VF-124 OPS FORM (REV 7-70)
1.5 HOURS

FS-SIT/WST 1 & 2

90° BEAM STERN INTERECEPTS

1. OBJECTIVE. To introduce the pilot to 90° Beam Stern intercepts and to the use of the APQ-94, 83B and 124 radars. T-39 applications will be shown in conjunction with F-8 parameters.

2. DISCUSSION

a. In any intercept it is pointless to get too close to the bogey without radar contact. If the fighter and bogey are too close together the blips appear merged or indefinite to GCI and precise control is impossible. As a rule of thumb never close to within less than 3 miles of the bogey without radar contact.

b. Discuss the 90° Beam Stern Intercept as presented in FS-RAD-4.

(1) In a perfect 90° Beam Stern the Bogey will be

	T-39:
(a) 30 Hot 30	(a) 30 Hot 20
(b) 20 Hot 20	(b) 25 Hot 15
(c) 15 Hot 15	(c) 20 Hot 10
(d) Dead Ahead 7-9	(d) Dead Ahead 3-4

(2) With 90° to go the Bogey should be Dead Ahead 7-9. Lead bogey by 20° during the attack turn to roll out 1-3 miles in trail.

(a) If bogey is more than 9 miles use 30-40° of lead during the attack turn to roll out 1-3 miles in trail.

(b) If bogey is less than 7 miles use 0-20° of lead during attack turn to roll out 1-3 miles in trail.

(c) Minimum acceptable range with 90° to go is 4 miles (F8J turn radius at 500 KTAS is 3.6 miles using 45° of bank.

(3) Ease off turn and let dot drift toward the centered position when approaching bogey heading (or earlier if it is desired to fire an IR missile before reaching bogey heading.)

c. T-39: With 90° to go, the Bogey should be Dead Ahead 3-4. Lead bogey by 20° during attack turn to roll out 1-2 miles in trail.

(1) If bogey is more than 4 miles use 30-40° of lead during the attack turn to roll out 1-2 miles in trail.

(2) If bogey is less than 3 miles use 0-20° of lead during attack turn to roll out 1-2 miles in trail.

3. PRESENTATION. Run as many 90° Beam Stern intercepts as time permits.

(1) Fighter 35,000 feet 0.9M. Bogey 35,000 feet (plus or minus 5,000) speed 0.8. Controller introduce errors into later runs so that student is faced with other than perfect situations.

T-39: Fighter 20,000 feet 0.5M. Bogey 18,000 feet 0.6M.

4. COMMON ERRORS

a. Not using enough lead during attack turn and rolling out long. If you find yourself on bogey heading beyond 3 miles then you have done something wrong.

b. Not correcting soon enough for an acute position, causing a tight turn to bogey heading with a probable over shoot.

c. Getting too close without radar contact. Stay at 3 miles and search.

1. OBJECTIVE. To introduce low altitude intercepts and low altitude Sidewinder firing techniques. Only targets below 2000 feet AGL are condidered in this discussion.

2. DISCUSSION

a. In any intercept it is pointless to get too close to the bogey without radar contact. If the fighter and bogey are to close together the blips appear merged or indefinite to GCI and precise control is impossible. As a rule of thumb never close to within less than 3 miles of the bogey without radar contact.

b. Discuss low altitude 90° Beam Stern intercept geometry.

(1) Turn radius will be less at low altitude.

(2) The bogey should be Dead Ahead at 5 miles with 90° to go.

(3) Run the entire intercept about 10 degrees more on the hot side than at medium or high altitudes.

(4) T-39: Same parameters as medium altitude 90° beam stern intercepts.

c. Discuss low altitude search techniques.

(1) Use lower gain settings. This will reduce the maximum contact range, but allows the pilot to separate the bogey from scope clutter. Although contacts are possible at greater ranges with higher gain settings, sea return and ground return are also increased and they may hide the target from view.

(2) Lock on as early as possible. The closer the bogey, the more the antenna will point down and the greater the possibility the target will be lost in scope clutter.

(3) The minimum fighter altitude should be 2000 feet AGL while outside the missile envelope.

(a) Allows the pilot to devote more time to the radar than if he were attempting to fly as low as possible.

(b) Provides margin of safety.

(4) FTC may reduce large land returns but will have little effect on sea returns.

d. Discuss low altitude missile firing techniques.

(1) Due to the positive angle of attack of the aircraft armament datum line it is possible to fly into the ground or water with the target boresighted.

(2) Maintain 2000 feet AGL until inside the missile envolpe.

FS-SIT/WST-4 135° BEAM STERN INTERCEPTS 1.0 HOURS
(REV 7-70)

1. OBJECTIVE. To explore the AIM 9B/D firing envelopes, to introduce the pilot to 135° Beam Stern intercepts, and to increase proficiency in the use of the APQ-94, 83B and 124 radars.

2. DISCUSSION.

a. In any intercept it is pointless to get too close to the bogey without radar contact. If the fighter and bogey are too close together the blips appear merged or indefinite to GCI and precise control is impossible. As a rule of thumb never close to within less than 3 miles of the bogey without radar contact.

b. Review the firing envelopes of the AIM 9B/D.

(1) Use intercept geometry to roll out on bogey heading inside the envelope for the missile being used. To roll out long and depend on speed alone to enter the envelope is to demonstrate poor intercept technique.

c. Discuss the 135° Beam Stern intercept as presented in FS-RAD-3.

(1) In an ideal 135° Beam Stern intercept the bogey will be

(a) 10 Hot 30
(b) 5 Hot 20
(c) Dead Ahead 16-18
(d) 15 Cold 10
(e) Turn to put bogey Dead Ahead 7-9 miles with 90° of turn remaining.
(f) Continue as in 90° Beam Stern and roll out in SW range.

T-39:

(a) 10 Hot 20
(b) 7 Hot 15
(c) Dead Ahead 10
(d) 10 Cold 5
(e) Turn to put bogey Dead Ahead 3-4 miles with 90° of turn remaining.
(f) Continue as in 90° Beam Stern and roll out in SW range.

(2) If the bogey is too hot, make an immediate correction of at least 30° to put him on the cold side. When assured of the lateral separation needed for the turn to bogey heading, then return to the 135° heading differential. It may be necessary to make one continuous turn to bogey heading.

(3) If the bogey is too cold, make an immediate correction of at least 30° to place him well on the hot side. It may be necessary to abandon the 135° intercept and proceed as in a 90° Beam Stern.

3. PRESENTATION. Run as many 135° Beam Stern intercepts as time permits.

a. Fighter 35,000 feet at 0.9M. Bogey at 35,000 feet (plus or minus 5000) at speed 0.8M.

4. COMMON ERRORS.

a. Not making corrections large enough. In the front quarter where closure rates are high there is no time to evaluate the effect of small corrections.

1. OBJECTIVE. To introduce the pilot to intercepts in which the bogey is flying at altitudes of more than 10,000 feet above the fighter. Onlu Beam Stern intercepts will be considered at this time.

2. PRESENTATION. Pitch-up intercepts will normally be made only when a bogey is cruising at altitudes near which the F8 cannot sustain level high speed flight. This would normally indicate a bogey at an altitude of 45,000 feet or above.

a. Review the vertical missile envelope.

3. DISCUSSION. Discuss the pich-up intercept.

a. Intercept Geometry. Considered to be the same as discussed in FS-SIT-1 for co-altitude intercepts, with the exception that the fighter should stay about 10° more acute at all times to avoid becoming sucked in the climb.

b. Air speed. With a target at 40,000 feet or less, any intercept would probably be co-altitude. If a target is above 40,000 feet the F8 should stay between 35,000 and 40,000 feet and accelerate to an airspeed which will allow a zoom climb into the missile envelope.

(1) For a 10,000 foot pitch-up a speed of 1,2 is recommended against a highspeed subsonic target.

(2) For pitch-up greater than 10,000 feet or against a supersonic target, maximum airspeed is recommended.

c. Search Technique. The following technique is recommended for any pitch-up intercept.

(1) At the expected maximum contact range attempt to spotlight the target.

(2) When the target passes undetected to inside of 20 miles, raise the tilt to spotlight the target as if he were at 15 miles. As the bogey moves from 20 to 15 miles he should fly into the radar beam.

(3) When the target passes undetected to inside of 20 miles, raise the tilt to spotlight the target as if he were at 10 miles. As the bogey moves from 15 to 10 miles he should fly into the radar beam.

(4) If the bogey is undetected at 10 miles switch to BAT and continue the intercept. At 5 miles begin the pitch-up to bogey altitude. Since the antenna is slaved to the armament datum line, radar contact will probably be make in the climb.

(5) Always lock on if possible before starting the pitch-up If lock on is lost switch to BAT and continue.

(6) Do not close to within 3 miles of the target without radar contact, if you are at ranges less than 3 miles the controller will not be able to continue accurate information.

(7) In determining the proper antenna tilt setting use the relationship of 1° at 10 miles equaling 1000 feet.

(a) 5° at 20 miles is 10,000 feet
7½° at 15 miles is 10,000 feet
10° at 10 miles is 10,000 feet

(b) 10° at 20 miles is 20,000 feet
15° at 20 miles is 20,000 feet
20° at 10 miles is 20,000 feet

(8) Example. A bogey is at 50,000 feet at speed 0,9M. The fighter should accelerate to 1.2M at 40,000 feet.

(a) Set antenna at 5° up elevation in normal search (this is 10,000 feet high at 20 miles).

(b) As GCI calls the bogey at less than 20 miles but more than 15, raise the antenna tilt to 7½° (this is 10,000 feet high at 15 miles).

(c) As GCI calls the bogey at less than 15 miles but more than 10, raise the antenna tilt to 10° (this is 10,000 feet high at 10 miles).

(d) If still no contact as the bogey closes to inside 10 miles, select BAT and continue to follow GCI instructions.

(e) At 5 miles begin pitch-up and continue to follow GCI instructions. Level at bogey altitude but do not close to within 3 miles with no radar contact.

(f) If the target had been 20,000 feet high, use maximum airspeed, double the tilt angles, and begin the no-contact pitch-up at 8 miles.

d. Pitch-up/No Contact. Maneuver is designed to put an F8 inside the missile envelope when a bogey is flying at an altitude higher than that which can be sustained by an F8 high speed level flight.

(1) Always use CRT during the pitch-up.

(2) If no contact, use about 2 G's to rotate the aircraft to 30° nose up and adjust as necessary to keep the speed from dropping below 0.96M. Use the cruise droop at speeds below 1.0M and level off at bogey altitude. In most cases the aircraft will stay supersonic unless the target is at an extreme altitude.

e. Pitch-up/Track Mode. The track display shows bogey altitude as a function of the angular elevation of the steering circle whose scale is the same as that of the elevation dot. Also shown is the altitude capability of the missile as represented by the calibrated vertical. Begin the pitch-up as follows.

(1) If the calibrated vertical extends to the artificial horizon or below, commence the pitch-up when inside the missile envelope. Using CRT, rotate the nose as necessary to center the steering dot.

(2) If the calibrated vertical does not reach down to the artificial horizon or below, begin the pitch-up when the target is 30° high as indicated by the steering circle. Do not let the bogey get more than 30° above the nose of the fighter, for the pitch-up would be too steep and too much airspeed would be lost. The in-envelpe light will illuminate when you are within range and when the calibrated vertical extends to the artificial horizon or below.

f. High Altitude Firing. When firing a missile at high altitudes use the following procedures.

(1) Select continuous ignition or thumb the ignitor microswitch prior to firing. This lessens the possibility of engine flameout caused by missile firing at high altitude and low airspeed combinations. If flameout does occur, relight procedures should be successful with normal fuel selected.

(2) To give the AIM-9C maximum climb potential, fire the missile with the steering dot near the bottom of the scope. If it is impossible due to low airspeed to raise the nose, the AIM-9C may be fired with the dot anywhere within its 9° limits, but the further down the dot, the more vertical potential the missile will have, As in other intercepts the in-envelope light must be on and the pilot must be receiving the proper tone.

4. PRESENTATION

a. Run one successful 90° Beam Stern 10,000 foot pitch-up per pilot.

(1) Fighter 35,000 feet speed 1.2M. Bogey at 45,000 speed. 0.95M
(2) Make target visible at 15 miles.

b. Run as many 90° Beam Stern 20,000 foot pitch-ups as time permits.

(1) Fighter 35,000 feet speed 1.35M. Bogey 55,000 feet speed 0.95M.
(2) On first intercept do not let the pilot see the bogey until at a range of 5 miles. Check for proper blind pitch-up procedures.
(3) On subsequent intercepts make target visible at 18 miles.

VF-124 OPS FORM 3521/6
(7168) FS-SIT/WST-6 1.0 Hrs.

HEADON INTERCEPTS

1. OBJECTIVE. To introduce the pilot to Front Quarter conversions to an AIM 9D attack.

2. DISCUSSION

a. It is recognized that in some situations the AIM 9D can be fixed from the Front Quarter. Good tactical planning, however, dictates that any intercept be planned to enter the Sidwinder envelope from the beam or stern area as chances for a successful firing will be improved. Nevertheless it is not uncommon to be placed in the headon area due to controller error or miscalculation on the part of the pilot.

b. A headon intercept will generally result from making slow or insufficient corrections to a 135° Beam Stern Intercept.

3. SEAM. Introduce the use of Seam.