INFINITY AIMING REFERENCE COLLIMATOR

"Aiming point, aiming post, deflection 2800, refer." No longer will this catch phrase signal the beginning of the number 5 cannoneer's 100-pace relay dash with two candy-striped aiming posts for batons. Instead, a device resembling an aiming circle (fig 1) will be set up within whispering distance of the gunner. It's the new infinity aiming reference collimator T6E1, shortened to the "aiming post T6."

This optical instrument may be used for indirect laying of field artillery weapons by establishing an optical reference from which weapon deflection angles can be measured. The aiming post T6 is essentially an optical collimator equipped with a special reticle (which can be illuminated), so that the instrument functions as an optical projection system simulating a target at infinity. The device works on the same principle as the old distant aiming point method, but affords greater accuracy.

ADVANTAGES

The advantages of the T6 are immediately obvious. It can be set up quite close to the weapon, eliminating the hand signal system and the time-consuming method of emplacing aiming posts with the gunner and number 5 man. Beyond that, it is unaffected by poor visibility. With its interior illuminating system (the bulb is located at the rear of the cylindrical barrel), the T6 operates in rain, snow, and fog, and at night as well as on the brightest day.

Another important advantage is its automatic correction for weapon displacement (weapon jump). The reticle is numbered so that further "zeroing" is unnecessary; matching the numbers of the panoramic telescope with corresponding digits on the T6 reticle corrects for displacement. The accuracy of this method, when compared with the gunner's visual "splitting the difference" of the old aiming posts with the vertical hairline of the panoramic telescope, is the real advantage of the infinity aiming reference collimator.

Because the T6 can operate within the relatively close distance of 12 to 48 feet, it can usually be placed under the camouflage net—or even in a gun pit—and still function. Maximum difference in height between the T6 and various weapon telescopes is 13 feet.

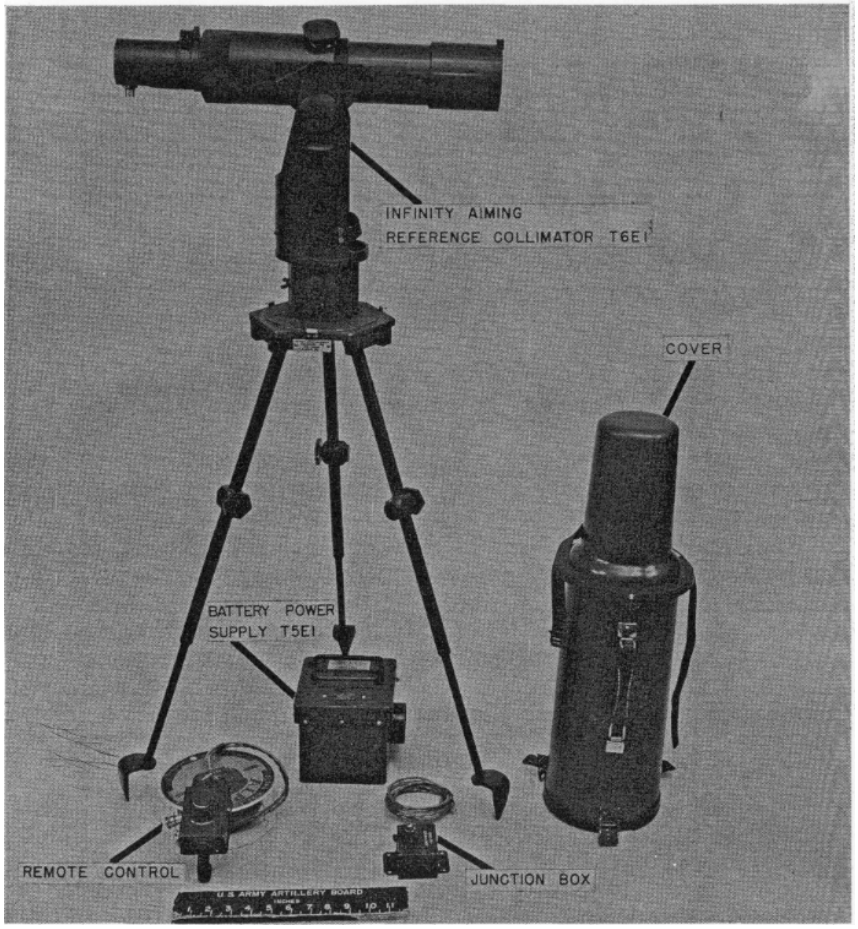

Figure 1. The infinity aiming reference collimator T6E1, and associated equipment.

Finally, although it has the optical instrument's natural disadvantage of fragility, it is less so than the aiming circle and can be taken anywhere.

COMPONENTS

The complete T6 system (fig 1) is comprised of (1) the infinity aiming reference collimator, (2) battery power supply T5E1, (3) light source remote control with connecting cables, (4) instrument covers, and (5) junction box.

The desired weapon deflections are obtained by matching appropriate symbols (numbers) of the panoramic telescope reticle with those of the

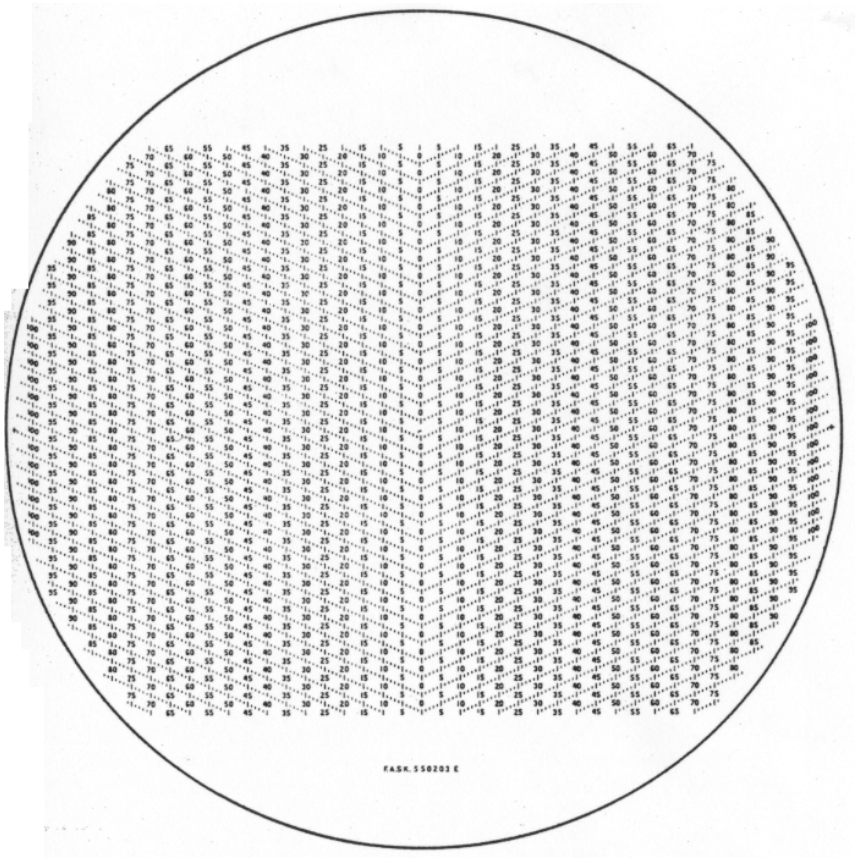

Figure 2. The reticle of the infinity aiming reference collimator T6E1.

aiming post reticle (fig 2), deflecting the weapon telescope through the desired angle, and traversing the weapon until reticle match is again obtained. Accurate angular deflections can be obtained even though the observing telescope is displaced, as well as rotated, when the weapon is

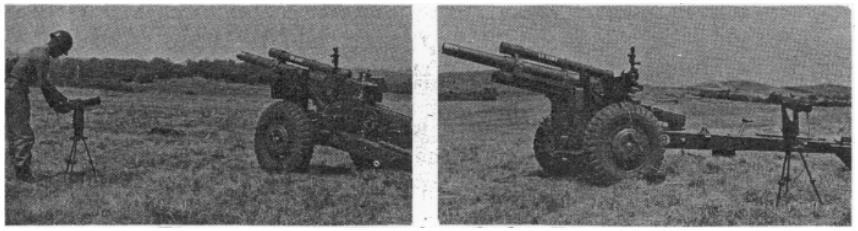

Figure 3. Photographs of the T6 in action.

traversed. The aiming post must be firmly stationed and approximately level for operation.

The weapon is laid by conventional procedures, and the aiming post is simultaneously set at the proper distance and height and is levelled (fig 3). After this is done, the panoramic telescope reticle is alined (matched) with the reticle of the T6 (fig 4). When a new deflection is set on the scales of the telescope, the weapon is traversed until mil graduations are again matched.

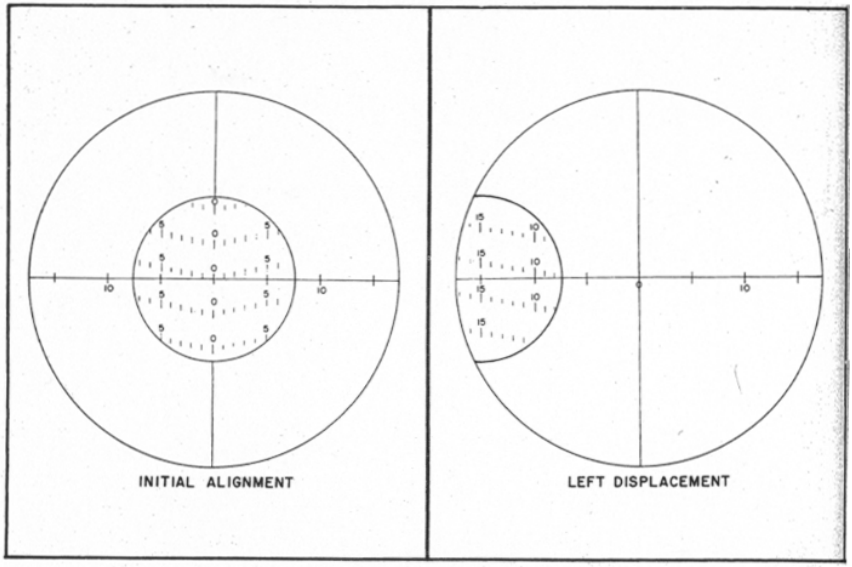

Figure 4. Matching the reticle of the panoramic telescope and the T6—both before and after weapon jump (displacement).

POWER AND COST

The reference collimator reticle has two sources of electrical power for illumination. If it is to be used with a towed weapon, the battery power supply T5E1 is attached to the power input cable of the remote light source control. This remote control contains a PUSH-TO-USE switch which is shaped to fit comfortably into the hand of the gunner; or, if he prefers, it can be hung on the shield of the weapon during operation.

When the aiming post is used with a self-propelled weapon, however, the internal electrical power of the vehicle itself can be fed through a junction box to the power input cable of the remote control.

The infinity aiming reference collimator will cost approximately $85.00. The battery power supply, which is necessary for towed units,

will cost an additional $80.00. However, even at the approximate $165.00 figure, the cost of the T6 will not be prohibitive, since the current aiming posts with night lighting equipment cost $55.00, and the newly authorized standard equipment, including radioactive reflectors, runs over $300.00 a set. And, considering that the greater accuracy of the new aiming post will waste fewer rounds than the older equipment, the T6 will pay for itself.

The T6E1 is being tested in the field by the US Army Artillery Board, and is scheduled for further testing at the US Arctic Board in its next test period. Since tests may indicate a need for minor changes, no production date, and thus no projected date of issue, can be predicted at this time.

A GEM FOR FDC PERSONNEL

A procedure has been developed for achieving an adjusted deflection in those cases where an adjusted quadrant elevation has been arrived at prior to the adjusted deflection. This situation occurs mainly when a large angle T is encountered, causing difficulty in establishing a positive deflection bracket because of doubtful FDC deflection sensings. FM 6-40, par 293 e, f, and g, states the action to be taken in general terms. This new procedure, however, will allow a positive FDC deflection sensing to be obtained with a minimum amount of rounds. Assuming that an adjusted quadrant elevation has been arrived at prior to achieving an adjusted deflection, the time registration will begin immediately. The observer will be told to sense, in meters, all *graze* bursts as to range and deflection. If the next two (2) *graze* bursts produce doubtful FDC deflection sensings, the following procedure will be followed:

The HCO will place the range deflection protractor (RDP) on the chart with the notch in the base on the pin representing the battery firing. The deflection arc is rotated until the last deflection fired is over the deflection index for the battery firing. The target grid should remain centered over the registration point and oriented on the azimuth given by the observer in his fire request. The HCO should then select an intersection of grid lines (on the target grid) that falls directly under the left edge of the RDP. This procedure is not absolutely necessary but will assist in plotting observer sensings more conveniently. The two graze bursts will be plotted on the target grid using the grid intersection (or any other location) as a starting point. This will result in two rounds plotted in relation to the GT line:

a. If the rounds plot on *opposite* sides of the GT line, the deflection is considered acceptable.

b. If the rounds plot on the *same* side of the GT line, the deflection is changed 1/2S in the appropriate direction or the existing deflection bracket, if any, will be split. The smaller of the two will be used.

continued on p. 66.

What are the organizational features of the new divisions that will require significant modifications of combined arms tactics and techniques? The major tactical units of the new infantry, mechanized, airborne, and armored divisions will be the three brigades. Like the combat commands of the present armored division, the brigades will be composed of various groupings of attached infantry and tank battalions. The brigades may often be "triangular," but they are designed to control from two to five battalion or task force size units. (*For detailed organizational information, see supplement to ARTILLERY TRENDS, August 1961.*)

Significant weapons changes are found within the maneuver battalions of the new divisions. The battalions' mortar/Davy Crockett platoons will contain four 4.2-inch mortars and three nuclear-firing Davy Crockett weapons. The antitank platoons will contain three ENTAC (*see ARTILLERY TRENDS, Aug 61, p. 59*) *missile squads.*

The three divisional 105-mm howitzer battalions, which will normally support the brigades, will each contain a headquarters battery, three howitzer batteries, and a service battery. Each of these battalions will have 5 liaison sections and 10 forward observers to work with the supported maneuver units, compared to one liaison section and five forward observers in the old battalion. An AN/MPQ-4 radar will be found in the target acquisition platoon of each headquarters battery, rather than in the division artillery headquarters battery.

Tactical concepts for employment of the new brigades envision greater mobility in the attack, but smaller frontages in the defense, if a nonnuclear situation exists. Frontages for infantry companies should not exceed 1,500 meters (*compared to 2,000 meters under the old concept*), *and frontages for battalions should not exceed 3,000 meters, even on "ideal terrain." In the first phase of an all-out nuclear war, however, units may have to increase their frontages and depths two to four times in order to survive the initial massive exchange of nuclear weapons. Under these conditions, the additional frontages assigned would be accepted as gaps between battalions and/or between brigades.*

The return of the battalion task force echelon to the infantry and airborne divisions emphasizes the role of the artillery liaison officer with these maneuver headquarters. These battalion liaison officers (*LO's 2, 3, 4, and 5*) *become key men in the combined arms pattern. The battalion liaison officer is the fire support coordinator* (*FSCOORD*) *for that force, whereas the brigade liaison officer* (*LO 1*) *is the assistant brigade FSCOORD.* (*The direct support artillery battalion commander is the brigade FSCOORD*). *The battalion liaison officer will prepare the fire plan for the maneuver battalion and will supervise the activities of the for ward observers with the companies within that battalion. This is in contrast to the present system in which the forward observers send their target lists directly to the artillery battalion S3.*

Parts I and II of ARTILLERY TACTICS FOR THE NEW DIVISIONS illustrate, by narrative situations, the employment of divisional artillery battalions in support of the new infantry and mechanized brigades. Two contrasting situations are depicted: defense in a nonnuclear war and offense on a nuclear battleground.