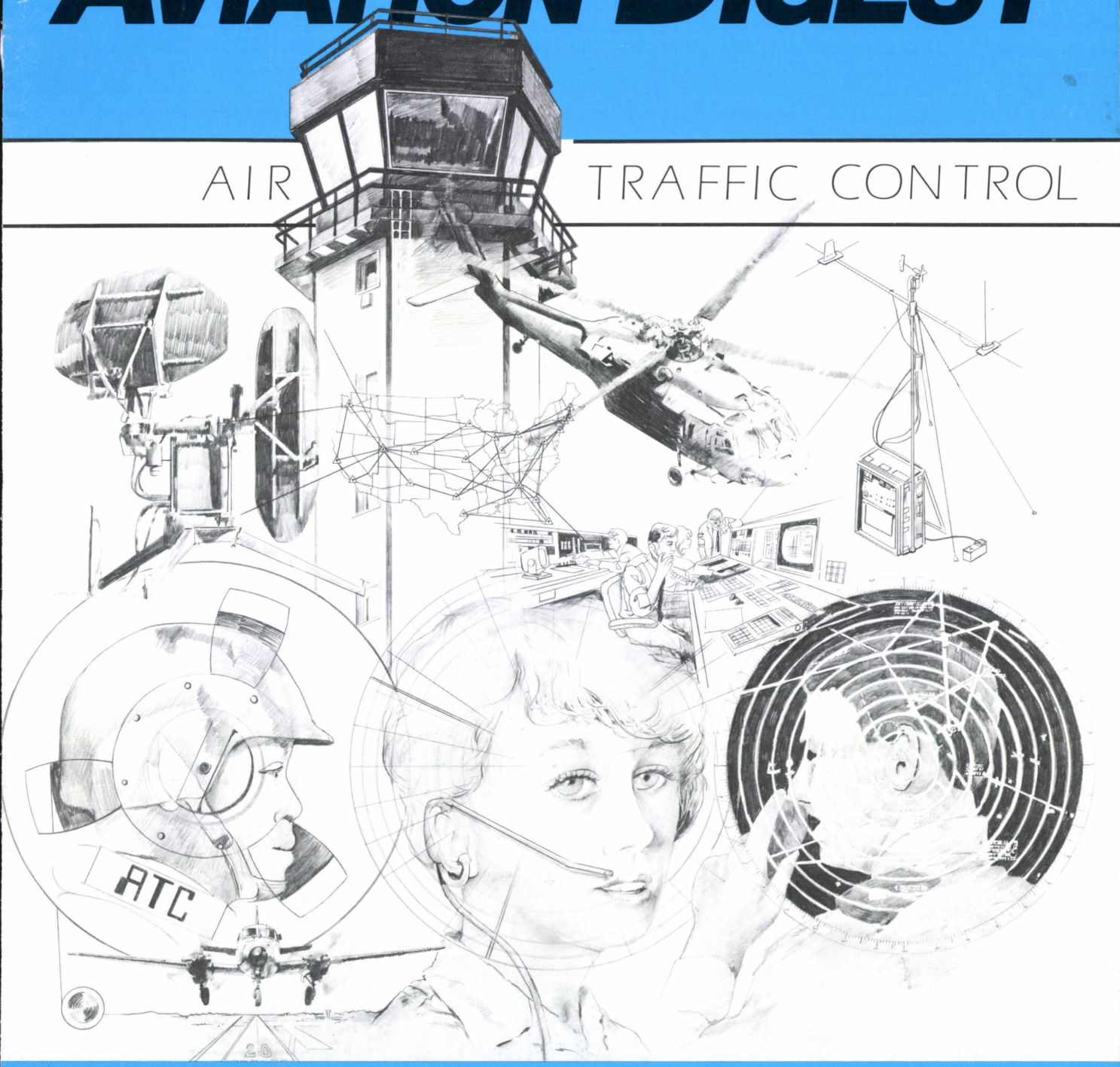
UNITED STATES ARMY

AVIATION DIGEST

MARCH 1989

AIR TRAFFIC CONTROL



Professional Bulletin 1-89-3

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PROFESSIONAL BULLETIN

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Cover: **The U.S. Army Air Traffic Control Activity (USAATCA) provided the articles to support the ATC theme for this issue. The lead article, "Organization of the U.S. Army Air Traffic Control Activity," begins on page 2 and discusses its mission, which includes being the proponent and integrator for all ATC matters (fixed base and tactical), for the U.S. Army. In addition, USAATCA is responsible for the overall development, management guidance, standardization, systems evaluation and development of the Army's ATC facilities and navigational aids.**

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Major General Ellis D. Parker
Chief, Army Aviation Branch

Air Traffic Control

ON 1 OCTOBER 1986, the proponency for air traffic control (ATC) transferred from Information Systems Command, Ft. Huachuca, AZ, to U.S. Army Aviation Center, Ft. Rucker, AL, U.S. Army Training and Doctrine Command (TRADOC), Ft. Monroe, VA. The Aviation Center gladly accepted the mission and the dedicated men and women of the U.S. Army Air Traffic Control Activity (USAATCA) as a part of the aviation team. The transfer and relocation of USAATCA to the Aviation Center has proven beneficial to the overall Aviation Branch mission. By bringing this essential element of aviation in proximity with the other key elements, we have established the opportunity for a synergistic approach to mission accomplishment, greatly accelerating air traffic development and enhancing operations.

Viewing the extensive modernization effort that has taken place in the ATC arena within the last 2 years, we can see it created serious challenges for combat trainers and doctrine developers. These challenges were met, allowing us to blueprint and structure the ATC organizations to conform to the Army of Excellence force design guidance and exemplify AirLand Battle doctrine. This had been completed in concert with the Interim Operational Concept for Air Traffic Service that was approved by the Combined Arms Center (CAC) on 4 March 1988. This document is the cornerstone for all future materiel and force development, doctrine and training for air traffic services. Tomorrow's equipment is in research and development today. As we look to the future, however, the investment strategy for Army ATC has to be based on the fiscal reality and the need for balance in our modernization process.

The USAATCA developed a consolidated master plan to address ATC requirements for the modernization of equipment for both tactical units and fixed base airfield sites. This is a living, working document that has been submitted to CAC for staffing, with subsequent approval by TRADOC and Department of the Army required. It includes a properly resourced program addressing ATC personnel and equipment requirements throughout the next decade. The master plan is vital in near- and long-range planning. It is the vehicle the Army will use to inform the user and interested agencies of ATC near- and far-term plans and requirements. Upgrading combat capability was a key consideration in developing the master plan. Our fixed base assessment indicates that while many modernization programs are ongoing, substantial requirements exist for modernization of existing systems. Funding constraints have hurt us all, but we have not been without support. TRADOC gave us an additional $1 million in fiscal year (FY) 1988 and committed an additional $3.6 million in FY 1989 to help defray the cost of fielding new ATC systems and replacing existing ATC programs. I foresee significant improvements in ATC equipment.

The soldiers who operate the equipment also are experiencing changes in the way they are trained and managed. The 93C ATC course is undergoing some major revisions. We are revamping the Control Tower Operator (CTO) examination from a five-part to a seven-part test. This is due to FAA restructure of the CTO. Along with this will come a design change in the course itself to enable the testing of the CTO at the end of the course. The next major change will discontinue the manual approach phase. Since there is a limited amount of manual approach facilities being used in the Army, this phase will be reworked to enhance the flight following segment of the course.

The development and modernization of both combat support and fixed base ATC systems are being vigorously pursued by the Aviation Center. I challenge you to make these initiatives a positive step for the cohesive development desired for the ATC arm of Army Aviation.

Organization of the U.S. Army Air Traffic Control Activity

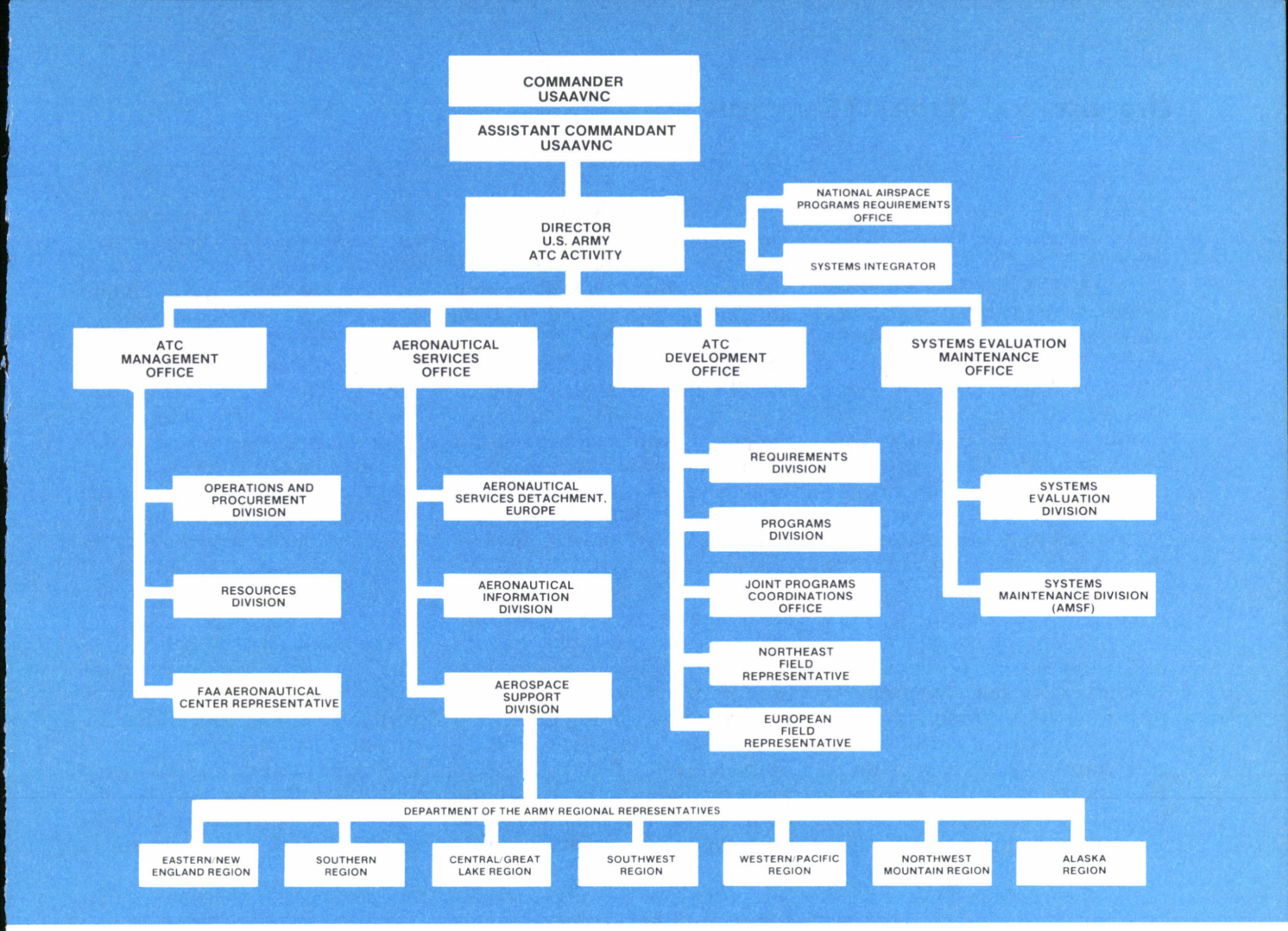
Colonel Melvin J. McLemore
Director
U.S. Army Air Traffic Control Activity
Fort Rucker, AL

THE CHIEF of Staff of the U.S. Army approved the transfer of air traffic control (ATC) to the Aviation Branch in early 1986. This was accomplished 1 October 1986 when the U.S. Army Air Traffic Control Activity (USAATCA) moved from Ft. Huachuca, AZ, to Ft. Rucker, AL, to become a part of the U.S. Army Aviation Center. The mission of USAATCA includes functional proponency and integrator for all ATC matters, including fixed base and tactical, for the U.S. Army. USAATCA is responsible for overall development, management guidance, standardization, systems evaluation and development of the Army's ATC facilities and navigational aids (NAVAIDs) worldwide. The activity acts as the Department of Army (DA) Deputy Chief of Staff for Operations and Plans (DCSOPS) executive agent. It interfaces with the Federal Aviation Administration (FAA), Department of Defense (DOD), Allied nations and counterpart Services on airspace and aeronautical information.

USAATCA is organized with the following major offices and functions:

The ATC Development Office provides guidance to establish, modernize, terminate and relocate ATC and NAVAIDs equipment. The Development Office has two separate divisions: the Programs Division and the Requirements Division, the latter soon to be renamed the Systems Integration Division. A major function within the Development Office is the tabulation of what fixed based facilities, NAVAIDs, systems and equipment are in use to support aviation throughout the world. A condition level is applied to each to begin the process of identifying any deficiencies. This is followed by a comparison of existing plans and programs with identified deficiencies. The results of this assessment assisted in prioritizing future resources to resolve deficiencies.

The Programs Division brought with it 44 ATC projects to the Aviation Center from Ft. Huachuca. The Programs Division monitors and provides recommendations to the engineering, acquisition and installation phases of ATC systems designed to satisfy both current and future requirements. The Programs Division coordinates and justifies, through channels to the DA and DOD level, funding to meet current and future Army ATC fixed base requirements. It also functions as the user representative for major Army commands (MACOMs) worldwide and coordinates project implementation of fixed base ATC equipment. Projects are implemented through coordination with the Program Manager-Transmission System,



U.S. Army Information Systems Command, to update user requirements.

The ATC Requirements Division develops, coordinates and provides equipment and systems configuration standards for Army ATC systems worldwide. The Requirements Division develops the ATC master plan in coordination with MACOMs, DA, DOD and other government agencies. This division prepares the ATC portion of the Aviation Modernization Plan.This division determines configuration of the National Airspace System Plan (NASP) in accordance with DOD and DA directives, policies and mandates. This includes all components of the NASP. Some of the components include the advanced automation system, NAVAIDs, communications, weather and military airspace. This division also provides for the coordination of ATC developments and integration of fixed and tactical systems.

Also assigned to the Development Office are three field representatives. The first is the European field representative located at Heidelberg, Federal Republic of Germany. This representative serves as an ATC functional area advisor to the commander, U.S. Army Information Systems Engineering Command, Europe. The representative reviews engineering and installation plans, and interfaces with host governments and U.S. Army, Europe. The field representative also conducts field visits and site surveys.

The Northeast field representative, located at Ft. Monmouth, NJ, advises the commander, U.S. Army Information Systems Management Activity, and interfaces with commanders at the U.S. Army Communications-Electronics Command and the U.S. Army Aviation Research and Development Activity on ATC equipment matters. This representative also reviews depot overhauls of ATC equipment, ensures interface with the

Organization of the ATC Activity

National Airspace System (NAS) and conducts field visits and site surveys.

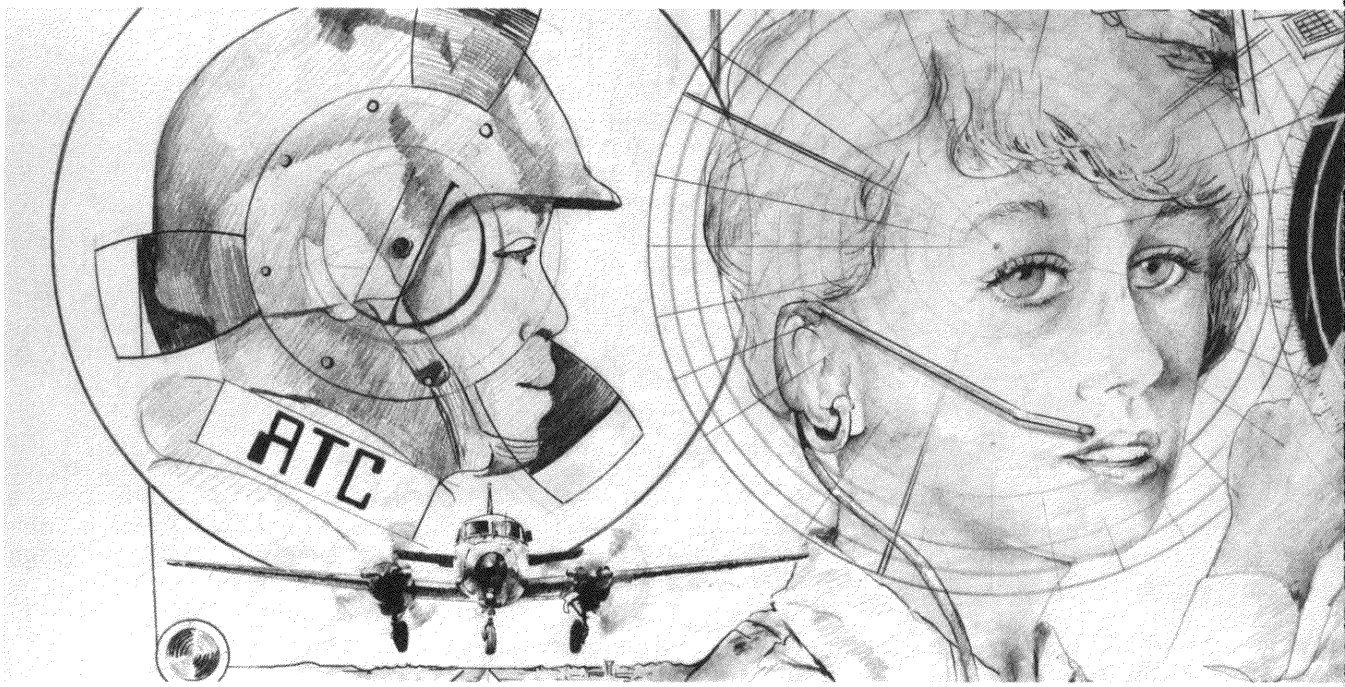
USAATCA also has an Army aviator assigned to the activity who is a field representative at the Joint Programs Coordinations Office in Washington, DC. This office coordinates the procurement of ATC equipment for DOD facilities. This representative consolidates the Army's requirements, initiates programing actions and coordinates with the FAA for joint acquisition of equipment and software.

The ATC Management Office is comprised of an Operations and Procedures Division and a Resources Division, which ensure proper staffing to meet the mission requirements due to the reorganization. After moving to Ft. Rucker, this office requisitioned and recruited personnel for the entire organization.

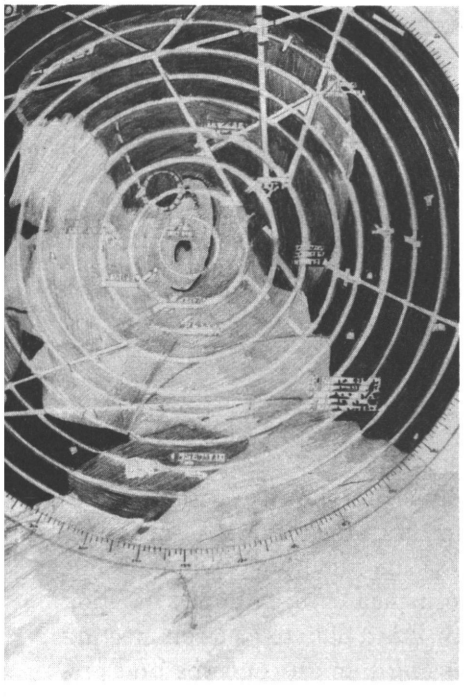
The Management Office developed policies for a totally new Resources Division responsible for accountability and obligation of operation and maintenance, Army (OMA) funds for USAATCA, the Aviation Center; 1st ATC Battalion, 11th Aviation Regiment; and the 256th Signal Support Company, U.S. Army Forces Command. Accounts were established in a short timeframe to manage OMA funds to support worldwide ATC projects, including aircraft procurement and Army funds for worldwide equipment acquisition. Policies and procedures were established with other MACOMs, Army depots, procurement activities, other DOD services and the FAA.

Also assigned to the ATC Management Office is an ATC representative at the U.S. Total Army Personnel Command. This representative assists in ATC assignments and helps manage career management fields 28 and 93 for the Army Aviation Branch. At the FAA Academy, Oklahoma City, OK, a liaison noncommissioned officer (NCO)/DOD academic coordinator represents the activity. The representative coordinates Army and other DOD training requirements and quotas and acts as the point of contact for DOD personnel attending the FAA Academy. The liaison NCO must participate with the FAA in development and execution of flight inspection procedures for Army ATC facilities.

The Systems Evaluation Division conducts worldwide flight inspection assistance for U.S. Army ATC and navigation facilities. For this mission, three U.S. Army aircraft are assigned and specially equipped by the FAA to perform aerial flight inspection. The FAA also certifies



flight inspection teams and flight crews in accordance with OA P 8200.1, United States Standard Flight Inspection Manual, section 103.3. Flight inspection crews (pilots and technicians) must, therefore, complete the Airspace Systems Inspection Course at the FAA Academy. These valuable resources ensure that navigation and landing aids can be evaluated safely and efficiently. The ATC Systems Maintenance Division is comprised of an area maintenance support facility that was already located at the Aviation Center. This function was reassigned to the Systems Evaluation and Maintenance Office, USAATCA, in the ATC transfer. The mobile maintenance contact team provides technical assistance, advice, formal and informal instruction to onsite technicians at ATC facilities throughout continental United States, Alaska, Panama, Hawaii and selected sites in Korea. The Repairable Exchange Maintenance Branch operates a repairable facility for modules and components of selected ATC equipment.



The U.S. Army Aeronautical Services Office (USAASO) located at Cameron Station, Alexandria, VA, serves as executor and the DA staff office for DCSOPS on matters pertaining to the NAS. This office also represents DA at the national and international level on the use of airspace; air traffic regulation, control and procedures; joint use of Army airfields by other than DOD aircraft; violation of Federal Aviation Regulations by Army personnel; flight procedures; aeronautical information; and aeromedical cartographic requirements. It manages that airspace within the NAS as delegated to the Army by FAA and provides DA representation to the FAA regional headquarters by assigning DA regional representatives to the various FAA regions. It validates Army Aviation requirements for flight information publications (FLIPs) and charts worldwide. It also establishes criteria and policy for the development of terminal and en route instrument procedures. USAASO is the approving authority for Army procedures published in DOD FLIPs.

USAATCA has a full-time Army aviator representative who serves on the staff of the DOD NAS Plan Requirements Office in Washington, DC. This office was established because of the long-standing need to have the military services more involved with the FAA's NASP.

Also located in Washington, with DA DCSOPS Aviation, is an ATC liaison officer (LO) who functions as a systems integrator for air traffic management (ATM)/ATC. The LO provides DA staff technical and policy advice in determining ATM systems requirements, operation and support. The LO also prepares ATM budget documents, justifications and plans to reflect an executable program. The LO also recommends acquisition priorities for ATM systems, equipment, research and development, and product improvement programs.

Air traffic services is an essential combat multiplier in aviation. Success on the modern battlefield will depend on the basic tenets of AirLand Battle doctrine. Army ATC personnel and equipment provide essential services for tactical operations worldwide. ATC personnel assist friendly aircraft perform their mission through positive and procedural control methods. The wartime role of ATC is influenced by Army airspace command and control efforts to synchronize all users of the battlefield airspace.

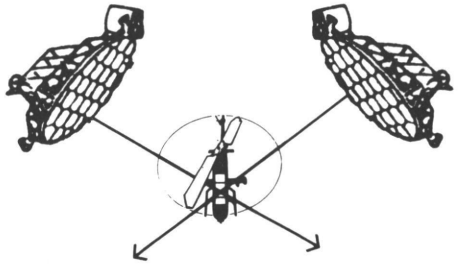
USAATCA has established a cohesive set of objectives, policies and programs to standardize the ATC facility training program. The central theme for this standardization includes the tasks, conditions and standards that drive our ATC training program. Some of these are equipment driven, but most are derived from FAA and Army guidance on the conduct of ATC in the NAS.

Competency is particularly important to the air traffic controller and is attained through the facility training program. Verification of this competency is assured through a variety of evaluations by both FAA and Army agencies. Feedback from these evaluations is used to continuously refine the facility training program that enables Army air traffic controllers to attain that exceptional expertise that makes them truly "Above the Best."

NATIONAL AIRSPACE SYSTEM PLAN

Lieutenant Colonel (P) James E. Dooley III
U.S. Army Representative, Federal Aviation Administration
Department of Defense
National Airspace System Plan Requirements Office
Washington, DC

Global positioning system.



BY NOW, ALMOST everyone in Army Aviation at least has heard of the National Airspace System (NAS) Plan of the Federal Aviation Administration (FAA). In case some confusion might exist as to what the plan really is or how it may affect us, an overview of the NAS plan follows.

First, a few things the plan is. It is a plan to modernize an aging air traffic control (ATC) system and hardware, both military and civilian, while taking immediate measures to enhance aviation safety and security. It is a plan to focus on meeting user needs, addressing human concerns and pro-

viding a road map to the 21st century NAS. It is the result of examining present operational, technical and human requirements for the transition period. It is a plan to allow for expansion of services as opposed to the system now in place that somewhat limits growth.

Second, a few things that the plan is not. It is not closed-ended with an exact date attached indicating when it will be completed. As a living, breathing, expandable document that allows for growth in technology, the plan will continue well into the next century. It is not a piecemeal effort to modernize a band-aid approach to our problems but a systems approach that uses new technical opportunities, addresses operational concerns, improves safety productivity, and above all, is flexible.

In December 1981, the FAA chartered what they called a comprehensive NAS Plan to modernize and improve ATC and airway facilities services through the year 2000. Now 7½ years later, the plan is in high gear with more than 90 projects and 90 percent of these are under contract. About 5,000 pieces of equipment are working today with hundreds more coming online every month. An important factor in the plan is that, while some programs necessarily had to be deleted because of technology breakthroughs, additional programs have been added. According to Mr. Joseph DelBalzo, executive director of systems development, FAA, these programs make this the largest civilian project since the Apollo astronauts landed on the moon.

The plan is designed to accommodate future traffic growth by using new technologies. It is safe to predict that the NAS Plan will never be a finished package of the ATC system, but a series of interrelated steps that constantly respond to the changing demands of our air transportation system.

An abbreviated walk through the NAS Plan would reveal that the basic foundation of the plan will be a multibillion dollar computer system, called the Advanced Automation System, which will start going online in 1991. This system is the heart and soul of the NAS Plan and will make almost every other improvement possible. Major improvements in communications, weather, surveillance, navigation and traffic management are included. It will put all of the primary traffic facilities into an integrated, highly automated system, giving us speed, capacity and flexibility to handle our increasing traffic loads well into the next century.

A further walk through the NAS Plan reveals that, today, we rely on very high frequency and ultra high frequency radio communications for our ATC. As the NAS Plan evolves, much ATC communication will use digital data link techniques to permit high efficiency in information flow via automation. Voice capabilities will continue to satisfy certain air-to-ground communications functional needs such as around terminal areas.

Operational needs and budgetary limitations will dictate the degree to which the Department of Defense will modernize in data linking, as well as any of the 90 projects.

Present navigation systems will continue to be used with very high frequency omnidirectional range, distance measuring equipment, tactical air navigation, nondirectional beacon, direction finder, and long-range navigation C series as well as those based in the aircraft. Future navigation (post-NAS) will be based largely on the highly reliable, accurate U.S. global positioning system (GPS), which has high integrity. The microwave landing system and possibly, to some extent, the GPS will provide the precision approach service.

The NAS Plan continues to provide a blueprint for the future while changing to incorporate new technology. A day may come when aircraft that will not be on any controller's primary en route radar, but vice versa, will occupy the national airspace. The aircraft will provide the controller, by data link, his exact position as determined automatically from GPS. That day may not be so far into the long-range future as we want to believe.

The impact on the Army from these modernization projects will certainly be minimal for the vast majority of our aviation assets. For those who fly in the NAS and those who provide ATC services to those aviators, the time to consider buying a ticket for this "train" ride is now.

AVIATION SYSTEM CONCEPTS

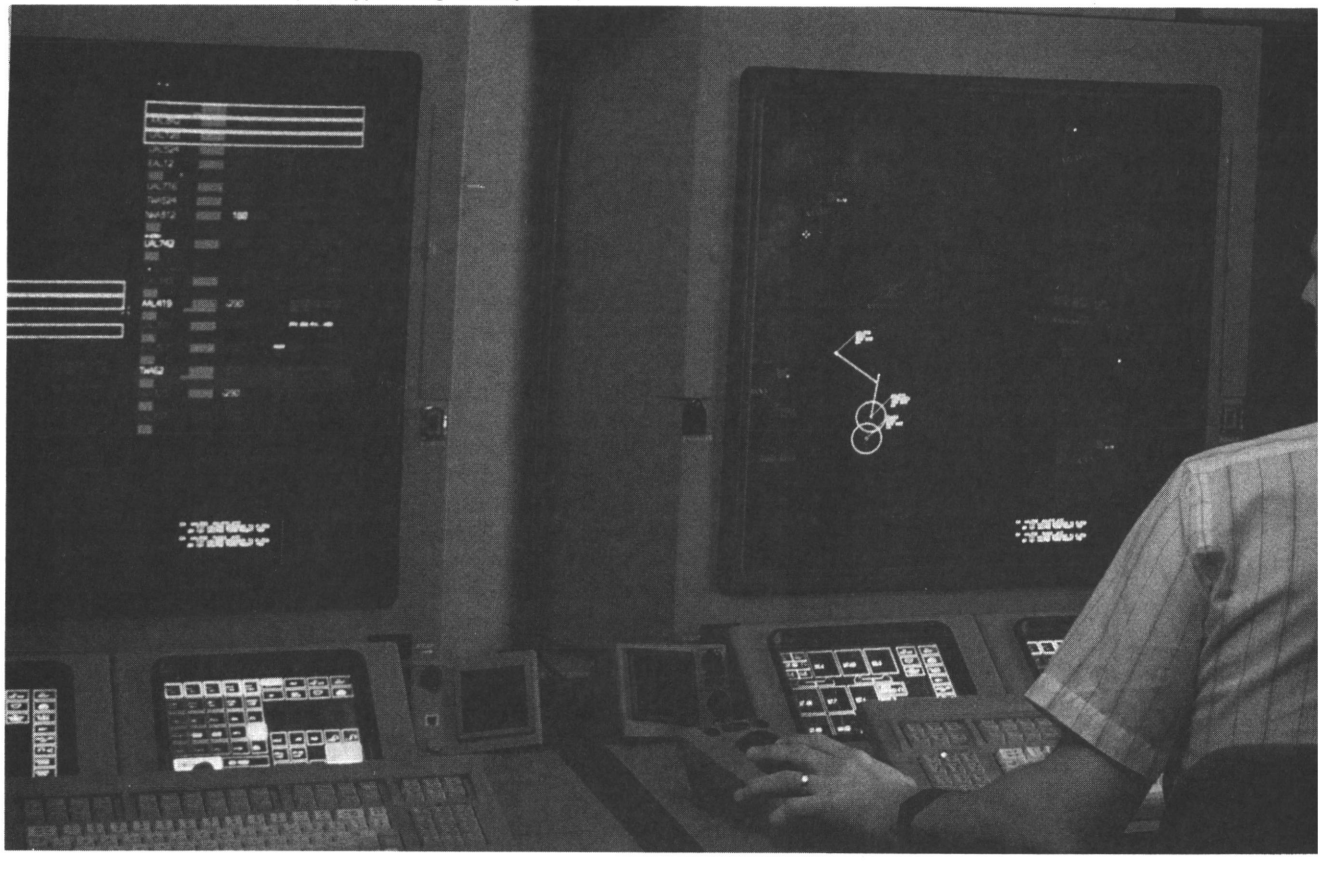
for the 21st Century

Mr. J. Lynn Helms
International Consultant
Westport, CT

THIS ARTICLE treats three separate elements: a methodology to analyze systematically air traffic control (ATC) operational scenarios and options pertinent to each, together with identifying needs of supporting research; selection, by the author, of one or two specific examples of research application and possible results; and from the foregoing, and other examples, construct a system concept that can be varied according to human judgment.

A long-range strategic plan has three parts: defining a baseline; creating a methodology to evaluate options and fallout; and institutionalizing a system to monitor performance against time, with inclusive means to make corrections, to meet established objectives. This article

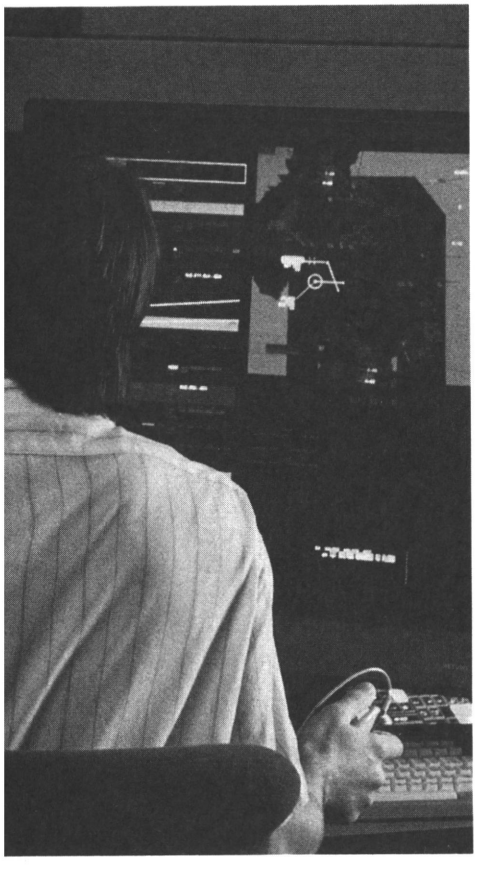
Advanced automation system, a joint project of the FAA and the DOD to upgrade the National Airspace System Plan, showing the common console prototype being developed by IBM.



treats a selected portion of the strategic planning process.

A methodology for analyzing ATC operational efforts

We should take advantage now of the new technology that is available in computer speed and capacity, software, telecommunications and simulators. Using this new technology, we should study the components and interfaces of the ATC system, with emphasis on the terminal area. We should undertake a national effort to create a dynamic simulation of major air traffic centers, starting with New York City. Next in all probability we should simulate Los Angeles, Chicago and Atlanta. When a physical and personnel plant is installed, computer software can accommodate any center in the world. However, we should work out the problems first in the New York area since that area is a composite of many problems.



First, we should create a dynamic simulation of the New York City aviation area with air routes, airfields, equipment types and locations, and present traffic patterns. Then we should load the system with regular traffic, as is being flown today, including air carriers, helicopters, the Concord, general aviation (GA) (commercial), military aviation and the East River float planes. Once we have absorbed that data, then we can simulate changes in the flight pattern, equipment types and locations. We can give the equipment new features and try the equipment out before writing a specification to procure it. After absorbing this phase, with it well underway, we should move to the second phase.

In the second phase, we should create a "mini New York approach control," with actual Federal Aviation Administration controllers, or private equivalents, to work the system and test new routes, equipment variations, possible new airfield locations and all aspects and portions of the simulation area. For example, apparently we are close to a decision for an aerospace plane, the so-called Orient Express; however, I don't know of any indepth work being done to see how we are going to get the plane on and off the ground or handle its traffic pattern. The question is, "Is there a way to handle this plane at John F. Kennedy Airport or do we have to mandate takeover of the southern tip of New Jersey?"

More important, and even more likely, the vertical lift machine with twin rotors and a cruise capability of some 300 knots, or better, will offer viable near-city center to near-city center capability. A stretch of more than 2 miles on the east side of the Hudson River is filled with old rotten pilings. With the precision and curved approach capability of the microwave landing system, coupled with the capability of the twin-rotor machine, what would be the benefits of such a downtown facility? How would such a machine depart Chicago Meigs airport, stop at Detroit, stop at Cleveland Lakefront and land alongside Manhattan? Is it feasible from an ATC viewpoint? Could the machine truly handle 5 flights an hour or 10 or 20 from a facility of only 3,000 feet, 4,000 feet and 5,000 feet in length? The New Jersey side railroad piers are still very solid. They are located away from the taller buildings of Manhattan, hence New Jersey may be an even more attractive possibility. Why not simulate the New Jersey airport and find out?

During the second phase we also would simulate weather and be able to study the results of sudden and dramatic weather changes. We could equally study the effect of new technology and equipment to accommodate the impact of such weather.

The third phase would include the dynamic simulation of actual flight deck crews. Both this, and earlier phases, would overlap somewhat. Since all the airline carriers require their crews to go through periodic simulator training, why not connect them to the dynamic simulation and let them "fly their schedule" into the simulation area? The telecommunications technology of today easily and routinely can connect Eastern Airline simulators, in Miami; American Airline, in Dallas; United Airline, in Denver; U.S. Airline, in Pittsburgh; and others to the dynamic simulation.

As far as the crews are concerned, they would be flying their airplane on an actual flight. Accordingly, we would have the flight deck crew, the controllers, and the ATC systems engineers

and designers working a common problem, at a common time and evaluating new solutions. Further, by using the simulation we could consider changes in the weather, equipment, routes, airplanes, locations, training, emergencies, schedules and airports. We could effectively simulate the entire scenario and make decisions that could save billions of dollars over the next quarter of a century. Would we not strongly want to have such a capability in Los Angeles now with some 10 percent of the nation's entire GA fleet in Southern California? How would a Mode S capability and a Mode C transponder mandate affect the ability to control? What are the other uses of traffic alert and collision avoidance system (TCAS) and in what environment? The possibilities are endless. A good dynamic simulation of a terminal facility is the only feasible way to project the future and to shape the operational usage and benefits of new subsystems such as Mode S data link.

History has shown unmistakenly that, as unexpected problems arise in new developments, so do new and unforeseen benefits and new uses. No doubt TCAS II, certainly TCAS III, will result in changes in the North Atlantic routes so that those with TCAS aboard can fly at 1,000 feet separation, and on offtrack profiles can "fly the weather," doing so with better safety than exists today. The ability to have such flexibility will save more than $100 million a year in fuel cost on the North Atlantic run alone!

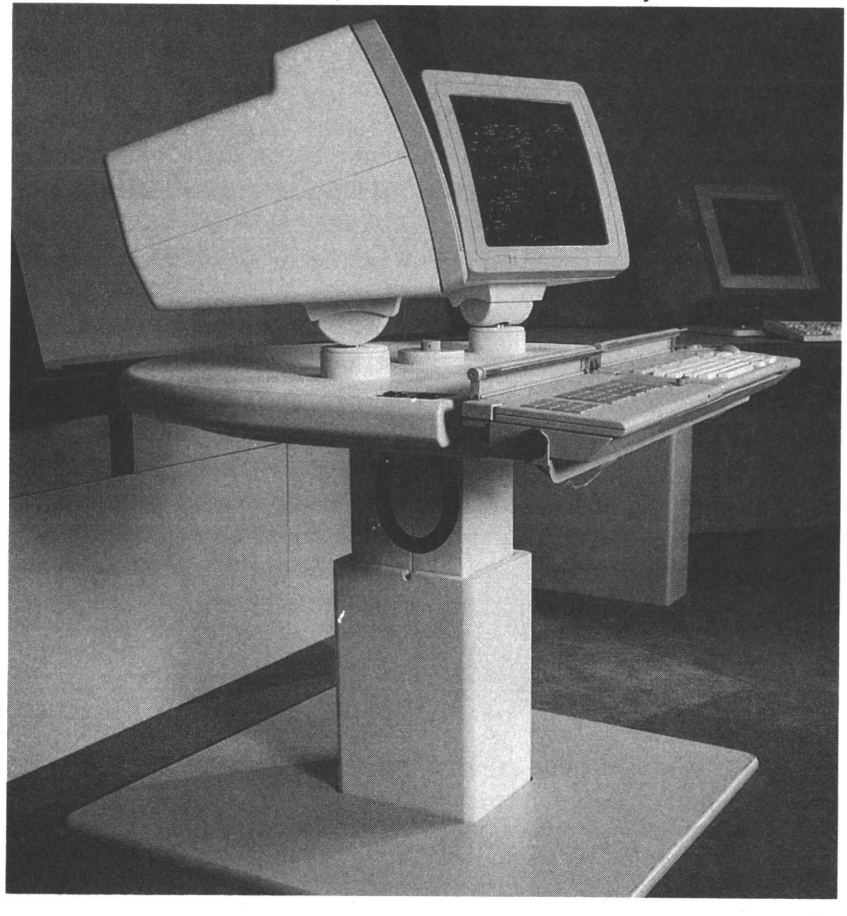
The flight deck crew using TCAS probably can perform "station keeping" of the terminal area, but ALWAYS with a ground controller watching to make sure. We haven't started to uncover all the possibilities of the individual subsystems that were conceived as part of the National Airspace System Plan. However, it is time to look beyond, and this time do it right. A national dynamic simulation program will give us that capability. It will identify the areas needing additional research and potential applications. Consider one or two of these applications.

Selected technology applications

Progress in super conducting material (SCM) is accelerating around the world; the popular consideration is with trains! However, we who have lived our lives with technology know differently. New technology *always* begins application of selected technology at the highest cost. When production technology makes such application possible, that application is reduced to insertion at the minimum unit to reduce the unit cost of the end product. SCM undoubtedly will be a candidate for early insertion in avionics and some other specialty electronics. "Delta" cost per unit volume versus performance and end product price make SCM a natural.

With a major reduction in power budgets, the weight of the selected subsystem will decrease. Not only true flat plate displays, but with a fold up of SCM to wallet size, a display could be carried from one GA airplane to another, and be attached as simply as today's pilot carries his or her own headset with throat or

A tower position console mockup for the advanced automation system.



lip microphone. A "portable glass cockpit" will result. GA airplanes will then be wired for such an installation, together with antenna installation. Thus, small GA airplanes will have the same capability for flight deck information as the airliners of the day, albeit in reduced format.

To match such usage in airborne, spaceborne and surface installations, a second area of technology advancement will be available. The tandem solar cell will deliver conversion factors of more than 50-percent solar power into electricity. Combine the gallium arsenide to absorb the blue end of the spectrum, and silicone to absorb the red end of the spectrum. By doing so, plastic lenses will increase the light concentration by some five orders of magnitude. With a reduced power budget, and a vast improvement in solar energy conversion available, the design parameter will become reliability so that systems can be built, placed in location and left alone for 20 years! Thus, the technical capability to build and power remote subsystems for ATC navigation, communication, surveillance, precision approach and even social needs of the passengers, will be available to meet the ATC system needs. Thus, the ATC system of the future starts to take a visible form.

ATC system concept for mid-21st century

Having exercised the dynamic simulation facility for more than a decade, we will have outlined far more quantitatively the needed system architecture than ever before; we will have identified areas, and priorities, of research needed. We will have applied other new technology in designing the system concept, completing a systems engineering design.

That ATC system will be based on a global electronic information grid. Using satellite and ground facilities, and with aircraft having infrared pointing and tracking systems for the sun, moon and selected stars as a backup, the density and product of the system will be as selected by each geopolitical element; i.e., each country or each region of countries acting together. Certainly the United States, Canada and Mexico will have reached such an accord. Most likely, the system will parallel one selected by Western Europe, and who knows, maybe Eastern Europe.

Use of the term "density" refers more to the information available at a specific latitude and longitude. Probably, it is less likely for detailed surface weather over the sands of the Sahara than the equatorial area of South America and the Far East with their giant thunderstorms. Mid-latitude events of seasonal change and frontal activity, major topography impact such as in Alaska, the Soviet Union and Central Africa, will all have unique local requirements. In the United States we will have constant real-time weather data—even the controller's view of the weather radar tracking a line of thunderstorms—instantly available in the cockpit. Our information grid will be quite dense.

The ten megabyte chip will have been long in production so that the cost for that capacity, if needed, will be relatively low. Routinely available will be the "S" EPROM, which is the author's designation for a factory-induced signature for each chip produced that is imbedded for life and that self-destructs if alteration is attempted. Hence, every aircraft flying will then have an electronic identifier, as firm as the certification number painted on the side and far less easy to alter. When the air vehicle leaves the ground, or before in most instrument flight rules cases, the system will be activated, perform an automatic "handshake" with the grid, and be both constantly tracked by and in constant communication with the ATC system; i.e., through the grid. If the pilot has fulfilled his "biannual flight check," or equivalent, he will insert this card into a slot next to the starting system, start the airplane and go on his way. If he has not done so, his card will be "zapped," and will not start his, or any other airplane, until he meets the established qualifications, and "gets his card punched"; i.e., unzapped!

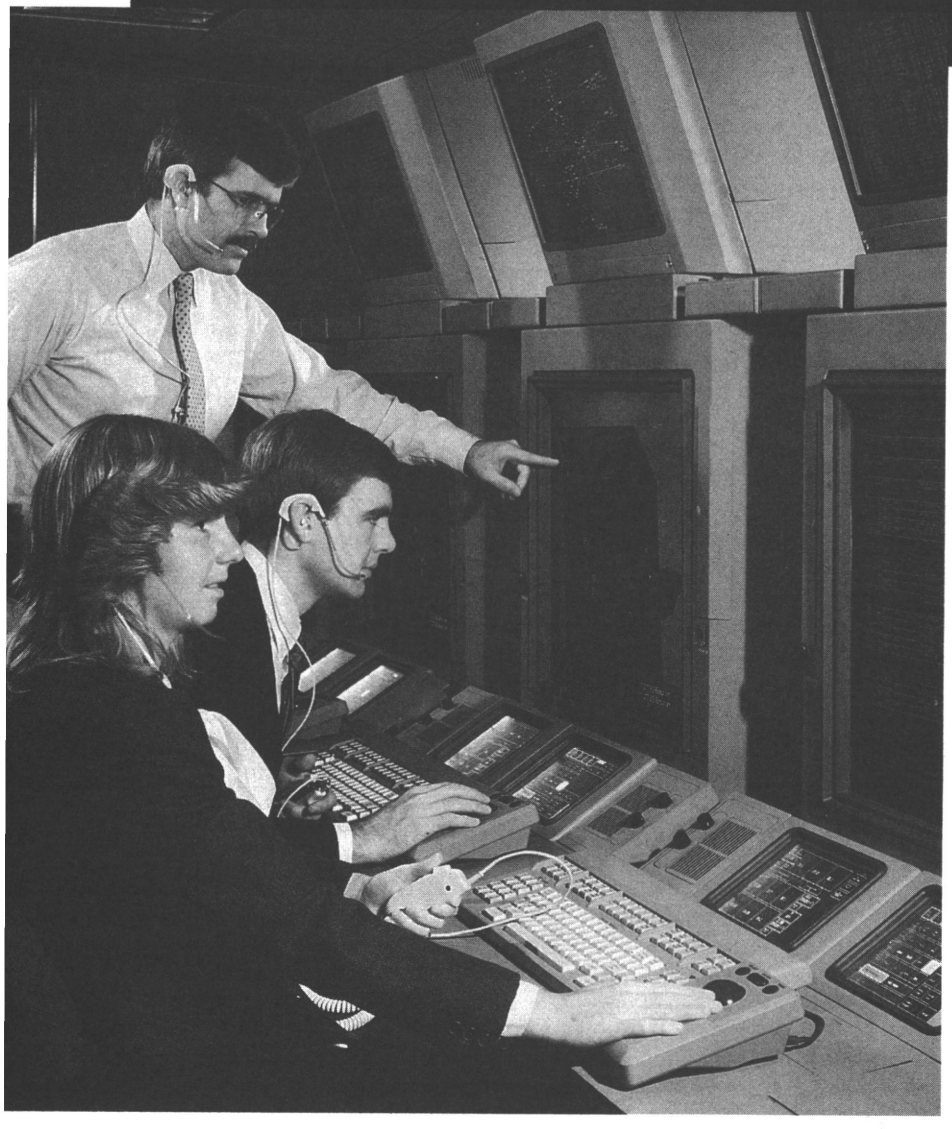
But, when "you dance you have to pay the fiddler." The global grid will have the option of selective mandatory handshake or no service. With proper equipment installed by a country, this means that every time the pilot uses a navigation facility or precision approach (but, hopefully, *not* weather!), his electronic identifier will be recorded. At the end of the month he will get a bill for "services rendered!" The capability for recording accurately, summing and billing for "user fees" will be in-hand; and, in the United States, it will probably happen!

This audience, made up of aviation and other experts and respected figures, literally from around the world, is a good group to consider the validity of such a far-reaching prognostication. I submit, the danger is not that I have overreached, but rather that I have underreached. The year 2050 is some 61 years ahead, with a constantly increasing technology curve. How many of you would have been with the Wright Brothers and accepted a forecast of where we are today?

Our challenge then, is, by slow, methodical and well-reasoned analysis, to take on the yearly and biyearly study to make it unfold. Someone will.

DOD COMMITMENT TO NATIONAL AIRSPACE SYSTEM MODERNIZATION

Mr. Frank J. Colson
Director for Transportation and Federal Aviation
Office of the Deputy Assistant Secretary (Logistics)
Headquarters, Department of the Army



SINCE THE Federal Aviation Administration (FAA) first published the National Airspace System (NAS) Plan, the Department of Defense (DOD), through its individual Services, has wrestled with the question of what its involvement should be and how to achieve these goals. The DOD and FAA have reached an agreement on what this joint architecture should look like and have started the process of determining the details for implementation. The military senior leaders have reviewed the plan. They support it and recognize the impor-

tance of staying abreast of the FAA's modernization process. They do not want to hinder the operational effectiveness of the NAS.

The scope of change for the way the military will perform their air traffic control (ATC) mission is significant. The FAA is charged with effectively managing the nation's airspace. However, the military must retain sufficient facilities to ensure controllers are trained for their wartime missions and have airfields that will support both intense military operations and an overseas rotational assignment process.

The planned modernization process will reduce the number of DOD radar approach controls from 56 to 43. This is not simply a reduction of military facilities but an exchange process with the FAA. The DOD will assume 5 facilities from the FAA, while the FAA is responsible for 14. As we modernize, the net effect will be a leaner military force, modernized facilities with lower operation and maintenance costs and an NAS that is transparent to the user from a service provision point of view.

The DOD is approaching this modernization process with renewed resolve to joint procurement. The perception is that ATC and landing systems do not drop bombs or shoot bullets. Because of this perception, funding support in the budget process frequently has been less than desired.

Also, a lead Service has not always been appointed and, while one Service may have been adequately funded, another might slip, which results in equipment incompatibility or other problems. To minimize these problems, the Assistant Secretary of Defense for Acquisition has established a National Airspace System Defense Acquisition Panel (NASDAP) and a program element code in the DOD budget to replace or support the individual Service's budget lines. Through the new process, a single Service is appointed as the lead acquisition agent for each particular line item and will acquire that line item for all the Services. In addition, the NASDAP has established a joint program coordinations office (JPCO) that is physically located with the FAA. The JPCO will coordinate acquisition activities between the FAA and the lead Service to ensure funding and procurement timing are adequate. The DOD's NAS program requirements office will continue to coordinate DOD NAS requirements.

Closely related to the NAS modernization process and absolutely essential to military readiness is the military airspace management system (MAMS). The military conducts training; tactics development; and weapon system research, development, test and evaluation within allocated special use airspace (SUA) throughout the United States. Both the FAA and the DOD have been charged to ensure effective use of this airspace because it is a scarce national commodity. Many in the aviation community and Congress perceive an excess of SUA. Military commanders are continually requesting additional airspace to train because of higher performance aircraft and more capable weapons. The General Accounting Office has called for better management oversight by the FAA and more effective use by the military.

The MAMS requirement was developed to address these criticisms and better use the available SUA. The MAMS goal is to enable near real-time management and use of SUA so that all military organizations desiring access to an area will know its status and adjust their schedules accordingly. Each block of SUA will have a manager. Through a distributed network of computer terminals, many organizations will have access to the block of SUA and minimize potential conflicts or unused airspace resulting from manual scheduling. Civil aviation interests should benefit since unused airspace will be readily identifiable and released to the FAA when practical. Initial prototyping efforts are underway; a fielded MAMS is expected no later than the mid-1990s.

Through these efforts and many more, the DOD senior leadership is both committed to, and involved in, the molding of a modernized and more efficient NAS. This improved system will permit the military operational requirements to be met and result in both manpower reductions and life-cycle cost savings to the American public.

ARMY SPECIAL USE AIRSPACE REQUIREMENTS

IN THE NATIONAL AIRSPACE SYSTEM

Mr. Jesse M. Burch Jr.
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Air Traffic and Airspace Manager
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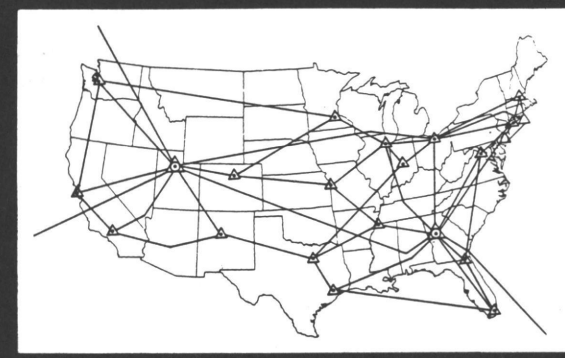


ARMY COMMANDERS, planners and program managers, please heed this article. It should apprise you of the fact that Army requirements for special use airspace (SUA) within the National Airspace System (NAS) can no longer be met as in the past. Airspace has become a highly critical national resource. Demands on the NAS are at an all time high and are expected to increase into the 21st century. Most of the demand for increased use will come from commercial and general aviation; however, military airspace requirements also will increase. In response to this increasing demand on the NAS, the Federal Aviation Administration (FAA) has imposed more and more control over the last several years. In future years even more constraints will be imposed on the NAS.

In the past, little concern has existed about Army activity being conducted within the NAS. The Army has enjoyed considerable freedom and flexibility in planning and conducting its activities. Restricted areas have contained the firing of artillery pieces, mortars, rockets, missiles and similar weapons. If additional SUA were needed, the U.S. Army Aeronautical Services Office (USAASO) easily obtained the space through the Department of the Army (DA) air traffic and airspace (ATA) manager and DA regional representatives (DARRs). However, SUA is not easy to obtain now and will become even more difficult to obtain in the future.

In 1958, when Congress first established the FAA, the Army had about 110 restricted areas. Some of these had existed since the early 1940s. All were sole use,

which means they were activated all the time, 24 hours a day, 7 days a week. Since then, because of the demands for airspace by commercial aviation, general aviation and other users of the NAS, the number of Army restricted areas has been reduced to 78. Because of additional constraints and controls imposed by the FAA, 72 of these have been designated for joint use, which means that this airspace is available to the public when the Army is not using it. The remaining restricted areas are used fulltime, or are activated fulltime for national security purposes.

Next, the FAA requested the Army to share its restricted areas with other NAS users, such as the Navy, Marine Corps and Air Force, when these users were conducting activities that were not considered compatible with nonparticipating aircraft. Army restricted areas are now listed for shared use. A program also is ongoing to segment all Army restricted areas, both vertically and horizontally, and to activate only those segments needed to accommodate the Army requirement. This should increase the availability of this airspace to the public. Letters of agreement (LOAs) have been negotiated between Army users and appropriate FAA controlling agencies. These letters specify how and when each restricted area will be activated and deactivated. These measures should provide more efficient use of airspace areas through real-time scheduling.

Other control measures are in existence, some of which have existed for many years, while others were set up during the last decade. These control measures include air traffic control assigned airspace (ATCAA), altitude reservations (ALTRVs), controlled firing areas (CFAs), military operations areas (MOAs), military training routes (MTRs), the speed rule and warning areas. (Definitions of the above terms and acronyms appear at the end of this article.)

Another control measure imposed by the FAA, and frequently aggravated by public involvement, is the time involved in processing new airspace proposals. At present, the FAA requires at least 90 days to process a nonrulemaking proposal once the FAA has received the proposal from the proponent. This time is being extended to 120 days. A rulemaking proposal requires 180 days to process. This time is being extended to 235 days. This schedule will be met only if no objection is raised by other users of the NAS or the general public. If an objection is raised, it may take several years to process the proposal. An example is the restricted area at Ft. Devens, MA. Several years ago Ft. Devens submitted a proposal to the FAA New England Region. People from the surrounding communities opposed the proposal and held several public meetings. A U.S. congressman became involved. As a result, the restricted area was established but only after 2 years. Numerous other situations similar to this one have occurred in the past and probably will occur again in the future.

One other measure in the offing is the establishment of a centralized scheduling facility for all Department of Defense (DOD) SUA or the military airspace management system (MAMS). This facility is not being set up directly at the request of the FAA. The MAMS is needed because of DOD's increased requirements for SUA and the increasing strident demands of commercial aviation, general aviation and the general public for access to DOD SUA areas. The combination of these requirements plus modernization of the air traffic control (ATC) system through the FAA National Airspace System Plan (NASP) places too great a burden on individual scheduling systems now used by each military department. This burden makes the creation of the MAMS a must.

The MAMS DOD system will provide automated support to military airspace managers within the NAS. The system should make the release and request of airspace from the FAA easier as well as airspace planning and scheduling, and the reporting of SUA required by the FAA. (Each military department will retain priority for use of its own SUA when the space is activated according to the LOA.) The MAMS will communicate electronically with the modernized FAA system now being developed. The MAMS also will communicate with all DOD users, facilities and systems required to efficiently plan, schedule and administer military airspace use. The MAMS will provide more effective management and more efficient use of SUA and the entire NAS.

As commanders, planners and program managers, you can do several things to assist in managing the Army's SUA program. You should become more aware of your airspace requirements. In planning for the future, such as relocating units, opening new or building up existing installations, or developing or employing new weapons systems, you should know your future airspace requirements. If sufficient SUA is not available, you should submit timely proposals to set up new, or modify existing, SUA areas as necessary. You should know where to go and who to talk to for assistance. For example, at the national level is the DA ATA manager; at the FAA regional level is the DARR; and at the major Army command and instal-

lation level is the ATA officer.

Army Regulation (AR) 95-2, *Air Traffic Control, Airspace, Airfields, Flight Activities, and Navigational Aids,* 15 September 1988, states that the Deputy Chief of Staff for Operations and Plans (DCSOPS), Headquarters, Department of the Army, has the overall responsibility for Army matters that impact on the NAS. The DCSOPS represents DA with other DOD, civil, government, national and international agencies. This regulation also directs the director, USAASO, to serve as the executive agent for the DCSOPS on matters pertaining to the NAS. It further requires the director, USAASO, to appoint a DA ATA manager to serve at the national level by managing the Army SUA program. The regulation requires the director, USAASO, to maintain DARR offices at various FAA regional headquarters. These offices serve as an extension of USAASO in performing all assigned functions.

Besides the above, AR 95-2 requires major Army commanders, major subordinate commanders, state adjutants general and installation commanders who have requirements or activities that impact on the NAS to appoint an ATA officer. This individual will represent the commander on matters pertaining to the NAS.

The DA ATA manager and the DARRs, experts in their field, are there to assist and serve you. As for your ATA officer, you should appoint the most qualified person available and ensure that person is given the chance for the training mentioned in AR 95-2. Despite what else you may do, plan ahead as far as possible; contact the DARR or DA ATA manager for assistance; submit timely proposals; be prepared to justify your proposals; and plan the use of your assigned SUA in the most efficient and effective way to benefit all NAS users.

Definitions and explanations of terms and acronyms used in this article follow.

• ALTRV—altitude reservation. Airspace assigned by the FAA Central Altitude Reservation Facility to provide separation of certain specified activities being conducted within that airspace from nonparticipating instrument flight rule (IFR) aircraft. ALTRVs are established only in positive controlled airspace (PCA) where only IFR aircraft are permitted. The FAA has not allowed the Army to use an ALTRV recently, citing that an ALTRV was not designed for this purpose.

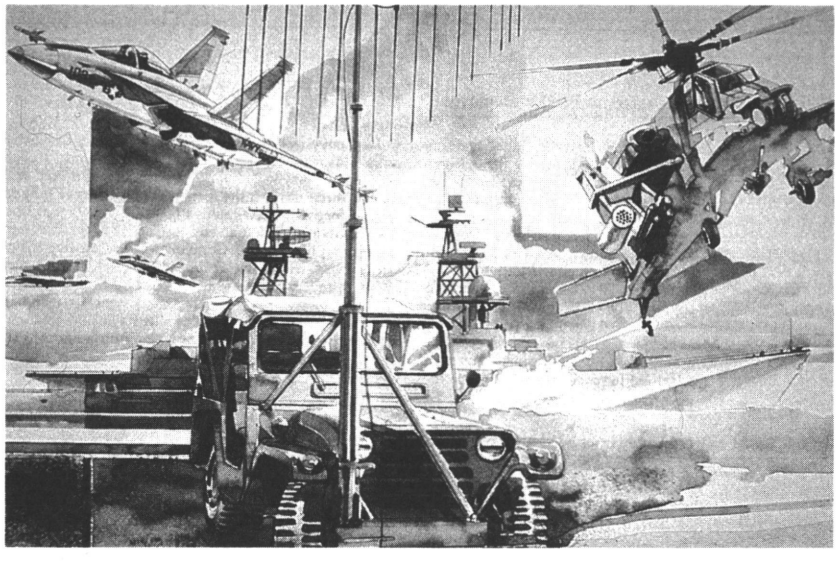
• ATCAA—ATC assigned airspace. Airspace assigned by ATC to provide separation of certain specified activities being conducted within that airspace from nonparticipating IFR aircraft. ATCAAs are set up and used by the Army the same way as ALTRVs. The same restrictions apply to an ATCAA as apply to an ALTRV. Again the FAA has not permitted the Army to use an ATCAA recently, citing that an ATCAA was not designed for this purpose.

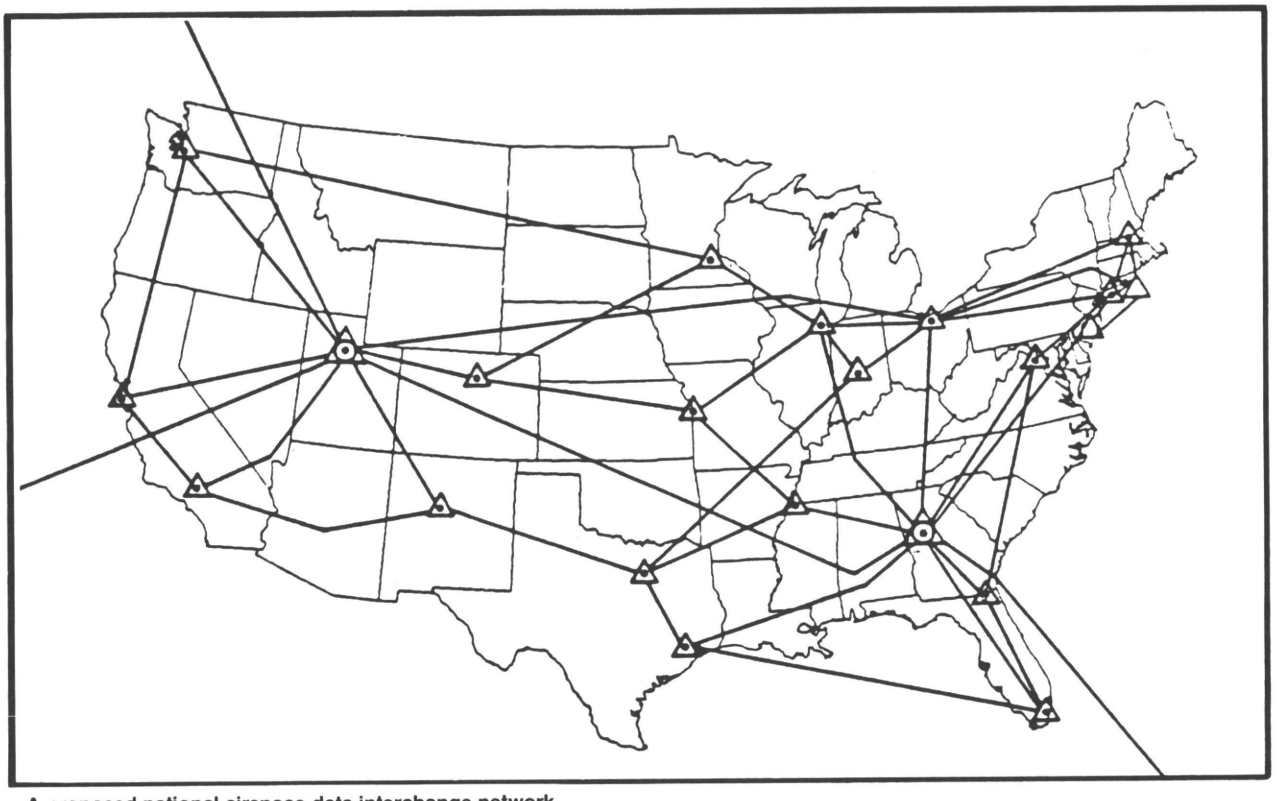
• CFA—controlled firing area. A CFA is set up to contain activities that, if not conducted in a controlled environment, would be hazardous to nonparticipating aircraft. The user provides for the safety of persons and property on the surface and in the air.

• FAA—Federal Aviation Administration. A Federal administration established by Congress in 1958 to manage the NAS.

• MOA—military operations area. Airspace set up to separate certain military aircraft training activities from nonparticipating aircraft operating according to IFR. When an MOA is active, nonparticipating IFR traffic may be cleared through the MOA if IFR separation can be provided by ATC. There is no restriction on nonparticipation visual flight rules (VFR) aircraft.

• MTR—military training route. Low-level, high-speed training routes set up according to criteria in FAA Handbook 7610.4, *Special Military Opera-*





A proposed national airspace data interchange network.

tions. Routes may be set up according to either VFR, designated visual routes or IFR and designated instrument routes.

• NAS—National Airspace System. The common network of U.S. navigational aids, equipment, airports or landing areas, aeronautical charts, airways, information, services, rules, procedures, manpower and materiel. Included also are the components and facilities shared jointly by the military and civilians, and the SUA used by the military.

• NASP—National Airspace System Plan; FAA's multibillion dollar modernization program.

• Nonrulemaking—actions in which FAA has authority to take final action without issuing a rule, regulation or order.

• PCA—positive controlled airspace. The altitude established by FAA, usually 18,000 feet MSL, at or above which only IFR aircraft are normally permitted.

• Restricted area—SUA areas within which the flights of aircraft, while not wholly prohibited, are subject to restrictions. Restricted areas denote the existence of unusual, often invisible, hazards to aircraft such as artillery firing, aerial gunnery or flight testing. Penetration of restricted areas without authorization from the using or controlling agency violates Federal regulations and may be hazardous to the aircraft and its occupants.

• Rulemaking—actions by which FAA issues, amends or repeals rules, regulations or orders designating airspace or airspace use.

• SUA—special use airspace. An area that has specific vertical and lateral limits. These limits are identified by an area on the surface of the earth in which activities must be confined or where aircraft operations, not a part of those activities, may be limited or restricted.

• Speed rule—aircraft operating below 10,000 feet MSL may not exceed 250 knots except when authorized by ATC or when operating in an SUA area that permits higher speeds.

• Warning areas—international airspace areas that may contain hazardous aircraft not taking part in area activities. Warning areas are set up beyond the 3-mile U.S. territorial limit. Though activities conducted in these areas may be hazardous to nonparticipating aircraft, warning areas may not be designated as restricted areas since they are in international airspace. The Army exercises very limited use of warning areas.

Aircrew Training Program Applicability to Department of the Army Civilians

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Flight Standardization Division
Directorate of Evaluation and Standardization
U.S. Army Aviation Center
Fort Rucker, AL

PERIODICALLY questions arise as to the applicability of the aircrew training program (ATP) to Department of the Army civilians (DACs). The ATP is designed to standardize training and evaluation and to ensure combat readiness within Army Aviation with the lowest possible number of flying hours. The role of DACs within the program is defined by the individual's job description and is the key to determining DACs' requirements within the ATP. Army Regulation (AR) 95-1, *Flight Regulations*, paragraph 2-1a(2), outlines the requirements for civilians to fly Army aircraft. One of the requirements listed is for a DAC to comply with transition, training, evaluation and currency as established by AR 95-1, chapter 4. This reference states that the ATP applies to all Army aviators in operational aviation positions and identifies DAC requirements. AR 95-3, *General Provisions, Training, Standardization, and Resource Management*, paragraph 4-3b, states that DACs will be trained as necessary to meet the requirements of the job description as specified by the commander. Keeping all this in mind, it becomes apparent that DACs have different requirements within the ATP.

The following are aspects of the ATP that DACs do not share with their military counterparts:

- DACs do not have a flight activity category (FAC) level or readiness level (RL). FAC levels are designated for aviation positions based on the commander's evaluation of its probable employment role. DACs are trained to meet job requirements only and, therefore, do not have an RL designation.
- DACs are only trained as necessary to meet the requirements of their job as specified by the commander. Task requirements for training and evaluating DACs should be designated in writing and may or may not be in the same format as a crewmember's task list. As a result, unless specified by the commander, a DAC does not have flying hour, simulator, task or task iteration, nuclear, biological and chemical, or night requirements.
- A DAC's annual proficiency and readiness test (APART) requires that he is responsible only for completing designated individual components of hands-on performance tests in a calendar quarter designated by the commander. A DAC need only complete those questions in the annual written examination that applies to his job as designated by the commander.
- DACs that fail to meet designated ATP requirements are processed in accordance with (IAW) appropriate Federal civil service regulations, whereas military aviators are processed according to appropriate Army regulations.

The following are ATP requirements that DACs share with Army aviators:

- Aircraft transition training must be IAW the appropriate aircrew training manual (ATM).
- Task training conducted to meet the job requirements will be IAW the appropriate ATM.
- A DAC has the same aircraft currency requirements as an Army aviator.
- Although the DAC's APART requirements are different, the required evaluations should be completed and conducted IAW the appropriate ATM.

DES welcomes your inquiries and requests to focus attention on an area of major importance. Write to us at: Commander, U.S. Army Aviation Center, ATTN: ATZQ-ES, Fort Rucker, AL 36362-5208; or call us at AUTOVON 558-3504 or Commercial 205-255-3504. After duty hours call Ft. Rucker Hotline, AUTOVON 558-6487 or Commercial 205-255-6487 and leave a message.

PEARL'S

Personal Equipment And Rescue/survival Lowdown

Donning and Boarding Forest Penetrator

The following interim operational guidance is provided for aircrews wearing the LPU-9/P automatic life preserver:

Once contact has been made with the forest penetrator, disconnect one end of the unstowed safety strap from the bolt that is affixed to the top of the penetrator.

Pass the disconnected end of the strap around the torso underneath the arms and firmly reconnect to the affixed bolt at the top of the penetrator.

If necessary, draw all the slack from the safety strap using the safety strap takeup tab.

Once secured, place the lowered seat between the legs.

Signal for recovery.

Note: Survivor should be aware of the excess cable connected to the top of the penetrator.

Aircrews flying with the LPU-9/P should be aware of and practice the above procedure. A command initiated Air Force technical order has been submitted to include these procedures in an updated technical order. Point of contact is MSG Riley, AUTOVON 574-3063.

Open Letter to PEARL'S

Dear PEARL'S,

I was quite enthused when I read your section in the *Aviation Digest*. I realize that you folks have been working for some time to make Army Aviation life support equipment (ALSE) into a recognized field, and it's real nice when you let us in the field know just what is being done.

You have requested some input from us out here, so here is some information that you might be able to use. My ALSE noncommissioned officer (NCO) (yes, I have a full-time NCO) and I sat down and came up with a man-hour requirement for proper operation of an ALSE shop. In just 1 month, we have 498 manhours worth of work to do! Based on a 7-hour workday, the results break down as follows:

- One person—71.14 days a month
- Two people—35.57 days a month
- Three people—25.71 days a month
- Four people—17.78 days a month

These figures are based on an attack helicopter unit with 102 flight slots in accordance with common table of allowance 50-900.

There are about 20 working days in any given month. A shop needs a minimum of 1 ALSE technician for every 25 aircrewmembers. I have been working with ALSE since December 1976. Here in U.S. Army Europe, we are required by a local regulation to attend the ALSE course before we are considered as qualified to work with ALSE.

The second major problem is the Army supply system. No one wants to furnish the required money. Medical items fall in the same category.

Perhaps ALSE should be considered as a warrant officer "track." In any case something must be done if we are to support our ALSE people out in the field.

SRU-21/P Survival Vest—Two Snap Links

There are two snap links on a modified SRU-21/P survival vest that could be used for rescue. These snap links were a special modification and were not authorized across the board.

If you have a question about personal equipment or rescue/survival gear, write PEARL'S, AMC Product Management Office, ATTN: AMCPM-ALSE, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798 or call AUTOVON 693-3573 or Commercial 314-263-3573.

HEAT STRESS

CW3 Robert E. Post
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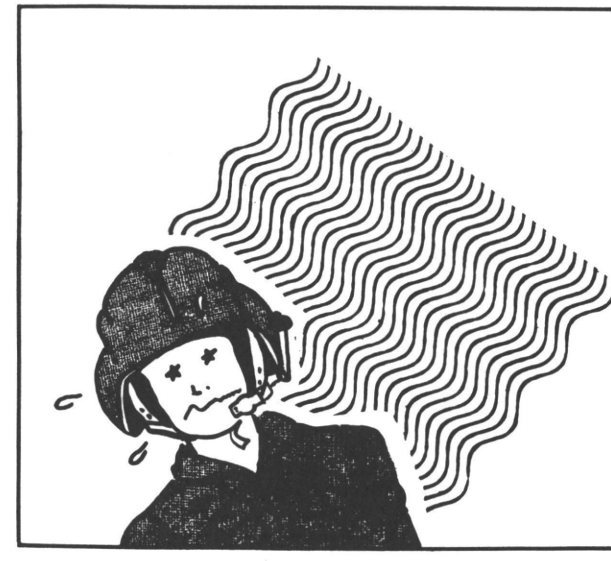
HHT, 1 Squadron, 4th Cavalry
Fort Riley, KS

The views expressed by this author are his own based on individual research and are not to be construed as being official views of the Department of the Army.



HIGH ENVIRONMENTAL temperatures can rapidly produce detrimental effects on the physical and mental abilities of aviators. Although there are many guidelines on heat stress, presently there are no guidelines that apply to aviation duties.

This past summer I observed and encountered the effects of heat stress firsthand. From these experiences I formed a method for recommending modification of crewrest based on heat exposure that aviators and line commanders can readily understand and implement.

Ft. Riley, KS, sponsored the third Reserve Officers' Training Corps (ROTC) region. The aviation regiment stationed here supported the ROTC training with an airmobile demonstration. Elements of the regiment flew many sorties in temperatures ranging from 38 to 41 degrees Celsius for up to 6 hours with hot refuels and lunch breaks only. There were no accidents, but the pilots described the effects on their abilities, and several switched out because they felt that they could no longer fly safely.

After interviewing these pilots, I flew several sorties as medical observer where the aircraft external temperature ranged from 38 to 39 degrees centigrade and the ambient humidity was greater than 60 percent. In fact, the measured surface temperature at the Manhattan, KS, airport was 104 degrees during this flight period. The calculated heat index was 114 degrees.

The sorties consisted of commander's evaluations of 1.1 hours for two officers, a 0.5-hour terrain reconnaissance flight and a 1-hour daylight area orientation flight for a newly assigned aviator. The flights started at 1100 hours local time, broke for lunch and refueled, broke again for change of crew (pilots) and ended at roughly 1530 hours local time. Crewmembers and the medical observers were acclimatized to the locale, and were well within recommended crewrest requirements, being the first flights on a Monday morning following 2 nonduty days. The crewmembers did not consume water during flight.

During the flights, I noticed an increasing number of small errors, such as forgetting to

change radio frequencies, initiating calls on the wrong frequencies and placing calls late or after being reminded by the tower. At one point, the pilot began entering a left downwind landing after being cleared for a right downwind landing. This error was recognized immediately and corrected before it endangered the safety of the aircraft. During the navigation portion of the flight, as the temperature progressed, so did errors in identifying landmarks. Even the instructor pilot, knowledgeable in the area, became disoriented and had to return to altitude to continue the flight. At the end of the flight, we had difficulty in filling out the DA Form 2408-12, transposing numbers and missing blanks on the form. The flight crews continued to interact well, and the errors usually were caught by one or more members before they became problems. At best, though, it was a miserable flight. Other pilots I interviewed reported similar experiences.

The lack of consumption of water while in-flight probably was a major contributor to the development of these in-flight errors. These aircrewmembers were at high risk for developing incapacitating heat-related illnesses while in-flight under these environmental conditions.

I recommend that aircrewmembers consume the following amounts of water in-flight as tabulated in figure 1.

My flight, factored according to current Army Regulation (AR) 95-3, *General Provisions, Training, Standardization, and Resource Management,* 15 September 1988, standards, was 4.8 hours long. To standards, we could have continued to fly for 3.2 more factored hours. I don't believe we could have continued much longer than 20 minutes without incident. I believe that, had we continued flying in accordance with AR 95-3 standards and the absence of adequate water intake, a major threat to aviation safety or an accident would have occurred.

FIGURE 1: Recommended in-flight water consumption.

Wet Bulb Globe Temperature	Water Intake Requirements Per Hour
78-82 degrees	0.5 quarts
83-85 degrees	1.0 quarts
86-88 degrees	1.5 quarts
above 88 degrees	2.0 quarts

After studying the effects on myself and comparing notes with the ROTC support pilots, I feel that these endurance factors are beyond acceptable safety standards at these heat categories. In addition to the water requirements listed above, I now recommend that the crew endurance factors in figure 2 be applied in the heat categories above "green."

Heat Category	Crew Endurance Factor
Yellow 85-87 degrees	2.1 (N-TR) + normal endurance factor
Red 87 degrees and above	2.3 night vision goggles + normal endurance factor

FIGURE 2: Recommended crew endurance factors.

These factors were derived from averaging the time the pilots and myself felt fully capable of safely controlling the aircraft and comparing them with the current endurance factors.

Similar use of day instrument factors for temperature ranges of 80 to 85 degrees should be considered relative to the situation, such as a nonacclimatized aviator. I also recommend the mission oriented protection posture training at temperatures of more than 87 degrees be curtailed. I believe that these water consumption recommendations and flight time limitations will prevent errors and reduce the risk for heat injury, which could result in a major threat to aviation safety, without seriously limiting training or mission accomplishment.

The Aviation Medicine Report is a monthly report from the Aviation Medicine Consultant of TSG. Please forward subject matter of current aeromedical importance for editorial consideration to U.S. Army Aeromedical Center, ATTN: HSXY-ADJ, Ft. Rucker, AL 36362-5333.

Should the Aviation Warrant Officer Wear Aviation Branch Insignia?

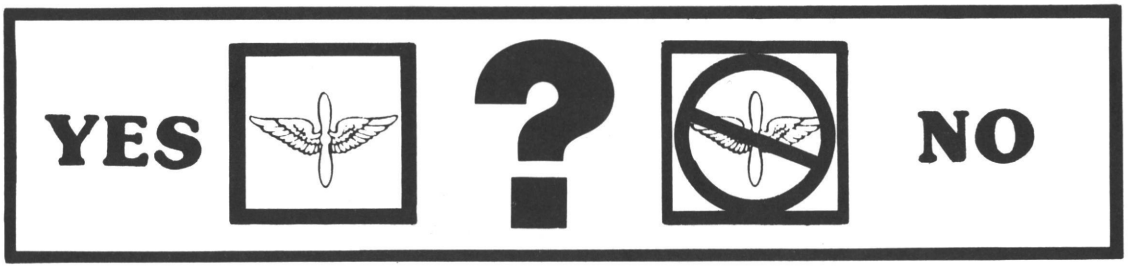
YES

The aviation warrant officer (AWO) is and has always been a member of the Aviation Branch and the Warrant Officer Corps. However, in the past, all warrant officers could not be associated with a branch of the Army. Most warrant officers were assigned in and out of branches at the needs of the Army. Today, all warrant officers are affiliated with or are members of a branch throughout their careers. AWOs are full-fledged members of the Aviation Branch and should be allowed to wear "their branch" insignia. Wearing branch insignia will further the branch identification and give the AWO a closer camaraderie in their daily association with both commissioned officers and enlisted members within their career field. Warrant officers of other services (Navy, Marine Corps, etc.) wear branch insignia on their collars without any detriment to their Warrant Officer Corps. The affiliation of AWOs with the Aviation Branch does not mean a threat to the management system that we now have at the U.S. Total Army Personnel Command (PERSCOM) (formerly TAPA). Warrant officer assignment managers could wear branch affiliated brass and still conduct business as usual.

NO

True, the AWO is a member of the Aviation Branch and the Warrant Officer Corps. However, for the sake of the Warrant Officer Corps, the AWO should not be allowed to wear the Aviation Branch insignia but should continue to wear the Warrant Officer Corps insignia. Wearing branch insignia will threaten the cohesion of the Warrant Officer Corps and could mean the end of the Warrant Officer Corps as we know it today. The Warrant Officer Corps has come a long way only because we kept branch affiliation out and took care of our own. The unity in wearing the warrant officer eagle gives the Warrant Officer Corps a sense of distinction and independence. The Warrant Officer Corps always has been recognized by the warrant officer distinctive insignia. The affiliation of AWOs with the Aviation Branch and wearing branch insignia could lead to the dissolution of the Warrant Officer Branch at PERSCOM and warrant officers could end up with a fractionalized management system.

WHAT'S YOUR OPINION ?



SHOULD AVIATION WARRANT OFFICERS BE ALLOWED TO WEAR AVIATION BRANCH INSIGNIA?

☐ YES ☐ NO

SHOULD ALL WARRANT OFFICERS BE ALLOWED TO WEAR THEIR BRANCH INSIGNIA?

☐ YES ☐ NO

SHOULD WEARING OF BRANCH INSIGNIA BY WARRANT OFFICERS BE LEFT UP TO THE BRANCH CHIEF?

☐ YES ☐ NO

SHOULD THE WEARING OF BRANCH INSIGNIA BE AUTHORIZED FOR WEAR BY THE UNIT COMMANDER?

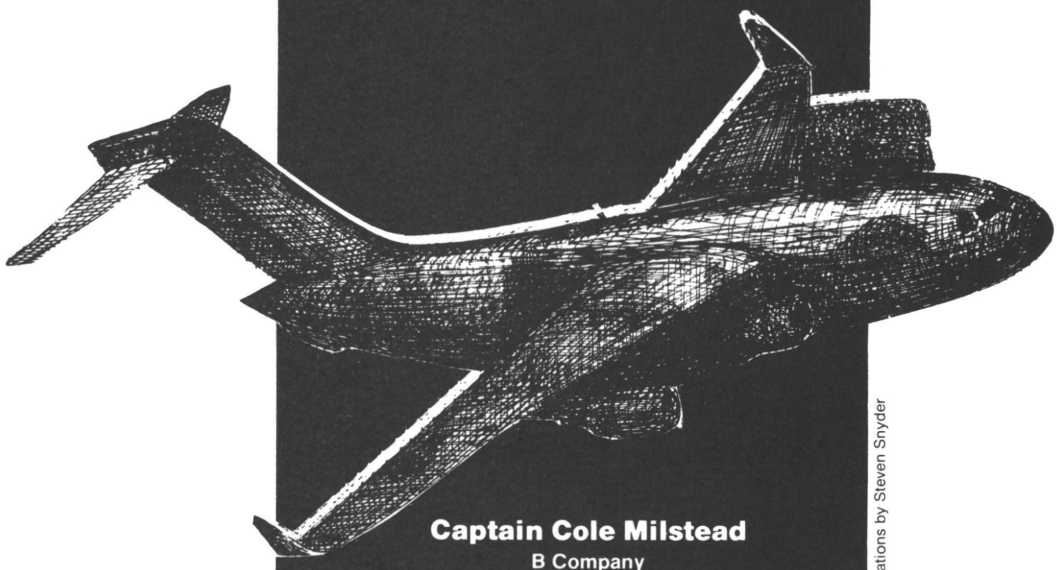
☐ YES ☐ NO

YOUR OPINION COUNTS TOO!

You may express your views by writing to the Office of Personnel Systems, Directorate of Aviation Proponency, Ft. Rucker, AL 36362; or mail the attached questionnaire to the above address ATTN: ATZQ-DAP-PS (CW4 Sweezy) no later than 30 June 1989.

MONTHLY WRITING AWARD

The Future of Combat Air Traffic Control?



Captain Cole Milstead
B Company
1st Battalion, 11th Aviation
Aviation Training Brigade
Fort Rucker, AL

illustrations by Steven Snyder

DATELINE: Sometime early in the next century.

A flight of four C-17s penetrated the darkness flying toward a busy light infantry division airfield in a war-torn southwest Asia nation. Calling it an airfield was something of a misnomer because it actually was nothing more than a level strip of dry lakebed. The strip's location in the division rear was at the foot of a key pass through mountains towering above the airfield. This mountain range spanned the entire length of the embattled nation, effectively splitting the country in half. The invading enemy to the north was trying to thrust south through the mountains to the gulf. Thus, the mountains were the focal point of allied efforts to hold off advancing enemy armor.

The United States had expended enormous efforts to air- and sea-deploy a single heavy division and four light divisions to the area of conflict. In contrast,

the enemy simply staged its forces and motored across its own border with up to five tank and combined arms armies. Each of our divisions was staring down the barrels of an enemy army with four to six divisions. The good news was that only a single enemy division at a time could squeeze through the narrow mountain passes and such passes were few. The bad news was that the distance between the mountainous main battle area and the Navy's gulfbound fleet was extensive and road networks in between were inadequate. So, airlines of communication had proven critical in sustaining and reinforcing front line elements.

U.S. Air Force transporters bore the primary burden of air movement forward. U.S. Marine Corps V-22 tilt rotor aircraft also proved invaluable, allowing Marines defending shoreline cities, ports and airfields to reinforce rapidly critical forward areas. The distance from gulf to mountains was too great for U.S. Army aircraft from both a flying-hour and fuel-conservation standpoint. Therefore, Army aviators concentrated on air transport within the vicinity of the mountainous combat zone. Even so, the quantity of Army aircraft and their critical mission required an enormous throughput of JP-8 fuel to the mountains. Engineers worked to construct and maintain assault pipelines over the desert terrain leading to zones of conflict. Pipeline sabotage efforts, however, made it necessary to continue air transporting bulk fuel using Air Force aircraft. The C-17's ability to wet-wing defuel into ground bladders and tanker transports had proven invaluable. They had turned every aircraft delivering to the division airfield into a fuel source for Army aircraft and the mechanized task force. The decision in the late 1980s to convert to a single common fuel was now showing its worth.

The C-17s now inbound to the desert airfield each carried a single M1A3 tank and two 155 mm towed howitzers with terminally guided, armor-killing munitions and crews. This was the third flight of C-17s to deliver such reinforcements during the past 4 hours. Once these aircraft were offloaded, a tank company and an artillery battalion would be combat-ready to augment a mech-heavy task force already near the airfield.

The reinforcements were needed to stop a tank division that had bypassed infantry chokepoints in the pass. This occurred because the two light infantry brigades defending the pass became fixed in a prolonged engagement with the enemy's lead motorized rifle division. That division frequently had attacked while dismounted, trying to seize overwatching terrain with the aid of extensive artillery and air support. This endeavor had failed, and the division ultimately was destroyed. However, in the process our forces in the pass had run critically low on ammunition, allowing the following tank division to slip by largely intact.

The corps commander ordered aerial reinforcement to contain the escaping tank division and aerial resupply for the light brigades in the pass to halt the lead division of the Army's approaching second echelon. He also allocated some of his scarce Army tactical missile assets, air interdiction, corps attack helicopters and Marine V-22 assault assets to the task of wearing down the fourth, still distant, division on the Army axis of advance. The division commander was confident that his resupplied brigades and strengthened mech task force could succeed because much of the enemy's critical air and artillery support had been stripped away in earlier actions. The division's two air reconnaissance troops, using their light helicopter experimental (LHX) aircraft, had located and destroyed the enemy's 280 mm rocket launcher regiment and army artillery group. This significantly reduced the threat to the distant division airfield and the light troops defending the pass. The "Air Cav" and the single division attack helicopter battalion, LHX-equipped, had also worn down most of the enemy's attack helicopters.

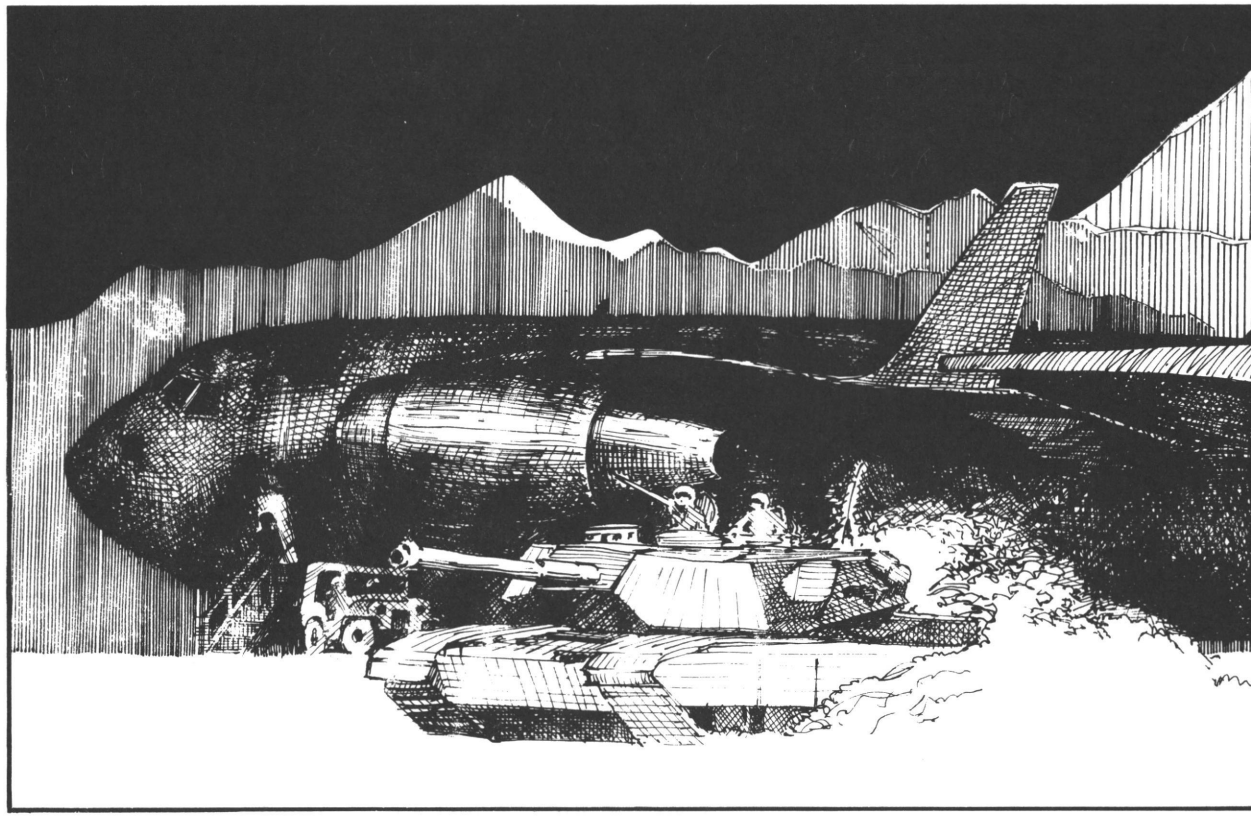
The division flight coordination center (FCC) had aided this latter effort. The FCC had matched enhanced position locating and reporting system (EPLRS) flight-following data on friendly aircraft to forward area air defense (FAAD) command, control and information (C^2I) radar data on enemy rotorcraft. This permitted early warning of the proximity of enemy helicopters, as well as the vectoring of our aircraft to help avoid or find the enemy first, thereby gaining an advantage in the event of air combat. When friendly aircraft were hit and downed by enemy air and ground fire, EPLRS flight-following position data could be used by the FCC to call for medical evacuation support or search-and-rescue aircraft identified from aviation brigade UH-60 Black Hawk assets. Precise grid coordinates were provided of last known positions. The FCC also vectored searching aircraft to crash sites as needed.

Meanwhile, at the division airfield, air traffic control (ATC) soldiers were at work in their small tower in the back of a high-mobility, multipurpose wheeled vehicle (HMMWV). The corps flight operations center (FOC) got word to the tower to expect the C-17s, so controllers alerted ground support crews to expect business. CH-47E Chinooks in

nearby mountain assembly areas were notified so they could prepare for their slingload mission, carrying the towed howitzers. A battalion of corps AH-64B Apaches, sent forward to engage the approaching tank division, were altered so that one company could divert temporarily to provide security for the airfield. The tower also checked with air defenders in the area to ensure they already knew about the inbound C-17s, Chinooks and Apaches so that they would not get trigger-happy.

The C-17 flight leader, who announced the flight's proximity and inbound approach for landing, interrupted coordinating activities. The tower responded on secure radio, and issued the landing threshold grid coordinate and landing direction. The flight leader read back the data to verify its correctness and entered the numbers into the aircraft's global positioning system (GPS). With the flip of a switch, the data were automatically transmitted to the other aircraft GPS systems to permit automatic GPS approaches to be executed. The flight continued inbound 2 minutes apart with station-keeping functions intact to assure safe separation in the darkness. The lead aircraft continued on automatic pilot toward the point on the ground that would require a 90-degree turn and a descent to landing.

The landing would be performed automatically. It was critical, because of the bomb-cratered surface of the lakebed, to hit the right touchdown point and landing azimuth. Many enemy air and missile attacks had pocked some of the previous landing surfaces badly. A failed, regimental-level, airborne attack against the airfield also left multiple BMDs (Soviet airborne combat vehicles) and other destroyed enemy vehicles littering the lakebed. These proved no match for the mechanized task force that was close by both to defend the exit of the pass and to provide rear operations support against such level III attacks. It had been necessary, however, repeatedly to shift the runway laterally and to change landing directions to find a suitable uncratered landing area. This



had been one of the benefits of the large lakebed because engineer runway repair requirements were reduced. It was easier to continue operations despite attacks.

The tower turned on night vision goggles (NVG)/forward looking infrared (FLIR) compatible runway and taxiway lights for final approach and taxiing to offload points. The air traffic navigation, integration and coordination system (ATNAVICS) radar section monitored the approaches to aid pilot peace of mind by reporting any approach discrepancies. One after the other the huge transporters landed and braked to a stop in under 3,000 feet. The large dust clouds created by each landing aircraft emphasized the need for automatic landing because visibility for each succeeding aircraft increasingly was reduced to pitch-black conditions. The C-17s combat-offloaded the palletized howitzers and ammunition out the back ramp in areas designated by the tower that would not block other taxiing aircraft. Tower personnel coordinated Chinook movement to these areas for later slingload operations.

The C-17s turned into each defueling and offloading pad as per tower instructions. Minutes later, tanks rumbled out the back of each aircraft, combat ready. While this was occurring, medics were preparing casualties for onloading. Fuel handlers also hooked up to under wing fuel ports to begin defueling JP-8 into corps 7,500 gallon tanker trailers or 10,000 gallon fuel bladders.

Everybody understood that speed was essential because four C-17s, valued at more than $180 million each, represented a lucrative enemy air and missile target. It was also understood that the gap between the airfield and the ground enemy was closing rapidly. It would only be a matter of hours before the airfield was within artillery range of the tank division. Two of the huge C-17s had already completed their missions and had taken off again. The third aircraft was nearly finished onloading and strapping down a damaged Patriot missile launcher. The fourth C-17 was wet-wing defueling into a CH-47E bladder bird that was taking on 3,000 gallons of JP-8 internally.

The tower's activity was heightened as a message came in from the corps FOC on EPLRS. Two flights of fighter bombers were believed to be 7 minutes outbound from the airfield location. Tower personnel knew the FOC had obtained this information from the airborne warning and control system through the Air Force control and reporting center, so that interceptors and air defense had been notified. The tower's mission was to warn aircraft still on the ground and to ensure ground support personnel were undercover. The C-17s were informed by radio. In less than a minute, the huge aircraft were lumbering away from offloading points in a race toward the end of the runway. Simultaneously, the radio warned CH-47s finishing hooking up their loads to get them off the airfield. The 7,500-gallon tankers sped off across the desert floor toward camouflaged and covered parking areas.

The mech task force was warned so they could prepare to engage inbound aircraft with cannon and machinegun fire. The pedestal-mounted Stinger systems on the back of HMMWVs and the Stinger-armed Apaches and LHXs were prepared equally and were tied by the FAAD C^2I system into the Patriot battery 50 kilometers (km) farther to the rear. The Patriots would try to "take out" as many aircraft as possible at extended ranges and would warn the Avengers and Apaches when the enemy was approaching their range.

Controllers watched as the last C-17 cleared the airfield and banked hard toward the south, staying low. The ATNAVICS ground controlled approach section provided radar vectors to the departing aircraft so that they could fly as low as possible without striking a mountain they might not see in time with their NVGs. The radar was placed in the directional mode to avoid aiding the enemy fighter-bombers in finding the airfield in the darkness. Tower operators watched a Patriot missile streak toward the mountains, which meant the enemy was near, so they jumped out of the tower and into their covered foxholes.

Fifty km to the north, a pair of corps attack helicopter companies were beginning to wear down the enemy tank division that earlier had escaped our infantry. The Apache and LHX mixes had been using a forward arming and refueling point (FARP) near the division airfield. This simplified the battalion's resupply efforts because the FARP was tied directly into the supply source. It also permitted the battalion to perform its secondary airfield security mission by having one of the three companies usually in the vicinity. This company had made initial contact while another of the companies badly needed to rearm and refuel. The commander of that company weighed his sustainment options and decided to request resupply at the division aviation brigade consolidated FARP farther north.

After telling battalion of his intentions and getting a green light, he called the division FCC to relay his request to the other end. The division airfield tower had already informed the FCC that a Chinook bladder bird and another loaded with ammunition were inbound to the brigade FARP. The FCC contacted the

ATC tactical air traffic control (TAC) team supporting that FARP and told them of the attack company's problem, the inbound supplies, and asked the team to contact the aviation brigade S4. Permission was granted. The FCC relayed this back to the Apaches along with a set of coordinates for the FARP and an offer to vector. Knowing that the FCC had a FAAD C^2I interface giving locations of suspecting enemy aircraft, the company commander agreed to the EPLRS low-level vectoring. He figured with low fuel and ammunition, the last thing he needed was to run into a flight of Hokums.

The brigade FARP sat in a valley, 30 km southwest of the pass, where the two light infantry brigades were fighting. One valley over from the FARP was a small, 1,500-foot airstrip and segments of the two infantry brigade support areas. On the ridgeline overlooking both was a four-man ATC TAC team. The team's HMMWV-mounted, tactical terminal control system shelter was remotely linked to its antennas nearly 2 km away. This provided a degree of safety to the controllers and the FARP/airstrip if the enemy targeted the radio emissions. It also permitted antennas to be placed for maximum directional line-of-sight (LOS), hopefully to preclude enemy interception.

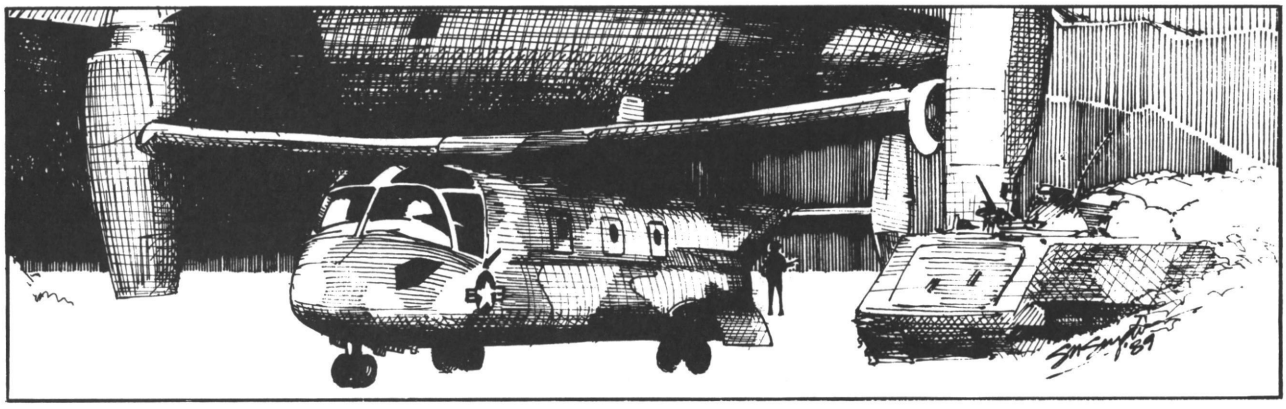
The brigade airstrip frequently was used by Air Force advanced tactical transports (ATT) that would airland, airdrop or LAPES (low altitude parachute extraction system) supplies forward. These enhanced survivability cargo aircraft could land in half the distance of the larger C-17 or C-130 Hercules they gradually were replacing. The TAC team had communications with ATTs, Army aircraft, the division FCC and the infantry and aviation brigade S4 elements. Team members not only controlled air traffic but, in many cases, coordinated and orchestrated air movements for the S4s. Air Force ATTs would receive GPS landing coordinates and runway directions from the team, or airdrop coordinates based on the prevailing winds. The team temporarily could remotely activate low power beacons in the valley below so that homing parafoils could glide to their relative vicinity. Controllers also relayed destination grid coordinates from S4 elements to UH-60Cs and CH-47Es transporting supplies.

If S4s needed information regarding the progress of aerial resupply missions, they could communicate with the FCC through the TAC team. Non-LOS EPLRS position locating capabilities simplified the FCC's ability to flight follow and monitor air movements. The FCC's location midway between the division and brigade airfields was ideal also for relaying administrative or logistical communications to and from the rear. The FCC also warned aircraft when they were approaching the vicinity of friendly artillery, air defense, and remotely piloted vehicle launch/recovery areas because locations of these systems also were displayed by EPLRS. Warnings were provided to Army aircraft transversing higher speed corridors in opposite directions so that midair collisions could be avoided.

Back at the division airfield, the air attack was over. Patriot missiles had destroyed two fighter-bombers as they silhouetted themselves to radar coming over the mountains. It took 30 seconds for the remaining enemy fighters to cover the last 10 km to the airfield. That was enough time for Stinger operators in HMMWVs and Army aircraft to spot the fighters through their FLIRs and launch a salvo that took out another two aircraft. During the final few km to the airfield, the sky lit up with 25 mm tracers from the Bradleys and tank .50-caliber rounds. This wall of fire was disrupting enough that most enemy pilots missed their targets entirely.

The fighters disappeared in the darkness, but everyone knew that they were setting up for another attack. The ATNAVICS section activated their radar from their remoted bunker position and began a 360-degree sweep now that there was no doubt that the enemy had found the airfield. Using a portable video console fiber-optically linked to the HMMWV-mounted ATNAVICS radar 500 meters away, controllers identified the low-flying enemy coming in from a different direction. Using a remoted radio headset, the radar controller announced a precoordinated brevity code and an azimuth. Numerous weapon systems reacted by directing their turrets or hover-turning toward the announced direction. Over a small bluff 5 km away, the enemy reappeared allowing several seconds to lockon with Stingers, letting loose another salvo. Tumbling in flames, one more fighter fell to earth. A moment later still another aircraft exploded, this time a casualty of an Apache's invisible but no less deadly 30 mm fire.

Later it was learned that intercepting Navy fighters had finished off the remaining two enemy aircraft as they attempted to return to home base. In two passes not a single combat vehicle or Army aircraft was hit. However, the "runway" had been broken up by multiple cratering submunitions, and one of the

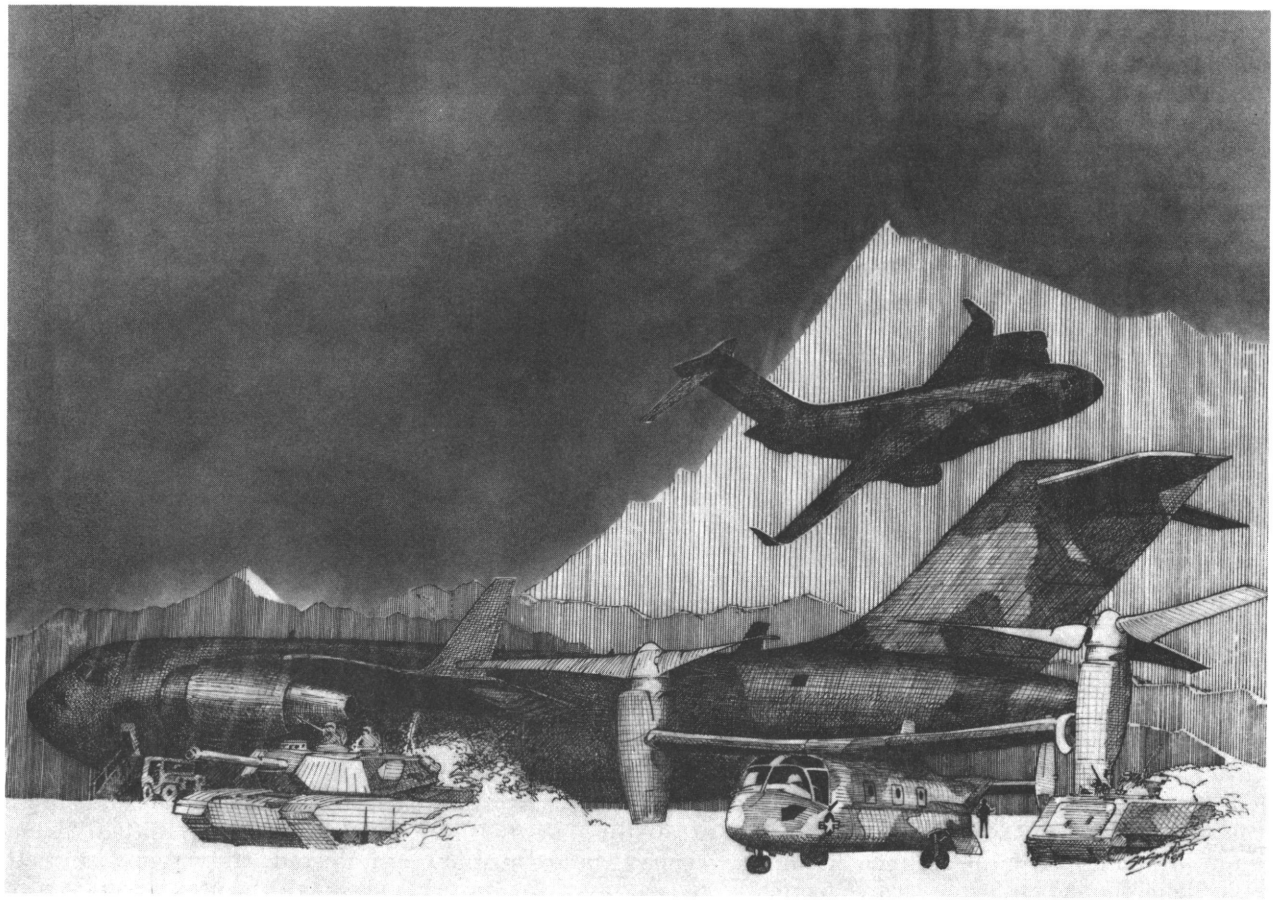


10,000-gallon fuel bladders was aflame. Fortunately, fuel handlers had been able to pump away the majority of the precious JP-8 to a covered and concealed bladder close to the airfield FARP before the bombs had started falling. Some ammunition on the ground at airfield offload points had been hit, but the policy of extracting supplies immediately as soon as they arrived, using Army aircraft, had paid off on the whole. The enemy had learned from past attacks that its losses would be high and its immediate gains low from such airstrikes. As a result, this time they had brought along an additional payload, consisting of chemical munitions, to close the field once and for all. The mech task force had anticipated this and had positioned itself upwind. After the attack it simply motored away farther upwind to check for and clean off any contamination.

The ATNAVICS radar section also had been damaged, but its modular construction would simplify repair. The HMMWV carrying the "fragged" radar was still drivable; therefore, section members jumped inside it in full mission oriented protection posture (MOPP) to go check the runway and pre-identified alternates to see which would still be usable for the next expected Air Force flights. Caution had to be taken because controllers knew that delayed munitions scattered about the lakebed would continue to go off.

Tower personnel were pleased that their equipment was still intact. The HMMWV had been parked inside a crater made by an earlier attack; it was well sandbagged and camouflaged. Controllers checked the area for contamination and delayed munitions; they discovered that a persistent liquid nerve agent was scattered in a low density in the area. The crew dug up a thin layer of contaminated surface sand surrounding the tower and moved it downwind. They marked the contaminated sand area that had been decontaminated. The section troops then pulled out the tent vestibule that was built into the HMMWV's tower entry door. The tower's climate-control and nuclear, biological and chemical filtering system slowly began inflating the sealed tent vestibule. Meanwhile, a pair of controllers at a time doffed their MOPP suits and entered the small tent airlock leading into the main tent and tower. Inside the airlock, the buddy team scrubbed their hood, masks and gloves and waited several minutes for the air to be filtered and recirculated. Then, unmasked, they took off their gloves and waited several more minutes before entering the main tent connected to the tower. Once inside, the ATC soldiers radioed the corps FOC and the division FCC to relay the airfield's status to using units. Controllers were told that another flight of C-17s was inbound so they coordinated with the ATNAVICS section to see which "runway" would be used this time. The enemy effort to close the airfield had failed. It would soon be back in business albeit under more controlled conditions to limit the spread of contamination....

Because ATC is such a necessary peacetime mission, we often lose sight of wartime missions and realities. Traditional ATC functions supporting Army aircraft largely disappear with



COMBAT ATC

the outbreak of hostilities. Vertical helicopter instrument recovery procedures for inadvertent instrument meteorological conditions may be viable during field training exercises; however, we should not deceive aviators flying near the forward line of own troops (FLOT) into thinking that pulling pitch in the fog will solve their woes in real wars. Perhaps pilots of newer aircraft should be practicing a sort of reverse instrument takeoff procedure. Stabilized hover features and increased crashworthiness may take a slow, controlled instrument descent to breakout; or they may make the trees a more attractive alternative than a missile-induced, uncontrolled fall from altitude.

Tactical instrument flight has been deemphasized for a reason. Threat radar air defenses are just too good, as are the enemy's capabilities to find emitting nondirectional beacons. Current ATC radios and radars also are unsecure emitters that many commanders do not want around. Flight following would be a legitimate combat mission, but current equipment does not work at wartime flying altitudes, nor are position updates sufficiently frequent to be of much use. Is there then a viable combat mission for Army air traffic controllers in the future?

Some say no. They argue that Army aircraft fly low and relatively slow, basically watching out for themselves. This argument carried to the extreme would ultimately result in civilianization of all Army ATC slots to fill Army needs in another military occupational specialty (MOS).

A different, but no less devastating, argument is that ATC is required in combat, but only to support larger, faster Air Force aircraft. The natural conclusion from this line of thought would be to give the Air Force the Army's approximately 1,600 military controllers. They then could accommodate Air Force support missions well into the corps,

division and brigade sectors.

While there may be elements of logic in both arguments, the Army would lose a significant combat multiplier if it followed or was dragged into either course of action. As a previous ATC naysayer, my opinion of the MOS has changed 180 degrees following my tour of duty as company commander of 8 percent of the Army's military controllers. A more intelligent, capable group of soldiers does not exist in the U.S. Army. The potential of the combined ATC body of knowledge far outweighs any gains the Army might realize by dividing that body up piecemeal. This is true, however, only if ATC soldiers have a legitimate combat mission. To continue allowing these soldiers to be under- or ill-equipped for combat would ultimately result in leaders viewing ATC as unnecessary and, therefore, a potential billpayer for future force structure cuts.

To prevent this we must identify and exploit the skills controllers learn so well in peacetime, and convert these skills into solving current and projected combat deficiencies. One such commonly recognized deficiency is our relative inability to provide accurate, timely Army airspace command and control (A^2C^2). Anyone who has ever considered the magnitude of the tasks involved to make A^2C^2 work may have had doubts that the mission was achievable. It may not be, but if any group of soldiers can make such a system viable, in perhaps a somewhat altered form, it is probably air traffic controllers. These soldiers are so good at seeing, analyzing and acting rapidly that they seemingly refute the concept of task overload. This coolness under stress is the primary ATC skill the Army should exploit. The chaos of war may seem an almost "ho-hum" affair to many seasoned ATC soldiers. Add to this unique abilities to communicate clearly over the radio and to interpret radar data. Then it is not difficult to imagine the possibilities, not just in A^2C^2, but in communications, logistical resupply and ground control intercept.

Future ATC units, like those in this scenario, are already proposed at corps and division level. Equipment described herein is not pie-in-the-sky technology. It either already exists, is programed or is likely to exist. The Aviation Branch as the ATC proponent simply can plug into many of these future communications, control, navigation, position-locating and early-warning systems that other proponents have already developed. Although some described missions would alter ATC responsibilities, thereby dictating doctrinal changes, the primary stumbling block to implementation is probably funding. For Army ATC to earn a niche for itself in future tight budgets, convincing arguments must be made that ATC will provide significant contributions to AirLand Battle doctrine.

One means to make this argument is to tie onto the coattails of already approved future systems and new missions that relate to ATC. The C-17 aircraft, for instance, will transform air transport by permitting forward-delivery of outsize/oversize cargo, or large supply quantities to 3,000 foot airstrips. These smaller, more austere airfields will need ATC support, but beyond that, will need a coordinating activity to get the C-17 and its supplies or cargo onto and off of the airfield as quickly as possible. This function for small airfields as of yet has no doctrine, nor is it supported with force structure. Therefore, the door is open for Army ATC to assume at least coordination of these activities. This would legitimize ATC as an active participant on supported unit administrative/logistical nets, thereby further justifying needed modernization of ATC communication equipment.

Inherent risks are associated with forward-delivery within the relative vicinity of the FLOT. We then should argue that Army ATC must be a player in the FAAD C^2I network to protect valuable airlift assets from air attack. We can also show that better flight following using EPLRS will improve A^2C^2, the monitoring of aerial resupply and downed aviator survivability by improving search and rescue efficiency. Combine the data gained from FAAD early warning and EPLRS flight following and an added capability will exist to vector aircraft in a manner akin to ground control intercept!

The "big picture" argument that makes the strongest case is that, in many contingencies, a light infantry, airborne, air assault or motorized division will win or lose battles and maybe wars, depending upon its ability to sustain and reinforce itself by efficient and survivable air transportation. Tactical ATC will be a major reason such transport is achievable but only if we properly equip ATC soldiers for that mission. The ever-changing threat dictates that we continually re-evaluate the role of every soldier on the future battlefield. Army ATC must keep an open mind about its future lest it lose it, and the Army an open checkbook to help finance it. Only through thoughtful change can we eliminate naysaying about ATC's peacetime-only emphasis. Only through evolution can we restore the combat necessity ATC has to our Army and Air Force. An air traffic controller is a terrible asset to waste. Let us return ATC to its rightful position of towering above the best.

USAASO SEZ

Mode C Requirement Impact on the Army

Mr. Lingiam Odems
Air Traffic Control Specialist
U.S. Army Aeronautical Services Office
Cameron Station, Alexandria, VA

RECENTLY, WE IN aviation have noticed an increase in articles, news reports and plain hangar conversations on transponders and Mode C (automatic altitude reporting capability). A reason exists for this interest. The requirement for installation and use of this equipment is partially due to an accident that occurred when air traffic controllers did not see a small aircraft before it collided with an air carrier aircraft because of the absence of Mode C.

The U.S. Congress enacted two statutes requiring the Federal Aviation Administration (FAA) to broaden its existing rule for the use of transponders with Mode C. These statutes are known as the "Fiscal Year 1988 Continuing Resolution" (PL 100-202) and "The Airport and Airway Safety and Capacity Expansion Act of 1987" (PL 100-223). Both laws state that the "FAA shall issue regulations requiring a transponder with Mode C on all aircraft operating in designated airspace where radar service is provided for separation of aircraft." The laws also directed that these regulations must be issued by 30 June 1988, with an effective date no later than 30 December 1990. On 17 June 1988, the FAA complied with the wishes of Congress and issued a final rule that expands the requirement for Mode C.

This rule requires aircraft to have an operating transponder (basic transponder or Mode S transponder) with automatic altitude reporting equipment (Mode C). The aircraft must have an operating transponder when operating in the vicinity of certain primary airports for which a terminal radar approach service area has been established, and in other airspace at or above 10,000 feet mean sea level (MSL). This rule will be implemented in two phases. Phase I will require a transponder with Mode C at or above 10,000 feet MSL, and in the vicinity of terminal control area (TCA) primary airports effective 1 July 1989. Phase II implements a transponder with Mode C requirement in airspace in the vicinity of airport radar service area (ARSA) primary airports, and also within airspace above an ARSA up to and including 10,000 feet MSL and at other designated airports. At these designated airports, all aircraft operations within a 10-mile radius of the airport from the surface to 10,000 feet MSL, excluding that airspace below 1,200 feet above ground level (AGL) beyond the airport traffic area effective 30 December 1990. A comparison of the existing requirement versus the new requirement is at right:

This rule will have the most impact on the Army's Reserve Component helicopters operating in specified airspaces listed in the preceding paragraph. The FAA believes that helicopters must be treated in the same way as any other aircraft. Also the congressional legislation referred to *all* aircraft with *no* provision for a categorical exclusion of helicopters. Helicopters no longer represent a small percentage of the aircraft operating in busy terminal areas. Also, helicopters are not limited by operational capability with respect to flight within these areas, which was the rationale applied to their original exclusion in Federal Aviation Regulation 91-24. The Army has more than 1,000 helicopters presently operating without Mode C in or around TCAs or ARSAs. These aircraft will be allowed to continue operating on an approved authorized deviation issued by the FAA until the aircraft can be brought into compliance. If a specific tactical aircraft cannot be equipped with Mode C or other navigational avionics because of weight limitations, space restrictions or other justifiable reasons, Headquarters, Department of the Army may petition the FAA for exemptions.

Efforts are underway within the Army to obtain necessary resources for compliance with the requirements. This is a painstaking, slow and expensive

Existing Transponder and Mode C Requirement	New Transponder and Mode C Requirement
EN ROUTE	
• Effective until 1 July 1989. All aircraft operations in controlled airspace of the contiguous United States above 12,500 feet MSL except for that airspace at and below 2,500 feet AGL. Exception: Gliders are excepted below a positive control area.	• Effective 2 July 1989. All aircraft operations in all airspace of the contiguous United States at and above 10,000 feet MSL except that airspace at and below 2,500 feet AGL. Exception: Gliders, balloons and aircraft without an electrical system are expected below a positive control area.
TERMINAL	
• Effective until 1 July 1989. All aircraft operations in the airspace designated as a terminal control area. Exception: Helicopters are excepted below 1,000 feet AGL within a TCA under the terms of a letter of agreement. In addition, ATC may authorize deviation on a case-by-case basis.	• Effective 1 July 1989. All aircraft operations within the airspace designated as a terminal control area. Exception: None, however, ATC may authorize deviations on a case-by-case basis.
• No existing requirements.	• Effective 1 July 1989. All aircraft operations within a 30-mile radius of the primary airport for which a TCA is designated, from the surface to 10,000 feet MSL. Exception: Gliders, balloons and aircraft without an electrical system are excepted in the airspace outside a TCA provided that airspace is outside the lateral boundaries and/or below the floors of a TCA.
• No existing requirements.	• Effective 30 December 1990. All aircraft operations within and above an ARSA up to and including 10,000 feet MSL. Exception: None, however, ATC may authorize deviations on a case-by-case basis.
• No existing requirements.	• Effective 30 December 1990. All aircraft operations within a 10-mile radius of a designated airport* from the surface to 10,000 feet MSL, excluding that airspace below 1,200 feet AGL beyond the airport traffic area. Exception: Gliders, balloons and aircraft without an electrical system are excepted. **Fargo, ND and Billings, MT, are the only airports currently designated.*

process. However, the Army intends to comply with these rules, thereby increasing the margin of safety within its own environment.

These changes in requirements are intended to significantly reduce the potential for midair collisions in terminal and en route airspace. The name of the game is safety. In the future, there will be additional rules with requirements that will impact on Army aircraft. The mission and readiness of the Army must not be reduced because of any additional requirements.

GLOSSARY

Transponder: The airborne radar beacon receiver/transmitter portion of the ATC radar beacon system (ATCRBS). This portion of the ATCRBS automatically receives radio signals from interrogators on the ground and replies selectively with a specific coded pulse group only to those interrogations being received on the mode that is set to respond.
Mode: The letter or number assigned to a specific pulse spacing of radio signals transmitted or received by ground interrogators on airborne transponder components of the ATCRB.
C: Mode C, "altitude reporting," used in ATC.
S: Mode S, discrete addressable secondary radar system with data link.

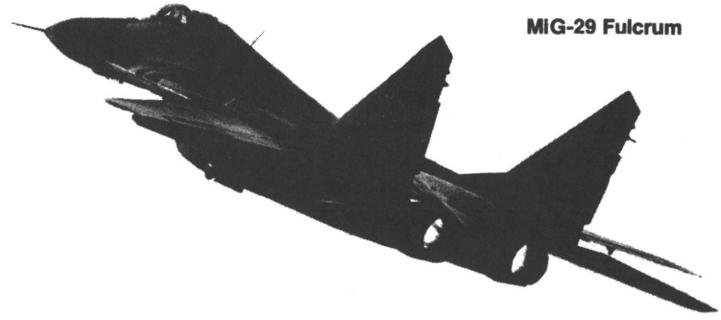
USAASO invites your questions and comments and may be contacted at AUTOVON 284-7773.

U.S. Army Class A Aviation Flight Mishaps

	Number	Flying Hours	Rate	Army Fatalities	Total Cost (in millions)
FY 88 (through 31 January)	7	536,101	1.31	0	$ 9.2
FY 89 (through 31 January)	31	496,320*	2.22	9	$27.0

*estimated

CW4 Charles T. Robbins
Western Army National Guard Aviation Training Site
Silver Bell Army Heliport
Marana, AZ



MIG-29 Fulcrum

A VISIT TO FARNBOROUGH

PART 1

This is the first of two articles highlighting the Farnborough biennial airshow. Army aviators can learn a great deal about the aircraft and related ground systems that may affect the future battlefield. Part 1 looks at the fixed-wing aircraft. Part 2 will discuss some of the newer rotary-wing programs and the Soviet involvement in the airshow.

THE FIRST FLIGHT in England of a powered aircraft occurred in 1908 at a field about 40 miles southeast of London, which was then the Royal Balloon Factory. With increased powered flight development, it became the Royal Aircraft Factory and produced thousands of aircraft for World War (WW) I and beyond. Today it is known as the Royal Aerospace Establishment, Farnborough, and is a major aviation research and development center for the United Kingdom.

Before, during and immediately after WW II, Britain held a dominant position in aircraft manufacturing and sales. An organization known today as the Society of British Aerospace Companies sponsored annual air displays at various locations before WW II, then starting in 1948 at Farnborough to sell British aircraft to a world market. With the subsequent decline of Britain as the world's leader in aviation exports, the Farborough Airshow became "international" to allow any country to display its military and commercial aircraft plus any related products and services. In 1962 the show became a biennial event, to occur on even numbered years. During odd numbered years, the Paris Airshow in France fulfills the same purpose as Farnborough.

Much of the glamour at Farnborough is focused on large commercial airliners and the latest jet fighters. However, there is much to be seen by the visiting Army aviator that may directly or indirectly affect the future battlefield.

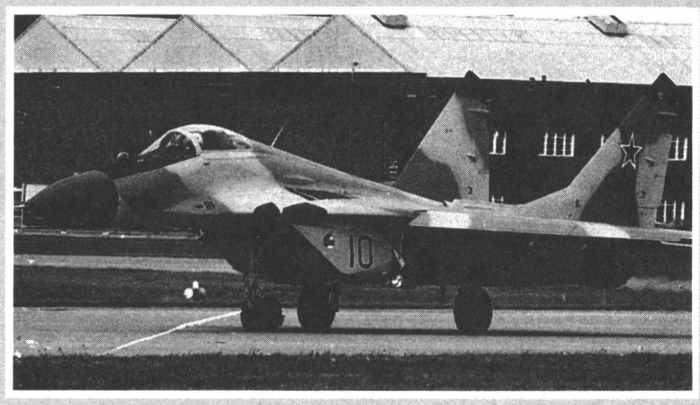
Until a decade ago individual aircraft companies conducted most military aircraft development programs. The Panavia Tornado strike-fighter, using British, German and Italian aircraft manufacturers, heralded the

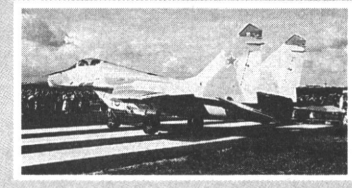
coming of the international development programs that are so prevalent today. Most of the advanced airplane, helicopter, antiarmor and antiaircraft weapons projects presented at Farnborough '88 had strong elements of multinational or at least multicompany cooperation.

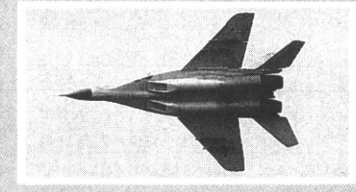
Major reasons for this trend are that complex and costly weapons systems require expertise, funds and resources that often no one company, or nation, can provide; and a desire by the major intended purchasers to have some of the economic benefits of coproduction. Stumbling blocks to cooperative projects have been, and continue to be, differing national military requirements and the lack of political commitment to be a part of a joint program.

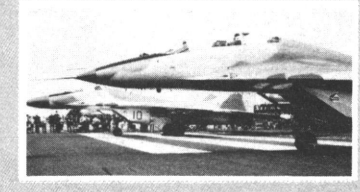
Farnborough '88 occurred during 8 days in early September. More than 100 military and civil aircraft were displayed and about half were flown in the daily flight displays. Even though it is one of the best airshows to be seen anywhere, the flying is intended to sell rather than entertain.

The major attraction for most observers at Farnborough was, by far, the appearance and flying display of the Mikoyan MiG-29 Fulcrum and the two-seat version, the MiG-29UB. The daily flight routine by the single seat MiG was the shortest of any fighter, but certainly the most watched. After a less than maximum power takeoff in about 300 meters, its initial vertical climb transitioned directly into a loop, followed by another vertical climb into what appeared would be a second loop. However, power was reduced and the aircraft was allowed to zero out airspeed while pointing straight up. At this point the Fulcrum descended several hundred meters tail first in a "tailslide" maneuver followed by a forward pitch over into normal flight. A slow speed pass at about 100 knots and 30 degrees angle of attack was followed by a knife-edge pass, several 9 "G" turns and a return for a no-flare landing. The drag chute was released at about 20 feet above ground level and the aircraft was allowed a long roll-out.









The MiG-29 Fulcrum was the most popular part of the Farnborough Airshow displays. ABOVE: A front view of the Fulcrum shows the "anti-FOD" engine inlet doors in the closed position, and the louvers above the intakes allowing air to the engines. ABOVE RIGHT, TOP: The MiG-29's two vertical fins have pointed tops, a design feature in common with the two other twin-tailed MiGs, the Foxbat and the Foxhound. RIGHT, MIDDLE: Bottom view shows blended fuselage design and space between engines where auxiliary fuel tanks can be fitted. RIGHT, BOTTOM: The MiG-29UB nose section is slightly lengthened and the radar removed to provide room for the second seat.

The Fulcrum fighter has a maximum speed of Mach 2.3 at high altitude and Mach 1.2 at low altitude. Two 18,300-pound thrust turbofan engines power the aircraft with a normal takeoff weight of 33,000 pounds. A 30 mm gun is normally mounted in the left wing's leading edge extension, but for the airshow it was taken out.

The fighter's radar is described officially as a multiple threat, look-down/shoot-down system that can acquire fighter size targets at 54 nautical miles (nm). Also on the Fulcrum is an infrared (IR) sensor and tracker able to pick targets at 15 nm.

A distinctive feature of the Fulcrum is the "anti-foreign

object damage" design of the engine air intakes. Whenever the landing gear is in contact with the surface, protective panels cover the intakes while louvers on top of the wing extensions open to allow air to the engines. With its wide landing gear stance, the MiG has been designed to operate from unpaved landing areas, a feature not shared by comparable North Atlantic Treaty Organization (NATO) fighters.

The Fulcrum does not use a flight control system or fly-by-wire system. Yet it still appears to be adept at flying complex maneuvers. Cockpit instruments are older, circular, analog designs; the pilot does not have good 360-degree visual coverage. The quality of workmanship varied from one area of the airframe to another with those more critical areas of the design receiving more attention than less critical areas. This was a similar observation about the MiG-25 Foxbat that landed in Japan more than a decade ago.

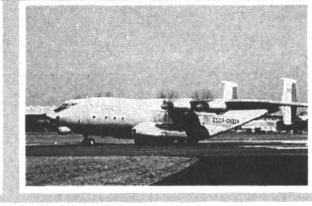
Even with its relative crudeness as compared to Western aircraft, the MiG still appears to be amply capable of performing its missions. With its advanced radar and fire control computer, 30 mm cannon, and its high-agility and low-altitude capabilities, the Fulcrum could be a major aircraft threat to Army Aviation.

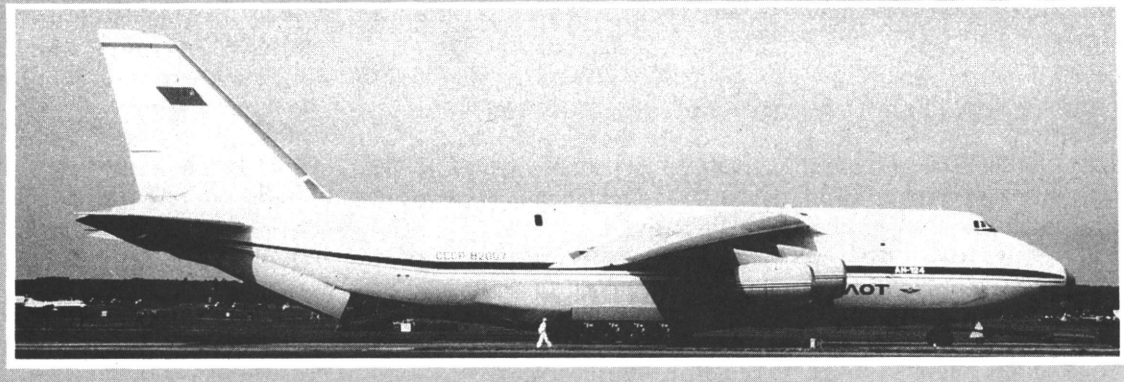
The MiG-29UB two-seat version, which does not have the advanced radar, did not fly during the airshow. The Antonov AN-124 Ruslin (NATO codename Condor) was scheduled to fly immediately after the single-seat MiG's performance, but aborted take-off on the first day because of a failed bleed-air system. A replacement engine was delivered from Kiev so that "the big ant," as the airshow announcer referred to it, was able to fly days 5 through 8. At 405,000 Kg (892,857 pounds) gross weight, it is the world's heaviest, and largest, aircraft.

Countering threat aircraft on the NATO front in the 1990s are several new designs proposed by multinational organizations and updated versions of current aircraft programs.

The newest European design is appropriately called the European fighter aircraft (EFA) multirole aircraft. It exists only in mock-up form, but is based on a similar looking research aircraft, which has flown. A consortium of British, Italian, German and Spanish aircraft companies are developing the EFA for their combined initial requirement of 800 aircraft. Eventual exports to other countries is a major goal for the EFA program to keep unit costs down. The first EFA proto-

BELOW: The AN-124 Ruslin (NATO codename Condor), the world's largest aircraft, dwarfs ground guides. NEAR RIGHT: The AN-124 kept its landing gear down throughout its flight displays. FAR RIGHT: On the takeoff roll is the AN-22, which brought in the replacement engine for the AN-124.

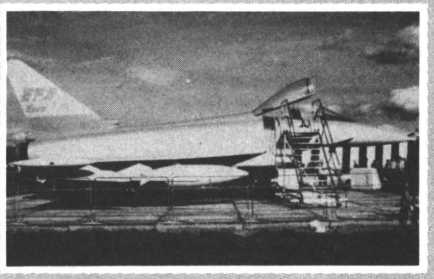




type is scheduled to fly in 1991 with initial operational capability by 1994 to 1995.

France was originally part of the EFA program, but pulled out several years ago to start its own multirole fighter. The Rafale "A" is the flying prototype to develop the Rafale "D," of which the French Air Force has an initial requirement for 250, and the Rafale "M," of which the French Navy will need 80. One estimate indicated a minimum sales requirement of 2,500 aircraft to allow Dessault-Breguet, the manufacturer, to break even financially. With an initial French requirement of only 330, much anticipation exists for a strong export program.

Complicating the Rafale program is that the French Navy needs to replace its F-8 Crusaders before the naval Rafale will be ready in 1998. Strong interest exists in using McDonnell Douglas F-18s in the interim period. This opens the door for a possible McDonnell Douglas initiative to sell the French Navy uprated F-18 2000s, in place of their Rafale M purchase, and to codevelop the radar for the remaining Rafale program. Such a program would save a third off the complete Rafale program and

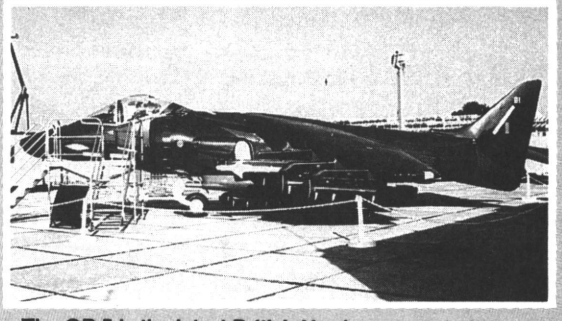


The Euofighter is intended to enter service in the mid-1990s.

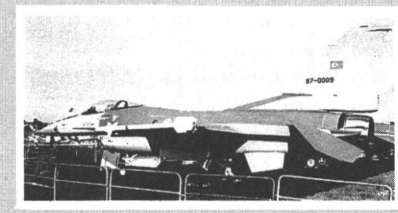
The Rafale prototype on short final shows off its canard wings.

The Canadians have painted silhouettes of the canopies on the undersides of their CF-18s to confuse enemy pilots.

The Sea Harrier, used during the Falklands war, provides a hovering demonstration.



The GR.5 is the latest British Harrier now entering service.



ABOVE: AN F-16C recently sold to Turkey.

LEFT: The 500th production F-16C was fitted with wingtip smoke generators to highlight the high angle of attack flown by the aircraft.

is being considered by the French.

The current F-18 program continues with sales to the U.S. Navy and Marines, Canada, Australia and Spain. The Canadians base CF-18s in Europe as part of their NATO commitment. One flew daily demonstrations at Farnborough in a routine similar to the MiGs.

McDonnel Douglas and British Aerospace (BAe) jointly have improved the Harrier "jump-jet." The new U.S. Marine version, the AV-8B, has already replaced the earlier AV-8A in service. An AV-8B flew flight demonstrations, while the new British version, the GR.5, was in the static display. The Harrier remains NATO's only runway nondependent jet fighter.

The General Dynamics (GD) F-16 Falcon program continues with strong sales now to 16 countries. The 500th production F-16C represented GD in the flight demonstrations. An F-16C recently sold to Turkey was in the static display.

A decade ago GD won the "sale of the century" with a coproduction contract with Norway, Denmark, Belgium and the Netherlands to produce the F-16. GD hopes to repeat a similar contract for codevelopment and coproduction of the "Agile Falcon," which would enter service in the mid-1990s. The Agile Falcon would have larger wings for better maneuverability and other refinements. GD has been proposing an A-16 close-air-support version of the F-16 that, if adopted, would replace A-10 Thunderbolts in joint air attack team operations.

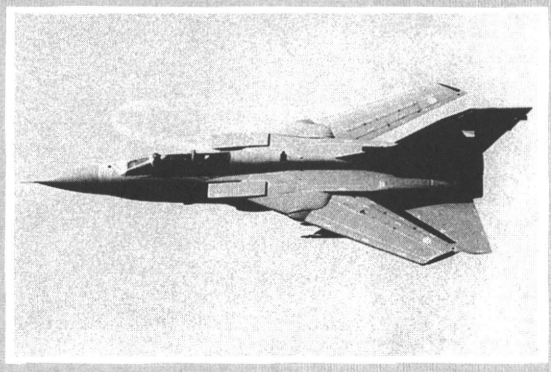
The loser of the sale of the century was the French Dassault-Breguet Mirage 2000, which today is the top fighter in service with the French Air Force. It has strong export potential for Africa and the Middle East, with recent sales to Egypt and Greece. A two-

The Mirage 2000 shows delta-wing design while on short final to land.

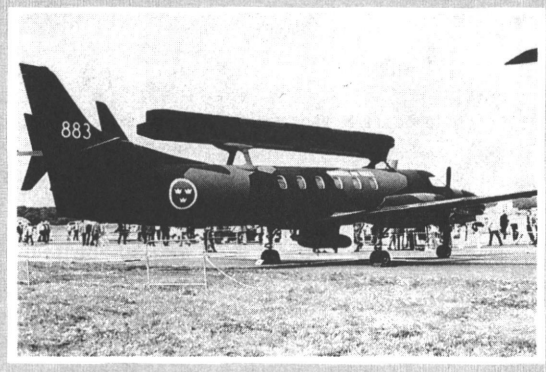
The Hawk trainer painted for display. The U.S. Navy is buying them as the T-45 Goshawk.

British Aerospace is hoping to sell some of its single-seat Hawk 200s.

The Brazilian/Italian AMX is in production for both countries.

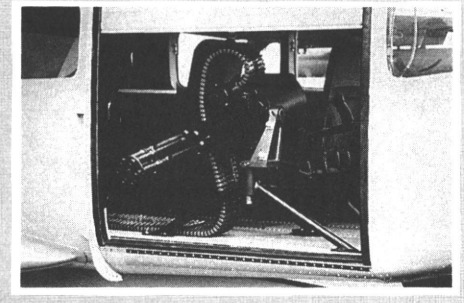


The F.3 version of the Tornado flew the fastest passes. Another version will have the mission of attacking enemy radar stations.



This Fairchild Metro III is used by the Swedish Air Force in the AEW role.

The Cessna 208 (U-27A) is offered for a variety of missions.



This optional .50 caliber Gatling gun in the U-27A could ruin somebody's day.

seat version flew daily at the Farnborough show.

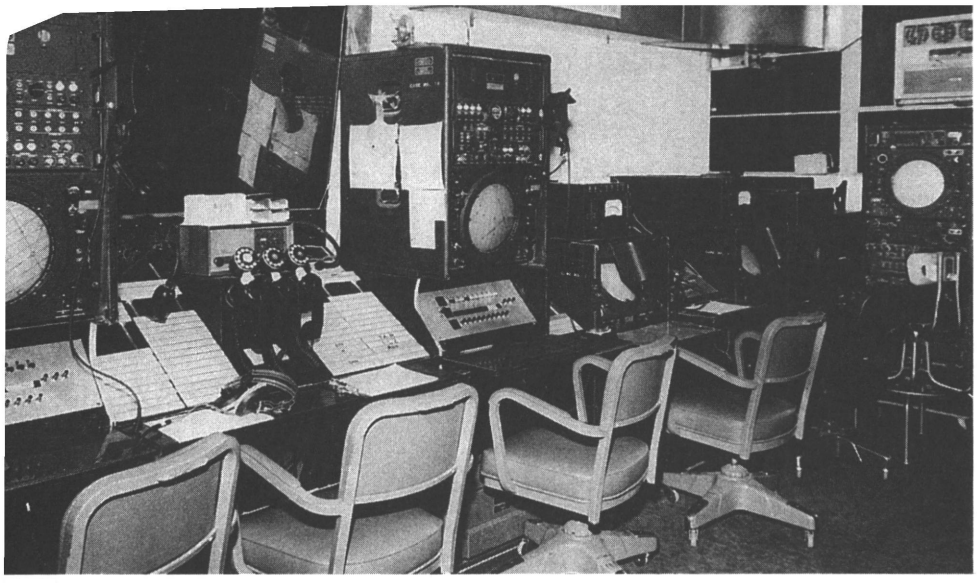
Two new ground attack aircraft that we might see in the future are the BAe Hawk 200, a single-seat version of the standard Hawk used as a Royal Air Force (RAF) trainer; and the AMX, an Italian-Brazilian airframe design, using a British engine, currently in production for both Italy and Brazil. The U.S. Navy recently contracted to purchase several hundred BAe Hawk trainers, which will be known as the T-45 Goshawk.

The ongoing Tornado program was represented in flight demonstrations by the F-3 Interceptor version for the RAF. Germany currently is developing an electronic combat and reconnaissance version that will be used in an antiradar role.

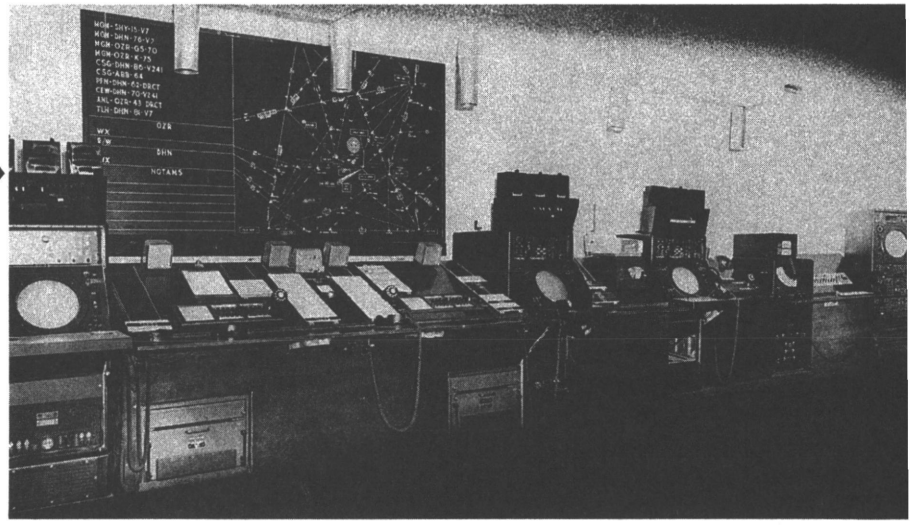
Farnborough is the place where manufacturers of civil aircraft will present their aircraft for a potential military role. Sometimes this results in some additional sales, but more often not. Among the more interesting successful examples is the Fairchild Metro III, which will be used by the Swedish Air Force for the airborne early warning role providing some overwater, or overbattlefield, surveillance.

Another aircraft of potential interest is the Cessna 208, which was painted in military grey. Dummy 2.75-inch rockets and Stinger missiles were hung under the wings. Best of all, a six-barrel .50 caliber Gatling gun was mounted just inside the cargo door. The aircraft is intended to be used by various government agencies for reconnaissance, drug interdiction and border patrol. According to the Cessna representative at the plane, some sales for this purpose have occurred, but he wouldn't say to whom or what the optional equipment was.

Many more fixed-wing aircraft of military significance were at the Farnborough Airshow. Most of those discussed will have some degree of impact in future Air-Land Battle operations. In Part 2 of this article some of the newer helicopter programs will be discussed along with some antiarmor and antiaircraft systems represented at the Farnborough Airshow.



Cairns RAPCON
July 1960—July 1961



Cairns RAPCON
July 1961—July 1967

Cairns ARAC
July 1967

Cairns ARAC
July 1974

The Army Radar Approach Control FACILITY

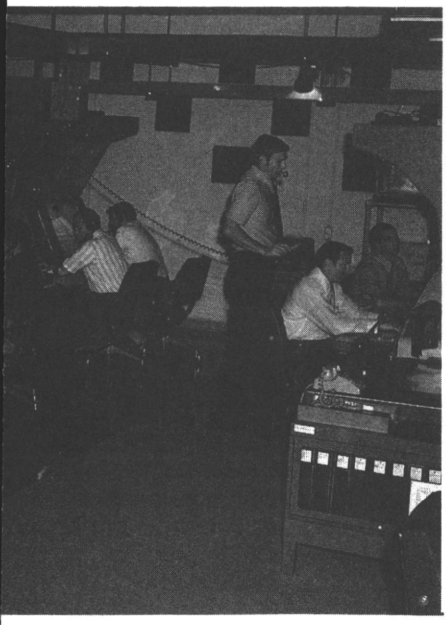
A Dimension of Excellence

Captain Robert L. Ledford Jr.
F Company, 1-13th Aviation Regiment
Aviation Officer Advanced Course
U.S. Army Aviation Center
Fort Rucker, AL

Army 60783: "Cairns Approach this is Army 60783 climbing through 600 for 2,000, over."

Cairns Approach: "Roger Army 60783, Radar Contact climb and maintain 5,000, over."

Army 60783: "Roger Approach, Army 60783 is passing through 650 for 5,000 feet."

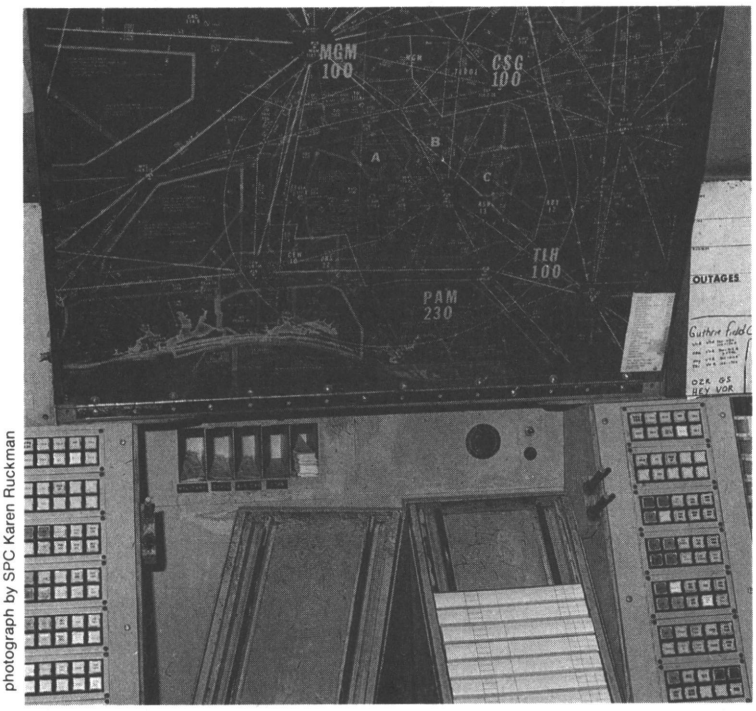


These words are familiar to every Army aviator who has ever flown out of Cairns Army Airfield, Ft. Rucker, AL. But how much is really known about Cairns Approach Control? The largest of the four Army approach controls (the others are located at Ft. Sill, OK; Ft. Campbell, KY; and Ft. Hood, TX), Cairns has distinguished itself through the years by providing air traffic control (ATC) services to the surrounding aviation community. Its proud history and never ending desire to excel were vital elements in its selection as the Army Air Traffic Control Facility of the Year for 1986.

The Army Radar Approach Control (ARAC) is a division of C Company, 1st Battalion, 11th Aviation Regiment, Aviation Training Brigade, Ft. Rucker. ARAC began operation in 1958 as the first approach control operated by the Army within the United States. This operation, located in Cairns Tower, began as a manual approach control, using time and altitude as the means of separating aircraft operating according to instrument flight rules (IFR). In its first year of operation, ARAC's traffic activity count was about 12,000 instrument operations (1.3 per hour). The area of jurisdiction at that time included the airspace surrounding Ft. Rucker that was clear of the Federal Airway System.

In 1960, radar was incorporated into the approach control, which used two airport surveillance radar (ASR) displays and a precision approach radar (PAR). Also at that time additional airspace was delegated to Ft. Rucker by the Federal Aviation Administration (FAA).

In 1961, ARAC's radar room was relocated. Services were expanded to include approach control for Dothan Municipal Airport and jurisdiction over a portion of the Federal Airway System. Between 1961 to 1967 other services were added such as the terminal en route service between Montgomery, AL; Columbus, GA; Albany, GA; Tallahassee, FL; and Tyndall Air Force Base, FL, approach controls. Also, ARAC assumed approach control responsibility for Marianna, FL, during this period. During this time ARAC

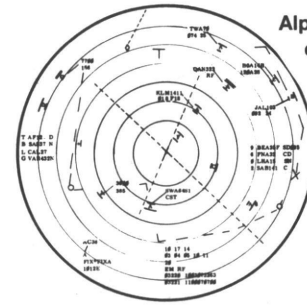


photograph by SPC Karen Ruckman

Airway chart defines sector boundaries in the Ft. Rucker control area. Below the chart is the telephone system used for coordination with adjacent ATC facilities.

photograph by SPC Sean Hill

Assistant controller marking flight progress strips for controller in the south sector. Also shown in the alphanumeric keyboard that serves as an interface between the controller and the ARTS computer.

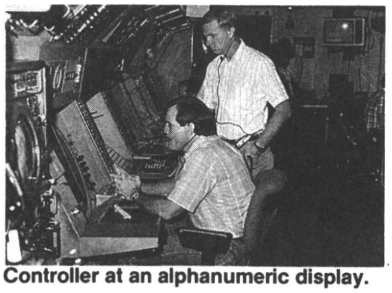


Alphanumeric display.

controlled about 70,000 instrument operations annually, a significant increase (4 to 8 per hour) over the prior years.

In 1967, ARAC's operations were relocated to a modernized facility that housed the latest state-of-the-art equipment. This equipment included both a dual channel ASR-5 radar and ATCBI-3 beacon interrogation equipment. This modernization program allowed the maximum capacity of 70,000 instrument operations per year to be expanded to accommodate more than 162,000 instrument operations (18 per hour) with no increase in the work force.

In 1971, initial action was taken to acquire an automated air traffic radar system that would assist the air traffic controller in providing maximum service and safety to its users. It was imperative that this system could perform redundant tasks such as identification and hand-off, and provide altitude and other information in an alphanumeric format. The FAA had such a system designed and built for them by the UNIVAC division of Sperry Rand. The FAA purchased this system, the Automated Radar Terminal System (ARTS-III), for use in its medium-density and high-density traffic terminal areas throughout the United States. With the inevitable increase in air traffic in the ARAC control area, it was decided that the ARTS-III



photograph by SPC Karen Ruckman

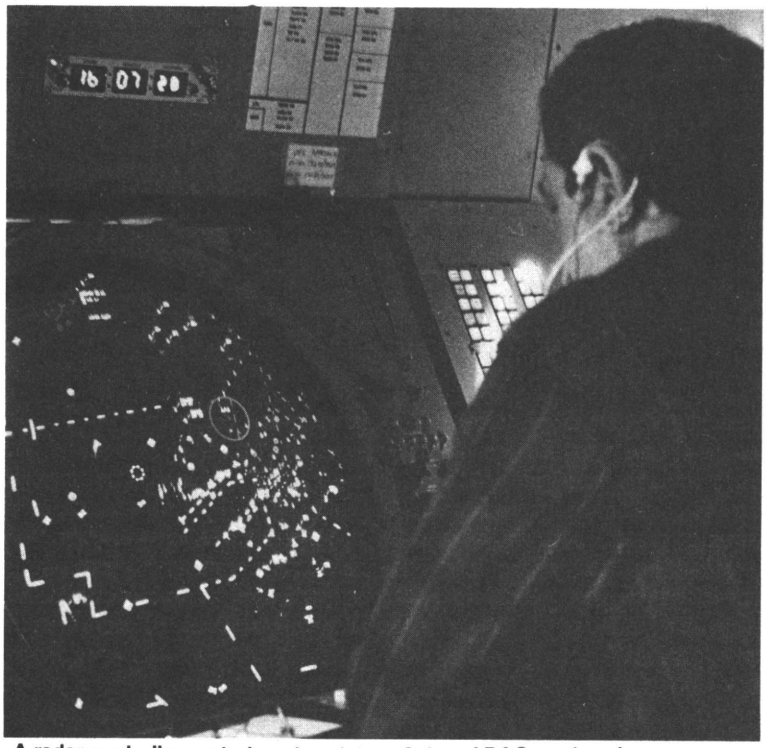
Controller at an alphanumeric display.

would be used. The first ARTS-III belonging to the Department of Defense became fully operational in September 1974.

With the purchase of the ARTS-III in 1973, a Data Systems Branch was formed to support the system. The branch's staff performs daily tasks such as systems analysis, programing ATC actions, reviewing proposed changes in ATC procedures, detecting computer malfunctions and resolving immediate problems of flight data.

In 1978, the system was enhanced further with the Minimum Safe Altitude Warning (MSAW) and Conflict Alert subprograms. The MSAW informs the air traffic controller when an aircraft is going to, or has, penetrated the minimum safe altitude for that particular leg of flight. The Conflict Alert gives each aircraft a sterile environment to operate in, much like a cocoon. When that cocoon is penetrated, it alerts the controller to the conflict. Both of these subprograms improve the air traffic controller's ability to provide a safe and expeditious flow of traffic.

In 1981 the FAA gave ARAC control of one of the largest areas of delegated approach control airspace in the southeastern United States. ARAC's control area extends from the surface to 10,000 feet mean sea level and covers a ground area of more than 8,000 square miles in southeast Ala-

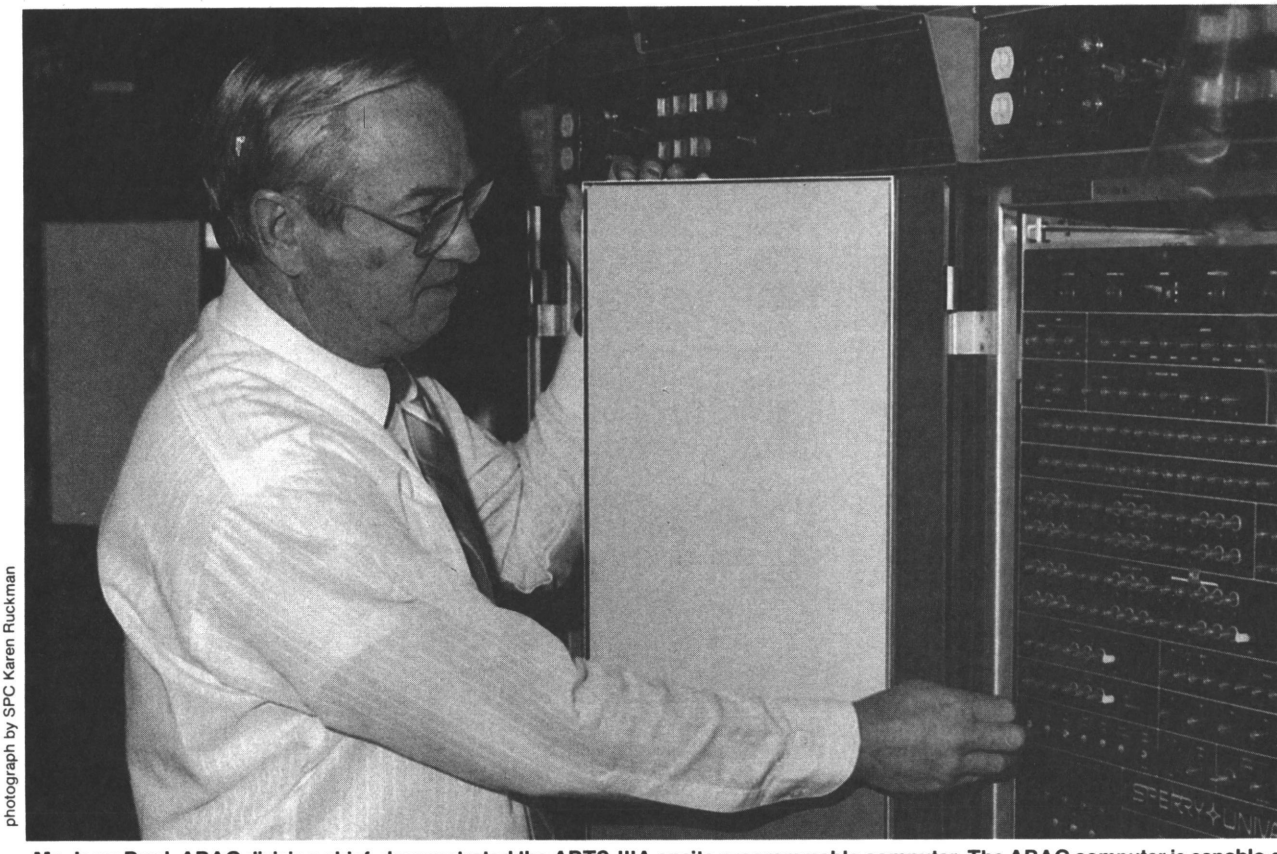


photograph by SPC Sean Hill

A radar controller vectoring aircraft into Cairns ARAC west sector.

photograph by SPC Karen Ruckman

Teamwork is required to control the commercial air carrier traffic into and out of the Dothan sector.



photograph by SPC Karen Ruckman

Mr. Jerry Byrd, ARAC division chief, demonstrated the ARTS-IIIA onsite programmable computer. The ARAC computer is capable of placing alphanumeric data on the radar scope, auto tracking of aircraft and associating data blocks with tracked targets.

bama, southwest Georgia and northwest Florida. It includes more than 360 miles of the Federal Airway System. Within this area, ARAC provides ATC services to 3 military airfields, 9 civilian airports and more than 100 different types of aircraft each month.

Besides the Federal Airway System, a unique one-of-a-kind Army Instrument Training Airway System (ITAS) is controlled by the ARAC facility. The ITAS consists of 491 miles of airways, 7 very high frequency omnidirectional ranges, 16 nondirectional beacons and 1 ground controlled approach. Eleven of these navigational aids are also a part of the National Airspace System. Initial entry rotary wing (IERW) training is conducted therein in visual flight rules conditions under the positive control of the ARAC using reduced separation standards. A complete simulation of Department of Defense flight information publications to include standard instrument departure procedures, en route chart and low altitude instrument approach procedures are published for use by IERW ITAS pilots. Altitudes used are from surface to 3,800 feet. The ARAC's control area is divided into four sectors (north-south-east-west), one of which controls that portion of the ITAS that underlies his sector boundaries. Participants may transition from ITAS to the Federal Airway System on request. With this area comes air traffic that totals more than 280,000 instrument operations annually (60 per hour). This allows ARAC to be classified as a highly complex level IV ATC facility. It also allows it to rank in the top 15 percent of all approach control facilities nationwide.

In conclusion, the ARAC has through the years evolved from being a manual approach control tucked away inside a control tower, to being the busiest Army radar facility in the world, a level IV facility with one of the largest control areas in the southeastern United States. Also it has seen the upgrading of its equipment to the state-of-the-art ARTS-IIIA. This upgrade has provided ARAC with the capability to ensure the safe and expeditious flow of traffic. ARAC has shown that it has the insight and ability to move forward as its environment changes. This is largely because of the devoted and highly professional men and women who strive to keep ARAC "Above the Best."

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ATC FOCUS

U.S. Army Air Traffic Control Activity

Guardsmen Meet for Air Traffic Control Capstone

Ms. Athena Petry
Public Affairs Specialist
Test and Evaluation Command
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AIR TRAFFIC CONTROLLERS from throughout the United States and Europe met in the Edgewood area of Aberdeen Proving Ground, MD, on 22 and 23 October 1988, for a conference designed to address training and capstone guidance concerns.

The conference was the third annual capstone meeting the Maryland National Guard 29th Air Traffic Control (ATC) Group (Gp) hosted. The 29th ATC Gp is collocated at the Gunpowder Military Reservation in Glen Arm, MD, and Weide Army Airfield, MD.

According to 29th ATC Gp commander, Colonel (COL) Rodney Lindsay, the conference was a great success.

"We had several topics we wanted to cover," he said. "First, we wanted to provide Department of the Army-level guidance on evolving ATC and aviation concerns. Second, we wanted to provide training guidance to our subordinate National Guard units. We also wanted to determine the status of their existing training, and to interface with each other for additional ideas."

COL Lindsay said representatives from 17 National Guard ATC platoons, 2 National Guard ATC battalions, 3 Active Duty ATC battalions and the U.S. Army Air Traffic Control Activity, Ft. Rucker, AL, attended the capstone conference.

The conference also brought together Department of the Army representatives from U.S. Army Training and Doctrine Command; National Guard; Active Duty aviation brigade commanders and members of the Combat Development's staff from the U.S. Army Aviation Center at Ft. Rucker, AL.

According to Master Sergeant Philip Brown, 1st Army Active Duty liaison for all Reserve Component (RC) air traffic controllers, this conference was particularly important.

"Many of the commanders and state headquarters people are new to their assignments, so it is very important for them to get together to establish a working knowledge about each other and to better understand how the RCs and their Active Duty counterparts work," he said. "There is also a lot of new equipment coming online," he added, "so they need to talk about reserve and affiliation support and training on that equipment."

COL Lindsay, who works as a full-time aircraft maintenance officer equipment specialist for the Aviation Division of the National Guard Bureau in Edgewood, said the National Guard is also acquiring TSQ-70 control towers.

"We have located several [control towers] that are excess to Active Duty requirements because they've received updated versions of the control towers. We will put the towers in place around the United States. Those towers will afford the Reserve Component air traffic controllers more practice and actual ground-controlled approach training," said COL Lindsay.

Readers are encouraged to address matters concerning air traffic control to Commander, USAAVNC, ATTN: ATZQ-ATC-MO, Fort Rucker, AL 36362-5265.

ARMY THEME FOR 1989

Secretary of the Army John O. Marsh Jr., Army Chief of Staff General Carl E. Vuono and Sergeant Major of the Army Julius W. Gates announced the successor to the Army's theme for 1988, the "Year of Training," in a 29 December 1988 proclamation.

The proclamation states the 1989 theme as the "Year of the NCO." It lauds the accomplishments of noncommissioned officers and outlines the role of today's enlisted leadership. The complete text of the proclamation is quoted below.

YEAR OF THE NCO

"The NCO is the Army theme for 1989.

"Soldiers who wear NCO chevrons on their sleeves represent a unique Army strength upon which this year's theme will focus. The previous yearly themes of Spirit of Victory, Physical Fitness, Excellence, Families, Leadership, Values, The Constitution and Training all have a special bearing on NCOs, who have key responsibilities in accomplishing the Army's missions.

"Throughout the history of our Army, the NCO has played an indispensable role in the warfighting readiness of our force. Baron Von Steuben, in writing our first Army manual, known as the Blue Book, acknowledged the importance of selecting the right soldiers as NCOs: The order and discipline of a regiment depends so much upon their behavior, that too much care cannot be taken in preferring none to that trust but those who by their merit and good conduct are entitled to it. Today, we continue to expect of our NCOs the highest professional standards and a diversity of knowledge in order to lead their soldiers in ensuring our Army is trained and ready. Tomorrow we shall expect no less.

"NCOs provide the day-to-day leadership to our soldiers. They ensure individual soldiers attain and maintain the required standards of proficiency and link soldier performance to unit missions. It is the NCO who must be certain of the soldier's ability to succeed in combat. With their officers, NCOs are responsible for the planning, execution and assessment of training.

"The NCO is both a leader and a role model. The process which develops NCOs as leaders has three components: institutional schooling at every level according to the Noncommissioned Officer Education System, operational experience in their respective military occupational specialties, and self-development which relies on the initiative an NCO takes to improve through reading, correspondence courses, and similar efforts. NCOs earn and retain the respect and confidence of their superiors and subordinates through demonstrated tactical and technical competence, and knowing how to lead and care for soldiers. As leaders, NCOs must satisfy the imperatives of mission accomplishment and the needs of their soldiers, and place both ahead of their own personal welfare.

"NCOs have a long history of dedicated service to soldiers, units, the Army and our Nation. We acknowledge their unique contributions, past, present and future, in declaring this special Army strength the 1989 Army Theme, 'The Year of the NCO.'"