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The Fortification of the Firth of Forth 1880–1977

‘The most powerful naval fortress in the British Empire’

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Chapter 12

THE OUTERMOST DEFENCES

Between the Kincaig and Fidra batteries, the Forth Estuary is 14.3km wide, most of which is navigable. The history of the consideration of the armament of an outer line, either on the Elie–Fidra line or the May Island line, is summarised in Part II. To the west of the line lay the important port of Methil, at the west end of Largo Bay, which from 1924 had been identified as the major convoy mustering point for the east coast.¹ In the First World War, there were no gun defences east of Inchkeith.

In the inter-war period, the main seaborne threat to the Forth was considered to be an attack by light cruisers, destroyers, submarines and fast motor torpedo boats, on vessels moored in Largo Bay, Leith Roads, and naval vessels at anchor between Inchkeith and the Forth Rail Bridge. Recommendations were made to move the outer line of coast batteries eastwards and mount 6-inch gun batteries at Caiplie on the Fife shore, on the May Island and at Gin Head on the East Lothian coast, which would have effectively closed the estuary to any hostile shipping. Despite the obvious logic of these proposals, they failed to materialise, in part for financial reasons, and in part because of uncertainties caused by the ‘gun v aeroplane’ debate (see Chapter 6 above). In July 1939, the Joint Defence Committee recommended that counter-bombardment batteries, to engage warships standing off and firing into the Forth at long range, should be established on the north and south shores of the Forth, in the vicinity of Fife Ness and Gin Head. The siting of a further battery of two 6-inch BL guns on Mk V (45°) mountings near Gullane was proposed to cover the narrower portion of the Forth in conjunction with the battery at Kincaig (Elie). The precise relationship between this discussion and the establishment of the Fidra ‘emergency’ Battery at some point early in 1940 is not clear. In August 1941, the Home Forces Coast Defence Committee recommended the installation of two 9.2-inch batteries to north and south of the Forth, but again these proposals came to nothing.²

12.1 Kincaig, Elie

Kincaig was the final permanent battery to be sited in the Forth. It was hurriedly constructed during the early days of

the Second World War, but later modifications provided it with the most modern guns in the estuary, and the only gun-laying radar. The site’s height (60m above sea level) and location made it an obvious choice. Its main objectives were to: protect merchant shipping in the convoy anchorage; act as advance look-out station for the Forth defences as a whole; prevent the entry of any enemy vessel; prevent beach landings; and engage at long-range, enemy vessels approaching or attempting to bombard shipping in harbour.

For the coast battery proper, there are two main sources of information: the Fort Record Book³ and a file of correspondence relating to the defences of the Forth.⁴ While the Fort Record Book has useful maps and photographs, its documents are sparse and often undated. The ‘History of the Work’ on the Fort Record Book is explicitly based on the memories of men who had served at the battery for four years, rather than on documents, and is consequently perhaps not wholly reliable. RM has collected reminiscences of the battery, both from personnel who served there and from local people, which informed his book about the area, written with Mike Ramage.⁵

In late September 1939, four 25-pdr field guns (from 109 Battery, 78 Field Regiment, RA) were sent to Kincaig to provide temporary cover while the more permanent battery was built.⁶ The field guns were provided with a temporary wooden Battery Observation Post, c 2.5m higher than the guns.

Two 6-inch BL Mark VII guns were mounted on CP MK II 15° mountings in October by Major R Shrive, RA, of the Armament Withdrawal Party. They were on simple holdfasts set at ground level, without any form of cover or protection, which at least had the advantage of allowing them a large arc of fire, including inland (Fig 12.1; Fig 12.2).⁸ It was only in January 1940 that the War Department bought the battery site.⁹

A two-storey Battery Observation Post (BOP), designed to look like an abandoned domestic building, was built a short distance behind the guns, where it had the best all-round view of the battery’s field of fire. The upper level contained the Battery Command Post and the telephone exchange. The lower

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level contained the watch-room and stores. Two Royal Marine signallers were stationed to communicate with shipping using semaphore and Morse code.⁷ After about a year, three RN signallers were sent to assist.

Behind the summit of the hill on which the guns were positioned, and therefore out of the line of fire, six underground magazines were completed in June 1940 by unit labour and civilian contractors. These magazines were used to store high explosive, armour piercing, solid shot, practice shells and cartridges (Fig 12.1).

During the early construction of the battery, the camp's main supply of water came from a single tap, which says much about the conditions on the emergency batteries.

At first, there was only a single barbed wire perimeter fence, extending down the cliffs on both sides onto the beach. A small armoury near the battery office contained a stock of Lee Enfield .303-inch rifles for use by the camp's garrison. There were no anti-aircraft defences. In the early days, between 20 and 30 National Defence Corps members were stationed at the camp to act as sentries and man the searchlights. A map

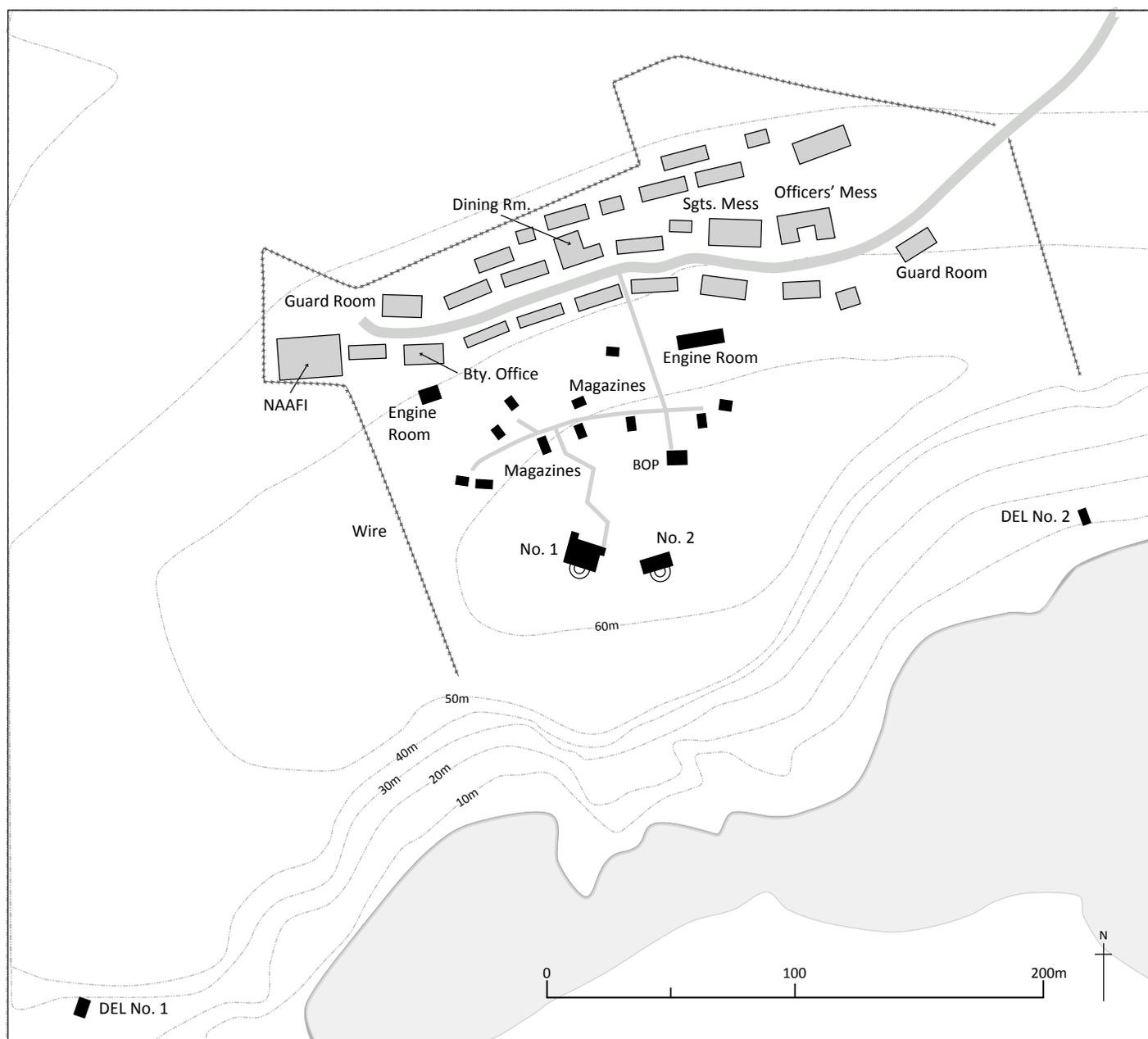


Figure 12.1

Plan of the first Mk VII 6-inch guns and battery accommodation at KinCraig, in 1940 (© Gordon Barclay)

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of Polish Army dispositions between October 1940 and March 1941 shows that a company of Polish infantry of the 4th Cadre Brigade was positioned just north of the battery, with defences facing landward as well as machine-gun positions on the cliffs. The coast of Largo Bay, just to the west, was heavily defended by the Poles.¹⁰

In April 1941, Brigadier A G Rolliston, RA, the Commander Royal Artillery at Scottish Command, reported his concerns to GHQ Home Forces about the lack of overhead protection of the coast defence gun crews from aerial attack. He dismissed arguments that such shelters would unnecessarily restrict the arc of fire of the guns because it was 'of no use having guns which [could] cover wide expanses of sea if they can't shoot into those areas owing to the disablement of the detachments'. He noted, consequently, that 'it has been decided to ignore the landward arc of Kinraig battery and instructions have been given for gun houses to be built...'.¹¹

He also reported that the duty shelters at Kinraig were 'terrible places, dark, dirty and gloomy', while recognising that they had been built as an emergency: 'new ones are to be built when a decision on the gun-houses is arrived at'.

The 6-inch guns were each provided with a fighting light in the form of a coast defence 90cm Mk III moveable searchlight. The battery was also to be provided with an emergency 'beach light', an aircraft homing light and a spare 90 cm Mk III lamp and reflector.

DEL emplacement No. 2 was built above the shoreline at the bottom of the cliffs, south-east from No. 2 gun, while DEL No. 1 was sited half-way down the cliff slope to the south-west of the battery and was accessed by a flight of steep concrete steps. Although the searchlights could be operated automatically from the Close Defence Battery Observation Post (see below for a description of this structure) using a 'Magslip' system, they were usually operated manually by an attendant, who received instructions by telephone from the BOP.

As part of the discussion about strengthening the outermost line, in July 1941, GHQ Home Forces decided to replace the existing guns at Kinraig with modern Mk XXIV 6-inch guns on Mark V 45° mountings (Fig 12.3). The principle had been established that coast artillery would be more effective firing in salvos of three shots, and so three gun houses were built at Kinraig; however, only two guns were mounted. The combination of the improved gun, with a higher muzzle velocity, and the increase in elevation allowed a significantly longer range of 24,500 yards (almost 22,000m) instead of 14,000 yards (just over 13,000m).¹² It was estimated that gun production schedules would allow the new guns to be supplied in October 1941. The new emplacements would be sited further apart and dug into the ground, to lower the height of the gun houses.¹³

The primary role of the newly equipped battery was the close defence of the Largo Bay convoy mustering area, although it was also expected to act as a counter-bombardment battery

until such time as the proposed heavier counter-bombardment guns were mounted nearer the mouth of the Firth.

The existing BOP was retained as the Close Defence (CD) BOP, and was provided with a Depression Range Finder with a range of 1,500–14,400 yards (c 1,370–13,170m).

A separate counter-bombardment (CB) BOP was sited on the ridge at Craig Heugh, c 370m to the east of the original BOP, just inside the camp's eastern boundary. It was equipped with a simplified Fire Direction Table (FDT) and a Depression Position Finder. The DPF had an operational range of 5,000–27,000 yards (c 4,570–24,700m). The rectangular structure was provided with embrasures for musketry defence and lay within its own barbed-wire enclosure (Fig 12.3). It appears to have been rarely used.¹⁴

The Battery Plotting Room (BPR) and Command Post (CP) layout was completed in June 1942. The CP was a small underground bunker located a short distance north of No. 2 gun, on the south side of the magazine trench from where it was accessed, and the BPR (Control Room) was a large room sunk into the ground a short distance north-east of the CP on the north side of the service road leading into the camp. The BPR contained a large plotting table and was the control room for the battery. A Lieutenant and nine gunners manned this room. Nine separate lines of communication cables connected the BPR to the guns, CP, OPs and other main places throughout the camp by separate underground routes.

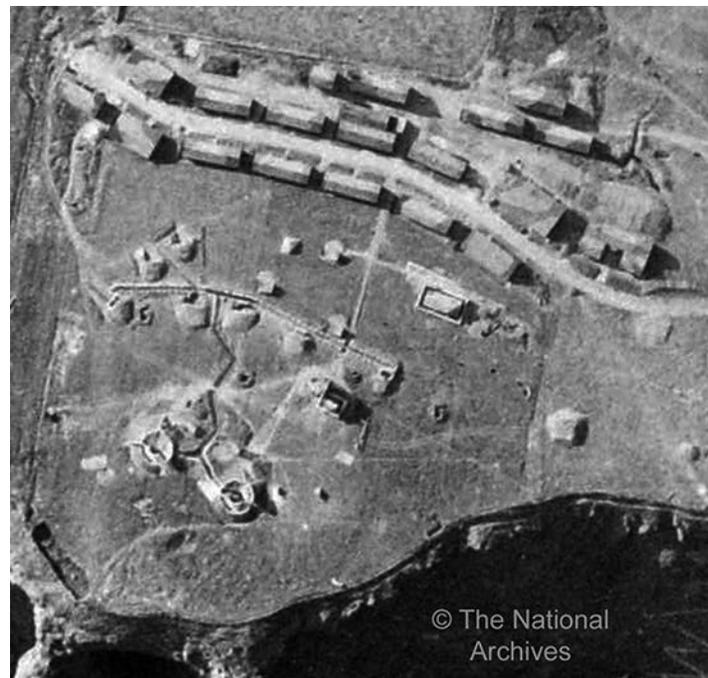


Figure 12.2
Aerial photograph of the original layout of 6-inch guns, 1 August 1940
(© The National Archives, WO 192/255)

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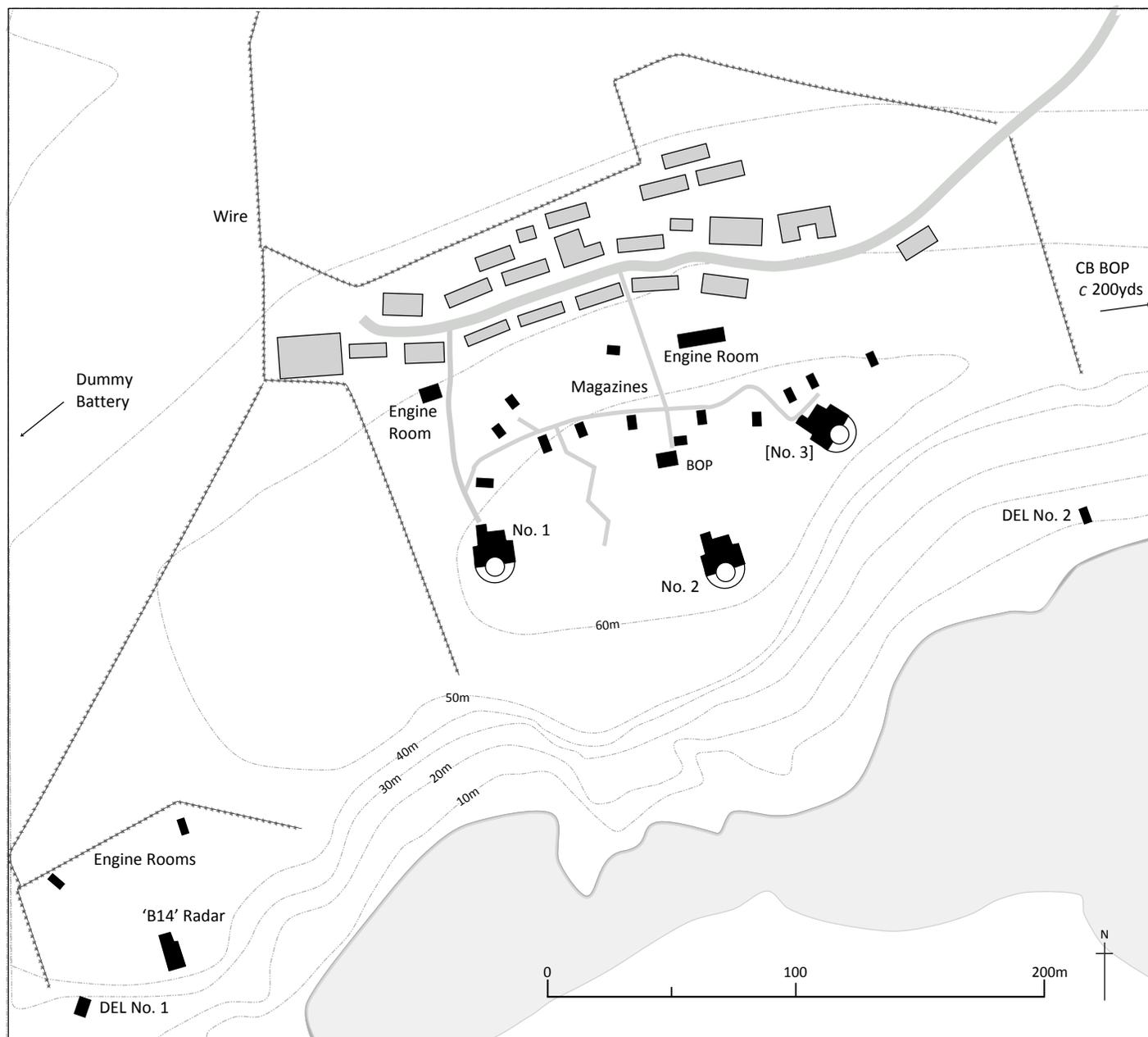


Figure 12.3

Plan of the reconstructed Kinraig battery, including the radar installation, in c 1943 (© Gordon Barclay)

Because the new Mk XXIV guns were not available for Kinraig by the time the 45° mounts and the new gun houses were complete (February 1942), two Mk VII guns were temporarily mounted in May 1942. The Mk XXIV guns were finally issued in April 1943.¹⁵

The sunken roadway linking the magazines was extended at this time to service additional magazines for the third gun position. As it transpired, the third gun position, although built, was never armed.

Although Kinraig's new guns had a maximum effective range of 24,300 yards (c 22.2km) by day, by night the effective range was limited by the range of the searchlights to c 4,000 yards (c 3.6km). This meant that during the hours of darkness there was a gap of c 7,000 yards (c 6.4km) in the centre of the channel in which enemy vessels would be immune from the guns at both Kinraig and Fidra, an unsatisfactory state of affairs that continued until the Kinraig Battery was equipped with radar.

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In November 1941, the decision was made to site a coast artillery radar set at Kinraig. Hitherto, the battery had been able to call upon the services of the radar station sited between Craill and Caiplie on the Fife coast. Radar designed for use with coast artillery had been developed earlier that year and could detect a surface vessel at a range of 35,000 yards (32km) or more and follow its course, giving accurate ranges and bearings as well as recording shell splashes from which corrections could be calculated. Smaller vessels could be picked up at 12,000 yards (c 11km) and the equipment could also detect low-flying aircraft. The radar equipment was to form part of a coast-watching cordon around the coast of Britain, but it was only in September 1942 that a Coast Artillery (CA) No. 1 Mark II radar set was installed at Kinraig within a purpose-built blockhouse, designated building 'B14'. This emplacement was located 275m south-west of No. 1 gun. Two 7ft (2.15m) parabolic dishes were mounted on its roof (Fig 12.4). The B14 emplacement comprised a visual Radar Observation Post at its front overlooking the cliff edge and the mouth of the estuary, a radar transmitting and receiving room directly behind the OP and a small engine room at the rear of the building. The Radar OP was provided with a director instrument for taking bearings of potential targets. Once established, the range and bearings would then be communicated by telephone to the Battery Plotting Room and used to aim the 6-inch guns.

The arrival of radar meant that it was now possible to engage hostile vessels at any time and in any weather across the whole width of the estuary and out to sea. Working together, all three Observation Posts (CD, CB and Radar) would have given the battery complete cover over all the areas of sea within range of its guns. In principle, all three OPs would send bearings and ranges of targets to the FPR, where the Fortress Plotter would convert these into map co-ordinates as he received them and chart the course of the targets. These co-ordinates would then be communicated to the battery, where they were converted into battery bearings and ranges by a co-ordinate converter. A Fire Direction Table mechanically calculated the necessary travel, ballistic and spotting corrections. The required elevations and direction were then passed to the guns by means of dials. Fall of shots reports would be passed from the OPs to the BPR, where the necessary adjustments could be made. Whenever the May Island's indicator loops detected an unidentified crossing, Kinraig Battery was informed by telephone and the guns were made ready for action.

In 1943, the fort was manned by two Regular RA officers and 138 other ranks (although the full complement was c 188 men). Documents associated with the 'Flood Tide' reduction in Coast Artillery personnel noted, in September and November 1944, that Kinraig was still manned by Regulars.¹⁶ It proved difficult to recruit Home Guardsmen for service at the relatively isolated battery.¹⁷

Dummy batteries were built early in the war at a number of places in the UK, to draw enemy gunfire away from the



Figure 12.4

The roof of the radar building with the parabolic antenna
(© John Handscomb Collection, reproduced by kind permission of the Handscomb family)

real battery.¹⁸ Kinraig was the only battery in Scotland for which we have evidence of a dummy battery.¹⁹ It lay c 300m west-south-west of the real one (the three 'guns' lying between NGR NT 46186 99801 and NT 46356 99799) and appears to have been built between April 1941 (when it is not visible on an aerial photograph) and 2 July 1942 (when it was recorded on a plan on the Fort Record Book). There are very clear but undated aerial photographs of the dummy battery on the Fort Record Book (Fig 12.5). Advice on the scale and cost of dummy batteries (c 10% of the cost of a real one) had been provided by the War Office in the form of a pamphlet titled 'The Concealment of Coast Defence Works' in 1938;²⁰ early in the war, some units had clearly been going too far, even employing film-set construction companies.²¹ In December 1940, it was reported that 'Scottish Command are having much trouble over their dummy batteries' and had not received a War Office specification of how they were to be built.²² Interestingly, the

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Figure 12.5

Undated aerial photograph showing the three dummy guns, positioned about 500m to the west-south-west of the real guns (© The National Archives, WO 192/255)

Kincaig dummy was much more likely to have been more than a mere Royal Artillery ‘wheeze’ to confuse the enemy. In September 1941, the fields around Kincaig were the site of a major exercise by Polish paratroopers simulating an attack on the real battery at Kincaig in the presence not only of many senior British officers, but also the Polish Prime Minister, General Sikorski. As the Poles would not have been able to use the operational battery as the target of their exercise, the dummy battery is more likely to have been built to serve that purpose.²³

In references to the land defence of the battery from late 1942 or early 1943, it was noted that ‘Polish Forces at Elie may be available to assist in defence of Kincaig’.²⁴ Kincaig was also issued with two field guns, a 75mm and a 4.5-inch howitzer (practice-firing being referred to from the spring of 1943).²⁵

During 1942, an Unrotated Projectile anti-aircraft projector was issued to Kincaig. As already noted above (Section 10.2), a man had to sit inside the device to operate it. The test-firing, however, only succeeded in blowing the door open. Fortunately, the operator was uninjured. The results were unimpressive; when the men did finally get the device to launch the rockets, some landed only a few yards away. Further efforts to master the weapon were soon abandoned. Reference is made to 40mm Bofors AA gun practice at Kincaig in July 1944.²⁶ As noted above, the field guns, and perhaps also this Bofors gun, may have been intended to familiarise men on the sort of weapons they might use when transferred out of shrinking Coast Defence units.

The battery camp lay on the northern, reverse side of the hill, protected from direct fire. It comprised a guard house, officers’ and sergeants’ messes and accommodation at the east; a street of seven living huts for the men, with a large dining hut in the middle and ablutions to the north (Fig 12.6). At the

western end of the street were the guard room and battery office, with the large NAAFI at the end, with a separate hut for the accommodation of its staff. Three further living huts lay to the north. Between the camp and magazines were two engine houses and stores.²⁷

The life of the battery

From Thursday 8 December 1939, weekly concert parties were organised in the NAAFI at the camp by the Reverend R L Kilgour. The frequency of the concert parties soon diminished to two or three a year. Dances, well frequented by local people, were also held in the NAAFI.

During 1940 or 1941, Captain Douglas Grant, who was stationed at Charles Hill Battery, near Aberdour, was detailed to lead a night-time practice attack on Kincaig Battery, to test the defences of the camp. Twenty to 30 men set off crawling across the open moors from Kilconquhar railway station towards the battery. Eventually, the raiding party arrived at their objective and successfully surprised the garrison, who, after recovering from the ignominy of ‘capture,’ reluctantly opened the canteen and treated Captain Grant’s men to a cup of coffee before they returned to their base.²⁸

In January 1940, George Tofts was one of two signallers with the Royal Marines who were sent to Kincaig to communicate using an Aldis Lamp to signal Morse Code to the two armed trawlers stationed at the mouth of the Forth and occasionally to other vessels, and to carry out vessel recognition.

On 10 June 1940, the day that Italy declared war on Great Britain and France, Tofts was duty signaller. Two Italian merchant ships were anchored off Methil and were to be boarded by Royal Naval personnel and their crews interned, but one of the vessels tried to make a run for the estuary mouth. The naval authorities alerted Kincaig Battery and when the vessel was c 4.8km off Chapel Ness, the crew at No. 2



Figure 12.6

The main street of the Kincaig camp, looking west. On the right are a living hut, the dining hut/cookhouse, and two further living huts (© John Handscomb Collection)

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gun fired a single solid bring-to round a short distance ahead of the vessel's bow, sending up a huge spout of water. The Italian crew then capitulated.

The examination trawlers would signal the BOP at Kinraig if they discovered any mines in the Firth of Forth, whereupon the duty signaller would telephone this information to the Chief Examination Officer at Leith or to the Extended Defence Officer at Inchkeith.

The camp's NAAFI received its supplies from the depot at Balgowan in Perthshire, sent by rail to Cupar and uplifted by camp transport. Bread was supplied by the Leven Reform Co-operative Store, sent by train to Kilconquhar railway station. Meals were served in the mess room, which was located about mid-way along the lower tier of the camp.

On most days, a baker from Elie would arrive after 4 p.m. with his van to sell cakes to the men through the camp fence. Sometimes these cakes were given on credit, because the soldiers were so poorly paid.

The Irish Nazi William Joyce ('Lord Haw-Haw') included Kinraig in his propaganda radio programme *Germany Calling*, boasting to British listeners that the Germans were going to bomb 'Kinraig Battery'. Despite this, Kinraig had a fairly quiet war and its guns were never called upon to engage enemy vessels.

At the end of the war in Europe in May 1945, when the battery sentries on the beach and cliffs were withdrawn, four local boys decided to 'do' the Chain Walk, something which had not been possible during the war years.²⁹ After finding a gap in the barbed wire fence, they scrambled up the steep slopes, which brought them out under Kinraig's guns. On discovering no one was about, the boys climbed on top of the guns and gun houses where they played for a short while before they continued their adventure in the direction of Shell Bay. As they neared Kinraig Point, the boys saw what appeared to be another large gun battery, constructed near the point, close to the shore. Up until this time they had been unaware of any other large guns in the area apart from those mounted above Kinraig cliffs. However, when they arrived at this gun battery they were amazed to find the gun positions were in fact the dummies, having wooden poles for gun barrels and timber turrets covered with roofing felt.

Major Johnstone, RA, OBE, took over command of Kinraig round about this time. He had the reputation for being a strict disciplinarian and, according to some accounts, he ran the camp like his own private army, with the personnel having no recourse to anyone else but himself. In fairness, some found the discipline was not as strict as at some other camps and felt it quite an enjoyable posting.

During his National Service, Gunner Roy Lewis from No. 3 Battery was stationed at the camp from August 1947 until July 1949. Lewis estimates there were c 150 men at Kinraig during his time. The Master Gunner (Warrant Officer) and



Figure 12.7

Photograph of the crew in front of their gun, at a TA camp in 1949, with the roof of the BCP (disguised to look like a derelict building) visible in the background. The gun is the southern of the guns, after the battery was reconstructed (© Bruce Stenhouse Collection)

two or three others, who had formerly been prisoners of the Japanese during the war, had been sent to Kinraig to train the National Servicemen on the guns and other equipment. These men were permitted to wear shoes instead of boots due to the condition of their feet as a result of their brutal treatment as POWs. In the mess, these men would complain when others left food on their plates and one of them even had the habit of storing food under his bed.³⁰

After being called up for National Service and on completing his basic training, 18-year-old Gunner David Winmill from South Wales was sent to Kinraig in May 1949. He was initially detailed to train on No. 1 gun, but afterwards worked mainly in the Battery Plotting Room as a range recorder and wireless operator. The battery was below strength at that time, with the complement being 130–140 officers and other ranks, including one Major (the CO), one Captain (Adjutant), three Lieutenants, two 2nd Lieutenants, one Battery Sergeant Major, NCOs and gunners and tradesmen. In addition, there were four or five cooks. Most of the personnel were billeted in the huts, each of which held 15–20 men.³¹

On 18 May, the *Revenge* class battleship HMS *Royal Sovereign* sailed into the Forth to be decommissioned, after having spent about seven months on loan to the USSR Navy, as the *Arkhangelsk*. Although the battleship had been returned to the Royal Navy on 4 February, the slightly eccentric Major Johnstone suspected she might still have a Russian crew on board, and he ordered the gun positions and other buildings at the top of Kinraig to be camouflaged with nets and foliage from trees.³²

During 1950, the battery received two mobile 3.7-inch QF HAA guns fitted with steel cruciform platforms with folding sides, which could be lowered into position at a chosen site and

the wheels then removed. At Kincaig, they were sited *c* 180m apart, one on either side of the 6-inch gun positions, but were occasionally repositioned.

Target shooting

Practice shoots with the 6-inch guns occurred regularly, using moving targets, which took the form of a bow-shaped log raft *c* 6m long with upright, white-painted, corrugated sheeting fixed along its deck. It was first towed to a rendezvous area outside the target range until orders were given to proceed with the exercise. The target range was a large area of sea at the mouth of the Firth of Forth, *c* 16–19km from the battery, north-east of North Berwick. Once the order was given to proceed, the target was towed through the range area at a set speed. For manual sighting of the guns, the target was towed (*c* 450m behind the launch and, for radar sighting, the distance was *c* 730m). The targets were towed by fast Royal Army Service Corps launches, fitted with three 500hp Rolls-Royce Merlin aeroplane engines, capable of 40 knots (*c* 74kmh).

On one occasion, after being picked up at Burntisland, Gunner Winmill and two other servicemen were taken in the launch to the rendezvous area to await orders to tow the target. The gun crews at Kincaig were on that occasion members of a visiting regiment who had come to do a day's training. The unit was practising using the telescopic sights, for direct firing at a fast-moving target. These sights were located on either side of the gun and, when the two telescopes were lined up on the bow wave of the target, the left sight gave the target's range and the right sight gave its direction.

Once the order was given to begin the shoot, 450m of towline was run out from the winch and the launch proceeded over a calm sea at a speed of *c* 30 knots (55kph), to replicate the speed of a destroyer. After a few minutes, Gunner Winmill heard No. 1 gun firing. It took several seconds for the projectile to travel from the gun to the target, and on scanning the skyline for the shell, the men in the launch suddenly became aware that it was travelling in their direction: it landed in the sea no more than 30m behind them, sending up a mighty spout of water. The now terror-stricken radio operator began to scream into the radio microphone to stop the shoot, as it was clear the battery was sighting on the launch and not the target.

It would only be a matter of seconds before the next shot, and at this point the Captain of the launch opened the throttle to escape the barrage. As the launch was carrying some 1,200 gallons of high octane fuel, being hit even by a solid shot shell could still have caused a massive explosion.

The wireless operator at Kincaig had difficulty understanding the frantic messages from the launch, but the shoot was brought to a sudden halt by one of Kincaig's own NCOs, who had looked through the gun's sights and realised the gun crew had been aiming at the launch and not the target.

There was no mains electricity and power was supplied by three diesel generators, which had to be started up at 6 a.m. every morning. They were switched off at midnight, leaving the camp without power until the following morning. The guardhouse was provided with a stove for heating and, during the black-out hours, an electric torch for light.

In October 1950, the troops were withdrawn from Kincaig and the battery went into care and maintenance, although the 6-inch guns continued to be used for training/practice shoots until 1956.³³ During the 1950s, units from 414 Coast Artillery (Forth) TA based at Easter Road in Leith visited Kincaig to train on the 3.7-inch guns, radar, range-finders, predictor and searchlights during their annual summer camp at Pettycur, Kinghorn. Finally, in October 1956, the site was closed and the equipment dismantled.³⁴ All stores were removed, apart from the guns, mountings, projectors, radar and searchlight generators, which were sold as scrap. One of the guard huts was sold to Elie Golf Club and was used as the Starter's Hut until 2015.

Surviving remains

Much of the battery survives. Efforts to reduce or remove the three gun emplacements, the CD BOP, main engine room and No. 2 searchlight have left these sites filled with the rubble from their superstructures. Radar building B14, with its two engine rooms, remains relatively intact, although the Nissen hut has long since disappeared. The CD BOP at Craig Heugh is now roofless but its walls still stand prominently on the ridge. All the magazines remain in good condition, without their steel doors, although some are in-filled with rubbish and earth. Two of the magazines were, until recently, used in connection with a modern radio mast erected at the gun positions. The Command Post, west engine room and underground water tank on the south side of No. 3 gun position remain relatively intact.

A gun holdfast lies on the Fife Coastal Path a short distance east from No. 3 gun position. This mounting may have been the site for the anti-aircraft rocket launcher which was unsuccessfully tested in 1942. A larger holdfast for the original No. 1 gun is also still visible a short distance east of the later house for that gun's replacement.

12.2 Fidra, Dirleton

Fidra was one of a series of emergency batteries erected in the first 18 months of the Second World War (Fig 12.8); in Scottish Command, the sequence ran from 301 Battery at Sullom Voe in Shetland, through Fidra at 309, and ending at Berwick-upon-Tweed at 310 (Berwick was in Scottish Command until October 1940). The role of the emergency batteries was recorded as: (a) to prevent the capture of the gun site; (b) to prevent troopships, transports, landing craft etc

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from approaching the beaches; (c) to engage troops in boats or landing craft or tanks attempting to gain footing on the beach; (d) in the last event to engage landwards targets, and then only if there were no ships or landing craft to engage.³⁵

The battery at Fidra is perhaps the least well-documented battery in the Forth defences. It lay not on the island of Fidra³⁶ but on the adjacent mainland, on a site now occupied by a modern house. There is a story that the adoption of the name 'Fidra' was intended to mislead German intelligence as to the exact location of the gun positions; certainly, considerable lengths were undertaken to camouflage the site. On 30 May 1940, two 6-inch BL MK XII guns on P VI 15° mountings were sent to Archerfield Point near Dirleton on the Lothian coast opposite Elie. They were erected on-site in June and originally named 'Dirleton Battery'. Tom Porteous, a forestry worker at Archerfield Estate, was given 24 hours' notice in which to vacate his cottage, such was the hurry to construct the defences. Oral history suggests that Major Douglas Grant was given the job of designing the layout for Fidra Battery.

The two guns were mounted on concrete platforms set at ground level. They were provided with two anti-aircraft-type searchlights which were mounted in the open on concrete plinths sited to either side of the guns, to illuminate their targets at sea.

No contemporary plan of the Fidra Battery has been located but a series of official photographs was taken in November 1940. Both this battery and its fellow at Berwick-upon-Tweed were at first concealed inside shelters of heavy canvas painted to resemble small single-storey cottages (Fig 12.8). The sparse Fortress Record Book for Berwick has a sketch plan of that battery, which probably had similar arrangements as Fidra – the very minimum was provided in the way of offices, stores and accommodation.³⁷

In December 1940, an inspection revealed that conditions at Fidra Battery were very poor for the 52 men who were stationed there. The battery had to 'cart all its water and the men have to go seven miles in an open lorry if they want a bath'. It was considered essential that a piped supply and a greater storage capacity be provided, if only because the battery lay in a pine wood and had no water for fire-fighting. The cost of £800 was approved in January 1941. Conditions at the camp were assessed as satisfactory in April 1941, although a good deal of work was still to be completed by civilian contractors.³⁸

Fidra received concrete gun houses at much the same time as the other batteries in the Forth. A report dated 23 March 1941 mentions that only one of the gun houses had a roof by that date, and that the second gun would have to be out of action for a week or two while the concrete of its shelter set.³⁹

The BOP was erected at the top of a short, steep slope behind the guns and was given a tiled, ridged roof so as to resemble a domestic building (Fig 12.9). A single DEL emplacement has been recorded by RCAHMS, presumably superseding the



Figure 12.8

One of the 6-inch guns at Fidra battery, disguised as a cottage using painted canvas (© Imperial War Museum H 5557)

earlier open AA searchlight installed in 1940. This structure has also, however, been identified as an observation post.

A reinforced concrete magazine (still surviving) was located behind the guns and to the south-east lay the hutted encampment and an engine room, apparently concealed in trees. RCAHMS has also reported a sighting of what may be the accommodation site, comprising eight buildings at NT 5039 8595 on aerial photographs taken in 1962. A second engine room was located in a depression to the west of the guns.

In October 1940, it is recorded that Fidra was to be incorporated, for command purposes, into the Forth Defences group, titled at this point 'Leith Port'.⁴⁰ Although Fidra Battery saw no action during the Second World War, a German bomber did offload its bombs nearby on 3 September



Figure 12.9

The Battery Command Post for Fidra battery, disguised as a domestic building, now demolished (© Ron Morris)

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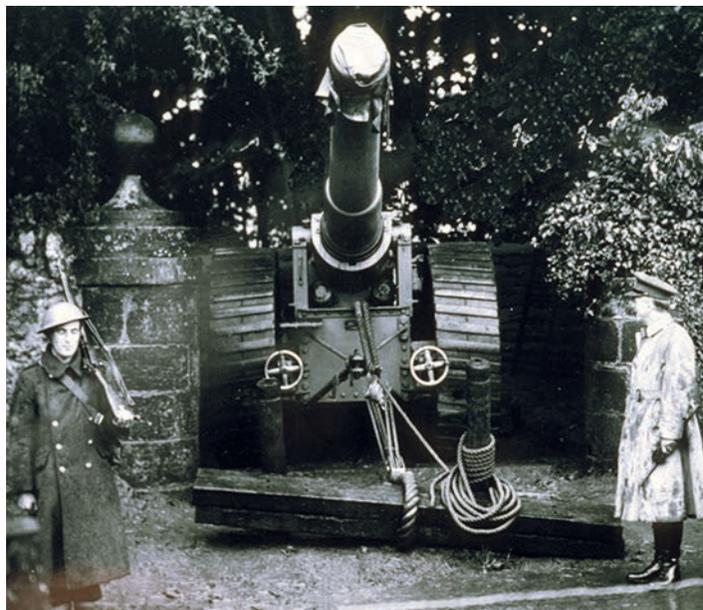


Figure 12.10

One of the two 6-inch naval guns on field carriages. These field versions were of First World War vintage (© Bruce Stenhouse Collection)

1940. Unlike Kinraig, Fidra was never developed into a permanent battery. In June 1943, Fidra was recorded as being a 'Close Defence' battery manned by the Home Guard;⁴¹ by September, there were three HG officers and 105 other ranks.⁴² By January 1944, Fidra had been reduced to care and maintenance.⁴³ Fidra's guns were removed in October 1945. Practice firing of a 4.5-inch howitzer at the battery is recorded in July 1943.⁴⁴

Survival

What survives from the site is a magazine currently used as a store, the westerly engine room hidden in a dense thicket of sea buckthorn, the close defence OP overlooking the beach and the concrete plinths for the searchlights. The gun positions have been consumed by the more recent extensions of Marine Villa, formerly a cottage adjoining the battery.⁴⁵

12.3 Dunbar

Two further guns were stationed in East Lothian, at Bowerhouse, near Dunbar (NT 66604 76696), as part of the anti-invasion defences, to tackle ships and boats carrying invading forces.⁴⁶ These were two First World War vintage 6-inch guns mounted on field carriages, originally used as heavy artillery on the Western Front (Fig 12.10). In November 1940, 155 (Lanarkshire Yeomanry) Field Regiment, RA, was responsible for artillery support for aerodrome and beach defence between Dunbar and Prestonpans. The regiment was

at that time, after Dunkirk, equipped with a mixed bag of old guns – 4.5-inch howitzers and French 75mm guns – and two batteries did not even have guns at this stage. The two troops of 'C' Battery were equipped with four 4.5-inch howitzers and two 6-inch guns respectively. The battery's observation post was at St Baldred's Cradle, between Peffer Sands and the mouth of the Tyne, just west of Dunbar.⁴⁷ An inspection in April 1941 reported that 'Detachment, 8th Defence Regt RA. [illegible] two 6" guns on wheels in the DUNBAR area. Good and [?]clean commanded by a smart Regular acting captain of three years' service ...'.⁴⁸

12.4 The May Island

With the development of the Rosyth Naval Base and the build-up of naval infrastructure, a series of War Signal Stations was planned for the islands (including the May) and both coastlines of the Forth Estuary to provide continuous lines of communications with Royal Naval vessels in peacetime and all seafaring vessels in wartime. Some of these War Signal Stations were to be manned continuously while others, like May Island, were only to be manned on mobilisation.

In November 1910, the Admiralty leased from the Northern Lighthouse Board a small area of land on the high ground east of the main lighthouse on the May to build a WSS with flagstaff and semaphore. When finally completed, it had the appearance of a bungalow with east-facing bay windows and an open observation platform at the east end (Fig 12.11).

First World War

Before Britain joined the war, but with the international situation deteriorating, a detachment of Coastguards was sent



Figure 12.11

The War Signal Station on the Isle of May in its first form
(© Isle of May Bird Observatory archive
www.isleofmaybirdobs.org)

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to the May in July 1914 to man the WSS. At that time, the Coastguard service acted as a reserve for the Royal Navy and carried out a number of duties on its behalf, such as signalling and wireless telegraphy.

In the spring of 1914, communication cables were laid to the island and at that time the *Edinburgh Dispatch* reported the May was to be fortified, and that 'the island was admirably adapted for gun batteries on the rock gallery system from which the weapons could be fired without much chance of being destroyed by opposing fire'. We have found no trace of any official planning for this.

At the outbreak of war, a flotilla of torpedo boats was employed on anti-submarine patrol duties within the Firth of Forth and surrounding North Sea. Two of these torpedo boats operated from the May Island to provide a rapid response to any sightings of enemy submarines.

As all navigation lights in the Forth were extinguished, the work of the torpedo boats was much hindered and some craft ran aground as a result. To aid navigation, three 'secret' lights were erected in the Firth; one at the May Island, one on the balcony of Elie Ness lighthouse tower and one at Eyebroughy Point on the south shore of the Forth.⁴⁹ The three lights were to be visible only to a distance of c 8km, and the May light was to be visible only to the west.

By the end of November, it was found necessary to relight the lighthouse on the May whenever any Royal Naval ships larger than a torpedo boat entered the Firth during hours of darkness. Ships passing within c 5km of the May Island were clearly illuminated by the light operating at full power, thus exposing them to the danger of a torpedo attack, and arrangements were made with the Northern Lighthouse Board to light, when requested, an oil light of lesser brilliancy.⁵⁰

The May Island was also the pilot station for the Forth from November 1914 to March 1915; there was so much warlike activity in the estuary that compulsory pilotage was needed from the May westward and accommodation for 50 pilots was established on the island, in Thistle Field. The Forth Pilots were withdrawn from the May in March 1915, pilots subsequently being taken on board closer to Inchkeith.⁵¹

During the first half of the war, the May Island was not provided with any heavy armament but, according to a lightkeeper who was stationed on the island in the inter-war years, a gun of some description was mounted in the upper part of Chapel Field, in a spot still known as Battery Park. It is possible that a mobile 6-pdr was placed on the island, in part as an anti-aircraft measure against Zeppelins, which often made landfalls in the vicinity of May Island, St Abb's Head or Fife Ness. Admiral Lowry had asked, in May 1916, that surplus 6-pdrs from Rosyth be deployed in this role, but his scheme was turned down.⁵²

Inter-War years

In 1919, the Admiralty obtained two more pieces of ground on the island to construct a Wireless Telegraphy Station and a small oil store. This lease and that for the site of the WSS were terminated at Martinmas in 1924, following large cuts in Admiralty expenditure.

In September 1934, the Northern Lighthouse Board granted the Midlothian Ornithological Club permission to use the now redundant War Signal Station to start the first co-operatively manned bird migration study centre in Great Britain. The building was by then the only ex-Admiralty building on the island not to have been demolished. When a party of Club members landed on the island on 2 September 1937, however, they found Royal Naval personnel in residence in the building and were obliged to camp near the south end of the island. A Royal Naval cable ship arrived off the island to



Figure 12.12

The armoured tail cables of the indicator loops, as they come ashore on the May Island (© Ron Morris)

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lay communication cables and indicator loops on the seabed as part of the defence arrangements planned for the Forth.

A concrete base was also laid about that time opposite the lightkeepers' quarters in Fluke Street in preparation for the possible future erection of a portable control station for the loops. This control station took the form of a long corrugated hut which was stored at Rosyth and which could be erected on-site within 24 hours.⁵³ Tail cables of the indicator loops were laid on the island between two huts erected at the north side of the WSS, a gully (later called 'Cable Cleft') and a hut near Altarstanes landing at the north-west of the island (Fig 12.12).⁵⁴ The Navy left the island on 21 September, allowing the Club to return to their 'bungalow' for the time being.⁵⁵

In June 1938, a hut and the control instruments for the indicator loops were put in place on the island.⁵⁶ Although the Navy was steadily building up its presence on the island, it was still being visited by excursionists during the summer months. The naval authorities thought it undesirable to stop this traffic in case the rumour that the island was being 'fortified' spread.

In the autumn, further buildings associated with the loops, wireless and their infrastructure were erected. The Admiralty also took over the WSS building and planned an octagonal glass observation room on top of the open observation platform and erected a c 21m-high signal mast alongside it.⁵⁷ The island was closed to visitors in September 1938 under the terms of the Defence Regulations. The station was still not permanently manned and the lighthouse keepers agreed to undertake the duties of caretakers.⁵⁸

Second World War

There are few official documents recording the May Island's role in both wars. However, in the early 1990s, a number of



Figure 12.13

The War Signal Station as it was reconstructed in the Second World War
(© Ron Morris)

ex-naval servicemen who had served there during the Second World War were traced and interviewed by one of us (RM).

In late August 1939, with the prospect of imminent war, the fixed anti-submarine defences were brought into an immediate state of readiness. The May Island received a garrison of Royal Naval Volunteer Reserve and Royal Naval pensioner personnel which, at its peak numbered c 70 men, and the island effectively became the 'stone frigate', HMS *May Island*. The May Island's role was to detect, contact and identify all vessels, surface or submerged, approaching or leaving the Forth estuary, and to act as a point of communication between these vessels and the naval authorities upriver. All Allied submarines were to enter or leave the estuary on the surface.

During the restoration of the WSS, the Navy built a wooden roof over the observation platform on the top of its flat roof to offer protection from the elements (Fig 12.13). At first, the platform was open on all sides, but windows were added later in the war. The WSS contained a Signals Distribution Office (SDO) on the ground floor, which housed the island's telephone exchange and quarters for the Signal Officer who was in charge of the station. There were also direct telephone lines to Royal Naval offices at Leith, HMS *Cochrane* II, Naval HQ *Pitreavie*, the Extended Defence Officer at Inchkeith, Royal Naval Air Station, Dunino, and a civilian line to Anstruther exchange.

Besides the Signal Officer, the WSS was staffed by a Chief Yeoman, three Yeomen, and 12 Signalmen, who were divided into four watches. Normally one Yeoman, or the Chief Yeoman, and one Signalsman, manned the SDO, while two other Signalmen manned the tower.

Initially, a fleet of five armed anti-submarine trawlers operating from Granton was assigned to the island's defences. These were augmented for a time by five requisitioned drifters from Buckie (based at Anstruther) to act as look-out vessels during times of poor visibility. At any one time, two or three of the A/S trawlers patrolled the estuary mouth inside the loop system. The examination vessel patrolled further upriver (nearer to Kincaig Examination Battery) so as not to interfere with A/S trawlers. Use of the island's lighthouse was restricted during the Second World War, but incoming convoys would occasionally request that it be illuminated for their safe passage.⁵⁹

Indicator Loop Control Station

Whenever a steel-built vessel passed over an indicator loop, the vessel's magnetic field induced a small electric current in the cable, which was recorded in the control station. All convoys were carefully checked in and out of the Forth, as their presence could provide cover for an enterprising U-boat attempting to enter the estuary undetected.

There seem to have been six Harbour Defence ASDICs (HDA) anchored to the seabed west of the guard loop system

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Figure 12.14

The Loop building on the Isle of May, now demolished (© Ron Morris)

at the May Island; four of them ('C' to 'F') are shown on a chart relating to an anti-submarine exercise in June 1943, and we believe that 'A' and 'B' continued the line to the south (Fig 7.1). As with the loops, they were connected by cables to the control station on the May from where they were operated. The ASDICs could determine the bearing of a submarine. Proposals in 1943 to relocate the May HDAs upriver may have resulted in one being moved to protect Inchkeith.⁶⁰

The Control Station was also known as the HDA Hut or the Loop Room (Fig 12.14). It consisted of three apartments: an engine room containing two diesel generators; a central monitoring room housing the instruments for operating the indicator loop and ASDIC devices; and a radio room, from where radio contact was made with the anti-submarine trawlers on patrol. Whenever there was an unexplained crossing of the loops, the ASDICs were turned on and the A/S trawlers were alerted.

During late summer 1940 a small Royal Naval station under the command of May Island was set up at Canty Bay on the Lothian coast, with a look-out on Gin Head, forming part of the 'May Island-Canty Bay Indicator Loop Early Warning System'. It was linked to May Island by telephone.⁶¹ Although it was originally planned to operate all the indicator loops south of May Island from Canty Bay, in June 1943 all the instruments for operating the loops were located within the Control Station on May Island.⁶² We believe that the Canty Bay station most probably operated only as a look-out post over the southern loops, alerting the May Island to any observed movements.

A small detachment of the Royal Observer Corps (ROC) was installed on the May in December 1941, in a small corrugated field post located on a hillock south of the Old Beacon.⁶³ There were usually eight observers on the island at a time, working in pairs, covering each 24-hour period.

Their primary function was to identify and report the movements of all aircraft sighted from the post. The ROC observers wore RAF uniforms and carried revolvers. Their normal spells of duty on the May were three weeks on, followed by three weeks off. However, prolonged spells of inclement weather often resulted in protracted periods spent on the island.⁶⁴

Approval was granted on 4 April 1940 for the establishment of a radar station on May Island, 'to assist, but not to replace the visual control of the indicator loop system'. However, production limitations at the time made it impossible to provide a special station for the May. At the end of November 1940, the RAF had recommended the installation of a Chain Home Low (CHL) radar station on the island. The CHL stations were designed to detect aircraft flying as low as 150m. This was strongly supported by the naval authorities at Rosyth, but nothing was done. An entry in the Admiralty War Diaries for 30 January 1941 records the concern of the Commander-in-Chief Rosyth about the lack of a CHL radar station on the island: on three occasions, during the afternoons of 24, 25 and 27 January, enemy aircraft had approached the Firth of Forth from the east and had carried out extensive reconnaissance of the Forth and Rosyth Dockyard without having been intercepted by fighters. On each occasion, the first indication of their presence was received from a ship, and this suggested that there was a line of approach by which aircraft could arrive undetected off the May Island. The Commander-in-Chief Rosyth strongly recommended that, in view of the growing importance of Rosyth Dockyard, such a station should be set up on the island.

Nothing more was done about a radar station until the spring of 1942, when a Type 31 low-power, coast defence, surface-watching radar set, housed in a transportable wooden cabin (known as a Gibson box) with its dish mounted on top, was delivered to the island. It arrived on a landing craft supply boat, and had to be manhandled up the island to its site, a concrete base situated a short distance east of the WSS. Sometime afterwards, a second radar set, believed to be a Type 41, which was a medium powered version of the Type 31, was sent to the May. At some point, this was housed in a small brick building known as the Radar Operations Room, which was constructed at the west side of the concrete platform where the Type 31 set remained.

Although these radar sets were not generally used for the detection of aircraft, a number of secret calibration exercises took place to check the accuracy of the sets, which involved low-flying Walrus seaplanes from Donibristle.

The May was supplied with food, fresh water and other supplies by two contracted vessels from Anstruther, which also transported personnel. In one year alone, one vessel made 527 trips to the island. Fresh water could only be landed at Kirk Haven Harbour during periods of calm weather, as it was pumped ashore into two lime-washed storage tanks.

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The length of service on the *May* varied from a few months to several years. Leave normally consisted of two periods of ten days each year. Although weekend leave was also available every six weeks or so, few of the crew made use of it as it did not allow them sufficient time to travel to and from more distant homes.

The Commanding Officer, Lieutenant Commander Griffiths, did not take shore leave as he was on call 24 hours a day. Naval discipline was rarely, if ever, enforced, because there was little occasion for it, rather than through any laxity. Uniform was seldom worn, except for church parade, taken by the Commanding Officer, or on other ceremonial occasions. The normal day-to-day dress of the crew was either jerseys and trousers or boiler suits.

Commander Griffiths had to overcome the restrictions on women serving on ships, as he recalled:

When my radar [Petty Officer] was hurt by a fall and hospitalised ashore, I had to make an urgent secret signal to the Commander-in-Chief, Rosyth, for a relief, who arrived the next morning; a gorgeous blonde who reported to me as my new PO Radar. When I could get my breath I enquired about her experience, to be told that she was reading for her mathematical tripos at Girton, when the Admiralty put its finger on her, gave her a three months' crash course in radar, and there she was. Having a sex-starved ship's company and no wrennery, I had to make her a guest of the wardroom mess, with my wife as chaperone, to the great satisfaction of my junior officers.⁶⁵

The island was largely undefended, as Commander Griffiths remarked, 'I had sufficient semi-automatic weapons to arm an infantry platoon, and an adequate supply of ammunition; but I am sure that an enterprising U-boat commander could have landed and cut our throats like so many sheep ...'. There was a single Lewis gun for anti-aircraft defence, mounted outside the north-east corner of the WSS. In May 1946, the Extended Defence Officer, Captain George Holbson Laing, RN, in a report on the defences in the Forth, stated that 'the very valuable and delicate instruments in connection with the Loop and HDA systems were most vulnerable to air attack, and this should have been provided against by housing the engines, and instruments, in caves excavated in the rocks. The personnel could also have been protected in this way. A single direct hit from a medium-sized bomb could have put all the underwater defences and communications out of action.' Holbson identified only Inchkeith and May Island as the locations for the delicate instruments.

U-boats were frequently suspected of lurking in the vicinity of the estuary mouth, but there was only one occasion when the crewmen of the *May* were convinced that a U-boat was actually attempting to enter the Firth of Forth. This occurred one afternoon during the very last days of the European conflict and was probably the consequence of a

determined U-boat commander hoping to make a final strike before the war ended. Ratings in the loop room detected a crossing of the outer loops close to the southern end of the island. At first this was routinely reported to the SDO, but when no surface vessel was seen over the loops, the ASDICs were manned and the A/S trawlers alerted. Sometime afterwards a second crossing was detected by the inner loop system, and it was then suspected that a U-boat was floating in on the incoming tide. Destroyers soon arrived at the scene to assist the armed trawlers, and depth charges were dropped in the area. However, further contact with the 'crossing' was lost, although the destroyers and A/S trawlers maintained the search throughout the night. Early next morning, when the tide was going out, similar loop crossings in reverse order were detected, suggesting the U-boat, if that is what it was, had not tried to carry through its attack and was now attempting to leave the Forth. This led to a repeat of the previous day's excitement, but a further search by the destroyers and A/S trawlers proved fruitless.

Post War

At the end of the war, the *May's* naval complement was considerably reduced, although a presence was maintained on the island until early 1946. On 12 May 1945, the ROC Post was stood down and the personnel left the island. However, as with all other ROC Posts, the Air Ministry retained possession of the Low Light (which had been used for accommodation) and the field station for a time in case they were required for reoccupation in the event of an emergency, or for training.

The rest of the Admiralty personnel were withdrawn in early 1946, but the hatted encampment was maintained until about 1960, and Naval Lieutenants regularly visited the island for short periods with parties of adventurous cadets.

In July 1952, all the wartime communication cables laid across the island were torn up.⁶⁶

The Korean War crisis and the increase in international tension led to proposals for a new ROC post to replace the wartime post, which had been dismantled. The Air Ministry erected an Observer's Post on a 5.5m square site leased from the Northern Lighthouse Board, close to the former site. In the end, it was never manned. At about the same time, the cable ship *Iris* arrived off the *May* and laid more cables on behalf of the Air Ministry, which increased the number of telephones on the island from six to twelve.

The dismantling of the large naval huts in Thistle Field began in 1961. In August 1980, the Head Lightkeeper, in a misguided attempt to tidy up the island, set fire to the WSS and the corrugated hut which had housed its generator. All the woodwork was reduced to a pile of ashes, but the brickwork remained standing. On 14 April 1981, the lightkeepers used explosives to remove the brickwork.

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Now all that remains from the First World War period is a stone-built toilet near Holyman's Road and the concrete plinth for the War Signal Station. There is also a wooden grave marker in the old graveyard on the south plateau bearing the inscription 'WUFFY', of HMTB 28, Drowned, 25.X.14, presumably marking the grave of a pet dog belonging to a crewman from one of His Majesty's Torpedo Boats, which were stationed at the May.

From the Second World War period, there still remain the radar operations room and radar engine room buildings, as well as the concrete foundations for the ASDIC/Loop Control Station, hutted encampment and Signalmen's quarters. Sections of loop cable, in its protective armour, survive on the shore at NT 658988.

Notes

- 1 CAB 36/17.
- 2 WO 199/1110.
- 3 WO 192/255.
- 4 WO 199/1171.
- 5 Morris and Ramage 2009. The description of the battery here is adapted from their description.
- 6 Forbes 2009.
- 7 ADM 1/9849; Forbes 2009.
- 8 WO 199/1171.
- 9 Registers of Scotland, search sheet 9669, Volume 99, page 108.
- 10 A.VI.1/77 (PISM); Barclay 2013: 257–60.
- 11 WO 199/1171.
- 12 Hogg 1978: 191–2.
- 13 WO 199/1171.
- 14 WO 199/1171; Tofts, pers comm.
- 15 WO 192/255.
- 16 WO 199/528 WO 199/1171.
- 17 Osborne 2009: 196.
- 18 Dobinson 2000: 63.
- 19 A set of structures at NT 2060 7690 near Cramond, visible on a 1946 aerial photograph (RAF sortie M/105/NLA/104 frame 0620), adjacent to an Army accommodation camp, has been identified by HES as a dummy AA site (Canmore NT27NW 51); one of our informants suggested that this was a coast defence dummy, but we agree with the HES interpretation.
- 20 WO 287/78.
- 21 WO 199/940.
- 22 WO 199/940.
- 23 King 2005: 137–8.
- 24 WO 192/255.
- 25 WO 166/11409; WO 166/15002.
- 26 WO 166/15002.
- 27 There is a persistent local story that local members of a strict Brethren sect, who were conscientious objectors, were held at Kinraig at some time during the war. It is unlikely in the extreme that these men would be imprisoned in a military camp, but it is possible that they were held there temporarily while their cases were being considered. There were few British military installations in Fife in which they might have been held, as Fife was garrisoned by the Polish Army for much of the war.
- 28 Morris and Ramage 2009: 40–4.
- 29 The Chain Walk is a scrambling route c 1km east of Earlsferry along the cliff, a little above high water. Eight chains provide hand-holds on the route, which can take two to three hours to complete.
- 30 Roy Lewis, pers comm.
- 31 David Winmill, pers comm.
- 32 Morris and Ramage 2009: 61.
- 33 Morris and Ramage 2009: 69.
- 34 WO 199/1171.
- 35 WO 166/1742.
- 36 *contra* Saunders 1985.
- 37 WO 192/98.
- 38 WO 199/940; WO 199/942.
- 39 Morris and Ramage 2009: 70.
- 40 WO 166/1742.
- 41 WO 199/527.
- 42 Osborne 2009: 197–8.
- 43 WO 199/954B.
- 44 WO 166/11408.
- 45 WO 199/528.
- 46 WO 166/1567; Barclay 2013: 252–5; Allan Kilpatrick, pers comm.
- 47 WO 166/1567.
- 48 WO 199/942.
- 49 Morris 2004: 9.
- 50 ADM 137/1170; Morris 2004: 10.
- 51 Morris 2004: 5–13.
- 52 ADM 137/1170; Morris 2004: 12–13.
- 53 Morris 2004: 38.
- 54 NLC10/3/80.
- 55 Morris 2004: 21.
- 56 NCL 10/3/80.
- 57 NCL 10/3/80.
- 58 NCL 10/3/80.
- 59 Morris 2004: 40–5.
- 60 ADM 1/13135; Bruce Stenhouse, pers comm.
- 61 Evans 1950; Morris 2004: 41. ADM 1/13135.
- 62 ADM 1/13135.
- 63 NLC 10/3/80.
- 64 Morris 2004: 47–9.
- 65 Morris 2004: 31.
- 66 Morris 2004: 65; *Isle of May Bird Observatory and Field Station Daily Logs, 25 and 30 July 1952* (now stored at Scottish Ornithologists' Club (SOC) HQ, Waterston House, Aberlady, East Lothian EH32 0PY).