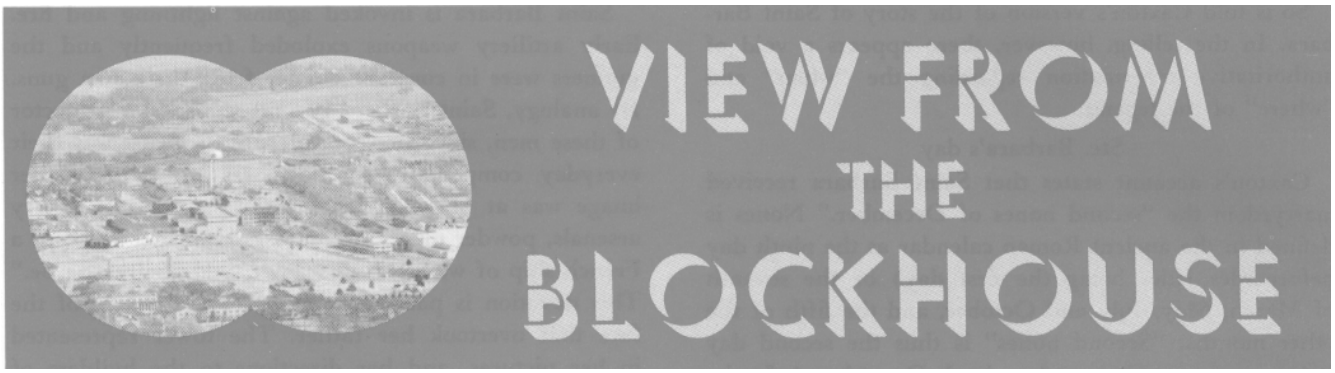


SIAGL Slated To Replace ABLE

The Survey Instrument Azimuth Gyro Lightweight (SIAGL) is a manportable north-seeking gyroscope capable of determining true north within field artillery accuracy requirements without using celestial or landmark sightings. The instrument was developed to replace the survey instrument, azimuth gyro (ABLE). The SIAGL was developed by the US Army Engineer Topographic Laboratories with Astronics Division of Lear Siegler, Inc., as prime contractor.

The system is presently undergoing preproduction test at the contractor facility. The SIAGL is to replace the present ABLE on an item-for-item basis and will be issued to all headquarters and headquarters batteries of the infantry, armored, mechanized and airborne division artillery, all field artillery target acquisition batteries and to most field artillery battalions. The fielding of SIAGL will provide the field artillery the capability of determining rapid, accurate azimuth for survey, fire direction and target acquisition purposes.

SIAGL CHARACTERISTICS

ACCURACY	± .15 MILS AT MID-LATITUDES
WEIGHT	50 POUNDS WITHOUT POWER SOURCE AND STANDARD TRIPOD
AZIMUTH DETERMINATION TIME	25 MINUTES
POWER SOURCE	24 VOLT NI-CAD BATTERY 24 VOLT VEHICLE BATTERY 110 VOLT AC USING CONVERTER
CONFIGURATION	GYROSCOPIC ASSEMBLY INTEGRAL THEODOLITE, ELECTRONIC CONTROL UNIT, TRIPOD, CABLES AND TRANSPORT CASES
AREA OF OPERATION	75° NORTH LATITUDE TO 75° SOUTH LATITUDE

The SIAGL in operational set-up for preproduction testing.

SOFAR

The Army-Wide Training Support Department of USAFAS has established a nonresident refresher course for field-grade officers—the Senior Officer Field Artillery Refresher Correspondence Course (SOFAR).

SOFAR consists of 11 subcourses totalling 82 credit hours and focuses on the broad fundamental aspects of branch tactical operations. Its coverage includes fire support coordination, fire planning, fire direction, target acquisition, communications, organization and employment since operations can be significantly effected by doctrinal changes in these areas.

The course also includes supplementary reference materials of particular interest to field artillerymen: training circulars, USAFAS handbooks and notes on maintenance, material, tactical operations and future trends.

Officers with highly specialized needs may continue to enroll for the specific subcourses they require independent of the course. Thus, a lieutenant colonel assigned to a division artillery from the Pentagon may choose to take the Nuclear Target Analyst Refresher Course and certain gunnery subcourses in addition to the "broad brush" SOFAR.

Majors and above who completed a Field Artillery Officers Advanced Course at least three years prior to enrollment are eligible for this course. Interested officers should

send a completed DA Form 145, Army Correspondence Course Enrollment Application, to the Commandant, US Army Field Artillery School, ATTN: ATSF-AW-AP, Fort Sill, OK 73503.

New Pershing Systems Tested

The Automatic Reference System (ARS) and the Sequential Launch Adapter (SLA)—latest developments in Pershing PIA Missile System—have been tested on Fort Sill's ranges by a platoon from C Battery, 3d Battalion, 9th FA, under supervision of the Field Artillery Board.

Appearing like a gigantic microscope, the ARS is actually a sophisticated north-seeking gyro and laser that finds true north and shoots a laser beam to the missile guidance section.

Using the laser and direction of fire from the computer in the Programmer Test Station (PTS), the ARS points the guidance section toward the target in less than half the time normally required—without human error.

With cables draped everywhere, the SLA looks like a mechanical octopus. However, it is a tailored junction box allowing up to three missiles to be connected into one PTS and counted in a series. The present Pershing system requires the PTS to move to each missile, wasting valuable time.

Each missile has 120 feet of cable weighing 1,300 pounds. This proved quite a task for crewmen to maneuver in Oklahoma's then soaring temperatures.

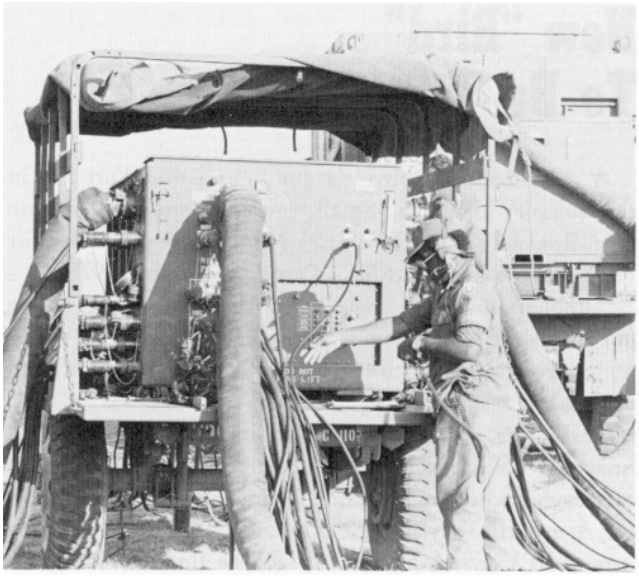
The specialized unit spent June at Martin Marietta Corporation in Orlando, FL, learning how to adopt ARSSLA into the Pershing system.

Since there is only one instrument to emplace and its operation is automatic, azimuth laying personnel found their task nearly eliminated by the ARS. In the meantime, Pershing's crewmen became musclemen as they squeezed 3,900 pounds of cable on the Erector Launchers.

One purpose of the testing was to insure ARSSLA can stand the strain, prove feasible for use in Germany and establish correct emplacement procedures.

A typical testing session followed this schedule:

- By 0600 preparations for testing had already begun. Maintenance was pulled for one hour, trucks were moved into position and the platoon quickly assembled the intricate Pershing system.
- By 0900 three missiles had been counted and were ready to fire. The platoon was put on stand-by. Shortly afterward, a fire mission horn sounded and crewmen scrambled to their positions for a quick count. The missiles erected and simulated liftoff, then were recaptured and march ordered.
- After lunch the position was moved and the testing resumed, often into night.



Signals from SLA through 360 feet of cable are monitored by SSG Rae Cunningham, Field Artillery Board. The cables are lifelines from the PTS to three Pershing missiles, enabling all three to quick count and fire in less than 18 minutes. (Photo by SP4 Michael Inouye)

Field testing ended in September and C Battery was scheduled to fire two ARS-SLA missiles from Fort Bliss, TX, to White Sands Missile Range, NM, in October. The Field Artillery Board is now evaluating test results.

Poised and ready, Pershing undergoes ARS-SLA testing. (Photo by SP4 Chris Sheriff)

View from the Blockhouse

New "Bird" To Be Tested

A new breed of "bird" is due to arrive at Fort Sill in the summer of 1975. Small, low-cost, simple-to-operate mini-Remotely Piloted Vehicles (RPVs) are scheduled for testing at the Field Artillery Center in October 1975.

Although the need met by RPVs (the ability to see "over-the-hill") is obvious, previously proposed RPV systems have been too costly, too sophisticated and offered only token results.

Early this year, the Commanding General of Headquarters, US Army TRADOC, decided to take a different approach in developing and fielding an RPV system for the Army. His very positive guidance was: "In developing a mini-RPV system, *simplicity* will be the overriding objective. Thus, any guideline which cannot be readily satisfied with a simple program should be deleted from the list."

He subsequently stated that the great enemy of RPVs included prohibitive costs stemming from complexity and long developmental lead time. He also pointed out that TRADOC is convinced that a reasonable, simple, "over-the-hill" capability can be developed rapidly and at low cost. He further stated that TRADOC and AMC Headquarters will work closely on design characteristics of the next generation prototypes to establish early requirements, or as he termed them, "the little 'r'." This is a method of developing the product to fly before it is purchased. In short—we will not wait for all requirements to be identified in the development cycle. Rather, "off-the-shelf" items are utilized and experiments are conducted at very low costs to determine actual requirements and current state-of-the-art.

In August 1974, after numerous conferences and discussions on the RPV program, USAFAS was designated as the TRADOC user proponent, having the proponency to represent all US Army users.

The initial action was to appoint COL Alonzo Kretzer as Task Force Director for the RPV experiment program. The colonel immediately organized his task force with four full-time members from different school departments. He further identified on-call members from the Center as well as representatives from all other interested schools and agencies. The first RPV Task Force meeting was held 20-23 August. At the meeting, hosted by USAFAS, the RPV experiment was identified and the entire RPV program was briefed.

The experiment program is now on its way. Some highlights of the milestone schedule follow. The contract letting deadline was 29 October for the procurement of 30 mini-RPVs. Very little can be stated now about the characteristics of these RPVs except that they will be simple and inexpensive, having a navigation system which will allow them to be flown to a predetermined location with ranges of about 25 kilometers. Additional characteristics of the RPV system will provide different sensor equipment which will include: photography, video (real time data link), laser ranging and laser designation.

These RPVs and their associated equipment are due to arrive here August 1975. In October 1975, the School will start the TRADOC experiment for the RPV program. The experiment will be conducted in five phases with each phase approximately four months in duration. The phases are: Phase I, surveillance; Phase II, photographic reconnaissance; Phase III, target acquisition; Phase IV, target location and artillery adjustment; and Phase V, laser designation. The experiment will be completed by June 1976.

Threat Instruction

"Threat" instruction for Field Artillery Officer Advanced and Officer Basic Course students has received new emphasis. The organization, strength, tactics, weapons and target acquisition capabilities of foreign ground forces are discussed in terms of how they would affect field artillerymen supporting maneuver forces at the company (FO), battalion (FSO) and brigade (DS) levels. As an integral part of the threat class, a seminar is used to identify the operations security measures that a US Field Artillery unit can take to increase its survivability on the modern battlefield. The instruction stresses specific vulnerabilities of weapons, limitations in tactical doctrine and weaknesses of the individual soldier that can be exploited.

Members of the next Officer Advanced Course (Jan 1975) will attend one day of conferences on threat, as opposed to receiving the material piecemeal throughout the course. This instruction will be scheduled early in the course so that the information on foreign armies can provide a basis for later classes on gunnery, maneuver forces, artillery tactics and target acquisition.

The Officer Basic Course began receiving a brief, but similar package of threat instruction in November 1974. Prior to this, the basic students did not receive classes on foreign armies.

A handout which highlights the capabilities of selected foreign equipment has been prepared from unclassified publications and is given to the students. The classroom instruction, plus the handout, should give the students enough basic threat data to initiate or update a training program in their next units. For example, the accompanying table reflects information available on Soviet-produced rocket and artillery weapons that are found in a number of foreign armies.

The following data on these Soviet rocket and artillery weapons is listed for general information. Only the latest models of each weapon are identified. There are many different models of the same caliber weapon found in a number of foreign armies; therefore, the data should be used on a selective basis. Also, there are several inconsistencies between various publications on the exact capabilities of each weapon. The ranges shown are believed to be accurate, but characteristics such as rate of fire and basic load may vary.

Soviet Weapons

Caliber	Model	Max Range (meters)	Wt Proj (lbs)	Max Rate of Fire (rpm)	Crew	Traverse (degrees)	Basic Load
122-mm How	D-30	15,300	48	6-8	7	360	120
152-mm Gun-How ..	D-20	17,200	96	3-4	10	58	90
130-mm Gun.....	M-46	27,000	74	5-6	9	50	105
100-mm AT Gun.....	T-12	8,500	21	10	6	54	90
122-mm MRL.....	BM-21	20,500	140	40	6	200	120
FROG 7*.....	(549-mm)	60-70,000	Over 1,000 (warhead)	. . . .	4/Lchr	. . .	. . .
120-mm Mortar.....	M-1943	5,700	35	15	6	8	120

*** Conventional or nuclear warhead**

13E20 Training

Mr. Battery Commander, you probably have noticed that the 13E20 AIT graduate now being sent to your unit from the Field Artillery School has changed in the past year or so. The volunteer concept has resulted in a new type of soldier to train as a Field Artillery Cannon Operations and Fire Direction Assistant. Mostly high school graduates, these soldiers are eager to learn and are looking forward to joining your unit. However, they differ from past AIT graduates in that they are younger, are in the Army by choice and have less formal education.

quality FDC members. Today's trainee has the potential to fulfill that need; it's just a matter of how best to develop that potential and maintain the same high quality 13E required to accomplish the mission. To do this, a joint effort is needed between the commander and the trainers at Fort Sill.

Some adjustments have been made in the gunnery training presented to the student during his seven weeks of AIT. The goal is to provide a soldier with a good, solid foundation in fundamental gunnery skills. But this does not make him an expert. He needs supervision and experience, on-the-job training—your training—before he's completely qualified.

To better prepare the student, Gunnery has implemented several innovations to his MOS training. Those who need help in math are given 12 hours of remedial training oriented toward basic artillery computations. His learning is reinforced by two additional field problems—the well-known "shack shoots"—so that he can *see* the results of his computations in the impact area. He now participates in four of these live fire shack shoots. The scope of his training on the FADAC has been improved by eliminating some highly sophisticated techniques and reinforcing his instruction on the computations of basic-type missions. The procedures in his class on high burst (HB) registration have been reduced to the graphic intersection method for locating the HB point; he can now spend more time in practical work and reinforcement to fully understand how to graphically intersect the HB point and to determine corrections.

He will also come to your unit with a good knowledge of recent changes in artillery doctrine . . . like the ABCA registration. Gunnery started teaching this to AITs on 1 October 1974. He's also using the one-gun adjustment concept and is experienced in computations for the M109A1 howitzer since it is the standard weapon used in gunnery instruction.

When the graduate joins your unit he is qualified in the use of firing charts, computation of firing data, determination and application of registration and met corrections, high angle fire, computation of data for white phosphorus and illuminating projectiles and the use of FADAC to compute firing data and apply registration and met corrections for predicted fire.

However, to become a fully qualified 13E20, he will have to be trained by his new unit in such specialized techniques as nuclear delivery, replot, ICM firing data, sheaf corrections and use of logarithms to compute HB/MPI location.

So you see, there is still a good deal of training he needs after he gets to your unit. He has proven his willingness and ability to learn at Fort Sill. All that remains is continue to build on that foundation until you have polished your 13E20s into the finished product you need in your FDC.

Let's Shoot, Lieutenant

"Let's shoot! To identify an antitank gun emplacing—from Marker Signal Mountain go right 90 mils and at that point down from the skyline 11 mils—this will place you on a large rusty car body—that is your adjusting point—prepare your call for fire."

To any Field Artillery Officer Basic Course (OBC) graduate of days gone by, these words from a gunnery instructor are as familiar as Marker Signal Mountain itself. However, that disciplined method of target identification has given way to a more informal method which has been fully implemented for OBC 5-75 beginning in November 1974.

In the past, the majority of OBC service practices were conducted from a stationary observation post (OP). The students were briefed prior to the service practice as to OP location, given a reference point diagram and necessary data to orient their observed fire fans. There was little or no time allotted for map and terrain analysis, preparation of terrain sketches, fire planning or giving the students detailed realistic tactical situations. As a result, observed fire training lacked realism. The typical OBC graduate could adjust artillery fire from a static OP location; however, any variation from that routine placed the student in an unfamiliar situation.

The current Field Artillery OBC program of instruction (POI) has been designed to prepare the newly-assigned artillery lieutenant to perform, in order of priority, the following artillery battery functions: forward observer (FO), battery fire direction officer (FDO) and firing battery executive (XO).

To prepare the OBC student to perform his primary duty, that of forward observation, the syllabus has been modified to provide more classroom instruction in observer-related subjects, create a more realistic environment by placing him in a variety of situations during field exercises, build confidence and encourage flexibility.

The OBC lieutenant's FO training begins in the classroom. During the course, he receives 23 periods of classroom instruction on target location, the call for fire, artillery adjustment procedures and additional instruction to reinforce and amplify his basic knowledge of observed fire (OF) procedures. Included in this reinforcement instruction are techniques to engage moving targets, establish smoke screens, use improved conventional munitions (ICM) and employ illuminating projectiles. Prior to a live shoot, the student participates in a practical exercise using the "puff-board" terrain model.

The next step is participation in a service practice. This encounter with live firing will be from a stationary OP conducted in an instructor-controlled environment on the 14.5-mm artillery trainer range. Upon arrival at the OP, the lieutenant will be given a tactical situation in which his instructor will portray the company commander of the supported unit. Prior to adjusting any artillery, the student will conduct a map and terrain analysis: he will be required to determine his location, pick any reference points he desires to use, become familiar with the terrain in front of him and associate that terrain with his map. Emphasis is on teaching the student to follow established techniques in adjusting artillery fire. The student will not be graded on his ability to adjust artillery fire on this service practice. All other shoots will be graded and, as the student

progresses through his OF training, the instructor will become more critical of his ability to adjust artillery fire.

Next comes the first full caliber service practice. This shoot, as in the 14.5-mm shoot, will be from a stationary OP. A tactical situation will be given, a map and terrain analysis made and reference points, if desired by the student, will be determined. The instructor will represent the maneuver company commander and will do so on all OF shoots. Prior to firing the first mission, the student will prepare a hasty fire plan to locate three targets. The target location will be graded. The map and terrain analysis and hasty fire planning forces the student to use his map, eliminating dependence on predetermined data, to prepare him to support the maneuver element. Being proficient in map reading is a must for the student since this is the last shoot (with the exception of an illumination shoot and a bunker shoot) using an OP. From this time, he will either be walking, riding or flying.

To build confidence and teach artillery adjustment in a danger close situation, the student's next step in learning to be an artillery observer is a service practice from a bunker. Here he can gain the experience of adjusting artillery fire to within 100 meters of his location, much as he would have to in combat if his supported unit had to repel an attacking enemy force.

Following the bunker shoot the student participates in two "walking" shoots. He is placed in an offensive tactical situation, orients himself, conducts his map and terrain study and begins to acquire targets (hasty fire plan) as the instructor develops the tactical situation. After completion of a mission, the student moves from the start point to as many OPs as possible during the exercise. This enables him to observe the change in perspective of a given piece of terrain even with slow movement and short distances.

To teach the employment of artillery fires in a fast moving tactical situation, a mobile shoot using tanks and APCs as the observer's means of transportation is conducted. Again, the student must make a map and terrain study and do his hasty fire planning. This, by far, is the most challenging shoot. It provides a variety of FO experiences. Operating from the commander's hatch, the student must make a continual map and terrain study, send his own radio transmissions, be versatile in determining the observer-target direction or adjust using the gun-target line method engagement, and control the movement of his tank or APC. As a result of continuous movement, the observer may lose sight of the target area. This will test his competence as an observer and his ability to relocate his target to continue his mission. Even though this exercise is difficult, those participating have been enthusiastic about its value in learning FO techniques.

The majority of students will have the opportunity to adjust artillery fire from an OH58 helicopter. This will give them entirely different perspectives of terrain features. Those students not fortunate enough to adjust artillery fire from the air will participate in another walking shoot.

A split shoot with firing battery is used to teach the OBC lieutenant the techniques of tactically occupying an OP to include the remoting of his radios.

Then comes the night illumination shoot on which the student learns to employ battlefield illumination—both searchlights and projectiles. He also learns to coordinate the illumination and adjust onto a target using high explosive projectiles.

Then will follow two "final exam" shoots. One requires the FO to engage multiple targets simultaneously and a final (second) mobile shoot operating from tanks and APCs.

As currently designed, OF instruction and training is more inclusive, more challenging and certainly more realistic than in the past. Throughout training the student is forced to rely on his knowledge and ability to employ artillery in varying situations. He is required to call for suppressive fires in conjunction with his hasty fire planning while in a fast moving tactical situation. "Dissipating" targets representing the firing of an antitank missile or gun are injected into several different shoots. He also learns to employ smoke in offensive and defensive situations.

Upon completion of OBC, the student is more competent, more flexible and has greater appreciation of the varying situations he is likely to encounter when providing fire support to the maneuver elements of the modern battlefield.