UNITED STATES ARMY

NOVEMBER 1972

AVIATION DIGEST

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UNITED STATES ARMY AVIATION DIGEST

NOVEMBER 1972 VOLUME 18 NUMBER 11

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ABOUT THE COVER

Cake and Vodka! What's the connection? Would you believe drug abuse in aviation? See page 8

Cover photograph by CPT Tom Greene

The mission of the U. S. ARMY AVIATION DIGEST is to provide information of an operational or 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, Fort Rucker, Ala. 36360.

Use of funds for printing this publication has been approved by Headquarters, Department of the Army, 1 October 1970.

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VIEWS FROM READERS

Sir:

Colonel Anderson's article, "A New Career Pattern," regarding AWO in the July issue was very interesting to me even though I am not an aviation warrant officer. Some similar pattern will have to be devised in the other warrant officer fields and I am glad to see the AWO Branch come up with something that may serve as a guide for the rest of us.

Unfortunately, there is one great obstacle to any career program for any Army warrant officer. That is DA's refusal to assign warrant officers by grade to TOE and TDA positions. Until the warrant officer grade level is recognized on authorization documents, no true career program exists. Perhaps the Aviation Warrant Officer Branch can pioneer a breakthrough in this area also.

CW4 Aniceto I. Bagley
HQ, USAMICOM
Redstone Arsenal, AL 35809

Sir:

I am in the process of compiling a series of articles with real information value on an easy-reading level. Looking through the June 1972 edition of the AVIATION DIGEST, I was particularly impressed with the pictures and writing in "Visual Illusion." I also liked "Sound Mind, Sound Body Sense" with its cartoons and easy reading script. May I have permission to use these as part of the USAFI developmental reading program? Do you have the plates for the illustrations?

Incidentally, in my opinion, AVIATION DIGEST is one of the finest of the service magazines. You are doing an outstanding job.

Mr. Bouri Flesch
Education Specialist
U. S. Armed Forces Institute
Madison, WI 53713

• The material you requested is on the way.

Sir:

As chairman of the U. S. Army Warrant Officers Association, I request that you bring to the attention of your readers the activation of our national headquarters in Washington, D. C. Our association is specifically for Army warrant officers of all components — RA, USAR, NG, AUS — both active and retired. We are trying to organize chapters at posts throughout the Army . . . . Anyone desiring information or application procedures should contact CW4 Don Hess; U. S. Army Warrant Officers Association; P. O. Box 3765; Washington, D. C. 20007.

CW4 Don Hess
Chairman, Pro-Tem

Sir:

We sincerely appreciate permission to reproduce the article "The Flight Surgeon's Role in Aircraft Accident Investigation" by Major Barreca. . . . If available, we would appreciate a copy of the July 1972 issue of the DIGEST which we understand has another article on medical aspects of accident investigation.

Thank you very much for these significant contributions to our training program for Air Force flight surgeons.

COL Samuel J. Brewer
Chief, Education Division
Brooks AFB, TX 78235

• A copy of the July issue is in the mail. The article you referenced is "The Flight Surgeon's Medical Team in Aircraft Accident Investigation" which was written by Major Robert R. McMeekin and Captain Clifford C. Hudson for the Society of the U. S. Army Flight Surgeons' "Aeromedic" feature.

Sir:

I have just read my copy of your June 1972 issue. . . . If possible, I would like two or three extra copies so that I may use the MEDEVAC article. I would like to send two copies back to Vietnam for the VNAF to read. I recently returned and after setting up the MEDEVAC (VNAF) in MR II, I am sure VNAF would be interested in reading how it all started within the U. S. Army.

COL John M. Slattery
5420 Rosecroft Boulevard
Oxon Hill, MD 20020

• The article Colonel Slattery refers to is "That They May Live" by Colonel Waldemar A. Solf (Retired).

The Magic Genie In The Hangar . . .

Cannibalization

The "quick-cure" procedure of cannibalization leaves its ill effects to be felt over an extended period. Beginning with the order to cannibalize, the maintenance workload is increased and so is that of supporting units . . . all are caught up in a chain reaction of ever-increasing demands

Captain F. Kevin Shea

LIKE A GENIE, cannibalization can work wonders for maintenance operations and mission accomplishment. However, there simultaneously exist great dangers that this genie creates. The two-faced nature of cannibalization throws the fear of Hades into maintenance officers.

Great care and control must be exercised when dealing with cannibalization. Basically it is an attempt to gain the use of available parts to increase the number of flyable aircraft. It consists of removing a needed part from a downed aircraft and installing it on another aircraft to return it to a flyable status.

It must be immediately recognized that cannibalization is a stop-gap remedy. It solves short-run difficulties but creates long-run problems. Therefore, it is impossible to use cannibalization to solve serious maintenance difficulties, such as overextended flight operations, tech supply problems or a lack of trained personnel. Maintenance difficulties must be dealt with directly, not indirectly, through cannibalization. Cannibalization, in fact, will combine maintenance difficulties at an ever-increasing rate. This is particularly true if cannibalization is used on a continuing basis.

The pitfalls of cannibalization are not readily apparent to the inexperienced eye. Rather, they are hidden and overshadowed by the seeming simplicity of achieving instant success. Further, the ill effects of cannibalization are felt over an extended period of time, beginning immediately with the order to cannibalize and ending only when all the deficiencies have been completed.

The immediate effect of cannibalization is to increase the workload of all personnel in the maintenance operation. Not only must the cannibalized part be removed from the losing aircraft and re-installed on the gaining aircraft, but also in the future the losing aircraft must receive a new part. Using normal supply channels only one operation —installation of the part—is necessary. Using cannibalization two additional operations are required. As the workload increases, it mushrooms into all maintenance areas affecting quality control, production control and tech supply operations. Thus, the workload of mechanics, supervisors, supply personnel, tech inspectors and the maintenance officer is greatly increased.

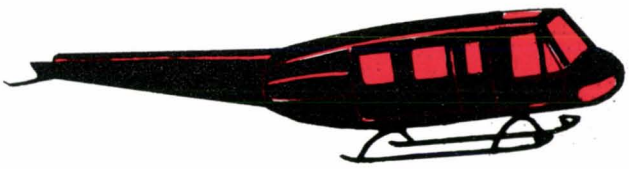
A mechanic's workload is greater because he must complete a number of operations to get and install the part. The pitfalls associated with cannibalization are a direct result of this increased workload. The mechanic may use short-cut methods during part removal. He justifies this by saying that the losing aircraft is not going anywhere and that newly created problems he's caused can be fixed later. However, the mechanic too often does not write up the part he removes, much less write up a problem he has created. If the mechanic happens to be removing the part from a "Hangar Queen," the ob-

servations are probably more valid. In addition to damaging the aircraft or the part, the mechanic can damage or loosen attaching parts or hardware. Thus, extra work has increased the possibility of maintenance errors. This possibility, in turn, demands extra work on the part of the supervisor.

The workload of the mechanic is tripled by cannibalizing. The supervisor's work is increased by at least that much. He must supervise two additional operations. These operations are not simple. Often lines must be capped, parts tagged and stored, and numerous records completed. Not only more time but also greater care and skill must be used.

The technical inspector's job is more than tripled. Not only must he inspect both aircraft and the removed part, but he must also complete the paperwork and historical records necessary to switch parts between aircraft. In addition, a number of charts must be adjusted. This paperwork is dull and time consuming, yet vital to aircraft maintenance. Mistakes here are brought to light usually during a records check. They may also surface during part failures.

Often the historical records, or other paperwork, are not adjusted or they are only partially completed. Many of us are probably familiar with aircraft whose records reveal that they are being flown without an engine, or a main rotor blade, or hub. These situations are often a direct result of cannibalization. Either poor procedures have been used or there is a deficiency in maintenance resources, such as



time and/or experience.

The workload of supply personnel is not greatly increased. However, there is ample room for errors and dangers to develop. Usually the mechanic will order the needed part from tech supply. Equipment deadlined for parts (EDPs) priority normally will be used when possible. If cannibalization is used, then the part originally ordered for the gaining aircraft must be canceled and reordered against the cannibalized aircraft. If this is not done, often the direct support unit will cancel the part. However, that unit will not reorder for you. Thus, you will not receive the part in a timely fashion.

Occasionally cannibalization will return an aircraft to a flyable status. The outstanding EDPs are not canceled and the unit has an aircraft flying with EDPs against it. This particular situation can cause serious problems for the maintenance officer if the aircraft should become involved in an incident.

The maintenance officer bears the responsibility of the decision to cannibalize. He must determine if any benefit is going to be realized. In arriving at a decision, he must consider whether his operation can afford the extra workload. Most maintenance operations are working a maximum number of hours. Increasing the workload will affect the morale and productivity of all personnel. The maintenance officer must consider his flow chart of scheduled periodic inspections. He must determine which aircraft are to be involved in the cannibalization. Some parts are more easily cannibalized than others, such as a main rotor head as opposed to a hydraulic servo. This is also true with aircraft. Cannibalization can affect adversely future aircraft availability. Choosing the wrong part or aircraft will only compound a negative situation.

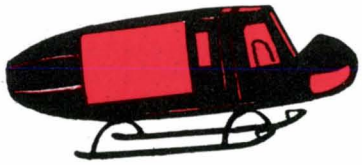
Once the part has been cannibalized, the consequences are quick to show. First, if the part cannibalized has a scheduled inspection, the timetable is usually disrupted. Normally a tail rotor is inspected during the periodic inspection of the aircraft. If the tail rotor was cannibalized and its inspection did not coincide with that of the aircraft, it will be necessary to ground the aircraft for this inspection. The alternatives are either to inspect the part early, which is wasteful and inefficient, or to forget the inspection. In the first instance, more work is generated; in the second, safety is jeopardized.

Secondly, a close tolerance part is often removed and installed without being inspected carefully. This happens because it is felt that a good part, giving good service need not be inspected. However, it may not give troublefree service, or any service at all. This is usually due to an unfavorable combination of connecting parts on the gaining aircraft. Often such a problem can be detected prior to installation. This may save some work, however, it points up another problem. Occasionally a part is selected for cannibalization that proves to be out of tolerance. It is used though because cannibalization is misunderstood and improperly controlled. Again, safety is jeopardized.

In addition to requiring more effort and care, cannibalization increases the possibility of maintenance error, jeopardizing flight safety. Cannibalization is not employed without certain consequences, expenses and risks. Ideally, cannibalization should be used sparingly and then only by units with a strong maintenance posture. It is only in such units that the expenses of cannibalization can be well afforded and handled.

A high rate of cannibalization, once discovered, usually is indicative of serious maintenance deficiencies. These deficiencies may exist in training, experience, facilities, personnel or support. It might be well to monitor the rate of cannibalization as a means of analyzing maintenance efficiency and trends.

The values of cannibalization have not been enumerated. More importantly though, the dangers and possible misconceptions have been brought out. It appears that far too much cannibalization is being demanded or permitted. There is too much reliance being placed on its short run benefits. Cannibalization can solve only the most immediate problems. Further, it was not designed to remedy internal maintenance problems. Often cannibalization seems saddled with this task. It is necessary for commanders considering cannibalization to be particularly aware of the demands it creates. Cannibalization is for emergencies and can usually be avoided by sound maintenance procedures, good lateral search operations and command emphasis.



Charlie and Danny's Write-In

Dear Danny: My question is in regard to the RU-21D and TM 55-1510-209-CL/4. The checklist calls for the APU to be disconnected after the second engine is started. It also states that the condition levers should be Lo IDLE. It is our opinion that this procedure is a hazard to ground personnel for the following reasons: The dash 10 warns that exhaust gases should be avoided since they are an irritant to the eyes, skin and respiratory system. In addition, page 3-10 shows the APU plug is in the 232 degrees C. to 121 degrees C. area. In our opinion this endangers ground personnel.

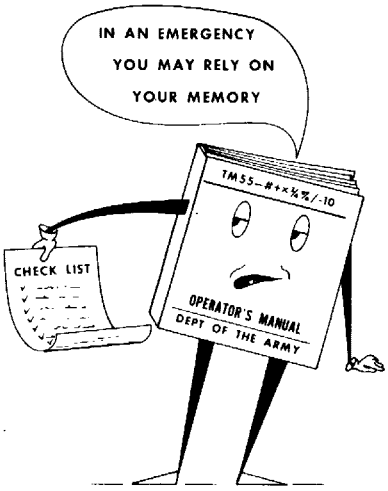
Can we get the dash 10 and CL changed so that the APU is disconnected after the #1 engine is started?

CW3 F. C. P.

Danny's answer: Certain restrictions will be placed on the pilot and ground crew personnel during all RU-21 engine starts depending upon the status of the mission equipment. As you know, if the mission equipment has been aligned using external power prior to starting the engines, then both engines must be started using the APU. The hazards in this case should be recognized and all precautions should be taken to protect the ground crew.

Consideration will be given to changing this procedure to allow the ground crew to disconnect the APU before the right engine is started if the mission equipment has not been aligned.

Dear Charlie: AR 95-1, chapter 4, paragraph 4-4e states: "The hazards inherent in inadequate preflights, starting, runup, takeoff and land procedures require that special attention be given to the use of aircrew checklists. To preclude aircraft accidents resulting from the failure to use checklists, the unit commander will insure that . . . crewmembers *will not* rely on memory for the accomplishment of prescribed operational checks."



Now, here is my question. In TM 55-1520-210-CL (UH-1 checklist) there are checks included for engine failure, emergency starting, governor control failure, fires, etc. As a UH-1 IP I have never taught nor been expected to use the checklist to accomplish procedures for inflight emergencies in training or otherwise. I recently gave a recurring standardization ride to one of our pilots who insisted that it is required by the reference quoted in the first paragraph. This individual is not a new aviator (instrument examiner, over 5,000 hours, etc.), however, I can't really visualize anyone pulling out their checklist to go through their procedures during an emergency. Could we please have an official reading as to how we are to interpret the phrase "prescribed operational checks" as quoted above. Thank you in advance for your cooperation.

CW2 C. D. A.

Charlie's answer: We have tossed the question back and forth here and have come up with an answer to you. A procedure to be followed during an emergency would not be classified as a "prescribed operational check."

Under certain conditions the operator will not be able to refer to a checklist for proper procedure, and we therefore suggest that an individual become thoroughly familiar with emergency procedures. By thoroughly familiar we do not exclude memorization. Certainly correct action during an emergency should come automatically and that is why we practice, practice, practice. Now, once the aircraft is under control and preliminary emergency steps have been taken, get out that checklist and look it over—there could be some part that didn't come automatically.

By the way, there is a draft change to AR 95-1 that will indeed require some parts of emergency procedures to be memorized. You should be reading about this soon.

Syndrome Of Complacency

Flight school can't produce experienced aviators in 200 hours; it does teach the way to fly an aircraft in the safest possible manner

Captain Uldis N. Cernonok

WHEN I FIRST arrived in the Republic of Vietnam, I noticed that there were some pilots who had developed their own flying techniques. A normal approach was something done "back in the world" and wasn't even heard of incountry. These generally were new aircraft commanders (ACs) who were flying in a totally different manner than the older and more experienced pilots within the unit. The reason was that the newer ACs had reached what is commonly called the 300 to 400 hour syndrome. This is a level of experience which is probably more dangerous than no experience at all.

After about 4 months incountry I too became an AC. This was considered a position of high status and naturally a good excuse to buy the bar at the club. Fortunately my roommate, also a new AC, helped share the expense of this festive occasion. So there we were, on top of the world, thinking we were God's gift to aviation, knowing we could fly by second nature alone. We finally had our own aircraft, call signs and responsibility of our crew and passengers aboard.

Almost everything I had learned in flight school seemed remote for now I could "really" fly a helicopter. I could fly "so well" that I was teaching newly arriving aviators all the bad habits I had so proficiently mastered.

Months later, having flown numerous missions without an accident or incident, it suddenly dawned upon me how foolish and absolutely dangerous my flying habits had become. I must have violated every principle of flight and exceeded every limitation of the UH-1 aircraft. As a matter of fact, the only reason I was still alive was due to the engine not failing and the lack of any unexpected inflight emergency.

After discussing this problem with some of the more experienced pilots, I found that they too had encountered this syndrome of complacency. The only solution that could save me was to fly the aircraft in the proper manner I was taught initially. Fortunately I corrected my deficiencies in time; however, my roommate was not so lucky.

Having around 400 hours of combat time under his belt, my roommate seemed quite confident in himself and the aircraft. He had reached a level of proficiency that enabled him to make any approach, at any angle, to any landing zone (LZ). This was all well and fine except that the more unusual his approaches became, the more vulnerable he became to any inflight emergency. One day it finally caught up with him . . . he had an engine failure while making a pinnacle approach. Although no one was killed the aircraft was destroyed and he sustained serious injury. The point is that these injuries may have been avoided had he executed a normal pinnacle approach.

It happened one morning

when we were flying a resupply mission for Hill 270, a fire base just southwest of DaNang. Although we weren't in the same aircraft, we had similar missions supporting the same people. Hill 270 had two landing sites, one halfway up on the north slope and the other on top of the hill itself. The winds were out of the west and my roommate had to land at the lower LZ to pick up some supplies. He was then instructed to land at the upper LZ to pick up some ground troops and take them to their field locations. He executed a normal pinnacle type approach to the first LZ, landed and picked up the supplies. Instead of departing and making another approach to the top LZ, he elected to reposition himself by simply high hovering the aircraft up the hillside to the top LZ. It seemed easy enough and appeared a good way to save some time. He picked up the aircraft, turned into the hillside and started a slow hover up the hill.

The wind picked up and the resultant downwash from the hill necessitated a large increase in power to maintain the climb. Unexpectedly the aircraft yawed to the left and I could see the rotors slowing down. Having no place in front to go, he put in left cyclic and lowered the collective in an attempt to establish an autorotative glide to the valley below. Because he was too close to the hill there wasn't room for the aircraft to fall through and turn toward the valley. The right skid caught the hillside and forced the left skid down into the hill.

The aircraft rolled five times to the base of the hill and came to a crumpled rest at the bottom. My roommate was unconscious; the only thing that saved his pilot was a chest protector that wedged itself between the greenhouse and the armored seat, thus preventing him from being crushed.

The rest of the crew was miraculously thrown free and only sustained minor cuts and abrasions. Could this have been avoided? Possibly not; yet, if the pilot had made a proper approach to the pinnacle he would have allowed a sufficient margin to provide the space needed to autorotate safely to the ground.

It is obvious why this accident occurred: the pilot did not use his head. He was taught the proper way to approach a pinnacle and even demonstrated it just a few minutes prior. Still there comes a time when aviators think they can accomplish the same task by doing it in a different manner that initially seems easier and possibly more expeditious. When a pilot becomes so confident that he can fly the aircraft in a different manner from that which he was taught, he is only asking for trouble. There is a definite reason for making a pinnacle approach the way it was taught, and that is to avoid any impending situations that you may not be able to recover from. Yet human nature and man's confidence in himself have a way of convincing you otherwise. Safety is of primary importance and the more one flies the more one realizes this. The greater the margin you have, the better your chances of survival.

Although flight school can't produce experienced aviators in 200 some odd hours, it does teach the proper way to fly in the safest manner. Anyone who thinks he's so good that he can fly a better way is only kidding himself and is on the verge of killing anyone with or near him.

Aeromedic

Hidden Forms Of DRUG ABUSE

Provided by the Society of U.S. Army Flight Surgeons

NEVER HAPPEN, you say? Any flight surgeon or commander who has observed or participated in the ritual at the formal or informal lounges of our officer, NCO or enlisted clubs might ponder that one.

Envision the smoke filled rooms . . . eyes tearing, the sips of brew . . . eyes glazing, peanuts, potato chips and sausage sticks . . . calories mounting and belts bulging. Those who consistently attend such rituals might carefully reflect upon the article at right to search within themselves for the poor examples set for wives and children.

Perhaps too often aviation commanders and flight surgeons complacently argue that drug abuse or illegal use of drugs is nary a problem in Army aviation. This position is easily embraced, for no aircraft accidents have clearly been associated with the illegal use of drugs. The U.S. Army Agency for Aviation Safety surveyed this problem in its records for the period from January 1961 through December 1969. During this 9 year period the Army had recorded no aircraft accidents due to the use of illegal drugs, and only four in which medications (self or physician prescribed) were a factor. The flight surgeon who researched this data speculated that ". . . perhaps for this type of person, the flying itself—the thrill of it—may fulfill the same psychological needs as some drugs."

While not being involved casually in aircraft accidents (at least in so far as they can be identified), illegal drugs *have* been found in the possession of a few aviators. In FY 1971 only 18 were indefinitely suspended from flying duty for this reason. In FY 1972 there were 9 of 24,000 aviators; in FY 1973 to date only 9 in 22,000. Most of these individuals came to the attention of authorities by accidental discovery, not by bizarre or unusual acts.

Aviation personnel are intelligent enough to avoid conditions that are illegal. They are sufficiently sophisticated to embrace an emotional release that is more or less socially acceptable. Thus alcohol, cigarettes and food are abused.

Picture the cargo or passenger section of a helicopter or fixed wing aircraft. Feel the eye irritating smoke accumulate . . . hear the click and flit of lighters, the groans and grunts searching or reaching for cigarettes. See the sloppy physiques of some soldiers . . . another round of beer, pretzels, popcorn . . . better get home for dinner . . . and more oral gratification.

What price paid? Certainly not total or even partial incapacitation. Perhaps only partial emotional disintegration . . . the failure to cope successfully or meaningfully with frustrations, disappointments and disillusionments by more spiritual or character building means. Perhaps reductions in performance or efficiency that become operationally borderline. Maybe only ebbing enthusiasm and quality or failure to set a suitable example for those around us. Thus, only our personal esteem and success, a sorry example for fellow air crewmen and family members. A small price? Perhaps not!

Commanders and flight surgeons, each and every air crewman can do something other than reflect the apathy and indifference echoed in the time honored but thoughtless comment: No drinking within 50 feet of the aircraft. We can and should recognize or identify less than satisfactory or useful methods and conditions of coping. Encourage positive intervention for all types of abuse. Health education with command interest and emphasis helps. Flight surgeons, fighting complacency or futility, can turn to fellow professionals to encourage the use and development of medically organized and supervised programs of weight control and alcohol or smoking withdrawal.—

LTC Nicholas E. Barreca, M.D.; Deputy Director, Department of Aeromedical Education and Training; U.S. Army Aviation School; Fort Rucker, Alabama

Major Barrett M. Maletzky, M.D.

WE HAVE BECOME accustomed in this country to regard drug abuse in a stereotyped and restricted fashion. We associate drug abuse with LSD, marijuana, amphetamines and worst of all heroin. We believe it afflicts mostly the young and the disenchanted, and we persist in the notion that drugs are used as stand-ins for happiness by those somehow lacking the perseverance and wherewithal to cope with the stress of modern life. In reviewing the literature, however, and in our own experience, we have come to regard drug abuse in a far different and much expanded light. By reviewing some of the myths surrounding drug abuse, we can come to a clearer understanding of past misconceptions and future possibilities.

The drugs of abuse: The dangers of hallucinogens, marijuana, even the amphetamines and narcotics, have been vastly overrated, and the public outcry against these drugs has been inordinately severe. For example, methadone, a potent narcotic, can be ingested daily for years without deleterious side effects and no examples of addiction to the hallucinogens or marijuana can be cited. We are not proposing legalization of these drugs, but rather a more discerning look at where major patterns of abuse lie. We have come to regard two quite different drugs as forming the underpinnings of drug abuse in our country: *alcohol and tobacco.*

Heroin abuse has reached "the epidemic stage" we are told. If so, alcohol abuse must constitute a major pandemic affecting 1,000 more times the number of people directly involved than narcotics and many times more indirectly in terms of families destroyed, jobs lost, money spent and human suffering effected. It has been estimated that the number of young people abusing alcohol exceeds, by a factor of 50, the number of young people abusing all other drugs combined. Astounding facts have recently come to light concerning alcohol: that alchol causes 50 percent of all fatal traffic accidents in this country; that more billions of dollars are lost to the economy because of alcohol abuse than from all illnesses combined; that the major drug of abuse among the so-called "flower children" of the 1960s is now not any hallucinogen or heroin but alcohol.

Yet alcohol in our society is a "protected" drug not just legally but, more importantly, socially as well. The drunk is more an object of laughter and pity for us now than of derision. Our standup comedy reeks of booze; within the winds of our heritage, the smell of alcohol is distinct.

Social drinking is so much a part of us that the line between a drinker and a drunk has become obscured, and the latter more often than not is camouflaged with the reassurance that "he just drinks a little too much" or "he just drinks to calm his nerves." Yet alcohol addiction is a clear entity which costs us more, in terms of money lost and human suffering gained, than LSD, marijuana, amphetamines and heroin use combined. Would one ever assert that the heroin addict "just shoots a little too much" or "just shoots to calm his nerves"?

The only abuse to seriously challenge alcoholism in our country, in terms of disastrous effects upon health, are tobacco and food abuse. Much has been published about smoking and health and many have come to regard smoking appropriately as a form of drug abuse. But overeating, much like alcohol, is usually considered only an indication of a mild lack of willpower and the obese person is subject, at worst, to bad jokes and nagging about "cutting down." Just like the alcoholic and the smoker, he is confronted with the object of his abuse daily. He alternates between painful periods of abstinence and gorging; he is subjected to frequent and ineffective exhortations to diminish intake because of future health penalties; and a major portion of his life is spent in tortured thoughts about his habit and the need to stop. We have neglected food abuse to a greater extent than any of our major drug problems. Such neglect is unfortunate; food abuse is one of the most difficult of habits to conquer. The "foodaholic," as distinct from the drug abuser, cannot quit "cold turkey."

While alcohol, tobacco and food abuse may be argued to occupy the periphery of drug abuse, it can readily be seen how they are, in fact, in the center of most drug abuse in this country. We teach our children by rewards, punishments and perhaps most importantly by imitation. Indeed, in families where tobacco and alcohol are used, drug abuse is far more common in the offspring. In this light one other form of drug abuse must be acknowledged as even more insidious than any previously mentioned: pill abuse.

Pill abuse refers to the vitamins we ingest and excrete without need; the aspirins we gulp for each headache; the decongestants for each sniffle; the sleeping pills; the weight control pills; and, worst of all, the Librium, Valium, Serax and Miltown we swallow to insulate our-

selves from any possible tension, to float away any anxiety, to numb us to life's exigencies and to prevent us from learning one of life's valuable skills—"to cope."

With regret it must be admitted that physicians bear the brunt of responsibility in this regard. Anxious to avert every anxiety, to dull every pain, they have unwillingly championed the idea of "better living through chemistry." Woe befalls the physician who denies his patient a pharmaceutical armamentarium to ward off the evils of distress. Yet, who knows better than a physician that penicillin and decongestants do not alter the course of most respiratory infections, that vitamins are largely superfluous, that minor relaxants do not improve the quality of life? And who, but a physician, would be in a better position to educate his patients by *refusing,* at least occasionally, to write the ubiquitious, invidious prescription?

The drug abusers: It has been common to picture the drug abuser as one who uses chemicals to fill a horrible void in his life. In this view some defect must have existed prior to drug abuse, thus removing the habit could only, at best, leave the abuser still suffering from a vaguely defined personality deficit.

Then how is one to explain recent research which convincingly demonstrates that any and all organisms, regardless of how happy or unhappy their past might have been, are capable of becoming drug addicts? In the prototype of this research monkeys are injected with solutions of a particular drug when they emit an operant response, such as a bar-press. Under these circumstances *every monkey tested* will become addicted and continue to self-administer the drug. The drugs these monkeys abuse are narcotics, amphetamines, alcohol and the "minor" tranquilizers such as Valium and Librium. No such self-administration will occur if the drug used is saline or chlorpromazine. Only two conditions must be satisfied here for addiction to occur: *the availability* of a drug and *the time* to abuse it. To postulate a third factor, for example an "addictive personality," affronts the respected rule of parsimony in science. It is superfluous.

Indeed, our own experience with drug and alcohol abusers is consistent with this research. Most of the abusers and addicts we have encountered do lead disordered lives filled with disrupted families, dysphoric feelings and job failures. The majority of these events followed drug and alcohol abuse and, in fact, could be directly traced to the abuse itself. Such research prompts us to rethink our smug, stereotyped impressions of just a few years ago. It may be that any of us, under life conditions similar to a heroin addict's, might become similarly addicted.

Treatment of drug abuse: The common notion has it that to treat any form of drug abuse one must rearrange the drug abuser's personality and fill in, so to speak, the gaps which weaken it. This notion remains not only totally unproven but also wholly unproveable. The programs which claim to work on this model, such as Synanon and Daytop House, have not published objective statistical evaluations, thus further beclouding the issue in ambiguity.

Lacking such extensive personnel and facilities, we have elected to treat *drug abuse,* not *the drug abuser.* We certainly have not neglected helping drug or alcohol addicts obtain better marriages and better jobs, and have even tried to teach social skills such as assertion or the more appropriate expression of emotions where indicated. But our major thrust has been directed against the abuse itself, utilizing the methods of behavior therapy.

Such techniques include covert sensitization in which the abuser imagines noxious scenes consequent upon the abusing behavior; "assisted" covert sensitization in which in addition to imagined noxious scenes, a highly offensive odor is introduced; time and distance aversion therapy utilizing the same offensive odor; electrical aversion therapy; operant conditioning techniques within a group community setting; and random timer techniques in which the addictive behavior is linked to a randomly decreasing external stimulus.

These techniques are not universally successful. However, we have been happily surprised: over 80 percent of clients who complete such programs have remained free of their habits for periods up to 1 year thus far. Smokers, drinkers, LSD and marijuana abusers, paint sniffers, "foodaholics" and even heroin addicts have been involved. Because many of these techniques lend themselves to automation and repetition, tape recordings and booster sessions have been utilized to continually stamp in the learning involved.

Such reconditioning makes but a modest claim: to end a habit. But a noteworthy one nonetheless. The addict, deaddicted, is free to learn or relearn the techniques of a happier, more rewarding life style. Indeed, much of our work in reshaping an ex-addict's "personality" comes *after* he is deaddicted, not before.

It can be seen that we do not restrict our treatment of drug and alcohol abuse to LSD, marijuana abusers and alcoholics. The Fort Rucker [AL] Drug and Alcohol Team is as actively involved in programs against smoking, overeating and overprescribing, as in the more conventionally thought-of forms of drug abuse. Examples: benevolent pressure antismoking groups using a timer device as an adjunct; weight control groups using the methods of Stuart and

Stunkard to teach better eating habits; and Valium withdrawal groups in which clients learn to effectively handle life stresses while their "minor" tranquilizers (usually prescribed by other physicians for many years) are gradually discontinued.

Research: The research already mentioned, coupled with our own experience in the field, has prompted us to review our directions in drug and alcohol abuse. We urge a triaxial approach to research on drug abuse. Objective research into which techniques, and which components of which techniques, work best against the specific addictions is badly needed. We currently are engaged in such an evaluative program. Also needed, strangely, is just the opposite, the kind of experience Azrin has recently promulgated based on his work with selected alcoholics in Illinois: a thoroughly clinical, massively organized, restructuring of an alcoholic's life, supplying potent reinforcements contingent upon nondrinking. In this type of program the fine, analytical study of which components are actually necessary is superfluous. As Azrin argues, "the important thing now is to help the alcoholics, even just one, not to tease out the niceties, not to conduct the impressive double-blind research, just to learn what *might* help."

A second axis urged in drug abuse research follows educative lines. We've too often heard the oft-repeated cliche, "More drug education is necessary." Blachly has been the most convincing in outlining the illogic behind this argument. Alerting the nation to the long-term dangers of any habit (smoking, drinking) is much like trying to talk a heroin addict out of wanting his next fix. The distant dangers are puny compared to the immediate rewards of drug abuse. Indeed, this deceptively simple fact serves as a major obstacle in the road to treatment of many nonpsychotic behavior disorders.

If this is true, of what value is any drug education? Rather than desert all educative efforts, however, it might be most fruitful to search out which kinds of education might affect which kinds of populations. For example, can certain young people be persuaded to avoid drug use with the right approach? Of equal significance, are there certain groups who might be encouraged to begin or continue abuse after exposure to educative techniques?

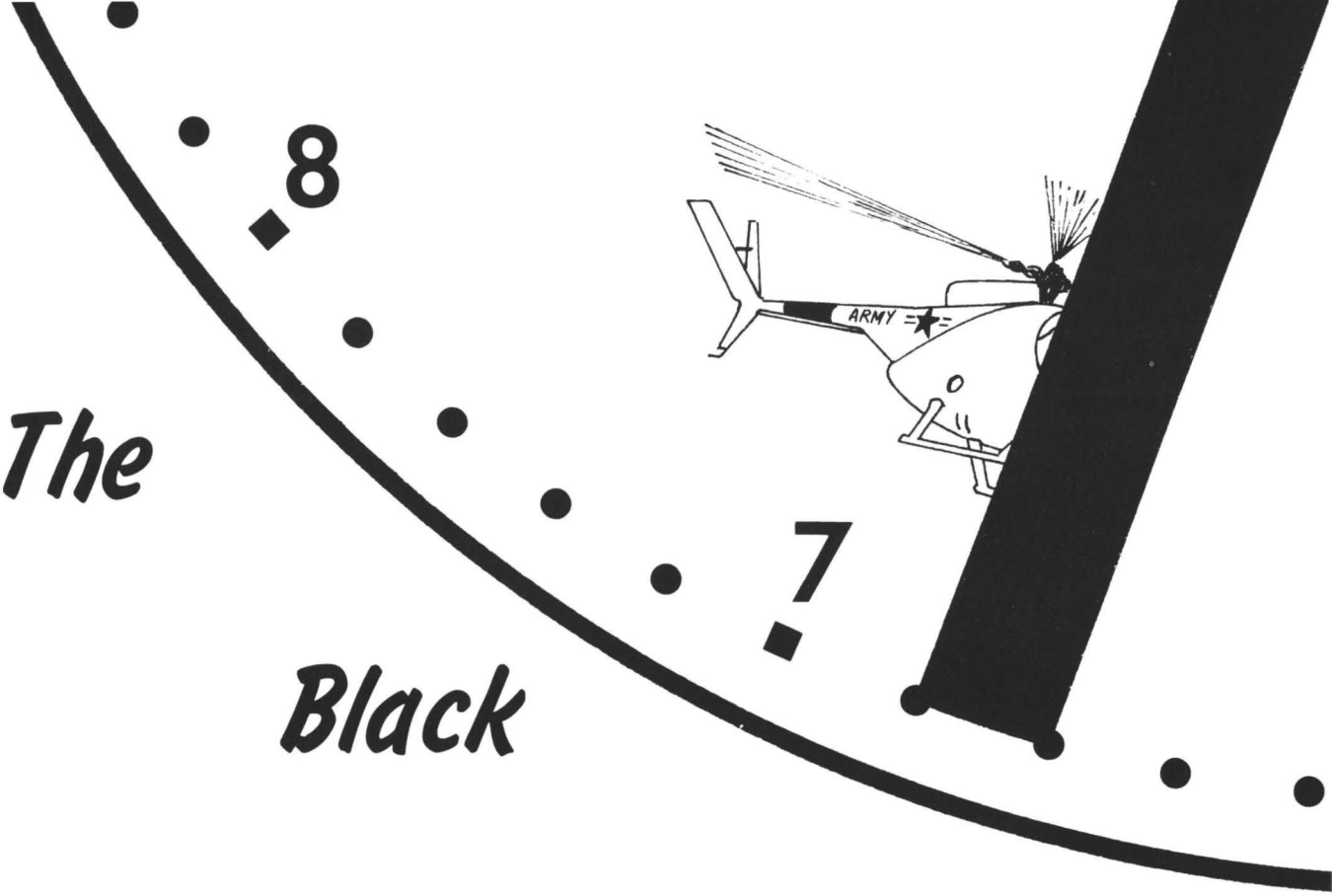
A third axis in the approach to research concerns a novel approach related to education. The question might legitimately be raised: Are there any families left in which drug abuse does not occur? If so, can these families be identified and studied as compared to those families who do abuse drugs (medications, overeating, smoking and the like) in terms of the quality of their lives and the extent of drug abuse developing in their children? Another suggestion would be to separate two groups of families: one which continued to abuse drugs in their usual style; the other which agreed (perhaps with monetary inducement) to wholly discontinue drug abuse in any of the forms already mentioned. One might then measure parameters of change in the quality of family life, such as money saved, drug abuse among offspring prevented, health factors improved. Such a prospective project, focusing on all forms of drug abuse, would be technically difficult but potentially rewarding enough to weigh heavily in our plans for the future.

If drug abuse in our country can be compared to a dwelling, its foundations would be alcoholism. This prototype of the addictions creates more forms of suffering than all the commonly conceived drugs of abuse combined. The walls of our structure would be constructed of tobacco and food abuse; these substances, constantly visible, form an important supporting function in drug abuse of all varieties. The roof: heroin addiction. Constantly visible, especially from on high, and subject to the winds and rains of public outcry, it persists to shelter and hide the other forms of drug abuse lurking underneath.

The windows and doors of our house would consist of pill abuse, especially the minor tranquilizer, sleeping pill variety. Through these doors and windows blow the winds which carry germs of drug abuse to infect our homes and their most precious inhabitants: our children. LSD? Marijuana? Amphetamines? These, I fear, would be the mere trappings, the furnishings of our house, subject to fad and change and utterly dependent upon the walls and foundations. In our country we are thus like a couple who constantly bicker over where to place the furniture while ignoring the basic structure of their home.

To change all this will require vast social alterations not likely to be forthcoming soon. Where to start? Our own homes might be a good first choice. Which drugs did you abuse today? Your wife? Your children? Instead of drugs what other rewards, what pleasures can you and your family provide for each other? Another point of beginning might be, strangely enough, our medical schools. We must teach medical students not only when to prescribe drugs but also when not and why not. Can we educate our future physicians to withstand the pressures from all about to prescribe more, rather than fewer drugs?

I cannot be optimistic, but let us hope the magnitude of change required does not forestall at least our first halting steps in the right direction.



The Black Minute

Our unit was put on alert for a practice night airmobile assault mission. All ships cranked up on schedule . . . so far everything had gone smoothly. Then we were told that there would be a delay; the VC had attacked an outpost in the vicinity of the practice LZ. Our practice mission was to be an actual night combat airmobile assault

Captain Claude T. Stanley

IT WAS 1800 HOURS on a particular night in mid-April 1969 when the 121st Assault Helicopter Company (Soc Trang Tigers) was put on alert for a practice night airmobile assault mission. This was not something this unit did regularly and, in fact, most of the unit's aviators had never participated in such a maneuver.

The operations officer had already posted aircraft and crews for the nightly alert missions. Every possible consideration was given for the selection of aircraft and crews and special equipment. Only aircraft which could meet full nighttime flight requirements and crews with the most experience were used in key positions. A flareship and two light fire teams were alerted and equipped along with 10 slicks and the command and control (C&C) aircraft. In addition, all remaining aircraft were fully armed and placed on a 5 minute standby. In effect, the en-

tire company was on alert status but only the required aircraft would go airborne.

At 1900 hours notification from higher headquarters stated that the flight would insert troops with a landing zone (LZ) time of 2030 hours. Along with the orders came the overlay of the LZ location and the position of friendly troops with routes of march. A final briefing was called at 1930 hours and covered the aviation unit's order of flight, route of flight, LZ and pickup zone (PZ) location, and assigned sectors and altitudes for the flareship and C&C helicopter. Two light fire teams of gunships were employed initially—one team low and the other high. The low team was assigned only a maximum altitude with a mission to recon and mark the LZ. The high team was assigned a minimum altitude and a sector of flight clear of the flareship and C&C. Its mission was to escort the slicks to the LZ and to relieve the low team onstation as necessary. The briefing ended with a reminder to the flareship crew of the winds from 090 degrees and the crank time and time interval of all sections.

At 2015 hours all ships were cranked and standing by for the order to go airborne. So far everything had gone smoothly and it seemed that this would be a routine practice mission.

At 2030 hours all ships were still running at flight idle and no word had been received explaining the delay. At the C&C ship the battalion commander informed the air mission commander that the ground commander had been delayed and that his arrival time was unknown. It seems that the Viet Cong had picked this particular time to attack an outpost in the area of the LZ. Orders were given to shut down all aircraft to conserve fuel, to stand by and to crank on the C&C aircraft.

At 2100 hours the ground commander arrived with orders to insert troops in the area of the outpost under attack. A friendly mechanized unit was enroute to the outpost and with luck the airmobile unit could trap Charlie between them. What had started to be a practice mission had turned out to be a night combat airmobile assault.

The air mission commander received his briefing and elected to brief all personnel of the changes after getting airborne. The maps issued at the briefing could still be used with only minor changes, and since time was important there could be no further delay.

At 2120 hours the C&C aircraft was enroute to the new LZ location with the gunships 30 seconds behind him. The flareship was 30 seconds behind the second fire team and the slicks had orders to come airborne 10 minutes after the C&C aircraft. Spacing was important for the smooth operation of the airmobile assault and the safety of night operations.

The flareship was assigned a new sector of flight with the altitude remaining the same. At the same time the high fire team was positioned along the flight path to act as an air control point and release point for the slicks. This was necessary because of the complete lack of good ground checkpoints. As the troop ships passed the orbiting gunships would pick up the slicks and escort them into the LZ. The flareship was instructed to kick out one flare and the low gunship team was ordered to check out the area and establish radio contact with the outpost. The LZ was selected in a large open area with the low gunship team pointing out the touchdown spot void of tall grass and dust.

At this time the slicks were passing the air control point, 5 minutes out of the LZ, with orders to report the release point on a 090 degrees heading. The whole operation was based on wind direction, not only for aircraft landing purposes but also for wind drift of flares and smoke. As the transports passed the air control point another flare was kicked out, and the low gunship team kicked out a large smoke pot, producing a white smoke trail parallel to the landing heading. The flareship gave continuous light as the slicks passed the release point and turned on their inbound heading toward the landing zone.

The flareship was dropping one flare at a time to the south of the inbound heading so that the flare drifted parallel to the landing heading. Each flare was dropped as the preceding one burned out, sometimes causing a momentary blackout. As the slicks approached on short final the flare burnt out. There was a long moment of blackness and a lot of talk on the radios as requests for another flare came from the flight.

The flareship crew kicked out four successive dud flares before light was restored. Somehow the slicks managed to stay together and they were only 10 feet high when the light was restored. It was a terrifying experience to have so many aircraft in a limited area without maneuvering room and not able to see.

The remainder of the mission went smoothly with a climbing left-hand turn out of the LZ and back to home station.

There was the usual afteraction debriefing and, of course, there was much talk about that black minute when all the ships were committed to landing. The debriefing covered all aspects of flare handling and employment. As a result, included in the unit SOP were the procedures to employ at least two flareships on all night airmobile operations and to kick out two flares during critical periods. This was a lesson well learned that night, luckily at no extra cost.

Maintenance

WHEN TREATING CORRODED AREAS

Treatment Of Corroded Areas On Aircraft: Treat corroded areas in the manner prescribed for the type metal involved as follows:

• Treat aluminum alloys by applying a chemical film conforming to military specification MIL-C-5541 to areas highly susceptible to corrosion. (Most solutions made to this specification leave a stain; therefore, it should not be used where appearance demands a bright metal finish.) Clear coatings are available and can be used for unpainted areas. Mixing and application instructions are contained on each can of solution. (Caution: Never use alcohol or materials containing alcohol on magnesium alloys due to severe corrosion effect.)

• Treat magnesium alloys by applying a process for corrosion protection, military specification MIL-M-3171, type 1, in the following manner:

a. Apply solution to affected area with a brush and allow to remain for 1 minute. Add more solution when necessary to keep surface wet. The temperature of the solution must be from 65 to 90 degrees F. (18.3 to 32.2 degrees C.).

b. Proper application time will be the least time required to produce desired finish color (iridescent to dark brown). Treat surface for at least 30 seconds and not longer than 3 minutes. Excessive time will cause deposits affecting paint adhesion.

c. Wipe up solution with a damp, lint-free cloth, frequently rinsing with clean water. Air dry surface. Drying may be speeded by use of low pressure clean air or gaseous nitrogen. (Note: Parts containing bronze, steel or cadmium-plated inserts may be treated by process in *a* through *c* above.)

• Treat ferrous metals (excluding stainless) by applying a cold phosphate solution as follows:

a. Wet clean ferrous metal surface by brushing, spraying, dipping or flow-coating with a solution made by mixing 1 part metal conditioner and rust remover, military specification MIL-M-10578, type II, with 3 parts water. Mix and store solution in glass or earthenware containers. [Note: Temperature of surface and surrounding air should be between 50 and 120 degrees F. (10 and 48.9 degrees C.).]

b. Permit solution to react with ferrous metal and to dry until a gray-white deposit forms on metal surface.

c. Wipe off any dark, sticky residue which remains on surface with a damp rag and allow surface to dry until a white deposit appears.

d. Brush or wipe all excessive or loose powdery deposits from surface.

Reference: TM 55-1500-204-25/1, paragraph 3-44.

Editor's Note: The U. S. Army Transportation School at Ft. Eustis, VA, advises that before treating a corroded area as outlined in paragraph 3-44 of TM 55-1500-204-25/1, the corrosion must be removed as outlined in paragraphs 3-40 thru 3-43 of the same TM.

Which Way? When reinstalling split cones on UH-1D/H models (main or tail rotor), remember that the beveled edge points up on the main rotor (TM 55-1520-210-20, chapter 8, section 2, paragraph 8-3) and points out on the tail rotor (TM 55-1520-210-20, chapter 8, section 3, paragraph 8-11).

Beware Of Dirt! When removing or disassembling a component, exercise care to prevent dirt or other foreign matter from entering the engine. Caps, plugs and temporary

Matters...

covers should be used to cover all exposed openings. Reference: TM 55-1520-220-20, chapter 5, section 2, paragraph 5-27.

Any Unidentified Lines Or Hoses? Before removing any line or hose be sure it is properly identified and its route understood for replacement in same manner. Cap or cover all openings at once to protect the system from contamination. Reference: TM 55-1520-210-20, dated September 1971, chapter 5, section 5, paragraph 5-17.

Wet Transmission? Inspections reveal that water is sometimes found in the OH-6A transmission. Maintenance personnel must ensure that a coat of silicone rubber is installed completely around the structure pan opening and the mast base when installing the mast assembly to the structure pan (edge of mast tube at base). This ensures a proper seal. Reference: TM 55-1520-214-35, page 7-16, paragraph 7-9.

Engine Runup Tip: When performing an engine runup on aircraft equipped with a manifold pressure gauge, check to see that the aircraft indicates the correct rpm for the manifold pressure and propeller setting that is being used for the check. This is because a dead cylinder and other engine malfunctions will be best indicated by an increase in the amount of manifold pressure required to attain a given rpm. Manifold pressure readings for different engines of the same type and model installed on the same type aircraft should not vary over 1 inch Hg at a given rpm when checks are performed in the same geographical location. Reference: TM 55-1500-204-25/1, chapter 5, section II, paragraph 5-53.

U-21 Heater Tip: If MWO 55-1510-209-30/14, improved heater installation (U-21A, RU-21A and RU-21D aircraft), has not been complied with, these steps should be followed to prevent nose section fire when selecting heater operation on the ground:

- Power—ON.
- Defroster control—OUT.
- Vent blower switch—ON.

If air is coming from the outlets, the vent blower is operating properly and the heater may be turned ON.

Torque Valves: Standard torque valves for Army aircraft are not called out in the TM for individual maintenance procedures. The standard torque table in the TM may be used to determine the correct standard torque. In instances where special torque valves are required, the special torque is called out in the assembly instructions for parts which require the special torque. The list of special tools and equipment provided for this type of organizational maintenance is found in TM 55-1520-210-20P.

Water In The Tank? Current procedures during the preflight exterior check of the UH-1 require the crew to place the battery and main fuel switch to the ON position prior to making any checks in area 4 (aft cabin left side). The engine and transmission decks are checked for leaks; the electrical compartment is checked; and the main fuel filter is drained. Meanwhile, the submerged electrical boost pumps have been running for several minutes and any contamination that may have been in the tank sumps will have already recombined with the fuel. Therefore, draining of the tank sumps should be accomplished prior to placing the battery and main fuel switch ON if we really expect to drain any water out of the tank sumps. Reference: TM 55-1520-210-10, dated 25 August 1971, chapter 3, section II, paragraph 3-11, page 3.3.

ARMY AIRCRAFT MOBILE TECHNICAL ASSISTANCE PROGRAM

Leonard E. Clay, DAC
U.S. Army Aviation Systems Command

Six months after completing training, a mechanic may be confronted with maintenance problems on newly introduced and modified aircraft not included in training. AAMTAP is designed to bridge this gap and improve the training of already trained and experienced personnel

SHOULD YOU EXPLORE the archives of Army aviation the necessity for maintenance technical assistance would be readily apparent. Due to the continual evolution of Army aircraft there is a constant need to update the mechanic's knowledge. Six months after completing formal training at Army service schools and aircraft factories the mechanic may be confronted with maintenance problems on newly introduced or modified aircraft which were not included during his training simply because they did not exist at that time. He may discover that the same rotor damper studied in class is no longer used, or it has been modified to the point that his "book learning" on how to time the damper, repair leaks or service the damper has become obsolete. This changing situation can be expected to continue.

Looking at the problem from another point of view it would be impracticable to send all the mechanics back to school constantly for further training. The Army could not afford this extravagance and, on the other hand, aircraft availability among units in the field would be impaired without proficient mechanics on hand to perform required maintenance. Additionally, the rapid turnover of personnel certainly adds emphasis to the need for an "onsite" type of training. These are only a few of the reasons which led to the establishment of the Army Aircraft Mobile Technical Assistance Program (AAMTAP) as a subprogram of the technical assistance program (AR 700-4). The AAMTAP training effort is not directed toward the initial training of mechanics, but rather at improving the techniques of personnel already trained in basic and fundamental aircraft maintenance.

The teams are used to "bridge the gap" for mechanics who are trained up to journeyman level, but due to system configuration changes and/or modifications they again become "apprentices" so to speak. The AAMTAP service adds the polished touch to the mechanic so that he is again capable of journeyman proficiency.

The instructors are capable of performing maintenance; however, their specific function is to provide onsite instruction to others in the latest maintenance techniques, modifications and troubleshooting methods. It is not required, nor is it desirable, that instructors perform actual maintenance on equipment except as necessary to determine trouble areas and/or demonstrate maintenance and operation of equipment. When occasions arise where AAMTAP instructors may attempt to solve an existing technical problem by performance on equipment, in the interest of practical demonstration, they will normally secure permission for such action from local responsible authority.

The necessity of this program is readily evidenced by the improvement in a unit's performance after completion of an AAMTAP visit. With this improvement in maintenance skills there is a definite decrease in aircraft downtime for maintenance and repair parts consumption rate. As a result aircraft availability goes up and customer satisfaction from both operations and support is assured.

While various maintenance training groups were operational in the

early days of Army aviation, the first AAMTAP team went into service in April 1957. During this infancy of this program the curriculum was limited to organizational maintenance. This program was highly successful. Later numerous requests were received for this service to be expanded to include general support as well as organizational maintenance. In early 1958 12 teams were organized—6 for organizational maintenance and 6 for general support maintenance. In November 1958 the first AAMTAP team with a consolidated curriculum (organizational and general support) was put into service. Today all teams have a consolidated curriculum.

Each AAMTAP team is fully qualified to conduct training in any combination of curricula. The curriculum number is the same for all teams; i.e., I for organizational, II for direct support, III for general support. The hours of instruction required for each curriculum usually varies for a specific system or between aircraft systems. As an example, current variation for curriculum I is from 7 to 15 days, curriculum II is from 10 to 20 days and curriculum III from 12 to 25 days, depending on the type and complexity of the equipment involved.

The teams have a built-in flexibility. Any curriculum may be repeated several times at one station or any combination may be presented. The duration of the curriculum is fixed; however, the media for presentation may vary. For example, at one installation the team may present 50 percent classroom instruction and 50 percent practical instruction (the latter includes actual demonstration of maintenance functions using the end item equipment). The next installation may require 85 percent practical and 15 percent classroom work. The service may be tailored to the user's requirements.

The teams are equipped with a complete complement of training materials including current technical manuals, student handouts, aircraft components, projection equipment, charts, viewgraph slides and other training aids as may be required. Prior to arrival arrangements are made for the use of an aircraft and classrooms. With the built-in flexibility the curriculum is tailored to the requirements of the installation. In addition, certain teams are prepared to present a curriculum for more than one system, e.g., OH-58 airframe and T-63 engine.

Control and management of this service is centralized at the U. S. Army Aviation Systems Command (AVSCOM), St. Louis, MO. Within the command the mission is assigned to the directorate for maintenance. Program controls exercised by directorate for maintenance include but are not limited to planning, programing, budgeting, developing schedules, establishing standards for performance, preparing and/or reviewing programs of instructions, evaluating training aids and orientation of new instructors.

Prior to the beginning of the fiscal year, requirements for AAMTAP services are determined through the consolidation of field commanders' requests from which schedules are subsequently developed. Should an installation cancel a training request due to unforeseen or uncontrollable circumstances, the team does not remain idle. The requirements of other installations are coordinated and the schedule adjusted. Schedules are also adjusted to compensate for any new requirements received during the course of the year.

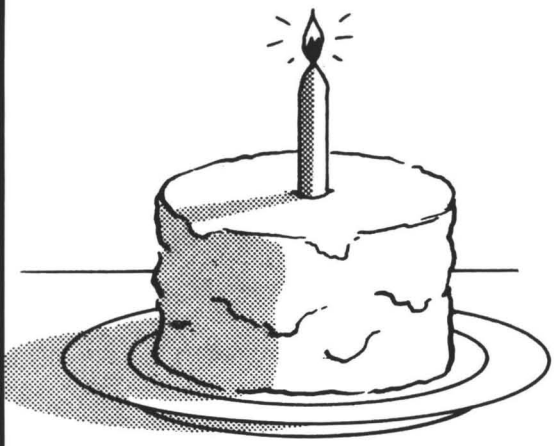
AAMTAP training is available on the following aircraft systems and related engines: UH-1, AH-1G, CH-47, CH-54, OH-6, OH-58, OV-1 and U-21. In addition, limited training is available on the OH-13, OH-23, CH-34 and CH-37.

The objective of this program is to provide sufficient AAMTAP service, within Department of the Army policy guidelines, to meet the requirements of all field customers and through the medium of AAMTAP to update maintenance personnel to the desired proficiency in aircraft maintenance.

The AAMTAP teams have performed in all the major oversea theaters and in all Army areas. Since this program was initiated in April 1957 almost every station in CONUS has been provided this service at one time or another. Some stations have used as many as four different AAMTAP teams. In addition to regular forces the Army National Guard and Reserve Components have and will continue to reap the benefits of this program. An increasing demand is being placed on the AAMTAP teams in support of the National Guard and Reserve Components due to recent policy changes, wherein reserve and guard components were assigned first line aircraft in keeping with an increased role in meeting this nation's commitments.

Today's technological requirements, in conjunction with an austere funding program and the rapid turnover of personnel, are reducing Army aviation maintenance capabilities, yet these pressures must not be permitted to compromise the accomplishment of our aviation oriented mission. Response must be both timely and appropriate.

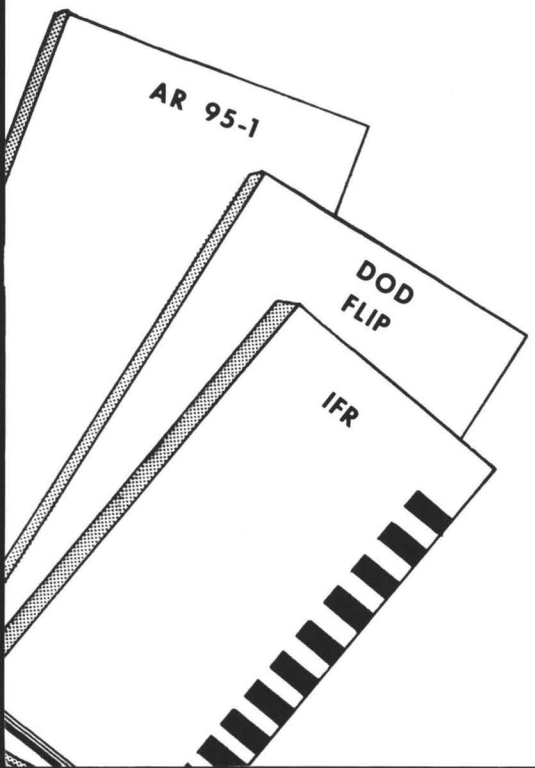
We at AVSCOM feel that the AAMTAP teams, in conjunction with other technical assistance personnel services (Department of the Army civilian maintenance specialists and contractor field service representatives), will play a feature role in the continued accomplishment of the Army aviation mission.



Annual Instrument Checkrides

There are two areas to consider when faced with the annual flight examination: A sound basic knowledge is one; the other is stamina or physical condition. Mental condition, alertness, reaction and other products of the basic areas are the keys to proficiency

CW2 Sammy D. Lanningham



EACH YEAR as the Army aviator prepares to celebrate his birth date, he is faced with the task of renewing his instrument qualification. In some cases this task poses a major problem due to the fact that some aviators are not prepared for the event.

In preparation for the annual flight examination there are two areas to consider. The first being a sound basic knowledge of procedures. A well-rounded general knowledge should be assimilated that leaves the aviator enlightened as to the rules and regulations that govern instrument flight. These rules and regulations can be mastered by constant reference to such publications as Army Regulations (AR 95-1 and 2), the Airman's Information Manuals, DOD FLIPs and the Federal Aviation Regulations. These references are all intended for pilot use and are designed for easy understanding.

We must also think of the practical knowledge that an aviator should possess prior to the checkflight. It is necessary that the procedures be executed periodically not only to attain the minimum set forth for aviator flight time but also to maintain the desired proficiency for instrument flight. The

all too common problem of the aviator coming in for his checkride after spending that 5 days prior attempting to develop his proficiency has resulted in many a sad faced man walking out of a briefing room. Rather than "cramming" as if it were a college final exam, the aviator should expose himself to instrument flight periodically in an attempt to maintain proficiency at a constant level.

The second area to consider in preparation for the instrument checkride is the aviator's conditioning. His physical condition is important because instrument flight, simulated or actual, requires a great deal of concentration and energy. This makes it all the more necessary to follow the habits of plenty of rest and good meals prior to this type of flight. It is truly a discouraging feeling to have one's stamina falter when only 1 hour into a 2 hour flight period.

The aviator's mental condition plays a most important role. His attitude toward the task will have a great effect on his performance. It is important to keep in mind that this flight is not undertaken in an attempt to remove the aviator's privilege to fly, but to check his knowledge and to update him on changes in procedures and regulations. With this thought in mind the aviator should be able to confidently perform his duties on the flight without anticipating the worst as the possible results. It is this anticipation that through experience has proven to be the greatest downfall of the aviator being examined.

As we turn to the execution of the examination, we must discuss planning. Good preflight planning will cut down considerably on that which is necessary in flight. While planning, study the route and become familiar with its characteristics. The more one knows prior to takeoff, the better he will be able to perform in flight. It might be easier if the flight is broken down into segments with each segment terminating at a turning point or some other enroute facility. After this has been done there only remains flying one segment at a time until landing. At any rate establish some flexible method to handle the flight that will conform to the requirements and your ability.

Alertness and reaction go hand in hand on an instrument flight. If a problem is not noticed, it cannot be corrected; therefore, it is important to use sound cross-checking procedures that permit reference to all the instruments. Once a discrepancy is noticed, the important thing becomes the reaction to it. It is not good to react suddenly to a problem as it may only aggravate the situation. Take calm, positive action that will return the aircraft to the desired flight profile. The speed at which the profile is attained is not necessarily as important as the correction made to assume the proper profile.

Now we come to composure, one of the very basic necessities to complete a satisfactory instrument checkflight. If an obvious error is made on the examination, there is little point to being concerned about it after the fact. This can only lead to more errors and more concern which begins to snowball and results in frustration and fatigue on the flight. Remember, once an event has passed, it no longer is of major importance to the remainder of the flight.

After the completion of a checkflight, it is important to maintain at least that level of proficiency throughout the year. This can only be done by constant reference to available publications and periodic exposure to instrument flight. Keeping this in mind, do not become one of the many that spend their week before the checkride in hurried preparation, and then the weeks following in preparation to take their flight a second time.

INSTRUMENT CORNER

Q. On a recent instrument checkride my examiner told me that I was porpoising up and down on the glide slope while executing an ILS approach. How can an aviator determine the best rate of descent to use on an ILS or precision radar approach?

A. There is a method to determine a rate of descent based on the angle of the glide slope and the ground speed while on the approach. Minor variations from this predetermined rate of descent should prevent the vertical "S's" you experienced while on final of your ILS approach. First, refer to the profile view (DOD FLIP Low Altitude Instrument Approach Procedures booklet) for the approach you are using and find the angle of the glide slope. Once you have determined your ground speed for the approach and know the angle of the glide slope, refer to the front of your DOD FLIP Low Altitude Instrument Procedures booklet. There is a chart where the rate of descent (feet per minute) can be obtained by combining the glide slope angle and the ground speed in knots. Interpolation may be required either in the glide slope angle column or the ground speed column.

The same procedure is used for a PAR approach except the glide slope angle is found in the DOD FLIP IFR Supplement.

Annual Award Monthly Winner Contest

Realization

Of A Dream

There are many exciting tours of duty for Army aviators. Among these is the Naval Test Pilot School at Patuxent River, MD (photo right). Once graduated from there, you'll be ready to tackle your next assignment, which may be the most interesting and challenging of your career

CW2 Robert Browning

AS YOU WALK into the operations building your stomach starts to knot with the excitement you have been trying hard to conceal. This is the day for which you have worked so hard for the last 8 months. As you approach the scheduling board you smile to yourself as you notice your name next to the aircraft you requested. Right away you know it will be a good flight.

The door on your left opens and through it walks your observer-checkpilot. You smile and shake hands as you remember the hours of instruction Lieutenant Commander Billue has given you on aircraft performance. He is a tough instructor but fair and you are glad to have him as your checkpilot.

After the introductions you get down to the briefing and preflight planning. About an hour later you hand your flight plan to the chief petty officer in charge. He checks it over carefully and gives his approval. After a sharp, "Have a good flight, sir," you walk into the equipment room and start to dress for your flight.

As you pull on your anti-G suit that knot in your stomach starts to tighten. Maybe it is childish, but you always have gotten a thrill out of wearing that suit. Next, you check your survival gear. Since the major portion of your flight will be over water, you check your MK-2 life vest and your MK-13 smoke flares. LCDR Billue gives you a call and you retrieve your helmet and oxygen mask from your locker and follow him to the crew bus.

The ride out to the aircraft is quiet and you are getting more nervous as you go. After arriving at your aircraft you perform your usual exacting preflight and climb aboard. The plane captain helps you strap to your ejection seat and climbs down. As LCDR Billue calls out the prestart checklist you respond until you start your F-4J's engines. They wind to life and all of your excitement and nervousness disappears. You become all business.

As you finish your before-taxi checklist, you call ground control for instructions. "Patuxent ground navy test 22 school ramp for taxi/takeoff."

At this point you may be thinking that this is an article about the Navy but it's about an Army aviator.

Each year the Department of the Army selects nine Army aviators to attend the 8 month course of instruction at the U.S. Naval Test Pilot School at Patuxent River Naval Air Station, MD. Army aviators are sent to the school to be trained as engineering research test pilots.

Many aviators will agree that Army aviation offers many courses of instruction which are considered difficult and taxing to an individual. Not the least of these courses is the initial entry rotary wing course. As most aviators will agree, learning to fly a helicopter is probably one of the hardest things they ever had to do.

The course of instruction at the U.S. Naval Test Pilot School undoubtedly represents the greatest academic and flight challenge ever presented to an Army aviator. The rigors of this course are directly

shown by the list of subjects which comprise the syllabus of instruction. While all aviators study basically the same subjects in each of the service flight schools, Navy and Air Force personnel attending the Naval Test Pilot School have an advantage in that they have already received extensive classes in such fields as aerothermodynamics and phenomena of transonic flight. Army aviators have not been exposed to such areas due to the Army's total enrollment in the area of rotary wing subsonic aviation.

This is not to say that Army aviators are poorly trained. On the contrary, I believe that we have the finest rotary wing school in the world, but the fact is Army aviators face a greater challenge than their interservice colleagues due to the new and unfamiliar subjects to which they are exposed.

The syllabus of instruction at the Naval Test Pilot School covers an 8 month time span with an actual 480 hours of classroom instruction. Half of each day is spent in the classroom during this time. See figure 1 for a list of courses and the amount of time spent on each.

Figure 1

1. **Math Review (10 hours)**
2. **Calculus (24 hours)**
3. **Mechanics (30 hours)**
4. **Technical Report Writing (9 hours)**
5. **Aerothermodynamics (18 hours)**
6. **Aerodynamics (48 hours)**
7. **Longitudinal Stability and Control (40 hours)**
8. **Instrumentation (10 hours)**
9. **Performance (40 hours)**
10. **Lateral Directional Stability and Control (20 hours)**
11. **Weapons Systems Analysis and Project Planning (38 hours)**
12. **Dynamic Stability (45 hours)**
13. **Jet Engines (40 hours)**
14. **Helicopter Performance and Testing (21 hours)**
15. **Helicopter Stability (20 hours)**
16. **Guest Seminars (12 hours)**
17. **Flight Test Techniques (55 hours)**

The flight program for Army aviators consists of 134.5 hours of flight time comprising a total of 93 flights. These flights are divided almost evenly between fixed and rotary wing aircraft. Some of the various tests a student can expect to perform are fuel consumption, acceleration and maneuvering performance, STOL investigation, rolling performance and high Mach number effects. The rotary wing flight test syllabus is shown in figure 2. The times in figure 2 do not include instrument and night proficiency flights.

Now for the key question: "How does a person get selected for the course?"

First, let's talk of the prerequisites. In the case of this school everyone probably thinks of prerequisites which equal those of astronauts. On the contrary the prerequisites are within the reach of almost every Army aviator. He must—

- Have completed college algebra, physics and calculus with above average grades.
- Be a rated Army aviator on active duty and currently on flight status.
- Be dual rated with a minimum of 1,500 hours military flying time of which 500 hours must be in each category.
- Possess current instrument rating.

Application procedures can be found in DA Circular 351-21 which not only gives the procedures for processing an application, but also guidance for officers in a position to recommend or endorse applications.

Once you have successfully graduated from the Naval Test Pilot School, you will be ready to tackle your next assignment . . . but what might that be? Well, I think we can safely say that the assignments will be some of the most interesting and challenging of an Army aviator's career. He can serve in a variety of jobs from test pilot to project or program manager. His tour of duty is spent at such places as Edwards Air Force Base, El Centro Naval Air Station, CA, and the like. In positions such as these an aviator can contribute to and further his profession for the benefit of all mankind.

I hope this article will generate interest and encourage Army aviators to apply for attendance at the Naval Test Pilot School. Just remember the last few pages you have read could be a "realization of a dream"—yours.

Figure 2

Mission	No. of Flights FW	RW	Hours
1. Jet Transition	15		24
2. Checkout and Familiarization	12	12	37
3. Performance Testing Demonstration	1	1	3
4. Performance Tests	5	7	18
5. Performance Dual		1	1.5
6. Flying Qualities Testing Demonstration	3	4	10.5
7. Flying Qualities Tests	7	9	24
8. Flying Qualities Dual	1	2	4.5
9. Soaring	6		3
10. Variable Stability	3		3
11. Navy Preliminary Evaluation		4	6
TOTALS	53	40	134.5

The Staff Warrant Officer

Captain Warren Domenick

Time—June 1977

Place—A battlefield in Europe

Event—We are at war

THE MILITARY situation seems dark. NATO forces can muster only 13 divisions against an enemy force of 45 divisions.

The enemy advance has been temporarily halted because of logistical problems. Our forces, barely recovering from the initial impact of the attack, are being regrouped and reinforced. A counterattack will be necessary as soon as possible. Some senior commanders have been killed and entire staffs have been destroyed. Units are desperate for leadership. Staff planners are being pooled from all resources . . . including graduates of the Aviation Warrant Officer Career Course (WOCAR).

Views expressed in this article do not necessarily represent those of the Department of the Army

The aviation warrant officer is unique. By definition he is a specialist or technician, a specialist who is directly involved in combat operations. He is the lifestream of the airmobile division. Should he be restricted to only flying for 20 or 30 years? The answer is no.

Just as in our mythical situation, who would be there to respond? It would be the WOCAR graduate. How do we prepare this man for this role?

From its early inception, the Combined Arms Branch of the Aviation Warrant Officer Career Course has relied upon the proponent tactical schools for guidance. Tactics developed by these schools are current. Instructors with military expertise have been assigned and are a tremendous asset. As the art of war is constantly being refined, so is the career course, which remains relevant, accurate and interesting.

The Aviation Warrant Officer Career Course includes approximately 100 hours of company, battalion and brigade tactics in the intermediate course and approximately 115 hours of brigade and division tactics in the advanced course at the U.S. Army Aviation School, Ft. Rucker, AL. This is exclusive of examination and review time. The program covers tactics and staff planning in infantry, mechanized infantry and armor

divisions and also includes instruction in artillery, air defense artillery, close air support, organization and doctrine.

Tactics presentations offer a basic conference and a realistic practical exercise in offense, defense and retrograde. In the exercise the aviation warrant officer becomes an assistant staff officer. He confronts situations, issues orders and develops an operations order.

The artillery portion presents a detailed look at artillery assets of each division, capabilities and limitations of each weapon, air observer techniques and aerial field artillery employment.

Air defense artillery is stressed to relate friendly capabilities to those of the enemy. After all, who will be the primary target of air defense? You guessed it—the aviation warrant officer. Air defense capabilities are discussed from the Nike system at field army to the Redeye at company level. Each is discussed as to its employment, capabilities and organization.

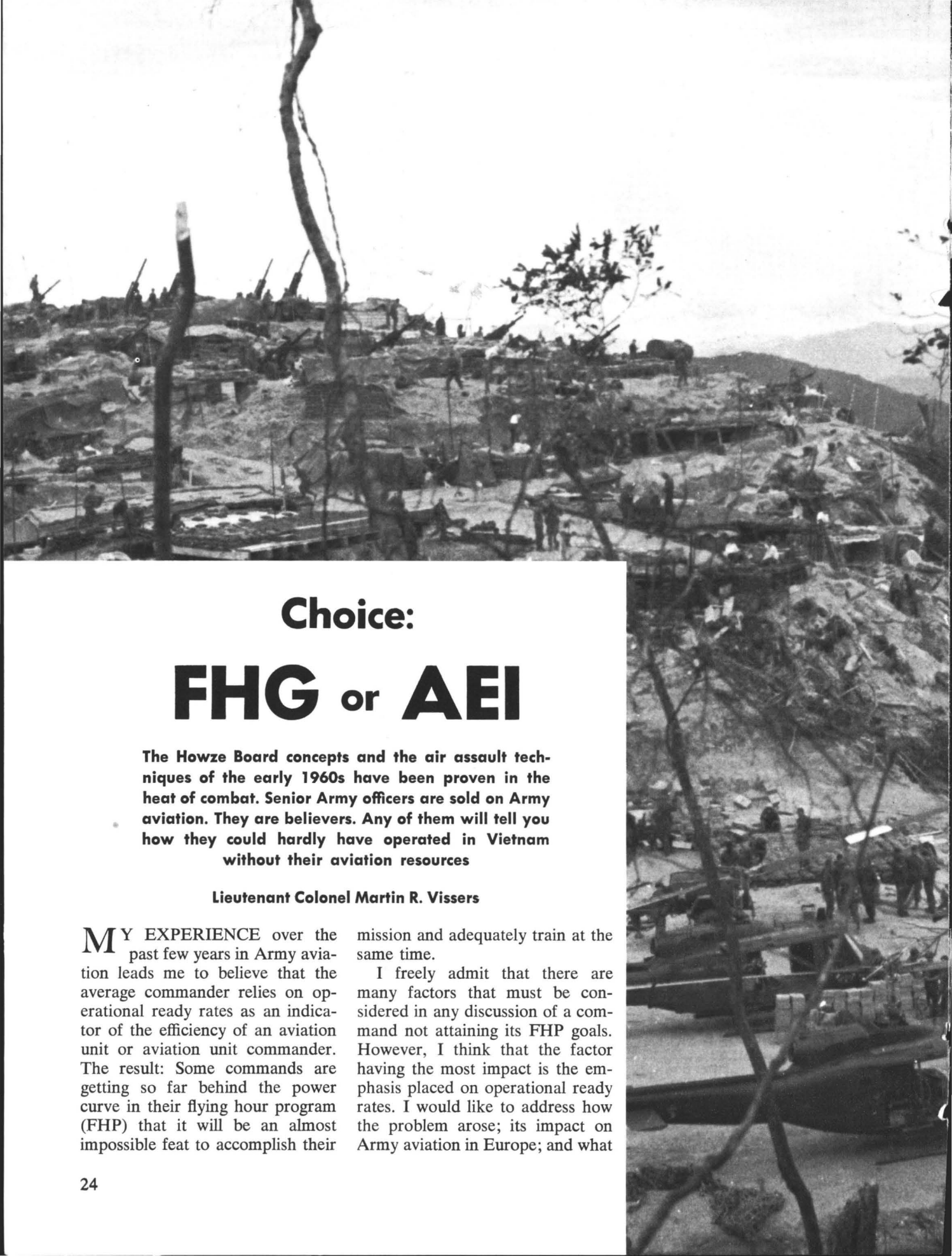
Close air support is the mission of the U.S. Air Force. The course covers the coordination and communication procedures for employment of close air support. In a future class, Air Force organization and types of aircraft will be introduced.

The organization classes also take a close look at the development of the Army division. This development starts at the squad, expands through the brigade and ends at the division base. This is done for each type division.

Doctrine classes act as an introduction to each phase of tactics. Basic definitions, principles and fundamentals are clearly explained.

So far this article has briefly outlined what the aviation warrant officer is offered. Now, what is expected from him? It certainly can expect an enthusiastic approach to each class and a will to learn. Also, once the warrant officer has been graduated his knowledge should not be lost. Periodically, questionnaires are sent to major commands requesting information on how the graduate is being employed. Of course, it will take some time for all commanders to become aware of the graduate's potential, but this recognition is as certain as tomorrow's sunset. Response to these questionnaires has been mixed, but it is up to the graduate to sell himself. As for ability there is no reason why this warrant officer cannot be an assistant operations officer of an aviation battalion. Or, how about a company operations officer?

The U.S. Army Aviation School at Ft. Rucker, AL, awards the graduated warrant officer his credentials in the form of a piece of paper called a diploma. Behind that is a soldier who is a product of time, dedication and pride.



Choice:

FHG or AEI

The Howze Board concepts and the air assault techniques of the early 1960s have been proven in the heat of combat. Senior Army officers are sold on Army aviation. They are believers. Any of them will tell you how they could hardly have operated in Vietnam without their aviation resources

Lieutenant Colonel Martin R. Vissers

MY EXPERIENCE over the past few years in Army aviation leads me to believe that the average commander relies on operational ready rates as an indicator of the efficiency of an aviation unit or aviation unit commander. The result: Some commands are getting so far behind the power curve in their flying hour program (FHP) that it will be an almost impossible feat to accomplish their mission and adequately train at the same time.

I freely admit that there are many factors that must be considered in any discussion of a command not attaining its FHP goals. However, I think that the factor having the most impact is the emphasis placed on operational ready rates. I would like to address how the problem arose; its impact on Army aviation in Europe; and what

can be done to change the trend.

First, consider that the Army's senior commanders are veterans of the war in the Republic of Vietnam and consequently appreciate the importance of Army aviation on the modern battlefield. They know how much they depend on helicopters just to get around, and the command and control (C&C) bird is now a household word that has attained the status of importance that can make the difference on a go/no-go decision.

The commander in Vietnam who had aircraft at his disposal received a daily briefing on their status. What is the operational ready rate today? The aviation unit commander who could maintain a relatively high rate was the "good guy." The operational ready rate was tremendously important because almost every operational ready bird was committed every day. Sure, there were local policies that stated that each lift company was required to provide X number of aircraft, but a commanding officer with an operational ready rate of 88 percent didn't have much to worry about.

Careers were made and unmade over operational ready rates. They were documented, reported, compared, bragged about and on occasion little white lies were told about them. What was the result of all this? It made believers of senior commanders and convinced them that an aviation unit with a good operational ready rate was a good aviation unit. Don't get me wrong. I agree. In the Vietnam environment with unlimited spare parts, almost 100 percent fill on aviators and maintenance types, basically new equipment and all the other manifestations of a high priority combat area, operational ready rates *were* good indicators of efficiency. But now the situation has changed, at least in Europe.

The aviator who flies 70 hours a month in Europe is working hard. With the 8-to-5 VOLAR day, the 5 day noise abatement week, short hops and long waits for VIPs, the Huey or LOH that accumulates 3 or 4 hours on a mission is the exception. This is a far cry from the 10 or 12 hours a day in Vietnam. A PE a month? Hardly. It's more on the order of two or three a *year*.

Well, you say, what are we getting all upset about? If a command isn't flying its FHP, then obviously they don't need that time and savings should be realized in dollars that can be used elsewhere.

Frankly that was my own first impression. Then I started looking at the fantastically high operational ready rates we were maintaining and I decided to see if I couldn't figure out just why we weren't flying any more than we were. Initially I got excuses and reasons why we couldn't fly.

First, it was the weather. You just can't fly in Europe in the winter time. But when considering that statement look at the local Air Force weatherman's chart on days that were VMC, IMC, below minimums, etc. Then ask him about last winter and you will find it was one of the mildest ones on record and if anything the weather (for flying, not skiing) was better than the average winter. I know there was some question about light ice and there was the problem of people without instrument tickets and so on to include the delays encountered in filing a flight plan IFR. But how many who were qualified and had a bird that was qualified really got out and flew? Anyone for a guilty conscience?

The next reason why we don't fly any more than we do is valid in many instances: There aren't enough people to fly the machines that are available. The situation has been pretty well resolved in most units (I'm going to get some nasty letters about that, but it's what DCSPER told me) and we still aren't flying.

How many people are assigned in high time consuming, low flying time jobs that don't really need to be occupied by an aviator? I don't know, but I think some soulsearching needs to be done. And I'm not talking about the man on ground duty doing an Infantry, or Armor, or what have you thing of his own. I am talking about the man who has an "additional duty" of questionable value to his unit, maybe just busy work, that takes a disproportionate amount of his time to accomplish. Is there some way to get him off the battalion A&R officer's job or perhaps off the group promotion board? Get him in the cockpit. How many assistant S-3s do units have that aren't really authorized but are filled by people holding down aviator slots?

The VIP problem is another reason offered as to why we aren't flying. It also has some merit. I know of units with aircraft assigned that had one-fourth of the fleet in maintenance (not too bad), one-fourth on standby for the full colonel, one-fourth on standby for the lieutenant colonel and the final fourth on standby for the major S-3. All of the aviators were standing by just waiting for someone to call "his private chauffeur." Of course I'm being a little facetious; the fleet consisted of four OH-58s, but except for that the story is not only true but also repeated. I don't even recall that kind of VIP treatment for lieutenant colonels and majors in Vietnam. At least I didn't get to see any of the benefits of it.

Am I saying that you should be out boring holes, making tracks around the idiot circle for the purpose of logging time? Not at all, I'm a taxpayer too. I feel that flying time must be used to make Army aviators more professional. Don't make the mistake of hanging your hat on the instrument upgrade program either. You just may find yourself flying *less* . . . considering ground school, a limited number of qualified instructor pilots to give the flying instruction and the requirement for an instrumented aircraft (as opposed to one of the UH-1s I usually get with all the instruments and radios obvious by their absence). It's tough to give instrument instruction when the attitude indicator is just a hole in the panel, or you have to look across to the other side of the aircraft for it (develops a "wide" if not fast cross-check).

What I am afraid of is that we may be dropping back into the pre-Vietnam role that I saw Army aviation in when I got into the program. We were "selling" Army aviation in those days. And that selling job was for the most part to Army people. There were feelings that the commander had to be sold on the value of Army aviation. So we took him to baseball games on Sunday afternoons and served as his junior aide when we flew him to a party. Nothing was really wrong with this, but the *selling time should now be over.* The Howze Board concepts and the air assault techniques of the early 1960s have been proven in the heat of combat. Senior Army officers are sold on Army aviation. If you don't believe it look around and see how many of these senior officers are wearing recently acquired wings. They are believers. Any of them will give you chapter and verse on how they could have hardly operated in Vietnam without their aviation resources.

I repeat, Army aviation is past the selling stage and should be capitalizing on its successful introductory sales program. It is time to capitalize and make profits. Army aviation personnel must show commanders how to integrate their aviation assets into unit training. Army aviators are the commanders' special staff officers on Army aviation. If a commander wants to know something about the health of his command, he goes to his surgeon; if he wants to know about the spiritual welfare of his command, he goes to his chaplain; if he is Infantry like me and he wants advice about artillery employment, he goes to his liaison officer; and so on down the line. If he *is not* coming to you for advice and information on Army aviation, *you* aren't doing your job. And I mean *you.*

How many staff officers have as many opportunities to talk to their commanders about their specialty as Army aviators do? You get to "lock" him up in your aircraft for extended periods of time and can talk to him about your specialty while he is observing it in action . . . a captive audience. He may be able to unplug you but at least he can't get out.

One of the points Army aviators can make to their "captive audience" concerns operational ready rate problems. Here are two proposals that may be discussed. The first would be a flying hour goal (FHG). This would be reflected as the number of hours a unit should have flown during a month. The FHP is already modified in Europe to compensate for the weather. What I would propose is a relationship between operational ready rates and the FHP. If a unit maintains an 80 percent rate or more, it is expected to also make 100 percent of its FHP. When the rate falls below 80 percent, the FHP also would be modified downward. Let me give you an example. A unit has 20 UH-1 aircraft and the FHP is 30 hours per month. With a rate of 80 percent or more average for the month the unit should have an FHG of 600 hours. At an average operational ready rate of 70 percent the FHG is 525 hours. (We assume that at 80 percent the 16 flyables will be able to accumulate 37½ hours per month. At 70 percent the 14 aircraft should still accumulate 37½ hours per month for 525 total.) This

sounds pretty complicated and it is a little. But at least the hangar door won't be locked so that all of the aircraft stay flyable. There isn't a ground unit commander in Europe who won't brag about how he is getting his units out in the field. They could lock the tanks in the motor pool and keep that real high operational ready rate, but they don't. Then why lock up, or at least not fly, the aircraft?

The second proposal would be to discuss establishing an aviation efficiency index (AEI) to relate all the variables of operational ready, FHP, FHG, authorized aviators versus assigned aviators and the same for 67Ns, etc. Then you would have a numerical rating awarded monthly that would give commanders grey hair and I don't know what else.

It is not easy to determine what is really going on, but I fear that Army aviation is regressing to its pre-Vietnam attitude. Gentlemen, there are still tests going on involving concept and hardware. There always will be. The Army is still testing march concepts for the Infantry and attempting to build a better boot. However, the marching has been going on and will continue. Let's not stop marching and wait for TRICAP to be over. Remember that professionally we have proven ourselves. And yet, there are an awful lot of aviators who are really down in the dumps with attitude problems and it shows in the units to which they are assigned. At a recent USAREUR aviator's orientation an aviator asked, "How can I volunteer for the RIF?" We don't need that guy; we can't afford him and we must not tolerate that kind of attitude. Why do we have aviators with such an attitude? Why do we have "not too good" units and aviators down in the dumps? What happens to change that aviator from a hard-charging LOH pilot to a "How can I volunteer for the RIF" type? It could be that it all comes from not having a meaningful mission. By not having a job. By not working hard enough at our chosen profession. It all comes back to one thing: *not flying.*

If the tankers had all their tanks locked up in the motor pool, or had to take the guns off to make them more comfortable to ride in and were called upon to take the colonel for a ride on Sunday, or had to stand by for the lieutenant colonel and the major in case they were needed to take them to a meeting in Heidelberg, they'd have an attitude problem too. However, such is not the case. The tankers go to the field; they go to the ranges and shoot; they actually go on alerts. In short, they practice their craft.

What can you do about it? Yes, *you.* You can become an active user of Army aviation. Remember, we don't have to sell or convince; we only have to show the customer who bought the product how to use it and get his money's worth out of it while he's doing it. Army aviation has been bought. Now it's up to all of the personnel in Army aviation to teach the purchaser how to use the product. You're the expert—get out and do it. Then we won't need to be discussing such things as an FHG or an AEI with our "captive audience."

So, I've really answered by own question. *No,* we don't need an FHG or an AEI *if* we just will tell people what *we* already know . . . how important Army aviation is and what it can do for them.

"Professionally we have proven ourselves." A formation of UH-1 Hueys comes in to pick up members of Company D, 2nd Battalion, 12th Cav during a combat assault in Vietnam

GSE

Roger L. Taylor, DAC
Equipment Specialist
Combat Developments Command Aviation Agency

IN 1942 I was an interested but unenthused spectator observing the birth of Army aviation at Post Field, Ft. Sill, OK. The child was anemic and frail at birth and many prophesied its early demise.

One noteworthy feature of Army aviation's early years was the relatively simple, light, commercial type aircraft which it employed. They required a minimum number of hand tools and ground support equipment which consisted basically of an air compressor and a small wooden box to stand on in lieu of a maintenance stand.

The maintenance and flight personnel of the original Army aviation group were faced with many problems, not the least of which was money to procure needed tools and equipment. Thus, it is easy to understand that the success or failure of this experimental Army service was dependent upon the use of field expedients, "moonlight requisitioning" and borrowing from the local civilian aircraft operators and the Army Air Forces to obtain parts, supplies, special tools, etc.

The early habit of using equipment from civilian and other military services persisted throughout the 1950s. In the early 1960s there was a marked increase in the numbers and the sophistication of Army aircraft. This caused a slight change in old habits and the Army began to recognize that the use of borrowed and outdated equipment was inadequate in the accomplishment of the maintenance mission. Efforts were initiated to obtain adequate ground support equipment (GSE) for Army aircraft to replace outmoded and borrowed equipment and to update existing Army GSE which had always followed the introduction of new aircraft into the Army inventory. The most significant results were achieved during the Air Assault II tests in the early 1960s and the ENSURE program utilized in operations in the Republic of Vietnam. This included the full emergence of an acute awareness that: (1) the practice of procuring GSE to fill the need for the performance of maintenance functions after the aircraft was in service was no longer a desirable or an acceptable method for GSE provisioning, (2) the development of tools and equipment must keep pace with the development of Army aircraft, (3) tools and equipment must be adaptable to variations in operational concepts, and (4) they must be issued to the using units at the same time the aircraft is fielded.

The airmobility concept of operation requires that future GSE be rugged, miniaturized, air transportable and easily operated and maintained in the field. This can be realized only by a continuing program for evaluation, design and development of GSE that will be compatible with current and future aircraft and with the organizational concepts of units to which aircraft are assigned.

JOINT AMC/CDC
WORK GROUP
AVIATION GSE

New GSE Acquisition Panel

- New equip req, dev & nondev
  - by aircraft system
    - multiaircraft
    - peculiar
  - by maintenance concept
  - by categories of maintenance
- Requirements Review
  - Existing QMR/SDR
  - OCO, QMDO, ADO
  - ENSURE, VLAPA
  - APC
- Program Reviews
  - R & D
  - Nondev
  - MACI
  - Testing
  - PI

Maintenance Concept Panel

- New Maintenance Concepts
  - Divisional
    - Airmobile
    - Group mobile
    - Airborne
  - Nondivisional
    - Avn units 12±acft
    - Avn units —12 acft
- Detachment
  - Ground-Universal
  - Airmobile Tailored
- Aircraft Maintenance Facility
  - Airmobile
- Systems Review
  - By aircraft system
    - MAC
  - By environment

Shop & Tool Set Panel

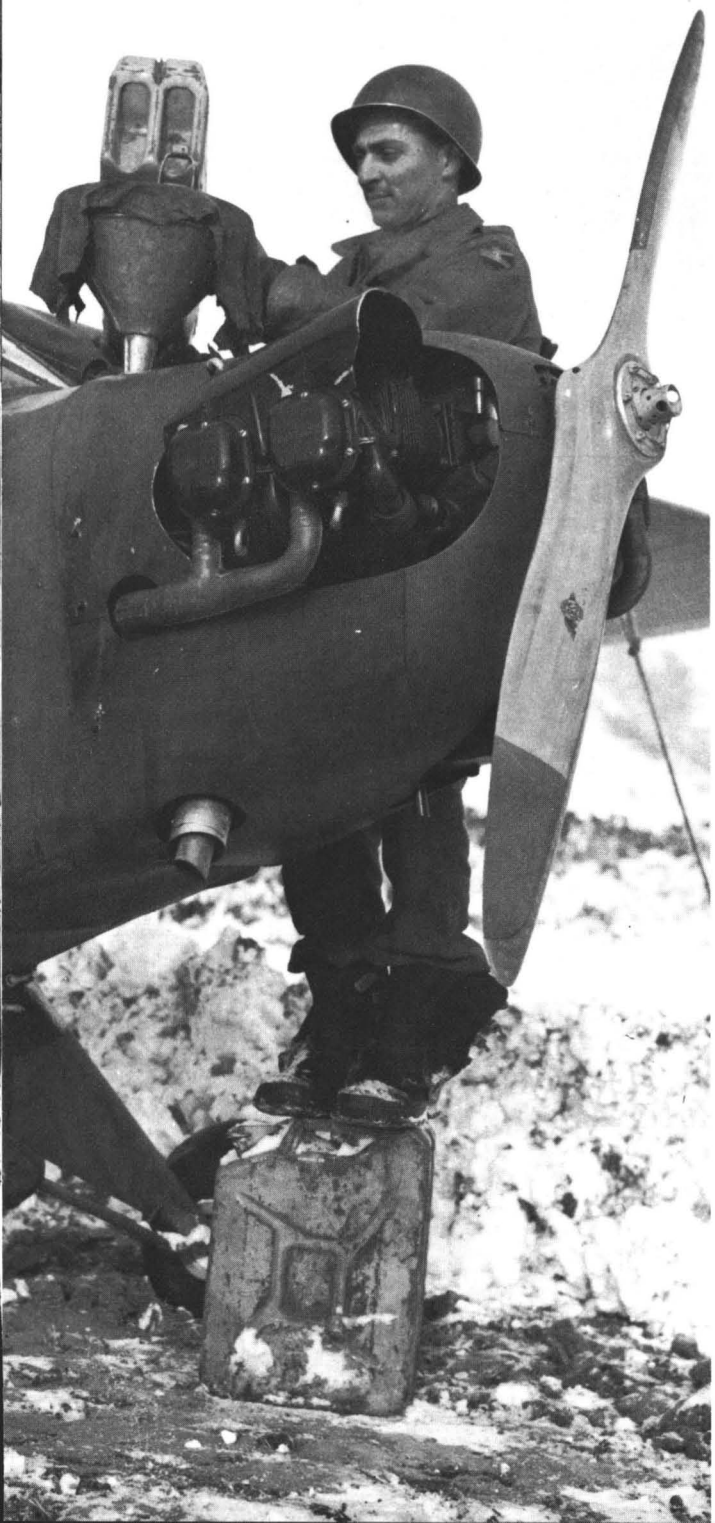
- Review composition to
  - eliminate excess tools
  - add required tools
  - recommend new sets for ET/ST
  - recommend dev of tools/equip
  - recommend PI of tools/equip
- Review configuration of shop sets for
  - each level of maintenance
  - each concept of maintenance
  - transport
  - inclusion of R&D items
- Special and peculiar tools
  - containerization
  - transportation
- Test, Evaluation and Type Classification

GSE Maint Support Panel

- Prepare maintenance support plans
- MOS for GSE
- Training
- Manuals
- Manpower

we've come a long way, baby!

Gone are the days of dope and fabric . . . also the jerry can maintenance stand and similar ground support equipment which today must be as sophisticated as modern Army aircraft



In 1969 the U.S. Army Combat Developments Command (CDC) and U.S. Army Materiel Command (AMC) entered into a joint effort to resolve the problem areas in GSE identification and acquisition. This effort resulted in a Joint Memorandum of Agreement between CDC and AMC whereby a Joint CDC/AMC Work Group for Aviation GSE was formally established. This agreement provides for joint coordination of concepts with technical, logistical and materiel acquisition procedures at the working levels with the aim of expeditiously providing suitable aviation GSE to the users. The general areas of responsibility in GSE were identified and four work panels have been established so that the experts at the working level will accomplish the necessary interchange of information, identify problem areas and resolve these problems at the lowest level possible. The joint work group panels and their areas of responsibilities are listed in the accompanying chart.

Army aviation has grown into a sophisticated and integral function of the airmobile concept for future conflicts. A modern management tool has been provided through the CDC/AMC Work Group for Aviation GSE to ensure that support equipment, tools and concepts are maintained in a current status. The efforts of these panels have already produced beneficial results; however, the ultimate success of the CDC/AMC Joint Work Group is dependent upon command emphasis and the interest and participation of all aviation personnel.

Every officer and enlisted man in Army aviation is urged to utilize the Joint Work Group in defining requirements and assuring that Army aviation GSE has a continuing, viable program. This emphasis and interest will ensure that the two primary problem areas in the aviation GSE program today are improved by:

- Elimination of desultory coordination and exchange of information between the field army, CDC and AMC, and
- Elimination of the "afteraction" procurement of GSE after the aircraft which it is intended to support is in the field.

Anyone who desires to make a contribution, suggestion or comment relative to aviation GSE is encouraged to submit his thoughts in writing to any CDC Agency or to one of the following:

Commanding General, U.S. Army Combat Developments Command, ATTN: CDCMS-V, Fort Belvoir, VA 22060.

Commanding General, U.S. Army Materiel Command, ATTN: AMCRD-FS, Washington, D.C. 20315.

RIGHT SIDE UP, OR UPSIDE DOWN?

Gene Berta
Directorate for Education and Prevention
USAAAVS

AN AVIATOR's flight experience could be expected to determine, at least to some extent, the magnitude of his disorientation episodes—whether they be mild, moderate or severe. Included in this survey of rotary-wing qualified aviators were questions about how many flying hours the helicopter pilot had accumulated, how recently he had flown "under the hood," and how long it had been since he had made an actual instrument flight.

We compared the number of flying hours each rated aviator had accumulated at the time of his disorientation episode with his opinion as to the magnitude of the episode. We found that susceptibility to disorientation was not limited to the aviator with few flying hours, as pilots having accumulated more than 2,500 flight hours reported incidents of disorientation. More low-time pilots responded to the survey than did high-time pilots, and we could not conclude that disorientation decreases as an aviator accumulates more flying time.

Our findings seem to indicate, however, that the disorientation episode tends to become less severe as the time since the aviator's most recent instrument flight decreases. The response showed that, as the elapsed time since the aviator's last instrument flight increased, the magnitude of the episode increased.

This same trend held true for "hooded" flight training. As the elapsed time since the aviator's most recent hooded flight increased, so did the magnitude of his disorientation episode. Table 1 shows the mean-months of elapsed time since the most recent actual and hooded instrument flight. It appears, then, that frequent instrument training tends to lessen the severity of disorientation experiences. These findings appear to substantiate the claim that maintaining instrument flight proficiency is important to the rotary-wing qualified aviator.

One question included 12 activities from which the responder was asked to choose as many as three that would best describe what he was doing at the onset of disorientation. Those activities most frequently selected by both rated and student pilots are presented in table 2. These selections are related to almost every aspect involved in disorientation incidents. The information gained discloses the specific aviator activity, or combination of activities, that heighten the probability of disorientation. Aviators should profit by familiarizing themselves with the cockpit activities in which these pilots were engaged at the onset of disorientation.

A sizable number of aviators described a disorientation episode that occurred when they were flying "under the hood." The frequency of this response is greatest for student pilots in the "mild" category because of the student pilot training environment in which flying under the hood is a regular occurrence. Aviators who experienced disorientation during hooded flight also were involved in activities such as "tuning radio" and "just as I straightened up my head." These activities illustrate the realistic environment provided by hooded flight in that these same movements have been known to cause orientation errors that resulted in major accidents. Frequent instrument flight training again appears to be invaluable in the avoidance of orientation-error episodes.

Furthermore, aviator activities point to the involvement of both psychological and physiological factors in disorientation episodes. A significant number of aviators responded with "relaxed, everything under control," as one of three descriptors of their actions at the time of the episode. This answer suggests that many pilots do not prepare themselves before hand for the possibility of encountering conditions and circumstances conducive to disorientation. For example, 10 pilots experiencing mild disorientation, 15 experiencing moderate disorientation and three experiencing severe disorientation chose the following three items to describe a single experience: (1) "relaxed, everything under control," (2) "looking straight ahead," and (3) "using a single light or star as a guide." These 28 pilots were flying at night, when limited visibility increases susceptibility to orientation error. They were also using a single light or star as a guide, which might have resulted in orientation error through autokinetic illusion. It seems, therefore, that many aviators may ignore, or be unaware of, the various conditions inducing orientation error.

Another psychological condition frequently encountered by aviators is "fascination" when flying. As shown in table 2, 35 pilots in the "mild" category chose both "relaxed" and "looking straight ahead" to describe each experience. In the moderate category, 88 pilots also described each of their experiences with the same items, and 68 selected "looking straight ahead" only. These aviators may have become oblivious to the orientation of their aircraft while their attention was focused on some object removed such as a distant light, other aircraft in formation or some part of their aircraft (fixation on one instrument). Target fixation is one well-known example of fascination in flying. The responses imply that fascination may be a subtle but commonly used path to disorientation.

Other activities reported by the aviators relate to physiological reactions in the flight environment. For example, aviators in all categories reported being engaged in activities that require head movement and thus make the aviator susceptible to "coriolis illusion." The vestibular coriolis effect has been well documented by flight surgeons in professional papers and is usually discussed during lectures on spatial disorientation for the benefit of all aviators, including student pilots. The illusion occurs when the fluid in one set of semicircular canals has come to equilibrium with the walls of the canals, removing any perception of motion since the hair-like receptors on the walls are not bent. When the aviator moves his head, a second set of canals is stimulated as they are moved into the plane of the flight maneuver. The aviator feels deceleration in the first set of canals as they are moved out of the plane of motion. Movement of endolympth (fluid) in two canals induces movement in the third, with a resulting false perception of the true aircraft motion.

The outcome of disorientation caused by the coriolis illusion can be catastrophic. However, activities of the rotary wing aviator shown in table 2 indicate that disorientation is influenced, to a much greater proportion, by psychological rather than physiological factors. That is, the aviator's "frame of mind," including his ability to recognize the clues to impending disorientation, seems to determine his performance in an orientation-error environment.

Initial reactions of helicopter pilots to disorientation were also an objective of the questionnaire. We asked the aviator how he compensated for the feelings of disorientation and gave him the choice of three responses: (1) "Turned controls over to second pilot," (2) "Relied completely on available instruments," or (3) "Ignored the instruments and relied on available visual references."

Both student pilot and rated pilot responses showed similar reaction to their mild, moderate and severe disorientation episodes. Of the student pilots experiencing mild disorientation, 19.7 percent turned the aircraft controls over to a second pilot. This percentage rose to 34.2 percent for moderate and 55.1 percent for severe episodes. Rated pilots reacted somewhat in the same manner as student pilots in that 22.4 percent of those experiencing mild disorientation turned the controls over to a second pilot. This proportion increased to 26.8 percent for moderate

TABLE 1
MEAN-MONTHS ELAPSED SINCE MOST RECENT ACTUAL AND HOODED INSTRUMENT FLIGHT
(Median Shown in Parentheses)

MAGNITUDE OF EPISODE	ACTUAL	HOODED
Mild	3.27 (1.63)	3.42 (2.00)
Moderate	3.71 (2.21)	3.87 (2.96)
Severe	4.06 (3.13)	4.17 (3.83)

This is the second in a series of articles based on a soon-to-be published technical report, "Disorientation in Rotary Wing Aircraft: An Appraisal of the Experiences of U.S. Army Rotary-Wing Qualified Aviators," by Stewart Lyons, Emil Spezia and LTC Charles Mateer, Applied Research Division, Directorate for Technical Research and Applications, U.S. Army Agency for Aviation Safety, 1972. This report analyzes the answers of over 5,500 rotary wing aviators who responded to a survey questionnaire on disorientation experiences.

TABLE 2
AVIATOR ACTIVITY PRIOR TO DISORIENTATION

STUDENT PILOT						RATED PILOT					
MILD		MODERATE		SEVERE		MILD		MODERATE		SEVERE	
n	Activity Just Prior To Episode	n	Activity Just Prior To Episode	n	Activity Just Prior To Episode	n	Activity Just Prior To Episode	n	Activity Just Prior To Episode	n	Activity Just Prior To Episode
108	On instruments Under the hood	88	On instruments Under the hood	14	On instruments Under the hood	46	On instruments	88	Relaxed Looking straight ahead	19	Looking straight ahead
43	Under the hood	35	Looking straight ahead	6	Relaxed Looking straight ahead	35	Relaxed Looking straight ahead	68	Looking straight ahead	17	Relaxed Looking straight ahead
34	Relaxed On instruments Under the hood	23	Relaxed Looking straight ahead	4	Looking straight ahead	31	Looking straight ahead	46	On instruments	9	On instruments
23	Relaxed Looking straight ahead	22	Under the hood	4	Under the hood	31	Looking out side window	36	Looking out side window	9	Looking out side window
21	Relaxed	15	Looking out side window	3	Looking out side window	22	Relaxed Looking out side window	29	Relaxed Looking out side window	9	Relaxed Looking out side window
20	Looking straight ahead	14	Relaxed On instruments Under the hood	3	Relaxed Look/straight ahead Look/side window	21	Relaxed On instruments	25	In formation/maintaining contact with A/C ahead	8	In formation/no contact with A/C ahead
14	Looking out side window	14	Looking straight ahead Single light, star	3	Relaxed Under the hood On instruments	19	On instruments Under the hood	24	Relaxed	5	In formation/maining contact with A/C ahead
12	Relaxed Looking out side window	13	Relaxed	2	Using single light or star as guide	16	Relaxed	17	Relaxed On instruments	5	Looking straight ahead Look/side window
8	Under the hood Just straightened up my head	13	Relaxed Looking out side window	2	Relaxed Looking out side window	15	In formation/maintaining contact with A/C ahead	15	Relaxed Look/straight ahead Single light, star	4	Look/straight ahead Formation/contact with A/C ahead
8	Look/straight ahead Using single light or star as guide	11	On instruments	2	Look/straight ahead Using single light or star as guide	14	Under the hood	15	On instruments Under the hood	4	Look/straight ahead Using single light or star as guide
8	Just straightened up from lowering my head	11	Relaxed Look/straight ahead Single light, star	2	Relaxed Look/straight ahead Straightened up	10	Relaxed Look/straight ahead Single light, star	14	Look/straight ahead Formation/contact with A/C ahead	4	Relaxed Look/straight ahead Look/side window
7	On instruments	9	Look/straight ahead Looking out side window	1	Look/straight ahead Looking out side window	7	Relaxed Look/straight ahead Look/side window	13	Relaxed Look/straight ahead Look/side window	3	On instruments Under the hood
6	Relaxed Look/straight ahead Single light, star	5	Under the hood Just straightened up my head	1	Relaxed Look/straight ahead Formation/contact	7	Relaxed On instruments Under the hood	13	In formation/no contact with A/C ahead	3	Relaxed Look/straight ahead Single light, star
5	Relaxed On instruments	4	Relaxed Look/straight ahead Look/side window	1	Look/straight ahead Relaxed Straightened up	7	Look/straight ahead Looking out side window	12	Look/straight ahead Using single light or star as guide	3	Using single light or star as guide
5	Relaxed Look/straight ahead Straightened up	4	On instruments Under the hood Straightened up	1	Tuning radio Relaxed	6	Relaxed Look/straight ahead Formation/contact	11	Look/straight ahead Looking out side window	3	Look/side window Formation/contact with A/C ahead
4	In formation/maintaining contact with A/C ahead	3	Relaxed Under the hood	1	In formation/maintaining contact with A/C ahead	5	On instruments Just straightened up my head	9	Look/straight ahead Formation/no contact with A/C ahead	3	Relaxed On instruments Under the hood
4	On instruments Under the hood Straightened up	3	Look/straight ahead Just straightened up my head	1	Relaxed	5	Relaxed Look/side window Formation/contact	8	Relaxed Look/straight ahead Formation/contact	3	Relaxed On instruments Look/side window
4	Using single light or star as guide	3	Look/side window Using single light or star as guide	1	Relaxed On instruments	5	Using single light or star as guide	8	Look/side window Just straightened up my head	2	On instruments Just straightened up my head
3	Relaxed Under the hood	3	In formation/maintaining contact with A/C ahead	1	On instruments	5	In formation/no contact with A/C ahead	7	Look/side window Using single light or star as guide	2	Look/straight ahead Just straightened up my head
3	On instruments Just straightened up my head	3	Look/side window Just straightened up my head	1	Look/side window Just off gauges	5	On instruments Tuning radio Under the hood	7	On instruments Just straightened up my head	2	Relaxed On instruments Look/straight ahead
3	Just off gauges/ trying to make contact	3	On instruments Tuning radio Under the hood	1	Relaxed Just off gauges Straightened up	5	On instruments Looking straight ahead	7	Under the hood	2	On instruments Look/straight ahead Just off gauges
3	Tuning radio	3	Just straightened up from lowering my head	1	In formation/no contact with A/C ahead	4	Just straightened up from lowering my head	6	Look/side window Formation/contact with A/C ahead	2	Relaxed Look/straight ahead Formation/contact
3	On instruments Look/straight ahead Under the hood	3	Relaxed Just straightened up my head	1	Relaxed Look/straight ahead Single light, star	4	Tuning radio	6	Relaxed On instruments Look/side window	2	Relaxed Look/side window Single light, star
3	Relaxed Look/side window Single light, star	2	Relaxed Look/side window Single light, star	1	Just straightened up from lowering my head	4	Look/straight ahead Formation/contact with A/C ahead	6	On instruments Look/straight ahead Look/side window	2	Look/side window Formation/no contact with A/C ahead
3	Look/side window Just straightened up my head	2	Under the hood On instruments	1	Just off gauges/ trying to make contact	4	Relaxed Look/side window Just off gauges	5	Relaxed Look/side window Formation/contact	2	Relaxed Just straightened up my head
2	Look/straight ahead Looking out side window	2	Relaxed Just off gauges			4	Just off gauges/ trying to make contact	5	Relaxed Just straightened up my head	2	Looking out side window Just off gauges
2	Tuning radio Just straightened up my head	2	Relaxed On instruments Look/straight ahead			4	Look/side window Formation/contact with A/C ahead	5	Relaxed Formation/contact with A/C ahead	2	Looking straight ahead Just off gauges
2	Relaxed On instruments Look/side window	2	Relaxed Look/side window Formation/contact			4	Relaxed Under the hood	5	Just off gauges/ trying to make contact	2	Look/side window Relaxed Formation/contact
2	Relaxed Just off gauges	2	Relaxed Using single light or star as guide			3	Relaxed Formation/contact with A/C ahead	4	Looking out side window Just off gauges	2	Look/side window Just straightened up my head

(n = number of pilots selecting activity)

TABLE 3
ATTITUDE OF ROTARY WING AVIATORS UPON REALIZATION OF DISORIENTATION

Attitude	STUDENT PILOT RESPONSES (Percent) Total	Mild	Moderate	Severe	RATED PILOT RESPONSES (Percent) Total	Mild	Moderate	Severe
(1) Would not have relinquished controls	62.8				58.5			
a. Felt capable		75.9	22.9	1.2		59.5	38.3	2.2
b. Felt uneasy		63.1	36.3	0.6		49.2	46.1	4.7
c. Felt quite uneasy		43.6	50.0	6.4		12.2	66.7	21.1
(2) Would have relinquished controls	37.2				41.5			
a. Felt uneasy		19.3	61.4	19.3		5.9	69.4	24.7
b. Felt quite uneasy		33.3	53.4	13.2		27.5	52.3	20.2

episodes and 37.3 percent for severe episodes. Response to this question indicates the importance of dual, rather than solo, flight.

Confusion of lights and stars, false horizon, depth perception, relative motion, autokinesis and flicker vertigo are typical illusions that make dependence on visual references during conditions of poor visibility dangerous for aviators. Despite flight-training emphasis on "believing the instruments," one out of every five student pilots and rated pilots relied on visual references outside the aircraft during his disorientation episode. Responses indicated that more aviators tended to rely on outside visual references as the magnitude of the episode increased: one out of every four student and rated pilots experiencing severe episodes relied on outside visual references.

The dangers of an aviator's reliance on visual references rather than aircraft flight instruments become evident when these findings are compared with the outcome of the disorientation experience (accident, incident, forced landing, precautionary landing, etc.). In three major accidents described, pilots had relied on available visual references while ignoring their instruments.

Each aviator was then asked to choose one of the following statements as best reflecting his confidence and attitude when he first noticed disorientation:

"1. Felt completely capable of continuing flight with no difficulty.

"2. Felt a little uneasy, would not have turned controls over to a second pilot had he been aboard.

"3. Felt quite a bit uneasy, and would have turned controls over had a second pilot been aboard.

"4. Felt uneasy and turned controls over to a second pilot.

"5. None of these. Explain."

We tabulated responses 1 through 5 in the categories of student pilot, rated pilot and magnitude of disorientation episode. We then bracketed these five items into two groups as shown in table 3: (1) those aviators who would *not* have relinquished control of the aircraft and (2) those aviators who would have, given the opportunity.

Responses from both student pilots and rated pilots show very similar trends through mild, moderate and severe disorientation episodes. Many of the student and rated pilots would have turned the aircraft controls over to a copilot had the opportunity existed. These responses emphasize the importance and inherent safety of dual flight (as opposed to solo flight) when flight conditions are conducive to orientation error.

In summary, we believe that the survey findings presented in this article form a basis for the following conclusions:

- Frequent instrument flight training appears to lessen the severity of disorientation experience and provides a realistic environment in which the rotary wing aviator can learn to avoid orientation error.
- Aviator familiarization with conditions and circumstances conducive to disorientation would assist in preparing him to cope with disorientation.
- The aviator's frame of mind, including his ability to recognize clues to impending disorientation, seem to determine his performance in a disorientation environment.
- Fascination with some object removed from the aircraft appears to be a subtle but common cause of disorientation.
- Many orientation errors occur because a pilot relies on some outside visual reference rather than on his instruments.
- The safety aspects of dual (as opposed to solo) rotary wing flight are significant in that many disoriented aviators would have turned the controls over to another pilot had one been in the cockpit.

If you have a question concerning aviation accident prevention, write to
CO, USAAAVS
ATTN: Orval Right
Fort Rucker, AL 36360

Crash Facts Messages

When must other forces be included as addressees on crash facts messages?—ASO

The answer is found in paragraph 4-2d of AR 385-40 which states, "When crash facts messages are dispatched pertaining to aircraft common to the U.S. Navy and/or U.S. Air Force, the commander, Naval Safety Center, Norfolk, Virginia, and/or the Deputy Inspector General/Safety, Norton Air Force Base, San Bernardino, California, will be included as addressees. (1) Aircraft common to U.S. Navy: AH-1, OH-58, OH-13, C-45, C-47, T-28, UH-19, UH-1, CH-34, CH-37, P-25. (2) Aircraft common to U.S. Air Force: OH-13, O-1, T-41, C-45, C-47, UH-19, T-28, U-6, U-9, U-10, UH-1, CH-21, CH-34."

Missing Aircraft

What regulation states when a missing aircraft will be classified as a missing aircraft accident or a missing combat loss?—CO

AR 385-40. Pertinent paragraphs are quoted for your information.

Paragraph 2-8a(2)(d): "Damage to an aircraft as a direct result of action by a hostile or belligerent force is not an accident but a 'combat loss' when one or more of the following conditions exist: damage or loss on the ground or in the air by enemy fire or sabotage; damage or loss due to evasive action taken to avoid enemy fire; or failure of an aircraft to return from a combat mission when its last known position was over enemy territory."

Paragraph 2-8b: "(6) *Missing Aircraft.* An aircraft not accounted for within 24 hours will be considered to have been involved in a major accident, unless it qualifies as a combat loss under the provisions of 2-8a(2)(d). (7) *Abandoned Aircraft.* An aircraft mishap which occurs in a remote area where recovery is impossible or impracticable. (Examples: Lost at sea, aircraft in area controlled by unfriendly forces, etc.) This mishap will be reported as a major accident."

Paragraph 4-4d(4): *"Abandoned and Missing Aircraft.* If an aircraft is abandoned or missing, the investigation board composition will be the same as for a major accident. The accident board will investigate and report all facts and circumstances on DA Form 2397 series even though the aircraft and/or wreckage is not available."

JP-4 Tankers

I noticed that Pershing missile batteries have JP-4 tankers. Can I refuel my aircraft from these tankers? —Aviator

No. These tankers contain the same JP-4 used in aircraft, but they do not have the required filters used on all aviation refueling tankers.

Survival Gear

As the G4 with an advisory team, I am responsible for handling the team's supply needs. Many of the advisors fly with their counterparts (Vietnamese) on VNAF aircraft. With the draw-down and the small size of our team, publications and information are hard to come by. We need a list of publication numbers for survival gear. Any assistance you can give us will be appreciated.—G4

We believe the following information should be of help. CTA 50-901 lists survival gear and the authority to requisition those items of equipment. Survival vest, SRU-21/P, FSN 8465-177-4819, is now Standard A worldwide and is currently available minus the lensatic compass. SB 700-50 lists authorized expendables, nonreportable items and replacement items for survival kits. SB 700-20 lists Army-adopted items. Note that items other than TOE/TDA must be listed in section 1 of the unit's TOE/TDA.

USAAAVS AAPC

I understand there has been a change in the procedure to be followed when applying for the USAAAVS Aviation Accident Prevention Course. What is the new procedure?—Aviator

An active duty (or reserve) officer or warrant officer submits a request for the USAAAVS Aviation Accident Prevention Course to his CO. The application is then forwarded to his major command for approval. Quotas have been allotted to the major commands for both active and reserve personnel. Applications for the Army Aviation Safety Officer's Course conducted at the University of Southern California should be forwarded through channels to your respective branch. Quotas for this course are controlled by the Office of Personnel Operations in Department of the Army.

PSP Accidents

During my career as an aviator, I have witnessed several aircraft accidents and near misses which were caused by helicopter skids catching on PSP. I have heard of other such accidents. My question is this: What can be done to prevent this type of accident? —Aviator

Prevention of accidents of this type requires both constant landing-mat maintenance and vigilance on the part of the flight crews.

The metal landing mats must be properly secured to the surface and free of obstacles that might present a hazard to aircraft operation. A good application of nonskid paint to the mats helps to keep them from becoming slippery as a result of the accumulation of water or fluids associated with aircraft.

Flight crews should be made aware of the hazards involved, especially with helicopters equipped with skid-type landing gear. As you have mentioned, skids are particularly susceptible to hooking the metal mats or other obstacles such as stakes. However, aircraft with the wheel-type landing gear are not exempt from problems, as demonstrated by an accident in which one CH-47 started sliding on a slippery metal landing mat and ended up a total loss.

You may be interested to know that during calendar years 1967-1971, 119 aircraft were involved in mishaps during operation from metal landing mats, including the CH-47 just mentioned. Most of these occurred when skid shoes hooked on a landing mat, or on stakes securing the mat to the surface.

Seals and Gaskets

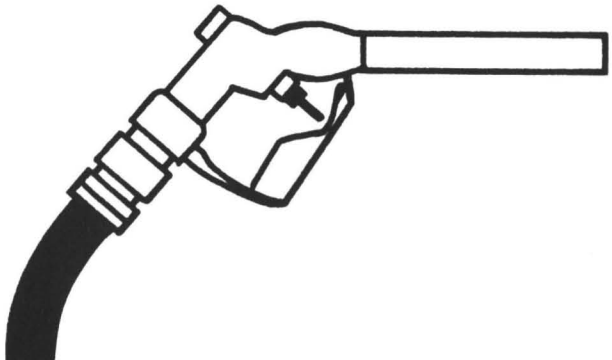
Is the shelf life of seals and gaskets specified in a publication?—Maintenance NCO

According to TM 55-1500-204-25, there is no longer any shelf life imposed on seals and gaskets.

Tiedown Procedure

Where do you find the proper procedure for tieing down the main rotor blade on an OH-58?—Crewchief

The dash 20 manuals for the various aircraft outline the correct procedure.



REGULAR OR

WHEN YOU DRIVE up to a service station, you usually specify the amount and type of fuel you want. If you don't, the attendant will usually ask. Occasionally, you may find an untrained attendant who will try to guess what you want; or your wife may pull into a self-service station to save a few cents. In either instance, you may wind up with the wrong kind of fuel.

If your car's engine requires ethyl gasoline and the tank gets filled with regular, you won't drive far before you realize the performance of your engine is below par. Although the wrong fuel in your automobile is harmful to your engine, it won't endanger your life. However, the wrong fuel in an aircraft not only can damage the engine, but also can endanger the lives of the occupants. Such was the case of the U-8D that was refueled with JP-4.

The copilot went to the aircraft to supervise refueling. The U-8D had not been refueled after either of two previous missions. The fuel truck driver who was instructed by the fuel supervisor to refuel the aircraft arrived shortly after the copilot. During the fueling operation, the pilot arrived and both he and the copilot assisted with the hoses on the truck. It was daylight but neither crew member realized the fuel truck contained JP-4, although it was plainly marked. The U-8 was serviced with 74 gallons of JP-4. This constituted an approximate ratio of 40 percent aviation gas and 60 percent JP-4. The fuel truck driver made entries in his log and left. The copilot made an entry on the dash 13 (in an improper block) and placed the log book back in the aircraft.

Starting, taxi and runup were normal and were conducted in accordance with the checklist. The aircraft departed and almost immediately the No. 2 engine began to run rough. The pilot canceled his IFR clearance, decreased carburetor heat to smooth the roughness, made some power changes and requested a new IFR clearance. Aircraft performance (during the remainder of the 65-minute flight), approach, landing and shutdown were all normal. All landing and shutdown checks were made in accordance with the checklist.

The U-8 was not refueled during the 60-minute stay on the ground. The crew reentered the aircraft, started the engines (using the checklist) and obtained taxi/takeoff clearance. Runup at the departure end of the 9,000-foot runway was satisfactory and takeoff was made without use of carburetor heat.

Two minutes after takeoff, at about 900 feet MSL (600 feet AGL) while in a left turn, the No. 2 engine quit without warning. Gear and flaps were up, air speed was about 120 knots, manifold pressure was 45 inches Hg and rpm was 3200. The pilot reduced power, feathered No. 2 propeller and began a gentle right turn. He called the tower and received permission to bypass the city. He later asked to reenter normal traffic for the same runway used during departure. Sight of the airfield was lost momentarily and, during this time, the No. 1 engine began to run rough. The pilot began a right turn, saw the lights from the field and realized he was too low to make it. He selected a road to land on but, after seeing it was lined with poles, altered his course toward a dark area to the right and approached it without landing lights.

Three to 5 minutes after loss of No. 2 engine, the aircraft descended into an area with a few scattered

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USAAAVS

ETHYL?

trees. After striking two small trees, it slid 189 feet, turned 90 degrees, crashed through a picket fence and came to rest in the front yard of a residence. Neither crew member was seriously injured and there was no fire.

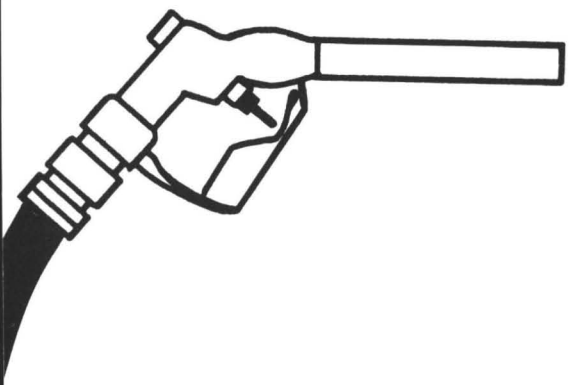
The pilot was a dual-rated senior Army aviator with over 2,100 flying hours and was an instrument examiner. His transition into the U-8 had not been made within the required 90-day period and he did not have the required 15 hours of pilot flying time. His DA Form 759 showed only 12.6 hours of flight in the U-8. Entry errors by the IP reduced this time to 9.3 hours, with no indication of night flight. The pilot's final grade slip showed he had 18 hours dual and one hour solo, but this was not substantiated by either the 759 or the dash 12. He received his initial qualification check ride 8 months before the accident. Records did not show that he had received the required 180-day standardization check ride. These things, combined with an unqualified copilot, may have overtaxed the pilot's ability to cope with the emergency.

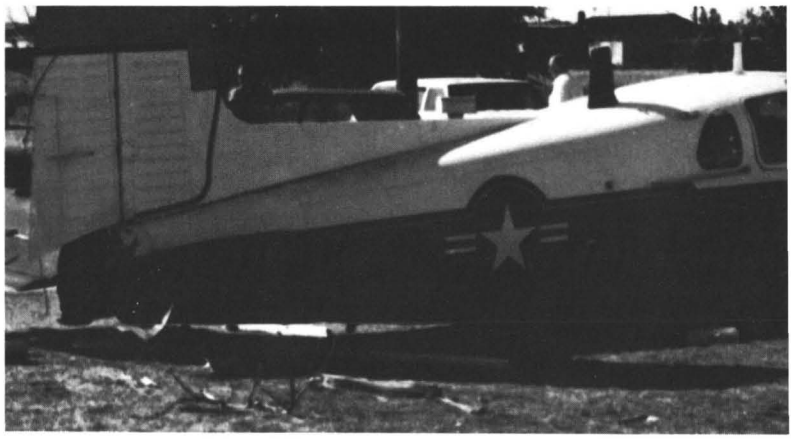
The copilot was rated as an aviator 12 months before the accident. His total flight time was less than 300 hours and he had accumulated only 4 hours as first pilot in the U-8. His low flying time and lack of U-8 experience probably caused him to be of little value to the pilot during the emergency. The pilot made all radio transmissions and performed all other actions in the cockpit prior to the crash.

Interview with the fuel truck driver during the accident investigation revealed several noteworthy facts. He had been working about 2 months as a POL handler. He had a helicopter mechanic MOS and had no training or schooling in POL handling except OJT, and very little of that. He had never seen a U-8 or U-21 before being assigned to the unit, but had refueled one of each since assignment and had been turned loose (on his own) as a POL handler without close supervision. No one had ever helped him or pointed out the differences between a U-8 and a U-21. When he went to refuel the U-8, he was unconcerned as to what type aircraft it was because he understood the fuel supervisor to say (while pointing at the aircraft through a window), "Go refuel that U-21." He checked a chart and found that a U-21 uses JP-4.

It was still daylight when he refueled the aircraft and the crew assisted him with the hoses on the JP-4 tanker. When he discovered he had mistakenly put JP-4 in the U-8, he knew the records should agree, so he went back and changed the JP-4 tanker log book to read "115/145." He then went back to the POL office and started worrying about what he had done. He was too scared to discuss it with anyone, so he continued to buff the floors he had started on before refueling the aircraft. About 10 minutes later, the dispatcher told him he didn't have to worry about refueling the aircraft because it had just crashed. The truck driver later stated that he then "put the buffer away" and told them he was leaving for the night. During the interview he was asked if anyone had ever briefed him on contaminated fuel and he said, "What do you mean by contaminated fuel?"

During an interview with the fuel supervisor, the following questions and answers were recorded.





Question: Do you feel that the fuel truck driver was thoroughly trained and competent to be out there on his own, refueling the aircraft?

Answer: I feel he was.

Question: But yet you feel he could have assumed that was a U-21 out there?

Answer: Well, yes, I feel he could have assumed that was a U-21, mainly because I think he got it in his head it was a U-21. That's what he thought it was before he ever went out to look at it.

Question: Where did he get that idea?

Answer: Well, I've talked to him before. He thinks I said U-21; I think I said the other. I'm not going to deny that it's possible I said it.

This accident began with the refueling operation at home base prior to the flight which ended in the accident. Engine analysis showed no discrepancies in No. 2 engine which might explain its failure. It was concluded that the JP-4, while being pumped into the fuel tanks of the U-8D, mixed with the 115/145 aviation gasoline (already in the tanks) by the force of the nozzle expelling the JP-4. This resulted in a fuel mixture of lower octane rating than 115/145, but still sufficient to sustain near normal operating conditions with both engines running.

During the flight to destination and the subsequent ground time there, the fuel settled and separated slightly, due to differing specific gravities. The JP-4, being heavier, tended to settle in the bottom of the tanks at the engine outlet sump. The engines were able to function satisfactorily for several minutes during taxi, runup and takeoff for the return flight. At some point after takeoff, the No. 2 engine received an input of fuel so concentrated with JP-4 that it caused complete engine failure, and the No. 1 engine was unable to maintain normal operations. Preignition began to occur and there was inadequate power to sustain level flight. From that point on, the aircraft was destined to return to the ground.

At the time of engine failure, the pilot was initiating a left turn (in the direction of the city). This placed the No. 2 engine on the outside wing in the turn, the most desirable condition to enable sustained level flight while turning. In an attempt to avoid overflight of the city, the pilot rolled into a right turn. This action required more power to maintain the same altitude and air speed and materially increased the radius of the turn. In addition, he became momentarily disoriented due to the change of direction, the loss of the city lights and the in-cockpit actions to feather the No. 2 propeller.

Crew testimony revealed that neither aviator could locate the airfield for some time. Radio transmissions to the tower did not, at any time up to impact, reveal to the tower operators that the U-8D had lost an engine or that any sort of emergency existed.

The accident investigation board determined that neither the pilot nor copilot was qualified in the U-8D, and that neither physically checked the contents of the aircraft fuel tanks following the last refueling, other than to visually check for quantity. The pilot should have been aware that he had not flown a sufficient number of hours to qualify in the U-8 and had not flown at night with an IP as part of the transition, within the required 90-day period. The copilot was also airfield operations officer and should have been aware of the fuel truck status. The only tactical tanker on the airfield contained JP-4, and was the one from which the U-8 was refueled.

The board also determined that supervisory error was a factor in the following areas:

- Local refueling SOP requires crewchief to make

When told the aircraft had crashed, the fuel truck driver put his buffer away and left for the night

refueling entries on DA Form 2408-13, but makes no provisions for entries in the event the crewchief is not present.

• There is no comprehensive training program for unskilled personnel who are required to perform duties in the POL servicing section.

• There is inadequate supervision of POL dispensing personnel who are known to be untrained in fuel servicing activities.

• There are inadequate controls on local requirements for 180-day standardization check rides to ensure they are conducted when required.

• There are insufficient checks made on DA Forms 2408-12 to detect erroneous entries by flight crewmembers prior to transcription onto DA Forms 759.

• There are inadequate provisions to verify compliance with appropriate training circulars to ensure that DA requirements for transition in various aircraft are properly carried out.

• There is no method by which crewmembers can verify the type fuel placed in an aircraft after the fuel truck departs the area of the aircraft.

Among the investigation board's recommendations were:

• A method should be devised which will ensure that improper fuel type/grade cannot be placed in aircraft. Method should allow for execution by semi-skilled POL handlers. Part of the plan should include a technique to provide the aircraft commander with a sample of the fuel dispensed into the aircraft, to be available from the time when refueling is completed until preflight inspection begins. An additional requirement should exist worldwide for a color-coded marking near the fuel filler cap and a like marking within the pumping compartment of the tank truck to specify fuel grade requirements for the type aircraft and fuel content of the dispensing vehicle.

• Unit SOP should be amended to require the POL section member who dispenses fuel into an aircraft to make the entry in DA Form 2408-13. This provides a double check on the fuel grade requirement for the POL dispenser. Crewmembers should check the entry for correctness.

• The aviation division should establish a comprehensive formal training program for newly assigned POL section members.

• There should be a qualified supervisor on each shift whose duties include frequent checks on service section personnel.

• The unit operations section must reemphasize the importance of checking the validity of entries in DA Form 2408-12 before they are transcribed onto the DA Form 759.

Supervision, training, inaccurate records, inadequate SOP, operation, inattention and complacency were all factors in this accident. The one thing without which there would have been no emergency was the wrong fuel being placed in the aircraft. This action was much the same as putting regular fuel in an automobile that requires ethyl. Engine performance was below par.

Whether you are going to operate the vehicle or just refuel it, make certain you have the right fuel. It *does* make a difference.

The following table shows some characteristics of JP-4 and AVGAS which should help personnel distinguish between the two fuels.

FUEL	COLOR	SMELL	FEEL
JP-4	Clear	Kerosene	Oily
AVGAS	Colored	Gasoline	Dry

PEARL'S

Personal Equipment & Rescue/Survival Lowdown

SRU-21/P INDIVIDUAL SURVIVAL VEST

YOUR AIRCRAFT is on fire and going down in hostile territory. Your first thought on crashing is to get free of the aircraft before the fire becomes intense. Once away from the wreckage, you realize your survival kit and radio are still in the aircraft. With no way to signal for help or survive in the wilderness, you must now face the long, tiresome, hazardous journey to friendly civilization; that is, if you are physically able to travel.

A hypothetical situation? Not necessarily, since many such accidents are substantiated by case histories. Situations similar to this can be and have been remedied by the Standard A SRU-21/P Individual Survival Vest, FSN 8465-177-4819, which became available to the field the early part of 1972. The use and abuse of the vest is described in TM 55-8465-215-10.

Presently, the vest is available only in the large size. This was the only size initially procured to rapidly accommodate air crewmembers who wear the armor vest under the survival vest. It is hoped that the small size vest will be available in the near future. The authority for requisition is the common table of allowances (CTA) 50-901 with a basis of issue (BOI) of one per air crewmember, issued without revolver, ammunition or survival radio.

Supply agencies have noted a lack of interest in the mesh survival vest. No one will be saved by a vest gathering dust in a warehouse. Only those items of survival, signaling and personal protection which are attached to the body are going to be conveniently available to the air crewmember under all emergency conditions. So don't put off until tomorrow what you can do today. REQUISITION YOUR STANDARD A SRU-21/P INDIVIDUAL SURVIVAL VEST NOW.

■ ■ ■

Dear Pearl:

Our unit has encountered a problem in the inspection and maintenance of the individual hot climate survival kit (FSN 8465-973-1861) and the individual overwater survival kit (FSN 8465-973-1863).

During the required 90-day inspections of the survival kits, the first aid kits, aviator (FSN 6545-965-2394), were inspected by the flight surgeon's office and found to contain items for which the service life had expired. Checking with the local medical depot, we were informed that the needed items to update the kits were not in stock and that it probably would be best to order complete new first aid kits. Upon trying to requisition new kits (FSN 6545-965-2394), it was discovered that these kits have been deleted from the supply system.

Our question is what kit is to be used in replacing the deleted one? It is thought that possibly the general purpose first aid kit (FSN 6545-919-6650) is to be used, but this is questionable due to the difference in size and contents.

Any information concerning this change or any other changes to these survival kits will be deeply appreciated. We do hope this change will be reflected in the next Change Bulletin to C8440/70-IL-A.

CW2 Russell W. McKnire
352nd U.S. Army Detachment
USARSO
Ft. Clayton, Canal Zone

Dear Mr. McKnire:

Thank you for bringing to our attention the difficulty of procuring replacement first aid kits for the survival kit, individual, hot climate (FSN 8465-973-1861), and the survival kit, individual, overwater (FSN 8465-973-1863). The U.S. Army Agency for Aviation Safety (USAAAVS) contacted the U.S. Army Natick Laboratories and the Defense Personnel Support Center and the problem has been identified.

The first aid kit, aviator (FSN 6545-965-2394), is to be replaced and is no longer available in supply. The new first aid kit, aviator (FSN 6545-823-8165), will be the replacement item. It is listed in the Federal Supply Catalog, Identification List, C8440/70-IL-A-CB6, dated 1 June 1972. This kit is not yet available in the system but, according to the Defense Personnel Support Center, will be available beginning in the October-November 1972 timeframe.

Pearl

If you have a question about personal equipment or rescue/survival gear, write Pearl, USAAAVS, Ft. Rucker, AL 36360

The following article is reprinted from USAAAVS Flight Surgeon's Newsletter, by request:

FLIGHT CLOTHING

A recent publication by an overseas Army unit related the story of an Air Force crewmember who was wearing an issue "CWU-9/P insulated underwear jacket over Nomex." A postcrash fire melted the jacket and the crewmember was burned, although the Nomex was not seriously damaged. This unit publication went on to describe the protective properties of Nomex, the principal one being flame protection, and how adding insulating layers under the Nomex will add to the protection afforded by the Nomex. But they really dropped the ball when they advised wearing the CWU-9/P insulated nylon or similar garments *under* the Nomex. This is a very definite hazard!

Nylon and similar artificial fibers melt at about 300 to 400 degrees F. Nomex will protect against flame and delay heat transfer, but sufficient exposure will soon enough raise the skin side temperature to 300 to 400 degrees F. Artificial fiber garments will then start melting and severe burns will result as the molten material sticks to the skin. Meanwhile, the Nomex will remain relatively undamaged and functional up to its rated temperature of approximately 900 degrees F., at which point it will char.

Nomex underwear can be purchased commercially (see the automobile magazines for racing clothing). USAARL experiments indicate, however, that standard wool/cotton long johns (like the Army issue) provide as much protection from heat transfer when worn under Nomex as does the experimental Nomex underwear. Those of you wearing greens—hopefully wool and not artificial fibers—or other standard uniforms "by direction" on certain types of missions could obviously profit from Nomex underwear, however. So, do not wear artificial fiber clothing—except Nomex, PBI or similar heat resistant garments—under your Nomex flight suit.

Those of you in 'Nam should be wary of those green nylon or acetate pullover sweater-like things called a "sleeping shirt." These melt. We recall an experiment in 1969, repeated in 1970, in which a sleeping shirt rolled inside a Nomex flight suit (top) melted into a jelly-like mass when exposed over a fire in a No. 10 can. The flight suit wasn't even singed. A garment seldom seen anymore is a green *wool* pullover sweater commonly called a "jungle sweater." This was an issue item until 1966 or so. Being a natural fiber, as is cotton, it is safe to wear under Nomex.

William D. C. Jones
Safety Management Specialist
Aviation Division, DSCO&T
Headquarters, Third U.S. Army

How To Get Things Done Through Others

EVERY GOOD safety manager knows the main problem in aircraft accident prevention is really a "people" problem. If you are successful in getting people involved in the safety program, you have it made. To put it another way, if every man in your unit took time to think through each task, and to figure the best way to get it done without injuries or equipment damage, there wouldn't be any need for a safety manager. Everybody would be his own safety manager, provided he sees the need to be safe and if only he knows how.

A rather big "if." No one has accidents purposefully; and since no one wants to be hurt or crippled, most people try to be as careful as they know how to be. The problem is that no one is perfect. Then, basically, what is the matter with our accident prevention effort? Why do people have accidents? If people do not want to be injured or killed, and managers do not want them to be involved in accidents, then why do people have accidents?

The answers to these questions are the targets of every safety program, as well as the key to the "people" problem. If it were not so, the people who make Band-Aids and Mercurochrome would be out of business; and if we want to get out of the "Band-Aid" approach to safety, we have to accept the fact that we must work through people. The "Band-Aid" approach is waiting for an accident to happen before deciding there is an accident potential and then hoping, after the fact, that corrective action will be good enough to prevent it from happening again. It's not a very good management approach to say the least.

If you personally believe it is possible to detect potential safety hazards before they become accidents, and if you believe most people will avoid accidents if they can see the risks involved, then you are on the way to becoming a good safety manager. Douglas McGregor, a leading psychologist, believes that people really want to do a good job. He stated, "Man will apply self-direction and self-control in attainment of goals which he believes worthy and to which he becomes committed."

If McGregor is right, then people in the unit will always resolve to do accident-free work provided there is personal commitment. That is, unit safety management objectives may become the personal goals of everyone in the unit. But these goals will be worked toward by employees only through personal commitment and only as a direct function of associated rewards. No rewards, no commitment.

If we, as safety managers, are to succeed in achieving accident-free operations as a unit goal, we must help employees see unit goals as their own personal goals through recognizing associated personal rewards. To put it more simply, we can persuade people to do their jobs well, without accident or injury, if we present unit goals in such a way that people wish to adopt them as their own. It is a simple enough idea to understand, but not easy to put to work. The key is in the phrase "associated rewards." Maslow, management psychologist, has done some basic research in that respect. He defines the human drive as "motivation" and has referred to the thing which is strived for as "need satisfaction." Maslow has evolved, through study and testing, a structure of human needs which are very strong motivators.

Some of these human needs are basic such as food, clothing, shelter and sex. Maslow states that these needs are so basic that, at first, they are stronger than any others. But once they are satisfied, they no longer function as motivators and the higher level needs emerge. He defines higher level needs as social needs, esteem and self-fulfillment. He also states that these higher level needs are so strong that they are seldom, if ever, completely filled. According to Maslow, once the higher level needs are awakened, the lower order needs will no longer serve as strong motivators. A good example of this is the artist who starves himself in a low cost garret apartment in order to paint, or sculpt, a work of art. His hunger pangs may be very real but they are not as strong as his

desire for self-fulfillment and, therefore, an occasional meal may be sufficient to keep him going. Take away his paints and chisels, however, and he becomes dissatisfied with everything and may even refuse food. He works only for self-actualization, disdaining money and all but occasional human companionship.

Hard and fast rules can seldom be made when dealing with human behavior, and the application of principles in human relations is more an art than a science. As an aid, however, in dealing with others and persuading them to accept unit goals as their own individual goals, see table 1.

"Remember that the people in your unit must see the advantages of accepting unit safety goals as their own before being persuaded to adopt them personally. When they have accepted them, they automatically become 'assistants in safety,' and thus you gain leverage as unit safety manager. When that happens you can begin concentrating on improving your golf game instead of the unit accident rate, and in both cases, the scores should be very low."

TABLE 1

The Art of Getting Work Done Through Others (Motivation Techniques)

THROUGH REDUCED TENSION

Anxiety is always present in people, especially in job security. To reduce anxiety, concentrate on the rewards of a good aviation safety program in reduced accidents and injuries, as opposed to the disadvantages of a high rate and command attention received because of fatalities. Capitalize also on the fact that most people really enjoy doing their jobs.

THROUGH HOPE

People want and demand the right for promotion. Under the current Army aviation safety philosophy and command emphasis, the commander may find that the success of the first aircraft accident prevention program may be included on his OER. Capitalize on the fact that this will be imparted through the commander to everyone in the unit, and vice versa.

THROUGH COMMUNICATION

No one in a unit or activity enjoys being kept in the dark about what's happening within the unit. People are more apt to contribute to unit plans if they know what the long range goals are. Keep everyone informed on his progress toward accident-free operations by a well-deserved pat on the back—but be sure it is deserved.

THROUGH BETTER WORKING CONDITIONS

People are much better workers when work is done in a pleasant environment. This refers more to good leadership than the work area itself. A good manager sets a good example by being industrious, working hard, and making good use of his time. The attitude of the manager can be seen in the people he supervises.

THROUGH TEAMWORK

No operation can succeed very well without teamwork. One way of creating team spirit is to create competition between your group and other groups. If you show people how they can gain personally by being on the "best team," they will contribute willingly.

THROUGH SELF-RESPECT

People crave status, respect, and esteem. Some people work only for the respect of their fellow workers, distaining the needs of their supervisors, while others seek recognition and approval only from their supervisors. Be sure you recognize correctly which type you are dealing with and act accordingly. Capitalize on the fact that group needs and supervisor needs must be seen as the same. Present unit goals in that light only.

THROUGH ATTENTION TO BASICS

If little gripes are attended to at once, big ones seldom develop. There is no such thing as a trouble maker—only trouble finders. When people voice a realistic complaint, take heed and find a real solution. This will always build morale. Capitalize on the fact that people will work harder if they understand you are genuinely concerned about their needs.

THROUGH PERSONAL CONTACT

Make the most of getting around and speaking to people. Be pleasant. People naturally distrust a man who can't smile. On the other hand, a smiling, pleasant face rubs off on others. If it is backed up by a pleasant, cheerful attitude, it will inspire confidence. You may be surprised at the things people will confide in you if you really respect their confidence. Be very careful how you handle a placed trust and always point out personal gain to the person which will accrue from a corrected fault revealed in confidence.

THROUGH SALESMANSHIP

People do more and better work when they are doing the work they like best. Evaluate the people in the group in which you work. If each member is well placed in his position, sell them on the reasons why they should contribute to the aviation safety program. If you find a square peg in a round hole, tell the boss and recommend replacement. Sell the boss on the reasons for increased work output by having the man do a job he likes. You will create interest in the safety program by consulting the worker about his job.

THROUGH SELF-ESTEEM

Every man wants to be proud of what he does on the job. He wants to believe that he represents true value in the scheme of things—that he is important. Listen, explain, respect, and show appreciation. Capitalize on the fact that people have and need self-esteem or pride.

Jack L. Finger
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AERIAL AMBULANCE

A military airlift of civilian patients has proven itself a real lifesaver

SOMEDAY, when he gets old enough to understand, I'd like to meet Gabriel Ortiz again. I'd like to tell him what I saw on 27 January 1972, when he was wheeled into the intensive care unit of The Children's Hospital of Santa Rosa Medical Center.

Gabriel was only a few hours old at the time. His wrinkled little face, as I glimpsed it through the glass window of the mobile incubator, was black and bluish.

Son of Mr. and Mrs. Juan Ortiz of Jourdanton, Gabriel was born prematurely in the Jourdanton hospital. When it was apparent his breathing difficulties could not be adequately treated there, an urgent call was put through to Project MAST.

MAST is an acronym that stands for Military As-

A 10-day-old baby suffering from dehydration is rushed into Santa Rosa Center after being flown by helicopter from Crystal City.

sistance to Safety and Traffic. It is a new U.S. Government program to provide helicopters and crew to transport critically ill or injured patients from outlying areas to better equipped metropolitan hospitals.

In a matter of seconds, the big war-green Huey was airborne out of Ft. Sam Houston, TX, where the MAST program is administered through the 507th Medical (Air Ambulance) Company.

A quick stop at the Santa Rosa picked up a Children's Hospital registered nurse as well as the much-traveled incubator, a machine that provides oxygen and helps monitor and regulate infants' temperature.

In less than an hour the chopper with the red cross emblazoned on its side was touching down once more on the Santa Rosa helipad located on the 12th floor of the hospital.

Though it was only a 20-minute flight from Jourdanton, the nurse, Mrs. Linda Ginnelly, was arm weary and exhausted from constantly squeezing an ambu-bag over the child's face to keep him breathing.

The worried look on her face as she alighted told the story. Over the roar of the engine she shouted: "Quick. I think he may be gone."

At touchdown, a life-saving team was springing into action. As the incubator was being wheeled towards a waiting elevator, Mrs. Ginnelly was relieved on the run by two other specialists, Mrs. Annette Stark, director of Inhalation Therapy, and Mrs. Lucille Kott, assistant area director of Children's Hospital.

Sprinting alongside the incubator, the two nurses worked frantically, drawing upon every shred of their expertise to revive the little preemie from Jourdanton.

"Shall we take the father to Admitting?" someone asked.

"No need for that," came the hushed reply. "He doesn't know yet, but the baby's dead."

With a sick feeling, I watched the elevator doors swallow up patient and nurses on their way to the Intensive Care Unit.

Gabriel Ortiz was the 176th patient to be flown by the 507th to the Santa Rosa. As Public Relations Director, I had witnessed most of the landings. The helipad is only a few steps from my office.

On this occasion I had intended to do something special in the way of a public salute to the pilots and crewmen who are doing such a great job in this new undertaking.

But now, with the 176th patient coming in Dead On Arrival, my copy went into the file to await another day, a happier moment. That moment came sooner than I expected.

About an hour and a half later my assistant, Mrs. Sandra Fewell, poked her head in my door to say:

"You know that baby who died here a while ago?"

"Yep. You can't win 'em all."

"He didn't die after all. They worked on him down in ICU and got him breathing again. They say he'll probably be okay."

My copy was quickly retrieved from the file and in a matter of minutes I had an exhilarated report on the air.

Next day I went down to ICU and saw Gabriel again. Still in his birthday suit, he was hooked up to what seemed to be a dozen instruments and machines. His color was good and he was screaming his head off. He went home to Mama and Papa 4 days later.

As I write this, 220 persons have been airlifted by Project MAST to the Santa Rosa, the huge downtown medical center in the heart of San Antonio.

To the best of our knowledge, 180 of these patients are still alive. How many of these survivors owe their lives to the quick evacuation is a matter of conjecture.

Dr. George M. Fleming, administrator of Santa Rosa, has been a supporter and admirer of the program since its inception in the summer of 1970 [See "The MAST Program." December 1970 DIGEST] Says he:

"A significant number of lives have been saved by the mere fact of getting the injured to us so quickly. The speed of evacuation, coupled with the training of crewmembers in handling trauma victims, undoubtedly has contributed to saving some of those 180 who survived."

MAST was begun in July 1970 as an experiment to see if U.S. government aircraft could play a role in the evacuation of trauma and emergency victims in a 10-county area surrounding San Antonio.

Since helicopters and crewmen assigned to the Fort Sam Houston unit were required to fly so many training missions anyway, why not put them to use in the transportation of real-life victims under honest-

to-goodness emergency conditions?

Santa Rosa received its first patient by air on July 24 when 3-day-old Alicia De La Rosa, daughter of Mr. and Mrs. Jesse De La Rosa of La Pryor, was rushed to The Children's Hospital.

From the time that Dr. Howard Britton, chairman of the Santa Rosa's Department of Pediatrics, made initial arrangements to have the baby transferred from a Crystal City hospital until the infant arrived less than 2½ hours had elapsed.

Suffering from a blood incompatibility, the baby was desperately in need of a blood exchange. This was accomplished and less than a week later she was on her way home.

Automobile accidents have accounted for the majority of adult patients brought in by MAST. A large number of infants suffering from respiratory or breathing difficulties has been received by air likewise.

There have been other dramatic evacuations. A man, kicked by a horse and unable to be moved from a mountaintop near Canyon Lake, was plucked off the hill by a helicopter.

A 13-year-old Kerrville girl, who fell from a tree, was brought in with a broken back. A 46-year-old man, injured when a tractor fell on his chest, was rushed from Floresville. An 18-year-old boy was brought from Runge after receiving a head injury playing football. A 13-year-old boy from Jourdanton got a quick chopper ride after falling from a horse; a well-known land developer, Tom Sheridan, was carried from New Braunfels after being critically injured in a jeep accident while hunting near Canyon Lake.

Several cases were handled involving children who swallowed an overdose of medication or lethal liquids, including arsenic cotton spray and lighter fluid.

MAST flights, it should be pointed out, are not without their costs to the hospitals. When notification is given that a flight is coming in, a battery of personnel must spring into action.

Emergency Room doctors, nurses, security officers, stretcher bearers and firemen must attend each landing.

Several times, during the first months of the project when bugs were still being worked out, choppers surprised hospital personnel by early or unexpected landings. On two occasions, the hospital was notified by a television cameraman.

Helicopters of the 507th are limited by range and regulation to fly no farther than 100 miles from San Antonio. However, on several occasions red tape has been cut to enable the Hueys to fly as far as Eagle Pass and Del Rio on "mercy missions" to ferry back critically ill or injured persons. On these trips the craft was refueled at Laughlin AFB before returning.

Even more red tape was chopped in September 1970 when the 507th flew three helicopter loads of nurses, administrative persons and supplies to aid hurricane-devastated Spohn Hospital in Corpus Christi.

Earlier this year, the report came that the MAST experiment in San Antonio and several other selected areas was declared successful. The program is now being expanded to other areas of the nation.

Project MAST has proved to be more valuable to rural areas than to metropolitan San Antonio. Ground ambulances are still the preferred means of evacuation from within the city.

Early in the game, an interesting situation developed on the outskirts of San Antonio where chopper and ambulance arrived on an auto accident scene about the same time.

An argument developed over who was going to deliver the patient to the hospital. The chopper won the decision rendered by a red-in-the-face law enforcement officer.

CPT Doug Fonnesbeck, one of the pilots who helped get the MAST program off the drawing board and who now occupies an administrative position, speaks fondly of the project.

"We'd be flying training missions anyway," he says. "Why not do some real good with it. All of our guys have been trained in rescue and first aid. And most of the pilots have had actual experience in Vietnam."

Fonnesbeck doesn't discount the public relations value to the Army, either. He likes to recall a mission to Gonzales in the spring of 1971.

"Man, the whole town turned out to see us land there. They sure seemed to appreciate what we were doing, too."

As I said, I'd like to talk to Gabriel Ortiz when he grows up. I'll bet he will appreciate what they did for him, too.

USAASO Sez

The U. S. Army Aeronautical Services Office discusses

An improved landing system

Air traffic controller's sunglasses

New Approach System In 4 Years: For many years the search for an improved landing system has been pursued on a relatively independent basis by civil and military agencies. The unique requirements of each agency have dominated this search. The resultant proliferation of systems has been extremely wasteful and has severely limited operational flexibility.

To stop this costly practice and to overcome operational incompatibilities, a planning group consisting of representatives of Department of Transportation, Department of Defense and the National Aviation and Space Administration formulated a national plan for development of the microwave landing system (MLS). The 5 year plan describes the actions required to obtain production specifications for several compatible system configurations capable of meeting the broad range of civil and military requirements. It consists of three basic phases:

- **Technical analysis and contract definition phase.**
- **Feasibility model demonstration and test phase.**
- **Prototype development/flight test/system evaluation phase.**

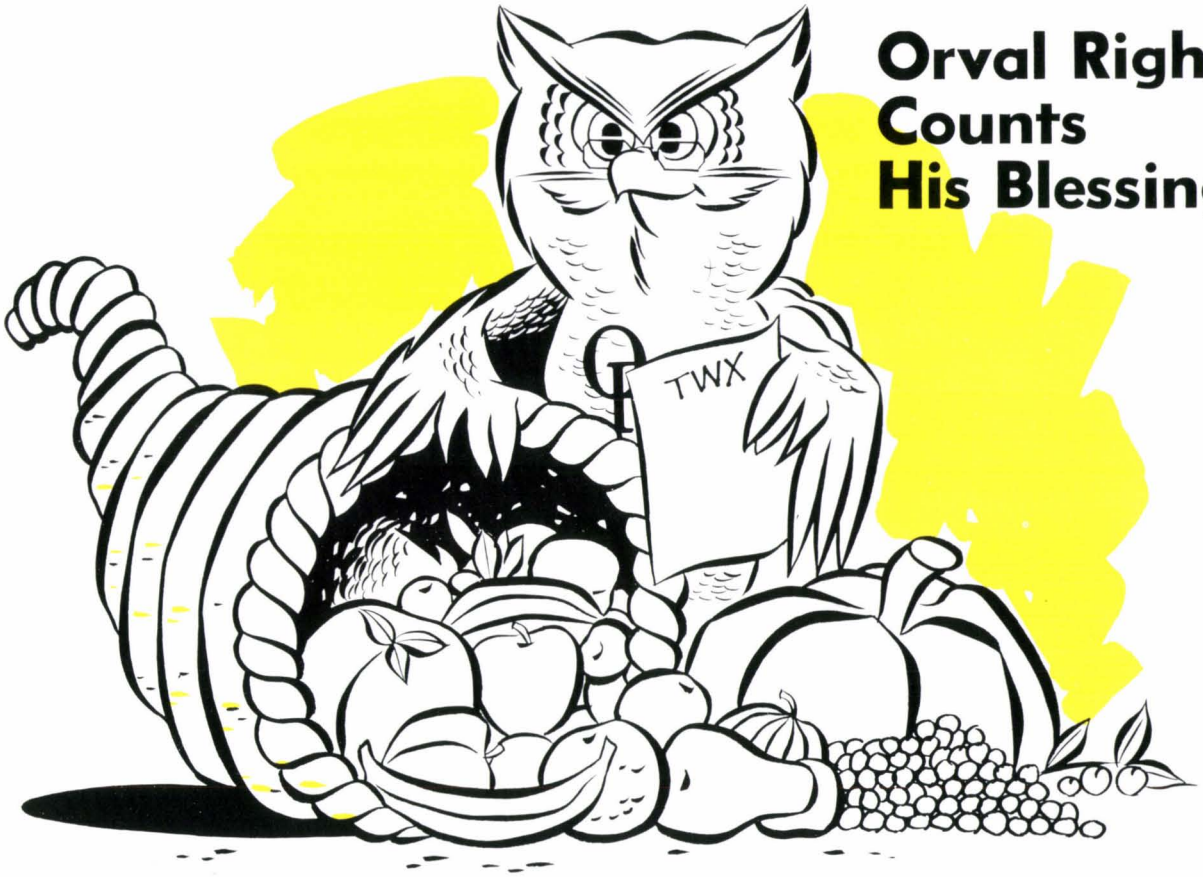
The plan also schedules the gradual replacement of instrument landing system (ILS) and "interim microwave systems" by national MLS between 1976 and 1986. Six competing industry teams were selected in January 1972 to begin phase one. As many as four will be selected to continue into phase two; as many as two will produce prototype hardware for test and evaluation in phase three.

Phase one was completed on schedule in September 1972. Evaluations to select phase two contractors are in progress. Military participation in the MLS program is provided by assignment of Army/Navy/Air Force representatives to occupy key positions in the FAA MLS Management Office. USAASO, as the life cycle manager of ATC ground equipments, has provided the Army representative. Additionally, the services have representatives on the Interdepartmental MLS Advisory Group.

The plan calls for a national system ready for production in 1976.

Sunglasses: ONE MORE TIME! The authorization for air traffic controller's sunglasses is contained in CTA 50-901, 17 February 1971. The CTA does contain one erroneous statement: "Enlisted personnel in MOS 71P with duty position as Air Traffic Controller." Well, don't be alarmed. A message correcting the error is out. DA message 242154Z May 71, paragraph 1a, amends the authorization: "Enlisted personnel with duty position as Air Traffic Controller." For you ATC types who require prescription sunglasses, your authority is contained in AR 40-3, paragraph 118g. Now we should all see better. Better controlling!

Orval Right Counts His Blessings



IT'S THANKSGIVING, and the spirit of the season has caught up with me. Just now, while I was reviewing a batch of crash facts messages, I realized the mistakes reported in some of the messages are the exceptions that prove a fine rule. For every mistake reported in a crash facts message, there are **many, many error-free performances.** So let's count our aviation blessings and be grateful for:

- Aviators who are wise enough to put a ship on the ground to check out a problem.
- Crewchiefs who fasten all the hatches.
- Aviators who will not try to fly VFR in IMC.
- Passengers who take care to avoid walking into turning propellers and rotor blades.
- Aviators and crewmembers who always use their checklists.
- Crewchiefs who direct pilots into confined areas so that trees don't get in the way.
- Mechanics who put their tools back into their toolboxes instead of leaving them inside compartments of moving components.
- Aviators who make sure rotor blades are untied when they start the engines.
- Mechanics who apply torque according to the book.
- Aviators who give good passenger briefings.
- Passengers who heed the pilot's instructions.
- Mechanics who install hydraulic and fuel lines so they don't chafe and spring leaks in flight.
- Ground crews who keep metal landing mats securely attached to the earth so they don't catch hold of helicopter skids.
- Aviators who look where they are going.
- IPs who take timely corrective action.
- Aviators who make sure fuel tanks are topped off.
- ASOs who fill out and submit crash facts messages and follow up with necessary supplements.
- Commanders who emphasize safety and pursue an aggressive flying and accident prevention program.
- The real professionals.

For all **these good guys** and all our other blessings, we give thanks.

Hidden Forms Of

DRUG ABUSE

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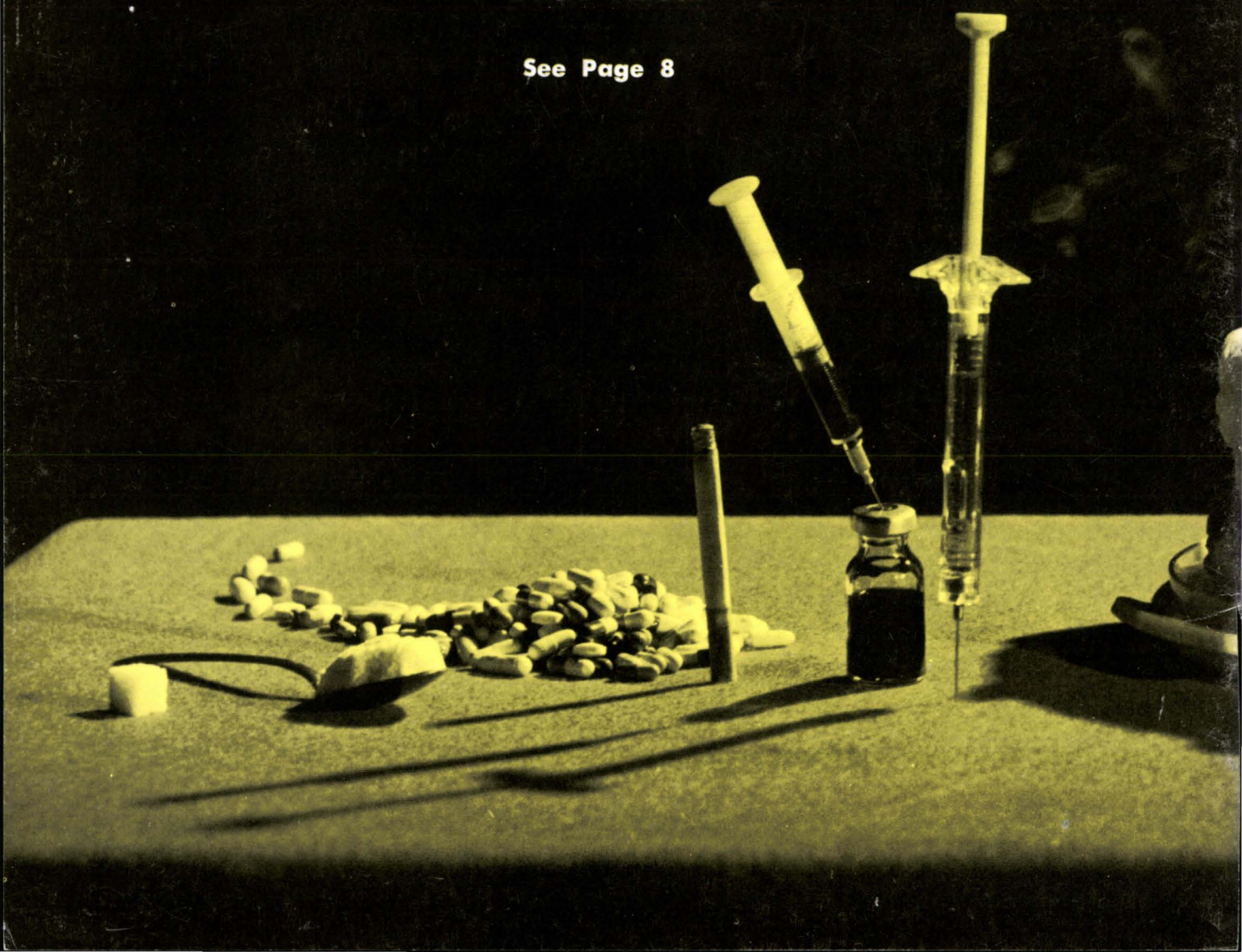
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