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COMMUNICATIONS INTELLIGENCE AND THE SINKING OF THE U-860, APRIL-JUNE 1944

By David Syrett

With the end of the convoy battles of 1943 the Battle of the Atlantic became in many respects a maritime guerrilla war in which Allied naval forces for the most part engaged in hunting down individual U-boats.1 In this phase of the Battle of the Atlantic the Allies were presented with problems that were far different from those associated with defending convoys from attack. In the years 1944-5 there were few pitched battles between wolf packs of U-boats and the Allied escorts of convoys, but rather Allied warships and aircraft engaged in searches, sometimes of great length, for a single U-boat.2 The problem confronting the Allies in the war against the U-boats during the years 1944-5 is simple to state, but at the same time it was extremely difficult to solve, for its solution required the location and then distraction of a single small enemy vessel, which might be submerged, hiding in the vast reaches of the ocean.3

The only means by which the Allies could locate a single U-boat at sea was to obtain accurate intelligence on the movements of the enemy vessel. Offensive patrols or hunts without good intelligence were useless, for a U-boat is small and the sea is large. Without knowledge of the movements and location of the enemy vessel, Allied ships, and even aircraft, would have been confronted with the hopeless task of searching thousands upon thousands of square miles of sea area in the hope that a U-boat might be sighted. Fortunately for the Allies, communications intelligence provided the means with which to locate and track German U-boats at sea.

The U-680 is an example of a U-boat which was located and then tracked by means of communications intelligence until it was intercepted and destroyed by the US Navy in the South Atlantic. The U-860, a 1,200-ton Type IXV U-boat on its first patrol and commanded by Fregattenkapitén Paul Buchel, sailed from Kiel on 12 April 1944 and briefly put into Kristiansand in Norway before passing into the North Atlantic en route to the Far East.

The voyage was without incident until 19 April when the U-860 was off Iceland. On that day two members of the U-boat’s crew were left on deck and lost when the U-860 crash dived after obtaining on her Wanz G-2 radar detector indications of the approach of an aircraft. This incident was not at the time reported to the BdU (Befehlshaber de Unterseeboote) in order to maintain radio silence and, thus, to avoid the possibility of detection by the Allies.4 Owing to the U-boat’s radio silence, Allied naval intelligence was probably not aware of the U-860 being at sea and surely did not have a hint of the vessel’s position until 13.49 on 27 April when the BdU directed the U-860 to send back to Germany by radio, from the North Atlantic, a series of weather reports. Buchel complied with this order, and beginning on 29 April and ending on 6 May, transmitted a number of weather reports. However, these weather reports were not received in Germany because of ‘radio disturbance’ and the BdU directed the U-860
to cease this activity. While the weather reports from the U-860 could not be received in Germany, the Allies intercepted all the radio transmissions to and from the U-860. The interception of these radio transmissions gave American naval intelligence the first clues that would lead to the sinking of the U-860 on 15 June 1944.

There were several ways in which the Allies could obtain information during the Second World War from radio communications to and from U-boats. One was to locate the source of a radio transmission by means of radio direction finding (D/F) and another was by obtaining the contents of a coded radio message through decryption. A third source of information is known as traffic analysis, which is the study of radio call signs, networks, signals and the like together with D/F. For example, from the type, ‘length of dispatch’ and other characteristics of a radio transmission the Allies could tell whether a U-boat radio message was a sighting, sinking, contact, position, reconnaissance, or weather report. Further, by means of identifying a radio operator’s Morse and the electronic characteristics of an individual radio set – these two processes are known as TINA and radio fingerprinting – information on individual U-boats could be amassed. The Germans from the beginning of the war in 1939 knew that there was the logical possibility that the Allies could exploit the radio communications to and from U-boats as a source of intelligence. However, this was discounted, for the BdU thought, incorrectly, that the enigma code machine produced codes so complex that the Allies would never be able to decode messages encoded by this machine in time to be of operational value. It was also believed, again incorrectly, by the BdU that it would be extremely difficult, to the point of impossibility, for the Allies systematically and accurately to intercept and D/F extremely short high-frequency radio transmissions. The Germans would not know until after the Second World War that the Allies had developed the technology and means not only to systematically intercept and D/F their radio transmissions, but also to decrypt and read their coded radio command communications. The BdU and its security officers never came to terms with the possibility that radio communications to and from U-boats were the main source of Allied intelligence on U-boat operations. In the last two years of the war the Germans, perhaps sensing that the Allies were obtaining information from their radio communications, tightened up their radio procedures. Gone were the days of wolf pack operations when the air waves were filled with German U-boat radio messages. In the years 1944-5 U-boats maintained radio silence as much as possible. Indeed, some U-boats went for periods of thirty or forty days without making a radio transmission. When a U-boat did transmit it was an extremely short message, made at an irregular time, on an off frequency. However, these measures did not prevent Allied naval intelligence from obtaining the information required to hunt down a U-boat.

To intercept and D/F U-boat radio communications the Allies established a string of intercept stations around the coasts of the Atlantic Ocean. When this system was fully established it consisted of 51 stations manned by Americans, Britons, and Canadians. Equipped with modern HF/DF sets to facilitate the interception of radio transmissions from the Atlantic Ocean, these Allied intercept stations had two main tasks. One was to accurately obtain the coded texts of a radio transmission to and from a U-boat for decryption. The second was to obtain a D/F bearing on the source of a radio transmission. The accuracy of a D/F bearing depended on the skill of the D/F set
operator and on the state of the weather and ionosphere. With six or seven D/F bearings, or 'cuts' as they are called, obtained by different shore based intercept stations, it was possible to plot at long range the location of a U-boat transmitting at sea to within 25 or 30 miles. Even though 'Fixing a position was more an art than a science', properly equipped and manned intercept stations gave the Allies the ability to fix by means of D/F the approximate location of a U-boat transmitting radio signals at sea. The Allied radio intercept stations were connected to London, Ottawa or Washington DC by high speed secure electronic communications systems. It took only 'six minutes' from the time of transmission for a D/F bearing to reach the Atlantic Section, Combat Intelligence, in the Office of COMINCH (Commander-in-Chief US Fleet) in Washington DC.

Of much greater importance than shore based D/F as a source of intelligence to the Allies in the Battle of the Atlantic was the decryption of German coded radio messages. The British broke the codes used by the U-boats in the Battle of the Atlantic on 13 December 1942. The US Navy, under terms of an agreement with the British, began to decrypt radio messages to and from U-boats, independently of but in co-operation with the British in December 1942. The US Navy’s OP-20Y-G(A) decrypted the U-boat radio messages at the Naval Communications Annex at 3801 Nebraska Avenue in Washington DC. OP-20Y-G(A) worked closely with the British code breakers in the Naval Section of the Government Code and Cypher School at Bletchley Park, exchanging cryptographic information on a daily basis.

Decryps of U-boat radio messages moved from OP-20Y-G(A) by secure teletype, or by the hand of an officer, to F-211 or the Secret Room adjacent to F-21 or Atlantic Section, Combat Intelligence, in the office of COMINCH on the third floor of Main Navy. Only five people were permitted to enter the Secret Room, plus several high ranking officers such as Admirals King, Edwards and Low. In the Secret Room decrypted German radio messages were married to other intelligence, such as D/F fixes, ship and aircraft sightings of U-boats, and prisoner of war interrogations, to produce a total intelligence picture. Intelligence, with its sources hidden, then moved out of the Secret Room to F-21’s Submarine Tracking Room, the Convoy and Routing Section of the 10th Fleet, and to various combat commands. The Secret Room was also in daily contact by teletype with the Operational Intelligence Centre’s Submarine Tracking Room in London and the Canadian Submarine Tracking Room in Ottawa.

When the decryps of the orders to the U-860 for the transmission of weather reports, the order cancelling these reports, plus the weather reports, and the D/F fixes of the radio transmissions of the weather reports arrived in the Secret Room, American naval intelligence learned the approximate location of the U-860. On 29 April 1944 American naval intelligence placed the position of the U-860 at 57°N 25°W and it was seen over the next several days from D/Fs of successive weather reports that the U-860 was moving south and west. On 6 May, when the U-860 transmitted her last weather report, the U-boat's position was fixed by American naval intelligence by means of D/F at 49°N 36°30’W.

When the U-860 ceased to transmit weather reports American naval intelligence continued to plot the position of the U-boat as moving towards the South Atlantic at the rate of 100 miles per day, by means of dead reckoning. The assumption that the
U-860 was moving towards the South Atlantic was confirmed on 18 May when the BdU again sent a radio message to the U-boat. This radio message was intercepted and decrypted by the Americans. The radio message informed the U-860 that the BdU intended that the U-boat undertake operations near the Laccad Islands off the west coast of India. However, until the U-860 broke radio silence American knowledge of the U-boat’s position would depend upon projections made by means of dead reckoning.

Even though according to American naval intelligence dead reckoning was not ‘as unsatisfactory’ as it might appear at first sight, it was still a rough and ready method of keeping track of the position of a U-boat. There are a number of uncertainties in dead reckoning calculations, such as the weather and the condition of the U-boat’s machinery, which might throw off a dead reckoning position. Further, errors in successive dead reckoning positions are cumulative and compound with each new calculation of a dead reckoning position. One historian has concluded that a U-boat whose position has been estimated by means of dead reckoning could be anywhere within an area of between 10,000 and 15,000 square miles. Nevertheless, it was found that the combination of communications intelligence and dead reckoning, however imperfect, was sufficient to give a near enough position of a U-boat for aircraft to have a fairly good chance of locating and attacking the enemy vessel. Aircraft, because they can search large areas of the ocean, enabled the Allies to use dead reckoning positions based on dated or vague communications intelligence to successfully hunt down a U-boat. The Americans intended in the case of the U-860 to hunt for the U-boat with a task group built around an escort aircraft carrier.

On 30 May 1944 Task Group 41.6, consisting of the escort carrier USS Solomons and four destroyer escorts, sailed from Recife, Brazil, to conduct anti-submarine operations. Task Group 41.6 proceeded south-east into the South Atlantic until 9 June when it reached 24°19'S 12°42'W. That same day, to the north-east of Task Group 41.6, the U-860 broke radio silence for the first time since 6 May when the U-boat had last transmitted a weather report to Germany. On 9 June the U-860 reported by radio to the BdU the loss of the two men, south of Iceland, when the U-boat had crash dived to avoid a suspected Allied aircraft. The U-860 also gave its position as 24°27'S 12°33'W. Allied shore based D/F fixes on the U-860’s radio transmission placed the U-boat at 17°25'S 16°18'W. These two positions, while being well to the south and west of the dead reckoning position of 04°30'S 04°E given to the U-860 by American intelligence, were close enough to Task Group 41.6 for that force to attempt to intercept the U-boat.

The radio transmission made by the U-860 on 9 June was a huge mistake made by Paul Buchel, the vessel’s commander. If it had not been made the Americans would not have had the information on the vessel’s position to intercept the U-860. The radio transmission supplied American naval intelligence not only with what the U-boat thought was her position, but also with a D/F fix on the German vessel. The U-860’s radio transmission enabled American naval intelligence to correct the accumulated errors in their dead reckoning position for the U-860 as well as to begin plotting a new and more accurate series of dead reckoning positions for the U-Boat. Also the U-860’s radio transmission supplied the Americans with enough information on the course,
speed, and location of the U-860 to be able to order Task Group 41.6 to attempt to intercept the U-boat.

On 9 June Task Group 41.6 received orders to alter course to one which would carry the American warships to the north and eastward to place the force in a position to enable aircraft from the USS Solomons to conduct search operations for the U-860 in the estimated area of the U-boat’s position as plotted by means of dead reckoning by American intelligence. At noon on 14 June Task Group 41.6’s position was 28°08’S 09°08’W." American naval intelligence plotted, by means of dead reckoning, the position of the U-860 on 14 June to be 23°30’S 07°W. At 20.33 on 14 June Task Group 41.6 altered ‘course to 045°T to intercept estimated (25-30/05-30w) as advanced from a D/F at 19s/8w—0922474.’

The next day, 15 June, aircraft from the USS Solomons began searching for the U-860. The Task Group had been radioed by COMINCH and given ‘three estimates’ for the location of the U-860, and after searching without result two of these areas a search was mounted with aircraft in the third area. At 1021Z a TBF Avenger aircraft, piloted by Ensign George E. Edwards, sighted the U-860 ‘in a position estimated to be approximately 30 miles in error’. Edwards radioed a sighting report to the USS Solomons. The U-boat was some 50 miles from the American escort carrier on a bearing of 70°T degrees. The American aircraft, after sending the sighting report, attacked the U-860 four times without damaging the vessel. During the fourth attack Edwards’s aircraft was hit by 20mm anti-aircraft fire from the enemy vessel and ‘plunged out of control into the sea about 1,000 metres from the U-boat’. Shortly after shooting down the American aircraft the U-860 submerged.

If the U-860, which was not damaged, had remained submerged there was the possibility that she might have escaped from the Americans. But the commander of the U-boat, Paul Buchel, was not a very experienced officer and on this occasion exercised a fatal lack of judgement. According to later reports of prisoners, the captain of the U-860 ‘was dissatisfied with the performance of his gunners during the morning battle and intended to give them more anti-aircraft gunnery practice’. Buchel ordered the U-boat to surface, disregarding the danger of his vessel being again attacked. The U-860, shortly before sunset, surfaced and just as the bridge watch had taken their stations another aircraft was sighted.

It was not until 14.00 that additional aircraft were dispatched from the USS Solomons to investigate Edwards’s contact report. At 17.22 a TBF Avenger aircraft sighted the U-860’s wake at a range of 11 miles. The aircraft, while it circled the U-boat, reported the U-860 to the USS Solomons and awaited reinforcements. A short time later, just after sunset, three more American aircraft – a TBF Avenger and two F4F Wildcat fighters – arrived over the U-860, which was clearly visible to the American aircraft crews. The two F4F Wildcat fighter aircraft attacked the U-boat by strafing the vessel with machine-gun fire to reduce the U-boat’s anti-aircraft defences by killing and wounding the U-860’s gun crews. As the two fighter aircraft attacked and passed about a hundred feet over the U-boat, one of the F4F Wildcats was damaged by gunfire and forced to return to the USS Solomons. Just as the two American fighters were completing their attacks, the two TBF Avenger aircraft attacked with rockets from two different directions. A total of 14 rockets hit the U-860 just forward of the conning tower. After
being hit by the American rockets the U-860 turned, slowed, and began to emit oil and smoke. Next, two additional TBF Avenger aircraft arrived over the U-860 and a third attack was undertaken, and the U-boat was again strafed and hit with six more rockets. The U-860's speed had now dropped to 3 knots and the vessel was 'trailing large quantities of greenish-yellow oil'. The U-boat was next attacked by a TBF Avenger aircraft with depth charges. The aircraft attacked, passing at a height of less than 50 feet over the enemy vessel. Two depth charges were dropped which 'caused a violent explosion' and set fire to the bomb-bay and forward cockpit of the attacking aircraft, which then crashed into the sea, killing the aircrew. The U-860 as a result of this last attack disappeared, having been destroyed. Several hours later the destroyer escort USS Straub arrived on the scene of the sinking and fished 20 Germans out of the water. No crew members of the downed aircraft were rescued.49

Both the Americans and the Germans made mistakes during the battle which resulted in the sinking of the U-860. It was a fatal error of judgement on the part of Paul Buchel to have surfaced after the shooting down of the first American aircraft to attack the U-boat. Perhaps if the U-860 had remained submerged the German vessel might have escaped. The American pilots also made several errors of judgement. The pilot of the first American aircraft to sight the U-860 should never have attacked the U-boat without waiting for the assistance of additional aircraft, while the pilot of the last American aircraft to attack the U-boat passed so low over the enemy vessel as to fatally damage the TBF Avenger with his own depth charges killing himself and his crew.

The sinking of the U-860 was a triumph of American communications intelligence and naval technology. Communications intelligence – D/Fing and decryption – enabled American naval intelligence to first locate the U-860 in the North Atlantic and then to track the U-boat southward into the South Atlantic. Again, communications intelligence pin-pointed the U-860 when the U-boat sent a single radio message from the South Atlantic. It is most likely that if the U-860 had not radioed the BdU on 9 June the German vessel would have passed through the South Atlantic into the Indian Ocean without being intercepted by the US Navy. That one radio message gave the Americans enough information to intercept the U-860 with an overpowering force – an escort group built around an escort aircraft carrier – which then sank the U-boat. Communications intelligence gave the Americans the approximate location of the U-860 while technology gave them the means to successfully search a large area of ocean some 575 miles south of St Helena and then to sink the U-boat.

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