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AVIATION DIGEST

Joint Air Attack Team

JAAT

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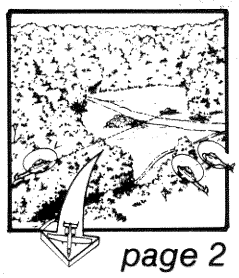

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Honorable John O. Marsh Jr.
Secretary of the Army

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The mission of the *U.S. Army Aviation Digest (USPS 415-350)* is to provide information of an operational, functional nature concerning safety and aircraft accident prevention, training, maintenance, operations, research and development, aviation medicine and other related data.

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Articles, photos, and items of interest on Army Aviation are invited. Direct communication is authorized to Editor, *U.S. Army Aviation Digest*, P.O. Drawer P, Fort Rucker, AL 36362. Manuscripts returned upon request.

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EVERYTHING you always wanted to know about a Joint Air Attack Team and were too busy to ask is contained in "JAAT—A Present Concept," this month's lead article.

Major William J. Filippini and Captain David S. Prewitt identify a JAAT as a force that enables the ground commander to engage "enemy forces beyond the range of other antitank weapons." They give a detailed explanation of how the team is formed and how it is used in battle. This is a most informative article about a topic we all need to become more conversant with.

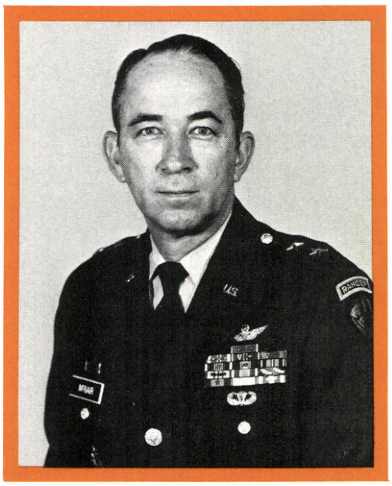
Colonel Lewis J. McConnell and Major Gary T. Downs also address a subject that needs additional attention. In "More Flight Hours/Less Fuel Dollars," they reiterate some well-known but oft-neglected ideas about fuel-saving ways to operate our aircraft. "The need is evident—and the numbers show that only a 5 percent savings through conservation will result in a significant increase in available flying hours for the same money," they write, adding that every Army aviator needs to acquire a renewed fuel conservation consciousness. Living evidence of the fact that fuel conservation can and does work is the experience here at the Aviation Center in fiscal year 1982 where 2,345,662 gallons of fuel were saved through strict conservation measures. As reported in an earlier *Digest,* we have been able to reduce our fuel required by 9.96 percent per flying hour by the application of fuel saving initiatives.

And like fuel conservation which is only good commonsense, it never ceases to amaze me how much our very sophisticated business of flying, of operating high-technology equipment in every conceivable environment, depends on the use of just plain old commonsense. That is especially true in our striving to be ACCIDENT FREE IN '83. For instance, in this issue's "DES Report to the Field," some elementary procedures are outlined as to how accidents may be avoided through increased vigilance during stressful operating conditions. The point is, many of those conditions could be alleviated by simply paying proper attention to commonsense procedures!

An especially good article that contains more essential information for us is Colonel John H. Boysen's "Noise Abatement and Flying Neighborly." Colonel Boysen, a veteran aviator, describes the emphasis that is being put on the reduction of helicopter noise by civilian industry and aviation organizations such as the FAA. Closer to home, he describes procedures (again simple commonsense ones!) that Army aviators can follow to cut the noise level of their machines. As Colonel Boysen concludes, "Everyone needs to pull together to accomplish this. All of us who share the sky must share responsibility for noise abatement." We at Ft. Rucker work diligently at this in harmony with our neighbors here in south Alabama. I'm sure that your unit has equally valid concerns about your neighbors, so "fly neighborly."

Just as we sometimes need to change our modus operandi in order to save fuel or make less noise, so changes are often necessary to improve the career patterns of Army Aviation people. "Aviation Personnel Notes" enlightens us about new selection procedures for the Command and Staff College. That column also contains some information on the Army Aviation Engineering Test Pilot Program, a super challenging program that begins with test pilot school at Patuxent River Naval Air Station.

All in all, there is good reading from cover to cover in this *Aviation Digest.* Read on and give us your feedback on its content. Your views are of utmost importance to help us ensure the magazine meets your needs. This issue incorporates a special survey form so that you can "tell it to the Editor." Take the time to complete and return the tear-out survey and you will help us to truly make this "your" magazine for the entire aviation team.



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JAAT

A Present Concept

THE AEROSCOUT, already a part of the combined arms team, plays a big role in accomplishing the U.S. Army Training and Doctrine Command's major mission areas in the AirLand Battle (close combat, fire support, air defense, communications, command and control, intelligence/electronic warfare, combat support/mine warfare and combat service support).

Much has been written recently concerning the AirLand Battle; therefore, this article isolates one major aspect of the close combat mission, the Joint Air Attack Team (JAAT). It addresses the components of a JAAT, its capabilities and the role of Army Aviation assets involved in a JAAT.

What is a JAAT?

A Joint Air Attack Team is a combination of U.S. Army scout and attack helicopters and U.S. Air Force close air support (CAS) aircraft (normally A-10s) operating together to attack high priority, lucrative targets. The JAAT normally operates in concert with U.S. Army field artillery, mortars, air defense artillery, naval gunfire and ground maneuver forces against enemy armored formations, command vehicles and enemy air defense weapons systems. A JAAT capitalizes on the maneuverability and firepower of the attack helicopter and CAS aircraft to engage and destroy the threat that is affecting or will affect the close-in battle.

Throughout any JAAT operation there are key elements that enhance the effectiveness of the team.

- The first element, and maybe the most important, is the infor-

Air Battle Captain is designated by the attack helicopter company commander for each attack team. The air battle captain normally directs employment of his team from a scout helicopter. He is the ground commander's subordinate for directing the attack helicopter team and for coordination of attack helicopters and close air support aircraft when working the same target array.

Air Liaison Office (ALO) is the senior Air Force officer at each Tactical Air Control Party (TACP). He advises the Army commander on all aspects of

MONTHLY WRITING AWARD

illustration by Paul Fretts

the employment of tactical airpower to include tactical airlift, tactical reconnaissance, battlefield interdiction and close air support. He serves as the focal point for Air Force coordination in joint air/ground operations and assists in the planning for tactical air support of ground operations. The ALO supervises the activities of TACP personnel and is responsible for all subordinate TACPs.

Attack Helicopter Team is a combination of U.S. Army attack helicopters and observation helicopters commanded by an air battle captain.

Close Air Support (CAS) is provided to ground forces by tactical aircraft such as the A-10, A-7, F-4 and F-16.

Contact Point (CP) is a point where CAS aircraft and a FAC establish radio contact.

Forward Air Controller (FAC) is a U.S. Air Force officer who provides for coordination and control of close air support aircraft employed in joint air/ground operations.

Indirect Fires are those systems, i.e., field artillery, mortar and naval gunfire delivered at a target which cannot be seen by the gunner.

Initial Point (IP) is a point from which the final attack run-in is made.

Suppression of Enemy Air Defense (SEAD) refers to any action which destroys, degrades or obscures enemy surface air defenses for a period of time to enhance the effectiveness of friendly air operations.

mation flow between the ground maneuver commander, the air battle captain (ABC), the forward air controller (FAC) and the fire support coordination officer. The exchange of "real time" information optimizes the effectiveness of the JAAT and assists in providing the ground maneuver commander a verbal threat update (figure 1).

- A second element that is essential for a successful operation is the employment tactics of each major JAAT element. Both the ABC and the CAS flight leader employ their respective elements according to each service's proven tactical doctrine. This does not suggest that we have two separate elements fighting two entirely different battles, but rather considers the difference in speed, maneuverability and weapons systems between the attack helicopter and the CAS aircraft.
- A third key element of a JAAT operation is augmenting the team with available indirect fire support. The addition of indirect fire weapons systems allows the team to focus its efforts on destroying the threat rather than having to perform suppression of enemy air defense (SEAD) tasks in conjunction with maneuvers against other threat weapons systems. It is recognized that indirect fire weapons systems will not always be available and that the team may have to perform its own SEAD; however, every effort should be made to integrate the indirect fire systems into the JAAT missions.

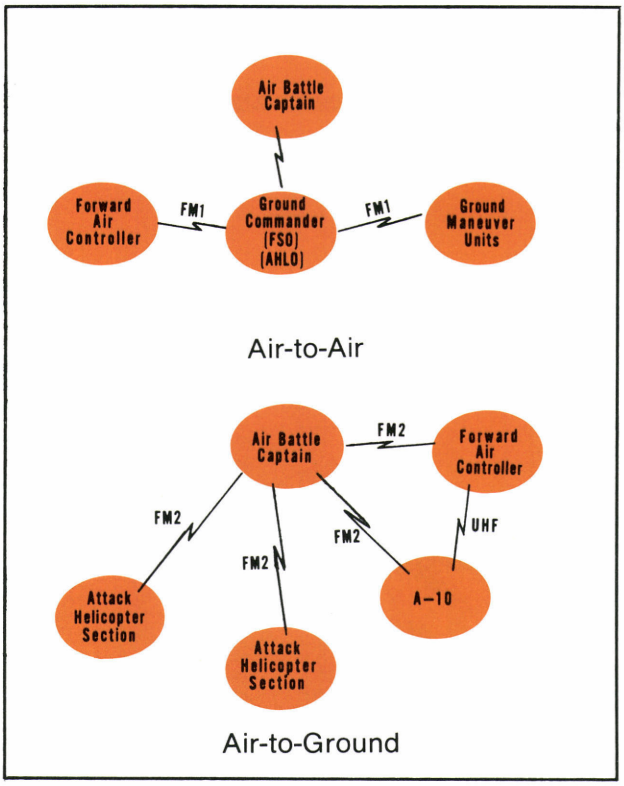


FIGURE 1: Communications

JAAT and the Ground Maneuver Commander

The integration of JAAT into the battle can provide the ground maneuver commander with a force capable of engaging enemy forces beyond the range of other antitank weapons. The ABC, FAC and scout pilots can adjust indirect fire beyond the range of ground observed fires thus allowing for continuous pressure on the enemy forces. The speed and flexibility of the team may be used to counter airmobile or airlanded insertions in friendly rear areas. The JAAT is capable of conducting independent operations forward of the FLOT (forward line of own troops) when other suitable options have been exhausted.

All in all, no matter what the tactical scenario, the JAAT can delay, disrupt and destroy enemy formations, help stop enemy penetrations and provide the ground maneuver commander with vital intelligence about enemy strengths, dispositions, composition and locations.

Up to this point, we have focused on the make-up and capabilities of the JAAT, but the real issue is how to bring together the AH-1 Cobra helicopter and the A-10 Warthog aircraft to form a JAAT?

How a JAAT is Formed

The CAS assets for a JAAT are brought together through one or more of the following:

- Preplanned CAS
- Immediate CAS requests
- Battlefield opportunities.

The preplanning for JAAT assets is normally accomplished through the same decisionmaking process that is used to identify preplanned CAS sorties; e.g., to support counterattacks, place antiarmor fires into lucrative engagement areas and support other tactical contingencies. The ground commander has the overall responsibility for the planning, coordination and employment of the JAAT; therefore, the ground commander is the primary initiator. The request for JAAT assets also may be spontaneous in regards to the specific target, location and time. The preplanned or immediate CAS sorties and attack helicopters may be diverted to attack appropriate targets of opportunity.

The actual formation of a JAAT begins when the commander initiates the request for CAS aircraft and, if necessary, attack helicopters through normal request channels. As the request is submitted through the close air support request channel, for CAS aircraft, and through

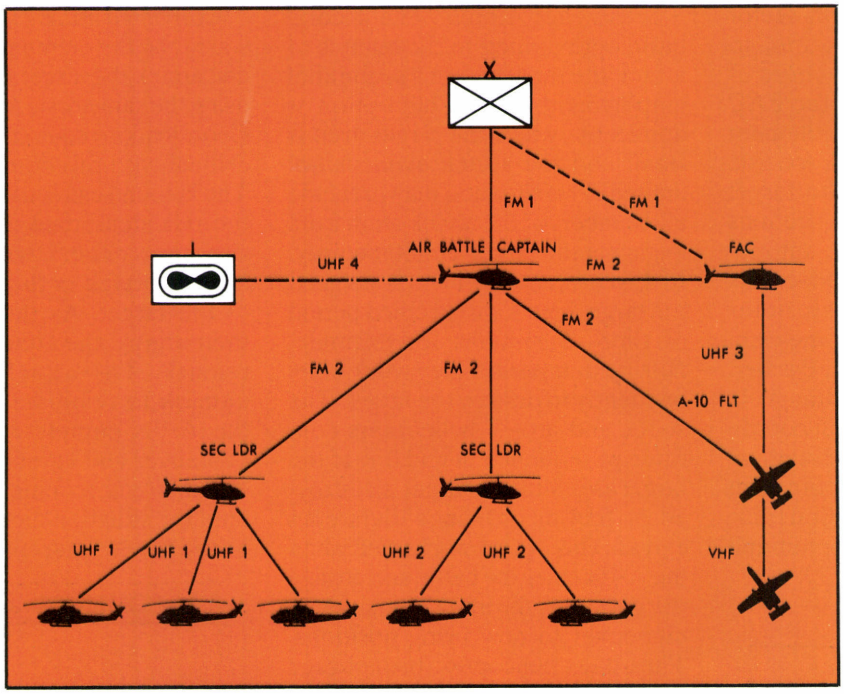


FIGURE 2: Communications Plan

operations channels to the division G-3, one item should be entered on both requests, "JAAT." The inclusion of JAAT in the mission request alerts the air support operations center that A-10 aircraft are preferred while also alerting the G-3 that attack helicopters are desired to form a JAAT.

Conduct of a JAAT

Let's say that the JAAT is approved and the assets are available. Now what happens? As stated earlier, the ground maneuver commander has the overall responsibility for planning, coordination and employment of the JAAT. However, the ABC and FAC initiate the necessary coordination as early as possible. For preplanned operations the opportunity may exist to coordinate such items as flight corridors, indirect fire support, call signs, frequencies, etc. When immediate air requests or battlefield opportunities initiate the formation of the JAAT, prior coordination may not take place. When this happens, the ABC and FAC or A-10 flight leader will coordinate on a common frequency (see figure 2). As a minimum the A-10 flight leader will pass to the FAC or ABC in the FAC's absence, the following:

- Call sign/mission number
- Ordnance available
- Loiter time.

The FAC or ABC will pass the following information to the A-10 flight leader:

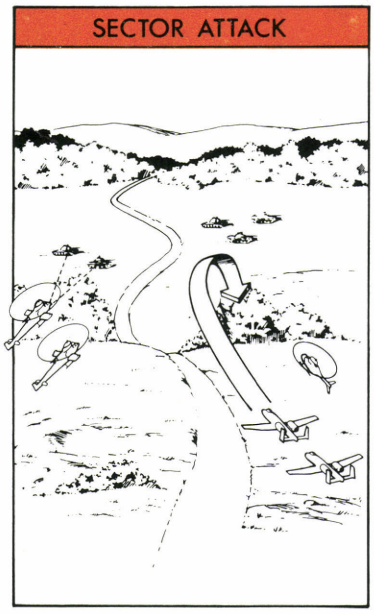
- Target location (coordinates or geographic reference)
- Initial point (IP)
- Heading and distance from the IP or contact point to the target
- Target description
- Air defense artillery (ADA) or air threat
- Position and activities of attack helicopters
- Location of friendly elements
- Restrictions (artillery firings, etc.)
- Additional information as necessary (inbound calls, departure calls, etc).

If conditions do not permit a full target briefing, as a minimum, the A-10 flight leader needs target location and description.

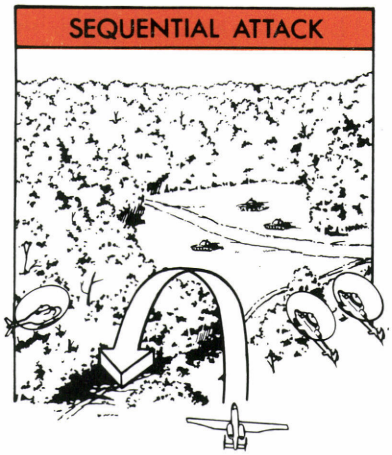
No matter what the circumstances are surrounding the formation of the JAAT, one person must direct the "total team effort." Since the ABC should be keenly aware of the ground and air tactical plan and can maintain continuous contact with enemy and friendly elements, he is the logical director/coordinator of the joint effort. He does not dictate attack methods but rather coordinates the air attack upon the enemy in consonance with the ground scheme of maneuver.

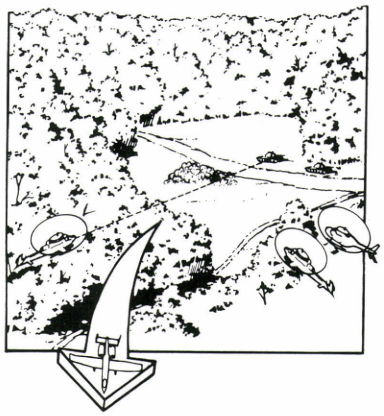
The attack is now in progress. The ABC and scout helicopter pilots are employing indirect fires to slow the enemy threat, suppress his ADA, canalize and button up his armored forces. The A-10 flight leader has exchanged the pertinent information with the FAC and the ABC and is turning toward the IP. What employment techniques are we likely to see? We use three employment techniques (figure 3, next page): sector, sequential and combined attacks. The actual technique or combination of techniques selected depends upon the situation, time and space available.

Sector Attack: During a sector attack the area of operation, to include the target and avenues of approach, is sectored by the FAC and ABC (figure 3). Each element of the JAAT is allocated a specific operating sector. With the target area divided into distinct sections the two groups can work autonomously within their assigned sectors while still providing each other mutual support. In this way the team can saturate the target area. Further, sector attack can reduce the problems associated with aircraft coordination, ordnance fan and fragmentation clearance and can function with reduced communications during periods of extensive communications jamming.



Sequential Attack: The second basic option open to the team is to attack the target using a sequential employment plan. This option is applicable when the target area is small and the attack avenues are limited. This situation may preclude all members of the attack team from engaging the target simultaneously. In this case, each element is assigned the target area for a specified period of time—5 minutes for example. During that period they work independently to destroy the target. The A-10s and attack helicopters continue to sequence in and out of the target area until the target is destroyed or fuel or ordnance dictate an egress. This option works well when the A-10s enter the battle and engage the targets as the attack helicopters maneuver to new firing positions. The attack helicopters then engage the target as the A-10s momentarily exit the target area thereby providing mutual support for each other and constant pressure on the enemy.





Combined Attack: If the situation warrants, the elements of the team can attack the target simultaneously using the same basic attack avenues. Coordination requirements are more critical with this combined attack. The inbound call is used to sequence the individual attacks. The optimum situation occurs when the helicopters attack as the A-10s ingress to the target. As the A-10s begin their attack, the attack helicopters remask. The attack helicopters unmask to reinitiate the attack as the A-10s complete their escape maneuver and egress. This coordinated attack scheme can continue until the situation dictates a change or the battle is terminated.

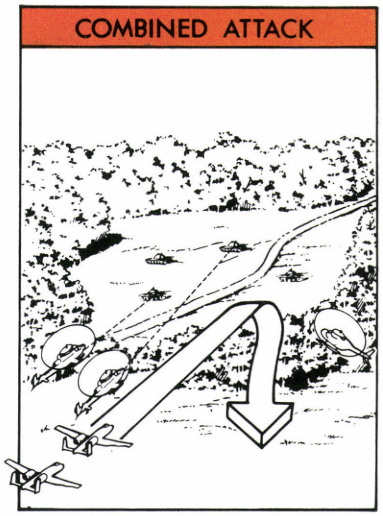


FIGURE 3: Employment Techniques

The JAAT may employ a decoy operation with any of the three basic employment techniques. By using one element of the JAAT to decoy the primary air defense threat, the other element can often maneuver to an advantageous attack position and successfully engage the primary target or neutralize the threat.

As we place the final TOW (tube-launched, optically-tracked, wire-guided) and Maverick missiles on the threat and watch the ground maneuver forces take advantage of a weakened enemy force, there is a realization that Army Aviation has evolved from its fire support role to that of an active participant in the AirLand Battle. However, nothing remains the same, our evolution is continuing. Further doctrine development is needed for the conduct of JAAT operations. Leaders, especially in the aviation community, must seize every opportunity to train for JAAT operations. The procedures described in this article have been formalized as doctrine in the Joint Field Manual 17-50-3, which is undergoing staff review. Your suggestions for changing how we fight the JAAT or for improving our approach to the training or conduct of JAAT operations should be directed to:

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Typical JAAT Sequence

1. Army attack assets **receive mission**
2. ABC **finds** the threat
3. ABC passes **target information** to FAC or the A-10 flight leader
4. Scout team leaders **position attack teams** into battle positions/firing positions
5. **FAC passes** IP, target description, heading/distance to target and clearance to A-10 flight leader at CP (in FAC's absence, ABC gives clearance)
6. A-10 **departs IP** with call on common frequency
7. **Call is acknowledged** by forward air controller or ABC
8. A-10s **call inbound** prior to bunt (unmask 100 to 300 feet to fire)
9. Artillery and or attack assets are coordinated to **mark the target** for ease in identification (suppress ADA, slow, canalize and button up threat)
10. A-10s and Cobras **attack** the threat
11. JAAT **reattacks** under direction of ABC until threat is destroyed or team is relieved
12. A-10s **egress** to IP/CP
13. Scout team leader **repositions/withdraws** Cobras as necessary
14. If JAAT is relieved, ABC or scout team leader should remain in area to **brief new team**
15. Appropriate **reports are forwarded** (end of mission, bomb damage assessment, situation report, etc.)

Note: The above sequence is only one of many ways the scenario may take place. Imagination, the situation, time and space including the METT factors (mission, enemy, troops, terrain/weather) all will play a role in the actual conduct of JAAT.

MORE FLIGHT HOURS

LESS FUEL DOLLARS

Framework for an Army FUEL CONSERVATION PROGRAM

Colonel Lewis J. McConnell
and
Major Gary T. Downs

HOW MUCH FUEL do you waste when you fly your Army helicopter? Do you even think about it? Uncle Sam pays the bill so you fly it like you've been trained. Right? Right! We need to realize, though, that you and I actually pay for that fuel and we also pay in terms of training hours available due to costs. What we really need to pay is—attention to fuel usage!

Many of us were trained BC (before crunch) and that means that we who are the instructors today aren't trained to teach fuel conservation. It's **not** that we haven't had the time and opportunity because we have had a fuel problem since 1973. We just don't find time to worry about fuel conservation because of all the other problems.

Well, we **should** worry!

Today's abundance will give way to shortage again and today's moderated prices, although high, will

rise again. We need to make needed changes now because fuel conservation will be even more important in the future if we are to maintain adequate flying hour programs for the more sophisticated aircraft being fielded. Those aircraft will require many more hours for proficiency than previous helicopters, so we cannot cut costs by reducing flying hours. We have to maintain flying hours or increase them by reducing waste and inefficiency.

Just how much is the Army's fuel bill each year and how much can we save? Well, in fiscal year 1981, Army aircraft burned about 130 million gallons of aviation fuels, at a cost of about $170 million. If we were to set a modest savings goal of 5 percent in our overall day-to-day operations, which is not unrealistic, the savings would amount to about 6.5 million gallons or about $8.5 million. That would translate into several more much needed flight hours.

There are many things aviators can do to effect such savings; procedures which do not require sacrifices and do not make job accomplishment more difficult. Below are a few ideas which are known fuel savers.

Optimize the number and type aircraft. Use the most economical aircraft for the assigned mission. If an OH-58 Kiowa will suffice, don't use a UH-1H Huey. Flight operations should do this as well to ensure that only the necessary number of aircraft are sent on a mission. It's better to have one aircraft at gross weight than two operating light.

Watch your fuel samples. It is not necessary to take a full quart fuel sample just because the container will hold that much; take only the minimum amount necessary to ensure there is no contamination in the tanks. Also, do not take samples after each refueling unless the aircraft sits for several hours. Contaminants settle slowly and samples taken too soon only waste fuel.

Get your clearance before you start. If you're flying on an IFR (instrument flight rules) flight plan, or the weather is marginal (special visual flight rules), get your clearance before you start the engine. If available, use a ground power unit to save the battery; however, a good battery should have no problem operating one radio as long as transmission is minimized. Any pretakeoff requirements which can be accomplished before starting engines will minimize wasted fuel.

Know your procedures and use the checklist. Perform your start and run-up requirements as quickly as possible, while ensuring accuracy. A lack of familiarity with the procedures, or just moving too slowly in performing them, results in extra fuel wasted. The goal is to get started flying as quickly as possible.

Keep hovering to the minimum. Hovering is one of the highest fuel consuming maneuvers performed in a helicopter. It should be avoided, in lieu of ground taxi or just sitting on the ground, if possible. Waiting in line to take off is inevitable at times, but every effort should be made to avoid it, because hovering while waiting increases fuel consumption drastically. Wheeled helicopters should ground taxi to the maximum extent possible.

Keep aircraft weight to a minimum. Carry only the equipment and personnel needed on a mission. Excess equipment and people add weight, increasing fuel consumption. In addition to weight, external equipment such as gun mounts also adds drag and further increases fuel consumption. These items should be removed when not needed and reinstalled as required.

Use the optimum airspeed for the mission. If your mission is one of staying airborne in an area (loitering) where endurance is required, use the airspeed for maximum endurance. This airspeed can be determined from the performance charts in the aircraft operator's manual (dash 10). When flying cross-country, airspeed should be as close to that for maximum range as possible (that also can be found in the dash 10). Since the maximum range airspeed in many cases is quite fast, it may not be advisable or comfortable to fly at this speed. However, airspeed should be held as close as possible to that for maximum range for the particular conditions.

Fly as high as possible with minimum safe rotor speed. Flying high and at reduced rotor speed is a proven fuel saver, saving as much as 50 percent when flying at optimum conditions versus sea level at maximum continuous rotor speed. Many variables must be considered, such as distance, wind speed, gross weight, etc., and that is where detailed flight planning is involved. Obviously this type of flying can only be done on cross-country type missions, but with detailed planning, flying at the optimum (high) altitude and at minimum continuous rotor rpm (revolutions per minute), significant fuel savings can be realized.

	TAS (kt)	Cruise Time (min:sec)	Fuel Flow (lb/hr)	Total Fuel Used (lb)
Sea Level (15°C) IAS=90 kt 8,000 lbs gross weight 324 Rotor rpm (6,600 engine rpm)	88	2:16	490	1,114
9,500 (-4°C) IAS=90 kt 8,000 lbs gross weight 314 Rotor rpm (6,400 engine rpm)	107	1:52	468	874

Fuel Savings = 239 lb or 21.5%

Fuel Consumed—200 NM Cruise—UH-1H (Based on standard day conditions)

When combined with flying at optimum airspeed, this is the greatest potential fuel saver of all the techniques presented. An example of the fuel savings possible on a flight with a 200 nautical mile (NM) cruise is shown in the figure.

Plan your descent to minimize power changes. When preparing to land, attempt to accomplish the descent with one power change rather than continuous power changes. Reduce power to a descent setting and increase airspeed, if possible, to accomplish the descent. Attempt to make the approach a constant power descent as much as possible. Frequent power changes disturb the steady operating condition of the engine resulting in increased fuel consumption. Also, descending too soon requires leveling off at higher power settings which increases fuel consumption. With good planning and minimum power changes, a safe approach with minimum fuel consumption can be achieved.

Idle the engine(s) as soon as possible. After landing, idle the engine(s) as quickly as possible to get the 2-minute cool down period going and to reduce fuel consumption. This allows plenty of time to accomplish all shutdown procedures, make any radio calls, and still shut down the engines right at 2 minutes after touchdown. Once again this will limit fuel wasted by engines running for prolonged periods while on the ground.

Be careful refueling. Use pressure refuel if available which will eliminate nearly all possibility of spilled fuel. If open port is used, try to minimize spillage whether you or the fuel handler refuels the aircraft. Drain the excess fuel out of the nozzle into the tank and not on the ground. Report any leaks in refueling equipment as soon as possible. The fuel lost on the ground during refueling would probably be enough for several more flying hours for each of us every year.

Most of the topics we've addressed are commonsense. Obviously, many of them do not apply to tactical operations in the NOE (nap-of-the-earth) environment, but some can be applied to that type of flight. It's up to each of us to do whatever we can to reduce unnecessary fuel usage.

There are other things which are being done to enhance fuel conservation. Better performance charts for the operator's manual are being developed to allow easier determination of optimum flight conditions. A handheld flight planning computer is being evaluated. Its purpose would be to reduce planning time

and allow greater accuracy; and it could also be used during the flight for changing conditions. Programs would be made for each type of aircraft and the computer would do the job now done by the performance charts—better, easier and quicker. These programs are being carried out by the Army Aviation Engineering Flight Activity and Army Aviation Research and Development Command as part of a comprehensive fuel conservation program.

Additional action that can be taken includes:

- Upgrade refueling equipment, preferably closed circuit.
- Revise operator's checklist to streamline procedures and require less ground time.
- Install better fuel monitoring instruments and use them to identify aircraft that are burning excessive fuel.
- Develop and distribute auxiliary fuel tanks for long-range operations.

Those steps would enhance fuel conservation without adding to the pilot's workload.

All of the ideas presented here will help toward the ultimate goal: more training flight hours for the same dollars through fuel conservation. The need is evident—and the numbers show that only a 5 percent savings through conservation will result in a significant increase in available flying hours for the same money. Before it can work, though, a program must be implemented and that means the biggest fuel conservation measure of all: a sense of urgency and dedication to conserving fuel by everyone concerned with Army Aviation. In particular, commanders need to place the same degree of emphasis on conservation measures that they place on other areas such as safety, personal appearance, etc.

A sense of fuel conservation consciousness on everyone's part means the desired results will be attained.

Note: The Army Aviation Center, Ft. Rucker, AL, intensified its efforts to conserve aviation fuel in FY 1979, and progressive savings have come from the resulting and ongoing energy conservation program. In FY 1982, those savings amounted to 2.3 million gallons and $2.9 million less than the targeted use.

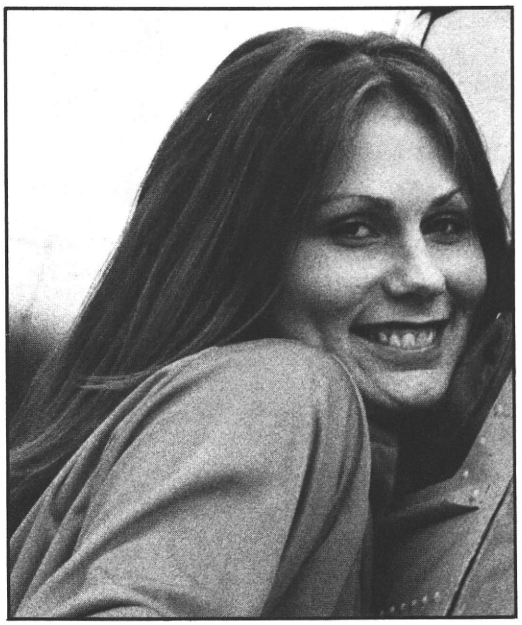
ABOUT THE AUTHORS

Colonel Lewis J. McConnell is a Master Army Aviator with more than 5,300 hours in fixed and rotary wing aircraft. He was commissioned from Infantry Officer Candidate School in November 1953 and completed fixed wing flight training in the first class to graduate from Ft. Rucker, AL, on 29 January 1955. Colonel McConnell's military schooling includes the Transportation Advanced Course, Command and General Staff College and the Industrial College of the Armed Forces. During his career he has commanded seven aviation units to include the 178th Assault Support Helicopter Co., 520th Aviation Maintenance Bn., the 229th Assault Helicopter Bn. in Vietnam and the 11th Aviation Group (Combat) in Germany. He served two tours on the Army Staff and was the U.S. Army Europe Aviation Officer before assuming his present position as commander, U.S. Army Aviation Engineering Flight Activity, Edwards AFB, CA.

Major Gary T. Downs graduated from the U.S. Military Academy in 1967 and has since served in Vietnam as weapons platoon commander in an air cavalry squadron and in Germany as armored cavalry troop commander. Subsequently he was assistant professor of mechanics at the U.S. Military Academy. He has completed Ranger School, Rotary Wing Aviator's Course, Infantry Officer's Advanced Course and the Command and General Staff College. He holds a master's degree in aerospace engineering from Georgia Tech and is a distinguished graduate of the Naval Test Pilot School at Patuxent River, MD. Currently assigned to the U.S. Army Aviation Engineering Flight Activity as an experimental test pilot, he is flying in several test programs which include the fuel conservation effort and the AH-64. He is a Senior Army Aviator rated in both fixed and rotary wing aircraft.

PEARL'S

Personal Equipment And Rescue/survival Lowdown



Elaine Chiboucas photo by Tom Greene

SPH-4 Ear Seals

Defense Electronics Supply Center (DESC), Dayton, OH 45401 (RIC-S9E) has advised that the national stock number (NSN) we have been accustomed to using to order the nonhardening ear seals has been deleted (old NSN 5965-00-058-1246) because of two stock numbers being assigned to the same item. You will now have to order NSN 5965-00-815-2525 to obtain the seals, according to Mr. Chuck Freeman of DESC, AUTOVON 850-5165.

TACOM Technical Area Manager For Life Support

The Tank Automotive Command has recently appointed LTC (P) Morton S. Brisker as Technical Area Manager for Life Support. He is the single focal point within TACOM for all matters pertaining to life support of crew and passenger personnel for military vehicles under the TACOM proponency. This designation also carries a TACOM research and development center designated line of authority for developing pertinent task objectives, proposing funding resources and reviewing task level technical performance. Should you desire to communicate with TACOM on this matter, please contact LTC (P) Brisker, AUTOVON 786-6386, or by letter to TACOM, ATTN: DRSTA-NR, Warren, MI 48090.

Life Preservers (LPU 2/P and LPU 10/P)

Aviation life support equipment (ALSE) shops that maintain LPU-2/P and LPU-10/P life preservers should refer to a current copy of Air Force Technical Order (TO) 14S-1-102, "USAF Flotation Equipment," and technical manual (TM) 5-4220-202-14 for maintenance and repair. However, the parts listings in these manuals list only part numbers rather than NSNs. The following list gives NSNs and source of supply for LPU repair parts.

Nomenclature	Source of Supply	U/I	NSN
FLU-1/P valve	FPZ	ea.	4220-00-295-7945
Cell, Flotation, LH	FPZ	ea.	4220-00-868-9259
Cell, Flotation, RH	FPZ	ea.	4220-00-868-9260
Nylon LPU Cloth	S9T	yd.	8315-00-078-2958
Gasket, CO_2 Cylinder	S9I	ea.	5330-00-018-0792
Gasket, Inflator Stem Upper	S9I	ea.	5330-00-018-0793
Gasket, Inflator Stem Lower	S9I	ea.	5330-00-018-0790
Cylinder, CO_2	AMDF	ea.	4220-00-543-6693
Rubber Cement	AMDF	kt.	8040-00-262-9062
Cell Protector	AMDF	yd.	8305-00-926-1584

The FLU-1/P valve is used to convert LPU-2/Ps to LPU-10/Ps. The FLU-1/P valve is a "breathing" valve that replaces the LPU-2/P assembly that uses a clip to hold the oral inflation valve in the open position. Both assemblies facilitate cell breathing during altitude changes, but the LPU-10/P is much simpler to maintain. When you replace the inflation assembly of the LPU-2/P with the FLU-1/P valve, redesignate the life preserver as an LPU-10/P.

The cells, flotation, left hand and right hand, are for replacement of nonrepairable cells, as identified in

TM 5-4220-202-14 and TO 14S-1-102. Repairable cells will be repaired with nylon LPU cloth and rubber cement.

Three gaskets are present in the inflation assembly. Two are on the inflator stem (part of the cell) and the other gasket is located in the CO_2 cylinder receptacle.

The cell protector is fabricated to protect the nylon cell from the metal inflation assembly.

All specific repair procedures can be found in TM 5-4220-202-14 and TO 14S-1-102. All items with a source of supply (SOS) other than "AMDF," must be ordered AOE off-line.

Point of contact for further info, CW2 Gibson, USAREUR Aviation Safety and Standardization Board, APO NY 09025, AUTOVON 423-1110, Ext 7234-720/545 and Mr. Ed Daughety, from this office, DRCPO-ALSE, AUTOVON 693-3307.

New Life Raft

The new LRU-16/P single person life raft provides needed thermal protection in a survival situation in cold water region areas. The raft is a fully inflatable insulated raft with blow-up floor and spray shield. It weighs 6¼ pounds (100 oz) and is 367 cubic inches in size. Used with retainer 62E4336 or 7036789, the LRU-16/P packs easily in the OV-1 RSSK. The NSN is 4220-00-118-6122.

Another new raft that is being made available for special requirements is the LRU-17/P. This raft is a take-off from the LRU-16 but without spray shield; therefore, it can be packed into a smaller package. Currently, it is available only by special request. The raft is managed by the USAF as is the LRU-16/P.

Sharing

Dear Pearl:

I am a young WO1 rated aviator enjoying my new assignment. My commander recently told me, "YOU ARE NOW THE ALSE OFFICER FOR THIS TROOP." You could have knocked me over with a feather. "But Major," I said, "I am only a WO1 recently out of flight school and I know little about ALSE"—and as you all well know, my plea ended there. Previous ALSE officers had apparently let things coast. The condition of our troop's ALSE is very bad. Pearl, being a new "kid" on the street of ALSE, I need all the information you can provide such as: How do I order equipment and expired components for survival kits/vests, spare parts for helmets, etc. I need help in setting up a system of inspection and maintenance procedures for my troop. Also, I have 40 tropical survival kits for the SRU-21/P survival vest. How do I inspect, seal and mark them after they are inspected so I can issue them to aircrew personnel? How does only one person inspect 45 aviators' ALSE such as survival kits, survival vests, hot and cold weather kits, survival radios, strobe lights, SPH-4 helmets along with the other numerous ALSE items and still find time for other duties? I have found out there is much more to ALSE than meets the eye. Will you please help me?

NAME WITHHELD

Dear Name Withheld:

Believe me, I certainly sympathize with you, but you are not alone. I receive many letters like this and it is apparent that others need help too. We in ALSE have come a long way and all things are not that gloomy. The tool to help the ALSE community will be available soon through the newly drafted Army Regulation AR 95XXXX titled, "U.S. Army Aviation Life Support Equipment System Program." In the meantime, use Training Circular 1-62 (Aviation Life Support Equipment); this was published more than a year ago and distributed to the field. It is soon to be reconstituted into two field manuals (FM), one for ALSE operations and the other for ALSE inspection, maintenance, repair and supply; the ALSE pamphlet published by the DARCOM Project Officer for ALSE has been out in the field now for more than 5 years and is under revision with a target publishing date of December 1982; this same office is developing ALSE information packets which are to be provided to new ALSE "experts" and are available for the asking. An ALSE checklist is available for further assistance to you in the field. I agree that you need a library of PEARL and FLIGHTFAX for there are many excellent articles that have been published which will certainly give you a firm background in ALSE. The formal ALSE training school is at the U.S. Army Transportation School, Ft. Eustis, VA, and they are going all out to make your "learning" meaningful with a 5-week "hands-on" course. I responded to your letter in this format to help other ALSE personnel who are in need, hope it fills the bill!

Sincerely,

PEARL

If you have a question about personal equipment or rescue/survival gear, write PEARL, DARCOM, ATTN: DRCPO-ALSE, 4300 Goodfellow Blvd., St. Louis, MO 63120 or call AUTOVON 693-3307 or Commercial 314-263-3307

ACCIDENT RATES, number of destroyed aircraft, and percentages of human error are some of the more popular figures used in aviation safety talks and publications. While the use of these numbers is essential in conducting trend analyses and various statistical studies, their full meaning often seems to get lost in the process.

A good example of numbers that really mean something is the 59 Class A aircraft accidents, 58 flight and 1 ground, and 46 Army fatalities for FY 82. (Taking into account all persons killed in Army aircraft accidents, the number of fatalities in FY 82 is 86.) These are not just numbers out of a computer. They are dead people and destroyed or heavily damaged aircraft. Their loss has affected the overall readiness of the Army, the number of replacement aircrewmembers required from the training command, the morale of their units, and the lives of their families. These 59 Class A accidents have cost the Army $60 million . . . enough to put 38 new Cobras on the flight line. And this figure is expected to increase when all data is in.

The Class A rate for FY 82 is 3.7 per 100,000 flying hours. This is the worst record since FY 73, when 64 Class A accidents and 74 fatalities were recorded.

Over the 4 years from FY 78 through 81, the Army averaged 42 Class A aircraft accidents each year. FY 80 was the best safety record in Army aviation history. Thirty-eight Class A accidents were recorded that year, with a Class A accident rate of 2.4. Flying hours for the 5 years through FY 82 were relatively constant, averaging about 1.5 million each year.

Fixed wing aircraft make up 6 percent of the total aircraft inventory and account for 12 percent of the total flying hours. Over the past 5 years, fixed wing aircraft have accounted for 7 percent of the total Class A accidents. Rotary wing aircraft make up 94 percent of the total Army aircraft inventory and account for 88 percent of the flying hours each year. Breaking out rotary wing aircraft into categories reveals the following:

- *Utility helicopters* make up half of the rotary wing fleet. They have accounted for 45 percent of the Class A accidents over the past 5 years.
- *Observation helicopters,* which make up 31 percent of the rotary wing fleet, have accounted for 26 percent of the Class A accidents over the past 5 years.
- *Attack helicopters,* making up 13 percent of the rotary wing fleet, have accounted for 15 percent of the Class A accidents.
- *Cargo helicopters* make up 6 percent of the rotary wing fleet. They have accounted for 7 percent of the Class A accidents.

Year in and year out, analysis of accident data continues to identify human error as the most persistent

Colonel Joseph R. Koehler
Commander
U.S. Army Safety Center

Professionalism and the FY

cause of aircraft accidents. Errors made by flight crews, flight commanders, mission commanders, and unit commanders accounted for 65 percent of the definite cause factors in all Class A aircraft accidents—and 70 percent of all Class A, B and C accidents—over the past 5 years. Environmental factors accounted for 18 percent and materiel failure or malfunction accounted for 17 percent.

Forty-two of the 59 Class A accidents for FY 82 involved crew or supervisory error as a definite cause factor. This number will probably go higher when all investigations are complete.

The predominant flight crew errors were faulty judgment, violation of regulations/flight discipline, failure to follow established procedures, inattention to tasks, and pilot-induced loss of control. Following are typical examples of these crew errors.

Faulty judgment

A UH-1 pilot made an approach into a "hot" mortar position without clearance. The mortars were firing almost directly below the aircraft, and the pilot took evasive action by banking to the right. While in the turn, he applied additional collective pitch which resulted in rotor and engine rpm bleed-down. The UH-1 settled into the trees and crashed. The aircraft was destroyed and the five occupants were injured.

Violation of regulations

While practicing confined area operations, an OH-6 pilot set up a final approach, with no intent to land, to an area he knew was not authorized for confined area practice. His aircraft hit two power cables and crashed. The pilot violated regulations and established procedures by flying below 500 feet agl, by not doing a high recon, and by not identifying a forced landing area.

Failure to follow procedures

The pilot of an AH-1, when confronted with an in-flight control malfunction, misinterpreted the aircraft actions as being caused by a main transmission mount failure. When the aircraft suddenly lurched and rolled, the pilot made incorrect flight control inputs. During the roll, the main rotor blades hit the ground

and the aircraft crashed, killing one occupant and injuring the other.

Inattention

An OH-58 pilot descended from 800 feet agl to about 200 feet over a lake. As the pilot passed one of the boats on the lake, he waved to the occupants in the boat. He was looking to the right front of the aircraft and did not notice that he was continuing to descend. The aircraft hit the water at an airspeed of about 90 knots. Both occupants of the aircraft sustained major injuries.

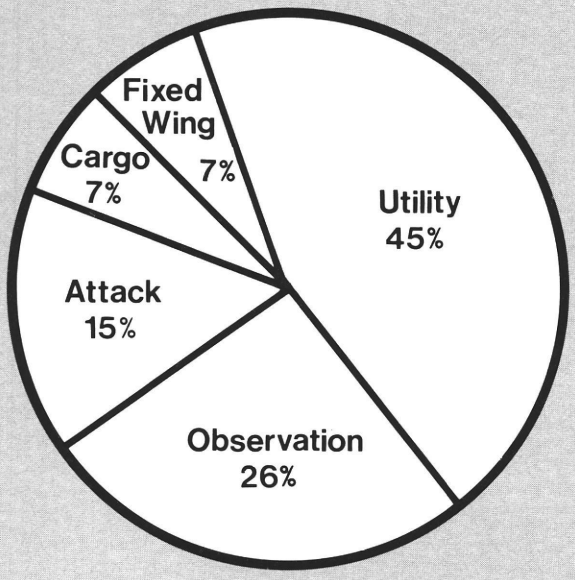
Pilot-induced loss of control

The pilot of an OH-58, during a tactical service mission, induced a loss of tail rotor control. When the aircraft yawed right as it cleared the tops of some trees, the pilot reacted with control inputs which caused aggravated control flight. The aircraft, near the critical limits of tail rotor control, went into an uncontrollable spin and crashed. The aircraft was destroyed and the three occupants were injured.

Supervisory error is also a persistent cause factor in a large percentage of aircraft accidents. Predominant supervisory errors in FY 82 Class A accidents were failure to provide adequate unit training, failure to correct actions of subordinates, failure to provide adequate guidance, and failure to insure instructor pilot qualifications. Following are examples of costly supervisory errors.

Failure to provide adequate unit training

An OH-58 was being operated under conditions known to be conducive to loss of tail rotor effectiveness. When the pilot attempted a tight right turn while 20 feet above treetops, the aircraft spun and crashed into the trees, killing one occupant and injuring the other two. The pilot had not been trained or



Class A Accident Distribution by Aircraft System
FY 78-82

instructed in the loss of tail rotor effectiveness during his transition into the OH-58 and was not knowledgeable of prevention or recovery procedures.

Failure to correct actions of subordinates

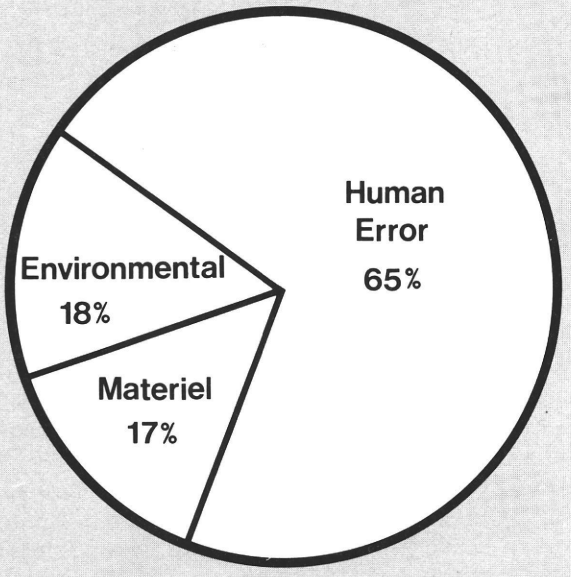
After dropping off supplies at a field location, a UH-1 proceeded down a river at 50 feet and 90 knots. The aircraft hit wires and crashed. Three occupants were killed and six were injured. The acting troop commander was one of the six passengers on board the aircraft.

Failure to provide adequate guidance

Four AH-1s were flying toward a pass. When the flight leader announced over his radio that the weather was deteriorating and he didn't think they would make it through the pass, the platoon leader, who was copilot of the trail aircraft, urged him to go a little further. The flight leader continued on, entered clouds, and became disoriented. Control was lost and the aircraft crashed into the side of a hill, injuring the two occupants.

Failure to insure IP qualifications

An IP and pilot were on a UH-1 high altitude training mission in mountainous terrain. The IP had no hands-on mountain flight training and no mountain flying experience in more than 6 years. On short final, the pilot was unable to maintain directional control, and the aircraft began to turn to the right. The pilot tried to fly out of the turn instead of landing as required by the operators manual. Flight control inputs were ineffective and the aircraft crashed. The qualifications of the IP who was conducting the high altitude mountain training were not checked prior to the training.



Cause Factor Distribution of Class A Accidents FY 78-82

The safety problem is a people problem

The sharp increase in Class A accidents in FY 82 is not the result of more demanding operations, nor is it peculiar to any particular aircraft system or level of aircrew experience. The accidents span the entire fleet of aircraft and are spread across the entire range of aviator experience levels.

The safety problem in Army aviation today is clearly a people problem which can be corrected. Human-error accidents can be reduced or even eliminated if commanders and supervisors get, and stay, actively involved with routine day-to-day flight operations.

Every person in the chain of command must establish an atmosphere within their organization that leaves no doubt that all hands are expected to prepare themselves professionally and execute their missions with integrity and discipline. There can be no approval of corner cutting in the name of expediency.

It is a proven fact that most people will perform the way they are expected to perform. If commanders demand professionalism, sound airmanship, and flight discipline, they will get it.

Professionalism is the most essential safety ingredient. Any job done professionally is inherently safe. But if there is no professionalism, there is no safety.

COBRA SURVIVAL KIT

AMERICAN ingenuity is a byword that often applies to Army Aviation people. Two who have laid claim to it are Chief Warrant Officer, CW3, John P. Goodrich and Chief Warrant Officer, CW2, Bryan D. McClendon.

Both are AH-1 Cobra pilots and unit safety officers—CW2 McClendon for Company C, 229th Attack Helicopter Battalion, Ft. Campbell, KY, and CW3 Goodrich for Company D, 7th Combat Aviation Battalion, Ft. Ord, CA.

Their realization that the aircraft they fly has no space for survival gear, other than what can be stuffed into the individual's vest, was not unique. That knowledge is shared, and dreaded, by every Cobra pilot.

Referring to the lack of gear to use in case of an accident or forced landing, CW2 McClendon said, "It is tragic enough to die in combat, but that is the price for peace. It would be a real heartbreak to have someone die in peacetime because of a lack of equipment."

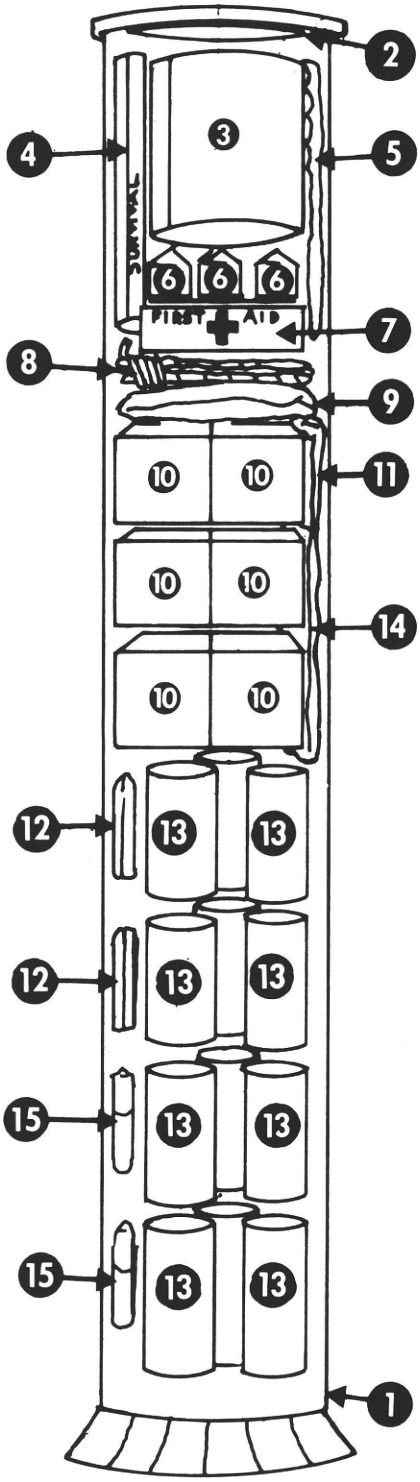
So in separate and independent efforts, the chief warrant officers determined to find a solution to the problem; and they came up with the same ingenious idea: for any Cobra (or other aircraft) with a TOW (tube-launched, optically-tracked, wire-guided) configuration, use an empty TOW tube as a storage place!

CW3 Goodrich uses the designator TUSK for his TOW tube survival kit. Items he placed in the kit for the Ft. Ord environment are shown in the accompanying diagram and listing, and the total weight is 38 pounds.

Preparation of the tube is vital, he said: "Wash and clean the TOW tube, then paint or otherwise seal it. Next, cut out two aluminum disks to seal the ends of the tube, coating the disk edges with rubber silicone to ensure a water-tight fit. Then reinstall the tube's original flange and flange retaining device, along with the disks.

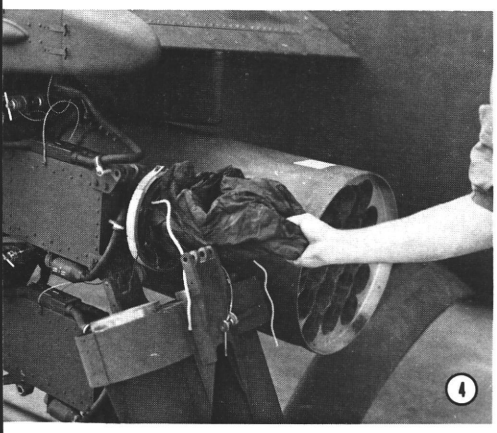
"The contents of the TUSK can easily be modified to meet the requirements of many different operating environments and missions. Development of a wing-strap device is underway so that the TUSK does not occupy a space needed for a missile when operating in a tactical environment."

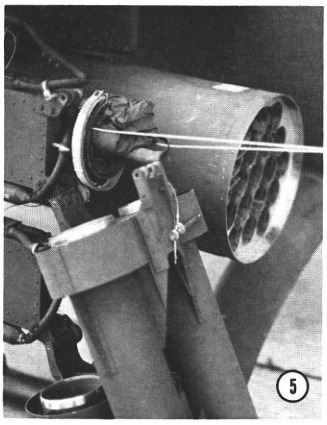
CW2 McClendon also agrees that the TOW tube survival kit will have to be put in another location if a mission dictates full missile capability.



The Cobra survival kit, TUSK, designed by CWO John P. Goodrich, Ft. Ord, CA, is depicted by a diagram showing how items are packed in the TOW tube, a list of contents with corresponding item numbers, and a picture of those contents and of CWO Goodrich, left, and SGT Joseph L. Freeman

Item Number	Item and Quantity	NSN
1	Expended TOW tube, 1	
2	Aluminum disk, 2	Local manufacture
3	Tarpaulin, 1	8340-00-485-3012
	Hat, sun, 1	8415-00-270-0229
	Bag, drinking water storage, 1	8465-00-485-3034
4	Air Force Manual (AFM) 64-5, 1	
5	Tool kit, survival, 1	8465-00-973-4807
6	Candle, 4	6260-00-840-5578
7	First aid kit	
	Zip lock plastic bag, 1	8105-00-837-7755
	Bandage, gauze, compressed, 3 × 6 yards, 1	6510-00-200-3185
	First aid kit, eye dressing, 1	6545-00-853-6309
	Bandage, muslin, compressed, 37 x 37 x 52, 1	6510-00-201-1755
	Dressing, first aid, field, 4 × 7, 1	6510-00-159-4883
	Provine iodine solution, 1	6505-00-914-3593
	Water purification tablets, iodine, 1	6850-00-985-7166
	Ammonia inhalant ampul, 3	6505-00-106-0875
	Bottle, safety cap	6530-00-112-0160
	Bandage, 18	6510-00-913-7909
	Chapstick, hot weather, 1 tube	6508-00-116-1473
	Gauze, petrolatum, 1 pkg.	6510-00-202-0750
	Preparation, sunburn preventive, 1 bottle	8415-00-938-6231
8	Parachute cord, 50 ft.	
9	Accessory packet	
	Zip lock plastic bag, 1	8105-00-837-7755
	Plastic spoon, 1	7340-00-170-8374
	Matches (nonsafety), 1	9920-00-985-6891
	Pocket knife, 1	5110-00-162-2205
	Waterproof match box, 1	8465-00-265-4925
	Wire, nonelectrical, 20 ft.	9525-00-596-3498
	Can opener, 1	
	Whistle, ball, plastic, 1	8465-00-254-8803
	Aluminum foil, 6 × 3 ft., 1	
10	Food packet, survival, 6	8970-00-082-5665
11	Headnet, insect, 1	8415-00-935-3130
12	Trioxane fuel, compressed, 3	9110-00-263-9865
13	Water, canned drinking, 12	8960-00-243-2103
14	Kit, fishing tackle, 1	7810-00-558-2685
15	Signal, distress, day/night, 2	1370-00-309-5028
	Zip lock plastic bags (for distress signals), 2	8105-00-837-7755





Clockwise from top right: **(1) CWO Bryan D. McClendon, Ft. Campbell, KY, points to the survival kit he designed for the AH-1 Cobra, or any aircraft that has a TOW configuration. (2) The contents of the survival kit are adequate for two aviators. (3) The security bolt can be removed with a pocket knife. (4) It only takes about 30 seconds to get the contents out of the tube. (5) Even the items in the rear of the tube are easily accessible with the pull cord**

photos by William H. Maki

The only structural change his invention requires for the TOW tube cannister is the removal of the electrical wiring connector from inside the tube.

He said, "Each survival kit is numbered so that control can be kept over it for inspection and maintenance. The tube is secured on the helicopter by simply placing a lock on the missile arming lever. That lock is removed before flight and the key kept in the logbook along with the door key. Securing the tube also relieves the crew from carrying it to and from the aircraft." (This is the same method used by CW3 Goodrich to secure the TUSK.)

The packing list for CW2 McClendon's survival kit includes two blankets, two ponchos and liners, knife, candles, chemical lights, nylon rope, copper wire, C rations and an opener, plastic bags, trioxane fuel tablets, matches and PRC-90 batteries.

Both inventors said the kits have been carried on Cobras in their respective units on training missions and that pilots have unanimously agreed the kit's presence adds to their peace of mind.

Action is underway within AVRADCOM to address all Army helicopter survival kit needs. Until the bright day arrives when the new module is available, however, two Army aviators have offered a workable interim solution.

They invite inquiries. CW3 Goodrich can be reached at AUTOVON 929-3008/4680 and CW2 McClendon at AUTOVON 635-6801/2364.

Editor's Note: The Digest appreciates the willingness of CW3 John P. Goodrich and CW2 Bryan D. McClendon to have articles they had submitted to the Digest published in this combined form.

READERS' SURVEY

U.S. Army AVIATION DIGEST

The purpose of this survey is to provide data that will enable us to improve the *Digest* to better help you in your profession—Army Aviation. Participation is voluntary and anonymity is preserved. After completion, fold page as indicated, staple and mail postage free.

Attention unit commanders:
We would appreciate your distributing as many copies of this as possible. They may be returned in a franked envelope.

Please circle the letter for the appropriate response. Make only one choice. Please answer every question.

1. I am
   - A. Enlisted
   - B. Warrant Officer
   - C. Commissioned Officer
   - D. Department of the Army, Navy, Air Force, Civilian
   - E. Contract Civilian
   - F. Other

2. My numerical grade is:
   (Examples: E-3/W-3/0-3 = C; E-7/O-7/GS-7 = G; GS-12 = L)
   - A. 1
   - B. 2
   - C. 3
   - D. 4
   - E. 5
   - F. 6
   - G. 7
   - H. 8
   - I. 9
   - J. 10
   - K. 11
   - L. 12
   - M. 13
   - N. 14
   - O. 15 or higher
   - P. Does not apply

3. The highest level of education I have completed:
   - A. Less than high school
   - B. High school diploma or GED
   - C. Some college
   - D. Bachelor's Degree (4-year degree)
   - E. More than a Bachelor's Degree

4. My total flying hours (present or former aviators/crewmembers):
   - A. 0 to 199
   - B. 200 to 999
   - C. 1,000 to 1,999
   - D. 2,000 to 2,999
   - E. 3,000 plus
   - F. Does not apply

5. Number of *Digest* issues I have seen in the past year:
   - A. None
   - B. 1 to 3
   - C. 4 to 6
   - D. 7 to 9
   - E. 10 to 12

6. Number of issues I have seen in the past 3 months:
   - A. None
   - B. 1
   - C. 2
   - D. 3 or more

7. How soon after publication do you see a copy? (*Digest* is usually mailed the last week of publication month):
   - A. Same month
   - B. One month later
   - C. Two months later
   - D. Three or more months later

8. I usually get/see a copy through:
   - A. Direct mail
   - B. In office distribution
   - C. In library
   - D. Visit to HQ or staff office
   - E. From friend
   - F. In dayroom
   - G. Rarely see a copy

9. Overall, I believe information in the *Digest* is:
   - A. Very useful
   - B. Moderately useful
   - C. Slightly useful
   - D. Not at all useful

10. How often have you used the *Digest* as a source document for policy/information papers, briefings/reports?
    - A. Frequently
    - B. Sometimes
    - C. Seldom
    - D. Never
    - E. N/A, I don't prepare those documents

11. I feel enough problem-solving articles are published:
    - A. Yes
    - B. No

12. Overall, material in the *Digest* is meaningful to me.
    - A. Yes
    - B. No

For questions 13 through 15, circle the letter which indicates your evaluation of the following:

		Excellent	Good	Average	Poor
13.	artwork	A	B	C	D
14.	charts and graphs	A	B	C	D
15.	photography	A	B	C	D

16. I prefer that acronyms be identified:
    - A. The first time used in the story (as is done now)
    - B. By an acronym key for each story
    - C. Both A & B if there are more than 10 acronyms
    - D. Acronym keys should not be used

17. My primary job is:
    - A. Aviation Command
    - B. Signal
    - C. Pilot
    - D. Instructor Pilot
    - E. Safety Officer
    - F. Maintenance
    - G. ATC
    - H. Logistics
    - I. Personnel
    - J. Armor
    - K. Infantry
    - L. Artillery
    - M. Intelligence
    - N. Transportation
    - O. QM
    - P. AD
    - Q. Other: _____

For questions 18 through 30, please circle the appropriate letter to indicate how much of the following articles you have read:

	All	Most	Scan	Remember Seeing but Didn't Read	Don't Remember Seeing
18. Center Commander's Introduction to the Issue	A	B	C	D	E
19. DES Report to the Field	A	B	C	D	E
20. Views from Readers	A	B	C	D	E
21. Threat	A	B	C	D	E
22. PEARL'S	A	B	C	D	E
23. ATC Action Line	A	B	C	D	E
24. Personnel Notes	A	B	C	D	E
25. Hangar Talk	A	B	C	D	E
26. Helicopter Aerial Combat Week	A	B	C	D	E
27. Army Aviation Systems Program Review '82	A	B	C	D	E
28. Forty Years of Army Aviation, Grasshoppers	A	B	C	D	E
29. Victory in Air-to-Air Combat, the Marine Corps Way	A	B	C	D	E
30. From Routine to Near Disaster	A	B	C	D	E

For each of the following statements about the *Digest*, circle the letter which indicates your agreement or disagreement:

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
31. It is interesting	A	B	C	D	E
32. It is informative	A	B	C	D	E
33. Appearance meets high standards	A	B	C	D	E
34. It has helped increase my professional knowledge	A	B	C	D	E
35. It stimulates thought and new ideas	A	B	C	D	E
36. Authors are knowledgeable experts in their profession	A	B	C	D	E
37. It is easy for me to read	A	B	C	D	E

Which two of the topic areas listed below would you most like to see (see more articles): (letter only)

38. Most _____

39. Next _____

A. Threat	G. Training	M. Accidents
B. Standardization	H. Armament	N. Combat Experience
C. ATC	I. Avionics	O. Flying Experience
D. Aviation History	J. Instrument Flying	P. Medical
E. Major Unit Missions	K. Maintenance	Q. Research/Development
F. Doctrine and Tactics	L. Weather	R. Safety

Which two of the topic areas from the list above would you least like to see (see fewer articles): (letter only)

40. Least _____

41. Next _____

Your comments next page.

Comments: _____

fold

Commander
U.S. Army Aviation Center
ATTN: ATZQ-ES-AD
Fort Rucker, AL 36362

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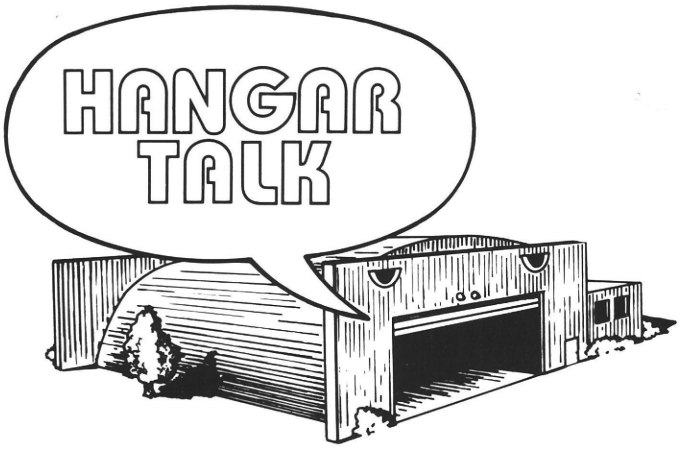


"Hangar Talk" is a quiz containing questions based on publications applicable to Army Aviation. The answers are at the bottom of the page. If you did not do well, perhaps you should get out the publication and look it over.

FM 1-5, Instrument Flying And Navigation For Army Aviators

CW2 (P) Gary R. Weiland
Directorate of Training Developments
U.S. Army Aviation Center
Fort Rucker, AL

1. If the difference between the indicated altitude and the known elevation does not exceed how many feet, an aircraft's altimeter is considered reliable for flight.

a. 30 c. 70
b. 50 d. 100

2. The turn and slip indicator aids the pilot in controlling the pitch attitude of an aircraft.

a. True b. False

3. While taxiing for takeoff, transponders will be operated in what position?

a. Off c. Low
b. Standby d. Normal

4. Pressure altitude is the height above mean sea level.

a. True b. False

5. Calibrated airspeed is indicated airspeed corrected for error due to air density (altitude and temperature).

a. True b. False

6. In a slip, the rate of turn is too fast for the angle of bank.

a. True b. False

7. If the glass face of the vertical speed indicator is broken, instrument indications will be reversed.

a. True b. False

8. If the air is colder than the standard temperature for the flight altitude, the aircraft will be lower than the altimeter indicates.

a. True b. False

9. Where available, runway visual range (RVR) is the controlling visibility for straight-in landings from an instrument approach.

a. True b. False

10. RVR will always be greater than an aviator's slant range visibility.

a. True b. False

ANSWERS

1. c, para 2-32a(2)
2. b, para 3-11
3. b, para 22-13c
4. b, para 2-33 b
5. b, para 2-36b
6. b, para 2-21c(2)
7. a, para 2-27b
8. a, para 2-31a
9. a, para 21-10
10. b, para 21-10

Directorate of Evaluation/Standardization

REPORT TO THE FIELD

U.S. ARMY AVIATION STANDARDIZATION

STRESS = REDUCED VIGILANCE = ACCIDENTS

VIGILANT, vigilance: 1. to watch, 2. staying watchful and alert to danger or trouble.

Vigilance is required in different degrees in almost everything we do. In aviation there are degrees of vigilance depending on what mode of flight you are in. On takeoffs and landings where a high degree of precision is required vigilance must be higher; once cruise flight is achieved then vigilance is usually reduced depending on the type mission being conducted.

Research has shown that a constant high level of vigilance cannot be maintained. Declines in performance during the working day are found in all types of work. In the type of vigilance required in aviation, inspection and monitoring tasks, the level of vigilance may decline within 20 minutes after the start of the mission. This decline in watchfulness will continue in a steady downward trend with only small upturns after rest breaks, such as lunch, and then continue downward until the end of the mission period.

In aviation we would like to assume that we are fully alert all the time that we are behind the controls. However, as mentioned earlier, a large amount of scientific research shows that it is not possible for a person to remain totally alert over an extended period of time. This is due to fatigue and stress.

An aviator who must maintain constant vigilance is under stress. The longer this vigilance must be maintained, the more stress the individual must deal with. The more stress the individual must face the less vigilant he will become—a vicious circle. It has been proven that as monotony, fatigue and stress on the job increase, and vigilance declines, the number of errors that are made is greater and the rate of accidents increases.

How can we in aviation overcome the vicious cycle of stress=reduced vigilance=accidents? There are several ways, but here we will name only a few:

- **Crewrest**—allowing your aircrews to obtain the maximum amount of rest between missions in order to reduce fatigue and stress. This is especially important during field training, in harsh environmental conditions, prolonged terrain flight training and Night Hawk-night vision goggles training.

- **Planning**—allow enough time to plan missions as completely as possible. If a great deal of mission planning must be done after the crew is airborne, the stress level is increased and at least part of the crew's vigilance is taken away from the control of the aircraft.

- **Emotional/Personnel Problems**—trouble in the aviator's family, conflicts in the chain of command or other problems create a great deal of stress. They are often hard to identify and, again, distract the crew from flying the aircraft. Aviators should be observed for such problems at all times and immediate action taken to either get the problem solved or at least discussed before the next mission.

• **Complete-the-Mission**—stress level usually will be high during any operation. It will especially be high during operations conducted in marginal weather conditions, night vision goggles and terrain flight operations. The perception by the aircrews that these missions must be accomplished "at all cost" causes additional stress that might be acceptable in wartime but not during daily peacetime operations.

This discussion could go on and on in the same manner, restating what seem to be commonsense approaches to reducing stress in our aircrews. Often these commonsense approaches are overlooked because the aircrews or their leaders are too busy planning for the big mission, but overlooking the obvious small details that are causing many of our aviation accidents. Stress=reduced vigilance=accidents.

DES welcomes your inquiries and requests to focus attention on an area of major importance. Write to us at: Commander, U.S. Army Aviation Center, ATTN: ATZQ-ES, Ft. Rucker, AL 36362; or call us at AUTOVON 558-3504 or commercial 205-255-3504. After duty hours call Ft. Rucker Hot Line, AUTOVON 558-6487 or 205-255-6487 and leave a message

CONNECTION ACTAAT

Aviation Center Training Analysis and Assistance Team

CREW REST

ISSUE: Many operational aviators feel that any crew rest policy should have rigidly enforced standards. Commanders should establish the policy locally, but both ground and aviation commanders should be required by AR 95-1 to waiver, in writing, any crew required to over fly the policy. Crew rest considerations need to be incorporated into all Pre-command Courses.

COMMENT: Establishment of a crew rest policy with rigid requirements would not be realistic. Large variances in the stamina, and recuperative power of individuals require any policy based on consideration of a fatigue-time relationship to be extremely broad, if it is to cover all personnel. In this case the policy becomes meaningless and amounts to little more than a reminder in the general vein of "don't work your people too hard."

Any policy not addressing the great disparity in human endurance leaves vulnerable those individuals on the extremities of the scale. In this case, the policy, if rigidly followed, creates more problems than it solves.

Most people recognize that there is a fatigue level beyond which a pilot cannot effectively perform. The unit commander, following general guidance, is the individual best qualified to make decisions regarding individual work and flight assignments.

(Directorate of Evaluation and Standardization)

New Army Engineering Test Pilots

ON 11 JUNE 1982, Class Number 81 was graduated from the Naval Test Pilot School at Patuxent River, MD. Congratulations to the Army graduates: Chief Warrant Officer, CW3, Hugh Lammons, Captain Robert MacMullin and Major Bill Leonard. We also have three students in Class 82. They will graduate in December.

The October 1981 *Aviation Digest* contained an excellent article outlining the Army Aviation Engineering and Flight Testing Program. Here is some additional information by way of an update.

The program is a doorway to challenging assignments and unique opportunities in the aviation research and development area. The competition for selection is keen and the program itself is 13 months of rigorous academic and flight training.

Test Pilot Program Prerequisites. Active duty Army aviators in the grade of major and below may apply.

- Must hold pilot status code 1 and either Specialty Code 15, 67J, 71, or military occupational specialty 100 series.
- Must be dual rated with a minimum of 1,000 hours military flight time.
- Must possess a current instrument certificate.
- Must be a competent swimmer.
- Must have completed college algebra, physics and calculus with above average grades.
- Experience in complex aircraft such as the CH-47 Chinook, UH-60 Black Hawk, AH-64 Apache or OV-1 Mohawk is highly desirable.

Selection and Training. Selection of Army aviators for participation in the program is made by an annual Military Personnel Center (MILPERCEN), Officer Personnel Management Directorate (OPMD) board. Board members are drawn from:

- U.S. Army Aviation Engineering Flight Activity (USAAEFA)
- U.S. Army Aviation Development Test Activity (USAADTA)
- U.S. Naval Test Pilot School (USNTPS)
- OPMD Combat Arms Division
- OPMD Combat Service Support Division
- OPMD Warrant Officer Division.

Only those applications of officers who are recommended by their respective career divisions are considered. Once selected, and prior to attending NTPS, officers are sent TDY (temporary duty) to the Army Test Pilot Orientation Course at USAAEFA, Edwards Air Force Base, CA. This 8-week course is designed to provide academic and flight refresher training. Academic subjects include college math through calculus, physics, aerodynamics, mechanics and technical report writing. Flight orientation includes high altitude environmental training, flight test techniques and familiarization in a number of aircraft used at NTPS. NTPS classes begin semiannually, in January and July. The Army's training quota is nine per year; however, the number of officers trained is a function of requirements. Upon successful completion of the NTPS, graduates are assigned to the U.S. Army Aviation Research and Development Command or USAADTA, Ft. Rucker, AL, as engineering test pilots.

Board Schedule. The next OPMD Engineering Test Pilot Selection Board will convene in January 1983. Department of the Army Circular 351-83, "Army Aviation Engineering Test Pilot Program," has been revised and the new one should reach the field this month. It provides further general information as well as detailed application procedures. Those readers whose applications have been held for future boards must update their application not later than 15 December 1982, which is also the administrative cut-off date for new applications.

Further information is available at the Aviation Plans/Programs Branch, USAMILPERCEN, ATTN: DAPC-OPA-V, 200 Stovall Street, Alexandria, VA 22332; AUTOVON 221-8156/7/8 or commercial (202) 325-8156/7/8.

Editor's note: The *Aviation Digest* regrets the recent death of CW3 Hugh Lammons.

Command And Staff College Selection Procedures

ON 19 AUGUST 1982, the Chief of Staff approved modifications to the Command and Staff College (CSC) selection system effective with the 1982 selection board that met earlier this month. The principal change is that zones of eligibility for consideration and selection for CSC attendance is now captain (P) through less than 14 years of service (YOS).

In 1980 the CSC selection system was changed to allow CSC selection and attendance of captains not yet selected for major. That was implemented in response to Department of Defense guidance for full tour stability and the review of education and training for officers (RETO) study recommendations. The combination of those factors required that officers complete staff training before their 12th YOS and have been at their previous duty station for 36 months before attending school. The eligibility zone for the 1981 selection board was changed to 8 to 11 YOS. Subsequent action to implement Combined Arms and Services Staff School (CAS3), coupled with a policy for early selection/attendance at CSC, resulted in assignment congestion for company grade officers and limited the time available for developmental assignment.

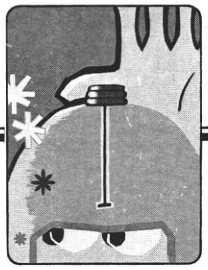
Since the planned attendance at CAS3 for 100 percent of the officer corps supported the RETO recommendation for staff training before 12 YOS, it was determined that changing the zone of eligibility for CSC selection to captain (P) through less than 14 YOS would alleviate assignment congestion and would add time for professional development and use of company grade officers. This change also recognizes CSC as a school which orients on preparation of officers for field grade duties. Previously programed at 9 through 14 YOS, attendance will now normally occur in 10 through 15 YOS. Other features of the new CSC selection system are:

- Elimination of the separate screen board. The modified zone of eligibility reduced the eligible population and negated the need for a screen board. The records of all eligible officers will be reviewed by the CSC selection board with a general officer as president.
- Elimination of the use of an alternate list. The board will select a fixed number of officers who will be scheduled to attend CSC in accordance with (IAW) stability guidance, operational requirements and annual seats available. Replacement students will be selected from principal selectees IAW slating guidance.
- Stability criterion remains at completion of a normal tour (up to 36 months onstation). This will result in some officers being deferred for not more than 2 years.

Year groups (YG68-75) affected by the former selection system were considered and selected under a rigid year group quota system. That system was considered appropriate because a large eligible population was competing for a fixed number of CSC allocations (14,000 officers vs. 1,000 allocations). Eligible populations for this year's board were smaller, and will be for all future selection boards, and therefore will receive a higher proportion of CSC allocations than under the past system. In order to preserve year group equity, selection boards will receive guidance on the minimum number of officers who should be selected from each year group on an annual basis. This year the eligible population consisted of all captains (P) and serving majors through year group 68, minus previous selectees, attendees or declinees. Future boards will only consider officers who have less than 14 years active federal commissioned service.

In the future, each year group will be considered for CSC during a 4-year eligibility period. Strength projections indicate that at least 50 percent of an eligible year group can now expect to attend resident CSC instruction; the former system allowed only 40 to 45 percent of the eligible population. Nonselectees by 14 YOS won't be considered for resident CSC.

VIEWS FROM READERS



Editor:

Request the enclosed listing of Missouri ARNG aviation facilities and units be published in the *U.S. Army Aviation Digest.*

Jefferson City

Army Aviation Support Facility
(Airfield Operations)
1717 Industrial Drive
Jefferson City, MO 65101
Comm: (314) 751-2321 Ext 237/238
AV: 631-3730

867th Medical Detachment
1717 Industrial Drive
Jefferson City, MO 65101
Comm: (314) 751-2321 Ext 277
AV: 631-3730 Ext 277

868th Medical Detachment
1717 Industrial Drive
Jefferson City, MO 65101
Comm: (314) 751-2321 Ext 277
AV: 631-3730 Ext 277

Det 1, HHC, 135th Engineer Group
1717 Industrial Drive
Jefferson City, MO 65101
Comm: (314) 751-2321 Ext 277
AV: 631-3730 Ext 277

Warrensburg

Army Aviation Support Facility
(Airfield Operations)
P.O. Box 5088
Whiteman AFB, MO 65305
Comm: (816) 687-3612
AV: 975-3612

Company D, 38th Aviation Battalion
(ATK HEL)
P.O. Box 290
Warrensburg, MO 64093
Comm: (816) 747-6211

Springfield

Army Aviation Flight Activity
(Airfield Operations)
Route 6, Box 385, Regional Airport
Springfield, MO 65803
Comm: (417) 862-8552

AVCRAD (1107th) (-Det 1)
1400 N. Fremont
Springfield, MO 65802
Comm: (417) 869-2501/2513

Det 1, AVCRAD (1107th)
Route 7
Lebanon, MO 65536
Comm: (417) 532-4381

HHD, 142d Transportation Battalion
(Aircraft Maintenance)
1400 N. Fremont
Springfield, MO 65802
Comm: (417) 869-6341

1106th Trans Co (AVIM) (-Det 1)
1400 N. Fremont
Springfield, MO 65802
Comm: (417) 869-6341

Det 1, 1106th Trans Co (AVIM)
409 W. Locust Street
Aurora, MO 65605
Comm: (417) 678-3568

COL Willard L. Bean
State Aviation Officer
Missouri National Guard

Editor:

Request the enclosed listing of Army Aviation National Guard units from the State of Washington be published in the *U.S. Army Aviation Digest.*

Tacoma (Gray AAF)
Attack Helicopter Troop (-), 116th AC
Camp Murray
Tacoma, WA 98430
Comm: (206) 964-6410
AV: 355-7410

Seattle
81st Inf Bde, Avn Section
1601 West Armory Way
Seattle, WA 98119
Comm: (206) 464-6161
AV: 941-3496

Spokane
841st Med Det (AA)
P.O. Box 19069
Spokane Int'l Airport
Spokane, WA 99219
Comm: (509) 458-5405
AV: 820-7405

LTC Timothy M. Flynn
State Army Aviation Officer
Washington National Guard

• **The *Aviation Digest* has carried listings of Army Aviation National Guard units in Illinois, Iowa, Kentucky, Minnesota, New York, Pennsylvania, South Carolina, Texas and Wisconsin. Also, a list of Reserve units, by state, is available. The *Digest* will be happy to publish listings of other National Guard units not previously printed.**

Editor:

I recently saw the second article in the series "Forty Years of Army Aviation" and would like a copy of the complete series. I served as an air observer in World War II, liaison pilot in 1945, Army aviator in 1950 and senior Army aviator in 1954. I was retired in 1961 and have continued to work for the Army (including active duty from 1966 to 1968 as an Army aviator).

Additionally, is there a way to get a Master Army Aviator rating now that the instrument/weather minimums have been reduced?

James W. Abbett
Lawton, OK

• There are no provisions for people who retired before 1 June 1981 to obtain a retroactive Master Army Aviator rating.

Editor:

Please add the Little Rock District, Army Corps of Engineers, to your mailing list.

Karen K. Johnson
Assistant PAO
Little Rock District
Corps of Engineers
Little Rock, AR

• Distribution of the *Aviation Digest* is handled through pinpoint distribution. It will be necessary for you to submit DA Form 12-5 in accordance with instructions on that form to start receiving the magazine.

Editor:

In reference to the article, "The MICOM Pledge: A Good Weapon Today, A Better One Tomorrow," which appeared in the May 1981 issue of the *Aviation Digest.* It was rather disconcerting to see the fruits of our efforts presented in a manner which did not acknowledge those of us responsible for the original concept and development of the mast-mounted sight (MMS). While every word in the paragraph on the MMS is true, the facts are that this project began at Frankford Arsenal, PA, in 1976 and was transferred to the U.S. Army Armament Research and Development Command (ARRADCOM) along with the personnel, following the closing of Frankford.

The pictured MMS was developed solely at ARRADCOM and in the opinion of the undersigned the omission of these facts imply otherwise.

Kennard Raisner, Project Engineer
Thomas W. Peters, Engineer
Anthony LaCosta, Engineer
James A. Connolly, Test Engineer
U.S. Army Armament Research and Development Command
Dover, NJ

Editor:

The June article by BG Ford, "Grasshoppers," was one of the best written pieces I have seen in your magazine. In addition to the high quality writing skill he displayed in portraying the birth of Army Aviation, another theme is described which is still current—40 years later. It is important to extract from his excellent article the fact that Army Aviation owes its existence to branch proponency.

As BG Ford describes, it was vitally important that the capabilities of the aviation machine be tied directly to the mission of artillery in order to ensure responsive fires. To do this, the aviation capability had to be decentralized away from the Army Air Corps—"the traditional operator in the flying domain"—and down to the artillery units. The training by BG Ford, the close working relationship with the artillery units and total mission orientation proved to be successful.

Today, however, we again find a centralization of aviation capabilities away from the branch and mission users of its capabilities. As he described 41 years ago, aviation is now "allotted to subordinate units on a mission-by-mission basis from centralized assets." We have pilots and an aviation specialty. We have a steady questioning of mission proponency. The child which broke away 40 years ago is growing to be more like the parent he broke away from. Where is the BG Ford to break the "holt" that is being made now?

MAJ William V. Chiaramonte
U.S. Army Concepts Analysis Agency
Bethesda, MD

Editor:

I read Betty J. Goodson's article "Victory in Air-to-Air Combat, the Marine Corps Way" with great interest in the July 1982 issue of *U.S. Army Aviation Digest.*

In the 1969/70 timeframe, Air Test and Evaluation Squadron Four (VX-4) at NAS Point Mugu, CA, conducted a Joint USN/USA evaluation, called "Project Strawman," of fighter airplanes vs. helicopters. The USA Cobra helicopters were from Ft. Ord, CA, and led by a Major Hirch (sic). As chief projects officer at VX-4, I led the fighter team. A joint report was written and is probably buried somewhere at VX-4 or OPTEVFOR. (Too bad we have to continue reinventing the wheel.)

In any case, the conclusions were the same as those noted by Major Goodwin and Major Wojtasck (page 6/7). If the helicopter pilot sees the fighter, then there is little chance of the fighter getting a solid (guns or missiles) shot. We concluded that the helicopter could easily evade (read-keep out of the fighter's weapons envelope), hide, or in many cases, get a high deflection passing shot at the fighter. We also noted that if the helicopter pilot had an AIM-9 (series) weapon (launcher on skids) available, he could: (1) get a valid shot; (2) scare hell out of the fighter; (3) scare hell out of himself; (4) all of the above.

One of the side "bennies" of "Strawman" was the fighter (F-4/F-8), Cobra cross training. Both teams gained great respect for the other guy's capabilities and problems by flying in the other's machine.

CPT F. S. Teague, USN
Chief, Current Operations
CINCPAC
Camp H. M. Smith, HI

Articles from the *Aviation Digest* requested in these letters have been mailed. Readers can obtain copies of material printed in any issue by writing to: Editor, *U.S. Army Aviation Digest,* P.O. Drawer P, Ft. Rucker, AL 36362

REPORTING FINAL

Late News From Army Aviation Activities

photo by Yvonne Lugo

FROM FORT RUCKER

New publications. Two new field manuals are expected to be available in early 1983: FM 1-301, "Aeromedical Training for Flight Personnel," superseding TC 1-20; and FM 1-202, "Environmental Flight," superseding TCs 1-10, 1-12 and 1-13.

FM 1-301 will provide aircrewmembers with information on effects of the flight environment and will assist commanders and flight surgeons in conducting aeromedical training. Topics covered in the manual include altitude physiology, oxygen equipment and cabin pressurization, G-forces, stress and fatigue, toxic hazards, temperature extremes, noise, vision problems and spatial disorientation illusions.

FM 1-202 will help crewmembers complete missions under such varying environmental conditions as desert, jungle, mountain and cold weather. Topics included are human and environmental factors, flying techniques, survival information and a recommended training program for each addressed environment.

(DTD POC: 1-301, Campbell, AV 558-7113; 1-202, Sharpe, AV 558-3801)

Winning Writer. Raymond P. Johnson, an air safety specialist with the Army Safety Center since 1963, won the *Aviation Digest* monthly writing award in July for his article "When Will We Learn About Mountain Flying?"

Mr. Johnson, who was an Army aviator from 1942 to 1962, said his purpose was to tell aviators some of the lessons they must learn to fly safely at high altitudes.

"I hope the article helps; some instructor pilots have told me I've probably saved some lives," Mr. Johnson said. **(USAAVNC PAO)**

A New Way to Fly. Some AH-1S Cobra pilots are being taught to fly their helicopters, from lift-off to touchdown, while under the hood and unable to see outside the cockpit by natural means.

They are participants in the Apache Flight Training Infrared Piloting System (AFTIPS) Assessment Program being conducted by the Army Aviation Board. It is designed to be used to determine the adequacy of the planned training program for the AFTIPS, which is scheduled to be incorporated on the AH-64.

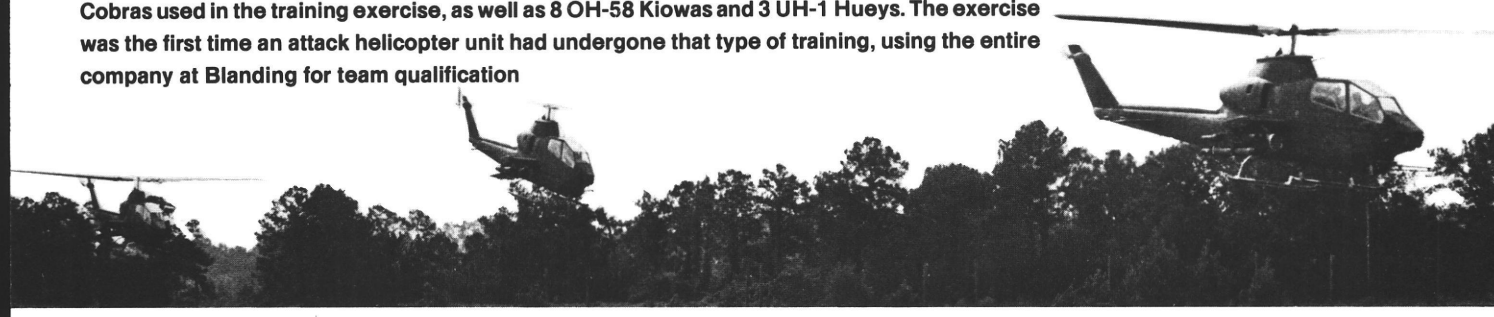
The system includes a helmet display unit that allows the pilot to see a video image of the outside world as interpreted by infrared radiation. The image can be seen only with the right eye, leaving the wearer's left eye free to view instruments and other objects inside the cockpit.

(Kontos, AVN BD)

Annual Conference. The third annual Army Aviation Policy Committee Meeting/Training Symposium was held 15 to 19 November with about 150 representatives of all major Army commands and Department of the Army staff agencies attending.

They were welcomed to the U. S. Army Aviation Center by its commander, Major General Carl H. McNair Jr. The Training Symposium began Monday morning and ended at noon Wednesday, and the Policy Committee convened Wednesday afternoon and adjourned Friday noon.

Opening remarks for the two separate but interfacing conferences were made by Brigadier General John M. Kirk, director of training, Office of the Deputy Chief of Staff for Operations and Plans, Department of the Army. He said his objective is to get the time, money, people and equipment needed to enable aviation training to be as effective as possible. "An area that needs special attention" he said, "is training resource



"Ghostriders." Aviators of D Company, 229th Attack Helicopter Battalion at Ft. Rucker, AL, take off for Camp Blanding, FL, for a week of annual gunnery training. There were 17 AH-1S Cobras used in the training exercise, as well as 8 OH-58 Kiowas and 3 UH-1 Hueys. The exercise was the first time an attack helicopter unit had undergone that type of training, using the entire company at Blanding for team qualification

management, which will make training at all levels easier than it is today."

Keynote speaker was Lieutenant General Julius W. Becton Jr., deputy commander for training, Army Training and Doctrine Command, Ft. Monroe, VA. Army Aviation's place as an essential multiplier of combat power for the combined arms team was further ensured, he noted, by the outcome of the Army Aviation Systems Program Review held at Ft. Rucker in March 1982.

"The scope and the force of the training issue of the SPR go right to the heart of the Army's capability to win the next war, and the whole force structure will be improved as the result of recommendations flowing from the SPR," he said. General Becton added that issues resolved in the November conferences will also strengthen Army Aviation's ability to meet the challenges of the AirLand Battle concept.

"We need to focus on the things we do well," was the theme Brigadier General Ellis D. Parker used for his remarks at the beginning of the Policy Committee meeting. As the Army Aviation officer, Office of the Deputy Chief of Staff for Operations and Plans, Department of the Army, he is the committee's executive chairman. Two of the elements he talked about were the symposium and committee conferences which provide a forum whereby an issue raised by a person anywhere in Army Aviation can reach a Department of the Army committee, and the standardization network that starts at DA level and has tentacles down to every unit.

Future issues of the *Aviation Digest* will carry detailed coverage on the conferences.

FROM TEXAS

Get Your Bearings Here. Since manufacturers have curtailed the production of aircraft bearings, reclamation has become highly profitable, considering that many helicopter bearings average about $800 each and prices have jumped as much as 300 to 400 percent in one quarter. That's what makes the work done by the bearing reclamation facility at the Corpus Christi Army Depot so valuable. Currently, the facility handles about 500 different types of bearings used in helicopter engines, transmissions, rotor heads and control systems.

In addition to saving money, the reclamation saves time. It reduces the 40 or more month delivery dates for new bearings to a timeframe that provides bearings for aircraft maintenance so that engine and transmission overhaul schedules can be met. **(TSARCOM PAO)**

FROM WASHINGTON

Military History Chief. A Master Army Aviator is now acting chief of military history for the Department of the Army. Colonel Olen D. Thornton was appointed to that position 1 October.

More Cobras Ordered. The U.S. Army has awarded Bell Helicopter Textron, Inc., Fort Worth, an $18 million contract for 12 AH-1S Cobras with deliveries to take place from November 1984 to February 1985. **(Tipton, Bell PR)**

FROM CANADA

Volcanic Ash Tracking. From research done on potential accidents caused when two commercial airlines had to make forced landings because of ingestion of volcanic ash from eruptions of Mt. Galunggung in Java, the International Civil Aviation Organization, Montreal, has deter-

mined that new procedures to track clouds of volcanic ash are needed.

ICAO learned that the U.S. National Oceanographic and Atmospheric Administration was able to monitor the ash cloud, using both geostationary and polar-orbiting satellites.

Information has also been received that Australian scientists have developed a method that might be useful in such tracking. Tracking stations in that country are said to be receiving data from one of the United States' satellites; and then through a painstaking computer-based automated discrimination process, clouds of ash can be seen at high altitudes where they usually are invisible to conventional weather satellites.

As a follow-up, the development of a standardized procedural warning system associated with volcanic eruptions is currently under discussion at ICAO. Immediately following a volcanic eruption near airways, the issuance of warnings can best be handled by local authorities and would most likely have to be based on observations from the ground or from aircraft. Subsequent tracking of ash clouds would be of international concern, and monitoring could be done in flight by aircraft observations and from weather satellites. **(ICAO PAO)**

Training Display Unit is Evaluated. As the pilot of an AH-1S Cobra, CW4 Stu Park is ready for a training flight using the new helmet display unit that is part of the Apache Flight Training Infrared Piloting System (AFTIPS). The training system consists of the helmet and the special infrared electronics onboard a modified Cobra and is geared to teach all phases of current flight procedures to the pilot who is inside an enclosed canopy. Twenty-four aviators at Ft. Rucker, AL, are participating in the Army Aviation Board's assessment of the proposed program of instruction using the new system

photo by Eugenio P. Redmond

THREAT

Captain (P) Dale L. Radtke
Threat Branch
Directorate of Combat Developments
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Fort Rucker, AL

How Do You Spell Threat?

IF YOU ASK THE typical Army aviator, "How do you spell THREAT?" the answer will probably be, "small arms." However, in a nonnuclear, nonchemical European scenario during normal everyday operations, this will not be the case if you, the aviator, make a full assessment of the battlefield environment and use current tactics and doctrine accordingly.

To do this assessment of the battlefield environment, and thus prioritize the threat to you during your specific flight, your preflight planning must include an analysis of the enemy situation, intentions and capabilities. To assist in this effort, the Threat Branch, U.S. Army Aviation Center, Ft. Rucker, AL, has identified below the prioritized list of systems posing a threat to U.S. Army helicopters in forward areas in a nonnuclear, nonchemical European scenario. This is a generalized list, as the threat may change considerably in any specific situation. It also assumes the crew/aircraft is using current tactics, is equipped with operational aircraft survivability equipment (e.g., APR-39 radar warning receiver) and can read a map correctly. It should not be confused with a list of target priorities which would be mission dependent.

- Regimental air defense systems (ZSU-23-4, SA-9 and follow-on SA-13, SA-7 and follow-on SA-14).
- Attack helicopters (Hind/Hip).
- Artillery (e.g., SP-122, SP-152, BM-21 multiple rocket launcher).
- Divisional air defense systems (SA-6, SA-8, SA-11).
- Tanks (12.7 AA MG and main tank gun).
- Armored personnel carriers (BMP with 73 mm gun or 30 mm cannon and SAGGER/SPIGOT ATGM, BMD and BTR with 14.5 antiaircraft machinegun).
- Fixed wing ground attack aircraft.
- Small arms.

Regimental air defense systems were chosen as the greatest threat because they can all use passive detection techniques to acquire a hovering helicopter, giving pilots no notice until the round or missile is en route to their positions, and because they have the range capability to acquire and shoot at a detected helicopter hovering at our doctrinal stand-off range. These systems are also present in large numbers near the forward line of own troops (FLOT). Since a ZSU-23-4 can acquire and fire optically (passive) or using the gun dish radar system (active), a ZSU-23-4 battery will probably operate with a mix of the two operating modes, unless visibility is restricted.

Attack helicopters were selected second because of the large number of Hind and armed Hip helicopters that will be in the forward area (parity with United

States in any brigade area) and because their mobility, long-range antitank guided missiles (ATGMs) and forward employment will place them well within range of U.S. attack and scout helicopters. While the armament carried, and the mission assignments of the Soviet attack helicopters are not optimized for air-to-air combat, they certainly have the capability to fire on a hovering helicopter as if it were a ground target. The U.S. Army Aviation Center position is that these "chance" encounters will occur to such an extent that air-to-air engagements will become a routine part of the Army Aviation mission.

Artillery was chosen third because of the likelihood of helicopters being located in the vicinity of vast amounts of artillery impacting around ground units (wrong place at the right time). It is not our contention that artillery will routinely be called in on helicopter firing positions, but that helicopters attempting to find firing positions to place effective long-range ATGM fire on Soviet systems will, of necessity, often find themselves near (within 500 meters) friendly ground troops. It is also possible that Soviet artillery forward observers may call for artillery upon detected helicopter firing positions when those helicopters do not move to alternate positions as soon as they should (e.g., delaying to fire one more missile).

The threat posed by radar-acquired, radar-guided surface-to-air missiles at division level will vary greatly with the type of system present in your sector and with its ability to acquire a hovering helicopter. Whereas an SA-6 battery probably will not be able to acquire a hovering helicopter unless it is hovering 30 feet above the trees and skylined, an SA-11 battery will be able to lock-on at a lower altitude in more ground clutter. With U.S. Air Force fixed wing aircraft as their greatest priority target, it is questionable to assume a divisional air defense battery will fire a missile at a hovering helicopter that only needs to descend 10 to 20 feet to break radar lock-on when given warning by an APR-39.

Soviet tank crews train to fire their 12.7 mm antiaircraft machinegun at a helicopter when the target is within range (1,500 meters) and to use their main gun if the helicopter is beyond that range. A tank crew will fire whatever round is loaded in the gun tube as the automatic loader cannot easily extract a shell from the tube. Tanks conducting an assault normally will be concentrating on their immediate objective and the ground forces on it, so the probability of them detecting hovering helicopters beyond 2,000 meters will be very low. BMP and BTR vehicles will have about the same potential for detecting helicopters but will be less of a threat because of range limitations.

Fixed wing ground attack aircraft have the potential to shoot down helicopters; however, their low level, high speed ingress/egress flight profiles near the FLOT allow little or no flexibility and reaction time for targets of opportunity. A greater threat would be posed by a ground controller who detects a line of attack helicopters in firing positions along a ridgeline and diverts inbound aircraft to attack the ridgeline.

Small arms were assessed as the least threat because riflemen and gunners will not be able to acquire helicopters at doctrinal standoff ranges and will rarely dismount their carriers during offensive actions.

In the following situations the weapons systems discussed will become a more (or less) effective threat as depicted.

Nuclear: In a nuclear environment, nuclear weapons will be the greatest threat but should equally degrade the performance of all Soviet ground systems by forcing them to button up. Small arms and the SA-7/14 teams will remain in their vehicles during offensive operations and will be no threat.

Chemical: In a chemical environment, systems with chemical, biological and radiological (CBR) protective systems allow the crew to function normally (without mask or CBR suit). The BMP, BMD, T-64, T-72, 122 mm howitzer, 152 mm howitzer and Hind can all function normally except buttoned up in a CBR environment. In contrast, older systems such as the ZSU-23-4 and T-62 have overpressurization systems that only protect the crew from radiation. Dismounted personnel firing small arms or an SA-7/14 would have to sight through their mask eyepieces and their performance would probably be reduced.

Night: In a night environment, weapon systems that do not have radar, thermal sighting systems such as forward looking infrared radar (FLIR), or long-range night vision devices will be seriously reduced threats. Any night vision devices that operate near the 1-micron range may be able to "see" any active laser rangefinders in their field of vision and, therefore, detect the source.

Heavy Smoke/Obscurants: In the vast smoke screens the Soviets will use during an assault, the IR (infrared) degrading smoke will cause more ZSUs to operate in the radar mode and the Hinds will maneuver around it, causing both to be increased threats. Systems with optical acquisition only (SA-7/14, SA-9/13, small arms) will be severely restricted and even systems with thermal acquisition systems (tanks and BMPs) will be degraded in effectiveness.

LEGEND

— decreased threat

+ increased threat

O no significant change

	nuclear	chemical	night	smoke	across FLOT	jamming	rear area	defense	reconnaissance
ZSU-23-4	O	—	O	+	+	—	—	O	—
SA-9/13	O	—	—	—	+	O	—	O	—
SA-7/14	—	—	—	—	+	O	—	+	+
HIND	O	O	+	+	+	O	—	O	O
artillery	O	O	O	O	—	O	—	O	—
SA-6/8/11	O	—	O	O	+	—	—	O	—
tanks	—	O	+	—	O	+	—	+	O
BMP/BTR	—	O	+	—	O	+	—	+	O
ground attack aircraft	O	O	—	O	—	O	+	O	O
small arms	—	—	—	—	+	O	+	+	+

Cross FLOT: During any cross-FLOT operations, helicopters will be much more susceptible to small arms and regimental/divisional air defense systems. Chance encounters with Hinds will be more likely, but exposure to hostile artillery and fixed wing ground attack aircraft would be unlikely.

Heavy Jamming: In a heavy jamming environment, regimental and divisional air defense systems will be degraded by radar and communications jamming. Tank and BMP companies will normally assign platoons to assist in the air defense of our forces under these circumstances.

Rear Area: During flights in our rear area, attacks from Soviet fighters or ground attack aircraft would be more likely, and small arms fire from infiltrators or insurgents would be possible but unlikely.

Defense: In a situation where the Soviets are in a defensive posture—for example, a frontline regiment in a hasty defense because of heavy attrition, awaiting passage of another regiment—the SA-7/14 teams and small arms will be dismounted and could be the greatest threat. Unbuttoned tanks and BMPs would be assigned defensive sectors and could easily detect and engage hovering helicopters as they pop up.

Recon Units: In a covering force area when Soviet reconnaissance units are preceding their main forces, these recon units will frequently dismount personnel; small arms and SA-7/14s could, again, be a major threat. Divisional and regimental air defense units are usually not present with recon units, but additional SA-7/14 teams could easily be attached to them. The volume of artillery normally associated with an assault would not be present, so artillery, as a threat, would be greatly reduced.

Assessing the threat to SEMA (special electronic mission aircraft) is much less complicated and, except for nuclear and chemical environments, should always remain—

1. SA-4/12.
2. Fighter/ground attack aircraft.
3. SS21/SCUD nuclear, chemical or ICM attack on base airfield facility.
4. SA-6/11.
5. Small arms/SA-7/14 (infiltration teams).

You, the aviator, will have to assess not only what weapons systems oppose you in the battle and where they are, but also what battlefield environmental factors will/won't enhance ability to acquire and kill you.

Army Aviation in Latin America

Dustoff Panama

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Presidio of San Francisco

*Major Furbish was assigned as chief, Air Ambulance Section, MEDDAC, Panama, when he wrote this article

AVIATION'S NEWEST team member in Panama is the U.S. Army medical department activity's (MEDDAC) Air Ambulance Section, "Ditch Dustoff."

With the implementation of the Panama Canal Treaty of 1979, the Army assumed responsibility for health care within the former Panama Canal Zone. To discharge this responsibility, an air ambulance section was organized, primarily to provide an aerial link between the two major treatment facilities, Coco Solo Army Hospital on the Atlantic side of the isthmus and Gorgas Army Hospital on the Pacific side.

Colocated with the 210th Aviation at Howard Air Force Base on the west bank (Pacific terminus) of the Panama Canal, this aviation section has a three-fold mission responsibility. Foremost is its aeromedical evacuation of casualties from jungle field sites and the interhospital transfer of patients between MEDDAC's two major treatment facilities. In addition, the unit transports essential medical personnel, whole blood, biologicals and other medical supplies.

Like most air ambulance units, Dustoff Panama has a four-man crew on standby at the airfield 24 hours a day, and it is because of this responsiveness that they also serve as crash rescue support to Howard AFB.

This unit's organization and mission are truly unique for several reasons. It is one of only two Department of the Army air ambulance units worldwide which are also under the command and control of a medical treatment facility.

With its geographic location on the 40-mile wide Isthmus of Panama, the section is also able to boast that it is the only Army unit with aeromedical evacuation duties ranging from the Atlantic to Pacific oceans.

Training in all types of terrain and all types of equipment keeps the air ambulance unit's personnel sharp

photo by SSG Charlie Drake

photo by Colin Hale

The possibility of removing a casualty from watercraft is real in Panama. Crews from the Gorgas Army Hospital air ambulance unit practice this tricky maneuver over a 1097th Transportation Company (MED BOAT) LCM on the Chagres River near Ft. Sherman, Panama

The makeup of the supported population provides another distinction not commonly found in most air ambulance units. As its primary mission the unit provides aeromedical evacuation to not only all Department of Defense elements of the U.S. Southern Command, but also to a large number of civilian Panama Canal Commission employees. Secondary to this support and similar in concept to the MAST (Military Assistance to Safety and Traffic) program, the unit is also frequently involved in search and rescue support, as well as humanitarian missions for the host country, Panama. These missions range from the extraction of injured sailors by rescue hoist from ships in waters adjacent to the Panama Canal to a mission of mercy flight to a small village deep within the Darien jungle of Panama to rescue a young woman with prenatal complications.

During the past year the unit flew 620 missions—an average of 52 per month—in support of its various missions. Viewed alone this may not seem impressive, however, these statistics were compiled with only three assigned UH-1V Huey aircraft on a Flying Hour Program that totaled 992 hours. This equates to 330 hours per airframe and could well make it the busiest air ambulance unit in the Army today.

Statistics like these are not easily obtained without a maintenance section that is responsive to mission requirements. Often working long hours, the unit's maintenance section has ensured the availability of a minimum of two standby aircraft at any given time. The maintenance section can take pride in the fact that the section has never missed a medical evacuation (medevac) due to a maintenance-related problem.

Supporting such a diverse mission load requires medical aids who are highly trained and able to work under pressure with no physician supervision. To prepare medics for these challenges, candidates are required to be Emergency Medical Technicians, complete the Advanced Cardiac Life Support Course, and receive extensive training in the labor and delivery wards of Gorgas Army Hospital.

As with all aviation in Panama, the requirements for safe operations in a tropical environment pose special challenges to the pilots. From the suddenness of a heavy tropical rain shower to the total darkness of the jungle at night, pilots of air ambulance flights must be highly trained and confident to handle the mission. To cope with these special mission requirements, a high premium is placed on night, instrument and high performance hoist proficiency.

Comprehensive ground school classes are conducted weekly complemented by regularly scheduled Night Hawk and instrument flight periods. Additionally, the aviators are annually sent to Ft. Benning, GA, for 20 hours of SFTS (synthetic flight training simulator) refresher training culminating in the renewal of their instrument flight tickets.

To familiarize aviators with the flight physiology, meteorology, aircraft performance and control techniques associated with high altitude operations, aviators annually conduct training in the 10,000 to 12,000 foot high mountains near San Jose, Costa Rica. The product of these training programs is aviators capable of planning flights and safely operating their aircraft over terrain as diverse as the hilly triple canopy jungle of the region, the vast open water areas surrounding the Panama Canal or the rugged mountainous areas of western Panama and much of Central and South America. Although the youngest of the Army's aeromedical evacuation units, the daily routine of long, tedious hours of standby punctuated by the shrill alert of the mission and a call for help is well known by all who serve with "Dustoff." Our air ambulance section proudly joins the long list of medevac units worldwide dedicated to providing a rapid and responsive evacuation link for all U.S. Armed Forces and Allied elements whom they serve.

"FRITZSCHE AAF (Fort Ord), CA.
A/O Remarks: NS ABTMT pro in eff in and around Ft. Ord and HQ area, acft must remain clear of all beaches and reserves."[1]

Noise Abatement

THIS ITEM in the Flight Information Bulletin is one of a growing number of procedures which are being published and practiced at Army Aviation facilities to put into action the noise abatement procedures being pressed by the "Fly Neighborly Program."

The Fly Neighborly Program is the vehicle by which the helicopter industry is trying to improve the environment by removing, or at least reducing, objectionable sound. All of us who fly have learned to live with noise and sometimes we take it for granted. Due to the growing voice of state and local governments, special interest groups and citizens, the civilian helicopter industry has begun to take an earnest interest because restrictions imposed to reduce helicopter noise—higher flight altitudes, route control and sound limits—would ultimately adversely impinge upon industry's growth.[2]

At its February 1982 convention at Las Vegas, NV, the Helicopter Association International (HAI) proposed a plan to reduce noise levels associated with helicopters through source design, engineering and piloting techniques. Design engineering to reduce acoustic signature hopefully will be realized in the future as manufacturers find new ways to muffle sounds, diffuse noise and reduce vibrations. In the near term, adaptation of sensible piloting techniques can contribute to elimination of noises and vibrations. This just means that we who fly helicopters must avoid flight envelopes which produce annoying noise. I hope to show you how in this article.

As military pilots, you and I have always been concerned as much as the civilian firms about helicopter noise, although the reasons for concern may have been different. We, of course, are aware of the need for good public relations, because we live and work very closely with—indeed side by side—civilian communities. Our unit personnel and our families are subject to the same conditions as "those civilians."

On the other hand, from a purely military sense of the word, we need to reduce detectability on the battlefield as a contribution to survivability. Also, the Army is sensitive to the effects that noise and the vibration associated with it have on the health and job efficiency of the soldier. We know that noise attenuation reduces fatigue and noise can provide anxiety, hearing loss and other health problems.

The intensity of noise is directly related to the loudness of the source and its proximity to the recipient ("victim"). Within the realm of Army Aviation, noise factors include engines, gearboxes, air turbulence, power tools, weapons and even the rushing sounds of the radios. The characteristics of our modern military operations with helicopters—flying lower and slower—exacerbate noise but remain necessary to accomplish our mission. These characteristics are:

- We must train as we intend to fight, which includes multi-aircraft formations.
- We must train to fight day and night.
- Sophisticated enemy detection and acquisition systems drive us to low levels (nap-of-the-earth) in order to survive. This requires slower speeds.
- Adverse weather forces us to lower altitudes, even on administrative flights.
- Training and normal operations often require us to fly 7 days a week.

From the point of view of civilians or other personnel who are not directly involved in the maneuvers at hand—like weekend vacationers—you can imagine the reaction to one or more noisy helicopters slapping through the rainy night air.

The Federal Aviation Administration's (FAA's) concern about noise abatement has prompted consideration of regulatory action. On 19 July 1979, the FAA issued Notice of Proposed Rule Making No. 79-

Colonel John H. Boysen

and Flying Neighborly

13 which proposed noise standards for helicopters considered for certification in the normal, transport and restricted categories. It also proposed to prohibit certain changes in type designs of helicopters that might increase their noise levels beyond prescribed limits. This notice was withdrawn on 25 November 1981, however, after review indicated that relatively small indicated benefits of noise reduction would be far outweighed by the potential costs. Still in force, however, is the Noise Control Act of 1972, which requires that noise reduction design features which are "within economic reasonableness and technological practicality," be incorporated in each newly certificated helicopter model. These design considerations include an environmental assessment report and require that external noise measurements be made during development and benefits of design technology are incorporated.

The International Civil Aviation Organization (ICAO) has adopted noise abatement standards and recommended practices in its publication on environmental protection.[3]

From the development point of view, we must remain cognizant of this requirement and move to improve the ways we can use technology to serve our needs. From the practical point of view, we must endeavor to reduce noise in all the ways we know.

What are some of the characteristics of noise that affect us? As you will see, knowing a little about this will enable you to defend yourself and others against harmful effects or the annoyance of noise. Figure 1 illustrates sound level in decibels (dB) and typical sounds.

In a series of publications, C. R. Cox of Bell Helicopter Textron provides pertinent data of great use to the pilot in understanding noise and its effects on the environment. In these pamphlets, he recommends procedures to reduce the adverse effects of noise when operating light[4] and medium[5] sized helicopters. Here are some highlights.

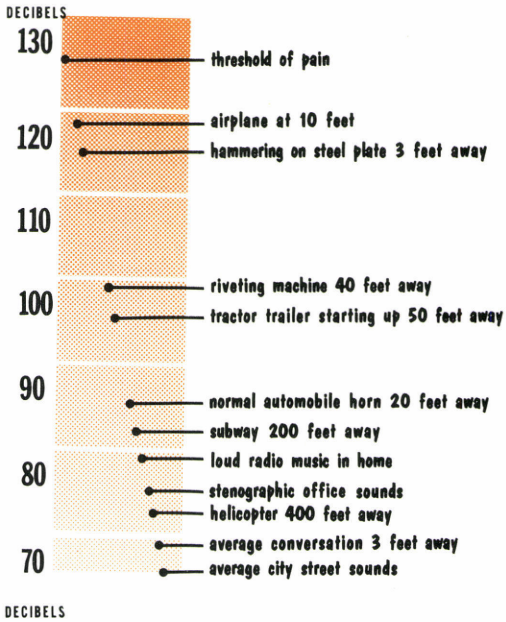
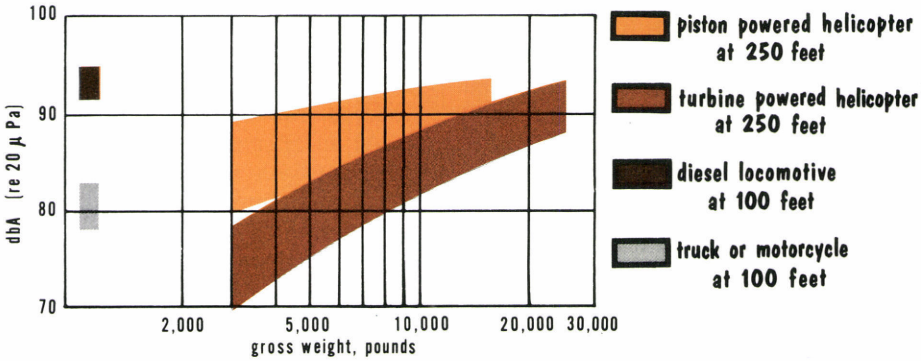


FIGURE 1: overall sound levels

Adapted from proposed City Code of Ordinance, Department of Health, Houston, TX, Chap V, Sect I, Noise Rules, Levels, Recommendations, not dated, p. 63.

FIGURE 2: trend of helicopter noise levels



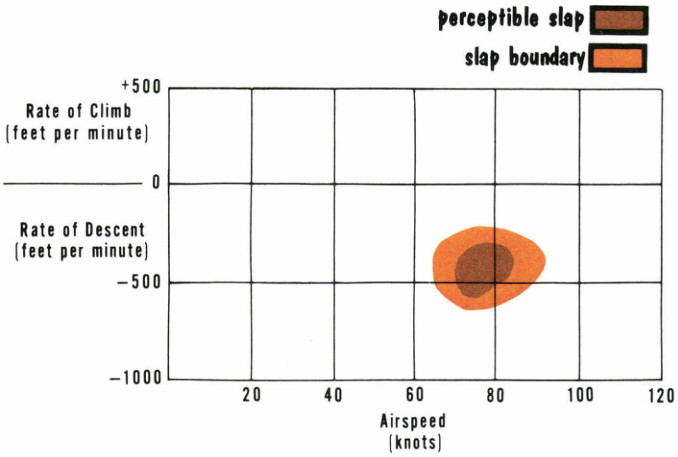


FIGURE 3: noisy flight operations, light helicopters

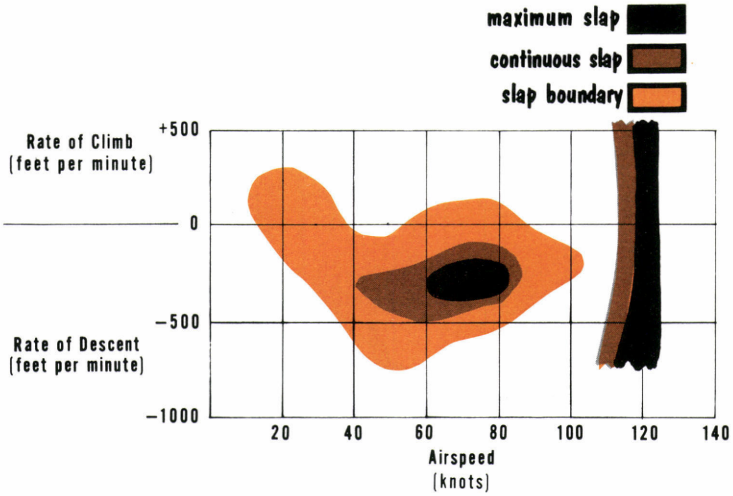


FIGURE 4: noisy flight operations, medium helicopters

Source of Sound

The noise level of a helicopter is, of course, a function of the size and type of power plant. Turbine powered helicopters are quieter than piston powered ones with unmuffled engine exhausts and produce sounds no louder than familiar vehicles (figure 2).

Blade slap occurs in the light helicopter typically during partial power descent, when a blade intersects its own vortex system or that of another blade, such as in formation flight. In the medium helicopter, this modulated sound occurs during high speed forward flight normally at airspeeds of more than 100 knots, during slow flight and during turns. Figure 3 illustrates blade slap regions of the Bell Model 206A (OH-58 Kiowa type) as a function of airspeed, rate of climb and rate of descent and shows where you can expect this sound. Note that maximum blade slap occurs between 65 and 80 knots and at rates of descent between 300 and 600 feet per minute (fpm).

Figure 4 illustrates the bounds of "slap" in the helicopter Bell models 204B, 205A and 212 (UH-1 Huey type). The "slap boundary" can be larger because the main rotor may slap outside of the zone illustrated intermittently when it encounters wind gusts or if you transition rapidly from one condition to another.

Elimination of the most offensive sounds can be accomplished by avoiding the slap region. Some other pointers to reduce the sound are: Avoid overflight of populated areas (if you must fly over them, maintain cruise airspeed of about 95 knots) and fly at highest practical altitude.

Noise Abatement Procedures for Light Helicopters

Approach and Landing. When commencing an approach in light helicopters such as the OH-58, follow one of these two procedures: Establish a rate of descent of at least 500 fpm *before* reducing airspeed, then reduce airspeed while increasing rate of descent to at least 800 fpm; or, hold rate of descent to less than 200 fpm while reducing airspeed to about 55 knots, then increase rate of descent.

At an airspeed between 50 and 75 knots, set up your glide path while maintaining a rate of descent of 800 fpm or greater. If the main rotor tends to slap, increase the rate of descent. When approaching the flare, reduce airspeed to below 60 knots before decreasing the rate of descent. Then execute a normal flare and landing.

Departure. You can limit the total area of exposure by using a high rate of climb and making a very smooth transition to forward flight.

Maneuver. Avoid rapid, high g turns. Perform maneuvers smoothly. A suggested technique to avoid blade slap is shown in figure 5.

Noise Abatement Procedures for Medium Helicopters

In medium helicopters such as the UH-1, the main rotor slaps to some degree between 10 and about 85 knots, where it slaps almost continuously. At other airspeeds, it slaps intermittently. Maximum slap occurs during partial power descents—at airspeeds between 60 and 80 knots and rates of descent between 200 and 400 fpm.

At airspeeds above about 100 knots, blade slap intensifies, and it may not be readily apparent to the crew because the sound propagates forward of the helicopter instead of spreading.

Blade slap also occurs during constant speed turns, if turn rates are too high due to blade interaction with the rotor wake. Figure 6 shows

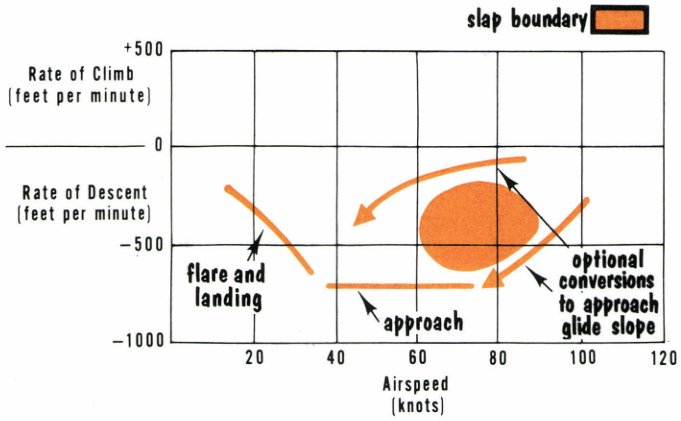


FIGURE 5: noise abatement flight technique, light helicopters

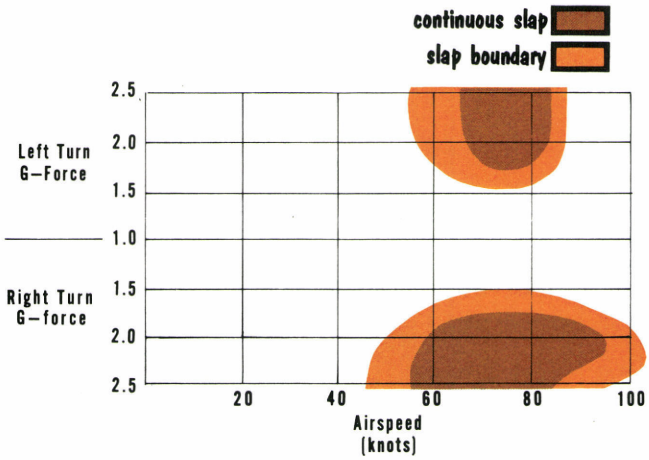


FIGURE 6: noisy maneuvers, medium helicopters

that continuous slap occurs in turns which exceed 1.5g with airspeeds between about 50 and 90 knots in a left turn and between about 40 and 110 knots in a right turn. The crew can hear this noise easily and learn to avoid these thresholds by adjusting power or the severity of the maneuver.

Noise Abatement Procedures Specifically for the Huey

The same ideas for noise attenuation listed above for the light helicopters generally apply to the Huey except for approach and landing.

When commencing an approach, begin the descent at least 200 fpm *before* reducing airspeed, then reduce airspeed while increasing rate of descent to about 800 fpm. This gives a slightly steeper approach angle like a semiautorotation and a smaller exposure "footprint" on the ground (figure 7).

At a convenient airspeed between 50 and 80 knots, set up your approach glide path while maintaining the fpm rate of descent. If the main rotor begins to "slap," increase the rate of descent. Approaching the flare, reduce airspeed to below 50 knots before decreasing the rate of descent. Then execute a normal flare and landing.

The suggested noise abatement flight technique illustrated in figure 8 will help you to avoid the "noise zones."

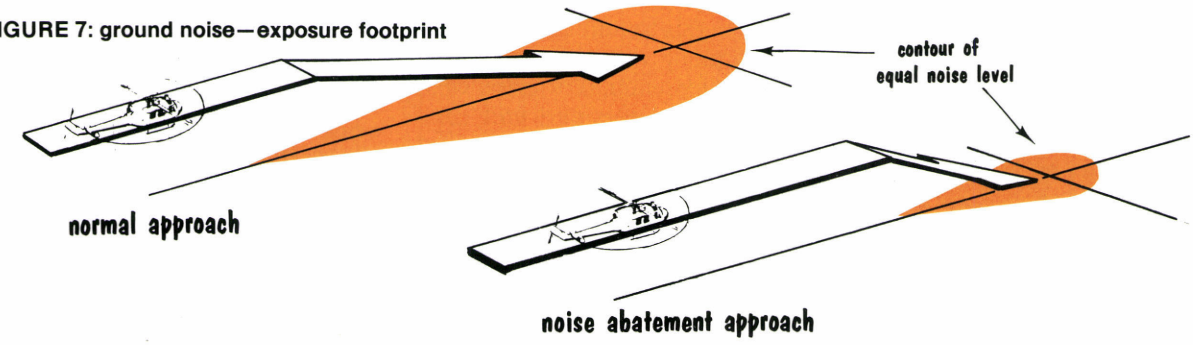
Humid days associated with low cloud cover and low winds increase sound propagation. When these conditions exist—particularly when there is fog, drizzle or light snow—use noise abatement procedures.

As a step toward immediately alleviating some of the noise problems through piloting techniques, HAI's plan suggests a four-element program. As you can visualize, each of these points is directly applicable to the Army's modus operandi.

Pilot Training and Indoctrination

- Increase pilot knowledge and awareness and concern for environ-

FIGURE 7: ground noise—exposure footprint



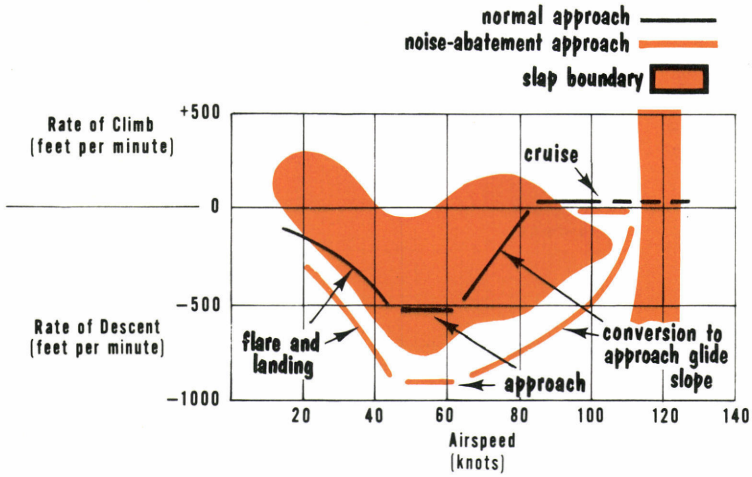


FIGURE 8: noise abatement flight technique, medium helicopters

mental improvement.

- Emphasize noise reduction.
- Issue and become familiar with publications which provide noise abatement information, power settings, and flight maneuvers and techniques.
- Condition our aviators to practice "good neighbor" flying.

Some common noise attenuation methods are literally right at the fingertips of every helicopter pilot. We can reduce the length of hovering and proximity to buildings or personnel. Hovering requires higher power settings and consequently causes higher noise levels. Avoid low level flying except in authorized areas.

Flight Operations Planning

- Develop discrete routes, approaches and approach procedures focusing on minimum exposure.
- Enforce the rules.

Public Awareness

- Join with civilian organizations to promote good neighbor practices.
- Seek public acceptance by developing community awareness of the benefits of Army helicopters and the need to fly as we do. Be concerned about community problems.

When Brigadier General Ellis D. Parker, Army Aviation officer at HQDA, was commander of 17th Aviation Group in Korea, he dispatched teams of people to measure decibel levels from which he regulated routes of helicopters. Although some of your noisier routes may remain, the populace will accept it more readily if you take the time and exert the courtesy to show them some consideration. This association will provide a foundation upon which to deal with serious complaints.

Program Administration

- Work with local planners and cooperate to make heliport facilities, operating hours and flight routes as compatible as possible with the local surroundings.
- Develop for each helicopter type (and model) the appropriate piloting techniques to reduce noise.
- HAI will continue to administer the Fly Neighborly Program including collection and distribution of program information.

Given this semitechnical information along with the theory that noise abatement makes sense, what can we as aviators and unit commanders do to make it work for us? Here are some thoughts. If reduction of noise can reduce acoustical detection of us by the enemy, then let's practice it! And, let's keep our neighbors—both military and civilian—happy by practicing noise abatement. Do this by careful flight planning and developing noise abatement routes and procedures wherever you operate. Educate these neighbors as to why and where you have to fly, consider their requests for relief and cooperate as much as possible.

There is no reason that we cannot continue to operate business as usual, train to be ready to fight and respect the consciousness of those around us—particularly when we are some of "those" affected by our helicopters. Everyone needs to pull together to accomplish this. All of us who share the sky must share responsibility for noise abatement.

FOOTNOTES

1. DA Tech Bulletin TB AVN 1-1157, "Army Aviation Flight Information Bulletin," HQDA, 2 March 1982, p. 8.
2. "Fly Neighborly Program (Draft)," Helicopter Association International, 8 February 1982.
3. ICAO International Standards and Recommended Practices, Environmental Protection, Annex 16, Volume I (Aircraft Noise), first edition—1981.
4. C. R. Cox, Flying Neighborly—How to Operate the Light Helicopter More Quietly, Bell Helicopter Textron, undated.
5. C. R. Cox, Flying Neighborly—How to Operate the Medium Helicopter More Quietly, Bell Helicopter Textron, undated.
6. C. R. Cox, Ibid.

ABOUT THE AUTHOR

Colonel Boysen was assigned to Headquarters, Department of the Army in Combat Division, Requirements Directorate, ODCSOPS (DAMO-RQD), when he wrote this article. He represented HQDA at the February 1982 Helicopter Association International Convention. This article is adapted in part from his speech to that forum. The author is a Master Army Aviator. He acknowledges assistance from Mr. C. R. Cox of Bell Helicopter Textron in editing the article for technical accuracy. Colonel Boysen is now assigned as security plans and operations officer, Headquarters, 13th Support Command, III Corps, Ft. Hood, TX.

U.S. Army Communications Command
ATC ACTION LINE

More On The Near Midair Problem

Mr. Kenneth S. Arnold
U.S. Army Air Traffic Control Activity
Aeronautical Services Office
Cameron Station, Alexandria, VA

JOSEPH PAUL Goebbels, the notorious Nazi propagandist once said, "If something is repeated often enough, people will soon begin to believe it."

Using Dr. Goebbels' premise, and at the risk of sounding repetitious, this short discussion is again aimed at the near midair collision menace. It is done so with the hope that all aviators will soon be convinced that as long as VFR and IFR traffic are permitted in the airspace, *only they* are in a position to really do anything more about the problem. Collision avoidance systems are only aids to the eyeballs and work on the same see and be seen concept.

It all comes down to this. The highest level of pilot vigilance must be maintained to avoid midair collisions, regardless of the airspace in which operations are being conducted and regardless of the air traffic control services being used. No pilot should permit himself or herself to be lulled into a false sense of security by ATC procedures that cannot necessarily guarantee separation under visual meteorological conditions.

Reports show that many pilots under radar control believe they will be advised of traffic which represents a potential conflict—and behave accordingly. They tend to relax their visual scan for other traffic until warned of its presence. When warned of a conflicting aircraft, they tend to look for it to the exclusion of within cockpit tasks and scanning for other unreported traffic.

Obviously, prohibitions against uncontrolled aircraft in terminal control areas are not entirely effective. A study of near midair collisions reported to the Federal Aviation Administration indicated that of half the near midairs in terminal control areas one of the aircraft involved was not known to or controlled by ATC. Any interpretation of near midair collision data within TCAs must take this into account. Intruders in TCAs are a random element in a system designed to provide maximum orderliness in high density terminal areas.

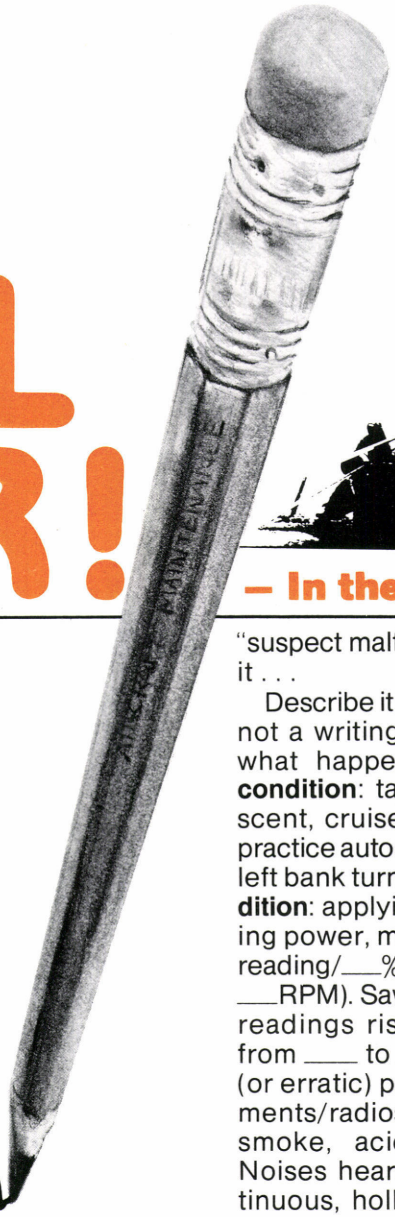
Air traffic controllers cannot inform pilots of traffic that is not visible on their radar scopes, nor can they provide separation from such traffic. It is plain that at least some pilots receiving Stage III services believe that they will be told about all traffic that represents a threat, yet controllers can handle traffic only with regard to threats they can see. With respect to participation in Stage III services in terminal radar service areas, the FAA has stated that 80 to 90 percent of VFR aircraft avail themselves of such services. Yet, FAA and military data indicate that almost two-thirds of near midair collisions in TRSAs involve a nonparticipating aircraft. Clearly then, the risk of a near midair collision is disproportionately high for the aircraft that does not participate in Stage III services.

One is thus faced with a situation in which pilots may expect more from the ATC system than it can deliver, and in which controllers may be expected to provide more information than their equipment gives them. Whether this problem exists because of misunderstandings, lack of pilot education or the implied promise of Stage III procedures is not fully understood, but the data available indicate that it does exist.

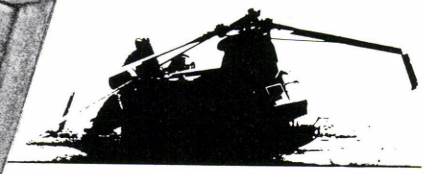
Those pilots, who do not understand the limitations of terminal radar and of the controllers who use it as their primary source of information, must be taught. Many aircraft in TRSAs, and some of the intruders in TCAs, are not transponder-equipped. Such aircraft are often not visible to controllers. These aircraft, and many others near TCA boundaries, represent a threat detectable only by the pilot, and then *only if he or she is looking for them!*

Readers are encouraged to address matters concerning air traffic control to:
Director, USAATCA Aeronautical Services Office, Cameron Station, Alexandria, VA 22314

PENCIL POWER!

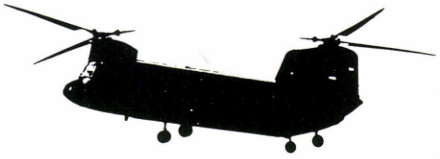


suspect malfunction



— In the Dash 13 —

"suspect malfunction" won't hack it . . .

Describe it in simple terms—it's not a writing contest: (you tell) what happened during (**flight condition**: taxi, T.O., climb, descent, cruise, hover IGE/OGE, practice autorotation, steep right/left bank turn) while (**power condition**: applying power, decreasing power, maintaining—torque reading/___% power/___in. Hg @ ___RPM). Saw engine instrument readings rise, drop, fluctuate from ____ to ____: lost electrical (or erratic) power to ____ instruments/radios/lights. Smelled smoke, acid, electric wires. Noises heard—one/many/continuous, hollow, solid, muffled, loud, soft, knock, chatter, purring, shrill, or none at all.) **Felt flight controls** respond, not respond, mushy, positive, opposite to command.

Be specific—give the maintenance crew all the data you remember so that they can fully correct the malfunction. Let's help ourselves to be *Accident Free In '83.*