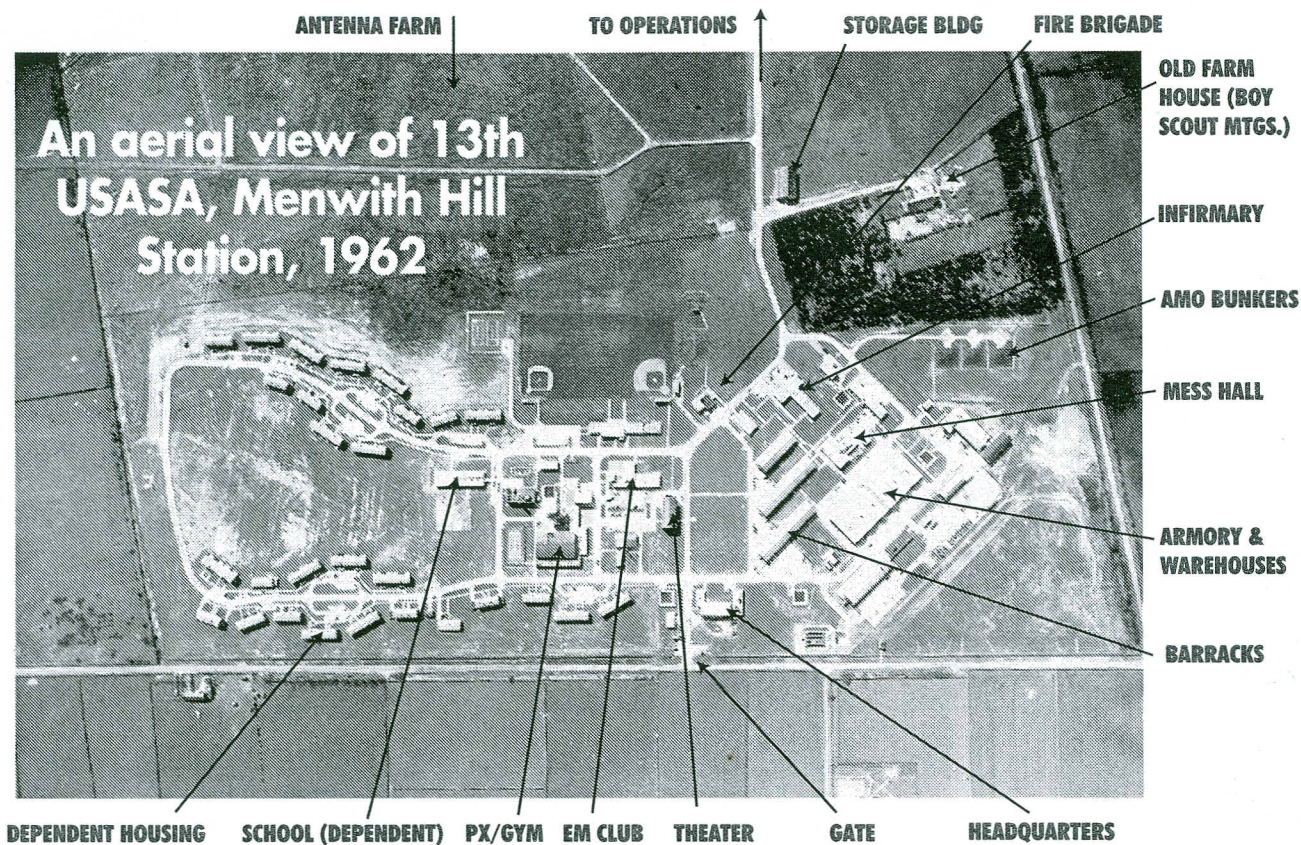


Menwith Hill Station



By Kenneth L. Bird, N9JLW

A Case Study in Signal Intelligence Gathering during the Cold War

The monitoring of communication signals has long been performed by agencies of world governments since the first signals were sent out on spark gap transmitters at the turn of this century. As technology advanced, so did the techniques and methods of gathering information by electronic means. The Second World War saw an explosion in electronic intelligence technology application, which became even more important in the cold war years that followed. The following is a thumbnail history of the prime United States agencies involved in monitoring electronic communications and one major location where it continues today.

■ The Origin

On November 4, 1952, President Harry S. Truman, signed a directive creating a super-secret government agency known as the National Security Agency (NSA), which, according to Mr. Truman, "would perform highly specialized technical and coordinating functions relating to the national security." The NSA (or "No Such Agency" to its members), was to become a powerful weapon at the height of the cold war.

Two years later, in 1954, the British War Department approached a Mr. S. Robinson to purchase his 246 acre "Nessfield Farm," situated in the Yorkshire Dales near the spa town of Harrogate. The land, described as a "strip of barren, marshy, windswept wasteland which is of little value for anything except for grazing a hardy breed of sheep," was known as Menwith Hill, or "stoney field" in 14th century English.

The original 246 acres of Menwith Hill were soon increased to a total of 562 and quietly leased to the U.S. Department of Defense. Soon workmen began surveying the area for what would be the 13th USASA (U.S. Army Security Agency) field station.

■ The U.S. Army Security Agency

The U.S. Army Security Agency was an expansion of the early U.S. military involvement in communications security (COMSEC), signals intelligence, (SIGINT), and cryptanalysis—the coding and decoding of communications. The value of listening to messages sent via radio had been seen in World War I, where both the Army and Navy practiced the interception of continuous wave (CW or Morse) coded signals transmitted by the Kaiser's military units.

The period between the World Wars saw great developments in radio communications and its employment by governments and the military. In the U.S., however, signals intelligence had languished and was only kept alive by the efforts of a few dedicated individuals in both the military and State Department. In response to growing threats in the 1930s, the U.S. Army established a separate organization known as the Signals Intelligence Service or SIS.

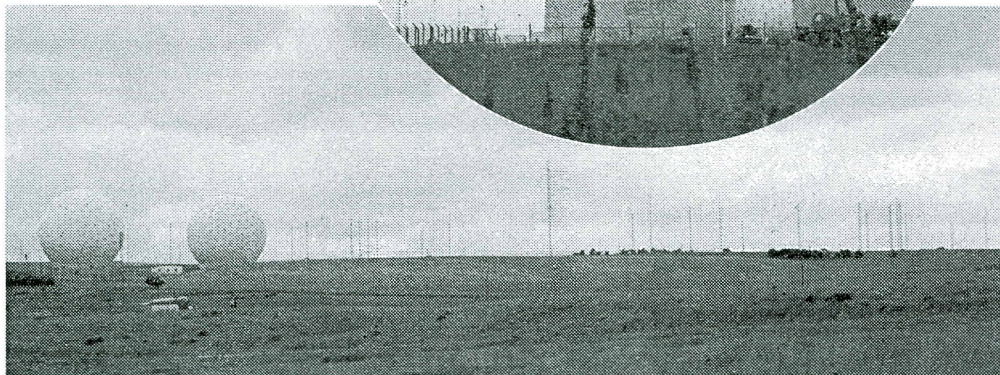
The general mission of the SIS was stated in a memorandum dated April 22, 1930, as:

"The preparation of all codes, ciphers, and other means of secret communications to be employed by the army in peace and war. In time of war, the interception of enemy communications by electrical means, the location of enemy transmitters by goniometric (electronic detection finding) means, and in peacetime, the necessary organization and training of personnel and the development of equipment to render the service capable of immediate operation in time of war."

At the outbreak of World War II, the SIS was expanded and the military designation was changed six times during the war years until on September 15, 1945, the U.S. Army Security Agency was the final name selected. The USASA was headquartered at a former girls school in Arlington, Virginia, known as Arlington Hall; a location near Warrenton, Virginia, known as Vint Hill Farm, was used as a primary monitoring and training post. With the end of that war, the USASA mission was reduced and the Agency was almost disbanded. But then came the "cold war," and the USASA regained its role as the main army signals intelligence organization.

As the cold war grew in intensity, the need for a broader intelligence gathering role for

Menwith Hill Station still listens on HF, but today's signal intelligence gathering is focused toward satellites.



the military resulted in the creation of NSA. This agency relied on the signal and communications gathering capability of the ASA and other military security services, using their resources on sea, air, and land. Members of the Army Security Agency were selected from the top ten percent of those who scored high on the army profile tests given at induction or enlistment. Candidates were given in-depth background checks and would be granted the highest security clearances. Most USASA members received training up to a full year at the "Intelligence University" which was located at Fort Devens, Massachusetts.

■ Construction and Operation

The U.S. Army was in the forefront in the search for improved signals intelligence capability. Construction at Menwith Hill commenced in April of 1956. The workmen at

Menwith Hill were soon joined by four USASA officers and three enlisted men.

Due to problems with soil and weather conditions, it took four years to complete the facility. The cost of construction was billed at \$6,800,000 plus another \$1,200,000 for dependent housing. The facility underwent several name changes: Originally designated Field Station 8613, the site was formally named 13th USASA field station on January 1, 1957. In January 1959 it was named Menwith Hill Station. It became operational in June of 1959 with the arrival 32 USASA troops, which by 1960 had increased to 450. The unit was assigned to ASA Headquarters in Frankfurt, West Germany, and attached to the third Air Force United Kingdom, for logistic purposes.

The Station consisted of a headquarters and service company, which provided logistical and technical support, and an operations company, whose members performed the ac-

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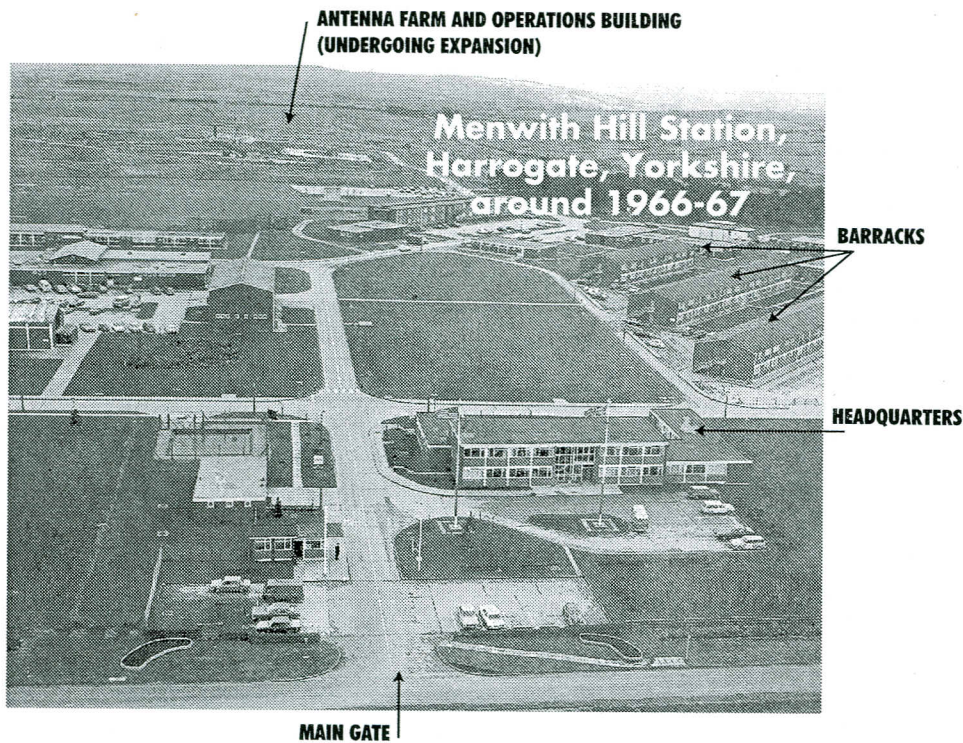
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Menwith Hill Station,
Harrogate, Yorkshire,
around 1966-67

tual missions as designated by NSA and the military. The major facilities consisted of an operations building, located in the huge antenna field one mile from the main post area. This building was self-contained, with an emergency power plant and double chain link security fence.

The main post had the headquarters buildings, barracks, and a large dependent housing area, along with necessary support buildings such as mess hall, chapel, movie theater, base store (PX), and the ever-popular officers and enlisted personnel clubs. Three earth-covered bunkers held ammunition and Thermite charges for the destruction of classified equipment, should the post ever be overrun by the enemy. By 1963, over five hundred USASA troops were in residence at Menwith Hill.

Menwith Hill proved to be an ideal location for signals intelligence gathering, with its low radio frequency (RF) noise location and proximity to the northern sectors of Western and Eastern Europe. The large antenna field contained huge directional rhombic antennas that could scoop up high frequency (HF) signals worldwide; even high altitude missile test information was read by the Menwith Hill operators. The obvious targets of the day were Warsaw Pact military units and the Soviet Union. Other missions involved "friendly" NATO nations and their organizations. Many of the mission-specific targets of the 1960 decade remain classified to this day.

Menwith Hill was viewed by the local British residents as just another United States military base—one of many that dotted the English and Scottish landscape in the aftermath of World War II. There had been a large

contingent of Yanks at an Army hospital in the nearby town of Harrogate during that war, and many of the locals had pleasant memories of the GIs. Menwith Hill was viewed as an asset that employed many of their relatives and friends.

The post was generally an open facility with gate security supplied by a U.S. Army military police (MP) detachment and the British Air Ministry Police. The curious did constitute a problem for the base security officer, and Soviet and Eastern block operatives made many trips to Harrogate on "holiday." Also there was a barber shop in the nearby town of Harrogate that had a most inquisitive barber, and GIs were warned to avoid the location and advised to get a haircut elsewhere, without the inquisition.

Despite the potential for security breach the base never suffered a mission compromise, although there were events such as an "IRA" raid on the ammunition bunkers and an occasional workman who strayed into the operations building, much to his displeasure and that of the post commander. During the 1970s and 80s many "Ban The Bomb" demonstrations were held outside the main gate and access to the facility was subsequently tightened up.

One story Menwith Hill never denied resulted from the presence of U.S. Naval personnel at the base. Most were there to take part in athletic competitions and the weekend dances held at the enlisted men's (EM) club. When she asked what the sailors were doing there, an English female guest was told that they were members of a *Polaris* submarine crew that was being refitted at the huge under-

ground facility beneath Menwith Hill. The submarines came in through a huge tunnel that had been constructed from the North Sea. The sailors warned their dance partners not to breathe a word of the story and, of course, it was all over Yorkshire in a week and even resulted in an inquiry from a London newspaper.

Operations

The highly trained military staff of the station worked a twenty-four hour shift every day of the year. At shift change time, the duty officers would be briefed on mission status, and the operators would relieve their counterparts. The operations building was divided into large rooms, each air conditioned and fed power and RF signals through floor ducts. (A great deal of heat was produced in the operations building by the mostly vacuum tube type of equipment then in use.)

"Cover" music was played constantly both in the rooms and in the perimeter area of the building—mostly rock music from then-operating shipboard pirate radio station *Radio Caroline!* ASA personnel would periodically "sweep" the building for possible "bugs" and to check the overall security of the facility.

Every conceivable form of RF signal within the high frequency bands were gathered by the equipment in the operations area. CW and voice signals along with compacted signals called "burst" transmissions were recorded on military versions of the famed Ampex tape recorder. Many CW signals were monitored live by operators called "ditty boppers" using manual typewriters. Some signals were copied on facsimile machines and paper tape; others, in FSK mode (frequency shift keying) were demodulated by an "AFSAV 65" that used interchangeable modules to decode various FSK configurations. These signals were sent directly to model 28 teletype machines for printout.

Critics of Menwith Hill today claim the facility taps international telephone traffic from a nearby British Telecom microwave tower. It would certainly be possible with the technology of today. Such activities were never performed during the USASA command of the facility and, even if possible, would have had no value to the main missions then in process.

The heart of the operations building was the "comm center" where the cryptographers worked with their deciphering machines. Few at Menwith Hill were cleared for this highly secret duty and many veterans of the 13th USASA still refuse today to discuss what they did in that inner sanctum. Much of what was

collected at Menwith Hill was sent encrypted by land line under the sea to NSA at Ft. Meade, Maryland, for final processing.

The communications center was fed signal intelligence provided by the finest hollow state HF receiver ever conceived, the Collins R390A. Menwith Hill had over two hundred of these radios, and they were kept in excellent condition by a radio repair lab located within the building. The radio featured a mechanical "digital" readout and a dynamic range rivaled by few of our present-day microprocessor-controlled radios. The gear train that indicated the frequencies is still a marvel of mechanical engineering, and many monitoring hobbyists still seek out these fine machines at swap meets and hamfests.

The R390A radios were fed RF signals from a large patch panel consisting of hundreds of jacks that terminated the coaxial cables from the antenna farm. Signals could be manually patched from this panel to any position in the various equipment rooms. All signals were received live; it was never dreamed that it would be possible to record and play back the desired portions of the RF spectrum and then search for a signal at will, as is done with today's technology.

Most activity in the operations building was routine and even tedious. Copying live code for eight hours was not always fun. Tending the various recording devices and finding new mission frequencies on the R390A were the main diversions from the norm. At times, alerts were called and the operators practiced equipment destruction procedures. Thermite charges capable of melting down radios and crypto machines were on hand in case World War III broke out and Soviet troops were to arrive at the station gates. While M-14 rifles were available in the base armory, Menwith Hill depended primarily on Her Majesty's Royal Regiments to defend it against any invaders.

■ Civilian Takeover and Expansion

Menwith Hill was under the command of the USASA for only six years when it was taken over entirely by NSA civilians. On August 1, 1966, NSA assumed control of the facility, replacing the commanding officer with a civilian "station chief." The remaining USASA operational

staff were transferred to other locations. Many were destined for Southeast Asia to join ASA operational units already in place, and the peaceful damp cold of Yorkshire was replaced by the dangerous steaming jungles of Vietnam and Laos.

The main reason for the NSA takeover was the evolving technology of the digital computer, coupled with space-based Signals Intelligence Gathering. USASA personnel enlisted for relatively short terms, and there was not a sufficient number of qualified career members. The new technology required the expertise of highly trained civilian technicians and engineers provided by NSA and its various contractors, such as Lockheed and Ford Aerospace, and IBM, who were building the new computers and satellite systems.

The technology of the 1970's and 80's brought many changes to the facility. Many new buildings were erected on the base, the operations building was enlarged, and huge white radomes hid the many satellite collection and transmission dishes that were now in use. The HF antenna masts are still in use, however. As one passes the base on the A7 road between the towns Skipton and Harrogate the radomes look like giant golf balls with the tall masts marking the putting green in the background. Signs warn of trespassing being subject to the "National Secrets Act," and photography is frowned upon by the local police.

The mission of Menwith Hill may be changing once again, for in 1995 the U.S. Army Intelligence and Security Command (INSCOM), which replaced the Army Security Agency in 1972, again took command of the station. One can only speculate on why the NSA gave Menwith Hill back to the Army. According to an unnamed source at INSCOM, the break-up of the Soviet Empire created more potential "bad guys" that the U.S. intelligence community must keep up with. Menwith Hill still plays a large part in the information collection necessary to thwart the such enemies, a role which may seem better suited to the military.

Monitoring hobbyists and intelligence buffs who might be tempted to visit Menwith Hill while on vacation in the United Kingdom are advised not to try to do so. It is still a very secure facility and visitors without official business are not admitted. Any type of trespassing may get you sentenced to a not-so-comfortable UK prison. Just enjoy the drive around the base on the public roads and then go find a nice

pub in the area and enjoy the hospitality of Yorkshire—leave Menwith Hill Station to the professionals.

For thirty-six years, Menwith Hill Station has been a premier electronic intelligence gathering location for the U.S. Army and the National Security Agency. The information gathered by Menwith Hill no doubt influenced the Berlin crisis, the Cuban missile crisis, the space race, the Vietnam war, the break-up of the Soviet Union, and the Gulf War. Even as this is written, the huge radomes at Menwith Hill gather information that continues to affect the U.S. response in hot spots around the world today. Perhaps someday, as with "ULTRA" or the "Manhattan Project," the detailed story of Menwith Hill will be revealed. Until that time, the major contribution made to our nation's security by those who have served, and continue to serve there will remain largely unknown.

On cold winter evenings, the writer enjoys sitting in front of his R390A basking in the glow of the vacuum tubes, and at times, in the noise of the headphones he thinks he can hear signals from Tashkent, or rocket a launch from Tyuratam, or the taut "fist" of an East German command post—all "cold war" ghost signals from the past of Menwith Hill Station.

POSTSCRIPTS:

In 1990, a few veterans of the 13th US Army Security Agency Field Station formed an association. The group meets every two years and has located over 500 former USASA members who served at Menwith Hill. The association can be contacted at:

13 USASA Field Station Association, P.O. Box 585, Fayetteville, NC 28302-0585

Internet Page: <http://www.greywolf.com>

The writer is indebted to Mr. James Gilbert, the command historian of the U.S. Army Intelligence and Security Command, for supplying information on the origins of the site of Menwith Hill and the early days of construction.

The writer served at Menwith Hill Station from 1963 to 1966. This article is based partly on that experience and information from the following sources.

Bramford, Peter, *The Puzzle Palace*, Penguin Books

Campbell, Duncan, *The Unsinkable Air-Craft Carrier*, Micahel Joseph (United Kingdom)

Brownell, George, *Origin and Development of The NSA*, Aegean Park Press

Editors, *Origins and Development of The USASA*, Aegean Park Press

Finnegan, John P., *Military Intelligence, a Picture History*, US Government Printing Office

Editor's note: Readers may also be interested in *The Codebreakers* by David Kahn, reviewed this month in "What's New?"



A home page for those who served at the 13th USASA station.