TAC ATTACK

DECEMBER 1976

HAPPY HOLIDAYS

TAC ATTACK DECEMBER 1976 VOLUME 16 NUMBER 12

TAC ATTACK

FOR EFFICIENT TACTICAL AIR POWER

FEATURES

DEPARTMENTS

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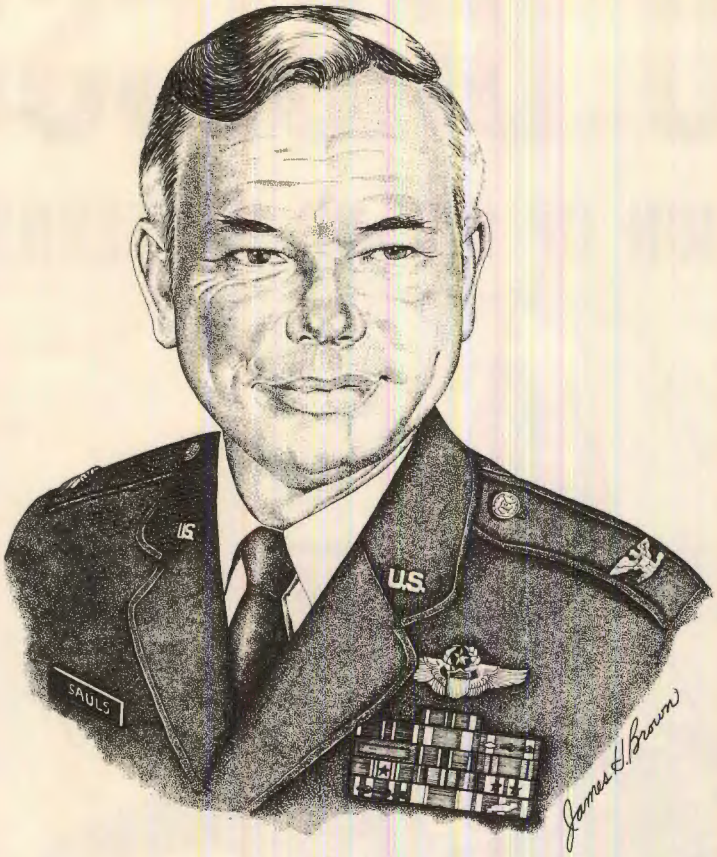

Angle of ATTACK

HAPPY HOLIDAYS

Peace on earth, goodwill, a child's bright eyes looking up at a beautiful Christmas tree. These thoughts, and many more, reflect the message of this joyous season.

The holiday season also brings with it an increase in late-night driving. More people are making trips to be with relatives and friends. Less daylight, crowded highways, and a general deterioration of road conditions combine to make this season especially hazardous. If we also increase the number of people on the highways who have had too much "cheer," the prospect is grim. The key to getting through the holidays safely is to guard against lapses in judgment and to exercise good old-fashioned common sense.

Our constant awareness of risks is the best insurance against tragedy for ourselves and a tragic loss for those who want us home safely. If you don't have to drive during the holidays ... don't. If you must drive, make sure your car, and you, are in top condition for the trip. Drive defensively. Be alert for those individuals who don't seem to care if they, or you, live through the holidays.

A little bit of common sense and judgment will ensure that a safe holiday season is had by all.

Happy Holidays from the TAC Safety staff.

George M. Sauls

GEORGE M. SAULS, Colonel, USAF
Chief of Safety

BACK TO BASICS:

PLANNING & EXECUTION OF POP-UP PATTERNS

By Captain James P. Feighny, Jr.
414th FWS, 57th FWW
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Tactical Air Command's fighter community over the past two years has been conducting some of the world's finest and most realistic training imaginable - training that demands an orderly progression of difficulty to be successful. Ground attack training now includes ingress navigation and tactical formation flying at very low altitudes and 500+ KTS, execution of pop-up patterns for achievement of precise delivery parameters, and egressing the target area with lots of calibrated airspeed at low level. At the same time, aircrews are required to evade and/or negate the sophisticated threats posed by SAMs, AAA, and MIGs. Elements of the air-to-ground and air superiority communities, as well as heavies, choppers, and SAR elements are being employed in concert to penetrate and destroy targets that are defended by a vast variety of surface-to-air weapon systems. To accomplish this, TAC fighter aircrews have devised some of the most sophisticated tactics in aviation history. Making them work requires extensive planning on the part of all the players, coordination between the players, and precise execution. However, while planning and executing these advanced tactics, some fighter pilots have made serious errors: THEY FORGOT ABOUT THE BASICS. This article goes back to the basics, discusses the mechanics of planning and executing pop-up maneuvers, gives a reference that deals extensively with pop-ups, and offers clues to help the tactical aircrews determine if a weapons delivery pass can be successfully completed or if it should be aborted.

Tactical fighter ground attack operations are focused on destruction of targets through use of a wide spectrum of weapons and delivery profiles. One such profile is the pop-up. The applicability of pop-ups in any given situation is not within the purview of this article, but the mechanics of planning and execution are. In discussing pop-up maneuvers, it is assumed that prior to aircrews progressing to pop-up maneuvers, they are thoroughly familiar with and have demonstrated proficiency in basic and curvilinear deliveries from a box pattern. Further, before these pop-up maneuvers can be applied to the tactical scenario, the crew must master low-level navigation techniques and tactical formations. The first consideration when transitioning to pop-up maneuvers is planning. This requires a thorough knowledge of Chapter 6, NNWD-F4-PT-1, Fighter Weapons School Instructional Text. Note: Rules of thumb in that text typically allow four to seven seconds on final and, as a result, provide some time for error analysis and subsequent corrections.

The place to start pop-up training is on a controlled range. These pop-up profiles must be designed to ensure valid learning situations exist, and they must meet the following criteria: (1) Parameters associated with the various phases of the profiles are thoroughly and accurately planned; (2) Profiles must provide the aircrews opportunity to vary the parameters on successive passes so they can learn what variances in parameters are acceptable; and, (3) geographic references for critical points in the profile must be easily identified from the cockpit.

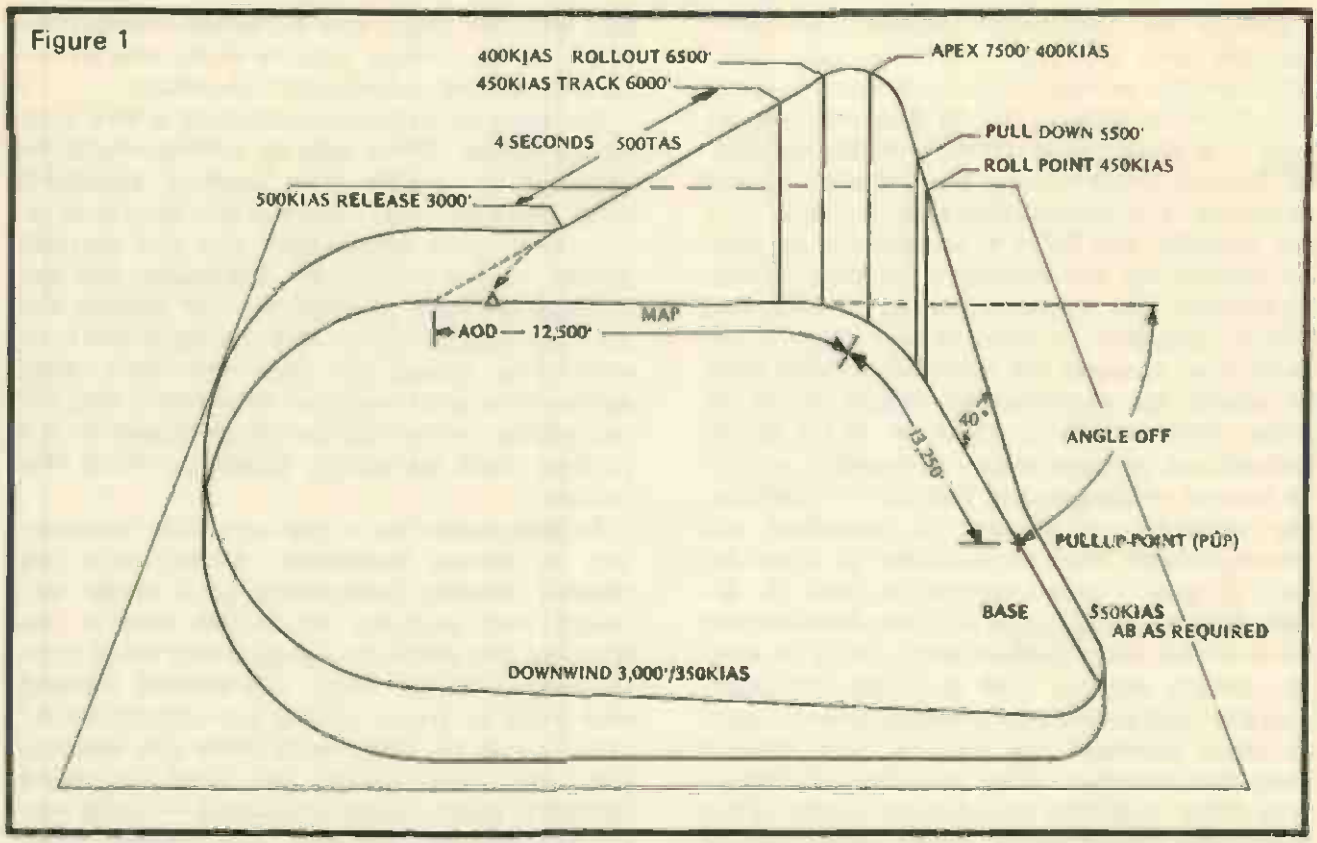
To adequately plan a pop-up profile, the problem is worked backwards starting from the desired delivery parameters (dive angle, airspeed, and altitude), which will provide the distance any particular weapon will travel from release to impact. Next, the desired tracking time must be known so that the desired roll-out altitude can be determined. With this information, the apex altitude and minimum attack perimeter (MAP) can be calculated. Knowing your ingress altitude, airspeed, and desired climb angle during the pull-up, the pull-up to MAP distance can be determined; also, the roll-in and pull-down altitudes are definable. Now all of the variables except angle-off are known, and the mechanics of planning are nearly completed. With the definition of angle-off, the check points on the range or in the area of a tactical target can be identified.

A typical F-4E (LES) range training pattern is depicted in Figure 1 : 30 degrees of dive and a 3,000' AGL release altitude. Target density altitude is sea level.

Using the typical pattern shown in Figure 1, let's talk ourselves through a pop-up training pattern, starting on downwind. Downwind should be flown at some fuel conserving combination of altitude/airspeed and far enough away from the target to allow for adjustment of pattern spacing. (A popular downwind airspeed for the F-4 is 350 KCAS). The turn from downwind to base should be designed so that once rolled out on base and tracking toward the pull-up point, there is adequate room to accomplish an unloaded acceleration to the desired pull-up airspeed and descend to the desired approach altitude. To do this, make a 4-G turn to the desired heading, lowering the nose only enough

back to basics:

Figure 1



to maintain your base airspeed at full military power, roll out, and unload to "0"-G, accelerating to 500-550 KCAS, and descend to the desired approach altitude. Initiate level-off on base early enough so that you don't have to "reef" in 4-Gs and bleed off airspeed unnecessarily. At the pull-up point, a wing's-level 4- to 5-G pull to the desired climb angle is initiated. In the case of a low thrust-to-weight ratio, or if a significant climb to reach the desired apex altitude is required, it may be necessary to have the afterburner(s) going prior to "G" onset at the pull-up point. Be sure you are aware of your aircraft's low altitude handling characteristics. As an example: The first time you F-4 drivers plug in the burners at 500-550 KCAS below 1,000 feet AGL, the pitch-down will get your attention if you are not anticipating it. Upon reaching the desired climb angle, unload the aircraft to establish a stabilized climb to the roll point. During this climb, some pilots will have a tendency to roll and look for the target and may even roll in as soon as they acquire the target; both errors could have serious consequences. In the first case, you may end up inside the MAP with an unacceptably steep dive angle. In the second case, most pilots will initiate the pull-down well below the proper altitude which will result in an excessively shallow dive angle. This normally means the weapon will be released below the minimum altitude for fuze arming time and/or safe separation. Moral to the story: Pull-up at the proper point and start the pull-down at the proper altitude by referencing ye ole altimeter. At the roll altitude, roll to acquire the target and initiate the pull-down to the aim-off point at the pull-down altitude. Transitioning from the climb phase to the roll and pull-down phases to achieve the desired dive angle requires that the aircrew be aware of airspeed, "G" available, and the flying characteristics of the aircraft. Airspeed at the roll point and pattern apex should be 20 to 50 and 50 to 100 knots respectively below delivery airspeed. These parameters may seem quite wide, but they allow for variations in the magnitude of the maneuver, individual pilot technique for "G" onset at pull-up, climb angle, aircraft thrust-to-weight ratio, and roll-in techniques.

Initially, the pilot may feel that the canopy clues available during a pop-up attack are much different than from a box pattern. However, he will notice that as he transitions during a

properly executed pop-up maneuver, from the roll, pull-down, and apex phases to establishing the desired dive angle, he should be relatively close to the same point over the ground that he used as a "crutch" during his training in the box pattern and that the same canopy clues should appear. It is at this point that error analysis is accomplished and where no surprises should occur. For example: If the aircrew is 50 to 100 knots off the planned airspeed at the pull-up point, he knows he isn't going to have the planned airspeed on top and, indeed, he will not be able to make the planned apex altitude at his planned airspeed, or maybe not at all. Likewise, if he overflies the pull-up point, or drops a wing toward the target, he must realize right then that he will be flying toward the MAP. The result being, if he doesn't do something immediately, he will be steep. This problem of being inside the MAP will be confirmed if he starts the roll-in. He will see that he is, in fact, inside his geographic "crutch." From roll-out to release through recovery - the pop-up pattern is no different than that of the box pattern except that most likely there will be time for only one azimuth and dive angle correction before reaching the release point. In these conditions, the pilot's error analysis must be instinctive, and the correction applied rapidly. This requires the aircrew be intimately familiar with the basics of dive deliveries. If the pilot cannot assimilate these conditions - he is not sufficiently familiar with the dynamics of the box pattern and has no business attempting pop-ups.

A successful attack from a pop-up maneuver depends on the aircrew's ability to maneuver to a precise position in space relative to the target. This position is determined by the type of ordnance carried, the desired delivery parameters, and maneuvering capabilities of the aircraft. In combination, these factors define an imaginary circle around the target within which the desired delivery parameters cannot be attained with a roll-in turn of 90 degrees or less. This circle is the MAP previously mentioned. If the attacking aircraft is within the MAP during the initial phase of the pop-up, pull-up to pull-down, the aircrew must be trained to realize that he cannot safely accomplish the desired attack without repositioning the aircraft outside the MAP. During pop-up training on a controlled range, the point at which the aircrew realizes he is inside the MAP (prior to rolling out pointed at the upwind aim point) is where he should abort the pass. If he has failed to recognize this, and rolls out on final in excess of five degrees steep, an immediate recovery should be initiated.

During initial pop-up training, repositioning maneuvers should not be permitted: Normally they would be prohibited due to the presence of other aircraft in the same weapons delivery pattern. However, when MC/MR aircrews progress to pop-up training on a tactical range, repositioning maneuvers must be part of any orderly training program. This article will not discuss specific repositioning maneuvers exept to note that: (1) There are several methods of completing repositioning maneuvers that have been tested on controlled as well as tactical ranges, and (2) The primary considerations of impact accuracy, weapon arming time, safe escape from weapons effect, visual contact with the target throughout the maneuver, survivability (exposure time), and safe recovery must never be compromised. It must also be realized that in actual combat, some of the methods of repositioning may be too difficult or not tactically sound. Therefore, the variety maneuvers available must be considered as basic additions to the aircrew's weapon delivery capability. In actuality, it all boils down to being able to judge the amount of turning room required for the given situation. This is something that must be learned in air-to-air training and applied to the air-to-ground arena, just like aircraft handling characteristics.

Up to this point, nothing has been mentioned about minimum airspeed in relation to aborting a pass. It must be realized all aircraft have a minimum turning radius. Being excessively slow over the top won't decrease the turning radius but does decrease the "G" available; therefore, turn rate decreases and, accordingly, the time from pull-down to roll-out is increased significantly. Consequences of increased exposure time during training in itself are not catastrophic ... in actual combat, they may be. Because of the adverse handling characteristics of modern day fighters at slow airspeeds and high angles of attack, and the fact that the apex of most pop-up maneuvers is well below the altitude required for recovery of an out-of-control condition, minimum airspeeds in the pop-up pattern must be considered. Just like flying inside the MAP and being steep by more than five degrees means gross errors have been committed, failure to meet prescribed minimum airspeeds means gross errors have also occurred, and that

back to basics:

Capt JAMES P. FEIGHNY,Jr. is this month's Fleagle T-shirt winner.

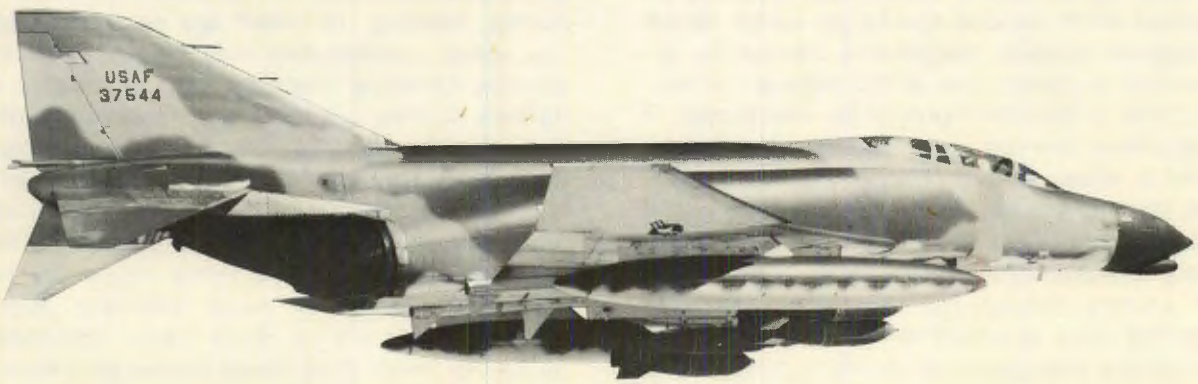
particular delivery pass should not be continued.

Finally, prior to proceeding on to pop-up training on a controlled range, a positive demonstration of proficiency in basic fighter maneuvers and situation awareness must be combined with the ability to consistently qualify in a basic gunnery pattern. Also, proficiency in pop-up maneuvers on a controlled range must be demonstrated before progressing to deliveries against tactical targets.

Let's now transition from the controlled range to tactical scenarios. Once the defensive scenario has been set, the target identified, and the sorties allocated, get everyone in the mission involved. This planning session is not to be confused with a political convention - but many good ideas for ingress, target area tactics and egress will evolve from a short, well-led tactics planning seminar. Remember the old adage, plan your flight, and fly your plan. Most of us do an adequate job of the first part of that verse - but when things start going down hill - playing the situation by ear most often puts somebody in an untenable situation. These "surprises" can most often be eliminated by a short session of "what-ifing" the plan, looking for weak points and areas of vulnerability. In planning, don't slight fuel requirements and switchology or brush them off as "standard." Nothing is more disconcerting (and deadly) than getting to the target area well below planned fuel or not having enough to properly evade or negate unknown threats, and then, making a dry pass due to an error in switchology. Set a point short of the target and establish a go/no-go fuel status. This point may or may not coincide with a point where weapons switchology may be accomplished without undue sacrifice to other tasks. One technique is to select a "fence check" point on the enroute map and write an abbreviated checklist for the weapons switches, then check that everything is, in fact, set at that point.

Target area maneuvering must also be carefully planned. Selection of an easily-identifiable IP, and pop-up point, either through visual or radar acquisition, will make or break a minimum exposure attack. Experience has shown that this task should be kept as simple as possible. Big mountains, towns, etc, have the disadvantage of not being precise enough navigation points, but a small isolated two acre plateau is also easily misidentified. So the technique of using gross navigation features to point you at a precise IP is easily applied. Fly the leg from the IP to the pull point in the same way you practiced on the range, and you won't be surprised when you reach the pull-up point.

Techniques used for target acquisition may be the same as noted in the IP selection. That is, find the big target area features, then move to the smaller pointing cues, finally arriving at your specific aim point. By using these navigation and pop-up techniques, you will be able to avoid those deadly square corners which plague the pop-up pattern. However, if you do have to reposition during the attack, make your decision early and get some maneuvering room just as you would when executing any basic fighter maneuver. What has been learned about maintaining separation between you and an air-to-air target applies in the same way to gaining turning room for the final phase of an air-to-ground attack from a pop-up maneuver. An important fact to realize is that you can put the ordnance on target out of a curvilinear approach using the planned delivery parameters by using a reposi-



F-4E: GW 44,000 Lbs., KTAS 500, KCAS 500

	25°/3,000 ft	30°/3,000 ft	35°/3,000 ft
AOA Mils	13	12	11
DFP Mils	110	95	83
Total Depression	123	107	94
Altitude Lost 5Gs in 2 Sec	950	1250	1625
Time of Flight	6.38 sec	5.41 sec	5.15 sec
Achieve Safe Escape Minimum Altitude	yes	yes	yes
Fuze Arming Criteria Met (4 Sec)	yes	yes	yes
Mil/Differential from Planned Parameter	+16	Basic 107	-13

tioning maneuver, much the same as in air-to-air, but it is going to cost you something. That something is increased exposure to defensive reactions. Whether you can live with the increased exposure depends on the situation at the time. Many variables must be considered; too many to be discussed in this article. However, it is an area to consider during mission planning.

The final subject in mission planning to be discussed is that of planned variances in weapons delivery parameters. Specified singular parameters are satisfactory for the "standard" range mission, but combat experience has proven a known parameter variance is a must. One technique is to use a five degree variation in dive angle. In planning this, define a minimum and maximum dive angle and release altitude combination that is consistent with fuse arming and fragmentation clearance. Determine a central sight setting and apply the known variances for the maximum and minimum dive angle. As an example, let's look at a 30° dive delivery of a MK-82 LDGP bomb with a desired release altitude and airspeed of 3,000 feet (AGL) and 500 KCAS respectively, and construct the above table.

You now have a reference point for making corrections within a known delivery window and can use a new aiming index which is slightly below the bottom eyebrow of the sight reticle if you roll out shallow, lower edge (25° dive), or the upper eyebrow if steep (35° dive). For those of you not familiar with the F-4E sight, the eyebrow is the 25 mil segmented circle that is inside a solid 50 mil circle that together with the pipper make up the sight reticle.

In the final analysis, the fighter pilot must be able to destroy the target where he finds it, employing the tactical and delivery techniques dictated by the nature and environment of the target. From the controlled range to the combat arena, aircrews must be taught to adapt to the situation they face at the time. Allowing them to walk before they run and providing them with a training program that incorporates specified paths by which they can progress to scenarios that place more demands on their abilities, will save lives, airframes, and ultimately result in aircrews that are "no sierra" combat ready. Don't unnecessarily constrain for the sake of safety. Safety is bred by proper, logical, and orderly training - training that is real world and not unrealistically constrained out of fear. →

AIRCREWMEN of DISTINCTION

Capt Horace E. Johnson
24th CompSq
24th Comp Wg
Howard AFB, CZ

Capt Alan C. Murphy
24th CompWg
Howard AFB, CZ

SSgt Marcelino Martinez
24th Comp Sq
24th Comp Wg
Howard AFB, CZ

Captain Johnson, Captain Murphy, and Staff Sergeant Martinez, UH-1N crewmembers, were scheduled to fly in support of the infiltration-exfiltration training of a combined USAF Combat Control and US Navy SEAL team. Prior to flight, the trainees, who were to climb up to the aircraft on rope ladders and then rappel to the ground, were thoroughly briefed on emergency procedures by Staff Sergeant Martinez.

After takeoff, initial hover was established at 35 feet above the ground and the first three trainees were cleared to the ladders. As the first two trainees began to ascend the ladders, all tail rotor thrust was lost. The aircraft began a clockwise spin, with a slight nose "tuck." Captain Murphy quickly analyzed the critical situation, retarded the throttles to flight idle, and executed a [illegible] autorotation. During the descent, the aircraft continued to rotate through two full 360 degree turns. Through [illegible] the nose was maintained by [illegible] inputs and by reference to the sweeping horizon. As these events occurred, the trainees trapped on the ladders and the trainee stabilizing the ladders were able to follow the prebriefed emergency procedures and roll clear of the aircraft without injury. Just prior to touchdown, the collective pitch control was increased to minimize the rate of descent. At touchdown, the rotational inertia of the aircraft and grassy cover of the landing site allowed an additional 30 degrees of turn to occur. Although elapsed time from control failure to touchdown was less than 10 seconds, the mission planning, briefings, crew coordination, and the instantaneous corrective actions of the flight crew and trainees resulted in recovery of the aircraft with minimal damage and no injury to personnel.

Subsequent investigation revealed a failure of the tail rotor drive quill shaft coupling which resulted in the complete loss of tail rotor thrust.

The superior airmanship and professional competence of the flight crew resulted in the saving of a valuable aircraft and averting injury. Their superior performance before and during this critical emergency qualifies them as the Tactical Air Command Aircrewmen of Distinction.

By Capt Josephine A. Bryne
Weapons Safety Officer
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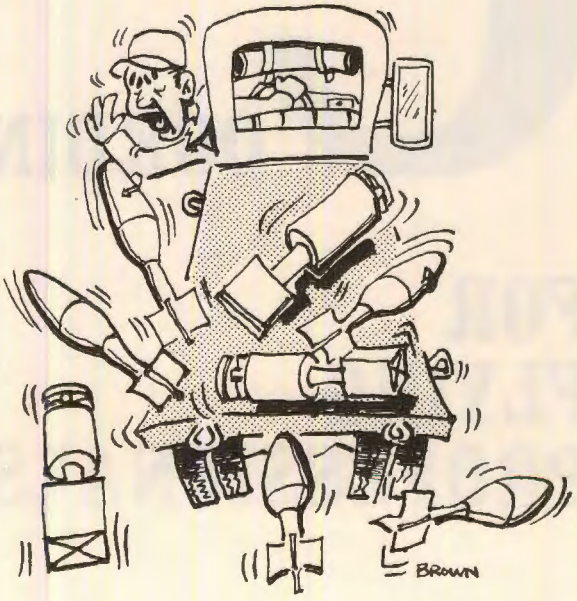
You never see a commercial trucker drive onto a base with an unbalanced, unsecured, and unplacarded load of explosives. Unfortunately, many military personnel are often not as careful as commercial trucking companies. Due to ignorance or rush, we sometimes completely ignore the basics of safe transportation. Look at a couple of recent TAC accidents:

Not too long ago some munitions troops loaded 126 practice bombs in a module on an MHU-110 trailer - 80 on the right side and 46 on the left. Then they delivered 12 BDU-33s at the aircraft, leaving 80 on the right and 34 (including the lighter MK-106 type practice bombs) on the left. During the trip back to the storage area from the flight line, the unbalanced load created stress factors that sheared the mounting bolts on the module, scattering practice bombs and the module all over the road.

Earlier this year, some skyrockets (which were electro-explosive devices) were "loaded" in a commercial van with some batteries and other equipment for transportation to a site to be used during an exercise. The skyrockets were not packed in approved DOT containers ... some were set on the floor of the van ... none were secured to prevent movement. Apparently the unshorted leads to one of the skyrockets touched the battery terminals during transport and the skyrocket ignited. The resulting fire completely destroyed the van and its entire contents. Fortunately, no one was injured.

While the transportation of explosives does not require a lot of technical knowledge, it does demand that responsible personnel use common sense. Every time you load a vehicle with explosives, before you jump in and drive off, STOP, step back, and LOOK at that load. No matter what kind of explosives you're transporting, the assembled item, crate, can or box must be secured (tied down, braced, or blocked) to prevent movement. Will the load remain secure regardless of the normal stresses applied during transport? Is the load balanced? Are your items protected from other materials or equipment which could initiate them? Are the vehicle bed, sides, and tailgate designed to carry the weight you have loaded? If the answer to any of these questions is no, you are taking a chance on your simple transport operation becoming an explosives accident. Don't take the chance.



THE ABC'S FOR FLYING PROFESSIONALS

By Colonel Richard C. Jones
Director of Safety
13th AF (PACAF)

Professional ability and performance have always applied to "the oldest profession in the world." However, this reference to job status, position, and quality performance is heard so often that its significance in the real world of the Air Force may be diluted. Throughout our Air Force career, we are told over and over again that we have been carefully identified, selected, and trained ... therefore, the final product represents "A Professional." Unfortunately, this philosophy is a myth and is far from the truth. Professionalism is something that many Air Force members only hear about. In fact, for many, it goes in one ear and out the other. At the same time, it is important that we have a symbol or status we can identify with ... one that signifies top standards of performance in each career field. Therefore, we need the term "Professional." In medicine or law, by simply attaining the education and receiving the degree, the individual is awarded the title of "Professional." However, this is not true in the Air Force. Only those who excel and constantly re-prove themselves attain the elite title "Professional." I am sure each of you can name, visualize, or recall many people in this select category.

But, what about those who are way below this standard? Unfortunately, the Air Force does have some of these. They are the ones who do not measure up to the average and who appear totally satisfied with being in that below-average category. There are many reasons why this person is not willing to pay the personal price for improvement or is not being required to be better. However, our big challenge is to improve or remove those individuals who cannot or will not work toward the status of "The Professional."

Let's review just a few of the special qualities that are essential if you are working toward a professional status: personal discipline, job knowledge, attitude, judgment, initiative, dedication, cooperation, concern, pride, and loyalty. These attributes will help you take whatever resources you have and, despite the challenge of shortcomings, turn them to your personal advantage. Yes, this list looks a lot like belief in Motherhood, Boy Scouts, or American apple pie; but these are a part of what it takes. A bit of personal pride is involved, but certainly not beyond the reach of anyone. The fact is, each of us can be a professional performer if there is an honest, positive approach to individual attainment.

How can we recognize individuals who don't meet these criteria or fall into the "I don't really care category"? It's quite easy. On a daily basis, numerous messages flash across communication lines citing aircraft accidents and incidents that were caused because a substandard performer violated, disregarded, or neglected one of the most important qualities necessary to be "A Professional." Of major concern to all commands are the instances where crew actions, crew briefings, and crew coordination were found to be at an unsatisfactory level of performance, both among air and maintenance crewmembers. These deficiencies were identified during the worst possible situations - accident/incident investigation boards. Certainly, there are many causes for aircraft accidents other than operator errors or maintenance foul-ups. However, the three I mentioned above, the ABCs for flying, coupled with keeping the bird in shape to fly, are of major importance. Crew actions, briefings, and coordination apply to both areas of responsibility. Flying, certainly - but they are also significant requirements in the daily performance of each maintenance specialist, supervisor, life support manager, and crew chief.

Let's highlight some recent Air Force happenings where the ABCs were managed improperly, totally disregarded, or flagrantly violated.

THE INFAMOUS DOGFIGHT

The mission was scheduled as a three ship air-to-air mission. The mission was briefed to include GCI intercepts and two MIG-Cap engagements. Before the flight departed squadron operations, it was determined that only two aircraft were available. Therefore, flight lead realigned the flight and quickly rebriefed the mission as one-versus-one air combat tactics using normal scenarios. The participating crews consisted of a flight examiner as flight lead (01) and the crew receiving training was 02. After two GCI intercepts, the flight set up for a scenario which consisted of opposing level passes at 12,000 and 14,000 feet followed by

the defender (01) executing a loop and the attacker (02) executing a half Cuban-8. The defender did not have 02 in sight at any time after the opposing pass. Coming over the top of his maneuver inverted, 02 saw 01 and realized that they were on a collision course. He rolled upright, wings level and attempted to avoid hitting 01. A collision occurred and all four crewmembers ejected successfully. Both aircraft were destroyed.

What happened? Why could such a disaster occur? First, the flight examiner and flight leader displayed questionable judgment in revising and briefing the mission profile at the last moment. This did not provide sufficient time to properly insure that the new crew actions and profile to be flown were briefed accurately. Second, the flight briefing did not insure that both crews understood and agreed on the maneuvers to be performed. Lead 01 briefed the attacker's maneuver in relation to his previous experience with "minimum time geometry" solution. The other crew, 02, was thinking basically that of the "free fighter" both before and after the re-brief. Inaccurate information was presented. Specifically, it was briefed that when the attacker reached the apex of his maneuver, the adversary would be on the downhill portion of his loop. This was not the case, and they collided. Finally, the aircraft commander in 02, although having visual contact with lead 01, misjudged aircraft attitude and position and failed to take appropriate actions to avoid this collision. Not very professional, and certainly a waste of our expensive, hard-to-get resources. These aircrews were lucky, though. Their ABC mistakes didn't cost them their lives. Another instance follows which ended more unfortunately for an aircrew.

THE ELECTRIFYING SPECIAL SPECIALIST

The next story is true. Only the names and faces have been changed to protect the "non-professionals." A flight of two aircraft departed home base to fly a normal range mission. Approximately one hour of flight passed uneventfully when lead reported he had a fire warning light on number two engine. Emergency procedures were followed by the aircrew, the engine was shut down, but the fire light continued to burn a bright red. The flight declared an emergency and quickly headed for home base. While en route, the crew of the number two aircraft reported to lead that his

number one engine was also on fire and fuel was flowing from the belly of the aircraft. Lead then made a decision to step out of the disabled bird and ordered his GIB to punch out. However, the aircraft impacted the ground prior to the ejection attempts. "Well," you say, "these things do happen." Not very common to get two engines on fire at one time, same day, or during the same flight. On the other hand, what could have caused such an uncommon happening? Some of you probably may have guessed it. The electrician specialist had just recently reworked part of the bird's fire warning system. This professional specialist had reversed the leads to the fire warning detectors! Accidentally, of course, and largely because it was raining and very cold. Tragically, the aircrew received erroneous information regarding the presence of fire, shut down the wrong engine, and then elected to eject from what they believed to be a disabled aircraft. Although certainly less important, another expensive air machine bit-the-dust, and thus required a group of accident experts to be totally tied up for several weeks in their quest for the cause. Most of the errors are obvious, but what else contributed to this costly and devastating accident? Substandard supervision was present in this accident and included the electrician's supervisor and quality control personnel who signed off the electrician's work in the aircraft forms. Although aircrew briefings were comprehensive regarding the range mission, key areas regarding emergency diversion actions, bail out altitudes, and crew coordination were omitted. Intra-flight coordination was unsatisfactory since lead did not request or get assistance from his wingman immediately after initial fire warning. Reviewing this accident,

it is obvious where the aircrew's and specialist's actions, briefings, and coordination did not meet the desired level of professional performance.

The last example is appropriately titled:

THE LAST "HELLO, MOM"

This flight was a local proficiency sortie with practice instrument approaches to be flown at an outlying civilian base. Upon reaching the vicinity of the base, the pilots were advised that clearance for instrument approaches could not be obtained. The pilots cancelled their IFR clearance and requested that the clearance be left open so that it could be resumed later. The aircraft then flew at low altitude near the pilot's home where a rolling maneuver was initiated. The aircraft completed three-fourths of the roll and struck the ground two-tenths of a mile from the front yard as his relatives watched. The aircraft was destroyed on impact and both crewmembers were killed. A cursory review of this fiasco will cause a rapid utterance like, "YGTBSM, is that stuff still happening?" The answer is yes! What caused these pilots to participate in such a risky sport? The stakes are high nowadays - loss of aircrew wings, career, or life. But let's review what things were wrong other than aircrew judgment, discipline, and knowledge.

The accident board that studied this "smoking hole" for a few days reached several conclusions. Although "buzzing" was quite obvious, aircrew actions as well as briefings and coordination were totally disregarded. However, let's just take a quick look at the findings.

First, there was a noted deficiency in the unit's operational supervision. Permissive squadron supervision created an atmosphere conducive to breaches in flight discipline. No crew briefing was conducted. A mission was authorized which afforded little training and encompassed questionable procedures. Also, it allowed the pilot to deviate from established rules and regulations and fly low over his relative's residence. The pilots did cancel their IFR flight plan and flew low level VFR in violation of AFR 60-16 which restricts such activity. Second, the pilots involved, requested an unusual flight profile that was approved without question and without adequate guidance as to performance level expected. Investigation established that the backseat pilot had been selected by the flip of a coin, further supporting the fact that there existed an

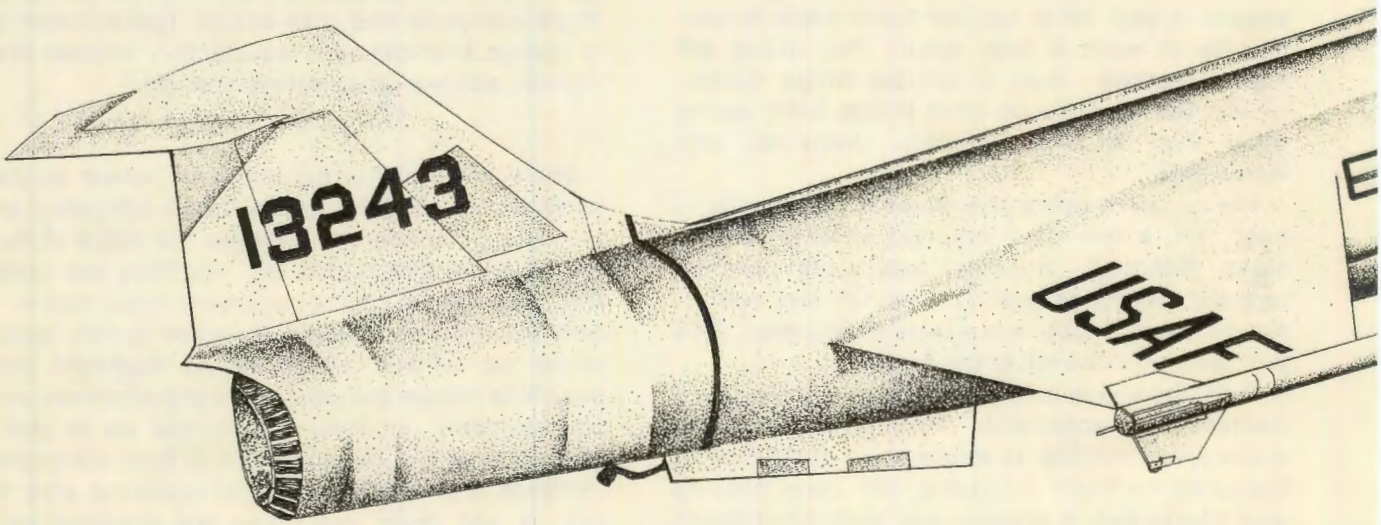
air of permissiveness conducive to violations in flight discipline and crew action. This accident is a classic example of unsatisfactory aircrew discipline, actions, and professionalism.

* * * *

There are more tragic incidents which would underscore the deficiencies found following an accident or incident. I consider the ABCs of flying to be highly significant, and they are ones that crop up as a factor in nearly every reportable accident or incident. A sequel to this review could be written which would highlight the superfine things our professional performers do. Unfortunately, in order to impress us as individuals, it seems we must read or hear about the mistakes and shortcomings of someone else. If not, it just does not make the essential impression.

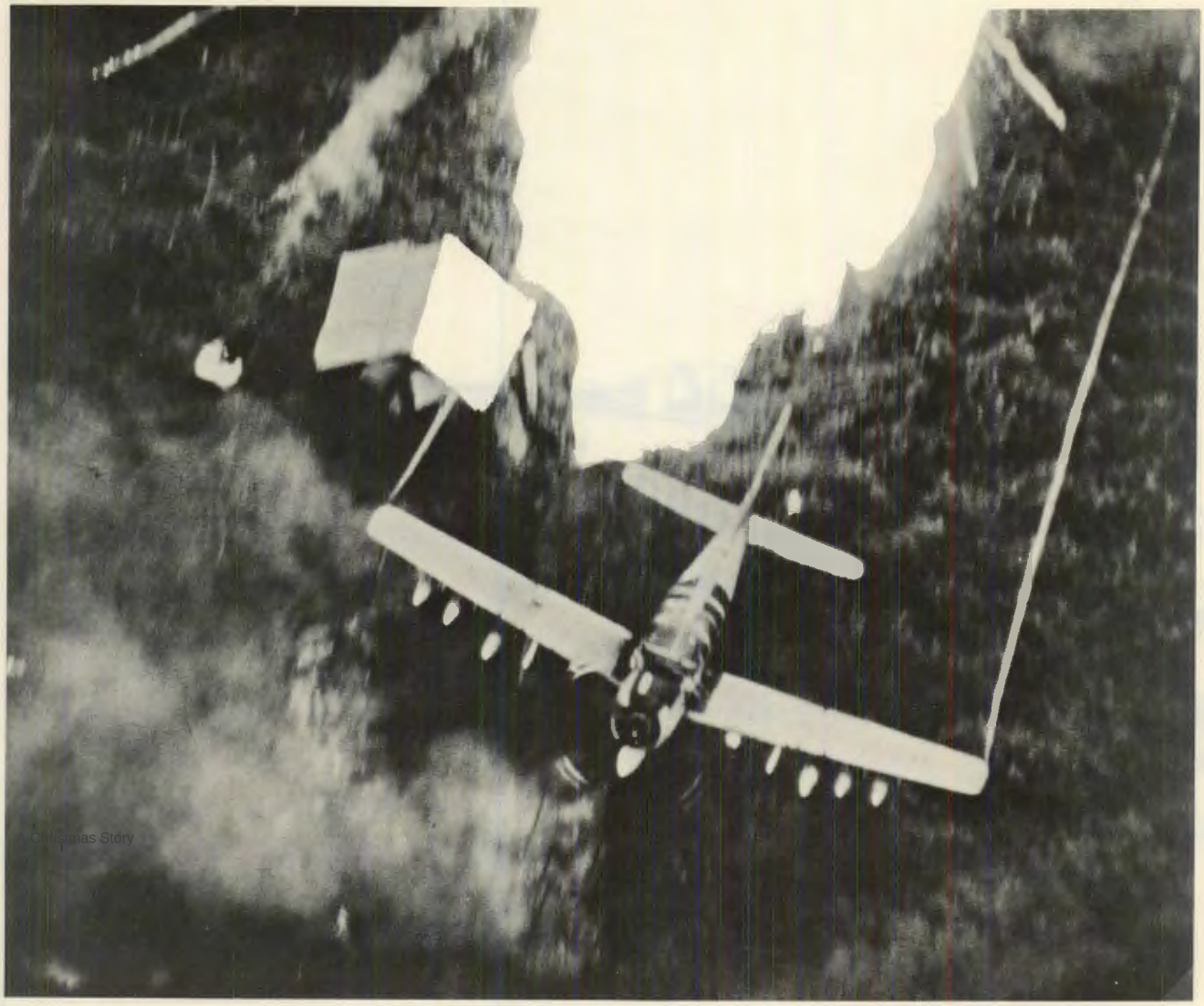
Being "A Professional" is not an easy challenge. Statistics during the past year indicate that human involvement was a cause in more than 95 percent of all types of accidents. "The Professional" is an attitude essential to everything we do. It is not just a phrase, it's a way of life. There's an old military saying that goes like this - "When I signed up, no one told me it would be easy." That's a true statement. Are you willing to pay the price?

F-104



James H. Brown

A Christmas Story



By Capt Craig W. Duehring
Fuels Management Officer
4500th Supply Sq, Langley AFB, VA

The exact date is easy to remember, December 14, 1970. The location is also easy to remember. Ask anyone who has been there. He'll tell you that the Plain of Jars was no picnic area.

The "friendlies", as we called them, had completed a helicopter assault on an abandoned airstrip in the hills overlooking the southern portion of Ban Ban Valley. The initial operation had met with unusually stiff resistance causing the friendlies to start moving sooner and faster than anticipated. Their plans were simple but extremely bold: to make a fast sweep from south to north, from one side of the valley to the other, gathering intelligence and disrupting enemy operations. The success of the entire operation depended entirely on speed.

From the beginning it was a Special Operations mission all the way: hit and run, close air support, air drop resupply. The Raven FAC s in their O-1 s and AT-28 s maintained constant cover over the friendlies with A-1 Skyraiders providing the bulk of the tactical support. The Nail FACs worked with the F-4s and F-105s and kept the enemy busy in other parts of the valley.

One flight of A-1s flew a typically long mission hitting targets near the constantly moving friendly positions. After several hours of breathing smoke and oil fumes, of twisting and turning often within a few feet of the Asian soil, then gunning the engine for every last inch of manifold pressure to climb away from the enemy guns, they finally headed for home. This type of mission was routine for these men. Their only tangible reward for this effort was 1/15 of an Air Medal. They don't give DFCs for "routine" missions.

But this pace rarely slackened. Day after day, mission after mission, the fatigue continued to increase. This is not your ordinary fatigue which can be eliminated with a good night's sleep. This is the chronic fatigue that builds as the weeks pass. If this situation is not alleviated, it will cause your own body to work against you - you tire quicker, your reactions are slower, and you tend to forget. Only someone who has experienced it can fully appreciate the danger.

And so this mission ended ... but, unlike most of the others, the anticipated rest was not forthcoming. The friendlies were still in serious trouble. In spite of many heroic attempts, they had been unable to get their needed supplies from the C-7 Caribous circling overhead. The warbirds were refueled and rearmed, and the pilots

once again found themselves heading north.

Sometime later they rendezvoused with the Raven over the target area. A quick briefing, a cloud of white smoke, and they were back at it, doing what Skyraiders did best.

It was during the first air drop pass when the lead A-1 pilot radioed that his engine was running rough. His wingman told him to gain precious altitude while he still could. A few seconds later, he replied that the engine was coming apart, and that he was bailing out. Almost immediately, a C-7 pilot saw the ejection seat separate from the crippled aircraft, and the parachute deploy. After a quick glance at the instrument panel, he looked back in shock as the parachute collapsed over an empty harness.

The friendlies searched for as long as they could...but an 8,000 foot fall leaves little hope.

No absolutely conclusive reason for the unsuccessful ejection can be given, but an analysis of events leaves little doubt that the most probable cause was failure of the pilot to ensure that his leg straps were fastened.

It was nearly sunset when we started back toward our base. In a few hours it would be Christmas Day. Gifts would be unwrapped, even in that remote part of the world. Back home, families would prepare for the inevitable arrival of Santa Claus. For one family, there would be another visitor ... a chaplain.

RED FLAG

(OR HOW TO FIGHT THE ELEMENTS AND LIVE TO TELL ABOUT IT)

By Capt Ronald E. Vivion
Chief, Programs and Current Ops Branch
3636th CCTW
Fairchild AFB, WA

RED FLAG! The ultimate training aid, or so some say. Go to war, shoot-em-up, shoot-em-down and learn how to do the job better. As readers of TAC ATTACK and proponents of tac air, I feel certain that most of you are intimately aware of the concept and operations of RED FLAG. If you aren't, just wait for a few months and you probably will be. There is a part of Red Flag, however, that takes you out of the cockpit and places you in a hostile and strange environment, and I'm not talking about casinos, showgirls or the like. It's man against the elements - SURVIVAL! Stories are already circulating about what a small detachment of the 3636th CCTW, Fairchild AFB, WA, is doing to the crews at Nellis AFB. I'm here to explain why we in Survival feel that we're doing something for you, not to you. Basically, your life and freedom are our concern - and concerned we are. Let me give you a few examples of the seemingly insignificant mistakes that people like you have been making in the Nevada desert and point out some of the ways these errors can be avoided. To put it all in perspective, an error at Red Flag will net you a debriefing. The same slip-up in a real combat SAR can cost you your life.

Okay, you just bailed out of your craft and hit the earth with a thud. You're in the midst of enemy activity and have two primary concerns - evade and get rescued. But, as everyone knows, Uncle and the life support troops have provided you with more gear than you'll need - namely a life raft, tons of parachute, harness, etc. Well, we taught you at Fairchild or Stead, "DON'T THROW AWAY ANYTHING UNLESS YOU'RE SURE YOU WON'T NEED IT AGAIN." Got any real good ideas

how you will use a raft on dry land with enemy all over the place? Same for all that white parachute material. So the logical decision is to get rid of it. So far, almost all the crews we have observed have done well to this point. But when it comes to getting rid of it, many people get into trouble. The instant answer is to "bury it." Good idea, if you have plenty of time, a shovel, soft dirt, etc. In the rocks or pressed for time? Forget it. Chances are good that the opposition has seen you land and is on his way. So, if you must conceal it, wrap it all up in the brown or green parachute panels and hide it under a bush or in the shadows, then move out. You'd be amazed at how tough it is to see a stationary object in almost any environment, regardless of the color. By not hiding the stuff, you only give away your landing site, so make your choice quickly and get out of there. But, before you go, remember these words: "DON'T THROW AWAY ANYTHING UNLESS YOU ARE SURE YOU WON'T NEED IT AGAIN." Many survivors have said they would destroy their URT-33 beacon. DON'T DO IT!! It's an alternate signalling or communicating device and could save your you-know-what. But first, be damned sure you've turned it off. If you're confused about what's off and on, just remember - "what you see is what you get." If it says off, it's off. Promise!

Okay, now it's time to move on. Generally speaking, as you begin to move, you enter the most critical phase of your whole problem. Imagine a search party trying to locate you. They find your landing site and look around. Lo and behold, a clean set of tracks moves off in the direction of a nearby hill. Problem solved, they can concentrate on that hill and chances are they gotcha. So when you leave the landing site, do everything you can to hide your trail. Step on rocks, bushes, clumps of grass, etc. Put your foot under bushes, in the shadows, beside logs or rocks. There's a hundred techniques. But, the important point is never to stop thinking about hiding your trail. Each time they lose it, the searchers have to take time to search all quadrants looking for it again. This is so, unless you've traveled in a straight line. Here's a hint, don't travel in a straight line. Take the toughest route you can find. But, please be careful, doubling back on a trail won't be worth a thing if you double back into the search party.

When you do travel, use all the tricks you can muster. Stop frequently and listen for "them." Travel slowly and choose your route carefully. Use not only trees and vegetation to mask your position, but also use the terrain. And by the way, just because we teach the military crest travel (2/3 of the way up a ridge), don't use it if it won't hide you.

The question usually comes up "how far do I go?" Answer - far enough but not too far. I'm being facetious, but it's the truth. You have to look over the situation and determine the distance, the terrain, the amount of enemy activity, nearby friendlies, SAFE areas... all these factors enter into your decision. The important point is to make up your mind and then have at it. If you just move out without coming to a decision, you'll probably stop short of the "far enough" point.

Remember, I said it was tough to see a stationary object at a distance. Well, it's just as ridiculously easy to spot a shiny object, even at great distances. When everything else around is a shade of brown or green, a flash of light sticks out like the proverbial thumb. So get rid of the shinies. Rank, watches, rings, eyeglasses, all need to be hidden. Take them off or discolor them. And don't overlook the totally obvious. It may be a good idea to take out your signal mirror and put it around your neck, but if you do, put that shiny thing at the end of the string in your pocket and zip it in. We've had survivors flash at everything but the rescue chopper by leaving a mirror flapping around their necks.

Now you've traveled just about far enough and you want a concealment site. Two things should be considered. First, if you put yourself in a spot where you're so well hidden that the enemy could never find you, the chances are good the Jolly won't have any luck either. They aren't magicians - they've got to see you to get you, and to get you, they've got to talk to you - so second rule - put yourself in a spot where line of sight communications is enhanced. Also, look for terrain that will mask the chopper. Sounds like a tall order, doesn't it? It is, but may be vital to your getting out.

When you finally get a chance to talk through the magic of radio, keep your cool. Don't give away your location - use a little Yankee (or Dixie, if that's your bag) ingenuity and talk around your spot. Also, don't trust anybody! The SAR force asks you to authenticate for a purpose, so you should also do the same. This may not seem necessary if the aircraft is in sight, but it doesn't take a very sophisticated intruder to fake the sound of a chopper over the radio and if you

RED FLAG (or how to fight the elements and live to tell about it)

give him too much, he may take it all - and you with it. If you fly a multi-place (2 or more) aircraft, plan ahead and determine who will do the talking during a SAR. If you have five people on the ground and everyone is trying to get his speech in, the chances are real fine that nobody will get rescued. Crew coordination extends clear through to being picked up.

When was the last time you talked on the radio, while preparing a signal flare and flashing a SAR bird with your mirror, all at the same time? If you haven't tried it, maybe you should. Chances are great that all three will be in use simultaneously - so be prepared. And while we're on that subject, get your smoke flare ready before they ask for it. It takes 5-10 seconds to get good smoke from the MK-13 flare day end, so the more prepared you are, the quicker you can get it out. Oh yes, can you do all these things one-handed? (Note, please don't pull the lanyard on the flare with your teeth. Use your foot or feet, but putting that flare to your mouth can give you a case of halitosis and loose teeth that you won't believe.)

Okay, last item. Remember I said that the Jolly's got to see you to get you? Well, when he gets close enough that you feel he ought to be able to see you, get out of your hiding place and be visible. As a guide, when you can recognize the door gunner as a person, he can do the same for you. But, I promise that hollering and whistling won't help a bit. Keep your head and don't lose your cool.

The little tips could go on fore ever, but the most important item is the last statement - "KEEP YOUR COOL," and if your day in the barrel comes and you're the survivor at Nellis, use that exercise to show yourself that it isn't impossible - only just a bit more uncomfortable. Better yet, don't leave anything to chance - don't get shot down.

If you have any comments or questions concerning this article or anything else concerning survival, give us a call or drop a note. Our address is:

3636 CCTW/DOO
Fairchild AFB WA 99011
AUTOVON 352-5470

PLACE THE FACE

After returning from a combat mission in the Communist held Seoul area, this young F-80 pilot shows his crew chief the exact place where he attacked two trucks and a power station.

While searching through our files, we came across "vintage" photographs of some of the senior people in TAC. Not many people in the office could figure out who they were ... but that's par for a bunch of staff weenies. For the next few months we'll give you a chance ... can you "place the face"? If you know who the dashing figure in the photo is, send us a note. We will print the correct answer, and the winner's name in the following month's issue. The prize? The winner will receive a "Fleagle Fanny Feather of Fate" award, decorated with one of Fleagle's own tail feathers and signed by the great one himself.

it only takes once

By Capt Bill Powley
3246th Test Wing
Eglin AFB, FL

The setting for this story could be any test or operational fighter unit where pilots are engaged in a demanding flying scenario as well as the proverbial "paper mill." As a safety officer, I have taken certain literary license to highlight potentially dangerous circumstances. Let me describe the situation.

Captain America, our hero, awakes around 0630. After taking care of a few necessary chores, he contemplates the optional breakfast available to him - fix it himself or have none at all. He chooses the obvious.

Captain America departs his quarters and arrives at his unit around 0730 on a bright Wednesday morning. His first thoughts are to get hot on some paperwork for a special project he has. He drafts letters, sends them for typing, corrects spelling, sends them for typing, corrects ... etc, etc. Over the loudspeaker Big Brother is heard to say, "Captain America, you have a call on 5480." It's the test engineer wanting to get together for a 1500 Hazard Analysis meeting. Captain America changes the meeting to 1530 since he has a 1400 T-38 training flight today. It's now 0815. "Now hear this, now hear this," booms through the hallowed halls. "There will be a safety council meeting in 15 minutes." Captain America knows the rest of his morning is shot. He has time to make one autovon call to coordinate a TDY coming up in a few weeks for his project.

The safety council starts at 0830. A new world's record is in the making, but the recorder quickly summarizes the last half hour's debate in two sentences and the council is adjourned. It's now 0950. Time for another cup of coffee, a trip across the hangar, where the latrine is strategically located, and he's ready to go again by 1015. The actions of the safety council now occupy his time as he tries to complete the appropriate paperwork for the projects briefed.

The distribution is delivered and as he sifts through it, Captain America is horrified to note that he is scheduled for instrument school a week from Thursday, all day, with an exam the day after. His physical exam is due this month, along with a dental checkup. Water survival is

scheduled for two Thursdays from now land survival next Tuesday. T-38 egress training is next Wednesday at 1330, and he has a records review next Friday at 0915. Captain America is not worried, though; for the next two weeks he'll be TDY in support of his project. They'll have to try and catch him some other time.

It's now 1030 and Captain America realizes he won't get to go to lunch. He orders an inflight lunch and returns to his paperwork. After being interrupted to pay $2.00 for his monthly coffee dues, register to vote, and you name it, it's now 1115. The letters he started this morning are in final form and Captain America takes them to be signed.

The thought of a flight is still lurking somewhere in his subconscious, but he suppresses it for the moment, knowing he has far more important (and boring) duties to perform.

Captain America now turns his attention to researching some data in the Dash One for the Operational Hazard Analysis (OHA) meeting later in the day. Before he knows it, it's 1155. He quickly grabs a flight planning form, copies the data from the board, checks his CIF, weather, and NOTAMS and signs the clearance form. The flight briefing starts at noon. Captain America gets a time hack - today is the 11th. He briefs the flight, and they split up at 1240.

Captain America grabs his box lunch from the dispatch counter and eats at his desk as he answers two phone calls and sifts through the rest of his in-basket. At 1300 he goes to P.E. where he checks his helmet and gets fitted for a new chute - his third in as many weeks. But he was lucky today - no red tags on his G-suit. He labors under the extra weight to the dispatch section, makes a final check, realizes his clearance form isn't initialed, finally finds the Ops Supervisor across the hangar, and he's on his way.

As Captain America comes back into the building, a scheduler frantically runs up and says, "If we delay your takeoff for half an hour, can you make a parts pick-up to Dingbat AFB?" Captain America replies, "I thought you'd never ask." After a few terse comments, Captain America decides he'd better bite the bullet and disregard all after 'time hack.' He pulls out his high altitude enroute chart and grabs a DD/175. He's now got 40 minutes to flight plan, go to Base Ops and file, get flight orders, insure the part is actually at Dingbat, call the test engineer and cancel the OHA, and tell his wife he won't be home for dinner. Just then, the scheduler races frantically back and says - "disregard the parts pick-up."

It's now 1340. He has 20 minutes until takeoff. The race is on! As Captain America departs the building he hears, "Captain America, you have a call on ..." Oh great! He wonders if that's his wife calling about more frequent labor pains, the security police announcing that he had a parking ticket last week for leaving his vehicle on a green spot by the base gym, or Ginger calling from Stan Eval wondering why he hasn't turned in his open-book A-7 test, overdue for two weeks. He figures if it's the security police, this might be his champagne flight, so he'll make it a good one.

The preflight is quick, but thorough, and engines are cranked, three and one-half minutes elapse, and the flight is on its way. Takeoff is at 1410. He proceeds to his training area, performs some airwork maneuvers, shoots a TACAN approach, missed approach, VFR patterns, and completes a wing landing. Time: 1515.

Captain America shuts down his T-38, goes to debrief, and asks his backseater to take care of the paperwork at Ops. He discards his P.E. gear and hastens to Building 104 for the OHA. Arriving 5 minutes late, he apologizes and they forge

ahead. By 1615, the meeting has adjourned, and Captain America is back at Ops. He quickly calls Stan Eval to tell Ginger he hasn't forgotten

it only takes once

about his A-7 test and heads over to the lounge at 1630.

After dinner that evening, he distinctly remembers something different happened today. A smile begins to creep across his face. "Why, that's it," he said, "I got to fly."

The scary part of this story is that it's not very far from the truth. Since I was the one who made this story up, I decided to give it a happy ending. But, perhaps, one who is not as optimistic as I would have given the story a tragic ending.

The FAA distributes a film entitled "It Only Takes Once" which depicts some pitfalls general aviation pilots can encounter. Each personal problem taken into the cockpit led to lapses in concentration, resulting in a near gear-up landing, fuel starvation, disregard of prudent judgment, and low altitude showmanship. Each situation was a result of work or home related pressures allowed to occupy the thoughts of the pilot to the exclusion of performing the necessary tasks involved in handling his aircraft.

These same problems are not foreign to the military aviator and are in no way lessened just because flying happens to be his profession. Indeed, aside from combat flying, the "paper mill" occupies most of his productive work hours.

If your Form 5 appears to have taken a hit over the past several years, here's why. Since 1972 through the end of 1975, total Air Force flying time has decreased from approximately 5,350,000 flying hours to 3,350,000 flying hours, or some 37%. In 1972, the pilot requirement was 32,300 while the inventory of pilots totalled close to 35,200. By 1975, the requirement had dropped to 26,400 (18%) while the pilot inventory was reduced to approximately 29,650 (16%). Flying hours are based on requirements and our inventory is approximately 3,000 pilot slots in excess of our requirement. This fact combined with the decrease in flying hours has ravaged many a monthly Form 5 sheet.

The fact that we're spending more time on the ground doesn't seem to correlate with spending more time preparing for each flight. It may be my imagination, but it appears that for each additional piece of new paperwork generated, there is not a corresponding decrease in old paperwork. What this means is that the workload is continuously increasing on the part of the "jock."

How does this relate to the supervisor and each pilot's responsibilities? For the supervisor, it indicates that he must be aware of the total workload imposed upon each individual. There's no reason for 10% of the people doing 90% of the work. There aren't too many aspiring young officers who, with their "can-do" attitude, will tell their boss they can't hack the extra workload. But a pilot performing primary flying duties is not necessarily an interchangeable part with the rest of his comrades who aren't performing flying duties at the present time. The frustration of the latter category may be taken out on their desk, or at the worst, in their car. But those who fly and are over-saturated may find their aircraft a convenient place to "let loose." It's an unhealthy situation to say the least, and this leads me to the responsibilities of the pilot.

In this modern era of "time compression" when all suspense dates seem to be 2 days ago, the pilot must keep a sense of humor that enables him to divorce himself from the hectic activities of the day before he goes to fly. All the problems that you had before the flight will probably still be there after you land, so there is no sense in worrying about them while airborne. Of greater importance, though, is not trying to mentally solve your earthbound problems while airborne. This will destroy your concentration and the alertness that is required to safely perform your aircrew duties.

The ability to mentally condition yourself for each flight will greatly enhance the aviator's ability to cope with unforeseen circumstances and to keep you from entering flight regimes detrimental to your health.

There's a lot of "Captain America" in each of us. It's rather unrealistic to think that our workload will get lighter - if anything, it will increase. Those of us who are fortunate enough to be performing the primary mission of the Air Force should be thankful, and every effort should be made to ensure that we can continue to perform this mission. As we fling our craft through footless halls of air, it will pay high dividends to remember that "it only takes once."

TAC SAFETY AWARDS

Maintenance Safety Award

Staff Sergeant William C. Hardy, 35th Organizational Maintenance Squadron, 35th Tactical Fighter Wing, George Air Force Base, California, has been selected to receive the Tactical Air Command Maintenance Safety Award for this month. Sergeant Hardy will receive a certificate and letter of appreciation from the Vice Commander, Tactical Air Command.

SSgt William C. Hardy

Crew Chief Safety Award

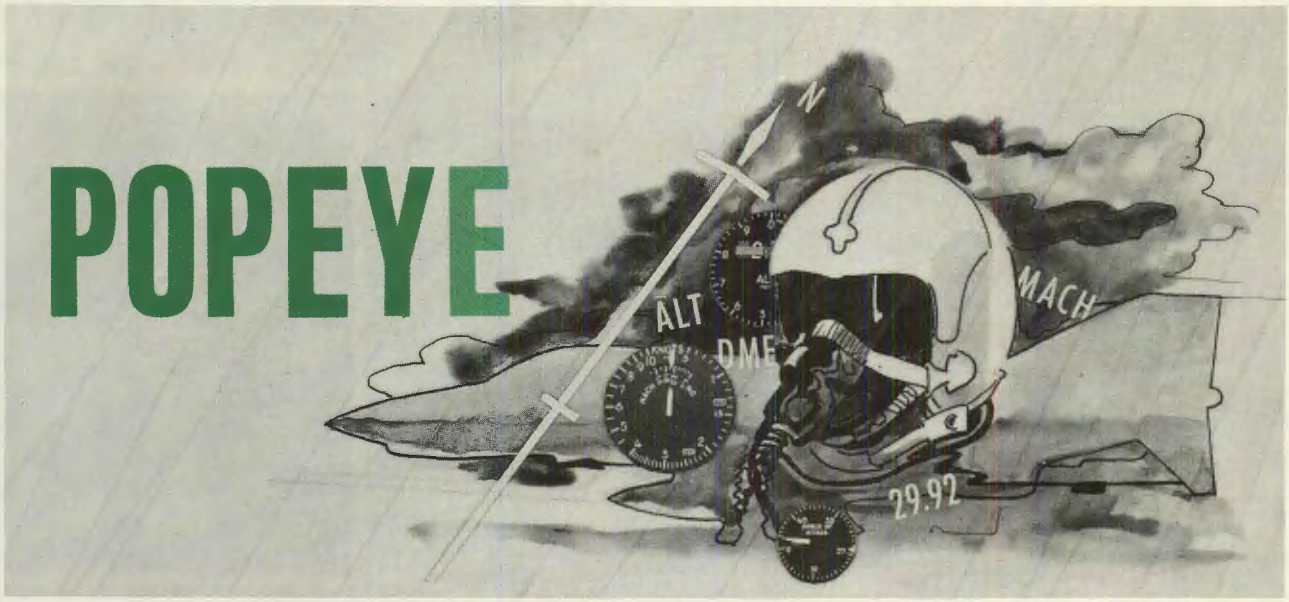
Staff Sergeant Timothy P. Schmidt, 1st Organizational Maintenance Squadron, 1st Tactical Fighter Wing, Langley Air Force Base, Virginia, has been selected to receive the Tactical Air Command Crew Chief Award for this month. Sergeant Schmidt will receive a certificate and letter of appreciation from the Vice Commander, Tactical Air Command.

SSgt Timothy P. Schmidt

Crew Chief Safety Award

Sergeant Billy D. Cox, 363d Organizational Maintenance Squadron, 363d Tactical Reconnaissance Wing, Shaw Air Force Base, South Carolina, has been selected to receive the Tactical Air Command Crew Chief Award for this month. Sergeant Cox will receive a certificate and letter of appreciation from the Vice Commander, Tactical Air Command.

Sgt Billy D. Cox



THRICE IS NICE

By Capt M. C. Kostelnik
Test Project Officer
4485th Test Squadron
Eglin AFB, FL

According to AFM 51-37, after entering the holding pattern, the pilot should compensate for the effects of a known crosswind, to arrive at an outbound position from which the turn inbound will place the aircraft on the holding course. Crosswind corrections may be accomplished by adjusting the bank angle during turns or by applying wind drift corrections on the outbound leg. When holding in fighter-type aircraft, the angle of bank should not be steepened to more than 30° nor shallowed to less than 15° of bank. Within these constraints, there are some useful drift compensating methods you may not have considered which can greatly simplify your holding technique. Let's first examine the no-wind holding pattern and the effect of crosswind on outbound positioning; then introduce the Double and Triple Drift Technique.

In order to fly the no-wind pattern, the pilot must simply hold his airspeed constant, make two 30° bank turns, and maintain the reciprocal of the holding course on the outbound leg. Unfortunately, no-wind conditions at altitude are the exception rather than the rule; therefore, we should be able to determine the effects of wind on the holding pattern, and develop techniques for coping with adverse effects. Once we are established on the holding course, we'll know when a crosswind component exists as the aircraft heading will differ from the magnetic course. This difference between the aircraft heading and the course is the drift (in degrees) and is a function of the aircraft speed and the crosswind component.

$$\text{DRIFT (DEGREES)} = \frac{\text{CROSSWIND COMPONENT (Kts)}}{\text{MACH} \times 10}$$

A crosswind of 50 knots, for example, would cause a drift of 10° on an aircraft flying at .5

Mach. If your aircraft is equipped with an Inertial Navigation System, you can determine the drift directly using the NAV/COMP position. Let's turn now to the effects of crosswind on the pattern. Referring to Figure 1, note that a turn downwind using 30° of bank will result in a wider than normal pattern. Although our turn in the air mass is the same as on a no-wind day, our position in relation to magnetic radials, changes as if our true airspeed were increased by the vector sum of the crosswind component and our aircraft velocity. Hence the larger effective airspeed results in a larger turn radius, and a wider than normal pattern. We also notice that the pattern width increases if the aircraft parallels the outbound heading. The turn inbound will have a subsequent decrease in the effective turn radius which will likewise result in further modification of the no-wind pattern. The net effect of the uncorrected crosswind pattern will be that the aircraft will not arrive at an outbound position from which a turn inbound will place the aircraft on the holding course. Since rolling out on the inbound course is one of our primary objectives, something must be done to correct for the adverse effects of wind.

If we start the holding pattern at the holding fix, with at least an estimate of the drift required to maintain the holding course, we will have three segments within which to correct for crosswind. Since the turn downwind is already at the maximum of 30° of bank, there is nothing we can do on this leg and the diameter of our pattern will certainly increase during this turn. This leaves us with two alternatives; we can either apply all of the required correction on the outbound leg, or we can make corrections by shallowing our bank into the wind. Remember, though, we are limited to a minimum of 15° of bank, and strong winds may require a combination of both bank reduction and heading correction. Once we have selected the method of correction we wish to employ, we must determine an appropriate heading for the outbound leg which will produce the necessary offset from the holding course. The Double and Triple Drift Techniques are two methods for determining an appropriate outbound heading.

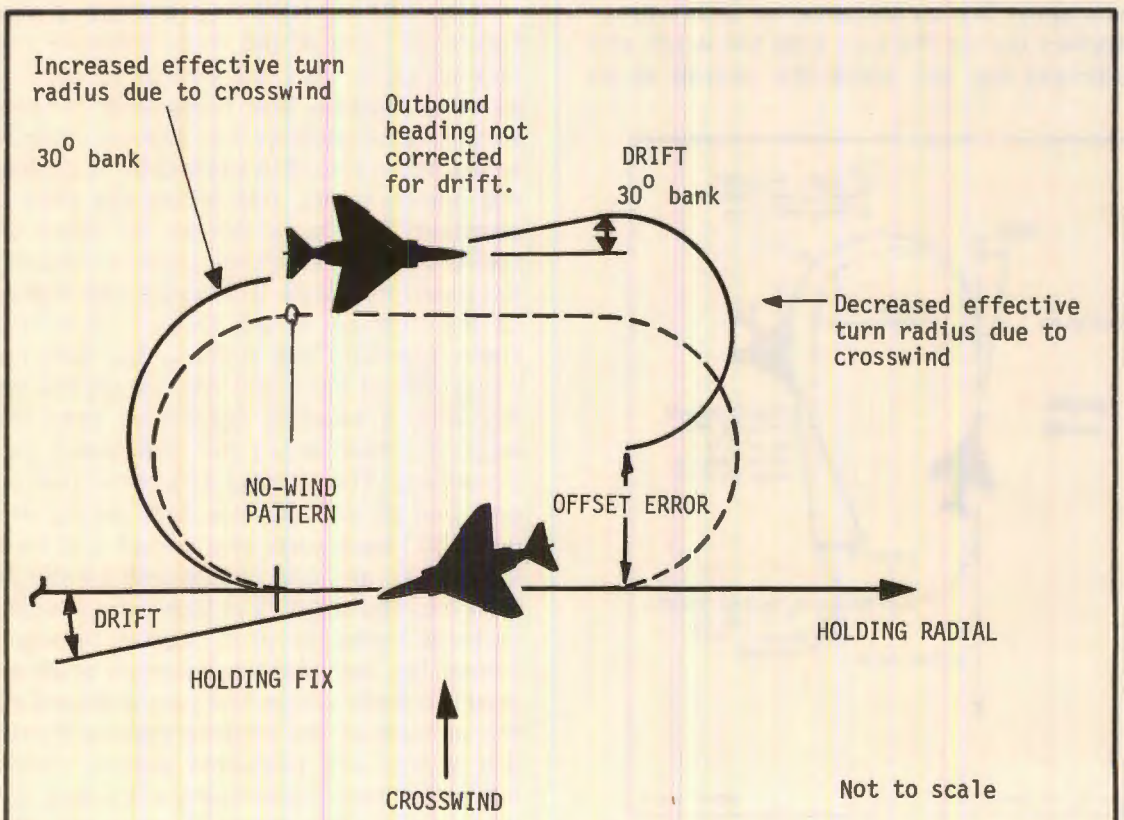


FIGURE 1: The Effect of Crosswind on the Holding Pattern

thrice is nice

THE DOUBLE DRIFT TECHNIQUE (Refer to Figure 2): Once established in the holding pattern, this technique will compensate for the effects of a crosswind and position the aircraft outbound, such that a turn inbound will place the aircraft on the holding course. When established on the holding course and proceeding inbound to the holding fix, note the difference between the aircraft heading and the published course (Drift). If there is significant drift, mentally note both the magnitude and the direction and continue to the holding fix. Prior to reaching the fix, determine whether the turn outbound will be downwind or into the wind. Let's assume that the turn outbound will be a turn downwind. To fly the corrected pattern, turn downwind using 30° of bank and roll out on the outbound leg with a heading correction (into the wind) equal to twice the drift noted on the inbound leg. One unit of drift correction will compensate for the drift on the outbound leg, while the second unit of drift will correct for the drift during the downwind 30° bank turn. Upon reaching the outbound turn point, turn inbound, with an angle of bank shallowed one degree of bank for each degree of drift (not to exceed the 15° minimum). The combination of drift corrections applied during the turn (into the wind) and the outbound leg, will place the aircraft at an outbound position from which the turn inbound will place the aircraft on the holding course.

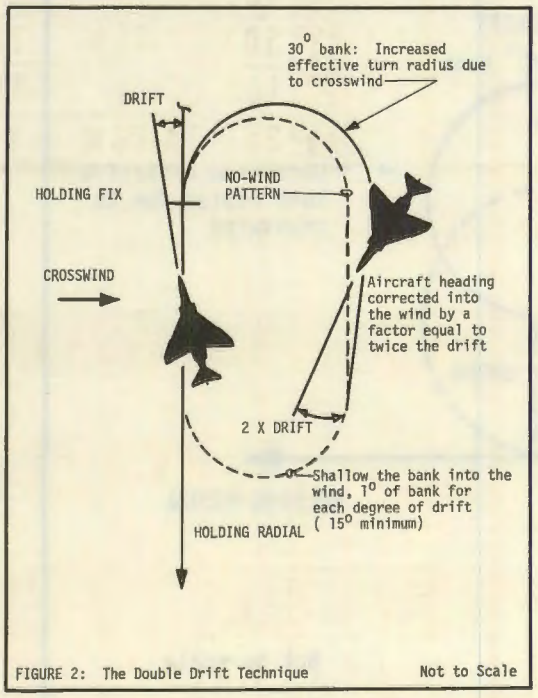


FIGURE 2: The Double Drift Technique Not to Scale

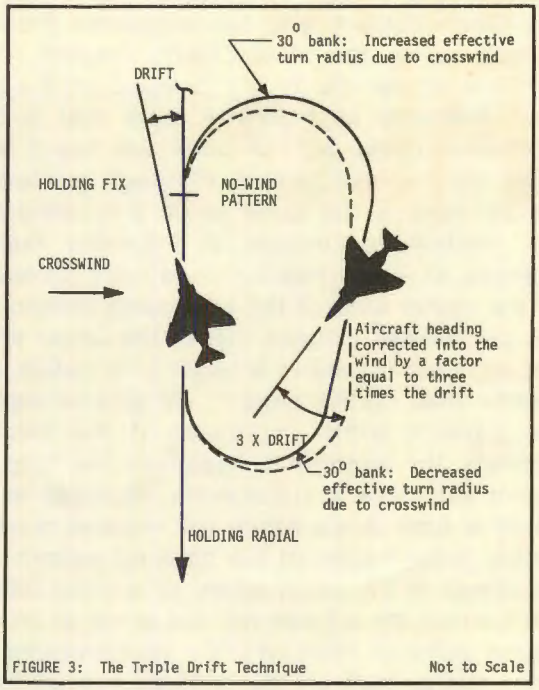
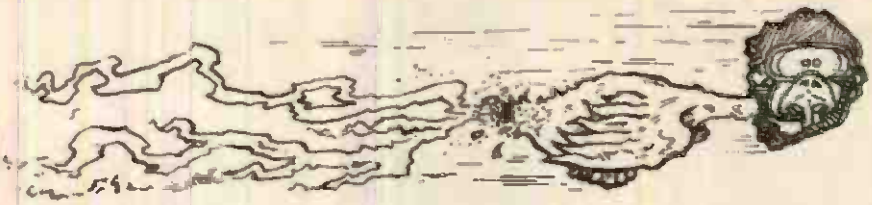


FIGURE 3: The Triple Drift Technique Not to Scale

THE TRIPLE DRIFT TECHNIQUE (Refer to Figure 3): One of the most effective crosswind techniques is also the easiest to apply and my personal favorite. The Triple Drift Technique is a simplified version of the Double Drift method, where the entire drift correction is performed on the outbound leg; this allows the pilot to use a constant 30° bank during all turns. Once established on the holding course inbound to the fix, determine both the magnitude and direction of the drift as in the Double Drift Technique. Upon reaching the holding fix, turn outbound using 30° of bank and roll out on the outbound leg with a heading correction (into the wind) equal to three times the drift noted on the inbound leg. The applied drift correction will allow one unit of drift for the drift during the downwind 30° bank turn, one unit of drift for the outbound leg, and one unit of drift for the 30° bank turn into the wind. A crosswind correction equal to three times the drift, applied during the outbound leg, will place the aircraft at an outbound position from which the turn inbound will place the aircraft on the holding course. If crosswinds are giving you problems during holding, give either of these techniques a try and see if you don't agree that twice is easy but THRICE IS NICE.

TAC TALLY



	TAC			ANG			AFR		
	Oct	thru Oct		Oct	thru Oct		Oct	thru Oct	
		1976	1975		1976	1975		1976	1975
TOTAL ACFT. ACCIDENTS ►	4	31	26	1	9	14	0	3	0
MAJOR ACFT. ACCIDENTS ►	4	29	24	1	8	12	0	2	0
AIRCREW FATALITIES ►	4	15	20	0	4	7	0	1	0
TOTAL EJECTIONS ►	2	25	16	1	5	5	0	1	0
SUCCESSFUL EJECTIONS ►	1	18	11	1	5	4	0	0	0

FIGHTER/RECCE WINGS		
ACCIDENT FREE MONTHS		
55	127 TFW	ANG
23	132 TFW	ANG
23	123 TRW	ANG
21	156 TFG	ANG
16	122 TFW	ANG

OTHER UNITS		
ACCIDENT FREE MONTHS		
91	135 TASG	ANG
87	182 TASG	ANG
83	507 TAIRCW	TAC
80	193 TEWG	ANG
78	602 TAIRCW	TAC

MAJOR ACCIDENT COMPARISON RATE 75/76

(BASED ON ACCIDENTS PER 100,000 HOURS FLYING TIME)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
TAC	75	7.9	5.4	3.6	2.6	3.1	3.5	5.3	6.4	6.0	6.6	6.3	6.1
	76	2.9	8.6	9.0	7.3	8.0	8.1	6.9	6.8	7.5	7.7		
ANG	75	5.3	2.8	5.3	3.7	4.7	6.8	5.8	5.1	5.1	5.5	5.4	5.4
	76	10.5	5.0	6.5	4.8	3.8	3.9	3.3	3.5	3.7	3.9		
AFRES	75	0	0	0	0	0	0	0	0	0	0	0	4.9
	76	0	0	11.3	8.1	6.1	4.9	4.1	7.2	6.3	5.7		

U.S' GOVERNMENT PRINTING OFFICE: 1976 735 - 023/2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