

Lasers To Smart Bombs

... A Story Of Technology Transfer

The Army missile engineer takes a handful of newspaper clippings from a drawer and hands them across the desk.

"Look at this. The Air Force guided one bomb right up the mouth of a railroad tunnel," he says as he sorts through the clippings for another example.

The story is about smart bombs. All clippings tell of the almost incredible accuracy laser guided bombs are demonstrating in the air war over North Vietnam, accuracy that the Secretary of the Air Force recently said made it possible for one tactical fighter to accomplish "what 25 might have done in the past."

The intense interest the civilian missile engineer and many of his colleagues in the research and development organization of the U.S. Army Missile Command have in news accounts of the combat success of the first laser guided weapons is understandable.

His name is David J. Salonimer. He has been working on laser guidance concepts and techniques for the Army since 1961. Many of the men who worked with him insist Salonimer was the key man in the successful effort to pioneer the concept, technology and experimental hardware subsequently used by the Air Force in the development of the laser guided smart bomb.

The Army missile team makes no claim to paternity, but the smart bomb has a host of proud uncles at Redstone Arsenal. Their work from the outset was aimed at laser guided weapons

that could be used by the Army. In developing them, they devised and proved a guidance concept applicable to bombs, rockets, missiles, even artillery shells, then transferred what they had learned to their Air Force counterparts and assisted them in bringing along the smart bomb. How that happened provides a classic example of how problems solved by one research team can give another a running start.

Widely hailed by laymen as a potential wonder weapon almost from the moment more than a decade ago when it was first demonstrated in the laboratory, a laser converts electrical energy into a very narrow, coherent beam of light, light of extreme brightness. Despite the predictions of those who said the advent of the laser in 1960 meant a death ray lay just around the corner, there were—and still are—major technical problems involved in using lasers as weapons. The early models required enormous electrical power to operate. Special properties of the laser beam, however, aroused immediate interest.

Dr. John L. McDaniel, Director of MICOM research and engineering, recalls: "Many people in our business could see that the laser might be a way to do something. The trick lay in finding a practical application for it."

Tough Problem

The something that interested Army missile engineers and others in the defense industry looked to be the answer to a particularly tough problem. By the early 1960's ways had been devised to guide missiles to hit tanks so long as the man who fired the missile had the tank in sight. The next step: finding a way to hit a tank when it was out of sight of the man who fired the missile.

A possible solution involved using some distinctive characteristic of the tank itself that a missile guidance system could recognize and home on, the way a heat seeking missile steers itself to the heat given off by an airplane engine. For a variety of technical reasons, that approach failed. When it did, those working on the problem began searching for a way to mark the target. What they wanted was a means to put a distinctive signature on the tank that a missile guidance system could recognize. Radio, radar, infrared and a host of other technical approaches were tried. All failed.

Beginning in 1961, Army missile engineers at Redstone evolved a concept and theory of laser semi-active guidance. Reasoning that advances in laser technology soon might make it possible to project the laser beam over sufficient distances to meet military requirements, they proposed using a laser as an illuminator, a means to mark the target by projecting a bright spot of light upon it. If that could be done, they were reasonably sure that a seeker could be built that could see the spot on the target and guide a missile to it.

The thing looked possible on paper, but the key elements needed to make a laser guided weapon, the illuminator and the seeker, had yet to be built.

Small Laser

In 1962, the illuminator loomed as the toughest problem. Soldiers on the battlefield would need a device that could be easily moved. The portability the Redstone group knew the Army would insist upon dictated not only an operating laser but a relatively small one, hopefully a device and its related power supply that could be carried by one man.

Allan A. Norman, then a team leader in the MICOM element charged with investigating potential future missile systems, recalls it as a time when one idea after another would be advanced, argued over and discarded. There was general agreement that to be useful to the Army, a laser illuminator and its power supply—probably batteries—would have to weigh no more than 40 pounds. Norman asked Salonimer to take a look at how that might be done.

(See ARMY RESEARCH on Page 10)

Inside Today —

Tomato Of Tomorrow

Page 4

Softball Roundup

Page 6

Alluring Worms

Page 7

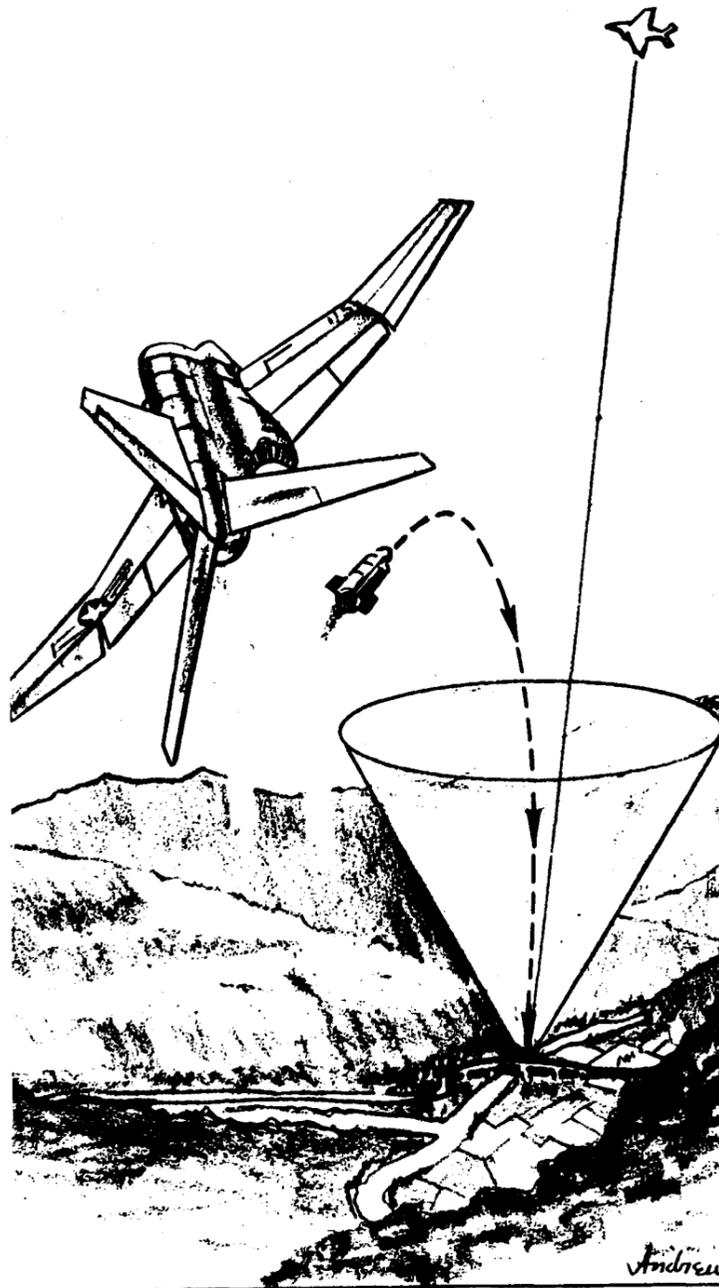
Mayor's Manuscript

Page 16

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Smart bomb is released by one aircraft, seeker in the bomb's nose homes on light reflected from target by laser illuminator in second plane.

The Redstone Rocket

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Rocket Ruminations

Cynicism is intellectual dandyism. George Meredith

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	1115	
	1900	
Sunday School	0945	Age 3 through Adult (Classes at the Chapel Annex, Bldg T-3151. (Bus Transportation from housing area).
	1800	Youth Choir Practice—grades 7-12 Post Chapel
	2000	Men's Choir Practice) 2nd and 4th Sunday each month) Post Chapel.
TUESDAY	0930	PWOC 3rd Tuesday of each month, Post Chapel.
WEDNESDAY	0615	Prayer Breakfast-NIKE Room of the RASACOM.
	0930	Ladies Bible Study, Post Chapel.
	1800	Third Wednesday of each month: Protestant Fellowship, Post Chapel Social Room. All Chapel "attendees" married or single are invited to attend.
	1900	Young Peoples and GI Bible Study Post Chapel Social Room.
THURSDAY	1900	Community Sharing, Post Chapel.
	1900	Adult Choir Practice, Post Chapel
FRIDAY	1900	Community Reachout (Transportation provided from Chapel).
SATURDAY	1900	Community Jesus Rally—2nd Saturday of each month. Transportation provided from chapel.

Catholic

SATURDAY	Mass	1700	Post Chapel (Fulfills Sunday Obligation)
SUNDAY	Mass	0830	Post Chapel
		1130	Chapel Annex, Bldg 3151
		1245	Post Chapel
		1700	Post Chapel
	Holy Name Society	0830	First Sunday of each month the Holy Name Society has a breakfast and meeting at the Officers' Club following Mass.
		1900	Youth Meeting Bldg 3168
MONDAY - FRIDAY	Mass	1200	Post Chapel
		0900	Ladies Sodality Mass and Meeting, Post Chapel (Every first Friday of the month).
SATURDAY	Confession	1600-1700	Post Chapel
		1800-1900	Post Chapel

Jewish

1000 Sabbath Service

Free Nursery service is provided at Rocket Nursery for all Chapel services and special activities.

(Staff Chaplain, 6-2409)

Dental Care Has Its Limitations

DENVER.—"I hope that expectant mothers recognize the limitations of the CHAMPUS program for dental care," Lieutenant Colonel (Dr.) W. E. Landefeld, Jr., D.D.S., Civilian Health and Medical Program of the Uniformed Services (CHAMPUS) Director of Dental Affairs, warns. "We are receiving many requests for reimbursement for care which is not authorized under the program," he continues. "Dental care under the CHAMPUS Basic Program is really quite limited."

There are some instances when dental care is not authorized on a cost sharing basis during pregnancy. Care is authorized to eliminate the centers of infection which might prove harmful to the health of the mother or the unborn child. If such care is necessary, it may include the removal of teeth, root canal work, periodontics (caring for the tissues supporting the teeth), restoration of decayed teeth, oral hygiene treatment and diagnosis necessary for this care. "Certain dental procedures are not authorized, however," Dr. Landefeld warns. "For example the replacement of teeth missing prior to pregnancy is seldom authorized." For such care to be authorized, he explains, there must be "compelling medical evidence" that the pregnancy is being seriously endangered because of nutritional deficiencies developing as a result of the lack of ability to chew food.

He also warns that CHAMPUS may not authorize gold restorations if a tooth may be "adequately" restored with another dental material, such as amalgam.

The agency that authorizes

payment of dental bills is Counselors located at military OCHAMPUS in Denver. CHAMPUS Advisors and Health Benefits information for beneficiaries.



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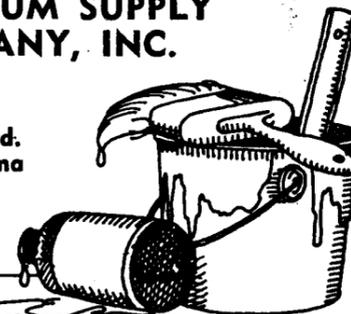
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Smith Heads Slate For AUSA Election

W. C. Smith, a Thiokol Corporation executive, is expected to be elected and installed as president of the Tennessee Valley Chapter, AUSA during the chapter's Annual Meeting next Wednesday evening, August 23.

Selected by a nominating committee to present to the membership along with his name are:



ROBERT L. JOHNSON

Lonnie N. Hightower, first vice president; Abner C. McNaron, second vice president; W. D. Slade, secretary and J. J. Weed, treasurer.

New directors nominated for various terms are:

Pat Smith, Albert H. Bryan, Brigadier General George H. McBride, Robert L. Van Wert, Miss Joyce Newton and George M. Burchfield. Burchfield's nomination marks the first time that a nominating committee has asked Local No. 1858 of the American Federation of Government Employees to select a person for full time membership on the chapter's board of directors.

Scheduled to address the annual meeting is Robert L. Johnson, Assistant Secretary of the Army for Research and Development. His topic will be future Army missile R&D programs.

The dinner meeting will begin at 6:30 p.m. in the Redstone Officers Open Mess, main ballroom.

Gregory Moshkoff, outgoing chapter president, said the chapter plans to award five \$100 savings bonds as door prizes and advised advanced ticket purchase as only 425 tickets will be sold.

MICOM WIVES

Wives of officers assigned to the Missile Command will have coffee in the Hawk Room of the Officers Open Mess at 10 a.m., August 22.

Wives not contacted by today may make reservations by calling Mrs. R. W. Huntzinger at 837-6174. Cancellations will be accepted until noon Monday by Mrs. D. A. Atwood, 837-0840.

Blue Collar Raise Rolled Back To June

The Department of Defense issued a new wage schedule granting retroactive pay raises averaging 12 cents an hour to approximately 1,170 federal blue collar employees in the Huntsville area.

Established under the coordinated federal wage system, the new schedule applies to federal blue collar workers engaged in laboring, craft and trade occupations. An effective date of June 11, 1972, was set for the new schedule. It provides increases from 10 to 14 cents an hour, an average of three percent for non supervisory employees.

Most of the federal blue collar workers in the Huntsville area are employees of the Army agencies and the Marshall Space Flight Center.

The pay raises contained in the new schedule are based on a survey of rates paid by private industry in this area as well as prevailing rates paid by the guided missile industry in the Dallas-Fort Worth, Texas, area as required by public law.

In accordance with U. S. Civil Service Commission instructions, new schedules are limited to an average increase of 5.5 percent. The pay increase limit follows the general standard laid down by the Pay Board.

Early Releases Back In Force

WASHINGTON (ANF)—Early release programs for both enlisted men and officers, suspended May 18, are back into effect.

Department of the Army announced the termination of the suspension of adjusted early release dates under special phasedown release programs went into effect on August 13.

The DA message did not announce an extension of early release programs. Personnel with original expired terms of service on or later than January 1, 1973, are not affected.

Personnel who had adjusted early release dates between May 18, 1972, and June 30, 1972, may now be separated on corresponding days during the period August 13 through September 30.

DA has made provisions for personnel to participate in Project Transition courses prior to separation if their training had been interrupted because of the suspension of the early release programs.

Details of the termination of the suspensions of early release programs are contained in DA Message 081925Z Aug. 72.

Combat Troops Launch Pershing Fall Series

Eight Pershing missiles will be launched from Utah to New Mexico in the fall series of firings starting in September.

Missiles will be fired from the Utah Launch Complex at Green River, and will impact on the 4,000-square-mile White Sands Missile range in southern New Mexico.

The series will be completed in late October.

Four of the annual service practice rounds will be fired by the Federal Republic of Germany (West Germany) Air Force, and three by the Europe-based Seventh U. S. Army. The last round will be fired by a battery of the 3rd Battalion, 9th Field Artillery, from Ft. Sill, Okla.

Technical test director for the firings will be James F. Conner representing COL. Samuel C. Skemp, in Pershing Project Manager, at the Missile Command. With the program for 10 years, Conner has never missed a Pershing series.

Since the off-range firing program began in August 1963, a total of 184 Pershing rounds have been fired to impact on White Sands Missile Range. Earlier, 56 rounds were fired at Cape Canaveral (now Cape Kennedy) to impact in the Atlantic Ocean.

Twenty rounds were fired in the spring series this year, conducted in April, May and June from the Utah Launch Complex at Green

River.

Most powerful of the Army's operational missiles, Pershing is 35 feet long, 40 inches in diameter and weighs 10,000 pounds at launch. It has a range up to 400 miles and is capable of delivering a nuclear warhead.

Early September Sign-Up Slated

The fall quarter registration at John C. Calhoun State Technical Junior College in Decatur begins September 5. Registration for night classes concludes the following day with that for day classes continuing through September 8.

THE REDSTONE ROCKET — AUGUST 16, 1972 PAGE 3

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Coleman Rites Held In Moulton

A funeral service for Thomas H. Coleman, 52, a procurement analyst at the Missile Command, was held Friday at Piney Grove Baptist Church. Burial followed in the Moulton City Cemetery.

Coleman died last Wednesday night of an apparent heart attack.

A shop steward in local 1858, American Federation of Government Employees, Coleman had founded and was a former editor of a union newsletter.

He had 28 years of federal service and had been employed by the Army at Redstone for 12 years. One of his most recent assignments was as an instructor in ALPHA, a program to convert all AMC procurement management into a single automated system.

He is survived by his wife Shirley and a son Tim, both of Moulton; a daughter Sharon and a granddaughter Denise.

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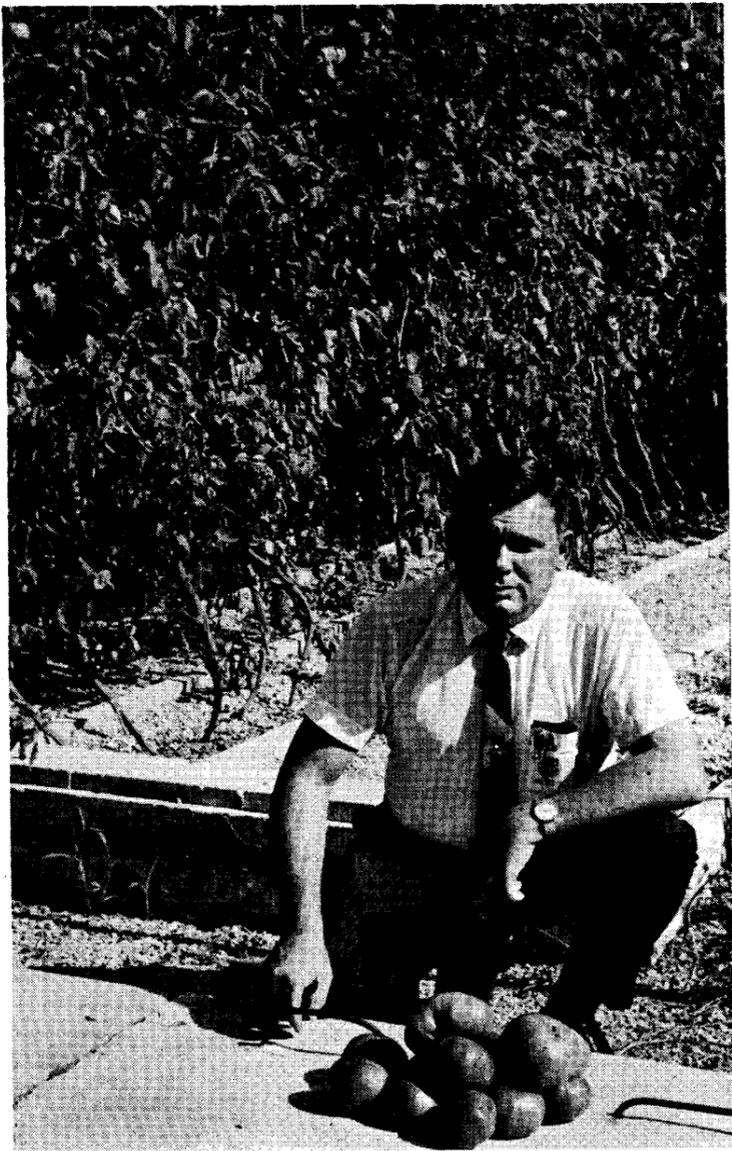
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HYDROPHONIC TOMATOES . . . LES BAGLEY

"If they ever start trying to grow vegetables or food on the Moon, it will be some form of hydroponic farming," according to Les Bagley, an Equipment Specialist in the Directorate for Maintenance.

Bagley, who majored in agriculture at the University of Florida, believes that one day hydroponic farming will be a commercial method of growing food right here in the United States.

All summer Bagley has been growing hydroponic tomatoes at his home as a hobby. The vines are from eight to ten feet high and the tomatoes are bright red, juicy and delicious to the taste. To date, Bagley has gotten more than 500 lbs. of tomatoes from his vines and they are still loaded with fruit that has yet to ripen.

Basically hydroponic farming is the use of water and chemicals to grow vegetables without having the plants in soil. It is a controlled process that takes a lot of the guesswork out of fertilizer and

moisture needs of the crop being grown.

Bagley's hydroponic garden consists of five rows 20 feet long. Each row is really a trench 12 inches deep and 18 inches wide, lined with concrete and filled with pea gravel.

At the end of the garden he has a concrete pit that is eight feet long, four feet wide and four feet deep capable of holding 1,000 gallons of water. The pit contains pumps that feed water to the plants at periodic intervals. When the water reaches the control level of the growing plants, a siphon allows the water not needed to run back into the pit to be used again.

Since Bagley is growing tomatoes he adds such chemicals as potassium nitrate, super phosphate and epsom salts to the water in the tank. He maintains the acidity at Ph 6.5 and uses a Comparator to check the water three times weekly. Chemicals are added once or twice weekly depending on plant growth.

The biggest tomato to come from Bagley's vines this year weighed

two-and-one-half pounds. The average tomato is smaller than this, but still bigger than those grown on regular vines.

He has sold some of his tomatoes to local restaurants and a great many given to friends and neighbors.

One of the advantages of hydroponic gardening is there are no weeds to grow around the plants and sap them or crowd them out.

While he has concentrated on tomatoes this year, Bagley has raised corn, squash, turnips, cabbage and cucumbers hydroponically, in previous years.

Bagley stressed that hydroponic gardening is not new. It started over 30 years ago in California and has spread to other states through the years. There are several places in the country that grow truck farms produce hydroponically for commercial use, but it has not become the conventional method as yet.

For Bagley, hydroponic gardening is a hobby and a way to keep current on agriculture techniques.

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TUESDAY, August 22
 "One is a Lonely Number" (PG)

Two shows nightly at 6:00 and 8:30
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 Sunday matinee at 2:00 p.m.

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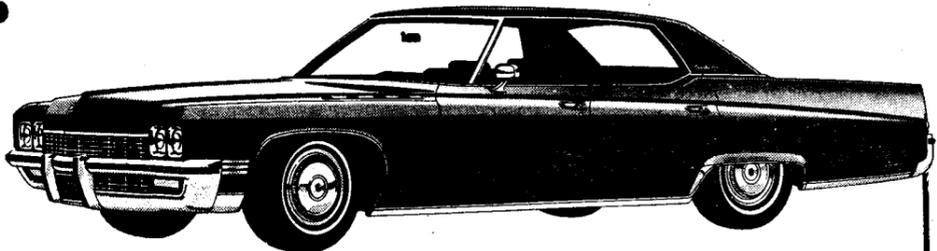
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Little Known Thoughts Spawn Valuable Ideas

Although few people on Redstone are aware of it, each month unsolicited proposals are sent here with original ideas ranging from completely new major missile systems to setting up new Army schools to train engineers.

In fact, each month the Missile Command receives eight to ten such proposals.

John Munger, coordinator for MICOM's Unsolicited Proposals Program, noted that about one third of the proposers actually receive a letter indicating that the government is interested in their idea.

Practically all of the proposals are serious—even the ones which may seem rather unusual to the average person.

"After all," said Munger, "the idea of an atomic bomb seemed somewhat unusual in the 1930's—but not after 1945. And every government project is the result of some proposal, whether solicited or unsolicited."

Most of the proposals come from very large corporations, but some are submitted by small companies. And even a few are sent in by interested individuals.

No one geographical area has a monopoly on unsolicited proposals. They arrive from all over the United States.

"Some are even relayed from Europe through Washington," Munger said. "In such cases, the proposals are translated in Washington, forwarded to the Missile Command for study, and then analyzed locally before being sent back to Washington with comments on their feasibility."

But regardless of who submits them, all proposals are treated alike.

"All material received is treated as proprietary," noted Munger. "A proposed idea belongs to the

person who submits it, and the only people who are allowed to see it are the evaluators—usually scientists or engineers in the Research,

Development and Engineering Directorate."

Thus, the only time the specific details of a proposal are revealed to the public is in the event that the material is unclassified.



Contract Role Cited In Award

Major Alvin D. Young, a Procurement and Production Officer in the Safeguard Contracts Office, was awarded the Meritorious Service Medal.

The award was presented to Young by Major General R. C. Marshall, Commanding General of the Safeguard System Command, for meritorious service from September 1968 to July 1972.

A citation highlighted Young's role as contract specialist for the System Engineering and Technical Assistance Contract for the Site Defense Project.

"The citation says in part," This procurement was processed on a nationwide competitive basis, and included as participants some of the nation's foremost missile and aerospace companies.

"The resulting multi-million dollar contract for technical assistance is a model for successful contracting as evidenced by the smoothness of interface between the Government and the contractor."

Young has been with Safeguard

since September 1968. A Columbus, Mississippi, native he has a BS degree in biology from Tuskegee Institute and a MBA degree from Alabama A&M University.



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MN-502/ NE-056	Statistical Techniques	TT	1900-2100	3 s.h./ 4 c.e.u.	Webb	\$157/ \$150
MT-511/ NE-021	Radar Technology (Weeks of Sept. 11 & 18)	M-F	0800-1200	3 s.h./ 4 c.e.u.	Polge & Hays	\$175
MN-521/ NE-051	Fundamentals of Program Management (Weeks of Sept. 25 & Oct. 2)	M-F	0800-1200	3 s.h./ 4 c.e.u.	Wyskida & Ignizio	\$175
NT-015	Applied Thermodynamics (Week of Oct. 2)	M-F	0800-1700	4 c.e.u.	UAT Staff	\$175
MN-541/ NE-061	Fund. of Contract Administration (Weeks of Oct. 30 & Nov. 6)	M-F	1300-1700	3 s.h./ 4 c.e.u.	Parker	\$175
MT-521/ NE-031	Flight Structures Technology (Weeks of Nov. 6 & 13)	M-F	0800-1200	3 s.h./ 4 c.e.u.	Chung	\$175
NT-018	Applied Signal Analysis (Week of Nov. 13)	M-F	0800-1700	4 c.e.u.	UAT Staff	\$175
General Interest Courses						
CD-101/ NA-001	Introduction to Child Development	MW	1900-2100	3 s.h./ 4 c.e.u.	Butts	\$73/ \$66
CD-201/ NA-003	Creative Activities for Children	MW	1600-1800	3 s.h./ 4 c.e.u.	Warvi	\$73/ \$66
ID-101/ NA-011	Fundamentals of Home Furnishings	MW	0900-1100	3 s.h./ 4 c.e.u.	Mikell	\$73/ \$66
ID-202/ NA-014	Interior Decoration Problems	TT	0900-1100	3 s.h./ 4 c.e.u.	Mikell	\$73/ \$66
LE-101/ NA-021	Introduction to Criminal Justice	TT	1800-2000	3 s.h./ 4 c.e.u.	Stroming	\$73/ \$66
HY-201/ NB-006	Impact of Technology on Life (Oct. 6 through Nov. 10)	F	2000-2200	1 s.h./ 1 c.e.u.	Roberts	\$29/ \$10
HUM-491/ NB-012	Religion and Secularity I (Sept. 12 through Dec. 12)	Tu	1900-2100	2 s.h./ 3 c.e.u.	Forstman	\$51/ \$20
NR-001	Effective Public Speaking	W	1900-2100	2 c.e.u.	C. Roach	\$44
NR-005	Choral Music Techniques for Singers	Tu	1900-2100	2 c.e.u.	Boyer	\$44
NR-007	Russian for Scientists & Engineers	TT	2000-2200	4 c.e.u.	Stromecky	\$66
NR-009	Creative Glass Blowing	M	1900-2100	2 c.e.u.	George	\$44
NS-006	Real Estate Principles & Practices	TT	1900-2100	4 c.e.u.	Bartlett	\$66
NS-010	Federal/State Income Tax	TT	1900-2100	4 c.e.u.	Vice	\$66

Most courses may be taken as credit or non-credit. Semester hours credit may be earned by students admitted to UAH or by persons enrolling as non-matriculated. Continuing education units (c.e.u.'s) are awarded in recognition of satisfactory completion of non-credit ("N" numbers) courses.

Registration for full-term courses will be held Aug. 31 and Sept. 1. Non-credit and non-matriculated registration will be from 1-6 p.m. in Room 230 Madison Hall (formerly Graduate Studies Building).

Additional information may be obtained from the Division of Continuous Education, UAH, telephone 895-6010.

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() technical courses.

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Curtain Dropping On Redstone Softball

UTC Rates Favorite Role In Military Play

It's official—UTC and MICOM have been crowned divisional champions of the 1972 unit-level softball league.

MICOM dropped its only game last week, a 12-6 drubbing at the hands of the 291st MPs, but still finished first in the American division with a 15-3 record. Bobby Williams lashed two doubles and a triple to lead the MPs to their upset victory. But the MPs also lost an 8-6 decision to the 200th Ordnance Detachment, which gave the 200th the final slot in the league playoffs ahead of the MPs.

Sonja Skemp Has Then Winning Way

The Golf Group sponsored by the Officers Wives Club played low gross, low net competition during playday last week.

Sonja Skemp was the low gross winner of the first flight with Mimi Diefl and Charlene Powell tying for low net.

June Young shot low gross in the second flight and Mary Sutherland hit low net.

The week before, the Group played a 9-hole scramble for low gross and low net. The team of Fran Sullivan, Mary Sutherland and Sonja Skemp registered low gross. Florence Teir, Connie Sterling and Kathren Murray had low net.

Company C, paced by Dave Lenhart and Mike Oury, finished second in the division with a 16-6 record, while MEDDAC came in third at 12-7. Both teams advance to the playoffs, along with MICOM and the 200th Ordnance.

In National division activity, UTC was idle. SAFEGUARD and the 4th ETC split two games, with SAFEGUARD winning 13-1, and the 4th triumphant in the second encounter, 6-5. Steve Singer tripled twice and Jeff Hasbrook collected three hits as the 6th ETC beat the 3rd ETC, 16-11, in a game between two non-playoff teams.

The four playoff qualifiers in the National division are UTC, SAFEGUARD, the 4th ETC and Company A. UTC "went to Town" all year to finish with an impressive 22-1 mark. With Ron Lockwood and Bruno Wargo leading the way, UTC will be favored to add the playoff title to their list of accomplishments this season.

SAFEGUARD finished second in the division with a mark of 17-7. The 4th ETC and Company A wound up third and fourth to capture playoffs berths.

Playoffs will begin August 21 in a double-elimination tournament. All first round games will be played Monday. Information about subsequent games will be available from the post gym (876-2943).

First round pairings and times: Field 1 — MICOM vs. Company A (6 p.m.)

Company C vs. 4th ETC (7:45 p.m.)

Field 2 — MEDDAC vs. SAFEGUARD (6 p.m.)

UTC vs. 200th Ord (7:45 p.m.)

Metrology Edges GEM

Metrology earned the final CWF slot in the all-Redstone slo-pitch tourney last Tuesday with a 9-5 win over GEM in the final game of the second division playoffs.

The Corps of Engineers had qualified for the position but was unable to field a team due to several of their players being sent on TDY.

The Labmen sent six runners racing across in the very first innings of their duel with GEM and then staved off repeated threats to hang up the win.

Jerry Williams and Bill McCormack collected three hits apiece as Don Agner picked up the win over John Chipser. The latter had three hits and Bob Fletcher got two more for GEM.

ROCKET SPORTS

Slo-Pitch Title Up For Grabs

The 1972 All-Redstone slo-pitch championship goes on the line at the Civilian Recreation Area this afternoon with at least one Army team involved.

MISD, the regular season CWF winners, won three games last week to advance to the final game and will meet the survivor of a two loser's brackets games played earlier this week.

Material Management played the NASA Center's purchasing on Monday evening with the winner going against the Astros, another Marshall entry, on Tuesday. A win for MISD tonight will give them their second straight Arsenal crown while a loss will necessitate another game at the NASA field tomorrow evening.

The CWF champs had to scramble in each of their preliminary games before hanging

up the win. MISD opened with a 11-9 win over the Dollars, slipped past Purchasing, 11-6 and got into the finals with a 15-11 decision over the Astros.

Material Management rapped SSL, 10-5, dropped a 12-9 nod to the Astros, then stayed alive while eliminating Missile Intelligence, 9-5.

Ladies League

A Wednesday morning ladies handicap bowling league is now being formed with a tentative starting date of September 20. The league will be open for officer and enlisted wives, active and retired.

The league will roll at the Post Lanes each Wednesday morning starting at nine.

Women interested in joining the league, or obtaining additional information may call at the Lanes.

Missile Intelligence started on the wrong side of the ledger in dropping a 7-1 decision to Purchasing and bowed out after ending the Dollar hopes in a 9-3 contest.

The final CWF entry from the Metrology Lab lost to the Astros, 14-6 upset SSL, 8-5, then dropped out with a 15-6 loss to Purchasing.

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SERVICE DEPT. OPEN 7:30 A.M. TO 5 P.M. WEEKDAYS



Anglers Lured Into Business

If you can invent a better fishing lure, fishermen will beat a path to your door. Warren Hunter and Robert Wheat, Army employees, invented the Rat-lur and already it has become the fastest selling item at the West Tennessee Tackle Show in Memphis, and is becoming widely known throughout the southeast.

It all started during the Christmas holidays in 1971 when Hunter and Wheat were fishing on Guntersville Lake. They were using plastic worms and a Cordell Hotspot and not having much luck with either.

Hunter happened to remark that if they had a worm that made as much noise as the hotspot, they'd be catching plenty bass. . . and an idea was born.

When Hunter and Wheat returned to Huntsville they decided to check their idea out and see if anyone had a similar patent on the market. They hired a patent attorney and found there were approximately 22 patents issued on plastic worms and not a single patent on a noise-maker.

With this information, the two men decided to invent a noise-maker that could be used on any plastic worm without infringing on anyone else's patent.

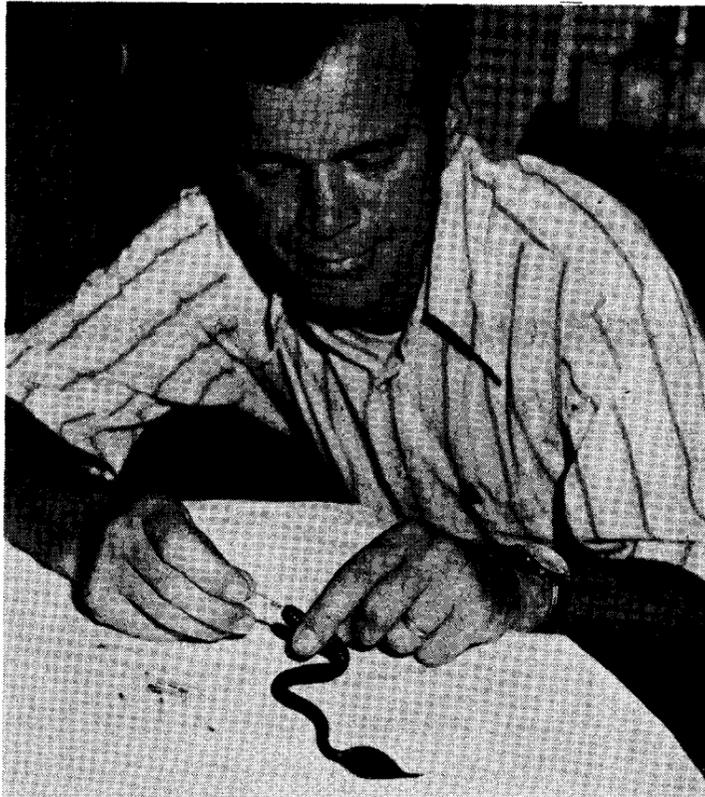
They bought some capsules at the drug store and tried small ball bearings to provide the noise. However when they inserted the capsules in the worms and put them in the water, the moisture and plastic material dissolved the capsules and eliminated the noise.

Next they tried plastic straws cut in small sections, but they found this plastic material became so soggy when wet that it didn't make noise either.

Finally they decided on a small one inch long glass cylinder and this proved successful. Then came the problem of how many little metal balls to put into the cylinder. Each time they got a new idea, they went fishing and tried it out.

Based on their fishing experiences, they found that three little metal balls produced the sound that attracted the most bass. . . and the Rat-lur was born.

Hunter and Wheat applied for a patent and then started making the lures themselves.



NOISY WORM. . . . WARREN HUNTER

Hunter, lead electronics instructor from Frankford Arsenal, working at Redstone, and Wheat, Chief of Technical Support for SAFLOG, found they could not make enough lures in their spare time to keep up with the demand.

They worked out a sub-contract agreement whereby handicapped persons at the Huntsville Rehabilitation Center would make the lures and deliver them. Hunter and Wheat filled the orders and mailed them out to fishing tackle shops in the area.

Deciding to branch out, the two men contacted a sales merchandising firm in Tennessee to handle promotion. Within a short time 25,000 Rat-lurs were sold and it was declared the hottest selling item at the West Tennessee Tackle Show.

At the present time fishermen can buy Rat-lurs in 27 different states and plans are being made to extend the market to other states.

Success is the best yardstick for a fishing lure, and Hunter is always willing to match his lure against any in the field. Last May he came in second in the fishing tourney at Smith Lake and won first place at the Shoal Creek tourney in June.

Though the Rat-lur is gaining in popularity, Hunter and Wheat hope that one of the national tackle companies will want exclusive rights to their invention.

In the meantime they are busy selling Rat-lurs and looking for ideas for another type lure to help catch the wily bass.

Golf Group Sets Tournament Plans

Among the business discussed at the August luncheon of the Officers Wives Golf Group were plans for the annual invitational tournament

slated for September. Two special guests attended the meeting, Col. Charles Kolankiewicz, chairman of the Arsenal Golf Committee, and Mel Davis, assistant golf pro. The colonel discussed improvements for the golf course and plans for the winter.

Sonja Skemp, chairman of the Golf Group, announced most of the committees who will work on the invitational with Bev Payne as chairman.

MMCS Officers Bowling Callout

The MMCS Officers Bowling League will begin play September 7. Membership is open to all officers and warrant officers, active or retired, currently assigned or attached to MMCS.

In addition, each team may have a maximum of one retired member that is not affiliated with MMCS provided that member was affiliated with the school when he retired.

Any person wishing to enter a team in the league should contact Captain James Cape at 876-2754, or Lefty Coffman at 876-7326 immediately.

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MICOM Girls Go After Third Straight Sweep

Despite the first blemish on their crown last week with a victory in glittering slate, the Missile Command girls came back to wrap up another Huntsville Women's Softball league regular season

Blue-Gray Duel Appears Likely

Civilian Welfare Fund netters scored a double win in B Division play of the Huntsville Tennis League last week setting up a possible intramural duel for third place in the final Division standings.

The Grays protected their hold on third with a 6-3 decision over Computer Science Corporation and the Blues stayed within reach of the spot by taking the Marshall Center in a 5-4 verdict.

Only two team matches remain of the regular season with the final being a position round. This week's action saw the Grays trying to sidetrack the leading IBM outfit and the Blues going against M&S Computing Service.

The Grays captured their match against CSC by dominating singles play, taking five of the six sets, and adding one of the three doubles points to their winning margin.

George Elrod and Jim Mitchell paired up to capture the winning doubles point after each had come out victorious in singles. Elrod tops the B ladder with Mitchell next.

The other winning points in singles were scored by Hal Craft, Jim Burt and Leo Schiffman.

The Blues also dropped two of three points in doubles but their one win, scored by Irv Kellogg and Charles McBrearty, proved to be decisive. The CWF team won four points in singles.

The winning points were posted by Don Combs, Phil Adair, Bob Lindeman and Gaston Boyd.

The Fraternal Club put an end to the Big Red winning string at 18 games with a 12-7 victory on Monday and two nights later the two rivals got together in a sudden death playoff with MICOM coming out on top with a hard fought 6-4 decision.

In between the two battles MICOM defeated State Farm and the Fraternal Club took the measure of Computer Science to set up the playoff.

All that remains of the season now is post season playoff now underway at Stoner Field in northwest Huntsville. MICOM has captured both the regular season and playoff titles for the last two years.

Barbara Roberson drove in five runs with a triple and a double but it wasn't enough to stave off the loss when the Fraternal Club took an early 4-0 lead and sealed the verdict with a five run burst in the fifth.

Gladys Hill took the Monday night setback but came back to blank State Farm on Tuesday with a five-hit job. Pat Shipp and Sherry Gray paced the attack with a pair of hits apiece.

MICOM scored twice in the opening frame of the playoff on hits by Barbara Ikard, Glenda Kidd and Kathy Leeth. After surrendering the lead on a Fraternal Club run in the third and two more in the fourth, MICOM went back out front with a deuce in the fifth and irised the win with another two-spot in the sixth.

Jackie Carswell ignited the winning rally with a single and Sara Fisk, the winning pitcher, kept the attack going with another. Donna Hudson got the equalizer home with a single up the middle and Kathy Leeth drilled a hit to left with the lead run.



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Janell Gause 883-0578

Nell Gaylord 881-7865





PRESENTS TROPHIES—Colonel Charles F. Kolankiewicz, chairman of the Redstone Golf Committee, presented trophies to winners of the Ginna Medaris Tournament at a luncheon for the Officers Wives Golf Group last week at the Officers Open Mess. The champion, Florence Teir, is at the left. Marion Deppensmith is chairman for tournaments for the Golf Group. Personal trophies were crystal and silver hollow ware.

All-Electric Show Slated

A completely new idea in the entertainment field will be seen at the Service Club Sunday evening when Harold Beer, displays his talent with electricity. An all audience participation show, "The Human Dynamo", will entertain a full hour with electrified comedy and fun. There will be such acts as the shocking kiss, the hot seat, getting lit up, the dance with electrified feeling and the electrocuted hot dog.

Retiring Officers Receive Honors

Retiring Colonel Robert Schmiedel and Lt. Col. Lowell Twitchell of the Safeguard System Command both received the Legion of Merit award last week from Major General R. C. Marshall. Col. Schmiedel received the award for outstanding services from July 1971 to July 1972. He came to Safeguard in October of 1971 and served as Field Office Coordinator, and Acting Chief, Program Management Office of Production and Logistics Directorate. Lt. Col. Twitchell received his award for outstanding services from September 1966 to July 1972. He was assigned to Safeguard in November 1970 as executive officer of the Research, Development, Test and Evaluation Directorate.

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I believe this is as good a group of grade cows as you will find on any farm. I was very impressed with the size and quality of these cows. You can get cows here capable of adding to your milk base. They have been milked by the family and they show this by their good quality udders. These cattle have been handled under practical feeding conditions, pasture and limited silage. Under optimum conditions I feel many of the cows could make 15-18,000# milk.

Individual age and calving information will be available sale day.

DAIRY EQUIPMENT

- 3 Unit Surge Milker, Complete With Compressor
- 1—220 3 Stack Electric Heater
- 1—110 Electric Heater
- 2—50' Water Hoses
- 52 Gal. Hot Point Hot Water Heater
- 2 Stainless Steel Milk Buckets
- 2 H.P. Rotary Vacuum Pump
- 100' 1 1/2" Glass Milk Line
- 80' 1 1/4" Galvanized Vacuum Line
- 8 Unit Universal Milk Pump, Pipe Line Milker
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- Double Tub Stainless Steel Wash Vat
- 1000 Gal. Stainless Steel Meuler Tank, 2 Yrs. Old
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| 1 Ford Corn Planter, 3 Point Hitch | 1 Pair Clamps |
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| 1 Power Fordson Major Diesel 4 Plow Tractor | 1 10' Wheel Type Disc |
| 1 3 disc Turning Plow, 3 Point Hitch | 1 Pull Type Disc |
| 1 2 row Cultivator, 3 Point Hitch | 1 Mulcher Cultipacker |
| 1 Ford Corn Picker, Rear Mount | 1 Case Wheat Drill |
| 1 2 Wheel Trailer, Rubber Tired | 1 Allis Chalmers Combine |
| 1 7' New Idea Pull Type Mower | 1 Electric Emory Rock |
| Other Articles Too Numerous To Mention | 2 Power Fans |

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THE FARM

This 156 plus farm is an excellent livestock farm, having an abundance of water and plenty of permanent pasture. It has approximately 100 acres in permanent pasture of fescue, orchard grass and clover, some lespedeza. There are about 15 acres Bottom land that will grow any kind of row crop or hay. Also to sell is a 3 bedroom trailer with 1 1/2 baths, stove and refrigerator. It has large feeder barn, small tenant house. There are excellent fences around the entire farm. Water is furnished by 7 cave springs, Agnew Creek and Chicken Creek. This well balanced farm is the type that is in demand now, so be sure to look this farm over and be at the sale on August 19. FARM WILL BE OFFERED SEPARATELY, IN COMBINATIONS, AND AS A WHOLE, HIGHEST PRICE WILL DETERMINE SALE.

SALE NO. 1: TRACTS

TRACT NO. 1—Consists of 30 to 35 acres, 8 acres level ridge land, balance rolling to hill land, 15 to 20 acres open land, sown in permanent pasture, balance in timber, watered by spring. This is an ideal baby farm not too far from Pulaski.

TRACT NO. 2—Consists of 22 acres, more or less with 10 acres bottom land, watered by two springs and branch on west boundary, has large barn, small tenant house, another excellent small tract.

TRACT NO. 3—Consists of 5 acres, more or less, bottom land fronting Chicken Creek Road, has branch through entire tract, excellent homestead.

TRACT NO. 4—Consists of 94 acres, more or less, with 50 acres open land sown in permanent pasture, water from 7 cave springs and branch running through this tract, new fence, bounded by Chicken Creek Road on south.

SALE NO. 2

Sale No. 2 will be the 3 bedroom trailer with 1 1/2 baths, stove, refrigerator. TERMS: Real Estate 25% down sale day, balance on or before 30 days. Personal Property Cash.

POSSESSION: With delivery of deed, except 1 acre turnip greens and 10 acres corn and garden which will be given possession to as gathered.

HOUSEHOLD FURNISHINGS

Glass top coffee table; Mahogany Table; End Table; 2 Platform Rockers; Vacuum Cleaner; Couch; Automatic Washer; Wood Bed; Broiler Pan and Rack; Glass Relish Dish; Glass TV Snack Set; Glasses; Glass Cream Pitcher; Sugar Bowl; Odd Bowls and Plates; Old Silverware; Rocking Chair; Walnut Bed; over 100 years old; 2 Bird Cages; Coal Heater; Wood Heater; Kerosene Heater; Other articles too numerous to mention.

FARM EQUIPMENT

Massey Ferguson baler No. 12, good condition; Ford mower 501; Allis Chalmers 114 tractor; Ford flat land turning plow; Allis Chalmers 16" flat land turning plow; Oliver rake; John Deere tractor; Bush hog, 66" cut; Rubber tire wagon; 1959 Mercury car; Lot of horse drawn equipment; 2 horse wagon; Horse drawn buggy; Used tin; Other articles too numerous to mention.

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7 Yorkshire and Hampshire sows, 6 with pigs; 13 pigs; 1 Yorkshire Boar.

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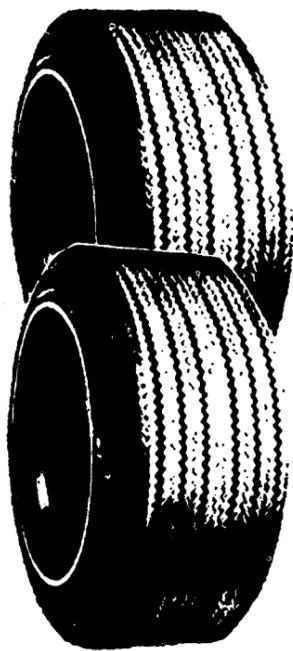
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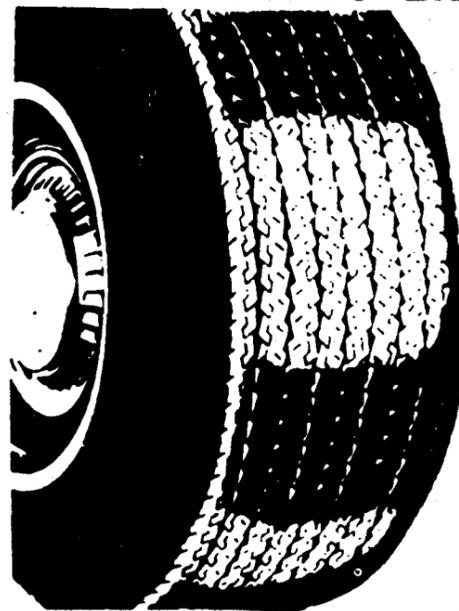
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Army Research Helps Answer Problems Fo

(Continued From Page 1)

Salonimer, then a 38-year-old general engineer with six years experience in the Army missile program, had recently completed a survey of existing and proposed missile guidance concepts. A graduate of Wayne State University, he had a solid background in electronics, circuitry and servo technology. Dr. Julian Kobler, who worked in the same group, recalls: "Dave was up to speed on current guidance technology. Beyond that, he had read every technical article on every subject he could get his hands on. He has a unique ability to synthesize a solution to technical problems by pulling together bits of diverse technology and figuring out a way to make them fit."

Synthesizing this solution took months. Often working alone for days at a time, Salonimer also drew on the specialized knowledge and skills of other members of the MICOM research team and his widespread contacts in defense industry. He polished his evolving thoughts in the chalk board group think sessions much favored by engineers.

Devils Help

Of those latter sessions, Salonimer says: "You can't underestimate the importance of the devil, the guys on the negative side, who say 'That won't work and here's why.' Opposition keeps an idea alive. When everyone agrees, you run out of steam."

The original thinking had been that the laser must illuminate with continuous energy, roughly analogous to pointing a flashlight at a target, switching it on and holding the beam on the target until the missile hit. Searching impatiently for a way to get away from the large power source that approach would require with laser technology then available, Salonimer came up with the idea of pulsing the laser beam. In effect, he proposed illuminating the target with regularly spaced short bursts of very high energy. That was a way to do the job with a relatively small power source if he could find answers for a host of new problems that approach presented.

When he assumed the laser could be pulsed, Salonimer found the pieces of his technical jig saw puzzle came together. He worked out a mathematical proof that his theory would work.

"Dave's equations were the road map," Norman recalls. "Once we saw them, we had the way to go."

New technology of great promise attracts widespread interest throughout industry and government research organization. By late 1962, that kind of interest had begun to accelerate laser technology. Once the snowball started



Dave Salonimer and an early experimental laser illuminator.

downhill, MICOM, as the advocate of the laser guidance concept, became the focal point for ideas that poured in from everywhere.

Salonimer recalls: "People would come in and offer ideas. Some probably didn't even know they had helped. None of us could tell you today where it all came from. We were sitting right in the middle, pulling it together, shaving off what we didn't need, urging the laser guidance concept on any one who would listen."

Use From Air

Some of the urging involved pointing out how laser guided weapons might be used in combat. The Army traditionally has used forward observers, men in position to see the target, to adjust the fire of cannons. Now it appeared that a forward observer, using a laser illuminator, could literally steer the weapon right to the target. If the illuminator

could be made, it could be used almost everywhere; by a soldier in a foxhole, or mounted on jeeps, tanks, helicopters or airplanes. The airborne illuminator was one of many suggestions Salonimer advanced to friends in industry as he urged them to consider the feasibility of laser guidance.

The process through which weapon systems evolve from thoughts into full scale development programs which produce useable military hardware, in the early stages, is essentially one of predict, then confirm. In June 1963, MICOM sought the first vital confirmations.

Autonetics and RCA received contracts totalling \$156,000 to investigate different technical approaches for seekers to home on pulsed laser radiation. Within six months, both the Autonetics concept using solid state devices and the RCA television image tube technique had been successfully demon-

strated under laboratory conditions.

As an offshoot of this effort, Autonetics also developed on its own a relatively light weight pulsed laser that could be used as an illuminator in experimental setups.

Salonimer, one of several MICOM engineers, who saw the crude device reflect its beam off a brick wall on the far side on a parking lot at the Autonetics plant, recalls:

"At that point we knew what we wanted was within reach."

Based on the highly promising initial reports from its contractors and the results of work continuing at Redstone, MICOM now began to shift the impetus of its effort toward hardware: seekers that could be tested, first on the ground, then flown in missiles, portable illuminators that could be operated on test ranges.

A 40 Pound Solution

In January 1964, development work on a portable illuminator got underway in the Redstone laboratories. A few months later additional contracts funded further seeker work. Awards to two industrial firms funded other possible technical approaches to the development of the laser illuminator. One of them, Martin Orlando subsequently delivered a practical pulsed laser illuminator weighing less than 40 pounds.

Military research organizations exist to produce good ideas, but not all good ideas go on to become weapons. Once a solid technical foundation begins to support theory, other factors become increasingly important, among them: cost of the proposed weapon and what it offers in the way of improved fighting capability to the service supporting the research.

Contrary to popular belief, each military service does not jealously guard the results of its research programs from the others. In fact there is a continuous exchange of information at several levels, ranging from Defense Department sponsored tri-service working groups down to informal discussions among individuals in government laboratories and their supporting defense contractors.

Just that sort of an exchange has been going on in laser semi-active guidance with Salonimer and a colleague, Norman L. Bell, serving as MICOM's primary points of contact with interested groups in other services and industry research organizations. Bell recalls: "Dave organized the exchange. It was very informal but we were talking back and forth to the other people all the time to make sure that everyone knew what was happening."

Air Force Interest

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The Air Force In Development Of Bomb

Army's pioneering work the Air Force evidenced definite interest in laser guidance in the Spring of 1964, an interest that grew throughout the year. Bell soon found that in addition to working out potential development programs for Army laser guided weapons, he had become the MICOM informal ambassador to the Air Force.

The Redstone group had decided by then to pursue solid state technology for the seeker, believing it offered the best approach for a high accuracy missile guidance system. The RCA image tube technique was diverted into a way to mark ground targets for pilots of attack aircraft.

By the end of 1964, sled testing on the Autonetics solid state seeker had begun at Redstone, Martin's first illuminator was nearing delivery and RCA had the target designation system ready for demonstration in an aircraft. In short, as 1965—the year of initial major commitment of American combat forces in Vietnam—began, the technology needed to make a laser guided weapon was pretty much in hand.

Crucial Session

At the invitation of the Air Force, Bell and Salonimer attended a meeting in Orlando, Florida, in April 1965. Looking back, both men agree that session was a critical, perhaps the most critical, point in the evolution of the smart bomb.

The Air Force called the meeting to review the status of laser guidance technology and how it might be applied in weapons. In essence, the questions of overriding importance discussed in the two day session were these: "Is the technology available now to support a development program for laser guided

weapons? How can they be used in tactical air warfare?"

Bell recalls: "As it turned out, Dave and I were the only technical types in the room who could talk in terms of both the technology and how it could be used in weapon systems. We had done our homework on applications."

The two Missile Command representatives answered the first question with an unqualified yes, then outlined several weapons concepts tailored to Air Force application. In particular, they talked about the laser guided Shrike.

Looking for a relatively inexpensive missile for its own concept the Missile Command had brought Texas Instruments Company into its effort in mid-1964, funding studies leading to integration of a laser seeker in the air launched Shrike missile, a Texas Instruments product.

Bell and Salonimer explained to the others at the meeting the mechanization of the Shrike program, how it could be put into a missile, or a free falling bomb.

Go For Bomb

A month later—in May 1965—the Air Force formally asked MICOM to participate in a short and quick demonstration program to establish the practicality of laser guided bombs and their anticipated greater effectiveness. Specifically the Command was asked to provide laser illuminators and operators, technical assistance and evaluation of the seeker proposals of the contractors selected by the Air Force to work on the bomb.

What the Air Force had in mind was a development program aimed at producing a relatively inexpensive modification kit to be fitted on a standard bomb, a simple seeker to home on laser illumination, coupled with moveable

fins that would cause the bomb to maneuver as it fell toward the target and achieve much greater accuracy.

Able to rely on MICOM for illuminators—Martin had delivered one in January 1965 and had received followup orders from the Command to build two improved models—the Air Force concentrated on the modification kit for the bomb, awarding contracts to Autonetics and Texas Instruments. The former had been deeply involved in the MICOM program for two years. Texas Instruments, building on what it had learned from the Command during the studies on the laser guided Shrike, had submitted an unsolicited proposal to the Air Force for a laser guided bomb.

18 Month Program

In the next 18 months with Bell coordinating the effort, the Army illuminators were used by both the Air Force and its contractors in developing and testing the laser guided bomb. Salonimer and others at Redstone provided advice and assistance to the Air Force, including detailed evaluation of the contractors' technical proposals. Autonetics, with its longer experience appeared the obvious choice. Texas Instruments offered an approach of higher risk, but potentially simpler and lower cost. Salonimer spotted that and urged the Air Force to fund both approaches. Texas Instruments eventually won the competition. The Martin Company, who built the first illuminators for MICOM, went on to develop the aircraft mounted illuminator used by the Air Force.

Building on the technical base developed by the Army programs, the Air Force and its contractors were able to bring the smart bomb along in a very short time. Well launched by successful demonstration in 1966 of the laser guided bomb, the Air Force went ahead in

an expedited program to get the weapons ready for combat at the earliest possible date.

The laser guided weapon, as a result, saw its first combat as a smart bomb. McDaniel explains why:

"The group working on laser guidance here at the Missile Command had been working to Army requirements, looking for a better way to fight tanks. The enemy was not using tanks in the early years of the Vietnam War. The Army had a good concept, but no targets. The Air Force, on the other hand, had targets plenty of targets. They wanted a way to hit them more effectively. They obviously got it. The Missile Command group continued to expand laser guidance technology for application to Army requirements. That was our primary goal from the outset."

Today Salonimer can see a laser guided missile by getting up from his desk in McMorrow Laboratories and taking a short walk down the hall. Army laser guided long range rockets have demonstrated unprecedented accuracy. Air to ground laser guided missiles are fired regularly from helicopters on Redstone test ranges.

Salonimer's mounting pile of newspaper and magazine clippings offers positive, if mute, evidence that the smart bomb has introduced a new dimension in warfare.

He feels it is just a beginning. "We've hardly scratched the surface of what can be done with laser guidance," he said the other afternoon, rapidly outlining a dozen potential applications.

Someone asked if he had ever seen a smart bomb tested. He seemed surprised by the question.

"No, I never did, but that wasn't important. We knew it would work," he said.

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Sergeant Jenny Preston, a medical specialist, found more than a challenging career and a chance to continue her education in the Army. She found a husband.

"There were many reasons I reenlisted. The main reason, however, was to be with my husband. He's also in the Army.

"Our chances of being together in the Army are a lot better than if I was just a dependent. We have a much richer life together. I'm looking forward to traveling together and seeing a lot more of the world.

"We're hoping to see Japan and Hawaii and I'm planning to return to the Philippines for a visit.



"My husband and I are saving as much as we can so the \$10,000 bonus was very, very nice.

"My job has been very rewarding because I'm dealing with people's lives. And what could be more important than that?"

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NAMES IN THE NEWS
 By SFC Wilfred Gileau

SOM
 Sp4 Frank D. Davenport, Company A, has been selected as the 1st Battalion's soldier of the month for August. Davenport is assigned to Land Combat Missile Maintenance. He will now compete against 2nd Bn. and UTC for MMCS Soldier of the Month.

School Brigade CO. A
 SSgt. Victor M. Ruiz-Medina was promoted to his present rank on August 3. Ruiz is an instructor in the Ammunition Dept. and previously served with the 60th Ord. Co., 3rd Ord. Bn., RVN.

CO. B
 SFC Sidney H. Dees was awarded the Army Commendation Medal for Meritorious Service on August 10. The award was for previous service while assigned to the 524th Ord. Co., Ft. Richardson Alaska, from April 69 to April 72.

SSgt. Freddie Durham was awarded the Army Commendation Medal for Meritorious Service on August 10 while assigned as an instructor in the NIKE Division. Durham had been scheduled to retire but has extended his service until January 1973. He was previously assigned to the 4th Ordnance Co. in Germany.

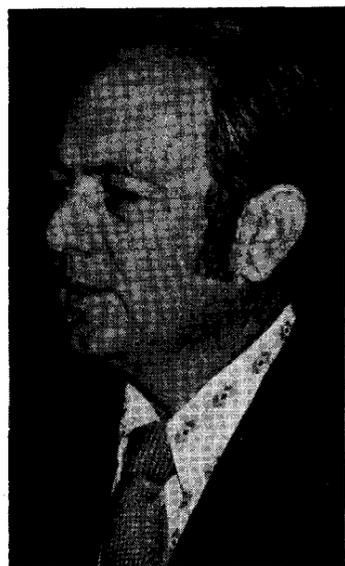
Ammunition Department
 Lt. Col. Charles J. Fricke, on convalescence leave at his home in Gunterville paid a short visit to the Department on August 9. Capt. Richard A. Carter, Commanding Officer, 6th ETC, observed the Department's orientation of the new 55x40 Ammunition Inspector Course August 9 with Maj. C. G. McLellan, Chief, Tech Ammo Div and Mr. W. B. Slade, Dep Director.

Capt. F. E. Noll, Commanding Officer, A Company, 1st Bn,

School Brigade, toured the entire facilities of the Department including the ASP Training Area. He stated he was very pleased with the training facilities and supervisory efforts of the instructor staff.

Gen Ammo Div, Records Branch
 1st Lt. Douglas J. Danley, US Marine Corps, will assume responsibility as Chief of Records Branch upon departure in September of CWO H. J. Hemingway. Lt. Danley had the responsibility of training ammunition students at the Ordnance School, Quantico, Va. Master Gunnery Sergeant (MGYSGT) M. P. Hearn, Gunnery Sergeant (GYSGT) P. J. Goodman and Gunnery Sergeant (GYSGT) H. L. Deffee were assigned to the Branch recently. MGYSGT Hearn, Senior Instructor, and GYSGT Goodman, Instructor, were formerly assigned to the Marine Educational Development Center, Quantico, Va. GYSGT Deffee Instructor, was formerly assigned to the Marine Corps Base, 29 Palms, Cal.

SSgt W. H. Hewett has joined the Branch. He recently completed the Ammunition Inspector Course, 55x40, here at Redstone Arsenal. His last assignment prior to the 55x40 course was the 1st, Bn, 50th Inf, Fort Hood, Texas.

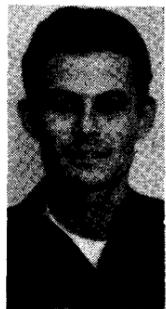


TWO-TIME WINNER. Gordon Farrar, an equipment specialist in Maintenance Directorate, won \$950 by suggesting a better and cheaper way of crating rocket motors and drew up the final design himself. The estimated first year savings was \$49,555. In 1968 he collected \$1,225 for a suggestion.

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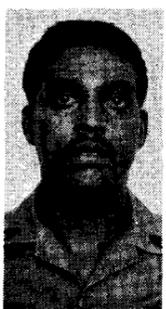
MEDINA



DEES



DURHAM



HEWETT

Persistence, A Key To Success

Persistence—the ability to move toward any goal despite temporary setbacks—is one of the key qualities in any man's success.

Colonel Max A. Craig delivered this message to 27 graduating students of the Missile and Munitions Center and School last week. Craig is director of the Missile Components Department at MMCS.

Echoing the thoughts of Dr. Norman Vincent Peale, Craig states several guidelines to success. "Pinpoint your goal in life. Vagueness is the invariable hallmark of the unfocused mind." Second, "use imagination to fan your desire. Clarity of purpose and intense desire are the chief

ingredients of success."

The third point is, "expect to pay for what you get. Unless you are willing to pay the price, take chances, make sacrifices, and endure setbacks you are wasting your time."

Craig warned the students against inertia, self-doubt, and aimlessness as three deadly characteristics which could short-circuit a successful and productive life.

HONOR GRADUATES

Five students were recognized as honor graduates in their respective classes: Specialist Five Gilbert Ramirez of San Antonio, Tex., in the nuclear weapons electronics specialist course; Specialist Four

Terrance W. Parsons of Hamilton, Ohio, in the HAWK CW radar repair course; Private First Class David L. Rogers of Natick, Mass., in the Shillelagh missile repairman course; Private First Class Michael A. Doubek of Menominee, Mich., in the Redeye Weapons system repair course; and Specialist Four Thomas C. Gill of Hueytown, Ala., in the land combat support specialist course.

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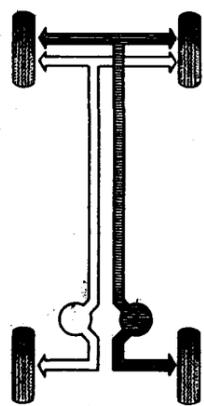
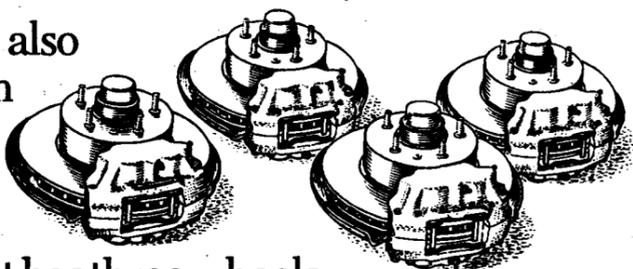
They're energy absorbing — designed to crumple under stress and absorb impact in case of a collision.

Volvo's brakes are designed so you shouldn't have to take advantage of this advantage.

Some cars give you two disc brakes as an extra.

Volvo gives you four-wheel power disc brakes at no extra.

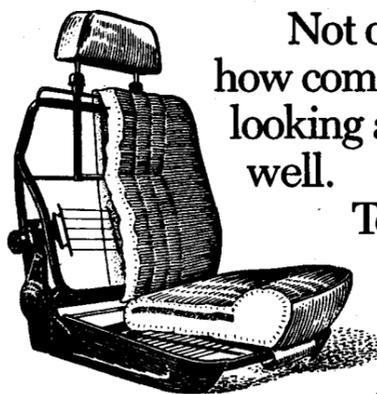
Volvo also comes with a dual circuit braking system that has three wheels on each circuit. If one circuit fails, you still have 80% of your braking power.



You can't see it, but its advantages are obvious.

Our fully reclining bucket seats have a hidden advantage that will become obvious when you sit down.

Inside the seat backs there are straps that can be adjusted with a knob to give your back either firmer or softer support. You can't see this feature. But you can feel it after a long trip. If you couldn't, why would Mercedes-Benz offer it as an option on their \$7200 car?



Not only is it impossible to tell how comfortable a Volvo is by looking at it, but how roomy as well.

To discover this, you have to compare Volvo to smaller cars. Like Cadillacs. A Volvo has more front seat legroom than any of them. More rear seat legroom than a Buick Electra. And a bigger trunk than a Lincoln Continental.

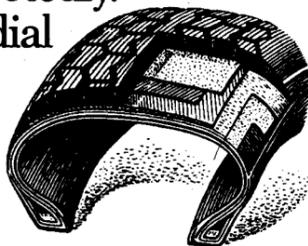
To see how well a Volvo handles, you have to drive it.

You'll find yourself sliding into parking spaces usually reserved for little compacts. Making sharper turns than you could in a VW.

And whizzing around curves very sure-footedly.



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are standard. For \$3900,

A VOLVO COSTS \$3900* BECAUSE WHAT YOU SEE ISN'T ALL YOU GET.

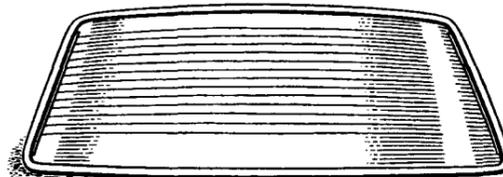
Volvo also gives you fuel injection. It costs more than

carburetors, but it's worth it. As you'll discover when you take a Volvo for a test drive. Which your local Volvo dealer will be happy to arrange.

But before you do, you're bound to notice that things like whitewalls, tinted glass and carpeting in the front and rear are standard.

As is an electric rear window defroster.

Which means that when you buy a Volvo, you're getting a lot of the things you can see in many \$3900 cars.



As well as a lot of the things you can't see in them.

VOLVO

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Millions of words have been printed about waste in government, over-runs, and other inflationary programs that costs the taxpayer, but very little is ever printed about the programs that cut costs and save dollars for the taxpayer.

Almost any government critic can tell you about the cost growth of the C-5A and F-14... but asks these same critics about the Value Engineering program or how much it is saving the government... and you draw blank stares.

It could be that the name, Value Engineering, causes problems for people who are not engineers, but the program is not limited to engineering as the name implies. For persons familiar with the words, analysis and management, it is easier to explain that the VE program is being applied in the areas of management practices, administration and organization with outstanding success.

Value Engineering is responsible for savings under the Army's Cost Reduction Program and its success is dependent upon the initiative and ingenuity of the individual workers. They are the key to the program and it is their VE proposals that are evaluated and validates as to the amount of money saved.

Goals Met

Within the Army Missile Command, VEPs are saving the Army and the taxpayers millions of dollars each year. Through June 1972, 13 of 20 organizational elements met or exceeded their established goals under Value Engineering, saving the Command \$8.5 million.

The LANCE Project office was the top organization with 31 VE proposals submitted and 23 accepted. Of this number, 11 have been submitted for validation and six have been audited for current year savings of over one million dollars. Five more are pending for nearly another million dollars.

How was this organization able to save so much? It was the individual efforts of the people who eliminated unnecessary and excessive costs by finding better ways to do their job. Some of the VE proposals outline savings of small amounts—others for larger sums, but they all add up.

While the LANCE Project office had the most VEPs, the SAM-D Project office came up with the biggest single saving of over one-and-a-half million dollars. This one proposal came from the Systems Engineering Division and eliminated the development and procurement of a tracked vehicle by changing part of the system configuration to modularized components and using standard vehicles.

Many of the VE proposals come as a result of studying and analyzing the systems and looking for shortcuts without compromising quality and performance. Patricia Lusk of LANCE, for example, effected a saving of over half-a-million dollars by diverting three propulsion systems for a qualification program to a flight program without compromise.

Jack O'Donel of SHILLELAGH saved nearly \$300,000 in transportation costs by having missiles modified in Europe instead of sending them to the U.S. for modification and then returning them to Europe.

C. A. Tidwell and A. A. Ming of PERSHING teamed up on two proposals that netted over \$800,000 in savings for the Command. One of their ideas, which accounted for a-half million dollars, was to refurbish used missile containers and G&C blankets and utilize them rather than buy new ones.

Better Job

While some of the proposals may be only a few hundred dollars for the deletion of unnecessary files or eliminating unneeded copies of reports, they all contribute to the overall effort of doing a better job

and saving money for the Army.

One of the important aspects of the Value Engineering program is that the same principles will work on the job as well as in the individual's personal life.

One of the important aspects of the Value Engineering program is that the same principles will work on the job as well as in the individual's personal life.

The philosophy of saving and receiving value for expenditures made can become habit on and off the job.

At home the individual realizes the savings... on the job these ideas develop into VEPs that save money for the Army.

Army employees can help their

organization meet its assigned dollar goal under the Cost Reduction Program, but they can also earn personal recognition and cash awards by submitting their ideas under the Incentive Awards Program.

Most of the project offices also receive Value Engineering Change Proposals from contractors and contractor personnel. In these proposals, both the Army and the Contractor share in the savings.



MSR Directs Spartan Hit

A Safeguard System Spartan missile, launched and controlled by a research and development Missile Site Radar (MSR), last week successfully intercepted a simulated ICBM target over Kwajalein Atoll.

The purpose of this mission was to test the capability of the MSR and its associated data processor to launch and guide the Spartan to a long range, low altitude intercept.

The Spartan interceptor missile passed close enough to the simulated target, as verified by radar instrumentation, to have successfully accomplished the

intercept. The Spartan did not carry an explosive warhead.

The MSR and the associated data processor which guided the interceptor missile are similar to equipment planned for use at the Safeguard tactical site now under construction.

The test—fourteenth in a second series that began a year ago—also involved the successful operation of a production model Spartan tactical cell cover.

There have been thirty tests in the two series, including 26 successful, two partially successful, and two unsuccessful tests.

ALL 1972 Model Chryslers, Plymouths & GMC Trucks

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1972 Duster Coupe
St. No. 20255, 3 speed manual transmission, 198 CID engine plus Chrysler Standard features.
\$2195 Plus Tax and License



1972 Fury Grand Coupe
St. No. P40213. 2 door hardtop, vinyl split back seats with center arm rest. Loaded including power steering, power disc brakes, air conditioned, AM/FM radio, speed control, electronic ignition system.
\$3995 Plus Tax and License



1972 Chrysler New Yorker
Brougham 4 door hardtop, St. No. 60171. Features 50/50 bench seats, trailer towing package, tinted glass, 440 CID engine, air conditioning, electronic ignition system, speed control, power steering, power windows, power door locks, power disc brakes, AM/FM radio, tilt steering wheel, steel belted tires.
\$5621 Plus Tax and License



1972 Valiant
4 door sedan, St. No. V-20281. Features, automatic transmission, 225 CID engine, tinted windshield, air conditioning, left remote mirror, power steering, vinyl side moulding, deluxe wheel covers, white wall tires.
\$3095 Plus Tax and License



1972 Chrysler Town & Country
9 passenger, St. No. C-60188. Features, 50/50 bench recliner seats, automatic transmission, 400 CID engine, power steering, power disc brakes, speed control, power seats, AM/FM radio, heavy duty suspension, air conditioner, white wall tires and deluxe wheel covers.
\$5269 Plus Tax and License



1972 Valiant Scamp
2 door hardtop, St. No. V-20051. Features, vinyl seats, automatic transmission, tinted glass, air conditioned, vinyl roof, whitewall tires, deluxe wheel covers.
\$3045 Plus Tax and License



1972 Plymouth Custom
Suburban station wagon, 9 passenger, St. No. P-40275, vinyl seats, light package, trailer towing package, cargo carpeting, 400 CID engine, tinted glass, air conditioning, luggage rack, electronic ignition system, radio, power steering, power disc brakes.
\$4383 Plus Tax and License



1972 Barracuda
2 door hardtop, St. No. 20128. Features vinyl bucket seats, power disc brakes, automatic transmission, 318 CID engine, tinted windshield, dual chrome mirrors, air conditioning, radio, power steering, deluxe wheel covers, whitewall tires.
\$3495 Plus Tax and License



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1972 Satellite Sebring
2 door hardtop, St. No. 40287. Features vinyl seats, power disc brakes, power steering, automatic transmission, 318 CID engine, tinted glass, left remote mirror, vinyl roof, deluxe wheel covers, white wall tires.
\$3695 Plus Tax and License



1972 Plymouth Fury III
4 door sedan, St. No. P-40158. Features 360 CID engine, electronic ignition system, power disc brakes, power steering, speed control, AM/FM radio, air conditioning, tinted glass, white wall tires automatic transmission, vinyl roof.
\$3926 Plus Tax and License



1972 Imperial LeBaron
4 door hardtop, 50/50 recliner seats, 440 CID engine, power seats, AM/FM radio, vinyl roof, power steering, power disc brakes, power windows, white wall tires, deluxe wheel covers. St. No. 80002.
\$6100 Plus Tax and License



ON BOB WALLACE AVE. JUST OFF PARKWAY

Mayor's Cooperation Praised

Here's Call For Timers, Judges

In mid-June of this year, Lt. Col. H. Zunkley, Senior German Air Force Liaison Officer at The Missile and Munitions Center and School, returned to West Germany on annual leave.

While there he visited the city where he had formerly been

stationed and gave a film and slide presentation on Huntsville and Redstone Arsenal to the City Council of Seghorn.

After the presentation, a discussion was held on how to better relations between the American troops stationed in the

Seghorn area and the local populace.

Col. Zunkley suggested implementing some of the programs that the people of Huntsville utilize for foreign servicemen stationed at Redstone where the servicemen are totally integrated into the

social activities of the community.

The Seghorn City Council was so impressed by the presentation that a Certificate was drawn up and they asked that it be presented to the Mayor of Huntsville on behalf of the Council.

Last Friday the Certificate was presented to Mayor Joe W. Davis in his office.

The Certificate read: "To the Honorable Mayor of Huntsville Joe W. Davis, in recognition of his contributions to international cooperation. The Council of Seghorn (Germany) signed by Mayor Carstens and members of the Council."

Also presented to Mayor Davis at the ceremony were several posters of the forthcoming Olympics to be held in Munich in the Fall.

The best place to watch a swimming meet is at the finish line and the best swimming to watch in this area is the Southeastern Regional AAU meet starting tomorrow at Decatur.

There are some empty chairs on the finish line, specifically they're looking for adult volunteers to help tell who wins and how fast they swim.

If you're interested in judging or timing go to Pt. Mallard pool Thursday, Friday or Saturday, and look up Jimmy Brown of the Decatur Department of Parks and Recreation.

Trials start at 8 a.m. each day and finals every evening at 6:30.

More than 2,700 of the best swimmers in the Southeast are entered



LT. COL. HORST ZUNKLEY PRESENTS a Certificate of Recognition for International Cooperation from the Mayor of Seghorn, W. Germany to Huntsville Mayor Joe W. Davis.

Are you putting me on?



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918 CORONADO

Once in a while you will find a modestly priced home in an excellent neighborhood. Here is a 4 bedroom 2½ bath home with a very large den with fireplace. Priced at \$31,000

BEEN LOOKING

For a lovely brand new home? Nearing completion is a French Provincial 4 bedroom home, large den with fireplace. To be carpeted with beautiful shag. 20'x20' overhead floored garage storage. \$33,900

4 BEDROOM BRICK RANCHER

On lovely lot with trees. Fully carpeted — separate 2 car garage. Built-in kitchen. \$25,000

BLOSSOMWOOD

Convenient 3 bedroom rancher — Carpeted covered patio and front porch. Large eat-in kitchen. \$20,000

SHERWOOD PARK

Family room and rec room in this 3 bedroom brick rancher. Separate dining room, Huge inside utility. Fenced yard. \$24,900

BEAUTIFUL TRI-LEVEL

In excellent condition and tastefully decorated. 4 bedrooms, foyer, formal dining room, family room. Carpeted throughout. Double ovens in large eat-in kitchen. \$30,750

FAGAN SPRINGS

Unusually lovely ranch home on tree covered lot. Beautifully decorated and maintained—large rooms—fireplace—redwood deck and patio. Great deal of storage and room for expansion. 2203 NORRIS RD

Carpeted 3 bedroom home in A-1 condition, gracious patio—beautiful landscaping. \$21,500

CONVENIENT HOME

On Sparkman Dr. Formal dining room—3 bedrooms. Carpeted throughout. \$17,500

McTHORNOR ACRES

Very liveable 4 bedroom home with extra large living area including 2 family rooms. Available immediately. \$27,750

LOTS FOR SALE

Mountainwood Circle \$4,500
 Kennamer Dr. 4,800
 Covemont 12,800
 Twickenham Manor — 2.14 Acres 6.81A 5,650 to 15,200

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- ★ 1967 V.W. GHIA COUPE
Runs good \$1075.
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- ★ 1966 V.W. BEETLE
White, very clean \$895.
- ★ 1962 V.W. BEETLE
Red, new paint, like new. \$750.
- ★ 1962 PONTIAC TEMPEST
Station Wagon, nice. \$435.
- ★ 1967 CHEVROLET IMPALA
2-dr., air, power, sharp. \$1275.
- ★ 1971 FORD PINTO
Sharp little car. \$1595.
- ★ 1965 CHEVROLET IMPALA
4-dr. sedan, runs good. \$650.
- ★ 1966 DODGE POLARA
4-dr. sedan, air, nice. \$775.

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Tanaka Wins Scholarship

Captain Rodney Tanaka, aide to Maj. Gen. Edwin I. Donley until recently has won a two-year scholarship to study in Japan.

The 28-year-old Honolulu native, who is concluding a three-year tour at Redstone, is one of nine men to win a George Olmstead scholarship. That's a two-year grant awarded annually to young officers who have demonstrated outstanding academic and military performance—and enables them to study at a foreign college, in areas such as social and political sciences and international relations.

"It's a program of getting to know your neighbors," said Tanaka who is to begin study at the University of Tokyo in April of 1973.

"I'm told I'll be able to travel extensively, that I'll get to meet



CPT. TANAKA

and talk with a lot of Japanese people, and get a chance to learn all about their mores and customs."

Tanaka said for every year of schooling, he'll have to serve an additional three years in the Army.

Prior to leaving for Japan, Tanaka will attend the Defense Language Institute at Monterey, Calif., to study the Japanese language.

"I'm really looking forward to it," Tanaka said. "Japan is a place I've always wanted to go and I'm excited about traveling and studying there."

Tanaka is a graduate of the University of Hawaii with a BS degree in electrical engineering.




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BATS Contract Won By Brown

Huntsville's Teledyne-Brown Engineering has won a Missile Command contract to produce low cost aerial targets for use by the Army in training air defense gunners.

Brown last week got \$1,628,740 to produce target missiles called BATS (Ballistic Aerial Target System). This brings to approximately \$3.5 million the amount that Brown has received to produce the targets.

BATS are comparable to clay pigeons, a one-shot device. Light and expendable, they will be used on ranges where other high performance target missiles cannot fly, and for training soldiers on air defense weapons such as Vulcan and the shoulder-fired Redeye.

Brown Engineering won the contract in competition with more than 40 companies that had been asked to submit bids.

Mrs. Levy Honored At Wives Club Reception

The Officers' Wives Club of Redstone Arsenal, will hold a Farewell Reception for Mrs. Gilbert P. Levy, wife of the retiring Missile and Munitions Center and School Commandant, in the ballroom of the Redstone Arsenal Officers Open Mess at 2 p.m. on August 22. Invitations have been extended to 400 friends and distinguished guests.

The Levy's will retire on August 31 with over 30 years' service in Killeen, Alabama and plan to build a home on Lake Wilson.

Mrs. Levy, a native Alabamian,

has been a Red Cross volunteer for the past 18 years and is active in various activities of the Episcopal Church. She has also been a Honorary Vice President of the Arsenal Officers' Wives Club for the past three years.

During their retirement, Colonel and Mrs. Levy will continue in their usual activities and hobbies of golfing, bowling and bridge. Mrs. Levy states she also plans to learn how to garden.

The Levy's were married on November 8, 1959, and have two children:



BETTER BUYS!

● **HUGE!**

Spacious 2 story home offers 14x16 separate dining, paneled den w/FIREPLACE, 4 bedrooms (3 are kingsized), 2½ baths, foyer, completely built-in kitchen with large breakfast area and pantry, carpeting and draperies, 11x15 indoor utility plus detached concrete floored exterior bldg., double garage, (walk to Weatherly). Pay equity and take over \$227.50 total mo. on a low interest loan. By appointment.

● **MADISON**

703 Madison St. Immediate occupancy. Immaculate brick 3 bedroom, 1½ bath, rancher/draperies throughout, carpet, built-in kitchen, central air, inside utility, beautiful landscaped 110'x150', low-low equity of \$3,933.51 and take over \$135.98 total mo.

● **PIEDMONT**

Well landscaped "TREE-ED" corner lot w/majestic "Columned" 2-story. Painted brick, 4 bedrooms (plus 5th or study in garage area), 2½ vanity baths. Spacious foyer, family room and separate dining. Much storage space and "closets galore." Completely built-in "pullman-style" kitchen.

● **BLOSSOMWOOD S.E. — SECLUDED!**

Excellent location—Secluded grounds. Brick, 3 large bedrooms 2 baths, formal dining and eat-in kitchen. \$23,000. Any type financing.

● **"NEAT AS A PIN" — CLUBVIEW DR.**

Redecorated inside and out. Ideal for "Newlyweds" — Brick, carpeted throughout, 3 bedrooms, 1 paneled for den, formal dining, built-in kitchen and 2 baths. Well landscaped "TREE"-ed lot. Custom draperies. Equity and \$109.04 total month.

● **"HIGH ON HILL" — RUTLEDGE HGTS.**

Brick, 3 Bedroom, 1½ bath, home. Dining combination, garage den, kitchen w/built-ins. Equity and take over low monthly payments of \$121.06.

● **SELECTED HOME OF THE WEEK BY MLS**

3454 DARLENE CR.
Offers an immaculate brick and cedar split-level. Spacious formal dining, pool table size den w/fireplace, 3 large bedrooms, 2 vanity baths. This choice property has central heat and air, and a kitchen complete with "lemon peel" colored built-ins. Large indoor utility and mature landscaped grounds. Equity and take over \$143.55 mo., or refinance VA, FHA, Conventional. Shown by appointment only.

● **CONTEMPORARY SOUTHEAST**

Custom designed and built of Western Cedar and Flagstone, this Contemporary rancher is well located on a 150'x200' heavily "WOODED" lot. From the spacious foyer, enter into the large completely built-in, eat-in kitchen, 3 bedroom wing or the spacious 16'x32' living/dining. Natural stone FIREPLACE, special lighting and the entire rear of home is glassed in therm-o-pane w/view of the magnificent natural setting. Large patio w/covered rear entry. Electronic filter and double garage. \$37,200. Appointment please!

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Three Receive MBA Degree

Three members of the Missile Command staff will receive the Master of Business Administration degree from Alabama A & M University Friday. They are Miles R. Hardenburgh, Captain Paul W. Janacek and Cherry M. Newell.

The program from which the three received their degrees was introduced in 1970 at A & M

Showcase Plans Discussion Set

Mrs. Frank Garner will be hostess for the meeting on August 24 of potential participants in the Pelican's Pocket Showcase.

The meeting will be at the Garner quarters, 35 Ripley Drive, from 10 a.m. to 1 p.m. Mrs. Garner said she hopes that people will bring along samples and ideas for the upcoming showcase set for October 10.

There will be discussion about how items are consigned to the Pelican's Pocket. Sandwiches will be served during the meeting which is open to all members of the Officers Wives Club.

Some types of things that people have made to sell through the Pelican's Pocket are knitted items such as capes and dresses, replicas of antique dolls, paintings, ceramics and more.

with assistance from Pennsylvania State University and is monitored by the university's College of Business Administration.

Hardenburgh, who has been teaching at A & M, is Chief of the Reliability and Maintenance Division in the Directorate for Product Assurance. He plans to enter Pennsylvania State this fall to work on a doctoral degree.

He had previous graduate study at the University of New York and the University of Connecticut. His bachelors' degree was granted by Wake Forrest.

Since he came to work at Redstone Arsenal in 1958, Hardenburgh has been in quality assurance.

Janacek graduated from the University of Illinois and entered the Army with an ROTC commission. He received some credit applicable in the A & M program from an advanced George Washington University while studying Army career course.

A young man in a hurry, Janacek wanted to complete his studies at A & M before the Army transferred him from Redstone Arsenal. He also worked full time on his job in the Directorate for Procurement and Production. He is a contract negotiator.

Janacek plans to make the Army a career, feels the course

helped him prepare to become a better manager. He considers the work he has just completed very useful for the future, and found the instruction superior.

Miss Newell agrees that the instruction and curricula at A & M are superior. She, too, attended all of her classes at night and worked full time in the Directorate for Materiel Management. She is an interne.

Miss Newell's bachelor's degree is in fine arts. She studied at the University of Colorado and did some graduate work which was applied to her credits in the graduate school at A & M.

The records at the Civilian Personnel Training and Development Office for the Command showed twenty-five Missile Command Employees taking graduate studies during the summer. These records are not complete because some people, like Miss Newell, are not receiving government financial assistance. Among the military, some are participating in the Army Education program

and others are receiving assistance on the G. I. Bill.

According to Barbara Combs, administrator for civilian gra-

duate studies at the Missile Command, more people enroll in graduate study programs during the fall and winter.



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SESSION BEGINS MONDAY EVENING, SEPT. 4

1. COMPUTER SCIENCES TECHNOLOGY UTILIZING IBM SYSTEMS 360/30

CERTIFICATE PROGRAM:
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S300 Introduction To Automatic Data Processing	6:00-10:00 MW
S310 Introduction To Computer Science	6:00-10:00 TTH

Eight Week Courses—

S320 Introduction To Cobol Programming	6:00-10:10 MW
S330 Introduction To Fortran IV	6:00-10:10 MW
S-340 Advanced Cobol Programming (Theory-Lab)	6:00-10:10 TTH
S350 Advanced Fortran Programming (Theory-Lab)	6:00-10:10 TTH
S490 Cobol Applications Programming (Theory-Lab)	6:00-10:10 TTH

CREDIT:
Certificates of completion will be presented for each module successfully completed by the student, as well as a letter grade reflective of his achievement. After completing one or more of the certificate modules, and a student decides to enroll in a degree producing program at Alabama A. and M. University, he may present his certificate(s) for evaluation in the same manner as he would transfer credit from another institution. Each module is the equivalent of three semester hours.

2. ASSOCIATE AND BACCALAUREATE DEGREE OFFERINGS: SESSION BEGINS SEPTEMBER 4, 1972

TBD 101 Mechanical Drawing	6:00-9:00 MW
IAE 402 Directed Teaching	TBA Off Campus
TIE 402 Directed Teaching	TBA Off Campus
TBC 100 Technological Orientation	6:00-8:00 T
ELC 411 Senior Problem	6:00-8:00 MW
ELC 421 Electronic Design Seminar	6:00-8:00 W
ELC 311 Digital Arithmetic Systems	6:00-8:00 TH
TGE 201 General Electricity	6:00-9:00 MW
EET 104 Circuits I	6:00-9:20 TTH
TGC 201 Applied Technical Concepts	6:00-7:15 MW
MDT 301 Descriptive Geometry	6:00-9:00 MW
TGC 212 Industrial Relations	4:45-6:00 MW
TGC 211 Industrial History	4:45-6:00 TTH
MTH 103 College Alg. & Trigonometry	6:00-7:15 MW
MTH 105 Analytic Geom. & Calculus	6:00-7:45 TTH
CMP 407 Advanced Computing	6:00-8:10 MW
CMP 101 Introduction to Computing	6:00-8:10 MW
CMP 201 Introduction to Computers	6:00-8:10 MW
CMP 301 Cobol Programming I	6:00-8:10 TTH
CMP 102 Data Processing	6:00-8:10 TTH
CMP 411 Systems Analysis-Simulation	6:00-8:10 MW
TGD 101 Technical Graphics	6:00-9:20 T
SOC 201 Introduction to Sociology	6:00-9:00 T
ECO 323 Principles of Economics	7:30-9:00 MW
SSC 511 International Relations	6:00-9:00 W

REGISTRATION: Persons wishing to register in a certificate course, or as a special student may do so in Room 216 Carver Complex North between the hours of 1:00 and 7:00 p.m., August 30 and 31 or between the hours of 1:00 and 5:00 p.m., September 1, 1972. Other course registration will take place in the Registrar's office at the usual time.

FOR FURTHER INFORMATION:
Contact—Dr. Joseph R. Jenkins, Director
Evening Program in Technology
At 859-0800 Ext. 417

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WANT AD RATES—\$2.50 minimum per weekly insertion, covering first 25 words. 5 cents per word for all over 25 words. Cash with copy, except where open account basis is previously established. 25c service charge added for credit. Mail copy with payment to Mrs. Vergie Robinson, P. O. Box 346, 905 Hillview Drive, Huntsville. Deadline is Friday noon, before Wednesday publication.

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3. Miscellaneous

30' SEDANN CRUISER CHRIS-CRAFT—excellent condition, \$4,750 see at Turner's Marina, Guntersville or call 536-0805 after 5 p.m. 8-16-c

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Moves Limited By New Policy

WASHINGTON (ANF) — The Office of Personnel Operations (OPO) in Washington has announced a plan for reducing involuntary permanent change of station (PCS) movements to a minimum during the 1972-73 Christmas-New Year holiday period.

This year, when Department of the Army makes assignment which require movement during the month of December, the movement will be required to the ultimate unit of assignment between Dec. 1 and 20.

For movement during January, DA will require all movements to ultimate units be completed be-

tween Jan. 6 and 31.

In oversea movements, persons with ranks of E1-E4 must request port call dates between Dec. 1 and 18 or between Jan. 6 and 31 as the case may dictate. E5s and above must request port call dates between Dec. 1 and 19 or between Jan. 11 and 31. Dates between Jan. 6 and 10 will be accepted in individual cases.

For the most part in intra-CONUS assignments, reporting dates will be scheduled between Dec. 1 and 20 and between Jan. 11 and 31.

In the past, PCS movements have only been stopped for a five-day period during Christmas for personnel enroute overseas. No limits were in effect on intra-CONUS travel.

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GETS AWARD—Lt. Col. Thomas Fitzgerald has won the Legion of Merit. The colonel, who retires from active military duty this month, was cited for meritorious service as Chief of the MICOM Finance and Accounting Division.

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| Auto Mechanics | Selectric Composer (MTST/SC) |
| Barbering | Household Appliance Repair |
| Electronics Technology | Practical Electricity |
| Business and Office | Radio, T.V. Service and Repair |
| Education Courses | Technical Welding |

All evening classes are conducted on a half-time basis and convene on Monday, Wednesday and Thursday evenings from 4:45 until 10:15 (with a 30 minute break included) with one exception: IBM-MTST/SC.

Drake State Technical School is accredited by the Southern Association of Colleges and Schools, and approved by the State of Alabama, Department of Education, Department of Health, Education and Welfare, and the Veterans Administration.

Applicants are accepted on first come, first served basis.

For further information contact:

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