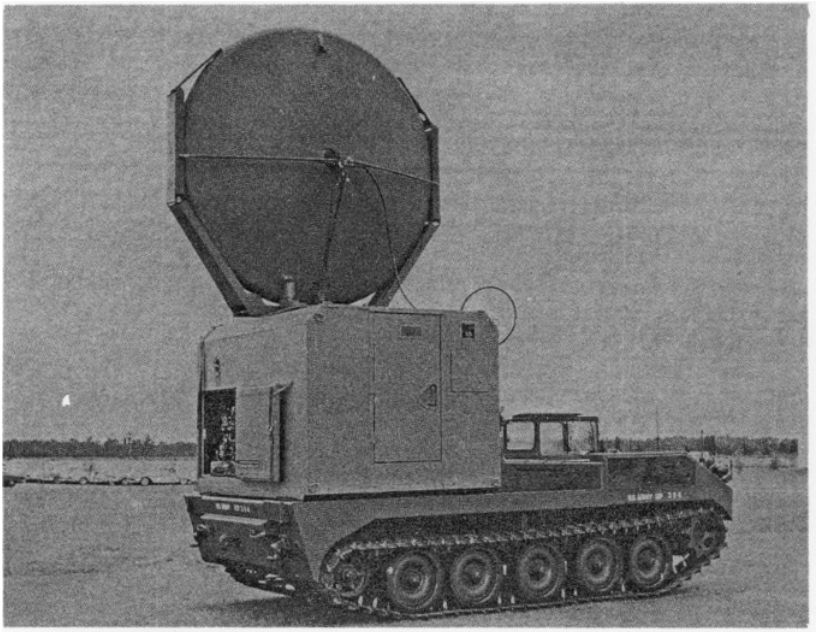

TRACK-80

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Early in the development of the Pershing missile system, it was realized that a requirement existed for communication equipment which would have the reliability and transportability of the rest of the missile system. As the concepts for the tactical employment of the system were developed, it became apparent that this communication equipment would have to operate at ranges up to 100 miles with a high degree of reliability.

To meet these requirements, the Collins Radio Company designed and manufactured the radio set AN/TRC-80. The AN/TRC-80 is a completely self-contained, portable, tropospheric scatter, radio communication terminal. It provides one duplex voice channel and one half-duplex teletype channel for point-to-point communication with an operational reliability of 99.9 percent at distances up to 100 miles. The AN/TRC-80 is equipped

with a highly directional, air-inflatable, parabolic antenna and operates in the 4.4- to 5-kilomegacycle band with 333 operating frequencies.

The requirement for a high degree of reliability dictated the decision to adopt the tropospheric scatter mode of propagation. This type of communication is immune to adverse atmospheric weather conditions and ionospheric disturbances and is difficult to jam by conventional means. An additional aspect of this method of propagation is that it is extremely difficult for enemy direction-finding equipment to locate this type of radio set.

Another requirement of this communication system is that it be capable of rapid emplacement by a small crew with a minimum of tools and auxiliary equipment. To meet this requirement, the AN/TRC-80 is designed to be set up for operation in 10 minutes, by a two-man crew, without the aid of any tools or auxiliary equipment.

The requirement for a completely self-contained unit included not only the complete radio set but also the primary power source. To meet this requirement, a gasoline engine-generator is housed in the shelter with the radio. This engine-generator is a 120-208 volt, 3-phase, 400-cycles per second, 4-wire power source rated at 10 kilowatts. During operation, a door is opened in the side of the shelter, and the engine-generator is moved out of the shelter on rails and operated in this position (fig 1). Since there is no requirement for separate loading of a large engine-generator, the entire terminal can be moved as one 4,600-pound load.

Figure 1. Final check of AN/TRC-80 prior to operation.

Although the AN/TRC-80 can be transported by helicopter, the primary means of movement is the XM474 tracked vehicle. This is the same vehicle that is used to transport the other elements of the Pershing missile platoon.

In the radio set AN/TRC-80, the field artillery has a radio system which meets the reliability, transportability, and range requirements of the Pershing missile system; it can accompany the Pershing any place the rest of the system can go and can fulfill the Pershing communication requirements upon reaching the missile site. This is the first item of communication equipment designed as a part of a field artillery weapons system, and, as such, it fulfills the requirements of the system more completely than any other communication equipment presently in the signal inventory.

GEM FOR THE 155-MM HOWITZER SECTION

If you've had problems laying out the necessary holes for your 155-mm towed howitzer before it comes into position, try the following method for quick, accurate orientation of high angle pit, trail holes, etc.

First, prepare a board as in figure 6. Then place marks on a length of nylon cord at 1) 30 inches from the end, 2) 53 inches from the end, 3) 78 inches from the end, and 4) 14 feet, 6 inches from the end.

USING THE BOARD

Place the board on the ground in the general direction of fire, and, using line "d" and a compass, orient the board on the azimuth of fire.

Stake the board to the ground (a wooden, brass, or aluminum stake is preferable, since the compass is being used) through the stake hole at point "g". Secure the nylon cord to the stake.

Holding the cord at the 30-inch mark, superimpose over line "a". Pull taut and mark the ground. Repeat this on the other side of the board. This line represents the inside position of the wheel blocks, if used. Next, use line "d" and the 2nd (53″) and the 3rd (78″) marks on the cord to establish the boundaries of the high angle pit. The pit should be wide enough to accommodate the traverse limits of the howitzer.

Finally, place the cord over line "b", and mark the ground (at the 14′6″ mark) while swinging the cord to a position over line "c". This outlines the center line of the left trail spade hole. Add approximately eight inches above and below the center line to complete the left trail spade outline. Repeat this process on the other side of the board (lines "e" to "f") for the outline of the right trail spade hole.

When a 155mm towed howitzer is brought in over holes dug from this board, it should be ready to drop in and begin laying procedures. And you have saved valuable time. Figure on page 11.

—submitted by SFC Thomas E. Hutton
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