All together in the month of June, eighty-five complaints of interference in HF radio channels came to the Signal Division of SHAEF. All were corrected except three, whose sources of interference could not be discovered.[130] All in all the tremendously complex frequency plan for OVERLORD had succeeded well.

As in every invasion in the ETO since TORCH, communications ships played a basic role. Aboard the FUSA headquarters ship, the USS *Achernar*, a 50-man contingent from the 6th Signal Center Team and the 17th Signal Operations Battalion handled the communications center. The USS *Bayfield* served as the headquarters ship for VII Corps. Also present was the "Lucky" *Ancon*, overhauled after her brush with German bombs off Salerno.[131] The ship provided the communications headquarters of the V Corps under signal officer Col. Haskell H. Cleaves. Radio nets aboard these headquarters ships furnished communications between echelons of FUSA headquarters, both afloat and ashore in the initial days, as well as communications back to the army rear echelon in England.[132] The headquarters ships hovered off the beaches for five days until the command post of FUSA was safely in operation. Then the men who had operated the centers disembarked and reported for duty to the 17th Signal Operations Battalion.

The lodgment in Normandy secure, cable connections with England became established. Brigadier Harris and his American deputy, Col. William C. Henry of the Signal Corps, presided over the laying of the first cable from Southbourne, England, to the Normandy beach near Longues, a task completed on 10 June. The second cable, started soon after and parallel to the first, encountered ill fortune when the British cable ship *Monarch* was shot up by enemy gunfire on D plus 8. A Signal Corps photographer aboard her had been photographing the operation but his film was lost in the riddled chart room. By 17 June a second cable spanned the Channel and, with the aid of the first, assured large-scale communications. Hardly had the two vital lines been completed when ships dragging their anchors fouled and snapped both cables during the great storm of 20 June (D plus 14). Not till 24 June and 28 June were the broken ends of the first and second cables, respectively, picked up, miles of new cable spliced in, and the circuits restored.[133]

Radio Relay

Meanwhile, both the British and the American version of the new and tremendously significant innovation, multichannel radio relay, maintained heavy traffic loads. The equipment had been installed and put into operation much sooner than the cables. Moreover, it remained unaffected by the vagaries of the storms and hazards of the sea.

The American version of the equip-

[130] (1) Harris, *Signal Venture*, p. 201. (2) Lanahan, "Radio for OVERLORD," *Signals*, I, No. 4, p. 52. and "Signal Planning for the Invasion," *Signals*, I, No. 3, p. 36.

[131] See above, p. 47.

[132] (1) FUSA, *Rpt of Opns, 20 Oct 43–1 Aug 44*, bk. VI, an. 12, p. 16. (2) First Army Signal Section Historical Record, ETO, sec. I, pp. 9–12. SCIA file European Theater folder 11–a.

[133] (1) OVERLORD Rpt, III, 602, and chart, p. 655. (2) Harris, *Signal Venture*, pp. 202–05. (3) MS Comment, Waite, Jul 59.

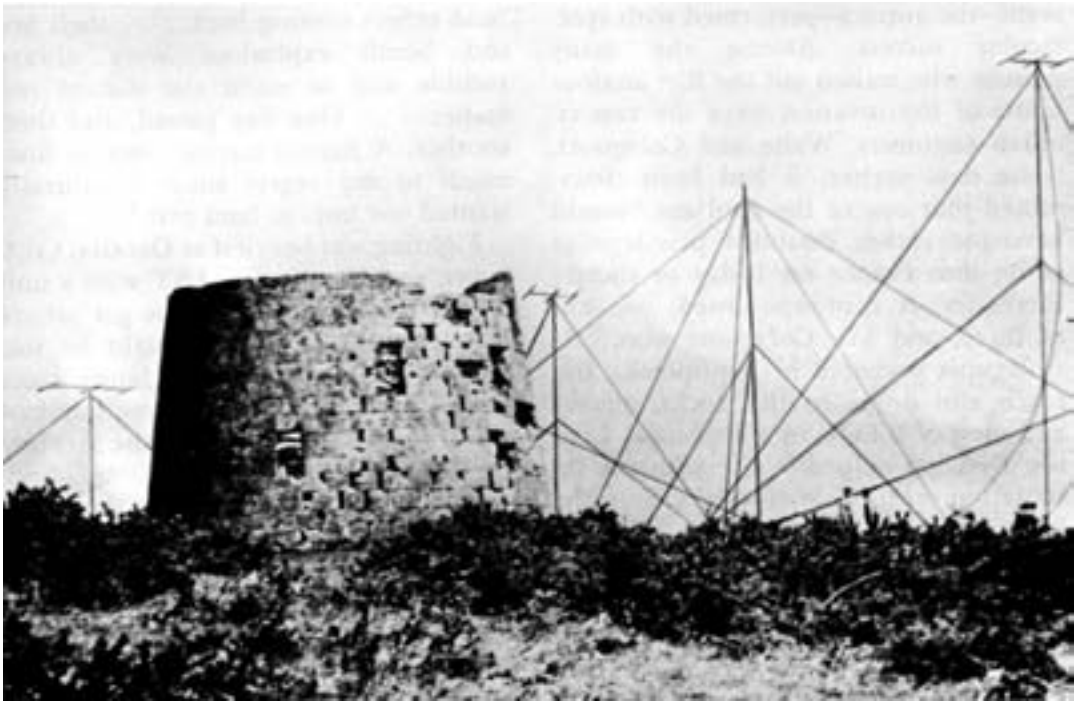
ment—the antracs—performed with spectacular success. Among the many persons who waited out the first anxious hours of the invasion were the two civilian engineers, Waite and Colaguori. Some days earlier, it had been determined that one of the civilians "would have the rather doubtful privilege of going into France on D-day or shortly thereafter. A coin was tossed, two out of three, and Mr. Colaguori won." As Colaguori prepared his equipment and truck and drove to the docks, officers and men of ETOUSA's Technical Liaison Division helped Waite with the installation on the Isle of Wight, atop the hill called St. Catherine's. On St. Catherine's crest the British (and U.S. Navy, using British AM sets) had already placed the several terminals of the British VHF radio links intended to reach the British GOLD and JUNO Beaches.

On the rounded grassy summit of St. Catherine's stand the ruins of an ancient tower. A watchtower centuries old, it had witnessed signals before, for it had been used as a station for signaling the approach of enemy ships, including, on one renowned occasion, the Spanish Armada. More recently, the ruins had served as a landfall for the German air fleets. Now, as a final touch in this mixture of the hoary remote and fantastic new, the Signal Corps men installed the paraphernalia of the first antrac in Europe.

On D-day Waite and members of the 980th Signal Company, specially trained on the AN/TRC–4 and newly arrived in the United Kingdom, began a long and anxious watch. "We could see the ships by the hundreds heading for France at our very feet almost," said Waite, "and others coming back . . . shell fire and bomb explosions were always audible and at night the distant red flashes. . . . One day passed, and then another. A British circuit came in first, much to my regret since I naturally wanted our boys to land first."

Fighting was heaviest at OMAHA. Colaguori, embarked on an LST with a unit of the engineers, could not get ashore throughout D-day. That night he succeeded, but it was many hours more before he could advance four hundred yards to the bluffs, where the fighting continued hotly.

Back on St. Catherine's hill, the Signal Corps men waited and worried. For seventy-two anxious hours they had no word from any American unit. Then at last, fourteen minutes past one o'clock on the afternoon of 8 June, they saw the indicator rise on the receiver meter, adjusted their equipment, and heard with complete clarity: "Hello, B for Bobbie; this is V for Victor." Waite, as soon as he could answer, replied with strict propriety, according to SOP: "Hello, V for Victor; this is B for Bobbie." Then with less propriety, "Where in hell have you been?" "What d'ya mean where have we been?" expostulated Colaguori at OMAHA Beach, "We've been through hell," punctuated by the nearby explosion of a German 88 shell, which the listeners in England heard clearly. Exchange of messages then began. Late that afternoon the first facsimile transmission passed over the complete length of the 125-mile relay from Middle Wallop to OMAHA Beach. Three or four days later, the headquarters of the First U.S. Army went ashore with carrier equipment, which immediately used the full potential of the antrac link as a



FIRST ANTRAC STATION IN EUROPE, ON ST. CATHERINE'S HILL, ISLE OF WIGHT

4-channel carrier system.[134] Scores and hundreds would follow as the demand for antracs reached a crescendo.

Lt. Col. John Hessel, formerly a civilian engineer at the Laboratories, now in Signal Corps uniform and serving in the Technical Liaison Division, Office of the Chief Signal Officer, ETOUSA, wrote triumphantly to a fellow engineer officer, Maj. William S. Marks, Jr., who was still serving in the Monmouth laboratories:

> You will be glad to know that Victor went with Colonel Williams at a very early date and that cross-channel communication was established on the AN/TRC–1 on D plus 2 at 1314 hours. . . . The circuit has been in continuous operation without fading except for two periods of not more than one minute each. The general opinion seems to be that this is the most reliable cross-channel circuit yet put into operation.

These remarks bore a 14 June date. A continuation, dated 20 June, adds: "Information has just been received that Colonel Williams has been decorated by General Bradley for the conspicuous success of his communications. The last report received is that the circuit is still on 24-hour-per-day operation and carrying capacity traffic with no failure and no breakdown." [135]

[134] (1) Waite-Colaguori Rpt. (2) MS Comment, Waite, Jul 59.

[135] Ltr, Hessel to Marks, Camp Colcs Sig Lab, 14 Jun 44. SigC 413.44, AN/TRC–1, 1943–45 (ET–2534).

"Waite and Colaguori both received Bronze Stars but much later." MS Comment, Waite, Jul 59.

The British sets on St. Catherine's worked well except during the warm parts of the day, when they faded out because of their AM characteristics. The American FM gear, on the other hand, did not lose modulation when signal strength weakened a bit during the midday hours. At such times, the American set provided cueing for the British to their installations at Caen.[136]

Facsimile transmission, too, received high praise. Photo reconnaissance planes took the pictures and flew them back to Middle Wallop for developing and identifying. Seven minutes after they were put on the facsimile machine on the Middle Wallop antrac, they had been received on OMAHA Beach and were being rushed to the gun control officer. The gunners had a continuing picture of enemy gun emplacements, tanks, and other targets concealed behind hedgerows, buildings, and terrain. Facsimile equipment transmitted typewritten material, line drawings, and photographs with equal ease.[137]

General Rumbough greeted the antracs enthusiastically. "This operation," he reported to General Ingles, "marks an important milestone in military radio communication. Tactical field radio equipment has been successfully integrated with wire line and terminal equipment to form a system comparable in reliability and traffic capacity to all-wire systems." [138]

Pigeons also landed on D-day, about five hundred of them. They were used to carry ammunition status reports, undeveloped film, and emergency messages. Communications by other means were so good, however, that the pigeon messengers were not used extensively.[139]

Communications for the Press

"Press communications," said General Lanahan, "is one of the most difficult problems facing an Army involved in modern mobile warfare." [140] Arrangements for press communications had occupied a large place in SHAEF signal planning, especially since it was well understood that President Franklin D. Roosevelt took a personal interest in communications for the press. To bolster the planning, Lanahan had obtained the services of Col. David Sarnoff, in civil life the president of RCA, to head the SHAEF section dealing with communications facilities for public relations matters.[141]

The generally unsatisfactory arrangements for press communications in the North African invasion clearly indicated

[136] MS Comment, Waite, Jul 59.

[137] (1) *Ibid.* (2) Waite-Colaguori Rpt, p. 29.

[138] Ltr, Rumbough to CSigO, 2 Jul 44, sub: VHF Radio Com. SCIA file 4 Rumbough Rpts folder 2. "Radio relay equipment," General Rumbough later declared in retrospect, "is a revolutionary development in communication." In fact, radio relay alone preserved communications on more than one occasion, when wire could not keep pace during the onrush of American armies in Europe. Rumbough, "Radio Relay," *Military Review*, XXVI, No. 2, pp. 3–12, *passim*.

[139] (1) Ltr, 1st Lt Thomas H. Spencer, Comdg 2d Platoon (Sep) 280th Sig Pigeon Co, to SigO 12th AGp, 27 Jul 44, sub: Transmittal of Pigeon Rpt, and Incl, Use of Pigeons in the Invasion of France. SCIA file European Theater folder 1–a. (2) Pigeons on D-day, SigC Tech Info Ltr 43 (Jun 45), p. 17.

[140] Lanahan, "Signal Planning for the Invasion," *Signals*, I, No. 3, p. 36. "Press communications" included communications for press copy, live and recorded voice broadcasts, still and motion pictures, and service messages concerning these matters.

[141] Ltr, Lanahan to Col Roscoe C. Huggins, 31 Oct 57.