McDonnell Douglas F-4 Phantom II

QUICK REFERENCE GUIDE (QRG)

Tandem two-seat, twin-engine, all-weather multirole fighter/interceptor

GENERAL AIRCRAFT DATA

- **Crew: 2 (Pilot + WSO/RIO)**
- **Engines: 2× GE J79-GE-17 (F-4E); afterburning turbojets**
- **Max Takeoff Weight: ~61,800 lbs**
- **Fuel Capacity: ~2,000 gal internal (~13,000+ lbs)**
- **Wing Span: 38 ft 5 in**
- **Length: 63 ft 0 in**

BASIC LIMITS

- **Max Mach: Mach 2.23 @ ~40,000 ft**
- **Service Ceiling: ~60,000 ft**
- **Max G: +7.33g / –3.0g (clean)**
- **Max Landing Weight: ~46,000 lbs**
- **Max Carrier Landing Speed (F-4J): ~142–148 KIAS**

TAKEOFF & CLIMB

- **Rotation (Vr): 155–165 KIAS (varies with weight)**
- **Lift-off Speed: ~170 KIAS**
- **Best Rate of Climb (Vy): 350 KIAS to 0.9 Mach**
- **Best Angle of Climb (Vx): ~250 KIAS**
- **Max Climb Rate: 30,000+ fpm (light, full AB)**
- **Climb Profile: 350 KIAS until 10k ft, then accelerate to 0.9M**

CRUISE PERFORMANCE

- **Cruise Speed: Mach 0.85–0.9**
- **Max Range Cruise: ~300–350 KIAS or ~0.85M**
- **Fuel Flow:**
  - **Cruise: 6,000–8,000 PPH**
  - **AB: 40,000+ PPH**
- **Max Endurance: ~1.5–2.5 hrs (internal fuel only)**

DESCENT & APPROACH

- **Descent Rate: 3000–4000 fpm (idle)**
- **Approach Speed (Clean): ~170–180 KIAS**
- **Approach Speed (Dirty): 140–150 KIAS**
- **Flaps/Slats/Gear Extension Speed:**
  - **Gear: ≤250 KIAS**
  - **Flaps: ≤250 KIAS**
- **Final Approach AOA: 15 units or ~145 KIAS depending on weight**
- **Carrier Optimum AOA: ~15–16 units (F-4J/N)**

V-SPEEDS SUMMARY

Speed	KIAS / Mach	Definition
Vne	Mach 2.23	Never exceed speed (clean, high altitude)
Vh	~Mach 2.0	Max level speed
Vy	350 KIAS → 0.9M	Best rate of climb
Vx	~250 KIAS	Best angle of climb
Best Glide	210–220 KIAS	Max L/D speed
Carrier Approach	140–150	Full flap, gear down
Max Gear/Flaps	250 KIAS	Limit speed for extension

COMBAT MANEUVERING (BFM)

Maneuver	Speed (KIAS)	Notes
One-Circle Fight	330–390	Tight nose-to-nose fight
Two-Circle Fight	420–480	Sustained turn rate fight, energy dominant
Corner Speed	420–450	Best rate turn (max g without bleeding energy)
Min Radius Turn	340–380	Max AOA, use elevator and rudder coordination
Max Roll Rate	~300 KIAS	Use for transitions or scissors maneuvers

Corner Speed: ~420–440 KIAS for the F-4E; varies with gross weight.
One-Circle = "nose to nose"; Two-Circle = "nose to tail" fights.

STALL CHARACTERISTICS

Signs of Imminent Stall:

- **Light buffet**
- **Nose-high pitch**
- **Uncommanded roll or yaw (especially in heavy-wing config)**

Stall Recovery:

1. **Stick forward (reduce AOA)**
2. **Throttles MIL/AB**
3. **Level wings, recover airspeed >250 KIAS**
4. **Retract speedbrake if extended**

SPIN & DEPARTURE

Departure Modes:

- **Often induced by uncoordinated full aft stick + rudder**
- **F-4 prone to inverted and flat spins if uncorrected**

SPIN RECOVERY (Standard Procedure – F-4E/J)

1. **Throttle IDLE**
2. **Rudder Full Opposite to Yaw**
3. **Ailerons Neutral**
4. **Stick FULL FORWARD**
5. **Hold inputs until rotation stops**
6. **Neutralize and recover to level flight**

Spin Recovery Time: May take 6,000–10,000 ft altitude loss
Lateral stick inputs can aggravate the spin!

MANDATORY EJECTION CRITERIA

Condition	Action
Spin unrecoverable <10,000 ft AGL	EJECT IMMEDIATELY
No recovery after 3 turns or 6 seconds	EJECT if below 12,000 ft
Inverted or flat spin persists	EJECT

Ejection Seats: Martin-Baker Mk.7 – zero/zero capable (for most models)
Rear seat can initiate command ejection if selected

EMERGENCY NOTES

Single Engine

- **Maintain 250+ KIAS for control**
- **Use rudder trim to offset yaw**
- **Reduce drag (clean configuration)**

Fire / Hydraulic Failure

- **Throttle OFF**
- **Fire extinguisher: ACTIVATE**
- **Land ASAP — gear may be manual extension only**

Electrical Failure

- **Emergency bus switch ON**
- **RAT (Ram Air Turbine) may auto-deploy or be manual**

Fuel Transfer Issues

- **Crossfeed valves — confirm flow**
- **Fuselage tanks feed engines first**

FINAL NOTES

- **Airbrakes: Effective in roll control and speed management**
- **Wings level critical during recovery from high AOA or spin**
- **Fuel Management: Forward CG shifts as aft tanks deplete**
- **Radar/Weapons: Vary by variant; APQ-120 in F-4E, AWG-10 in F-4J**

Created by LetsFLYVFR.com for the X Plane Community 2025