FAST Wingman Practical Test Guide
Bomber Transport Aircraft

CONTENTS

INTRODUCTION

FAST (Formation And Safety Team) has developed this practical test guide to be used by check pilots when conducting wing pilot practical tests. Instructors are expected to use this guide when preparing students for the practical test.

Required Qualifications for Wing Applicant

- Private pilot certificate*
- 350 hours total time (250 hours with a Commercial certificate)
- 10 hours recent** formation time (military or civilian)
- Complete a formal ground school conducted by an FAA* recognized formation organization
- Current member of an FAA* recognized formation organization
- Practical test recommendation by a current lead pilot
- Successfully complete practical test

**or non-US, country equivalent*
*** within the preceding two years*

2-Ship Wingman Qualifications

For formation organizations that choose to use a 2-ship, stepping stone approach, posted below are the qualifications for 2-ship wingman. ***This is only valid for an organization that has a formal 2-ship wingman program and issues credentials that are restricted to 2-ship wingman.***

For Bomber/Transport aircraft the minimum Wingman Qualifications are the same as outlined above, under Required Qualifications for Wing Applicant.

Instructor Pilot's Responsibility

A qualified and current formation instructor pilot is responsible for training the wing pilot applicant to acceptable standards in all subject matter areas, procedures and maneuvers included in the TASKS within each AREA OF OPERATION in this practical test guide.

Because of the impact of their teaching activities in developing safe, proficient formation pilots, instructor pilots should exhibit a high level of knowledge, skill and the ability to impart that knowledge and skill to students.

Check Pilot's Responsibility

The check pilot who conducts the wingman practical test is responsible for determining that the applicant meets acceptable standards for knowledge and skill in the selected TASKS.

Use of the Practical Test Guide

All the subject matter, procedures and maneuvers for wing pilot qualification have been included in the *Wingman Practical Test Guide*. The check pilot should select the AREAS OF OPERATION that are appropriate to the applicant's formation organization and aircraft. The check pilot should then select enough TASKS within the applicable AREAS OF OPERATION to determine that the applicant is proficient. The check pilot will adhere to the applicant's signatory's minimum requirements and beyond that, can select as few or as many additional TASKS as he/she feels is appropriate to qualify the applicant.

In preparation for the practical test, the check pilot will develop a "mission profile" that will include the required TASKS in each AREA OF OPERATION. If the applicant is unable to perform a TASK in the mission profile due to circumstances beyond his/her control, the check pilot may substitute another TASK from the applicable AREA OF OPERATION.

Aircraft and Equipment Required for the Practical Test

The wing pilot applicant will provide an airworthy aircraft for use during the practical test. The aircraft will also have:

1. A functional intercom system
2. The capability for the check pilot to transmit and receive on both radios

The check pilot will have final authority as to whether the aircraft meets the provisions of this paragraph.

Formation Aircraft and Pilots Required for the Practical Test

The wing pilot practical test should be conducted in a 2-ship or 4-ship formation, as applicable.

The applicant should be evaluated in both the #2 and #4 positions for the 4-ship practical test (separate flights are not required—the flight can be reconfigured to accomplish the evaluation).

All members of the flight will be formation qualified and current. With the consent of the check pilot, a formation qualified and current right-seat instructor pilot paired with a student can fulfill this requirement.

The check pilot will ride with the applicant.

Provision for 2-Ship Qualification

Signatories flying Bomber/Transport aircraft may choose to qualify pilots in 2-ship formation prior to moving to 4-ship. Those signatories may perform the practical test in 2-ship formation. In this instance, the signatory organization will issue formation credentials that indicate that the pilot is restricted to 2-ship formation in waivered airspace.

Satisfactory Performance

Satisfactory performance to meet the requirements for formation qualification is based on the applicant's ability to safely:

1. Demonstrate proficiency in the applicable TASKS specified in the AREAS OF OPERATION.
2. Demonstrate mastery of the aircraft with the successful outcome of each TASK performed never seriously in doubt.
3. Demonstrate sound judgment and situational awareness.

Unsatisfactory Performance

If, in the judgment of the check pilot, the applicant does not meet the standards of performance in any of the TASKS performed, the associated AREA OF OPERATION is incomplete and the practical test is

unsatisfactory. If there is some question in the check pilot's mind about the satisfactory completion of a TASK, the check pilot may have the applicant repeat the TASK. The check pilot or the applicant may discontinue the practical test at any time when the performance of a TASK is unsatisfactory. If the practical test is discontinued, the applicant is entitled to credit for those TASKS satisfactorily performed. However, during the retest, at the discretion of the check pilot, any TASK may be re-evaluated, including those previously completed satisfactorily.

ORAL PHASE

I. AREA OF OPERATION: FORMATION FUNDAMENTALS

A. TASK: HAND SIGNALS

Objective: To determine that the applicant exhibits knowledge of formation hand signals by:

1. Interpreting or demonstrating—
   a. Visual signal acknowledgement
   b. Can't hear
   c. Can't transmit
   d. HEFOE

B. TASK: AIRCRAFT SIGNALS

Objective: To determine that the applicant exhibits knowledge of formation aircraft signals by:

1. Interpreting or describing—
   a. Attention in the air

C. TASK: RADIO COMMUNICATION

Objective: To determine that the applicant exhibits knowledge of radio communication by:

1. Explaining—
   a. Frequency change procedures
   b. Circumstances under which the "terminate" call would be used
   c. Procedure to follow when "terminate" is called

II. AREA OF OPERATION: TAKEOFF, DEPARTURE

A. TASK: SINGLE-SHIP, INTERVAL TAKEOFF

Objective: To determine that the applicant exhibits knowledge of single-ship, interval takeoffs by:

Explaining—

a. The procedure for "feeding" formation aircraft onto the runway for takeoff
b. The reference used for initiating takeoff behind preceding aircraft

B. TASK: DEPARTURE

Objective: To determine that the applicant exhibits knowledge of departure procedures by:

Explaining—

a. Element rejoin in the #2, #3, and #4 positions
b. Rejoin following single-ship, interval takeoff in the #2, #3, and the #4 positions.

III. AREA OF OPERATION: BASIC MANEUVERS

A. TASK: WING WORK/STATION KEEPING

Objective: To determine that the applicant exhibits knowledge of wing work/station keeping by:

Explaining—

a. Power, pitch and roll management during turns away from the wing pilot

b. Power, pitch and roll management during turns toward the wing pilot

c. Power, pitch and roll management during echelon turns

B. TASK: CROSS-UNDER

Objective: To determine that the applicant exhibits knowledge of the cross-under by:

Explaining—

a. The procedure used for executing a cross-under

b. The consequences of crossing under with insufficient stack down

c. The consequences of crossing under with excessive bank

C. TASK: ROUTE

Objective: To determine that the applicant exhibits knowledge of the route position by:

Explaining—

a. The parameters of route position

b. The circumstances under which route position would be employed

D. TASK: ECHELON

Objective: To determine that the applicant exhibits knowledge of the echelon position by:

Explaining—

a. The parameters of the echelon position

b. The circumstances under which an echelon turn would be used verses a "stacked" turn

E. TASK: DIAMOND

Objective: To determine that the applicant exhibits knowledge of the diamond position by:

Explaining—

a. The parameters of the diamond position

b. The procedure for entering and exiting the diamond position

F. TASK: TRAIL

Objective: To determine that the applicant exhibits knowledge of The trail position by:

Explaining—

a. The parameters of the trail position

b. The procedure for entering and exiting trail

IV. AREA OF OPERATION: RENDEZVOUS

A. TASK: PITCHOUT AND REJOIN

Objective: To determine that the applicant exhibits knowledge of the pitch out and rejoin by:

Explaining—

a. The references used to execute a rejoin

b. The techniques used to control the rejoin (turn circle management)

c. The differences between a turning rejoin and a straight-ahead rejoin

B. TASK: UNDER-RUN *(sometimes termed "overshoot")*

Objective: To determine that the applicant exhibits knowledge of the under-run maneuver by:

Explaining—

a. The circumstances under which the under-run maneuver would be executed

b. The procedure for executing the under-run maneuver

c. Potential dangers associated with the under-run maneuver from the perspective of #2, #3 and #4

d. The rejoin protocol for #2, #3 and #4 after the blown rejoin and under-run

V. AREA OF OPERATION: 3-SHIP FORMATION

A. TASK: 3-SHIP VIC

Objective: To determine that the applicant exhibits knowledge of 3-ship vic by:

Explaining—

a. The configuration of a 3-ship vic

b. The protocols used to fly 3-ship vic

VI. AREA OF OPERATION: TRAFFIC PATTERNS

A. TASK: OVERHEAD 360° PATTERN

Objective: To determine that the applicant exhibits knowledge of the 360° overhead pattern by:

Explaining—

a. The method #2, #3, and #4 will each use to determine pitch-out interval

b. The flight path #2, #3, and #4 will follow after the pitch-out to achieve the desired minimum landing interval

c. The perch position

d. Where in the traffic pattern flaps and gear will be extended

e. Where in the traffic pattern base turn should be initiated

f. Where #2, #3, and #4 will touch down on the runway

g. Procedure for go-around after the pitch-out

VII. AREA OF OPERATION: EMERGENCY/ABNORMALS

A. TASK: EMERGENCY ACTIONS

Objective: To determine that the applicant exhibits knowledge of emergency procedures during different phases of flight by:

Explaining—

a. The actions a wingman will take when experiencing an emergency during takeoff roll

b. The actions a wingman will take when Lead experiences an emergency at altitude

Explaining—

c. HEFOE

d. NORDO recovery procedures

e. Chase aircraft procedures

f. Assistance/coordination procedures following forced landing or other emergency procedures.

B. TASK: ABNORMALS

Objective: To determine that the applicant exhibits knowledge of abnormal procedures by:

Explaining—

a. Bingo and joker fuel

b. Hard deck

c. The reasons for calling "knock-it-off"

d. Knock-it-off procedures

e. The reasons for breaking out of the formation

f. Break out procedures

g. Lost sight procedures

h. The circumstances under which lost sight procedures would be used

FLIGHT PHASE

VIII. AREA OF OPERATION: PREFLIGHT PROCEDURES

A. TASK: BRIEFING

Objective: To determine that the applicant:

1. Understands all the salient elements of the briefing
2. Understands his/her responsibilities in the formation flight
3. Raises questions, as necessary, to clarify any portion of the mission that is not understood, or has not been briefed

B. TASK: START, TAXI

Objective: To determine that the applicant:

1. Properly plans pre-flight, is strapped in and ready at start time
2. Concentrates on Lead and complies with start, radio check-in, and taxi signals
3. Configures aircraft as briefed when taxiing
4. Maintains taxi position without excessive use of power or brakes

C. TASK: RUN UP

Objective: To determine that the applicant:

1. Taxis into proper parade position in sequence, space permitting, and smoothly stops with no wing overlap
2. Complies with Lead's run–up signal and performs run–up and pre–takeoff checks in a timely manner
3. Upon completion of checks, configures his/her ship for safe takeoff without missing any check-list items, selects proper transponder mode (standby/off), and acknowledges ready in sequence

IX. AREA OF OPERATION: TAKEOFF, DEPARTURE

A. TASK: SINGLE-SHIP, INTERVAL TAKEOFF

Objective: To determine that the applicant:

1. Takes proper position on the runway or feeds onto the runway, as briefed
2. Does not initiate takeoff roll until the briefed interval has been achieved
3. Performs smoothly, compensating for any prop/jet wash and vortices

B. REJOIN AFTER SINGLE-SHIP, INTERVAL TAKEOFF

Objective: To determine that the applicant:

1. Maintains up to a 10 knot (or 10%) speed advantage over Lead
2. Initiates the rejoin turn after takeoff at the appropriate position/time
3. Turns at a rate that places him/her inside Lead's turn circle at the correct aspect angle
4. Adjusts bank to maintain proper aspect angle so as to arrive at the correct station keeping position for the wing position being flown
5. Properly controls altitude throughout the rejoin
6. Once stabilized, maintains fuselage alignment with Lead throughout the rejoin
7. Uses power as required when within two to four plane-widths of Lead but does not substitute power usage for proper cutoff/geometry, or exceed engine limits during power changes

X. AREA OF OPERATION: BASIC MANEUVERS

A. TASK: WING WORK/STATION KEEPING—90º AND 180º CLIMBING TURNS, LEVEL OFF AND POWER REDUCTION

Objective: To determine that the applicant:

1. Exhibits precise aircraft control, resulting in little or no relative motion
2. Manages power such that control is timely, with no erratic throttle control
3. Exhibits stable vertical and horizontal positions
4. Is able to smoothly and precisely maneuver his aircraft, assuring proper station keeping position
5. Provides a stable platform to enhance the ability of #3 or #4 to maintain relative position
6. Applicant monitors engine performance and systems periodically to assure compliance within aircraft limitations
7. Stays alert and aware while consistently maintaining concentration and discipline assuring the integrity of the flight
8. Maintains positional and situational awareness

B. TASK: ECHELON TURN

Objective: To determine that the applicant:

1. Exhibits precise aircraft control, resulting in little or no relative motion
2. Adjusts horizontal position to maintain proper position as the turn is initiated
3. Stabilizes in the echelon position, without becoming wide or sucked
4. Rolls out of echelon in concert with Lead
5. Is in the proper wingtip position at the completion of the roll out

C. TASK: LAZY EIGHTS, LEFT AND RIGHT USING UP TO 30° BANK TURNS, AND UP TO PLUS OR MINUS 10º OF PITCH

Objective: To determine that the applicant:

1. Maintains precise station keeping position and understands and appreciates the acceleration and deceleration effects with respect to the lazy-eight maneuvering
2. Uses power with anticipation, smoothness, and well within engine limits
3. As required, advances the propeller control to a higher rpm so as not to exceed engine limits in engines that are supercharged
4. On the inside and the outside of the turns, does not change position fore and aft as the result of acceleration or deceleration effects in the maneuvering

C. TASK: CROSS-UNDER

Objective: To determine that the applicant:

1. Understands and acknowledges Lead's radio signals
2. Exhibits smooth, coordinated and predictable power and primary flight control use
3. Uses the correct technique with proper step-down, nose to tail clearance, and prompt power application
4. Crosses at the correct rate, wings level, in coordinated flight
5. Takes up the proper station keeping position after crossing under

D. TASK: ROUTE POSITION

Objective: To determine that the applicant:

1. Acknowledges Lead's signal to go to route position
2. Exhibits smooth, coordinated control while maneuvering into the route position
3. Stabilizes in the proper route position

E. TASK: DIAMOND

Objective: To determine that the applicant:

1. Acknowledges the signal to go to the diamond position
2. Exhibits smooth, coordinated control while maneuvering into position
3. Uses the correct technique with proper step down, nose-to-tail clearance, and prompt power application
4. Stabilizes in position and makes the proper radio call
5. Maintains proper position throughout the flight's maneuvers
6. Acknowledges Lead's signal to return to fingertip
7. Exhibits smooth, coordinated control while maneuvering back to fingertip

F. TASK: TRAIL

Objective: To determine that the applicant:

1. Acknowledges the signal to go to trail
2. Exhibits smooth, coordinated control while maneuvering into position
3. Maneuvers into position in proper sequence with respect to other wingmen
4. Stabilizes in position and makes the proper radio call
5. Maintains proper position throughout the flight's maneuvers
6. Acknowledges Lead's signal to return to fingertip

7. Exhibits smooth, coordinated control while maneuvering back to fingertip

G. TASK: LEAD CHANGE (APPLICANT REMAINS ON THE WING OF LEAD OR DEPUTY LEAD)

Objective: To determine that the applicant:

1. Exhibits situational awareness during the Lead change
2. Maintains proper position during the transition
3. Recognizes his new position in the flight and checks in with the proper radio call

XI. AREA OF OPERATION: RENDEZVOUS

A. TASK: PITCH OUT AND REJOIN

Objective: To determine that the applicant:

1. Acknowledges Lead's pitch out commands
2. Breaks at the specified interval and turns into trail with Lead on the horizon
3. Demonstrates radius of turn principal in breakup phase so as not to overrun or lag in trail on Lead
4. Acknowledges the rejoin signal and commences maneuver, adding power to gain up a to 10 knot (or 10%) speed advantage
5. Maneuvers inside Lead's turn circle to acquire the proper aspect angle and modulates bank as necessary to maintain aspect angle references while simultaneously maintaining proper altitude reference
6. Once stabilized, maintains proper fuselage alignment with Lead through remainder of rejoin
7. Uses power as required when within two to four plane widths of Lead but does not substitute power usage for proper cutoff, or exceed engine limits during power changes
8. Executes the rejoin so as to arrive in fingertip position within 180º of turn (from #2 position)

B. TASK: UNDER-RUN MANEUVER *(sometimes termed "overshoot")*

Objective: To determine that the applicant:

1. Recognizes the under-run situation within an appropriate time-frame
2. Uses proper technique during the under run so as to pass behind and below Lead with proper nose-to-tail clearance
3. Demonstrates proper use of the clear airspace outside of Lead's turn circle by not maneuvering higher than a normal echelon sight picture on Lead
4. Does not pass forward of Lead's 3/9 line
5. Maintains enough energy to maneuver back inside the turn circle and effect a proper rejoin without becoming sucked
6. Demonstrates smooth, predictable aircraft control and never exhibits a tendency to go wing up or lose sight of Lead
7. Demonstrates proper rejoin protocol following a blown rejoin and subsequent under run

XII. AREA OF OPERATION: SIMULATED EMERGENCY/ABNORMALS

A. TASK: SIMULATED EMERGENCY

Objective: To determine that the applicant:

1. Maintains situational awareness during a simulated emergency situation

2. Is able to perform the proper, supportive roll when another flight member experiences a simulated emergency

B. TASK: KNOCK-IT-OFF

Objective: To determine that the applicant:

1. Takes the appropriate action when a KIO call is initiated
2. Makes the proper radio call when a KIO call is initiated

C. TASK: BREAK OUT

Objective: To determine that the applicant:

1. Takes the appropriate action when a break out is necessary or is directed
2. Makes the proper radio call when a break out is initiated

XIII. AREA OF OPERATION: TRAFFIC PATTERNS

A. TASK: OVERHEAD 360° TRAFFIC PATERN

Objective: To determine that the applicant:

1. Maintains precise station keeping position during echelon formation on initial approach to the airport
2. Acknowledges Lead's break–up interval, times the break precisely to the interval, and takes proper spacing when turning from the initial approach to downwind
3. Maintains precise in–trail position on the preceding aircraft at the same altitude, configures the airplane for landing, and precisely flies the pattern to land with appropriate interval spacing, in accordance with flight number position
4. Touches down at the appropriate spot on the runway (in the first 1,000 feet or as necessary or briefed) using the landing spacing set by flight member number 2, but in no case less than the prescribed minimum landing interval

XIV. AREA OF OPERATION: COMMUNICATION

A. TASK: RECOGNITION AND RESPONSE

Objective: To determine that the applicant:

1. Recognizes and responds correctly to radio calls
2. Takes appropriate directive action following radio calls
3. Recognizes and responds correctly to visual signals
4. Recognizes and responds correctly to aircraft signals

B. TASK: FREQUENCY CHANGE

Objective: To determine that the applicant:

1. Is able to correctly respond to frequency change calls with proper call sign and cadence
2. Moves out to route position, as necessary to accomplish the frequency change safely

XV. AREA OF OPERATION: POST FLIGHT OPERATIONS

A. TASK: TAXI, ENGINE SHUTDOWN

Objective: To determine that the applicant:

1. Configures aircraft as does Lead and maintains appropriate nose-to-tail clearance during taxi
2. Completes engine run-up and shutdown, as appropriate, in accordance with Lead's signals

3. Turns into the ramp space in flight-number sequence, with the appropriate fuselage line-up and spacing
4. Shuts aircraft down in accordance with the command cut signal and the execution signal from Lead

B. TASK: DEBRIEF

Objective: To determine that the applicant:

1. Is attentive and, when the case arises, contributes meaningful information
2. Accepts constructive criticism with appreciation and understanding
3. Demonstrates maturity and objectivity and appreciates his responsibility to maintain the integrity of the flight