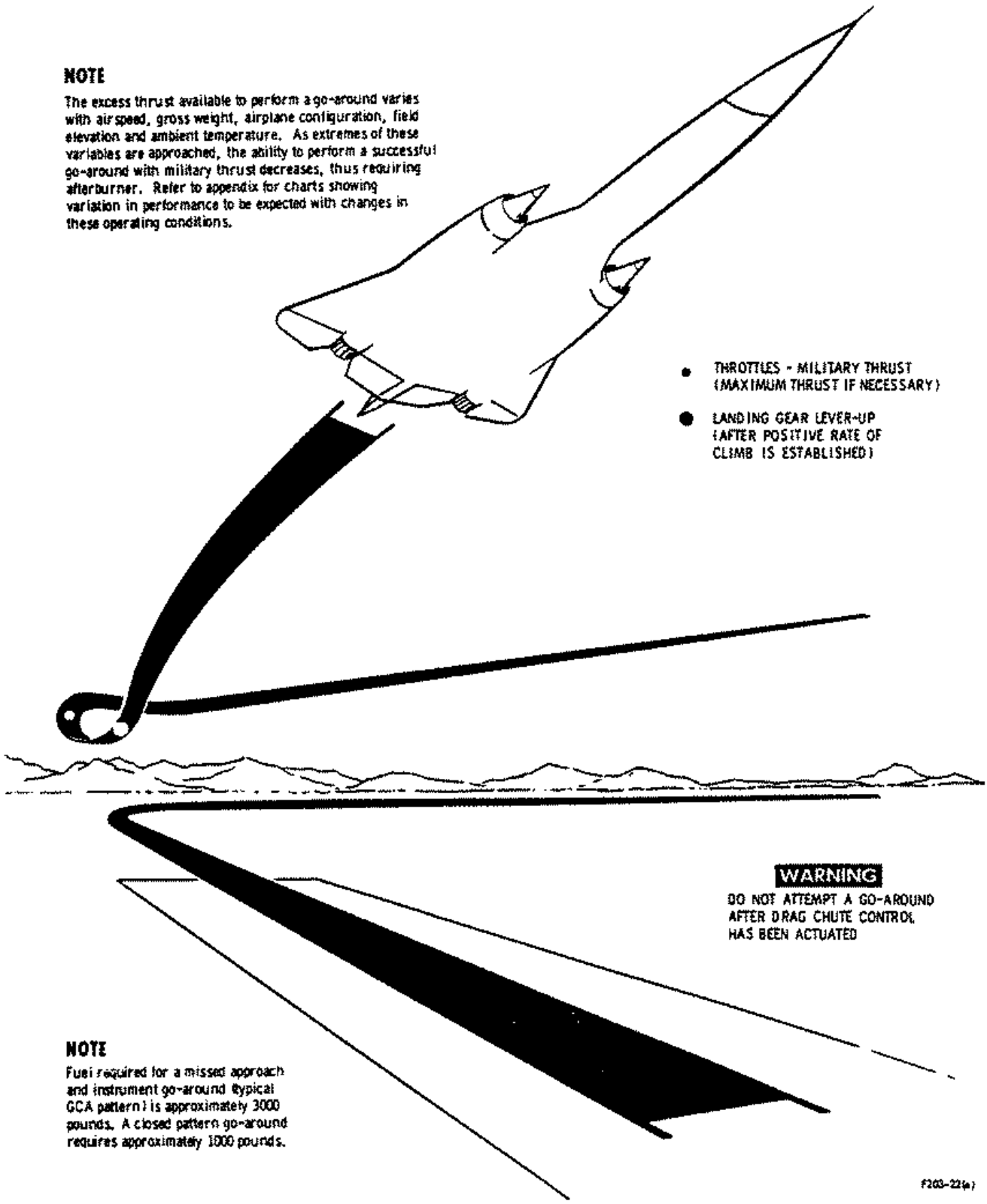


Figure 2-18

failure at heavy weight, the brakes should be applied early in the landing roll. This reduces the distance travelled at high speed. Retain the drag chute. Barrier engagement should be anticipated, since the brake energy rating may be exceeded. Refer to Figure 5-9, Section V.

GO-AROUND

A go-around may be initiated at any time during the approach or landing roll when sufficient runway remains for takeoff and no attempt to deploy the drag chute has been made. (See Figure 2-18.) For go-around after touchdown, reduce pitch attitude to approximately 5 degrees pitch angle (5 degrees above what the attitude would be with the nose on the ground) then adjust attitude to takeoff at 210 KIAS.

TOUCH-AND-GO LANDING

Normal Before Landing and After Takeoff procedures apply to touch-and-go operations. The maximum fuel load recommended is 25,000 pounds remaining and cg aft of 17%. The limit sink rate is 8.7 fps (522 fpm) with 25,000 pounds of fuel.

CAUTION

Do not extend the landing gear more than 10 times each flight.

At least ten complete retract and extend cycles of the gear can be made with normal hydraulic quantity and reservoir nitrogen pressure servicing. If reservoir nitrogen pressure is depleted, cycling the landing gear may cavitate the L hydraulic system pump and cause complete loss of L hydraulic system pressure.

NOTE

Manual EGT trim may be used when making successive low approaches or touch and go landings. This prevents auto EGT up-trim "ratcheting" which could occur because of power manipulation during approach, and which might result in EGT overtemperature while at or above Military power during go-around.

1. Throttles - IDLE.
2. Touchdown speed - As required.

   Base touchdown speed on fuel remaining.

After touchdown:

3. Pitch angle - Approximately $+5^{\circ}$

   Reduce pitch attitude to approximately 5 degrees pitch angle (5 degrees above what the attitude would be with the nose on the ground). The nosewheel should not touch the runway.

4. Throttles - Military
5. Pitch attitude - Adjust to fly off at 210 KIAS.

AFTER LANDING

T 1. SAS channel engage switches - Off.

2. Landing light - OFF.

   Select TAXI LT if lighting is required; otherwise, select OFF. The landing light should not be operated without airstream cooling or it will burn out prematurely.

3. Right refrigeration switch - ON.

(T4) Cockpit air shutoff handle - ON.

(T5) HF radio - OFF.

(T6) IFF - OFF.

When clear of the runway:

7. Pitot heat switch - OFF.

8. Crossfeed - Closed.

T 9. EGT trim switches - HOLD.

T 10. Periscope - Stowed.

(11) Viewsight power - Off.

ENGINE SHUTDOWN

1. Wheel chocks - Installed.

2. Nosewheel steering - Disengaged.

(3) OBC Power Control switch - OFF.

4. C.G. - Forward of 17%.

Transfer fuel forward of 17% for easier downloading of sensor equipment.

NOTE

If Tank 4 is not on, press Tank 4 boost pumps on before transferring fuel forward. Otherwise, with crossfeed off, a reduction in fuel flow to approximately 3600 lb per hour will occur on the right side. This is less than the desired value for normal operation of the fuel heat sink system. Release the tank after completing fuel transfer.

In the SR-71B, use the DAFICS BIT check after landing to check aft cockpit switch inputs to DAFICS.

(T) 5. APW switch - PUSHER/SHAKER.
APW switch position in the cockpit that does not have APW switch control does not affect the DAFICS BIT.

(T) 6. SPIKE DOOR control transfer - Take control.
Check SPIKE DOOR transfer light illuminated on aft cockpit control transfer panel. Inlet switches in the cockpit that does not have SPIKE DOOR control are not functional and do not affect the DAFICS BIT.

(T) 7. AFCS control transfer - Take control.

T 8. DAFICS Preflight BIT - Check.

T a. SAS channel engage switches - ON.

T b. SENSOR/SERVO lights - Check off.

T c. Forward cockpit (aft cockpit in SR-71B) switch positions for DAFICS PREFLIGHT BIT - Set.
- Autopilot pitch and roll engage switches - ON.
- ATT REF SELECT switch - ANS
- KEAS HOLD switch - ON
- HEADING HOLD switch - ON

T d. DAFICS PREFLIGHT BIT switch - ON.

The BIT TEST light illuminates steady green while the test is running.

Pressure from A hydraulic system is required to engage the DAFICS PREFLIGHT BIT. Low pressure or flow from A, B, L or R hydraulic system will cause the DAFICS preflight BIT to fail.

If the DAFICS PREFLIGHT BIT switch will not engage, recheck:

1) CSC/NWS switch - Released.
2) ATT REF SELECT switch - ANS
3) APW switch - PUSHER/SHAKER
4) SPIKES & FWD BYPASS doors - AUTO
5) RESTART switches - Off
6) Throttle Restart switch - Off
7) SAS channel engage switches - ON.
8) AUTOPILOT PITCH & ROLL engage switches - ON
9) KEAS HOLD switch - ON
10) HEADING HOLD switch - ON

NOTE

If at BIT completion the FAIL light, any SENSOR light, any SERVO light, or any CMPTR OUT light illuminates, notify maintenance.

After one minute:

e. Check BIT TEST light flashing green, sensor and servo lights extinguished, BIT FAIL light extinguished, and OFF flags in both TDI's. The CIP barber pole reads zero.

f. Check autopilot pitch and roll engage switches, KEAS HOLD switch, and HEADING HOLD switch -Off. AUTOPILOT OFF and SAS OUT lights illuminated.

g. Check DAFICS PREFLIGHT BIT switch - OFF (guard down).

h. SENSOR/SERVO recycle switches - Press one of the six.

Pressing one of the six SENSOR/SERVO recycle switches resets the DAFICS system to the flight mode. Check SENSOR/SERVO lights, BIT TEST light, and SAS OUT lights are out. Check both spikes have returned to the full forward position and the CIP barber pole has returned to normal. Both TDI's will initiate resynchronization and run up to 55,000 ft., Mach 2.0, and 300 KEAS. AOA will indicate 10°. AOA will return to 0° in approximately 1 min 15 sec and TDI indications will return to normal in approximately 2 min 15 sec after the DAFICS system has been reset to the flight mode. The A, B, and M CMPTR OUT annunciator panel lights flash momentarily when the DAFICS system is reset.

9. Exterior lights - OFF.

▲10. TACAN and ILS - OFF.

11. PVD - OFF.

▲12. Loose items - Secured.

▲13. Canopy seal pressure lever - OFF.

▲14. Canopy - Open

CAUTION

The pilot should notify the RSO when he opens the canopy. If either canopy is open, the aft canopy latch handle must be in the aft position or the cockpit air handle must be in the forward (off) position for adequate equipment cooling. Otherwise, most of the cooling air would exit through the cockpit openings instead of the bays.

15. SENSOR/SERVO lights - Check off.

All pitch, yaw, and roll SAS channels should be engaged before checking the effects of generator switching.

(T16.) ANS MODE switch - OFF.

Prior to ANS shutdown, place system in DEAD RECKON MODE and record LAT/LONG from Present Position Display. Coordinates will be used for system evaluation.

17. Right generator switch - OFF.

NOTE

With transfer of electrical power while on the ground, the DAFICS may undergo ground reinitialization indicated by momentary illumination of the A, B, and M CMPTR OUT caution lights, OFF flags in both TDIs, and TDI resynchronization to 55,000 ft., Mach 2.0, and 300 KEAS.

18. Bus tie pushbutton - Press.

    Split the buses to obtain satisfactory MRS records.

NOTE

The tank 4 boost pump indicator light may extinguish.

The tank 4 boost pump indicator light is associated with the power supply to pumps 4-3 and 4-4 only. If pumps 4-2 and 4-4 are on and pumps 4-1 and 4-3 are off (tank 5 empty, tank 2 feeding, tank 4 not manually selected), when the right generator is turned off and the buses are split, the tank 4 boost pump indicator light will extinguish as pump 4-4 is de-energized. In this condition, pumps 2-1 and 4-2 continue to supply the engines. The tank 4 boost pump indicator light should illuminate again when the right generator is returned to service.

19. Right generator switch - NORM.

    Check the GEN BUS TIE OPEN caution light on and the R GEN OUT caution light extinguished.

20. APW System switch - OFF.

    (T) a. Aft cockpit - CONT FWD.

21. Fuel derich system - Both checked, rearmed, and OFF.

    a. Set both engines 400 rpm above idle speed.

    b. Actuate the derich test switch until 860°C EGT is exceeded with LEFT and then RIGHT selected.

    When the EGT indications exceed 860°C:

    c. Verify that the EGT gage warning lights are on and that the Fuel Derich lights are on.

    d. Note that engine speeds decrease between 50 and 400 rpm.

    e. Cycle the fuel derich switch to REARM, and then OFF.

       Verify that each engine returns to 400 rpm above idle, and EGT indications are normal.

    f. Reset the throttles to IDLE.

22. Tanks No. 1 & 4 boost pump switches - Press on.

23. Left generator switch - OFF.

After fifteen seconds for MRS recording:

24. Left generator switch - NORM.

25. Right generator switch - OFF.

After fifteen seconds:

26. Left generator switch - OFF.

    Check that both GEN OUT caution lights are on. DAFICS computers should automatically reset after power transfer, and no SAS SENSOR or SERVO lights should illuminate.

    Check that the following lights are off:

    SAS OUT
    MRS power switch (RSO)

NOTE

Rapid control surface deflection while near idle rpm may result in temporary illumination of an A or B HYD warning light. The light should extinguish when flow demands on the system diminish and normal pressure is restored.

37. Brakes and steering - Checked.

Check brakes and nosewheel steering operate with only one hydraulic system (L or R) operating. Pump brakes and check normal pressure while crew chief visually confirms brake actuation on both trucks. Nosewheel STEER ON light illuminates when nosewheel steering engaged. Nose should swing as rudder pedals are moved slightly.

38. Second generator switch - OFF.

Confirm with ground personnel that area under engine is clear.

CAUTION

Do not delay engine shutdown after generator power to the boost pumps is removed.

39. Second engine throttle - OFF.

40. Instrument inverter - Checked and OFF.

Check that the following lights are on:

INSTR INVERTER ON
EMER BAT ON

NOTE

A relay delays EMER BAT ON light illumination for 10 seconds after loss of T-Rs (Step 38).

Press the Indicator and Lights Test switch to check AØ and BØ (bright illumination of the left and right FIRE lights, respectively) of the instrument inverter. TDI off flag (Pilot and RSO) remaining out of view with normal TDI indications (or TDI values increasing or decreasing in response to DAFICS resynchronization) is a check of CØ instrument inverter power.

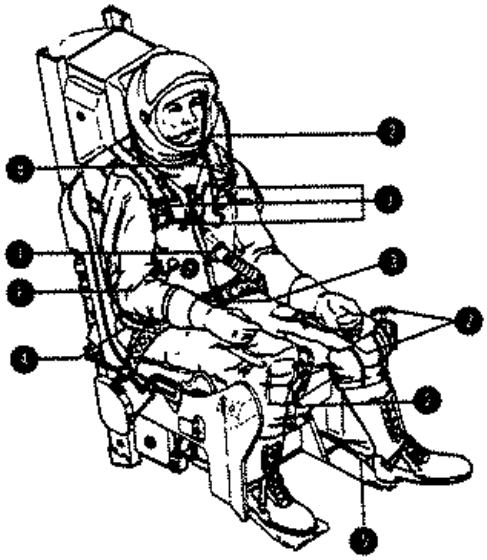
▲41. Seat and canopy safety pins -Installed.

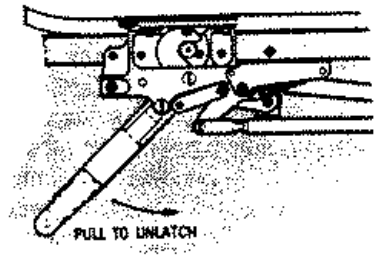
▲42. UHF and VHF radios - OFF

43. Battery switch - OFF.

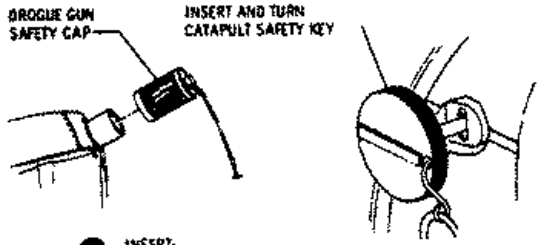
SECTION II

NORMAL GROUND EGRESS - Pressure Suit

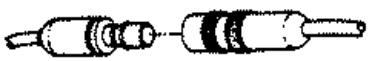




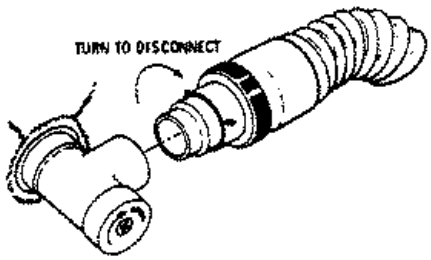
1 DEFLATE CANOPY SEAL, UNLATCH AND RAISE CANOPY



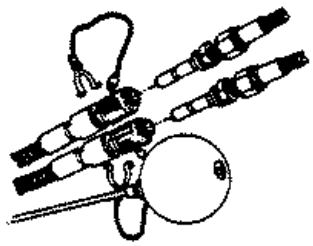
2 INSERT:
CATAPULT SAFETY KEY
DROGUE GUN SAFETY CAP
EJECTION O-RING SAFETY PIN
CANOPY JETTISON HANDLE SAFETY PIN
SECONDARY EJECTION T-HANDLE SAFETY PIN



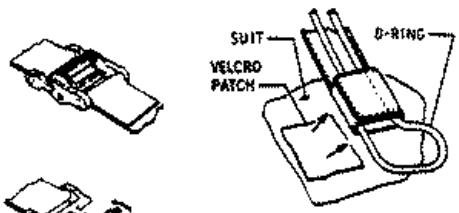
3 DISCONNECT COMMUNICATION CORD

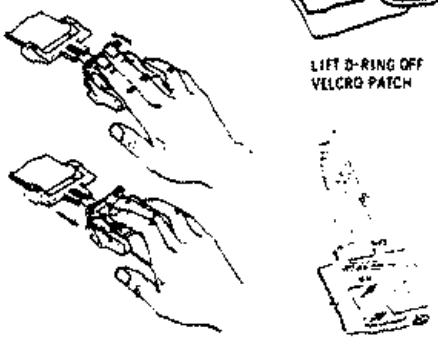


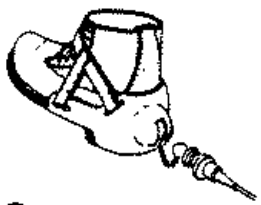
4 DISCONNECT SUIT VENTILATION AIR HOSE



5 UNLOCK AND DISCONNECT BOTH OXYGEN HOSES







6 UNHOOK BOTH STIRRUPS

CAUTION

Foot spurs must be attached and removed from foot retractors carefully. When removing spurs, the foot retractors must be fully retracted. Stamping and kicking feet to engage or disengage the foot retractors will damage the return cables.

7 DISCONNECT SURVIVAL KIT (TYPICAL 2 PLACES)

8 UNLATCH AND RELEASE LAP BELT AND BOTH PARACHUTE ATTACHMENTS

FZ02-1001A-1

Figure 2-19

SURVIVAL QUICK LAUNCH

WARNING

Quick Launch procedures are not intended for normal operations. Quick Launch procedures will only be used when directed by the commander.

Takeoff using Survival Quick Launch procedures should be used only to avoid destruction of the aircraft.

QUICK LAUNCH SETUP

The Quick Launch Setup procedures require that all normal procedures through Before Taxiing (or Before Takeoff) have been completed before the Quick Launch Setup checklist is initiated.

QUICK LAUNCH SETUP PROCEDURE

After Before Taxiing (or Before Takeoff) checks complete:

(T1.) HF Radio - OFF.

(T2.) IFF mode 4 code select switch - HOLD.

Place the switch in the momentary HOLD position for 15 seconds, then wait another 15 seconds before turning equipment OFF.

After 15 seconds:

(T3.) IFF - OFF.

(4.) Sensor and OBC power - Off.

5. Pitot heat switch - OFF.

6. EGT trim switches - Downtrim, if desired, then AUTO.

If engine run to check automatic EGT trim has not been completed, consider downtrimming EGT slightly. Return EGT trim switch to AUTO so that automatic EGT trimming will trim EGT into the nominal band during takeoff.

7. C. G. - 18%.

Transfer fuel to 18% so that c.g. will be at 18% to 20% for takeoff.

8. PVD - OFF.

▲9. Loose items - Secured.

(T10.) Cockpit air - Off (forward).

▲11. Canopy seal switch - OFF.

▲12. Canopy - Open.

(T13.) ANS MODE switch - OFF.

(T14.) INS FUNCTION switch - OFF.

(T15.) INS PWR switch - Press (Off).

16. Right generator switch - OFF.

17. Right throttle - OFF.

Confirm with ground personnel that area under engine is clear before shutting down the engine.

18. Left generator switch - OFF.

Confirm with ground personnel that area under engine is clear.

CAUTION

Do not delay engine shutdown after generator power to the boost pumps is removed.

19. Left throttle - OFF.

20. Instrument inverter - Checked and NORM.

21. Cabin pressure switch - 10,000 FT, if desired.

▲22. Seat and canopy pins - Installed.

23. Pilot's A, B, and M CMPTR circuit breakers (3 total) - Pull.

(T24.) RSO's A, B, and M COMPUTER circuit breakers (9 total) - Pull.

(T25.) INS FUNCTION switch - STOR HDG.

▲26. Oxygen - OFF.

27. Battery switch - OFF.

QUICK LAUNCH START

While subject to Quick Launch, ensure that nobody has access to the aircraft unless authorized by the aircrew.

If Quick Launch Setup procedures were not completed prior to start or if the aircraft is removed from Quick Launch status, use normal procedures for launch.

When routine aircraft servicing is required, cockpit access requires crew authorization and the crew should accompany maintenance personnel (to remain aware of aircraft status and confirm that cockpit setup is not changed).

Quick Launch Setup and Quick Launch Start procedures require ANS Ground Hot Start and INS Stored Heading procedures. If the aircraft is moved after the ANS and INS are shutdown, these alignments are invalidated and normal procedures for ANS and INS alignment should be used.

Survival Quick Launch procedures assume external power is available for start. If external power fails the engines can be started but engine instrument indications, except for rpm, will not be available until a generator is turned on. If the crew chief does not use a headset during start, the aircrew must coordinate the hand signals to be used prior to assuming Quick Launch status.

QUICK LAUNCH START PROCEDURES

After external power applied:

(T1.) INS PWR switch - Press (On).

2. Battery switch - BAT.

3. Right engine - Start.

(T4.) RSO's A, B, and M COMPUTER circuit breakers (9 total) - Push in.

These circuit breakers are pulled to keep the PTAs from being powered until cooling air is available. The circuit breakers may be reset as soon as the start procedures are in progress. Since the left and right refrigeration switches are still on (from Before Taxiing checks), cooling air to the PTAs will be available as soon as the right engine starts.

The DAFICS circuit breakers in the front cockpit are reset after the DAFICS circuit breakers in the aft cockpit to prevent the DAFICS computers from operating (sensing and storing power faults) until DAFICS has proper power. If the forward cockpit circuit breakers are reset first, DAFICS memory will indicate transient power faults, however DAFICS operation and reliability is not degraded.

After right engine is started:

5. Right generator - On (NORM), light off.

Check R GEN OUT light extinguishes

(T6.) ANS Mode switch - INERTIAL ONLY.

The ANS is not turned on until after the right engine is started so that the ANS has cooling and the LIMIT light will not flash.

The MAL light will flash until the HOT switch is pressed.

(T7.) ANS HOT switch - Press.

8. External power - Disconnected.

9. Left engine - Start.

10. Left generator - On (NORM), light off.

Check L GEN OUT light extinguishes.

11. Pilot's A, B, and M CMPTR circuit breakers (3) - Push In.

Setting the 3 dc CMPTR circuit breakers in the forward cockpit starts the DAFICS computers. Check the A, B, and M CMPTR OUT annunciator lights extinguish.

▲12. Ejection seat and canopy pins - Removed.

▲13. Canopy - Closed and locked.

▲14. Canopy seal switch - ON.

(T15.) Cockpit air - On (aft).

16. Nosewheel steering - Engaged.

With NAV RDY light flashing:

(T17.) INS FUNCTION switch - NAV.

With F/A in mode window:

(T18.) ANS MODE START switch - Press.

The chronometer may not be charged for Quick Launch procedures; if not, the ANS will not star track if Astro-Inertial mode is selected.

(T19.) MRS - ON.

QUICK LAUNCH TAXI

1. Brakes - DRY or WET and ANTI SKID ON.

▲2. Circuit breakers - Checked.

3. Flight controls and trim setting - Check.

4. Fuel - Check tanks 1, 3, and 5 (or 6) on.

▲5. CG - Checked.

▲6. Oxygen - ON and pressure checked.

7. Pitot heat switch - ON.

(T8.) IFF - NORMAL.

(T9.) HF radio - On.

QUICK LAUNCH TAKEOFF

T 1. SAS - Engaged, lights off.

▲2. Warning and caution lights - Checked.

3. Tank 4 - Press on.