

# DMA 10TH ANNIVERSARY EDITION

The Defense Mapping Agency officially became an operational organization under the Department of Defense and the U.S. Air Force Aeronautical Chart and Information Center became known as the Defense Mapping Agency Aerospace Center on July 1, 1972.

The change for the St. Louis Center was mostly administrative and slightly ceremonial on that warm July day for after all, the mission of producing the best aeronautical charting products for the nation's military forces was to remain the same. And, in basic terms, the mission today is still the same but how those charting products and the technology to produce them have changed during the ten years is another story.

This special 10th Anniversary edition of the *Orienteer* will discuss the change in articles on requirements, production, personal views of the Center and MC&G, and through photographs that document the actions that took place during ten years.

Perhaps as you read, you will learn more about what the Center and the agency has done, is doing and will do. We did.



1972



1982

The Editor

## Orienteer

DEFENSE MAPPING AGENCY AEROSPACE CENTER

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### Least Known; Most Vital—DMA

One of the nation's least known and most vital organizations, the Defense Mapping Agency, celebrates its first decade of service to the armed forces today.

As part of its Decennial Observance, DMA unfurled new colors in a military ceremony at its headquarters on the grounds of the U.S. Naval Observatory in Washington D.C. and saluted those who directed the agency during a period of dramatic transition in the

exploration and mapping of a continent, a Civil War, two World Wars, Korea and Vietnam, up to the present. Navy chartmaking was formally organized in 1830 and is even more critical today both on the surface and under the world's oceans. Aviation and aerospace charting date from the first World War and have included both the landings on the Moon and today's space shuttle flights.

Office of Distribution Services is also located in Brookmont, with branches in a dozen domestic and overseas locations, and the Inter American Geodetic Survey, which works with most Latin American nations, is located in San Antonio, Texas. The Defense Mapping School at Ft. Belvoir, Va., trains students from all the services and some allied personnel.

Since these and other car-

### AC to Celebrate DMA 10th in Tuesday Ceremonies

Two special commemoration ceremonies will be held Tuesday at the Aerospace Center 2nd Street and South Annex installations to mark the Decennial Observance of the Defense Mapping Agency.

DMA Director, MG Richard M. Wells, USA, will be the featured speaker at the ceremonies which will be held from 11:00 to 11:30 a.m. on the 2nd Street Parade Ground and from 12:30 to 1:00 p.m. in the South Annex Auditorium.

In addition to General Wells' presentation the events will include special musical selections by the AC Chorus, introduction of Center DMA award winners, and the unfurling of the new DMA flag.

ceremonies will be the presentation by the chorus of an original musical selection written by chorus director, Gene Knight, for the 10th Anniversary. The song is titled "Mission Aerospace."

Employees are encouraged to attend the events at their respective installations. Because of limited seating in the Annex auditorium quotas have been assigned based on organization population. Employees are asked to assemble five minutes prior to the start of the respective ceremonies.

Souvenir programs and anniversary memento maps will be provided to employees during the

mapmaking profession.

Charged with providing maps, charts and geodetic information on the world to the Department of Defense and other national security agencies, the role of DMA has undergone a transformation in the past 10 years, to the point where more of its effort goes into producing computerized data for new navigation, command and weapon systems than into traditional paper maps and charts.

Such new weapons as the Pershing II, the Poseidon/Trident and the Cruise missiles all rely on DMA-produced digital data for their guidance, literally from point-to-point on the surface of the Earth. These and other new "smart weapons" are guided computer-to-computer by DMA data, which is also critical to navigation and operation of most aircraft, naval ships and many ground units.

DMA's component organizations date from the earliest days of this nation, when General George Washington, himself a surveyor, appointed the first Army mapmakers—initiating a service which has run continually through the Revolutionary War, the ex-

computerized operations, the paper map and chart are still indispensable to many military operations, on land, sea and in the air. In the past fiscal year alone, DMA developed some 700 new maps and charts and updated 2,100, as well as reprinting another 3,400 to keep stockpiles current.

Over 43 million copies of maps and charts were printed in fiscal 1981, along with some 19 million copies of publications—navigational booklets and Notices to Mariners and a variety of flight information publications for aviators.

In addition to this traditional production, digital data was developed for more than five million square nautical miles on the face of the Earth, much of it for weapons system guidance.

To accomplish this huge task, the Defense Mapping Agency has nearly 9,000 military and civilian employees assigned, in more than 50 locations around the world. In addition to its headquarters in Washington, DMA includes two main production facilities: a Hydrographic/Topographic Center in Brookmont, Md., and an Aerospace Center in St. Louis. An

ences were combined into this joint defense agency in 1972, the work of the military mapmaker has progressed to the point where no ship, plane, ground unit or missile—or those working in their electronic command posts—may operate without the products generated by the Defense Mapping Agency.

—Hq DMA/PAO

## At Presstime

St. Louis Mayor Vincent C. Schoemehl Jr. has proclaimed June 22, 1982 as DMA Day in St. Louis and issued an official proclamation which will be presented at the 2nd Street ceremonies.

# JUST REMINISCING IN THE BLACK BOOK

by David L. Black

In the span of history ten years is but an instant of time but measured in terms of a federal employee's average career (25-35 years) the time is significant. So it is that the Decennial of DMA is an important milestone for many of us who have lent what could be one-third of our career to the agency. Articles elsewhere in this issue speak of the technology changes in MC&G and the aerospace weapon systems. I would like in the next few paragraphs to flip through the pages of the Black book and reflect upon some of the things I remember about the ten years just past. Things that really can't be classed as major MC&G events or great technological advancements but happenings just the same.

I refer to little things like that twinge of sadness when "us old timers" (I can finally refer to myself as that) watched as the ACIC sign came down and a new Aerospace Center one went up.

I refer to the excitement, con-

cern and camaraderie displayed by employees during the big flood in 1973 that threatened to wash the Annex down the Mississippi. There was no such thing as position or seniority, everybody able sandbagged. It was a good feeling when all was over.

For those of us on the staff, I remember the confusion we went through in the early years trying to determine the difference between the Air Force way and the Army and Navy way to which we were suddenly being exposed. I'm not sure I've figured out the Navy rank insignia yet.

From the public affairs standpoint and from that of a concerned employee, I was glad to see an end to the anti-war demonstrations of the early 70's and in the mid-70's the elimination of the air pollution situation at the Annex.

The employee across the aisle or down the hall has changed—retirements, deaths, transfers—have taken their toll but as one departs another steps in. All

leave their individual marks on each of us. I've said, as I'm sure you have, good-bye to several very special people in these ten years and rewardingly have said hello to others.

And remember 1976, the Bicentennial year, with the big open house and National Historic Site dedication. It was lots of fun for everyone and from the size of the crowd that day in May, I'd say most everyone was there.

Speaking of fun, the first of what has become an annual picnic was a pleasant moment in memory.

There were some other moments that weren't so pleasant, at least not at the time. . . cold weather and deep snow come to mind rather quickly. We had more than our share through the years and this last winter even resulted in our first complete shutdown.

. . . primarily because those few that were here couldn't get out and those many who weren't here couldn't get in through the deep

continued pg 5

## Inside

Decade of Requirements .....	2
Erskine Award .....	3
Decade of Production .....	4
Civic Leaders Comments .....	4,5
Today's Happenings .....	6

# Decade of Progress-Decade of Challenge

# Requirements For Advanced Systems

Prepared by the PR staff

Since the Defense Mapping Agency was formed in July 1972, perhaps the most significant trend in MC&G requirements has been toward digital products. While paper and film products continue to be vital to the support of many of today's weapon systems, these requirements have slowly declined over the past ten years, while our digital production and test requirements have increased rapidly. So rapidly, in fact, have these requirements grown, that an order of magnitude increase in DMAAC direct labor spaces devoted to digital programs will have occurred by the end of 1982—when our conventional cruise missiles augmentation will have been effected. The number of aerospace systems requiring some sort of digital MC&G product is rapidly expanding, as are the uses being found for our data. The following are advanced systems greatly dependent on our data for their mission success:

## CRUISE MISSILES

DMAAC began its first system-level support to Cruise Missiles in 1975. Today we are providing products for the ALCM, GLCM, SLCM, TALM/C, and MRASM cruise missile systems. A total of five products are required. These are Terrain Contour Matching (TERCOM) reference scenes, Digital Scene Matching Area Correlation (DSMAC) reference scenes, Point Positioning Data Bases (PPDB), Digital Terrain Elevation Data (DTED), and Vertical Obstruction Data (VOD). TERCOM reference scenes are

missiles it carries. This ability is being provided as just one of many B-52 improvements being managed under a program called the Offensive Avionics System (OAS). While this program shares the extremely high Air Force Precedence of 1-1 assigned to the cruise missiles, it will not be a major DMAAC production program. Since the TERCOM reference maps being produced for the cruise missiles in the operational area can also be used by the B-52's, the number of maps required for the bombers alone will remain rather small. There will be a few required each year near targets better attacked by penetrating bombers than by cruise missiles, and a few built in the U.S. each year to be used in crew training and evaluation. A second area being automated for aircraft application is mission planning. By the end of this year, the automated mission planning facilities being provided to the theater CINCS will have the capability to plan F-111 and A-6 missions. Like the cruise missile applications, our DTED and VOD will play a key part in routing and flying height determinations. In addition, certain features from our DFAD file and airfield information will be available to the planners.

## AIRCRAFT SIMULATORS

Data to support aircraft simulators were DMA's first major digital requirements and currently comprise the largest single use of DMA digital data. Over the last decade, the rapid increase in aircraft procurement and development costs, a correspond-

models required for the system. We constructed many digital terminal reference scenes, simulating two sensors, over several geographic areas to support informed decisions on whether terminal fix sensing was a viable option for the MX. And currently, our DTED is being used with special, in-house designed software to do automated screening of areas of the U.S. that may support a Dense Pack permanent basing mode.

## IMPROVED TRIDENT

Under the SLBM Improved Accuracy Program (IAP) the Navy investigated several options to improve the accuracy of their ballistic missile systems. DMAAC played a key role in developing two of the options, namely improved gravity modeling and terminal fix sensing. As a result of these and similar efforts, decisions were recently made on which option would be incorporated into the Improved Trident scheduled to go operational in the late 1980's. Improved gravity modeling will be incorporated into the system, and DMAAC has defined additional gravity collection efforts needed to support these models. Although cost and technology status did not allow terminal fix sensing to be incorporated in the next version of the TRIDENT, AC did contribute significantly in defining a realistic three-year test program for this option and in building digital reference scenes for four candidate on-board sensors near several candidate targets, thus generally advancing ballistic

# WE ASKED THEM . . .

*"As a military pilot having served with DMA during its inception and now as Center Director, what do you view as some of the major changes in military aeronautical charting products since 1972?"*

DMAAC has increased its capability to provide world coverage of charting requirements. Military training exercises have increased our requirement for ONCs and TPCs. The demand for filmstrips has increased fourfold in the past 10 years and we are about to enter digital display cockpits. Space Shuttle support with Star Charts, Orbital Maps and Approach/Landing Charts are follow-ons to our previous lunar support projects. Color process printing reduced greatly our production time. We entered the digital arena and will see great changes in work processes of the future. Ten good years—more to come!

—Col. J. W. Small  
Director



*"From your position as Center Technical Director, what key transformation have you noted in our production process during the first DMA decade?"*

The primary change I recognize is the continuing effort to automate the more tedious parts of our operations, thus allowing our people to concentrate on the more challenging aspects of their jobs. This change takes a long time to implement, but we continue to make progress. The productivity index for 1981, compared to the 1973 base year, showed gains of 31 percent for AC. This reflects very favorably on the ability of our people to identify those areas where improvements can be made, design the changes we want, procure and install new equipment or processes and adapt to the modified production flow. I think it is well recognized that we are on the forefront of productive change within the Agency.

—Dr. Mark Macomber  
Technical Director



*"People are what makes the Center successful; describe the changes you've noted in our workforce during the first decade?"*

I have found that there have always been well qualified employees to replace those who retire or leave for some other reason and that new employees are melded well into the workforce. We are always striving to hire people who are able to meet the challenges of new technology. These are critically important to sustaining the





ing increase in their operating navigation systems thru correlating sensed terrain elevations with our stored reference scenes. DSMAC is also a correlation guidance system used in the terminal area by the two conventional missiles and provides the additional accuracy required by those systems. DMA built the DSMAC reference scenes used during the development phase of the two conventional systems. In the interest of greater responsiveness and targeting flexibility, however, the current plan for operational use is for the system operators to build these scenes in the field at their mission planning facilities. When built in the field, the mission planners place these scenes into the same geodetic framework as the target through the use of DMA-produced PPDB's. DTED and VOD are also used in the mission planning phase. DTED allows the planner to take advantage of terrain masking of enemy radars and both products are used in computation of the optimal flying height. These products are being used by SAC, PACOM and LANTCOM today in planning operational sorties in anticipation of their initial operational capability dates scheduled for later this year.

#### **AUTOMATED AIRCRAFT SYSTEMS**

Some of the technology developed for the cruise missile programs has been adopted for early use on manned aircraft. The B-52G is being given the capability to update its inertial navigator using TERCOM in a manner similar to that used by the cruise

missile terminal fix sensing technology, and a better appreciation of the limits on our fossil fuels sources have all dictated an increasing dependence on simulator usage rather than actual flight for crew training purposes. Our DTED and DFAD are used to produce simulated radar returns that allow realistic navigation and bombing training. Currently, approximately 23.4 million square nautical miles of the earth's surface must be digitized into the DTED and DFAD formats to satisfy the radar simulation requirements of such aircraft as the A-6E, EA-6B, B-52, KC-135, C-130, B-1B, F-16, and EF-111A. The A-6E was the first system to become operational, in 1979, followed closely by the EA-6B in 1980. The B-52, KC-135 and C-130 are scheduled to be ready for training later this year.

#### **MX MISSILE**

Much of the decade was spent in developing the technology and narrowing the deployment plans for the next-generation ICBM—the MX. DMAAC has made significant contributions in a wide variety of ways. We were deeply involved in initial screening studies to narrow the portions of the U.S. that might be suitable to support various proposed basing modes. We qualified and quantified gravity collection and geodetic survey requirements to support Launch Region Gravity Model and Missile Launch Site Data definition. We began development of a refined World Geodetic System (WGS-84) primarily to support this system. We worked closely with the Ballistic Missile Office in defining a form and format for all gravity

missile terminal fix sensing technology.

#### **GLOBAL POSITIONING SYSTEM**

This decade has seen slow but sure progress in defining the requirements and form this system of navigation satellites will take. Although funding cuts have delayed the IOC to the late 1980's and forced a reduction in the satellite constellation from 24 to 18, the goal of providing a continuous, world-wide, 3D positioning capability of 16 meters or less will be obtained. Along with the three Services, DMA is a major sponsor of the system and is actively pursuing development of both a land-based geodetic receiver and, along with NASA, a satellite receiver. DMAAC has provided the Deputy Program Manager to the GPS Joint Program Office, has provided the specified datum transformation information that will go into all GPS receivers, and continues to provide the world-wide geodetic framework for all positioning in the form of the current WGS.

#### **PERSHING II**

Although prime responsibility for support of the PERSHING II system has been turned over to DMAHTC, this Center did the major development work in defining and constructing first the analog and then the digital reference scenes carried aboard the missiles for terminal correlation guidance. We also played the major role in defining how our Level I DFAD could be adjusted relative to our PPDB and target coordinates to form a compatible set of MC&G products that would support the system's accuracy goals.

—Richard A. Vierling  
Director of Civilian Personnel



#### **POINT POSITIONING**

A variety of weapon systems, including nearly all weapons delivery aircraft and the Short Range Attack Missile (SRAM), require AC-produced, accurate point positions to either determine target coordinates or to update their inertial navigation set during flight. These requirements are normally identified by their production program names and include SRAM points, Radar Fix Points, Offset Aiming Points, and Strategic and Tactical Targets. Since 1972 DMA has derived positions for approximately 180,000 such points.

#### **SPACE SHUTTLE**

Careful preparations during most of the past decade have resulted in three successful Space Shuttle launches to date. An important part of these preparations was the definition of MC&G products required by NASA both aboard the Shuttle and in the mission control center. These products include base charts of that portion of the earth traversed by the shuttle. Various versions have ground track overprints, portrayals of all acceptable landing sites, range coverage of all tracking and control stations and other information needed by the astronauts and flight controllers. In addition the Center has produced working charts at a scale of 1:10,000,000 for use by the astronauts during their various experiments and FLIP-type landing charts for all approved runways at the several prime and alternate landing sites.

#### **THE FUTURE**

There have been several significant technology initiatives in addition to the system-related programs mentioned above. These are the types of technologies that you might expect to be applied to systems in the next decade and that you might read about in the bi-decennial issue of the *Orienteer* in July 1993:

1. Three dimension digital reference scenes that simulate terrain and features as viewed in the infrared band by both passive receivers and active IR Lasers. This technology is primarily being managed by DARPA under their Autonomous Terminal Homing Program and will likely be adopted for advanced technology cruise missiles.

2. CO<sub>2</sub> Laser Technology (COLT) for terrain and obstacle avoidance as well as midcourse and terminal positional updating. This technology is being managed by the Air Force Armament Division for missile applications—initially to the Conventional Standoff Weapon; and the Air Force Aeronautical Systems Division for aircraft applications. Since the technology is being pursued primarily for tactical applications, its use could be worldwide.

3. Aircraft simulators incorporating sensors other than radar. Sensors in the IR and visual bands of the electromagnetic spectrum are already in use in aircraft today. For realistic aircrew training, digital MC&G products must support these simulation needs.

4. Advanced Cockpit Displays. As computer storage, processor,

# General, Admiral, Civilian Receive New DMA Erskine Award

Two former DMA directors and the first deputy director for Management and Technology have been named as recipients of the Robert Erskine Award for Exceptional Achievement. The award was established by the current DMA Director, MG Richard M. Wells, as part of the agency's decennial observance.

The Erskine Award is designed to recognize those individuals, military or civilian, who have been judged by a special awards panel as having contributed the most to the establishment of and/or continued success of the DMA operation during the past 10 years.

Announced as recipients of the award were the first director of the agency, Lieutenant General Howard W. Penney, USA; Vice Admiral Shannon D. Cramer, Jr., USN, the second director of DMA; and Thomas C. Finnie, the agency's first deputy director of Management and Technology and former Technical Director of the Aerospace Center.

The award was named for Robert Erskine who was appointed by General George Washington in July 1777 as the nation's first "mapper."

The special awards were



LTG Penney



VADM Cramer



Mr. Finnie

presented yesterday at the Annual DMA Awards Day Luncheon and Ceremony held at the Officers' Club, Bolling AFB.

**General Penney** served as the agency's first director from July 1972 thru August 1974. Prior to officially taking the rein as director of the newly established agency, he guided the work of the organizational and operational concept for today's DMA.

**Admiral Cramer** served as the agency's second director from September 1974 thru August 1977. During his leadership the agency formulated a major structural reorganization of its topographic and nautical components. He further was responsible for the

agency during its transition into the digital arena of technology and its closer association with the modern weapon systems.

**Thomas C. Finnie**, one of the foremost "mappers" in the Federal government, served as the DMA deputy director of Management and Technology from the agency's inception in July 1972 thru June 1974. He was also one of the initial planners who assisted General Penney in organizing the agency during the months of the start-up staff. Prior to his tenure with DMA he was associated with the Aerospace Center and its predecessor the USAF Aeronautical Chart and Information Center for 24 years.



## DMA Awards Day 1982 Recipients

### ROBERT ERSKINE AWARD FOR EXCEPTIONAL ACHIEVEMENT

LTG Howard W. Penney, USA (Ret.) - Former Director, DMA  
VADM Shannon D. Cramer, USN (Ret.) - Former Director, DMA  
Thomas C. Finnie - Former Deputy Director, Management and Technology

### DMA DISTINGUISHED CIVILIAN SERVICE AWARD

Lawrence F. Ayers - HQ DMA  
Kenneth I. Daugherty - HTC  
Penman R. Gilliam - SPO (while assigned to HTC)

### DMA MERITORIOUS CIVILIAN SERVICE AWARD

Thalma A. Robinson - HQ DMA (while assigned to HTC)  
Charles R. Payne, Jr. - AC  
William P. Wall - AC  
John D. Garrett - HTC  
Theodore Colangelo - ODS  
Norman E. Fassett - IAGS

### OUTSTANDING PERSONNEL OF THE YEAR AWARD

Erich Rutscheidt - HQ DMA  
Roberta Munske - HQ DMA  
Rebecca I. Beach - HQ DMA  
Emily N. Aschenbrenner - HQ DMA  
Mildred H. Wallace - AC  
Lt Col Jack C. Dills, USAF - AC  
Andrew A. Jackson - AC  
Robert G. Edwards - AC  
Richard W. Powell - HTC  
Anthony W. Jaskulski - HTC  
Maj Harry Jensen, Jr., USMC - HTC  
Sergio P. Martinez - HTC  
Dina K. Tripp - HTC  
Nelson L. Motley - HTC  
Howard R. Shaw - DMS  
WO1 Raymond S. Seeley, USA - DMS  
SP5 Sandra L. Pegues, USA - DMS  
Faye R. Chippeaux - ODS  
TSgt Gregory P. Zelinski, USAF - ODS  
Marvin W. L. Hoffman - ODS  
LT David J. Skinner, USNR - ODS  
SMSgt Jerry M. Dennis, USAF - ODS  
Shirley H. Kaleikini - ODS

### BENJAMIN B. LANE AWARD FOR TECHNOLOGICAL ACHIEVEMENT

Henry R. Cook - HTC

DMA RESEARCH AND DEVELOPMENT AWARDS



and display technologies have rapidly evolved, all services and the civilian aircraft industry are trending toward advanced displays using digital inputs.

DMAAC is presently laying the groundwork necessary for producing cartographic and flight information data to our customers in the format required by these advanced displays. The challenge of DMA's first decade can be characterized as one of accommodating rapid expansion into the area of digital data requirements. The challenge of the next decade now appears to be effectively consolidating these requirements into the minimum number of standard products consistent with proper appreciation of level of detail, accuracy, product compatibility and cost considerations.

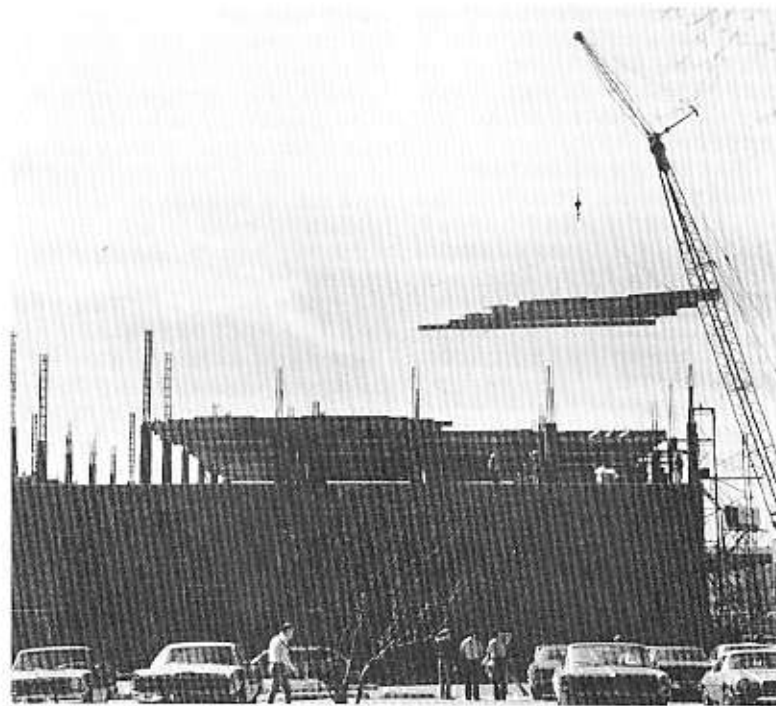
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Col. J. W. Small  
Director

David L. Black  
Chief, Public Affairs Office

Paul Hurlburt  
Editor

## The Flood-1973



FEBRUARY 1976—Things are looking up, at least for the sidewalk superintendents at the Aerospace Center, as the addition to the new wing begins to take shape. In the photo, girders are being positioned for the wing's new third floor.

Vincent J. Narozza - Rome Air Development Center, N. Y.  
George D. Lukes - USA Engineer Topographic Laboratories, Ft. Belvoir, VA

George Hadgigeorge - USAF Geophysics Lab, Bedford, MA

### SPECIAL ACT AWARDS

Leroy E. Anstead - HQ DMA

John A. Hindsley - HQ DMA

Leland Graves, Jr. - AC

Robert W. Valska - AC

Wavystone Team - HTC

COL Christ F. Potamos, USA - HTC

Willis Little - HTC

CAPT Charles K. Roberts, USN - HTC

Maurice S. Dodge - HTC

Richard G. Hardwick - HTC

Carolyn A. Tettau - HTC

David A. Boyle - HTC

SGM Charles W. Locke, II, USA - DMS/

Sue H. Kersey - DMS/ - Joint Award

GySgt Paul Wilson, USMC - DMS/

Charles R. Monroe - ODS

Wolfgang F. Schroeck - ODS

Barbara A. Stewart - ODS

### AWARDS FOR ACHIEVEMENT IN EEO

Irvin E. Rogers - AC

John E. Moss - HTC

Gail M. Clarke - ODS

### AWARD FOR ACHIEVEMENT IN SAFETY

Anthony W. Jaskulski - HTC

### AWARDS FOR ACHIEVEMENT IN PAPERWORK REDUCTION

Christine E. Gardner - HTC

YN2 Christopher Caton, USN - ODS

### DMA HANDICAPPED EMPLOYEE OF THE YEAR AWARDS

Gerald L. Breville - AC

Justin F. Lambert - HTC

### COMMENDATION FOR SUGGESTION - MOST ADOPTED

James J. Dolan - AC

### COMMENDATION FOR SUGGESTION

#### HIGHEST CASH AWARD

2d Lt Kurt D. Shinkle, USAF - HTC/GSS

### DMA EFFECTIVENESS/PRODUCTIVITY AWARD

DMA Aerospace Center

### DIRECTOR'S SPECIAL AWARDS TO COMPONENTS FOR ACHIEVEMENT IN THE DMA SUGGESTION PROGRAM

#### HIGHEST AVERAGE TANGIBLE SAVINGS

DMA Hydrographic/Topographic Center

#### MOST ADOPTED SUGGESTIONS PER CAPITA

DMA Office of Distribution Services



# Production Today and Tomorrow

Prepared by the PR staff

From the inception of DMA, the Aerospace Center has produced many types of products which support key programs of the Department of Defense. The Aerospace Center has developed programs to exploit digital image technology for the advancement of mapping, charting and geodesy. Primary investigations include image processing, analysis and display techniques, and computer image generation. A dramatic impact has been made in the ability to produce, analyze and validate various digital data bases produced by the Defense Mapping Agency by applying state-of-the-art digital image technology concepts to the development of new interactive prototype and production cartographic systems.

## CRUISE MISSILE

In this first decade, DMA has supported the development of a family of Cruise Missiles. These weapon systems employ inertial navigation as the primary guidance system which is updated in flight through Terrain Contour Matching (TERCOM). DMA is responsible for producing the digital elevation data supporting TERCOM. DMA supported many test flights to prove the system as well as provided the primary product support needed for the Government to select the major contractors. Based on the criticality of this support this

data to provide responsive support in a cost effective environment for all programs requiring the use of digital data. DMAAC was tasked to develop and maintain this system for DMA. By expanding and enhancing the cartographic data base system, DMAAC developed a fully automated digital data management system (DDMS) which was implemented in January 1977. The DDMS is comprised of a collection of digital data files to support various digital requirements for DoD users and within DMA and participating NATO countries. Digital data management, storage and retrieval are the three elements of the system.

## DIRECT POSITIONING PHOTOGRAMMETRIC COMPILATION TECHNIQUE

In June 1974 a management action was initiated to implement the Direct Positioning Photogrammetric Compilation Technique in the mapping and charting programs at DMAAC. With implementation of this, several production steps were eliminated from the current production process which significantly reduced manhour costs and reduced the calendar time.

## PPDP/APPS SYSTEM

Development of Point Positioning Data Bases (PPDB) and related hardware (Automated

needs of the Department of Defense. The system, designated as WGS-72, represents the culmination of approximately five years of data collection within the Department of Defense and the scientific community. Principal agencies involved in the developmental cycle were the Defense Mapping Agency and the US Naval Weapons Laboratory. The method of solution for an adjustment of this magnitude is characterized by the formation of a large-scale matrix by combining normal matrices from each of the major data input sets. DMA has established a Post-80 WGS subgroup charged with the development of a replacement for WGS-72.

## SENSOR IMAGE SIMULATOR

The primary objective of the digital sensor simulation investigations being conducted at the Defense Mapping Agency (DMA) is to establish an editing and analysis capability for the digital culture and terrain data bases. These data bases are being produced by DMA to support advanced aircraft simulators by providing an improved high, medium and low level radar training capability offered by the digitally generated radar landmass images. As a result of the technology developed for the aircraft simulator support, sensor guidance reference scenes are also being generated.

Office of the Mayor

Vincent C. Schoenfeld, Jr.  
Mayor

May 28, 1982

My dear Colonel Small:

The achievements of your Agency are known around the world. Certainly you, the USAF and all your personnel, are known for taking special pride in all the programs in which you participate. All of you deserve self praise and I encourage you to enjoy the praise that is bestowed upon your organization.

Congratulations on your tenth anniversary. The Agency is important to Saint Louis and this entire area. We want to thank you for making Saint Louis your base of operations and we hope we can be of service to you today or in the future.

Ten years does not seem to be a long time; however, your successes seem to multiply that figure tenfold.

Yours is not an ordinary organization but rather a great team of unity which produces attractive results for everyone.

Sincerely,



## DIGITAL DATA IN CHART PRODUCTION

SAC has reemphasized the need for more contours on the S/200 U.S. Air Target Charts. AC is satisfying the requirement by deriving smaller interval contours from Digitized Terrain Elevation Data (DTED). AC is also experimenting with Digital Feature Analysis Data (DFAD) being converted to Radar Significance Analysis Code (RSAC) for denoting the various

had been modified to simulate the Orbiter. The first STAG was produced for White Sands. The requirement has since expanded to include Edwards AFB and Kennedy Space Center and are designated as the Shuttle Pilotage Charts. The requirement and production of these training products will probably endure for the duration of the Shuttle Program. The primary products produced by AC and required for

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Tucker & Market Streets  
St. Louis, Missouri 63102  
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Center received approval for two major resources enhancements in 1979 and 1981. The Aerospace Center is now producing operational data for both the nuclear and conventional cruise missile systems. All the Initial Operational Capability (IOC) dates for the user commands have been met. DMA is expected to expand its capabilities in the mid 80's to ensure product support for the present and new variants of the cruise missile.

#### **INTEGRATED PHOTOMETRIC INSTRUMENT NETWORK**

In FY 75 the development of an extensive photogrammetric data collection/processing/editing network was initiated. This network or system was named "The Integrated Photogrammetric Instrument Network" or IPIN. The IPIN was designed by DMAAC to improve/increase by an order of magnitude, DMA's capability to produce digital terrain data in support of DoD Advanced Weapon System and Digital Land Mass simulation requirements as well as ongoing mapping and charting programs. The IPIN is composed of a highly sophisticated collection system of AS-11A, AS-11B-1, and Advanced Compilation Equipment (ACE) and analytical stereo mapping devices, a post-processing system to handle all data processing, and an edit system.

#### **CARTOGRAPHIC DATA BASE**

As a result of a technical study initiated in 1973, DMA established the need for a centralized automated repository of digital

photogrammetric data. The Cartographic System - APPS provided a major impetus to precise point determination by enabling using elements to identify and derive features of interest on line, in the field, and with significant reduction in processing time.

#### **MINIBLOC**

The MINIBLOC program was validated and accomplished by DMA to provide Maximum Terrain Elevation (MTE) data over selected areas in order to meet certain Air Force low level flight requirements.

#### **CONTINENTAL CONTROL NETWORK**

The Continental Control Network (CCN) was developed to meet the technical MC&G accuracy objectives of future improved weapon systems. It is a homogeneous system of ground control features covering large areas from which point positions are derived. **TOMOHAWK CRUISE MISSILE**

#### **TOMOHAWK CRUISE MISSILE FLIGHT TEST PROJECT**

The TOMAHAWK Inertial Navigation System Proof Flight was conducted in May 1976. The proof flight was designed to demonstrate that the Defense Mapping Agency Aerospace Center (DMAAC) could independently select terrain correlation maps to be used by Terrain Contour Matching (TERCOM) to update the inertial navigation system.

#### **WORLD GEODETIC SYSTEM**

An improved World Geodetic System was developed and implemented in 1974 to satisfy the mapping, charting and geodetic

requirements. The Weapons Support System is a computer system designed to provide an on-site, real-time, interactive, capability to handle all AC gravity maintenance and processing activities including the evaluation of gravity data acquisitions. The fully augmented WSS will enable AC to rapidly accomplish its geodetic and geophysical (G&G) product requirements in support of existing and advanced DoD weapons systems.

#### **REMOTE WORK PROCESSING FACILITY**

A Remote Work Processing Facility (RWPF) has been installed, thereby initiating image processing activities. The RWPF allows digital imagery to be handled in a "softcopy" mode through the use of an integral computer capability.

#### **SATELLITE ALTIMETRY**

Radar ranging data from the GEOS3 and SEASAT satellite altimetry systems has been used to measure distances from the satellites to the surface of the sea for the purpose of determining geoid heights and gravity anomalies. In addition, the GEOSAT satellite altimetry system is scheduled to further define the geoid. This data is used in various geodetic and geophysical (G&G) computations to support DoD weapons systems.

#### **MOVING MAP DISPLAYS**

In 1972, there were 17 different navigational filmstrips in the DoD inventory for use in the A7 and F-111 aircraft. In 1982, there are 58 different filmstrips which are used in the A7 and F-111 aircraft, plus the HH-53 helicopter. Soon, production will commence for the A-18, A-10 and for the Army's HH64 attack helicopter.

Major users of this chart series are evaluating for adequacy.

#### **DIGITIZATION OF FLIPS**

In June 1980, the Automated Air Information Production System (AAIPS) was acquired for use in automated (digital) production of the Flight Information Publication (FLIP) products. This system employs a series of small to medium scale computers in conjunction with digitizing stations to electronically store FLIP graphic and textual products for revision during the update cycle. At the end of each cycle, the digitized data is rapidly processed through an Electron Beam Recorder (EBR), which exposes the images on electron sensitive film, which is developed into a reproduction negative. For graphic products, this system replaces the time consuming manual drafting phase of production. For the textual products, it replaces an obsolete mechanical card camera system which has been in use since the nineteen fifties.

#### **NASA SPACE SHUTTLE SUPPORT PROGRAM**

The Space Shuttle Orbiter was rolled out at Palmdale, CA on September 17, 1976 and was named "Columbia." Initially, Columbia was scheduled to have its first manned orbital test flight in March 1979. However, due to technical difficulties, its maiden flight was delayed until April 12, 1981. Support for shuttle was initiated in November 1976 when this Center compiled and printed the Shuttle Training Aircraft Graphic (STAG). This graphic was specifically designed for use by the astronauts for approach/landing operations conducted with the Shuttle Training Aircraft, i.e., conventional aircraft whose design

System mission are: Star Charts, World Map Book, Orbit Maps, Mission Charts, and Approach/Landing Charts. The launch record supported by AC during DMA's Decennial (1972-1982) was the STS-1 April 1981, STS-2 Nov 1981, STS-3 Mar 1982, STS-4 June 1982, and STS-5 Nov. 1982. The projected STS Traffic Base Line Forecast for which this Center will be required to provide support during the period 1983-1987 is: 1983 - 6 missions (STS-6 to 11), 1984 - 10 missions (STS-12 to 21), 1985 - 13 missions (STS-21 to 34), 1986 - 17 missions (STS-35 to 51), and 1987 - 21 missions (STS-52 to 72). Starting in 1988 and beyond NASA estimates that 24 missions will be conducted annually. Starting in 1985 this Center estimates that 7 work years of effort will be required annually to support the space shuttle.

#### **PROCESS PRINTING**

In 1974 for reasons of economy and improvements in the "state-of-the-art," the Process Color Printing technique was adopted for maps and charts. The use of a five color press is essential for accomplishing the printing in one press pass and avoiding misregister of multiple press runs and paper movement. Many DMA map/chart products of six colors or more are now being produced by the four color process technique. By having five color presses, the process is altered by taking a critical feature in the chart (i.e., aeronautical information) and printing it in the conventional color, thus, eliminating it from the four color process printing technique. This ensures optimum quality for a five color job printed one time through a five color press. The labor savings on a typical



## 1981 E/P Award For Center

The Aerospace Center is back in the winner's circle, in the competition for the annual DMA E/P (Effectiveness/Productivity) Award. Since the inception of the award, AC has won the award every year except 1980.

In ceremonies yesterday at HQ DMA, Colonel Small was presented the award in recognition of AC's achievement of validated E/P savings in excess of \$4,000,000 for the FY 1981-83 period.

Many—especially the Center's employees—might ask; "What is the E/P Program?" E/P program is the agency's plan for improving customer support, and for generating more products (output) with the limited number of resources (input) at AC's disposal."

The agency continues to have new requirements assigned which support advances being made in weapon systems. In addition, current system requirements must still be met. Funding restrictions, however, continue to limit the amount of workforce resources. This is where the E/P Program comes into play. The E/P Program is really a self-help vehicle where the needed "additional resources" are generated by using the appropriated resources more productively and effectively.

This allows more requirements to be satisfied without any actual increase in resources. Generally, our major productivity increases have come from organizational changes, increases in workforce proficiency, major changes in production techniques and the investment in labor saving capital equipment.

Annually, each Center is challenged to establish a "productivity improvement goal" for its organization. The goal is translated to a dollar based figure; then, as each improvement action is approved it is counted toward the overall goal. For FY 1982, AC's productivity improvement goal is \$1,135,000. Approximately \$742,000 in first-year benefits have already been certified.

"E/P, like quality assurance, is really everyone's responsibility", says Hemple, "so lets all see to it that AC wins the E/P Award in FY 1982."

### The Snows '73 and '82



**Aerospace People  
Are Doers Every Year  
They Contributed over a  
million and one half**



OFFICE OF THE COUNTY EXECUTIVE  
SAINT LOUIS COUNTY  
CLAYTON, MISSOURI 63105

Gene McNary  
County Executive

June 8, 1982

MESSAGE FOR DEFENSE MAPPING AGENCY'S TENTH ANNIVERSARY

On behalf of the one million citizens of St. Louis County, I am privileged to send congratulations and best wishes to the 3,700 men and women who are celebrating the tenth anniversary of the Defense Mapping Agency Aerospace Center. Now more than ever we are aware of the vital role you serve in providing support to our nation's military forces. We are grateful for the talented and dedicated people who work to keep America safe and free.

We hope that Congress will approve your expansion plans in the near future and look forward to the Agency being a part of the St. Louis community for many years to come.

Happy Tenth Anniversary.

Sincerely,

*Gene McNary*  
Gene McNary  
County Executive

GMcN/re

## JUST REMINISCING . . .

continued from pg 1

snow drifts. But just as in the flood at the beginning of the decade, people rallied in adversity and assisted their fellowman through deeds of kindness, compassion and dedication.

Getting in wasn't the problem for most employees after flexitime became a practice at the Center. Most arranged their time for the

seas units. We welcomed the Kansas City Office and all those fine people in 1977.

The size of the work force enlarged through the years and so did the size of typing paper; Building 36 and the main frame computer. Shrinking in size was the shuttle bus and the staff cars during the energy crisis (the bus

## dollars to Charity in the DMA Decade

chart for a quantity of 10,000 when printed by Process Color versus Conventional 12 Color printing is 58%. The production clock time is reduced 40%. Additionally, in 1975 a Standard Printing Color Catalog (Process) was developed and published which is used as the color standards during printing operations.

### MAJOR REORGANIZATION

The Cartographic Technical Squadron (CTS) at March AFB, California was inactivated effective 30 September 1977, and the HTC Kansas City Field Office was reassigned to AC as a Division assigned to the Aerospace Cartography Department. Since then, the majority of the ATC S/200 program is now being produced by CDK. This has allowed AC to absorb other types of high priority production.

### AUTOMATED GRAPHIC DIGITIZING SYSTEM

This system was acquired by DMAAC in 1978 to provide a stand-alone hardware and software production system of Advanced Weapons System Digital Data (DTED, DFAD) and automated charting products. Source graphics are raster scanned, linealized and interactively edited to produce output digital data which can be converted to output final color separation materials on a color separation plotter or enter the SLMS software processing system. \*

### E/P PROGRAM

The production and program accomplishments realized during the past 10 years are directly related to AC's continual efforts to enhance productivity. This enhancement is based on the DMA Effectiveness/Productivity (E/P) Program. The primary objective of this program is to provide more and better support (output) to product users, while operating within the workforce resource (input) limitations imposed by the DoD. The measure employed to record the change in the ratio of output to input, relative to the base year of FY 1973, is the Productivity Index (PI). At AC, during the years of the Decennial, productivity has shown an upward trend resulting in a Productivity Index of 131.4 for FY 1981 (FY 1973 was 100.00) The PI is further projected to increase to 132.8 by the end of FY 1982. The accumulated dollar savings (benefits) associated with the increase in the Productivity Index amounts to just under \$20 million, for the period FY 1974 to date. The majority of these savings (benefits) resulted from reductions in work hours required to produce AC's mission products. These reductions are attributable to the use of productivity enhancing capital equipment investments, increases in workforce proficiency and major changes in organization configuration and production techniques. The DMA E/P Annual Award has been won by AC every year except one.

## New Equipment-New Employees



### PRODUCTION MANAGEMENT

In FY 81 and FY 82 DMAAC opened new dimensions into tomorrow's computer technology by a management action to procure and implement microcomputer systems for Center-wide production management activities. These desk-top, stand-alone units are easy to operate and extremely versatile in providing computer support capable of being readily tailored to any individual office environment. The systems account for linear and non-linear project, program and resource demands, make performance comparisons, array information in various formats, and plot graphics from tables and projections.

### DVOD PROGRAM

The Digital Vertical Obstruction

Data (DVOD) Program was initiated in 1979 at the direction of the Office of Secretary of Defense. The purpose of the vertical obstruction program was to support cruise missile mission planning with a digital data base of vertical obstructions in operational areas. In early 1981, an operational DVOD Program was begun and the first digitized and processed DVOD data was released to the DMA Cartographic Data Base in September 1981. Currently, the DVOD Program is undergoing intensive analysis to upgrade collection systems, specifications and technical equipment to provide a digital vertical obstruction data base which will enhance the success of cruise missile operations.

6:30 hour so they could go home at 3:00. Of course, there were a few of us who found late sleeping a pleasure. During the ten years we said farewell to the Cartographic Technical Squadron in California, the Geodetic Survey Squadron in Wyoming and a number of over-

has recovered). After duty sports activity has increased through the years as employees lob softballs, smash tennis balls, bounce basketballs, spike volleyballs, roll bowling balls and swing at golf balls. Some things have remained constant, as I look over the memory file, we still move desks and phones faster than we can change the directory; and the railroad tracks and pot holes on 2nd Street bounce cars today the same as they did in '72; parking space still is a topic of conversation; payday is every two weeks; and the summer smell of hops brewing still makes breakeime walks in Lyon Park a most enjoyable undertaking.

On that pleasant thought I'll end my look at the DMA ten years and prepare myself for the next. May that be as good.

## The Picnic 1981



## Spring Derby Runners Brisk

The Aerospace Striders Spring Derby was blessed with fine running weather, conducive to some fast times and vigorous appetites. Colonel J. W. Small was most appreciated for serving as official starter and presenting the awards.

In the men's two-mile, young Bryan Keil (son of George Keil) captured the overall winner's trophy with a time of 12:14. Bryan's younger brother Bruce was not far behind as he won the boy's two-mile in 13:54.

Mark Jessup also ran a brisk time despite straying off the course. Jessup, widely known as an ace cartographer and map reader, was reoriented by a trailing runner (Thanks, Jack).

In the women's races, wonder woman Carole Keil was an inspiration to all as she won both the two- and five-mile races. However, the fastest times of the day were the two-milers flying to the barbecue pit for pork steak and beer. Meanwhile, Boyd Breeding was leading the pack in the men's five mile with a fast winning time of 30:25.

Thanks to all those who helped. See you at the Fall Derby.

—Chris Cuppan

Here are some other race results:

Pepsi Challenge 10K Run, May 16: Bob Howard (39:30)—first in age division, Lebon Thornton (40:11)—third in age division, Boyd Breeding (39:43), Leon Fennell (NT), and Ward Bradley (41:00).

St. Louis Track Club Two-Mile



Her eyes trained on the ball, Rose Hunkins of Fool's Gold does her best to give the spectators a thrill in a game against the Chips. Eloise Reed catches for the Chips, who won 22-1.

## Women's Softball

With rain-shortened schedules, Kelly's Girls and the Chips each scored a big victory to remain on top of the Women's Softball League. Michele Schneeberger pitched Kelly's Girls to a 19-3 win over Basye's Babes. Martha Hovis collected three hits for Kelly's Girls. Leslie Bovier had three hits for Basye's Babes. The Chips scored an impressive victory over Fool's Gold, 22-1. Rubbie Herron and Beverly Boykins led the Chips' hitting attack.

Plum Crazy pushed their record to 3-1 with a 13-7 win over the Rednecks. Melody Baker and Kathy Hagedorn led Plum Crazy's hitting with three hits each. Pat Hudson had three hits for the

Rednecks.

The Wined-Ups evened their record at 2-2 with a 14-8 victory against Babes Ruthless. Wined-Ups' Betty Wolf and Penny Miller collected three hits each. Chris Ireland had three hits for Babes Ruthless.

—Chuck Arnns

### Standings Through June 10

Team	Won	Lost
Kelly's Girls	4	0
Chips	4	1
Plum Crazy	3	1
Rednecks	3	2
Basye's Babes	2	2
Wined-Ups	2	3
Babes Ruthless	1	4
Fool's Gold	0	6

## Men's Softball

In an abbreviated schedule due to rainy weather, five teams remain undefeated. The Tavern (5-0), Yukon Jacks (5-0) and Traitors (4-0) remain on top in the American Conference while the Panthers (5-0) and Recaps (4-0) lead the National Conference.

Herb Baker's two home runs and single paced the Tavern's attack in a 13-3 win over the Bar and Stripes. The Tavern's Paul Kohlen and Scott Gibson had two hits each while Dick Wagner led the Bar and Stripes' offense with two hits.

Rob Goodrich pitched a four-hit shutout as he led the Yukon Jacks to a 10-0 victory over the Deacon Blues. Boyd Breeding and Bruce Williams had two hits each for the Yukon Jacks. Tom Morrow had two hits for the Deacon Blues.

The Traitors continued their winning streak with a 15-5 win over the Assassins. Ray Staggemeier and Ron Muse led the Traitors' offense in the win.

The Jackalopes continued their winning streak after a season opening loss with a 12-7 victory over the Thunderbirds. The Jackalopes' Dean Lakeman and Lane Mousel had three hits each while Mark Feller had four hits for the Thunderbirds.

Other American Conference games were the Bombers over the Master Batters, 12-8 behind Dave Damschroeder's three hits. Paul McCoy, John Dellinger and Mike Merlo contributed three hits each in a losing cause for the Master Batters. In a battle of the winless, the Hollywoods won their first game of the season, 16-5 over the Good Ol' Boys. Brent Danforth

paced the Hollywood's hitting with three hits.

The Panthers stayed on top of the National Conference with a 23-6 win over the Twins. Tony Garwood with five hits and Zach Franklin and Robert Gully with four hits each paced a 29-hit Panther attack. John Goodwin and Larry Henning had two hits each for the Twins.

James Amling pitched the Recaps to a six-hit shutout win over the Guided Muscles, 11-0. Don Duncan had a home run and double for the Recaps while Donald Giarraffa and Alan Fruend collected two hits each for the Guided Muscles.

The Wombats and Mustangs remained near the top with the Wombats squeaking by the Buffalo Chips, 13-12 and the Mustangs beating the Foto-Flashers, 14-4. The Wombats' Bill Kock drove in the winning run with a one-out single in the Wombats' victory. John Geiss led the Wombats with four hits. Jerry Johnston and Steve Neville had three hits each for the Buffalo Chips. Bill Gillespie's three hits paced the Mustangs' offense in their win over the Foto-Flashers.

In other National Conference games, the Misfits defeated the Feds, 15-3 behind the three-hit performances of Gary Wallace, Denny Costello and Sam Searce. John Simon led the Feds' offense with two hits. The Wonies defeated the Cougars in a close game, 9-7.

—Chuck Arnns

### Standings Through June 10 American Conference

Team	Won	Lost
Tavern	6	0
Yukon Jacks	5	0



Fennell (11:29)—second in age division, and Bob Howard (12:40)—fifth in age division.

Chesterfield Adult Run, May 23: In 3K Run, Lebon Thornton (NT)—second in age division. In 10K Run, Leon Fennel (NT)—fourth in age division, Bob Howard (NT), Ward Bradley (40:57) and Phil Alderman (NT).

—Greg Shepherd

## ACS Picnic

The Aerospace Charting Seniors retiree association will hold its 2nd annual barbecue picnic at the DMAAC parade grounds on June 26 between the hours of 1:00 p.m. through 6:00 p.m. Food will be served at 4:00

There will be sports and game activities for all to enjoy. A fare of pork steaks, hamburgers and gourmet hotdogs with tasty side dishes will be served. Soda and iced tea will be free with beer available at cost.

All members of ACS are urged to attend. The ACS extends a special invitation to all DMAAC retirees to come and see old friends and share in the camaraderie. Family, guests and children are all welcome, too.

The price per person is only \$6.00. Please make your reservations before June 23 so the Picnic Committee can order the proper amount of food and drinks. Mail your check to Aerospace Charting Seniors, P.O. Box 8823, St. Louis, Mo. 63102, or call Floyd Lamar at 532-4094 or Bob Daily at 355-3725 to say you'll be there.

# Team Tennis Sees Improvement, Struggle

The 1st of June opened the fourth week of tennis with the league standings lengthening in both directions as some teams got better and some struggled. Kate's Kritters, behind solid performances by Hamlet Kelley and Bob Spors, defeated the Tie Breakers 4-0. Pete Robison seems to be taking firm charge of his team as he led Pete's Problems to a 4-0 sweep of Rick's Racquets. The Racquets have been struggling of late and the loss of Jack Cumbow to surgery is sure to hurt.

The Pelicans maintained their first place ranking as they handled Ad'In 3-1. Bennie Martin and Harold Light contributed a win for Ad'In, but it wasn't enough to overcome the powerful Pelicans. The Broken Strings stopped Match Point in the tracks 3-1. The Broken Strings' wins came from the predictably steady team of John Goodwin and Dick Miner, along with rising stars Pete Ofstedal and Felton Mitchell.

On June 8 Rick's Racquets seemed to be scraping the barrel as they coaxed Tony Mosello out of semi-retirement as a substitute for the ailing Jack Cumbow. This

dubious shot in the arm didn't help as the Broken Strings outlasted the Racquets 3-1 with Mary Beth Farrar and Gary Wallace managing the only victory tally for the Racquets. The Tie Breakers managed to put the sky-high Pelicans into a stall with a 2-2 tie. The Tie Breakers were helped by Col. Small, as he soundly thrashed his opponent, and by a forfeit of total games by the Pelicans. (Not fielding enough players is really hurting some teams/)

Match Point tamed Kate's Kritters by a score of 3-1 behind inspired performances by the teams of Weber/Burk and

Carivou/Hagedorn. Pete's Problems fought to a 2-2 tie with Ad'In even though Ad'In won two out of the three matches. The fourth point was awarded to Pete's team because of the super team effort of winning the most total games. That's what Team Tennis is all about!

—Tony Mosello

## Fall Softball Leagues Form

The Aerospace Center Sports and Recreation Council wishes to announce registration for the Men and Women Fall Softball Leagues and the Senior Men Fall Softball League. The Men's Fall League will be a doubleheader league with no age restriction, played on Monday and Tuesday evenings at Lyon Park. The Women's Fall League will be single games played on Tuesday afternoons at Lyon Park. The Senior Men's Fall League will be single games with an age restriction of 40 and over, played on Monday evenings at Lyon Park.

All leagues are restricted to Aerospace Center employees with the Senior Men's Fall League open to Aerospace Center retirees and employees. All leagues will begin on Aug. 30 and will end around Oct. 19 and will be competing in the Amateur Softball Association Metro League. For further information or team or individual registration, contact Chuck Arns, 4901, Mike Coulson, 4425 or Larry White, 4781. The deadline for registration is Friday, July 9.

## Golf Classic Rescheduled

Due to rainy weather, the first annual DMAAC-RCPAC Golf Classic was cancelled and rescheduled for Monday, Aug. 2. Tee time will begin at noon and the classic is open to all Aerospace Center employees, dependents and retirees.

Rules for the rescheduled classic are the same as originally announced. Fees for the classic will be \$11.00 without cart and \$17.00 with cart. Twosomes from DMAAC and RCPAC will be matched according to their playing skills. Information or registration can be made for twosomes or individuals by contacting Noble Ladd, 4778, Larry White, 4781, or Chuck Arns, 4901. The deadline for registration is Tuesday, July 20.

### League Standings

Team	Won	Lost
Pelicans	14	6
Broken Strings	14	6
Match Point	11	9
Pete's Problems	11	9
Kate's Kritters	11	9
Ad'In	8	12
Tie Breakers	7	13
Rick's Racquets	4	16

Traitors	4	0
Jackalopes	4	1
Bombers	3	3
Bars and Stripes	2	3
Thunderbirds	2	3
Assassins	2	3
Master Batters	1	4
Hollywoods	1	4
Deacon Blues	0	4
Gold Ol' Boys	0	5

### National Conference

Team	Won	Lost
Panthers	5	0
Recaps	4	0
Wombats	4	1
Mustangs	4	1
Wonies	3	1
Misfits	3	2
Guided Muscles	2	3
Buffalo Chips	2	4
Cougars	1	4
Foto-Flashers	1	4
Twins	0	4
Feds	0	5

## In Sympathy

Word has been received of the death June 2 of retired employee Dorothy Dixon Voegele.



A free-lance writer and author several books, Mrs. Voegele wrote under the pen name Dorothy Dixon. She had recently completed several yet-to-be published paperback Westerns, part of a series for which she was under contract.

She began her federal career at the Aerospace Center in October 1961. At the time of her retirement in July 1979, she was a secretary in the Office of the Controller.

Mrs. Voegele leaves a son, David Beaman of Manchester, Mo. Interment was in Mount Hope Cemetery, Belleville, Ill.