

DCS: COMMUNITY A-4E-C

BY ALI



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10. AUTOPILOT
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1. Introduction

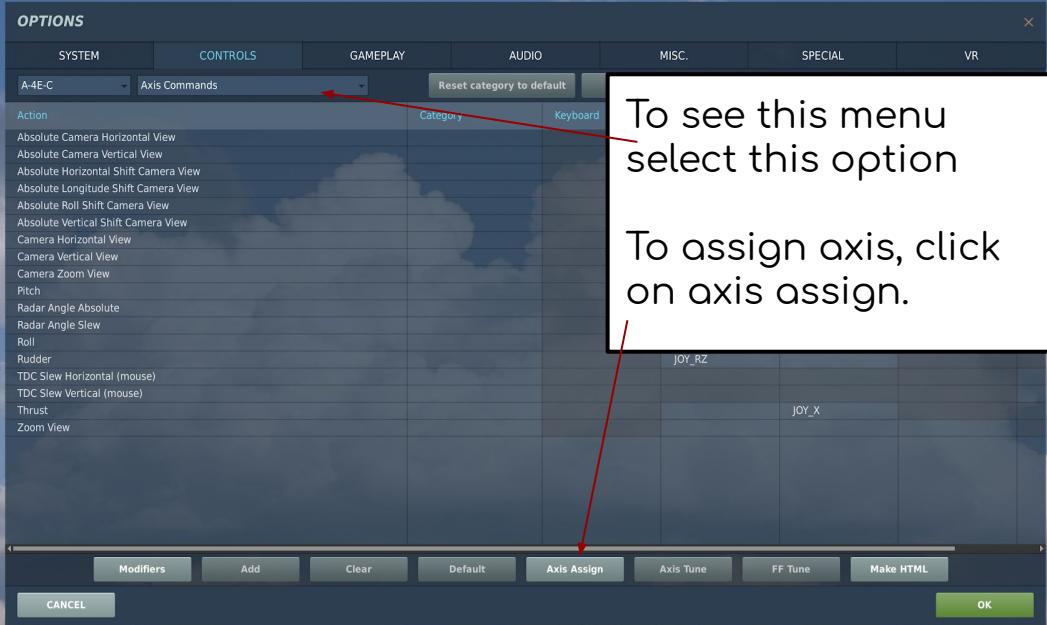
The Navy Model A-4E Skyhawk is a single-place monoplane with a modified delta-planform wing manufactured by the McDonnell Douglas Aircraft Company, Aircraft Division, Long Beach, California. It is powered by a P&W J52-P-6A gas turbine engine producing a sea-level static thrust rating of 8500 pounds.



Designed as a high performance lightweight attack aircraft, it mounts two 20-mm guns internally, carries a variety of external stores, and is capable of operating either from a carrier or from a shore base.

Control Setup

2. CONTROLS



Control Setup

As this is a basic jet aircraft, I have a minimum of control assignments, however, there are a few oddities noted here.

I have mapped:

Zoom [num*, num/]

Speedbrake [LShift + B]

Landing Gear [G]

Tailhook [I Alt + G]

Weapon Fire [Space]

Weapon Release [Alt + Space]

Release Countermeasures [O]

Release Seante
Wheelbrake [W]

Wheelbrake [W]
Trim [RCtrl + :] / [L]

Speed Hold Increases [L Shift + 0]

Speed | Hold Increase [LSHIFT + 0]

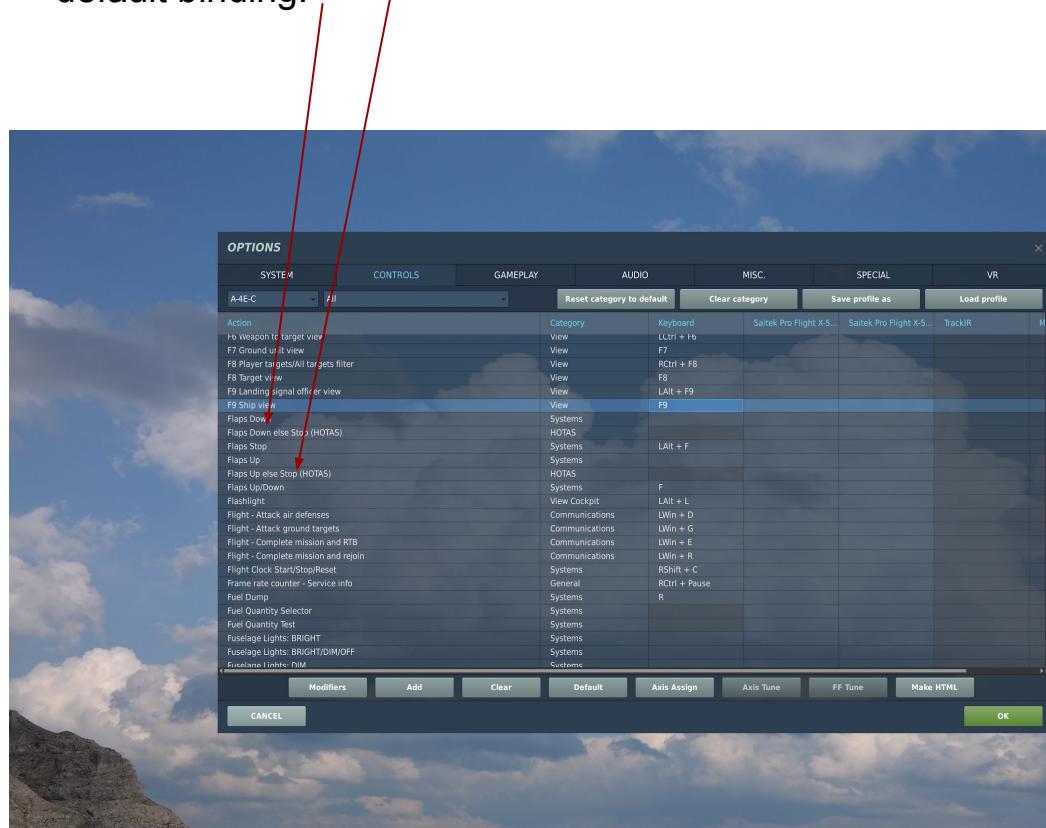
Speed Hold Decrease [LSHIFT + S]
Speed Hold Toggle [L Shift + S]

Speed Hold Toggle [LSHIFT + 8]
Random Hold Increases [L Shift + Z]

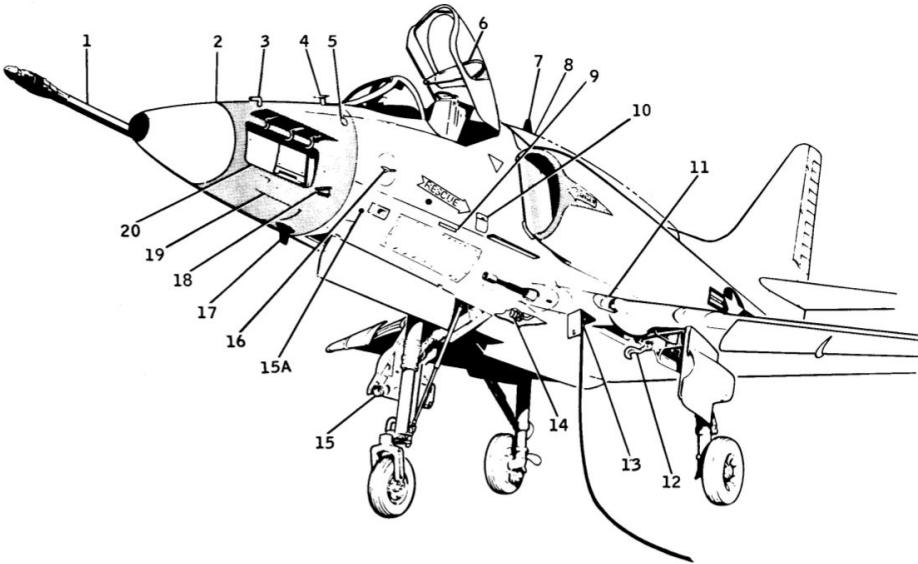
Radial Hold Increase [LSHift +7]

Radar Hold Decrease [LShift +
Radar Hold Toggle [L Shift + F1]

To map flaps, use these two assignments. They will increase/decrease flap angle while held. They have no default binding.

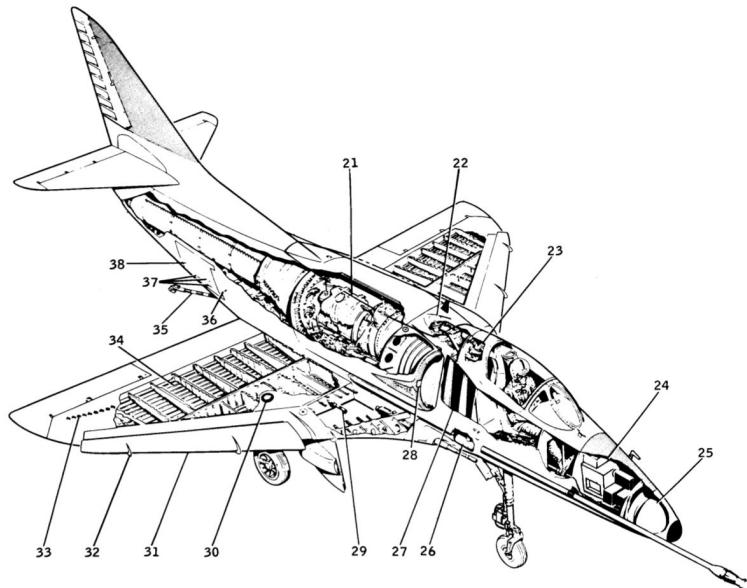


3. COCKPIT AND GAUGES



- 1. Air refueling probe
- 2. Radome
- 3. Pitot tube
- 4. Total temperature sensor
- 5. Brake fluid level window
- 6. Thermal radiation closure
- 7. AN/ARC-51A (UHF) or AN/ARC-27A (UHF) radio antenna
- 8. Upper avionics package
- 9. Normal cockpit entry handle
- 10. External canopy-jettison handle

- 11. Approach lights
- 12. Catapult hook
- 13. External power receptacle and access door
- 14. Oil tank pressure filler cap
- 15. Taxilight
- 15A. Engine bleed static port
- 16. Angle-of-attack vane and transducer
- 17. AN/ARN-52(V) or AN/ARN-21B TACAN antenna
- 18. Pitot static orifice
- 19. AN/ARA-50 or AN/ARA-25 (UHF-ADF) antenna cover

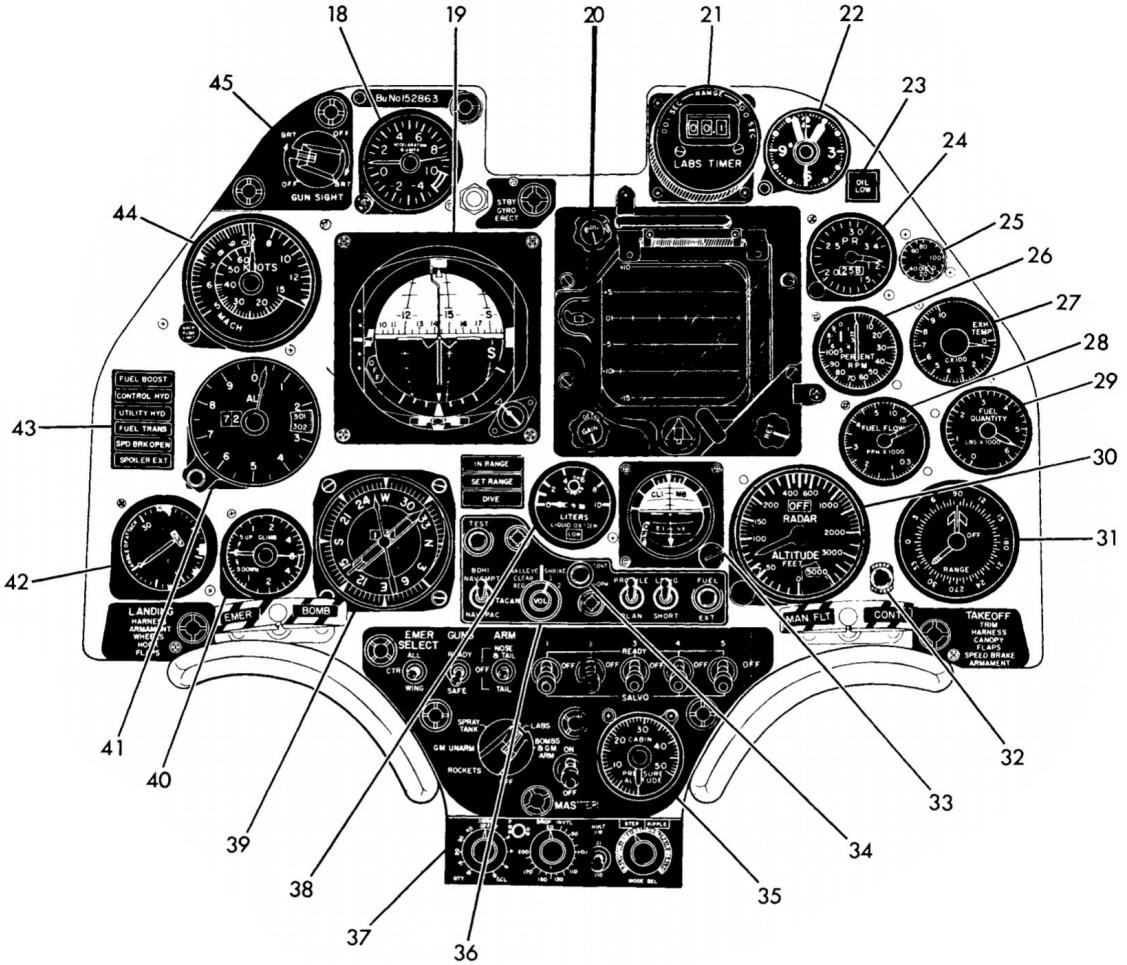


- 20. Nose compartment access door
- 21. Oil tank
- 22. Fuselage fuel tank filler cap
- 23. Cockpit canopy air bungee cylinder
- 24. Nose section electronic equipment compartment
- 25. AN/APG-53A/B radar transmitter and receiver group
- 26. Emergency generator
- 27. Fuselage fuel tank
- 28. Air refueling probe light
- 29. Catapult hook
- 30. Wing tank filler cap
- 31. Slat
- 32. Barricade engagement detent
- 33. Vortex generators
- 34. Integral wing fuel tank
- 35. Arresting hook
- 36. JATO igniter terminal
- 37. JATO mounting hooks
- 38. Speedbrake

3. COCKPIT AND GAUGES

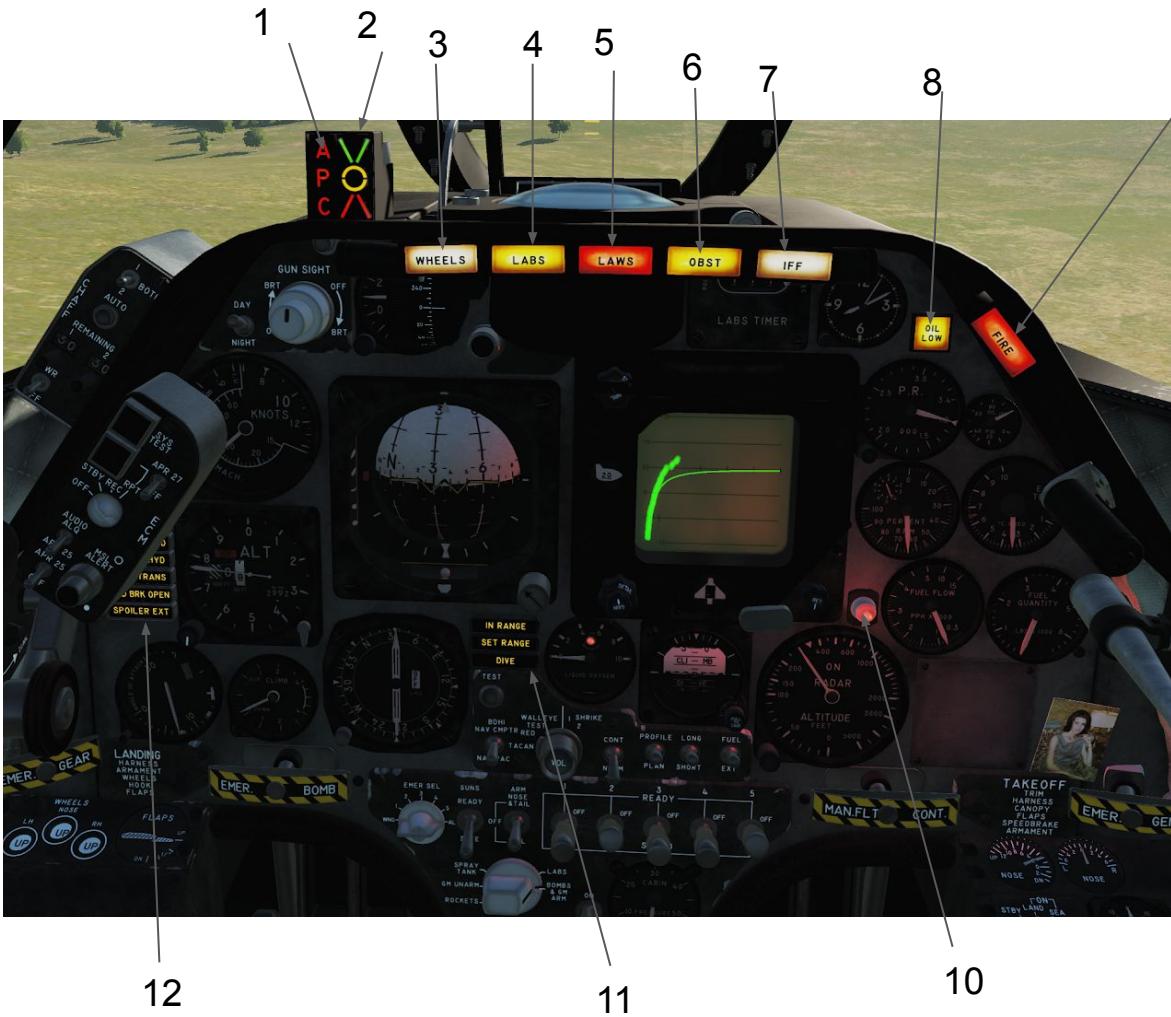


3. COCKPIT AND GAUGES



18. ACCELEROMETER
 19. ALL-ATTITUDE INDICATOR
 20. RADAR SCOPE
 21. LABS TIMER
 22. 8-DAY CLOCK
 23. OIL QUANTITY INDICATOR SWITCH (LATE A-4E)
 24. PRESSURE RATIO INDICATOR
 25. OIL PRESSURE INDICATOR
 26. TACHOMETER
 27. EXHAUST GAS TEMPERATURE INDICATOR
 28. FUEL FLOW INDICATOR
 29. FUEL QUANTITY INDICATOR
 30. RADAR ALTIMETER
 31. DEAD RECKONING INDICATOR (EARLY A-4E)
 32. RADAR ALTIMETER LOW-LIMIT WARNING LIGHT
 33. STANDBY ATTITUDE INDICATOR
 34. SIDS CONT-NORM MODE SWITCH
 35. ARMAMENT PANEL
 36. MISCELLANEOUS SWITCHES PANEL
 37. AIRCRAFT WEAPONS RELEASE SYSTEM PANEL (LATE A-4E)
 38. OXYGEN QUANTITY INDICATOR
 39. BEARING-DISTANCE-HEADING INDICATOR
 40. VERTICAL SPEED INDICATOR
 41. ALTIMETER
 42. ANGLE-OF-ATTACK INDICATOR
 43. CAUTION PANEL (LADDER LIGHTS)
 44. AIRSPEED INDICATOR
 45. GUNSIGHT PANEL

3. COCKPIT AND GAUGES



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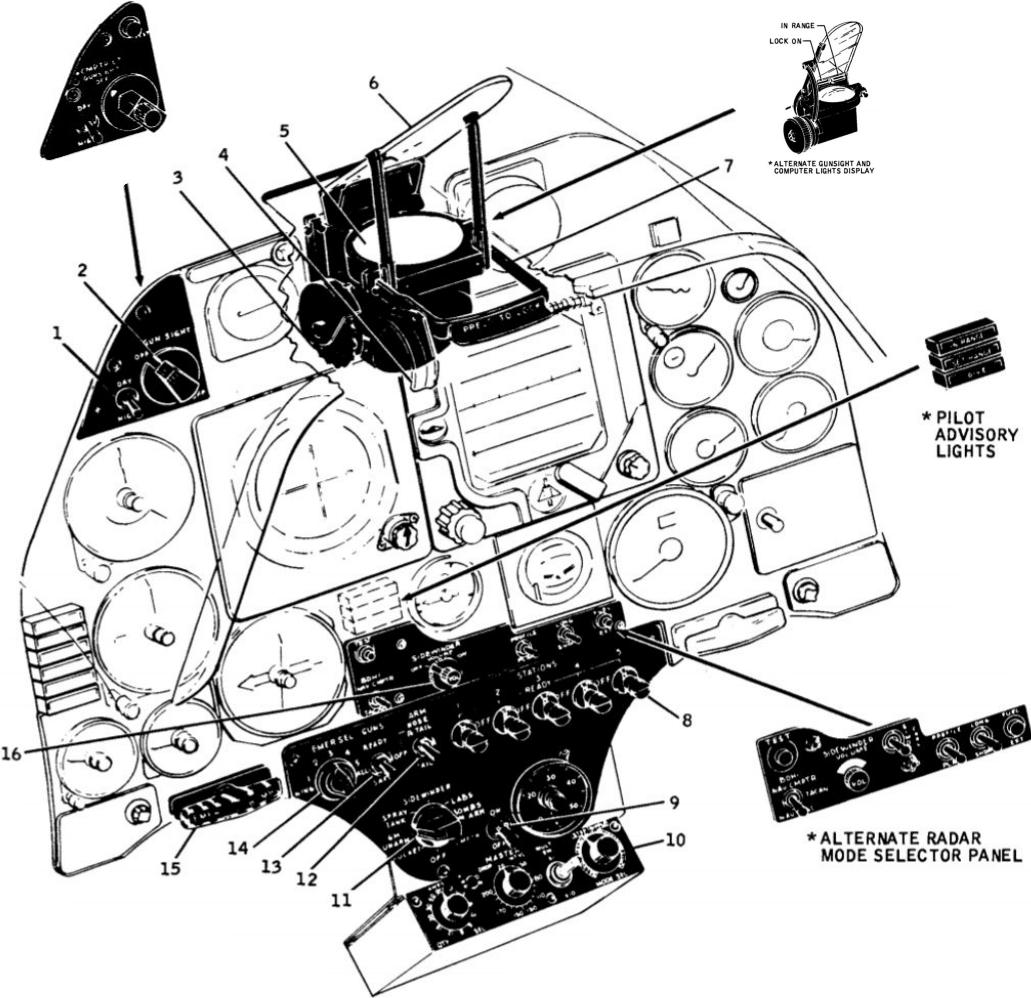
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3. COCKPIT AND GAUGES



3. COCKPIT AND GAUGES

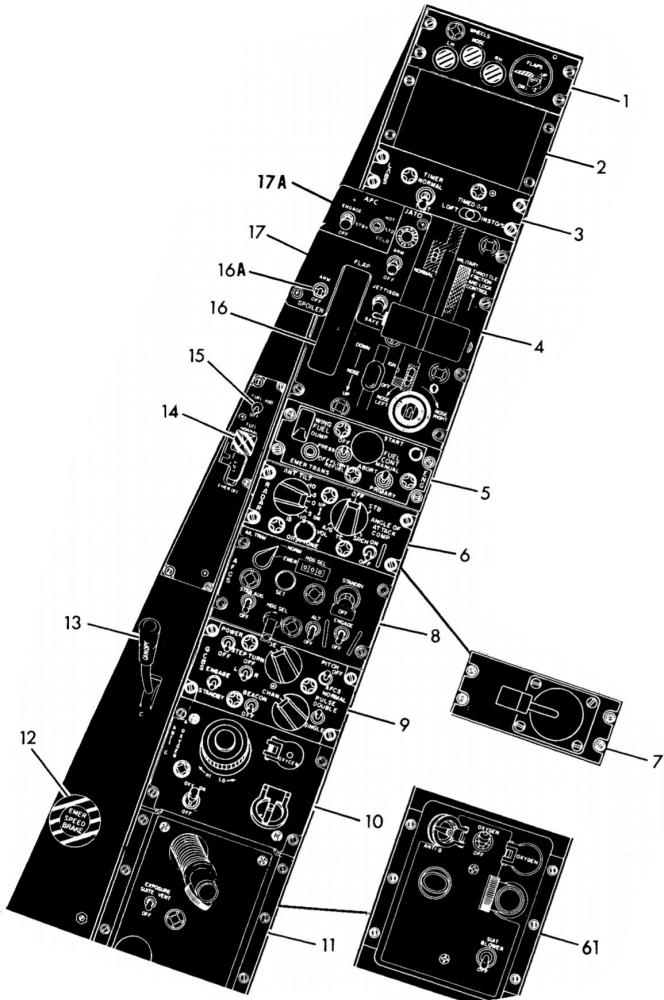


1. GUNSIGHT DAY-NIGHT SWITCH
2. GUNSIGHT LIGHT CONTROL
3. GUNSIGHT ELEVATION CONTROL
4. ELEVATION CONTROL GUARD
5. GUN SIGHT
6. GUN SIGHT REFLECTION PLATE
7. ELEVATION CONTROL LOCKING YOKE
8. STATIONS SELECT SWITCHES
9. MASTER ARMAMENT SWITCH
10. AWE-1 AIRCRAFT WEAPONS RELEASE SYSTEM PANEL
11. FUNCTION SELECTOR SWITCH (*CMPTR POSITION)
12. BOMB ARMING SWITCH
13. GUNS SWITCH
14. EMERGENCY SELECTOR SWITCH
15. EMERGENCY STORES RELEASE HANDLE
16. SIDEWINDER COOLANT OFF-ON AND VOLUME CONTROL SWITCH

3. COCKPIT AND GAUGES



3. COCKPIT AND GAUGES

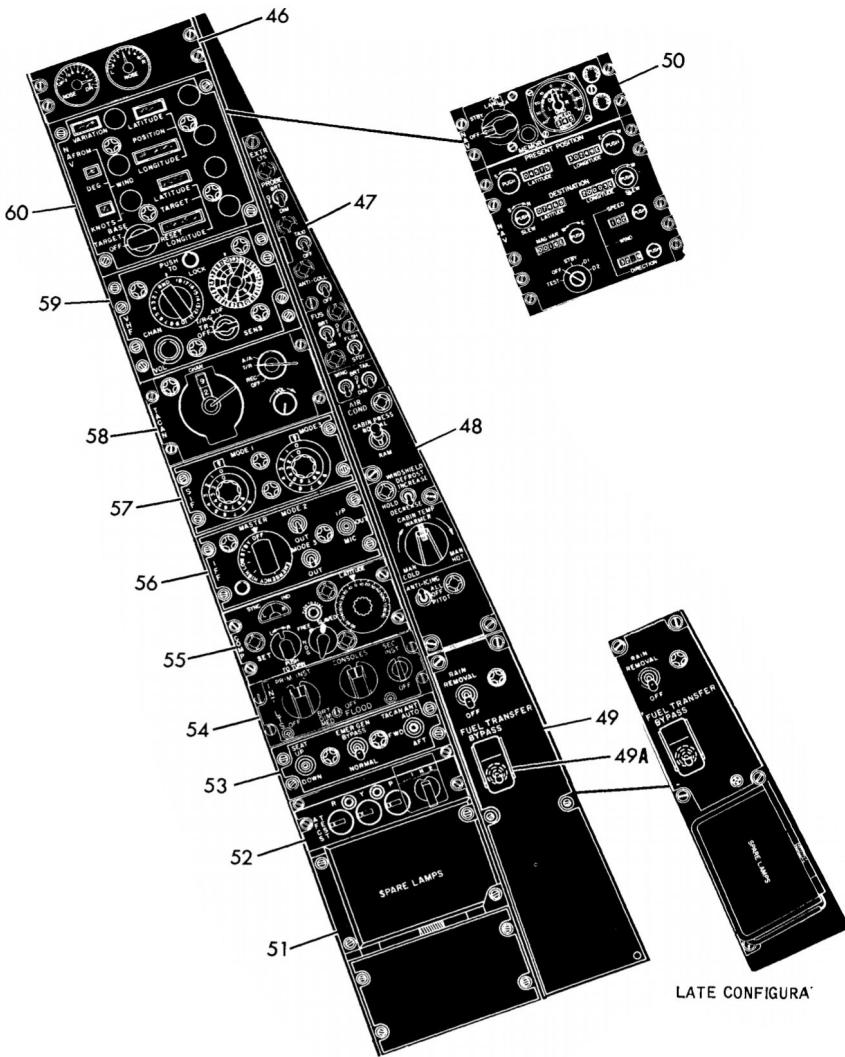


1. WHEELS AND FLAPS PANEL
2. BLANK PANELS (NOT REWORKED PER A-4 AFC 376)
WEAPON CONTROL PANEL (REWORKED PER A-4 AFC 376)
3. LABS CONTROL PANEL (NOT REWORKED PER A-4 AFC 376)
BLANK PANEL (REWORKED PER A-4 AFC 376)
4. THROTTLE PANEL
5. ENGINE CONTROL PANEL
6. RADAR CONTROL PANEL (NOT REWORKED PER A-4 AFC 256
OR REWORKED PER A-4 AFC 387)
7. ARN-77 CONTROL SELECTOR (REWORKED PER A-4 AFC 256)
8. AFCS PANEL
9. GCBS PANEL
10. OXYGEN AND ANTI-G PANEL
11. ANTIEXPOSURE SUIT CONTROL PANEL
12. EMERGENCY SPEEDBRAKE CONTROL
13. CANOPY CONTROL HANDLE
14. MANUAL FUEL SHUTOFF CONTROL LEVER
15. SMOKE ABATEMENT SWITCH
16. FLAP HANDLE
- 16A SPOILER ARM SWITCH
17. JATO CONTROL PANEL
- 17A APPROACH POWER COMPENSATOR CONTROL PANEL
61. OXYGEN, ANTI-G, AND ANTIEXPOSURE SUIT CONTROL
PANEL (REWORKED PER A-4 AFC 387)

3. COCKPIT AND GAUGES



3. COCKPIT AND GAUGES



46. TRIM POSITION INDICATOR PANEL
47. EXTERIOR LIGHTS PANEL
48. AIR CONDITIONING PANEL
49. RAIN REMOVAL PANEL
- 49A FUEL TRANSFER BYPASS SWITCH
50. DOPPLER NAVIGATIONAL COMPUTER (ASN-41)(LATE A-4E)
51. SPARE LAMPS CONTAINER (NOT REWORKED PER A-4 AFC 256)
AFCS TEST SWITCH PANEL (REWORKED PER A-4 AFC 256)
52. AFCS TEST SWITCH PANEL (NOT REWORKED PER AFC 256)
COMPASS CONTROL PANEL (REWORKED PER A-4 AFC 256)
53. MISCELLANEOUS SWITCHES PANEL
54. INTERIOR LIGHTS PANEL (REWORKED PER A-4 AFC 428)
55. COMPASS CONTROL PANEL (NOT REWORKED PER A-4 AFC 256) IFF CONTROL PANEL (REWORKED PER A-4 AFC 256)
56. IFF CONTROL PANEL (NOT REWORKED PER A-4 AFC 256)
RADAR CONTROL PANEL (REWORKED PER A-4 AFC 256)
AN/APR-25 (V) CONTROL PANEL (REWORKED PER A-4 AFC 394)
57. SIF CONTROL PANEL
58. TACAN CONTROL PANEL
59. UHF CONTROL PANEL
60. NAV CONTROL PANEL (ASN-19, EARLY A-4E)

4. STARTUP

Startup Procedure

1. Contact Ground Crew -
Ground Power On (\> F8
>F2 > F1)
2. Press Start Button
3. When Throttle RPM
reaches 5%, move throttle
to start (right click)
4. When throttle RPM reaches
15%, move throttle to idle
(right click again)
5. When Throttle RPM
reaches 40%, turn off
ground power (\> F8 > F2
> F2)

Ready To Taxi!
(Avoid fast taxi as carrier
script can kick in at around
4 kts, causing a runaway
taxi! Use your brakes)

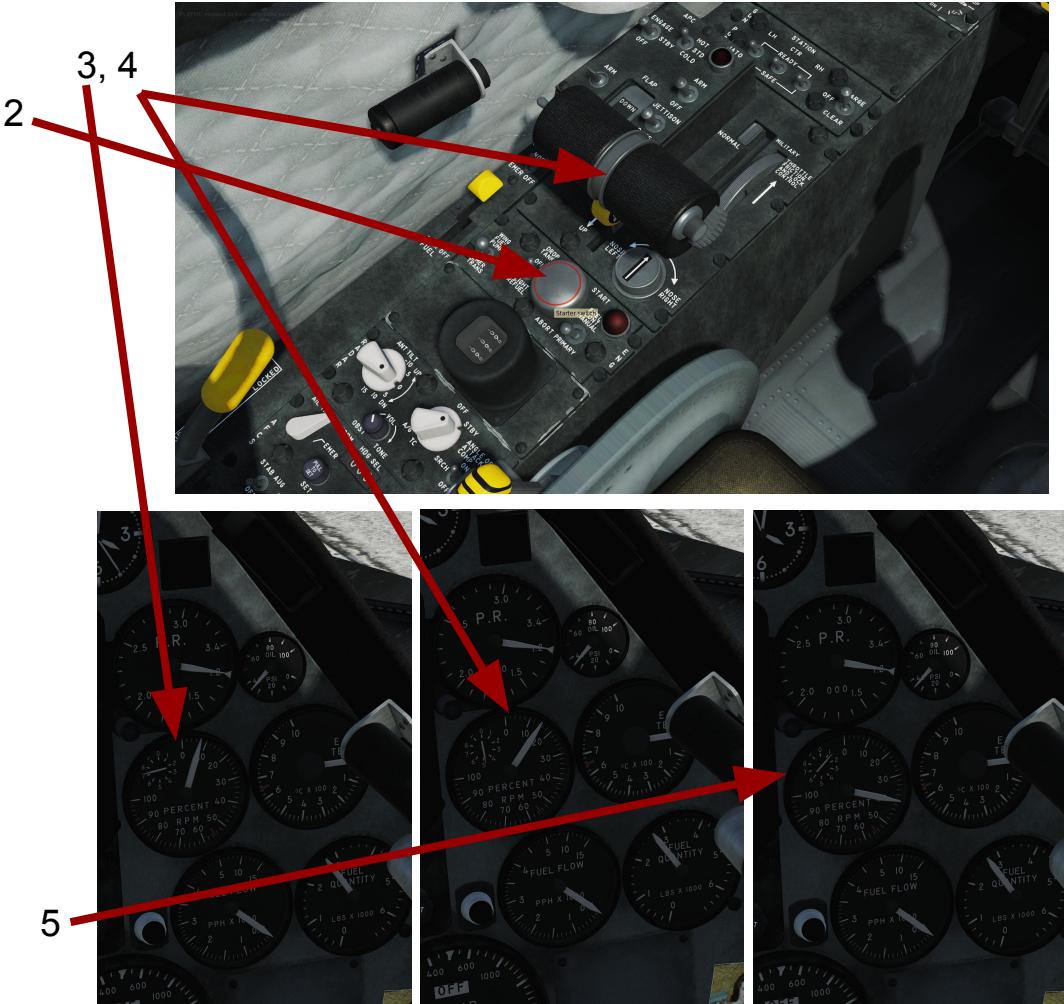


4. STARTUP

Startup Procedure

1. Contact Ground Crew -
Ground Power On (\> F8
> F2 > F1)
2. Press Start Button
3. When Throttle RPM
reaches 5%, move throttle
to start (right click)
4. When throttle RPM reaches
15%, move throttle to idle
(right click again)
5. When Throttle RPM
reaches 40%, turn off
ground power (\> F8 > F2
> F2)

Ready To Taxi!
(Avoid fast taxi as carrier
script can kick in at around
4 kts, causing a runaway
taxi! Use your brakes)



4. STARTUP

Nav Setup Procedure : AN/ASN - 41

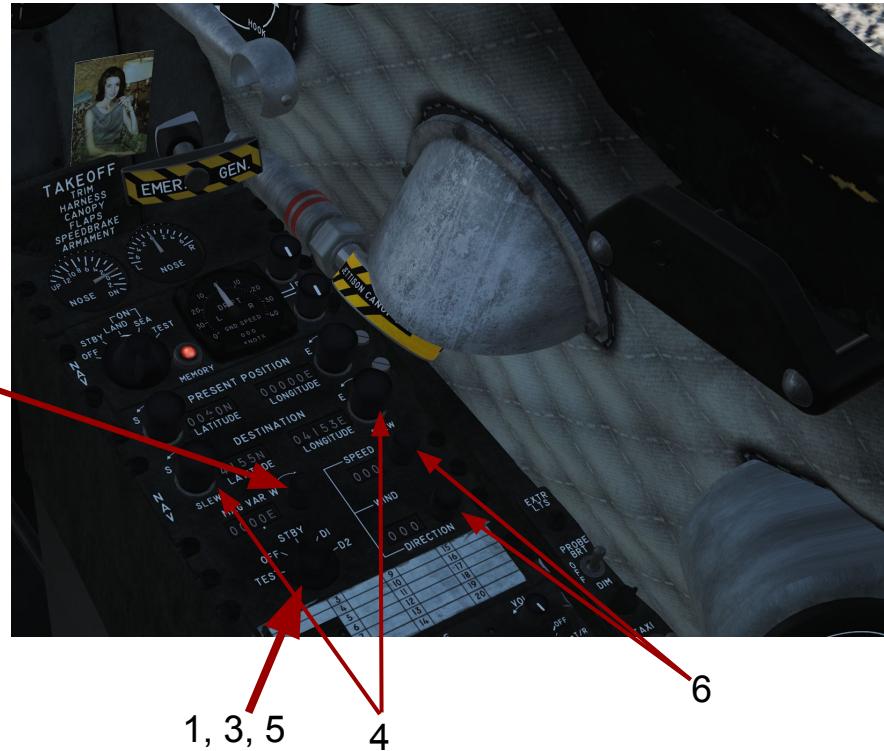
1. Set AN/ANS-41 DNS waypoint selector to STBY and wait 5 mins
2. Set magnetic var (6°E for Caucuses, 12°E for NTTR, 8°E for Normandy, 1.6° E for Persian Gulf)

To save waypoints:

3. Set waypoint selector to D2 (present position will be set, and set as D1 and D2 when dial moved off STBY)
4. Set waypoint coordinates via dials
5. Repeat for D1

(Optional)

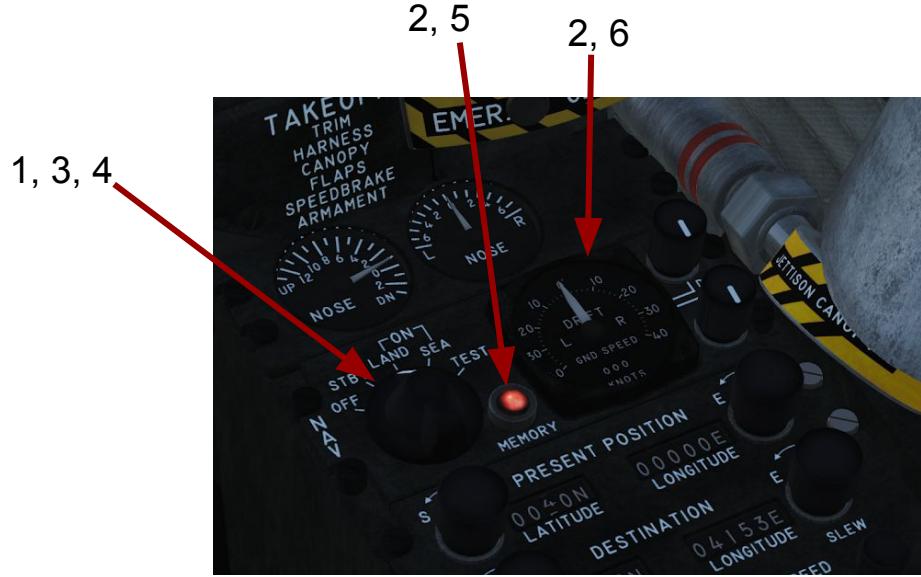
6. Set wind speed and direction (will be set automatically if using with AN/APN-153 radar)



4. STARTUP

Nav Setup Procedure : AN/APN-153

1. Set AN/APN-153 Doppler Radar Set to TEST and wait 5 min. (DO NOT DO before power on)
2. After warm up time memory light should extinguish and groundspeed dial should read 121 ± 5 kts, drift angle should read 0 ± 2 degrees
3. Turn to STBY
4. Prior to takeoff set selector switch knob to ON-LAND or ON-SEA as appropriate
5. Approximately 30 seconds after aircraft has reached 150 kts and 40 ft of altitude, the memory light should extinguish
6. After cruise altitude is attained, ground speed and drift should read within ± 50 kts and ± 10 degrees respectively for known conditions of flight



During flight:

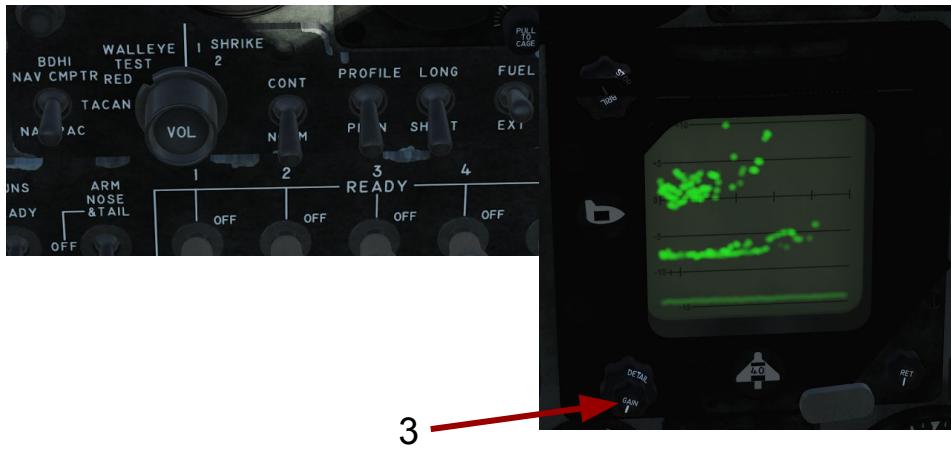
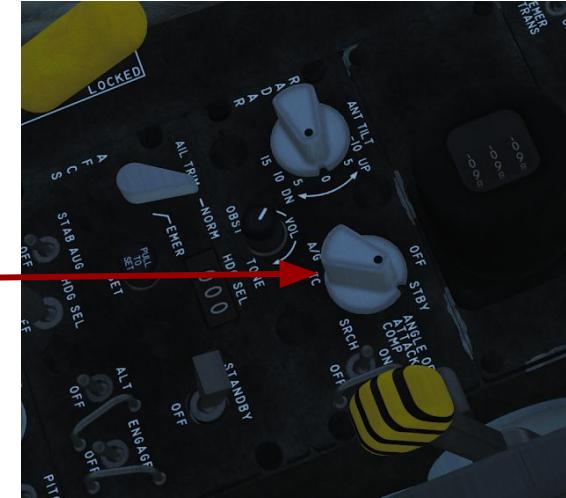
Bank and turns should be limited to 30 degrees left or right/type of terrain being flown over, or memory light will ignite, indicating loss of tracking.

Climbs and descent should be limited to 25 degrees as this is near operating limits. Memory light may ignite for no more than 3 seconds.

4. STARTUP

Radar Setup Procedure : AN/APG-53A

1. Mode Selector Switch to STBY and allow 3 mins for warm up
2. Mode Selector Switch to SRCH
3. Turn Gain Control Knob Clockwise until targets appear
4. Position Range Switch to SHORT - Confirm flag indicates 20 miles
5. Mode Selector Switch to T/C - Confirm flag indicates 10 miles, tilt control should zero.
6. Turn Gain Control Knob clockwise until targets appear to be 5 degrees in vertical dimension
7. Turn Detail Knob clockwise until targets are reduced to 1 degree in vertical dimension.
8. Observe terrain clearance line on scope. Position Range selector switch to LONG - Confirm terrain clearance line moves to the left and slightly up
9. Position Mode Selector Switch to A/G and confirm horizontal line sweeps from top to near bottom
10. Position Mode Selector Switch to OFF



Radar Setup Procedure : AN/APG-53A

1. Mode Selector Switch to STBY and allow 3 mins for warm up
 2. Mode Selector Switch to SRCH
 3. Turn Gain Control Knob Clockwise until targets appear
 4. Position Range Switch to SHORT - Confirm flag indicates 20 miles
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Position Range selector switch to LONG -
Confirm terrain clearance line moves to the left
and slightly up
 9. Position Mode Selector Switch to A/G and
confirm horizontal line sweeps from top to near
bottom
 10. Position Mode Selector Switch to OFF



4. STARTUP

Radar Setup Procedure : AN/APG-53A

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9. Position Mode Selector Switch to A/G and confirm horizontal line sweeps from top to near bottom
10. Position Mode Selector Switch to OFF

5



6



4. STARTUP

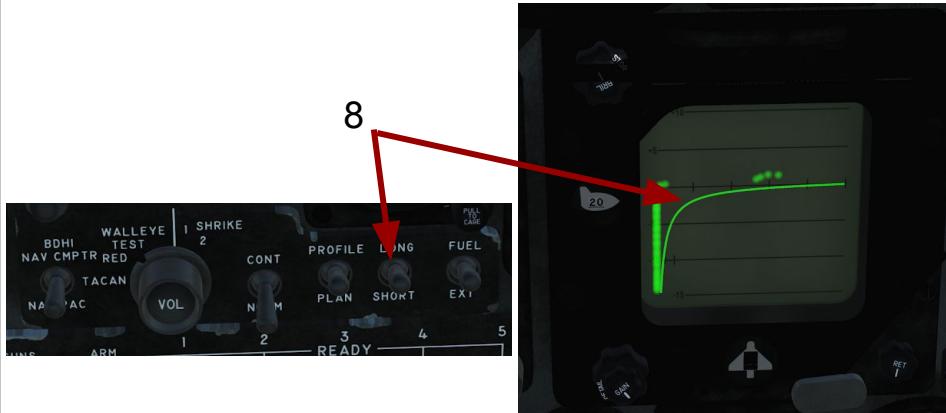
Radar Setup Procedure : AN/APG-53A

1. Mode Selector Switch to STBY and allow 3 mins for warm up
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7



8



4. STARTUP

Radar Setup Procedure : AN/APG-53A

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2. Mode Selector Switch to SRCH
3. Turn Gain Control Knob Clockwise until targets appear
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5. Mode Selector Switch to T/C - Confirm flag indicates 10 miles, tilt control should zero.
6. Turn Gain Control Knob clockwise until targets appear to be 5 degrees in vertical dimension
7. Turn Detail Knob clockwise until targets are reduced to 1 degree in vertical dimension.
8. Observe terrain clearance line on scope.
Position Range selector switch to LONG - Confirm terrain clearance line moves to the left and slightly up
9. Position Mode Selector Switch to A/G and confirm horizontal line sweeps from top to near bottom
10. Position Mode Selector Switch to OFF



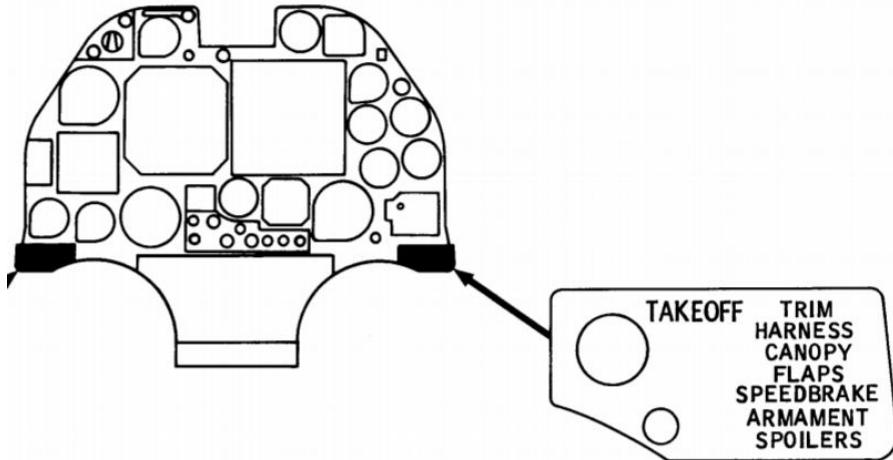
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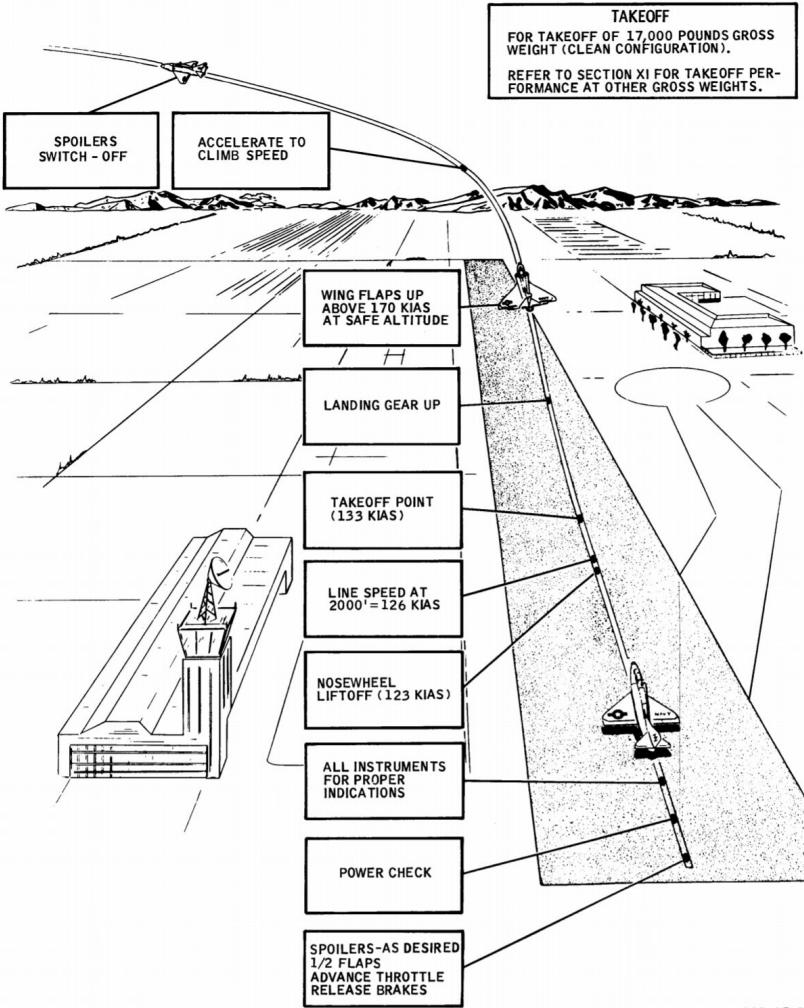
5. TAKEOFF



Takeoff Checklist

1. Trim :
 - Aileron: Stick Centered Tab Faired ± 1/5in
 - Rudder: 0 degrees
 - Elevator (field) 8 Degrees Up
2. Harness
3. Canopy
4. Flaps - Set at $\frac{1}{2}$
5. Speedbrakes - Closed
6. Armament - All Switches off.
Emergency selector switch appropriate setting
7. Spoilers - As desired (If ARMED, closed - power above 70%)

5. TAKEOFF



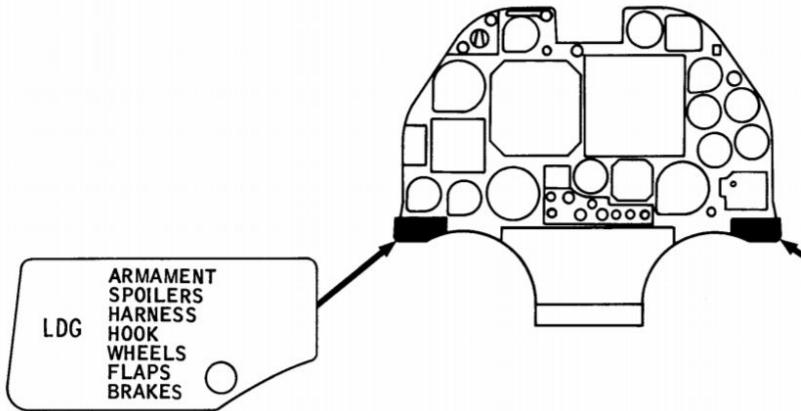
Takeoff

1. Complete Checklist
2. As engine accelerates through 90%, release brakes to avoid skidding tyres.
3. Ensure acceleration is within acceptable limits and engine accelerates smoothly
4. Lift nose-wheel at 123 KIAS
5. Takeoff at 133 KIAS
6. Gear up at 40ft
7. Flaps up at 170 KIAS at safe altitude
8. Once climb speed reached switch spoilers off.

Note:

On rough runways nose-wheel bounce may occur, forward stick pressure should be used to counter this.

6. LANDING



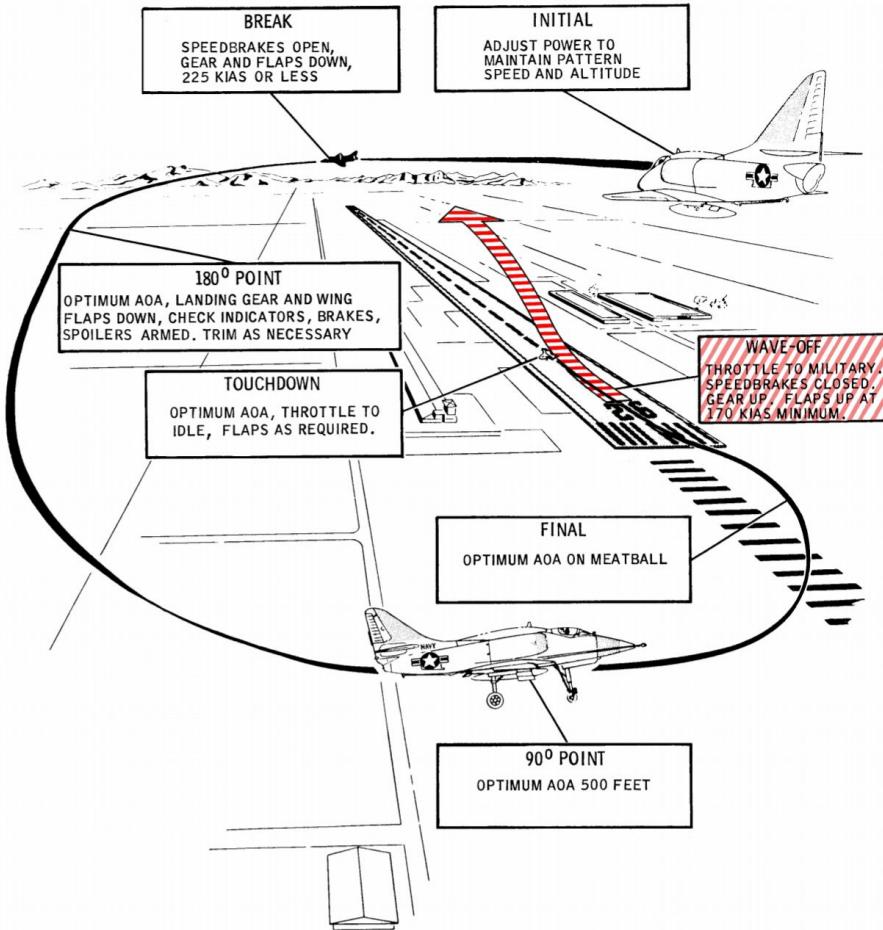
Landing Checklist

1. Armament - All switches off.
Emergency selector switch appropriate setting
2. Spoilers - Off
3. Harness
4. Hook Up (field landing)
5. Wheels - Down
6. Flaps - Full
7. Brakes - Pump before landing, gentle pressure upon landing to avoid skid.

b. LANDING

NOTE

REFER TO LANDING DISTANCE CHARTS
IN SECTION XI FOR FINAL APPROACH
AND TOUCHDOWN SPEEDS.



Landing

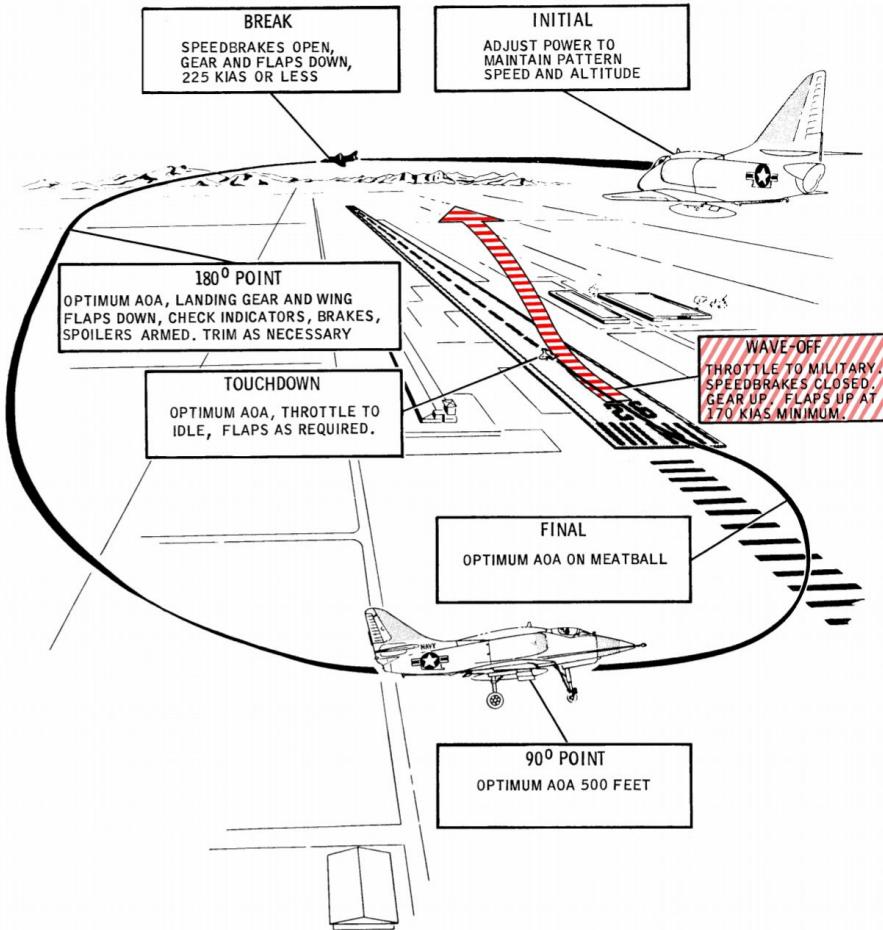
1. After break - Extend speedbrakes and retard throttle to 70% (speedbrakes will remain extended throughout approach and landing)
2. As aircraft decelerates to 225 KIAS or lower, lower landing gear and extend flaps full
3. As aircraft decelerates to 170 KIAS or lower, adjust power to maintain desired airspeed.
4. Complete Checklist
5. Crosscheck airspeed with AOA indexer indication

Note: at gross weight of 14,000 lbs, recommended approach speed is approx 125 KIAS at abeam position. Optimum AOA indication is 17 ½ units. For each 1000 lbs increase over 14,000, optimum approach speed increases approximately 5 KIAS.

b. LANDING

NOTE

REFER TO LANDING DISTANCE CHARTS
IN SECTION XI FOR FINAL APPROACH
AND TOUCHDOWN SPEEDS.



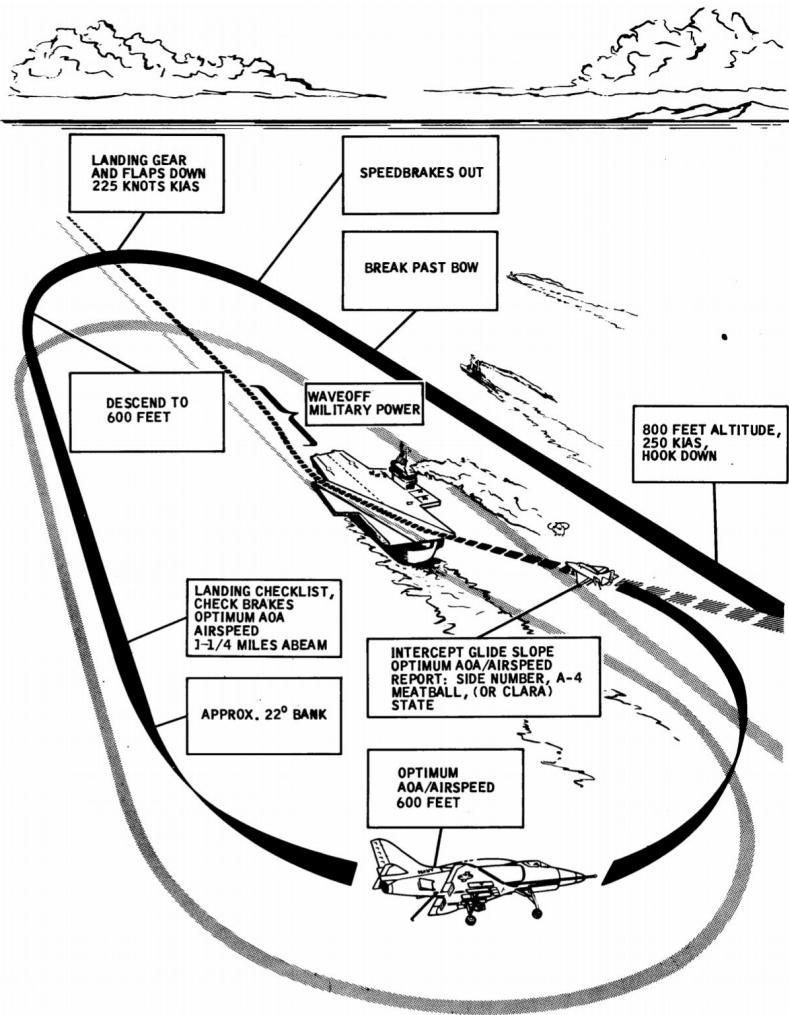
Upon Landing

1. Power to IDLE
2. Flaps as required by conditions
3. Apply full forward stick as necessary to maintain wings level
4. Apply rudder as necessary to maintain control
5. Use brakes as necessary
6. As rudder becomes ineffective, used brakes for directional control

For minimum distance landing:

1. Maintain optimal AOA during approach
2. Upon touchdown let nose fall through and use full forward stick
3. Leave flaps extended unless excessive crosswind
4. Apply moderately heavy braking immediately upon nose-wheel touchdown
5. Maintain steady braking throughout rollout to stop or desired taxi speed, increasing pressure as speed decreases.
6. Landing roll may be reduced by shutting down engine upon touchdown

6. LANDING



HH1-89

Figure 3-7. Typical Carrier-Landing Pattern

Carrier Landing

1. Minimum Straight in of 3 miles on starboard side, parallel to Base Recovery Course at 800 ft and 250 KIAS.
2. Break should occur past bow
3. Speedbrakes out at break (may not be desirable at heavy weights)
4. At 225 KIAS or lower, landing gear down and flaps full
5. Descend do 600 ft after break
6. Complete landing checklist and maintain optimum AOA airspeed at 1-1/4 miles abeam
7. Bank at approx 22 degrees
8. Maintain optimum AOA/Airspeed and 600ft altitude on turn-in
9. Intercept glide slope and descend
10. Upon touchdown, advance the throttle to MILITARY and retract the speedbrakes
11. After arrestment is assured, retard the throttle to IDLE and raise the hook and flaps. The aircraft should be allowed to roll back a short distance after arrestment to permit the hook to disengage from the pendant.
12. Hold brakes on carrier or carrier will slide out from underneath you (SFM product)

7. SENSORS



AN/APN-141 Radar Altimeter

The AN/APN-141 radar altimeter employs the pulse radar technique to furnish accurate instantaneous altitude information to the pilot from 0 to 5000 feet terrain clearance.

Aircraft height is determined by measuring the elapsed transit time of a radar pulse, which is converted directly to altitude in feet and displayed on the cockpit indicator.

The indicator dial face is marked in 10-foot increments up to 200 feet, 50-foot increments from 200 to 600 feet, 100-foot increments from 600 to 2000 feet, and 500-foot increments from 2000 to 5000 feet.

A control knob on the front of the indicator controls power to the indicator and is used for setting the low-limit indexer

7. SENSORS



AN/APN-141 Radar Altimeter

An OFF flag on the indicator face appears when signal strength becomes inadequate to provide reliable altitude information, when power to the system is lost, or when the system is turned OFF.

At altitudes above 5000 feet terrain clearance, the OFF flag will appear and the pointer will move behind the masked portion of the indicator dial. The pointer will resume normal operation when the aircraft descends below 5000 feet.

The radar altimeter operates normally during 50-degree angles of climb or dive and 30-degree angles of bank, right or left. Beyond these points, the indications on the radar altimeter become unreliable but will resume normal operation when the aircraft returns to normal flight.

7. SENSORS



Low Altitude Warning System

The low altitude warning system is used to warn the pilot of impending danger due to low altitude.

The warning system consists of two warning lights and an aural warning tone heard in the pilot's headset that operates in conjunction with the AN/APN-141 radar altimeter.

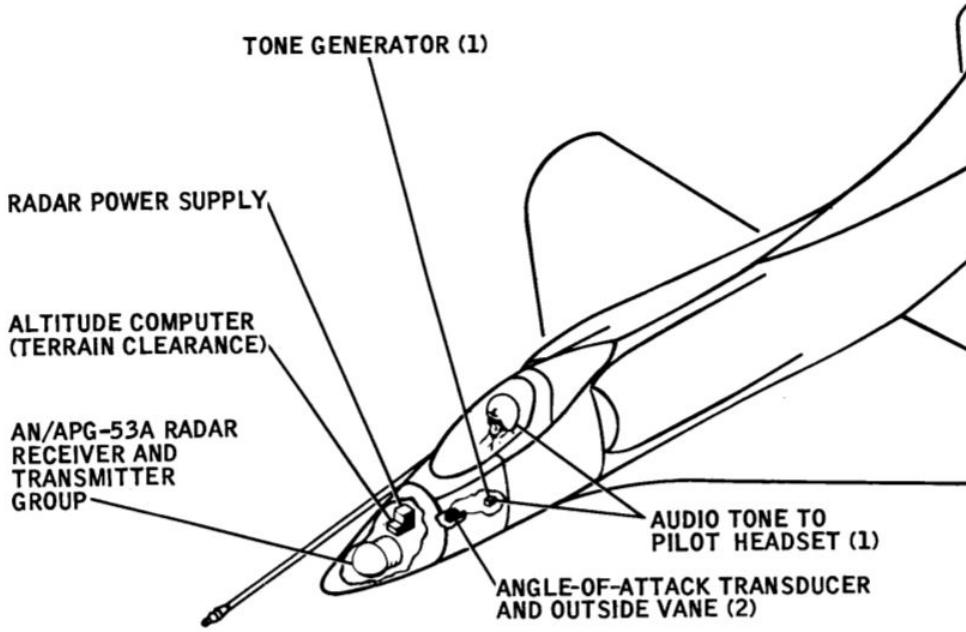
One warning light is located under the glareshield, and the other, which is the radar low limit warning light, is located adjacent to the radar altimeter.

When the AN/APN-141 radar altimeter indicator pointer drops below the preset low-limit indexer altitude setting, both warning lights come on and the aural warning tone is activated for 2 seconds.

The warning tone is an alternating 700- to 1700-cps tone with a repetition rate of 2 cps.

In addition, a reliability warning signal sounds for 2 seconds when the radar altimeter acquires or loses its lock-on. The reliability warning signal has the same frequency range but a repetition rate of 8 cps.

7. SENSORS



AN/APG-53A Radar System

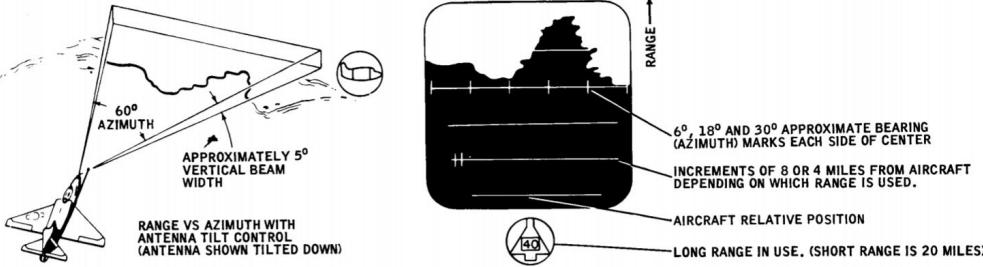
The ANI APG- 53A radar system provides the pilot with search or mapping capabilities for navigational purposes, two modes of terrain clearance for obstacle avoidance in either the azimuth or elevation plane, and air-to-ground slant range for weapons delivery.

Automatic fire control is not provided.

Operating controls are provided on the radar control panel located on the right-hand console, on a small radar switch panel installed near the center of the bottom edge of the instrument panel, and around the perimeter of the azimuth-elevation-range indicator (scope) mounted in the instrument panel

Four modes of operation are available for pilot selection; standby, search, terrain clearance, and slant range. In search mode the B scope presentation is utilized, in terrain clearance mode B scope presentation is used for PLAN and E scope presentation is used for PROFILE, while slant range mode is presented as a vertical sweep range bar.

SEARCH MODE



AN/APG-53A Radar System

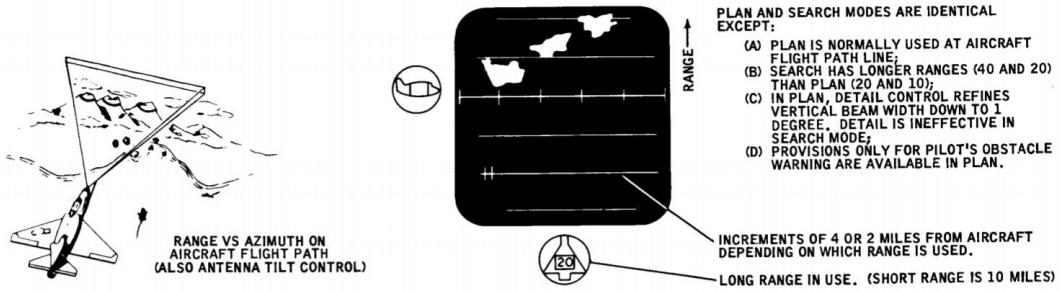
The search mode presentation displays range versus azimuth. Either 0- to 20-mile range or 0- to 40-mile range in nautical miles may be selected.

The range in use is shown by a flag-type marker in the plan-view aircraft at the bottom of the scope. The indicator face is divided by horizontal lines, each representing one-fifth of the total range. This gives a calibration line every 8 miles for LONG and 4 miles for SHORT.

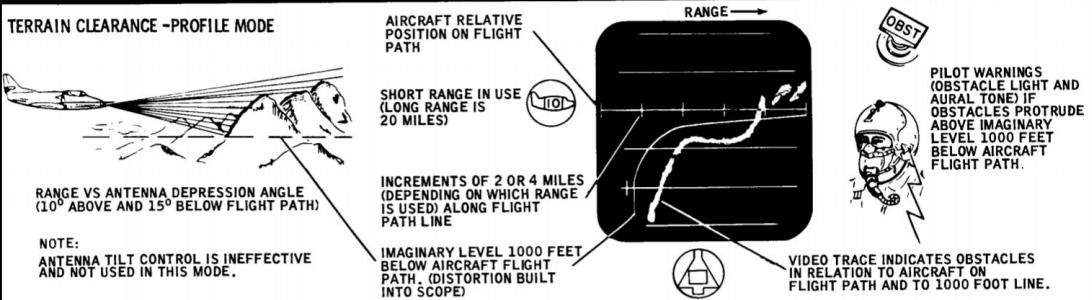
In SRCH, the radar antenna is programmed to sweep 60 degrees in azimuth using a 5 degree cone of radiation at the elevation angle (antenna tilt) selected by the pilot. Vertical marks on the zero elevation line of the reticle show the approximate bearing to any point on the display. The marks represent 6, 18, and 30 degrees each side of center. The antenna elevation is set by the pilot and may be varied from 10 degrees above to 15 degrees below the flight path (angle-of-attack switch ON).

7. SENSORS

TERRAIN CLEARANCE-PLAN MODE



TERRAIN CLEARANCE - PROFILE MODE



AN/APG-53A Radar System

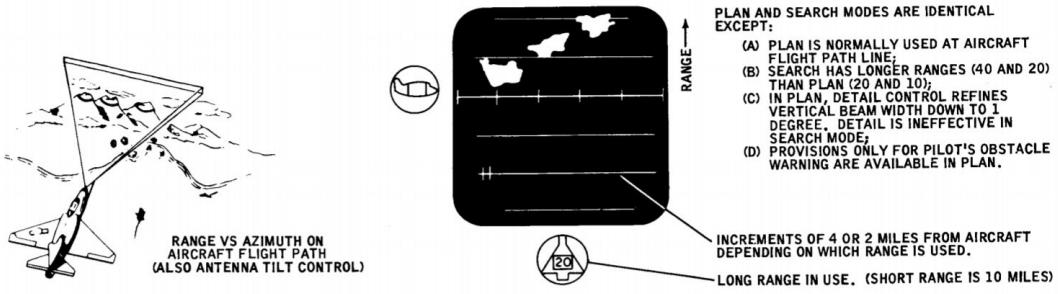
TERRAIN CLEARANCE - PLAN MODE

With the profile-plan switch in the PLAN position, the rotary mode selector switch in the TiC position, and the angle-of-attack switch ON, the indicator (scope) provides a B-scope (range-versus-azimuth) presentation of obstacles in the projected flight path of the aircraft. The terrain clearance PLAN display is provided to enable the pilot to maneuver around obstacles rather than over them. Azimuth scan is 60 degrees using a beam width of 5 degrees and a vertical beam width effectively reduced to 1 degree by means of the detail control on the scope.

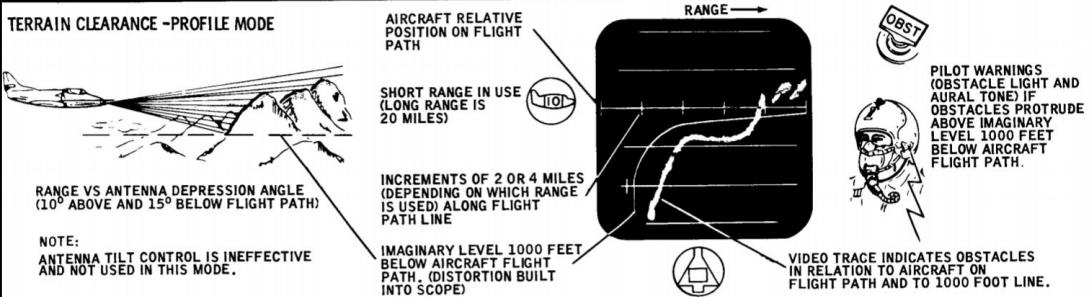
The vertical width of the beam is determined by the setting of the detail knob. With the knob fully counterclockwise, beam width is approximately 5 degrees; fully clockwise, beam width approximates 1/2 of 1 degree. The scope will display only those obstacles that are within the beam. If the antenna tilt control is at zero degrees and the angle-of-attack switch is in ON, the objects shown will be in a plane that contains the projected flight path and is parallel to the lateral axis of the aircraft. With the angle-of-attack switch OFF, the objects will be in the plane of the armament datum line. Only radar return from the near slope of mountains is received so the presentation is usually patchy

7. SENSORS

TERRAIN CLEARANCE-PLAN MODE



TERRAIN CLEARANCE - PROFILE MODE



AN/APG-53A Radar System

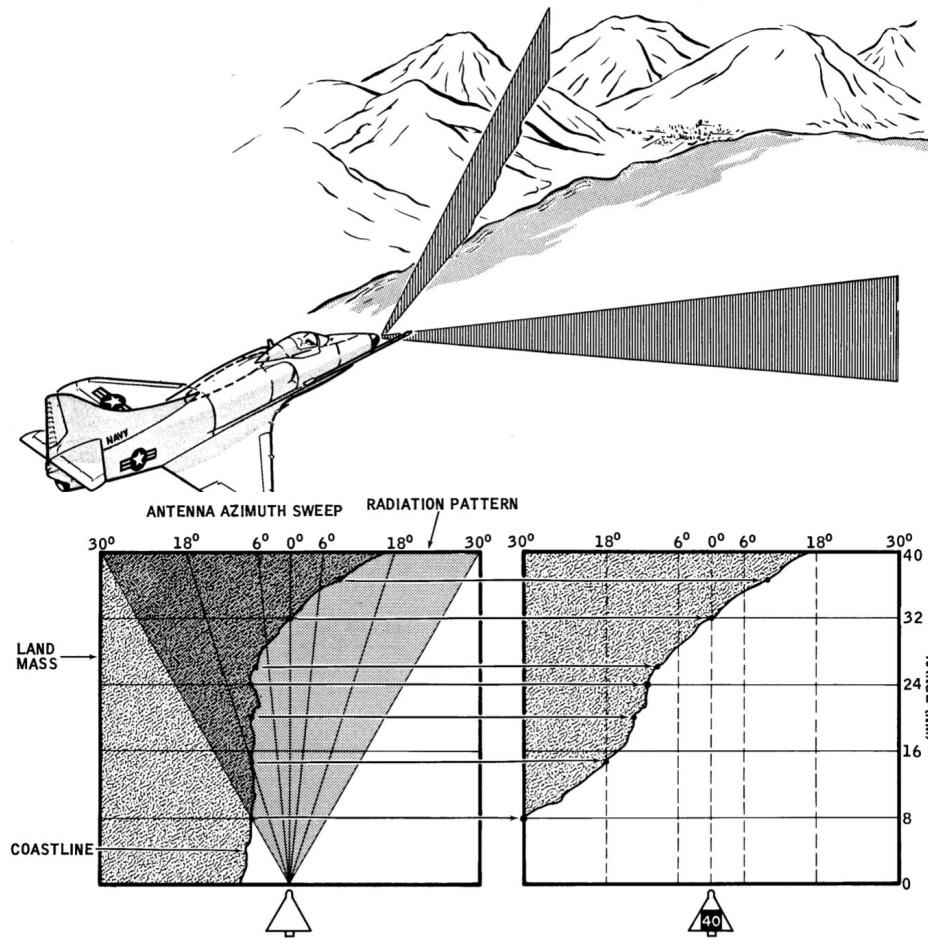
TERRAIN CLEARANCE - PLAN MODE

The pilot may examine terrain above or below the flight path (or ADL) by manually adjusting the tilt control to the desired setting (from plus 10 degrees to minus 15 degrees). However, the tilt control knob is spring loaded in the TiC modes and will return to zero when released. Available for selection are ranges of 0 to 20 or 0 to 10 nautical miles (LONG or SHORT). The range in use is indicated by a flag-type marker in the plan-view aircraft at the bottom of the scope as in SRCH mode.

The horizontal lines on the indicator face each represent one-fifth of the total range, giving 4 miles in LONG and 2 miles in SHORT.

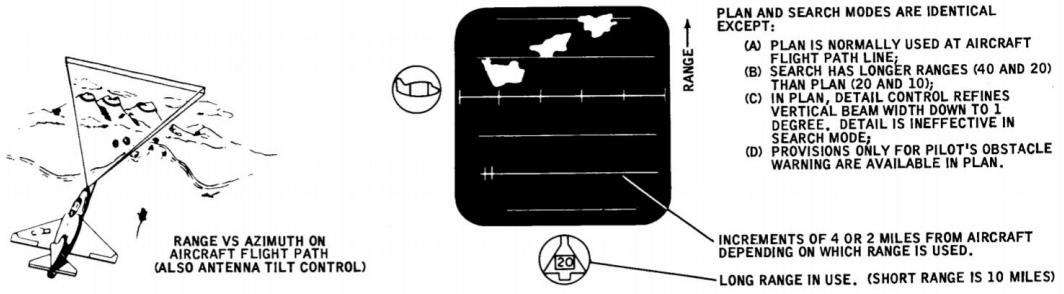
Azimuth markings are identical to search mode; 6, 18, and 30 degrees to the left or right of the aircraft heading.

Terrain Clearance - Plan Mode

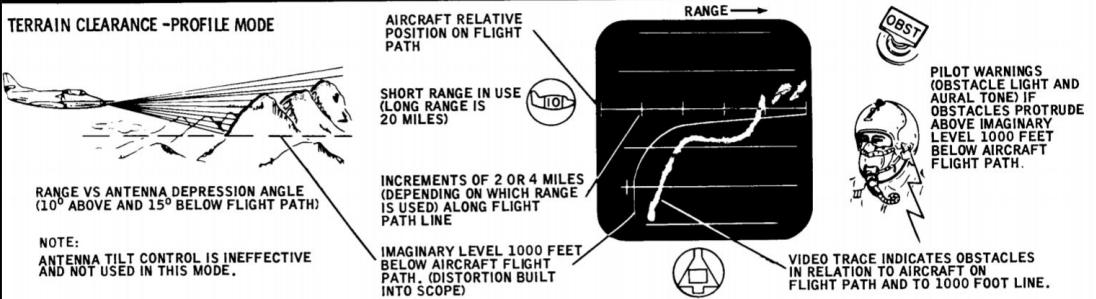


7. SENSORS

TERRAIN CLEARANCE-PLAN MODE



TERRAIN CLEARANCE - PROFILE MODE



AN/APG-53A Radar System

TERRAIN CLEARANCE - PROFILE MODE

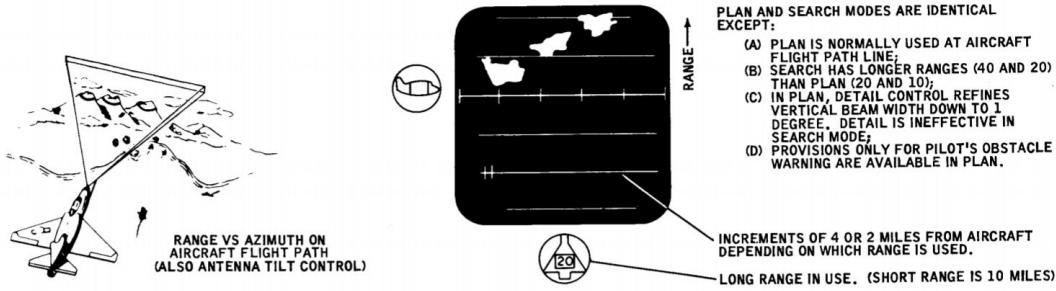
With the presentation switch at PROFILE, the indicator (scope) provides an E-scope (range versus antenna depression angle) display of the terrain profile ahead of the aircraft.

The radar beam automatically locks in azimuth and sweeps in elevation from plus 10 degrees to minus 15 degrees using a beam width of 5 degrees and a vertical beam width effectively reduced to 1 degree by means of the detail control on the scope.

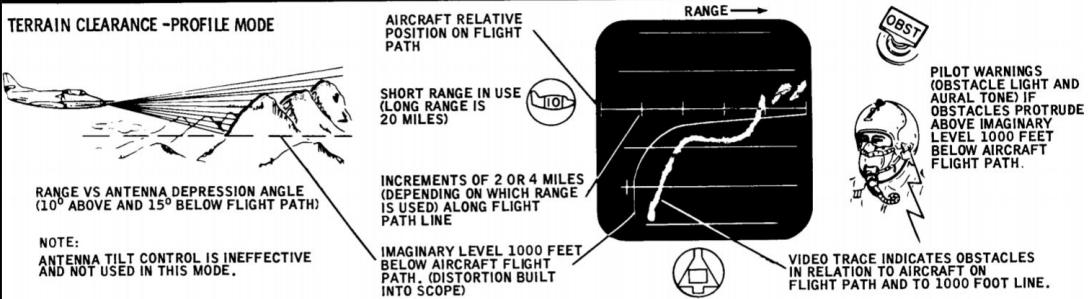
The elevation zero is normally referenced to the flight line by including an angle-of-attack correction in the servo loop. This provides for an extended antenna sweep up to a maximum of plus 11 degrees to minus 19 degrees from the armament datum line (antenna sweep limits).

The antenna tilt control does not function in this mode .

TERRAIN CLEARANCE-PLAN MODE



TERRAIN CLEARANCE - PROFILE MODE



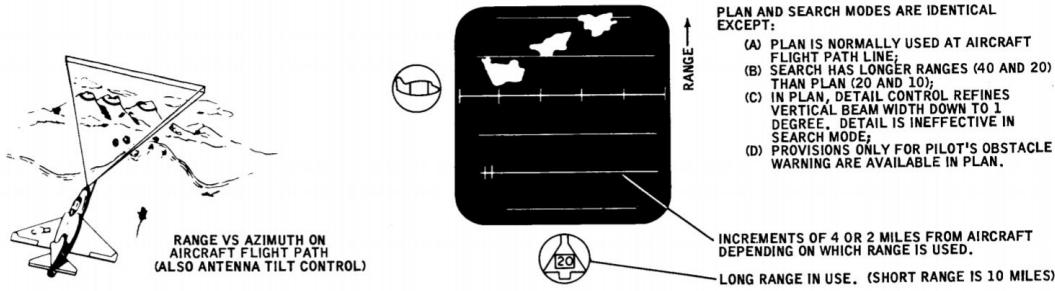
AN/APG-53A Radar System

TERRAIN CLEARANCE - PROFILE MODE

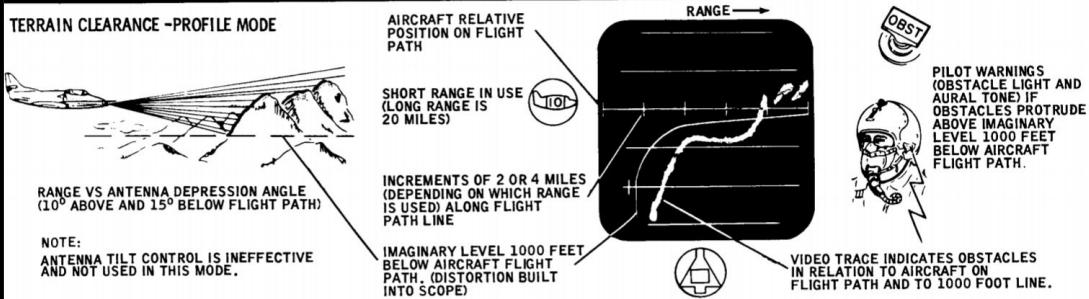
The LONG-SHORT range switch provides either 20- or 10-mile ranges for sufficient detail under various conditions. Vertical marks on the horizontal zero-degree elevation line divide the display into 2- or 4-mile segments according to the range in use. A flag-type marker in the aircraft silhouette at the left of the scope shows which range is in use.

A solid line representing an imaginary plane 1000 feet below the antenna zero-degree elevation line is electronically displayed on the indicator as an aid to low level navigation. This is the terrain clearance scribe line (see figure 1-20) and is synchronized with the elevation sweep. The zero-degree elevation line of the indicator reticle represents the instantaneous forward projection of the aircraft flight or armament datum line depending on the position of the angle-of-attack switch. Since the vertical calibration is in degrees of antenna depression angle rather than in feet of altitude, the resulting expansion of the conical radiation pattern into a rectangular display causes the 1000-foot marker and radar target return to curve downward at the low range end of the indicator. (See diagram later)

TERRAIN CLEARANCE-PLAN MODE



TERRAIN CLEARANCE - PROFILE MODE



AN/APG-53A Radar System

TERRAIN CLEARANCE - PROFILE MODE

An irregular line display is the radar return.

Assuming level terrain and by flying so that the radar return presentation is parallel to the 1000-foot marker, it is possible to fly at a constant altitude above level terrain.

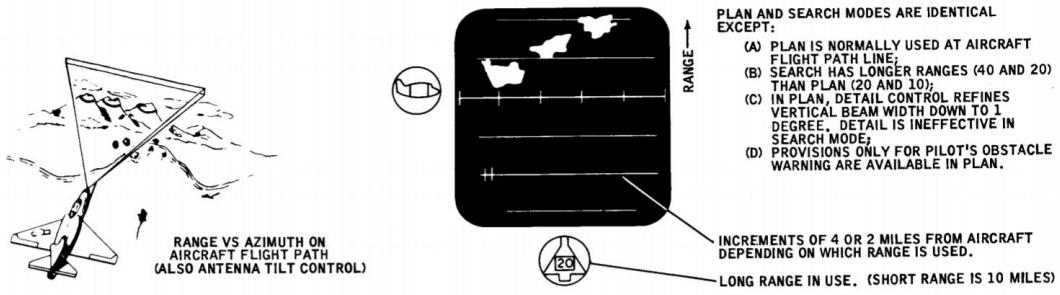
The PROFILE function also incorporates both visual and aural warning to the pilot when obstacles protrude above a horizontal plane positioned 1000-feet below and parallel to the antenna zero-degree reference plane.

The obstacle alarm consists of both the obstacle light and the pilot's headset signal, warning the pilot that a potential hazard exists.

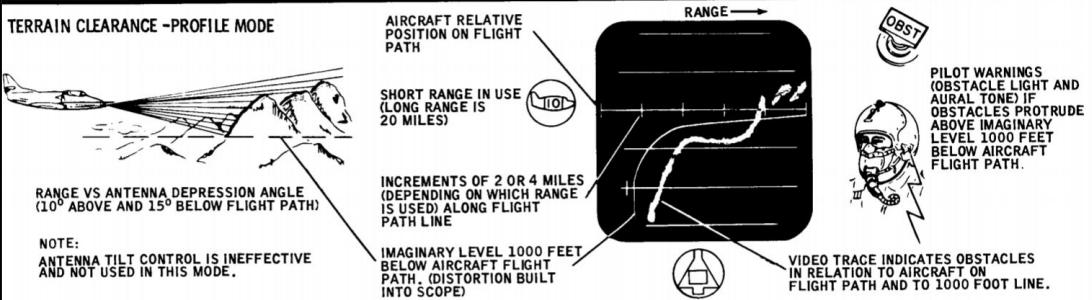
The alarm is controlled by the same circuits that control the 1000-foot terrain clearance scribe line and warns if any obstacle appears above it. A rough indication of the range to the target is provided by the percentage of time that the alarm is actuated. Targets near maximum range will give short blinks and as the target comes closer, the light will remain on for longer periods.

7. SENSORS

TERRAIN CLEARANCE-PLAN MODE



TERRAIN CLEARANCE - PROFILE MODE



AN/APG-53A Radar System

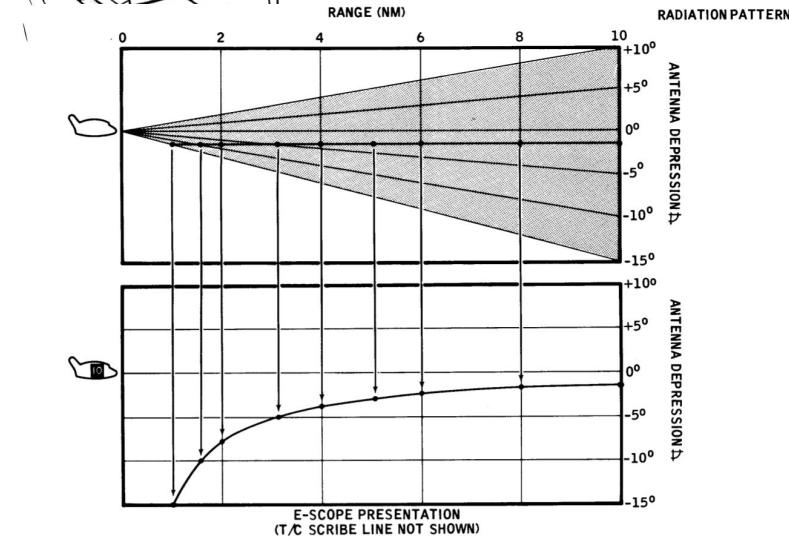
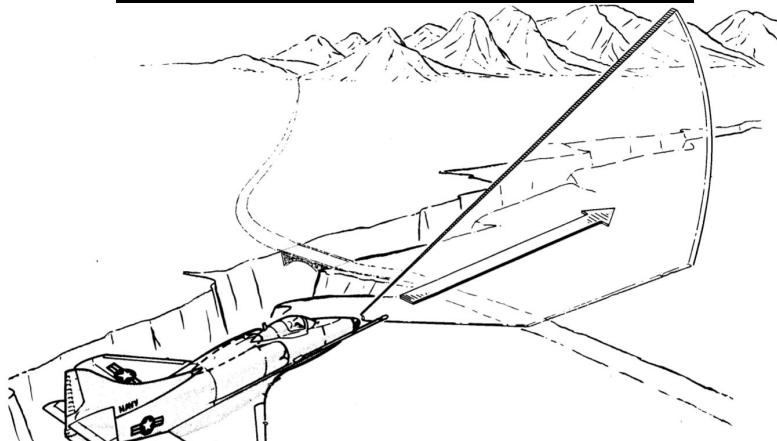
TERRAIN CLEARANCE - PROFILE MODE

The PROFILE display also provides an aid to letdown under conditions of reduced visibility.

The letdown is accomplished simply by descending at the desired schedule until the radar return intersects the 1000-foot terrain clearance scribe line at a range of 5 miles when operating on LONG range.

The dive angle is then continuously readjusted to maintain the intersection of radar return and T/C scribe line at 5 miles. This results in a gradual reduction in dive angle (and rate of descent) until in straight and level flight 1000 feet above the terrain.

Terrain Clearance - Profile Mode



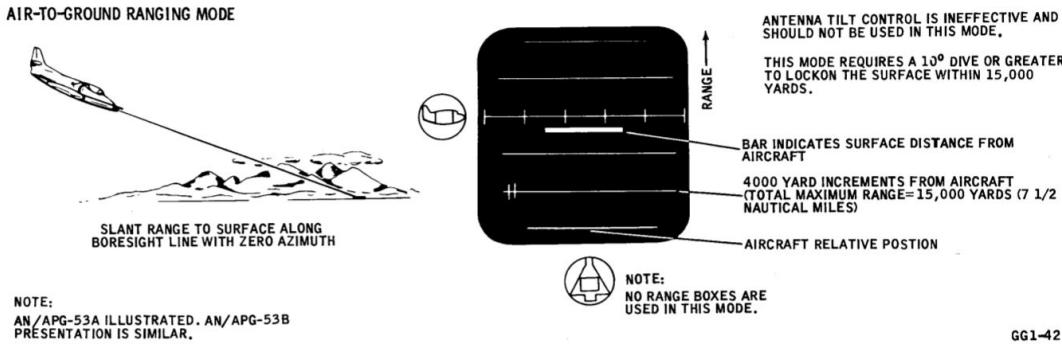


Figure 1-19. Radar Scope Presentations

AN/APG-53A Radar System

AIR-TO-GROUND MODE

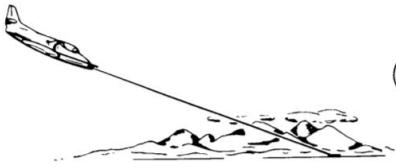
With the mode selector switch in the A/G position, the indicator (scope) shows the distance to the ground dead ahead.

The antenna is automatically fixed in the azimuth zero position and is parallel to the armament datum line in the elevation coordinate. When the antenna bore sight line and the sight line are made parallel (zero mil lead), the range indication will show the distance to the point on the ground at which the sight is aimed.

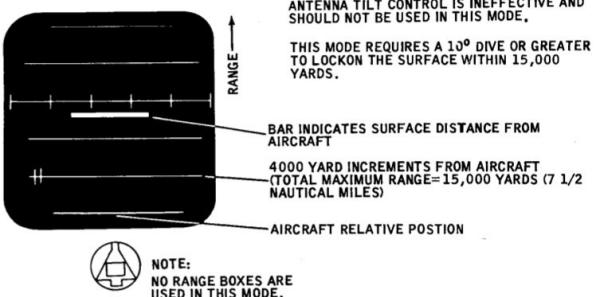
The angle between the ground and the antenna boresight line should be at least 10 degrees to provide adequate radar return for ranging lock-on

- If the distance to the ground exceeds the radar lockon range, the horizontal line will search from the top of the scope to the bottom.

AIR-TO-GROUND RANGING MODE

SLANT RANGE TO SURFACE ALONG
BORE SIGHT LINE WITH ZERO AZIMUTH

NOTE:
AN/APG-53A ILLUSTRATED. AN/APG-53B
PRESENTATION IS SIMILAR.



GG1-42

Figure 1-19. Radar Scope Presentations

AN/APG-53A Radar System

AIR-TO-GROUND MODE

When ground lock-on occurs the line will stop cycling and, as the slant range decreases, the bar will move downward.

The solid horizontal bar gives the pilot the approximate slant range in yards. The total maximum range in A/G mode is 15,000 yards (approximately 7 1/2 nautical miles. The aircraft relative position is at the bottom line on the scope (minus 15 degree elevation line).

After range lock-on of the horizontal bar, slant range can be read by reference to the horizontal lines etched on the reticle each of which represents a range increment of 4000 yards.

7. SENSORS



Approach Power Compensator

The APC controls the fuel control and is designed to maintain the optimum angle of attack of 17.5 units resulting in an optimum approach speed on the glide slope and during normal maneuvers in the landing pattern at any landing gross weight.

The APC is designed to command throttle position between an approximate 70 percent rpm and an approximate military rated thrust (MTR) in response to angle of attack.

The angle-of-attack signal is modified by normal acceleration and elevator control stick position. If the APC is engaged or operating when aircraft angles of attack are greater than or less than optimum, the APC will compensate by increasing or decreasing throttle position accordingly.

At angles of attack greater than optimum, the APC will command an increasing throttle position until MRT (approximate) is attained or the angle of attack returns to optimum. Conversely, at angles of attack less than optimum, the APC will command a decreasing throttle position until 70 percent (approximate) rpm is attained or the angle of attack returns to optimum.

7. SENSORS



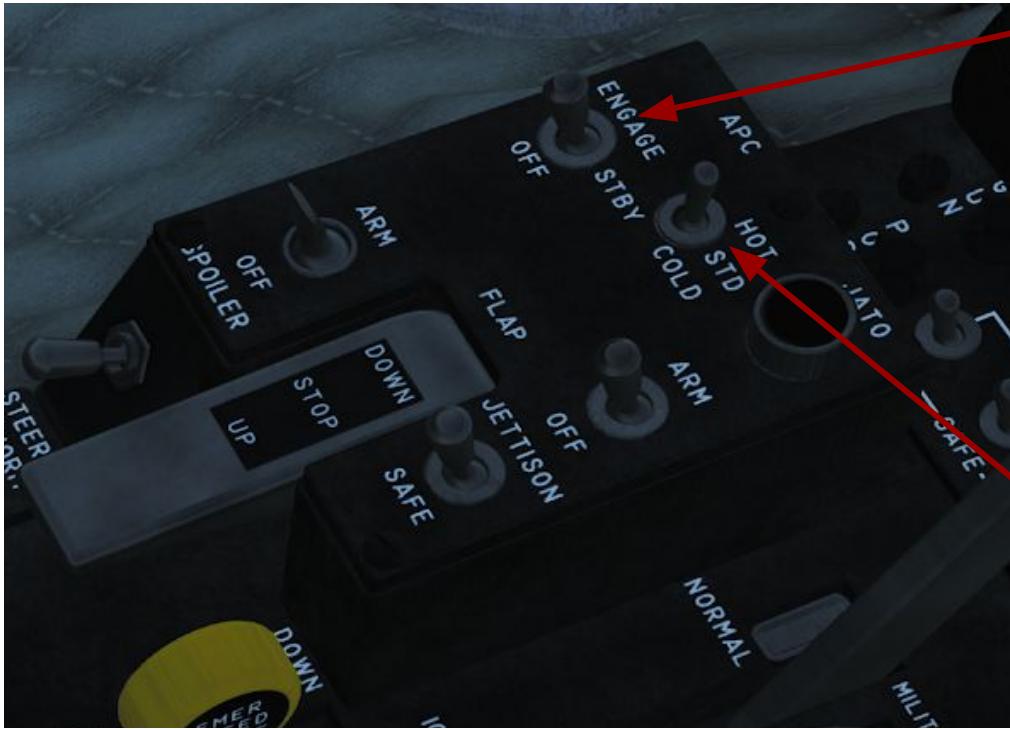
Approach Power Compensator

When the APC is in operation (power switch - ENGAGE), the system will disengage if any of the following occurs:

1. Throttle friction is applied.
2. Throttle position is below 70 percent (approximate) rpm.
3. Weight is applied to the main landing gear.
4. An override force of 25 to 30 pounds is applied to the throttles.
5. Power switch is manually returned to STBY position.

NOTE It is possible to manually hold the APC engaged and override features 1, 2, and 3.

7. SENSORS



Approach Power Compensator

APC POWER SWITCH

The APC power switch, labeled OFF, STBY, and ENGAGE, controls electrical power to the APC system. When the switch is in the OFF position, the APC is de-energized.

Placing the switch in STBY position energizes the APC but does not engage the system.

After the power switch has been positioned in STBY for a minimum of 15 seconds, and the status light (located on the AOA indexer) comes on, the APC will function when the power switch is placed in the ENGAGE position.

TEMPERATURE SWITCH

The air temperature switch, labeled HOT, STD (standard), and COLD, provides a means of compensating for variation in thrust due to outside air temperature changes. The HOT position should be used for temperatures above 80°F (27°C), STD, from 40° = to 80°F (5 to 27°C); and COLD, below 40°F (5°C)



Approach Power Compensator

APC STATUS LIGHT

APC system status is indicated to the pilot by the APC status light attached to the AOA indexer above the instrument glareshield.

The light comes on when the system is in STBY and goes off when the APC is engaged. The light comes on when the system is disengaged and/or is returned to STBY.

Approach Power Compensator Procedure

Normal Procedures for Landing:

1. Complete Landing Checklist
2. Throttle Friction - OFF
3. Air Temperature Switch - SET
4. APC Power Switch - STBY (Observe APC Light ON)
5. APC Power Switch - ENGAGE (Observe APC Light OFF)
6. Throttle - Observe movement
7. Angle-Of-Attack/Airspeed - Cross-Check

After Landing:

1. Throttle - Position as required
2. APC Light - ON
3. APC Power Switch - Check for STBY position.



7. SENSORS



Approach Power Compensator Technique

The technique required for an APC approach differs from a manual approach in that all glideslope corrections are made by changing aircraft attitude.

Since this technique violates the basic rule that altitude is primarily controlled by the throttle, practice is required to develop the proper control habits and coordination necessary to use APC.

Smooth attitude control is essential for the satisfactory performance of the APC. Large, abrupt attitude changes result in excessive thrust changes. Close-in corrections are very critical. A large attitude correction for a high close-in condition produces an excessive power reduction and can easily result in a hard landing.

If a high close-in situation develops, the recommended procedure is to stop meatball movement and not attempt to recenter the meatball. A low close-in condition is very difficult to safely correct with APC and usually results in an over-the-top bolter. The recommended procedure for a low close-in condition is to override the APC and complete the pass manually. Throughout the approach, the pilot should keep his hand lightly on the throttle in case it becomes necessary to manually override the APC.

8. WEAPONS AND ARMAMENT

Weapons and Armament

The A-4E is a versatile jet, capable of supporting a wide array of air-to-air and air-to-ground munitions across five hard points, including bombs, rockets, missiles and gun-pods

It played a key role in conflicts around the world, including the Vietnam War, the Yom Kippur War and the Falklands War, as well as serving as a training aircraft for the F-14 and an adversarial aircraft for the US Navy.

It was capable of carrying a bomb load equivalent to that of a World War II-era Boeing B-17 bomber



8. WEAPONS AND ARMAMENT

Guns

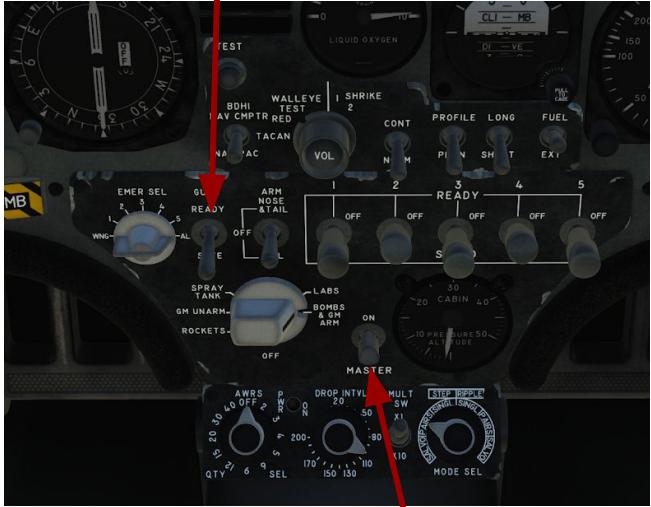
The A-4E has twin 20mm cannons built in and has the option of employing up to 3 MK4 HIPEG 20mm gunpods.



8. WEAPONS AND ARMAMENT

20mm Onboard Cannon

1. Master Arm to ON
2. Set GUNS switch to READY
3. Set gunsight range using dial to side of sight
4. Pull trigger to fire



2

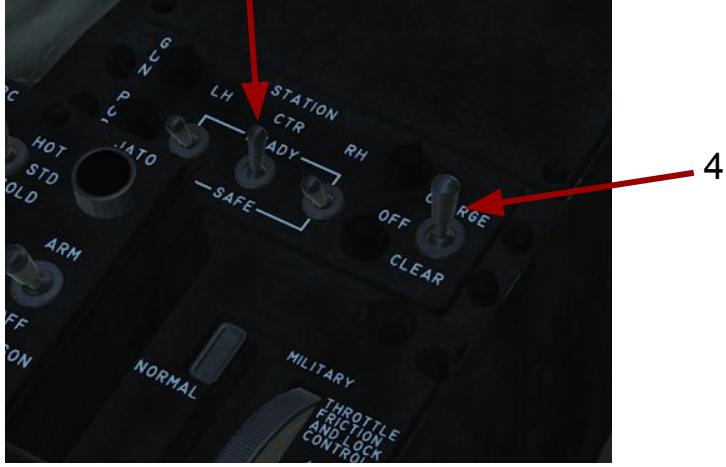
1

3

8. WEAPONS AND ARMAMENT



- ### Mk 4 HIPEG 20mm Cannon Pods
1. Master Arm to ON
 2. Set GUNS switch to Safe (So internal don't fire as well)
 3. Select pod pylon (Left, Center or Right)
 4. Set Pods to Charge
 5. Set gunsight range using dial to side of sight
 6. Pull trigger to fire



1

2

3

4

Introduction

Due to the sheer amount of munitions available for the A-4E-C I will be breaking them down by type.

BOMBS

WEAPON	TYPE	WEAPON	TYPE
AN-M30A1	100lb. General Purpose	Mk-77 Mod 0	750lb. Fire bomb
AN-M57A1	250lb. General Purpose	Mk-77 Mod 1	750lb. Fire bomb
AN-M64	500lb. General Purpose	Mk-81	250lb. General Purpose
AN-M65A1	1000lb. General Purpose	Mk-81SE (Snake Eye)	250lb. General Purpose - Retarded
AN-M66A2	2000lb. General Purpose	Mk-82	500lb. General Purpose
AN-M81	260lb. Fragmentation	Mk-82 Snake Eye	500lb. General Purpose - Retarded
AN-M88	220lb. Fragmentation	Mk-83	1000lb. General Purpose
M117	750lb. General Purpose	Mk-84	2000lb. General Purpose
Mk-20 (Rockeye)	Cluster Munition. 247 Dual-Purpose AP shaped charge bomblets		

8. WEAPONS AND ARMAMENT

Bombs

The A-4E carries its weapons on 5 pylons and has a number of deployment methods, which I will cover here.

It is able to release bombs in single, pairs or as a salvo, in step or ripple mode.

That is, it can release bombs individually, as a pair, or in a salvo of any number from 1 to a theoretical maximum of 400.

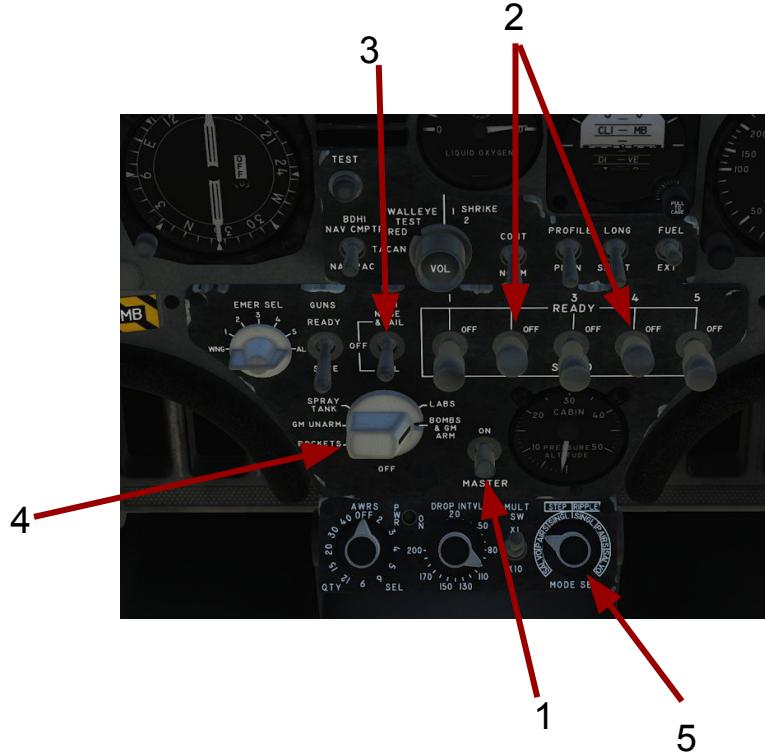
This is all controlled from the panel shown below.



8. WEAPONS AND ARMAMENT

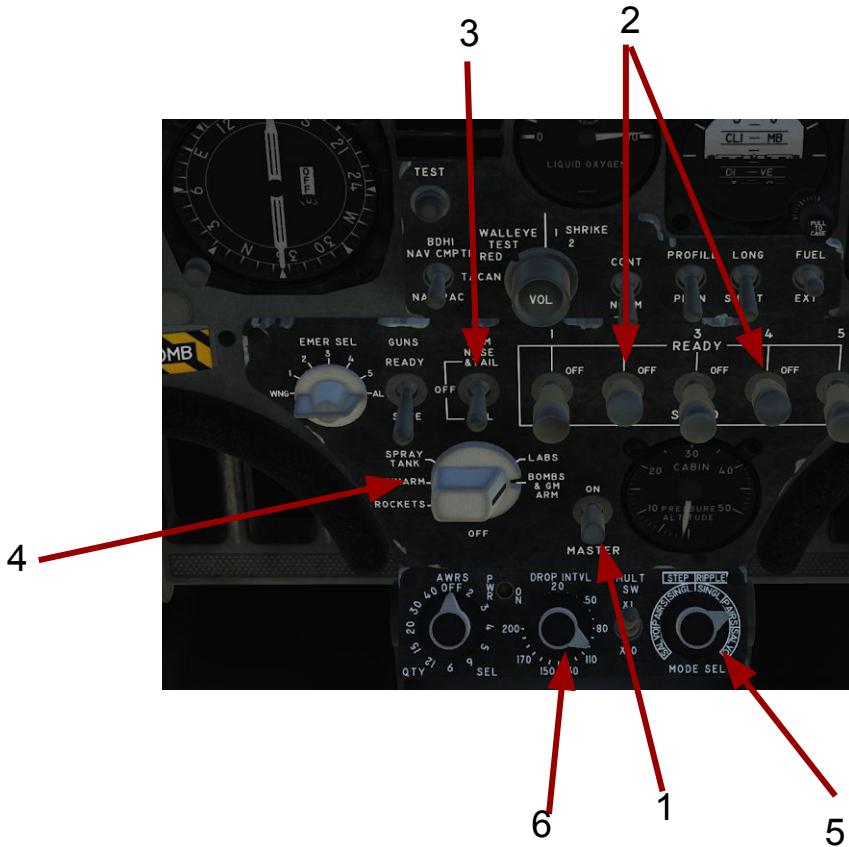
Bombs - Step Release

1. Master Arm to ON
2. Select hardpoint with desired bombs (2 and 4 in this case)
3. Set desired fusing (Nose & Tail in this case)
4. Weapon selector dial to Bombs & GM Arm
5. Select delivery number (in this case step pairs)
6. Pickle when on target (weapon release)



Bombs - Ripple Release

1. Master Arm to ON
2. Select hardpoint with desired bombs (2 and 4 in this case)
3. Set desired fusing (Nose & Tail in this case)
4. Weapon selector dial to Bombs & GM Arm
5. Select delivery type (in this case ripple pairs)
6. Set Desired Interval
7. Hold Pickle for duration of weapon drops



Bombs - Salvo Release

1. Master Arm to ON
2. Select hardpoint with desired bombs (2 and 4 in this case)
3. Set desired fusing (Nose & Tail in this case)
4. Weapon selector dial to Bombs & GM Arm
5. Select release type - salvo ripple
6. Select salvo number
7. Set Desired Interval
8. Hold Pickle for duration of weapon drops

To set more per salvo, use the x10 switch

4

6

7

5

3

2



Bombs - Depression Tables

Up until now I have been unable to find depression tables for all the bombs employed by the A-4E, however, it seems that a lot of the munitions behave very similarly to the Mk 82 Low Drag Bombs - For which I do have depression tables, I will include some indicative values below.

For reference purposes, at 0 ft distance on the reticle, each line away from the centre represents 10 mills

Sourced from the F-5E Weapons Manual

DIME ANGLE ABOVE TGT	ALT FT	TAS KTS	ELEV. RNG ^a	TIME OF FLIGHT	SLANT RANGE FROM REL	IMPACT ANGLE FROM FLIGHT PATH	SIGHT DEP MILS	WIND CORRECTION FACTORS		
								HEAD MILS/KNOT	TAIL MILS/KNOT	CROSS DRIFT CRAB FT/KNOT
0	400	362	2469	4.68	2327	15	144	.41	-.39	7.9
	400	2119	4.68		3144	14	130	.43	-.32	7.9
443	3728	4.68			3451	12	118	.28	-.26	7.9
443	3737	4.68			3758	11	108	.23	-.22	7.9
520	4045	4.69			4055	11	100	.27	-.19	7.9
560	4352	4.69			4370	10	97	.17	-.17	7.9
1	501	761	3161	5.27	3200	17	159	.45	-.43	8.9
	403	2569	5.27		3554	15	143	.37	-.35	8.9
443	3856	5.27			3884	14	131	.31	-.29	8.9
446	4223	5.28			4232	12	120	.26	-.25	8.9
520	4649	5.28			4576	12	111	.22	-.21	8.9
563	4894	5.28			4919	11	103	.19	-.18	8.9
0	600	360	3478	5.41	3529	18	173	.49	-.47	9.8
	450	3662	5.41		3917	17	156	.46	-.43	9.8
446	4242	5.41			4284	15	142	.33	-.32	9.8
446	4623	5.42			4662	14	130	.28	-.27	9.8
520	5304	5.42			5040	13	121	.24	-.23	9.8
560	5582	5.42			5416	12	112	.21	-.20	9.8
0	700	761	3764	6.38	3834	20	185	.53	-.50	10.6
	400	4183	6.30		4242	18	167	.47	-.41	10.6
446	4597	6.31			4650	16	153	.36	-.34	10.6
446	5319	6.31			5058	15	140	.30	-.29	10.6
520	5421	6.31			5466	14	130	.26	-.25	10.6
560	5831	6.32			5872	13	121	.22	-.21	10.6
0	800	360	4340	6.76	4118	21	197	.56	-.53	11.4
	410	4454	6.76		4556	19	178	.46	-.43	11.4
446	4927	6.77			4991	17	162	.38	-.36	11.4
446	5368	6.77			5427	16	149	.32	-.31	11.4
520	5609	6.78			5864	15	138	.27	-.26	11.4
560	6247	6.78			6298	14	128	.24	-.23	11.4
0	900	360	4294	7.19	4387	22	208	.59	-.56	12.1
	400	4765	7.20		4858	20	188	.48	-.46	12.1
446	5236	7.20			5212	18	171	.40	-.38	12.1
446	5705	7.21			5775	17	158	.34	-.32	12.1
520	6177	7.21			6238	16	146	.29	-.28	12.1
560	6338	7.22			6698	15	136	.25	-.24	12.1
0	1000	360	4574	7.60	4642	23	219	.62	-.58	12.8
	400	5031	7.51		5134	21	198	.51	-.45	12.8
446	5527	7.61			5617	19	180	.42	-.40	12.8
446	6222	7.62			6105	18	166	.36	-.34	12.8
520	6516	7.62			6592	17	153	.30	-.29	12.8
560	7006	7.63			7077	16	143	.26	-.25	12.8
0	1100	430	5284	8.00	5397	22	297	.52	-.50	13.5
	440	5805	8.00		5904	20	188	.44	-.42	13.5
446	6274	8.01			6419	19	173	.37	-.36	13.5
520	6842	8.01			6930	17	160	.31	-.31	13.5
560	7156	8.02			7438	16	149	.28	-.27	13.5
0	1200	430	5525	8.37	5654	23	215	.55	-.52	14.1
	440	6069	8.37		6186	21	196	.46	-.44	14.1
446	6612	8.38			6720	20	181	.39	-.37	14.1
520	7153	8.39			7253	18	167	.33	-.32	14.1
560	7691	8.40			7777	17	156	.29	-.28	14.1
0	1200	440	6323	8.72	6455	22	204	.47	-.45	14.7
	450	6878	8.74		7039	21	187	.40	-.38	14.7
446	7461	8.75			7562	19	174	.34	-.33	14.7
520	8110	8.76			8115	18	162	.20	-.29	14.7

Bombs - Depression Tables

Up until now I have been unable to find depression tables for all the bombs employed by the A-4E, however, it seems that a lot of the munitions behave very similarly to the MK82 Low Drag Bombs - For which I do have depression tables, I will include some indicative values below.

For reference purposes, at 0 ft distance on the reticle, each line away from the centre represents 10 mills

Sourced from the F-5E Weapons Manual

DIVE ANGLE DEG	ALT FT	TAS KTS	BOMB RANGE FT	TIME OF FLIGHT SEC	SLANT RANGE FROM RETICLE FT	IMPACT ANGLE DEG	SIGHT DEP FROM FLIGHT PATH MILS	WIND CORRECTION FACTORS		
								HEAD MILS/KNOT	TAIL MILS/KNOT	GROSS FT/SEC
15	1000	360	2467	4.27	2662	28	126	1.05	-1.00	7.2
	400	2592	4.34	2774	26	109	.91	-.87	6.8	
	440	2701	4.42	2880	25	95	.80	-.77	6.5	
	480	2746	4.53	2963	23	86	.71	-.69	6.1	
	520	2879	4.75	3148	23	74	.64	-.62	5.8	
	560	2952	4.79	3117	22	67	.59	-.57	5.5	
15	1510	360	3146	5.85	3667	31	161	1.13	-1.08	9.8
	400	3547	5.54	3847	29	143	.98	-.93	9.3	
	440	3718	5.29	4009	28	123	.86	-.82	8.9	
	480	3873	5.05	4153	26	109	.76	-.73	8.5	
	520	4012	4.81	4243	25	97	.68	-.66	8.2	
	560	4135	4.63	4399	24	87	.62	-.60	7.8	
15	2010	360	4115	7.17	4575	35	192	1.19	-1.14	12.1
	400	4379	6.87	4814	32	168	1.03	-.98	11.6	
	440	4617	6.59	5320	30	148	.90	-.87	11.1	
	480	4832	6.32	5234	29	132	.80	-.77	10.7	
	520	5027	6.08	5410	27	114	.72	-.69	10.3	
	560	5201	5.85	5572	26	106	.65	-.63	9.9	
15	2500	360	4866	8.40	5617	37	219	1.24	-1.19	14.2
	400	5133	8.04	5719	35	192	1.07	-1.03	13.6	
	440	5432	7.74	5979	33	171	.94	-.90	13.1	
	480	5704	7.49	6228	31	152	.83	-.80	12.6	
	520	5952	7.22	6456	29	137	.75	-.72	12.2	
	560	6177	6.97	6663	28	124	.68	-.65	11.8	
15	3000	360	5438	9.53	6210	40	244	1.28	-1.23	16.1
	400	5825	9.20	6552	37	215	1.11	-1.07	15.5	
	440	6141	8.94	6870	35	191	.97	-.93	15.0	
	480	6508	8.58	7166	33	171	.86	-.83	14.5	
	520	5408	8.29	7446	31	154	.77	-.75	14.0	
	560	7041	8.03	7690	30	149	.70	-.68	13.5	
15	3500	400	6467	10.24	7154	39	235	1.15	-1.10	17.3
	440	6878	9.91	7717	37	210	1.00	-.97	16.7	
	480	7257	9.59	8557	35	188	.89	-.86	16.2	
	520	7708	9.29	8374	33	170	.80	-.77	15.7	
	560	7927	9.02	8665	31	155	.72	-.70	15.2	
15	4000	440	7532	10.88	8528	38	227	1.03	-.99	18.4
	480	7961	10.55	8910	36	205	.92	-.88	17.8	
	520	8360	10.24	9264	34	185	.82	-.79	17.3	
	560	8724	9.96	9597	33	169	.74	-.72	16.8	
15	4500	480	8627	11.46	9731	38	220	.94	-.91	19.3
	520	9073	11.14	10286	36	199	.84	-.81	18.8	
	560	9478	10.86	10492	34	182	.76	-.74	18.3	
15	5000	520	9751	12.01	10958	37	213	.86	-.83	20.3
	560	10197	11.72	11357	36	195	.78	-.76	19.8	
15	5500	520	10399	12.84	11764	38	225	.88	-.85	21.7
	560	10885	12.55	12194	37	207	.80	-.77	21.2	
20	1000	360	2048	3.64	2279	31	188	1.23	-1.17	6.1
	400	2129	3.41	2352	29	183	1.07	-1.03	5.8	
	440	2197	3.20	2414	28	80	.95	-.92	5.4	
	480	2255	3.01	2467	27	71	.86	-.83	5.1	
	520	2304	2.84	2512	26	63	.78	-.75	4.8	
	560	2347	2.68	2555	25	56	.71	-.69	4.5	
20	1500	360	2857	6.36	3209	34	139	1.28	-1.22	8.5
	400	2971	4.77	3323	32	120	1.12	-1.07	8.1	
	440	3088	4.51	3433	31	105	.99	-.96	7.6	
	480	3188	4.27	3524	29	92	.89	-.86	7.2	
	520	3276	4.05	3603	28	82	.81	-.78	6.8	
	560	3352	3.85	3672	27	73	.74	-.72	6.5	
20	2000	360	3539	6.34	4065	37	167	1.33	-1.27	10.7
	400	3727	6.01	4230	35	145	1.16	-1.12	10.1	
	440	3893	5.70	4377	33	127	1.03	-.99	9.6	
	480	4038	5.43	4506	32	112	.92	-.89	9.2	
	520	4166	5.17	4621	30	100	.83	-.81	8.7	
	560	4278	4.93	4723	29	89	.76	-.74	8.3	

8. WEAPONS AND ARMAMENT

DIVE ANGLE ABOVE TGT	ALT FT	TAS KTS	BOMB FT	TIME OF FLIGHT SEC	SLANT RANGE FROM REL FT	IMPACT ANGLE DEG	SIGHT DEP FROM FLIGHT PATH	WIND CORRECTION FACTORS			DIVE ANGLE ABOVE TGT	ALT FT	TAS KTS	BOMB FT	TIME OF FLIGHT SEC	SLANT RANGE FROM REL FT	IMPACT ANGLE DEG	SIGHT DEP FROM FLIGHT PATH	WIND CORRECTION FACTORS												
								HEAD	TAIL	CROSS																					
								MILES	MILES/KNOT	FT/KT																					
15	1000	360	2457	4.27	2662	28	126	1.05	-1.00	7.2	20	2500	360	4177	7.50	4468	39	192	1.37	-1.31	12.7	400	4418	7.14	5077	37	167	1.20	-1.15	12.1	
	400	2592	4.04	2776	26	109	.91	-.87	6.8		440	4633	6.81	5264	35	147	1.06	-1.02	11.5	440	4822	6.50	5432	33	130	.95	-1.92	11.0			
	440	2701	3.82	2680	25	95	.80	-.77	6.5		520	4992	6.21	5583	32	116	.86	-.83	10.5	520	5152	5.95	5717	31	105	.78	-.76	10.0			
	480	2746	3.63	2969	23	46	.71	-.69	6.1		560	5292	2.79	3117	22	57	.59	-.57	5.5												
	520	2879	3.45	1646	23	74	.54	-.62	5.8																						
	560	2952	3.27	4317	22	67	.59	-.57	5.5																						
15	1500	360	3346	5.81	3667	31	161	1.13	-1.08	9.8	20	3000	360	4766	8.58	5631	41	214	1.41	-1.35	14.5	400	5058	8.20	5841	39	187	1.23	-1.14	13.6	
	400	1547	5.54	3847	29	143	.98	-.93	9.3		440	5320	7.84	6108	37	165	1.00	-1.05	13.2	440	5555	7.51	6313	35	147	.97	-1.94	12.7			
	440	1718	6.29	4000	28	123	.86	-.82	8.9		520	5765	7.20	6499	34	132	.88	-.85	12.1	520	5952	6.92	6665	32	119	.80	-.78	11.7			
	480	5873	5.05	4153	26	109	.76	-.73	8.5		560	6178	5.61	6878	30	108	.76	-.73	8.1												
	520	4052	4.81	4263	25	97	.68	-.66	8.2																						
	560	4135	4.63	4299	24	47	.62	-.60	7.8																						
15	2000	360	4115	7.17	4575	35	192	1.19	-1.14	12.1	20	3500	360	5315	9.59	6364	43	234	1.43	-1.37	16.2	400	5657	9.19	6652	41	206	1.26	-1.21	15.5	
	400	4379	6.87	4714	32	168	1.03	-.98	11.6		440	5965	8.82	6916	39	183	1.11	-1.07	14.9	440	6243	8.46	7157	37	163	1.09	-1.06	14.3			
	440	4617	6.59	5322	30	148	.90	-.87	11.1		520	6494	8.13	7377	35	146	.90	-.87	13.7	520	6718	7.83	7575	34	132	.82	-.80	13.2			
	480	4852	6.32	5234	29	132	.80	-.77	10.7		560	7145	7.45	7824	37	120	.92	-.89	10.2												
	520	5627	6.18	5610	27	118	.72	-.69	10.3																						
	560	5801	5.95	5672	26	106	.65	-.63	9.9																						
15	2500	360	4506	8.40	5117	37	219	1.24	-1.19	14.2	20	4000	400	6220	10.13	7305	42	223	1.28	-1.23	17.1	440	6577	9.74	7695	40	198	1.13	-1.09	16.4	
	400	5133	8.08	5710	35	192	1.07	-1.03	13.6		440	6894	9.37	7970	38	177	1.02	-1.04	15.8	440	7165	9.02	8224	37	160	.92	-.89	15.2			
	440	5432	7.74	5979	33	171	.94	-.90	13.1		520	7445	8.71	8452	35	145	.84	-.81	14.7	520	7718	8.39	8757	34	132	.82	-.80	14.1			
	480	5704	7.49	6226	31	152	.83	-.80	12.6																						
	520	5952	7.22	6456	29	137	.75	-.72	12.2																						
	560	6177	6.97	6665	28	124	.68	-.65	11.8																						
15	3000	360	5438	9.55	6210	40	244	1.28	-1.23	16.1	20	4500	400	6755	11.93	8116	44	239	1.30	-1.25	18.6	440	7151	10.62	8449	42	213	1.15	-1.11	17.9	
	400	5825	9.20	6552	37	215	1.11	-.107	15.5		440	7513	10.24	8758	40	191	1.03	-1.08	17.3	440	7844	9.88	9043	38	172	.93	-.90	16.7			
	440	6141	8.94	6870	35	191	.97	-.94	15.0		520	8139	9.56	9200	36	157	.85	-.83	16.1	520	8460	9.19	9520	36	138	.82	-.80	15.5			
	480	6508	8.54	7166	33	171	.86	-.83	14.5																						
	520	5608	8.24	7446	31	154	.77	-.75	14.0																						
	560	7041	8.03	7690	30	149	.70	-.68	13.5																						
15	3500	400	6467	10.24	7154	39	235	1.15	-1.10	17.3	20	5000	440	7702	11.47	9183	43	227	1.17	-1.13	19.4	440	8105	11.07	9523	41	204	1.05	-1.02	18.7	
	440	6878	9.91	7717	37	210	1.00	-.97	16.7		520	8474	10.70	9859	39	185	.95	-.92	18.1	520	8807	10.37	10124	38	168	.87	-.84	17.9			
	480	7257	9.59	8457	35	188	.89	-.86	16.2																						
	520	7608	9.29	8374	33	170	.80	-.77	15.7																						
	560	7927	9.02	8655	31	159	.72	-.70	15.2																						
15	4000	440	752	10.88	8528	38	227	1.03	-.99	18.4	20	6000	480	9218	12.65	12998	43	229	1.08	-1.04	21.3	440	1024	10.52	1064	40	190	1.05	-1.02	20.7	
	480	7961	10.55	8810	36	205	.92	-.88	17.8		520	9666	12.26	11372	41	207	.98	-.95	20.7	520	10374	11.15	10976	39	179	.88	-.86	18.8			
	520	8370	10.24	9268	34	185	.82	-.79	17.3																						
	560	8724	9.97	9547	33	169	.74	-.72	16.8																						
15	4500	480	8627	11.46	9731	38	220	.94	-.91	19.3	20	6500	520	1222	13.80	17114	42	218	.99	-.96	21.0	440	1234	11.47	2053	40	197	1.00	-1.03	20.6	
	520	9073	11.14	1028	36	199	.84	-.81	18.8		520	1265	11.02	2068	39	91	1.02	-1.07	20.5	520	13074	10.61	2014	40	196	.96	-.93	19.4			
	560	9478	10.86	10492	34	182	.76	-.74	18.3																						
15	5000	520	9751	12.01	10898	37	213	.86	-.83	20.3	20	7000	560	12222	13.80	17114	42	218	.99	-.96	21.0	520	1265	11.47	2053	40	197	1.00	-1.03	20.6	
	560	10197	11.72	11357	36	195	.78	-.76	19.8																						
15	5500	520	10399	12.84	11764	38	225	.88	-.85	21.7	20	7000	560	12855	12.77	17114	42	218	.99	-.96	21.4	520	13270	12.30	17445	40	197	1.00	-1.03	21.0	
	560	10885	12.55	12194	37	207	.80	-.77	21.2																						
20	1000	360	2048	3.64	2279	31	188	1.23	-1.17	6.1	20	2000	400	2630	5.12	3244	43	128	1.62	-1.56	8.6	440	2730	4.78	3345	41	118	1.44	-1.39	8.1	
	400	2129	3.37	3209	32	120	1.12	-1.07	6.1		440	2815	4.47	3416	42	96	1.20	-1.25	7.6	440	3045	4.00	3511	39	84	1.18	-1.14	7.1			
	440	2197	3.20	2414	28	80	.95	-.92	5.4		520	2446	3.94	3561	37	74	1.08	-1.04	6.7	520	2997	3.74	3663	37	66	1.00	-1.02	6.3			
	480	2255	3.01	2607	27	71	.86	-.83	5.1																						
	520	2304	2.84	2512	26	63	.78	-.75	4.8																						
	560	2347	2.68	2551	25	56	.71	-.69	4.5																						

8. WEAPONS AND ARMAMENT

DIVE ANGLE ABOVE TGT	ALT FT	TAS KTS	BOMBS FT	TIME OF FLIGHT SEC	SLANT RANGE FT	IMPACT ANGLE DEG	SIGHT DEP FROM REL FT	WIND CORRECTION FACTORS			HEAD MILS/KNOT	TAIL FT/KT	GROSS FT/KT	HEAD MILS/KNOT	TAIL FT/KT	GROSS FT/KT	HEAD MILS/KNOT	TAIL FT/KT	GROSS FT/KT													
								HEAD	TAIL	GROSS																						
								MILES	MILES	FT																						
30	3500	360	4100	4.05	5307	68	183	1.67	-1.61	13.6	30	9500	480	10024	15.08	13811	55	235	1.29	-1.25	25.4	30	10000	480	14000	15.67	14428	54	243	1.29	-1.26	26.4
		400	4312	7.63	5564	66	159	1.49	-1.43	12.6			520	1457	14.59	14226	51	214	1.19	-1.16	24.6			520	18026	14.29	14003	50	197	1.11	-1.08	24.0
		440	4488	7.19	5692	44	140	1.34	-1.29	12.1			540	1461	14.83	14228	51	214	1.19	-1.16	25.6			540	1854	15.19	14759	52	221	1.19	-1.16	25.6
		480	4641	6.81	5813	43	126	1.21	-1.18	11.5			560	1475	6.47	5920	41	110	1.11	-1.08	10.9			560	11241	14.79	15045	51	204	1.12	-1.09	25.0
		520	4775	6.47	5920	43	99	1.32	-1.00	10.4			560	4849	6.17	6013	43	99	1.03	-1.03	11.7			560	2042	4.99	3228	55	132	2.03	-1.96	8.3
		600	4977	4.45	6238	47	174	1.58	-1.45	14.3			400	2103	4.53	3267	53	34	1.83	-1.77	7.7			400	2152	4.21	3299	52	76	1.66	-1.62	7.1
30	4000	360	4549	8.93	6057	49	199	1.68	-1.62	15.1	30	3500	360	2714	5.74	3834	56	115	2.02	-1.95	9.7	30	3000	360	2387	5.74	3834	56	115	2.02	-1.95	9.7
		400	4747	4.45	6238	47	174	1.58	-1.45	14.3			440	2161	6.10	4492	56	139	1.82	-1.76	10.3			440	2466	5.33	3884	55	99	1.82	-1.77	9.8
		440	4994	8.92	6398	45	153	1.35	-1.30	13.5			480	5175	7.62	5514	44	135	1.22	-1.19	12.9			480	2491	4.97	3925	53	86	1.66	-1.62	8.4
		480	5175	7.62	5514	44	135	1.22	-1.19	12.9			520	5335	7.25	6668	42	121	1.12	-1.09	12.2			520	5472	6.92	6778	41	199	1.03	-1.03	11.7
		520	5335	7.25	6668	42	121	1.12	-1.09	12.2			560	5472	6.92	6778	41	199	1.03	-1.03	11.7			560	2585	4.64	3560	52	76	1.52	-1.49	7.8
		560	5472	6.92	6778	41	199	1.03	-1.03	11.7			400	2152	4.21	3299	52	76	1.66	-1.62	7.1			400	2466	5.33	3884	55	99	1.82	-1.77	9.8
30	4500	360	4969	9.77	6703	51	213	1.69	-1.63	16.5	30	4000	360	3036	7.33	5821	58	177	2.00	-1.94	12.4	30	4500	360	3714	6.55	4431	57	127	2.01	-1.95	11.1
		400	5242	9.28	6807	48	147	1.52	-1.46	15.7			440	5479	8.01	5933	56	119	1.81	-1.76	11.5			440	3151	6.48	5533	55	104	1.65	-1.61	10.8
		440	5479	8.01	5933	55	104	1.36	-1.31	14.9			480	5684	8.74	6044	54	124	1.76	-1.70	12.0			480	3244	5.01	5247	54	92	1.52	-1.48	10.2
		480	5684	8.74	6044	54	124	1.23	-1.20	14.2			520	5874	9.30	6154	53	111	1.14	-1.11	13.5			520	3283	5.02	4625	52	74	1.41	-1.37	8.5
		520	5874	9.30	6154	53	111	1.13	-1.10	13.5			560	6034	9.87	6262	45	127	1.05	-1.02	14.1			560	3462	5.36	5291	52	73	1.31	-1.28	9.0
		560	6034	9.87	6262	45	127	1.05	-1.02	14.1			400	3151	6.48	5533	55	104	1.65	-1.61	10.8			400	3479	7.55	5688	57	128	1.80	-1.76	12.8
30	5000	360	5370	10.58	7378	52	227	1.69	-1.63	17.9	30	5500	360	3637	8.08	5605	59	144	1.98	-1.93	13.6	30	6000	360	4541	9.52	6143	60	156	1.98	-1.92	14.9
		400	5676	10.77	7566	50	199	1.51	-1.46	17.0			440	5945	7.68	5933	56	119	1.81	-1.76	11.5			440	3251	6.48	5533	55	104	1.65	-1.61	10.8
		440	5945	9.59	7766	48	176	1.37	-1.32	16.2			480	6184	9.14	7952	46	157	1.24	-1.20	15.4			480	3247	5.70	5454	54	95	1.66	-1.61	9.6
		480	6184	9.14	7952	46	157	1.24	-1.20	15.4			520	6395	8.73	8116	44	141	1.14	-1.10	14.7			520	3285	5.34	4597	52	84	1.52	-1.49	9.8
		520	6395	8.73	8116	44	141	1.13	-1.10	14.7			560	6577	9.17	8262	45	127	1.05	-1.02	14.1			560	3462	5.36	5291	52	73	1.31	-1.28	9.0
		560	6577	9.17	8262	45	127	1.05	-1.02	14.1			400	3151	6.48	5533	55	104	1.65	-1.61	10.8			400	3479	7.55	5688	57	128	1.80	-1.76	12.8
30	5500	360	5756	11.36	7962	53	240	1.70	-1.64	19.2	30	6000	360	3541	8.08	5605	59	144	1.98	-1.93	13.6	30	6500	360	4379	7.55	5821	58	177	2.00	-1.94	12.4
		400	6094	10.43	8209	51	211	1.52	-1.47	18.3			440	5945	7.68	5933	56	119	1.81	-1.76	11.5			440	3251	6.48	5533	55	104	1.65	-1.61	10.8
		440	6395	10.33	8435	49	188	1.37	-1.33	17.4			480	6662	9.47	8639	47	167	1.25	-1.21	16.7			480	3247	5.70	5247	54	92	1.52	-1.48	11.3
		480	6662	9.47	8639	47	167	1.25	-1.21	16.7			520	6899	9.44	8823	45	150	1.14	-1.11	15.9			520	3776	5.36	5874	54	86	1.41	-1.37	13.6
		520	6899	9.44	8823	45	150	1.14	-1.11	15.9			560	7164	9.76	9694	45	144	1.07	-1.04	16.5			560	4220	6.57	6543	54	85	1.31	-1.28	11.1
		560	7164	9.76	9694	45	144	1.07	-1.04	16.5			400	3151	6.48	5533	55	104	1.65	-1.61	10.8			400	3479	7.55	5688	57	128	1.80	-1.76	12.8
30	6000	360	6889	12.29	9472	53	233	1.53	-1.48	20.7	30	6500	360	3973	9.52	6766	61	157	1.97	-1.91	16.1	30	7000	360	4730	11.53	7468	62	184	1.95	-1.90	17.2
		400	7259	11.76	9737	50	208	1.38	-1.34	19.8			440	6182	12.44	10375	51	218	1.39	-1.35	21.0			440	4686	10.26	6013	60	154	1.78	-1.72	16.2
		440	7259	11.76	9737	50	208	1.38	-1.34	19.8			480	6577	11.53	10637	49	195	1.27	-1.23	20.1			480	4737	9.55	7012	56	176	1.66	-1.60	15.3
		480	7259	11.76	9737	50	208	1.38	-1.34	19.8			520	7681	10.51	10200	47	168	1.16	-1.13	18.2			520	4975	9.73	7302	55	181	1.40	-1.37	17.7
		520	7681	10.51	10200	47	168	1.16	-1.13	18.2			560	8110	10.39	10393	46	153	1.07	-1.05	17.6			560	4964	9.73	7774	55	97	1.31	-1.29	13.1
		560	8110	10.39	10393	46	153	1.07	-1.05	17.6			400	3151	6.48	5533	55	104	1.65	-1.61	10.8			400	3479	7.55	5688	57	128	1.80	-1.76	12.8
30	6500	360	7259	11.76	9737	50	208	1.38	-1.34	19.8	30	70																				

8. WEAPONS AND ARMAMENT

Bombs - Depression Tables

The same tables for the Mk82 SE now follow

DIVE ANGLE ABOVE TGT	ALT FT	TAS KTS	BOMB RANGE FT	TIME OF FLIGHT SEC	SLANT RANGE FT	IMPACT ANGLE DEG	SIGHT CORRECTION		WIND CORRECTION		
							FROM FLIGHT PATH	MILS	HEAD MILS/KNOT	TAIL FT/KNOT	CROSS DRIFT CRSS FT/KNOT
0	100	360	1170	2.44	1174	11	.90	.33	-.31	4.1	.9
		430	1244	2.46	1248	10	.82	.28	-.26	4.2	.9
		440	1295	2.49	1298	9	.76	.24	-.22	4.2	1.0
		440	1597	2.51	1536	9	.70	.20	-.19	4.2	1.1
		520	1618	2.53	1611	8	.66	.18	-.17	4.3	1.2
		560	1711	2.56	1714	8	.62	.16	-.15	4.3	1.3
0	125	360	1293	2.80	1299	12	1.01	.38	-.36	4.7	1.1
		410	1416	2.83	1421	12	.92	.32	-.30	4.8	1.2
		440	1534	2.86	1539	11	.85	.28	-.26	4.8	1.3
		440	1650	2.89	1654	11	.79	.24	-.23	4.9	1.4
		520	1762	2.91	1766	10	.74	.21	-.20	4.9	1.5
		560	1871	2.94	1875	10	.70	.19	-.18	5.0	1.6
0	150	360	1398	3.12	1436	14	1.11	.44	-.46	5.3	1.4
		400	1528	3.16	1536	13	1.02	.37	-.34	5.3	1.5
		440	1652	3.20	1660	13	.96	.32	-.30	5.4	1.6
		440	1774	3.23	1780	12	.88	.28	-.26	5.4	1.6
		520	1891	3.26	1897	12	.87	.25	-.23	5.5	1.9
		560	2195	3.29	2011	11	.78	.22	-.21	5.6	2.0
0	175	360	1492	3.47	1502	16	1.21	.49	-.45	5.8	1.7
		410	1627	3.47	1636	15	1.11	.41	-.39	5.9	1.8
		440	1757	3.51	1765	14	1.03	.36	-.34	5.9	1.9
		440	1882	3.45	1890	14	.96	.31	-.30	6.0	2.1
		520	2004	3.58	2011	13	.90	.28	-.26	6.0	2.2
		560	2121	3.62	2128	13	.85	.25	-.24	6.1	2.3
0	200	360	1575	3.72	1567	18	1.30	.54	-.59	6.3	1.9
		400	1714	3.77	1726	17	1.20	.46	-.43	6.4	2.1
		440	1849	3.81	1859	16	1.11	.40	-.37	6.4	2.2
		440	1978	3.85	1988	15	.94	.35	-.33	6.5	2.4
		520	2113	3.88	2112	15	.98	.31	-.30	6.6	2.5
		560	2223	3.92	2222	15	.92	.28	-.27	6.6	2.6
0	225	360	1650	4.00	1665	19	1.39	.59	-.54	6.7	2.2
		400	1793	4.04	1808	18	1.28	.50	-.47	6.8	2.3
		440	1931	4.09	1944	15	1.19	.44	-.41	6.9	2.5
		440	2064	4.13	2076	17	1.12	.39	-.36	7.0	2.7
		520	2192	4.17	2203	17	1.05	.35	-.33	7.0	2.8
		560	2315	4.21	2325	16	.99	.31	-.30	7.1	3.0
0	250	360	1718	4.26	1736	21	1.48	.64	-.59	7.2	2.4
		400	1866	4.31	1852	20	1.37	.55	-.51	7.3	2.6
		440	2007	4.35	2022	19	1.27	.48	-.45	7.3	2.8
		440	2142	4.40	2157	19	1.19	.42	-.40	7.4	3.0
		520	2272	4.44	2286	18	1.12	.38	-.36	7.5	3.1
		560	2397	4.48	2410	18	.96	.35	-.32	7.6	3.3
0	275	360	1781	4.50	1802	22	1.57	.69	-.64	7.6	2.7
		410	1932	4.56	1951	22	1.45	.59	-.55	7.7	2.9
		440	2076	4.61	2094	21	1.35	.52	-.46	7.8	3.1
		440	2213	4.66	2230	20	1.26	.46	-.43	7.9	3.2
		520	2346	4.70	2362	20	1.19	.42	-.39	7.9	3.4
		560	2473	4.74	2488	19	1.13	.38	-.35	8.0	3.6
0	300	360	1840	4.74	1864	24	1.65	.74	-.68	8.0	2.9
		410	1993	4.80	2016	23	1.53	.64	-.59	8.1	3.1
		440	2139	4.85	2160	22	1.42	.56	-.52	8.2	3.3
		440	2279	4.90	2299	22	1.34	.50	-.47	8.3	3.5
		520	2417	4.95	2432	21	1.26	.45	-.42	8.4	3.7
		560	2542	4.99	2560	21	1.20	.41	-.38	8.4	3.9
0	410	360	2340	5.62	2079	30	1.97	.94	-.86	9.5	3.8
		410	2201	5.69	2217	29	1.85	.82	-.75	9.6	4.1
		440	2355	5.75	2349	28	1.71	.72	-.67	9.7	4.4
		440	2502	5.81	2533	27	1.51	.65	-.60	9.8	4.6
		520	2541	5.86	2672	27	1.53	.59	-.55	9.9	4.8
		560	2775	5.91	2404	26	1.45	.54	-.50	10.0	5.0

WEAPONS AND ARMAMENT

PIKE ANGLE ABOVE TGT	ALT TAS	RNGR FROM	TIME OF FLIGHT	SLANT RANGE	IMPACT ANGLE	SIGHT DEP FROM FLIGHT PATH	WIND CORRECTION FACTORS	DIVE						TIME OF FLIGHT	SLANT RANGE	IMPACT ANGLE	SIGHT DEP FROM FLIGHT PATH	WIND CORRECTION FACTORS										
								HEAD			TAIL	GROSS	HEAD			TAIL	GROSS	HEAD			TAIL	GROSS						
								DEG	FT	KTS	FT	SEC	FT	DEC	MILS	MILS/KNOT	FT/KT	DEG	FT	KTS	FT	SEC	FT	MILS	MILS/KNOT	FT/KT		
10	400	360	1734	7.19	1446	24	110	1.29	-1.02	5.4								10	1510	520	3240	9.60	4588	54	259	1.08	-1.83	16.2
		400	1646	7.06	1517	22	95	1.95	-0.89	5.2								20	700	560	3345	9.53	3702	53	245	1.05	-1.70	16.1
		440	1520	2.93	1582	21	85	1.83	-0.78	4.9								20	700	360	1415	3.54	1579	74	114	1.76	-1.65	6.0
		480	1500	2.81	1539	20	76	1.74	-0.70	4.7								20	700	430	1472	3.43	1670	33	98	1.55	-1.46	5.6
		520	1543	2.69	1691	19	68	1.67	-0.63	4.5								20	700	440	1521	3.14	1675	31	96	1.38	-1.30	5.3
		560	1691	2.54	1738	18	61	1.60	-0.57	4.4								20	800	360	1555	4.09	1748	37	170	1.90	-1.77	6.9
10	500	360	1597	7.93	1674	28	133	1.25	-1.16	6.6								20	800	590	1622	3.47	1806	35	113	1.67	-1.57	6.6
		400	1688	7.80	1760	26	117	1.09	-1.02	6.4								20	800	490	1682	3.41	1811	33	98	1.49	-1.40	6.2
		440	1778	3.67	1439	25	104	1.96	-0.90	6.2								20	800	480	1771	3.47	1907	32	87	1.34	-1.27	5.9
		480	1845	3.56	1912	23	93	1.86	-0.81	6.0								20	900	360	1681	4.63	1997	40	146	2.03	-1.89	7.8
		520	1913	3.42	1978	22	84	1.77	-0.73	5.8								20	900	440	1788	4.41	1975	38	127	1.80	-1.68	7.4
		560	1976	3.31	2038	21	76	1.70	-0.67	5.6								20	900	440	1826	4.20	2036	36	112	1.61	-1.51	7.1
10	600	360	1772	4.63	1872	32	155	1.42	-1.31	7.8								20	1000	520	1707	5.17	2056	42	162	2.17	-2.01	8.7
		400	1878	4.51	1971	30	138	1.24	-1.15	7.6								20	1000	480	1883	4.45	2132	40	142	1.92	-1.79	8.3
		440	1973	4.41	2052	28	124	1.10	-1.02	7.4								20	1000	480	1959	4.73	2199	38	126	1.72	-1.61	8.0
		480	2021	4.26	2147	27	112	1.08	-0.92	7.2								20	1000	480	2027	4.53	2260	37	112	1.56	-1.47	7.6
		520	2142	4.14	2224	26	101	0.99	-0.83	7.0								20	1000	520	2088	4.73	2115	35	100	1.42	-1.34	7.3
		560	2217	4.01	2296	24	92	0.91	-0.76	6.8								20	1000	560	2143	4.15	2364	34	90	1.30	-1.23	7.0
10	700	360	1924	5.70	2048	26	178	1.58	-1.45	8.9								20	1100	360	1902	5.71	2197	45	178	2.10	-2.14	9.6
		400	2040	5.18	2157	34	159	1.39	-1.28	8.7								20	1100	400	1996	5.48	2279	43	157	2.05	-2.01	9.2
		440	2147	5.07	2255	32	144	1.23	-1.15	8.5								20	1100	400	2041	5.26	2354	41	140	1.84	-1.72	8.9
		480	2245	4.95	2352	30	130	1.11	-1.04	8.4								20	1100	480	2156	5.16	2421	39	125	1.67	-1.57	8.5
		520	2337	4.84	2439	29	119	1.01	-0.94	8.2								20	1100	520	2255	5.28	2492	38	113	1.52	-1.44	8.2
		560	2422	4.73	2521	28	109	0.92	-0.86	8.0								20	1100	560	2246	4.67	2537	36	102	1.40	-1.32	7.9
10	800	360	2057	5.94	2207	39	200	1.74	-1.60	10.0								20	1200	360	1948	6.23	2331	48	195	2.44	-2.26	10.5
		400	2182	5.83	2324	37	180	1.54	-1.42	9.8								20	1200	400	2100	6.01	2419	45	173	2.18	-2.02	10.1
		440	2298	5.72	2433	36	163	1.37	-1.27	9.7								20	1200	440	2192	5.79	2499	43	154	1.96	-1.83	9.8
		480	2456	5.61	2535	34	149	1.24	-1.15	9.5								20	1200	480	2275	5.58	2572	42	139	1.78	-1.67	9.4
		520	2505	5.51	2636	33	137	1.13	-1.05	9.3								20	1200	520	2225	5.46	2482	38	113	1.52	-1.44	8.2
		560	2598	5.40	2719	32	126	1.03	-0.97	9.1								20	1200	560	2418	5.19	2730	36	104	1.50	-1.41	8.8
10	900	360	2174	6.56	2353	43	221	1.90	-1.75	11.1								20	1300	360	2087	6.75	2459	50	211	2.57	-2.38	11.4
		400	2307	6.46	2476	41	200	1.69	-1.55	11.9								20	1300	400	2196	6.53	2552	48	188	2.30	-2.14	11.0
		440	2430	6.15	2591	39	183	1.51	-1.40	10.7								20	1300	440	2294	6.31	2637	46	169	2.08	-1.94	10.7
		480	2545	6.25	2699	38	168	1.37	-1.27	10.6								20	1300	480	2384	6.43	2757	44	153	1.89	-1.77	10.3
		520	2662	6.15	2800	36	155	1.25	-1.16	10.4								20	1300	520	2552	6.28	2839	40	125	1.63	-1.53	9.1
		560	2752	6.15	2895	35	144	1.15	-1.07	10.2								20	1300	560	2579	5.72	2853	41	126	1.60	-1.51	9.6
10	1000	360	2278	7.15	2488	46	242	2.06	-1.89	12.1								20	1400	360	2149	7.26	2582	52	227	2.70	-2.49	12.3
		400	2418	7.06	2617	44	220	1.83	-1.69	11.9								20	1400	400	2244	7.04	2679	50	203	2.43	-2.25	11.9
		440	2548	6.95	2737	43	202	1.69	-1.52	11.8								20	1400	440	2388	6.83	2768	48	184	2.20	-2.05	11.5
		480	2668	6.87	2853	41	196	1.59	-1.39	11.6								20	1400	480	2484	6.62	2851	47	167	2.01	-1.88	11.2
		520	2782	6.77	2966	40	173	1.37	-1.27	11.4								20	1400	520	2651	6.91	2947	43	139	1.74	-1.63	10.0
		560	2888	6.64	3056	39	161	1.26	-1.18	11.3								20	1400	560	2579	6.75	2958	44	126	1.61	-1.50	9.5
10	1200	360	2372	7.73	2614	49	263	2.22	-2.03	13.0								20	1500	360	2245	7.76	2760	55	243	2.83	-2.61	13.1
		400	2514	7.64	2747	47	240	1.98	-1.82	12.9								20	1500	400	2345	7.55	2811	53	219	2.55	-2.36	12.7
		440	2653	7.55	2872	46	221	1.79	-1.65	12.7								20	1500	440	2475	7.74	2894	51	198	2.32	-2.15	12.4
		480	2779	7.46	2989	44	205	1.63	-1.51	12.6								20	1500	480	2576	7.13	2981	49	181	2.12	-1.98	12.0
		520	2897	7.37	3099	43	191	1.49	-1.39	12.4								20	1500	520	2618	6.94	3061	48	165	1.95	-1.83	11.7
		560	3017	7.29	3203	42	178	1.38	-1.28	12.3								20	1500	560	2737	6.75	3136	46	152	1.81	-1.70	11.4
10	1300	360	2608	8.20	2871	50	259	2.13	-1.95	13.8								20	1600	360	2315	8.26	2844	57	258	2.96	-2.72	13.9
		400	2744	8.12	2999																							

8. WEAPONS AND ARMAMENT

FOR
MK-82 (SNAKEYE II) AND MK-36 - HIGH DRAG

DIVE ANGLE ABOVE TGT	ALT KTS FT	TAS KTS FT	DOME RANGE FT	TIME OF FLIGHT SEC	SLANT RANGE FT	IMPACT ANGLE DEG	SIGHT DEP FROM REL FT	WIND CORRECTION FACTORS FLIGHT PATH	DIVE ANGLE ABOVE TGT			ALT FT	TAS KTS FT	DOME RANGE FT	TIME OF FLIGHT SEC	SLANT RANGE FT	IMPACT ANGLE DEG	SIGHT DEP FROM REL FT	WIND CORRECTION FACTORS FLIGHT PATH						
									HEAD	TAIL	CROSS								HEAD	TAIL	CROSS				
									MILS/KNOT	MILS/KNOT	FT/KT								MILS/KNOT	MILS/KNOT	FT/KT				
20	1800	360	2441	9.23	3033	61	289	3.29	-2.95	15.6					30	2200	360	2228	9.27	7171	65	258	3.66	-3.41	15.6
		400	2576	9.62	3142	59	263	2.91	-2.69	15.2					400	2341	8.95	7213	63	233	3.35	-3.13	15.1		
		440	2699	8.82	3244	57	241	2.66	-2.47	14.9					440	2644	8.15	3288	62	211	3.09	-2.89	14.6		
		480	2817	8.62	7339	56	222	2.45	-2.28	14.6					480	2537	4.17	3354	60	193	2.86	-2.68	14.1		
		520	2914	8.44	3429	54	236	2.27	-2.12	14.2					520	2672	8.10	3423	58	176	2.66	-2.50	13.7		
		560	3017	8.26	2513	53	191	2.12	-1.98	13.9					560	2700	7.84	3483	57	162	2.48	-2.34	13.2		
20	1900	360	2497	9.70	3134	62	304	3.32	-3.05	16.4					30	2300	360	2275	9.71	3235	66	270	3.75	-3.49	16.4
		400	2637	9.50	3250	61	274	3.02	-2.79	16.0					400	2392	9.19	3139	65	244	3.45	-3.22	15.9		
		440	2764	9.70	3354	59	255	2.77	-2.57	15.7					440	2699	9.10	3396	63	223	3.18	-2.98	15.4		
		480	2882	9.11	3452	58	236	2.56	-2.38	15.4					480	2596	8.81	3468	62	204	2.95	-2.77	14.9		
		520	2991	8.93	3543	56	219	2.38	-2.21	15.1					520	2684	8.54	3535	60	187	2.75	-2.59	14.4		
		560	3102	8.75	3629	55	204	2.22	-2.07	14.8					560	2765	8.28	3597	59	172	2.57	-2.42	14.0		
20	2000	360	2551	10.17	3241	64	318	3.43	-3.15	17.2					30	2400	360	2319	10.15	3338	68	281	3.84	-3.58	17.1
		400	2693	9.57	3359	62	291	3.03	-2.89	16.8					400	2640	9.83	3423	66	256	3.54	-3.30	16.6		
		440	2874	9.78	3461	61	259	2.88	-2.64	16.5					440	2550	9.54	3502	64	234	3.27	-3.06	16.1		
		480	2945	9.59	3560	60	259	2.67	-2.47	16.2					480	2650	9.25	3575	63	214	3.04	-2.85	15.6		
		520	3058	9.41	3656	58	232	2.48	-2.31	15.9					520	2742	8.94	3644	62	197	2.84	-2.67	15.2		
		560	3162	9.23	3742	57	217	2.32	-2.16	15.6					560	2877	8.72	3704	60	182	2.66	-2.51	14.7		
30	1700	360	1559	4.73	1967	48	136	2.58	-2.42	8.0					30	2500	360	2361	10.58	3439	69	293	3.93	-3.66	17.9
		400	1619	4.45	2015	46	117	2.31	-2.17	7.5					400	2486	10.27	3525	67	267	3.63	-3.38	17.3		
		440	1713	4.49	2151	48	128	2.41	-2.27	8.3					440	2599	9.98	3606	66	244	3.36	-3.15	16.8		
		480	1771	4.62	2197	46	112	2.18	-2.06	7.4					480	2702	9.69	3681	64	225	3.13	-2.94	16.4		
		520	1829	5.65	2225	52	180	2.81	-2.63	9.5					520	2797	9.42	3751	63	208	2.93	-2.75	15.9		
		560	1866	5.06	2332	48	123	2.28	-2.15	8.5					560	2885	9.17	3817	62	192	2.75	-2.59	15.5		
30	1500	360	1806	6.11	2347	54	172	2.92	-2.73	10.3					30	2600	360	2401	11.02	3539	70	304	4.02	-3.74	18.6
		400	1885	5.80	2409	51	151	2.63	-2.47	9.8					400	2529	10.71	3627	69	275	3.72	-3.47	18.1		
		440	1955	5.51	2464	50	134	2.39	-2.25	9.3					440	2645	10.41	3709	67	255	3.45	-3.23	17.6		
		480	2016	5.26	2513	48	119	2.18	-2.06	8.6					480	2751	10.13	3785	66	235	3.22	-3.02	17.1		
		520	2078	5.56	2567	55	185	3.04	-2.84	11.1					520	2849	9.46	3857	64	218	3.02	-2.83	16.6		
		560	2130	5.68	2646	50	129	2.28	-2.15	9.6					560	2939	9.60	3924	63	202	2.84	-2.67	16.2		
30	1700	360	1946	7.02	2584	57	197	3.15	-2.94	11.8					30	2700	360	2430	11.45	3678	71	315	4.18	-3.82	19.3
		400	2036	6.71	2653	55	175	2.85	-2.66	11.3					400	2560	11.14	3727	70	289	3.80	-3.54	18.8		
		440	2117	6.41	2715	53	155	2.59	-2.44	10.8					440	2688	10.45	3810	68	266	3.54	-3.31	18.3		
		480	2178	6.13	2771	51	139	2.38	-2.24	10.3					480	2797	10.57	3888	67	246	3.31	-3.10	17.8		
		520	2232	5.47	2822	50	125	2.19	-2.07	9.9					520	2898	10.70	3961	66	228	3.10	-2.91	17.4		
		560	2300	5.09	2894	52	135	2.28	-2.16	10.7					560	2991	10.34	4030	65	212	2.92	-2.74	16.9		
30	1800	360	2019	7.67	2694	59	210	3.25	-3.03	12.6					30	2800	360	2475	11.47	3737	72	326	4.18	-3.90	20.0
		400	2105	7.16	2770	57	186	2.95	-2.76	12.1					400	2608	11.57	3826	71	299	3.80	-3.62	19.5		
		440	2198	6.86	2835	55	167	2.69	-2.53	11.6					440	2730	11.28	3910	69	276	3.62	-3.38	19.0		
		480	2267	6.58	2895	53	150	2.47	-2.33	11.1					480	2642	11.09	3989	68	256	3.39	-3.17	18.6		
		520	2336	6.31	2949	52	135	2.28	-2.16	10.7					520	2945	10.73	4063	67	238	3.19	-2.99	18.1		
		560	2404	5.94	3049	57	171	2.57	-2.42	11.0					560	3040	10.48	4133	66	222	3.00	-2.82	17.7		
30	1900	360	2469	7.93	2889	61	222	3.36	-3.13	13.4					30	2900	360	2509	12.10	3835	73	336	4.26	-3.97	20.8
		400	2579	7.51	2984	59	195	3.09	-2.86	12.8					400	2645	12.00	3925	72	310	3.96	-3.70	20.2		
		440	2676	7.11	3052	57	178	2.79	-2.59	12.1					440	2769	11.71	4010	71	287	3.70	-3.46	19.8		
		480	2741	7.03	3015	55	160	2.57	-2.42	11.0					480	2883	11.43	4089	69	267	3.47	-3.25	19.3		
		520	2814	6.76	3072	53	145	2.38	-2.24	11.4					520	2989	11.16	4164	68	248	3.27	-3.06	18.8		
		560	2880	6.50	3124	52	132	2.21	-2.09	11.0					560	3087	10.91	4235	67	232	3.08	-2.90	18.4		
30	2000	360	2125	8.17	2918	62	234	3.46	-3.22	14.1					30	3000	360	2541	12.73	3932	74	346	4.34	-4.04	21.5
		400	2230	8.06	2996	60	210	3.15	-2.95	13.6					400	2681	12.42	4123	73	320	4.04	-3.77	21.0		
		440	2325	7.76	3067	59	208	2.89	-2.71	13.1					440	2805	12.13	4108	72	297	3.78	-3.53	20.5		
		480	2418	7.49	3132	57	171	2.67	-2.51	12.6					480	2922	11.56	4188	71	277	3.55	-3.32	20.0		
		520	2488	7.31	3192	56	156	2.47	-2.33	12.2					520	3071	11.59	4264	69	258	3.35	-3.14	19.6		
		560	2558	6.95	3247	54	142	2.30	-2.17	11.7					560	3131	11.34	4336	68	242	3.16	-2.97	19.1		
30	2100	360</td																							

8. WEAPONS AND ARMAMENT

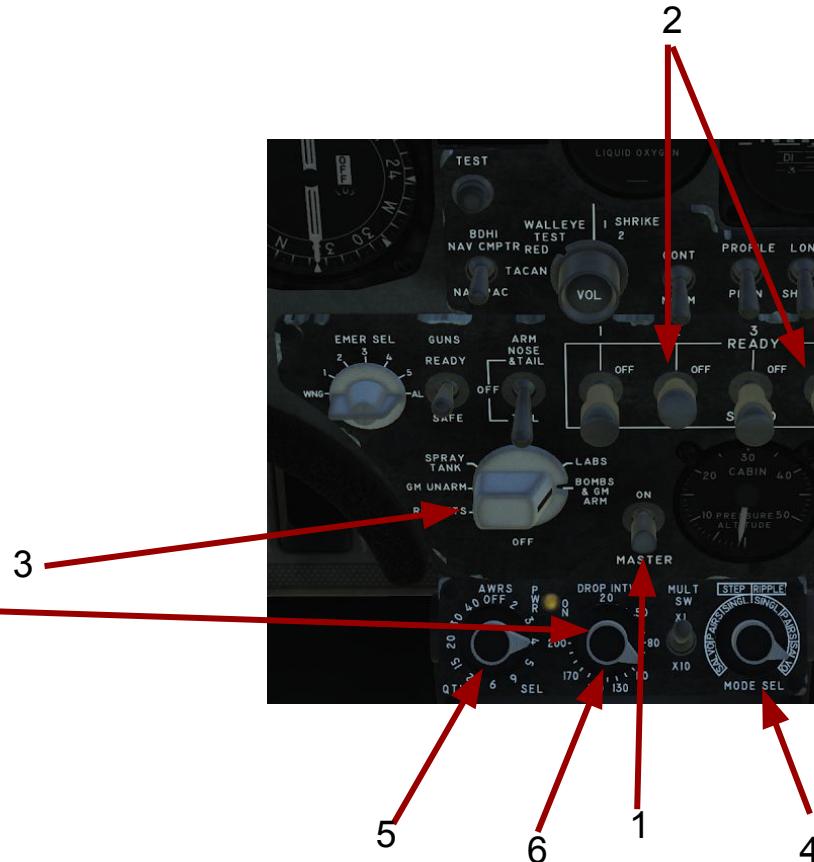
Cluster Munitions	
WEAPON	TYPE
CBU-1/A	Anti personnel cluster munition
CBU-2/A	Anti materiel cluster munition
CBU-2B/A	Anti materiel cluster munition



Cluster Munitions - Salvo Release

1. Master Arm to ON
2. Select hardpoint with desired bombs (2 and 4 in this case)
3. Weapon selector dial to Bombs & GM Arm
4. Select release type - salvo ripple
5. Select salvo number
6. Set Desired Interval
7. Hold Pickle for duration of weapon drops

To set more per salvo, use the x10 switch



8. WEAPONS AND ARMAMENT

Rockets	
WEAPON	TYPE
LAU-10 - 4* Zuni MK71	5in High Explosive (?)
LAU-3 - 19 * FFAR M156	2.75in White Phosphorus
LAU-3 - 19 * FFAR Mk1	2.75in High Explosive
LAU-3 - 19 * FFAR Mk5	2.75in High Explosive Anti Tank
LAU-68 - 7 * 2.75in Rockets M257	2.75in Parachute Illumination
LAU-68 7 * 2.75in rockets MK5	2.75in High Explosive



Rockets - Pairs Release

1. Master Arm to ON
2. Select hardpoint with desired rockets (3 in this case)
3. Weapon selector dial to ROCKETS
4. Select release type - step pairs
5. Pull trigger when ready

Note: Be sure to set GUNS to SAFE to prevent firing both rockets and guns simultaneously

Note: Single/Pairs/Ripple/Salvo operate the same as with bombs.



2

3

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4

8. WEAPONS AND ARMAMENT

Rockets - Depression Tables

The depression tables for the 2.75' FFAR Rockets follow

ALT ABOVE TGT FT	KGAS	DIVE ANGLE DEG	TIME OF FLT SEC	AIRCRAFT GROSS WEIGHT - THOUSANDS OF POUNDS						WIND CORRECTION FACTORS					
				12.0	14.0	16.0	18.0	20.0	12.0	16.0	20.0	12.0	16.0	20.0	
900	360	10	2.30	38	42	47	52	56	4566	4623	4682	4676	4535	4594	4 .2
900	400	10	2.25	31	34	38	42	46	4565	4606	4648	4675	4517	4580	4 .2
900	440	10	2.20	25	28	31	34	37	4574	4605	4636	4685	4516	4548	4 .2
900	480	10	2.16	20	23	25	28	30	4588	4611	4634	4699	4522	4545	4 .2
900	520	10	2.12	16	18	20	22	24	4604	4622	4639	4615	4533	4551	4 .2
900	560	10	2.08	13	15	16	18	20	4623	4636	4650	4535	4568	4562	4 .1
1250	360	10	3.02	42	46	51	56	60	6207	6281	6356	6080	6155	6232	5 .2
1250	400	10	2.94	35	36	42	46	50	6211	6264	6318	6084	6138	6193	5 .2
1250	440	10	2.88	29	32	35	38	41	6227	6267	6307	6100	6141	6182	5 .2
1250	480	10	2.82	24	26	29	31	34	6250	6279	6309	6124	6154	6184	5 .2
1250	520	10	2.77	20	22	24	26	26	6279	6298	6321	6149	6172	6196	5 .1
1250	560	10	2.72	16	18	20	21	23	6303	6321	6338	6178	6196	6233	5 .1
1250	360	10	2.24	36	41	45	50	56	4448	4486	4524	4269	4308	4348	4 .2
1250	400	10	2.19	29	33	37	40	44	4447	4475	4502	4268	4325	4352	4 .2
1250	440	10	2.14	24	27	30	33	36	4453	4474	4494	4274	4295	4317	4 .2
1250	480	10	2.10	19	21	24	26	29	4463	4478	4493	4284	4300	4315	4 .2
1250	520	10	2.06	15	17	19	21	23	4473	4485	4496	4295	4307	4319	4 .2
1250	560	10	2.03	12	13	15	17	19	4485	4494	4503	4308	4317	4326	4 .2
1500	360	10	2.59	38	43	47	52	56	5299	5343	5388	5082	5128	5175	4 .2
1500	400	10	2.53	31	35	39	42	46	5299	5331	5364	5083	5116	5150	4 .2
1500	440	10	2.48	26	29	32	35	38	5308	5331	5355	5091	5116	5141	4 .2
1500	480	10	2.43	21	23	26	28	31	5320	5337	5355	5104	5122	5140	4 .2
1500	520	10	2.38	17	19	21	23	25	5333	5347	5360	5118	5132	5146	4 .2
1500	560	10	2.34	13	15	17	18	20	5349	5359	5369	5134	5145	5155	4 .2
1750	360	10	2.96	40	45	49	54	58	6137	6187	6238	5882	5935	5988	5 .2
1750	400	10	2.84	33	37	41	44	48	6140	6176	6213	5885	5923	5961	5 .2
1750	440	10	2.83	27	30	33	36	40	6151	6178	6205	5897	5925	5953	5 .2
1750	480	10	2.77	23	25	28	30	33	6166	6186	6206	5913	5933	5954	5 .2
1750	520	10	2.72	18	20	23	25	27	6183	6198	6214	5930	5946	5962	5 .2
1750	560	10	2.67	15	17	18	20	22	6202	6213	6225	5950	5962	5974	5 .2
1500	360	20	2.11	34	38	43	47	52	4140	4166	4192	3859	3887	3915	4 .3
1500	400	20	2.06	27	31	34	38	42	4139	4158	4177	3858	3876	3899	4 .3
1500	440	20	2.02	22	25	28	31	34	4144	4157	4171	3862	3877	3892	4 .3
1500	480	20	1.98	17	20	22	25	27	4150	4160	4170	3869	3886	3891	4 .3
1500	520	20	1.94	13	15	17	19	21	4157	4165	4173	3877	3885	3894	4 .3
1500	560	20	1.91	10	12	13	15	17	4165	4171	4177	3865	3892	3898	4 .3
1750	360	20	2.37	36	40	44	49	53	4810	4840	4870	4480	4512	4545	4 .2
1750	400	20	2.32	29	32	36	39	43	4810	4831	4853	4488	4503	4527	4 .2
1750	440	20	2.27	21	26	29	32	35	4815	4831	4847	4486	4503	4520	4 .2
1750	480	20	2.23	19	21	23	26	28	4823	4835	4846	4494	4507	4519	4 .2
1750	520	20	2.18	15	17	19	21	23	4831	4841	4850	4503	4513	4523	4 .2
1750	560	20	2.15	11	13	15	16	18	4841	4848	4855	4514	4521	4529	4 .1

8. WEAPONS AND ARMAMENT

ALT ABOVE TGT FT	KCAS	DIVE ANGLE DEG	TIME OF FLT SEC	AIRCRAFT GROSS WEIGHT - THOUSANDS OF POUNDS								WIND CORRECTIONS FACTORS			
				12.0	14.0	16.0	18.0	20.0	12.0	16.0	20.0	12.0	16.0	20.0	MIL/KT
2000	360	20	2.65	37	41	46	50	55	5475	5500	5542	5096	5132	5169	4 .3
2000	400	20	2.59	30	34	37	41	44	5475	5500	5524	5097	5123	5149	4 .3
2000	440	20	2.53	25	27	30	33	36	5482	5500	5515	5104	5124	5143	4 .3
2000	480	20	2.46	20	22	25	27	30	5492	5505	5518	5115	5129	5143	4 .3
2000	520	20	2.44	16	18	20	22	24	5502	5512	5523	5126	5137	5148	4 .3
2000	560	20	2.39	12	14	16	17	19	5513	5521	5528	5138	5146	5154	4 .3
2000	360	30	1.95	29	33	37	41	45	3870	3884	3899	3313	3330	3347	3 .4
2000	400	30	1.95	23	26	30	33	36	3870	3880	3890	3313	3325	3337	3 .4
2000	440	30	1.91	18	21	23	26	29	3872	3880	3887	3315	3324	3333	3 .4
2000	480	30	1.87	14	16	18	21	23	3875	3881	3887	3319	3326	3332	3 .4
2000	520	30	1.86	10	12	14	16	18	3878	3884	3888	3324	3329	3334	3 .4
2000	560	30	1.81	-	9	10	11	13	3884	3887	3890	3329	3333	3336	3 .4
2250	360	30	2.17	30	34	38	42	46	4346	4362	4378	3718	3737	3750	4 .4
2250	400	30	2.11	24	27	31	34	37	4346	4357	4369	3718	3732	3745	4 .4
2250	440	30	2.06	18	22	24	27	30	4349	4357	4366	3721	3755	3742	4 .4
2250	480	30	2.04	15	17	19	21	24	4353	4359	4365	3726	3741	3741	4 .4
2250	520	30	2.00	11	13	15	17	18	4357	4362	4367	3731	3747	3742	4 .4
2250	560	30	1.97	7	9	10	12	13	4362	4365	4369	3737	3745	3745	4 .4
2500	360	30	2.36	31	35	39	43	47	4821	4838	4856	4122	4147	4163	4 .4
2500	400	30	2.31	25	28	31	35	36	4821	4834	4846	4122	4137	4152	4 .4
2500	440	30	2.29	21	22	25	28	31	4824	4834	4843	4126	4137	4148	4 .4
2500	480	30	2.21	15	18	20	22	24	4829	4836	4843	4132	4140	4148	4 .4
2500	520	30	2.17	12	14	16	17	19	4834	4840	4845	4138	4144	4150	4 .4
2500	560	30	2.13	8	9	11	12	14	4839	4843	4847	4143	4148	4153	4 .4
2750	360	30	2.55	32	36	40	44	48	5294	5313	5333	4523	4546	4569	4 .4
2750	400	30	2.43	26	29	32	36	39	5294	5308	5322	4524	4541	4557	4 .4
2750	440	30	2.44	21	23	26	29	31	5299	5309	5319	4529	4541	4553	4 .4
2750	480	30	2.79	16	18	21	23	25	5304	5312	5319	4535	4544	4553	4 .4
2750	520	30	2.35	13	14	16	18	20	5310	5316	5322	4542	4549	4556	4 .4
2750	560	30	2.30	8	10	11	13	14	5315	5319	5324	4548	4553	4558	4 .4
3000	360	30	2.75	33	37	41	45	49	5765	5786	5807	4924	4948	4972	5 .4
3000	400	30	2.69	27	30	33	36	40	5767	5782	5797	4925	4942	4960	5 .4
3000	440	30	2.63	21	24	27	30	32	5771	5783	5794	4930	4943	4957	5 .4
3000	480	30	2.58	17	19	21	24	26	5778	5786	5794	4938	4947	4957	5 .4
3000	520	30	2.52	13	15	17	19	21	5784	5791	5797	4946	4953	4961	5 .4
3000	560	30	2.48	9	10	12	13	15	5790	5794	5799	4952	4957	4963	5 .4
3500	360	30	3.16	35	39	43	47	51	6784	6728	6752	5718	5746	5774	5 .4
3500	400	30	3.09	28	32	35	38	42	6786	6723	6741	5721	5741	5761	5 .4
3500	440	30	3.02	23	26	29	31	34	6713	6725	6738	5728	5743	5758	5 .4
3500	480	30	2.96	19	21	23	25	28	6721	6730	6739	5737	5748	5759	5 .4
3500	520	30	2.90	15	17	19	21	22	6729	6737	6748	5756	5765	5779	5 .4
3500	560	30	2.84	9	11	12	14	15	6735	6749	6754	5760	5766	5766	5 .4
4000	360	30	3.50	37	41	45	49	53	7635	7662	7689	6583	6535	6566	6 .4
4000	400	30	3.52	30	34	37	40	44	7639	7658	7678	6588	6531	6553	6 .4
4000	440	30	3.44	25	28	30	33	36	7647	7662	7676	6518	6535	6551	6 .4
4000	480	30	3.36	20	23	25	27	29	7657	7668	7678	6530	6542	6554	6 .4
4000	520	30	3.29	17	19	20	22	24	7665	7677	7685	6543	6552	6562	6 .4
4000	560	30	3.23	10	12	13	15	16	7675	7680	7686	6550	6556	6563	6 .4

8. WEAPONS AND ARMAMENT

ALT ABOVE TGT FT	KCAS	DIVE ANGLE DEG	TIME OF FLT SEC	AIRCRAFT GROSS WEIGHT - THOUSANDS OF POUNDS												WIND CORRECTIONS FACTORS		
				SIGHT SETTING - MILS				SLANT RANGE - FEET				HORIZONTAL RANGE - FT				FT/KT	MIL/KT	
				NEG	SETTING	INDICATES	ELEV											
900	360	10	2.24	37	41	46	51	55	4594	4648	4704	4505	4560	4617	4	.2		
900	400	10	2.19	29	33	37	41	44	4594	4633	4673	4505	4545	4586	4	.2		
900	440	10	2.14	23	27	30	33	36	4603	4631	4660	4514	4543	4573	4	.2		
900	480	10	2.10	18	21	24	26	29	4616	4638	4659	4528	4549	4571	4	.1		
900	520	10	2.06	15	17	19	21	23	4633	4649	4665	4544	4561	4578	3	.1		
900	560	10	2.02	7	8	10	12	13	4636	4648	4660	4548	4560	4572	3	.1		
1250	360	10	2.91	48	45	50	54	59	6254	6325	6398	6128	6201	6274	5	.2		
1250	400	10	2.84	33	37	40	44	48	6259	6311	6363	6133	6186	6239	5	.2		
1250	440	10	2.78	27	30	33	36	39	6275	6313	6350	6149	6188	6226	5	.1		
1250	480	10	2.72	22	24	27	29	32	6297	6325	6353	6172	6200	6229	5	.1		
1250	520	10	2.67	18	20	22	24	26	6322	6343	6364	6197	6219	6240	5	.1		
1250	560	10	2.62	9	11	12	14	16	6328	6343	6359	6203	6219	6235	4	.1		
1250	360	15	2.18	35	40	44	49	53	4466	4502	4539	4288	4325	4363	4	.2		
1250	400	15	2.13	28	32	35	39	43	4466	4492	4519	4288	4315	4342	4	.2		
1250	440	15	2.08	22	25	28	31	34	4472	4491	4510	4294	4313	4333	4	.2		
1250	480	15	2.04	17	20	22	25	27	4481	4495	4509	4303	4318	4332	3	.2		
1250	520	15	2.00	13	15	17	19	21	4491	4502	4513	4314	4325	4336	3	.2		
1250	560	15	1.96	5	7	8	10	12	4492	4500	4508	4315	4323	4331	3	.2		
1500	360	15	2.51	37	41	46	51	55	5323	5365	5408	5107	5151	5195	4	.2		
1500	400	15	2.45	30	33	37	41	45	5324	5355	5386	5109	5140	5173	4	.2		
1500	440	15	2.40	24	27	30	33	36	5332	5354	5377	5117	5140	5163	4	.2		
1500	480	15	2.35	19	21	24	26	29	5344	5360	5377	5129	5146	5164	4	.2		
1500	520	15	2.30	15	17	19	21	23	5357	5369	5382	5143	5155	5166	4	.2		
1500	560	15	2.26	6	8	9	11	13	5358	5367	5376	5144	5153	5163	4	.2		
1750	360	15	2.85	39	43	48	53	57	6169	6217	6265	5915	5965	6016	5	.2		
1750	400	15	2.78	31	35	39	43	46	6172	6207	6242	5919	5955	5992	5	.2		
1750	440	15	2.72	26	29	32	35	38	6183	6208	6233	5930	5956	5983	5	.2		
1750	480	15	2.67	21	23	26	28	31	6197	6216	6235	5945	5965	5985	5	.2		
1750	520	15	2.62	16	18	20	22	24	6212	6226	6240	5961	5975	5990	4	.2		
1750	560	15	2.56	7	9	11	12	14	6215	6225	6236	5964	5974	5985	4	.2		
1500	360	20	2.06	33	37	42	46	51	4152	4177	4201	3872	3898	3925	3	.3		
1500	400	20	2.01	26	30	33	37	40	4152	4170	4188	3872	3891	3910	3	.3		
1500	440	20	1.97	20	23	26	29	32	4156	4169	4182	3876	3890	3903	3	.3		
1500	480	20	1.93	16	18	21	23	25	4162	4171	4181	3882	3892	3903	3	.3		
1500	520	20	1.89	12	14	16	17	19	4169	4176	4183	3889	3897	3905	3	.3		
1500	560	20	1.85	3	5	6	8	10	4168	4174	4179	3889	3895	3900	3	.3		

8. WEAPONS AND ARMAMENT

ALT ABOVE TGT FT	KCAS	DIVE ANGLE DEG	TIME OF FLT SEC	AIRCRAFT GROSS WEIGHT - THOUSANDS OF POUNDS												WIND CORRECTIONS FACTORS		
				SIGHT SETTING - MILS				SLANT RANGE - FEET				HORIZONTAL RANGE - FT				FT/KT	MIL/KT	
				NEG	SETTING	INDICATES	ELEV											
1750	360	20	2.31	34	39	43	48	52	4825	4853	4882	4946	4527	4557	4	.3		
1750	400	20	2.25	27	31	35	36	42	4826	4846	4867	4497	4519	4541	4	.3		
1750	440	20	2.20	22	25	28	30	33	4831	4845	4860	4503	4518	4534	4	.3		
1750	480	20	2.16	17	19	22	24	27	4838	4849	4860	4510	4522	4534	4	.3		
1750	520	20	2.12	13	14	16	18	20	4846	4854	4862	4519	4527	4536	4	.3		
1750	560	20	2.08	4	6	7	9	10	4846	4852	4858	4519	4525	4532	4	.3		
2000	360	20	2.56	36	40	45	49	53	5493	5525	5557	5116	5150	5185	4	.3		
2000	400	20	2.50	29	32	36	39	43	5495	5518	5541	5118	5143	5168	4	.3		
2000	440	20	2.45	23	26	29	32	35	5501	5518	5535	5125	5143	5161	4	.3		
2000	480	20	2.40	18	21	23	25	28	5510	5523	5535	5135	5148	5161	4	.3		
2000	520	20	2.35	13	15	17	19	21	5519	5528	5537	5144	5153	5163	4	.3		
2000	560	20	2.30	5	6	8	9	11	5519	5526	5533	5144	5152	5159	4	.3		
2000	360	30	1.94	28	32	36	41	45	3876	3890	3904	3321	3336	3352	3	.4		
2000	400	30	1.90	22	25	29	32	35	3876	3886	3896	3321	3332	3344	3	.4		
2000	440	30	1.86	17	19	22	25	28	3879	3886	3893	3323	3331	3340	3	.4		
2000	480	30	1.83	12	15	17	19	21	3882	3887	3893	3327	3333	3339	3	.4		
2000	520	30	1.79	8	10	12	13	15	3885	3889	3893	3331	3335	3340	3	.4		
2000	560	30	1.76	-0	1	3	4	6	3884	3887	3890	3330	3333	3337	3	.4		
2250	360	30	2.12	29	33	37	41	46	4354	4369	4384	3727	3745	3763	4	.4		
2250	400	30	2.07	23	26	29	33	36	4354	4365	4376	3728	3740	3753	3	.4		
2250	440	30	2.02	18	20	23	26	28	4357	4365	4372	3731	3740	3749	3	.4		
2250	480	30	1.98	13	15	18	20	22	4360	4366	4372	3735	3742	3749	3	.4		
2250	520	30	1.95	8	10	12	14	15	4364	4368	4372	3739	3744	3749	3	.4		
2250	560	30	1.91	-0	1	3	4	6	4363	4366	4370	3738	3742	3746	3	.4		
2500	360	30	2.29	30	34	38	42	46	4830	4846	4863	4132	4152	4171	4	.4		
2500	400	30	2.24	24	27	30	34	37	4830	4843	4855	4133	4147	4161	4	.4		
2500	440	30	2.19	18	21	24	26	29	4834	4842	4851	4137	4147	4157	4	.4		
2500	480	30	2.15	14	16	18	21	23	4838	4845	4851	4142	4150	4157	4	.4		
2500	520	30	2.10	9	11	12	14	16	4841	4846	4851	4146	4151	4157	4	.4		
2500	560	30	2.06	0	2	3	5	6	4841	4845	4848	4145	4150	4154	3	.4		

8. WEAPONS AND ARMAMENT

Air-to-Air Munitions	
WEAPON	TYPE
AIM-9p5	Short-range, all-aspect annular blast-frag missile
GAR-8	Early model AIM-9 with USAF Nomenclature



AA Missiles

1. Master Arm to ON
2. Select hardpoint with desired missile(2 and 4 are available)
3. Weapon selector dial to BOMBS & GM ARM
4. Select release type (In this case single)
5. Pull trigger when tone changes to high pitch

Note: Be sure to set GUNS to SAFE to prevent firing both missile and guns simultaneously

Note: Single/Pairs operate the same as with bombs.



2

3

1

4

8. WEAPONS AND ARMAMENT

Air-to-Ground Missile

WEAPON	TYPE
AGM-45A "Shrike"	Anti-Radiation Missile



AA Missiles

1. Master Arm to ON
2. Select hardpoint with desired missile(1 and 5 are available)
3. Weapon selector dial to BOMBS & GM ARM
4. Select release type (In this case single)
5. Pull trigger to launch

Note: Be sure to set GUNS to SAFE to prevent firing both missile and guns simultaneously

Note: Single/Pairs operate the same as with bombs.

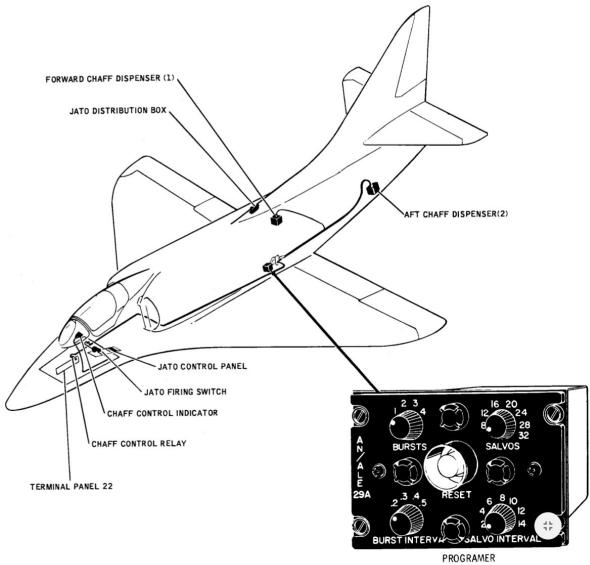
Note: The Shrike has an off-bore viewing angle of ± 3 degrees, so consider boresighting or lofting accurately



9. COUNTERMEASURES

Countermeasures

The A-4E-C comes equipped with an AN/ALE Chaff Dispenser loaded with two banks of countermeasures loaded with 30 chaff(flares?) as standard, located fore and aft.



9. COUNTERMEASURES

Countermeasures

To arm countermeasures:

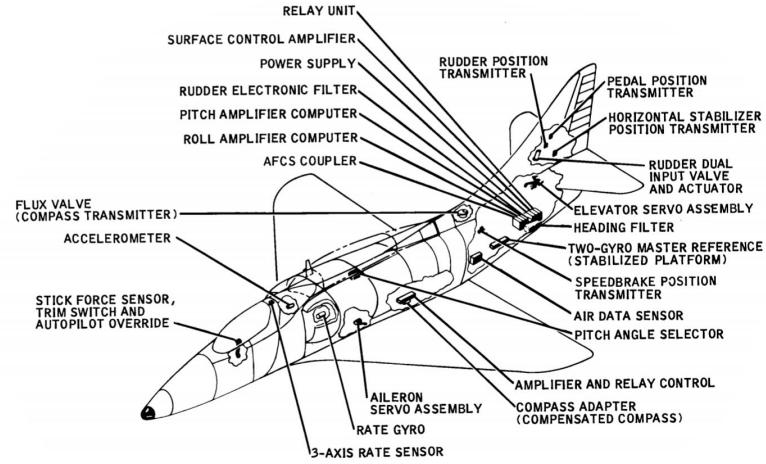
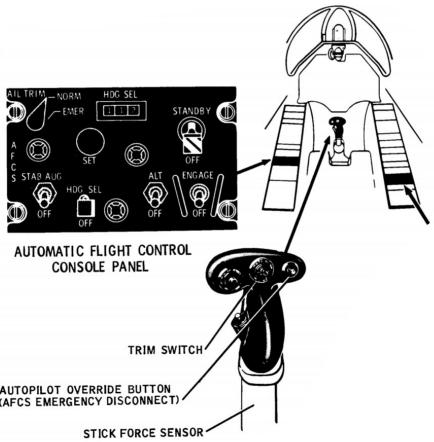
1. Turn power on to unit
2. Press countermeasure release to dispense



10. AUTOPILOT

Autopilot - Systems

The A-4E-C has several autopilot measures available to the pilot, these are contained within the AFCS - the Automatic Flight Control System.



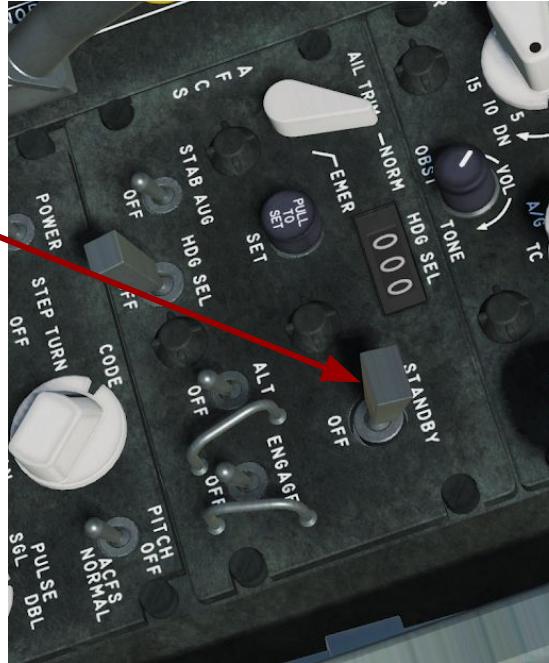
Autopilot - Systems

Movement of the standby switch to STANDBY provides electrical power to the AFCS for warmup and automatic control synchronization to prevent engage transients.

This switch should be in STANDBY at least 30 seconds prior to engaging the stability augmentation switch or the AFCS main engage switch.

When this switch is placed in the OFF position, all toggle switches on the panel return to the OFF position.

Standby Switch



Autopilot - Systems

Movement of the engage switch to the ENGAGE position turns on the AFCS in one of two modes; attitude hold or heading hold, depending on flight attitude.

In addition, the pilot can further select anyone of three modes: control stick steering, altitude hold, and/or heading hold.

The switch may be placed in the OFF position at any time.

The switch should not be placed in ENGAGE position until the standby switch has been in STANDBY position for 30 seconds.

The AFCS will not engage until the all attitude indicator OFF flag disappears.

Engage Switch



All attitude indicator flag



Autopilot - Systems

When this switch is placed in the OFF position both the heading select switch and the altitude switch return to the OFF position.

An abrupt lateral stick force of 40 pounds causes the aileron servo to bypass, which effectively disengages the AFCS lateral controls.

The engage switch does not move from the ENGAGE position. Lateral control of the aircraft is then provided by the normal control system.

To re-engage the lateral servo, cycle the engage switch to the OFF position and then return to the ENGAGE position. This operation may be performed at any time.

Pressing the AFCS override button (AP) on the control stick causes the mode switches to move automatically to the OFF position. The AFCS can be re-engaged by moving the engage switch to ENGAGE.

Engage
Switch



All attitude
indicator flag

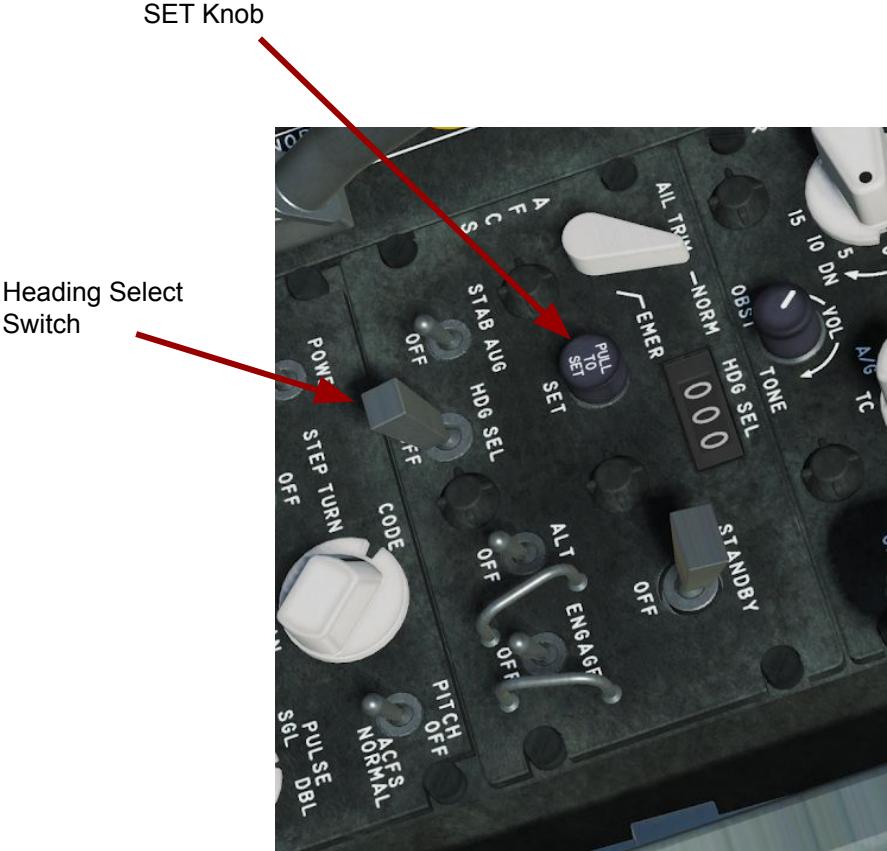


Autopilot - Systems

HEADING SELECT SWITCH

Movement of the heading select switch to the HDG SEL position starts the aircraft turning by the shortest route toward the heading selected on the heading select indicator by use of the SET knob.

The heading select switch may be placed in the OFF position at any time. If placed in the OFF position prior to the completion of a turn, the aircraft will roll smoothly to a level attitude and maintain the compass heading indicated at that time.



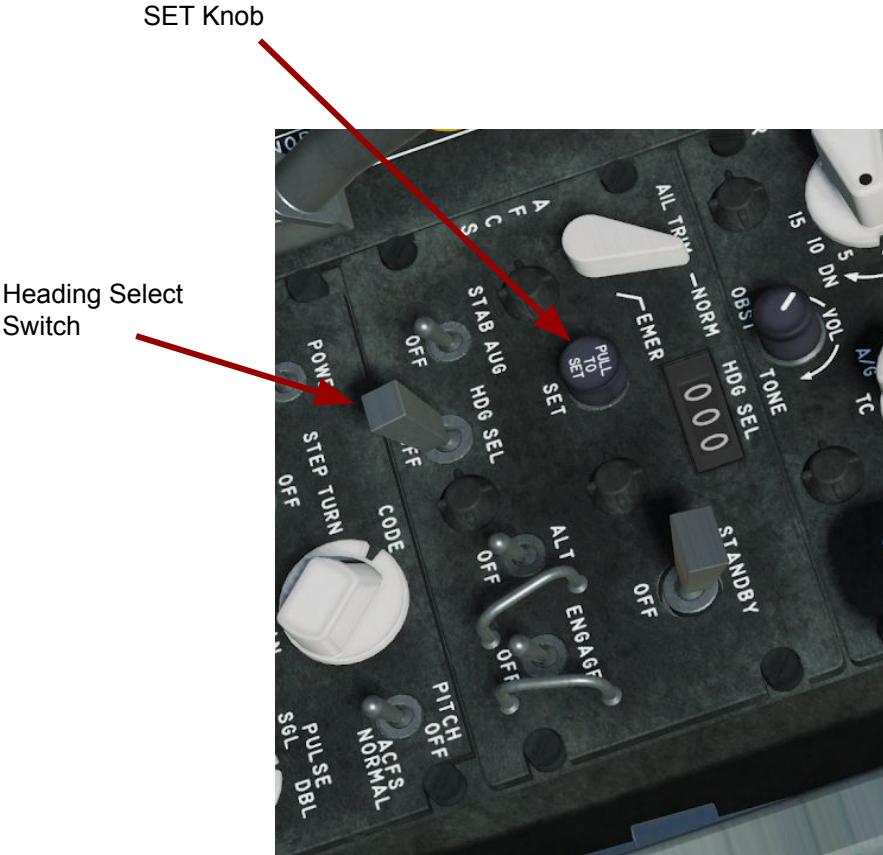
Autopilot - Systems

If the SET knob is used to change the heading on the indicator while the switch is in the HDG SEL position, the following can occur:

1. If the aircraft is in level flight, sudden SET knob movement will result in abrupt aircraft lateral movement. If the SET knob is moved very slowly, small heading changes can be made satisfactorily.
2. If the aircraft is already in a preselect heading turn, the SET knob may be moved at any rate if the new selected heading is in the same direction as the turn and is less than 180 degrees away from the compass heading at the time of selection. Selection of a heading reciprocal to the present aircraft heading will cause the aircraft to reverse the turn abruptly.

The HDG SEL switch will automatically move to the OFF position if the control stick steering mode is engaged.

Upon engaging the HDG SEL switch, the approximate pitch attitude will be maintained during the turn. If a level turn is desired, the altitude hold mode should be engaged by moving the altitude switch to ALT.



Autopilot - Systems

ALTITUDE SWITCH

Movement of the altitude switch to the ALT position causes the aircraft to maintain the barometric altitude at actuation.

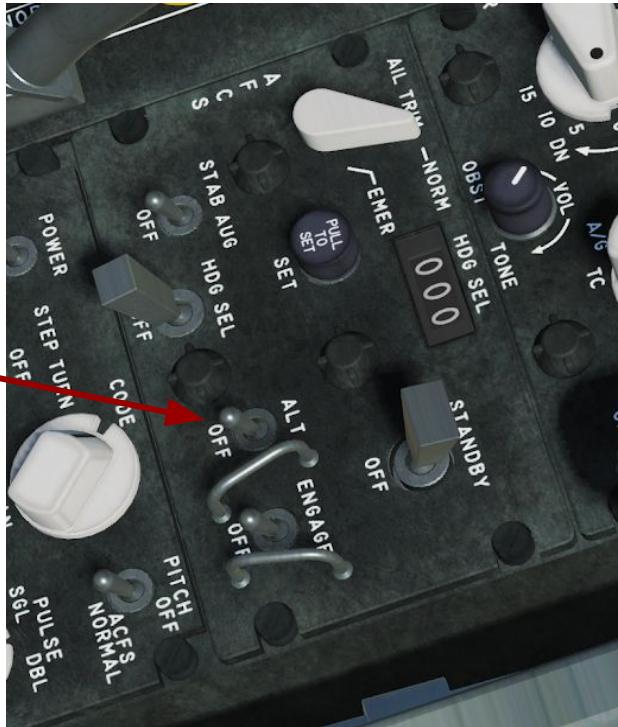
If the mode is engaged in a climb or dive, the aircraft will return to the barometric altitude existing at the time of altitude switch engagement.

The altitude switch cannot be engaged in climbs or descents in excess of 4000 feet per minute.

The mode cannot be engaged if any force is being applied to the control stick.

The switch will move automatically to the OFF position whenever control stick steering mode is engaged.

Altitude Switch



Autopilot - Systems

STABILITY AUGMENTATION SWITCH

Yaw damping action is provided when the engage switch is in the ENGAGE position or the stability augmentation switch is in the STAB AUG position.

AILERON TRIM NORM-EMERGENCY SWITCH

The aileron trim switch has two positions NORM and EMER. This switch is usually in the NORM position, but may be placed in the EMER position to provide aileron trim after the AFCS is disengaged, if aileron trim is not available in NORM.

Movement of this switch to the EMER position also disengages and prevents reengagement of the AFCS, except stability augmentation, while in the EMER position.

The AFCS can be re-engaged after placing the switch in the NORM position.

Aileron Trim
Norm-Emergency Switch



Autopilot - Modes of Operation

Modes of operation:

CONTROL STICK STEERING (CSS) MODE

The CSS mode provides for longitudinal and lateral control of the aircraft through the AFCS by pilot movement of the stick as in normal flight.

This mode is engaged regardless of other modes selected or in operation by applying a force on the control stick grip of 2 pounds or more.

Preselect heading and altitude hold modes are disengaged by use of CSS and they must be re-engaged to be used again. The AFCS reverts from CSS mode to either attitude hold or heading hold mode when pilot force on the control stick is reduced below 2 pounds.



Autopilot - Modes of Operation

The aircraft is controllable in all attitudes in CSS throughout the AFCS flight envelope, which is $4\pm1/2$ positive-g, $1-1/2\pm1/2$ negative-g, and one-half aileron deflection left or right.

If these limits are exceeded, the AFCS disengages.

The AFCS will not switch out of CSS at bank angles exceeding 70 degrees or pitch angles exceeding 60 degrees nose-up or nose-down unless limits of acceleration or aileron deflection are exceeded.



Autopilot - Modes of Operation

ATTITUDE HOLD MODE

With an aircraft bank angle between 5 degrees and 70 degrees and a pitch angle less than 60 degrees nose-up or nose-down, the aircraft lateral and longitudinal attitude at time of engagement of the AFCS or reversion from the CSS mode will be maintained.

HEADING HOLD MODE

If the pitch angle is within 60 degrees nose-up or nose-down and the bank angle of the aircraft is less than 5 degrees upon engagement of the AFCS or reversion from CSS mode, the aircraft will be rolled to a level attitude and the heading and pitch angles at that time will be maintained.



Autopilot

PRESELECT HEADING MODE

Upon engagement of this mode after the heading has been preselected on the indicator, the aircraft will roll into a smooth turn to the preselected heading and then roll out on this heading.

The turn will always be in the direction of the shortest route to the preselected heading. The bank angle will be maintained at 27 ± 5 degrees under all conditions.

NOTE: The fixed bank angle of 27 ± 5 degrees may cause the aircraft to buffet in an approach to stall if the preselect heading mode is selected below airspeeds ranging from 160 KIAS at 10,000 feet to 200 KIAS at 40,000 feet.



Autopilot - Modes of Operation

STABILITY AUGMENTATION MODE

The stability augmentation mode provides rudder yaw damping action which is that of pilot movement of the rudder pedals.

The mode can be selected at any time without other AFCS functions. It is also in operation automatically during all other AFCS functions.

The pilot must trim the aircraft directionally while using the AFCS in the same manner as he would when on the normal flight control system.

If the aircraft is out of trim directionally, the following will occur:

1. A lateral engage transient will occur during change to the control stick steering mode.
2. The aircraft will be in a steady heading sideslip in the heading hold mode.



Autopilot - Modes of Operation

ALTITUDE HOLD MODE

The altitude hold mode may be engaged when the rate-of-change of altitude is less than 4000 ± 500 feet per minute.

The aircraft will maintain the altitude at engagement. The aircraft automatically will pull out of its climb or dive and return to and maintain the engage altitude.



II. NAVIGATION

Nav Setup Procedure : AN/ASN - 41

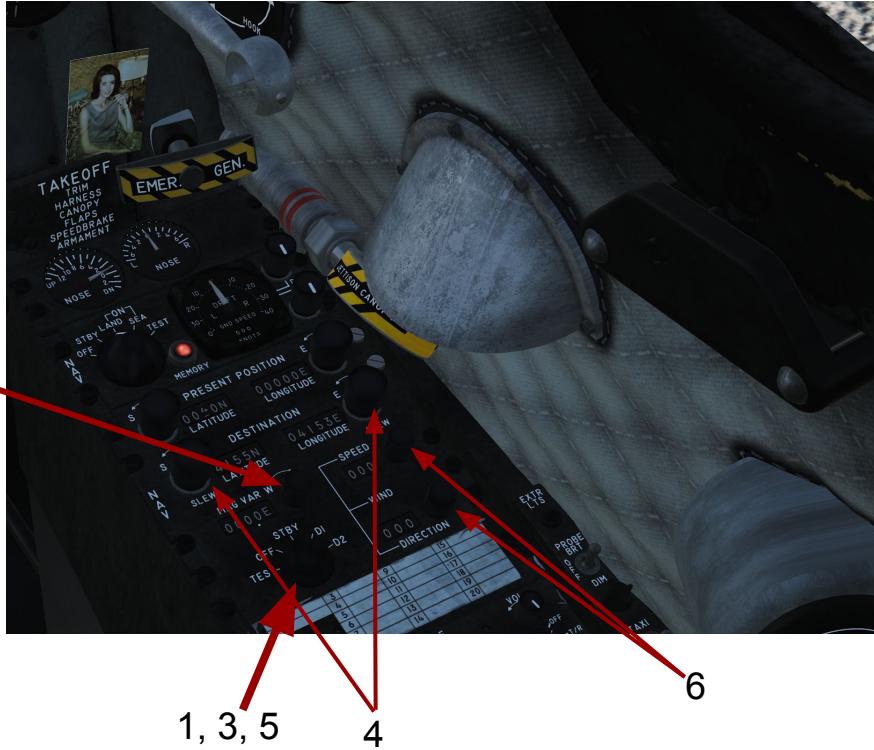
1. Set AN/ANS-41 DNS waypoint selector to STBY and wait 5 mins
2. Set magnetic var (6° E for Caucuses, 12° E for NTTR, 8° E for Normandy, 1.6° E for Persian Gulf)

To save waypoints:

3. Set waypoint selector to D2 (present position will be set, and set as D1 and D2 when dial moved off STBY)
4. Set waypoint coordinates via dials
5. Repeat for D1

(Optional)

6. Set wind speed and direction (will be set automatically if using with AN/APN-153 radar)



II. NAVIGATION

Navigation : AN/ASN - 41

Once waypoints are set in the AN/ASN-41 system, the Bearing-Distance-Heading Indicator (BDHI) can be set to NAV CMPTR (Navigation Computer) and the distance and bearing to the selected heading can be seen on the BDHI and manually switched between.

BDHI Heading



BDHI Switch



BDHI
Distance
Indicator

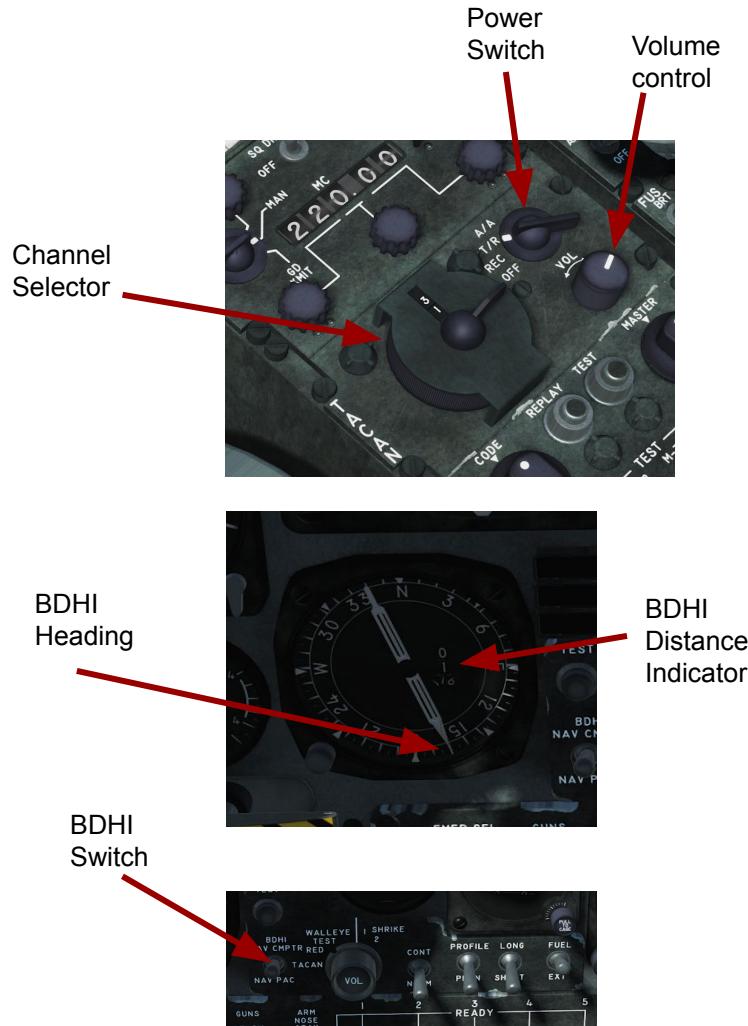
II. NAVIGATION

Navigation : TACAN

To tune to a TACAN station:

1. Set power switch to REC
2. After 3 mins switch power to T/R for ground use or A/A for air-to-air use.
3. Set channel on channel selector
4. Use volume control to confirm TACAN is tuned to active station
5. Set Bearing-Distance-Heading Indicator (BDHI) to TACAN

The distance and bearing to the selected heading can be seen on the BDH, on pointer 2 (two bar pointer, pointer 1 is for UHF/VHF use
- Not active currently)



12. THX AND EXTRAS RESOURCES



Thanks to the A-4E-C team for creating one of the best mods I've ever seen:

- Gospadin (In Memoriam)
- Gyro vague
- Plusnine
- Kryb
- Merker
- Jones
- Farlander
- Dr. Manius

Thanks to Chuck for his amazing guides and okaying my blatant rip-off.

For more information see:

NATOPS A-4E/F/G Skyhawk Manual NAVAIR
01-40AVF-1

Weapons tables from the F-5 Non-nuclear weapons manual