Standard Aircraft Characteristics

NAVY MODEL
F-14A
AIRCRAFT
(TITLE UNCLASSIFIED)

This Manual Supersedes NAVAIR 00-110AF14-1 Dated July 1974 Which Should Be Destroyed In Accordance With Applicable Security Regulations

This publication shall not be carried in aircraft on combat missions or when there is a reasonable chance of its falling into the hands of an unfriendly nation, unless specifically authorized by the "Operational Commander."

PUBLISHED BY DIRECTION OF THE COMMANDER OF THE NAVAL AIR SYSTEMS COMMAND

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DECLASSIFIED
APRIL 1977
STANDARD AIRCRAFT CHARACTERISTICS (U)

F-14A TOMCAT

GRUMMAN

APRIL 1977

DECLASSIFIED
NAVARO 00-110AF14-1

POWERPLANT

Number and Model ___________________________ (2) TF30-P-412A
Manufacturer ____________________________ Pratt & Whitney
Engine Specification Number _______ N-6191, 30 May 1972
Type __________________________________ Twin-Spool Axial-Flow Turbofan
Augmentation _____________________________ Modulated A/B
Length with A/B ___________________________ 223.59 in.
(Operating Temp, Nozzle in A/B Position) ______ 70°F
Diameter (Operating Temp) __________________ 50.9 in.
Dry Weight _______________________________ 3971 lb
Nozzle Type ______________________________ Translating C-D iris

RATINGS

STATIC THRUST AT SEA LEVEL

THRU, RPM TIME

LB SFC (N2) LIMIT

Maximum A/B 20,900 2,780 14,780 45 min
Intermediate 12,350 0.969 14,800 45 min
Max Continuous 10,800 0.631 14,300 None

ELECTRONICS

WEAPONS CONTROL
Airborne Missile Control System ________ AN/AWG-9(MOD)
Fire Control System _____________________ AN/AWG-158
ELECTRONIC WARFARE
Radar Warning System ________ AN/ALR-50(V), AN/ALR-45(V)
Defensive Electronic Countermeasures ______ AN/ALQ-100
IFF Transponder ________________________ AN/ALQ-39

FLIGHT CONTROL
Automatic Flight Control System ________ AN/ASW-43A
Radio Power Control System _______ AN/ASW-10C
AIDS Programmer ______________________ C-8684 A/A

COMMUNICATION
Intercommunication Set __________________ LS-460B/IFIC
IFF Transponder ________________________ AN/AFX-72
Cryptographic System ____________ TSC/KY-16
Interference Blanker ____________________ MX-947/A
Digital Data Link _______________________ AN/ASW-5/E
Radio SET _____________________________ AN/ARC-159/AIVS
Beacon Augmentor ______________________ R-1603/APN-154
Radar Beacon __________________________ AN/APN-154(A)
Receiver Decoder Group ____________ AN/ARA-63A

NAVIGATION
Radar Altimeter ________________________ AN/ARN-194(V)
Inertial Navigation System ________ AN/ASN-92(V)
Attitude Heading Reference _______ A/A245-3B
TACAN Set ____________________________ AN/ARN-84(A)
UHF Auto Direction Finder ________ AN/ARA-60
Central Air Data Computer ___________ CP-11668/A
Signal Data Converter Computer _______ CP-11664/A

MISSION AND DESCRIPTION

The F-14A is a carrier-based, variable-sweep-wing, all-weather, two-man, tandem cockpit, high-performance weapons system. Two afterburner-equipped turbofan engines are mounted in podded nacelles, permitting adaptation to future powerplant requirements.

The primary roles of air superiority and fleet air defense are achieved by the incorporation of an integrated airborne missile control system and specially designed weapon rails. Other electronic devices are incorporated to fulfill additional alternate missions.

A Mach/Sweep programmer provides wing sweep for optimum performance and maneuvering throughout the entire operating range of the aircraft without pilot attention. Control about all three axes is achieved by irreversible, hydraulically actuated surfaces. Symmetrical movement of the all-moving horizontal tail surfaces provides longitudinal control. Lateral control is provided by spoilers and asymmetric movement of the horizontal tail surfaces. Twin rudders are used for directional control.

High-lift devices consist of simply pivoted single-slotted trailing edge flaps and conventional leading edge slats. The flaps and slats in conjunction with the glove vans, housed in the leading edge of the wing, are also used as maneuvering aids during subsonic and transonic flight. Increased maneuverability and specific excess power (I/P) in supersonic flight is provided by automatic extension of the glove vane. Deceleration control is provided by conventional speed brakes located on the upper and lower surfaces of the aft fuselage.

A wing overawe position results in an optimized spotting factor of 1.54 based on 145 A-7 aircraft. Nose tow catapulting is used. A retractable boom is provided for in-flight refueling.

DEVELOPMENT

Contract Date ________ Feb 1969
First Flight ________ Dec 1970
Initial NPE ________ Dec 1971
Initial Carrier Suitability Trials Completed ________ Nov 1973
Fleet Introduction ________ Sept 1974

DIMENSIONS

WING
Area (Reference) ___________________________ 565 sq ft
Unwetted Leading Edge ____________________ 70°
Span ________________________ 64.13 ft
MAC ____________________________ 117.62 lb
Incidence at B.L. _______ 96.3°
Dihedral ________________________ -1°06'
Sweep Leading __________________________ 88°
Span ________________________ 38.2 ft
Overwetted Leading ______________________ 75°
Length ________________________ 33.29 ft
Height ________________________ 61.9 ft
TREAD ________________________ 16.4 ft

WEIGHTS

LOADINGS

Empty (Actual Weight) __________________ 39,037
Basic Fighter Escort ___________________ 50,445
Flight Design Gross Weight ___________ 51,868

ATTACK ____________________ 75.94
Maximum Takeoff ______________________ 74,349

Maximum Landing ______________________ 51,830

WEIGHTS

FUEL AND OIL

NO. OF TANKS GAL LB (UP-5) LOCATION

2 620 4216 Wings
2 370 2516 Wing Box
8 1,392 9456 Fuselage
2 560 3800 Drop Tanks
Fuel Grade ____________________________ JP-4 or JP-5
Fuel Specification ______________________ MIL-F-5624
Fuel Capacity __________________________ 4 gal/engine (usable)

ORDNANCE

GUN
Vulcan ________________________ M61A1 (676 rounds)

MISSILES
Sparrow ______________________ AIM-7E, AIM-7F
Sidewinder ______________________ AIM-9D, G, H
Phoenix ________________________ AIM-9A

BOMBS
Gen Purpose ________________________ MK-81, MK-82, MK-83, MK-84
MK-81 W/MK-14, MK-82 W/MK-15,
MK-40 W/MAU-91A/B
Cluster ___________________________ MK-20 Mod-2, CBU-59/B
Practise ___________________________ MK-76

ROCKET PACKAGES __________________ LAU-10A/A

FLARES ___________________________ MK-45

FUEL TANKS ________________________ FPU-1A (260 gal)
LAUNCHERS ______________________ LAU-92A (AIM-7), LAU-7A, 3
(AIM-9), LAU-93/AIM-54

BOMB RACKS ________________________ BRU-10, BRU-24, BRU-25

MULTI-ADAPTERS ___________________ MAK-79C/AS78
Triple Ejector Rack __________________ A/AS7B-5

FUEL TANK JETTISON MECHANISM ________ MXU-611/A

SERVICE

3

F-14A

APRIL 1977

DECLASSIFIED
# PERFORMANCE SUMMARY

## TAKEOFF LOADING CONDITION

<table>
<thead>
<tr>
<th>Condition</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Takeoff Weight</td>
<td>57,046 lb</td>
</tr>
<tr>
<td>Fuel internal/external (JP-8)</td>
<td>16,200 lb</td>
</tr>
<tr>
<td>Payload</td>
<td>378 lb</td>
</tr>
<tr>
<td>Wing loading (Based on Ref. area)</td>
<td>102.0 lb/sq ft</td>
</tr>
<tr>
<td>Stall speed – power off</td>
<td>115 kn</td>
</tr>
<tr>
<td>Takeoff run at S.L. – calm (A)</td>
<td>2,290 ft</td>
</tr>
<tr>
<td>Takeoff run at S.L. – 25 kn wind (A)</td>
<td>1,490 ft</td>
</tr>
<tr>
<td>Takeoff to clear 50 ft – calm (A)</td>
<td>3,070 ft</td>
</tr>
<tr>
<td>Max speed/altitude (A)</td>
<td>610/S.L.</td>
</tr>
<tr>
<td>Rate of climb at S.L. (A)</td>
<td>10,000 fpm</td>
</tr>
<tr>
<td>Cruising altitude(s)</td>
<td>36,400/40,100 ft</td>
</tr>
<tr>
<td>Combat radius/mission time (n mi/hr)</td>
<td>739/3.71</td>
</tr>
<tr>
<td>Average cruising speed (kn)</td>
<td>407</td>
</tr>
<tr>
<td>Ferry Range</td>
<td></td>
</tr>
<tr>
<td>Loiter time @ 35,000 ft (hr)</td>
<td>1.60</td>
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## COMBAT LOADING CONDITION

<table>
<thead>
<tr>
<th>Condition</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Combat Weight</td>
<td>51,166 lb</td>
</tr>
<tr>
<td>Engine power</td>
<td>MAX A/B</td>
</tr>
<tr>
<td>Fuel</td>
<td>9,720 lb</td>
</tr>
<tr>
<td>Combat speed/combat altitude (B)</td>
<td>1,178 35,000 ft/min</td>
</tr>
<tr>
<td>Rate of climb/combat altitude (B)</td>
<td>28,000/35,000 ft/min</td>
</tr>
<tr>
<td>Combat ceiling (500 fpm)/speed (B)</td>
<td>58,500/1,030 ft/min</td>
</tr>
<tr>
<td>Rate of climb at S.L. (B)</td>
<td>47,400 fpm</td>
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<tr>
<td>Max speed at S.L. (B)</td>
<td>794 kn</td>
</tr>
<tr>
<td>Max speed/altitude (B)</td>
<td>1,170/40,000 ft/min</td>
</tr>
<tr>
<td>Time: S.L. to 40,000 FT (B)</td>
<td>1.56 min</td>
</tr>
<tr>
<td>LANDING WEIGHT</td>
<td>43,341 lb</td>
</tr>
<tr>
<td>Fuel</td>
<td>1,695 lb</td>
</tr>
<tr>
<td>Stall speed – power off/approach power (kn/kn)</td>
<td>101/95</td>
</tr>
<tr>
<td>Landing distance – ground roll/over 50 ft obstacle (ft)</td>
<td>2,500/3,450</td>
</tr>
</tbody>
</table>

## NOTES

- SPOTTING: A total of 94 airplanes can be accommodated in a safe parking area on the flight & hangar docks of a CVA-59 class angled deck carrier.
- PERFORMANCE BASIS: Flight Test

(A) Intermediate Thrust
(B) Max A/B Thrust
(C) Drop Tanks Symmetrically Dropped When Empty
(D) Drop Tanks Retained
(E) Current limit, Maximum Mach = 2.04

F-14A 4 APRIL 1977
### MISSION SUMMARY — ALTERNATE LOADINGS

<table>
<thead>
<tr>
<th>EXTERNAL STORE LOADING</th>
<th>T/DW</th>
<th>COMBAT RADIUS, n mi</th>
<th>MISSION TIME, hr</th>
<th>LOITER TIME AT 35,000 FT, hr</th>
<th>MISSION TIME, hr</th>
<th>COMBAT RADIUS, n mi</th>
<th>MISSION TIME, hr</th>
<th>COMBAT RADIUS, n mi</th>
<th>MISSION TIME, hr</th>
<th>COMBAT RADIUS, n mi</th>
<th>MISSION TIME, hr</th>
<th>COMBAT RADIUS, n mi</th>
<th>MISSION TIME, hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>(4) Sparrows + (1) M61A1 20MM Cannon + (2) 280 Gallon Drop Tanks</td>
<td>64,076</td>
<td>630</td>
<td>3.12</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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<td></td>
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<tr>
<td>(4) Sparrows + (4) Sidewinders</td>
<td>61,328</td>
<td>389</td>
<td>1.96</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>(4) Sparrows + (4) Sidewinders + (1) M61A1 20MM Cannon + (2) 280 Gallon Drop Tanks</td>
<td>66,758</td>
<td>554</td>
<td>2.77</td>
<td></td>
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<tr>
<td>(4) Phoenix + (1) M61A1 20MM Cannon</td>
<td>63,456</td>
<td>1.34</td>
<td>2.14</td>
<td></td>
<td></td>
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<tr>
<td>(4) Phoenix + (1) M61A1 20MM Cannon + (2) 280 Gallon Drop Tanks</td>
<td>67,886</td>
<td>2.10</td>
<td>2.90</td>
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</tr>
<tr>
<td>(6) MK-82 Snakeyes + (1) M61A1 20MM Cannon</td>
<td>62,588</td>
<td>317</td>
<td>2.57</td>
<td>395</td>
<td>2.57</td>
<td>441</td>
<td>2.54</td>
<td>441</td>
<td>3.17</td>
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<tr>
<td>(6) MK-82 Snakeyes + (1) M61A1 20MM Cannon + (2) 280 Gallon Drop Tanks</td>
<td>67,018</td>
<td>408</td>
<td>3.25</td>
<td>516</td>
<td>3.31</td>
<td>616</td>
<td>3.39</td>
<td>610</td>
<td>4.00</td>
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<tr>
<td>(14) MK-82 Snakeyes + (1) M61A1 20MM Cannon</td>
<td>67,332</td>
<td>306</td>
<td>2.46</td>
<td>377</td>
<td>2.43</td>
<td>413</td>
<td>2.40</td>
<td>393</td>
<td>2.94</td>
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<tr>
<td>(14) MK-82 Snakeyes + (1) M61A1 20MM Cannon + (2) 280 Gallon Drop Tanks</td>
<td>71,762</td>
<td>394</td>
<td>3.12</td>
<td>493</td>
<td>3.13</td>
<td>577</td>
<td>3.20</td>
<td>552</td>
<td>3.72</td>
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<tr>
<td>(8) MK-82 Lo Drag + (1) M61A1 20MM Cannon + (2) 280 Gallon Drop Tanks</td>
<td>71,508</td>
<td>405</td>
<td>3.18</td>
<td>511</td>
<td>3.21</td>
<td>645(A)</td>
<td>3.38(A)</td>
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</tr>
</tbody>
</table>

**Notes:**
- Drop tanks symmetrically dropped when empty
  - (A) 50 N Mi S.L.Cruise
  - (B) 50 N Mi S.L.MACH + .8 Dash

F-14A | APRIL 1977
### STORE STATION

<table>
<thead>
<tr>
<th>MISSILES</th>
<th>1</th>
<th>1</th>
<th>1</th>
<th>1</th>
<th>1</th>
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<tbody>
<tr>
<td>AIM-7E/F (Sparrow)</td>
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<tr>
<td>AIM-9D, G, H (Sidewinder)</td>
<td>2</td>
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<td></td>
<td></td>
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<td>4</td>
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<tr>
<td>AIM-54/A (Phoenix)</td>
<td>1</td>
<td></td>
<td></td>
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<td>6</td>
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<tr>
<td>BOMBS</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>MK-81 (Lo &amp; Hi Drag)</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>MK-82 (Lo &amp; Hi Drag)</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>4</td>
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<td>14</td>
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<tr>
<td>MK-83 (Lo Drag)</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td></td>
<td>9</td>
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<tr>
<td>MK-84 (Lo Drag)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<td>4</td>
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<tr>
<td>MK-40 (Dector)</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
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<td>6</td>
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<tr>
<td>MK-20 (Rockeye)</td>
<td>2</td>
<td>1</td>
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<tr>
<td>CBU-59/8 (APAM)</td>
<td>2</td>
<td>1</td>
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<tr>
<td>MK-76 (Practice)</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
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<tr>
<td>MK-45</td>
<td>3</td>
<td>4</td>
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<td>3</td>
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<td>ROCKETS</td>
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<tr>
<td>LAU-10A/A</td>
<td>1</td>
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<td>3</td>
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<tr>
<td>FUEL TANKS</td>
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<tr>
<td>FPU-1/A (280 Gal.)</td>
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<td></td>
<td>1</td>
<td>2</td>
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<tr>
<td>MULTI-ADAPTER</td>
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<td></td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

PLUS INTERNAL M61A1 20-MM GUN/676 RDS
MINIMUM WIND OVER DECK FOR CATAPULTING

MINIMUM WIND OVER DECK FOR ARRESTING

SINGLE ENGINE RATE OF CLimb

CARRIER APPROACH SPEEDS

(A) These curves should be used for planning purposes only. Actual catapult and arresting gear operation should be in accordance with applicable Aircraft Technical Orders, and Catapult and Arresting Gear Bulletins.

(B) Flap deflection for catapulting and landing = 35°.

(C) DLC = Direct Lift Control.
HI-HI-HI
- Warmup, taxi, takeoff: 5 min at sea level static with maximum continuous power
- Climb on course to optimum cruise altitude with intermediate power
- Cruise out at maximum range speed at optimum cruise altitude (drop external fuel tanks when empty)
- Combat: 5 min at 35,000 ft altitude intermediate power M_{max}
- Cruise back at maximum range speed at optimum cruise altitude
- Descend to sea level: No distance gained or fuel used.
- Reserve: 5% of initial fuel plus 20 min at maximum endurance speed at sea level

FIGHTER ESCORT
- Warmup, taxi, takeoff: 5 min at sea level static with maximum continuous power
- Climb on course to optimum cruise altitude with intermediate power
- Cruise out at maximum range speed at optimum cruise altitude (drop external fuel tanks when empty)
- Descend to 10,000 ft: No distance gained or fuel used
- Combat: 2 min at max A/B power at M = 1.0
- Cruise back at maximum range speed at optimum cruise altitude
- Descend to sea level: No distance gained or fuel used
- Reserve: 5% of initial fuel plus 20 min at maximum endurance speed at sea level

FLEET AIR DEFENSE
- Warmup, taxi, takeoff: 5 min at sea level static with maximum continuous power
- Climb on course to optimum cruise altitude with intermediate power
- Cruise out at maximum range speed at optimum cruise altitude (drop external fuel tanks when empty)
- Descend to 10,000 ft: No distance gained or fuel used
- Combat: 2 min at M = 1.35 max A/B power
- Cruise back at maximum range speed at optimum cruise altitude
- Descend to sea level: No distance gained or fuel used
- Reserve: 5% of initial fuel plus 20 min at maximum endurance speed at sea level
DECK-LAUNCHED INTERCEPT

- Warmup, taxi, takeoff: 5 min at sea level static with max continuous power
- Climb with max A/B at M=1.8 and 45,000 ft altitude. (Drop external fuel tanks when empty)
- Dash: Dash out at M=1.8 and 45,000 ft
- Combat: 2 min at M=1.8 and 45,000 ft
- Cruise back at max range speed at optimum cruise altitude
- Descend to sea level; no distance gained or fuel used
- Reserve: 5% of initial fuel plus 20 min at max endurance speed at sea level

FERRY OR COMBAT RANGE

- Warmup, taxi, takeoff: 5 min at sea level static with max continuous power
- Climb on course to optimum cruise altitude with intermediate power
- Cruise out at max range speed at optimum cruise altitude
- Descend to sea level; no distance gained or fuel used
- Reserve: 5% of initial fuel plus 20 min at max endurance speed at sea level

LO-LO-LO

- Warmup, taxi, takeoff: 5 min at sea level static with max continuous power
- Cruise out at max range speed at sea level. (Drop external fuel tanks when empty)
- Combat: 5 min at sea level intermediate power. M_max (stores on, no distance gained) / Stores dropped after combat
- Cruise back at max range speed at sea level
- Reserve: 5% of initial fuel plus 20 min at max endurance speed at sea level
LO-LO-HI

- Warmup, taxi, takeoff: 5 min at sea level static with maximum continuous power
- Cruise out at maximum range speed at sea level (drop external fuel tanks when empty)
- Combat: 5 min at sea level intermediate power $M_{\text{max}}$, Stores dropped after combat
- Climb on course to optimum cruise altitude with intermediate power
- Cruise back at maximum range speed at optimum cruise altitude
- Descend to sea level: No distance gained or fuel used
- Reserve: 5% of initial fuel plus 20 min at maximum endurance speed at sea level

HI-LO-LO-HI

- Warmup, taxi, takeoff: 5 min at sea level static with maximum continuous power
- Climb on course to optimum cruise altitude with intermediate power
- Cruise out at maximum range speed at optimum cruise altitude (drop external fuel tanks when empty)
- Descend to sea level when 100 n mi from target (no fuel used, no distance gained)
- Cruise out at sea level at maximum-range speed to target
- Combat: 5 min at sea level intermediate power $M_{\text{max}}$, Stores on, no distance gained! Stores dropped after combat
- Cruise back at sea level at maximum-range speed to a point 100 n mi from target
- Climb on course to optimum cruise altitude with intermediate power
- Cruise back at maximum-range speed at optimum-cruise altitude
- Descend to sea level: No distance gained or fuel used
- Reserve: 5% of initial fuel plus 20 min at maximum endurance speed at sea level

CLOSE SUPPORT

- Warmup, taxi, takeoff: 5 min at sea level static with maximum continuous power
- Climb on course to optimum cruise altitude with intermediate power
- Cruise out at maximum range speed at optimum cruise altitude (drop external fuel tanks when empty)
- Descend to 5000 ft (no fuel used, no distance gained)
- Loiter 1 hr at maximum endurance speed at 5000 ft (stores on, no distance gained) Stores dropped at end of loiter
- Climb on course to optimum cruise altitude with intermediate power
- Cruise back at maximum-range speed at optimum cruise altitude
- Descend to sea level: No distance gained or fuel used
- Reserve: 5% of initial fuel plus 20 min at maximum endurance speed at sea level