Grumman F-14 Tomcat

QUICK REFERENCE GUIDE (QRG)

Twin-engine, variable-sweep, carrier-based air superiority fighter/interceptor



GENERAL AIRCRAFT DATA

- Crew: 2 (Pilot + RIO)
- Wingspan:
 - Full Forward: 64 ft
 - Full Sweep: 38 ft
- Engines:
 - F-14A: 2× TF30-P-414A
 - F-14B/D: 2× GE F110-GE-400
- Fuel Capacity: ~16,200 lbs internal
- Max External Load: ~14,500 lbs
- Max Takeoff Weight: ~74,350 lbs

BASIC FLIGHT LIMITS

- Max Mach: ~Mach 2.34 @ altitude
- Max G: +7.5g / –3.0g clean
- Carrier Landing Speed: ~140 KIAS
- Max Altitude: 50,000 ft
- Wing Sweep Auto Range: 20° to 68°
- Max Roll Rate: ~180°/sec

TAKEOFF & CLIMB

- Catapult Launch Speed: ~145–155 KIAS
- Rotation Speed (Vr): 145–165 KIAS
- Initial Climb: 10–20° pitch, 300–350 KIAS
- Best Climb Speed (Clean): 300–350 KIAS to 10,000 ft, then 0.8–0.9 Mach
- Afterburner: Used for max performance or heavy launch

CRUISE PERFORMANCE

- Optimum Cruise Mach: Mach 0.85–0.9
- Fuel Flow:
 - Subsonic cruise: ~6,000–8,000 PPH
 - Max AB: 45,000+ PPH
- Wing Sweep: Auto mode recommended for efficiency
- Max Endurance Speed: 250–300 KIAS (clean, low altitude)
- Max Range Speed: ~0.8 Mach at altitude

DESCENT & APPROACH

- Normal Descent Rate: 2000–4000 fpm
- Approach Speed (Carrier): 140–150 KIAS (varies with weight)
- Flaps/Slats: Extend on downwind abeam (~250 KIAS or lower)
- Hook-to-Eye Distance: ~17 ft (carrier approach sighting)
- Final Descent: 700–800 fpm at 3° glide path
- Optimum AOA: 15 units (measured, not in degrees)

COMBAT MANEUVERING (BASIC FIGHTER MANEUVERS - BFM)

Maneuver	Speed (KIAS)	Notes	
One-Circle Fight	330–420	High turn rate, nose-to-nose fight; max AOA useful	
Two-Circle Fight	420–480	Energy fight, radius matters; manage speed closely	
Min Radius Turn	320–350	Max AOA, use speed brake to manage overshoot	
Corner Speed (Max Rate Turn)	375–420	Best sustained turn rate, especially F-14B/D	
Roll Rate Peak	~300 KIAS	Max aileron response speed range	
 One-Circle = Nose-to-Nose: Pull hardest turn inside enemy 			

• Two-Circle = Nose-to-Tail: Out-radius the opponent

V-SPEEDS SUMMARY

Speed	KIAS / Mach	Definition
Vne	Mach 2.34	Never-exceed speed (clean, high altitude)
Vmax Sea Level	~800 KIAS	Limited by drag & engine temp
Best Climb	350 KIAS \rightarrow Mach 0.9	Profile climb
Cruise	Mach 0.85–0.9	Normal cruise
Best Glide	230–250 KIAS	Max L/D ratio
Carrier Approach	~140–150	With full flaps, gear down

STALL RECOVERY

Imminent Stall Indications:

• Buffeting, AOA spike (>21 units), airframe vibration

Recovery Actions:

- 1. Stick Forward: Reduce AOA
- 2. Roll Wings Level: Prevent departure
- 3. Throttle MAX/MIL: Use AB if needed
- 4. Airbrakes IN
- 5. Recover airspeed above 250 KIAS before maneuvering

SPIN & DEPARTURE

Departure Conditions:

• High AOA (>25), asymmetrical loading, abrupt control inputs

Spin Entry (Unintentional):

- Aircraft may enter a flat or inverted spin
- Yaw rate increases, controls become ineffective

SPIN RECOVERY PROCEDURE

- **1. Controls NEUTRAL**
- 2. Throttles IDLE
- 3. Rudder FULL opposite yaw
- 4. Stick FORWARD until rotation stops
- 5. Then neutralize controls, recover to wings level
- 6. Throttle as needed

MANDATORY EJECTION CRITERIA

Spin Recovery Not AchievedActionBelow 10,000 ft AGLEJECT IMMEDIATELYNo recovery after 3 turnsEJECT if altitude <12,000 ft AGL</td>Inverted/flat spin unrecoverableEJECT

- Delay = Fatal: The F-14A especially had poor spin recovery
- Martin-Baker GRU-7A: Ejection seats (zero/zero capable)

EMERGENCY NOTES

- Single Engine Ops: Maintain ≥200 KIAS, avoid high AOA
- Fire: Throttle off, extinguisher activated, land ASAP
- Hydraulic Failure: Can lead to loss of gear/flaps/control
- Electrical Failure: Backup inverter and RAT may supply critical power

ADDITIONAL NOTES

- Wing Sweep Manual Use: Only for emergencies or tactical advantage
- Auto Throttle (F-14D): Use for carrier landings
- Pilot's AOA Indexer: Primary tool for carrier approach, not airspeed
- Be Alert for Mach tuck: Avoid rapid pitch down near transonic speed.

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