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## The Fortification of the Firth of Forth 1880–1977

‘The most powerful naval fortress in the British Empire’

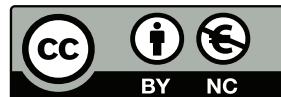
Gordon J Barclay and Ron Morris

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## Chapter 7

# THE SECOND WORLD WAR, 1938–45

*'The Firth of Forth represents the most militarily and economically important area of the Scottish east coast for British warfare.'*<sup>1</sup>

### 7.1 Growing tension, March 1938 to 1939

The reoccupation of the Rhineland in 1936 was the first indication that the Nazi regime in Berlin was prepared to risk the use of force to occupy or, in its terms, reoccupy 'German' territory. There followed the *Anschluss* with Austria in March 1938, the occupation of the Sudetenland in October 1938, the invasion of the rest of Czechoslovakia in March 1939 and Germany's ultimatum in the same month to Lithuania, to 'return' a province lost to Germany in 1919. From 1938, Britain began seriously to prepare to defend itself and on 31 March 1939 Britain and France guaranteed Polish independence.

References in an Admiralty file suggest that four indicator loops and three Harbour Defence ASDIC units had been laid in the Forth in 1937 in 25 fathom water (c 46m), and that they were due for urgent maintenance by August 1939.<sup>2</sup> Early in the war six Harbour Defence ASDICs were placed on the seabed west of the May Island loops.<sup>3</sup> The position of four of the six HDA instruments was recorded on a chart of an anti-submarine exercise on 8 June 1943, just west of the inner line of guard loops (Fig 7.1).<sup>4</sup>

Work on other parts of the anti-submarine defences began in 1938; for example, moorings were placed for the booms on the bottom of the main channel. Instructions had been issued in May to prepare the Rosyth boom defences, beginning with the A/S equipment across the main ship channel southward of Inchcolm – laying trots and other moorings in Mortimer's Deep and across the main channel south of Inchcolm, and the gate moorings between Inchcolm and Cramond. A scheme was developed to bring the anti-submarine, anti-boat and anti-torpedo boom defences to a high state of readiness by March 1939. The guard loops were already in position and a portable control station was stored at Rosyth which could be installed at 24 hours' notice. Work was still needed to complete the Port War Signal Station on the May Island, to be completed in 1939. It was at this stage that the decision was made to erect an anti-boat boom of concrete pylons between Cramond Island and the mainland.<sup>5</sup>

On 12 October 1938, naval authorities in the east of Scotland emphatically denied rumours, which had apparently

gained some currency, that a German submarine had ventured into the Forth during the international crisis preceding the Munich Agreement and became trapped in the boom defences, with loss of life. The Navy vigorously denied it: 'It is utter rubbish, and definitely harmful that such a story has gained currency.'<sup>6</sup> From our research, it seems certain that no booms or nets were in place in 1938.

German naval intelligence had, by March 1939, built up a detailed, if not wholly accurate, picture of the ports, installations and defences of the Forth.<sup>7</sup> Their conclusion was that:

The Firth of Forth represents, militarily and economically, the most important area of the Scottish east coast for British warfare. The Rosyth war harbour, situated to the west of the Forth Bridge on the north bank of the Firth of Forth, had been closed down until 1925–27. With the port on the south bank, Port Edgar, it is the most important naval base of the entire British east coast, and possesses the most modern state shipyards [in Britain]. The Firth of Forth is still the only anchorage for a large fleet in the northern section of the British east coast.

While the report had the broad outline of the defences correct, any German force attacking the river would have faced one or two surprises, particularly as the defences were weaker than their intelligence suggested. There had been sufficient indications to lead the Germans to expect coast batteries at Fife Ness, Crail and Dunbar, the latter having supposedly had six 6-inch guns during the First World War. The batteries of Inchkeith and Leith were described accurately, the latter having been photographed from nearby in the docks (Fig 11.86), the former mapped in some detail, with annotated photographs of the north and west sides, although three torpedo tubes observed on the pier in 1936 were imaginary. Batteries were supposed to exist on the Middle Craig rock and at Portobello. Both the 'Battery Point' (Coastguard) and Inchgarvie batteries were recorded as still each being armed with two light guns with protective shields.

In July 1939, it was recorded the Forth had by that date four indicator loops and three Harbour Defence ASDIC sets in

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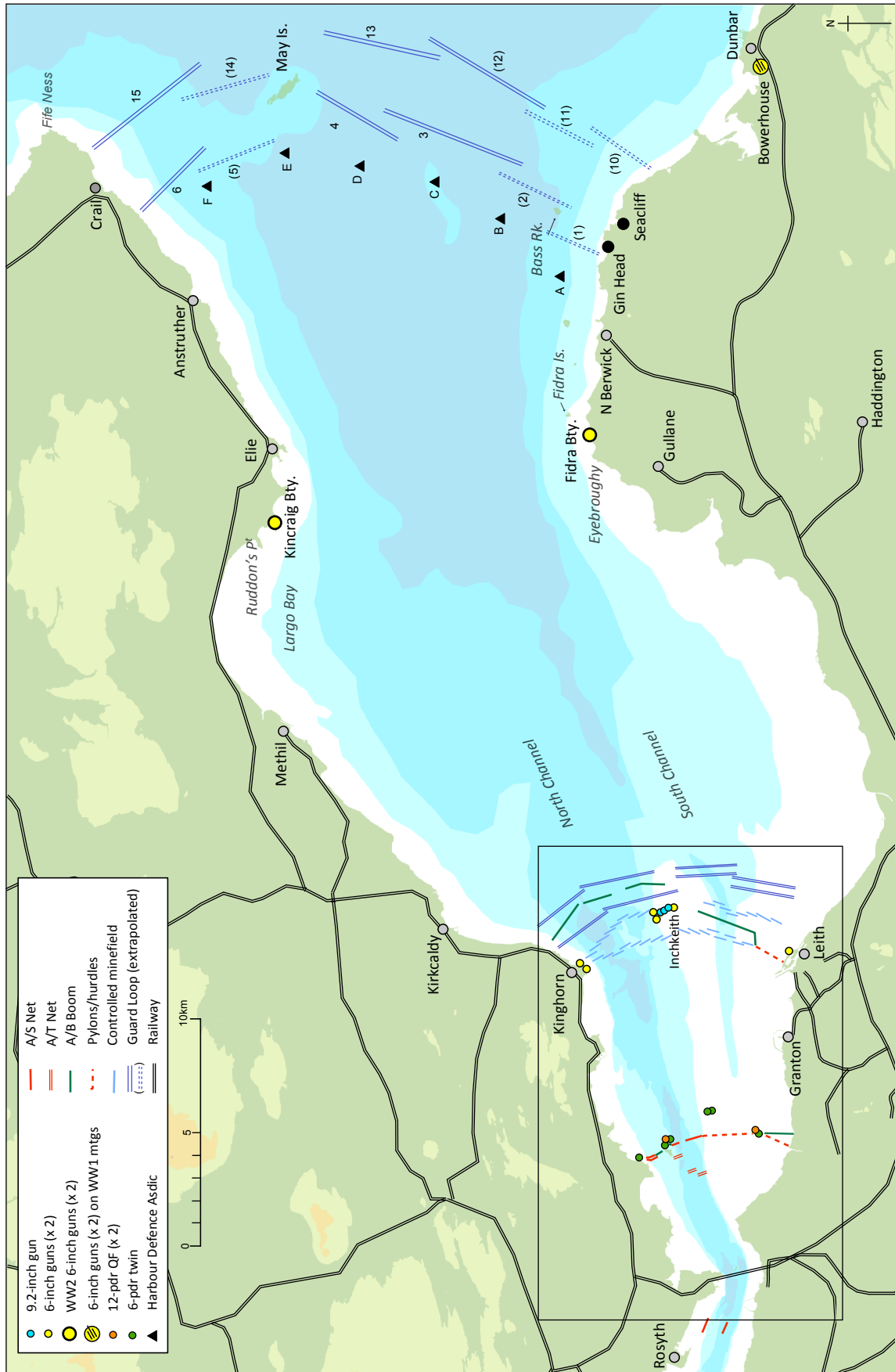


Figure 7.1  
Map of the outer estuary in the Second World War, showing the location of anti-submarine nets, anti-boat booms and built obstructions. The extent of Figure 7.3 is indicated (© Gordon Barclay)

position, and that 73 nautical miles of loop cable had already been laid in 1937.<sup>8</sup>

The War Diary of the Forth Fixed Defences recorded the preparations in the days leading up to the declaration of war, starting on 22 August 1939 with the receipt of the code-word ‘HASTINGS’; the cancellation of all leave on the 23rd; the guarding of vulnerable points and the issuing of the code-word ‘PLUMER’ on the 24th;<sup>9</sup> Inchgarvie, Coastguard, Kinghorn and Pettycur were ready for action on the 25th; the infantry defence and the Examination Service was in place on 1 September; the warning at 9 a.m. on the 3rd, ‘Expect hostile action after 0900 hours’; and finally the signal at 1.20pm on the same day from the War Office: ‘WAR HAS BROKEN OUT WITH GERMANY.’<sup>10</sup>

In November 1939, the Forth’s defences were listed as three 9.2-inch guns, 12 6-inch guns (with 15° mountings); four 12-pdr QF and two 2-pdr QF ‘pom-poms’ of First World War vintage, on Inchcolm, in an anti-motor torpedo boat (MTB) role. In a list of priorities for further guns, the Forth was first for 6-pdr twins, above the Humber, Harwich and the Thames; it was not, however, a priority for further medium or heavy armament – Scapa Flow, for example, was listed as the first priority for 6-inch guns in the UK.<sup>11</sup>

In December 1939, it is recorded that an experimental RDF (radar) station was to be situated for testing between Crail and Caiplie, in Fife: ‘preliminary trials indicate that it may be possible to plot the position of surface craft between May Island and the north shore under all conditions of visibility’. In the meantime, five ‘look-out trawlers’ were requested to supplement the A/S trawlers on visual watch over the ‘proposed loop system’.<sup>12</sup>

At the outbreak of the Second World War the anti-submarine defences of the Firth of Forth were in a far more advanced state than at the outbreak of the previous conflict (Table 15).<sup>13</sup>

British losses in home waters were high from both U-boats and mines, but the U-boats were withdrawn for the Norwegian campaign and were subsequently deployed in the Atlantic, operating from captured bases in France.

The U-boats began operating again in British coastal waters during late 1944, after they had lost their French bases and had been relocated to Norway. From this time until the end of the war, a concentrated attack on British coastal waters took place, which was later known as the ‘Inshore Campaign’.<sup>14</sup>

Curiously enough, it was a new U-21, following in its predecessor’s footsteps, which succeeded in penetrating the Firth at the beginning of the Second World War. On the night of 4 November 1939, it laid nine mines around 15km east-north-east of Inchkeith before escaping. Her mines have been credited with two sinkings and the damage caused to the light cruiser HMS *Belfast* on 21 November 1939. U-21’s successes apparently resulted in the doubling of the indicator loops at the mouth of the Forth soon afterwards.<sup>15</sup>

During the Second World War, the German Air Force took over the role of laying mines, starting in November 1939 with the laying of the first magnetic mines off the east coast of England. Despite countermeasures, these parachute mines remained a threat throughout the war, with reports of mainly Heinkel HE-111 aircraft dropping them in the Forth, especially during the period 1940–1. From the spring of 1940, references begin to be made to a degaussing range near Inchkeith, to demagnetise ships’ hulls (for example, on 13 May 1940, ‘Destroyer JUNO was detached *en route* to run the D.G. Range at Inchkeith’).<sup>16</sup>

There is an anecdotal report of a parachute mine exploding (presumably prematurely) *c* 1,000ft (*c* 300m) above Inchcolm Abbey. It did not cause any damage to the historic monument but a number of service personnel were taken to hospital suffering from concussion.<sup>17</sup>

## 7.2 Indicator loops, ASDIC, booms and mines, 1939–45

A series of reports by the Commander-in-Chief Rosyth on the defensive armament of Rosyth Command (that is from Invergordon to the Berwickshire coast) from August 1941 to March 1943 included not only the gun armament and the booms, but also indicator loops, minefields and booms at minor harbours, and show the defences at their peak,

Table 15

War Office table of armament mounted in 1937–9, May 1940 and November 1940, as well as what was ‘approved’ in February 1941 (CAB 44/47 1948)

Allocation 1937–9	In Position May 1940	In Position November 1940	Approved (but not all eventually mounted) February 1941
3 x 9.2-inch (35°)*	3 x 9.2-inch (15°)	3 x 9.2-inch (15°)	4 x 9.2-inch (35°)
1 x 9.2-inch (15°)†		2 x 6-inch (Naval)‡	4 x 6-inch (45°)
16 x 6-inch (15°)	14 x 6-inch (15°)	14 x 6-inch (15°)	12 x 6-inch (15°)
	4 x 12-pdr§	4 x 12-pdr	4 x 12-pdr
6 x twin 6-pdr		6 x twin 6-pdr	6 x twin 6-pdr

\* Inchkeith; † Kinghorn; ‡ Fidora; § Inchcolm and Cramond

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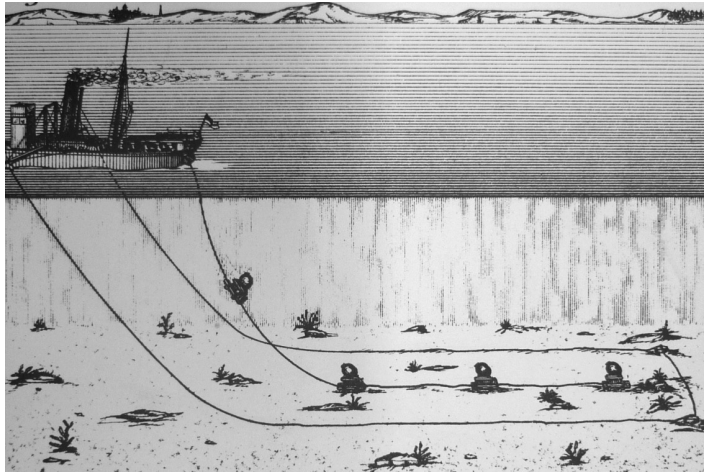


Figure 7.2

The method of laying a line of controlled mines within the detector loop round them (Admiralty 1938 *Handbook of Controlled Mining*)

before the 'Flood Tide' reduction programme (Fig 7.1) (Table 16).<sup>18</sup>

In 1941 to 1942, even the smallest harbours in the Forth were to some extent defended by booms or had barriers of some kind ready to block the entrances. Dunbar was also equipped with a flame projector at the Victoria entrance. The value of these defences and the need to expend scarce resources on them must be doubted.<sup>19</sup>

In the Second World War, three armoured trains were deployed to provide mobile artillery support for the anti-invasion defences. Two of them, based at Stirling and in Edinburgh, could bring their pair of short-barrelled 6-pdr guns to bear on any part of the Forth coast where there was a railway line.<sup>20</sup>

The development of indicator loops at the end of the First World War transformed the effectiveness and value of controlled mines. 'Guard loops' were simple indicator loops set in advance of the minefield to give warning of an approaching vessel. 'Mine loops' were laid around sets of controlled mines in such a way that the operator would know when a submarine had entered the controlled minefield and the mines could be detonated (Fig 7.2). All the mines in a set of 16 mines would be blown at once; to avoid leaving a hole in the defences, the lines of mines were overlapped (see Fig 7.3 (l, m, n and o)).

The controlled mining handbook issued in June 1938 shows the arrangement of a 'standard 16 mine loop', individual mines being 112ft (34.1m) apart (to avoid sympathetic detonation), within a rectangle of cable 640 yards (585.2m) long and 25 yards (22.9m) wide, the cables extending 120ft (36.6m) beyond the last mines. Guard loops, covering the whole front of the controlled minefield, could be of any length up to c 3,000 yards (c 2,750m). The standard mine contained 500lb (226.8kg) of explosive and had a life under water of

about a year before maintenance or replacement was required. The control stations in the Forth were portable and comprised a control hut, a power hut containing engines and batteries, and a telephone. Purpose-built mine control towers were built in other ports, but not in the Forth. A normal single station could control up to eight separate mine loops and two guard loops. Each 16-mine loop was supposed to overlap by 160 yards (146.3m) but the lines had to be 100 yards (91.4m) apart to avoid sympathetic detonation. Each mine had a destructive circle of 35ft (10.7m) radius in all directions.<sup>21</sup>

There were also guard loops at the May Island. These were laid in pairs, the two loops overlapping along a centre line, thus allowing the operator to determine in which direction a submarine was moving. There were two lines of these double loops, one in advance of the other. Six of these loops are mapped on a chart recording a submarine penetration exercise and are marked on Fig 7.1 (labelled '3', '4', '6', '13', '15', and one un-numbered, probably No. 12). The chart seems only to show the specific loops used in the penetration exercise, and we have marked the likely positions of six further loops implied by the numbering system, by the testimony of servicemen who operated the loops, and a mention of the establishment of a loop guarding the gap between the Bass Rock and the coast.<sup>22</sup> We do not yet know where loops 7, 8 and 9 were located, and future research may reveal a different pattern from that which we propose.<sup>23</sup>

Whereas the hydrophones in use in the First World War were 'passive' detectors, merely detecting the sounds made by a ship, the breakthrough in using sound to detect submarines came with 'active' methods, known at first as ASDIC, and later as SONAR, developed towards the end of the First World War; in ASDIC, the set generated one or more sound signals and the time taken for the signals to return and their direction provided accurate information on the location of submarines. Although ASDIC was almost exclusively mounted on warships, Harbour Defence ASDIC (HDA) was installed on the seabed to detect submarines in the vicinity of ports. HDA was developed in Britain in the 1920s and used in the Forth in the Second World War.<sup>24</sup> The HDA sets controlled from the May Island were switched on when the guard loops detected a possible submarine (Fig 7.1 (A-F)).<sup>25</sup>

There were two complete lines of physical obstructions across the Forth in the Second World War, one across the river at Inchkeith and the other at Inchcolm (Fig 7.3).

At Inchkeith, a vessel approaching the anchorage by the North Channel would first have to cross guard loops, which would alert their operators to a developing attack; the guard loops were arranged in double lines (Fig 7.3 (g and h)). Between the guard loops in the North Channel there was an anti-boat boom in three parts (Fig 7.3 (p)); this is marked on two charts of the defences, and is included in a list of defences dated 1 March 1942. It is explicitly stated that a 'dummy boom' had been put in place earlier and was replaced by the light A/B

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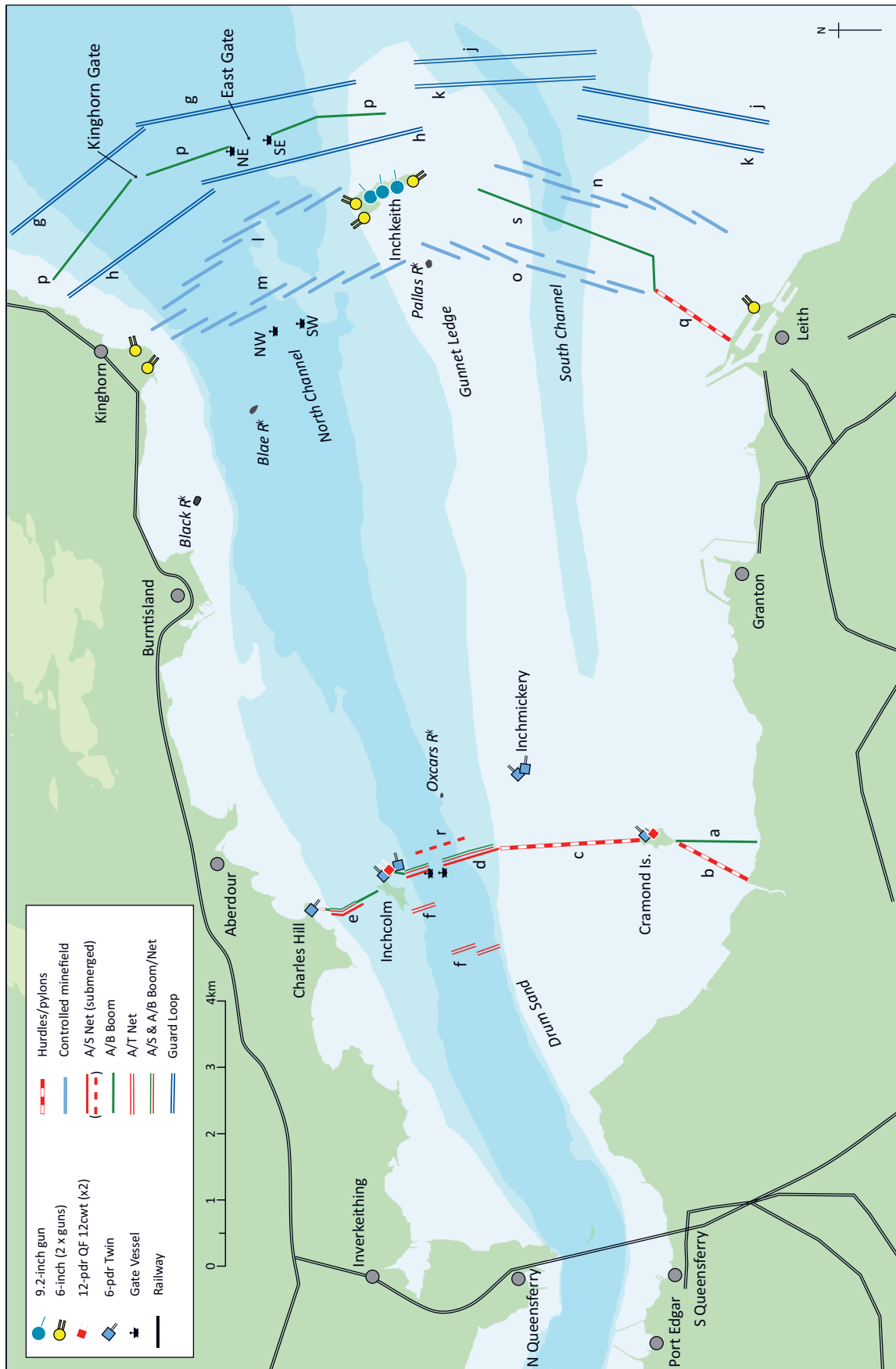


Figure 7.3 Map of the inner estuary showing the location of guns, anti-submarine nets, anti-boat booms, controlled minefields, guard loops and built obstructions, around 1942 (© Gordon Barclay)

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boom by May 1942. The 'East Gate' through this boom was provided with two gate vessels (labelled 'NE' and 'SE'), while the 'Kinghorn Gate' to the north was intended for emergency use. Another double line of guard loops covered the area south of Inchkeith (Fig 7.3 (j and k)).<sup>26</sup>

Once it had passed the guard loops, an enemy submarine would then face the teeth of the defences – a series of 32 sets of overlapping controlled mines, in two double lines, each set within its own detector loop (Fig 7.3 (l, m, n and o)). The mines were controlled from Kinghorn, Inchkeith and Leith. Between the two southern lines a further boom is marked on one chart and as a 'proposed' boom on another (Fig 7.3 (s)). This boom was anchored at the northern end of the Leith rail barrier, constructed of lengths of railway line, which ran out from the edge of the docks for a distance of *c* 1,500m (Fig 7.3 (q)). The rail barrier itself is marked as an obstruction on the Admiralty Chart of 1946 and was still, in 2017, being salvaged for scrap.<sup>27</sup>

All the defences near Inchkeith were contained within a 'Dangerous Area', the north-east and west limits of which were marked on one of the charts. A number of charts and tracings show that there was a very closely defined safe course, two cables (371m) wide, from east-north-east to west-south-west. Where this route passed out of the Dangerous Area, there were two further gate vessels ('NW' and 'SW', Fig 7.3).

The inner boom was on the Inchcolm line. In the absence of an obstruction across the Drum Sands, the gap between Cramond Island and the mainland was blocked for the first time to prevent the passage of torpedo craft at high tide; initially, there was a floating boom anchored at both ends, until a permanent barrier of concrete pylons was built (Fig 7.3 a and b respectively; Fig 10.9).

The main Second World War anti-submarine and anti-boat booms ran direct from Cramond Island to Inchcolm, and then to the Fife coast. In the first section, out to the 10 fathom (*c* 18.2m) isobath, the boom was supported on hurdles (Fig

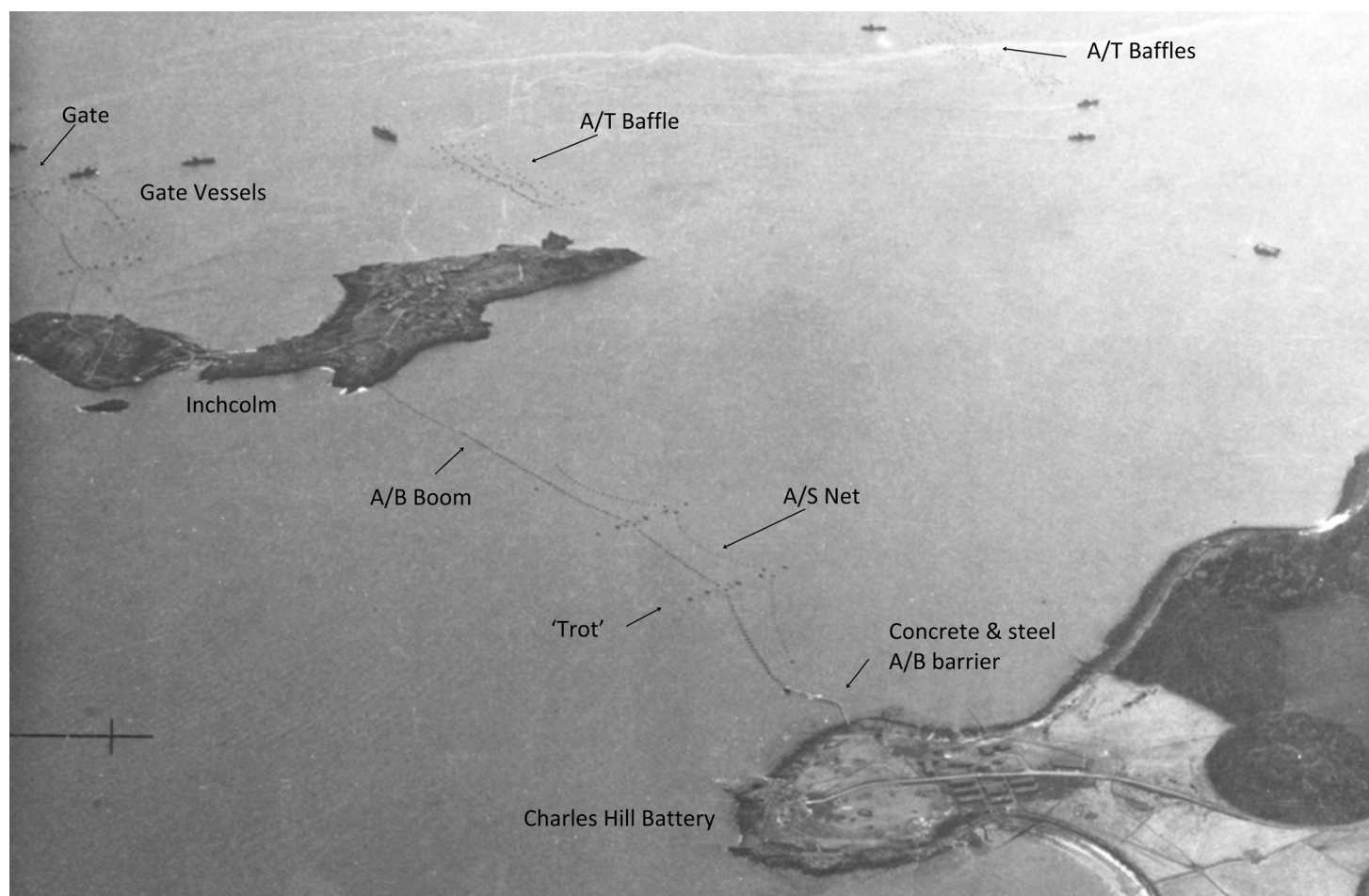


Figure 7.4

A detail from an RAF aerial photograph dated 6 April 1941, showing the anti-boat (A/B) and anti-submarine (A/S) obstructions between Charles Hill and Inchcolm, the main gate beyond, and the anti-torpedo (A/T) 'baffles'. In the foreground is the First World War A/B barrier of concrete and steel, re-used in the Second World War as the northern anchor point of the boom (© National Collection of Aerial Photography 000 000 158 003 www.ncap.org.uk)

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*Table 16*

The defences at their Second World War peak, as recorded in November 1941 (ADM 1/12930 1941–43)

Name	Approved Armament	DELS	Notes
<b>Outer line</b>			
Kincraig	2 x 6-inch 15°	2 x moving concentrated beams	Examination Battery, then Close Defence. 45° mountings and Mk XXIV guns by 1/3/1943
Direlton (Fidra)	2 x 6-inch 11°	2 x moving conc. AA type searchlights	ex-Naval guns of unknown Mark. By 1/3/1943 complement reduced; Home Guard reinforcement if needed
<b>Middle Line</b>			
Kinghorn	2 x 6-inch 15°	2 x moving concentrated beams	Examination battery, then Close Defence. In care and maintenance by 1/3/1943
Pettycur	2 x 6-inch 15°	2 x moving concentrated beams	By 1/3/1943 complement reduced; Home Guard reinforcement if needed
Inchkeith	3 x 9.2-inch 15°: 6 x 6-inch 15°	6 x concentrated beams	North Guns were an Examination Battery
Leith Docks	2 x 6-inch 15°	2 x moving concentrated beams	
<b>Inner line</b>			
Inchcolm	2 x 12-pdr: 2 x 6-pdr twin	4 x fixed dispersed beam; 1 x moveable dispersed beam; 1 x moving concentrated beam	
Charles Hill	1 x 6-pdr twin	3 x fixed, dispersed; 1 x moving – Lyon Beach Defence Light	
Inchmickery	2 x 6-pdr twin	6 x fixed dispersed; 2 x moving concentrated	
Cramond Island	2 x 12-pdr 1 x 6-pdr twin 1 x 75mm (fixed)	3 x fixed dispersed; 3 x moving concentrated. 1 x concentrated Beach Defence Light	
Methil	1 x 12-pdr on railway truck at north-east corner of docks		Manned by DEMS (Defensively Equipped Merchant Ships) ratings. Marked as removed by 1/3/43
Port Seton	1 x 4-inch		Normally used for instruction of DEMS ratings

7.3 (c)). Across the deeper channel there was a double boom, the A/B to the east of the A/S, supported on ‘trots’, large buoys anchored to the seabed (Fig 7.3 (d)). To the north of Inchcolm, a length of A/B boom was linked to a combined A/S and A/B boom and then anchored to the First World War concrete and steel A/B barrier at Charles Hill; part of the boom was doubled up behind by a second A/S barrier (Fig 7.3 (e)). Behind the main gate south of Inchcolm there were three lines of A/T ‘baffles’ to prevent a submarine firing through the main gate when it was open (Fig 7.3 (f)). Figure 7.4 shows very clearly the boom between Charles Hill and Inchcolm, the main gate and the A/T baffles. One file notes the presence of a ‘submerged net’, that is, an anti-submarine net with its top at a depth of 50ft (c 15m) below the surface, some 1¼ cables (c 230m) to

the seaward of both the main and the emergency gates (Fig 7.3 (r)) (the emergency gate lay immediately to the south of the main gate).<sup>28</sup> This submerged net was intended to make it more difficult for a submarine to pass through the gate, submerged, when it was opened for a surface vessel.

Smaller observation minefields (that is, traditional controlled minefields where a shore-based observer had to see an enemy vessel enter the minefield) were put in place in the main approach channel to Rosyth and in the approaches to Methil and Burntisland docks. Methil and Burntisland were also armed with fixed torpedo tubes; one battery of three tubes at Burntisland and two at Methil (on the breakwater and on a moored barge). Booms to allow the closing of harbour mouths were put in place at every small port in the Forth below the



boom, from Kirkcaldy at the largest to places as small as Fisherrow and North Berwick.

The various fixed defences were patrolled by small craft: three river patrol boats operated between Stirling and the boom; seven patrol craft observed the boom; and 36 boats of the Mine Observation Patrol operated between the boom and the May Island, searching for mines dropped by German aircraft or submarines. In addition, a varying number of larger vessels patrolled the area near the guard loops to attack any submarine detected.<sup>29</sup>

From May 1940, in the period of near-panic as the possibility of a German invasion became apparent, a series of emergency batteries was built round the coast, armed with surplus naval 6-inch and smaller calibre guns.<sup>30</sup> At first, ten 6-inch batteries were planned for Scottish Command, at Wick, Peterhead, two on Shetland, Montrose and Berwick-upon-Tweed (at this stage still in Scottish Command). Batteries were also to be added to ports already defended, Aberdeen, Cromarty and Dundee.<sup>31</sup> The tenth was to be at Gin Head. This battery was actually installed near Dirleton and is described in Chapter 12.

### 7.3 Changes: 1941–5: 45° mountings, ‘Ebb Tide’, ‘Flood Tide’ and ‘Neap Tide’

A major impediment to the effectiveness of coast artillery was the invisibility of its targets on the surface at night or in bad weather. Defence Electric Lights provided a partial solution to one problem, at least in narrow waterways, but at night in the outer waters of the Forth and in bad weather, the defences were blind. As early as December 1939, however, experiments were being carried out in the Forth into the use of radar for detecting surface vessels. The experimental radar (RDF) station between Crail and Caiply was primarily for the detection of aircraft, but the opportunity was taken to investigate the value of the station ‘in co-operation with the May Island Indicator Loop System’. Whenever poor visibility precluded visual confirmation of a ‘surface’ crossing of the loop, the RDF station carried out a sweep over the area. In every case, the radar station was able to confirm accurately that a ship was in the area; detection was possible at ranges from *c* 7¾ miles (*c* 12.5km) to over 10 miles (*c* 16km). The Commanding Admiral at Rosyth was so impressed that he sought approval for the installation of a RDF station on the May Island, specifically to cover the detector loops. Unfortunately, production difficulties with the sets resulted in this installation being cancelled, and the help of the experimental site continued to be sought.<sup>32</sup> The first radar set on the May Island (a Type 31 Low Power set) was installed in the spring of 1942 and a more powerful Type 41 set was later installed beside it.<sup>33</sup>

The only coast artillery site to be equipped with specialist gun control radar was Kinraig, from September 1942. This is described in more detail in Chapter 12.

As early as October 1941, the Home Forces Coast Defence Committee was trying to cut the number of men engaged in coast defence from 38,000 to its new official complement of 35,000. Western Command, Scottish Command and Northern Command were those from which men were to be taken first. Anti-MTB defences were not to be reduced and main fleet bases were to be excluded; thus the Forth was to be protected.<sup>34</sup>

In November 1941, the Committee was considering the provision of 6-inch guns on 45° mounts, which gave the guns a much-increased range. At that time, 65 guns and mountings had been placed on order and their distribution was up for discussion. Kinraig was the only battery in the Forth equipped with two of these guns (with a housing for a third, never occupied).<sup>35</sup>

At 14 minutes past midnight on 23 September 1942, a look-out reported that Inchmickery had exposed its searchlights and revealed three small vessels, not showing their signal lights, approaching the gate in the boom. Urgent enquiries were then made with the duty officer at Inchcolm Fire Command and with the Inner Gate Vessel, asking if they had any information regarding the three vessels, which was met with a negative response. The vessels were recognised as patrol types, possibly friendly, but they continued their approach. The Fire Commander then ordered Kent Battery (on Inchcolm) to fire a ‘bring-to’ round from No. 1 12-pdr gun. The round was fired, upon which the three vessels stopped. It transpired that the vessels were Royal Navy patrol craft sent out from Granton without the Fire Commander having been informed.<sup>36</sup>

The first coherent programme to reduce the number of men in Coast Defence, to allow them to be reallocated to Field Regiments, was called ‘Ebb Tide’, in 1942. Its avowed aim was to reduce Coast Defence manning from 40,000 to 25,000.<sup>37</sup> In January 1943, the War Office was looking for a further 5,000 men from Scottish Command’s batteries.<sup>38</sup>

In February 1943, it was proposed that some batteries in Scottish Command should either have their complement reduced or be put into care and maintenance; in this phase both Inchkeith South and West (already due to be placed in care and maintenance under Phase III of ‘Ebb Tide’) were included. Kinghorn was to be retained, in part because Pettycur had already had its complement reduced.<sup>39</sup>

From the summer of 1943, as the need for Royal Artillery field batteries grew and the risks of an attack on coastal installations diminished, further proposals were made to reduce the number of men employed in coast defence, from the 27,000 actually achieved under Ebb Tide to 12,000, nationally.<sup>40</sup> It was proposed that all 9.2-inch guns and virtually all the ‘emergency’ 6-inch batteries built in 1940–1 (in the Forth, only Fidra) should go into care and maintenance, with a reduction in other 6-inch batteries to provide the lowest practicable close defence and examination capacity. Only the

9.2-inch guns in the Dover Straits were retained and in the end a close defence capacity was to be retained only at ports from the Wash around to Land's End. Anti-MTB defences were to be retained only between the same points, and in Orkney. The examination batteries in the Forth were to be reduced to a single gun.<sup>41</sup>

The Commander-in-Chief Rosyth expressed his concerns in November 1943 about the proposed reductions, asking that the capacity to illuminate the booms at the Middle Line be maintained in case of attacks by 'human torpedoes' or coastal motor boats. By September 1944, it was proposed that only one 12-pdr and three searchlights be manned on Inchcolm, and one 6-pdr twin and three searchlights on Cramond.<sup>42</sup>

By 20 March 1944, Inchkeith West, Fidra, Kinghorn, Kent (Inchcolm) Inchmickery, Dalmeny (Cramond) and Charles Hill were all in care and maintenance, and HQ Coast Artillery Forth was disbanded by 20 April 1944.<sup>43</sup> On 27 September 1944, under Operation Neap Tide's 'Reorganisation of Coast Artillery Equipments in Home Guard Batteries', Pettycur and the Leith Docks 6-inch batteries (already Home Guard-manned) were also reduced to care and maintenance.<sup>44</sup> On 4 November 1944, under Operation 'Neap Tide II', both 6-inch guns at Kincaig, one of the 12-pdrs at Kent (Inchcolm), two 6-inch guns at Inchkeith North and one 6-pdr at Cramond were reduced to care and maintenance. Only a limited number of DELs were to be retained.

In January 1945, only Kincaig, Inchkeith North, one 12-pdr of the Kent Battery on Inchcolm were in action, and Kincaig was placed in Care and Maintenance in February 1945.<sup>45</sup>

#### 7.4 The final act

In the worst days of the war, in February 1941, the Port Defence Committee had felt it necessary to consider the heavy gun defence requirements for 15 ports believed liable to attack by modern battleships, battle cruisers and lesser ships. One must wonder which navy was thought to be in a position to risk its major capital ships (the *Tirpitz* for example) on an attack on a British defended port? The list included, in Scotland, Scapa and the Forth. The Forth's four 9.2-inch guns were to be increased to six, four of which (two new and two removed from Inchkeith) were to arm two new batteries at Gin Head or Fidra on the south shore, and at Fife Ness on the north. The planning was for the long term, as the forecast date for the provision of all the 9.2-inch guns required was mid-1946! The Committee returned to the subject over the next three years with what can only be considered, in retrospect, decreasing relevance.<sup>46</sup> In August 1942, there was another round of the apparently endless discussion about whether the gun was still the primary coast defence weapon or whether aircraft had displaced it. In the light of the exaggerated claims made by the Air Staff in the 1920s and

1930s, an Air Ministry statement that 'attack by [our] aircraft could not be regarded as an adequate guarantee against the bombardment of ports at home by enemy warships' – was realistic and modest.<sup>47</sup>

In November 1944, discussion had moved on to what the next generation of coast defence guns would be. It was unlikely that the Navy would have a future use for 9.2-inch guns, and hence the Army alone would have to bear the cost of developing new variants. The Army moved to adopt the naval 5.5-inch gun: one mounting was designed solely for anti-aircraft work, while the other (the Mk 1B in an armoured turret) was dual-purpose anti-aircraft/coast defence. A few of the dual-purpose guns were mounted in 1944–5, including at South Shields and Gibraltar.

The Firth of Forth, having been the location of the first loss of a warship to a torpedo, in 1914, was also the location of Germany's final controversial action in the U-boat war. On 4 May 1945, U-boat HQ had signalled all operational submarines to cease hostilities and to return to base in advance of Germany's final unconditional surrender three days later.<sup>48</sup> On 1 May, U-2336, of the new, smaller Type XXIII class, had sailed from Larvik in southern Norway for operations near the Firth of Forth. Her Commander, Emil Klusmeier, had been a U-boat staff officer who had developed tactics for the new type of U-boat, and this was his first command. The Type XXIII carried only two torpedoes, and was designed to attack two targets in quick succession.

Two hours before the end of the war in Europe, at about 10 p.m. on 7 May, Convoy EN91 left Methil for Belfast. It comprised five freighters escorted by three armed trawlers; HMT *Angle*, *Wolves* and *Leicester City*. The crews were relaxed for the first time in years, as the news of Germany's order to cease fire at sea was then common knowledge.<sup>49</sup> At about 10.50 p.m., when the convoy was about 3.2km south of the May Island, Klusmeier fired a torpedo at the Canadian freighter SS *Avondale Park*, striking her on her starboard side and causing a large explosion. The Norwegian collier *Sneland I*, which was following the *Avondale Park*, was forced to alter course to port to avoid the sinking vessel, but three minutes later she was struck by Klusmeier's second torpedo and sank within two minutes. Over the next hour, HM Trawler *Leicester City* and the Norwegian destroyer HNoMS *Stord* pursued ASDIC contacts, but U-2336 escaped unscathed. Two days later, Klusmeier claimed to have received his first news of Germany's capitulation and surrendered at Kiel on 14 May.

Nine men died on the two ships, including *Sneland's* captain; Klusmeier's claim that he had not received the 4 May order to cease fire, nor its repeat transmissions over subsequent days, has not generally been believed.<sup>50</sup>

Thus, the Firth of Forth saw both the first German U-boat sinking by torpedo of a British warship in 1914, and the last, with Klusmeier's murderous attack in May 1945.

# FORTIFICATION OF THE FIRTH OF FORTH

## Notes

- 1 German Naval Intelligence report, March 1939 M.Dv.502 1939 (ZMSBw).
- 2 ADM 1/9848.
- 3 ADM 1/12930; Morris 2004: 46–7.
- 4 ADM 1/13135.
- 5 ADM 116/5590; ADM 1/9505.
- 6 *Fife Free Press*, 15 October 1938.
- 7 M.Dv.502. 1939 (ZMSBw).
- 8 ADM 1/9848.
- 9 The code-word ‘HASTINGS’ meant that senior formation Commanders were recalled from leave, and duty officers had henceforth to be available by telephone at all Regular and Territorial units; ‘PLUMER’ meant that Passive Air Defence measures were put into operation.
- 10 WO 166/2058.
- 11 ADM 1/9856; WO 192/254.
- 12 ADM 1/10392.
- 13 CAB 44/47.
- 14 White 2008: 24–5.
- 15 Baird and Baird 2009: 75–6, 135–6.
- 16 Kindell 2012.
- 17 Bruce Stenhouse, pers comm.
- 18 ADM 1/12930.
- 19 Barclay 2013: 64, 72–7.
- 20 Barclay 2013: 79–82.
- 21 Admiralty 1938.
- 22 ADM 1/9855.
- 23 ADM 1/13135; Morris 2004: 45.
- 24 ADM 1/12930; Walding 2009.
- 25 Morris 2004: 47.
- 26 ADM 1/12930.
- 27 Bill Simpson, pers comm.
- 28 ADM 1/12930.
- 29 ADM 1/12930.
- 30 Dobinson 2000: 62–3; Barclay 2013: 72–7.
- 31 WO 166/11.
- 32 ADM 1/10392.
- 33 Morris 2004: 28.
- 34 WO 199/1110.
- 35 WO 199/1110.
- 36 WO 166/7128; WO 192/108.
- 37 Dobinson 2000: 71.
- 38 WO 199/2673.
- 39 WO 199/2673.
- 40 Dobinson 2000: 72.
- 41 ADM 1/15298.
- 42 WO 199/1171.
- 43 WO 32/10376.
- 44 WO 199/528.
- 45 WO 199/930.
- 46 ADM 1/16723.
- 47 ADM 1/16723.
- 48 Morris 2004: 57.
- 49 Paterson 2008: 159–61.
- 50 Morris 2004: 57–8; Baird and Baird 2009: 150–7.