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Toys for Training?

**XM-1 Overweight
3½-7½ Tons**

**AMST Scratched
for New CX**

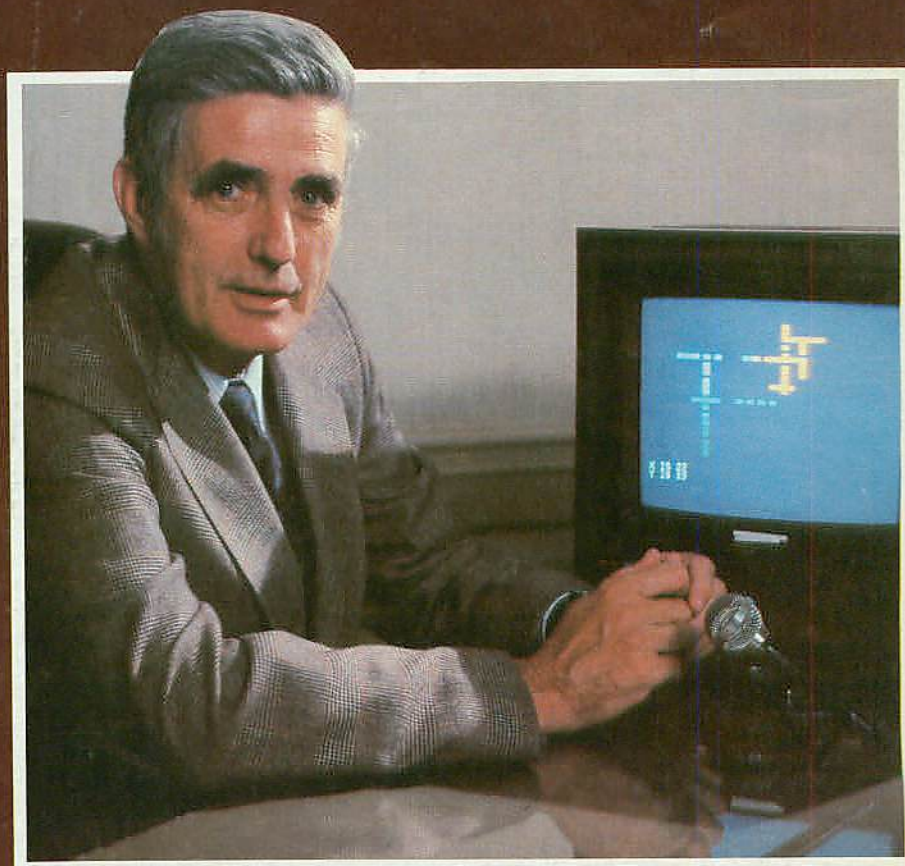
**More Benefits + Pay
Hike in FY81**

**NATO's Nuclear
Numbers Game**

**Brown's Bewildering
Strategic Balances**

**"Posture" Statements
Need An Overhaul**

**AFJ Exclusive
Interviews:
DoD's Dr. Walter B.
LaBerge
USAF's Harry M.
Zubkoff**



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Washington, D.C. 20037
(202) 296-0450

Telex No. 892763
Answer back is Sherwood WSH.

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Issues from 1863 and article reprints available on
microfilm from University Microfilm, Ann Arbor,
Michigan 48106.

Subscription rate: \$18.00 one year. USA: \$35.00
one year Foreign (Air Mail) Second Class postage
paid at Washington, D.C. and other mailing offices.

Armed Forces Journal, Vol. 117, No. 4,
Whole No. 5676, December 1979. Published
by Army & Navy JOURNAL Inc., in each
calendar month. Publication office: 1414
22nd St., NW, Washington, DC 20037.

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INTERNATIONAL

Founded in 1863 as
The Army and Navy Journal

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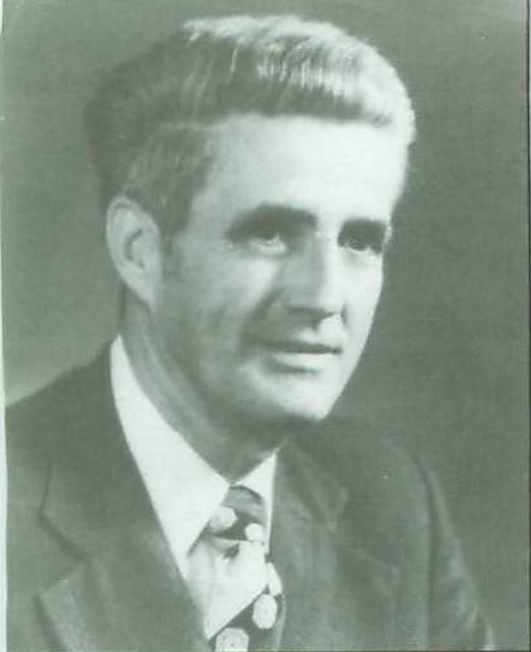
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THIS MONTH'S COVER: Dr. Walter B. LaBerge, DoD's new Principal Deputy Under Secretary of Defense for Research and Engineering, takes a look at commercial technology and how it can be applied to the people problems facing the Services today. Dr. LaBerge's innovative new concepts include adapting electronic games—such as Texas Instrument's Speak and Spell children's toy designed to make learning fun—for use in military training programs.

Beginning on page 20, Dr. LaBerge talks about his new job at DoD and the responsibilities that go with it.

On page 34, AFJ interviews the Pentagon's resident maverick, Harry M Zubkoff, Chief of the Secretary of the Air Force's Research and Analysis Division and the man responsible for the Department of Defense's clipping and news analysis services. And much, much more. Cover by Larry Olsen of Adams Studio. ■★ ■



"I am really anxious to use entertainment and educational technology—for example, the Speak and Spell game."

Dr. Walter B. LaBerge

WITH YEARS OF RESEARCH & ENGINEERING EXPERIENCE in industry and government, Dr. Walter B. LaBerge was sworn in as Principal Deputy Under Secretary of Defense for Research and Engineering on September 14.

Educated at the University of Notre Dame, Dr. LaBerge received B.S. degrees in both naval science (1944) and physics (1947). In 1950, he received his PhD in physics.

Dr. LaBerge's military service included tours as an executive officer and then commander of the US Navy Minesweeper YMS 165 in the early 1950s. He was Program Manager for the Sidewinder Missile between 1950 and 1957 at the Naval Ordnance Test Station, China Lake, CA.

From 1957 to 1963, Dr. LaBerge worked in private industry as the Director of Engineering at Western Development Labo-

ratories, Philco-Ford Corporation, Palo Alto, CA. He became Director of their Houston operation in 1963 and was promoted to Vice President for Research and Development, Corporate Staff, in 1965. From 1966 to 1971, Dr. LaBerge was first a Division Vice President and then Vice President for the Electronics Group at Western Development Laboratories.

In 1971, Dr. LaBerge returned to public service as Deputy Technical Director of the Naval Weapons Center, CA. He became Technical Director in 1973. From 1973 to 1976, he served as Assistant Secretary of the Air Force for Research and Development. From 1976 to July 1977 he served as NATO's Assistant Secretary General for Defense Support. In July of 1977 he assumed responsibilities as Under Secretary of the Army, his last position before his appointment to his present post.

AFJ Interview:

"...work the people problem in a coupling of the technology...."

by Deborah M. Kyle and Benjamin F. Schemmer

AFJ: Do you consider your new job a promotion or a demotion?

Dr. LaBerge: I consider it an opportunity to do something which Harold Brown and Bill Perry think more important than what I have been doing. This position probably couples the experience that I have to the chance to do something with that experience better than the prior job did. It's pretty clear any Under Secretary is important, as vice presidents are important—but as a backup to the guy who's in charge. As long as the guy who's in charge is there, healthy and working the problems, that person who is backup is not generally working at full capacity. So I see this new job as one where I really can work at my full capacity.

AFJ: As we read your new charter, you're going to oversee tactical programs for Dr. Perry. Doesn't he have an Assistant Deputy Under Secretary, Bob Moore, for tactical programs? Could you describe your new responsibilities for us?

Dr. LaBerge: I really am a Principal Deputy to Bill, as is Gerry Dinneen. We are each an alter ego to Dr. Perry when he is not available or not in town or chooses to delegate us assignments. A typical example is any day in the next three weeks when Dr. Dinneen will be in the Far East and Dr. Perry will be attending the Four Powers meeting and is then off on a European trip. During these times I will act

for Bill in the full spectrum of circumstance. This support to the Perry function I consider to be the prime assignment of my new job.

The visualization of how this office works, from Dr. Perry's standpoint, is that in addition to sharing the central management of USDRD&E, we will each have a particular sphere of interest. He will continue to be the primary person responsible for strategic systems issues, but he will look to Dr. Dinneen to concentrate on C³ and for me to concentrate on General Purpose forces. We each will bridge the gamut from the conceptual planning of applied technology through establishment of programs on to the operational tests. Each of us will work with Dr. Fossum at ARPA, Dr. Davis in RA&T, Dr. Garber in International Programs and Admiral Linder in the test function as well as the special program deputy (in my case Bob Moore). I do not see this as abridging Mr. Moore's functions but rather as supporting them.

I don't visualize this as being a new way of doing business; it's rather taking a complicated function that Bill and Gerry did as two people and now making it one that three people work in order to get it done properly.

AFJ: Is the bulk of your time, when all three of you are here, going to be spent focusing on tactical programs?

Dr. LaBerge: Yes, but not necessarily solely in Bob Moore's area. The perception that

Bob has all the tactical programs is wrong. Bob has a very important piece of work. It is his job to take programs which have been authorized and see them implemented in hardware. The job I would hope to do would be to work with Moore, Bob Fossum and Ruth Davis and with all of the other contributors to General Purpose Force development.

AFJ: Could you give us an example of one?

Dr. LaBerge: There is a very interesting case that people are now working on which is typical. ARPA and RA&T believe they have new metallurgical processes which will allow us to run jet turbines at much higher temperatures. So far, they have been thinking about applying this to the F-100 engine as a way to get longer life in our present engines. However, it is fairly obvious that with this technique we can get better fuel efficiency in turbines of all kinds; for example, that the Army should consider this technique in their next round of improvements on the XM-1 engine. In a case like this what I do is make sure Bob Moore and Robert Fossum are working together on what we think are the most fruitful ways to apply the technology that is bursting out to the most important problems that exist.

Another example of what I do; we are going out to TASVAL [Tactical Aircraft Survivability Against Armor]—Isham Linder [Director, Defense Test & Evaluation], Moore, and myself—to make sure



"When you have a guy for three years and train him for a year and a half, you are, in fact, only using a portion of his potential."

that the test program, as set up, gives to the developer the things which are most important and that I know, from some first-hand knowledge, a little bit about whether or not the test program actually gives you the kind of insight you need when you go back to the budgets to argue whether you need A-10s and AAHs—and whether that means you need scout helicopters or not.

AFJ: Isn't it a little late to be doing that? There have been troops from Ft. Lewis, WA at Hunter Liggett living in tents since last spring for TASVAL. Are you telling us you are just now getting down to finding out whether or not your test objectives have any merit?

Dr. LaBerge: I'm really telling you that I'm going out to personally understand it. I'm going out with the principal people that I'll be working with who have a common basis of understanding. This is the first time that the three of us will be able to go out and establish a way of working together.

AFJ: Do you expect anything to change in the TASVAL test objectives or program as a result of this trip?

Dr. LaBerge: No. I do expect to talk about whether it's important to find a way two years from now to run another series of experiments which allow us to apply what we have developed in the intervening period.

AFJ: Let's look at TASVAL for a moment. Here at the tail-end of 1979 as you go out to review these tests—isn't it really a little late to be conducting that expensive a test to have any significant influence on the very decisions you suggested—the A-10 Advanced Attack Helicopter interface and the utility of an Advanced Scout Helicopter? Those were all budget decisions which were made in one way or another in Harold Brown's program decision memorandum.

Dr. LaBerge: Again you've got to continue to monitor the data that you get. There have been any number of interplays not as elaborate as this one. What we would do next year or the year after could conceivably employ yet more resources. It

Untapped Resource

by Deborah M. Kyle

IT IS A NEW APPROACH to an old problem. Dr. Walter B. LaBerge told *AFJ* that he is looking at voice technology; more specifically at electronic games that use it, and how it can be adapted to work the people problems facing the Services today.

Voice technology—synthesis and recognition—is big business. Products range from Texas Instrument's Speak and Spell—a toy which uses voice synthesis to teach a child via spelling games—to the more sophisticated electronic TV games produced by Sanders Associates. These games help players develop skills—in the first instance reading and in the second, motor—but both in a way that is fun and affordable (The Speak and Spell retails for \$48.99 and TV games can be purchased for \$19.95.) With slight adaptations, these toys could become military training tools at a slightly higher per unit cost to cover the R&D for conversion to military usage.

For example, voice technology is being considered to train personnel who have reading comprehension problems but can listen and understand. Toys like the Speak and Spell free a player to concentrate on specific tasks and provide instant feedback on whether the task is performed correctly.

Environments where audio instruction would ease the workload for military personnel: ground control approach operations and in the cockpit. A verbal instruction eliminates the need to manually perform simple mechanical duties like changing air frequencies or plotting direction coordinates, thus allowing the operator to concentrate on more important tasks, e.g. watching approaching craft or engine monitoring.

In other areas of voice synthesis, companies such as Texas Instruments have developed portable units that teach the basics of foreign languages. The units resemble hand held calculators with letters as opposed to numbers and have visual displays which print a word as the synthesizer is saying it. This device could be used to teach military personnel who are deficient in English or the native tongue, depending on where the soldier is.

The military is just beginning to explore these untapped resources and is anxious to learn more. The First Service/Industry Conference was held at the end of November in Orlando, FL, in an effort to bring representatives from industry together with military R&D types. Another conference—focusing on voice technology—is being planned for mid-1980. ■ ☆ ■

could be more complicated. But basically, you don't want to shut yourself off from knowledge and this is going to give us a continuing insight. It's not the only test though, that has been run.

AFJ: You've just come from a number of years as Under Secretary of the Army, and the Army seems to have, as General Shy Meyer suggested in his first press conference as Chief of Staff, a major problem. He calls it his second biggest challenge—modernization. Can the US Army digest all of the new hardware programs which the research and development community has brought to fruition, or are you in the process of cancelling—as Dr. Perry suggested a year ago July in an interview with us—some of them in order to budget those with most merit?

Dr. LaBerge: I think they are two different questions. Yes. I think we can digest what we're getting. The jury is out on what we can afford. I think particularly in air defense, we have got to sort through what we can afford and in particular, how we work with our allies. We cannot set it up and solely look at it as the air defense of the Vth and VIIth Corps. We have got to get a system that prevents people flying around our defenses. We really need to broaden the issue and those discussions are currently going on as a part of a Task Force V NATO group...

AFJ: But Task Force V won't be finished, will it, in time to influence the FY81 budget decision....

Dr. LaBerge: It won't influence '81. However, it probably will substantially influence the budgets thereafter.

AFJ: But hasn't Harold Brown already suggested for the FY81 budget, cutting the procurement of Roland fire units from 180 to 95 and bringing in some Rapiers instead to defend the Air Force's main operating bases in England?

Dr. LaBerge: I guess it is not a fair item to comment on, because by the rules of the game it really isn't the budget until it comes in. I think it's clear that in every part of the government, we have a priority problem of wanting more things than we will be able to afford, and having to make the judgments as to which ones get into this year's budget, and which ones will be done in the out years.

AFJ: Doesn't that example get to the very heart of whether or not the Army can afford all of these new systems?

Dr. LaBerge: It is clearly an affordability issue that dominates the budget this year, but that's not wrong or atypical.

AFJ: But you just told us you felt, yes, the

Army could afford all of these new programs. Isn't that what you said?

Dr. LaBerge: No, no. What I said was yes, I think you can digest them. I don't think we have a digestion problem....

AFJ: Does that mean you're going to forego part of the menu in order to digest the rest?

Dr. LaBerge: No. I'm saying what we now have on our plate, I believe we can digest—where digestion means being able to perform on them—to implement them.

AFJ: On all of them?

Dr. LaBerge: Yes.

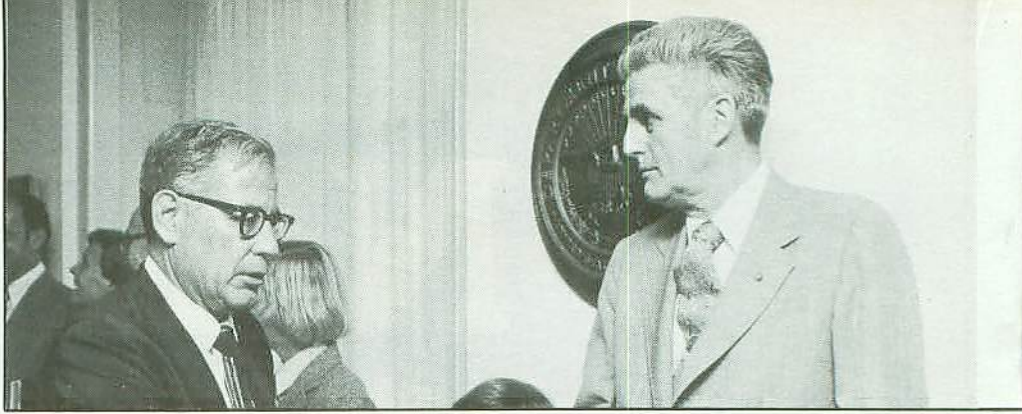
AFJ: Then why did the Army ASARC recently cut back its Copperhead procurement acquisition objective from 160,000 rounds to only about 40,000?

Dr. LaBerge: That's again a priority issue on how you see employment and what you need most when. By digestion, I mean you can design and build a Copperhead which will work the way you said it was going to work, when you get the authorization to proceed in the program. How many you buy is sort of a function of how you intend to use it and what other things it competes with for resource allocation. Whereas a year ago, XM-1 was in skidderish shape with respect to being able to convince anyone, including the *Journal*, that the engine would be reliable by the time you needed it to be—tests at Knox indicate that the fixes that have gone in have worked according to the beliefs of the engineers that put them in. We are digesting XM-1.

AFJ: Can you afford to bring all these new systems into the Army? Or, are you going to have to cancel some as Percy Pierre suggested a few weeks ago in a speech, as Bill Perry suggested a year ago in July? We have yet to see a program cancelled.

Dr. LaBerge: I think we are more likely not to start programs than we are to cancel them, because I don't know of any current ones that deserve to be cancelled. Now as you get at the affordability issue—and that is determined by whether Congress keeps the budget level or lets it increase—you have options to do AAH and ASH and a whole bunch of things that you haven't yet fully put your major money into, and I think our prime issues are going to be whether we feel at the time we have to make the decision that we have the resources to program into the future.

AFJ: But basically, haven't you already made a decision to slip the AAH for a year because of affordability?



"We took a 15-20 year sabbatical between Korea and Vietnam in improving equipment, and therefore we had to take the big jump."

Dr. LaBerge: The probability is reasonably high that we will slip the AAH. It's a combination of a number of things of which affordability is clearly one.

AFJ: Would you in your new responsibilities, Dr. LaBerge, and with your background at China Lake and the Air Force and as Under Secretary of the Army, want to deploy an AAH as it's configured today without a parallel capability in an advanced scout helicopter, which the Secretary of Defense has recommended cancelling?

Dr. LaBerge: Now you are talking about an individual thing in a system... I think in a position in unlimited affordability you can make an excellent case for an ASH. In a position of having to compete for resources, we are going to have to see how many resources we have in order to really decide, from my view, in a high intensity central European battle front, it's the shooters who in the end are going to dominate over the people who try and find where the battle is. For example, if we have an ASH, I would expect it will have a role to provide some firepower as well as perform the scout mission. We should put enough drive train performance into it so it could.

AFJ: How does it affect AAH? Do you think that program should go forward without an ASH, or even if the ASH has to go out?

Dr. LaBerge: Sure.

AFJ: You probably have a greater mix of background and exposure to all three Services than any senior official who's ever served in the Defense Department in the research, development and acquisition role. With that background, could you give us your evaluation of US and Soviet acquisition strategies as you see them today?

Dr. LaBerge: I believe that the US does better than what I suspect others here in the building feel. I really *do* believe that the equipment we field is good equipment and the flexibility inherent in it will be extremely important. The Soviets have essentially product-improved programs forever, and

at some point or other you run out of the capacity to product-improve. The US has done less to product-improve and has made major leaps, and I guess the interesting part of the question to me is that inevitably we are going to have to move much more to the product-improving, and they are going to have to move much more to the major leap. The ability of their products to compete in the battlefield in my view is going to require them to make the major jumps. I don't argue that there is necessarily a right or a wrong way to do it. We took a 15-20 year sabbatical between Korea and Vietnam in improving equipment, and therefore we had to take the big jump.

AFJ: But aren't a lot of your big jumps resulting in programs that you can field in three or four years from now which will be so much better than something the Soviets put into the force three years ago? Let's take the AAH with the Hind-D. You'll have the AAH in five years, if you're lucky. The Hind-D seems to be a very capable system, but without the all-night, all-weather, ultra-sophisticated capability that you might have in the AAH—but there's an eight year gap there.

Dr. LaBerge: That's a problem that was generated ten years ago, and I think our problem is to get these things into the field in a way that allows the troops to use them as rapidly as we can.

AFJ: How are you going to do that?

Dr. LaBerge: I believe by plowing ahead in a careful test program. XM-1 will hit the field and it's going to work. Had we rushed to field test that thing we would have gone out with an engine which just didn't have the fixes in. We are far the better for doing a careful program. We take many too many knocks in this business for the length of time that it takes to get something to the field.

Let me tell you some of the things I think we do wrong. We don't do a systems analysis and put together an anti-air system. We do a bunch of projects. We will have much more capacity when we link these things together as pieces of a complete system. For example, Patriot linked to Chaparral and to Roland, so as

not to fire all expensive missiles at targets the cheaper ones could destroy. One should get an integrated battlefield intelligence system, and in point of fact, we're really doing that.

AFJ: And what would you call that program?

Dr. LaBerge: There is a battlefield systems integration program done by the Army at DARCOM, but there was a joint Task Force that the Army and the Air Force got together on.

AFJ: Is this the Beta project?

Dr. LaBerge: Well, one of the things that comes out of it is the support of Beta, but it is sort of making sensible the range of programs that run from the high altitude programs down through the Mohawk and the SOTAS and then let the things talk to each other. I'm saying the deficiency from my view of the place is that we do project engineering and not systems engineering. That's the thing I believe I can bring—a way to get the Air Force "blue air" playing into the air defense in a more effective way with the Army.

AFJ: Aren't you really describing an effort like Assault Breaker?

Dr. LaBerge: Well, Assault Breaker is one, but tying AWACS into the Army ground systems... is more what I mean. For example, how do you best use Stinger? You use Stinger best by letting the Stinger gunner know where the target is coming from and bringing the total battlefield resources to each of the systems rather than having each one trying to do it on its own.

AFJ: Are you suggesting that the Stinger will have a lack of targets in a Central European war?

Dr. LaBerge: No, but the introduction of that new weapon puts a premium on acquisition, and you can either buy it for yourself and run into an affordability problem or look around and see who can help. The thing which I think I can do from this experience of being with all the Services is to know what's around.

There are three things you've got to have—a high enough position to make something happen, a diversity of knowledge, and a willingness to work the problem. In that sense I'm probably unique—and the thing I will do that others probably don't do is make these systems tie together better, because I think the affordability issue gets much worse if everybody's doing it himself.

One last thing I'd like to bring up—the tremendous technology in the people

business. Shy Meyers' first problem is people. All you've got to do is go to the arcade and see how for 25c you can amortize games that provide skills to people. I am really anxious to use entertainment and educational technology—for example, the Speak and Spell game. I don't know whether you've seen that, but that's the biggest technological achievement I've seen. For forty bucks you can buy a device that will essentially teach people how to spell, play games, and make it fun to learn. Industry is coming out with equipment that will allow us to help train young people in the language of the MOSs. We have spent very, very little on what I consider to be the primary problem the Services have: How you essentially take people who have not had the highest success in prior schooling and take their innate talents and make them able to work the complicated equipment. Let me give you one example.

It's hard for many kids to learn to read and write. Many of them, in fact, can listen very well and understand. The Speak and Spell shows you how to take computer-generated information and turn it into audio instruction at a cost you can afford. That ought to allow you to do a pile of things with respect to kids that you can't train in all of the equipment and provide techniques for them to understand how to repair equipment by giving them audio instruction rather than forcing them to do a lot of reading that they find difficult.

Another thing is the way the FAA is teaching people how to be flight controllers with the computer being the only instructor. What it really does is allow the micro-circuit technology, which is cheap, to be applied to the crucial problem we've got.

How do you train people rapidly enough so that in their tours they can be productive? When you have a guy for three years and train him for a year and a half, you are, in fact, only using a portion of his potential. What I would hope to do is to work the technology—which is building gadgets to shoot—and spend a little more time working on the guy who has got to learn how to operate it. If I were to guess a most significant change in the technology it will be things that apply to people, and how you make them able to efficiently use the hardware we generate. And what I would recommend to you is to look at the burgeoning of stuff which is coming out in this area, and that's what I hope to force this system to want to do.

AFJ: Is that sort of Walt LaBerge's goal in this new job?

Dr. LaBerge: If I could do one thing, it would be to work the people problem in a coupling of the technology, because nobody else is working that. The rest of the building has got some smart people working the rest of the problems. ■ ☆ ■

I.I.S.S. (cont. from page 17)

that something approaching near parity now exists" in theater nuclear forces, "it is moving in favour of the Warsaw Pact" and that "a substantial advantage lies with the tightly controlled Warsaw Pact when compared with the politically diverse Western Alliance."

The I.I.S.S. also was in no position to deal with the complicated problems raised by Soviet modernization of its theater nuclear forces. It has no real source of data on the nature of Soviet SS-20 deployment, on how the Soviets employ their ICBMs, on how they would use maritime forces with nuclear capability, on the probable nature of its modernization of its strike aircraft, or on the details of Warsaw Pact conversion to SS-21, SS-22, and SS-23a missiles. This lack of data has traditionally given the I.I.S.S. serious problems in dealing with theater nuclear forces. For example, the I.I.S.S. *Military Balance* carried total Warsaw Pact theater nuclear weapons inventories at very low levels for years, even though Soviet exercises at the time regularly simulated the use of larger numbers of weapons.

Further, the real problem does not lie with the I.I.S.S. analysis, but with the use to which it is now being put. NATO, after all, cannot structure its own theater nuclear forces on the basis of the damage they would do to the Soviets in a first strike; NATO must both defend and minimize its vulnerability in order to make deterrence effective. NATO cannot afford to judge NATO force modernization that cannot take place until 1983-87 in terms of a 1979 balance which is already rapidly shifting in favor of the Warsaw Pact. NATO also cannot afford the trap of conspicuously falling behind in real world theater nuclear capabilities—with all the attendant problems in terms of political perceptions and influence in a crisis—because a few European Parliamentarians misuse a flawed academic analysis. ■ ☆ ■

Rapier (cont. from page 17)

man the system at seven USAF bases in the UK, at a manning level that would meet USAF requirements.

In an August 2nd "Program Decision Memorandum," US Secretary of Defense Harold Brown ordered the USAF to buy the 28 British-built Rapier air defense fire units (Sept. *AFJ*). According to the October 24th issue of the *London Financial Times*, Pattie has said that the US Defense Department is "expected to sign" the \$172-million procurement contract "within weeks." But Pentagon sources say that while a Rapier buy is still being considered, they know of no basis for such an optimistic view.

Pattie told *AFJ* that he was "particularly disappointed" in the fact that disagreements over funding the responsibility for the system between the Air Force and the

(cont. on page 43)

CX (continued from p. 13) about \$216-million in FY78 dollars. (Defense Secretary Brown told the Air Force on October 31st to budget about \$1.2-billion over the next five years for the CX's R&D, enough to assure an industry-wide competition to develop an entirely new plane.) For a Pentagon buy of 100 planes, Lockheed says the recurring costs would be about \$5.9-billion, for an average "program cost" of \$61.4-million per aircraft. ■☆☆

Rapier (continued from p. 28)

Army were delaying US procurement of Rapier. He added that there is complete agreement on the operational necessity for such a defense system, and added that Rapier systems already deployed in the UK and Germany have fully proven their capability.

Pattie stressed that the British government "has been concerned for some time about the 4:1 imbalance in the working of the two-way street," referring to his country's purchases of US equipment, versus US procurement of British equipment.

After completing a series of talks with Deputy Defense Secretary Graham Clayton, Air Force Secretary Hans Mark, Air Force Under Secretary Antonia Handler Chayes, Under Secretary of Defense for Policy Robert W. Komer, and USAF Chief of Staff Gen. Lew Allen in Washington recently, Pattie announced to reporters that Britain's offer to man Rapier at seven USAF bases in Britain was "very positively received." He added that the British government would be "extremely disappointed" if this latest suggestion did not finally result in the procurement of the system. ■☆☆

First Roland Production

THE NEW BRITISH OFFER to man USAF Rapier units at its UK air bases, if the US would procure the systems, came within days of an Army contract award to Hughes Aircraft and to the Boeing Company to begin initial, low rate production of the competing Roland air defense missile system.

The contract had been held up pending successful Congressional resolution of an impasse over whether to kill the program, or proceed with it (Sept. *AFJ*).

Under the contract, worth about \$60-million and funded in the FY79 budget, the Army will get its first three Roland fire units and 75 missiles. The contract provides an option for the Army to buy 18 additional fire units and 410 more missiles, funded in the FY80 budget recently passed by Congress.

The US version of Roland is a derivative of the system designed by Messerschmitt-Boelkow-Blohm of West Germany and Aerospatiale of France under a joint venture consortium called Euromissile. The American-built missile and most of the fire unit parts are interchangeable with

the European-built Roland. Roughly 90% of the field replaceable parts are interchangeable. The US version of Roland is the first major European-designed weapon system selected by the Army for production in this country. ■☆☆

USMC Awards MIFASS Contract to Norden

THE LONG-AWAITED EFFORT to automate and speed up US Marine Corps battlefield data exchange has been launched with award of an engineering development contract to Norden Systems of United Technologies for the Marine Integrated Fire and Air Support System, called MIFASS. The first systems are to be operational in 1986.

In heavy combat, when there might be 24 requests per hour for air, artillery, or naval gunfire support, the Marine Corps says that MIFASS would cut the time needed to get fire on a target from the present 30 minutes to only about 10 minutes. Of that response time, 23 and 3 minutes, respectively, are taken up coordinating the fire support.

MIFASS is designed around 18 computer centers employed with a full USMC division, each with a plasma display—a map of the combat area overlaid with schematic positions of all friendly and reported enemy forces. The display is to be located at each infantry and artillery command post at battalion level and above. Assembled from roughly a dozen basic units, the divisional MIFASS center will occupy a shelter 20 feet long; at regimental level, the shelter is 10' long; at battalion level, the MIFASS center is not sheltered, but one half of its equipment can duplicate the functions of the other so that echelonning can be accomplished without interruption.

The system shows the status of hostile and friendly aircraft, ground forces, terrain, and according to former Commandant General Louis H. Wilson, will "integrate, control and coordinate mortar, artillery, naval gunfire, and direct air support—without stopping one for the other, as we have had to do in the past" (November 1978 *AFJ*). ■☆☆

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USMA ASSOCIATE PROFESSORS (Mathematics) SOUGHT

The Superintendent of the U.S. Military Academy has appointed a committee to screen applicants and recommend the appointment of two Permanent Associate Professors for the Department of Mathematics. One position involves the direction of advanced programs of undergraduate study, counseling cadets enrolled in those programs and teaching those elective offerings that support the program. The second position involves the direction and development of upper-division electives in the study sequence for mathematics concentrators. In addition to relevant academic qualifications, the committee will also consider military experience and other evidence of leadership ability. Applicants must be willing to pursue mathematics, applied mathematics, or ORSA studies toward a PhD, if one has not already been earned. Applicants with more than 15 years of service as of May 1980 must have completed the PhD by that date.

Any officer interested in applying for this position may obtain application information by contacting Maj R. Craig Ham, Selection Committee Secretary (Mathematics), Office of the Dean, USMA, West Point, NY 10996 by 15 December 1979.