CDSG tour group photo at 15-inch (381 mm) 45 cal. gun #3 at Paloma Alta Battery, Tarifa

CDSG Tour to Spain and Gibraltar:

October 13-23, 2005

Text by Alan Bailey, photos by Terry McGovern

Introduction

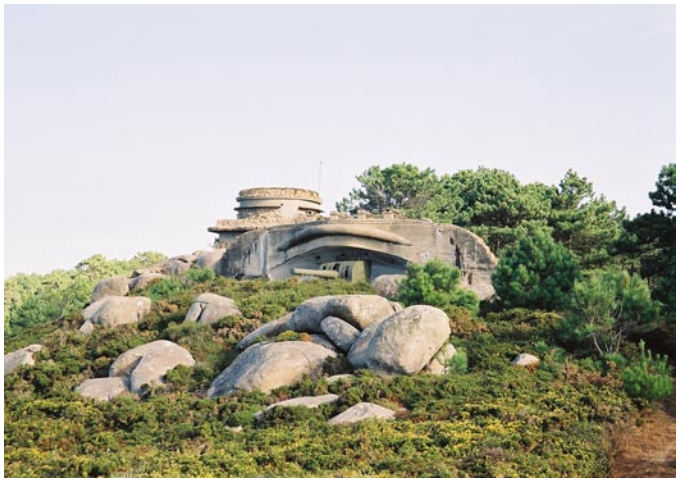
This 11-day tour was organized by Terry McGovern for the Coast Defense Study Group and attended by CDSG members from nine countries. We spent three days in northern Spain in the province of Galicia, based in La Coruña (Hotel Melia Maria Pita) and five days based in southern Spain by Tarifa (Hotel Dos Mares), two of those days visiting Gibraltar by car. Local transport in Spain was hired cars, which can make keeping together in urban rush-hour traffic, dark nights, and pouring rain interesting, but did enable us to get right to batteries in the hills up some very rough tracks.

Spain is one of the few countries to still maintain active coast defense guns. Probably nowhere else in the world is it possible to see such a collection, either working or in good order, nearly all Vickers, built in the UK or under license in Spain. Coast defense batteries complete with guns in situ were the key objective and highlight of the tour: 6-inch, 12-inch, 15-inch guns, singles and twins, many maintained by the military and fully operational. In so many of the places we usually visit you can see only empty concrete emplacements, while the guns exist only in your imagination. Many are on active military ground, which has no doubt saved them from the fate of most others around the world. This was an opportunity not to be missed; the military is extremely unlikely to maintain their guns for much longer. Many batteries, 15-inch and 6-inch, have already been dismantled, their guns chopped up and machinery scrapped; only one complete site has survived the transition from army hands to a public park (at Monte San Pedro, near La Coruña), and while this battery is complete with its 15-inch guns, they are deteriorating through leaks and lack of care.

La Coruña and Vigo

When King Carlos III of Spain formally designated Ferrol, Cartagena, Mahon, and Cádiz as Spain's naval bases in 1726, they needed to be defended appropriately; at this period this meant bastioned fortifications and cannon. Over the next two hundred years these were updated, with new forts and batteries and eventually breech-loading guns. By 1900, the rapid development of naval technology meant that the defenses had to be extended far from the bases themselves. In 1926, the modernization of the artillery defenses of Ferrol, Mahon, and Cartagena was approved. For the naval base at Ferrol, these defenses were to mount eight 15-inch guns, twenty 6-inch guns and twenty 10.5 cm antiaircraft guns, in four groups. These were the Campelo, Prior, Prioriño and San Pedro positions, running north to south along the Galician coast, from north of Ferrol to south of La Coruña.

During our tour in Galicia we were led by Juan Vázquez García (co-author of Los Cañones de La Coruña, La Costa Inexpugnable and a CDSG member) whose expertise and valuable military



6-inch casemate and central fire control at El Grove Battery, Rias Baizxxas

connections ensured access and a warm welcome on military establishments. Attending the first phase of our tour was Alan Bailey, Charles Blackwood, Charles & Mary Bogart, Chris Bristow, Bob Burt, Tom Kavanagh, Mike Kea, Terry McGovern, Svein Olsen, Gary Paliwoda, Norma Rogers, and Phil Sims. The group gathered at the Madrid airport and flew to La Coruña on October 13 for our 3-day tour of the coast defenses of Galicia.

6 inch gun in casemate at El Grove Battery, Rias Baixas

On our first day (10/14) we went south to see the defenses of Vigo, surrounding the Rías Baixas. We went to the El Grove Battery of four 6-inch (152.4 mm/50 cal) Vickers guns on military land. When we arrived, an infantry company was going on exercise. We walked towards the battery position and entered a tunnel just under the surface, with storerooms and a light railway for moving ammunition, and climbed steps to an observation bunker. Returning along the tunnel, we walked out to the guns - in a line a hundred or so meters apart, in concrete emplacements with overhead protection. The guns were no longer in use but in a good state of preservation. After coffee in the barracks there was a PowerPoint presentation on Spanish coast defenses (we were given a CD of it on leaving), after which we headed for Bayona for lunch in a very swish hotel in the Castillo de Montereal, a 14th-century castle surrounded by fortified walls. A walk around the walls took us to some 17th-century batteries with cannon and a superb view over the bay.

Our next stop was the Cabo Silleiro Battery, to visit another 6-inch (152.4 mm/50 cal) Vickers battery. Set on a very steep hill overlooking the Atlantic Ocean, the guns were in a vertical line, stepped one above the other. A defended barracks and stores was set in a hollow behind the hill, giving underground tunnel access to the fire control tower and all four gun positions. The guns had been sealed in their emplacements with concrete so all one could see from the outside was the barrels sticking out of a gray wall. These emplacements were excavated in the rock, with concrete bunkers for overhead protection, and ammunition storage behind each gun. Some our most intrepid explorers found their way into all the gun positions.

Our next stop was the Monteferro Battery, now part of popular park, where we had to scramble down the steep hillside to see the rusting remains of two Munáiz guns, one in the open and one en barbette in its emplacement, all that remains of the original three guns. The 15 cm Munáiz gun was in service from 1903

6-inch gun cemented into its casemate at Cabo Sillero Battery, Vigo

until the 1930s. The shell weight was 50 kg, muzzle velocity 747 m/sec, maximum range 13,300 m, and rate of fire four rounds per minute. We returned to La Coruña, a long haul in the darkness and rain, and had dinner out.

The following day (10/15) was spent visiting the defenses of La Coruña itself. Firstly to Fort San Antón, built on a rocky island 200 m from the shore and linked by a causeway to the mainland; a 16th-century fort built in the reign of Philip II, with construction of the upper level completed in the 18th century. It was armed with 30 guns, 18 and 24 pdrs, which covered 1500 m around the fort. It was built to defend the harbor of La Coruña,

Central fire control position st Cabo Sillero Battery, Vigo

a major trading port with the Indies, served later as a prison, and was restored and converted into a museum in 1968. A walk along the remains of the old town walls took us to a 6-inch (152.4 mm/50 cal) Vickers gun on a terrace in a garden, then a quick look at a military museum with a selection of guns, fire control instruments, and some large shells.

Next we drove to the San Pedro Battery, which is now the Monte San Pedro Park, some 425 feet above sea level, and the site of two preserved 15-inch (381 mm/45 cal) guns in separate turrets surrounded by flower beds and well cut grass. The guns formed the southern flank of the Le Coruña defenses. The 15-inch Vickers gun was the most powerful gun installed in the Spanish coastal defenses, derived from the excellent British 15-in/L42 naval gun, initially installed in the Queen Elizabeth class dreadnoughts. The Spanish guns weighed 86 tons, with a 57.7 ft barrel, a shell weight of 1760-1870 lbs, and a maximum range 38,000 yards. Armor piercing shell could penetrate 22 inches of armor at 9842 yds. The gun was protected with by a 0.28-inch shield. Underneath the gun was a well with underground magazines for shells and powder charges on opposite sides. A passageway with a double-armored door gave access to the machinery room. Slowly deteriorating, the machinery is complete, including hoists and carriages for shells and cartridges. Back aboveground, we walked around these guns and the door in the back of the turret was opened so we could see the breech and mechanisms. Then back underground to the fire control facilities. Each battery had a fire direction system with one or two 30 ft Barr & Stroud or Lopez-Paloma rangefinders. We could not get inside this aboveground room as the concrete door surround had been distorted, but we could enter the underground fire control room containing the battery plotting table and the electro-mechanical gun computer. On the wall was a diagram of range against armor penetration and listed at the side were the names of British WWII battleships. The guns were actually fired locally from the gun itself. There was also a co-located monoblock antiaircraft site, four 10.5 cm Vickers guns.

15-inch gun at San Pedro Battery. La Coruna

Plotting room at San Pedro Battery, La Coruna

Our next stop was Monticaño Battery, where we had a lunch of very large sandwiches in the park's cafe, and then a walk up the hill to the battery site. This was another 6-inch (152.4 mm/50 cal) Vickers battery. Only one gun was complete, with the remains of one more, and two mobile 88 mm antiaircraft guns. Sadly, the battery command post had been vandalized. Returning to La Coruña, we visited the Hercules Tower on the seafront. Buried in the base are the accessible remains of the Roman pharos, the first building on the site. We finished the day at Fort Santa Cruz, a small 18th-century battery reached by a causeway, and walked around the outside, returning to La Coruña for dinner.

The next day (10/16) we visited the defenses of Ría de Ferrol, starting in the morning on the Montefaro area on the south side of the Ria. This peninsula had six batteries, three at the seaward end of the peninsula - Segano, Salgueira, and Sudova - and three on the top, Bailadora, Fuenteseca, and Faro. The upper batteries each had six 24 cm Ordóñez steel howitzers in concrete emplacements. These entered service in 1916, had a maximum range of 12,400 yds, muzzle velocity 690 to 1,180 ft/sec, and a shell weight of 440 lbs. We first visited the howitzer batteries of Bailadora Battery and the Fuenteseca Battery, and near the last, the AA position of Montefaro - 4x10.5 cm Vickers from 1940, with crude drawings on the walls of several British airplanes. From there we dropped down to Segano Battery on the coast, which mounted two 26 cm Krupp guns in large D-shaped barbette emplacements, empty but for the steel cones of the mountings. There was a building to

Castillo de la Palma, Ria de Ferrrol

house a searchlight and rails to move it on. The nearby batteries of Salgueira Battery (visited) and Sudova Battery had six 15 cm Munáiz guns; only the concrete emplacements and support buildings remain. Heading for the northern defenses of the Ría, via Ferrol for lunch, we had a photo stop at the very impressive Fort La Palma - a large 19th-century granite fort at water level, with casemated batteries and positions for two Krupp 26 cm steel guns en barbette on the roof and in service in 1884.

Then we drove to Fort San Felipe on the other side of the estuary - a large 18th-century fort with powerful batteries on several levels facing over the water towards La Palma and down the Ría, and a hornwork and small ravelin defending the land approach. Here in 1800 the Spanish beat off a determined British attack on Ferrol, the fort being the last barrier. We spent ninety minutes going round this fascinating mixture of a fort, with its later secondary batteries, barbettes, casemates, and a 19th-century gun tower.

On to the Cabo Prior and Cabo Prioriño positions to see the remains of the two-gun 15-inch batteries and the four 6-inch batteries. Each position also had an AA battery of four 10.5 cm Vickers guns in a monolithic concrete structure. These batteries had all their guns removed and have been vandalized. The 15-inch guns had unfenced wells one could enter by steps or slopes to see the wreckage of the magazines and machine rooms; a sad sight - the guns were only cut up and dismantled in 1997. The 6-inch battery positions were below the 15-inch batteries, in line in a monoblock arrangement as usual, with ammunition storage below the guns. Darkness, rain, and time kept us from reaching the Campelo position, which also at one time mounted 15-inch and 6-inch Vickers guns, before returning to La Coruña for the last time for dinner and to pack for traveling to Southern Spain the next day.

Emplacement for 15-inch gun at Cabo Priorino Battery. El Ferrol

Shaft for 15-inch gun at Cabo Priorino Battery. El Ferrol

Tarifa

Early on the morning of October 17 we flew from La Coruña to Jerez la Fronterra via Madrid, collected more hired cars, and drove some 100 km to Tarifa. On the second phase of our tour, our group grew with the addition of Christian Casartelli, Al Chiswell, Martin Egger, Mike & Pam Fiorini, Jean Guichard, Mark Ligget, Casper Vermeulen, Hans & Cornelia Vermeulen, and Deiter Wernet. Tarifa is on the Spanish coast on the most southern point of the Iberian Peninsula, further south than Gibraltar. It is at the south end of a long beach, with our hotel just a few miles up the road at the north end. The Dos Mares hotel is right on the beach, decorated in Moorish style, with separate bungalows for guests.

The next day (10/18) we left our hotel to drive to the Spanish Army's headquarters for the defense of the Strait of Gibraltar (MACTAE) in El Bujeo (midway on the main road between Tarifa and Algericias). MACTAE consists of two coast artillery regiments which man both fixed and mobile batteries from Cadiz to Gibraltar, and the Spanish enclaves in North Africa at Meuta and Ceuta. These are the only two remaining active coast artillery units and batteries in the Spanish Army; the rest of the once extensive coastal defenses have been deactivated. Here we were joined by César Sånchez de Alcåazar Garîa, who accompanied us for the next five days. His military connections were invaluable, and he opened many doors for us. We could not have visited most of the military sites without his and Juan Vázquez García's work on our behalf. We were welcomed by the chief of staff for MACTAE, as the commanding general was on medical leave. After a speech and light refreshments we departed El Bujeo for the first site visit of the day, Paloma Baja Battery, fully operational, with four 6-inch (152.4 mm/50 cal) Vickers "W" guns. These single-gun mounts were in a line of separate concrete emplacements. Three came from La Mola coast battery at Mahon in 1942; the fourth came from Reinosa Enterprise (Spanish gun manufacturers) in 1952. The gun uses a 45.30 kg shell with a charge of 16 kg, giving a maximum range of 21,600

6-inch gun drill at Paloma Baja Battery A-5, Tarifa

m. The Barr & Stroud range finder was later replaced by gun-laying radar; nearby was a fire control center on several levels. The Spanish artillery crew gave us an excellent demonstration of loading one of the guns.

We then drove up the hillside on military roads to Paloma Alta Battery to see one of the 15-inch (381 mm/L45 cal) guns. The battery comprises three of these guns in single-gun mounts in open emplacements (one Vickers Ltd and two Vickers-Armstrong 1926 models); two were brought from Campelo Alto (Galicia) and their emplacement was completed in October 1941. During the proof firing, the second gun was destroyed by a premature explosion. Two more guns were brought from Favarix battery (Menorca) and were ready in January 1944. The two 9.14 m base Barr & Stroud range finders were replaced with Lopez Palomo range finders and in 1972 by a RX-80E radar set. The guns use an 885 kg shell and a charge of 197 kg, with a maximum range of 35,100 m. We entered the underground area, walking down a large tunnel - we saw the power room, shell, and propellant storage areas. A number of Spanish artillerymen were standing to attention and they demonstrated the hydraulic equipment for, moving shells and cartridges to the breech of the gun above us. A walk back through the tunnel and up a steep slope took us to the actual gun position. To me this was one high point of the tour, to not only see a truly massive 15-inch gun, but one in full working order, and see it operated by the crew. The turret was opened for us and we were able to examine the interior while the barrel was elevated and the turret rotated. A group photograph just had to be taken in front of the gun.

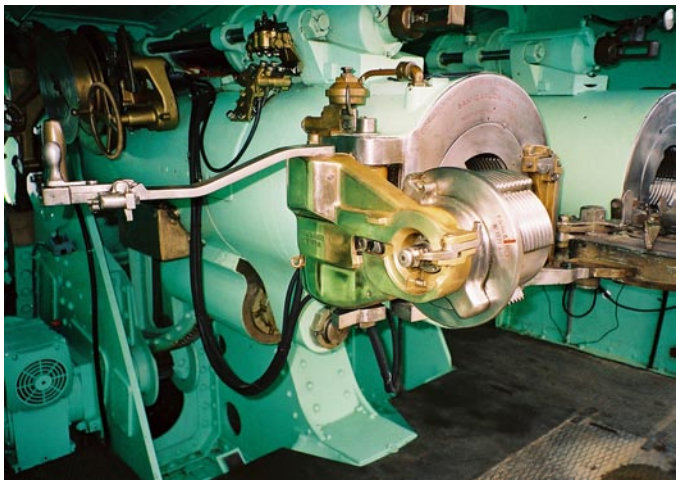
15-inch gun #3 at Paloma Baja Battery (A-6), Tarrifa

Shell lift and hoist for 15-inch gun, Paloma Alta Battery (A-6), Tarifa

Finally the gun barrel was lowered and placed below a canvas cover to conceal it (this works well; it is usually the shadow of the barrel that gives away a gun's position - the guns at La Coruna are easy to find on the satellite images of Google Earth, much more difficult at La Paloma Alta). It was a great pity we had missed the firing of this gun on the previous day while we were traveling to Tarifa. We were each given a colored photograph of the gun being fired, with much flame and smoke, after which we were treated to lunch in the battery mess by the officers of Regimento de Artilleria de Costa No. 5 (RACTA 5th).

Afternoon saw us parked near a cemetery outside the city limits of Tarifa and walking over fields past some field fortifications towards the two gun positions of the Canteruela Battery, empty concrete "D"s which used to have two 10-inch (260 mm/35 cal) Krupp Model 1883 guns. We finished the day exploring Tarifa, the Moorish castle, and the town walls. The fortified Isle de las Palomas is connected to Tarifa by a causeway, which we walked. It is used for detainees from North Africa and we were unable to get inside. On the seafront there was another small castle surrounded by Spanish pillboxes with domed roofs. We had a splendid dinner in the Spanish Army officers' residence in the center of Tarifa.

The next day (10/19) was spent visiting batteries still in use by the Spanish Army along the Strait of Gibraltar. We saw several twin 6-inch Vickers batteries situated at sea level and two twin 12-inch batteries no longer in use, in the hills above the coast. We first visited Punta Camorro Bajo Battery, where we walked down a winding track from the cliff top to the battery. This battery had two 152.4 mm/50 cal Vickers "V" guns in one mounting, whose gun performance was the same as at Paloma Bajo. These guns from the Spanish cruiser Miguel de Cervantes were installed in 1941. There is a fire control position directly behind the guns, with an excellent view of Morocco across the straits.



Twin 6-inch guns at Punta Camorro Battery (D-8) at the Strait of Gibraltar

A short distance away, Vigia Battery had two 12-inch (305 mm/50 cal) Vickers-Armstrong guns in one turret. It was built on a large concrete area with all the support facilities underneath, but these could not be visited. These guns from the forward turret of the battleship Jaime I were installed in 1941. They could fire 385.55 kg armor piercing and semi-armor piercing shells, as well as grapeshot, with a charge of 127.70 kg and a maximum range of 22,000 m. After lunch we drove up into the hills to find Cascabel Battery, another single turret with a pair of 12-inch guns from the same battleship, from the stern turret, and were also installed in 1941. Our hosts from Regimento de Artilleria de Costa No. 4 (RACTA 4th) then took us further up the coast to visit Punta Palmera Battery, which mounted twin 6-inch Vickers guns in two emplacements. These guns from the cruiser Almierante Cervera were installed in 1972. They are maintained in excellent condition and full working order. We also visited the remaining emplacements for the Gral. Jevenois Battery, which formerly mounted 10-inch (305 mm/35 cal) Krupp M1887 guns.

We traveled to the Spanish Army residence for a multi-course lunch. While some of our party returned to our hotel after our meal, a small group went to visit Punta Carnero Alto Battery; the stiff climb to the top of the hill overlooking Algeciras Bay gave us our first view of Gibraltar. This battery used to have four 120 mm/45 cal Vickers Model "F" guns in a monobloc position, with concrete-covered magazines and storage an intrinsic part of the battery; it is rapidly becoming overgrown.

Twin 12-inch guns at the Vigia Battery (D-9)

Twin 12-inch guns at the Cascabel Battery (D-10)

On our final day (10/20) of visiting Spanish coast defense sites we drove up to Cadiz, some 100 km north of Tarifa. Our first stop was Camposoto, which is a MACTAE primary support base, located in San Fernando. Near the main gate is the Le Marquina Battery, which has a single-gun turret, a 12-inch (305 mm/50 cal) Vickers Model 12 gun from the battleship España, the only remaining example of three such batteries in this military area. There were the usual underground support facilities, reached by a sloping hairpin tunnel. Below were rooms containing generators, an electro-mechanical computer, and a splendid scale model of the

12-inch gun at Le Marquina Battery (A-12), Camposoto, San Fernando

battery, which enabled an easier grasp of the unusual magazine layout - a series of compartments arranged in a circle around the turret stem. We able to view several mobile artillery pieces at the camp, including the new 155 mm Santa Barbara towed artillery that will replace most of the fixed coast artillery of MACTAE.

Crossing the isthmus to enter Cadiz, we passed a large concrete blockhouse on our right, and then went through the old bastioned front and turned into Fuerte de la Cortadura. Passing through a building for retired military personnel, we reached the La Cortadura Battery. This battery had four 150 mm/35 cal Munáiz Model 1903 guns in a line on plinths, in good condition, mounted on top of the old fortified sea wall to cover the bay.

We drove on into Cádiz, lunched, and explored independently before joining to be admitted into Castillo de San Sebastián late in the day. On the seafront was the small 18th-century fort of Santa Catalina, which had been restored as a cultural center and museum. It had an exhibition on the battle of Trafalgar off Cape St Vincent not far from Cádiz and there was a wonderful exhibition of the plans of the fortifications of Cadiz over several hundred years. Farther round the corner, the Bastion of Candelaria, a 19th-century half-moon battery with a defended gorge, was not open at the time. We found two large bookshops but no fortification books. Buried in a little side street (most of old Cádiz is pretty well car free) is the Museo de las Cortez de Cádiz, which contains a magnificent model of the Cadiz fortifications, made in wood and ivory in 1769 and filling a large room. Be sure to see it if you get the opportunity.

Four 6-inch guns at Castillo de San Sebastian (A-9), Cadiz

150mm/30 cal. Munaiz gun at Fuerta de la Cortadura, Cadiz

For much of our time in Cádiz it rained, but luckily it cleared for the walk across the causeway to meet our guide to visit the fort of Castillo de San Sebastián, built out in the bay. The large fort 18th-century fort is on one rocky island, separated by a ditch from the larger 19th-century fortifications. Two tiers of casemated gun positions pierce its high walls, now topped with an abandoned battery of four single 6-inch (152.4 mm/50 cal) Vickers guns in shields, covering the bay. Magazines for this battery were contained in the old casemates beneath them. We were also able to visit the remaining emplacement for three 12-inch (305 mm/35 cal) Krupp Model 1887 guns that were once the primary armament of the fort, and several 75 mm quick-fire emplacements. There is a huge fire control tower in the center of the fort. Returning late to Tarifa we enjoyed another excellent dinner in the military residence.

CDSG Tour group photo at Punta Carnero Battery with Gibraltar behind

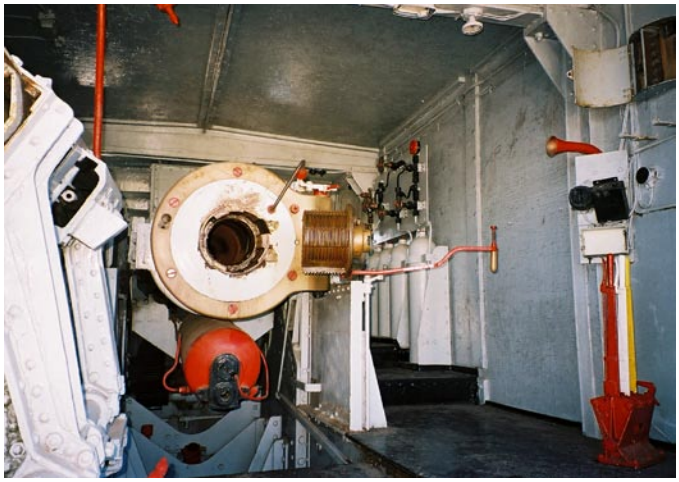
Gibraltar

Arrangements for transport and access on the Rock were made by Dr. Darren Fa, Deputy Director of the Gibraltar Museum and another CDSG member. He ensured that all went smoothly and our two days were most successful. We were joined by three more CDSG members, John Nash, Alyssa Ligmount, and John Wood, for the Gibraltar portion of the tour. On our two Gibraltar days, we drove (about 45 minutes) from Tarifa to La Linea, left the cars, and walked over the frontier to Gibraltar to meet our host and hired coaches.

The first day (10/22) our two coaches drove us to the upper Rock, where the three 9.2-inch/46 cal single-gun Breakneck, Lord Airey's and O'Hara's Batteries occupied us for the next several hours. The 9.2-inch Mark X was the largest of the four standard coast defense types chosen by the British Army at the turn of 19th-century and it became the main counter-bombardment gun from then until the end of WWII. It appeared in two main configurations, the earlier being the "9.2 inch, Wire Mark X on Carriage Garrison Barbette Mk V." This had a maximum elevation of 15 degrees, giving the 380 lb shell a maximum range of 17,400 yds (Breakneck Battery). Of the later mountings, the Mk VII gave a greatest range of 36,700 yds at an elevation of 35 degrees (Lord Airey's and O'Hara's Batteries).

At Breakneck Battery we saw the ammunition handling area beneath the gun, including the hydraulic system for the shells and the hydraulic accumulator. The gun has a U-shaped open-top gun shield to which a gun house has been added to give overhead protection from airbursts. No Mk V survives in the UK, although three survive in Bermuda in a neglected state. The

9.2-inch gun on Mark V carriage at Breakneck Battery



Inside the gun house of the 9.2-inch gun on Mark VII carriage at O'Hara's Battery

Underground Gibraltar - Great North Road running under the length of the rock

two Mk VII mountings at Lord Airey's and O'Hara's Batteries have a much more sophisticated system for the rammer, and shell and cartridge hoists. For example, the interlocks in the hydraulic system, the large hydraulic valve block in the center at the back of the platform was activated by the rammer being swung over into the ram position, where it would push down on the valve on the top of the block and complete the hydraulic circuit to allow the rammer to operate.

After a box lunch, we visited the recently discovered "Stay Behind" tunnels, a number of rooms cut into the rock so that if the Germans had invaded, personnel could seal themselves inside the Rock and observe the Germans by several concealed observation holes, reporting by radio. There was even a working tap inside one room, and the remains of cork sound insulation tiles on the floor.

Returning to the coaches, we went down to Devil's Gap Battery, good examples of 6-inch/45 cal Mk VII guns and almost unique in having both guns in place. The guns were in reasonable condition; the breeches had been removed and platted over. The hand wheels had been removed but the rest of the elevating and traversing gear and the buffer and recuperators were in place. Like the older 9.2-inch guns, these 6-inch guns had a sheet-steel house welded on to the top of the mount to provide overhead protection. The Siege Tunnels of 1779, next on our tour, were hewn from the rock so that cannon could fire on the Spanish and the French advancing across the isthmus. The tunnels are busy tourist attractions but well worth visiting, as they contain several cannon pointing from the rock. This completed a full day and we returned to Tarifa for the night.

6-inch gun at Devil's Gap Battery

The next day (10/23) we carried on exploring Gibraltar after driving from Tarifa and crossing the border. Our plan was to visit Underground Gibraltar for half a day. The coaches delivered us to the entrance to Foss Way, one of the main tunnels that lie beneath the rock; literally miles of them were built in WWII to house thousands of troops. At 34 miles, there are reckoned more miles of road underground than in the open. Our guide, Peter Jackson of the Gibraltar Regiment, was an expert and entertaining guide, a font of knowledge and anecdotes. Currently they are to train British troops in cave fighting using special bullets that do not ricochet off the rock. We walked east for half a mile along the Great North Road Tunnel that runs under much of the Rock and then went through an old area that included a wartime hospital and air raid shelters (torches essential). We then joined some tunnels that been tidied up for the general public - concrete floors, modern lighting, etc. - followed by an excellent view from a balcony half way up the rock. Blast traps are everywhere, consisting of several right-angle turns.

Next, we came out of the tunnels to Princess Anne's Battery. The 5.25-inch/50 cal Mk 1B gun represents the final generation of British coastal defense artillery. By the 1940s, it was recognized that it was necessary for coast defense guns to be dual-purpose antiaircraft and coastal defense. The gun was derived from the naval 5.25-inch ordnance, incorporated into a purpose-designed power-operated turret, only a few being deployed; we saw four of them in one battery. It was a pity all openings had been welded shut but perhaps that is the best way to preserve them from vandalism.

5.25-inch dual-purpose guns at Princess Anne's Battery

Then it was back into Gibraltar's tunnels, down the several hundred steps of Thomson's Raise, with chicanes and gun loops covering the stairs, and out at William's Way to sea level. The steps were an experience, badly lit and slippery - several people slipped - with bits of debris everywhere. All part of forting. In the North Face galleries we came across a mounted 4-inch gun and nearby there was a rusty anti-tank gun, a 6-pdr 6 cwt wheeled infantry AT weapon without its trails and wheels, welded onto a crude angle iron structure atop an unidentified plinth. Presumably, these guns were to cover the isthmus and any tank assault that might come across. Where we exited from the tunnels, a large overhead canopy gave protection from falling rock on the cliff face. A quick headcount reviled that we had "lost" one our tour members within. With little enthusiasm to climb all the way back up the inside of the Rock, we hoped he would find his way out.

4-inch naval gun within the Rock's north face to cover the neutral ground

After a box lunch, our coaches took us on to Napier of Magdala Battery. On the way, we luckily spotted our lost member walking through town and picked him up. The 100-ton gun was the largest British rifled muzzleloader, as usual part of an arms race. The Italians built two battleships with two of these guns each, so the British installed two in Malta and two in Gibraltar. The 17.72-inch 100-ton RML, 35 ft long on a barbette mounting, was installed in 1884. The gun had a maximum range of 7,000 yds, a muzzle velocity of 1,550 fps, and could penetrate up to 20 inches of armor. The charge was 450 pounds of black prismatic gunpowder, wrapped in silk to make four cartridges. There were four types of shell - common, armor piercing, shrapnel, and case shot. The rate of fire was supposed to be one round every 4 minutes, but they got it down to one round every minute and a half. The gun is painted black and looms over everything; it shows the skills of the Victorian builders and the Royal Engineers and Artillery who installed and manned it. It was in use until about 1905, when the 9.2-inch guns took over. During World War II, the battery became the site of four 3.7-inch AA guns, one of which remains today.

100-tom RML gun on barbette carriage at Napier of Magdala Battery

We then parted company, some to get a beer while the others walked round the corner to Parsons Lodge Battery. (Gibraltar's bookshops are not open on Saturday.) This battery is one of the most impressive in Gibraltar, rising from the rocky cliff of Rosia Bay. In 1884, three 10-inch 18-ton RMLs were installed in casemates. During World War II the casemates were given reinforced concrete canopies. Under the casemates were tunnels that had machine guns and 6 pdr AT guns, two of which are still on site. On the way to the border, Darren Fa very kindly opened the Gibraltar Museum for us, allowing us to view the magnificent large model of the Rock and it fortifications, one of two built in 1865 to help give Fortress Commanders a better conception of the Rock's defenses. After crossing the border to our rental cars, some of group visited several concrete bunkers and gun positions in La Linea, built by Spain during World War II in case the Allies invaded Spain from Gibraltar.

The next day (10/23) we left our hotel in Tarifa very early to catch a flight to Madrid from Jerez's airport and thence home. It was an excellent tour and we owe a large vote of thanks to all the

6-pdr anti-tank gun in casemate at Parson's Lodge Battery

people who arranged the tour for us and made it such a success. First to Terry, who organized the tour from the USA and made the arrangements, secondly to our guides in Spain and Gibraltar - Juan, César, and Darren, and thirdly to our drivers, who had to abstain while the rest of us enjoyed our wine. The approval and assistance of the Spanish Army and MACTAE was paramount in making our tour a success. We thank Gral. Justo Ruiz Sevilla, Cmte. Pino, T. Col. Tomé and the other officers and men who gave of their time to be such excellent hosts and guides.

Firing the 100-ton RML gun at fort Rinella, Malta in 2005.

* * * * *

Aerial Photos at the National Archives

Glen Williford recently found a cache of US Army Air Corps aerial photos in the Still Pictures room at the College Park National Archives, including many of coastal forts from the 1920s and 30s. Not every fort is included, but most are, with 2 to 5 pictures, generally. The photos are approximately 8 x 10 inches.

The file is RG 342-FH, and the boxes with forts are 1059-1064. There is a notebook with the forts listed, but the simplest thing is to just call up the 6 boxes - the forts are in alphabetical order.

* * * * *

Preservation Committee Report

Gordon Bliss

This is going to be a very short Preservation report. I would report on the tragic fire at the Peace Magazine at Fort Mott, but that is covered elsewhere. I only hope that the building can be saved. The one other new item is my receiving a draft archeological survey report on Fort Slocum based on field work done in September-October 2005. While I haven't looked at it in detail yet, nothing I've seen mentioned in it looks like it will change the situation described in my last two columns.

If you have a Preservation issue, contact the Preservation Committee Chair, Gordon Bliss, at gblisscdsg@msn.com.

* * * * *

The CDSG Representative Program

The CDSG Representative Program was established to foster a closer working relationships between the CDSG and the owners, managers, and historians of American coastal fortifications. Over the past several years, members have volunteered as CDSG representatives for a majority of coastal defense locations. The hard work of our representatives can be seen at the CDSG website's "Representative Site Visit Reports." These updates provide essential information on the status of fortifications and act as a guide for members visiting those locations. Over the past year the volunteer efforts have slowed but we still need to cover a number of important locations.

The goals of the Representative Program, as determined by the CDSG Board of Directors, are:

- Introduce the CDSG to the site
- Suggest CDSG membership to sites that do not currently belong to CDSG
- Collect historical and other information about the site
- Offer CDSG assistance to the site
- Determine if there are any projects at the site suitable for funding by the CDSG Fund

Without our representatives' efforts, important HD locations are endangered by neglect. The representatives are an essential part of the process to identify and educate the public and CDSG members of the importance of these sites and help determine how intervention can preserve these sites.

For additional information and your representative kit, contact Representative Committee chair Andy Grant at oozlefinch@mindspring.com.

(right) Fort Michie 1935

the Lebanese coast would be Israeli. INS *Hanit* thus degraded her antiaircraft/missile weapon systems while patrolling off of Beirut, another example of a military community developing an automatic firing system and then becoming afraid to use it because it might fire on friendly units.

Obviously, accurate, reliable information from either side is lacking at this point, but whatever details eventually emerge concerning this attack, it seems clear that surface-to-surface guided missiles have a vital role to play in 21st-century coast defense.

* * * * *

Vickers Coast Defense Guns in Spain

Charles H. Bogart

Spain found it difficult to design and manufacture heavy coast artillery guns, so foreign weapons were often used, including those designed by the British firm of Vickers. This article is based on handouts from the CDGS tour of Spain, personal observations, conversations with our guides, and Babblefish translation of Spanish documents found on the Internet or collected in Spain. Any errors are due to my unfamiliarity with the Spanish language. All photos are by the author unless otherwise noted.

Vickers 152.4 mm/50 Model 1923 Coast Defense Guns

Vickers 152.4 mm/50 Model 1923 coastal defense guns were emplaced around almost all Spanish WW II-era defended ports. Single mounts were Model 1923 "W"; twin-gun mounts were Model 1923 "V." These guns were originally developed in the 1920s to arm Spanish cruisers. The three *Libertad*-class cruisers were armed with eight 152.4 mm guns, six-inch "W" gun mounts, and two-inch "V" gun mounts. The guns were built under license at La Carraca. Later production was strictly for coast defense.

There are two batteries of "V" mounts at Tarifa, each with three mounts. Those at Battery D-8, from the cruiser *Miguel de Cervantes*, were proof fired in August 1941. Those at Battery D-11, from the cruiser *Almirante Cervera*, were not proof fired until November 1971. The disposition of the three "V" mounts from the *Libertad* is not known to this author.

Also at Tarifa is Battery A-5, with four "W" single-mount guns, three from La Mola Battery at Mahon, and one directly from the manufacturer, S.E. m C.N. Reinosa, Ltd. I assume some of the "W" mounts we saw elsewhere came from the cruisers *Mendez Nunez* and *Navarra*, each of which mounted six, and *Libertad*, *Almirante Cervera*, and *Miguel de Cervantes*, each of which had two.

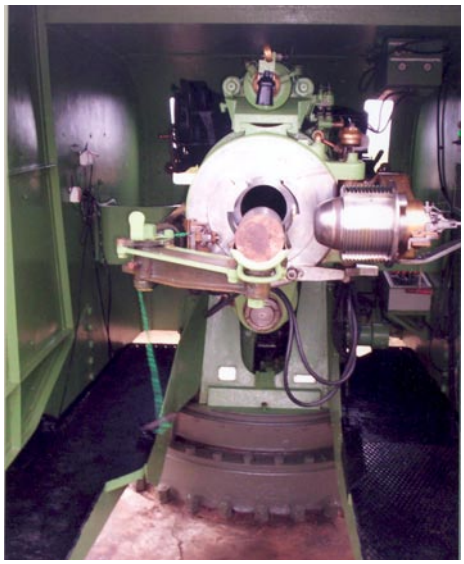
The Vickers gun could fire a 45.30 kg AP round 21,600 m, with a muzzle velocity of 915 mps, using a 16 kg powder charge. A well-drilled crew could fire four rounds a minute. The gun could be depressed to -10 degrees and elevated to +35 degrees. The guns originally had a 2.74 m-base Barr and Stroud range finder and a Poligono fire control system but were converted to radar in the 1960s. Most of the 152.4 mm/50 coast defense guns were proof fired between 1941 and 1944 but only became operational in the 1970s.

1. A 152.4 mm/50 "W" gun in a covered position near A Cuenca, out of service with the barrel plugged. The shield provides little protection from shell splinters.

(Photos 2-15 are of Battery A-5 near Tarifa)

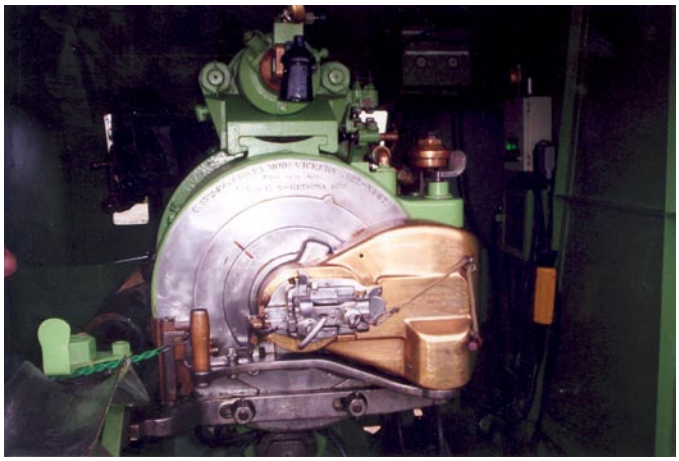
2. The crew of a "W" gun at attention, preparing to man their gun. The protective doors have been opened to give access to the gun's breech.

3. A demonstration 152.4 mm round in preparation for the gun drill.



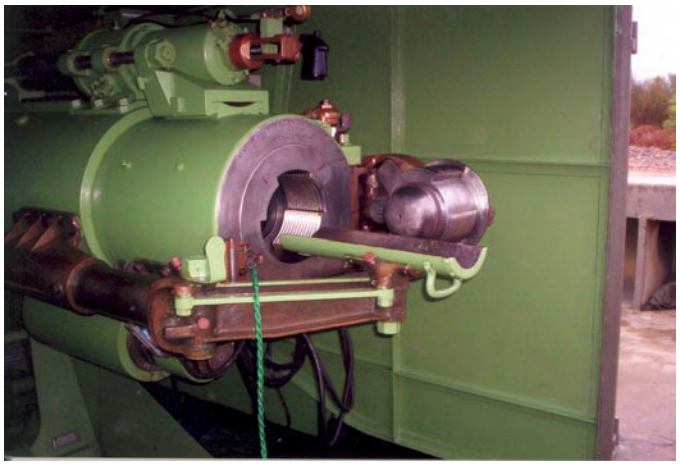
4. The 152.4 mm round resting on the loading tray, ready for ramming.

5. The 152.4 mm shell is rammed.



6. The powder charge has been added and the breech is closed in preparation for firing. The lettering on the breech reads "C.15'24 c/m COASTA MOD VICKERS 1923 No. 47, PLSO 8636 KGS, S.E. m C.N. REINOSA 1932." Reinosa was licensed by Vickers to build 152.4 mm/50 guns for Spain.

7. "Standby!" is given before firing the gun with the yellow box carried on the side of the gun captain. Note the bearings painted on the rim of the concrete gun pit and the thin shield.



8. The "W" breech, with its loading tray.

9. A companion "W" gun with protective cap on the end of the barrel and the porch on the rear of the gun to protect the breech. The gun sits in a slight gun pit with a concrete apron extending beyond the gun position.

10. The "W" gun position. The concrete shelter in the upper left leads to the magazine below, which contained only dummy rounds and cartridges.

11. The rear entrance to the magazine area. The gun is in the upper left of the photo.

12. Seven training rounds were in the "W" magazine. The eighth round was at the gun position.

13. A "W" gun position showing the extensive concrete apron around some of these guns. The concrete has received camouflage paint.

14. A "W" gun with its cap to protect the gun barrel. Note the cracking of the concrete around the gun.

15. A side view of a "W" gun. The concrete building to the right of the gun, rear of photo, provides access to the magazine. The doorway at the right is to a ground-level hallway that leads to steps down to the magazine.

Photos 20 to 32 are of Battery D-8 near Tarifa

20. The 152.4 mm "V" gun positions from the barracks area. This gun came from the cruiser **Miguel de Cervantes**. The concrete support structures have been formed to look like rock.

21. A "V" gun position showing the extensive concrete blast apron around it. The gun and apron have had camouflage paint applied.

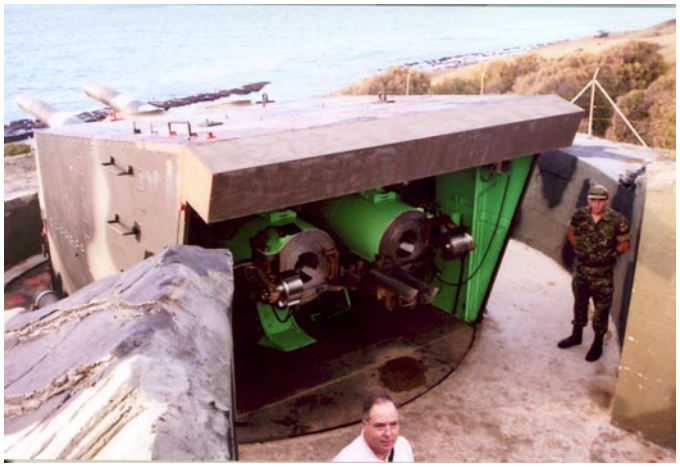
22. A silhouette of a "V" gun position.

24. The entryway into the "V" gun position. The camouflage paint shows up on the horizontal structures. Note that the roofs are rough, to simulate ground.

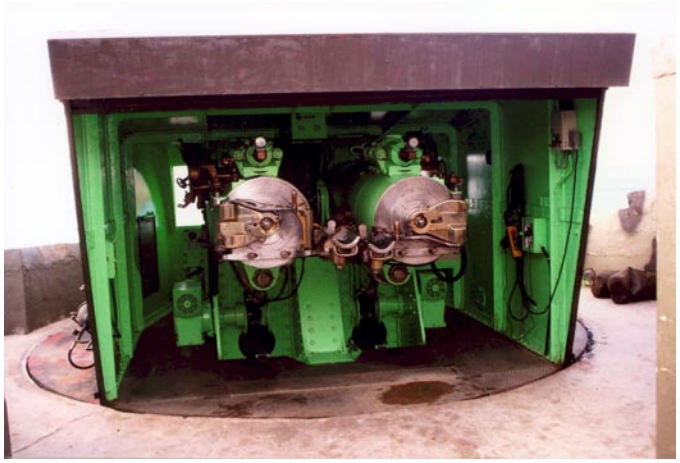
25. A "V" gun position. The buildings on the top of the hill are former range finder and battery commander positions now used by Coast Artillery Regiment 5 (RACTA 5), Artillery Observation and Information Battalion (GRUIL).

The pole to the right had supported a camouflage net. The concrete structure underneath gave access to the magazine. The unevenness of the edge of the blast apron simulates natural ground.

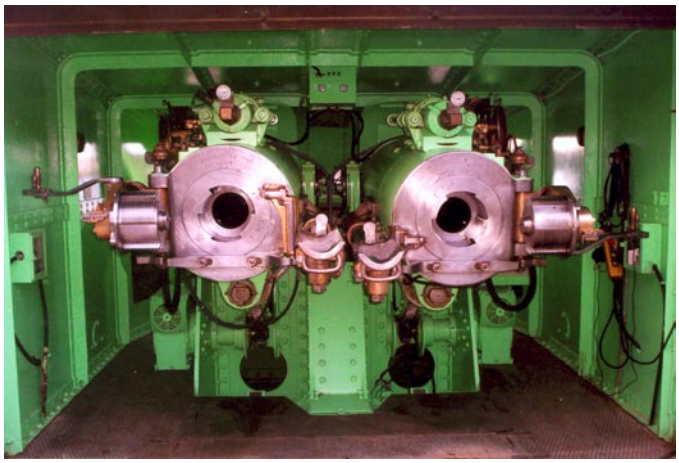
26. The roughness and irregularity of the "V" gun's concrete apron help hide it.



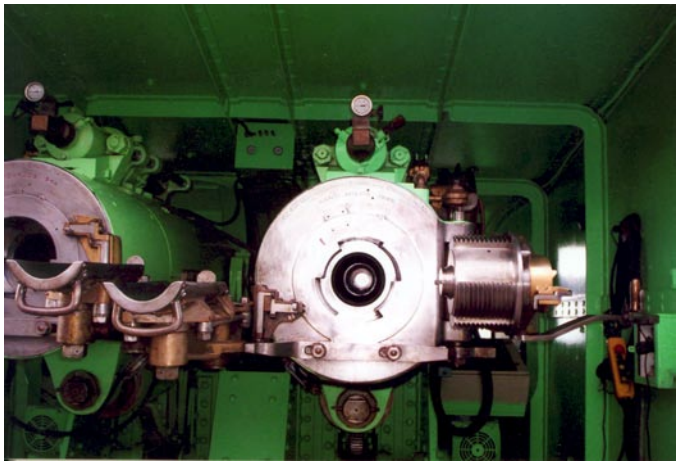
27. The "V" gun position on the military crest, just back from the sea.



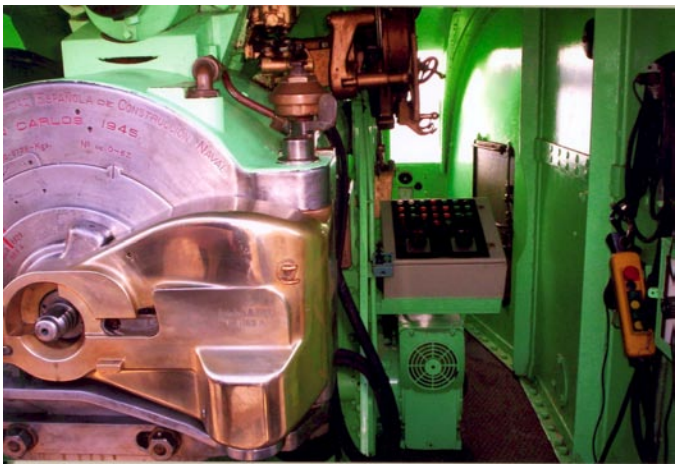
28. The lever for opening the left-hand "V" breech is at the top of the breech, and that on the right gun is at the bottom of the breech.



29. The "V" guns. The engraving on the left hand breech reads "152.4 m/m VICKERS SOCIEDAD ESPANOLE DE CONSTRUCCION NAVAL, SAN CARLOS 1944." The engraving on the right breech is the same with the date "1945." The loading trays swing into the center between the guns, and the breechblocks swing outward.

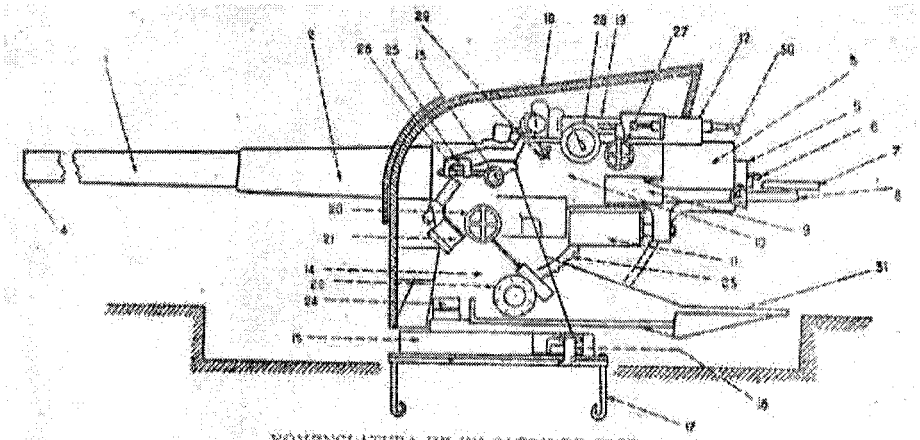


30. Looking down the barrel of the right-hand gun.



31. The gun crew station alongside the right gun barrel. The red firing button on the yellow bar on the right wall is carried by the gun captain.

32. The "V" gun. While the concrete workmanship looks poor, it is designed to blend into the landscape.



NOMENCLATURA DE UN CAÑON DE COSTA

1.—Tubo.
2.—Manguito.
3.—Zuncho de arrastre.
4.—Tulipa.
5.—Cierre.
6.—Llave de fuego.
7.—Teja de carga.
8.—Soporte de la teja.
9.—Aparato de carga.
10.—Cuna.
11.—Freno.
12.—Cilindro del recuperador.
13.—Muñonera.
14.—Cureña.
15.—Base de la cureña.
16.—Aparato de dirección.
17.—Perno de anclaje.
18.—Escudo.
19.—Vástago del recuperador.
20.—Volante de elevación.
21.—Receptor de evacuación.
22.—Engranaje de elevación.
23.—Sector dentado.
24.—Acumuladores.
25.—Puerta anteojo.
26.—Anteojo.
27.—Volante de alcances.
28.—Platillo de alcances.
29.—Volante de derivas.
30.—Lámpara de carga.
31.—Plataforma.

Vickers 305 mm/50 Coast Defense Guns

Until recently, Vickers 305 mm/50 model 1912 coast defense guns were the mainstay of Spanish coast defense. First installed as a coast defense gun in 1941, the guns remained in active service until 1985. Some of the guns thereafter were scrapped on site, some preserved as historical exhibits, and some mothballed for future re-activation.

The Vickers gun was a naval gun used in a coast defense role. It armed three dreadnaughts ordered by Spain in 1909, the *Espana, Alfonso XIII*, and *Jaime I*. At 15,000 tons, the ships were, in reality, more coastal defense ships than sea-going battleships. They were 139.9 m long, 24 m wide, and drew 7.7 m of water. Each was armed with four twin 305 mm/50 turrets, in addition to 20 single 101.6 mm/50 anti-torpedo boat guns. One 305 mm turret was on the bow and one on the stern; two were amidships, in echelon. The three battleships were built by Bazan at Ferrol, but many of their components were built in the United Kingdom. Thus, *Espana* was finished in 1913 and *Alfonso XIII* in 1915, but because of WWI, Britain did not release *Jamie I's* guns and boilers to Spain until 1919, and she was not completed until 1921.

This trio of *Espana*-class battleships all became operational losses. *Espana* ran aground at Tres Forcas off Morocco in August 1923. While the ship was a total loss, her guns and some of the machinery were salvaged. Following *Espana's* loss, *Alfonso XIII* was renamed *Espana*. This second *Espana* was lost in April 1937, when she struck a "friendly" coast defense minefield off Santander on the north coast of Spain. This time the guns could not be salvaged. The last of the trio, *Jamie I*, was destroyed by an internal explosion in June 1937 while at Cartagena repairing bomb damage. At the end of the Spanish Civil War, *Jamie I* was broken up where she lay, but her guns were salvaged.

While Spain was officially neutral during WWII, Franco's close ties to Nazi Germany alienated Spain from many western countries. European Socialists and Communists wanted the Allies to invade Spain and oust Franco, leading Franco to build numerous infantry and artillery bunkers to defend potential invasion beaches and to protect various ports. Among the surplus weapons available to Spain in 1940 were the 305 mm/50 guns from the *Espana*-class battleships.

In all, there were sixteen 305 mm guns available for coastal defense guns - seven from *Espana*, eight from *Jamie I*, and one spare barrel. The 305 mm guns could fire a 385.55 kg shell 22,000 m, but there were only some 80 shells available per gun, since some 1500 shells were lost with the sinking of the three ships, and others had been fired during the civil war. The only shells remaining were the war reserve supply. New shells could not be manufactured in Spain, as the machinery was in Great Britain. The guns were originally equipped with armor-piercing, semi-armor-piercing, and high explosive shells, but it is not known just what type of shells the coast defense batteries were armed with. The sixteen 305 mm/50 guns were mounted as follows:

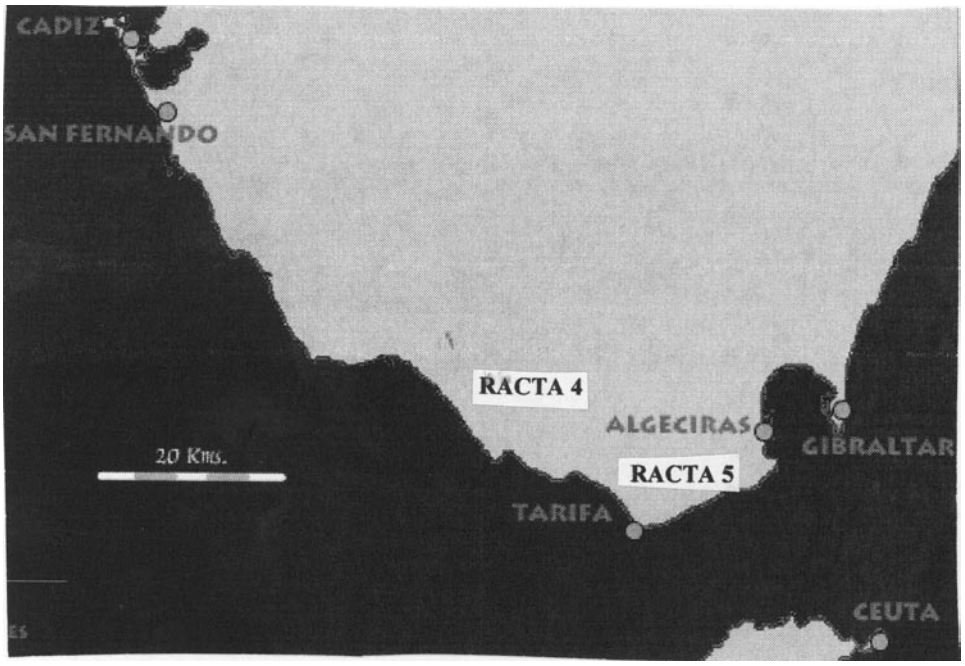
Place	Year	Turret
Cabo Blanco on Mallorca, near Palma	1953	Single
Cabo Blanco on Mallorca, near Palma	1953	Single
Refeubetx on Mallorca, near Palma	1954	Single
Refeubetx on Mallorca, near Palma	1954	Single
Guadirao, at Algeciras	1947	Single
Guadirao, at Algeciras	1948	Single
Guadirao, at Algeciras	1949	Single
El Vigia, at Tarifa	1941	Double
Cascabel, at Tarifa	1941	Double
Cerro de los Marties, near Cadiz	1943	Double
Cerro de los Marties, near Cadiz	1952	Single
Camposoto, at Cadiz	1944	Single
La Marquina, near Cadiz	1943	Single

As mounted, each gun had an underground magazine, with hoists to raise the shells and powder to the gun. The shell magazine was in a circle around the barbette mount and the powder was stored in an alcove. The gun itself was in a steel "turret" that rotated on a ring of roller bearings. While giving the appearance of armor, it was actually mild steel, providing only limited splinter protection.

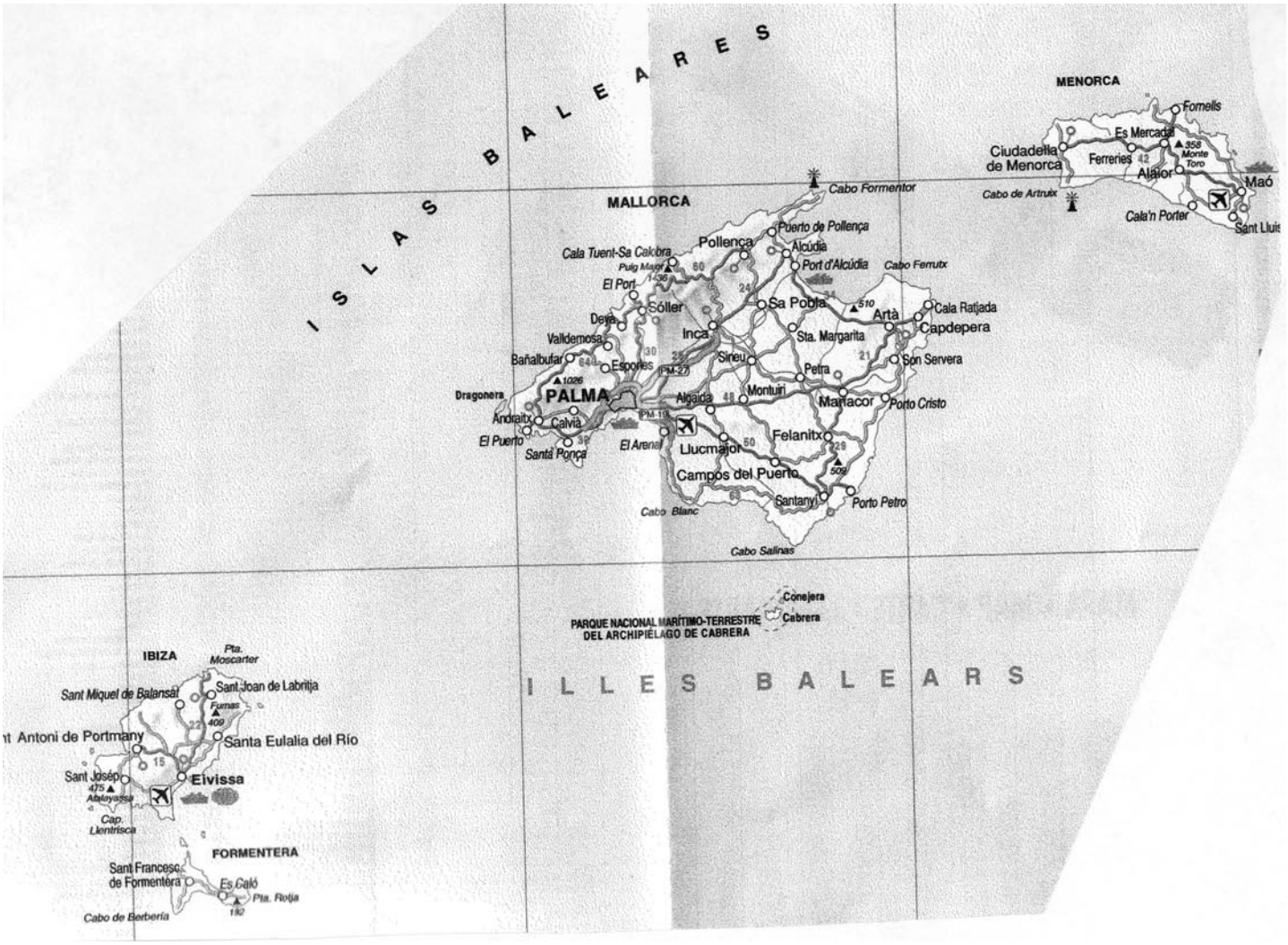
The mounting and proof firing of El Vigia and Cascabel Batteries in 1941 gave pause to the Royal Navy. These two batteries overlooking the Straits of Gibraltar could reach North Africa with their shells. If Spain joined the Axis, they could close the straits to the Royal Navy and the merchant ships that supplied Malta and Gibraltar. These two batteries continued to worry the Allies through 1944. The Allies knew of the German plan, Operation Felix, to capture Gibraltar. While Franco had vetoed the plan in 1941, the Allies continued to worry that Franco might change his mind.

Starting in the 1970s, the Spanish Army retired the 305 mm/50 guns from active service; manpower and funds were shrinking and other military needs had greater priority. The last battery closed was Cabo Blanco on Mallorca, in 1985. In 1996, Battery Cabo Blanco was transferred to Museo de San Carlos de Palma De Mallorca.

1. Battery Cascabel, one of two twin 305 mm/50 gun turrets installed at Tarifa in 1941. No longer active, it is in excellent condition. Support structures in the background provide access to the underground magazine and support rooms.



31. The Spanish coast between Cadiz and Gibraltar.



32. The Islas Beleares and Isle Mallorca with its port of Palma.

2. One has to wonder about the effectiveness of the camouflage paint at Battery Cascabel with the large white blast apron in front of the gun. The metal box behind the turret was used to replenish the magazine with shells and propellant.

3. Battery Cascabel's guns swung 90 degrees to the right of their field of fire, barely clearing a concrete wall. In theory, with the guns in this position no one could toss an explosive charge down the gun barrel.

4. Close-up of Battery Cascabel's gun mount, showing the blast doors on the support structures in the background.

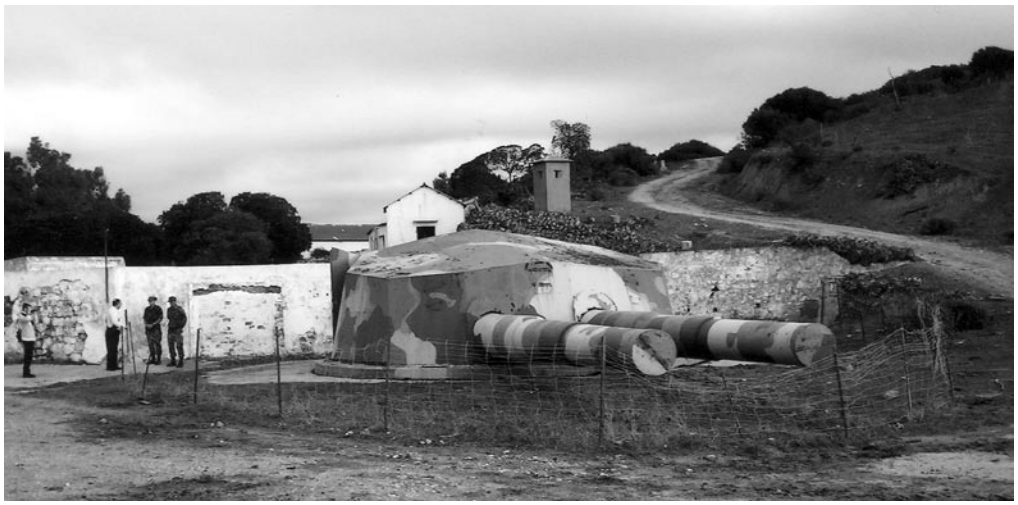
5. Side view of Battery Cascabel. The flaring skirt around the base of the shield carries rainwater away from the turret.

6. Battery Cascabel on the crest of the hill overlooking the Straits of Gibraltar. The blast apron is to the left, with the waters of the straits half a kilometer from the cliff edge.

7. Markings on Battery Cascabel's left gun. The right barrel had serial number 17067. Both guns came from **Jamie I.**

8. Battery Cascabel from between the guns.

9. Battery El Vigia, one of two twin 305 mm/50 coast defense batteries built at Tarifa in 1941. The support structures at this battery are considerably different from those at Battery Cascabel, and the battery lacks a blast apron.



10. Battery El Vigia is presently mothballed. Unlike Battery Cascabel, El Vigia's guns point toward the straits.

11. Battery El Vigia. The gun caps that protect the barrels extend 100 mm over the barrel, with camouflage paint matching the barrel. A rust streak on the left barrel marks where the cap ends.

12. The left side of Battery El Vigia. The skirting around the bottom of the mount is different from Battery Cascabel.

13. Battery El Vigia. With all the dirt in the area, she must have generated a cloud of dust when fired. She fired her first round on August 14, 1941, and her last on September 8, 1977.

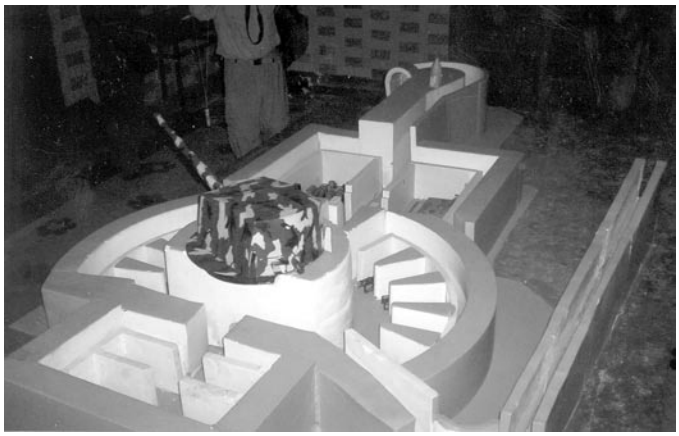
14. Battery El Vigia from above. The gun is covered in heavy Cosmoline to preserve it. Note the thin metal shield.

15. Battery El Vigia's right-hand gun, No. 1428 A. The left gun is No. 1429 A. Pity the poor crew that has to remove the Cosmoline.

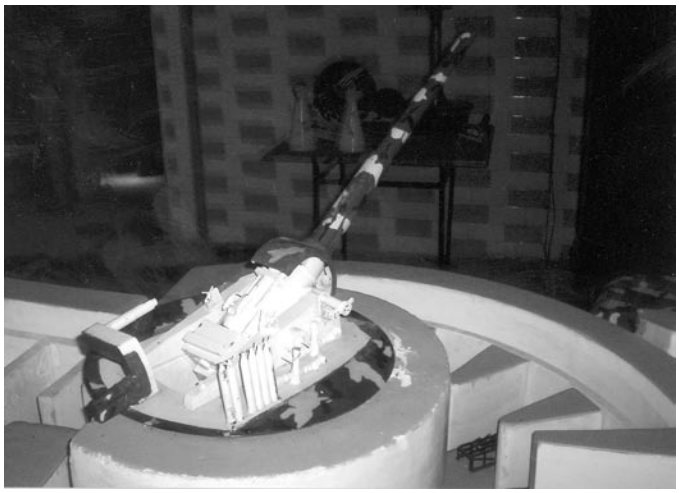
16. Mary Ann and the author pose by Battery El Vigia to prove they were there. Mary Ann was one of four women who explored the gun batteries with CDSG.

17. The gate guard at the Camposoto Spanish Army base in Cadiz. The Camposoto 305 mm gun came from **Espana** and has No. 16573 on its breech. It now faces 180 degrees from the sea, pointing at the entrance to the base.

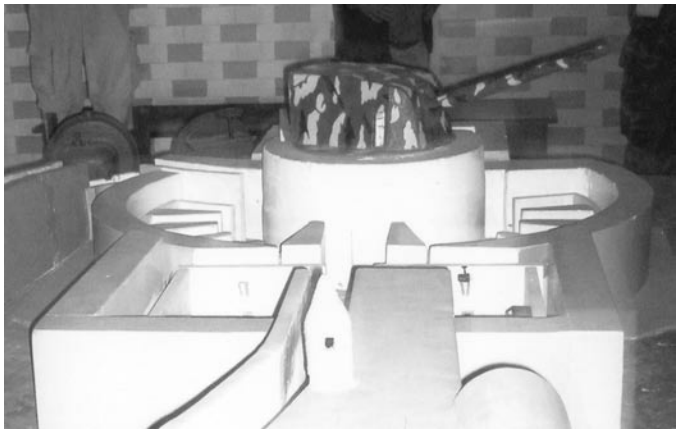
18. The 305 mm gun of the Camposoto Battery at almost sea level. Beneath the gun is an extensive bunker. Due to the greener vegetation near Cadiz, the gun's camouflage is green, not brown like at Tarifa. The gun sits in a shallow depression with a 360-degree blast apron, in theory capable of defending Cadiz against land attack.

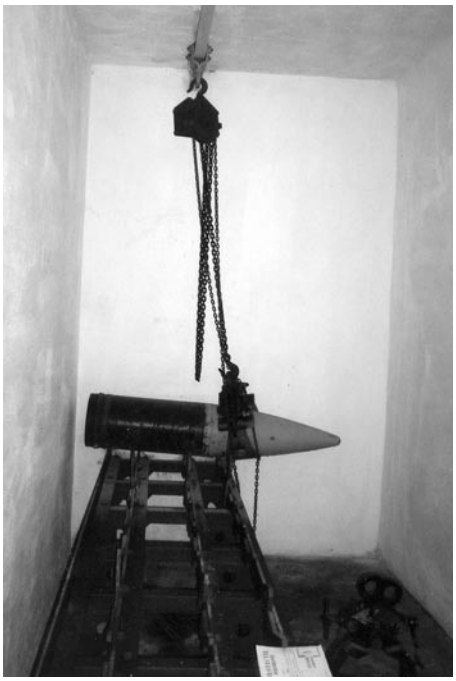


19. A model of the Camposoto 305 mm gun. The entrance to the battery is at the top of the picture. The entry faced a ditch and once underground, made a 180-degree curve for blast protection. The fire control room is to the left of the entryway; the mechanical room is to the right. The gear-like structures around the gun housed the shells. In the lower left is the powder room. The emergency escape passage way is in the center lower right. Note the shell racks in the two upper-right gear teeth.



20. The Camposoto 305 mm gun model with the shield around the gun removed.

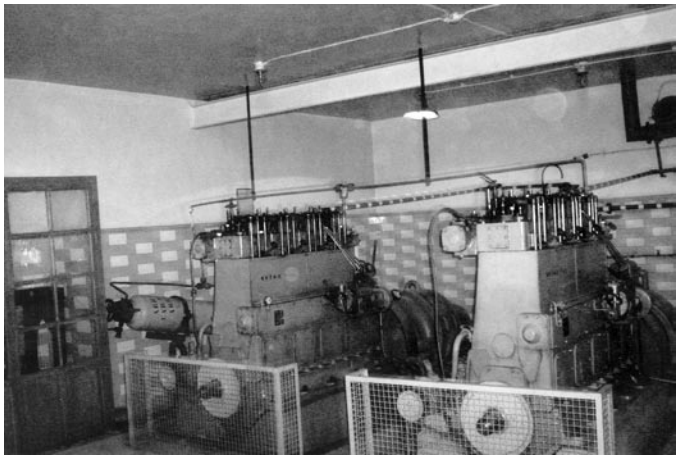




21. One of the shell-holding passageways within the Camposoto Battery, with a demonstration round on the shell rack. The shell was picked up by a clamp hanging from a monorail. Manpower moved this to the shell hoist opposite the powder room. Each shell rack held eight shells and there are ten shell-holding alcoves.

22. In the Camposoto Battery powder magazine, Charles Blackwood demonstrates the size of a dummy powder cartridge for the 305 mm gun.

23. (Left) The model of the 305 mm gun at Camposoto Battery from the entrance into the gun, showing the curved passageway into the underground chambers.

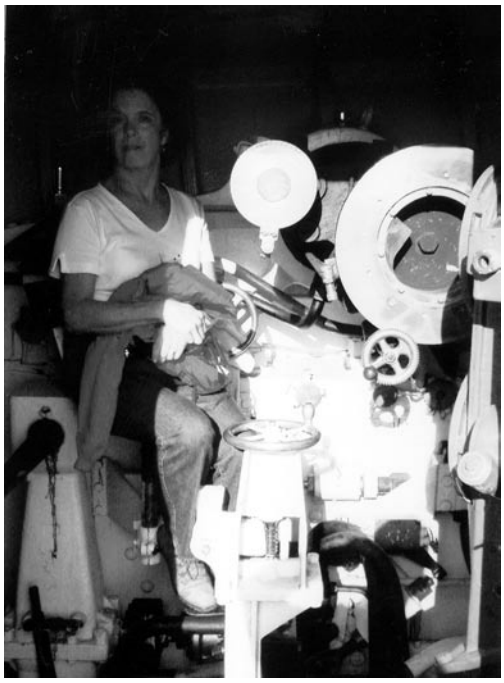


24. The mechanical room of the Camposoto Battery.

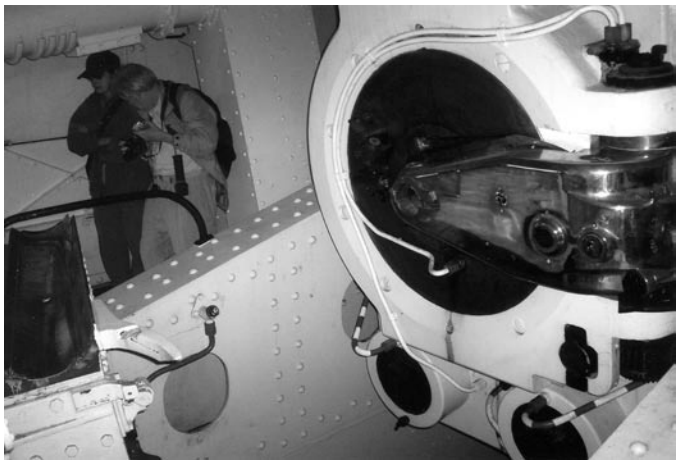
25. The rear of the Camposoto Battery. Note the thin shield and the depression that the gun sits in, unlike the guns at Tarifa.

26. The Camposoto Battery powder magazine handling door and powder distribution tray. The powder bags were passed into the handling area via the metal container on the right. When the lid was lifted to access the powder bag, a shutter dropped, sealing off the powder-handling area from the powder magazine. When the lid closed, a shutter rose and the powder magazine could insert another powder charge into the handling tray.

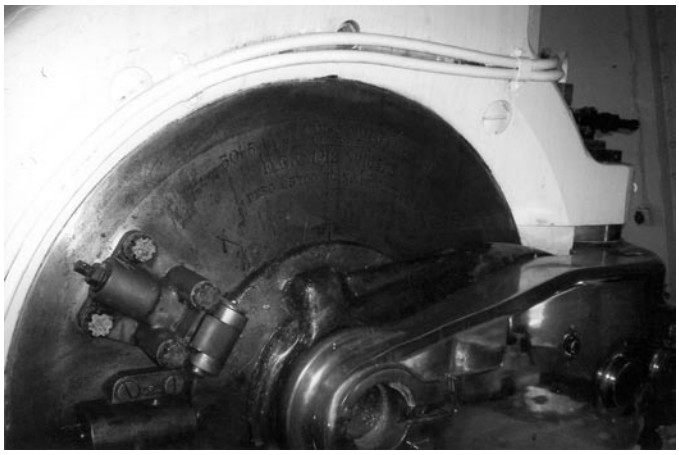
27. The right side of the Camposoto 305 mm gun, looking at the gun trainer and gun captain's positions.



28. The interior of the left side of the Camposoto 305 mm gun. Mary Ann Bogart sitting in the gun elevator position.



29. The breech of the Camposoto 305 mm gun. In the lower left, the loading tray for the gun is perpendicular to the gun.



30. A close-up of the Camposoto 305 mm breech, with its 1912 building date and serial number 16573.

Vickers 381 mm/45 Coast Defense Guns

In 1912, King Alfonso XIII ordered a comprehensive study on upgrading Spanish coast defenses, but World War I and the economic depression that followed intervened. In 1925, with an improved economy, Alfonso consented to the request of General Miguel Primo de Rivera, director of the Spanish War Ministry, for 18 Vickers 15 in/45 coast defense guns, classified as

"D Costa de 38.1 Modelo 1926." Eight were assigned to defend the twin ports of Ferrol and A Coruna, six to protect Mahon in the Menorca Islands, and four to guard Cartagena.

The Vickers 15-inch gun became the mainstay of Britain's battleships with the introduction of the *Queen Elizabeth* Class of 1912. The five ships in the class and the following five-ship *Revenge* Class of 1913 were all armed with eight 15 in/42 guns, as were the Royal Navy's last battle cruisers. The two-ship *Renown* Class of 1915 had six 15/42 guns, the two-ship *Courageous* Class were armed with four, while Hood had eight. The monitors *Marshall Soult*, *Erebus*, and *Roberts* were also equipped with 15/42 guns. Great Britain would emplace five 15-inch coast defense guns at its Singapore Naval Base in the 1930s - two guns at Battery Buona Vista and three at Battery Johore.

The Spanish adoption of the Vickers 381 mm/45 gun as a coast defense gun was not taken without study. In 1913 and in 1921, Spain had approached Vickers about designing a new class of seagoing battleships. The proposed 1913 battleships were to be armed with 15 in/40 guns and the 1921 battleships with 15 in/42 guns. Though neither of these proposals went beyond preliminary paper designs, they did give Spain an understanding of 15-inch guns. In addition, by 1925 Spain had the Royal Navy's WW I operational history to add to the knowledge from its two battleship design proposals. Thus in 1925 Spain had considerable insight into the capability of the Vickers 15-inch gun.

In turn, Vickers' equipment to build 15-inch guns was idle, with no orders from the Royal Navy being projected for the foreseeable future. In fact, the latest two Royal Naval battleships, *Nelson* and *Rodney*, ordered in 1922, were being armed with 16-inch guns. Thus, one would assume that Spain's desire for modern coast defense guns and Vickers's surplus gun-building capacity led to a meeting of minds on price.

The 381 mm/45 guns as mounted in Spain were all in single-gun turrets; usually two turrets comprised a battery. At Ferrol and A Coruna, the guns were placed in four batteries: Battery Monte San Pedro at A Coruna, Battery Lobateiras at Ferrol, and Batteries Prior and Campelo at Cabo Prior. At Cartagena, there were two batteries of two guns each, Battery Cabo Tinosa to the west of Cartagena and Battery Cenizas to the east. At Mahon, there were two batteries of two guns each, Batteries Llucalary on the south coast and Favaritx on the northeast coast.

In 1940, Franco ordered a re-structuring of Spanish coast defenses. Due to fear of an Allied invasion, based on Gibraltar, he ordered the defenses around Tarifa and Algeciras upgraded. The Spanish Ministry of War drew up plans to place four 381 mm guns west of Tarifa, at Battery Paloma Alta, to control the entrance into the Mediterranean. To provide the necessary guns, Battery Campelo Alto at Ferrol and Battery Favaritx at Mahon were closed and their guns moved to Tarifa. The guns from Battery Campelo Alto were mounted in two turrets in 1941. During their proof firing on May 13, 1942, a premature explosion destroyed one of the guns, which was replaced by a gun from Battery Favaritx. The other Battery Favaritx gun was then emplaced in a third turret. These last two guns were proof fired on January 10, 1944. The result was that Battery Paloma Alta became a three-gun battery, today the only active 381 mm guns in the Spanish Army.

On June 26, 1953, the 10th Battery of Artillery was carrying out a firing exercise with Gun No. 2 of Battery Llucalary on Mahon. At 1215 hrs, while the gun was being loaded, an explosion ripped through the turret. It is thought the powder bag fouled in the ammunition hoist, tearing the bag, and the friction of the gearing on powder grains caused the powder to explode. Twenty-three men were killed and eight wounded.

After the explosion at Battery Llucalary, powder bags for the 381/45 guns were not sent up the ammunition hoist but carried by hand, in a metal container, from the powder magazine, through the bunker's underground personnel entrance, and up outside steps to the gun. The powder bag at the gun position was then passed through the turret's rear door for loading into the breech of the gun. This was the policy on October 17, 2005, when Battery Paloma Alta carried out its annual firing. Interestingly,

this firing was without a shell, as it is too difficult to establish a safe zone to actually fire at a target around Tarifa, thus only a powder charge was used.

The underground magazines of the 381/45 guns resemble a cross standing on a ball, the ball being the area in which the gun turret sits. The head of the cross is the entrance to the magazine. The right arm of the cross is the projectile storage area. The shells are stored here in metal bins and are moved by a two-step overhead monorail from storage bin to the ammunition hoist. The first movement is by monorail to the shaft of the cross. The second movement by a second monorail is down the shaft of the cross to the ammunition hoist. Shells are carried nose down up the ammunition hoist. The ammunition hoist is at the foot of the cross just before the ball area in which the turret sits. The powder is stored in metal containers in the left arm of the cross.

The 381/45 mm gun has a range of 35,100 m. It fires a 885 kg armor piercing round, at a muzzle velocity of 762 meters per second, using 197 kg of powder. The guns are capable of one round per minute. The gun can be depressed or elevated from -5 to +40 degrees and trained 360 degrees. The gun positions were originally equipped with two Barr-Stroud 9.14 m-base range finders, but these were replaced in 1972 with RX-80E fire control radar. The Babblefish translated text reads "It had two telemeters 'Barr-Stroud' with 9,14 meters base and a FDC 'Vickers'. Both telemeters were substituted by two telemeters 'Lopez Palomo.'" I assume FDC stands for fire control director.

Ten of Spain's eighteen 381/45 guns still exist; the three guns of Battery Paloma Alta, which are still in service, the two guns of Battery Monte San Pedro at A Coruna, the four guns at Cartagena, and Gun No. 1 at Battery Llucalary at Mahon, which are preserved as museum pieces.

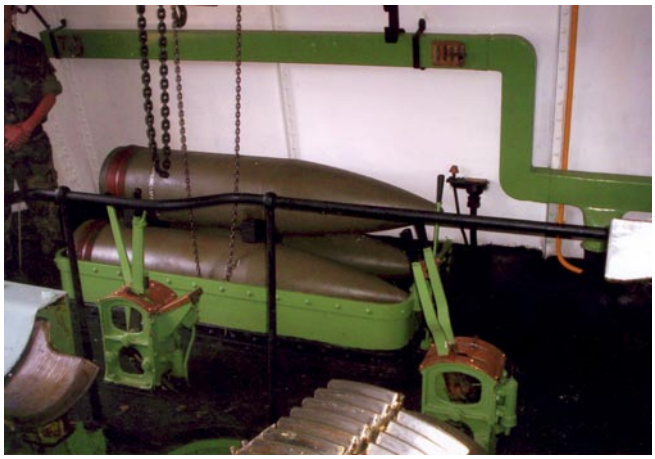
1. One of the three 381/45 guns at Battery Paloma Alta, raised for maximum range. The guns at the battery all had camouflage paint. A small concrete blast apron that did not extend to the length of the gun barrel surrounded the turret.

2. One of the 381/45 guns at Battery Paloma Alta with its gun at normal elevation.

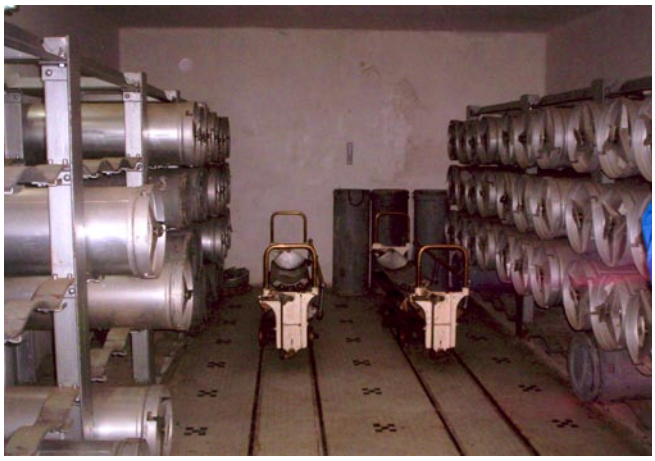
3. The gun crew for one of the 381 mm guns at Battery Paloma Alta. The entrance to the magazine is in the left background. The gun is just above, out of sight. Powder charges are brought out from the bunker and carried up the steps to the right to the gun position.

4. The rear of one of the 381 mm guns showing the opening through which the powder charges are passed into the turret. The crane and the trap opening are for loading shells into the shell magazine.

5. A close-up of the turret and the plate it rides on around the concrete apron. The standing water on the metal ring is from a recent shower.



6. The war-reserve shells within the 381 mm turret. Three shells were on the right and left side of the gun.



7A & B. The powder room and its metal powder containers. Note the powder carts, the narrow-gauge track, and the tile floor. I understand the powder is removed from the metal containers and placed in one of three carrying containers, standing up right against the back wall. The gunpowder is carried in these containers to the gun.

8. The shell room with the shell bins and the overhead monorail. The shell clamps can rotate 360 degrees to grab a shell or deposit it at the monorail that carries the shell to the loading hoist. No one could explain the storage of the shells in the metal bins.

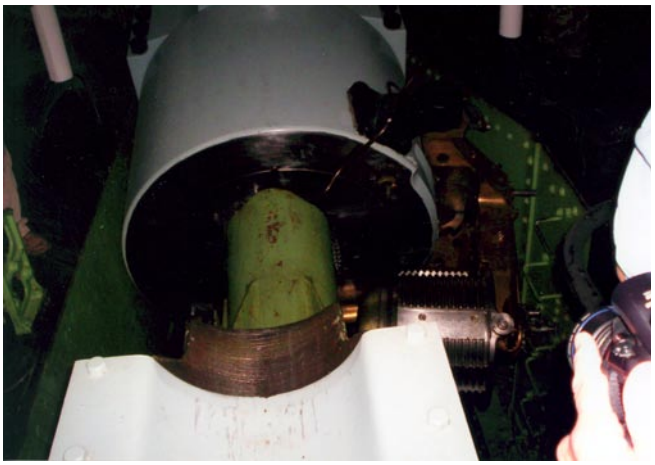
9. The shell has been picked up from the storage bin and is being moved to the next overhead monorail position.

10. The second overhead monorail has picked up the shell from the tray where it was deposited by the first monorail. The shell will now move to the ammunition hoist.

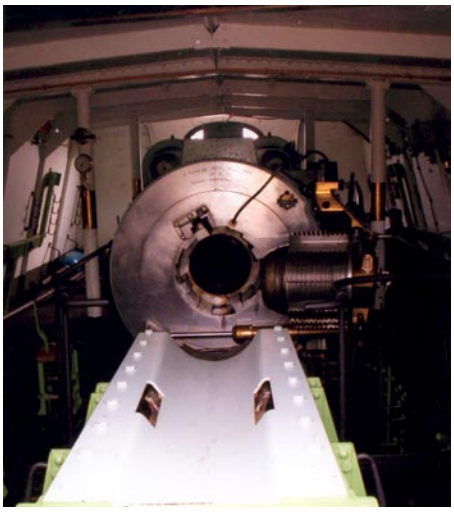
11A & B. The shell will be lowered into this tray, and the brass cap will push the shell into the shell hoist container.

12. The shell being lowered from the second overhead monorail into the shell hoisting mechanism.

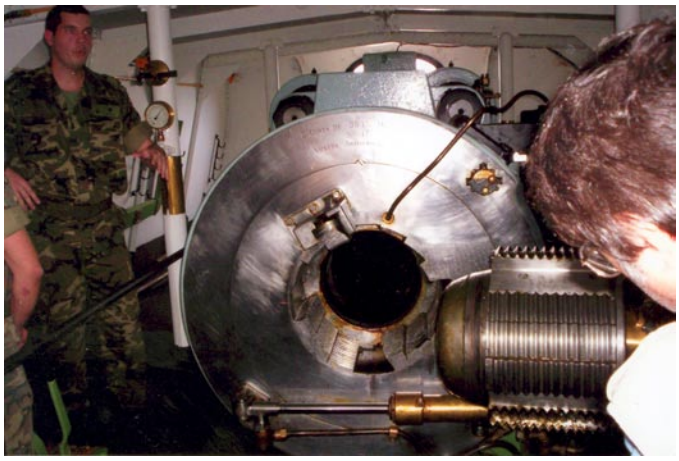
13. The shell raised into the ammunition hoist, starting its journey to the gun.



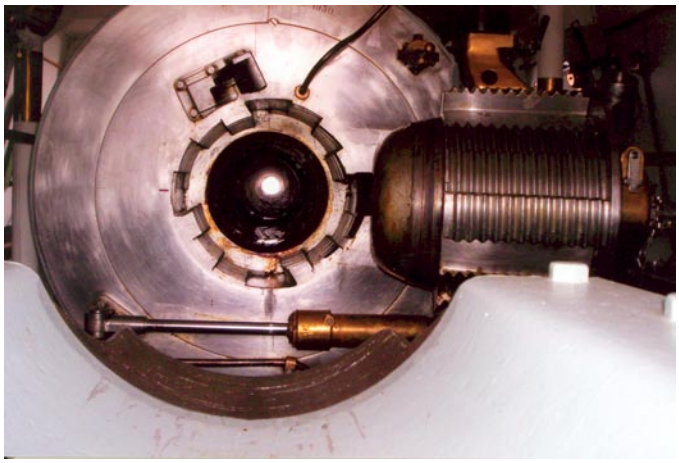
14. The shell being loaded into the gun.



15. The shell and powder-loading tray in position to receive a shell or powder bag.



16. A view of the gun breech, inscribed "D Costa de 38.1 Modelo 1926, No 17, Vickers Armstrong 1930."



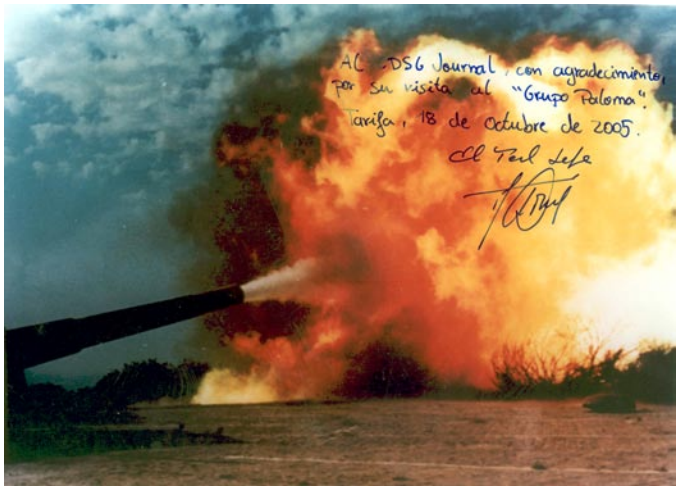
17. The interior of Gun No. 17.

18. The gun was manned by a mixed crew of males and females. The female was the gun's trainer and the male the gun captain. The gun plate has been removed from in front of them and a person can be seen standing on the outside of the mount.

19. The Paloma Alta gun from the rear, with the barrel elevated.

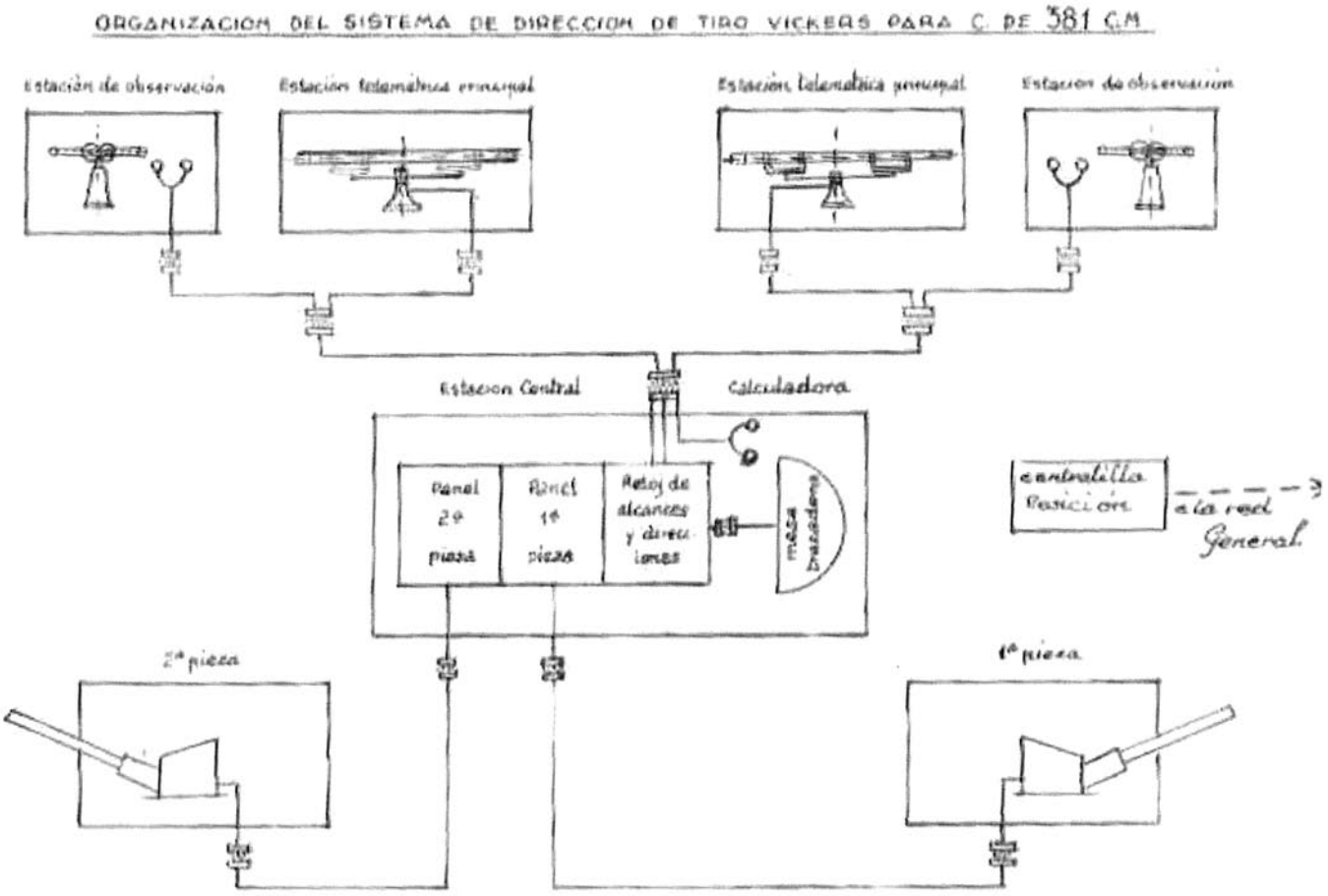
20. A view of the Paloma Alta gun from the front with the barrel depressed. The steel shutter has been removed from the window at the gun captain position (See Illustration 18)

21. The CDSG tour group in front of one of the 381 mm guns. (Courtesy Svein Olson)



22. A 381 mm guns firing. The muzzle blast lights up the area. (Courtesy Commanding Officer RACTA-4)

23. Within this headland are the guns of the Paloma Alta Battery. (Courtesy Commanding Officer RACTA-4)



24. Layout of a 381/45 gun battery as originally established. (Courtesy Commanding Officer RACTA-4)

* * * * *

A Photographic Look at Some of Gibraltar's WWII Gun Batteries

Charles H. Bogart

During the CDSG tour of Gibraltar, we visited five World War II-era gun batteries. O'Hara's, Lord Airey's and Breakneck Batteries are each armed with a single 9.2-inch BL Mk X gun. They are all located along the upper ridge of Gibraltar, giving them a commanding view over the Straits of Gibraltar. Devil's Gap Battery contains two single 6-inch BL Mk VII gun mounts. Princess Anne's Battery is equipped with four single mount 5.25 inch QF Mk II guns.

O'Hara's and Lord Airey's 9.2-inch guns are mounted on Mk VII mountings while Breakneck uses a Mk V mounting. The 9.2-inch guns could fire a 380-pound shell 29,600 yards. From Gibraltar to North Africa is 25,500 yards and to Algeciras, Spain 9,000 yards. The three guns extend in single file along the southern ridge of Gibraltar. Breakneck is the northern-most and O'Hara's the southern-most gun. All three were mounted at the beginning of the 20th century. Originally the guns were not protected by shields, which were added in the 1930s and 40s.

O'Hara's Battery, the lowest of the three, is 1383 feet above sea level. O'Hara's, Lord Airey's, and Breakneck Batteries were all declared surplus to requirements by the British Army in the 1980s. O'Hara's and Lord Airey's batteries fired for the last time on April 7, 1976. A tunnel connects O'Hara's Battery and Lord Airey's Battery. Within the tunnel are various pieces of fire control gear, as well as the shell and powder magazines for the two guns.

Breakneck Battery, according to one legend, is so named because one falling off its gun platform would fall to the bottom of the hill, resulting in a broken neck. Another story says that a soldier working at the gun position fell during its construction and broke his neck. Lord Airey's Battery is named for Gen. Richard Lord Airey, Governor of Gibraltar from 1865 to 1870. O'Hara's Battery is named for Lt. Gen. Charles O'Hara, Governor of Gibraltar from 1787 to 1799.

A recent find, located near Breakneck Battery, is a hidden tunnel that leads to a concealed position. We were told it was to be manned by a stay-behind party if Gibraltar was captured. The party had supplies for two years and two concealed viewing ports overlooking Gibraltar Bay and the Mediterranean Sea. They were to be sealed in a large room with a cork floor to deaden any sound. Stairs led upward from this room to the two viewing ports. Waste products were to be carried down into the substructure of the rock of Gibraltar. Water would be drawn from catchments. I assume that reports would have been by radioed at a set time and frequency, broadcasting only if necessary.

Devil's Gap Battery, originally the site of a mortar during the Great Siege of 1789 to 1793, received its name from the Spanish name for its location, Punta del Diablo. In 1878 the position was rebuilt and two 9-inch RMLs installed. The 9-inch guns were removed in 1900 and replaced in 1902 by two 6-inch Mk VII guns on central pivot Mk II mountings. The 6-inch guns had a range of 6,000 yards and looked out over Gibraltar Bay. While some literature claims that Devil's Gap Battery sank a German submarine off Algeciras in August 1917, standard sources on WWI U-boat loses show no U-boat lost in this area during 1917. The battery was manned during WWI and WWII and then declared surplus in 1954.

Princess Anne's Battery is on the hillside above the harbor. The site is sometime referred to as Princess Caroline's Battery, Princess Amelia's Battery, or even Princess Royal's Battery. These three battery names, however, refer to 18th and 19th-century batteries located in and around Princess Anne's Battery. Princess Anne's Battery was constructed in 1732 to mount five 12 pounders, and saw action during the Great Siege. During the 19th century, Princess Anne's Battery was rebuilt to house four 12 pounders and three 13-inch mortars.

In 1942 it was proposed to increase the antiaircraft defense of Gibraltar by mounting seven 5.25-inch guns, three on Europa Point and four at Princess Anne's Battery. The 5.25 QF Mk Is were dual-purpose guns, built for twin mounts on Royal Navy cruisers and battleships. The British Army took the basic design and upgraded it into the Mk II, with a stronger breech ring to allow a muzzle velocity of 2850 f/s as opposed to the Mk I's 2672 f/s.

The four 5.25 QF Mk II guns on IB mountings did not become operational until 1956. Shortly after becoming operational, the four guns were reduced to caretaker status and declared surplus in the 1990s. The guns could fire ten, 88-pound shells per minute skyward to 55,000 feet, or horizontally to 27,000 yards or 13.5 miles. The Mk IB mounting has an enclosed gun shield, while the shield for the IA mount was open in the rear.

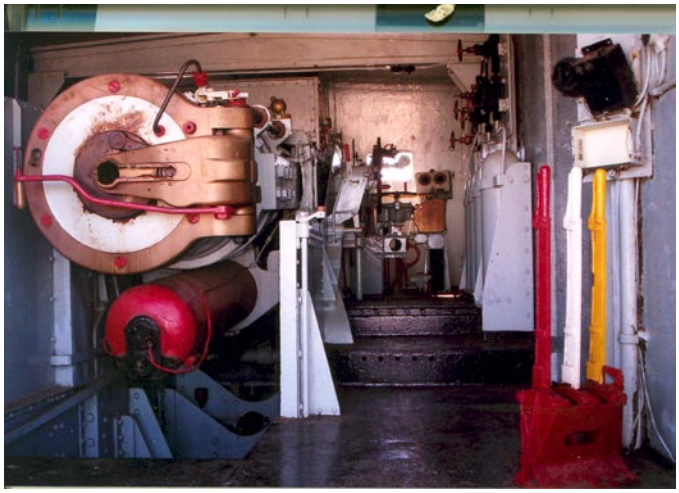
The four guns of Princess Anne's Battery are each partially enclosed by a concrete wall. Guns Nos. 1, 2, and 3 have a semi-sunken magazine, while gun No. 4's magazine is completely below ground level. To the rear of Gun No. 2 is an entrance into Willis' Gallery, a segment of Gibraltar's 30 miles of underground tunnels.

Princess Anne's Battery was named after the eldest daughter of George II, Princess Anne, Princess Royal of Great Britain and Ireland. She is better known as Princess Anne of Orange due to her marriage to Prince Willem IV of Orange-Nassau.

Issue Number 21 of *After The Battle* magazine, devoted to Gibraltar in WWII, is well worth reading before traveling to Gibraltar. I unfortunately did not get to read it until after I had returned home.

Any errors in this article are totally my fault, as I put my notes from Gibraltar in such a safe place I cannot find them; thus this article is created from memory.

Photos by author unless otherwise noted.

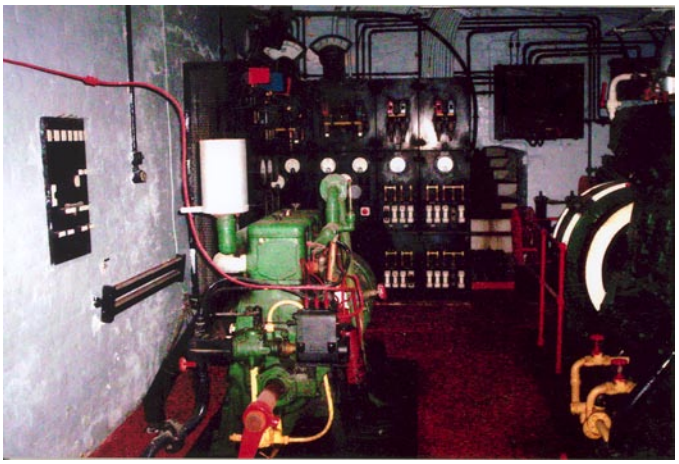


1. A view into the gun shield of O'Hara's 9.2-inch gun. Both O'Hara's and Lord Airey's Batteries are fenced off from the public and in fair condition. It is almost impossible to get a photo looking along the barrel to the front of the gun.

2. The author opens the breech of O'Hara's gun.

3. O'Hara's shell hoist.

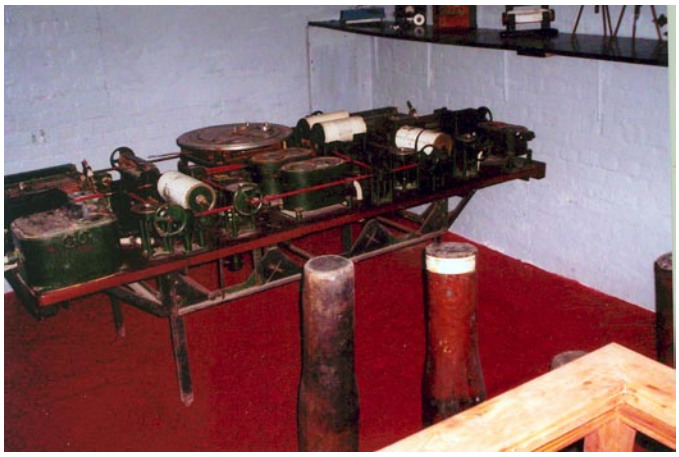
4. Trolley used at O'Hara's Battery to move shells from the ready locker to the loading hoist.

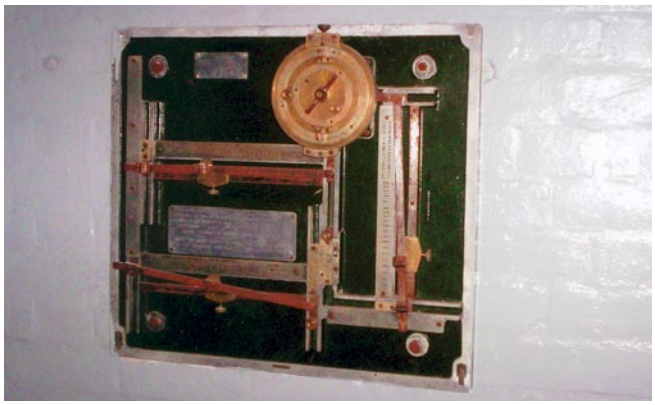


5. Engine room that served O'Hara's and Lord Airey's.

6. Shell storage area for O'Hara's Battery.

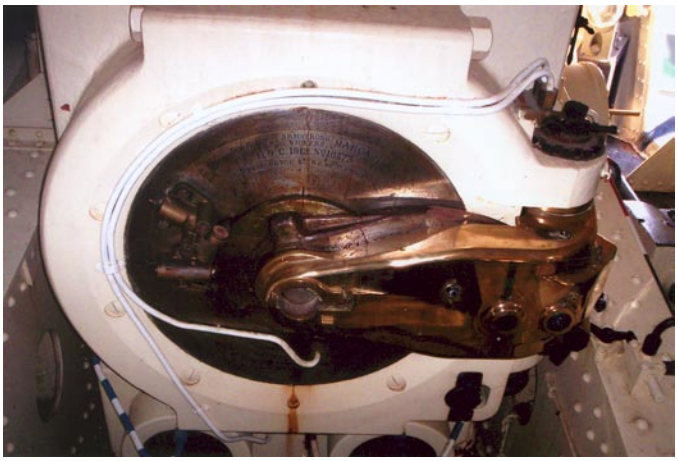
7. Spare 9.2-inch barrel moved between O'Hara's and Lord Airey's Batteries early in WWII. Lord Airey's Battery is above the gun barrel.





8 & 9. Fire control gear on display in the tunnel between O'Hara's and Lord Airey's Batteries.

10. Lord Airey's Battery from the spare 9.2-inch barrel.

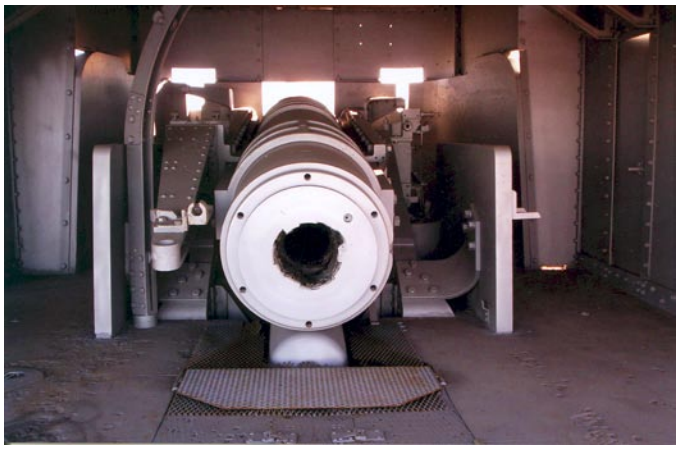


11. Breech of Lord Airey's 9.2-inch gun. The gun is in bad shape, but is to be restored in the near future.

12. Breakneck Battery datum marker.

13. Breakneck Battery's 9.2-inch gun. There is a sheer drop down the hillside from the gun platform.

14. Breakneck Battery looking out into the Mediterranean Sea.



15. The interior of Breakneck Battery's 9.2-inch gun mount. The breechblock is missing.

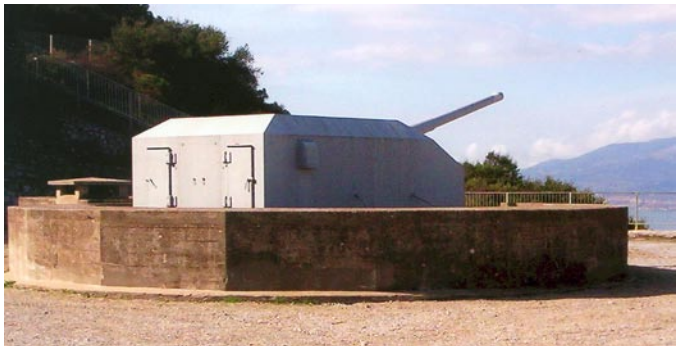
16. The left-hand 6-inch gun of Devil's Gap Battery, surrounded by an extensive concrete blast apron. The shield appears to have been upgraded with straight armor plating above and along the side of the original circular gun base.

17. The right-hand gun of Devil's Gap Battery. The building date "1902" is in the roof of the concrete shelter.

18. Devil's Gap No. 2 Gun. Note the metal ring extension, part of the original gun mount rendered useless by the new gun shield.

19. The breechblock of Devil's Gap's No. 2 Gun. The interior is smothered in graffiti and the breech welded in place.

20. Princess Anne's Battery. The closest gun is No. 3. Note the concrete shelf running around the guns. The magazine for each gun is in the concrete house to the left of the gun



21. Princess Anne's No. 1 Gun showing the concrete wall around it. The magazine is to the left of the gun, underneath the ventilation structure.

22. Princess Anne's No. 2 Gun. I wondered if the concrete wall around the gun was designed to help keep debris thrown up by shell or bomb burst from clogging the training gear.

23. Princess Anne's No. 3 Gun showing the ammunition ventilation outlet.

24. Princess Anne's No. 4 Gun. Notice how the gun sits below the level of the ground

25. Princess Anne's No. 4 Gun. The entrance to the magazine leads off to the lower right. The purpose of the metal tubing attached to the gun shield is unknown.

26. The stay-behind chamber looking to the left as one enters. The floor is covered with cork, now disintegrating, to reduce the sound of people moving about in the room, as rock is a good conductor of sound. Walking within the room is confined to a 12-inch-wide board to preserve the cork.

27. Looking to the left as one entered the stay-behind chamber; the stairs to the observation post at the left climbed approximately 20 steps and then branched left and right. The latrine is just inside the staircase to the left. Across from it was the radio room.

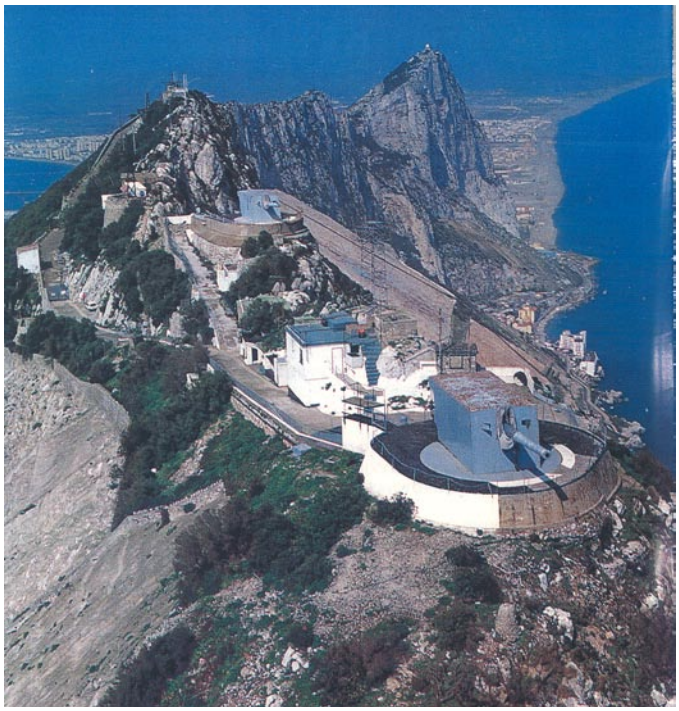
30. Lord Airey's Battery from O'Hara's. The gun sits on the spine of the hill that forms the Rock of Gibraltar.

28. Looking up the steps in the stay-behind chamber at the port for viewing the Mediterranean. The photo distorts the size of the viewing port, making it look larger then it is. The viewing port is hidden under a rock overhang.

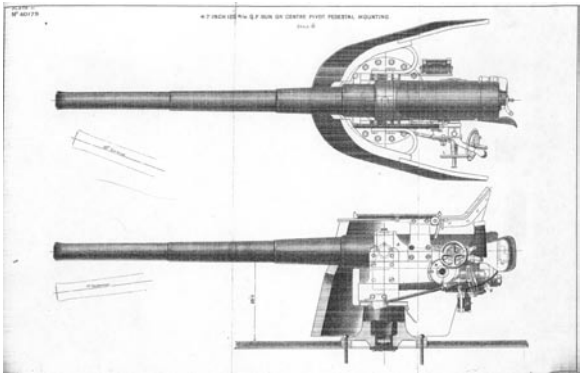
29. The Mediterranean Sea from the viewing port.

31. Lord Airey's and Breakneck Batteries from O'Hara's. The arrow marks the location of Breakneck Battery; its gun barrel can just be seen. All the guns sit on the spine of the hill that forms the Rock of Gibraltar.

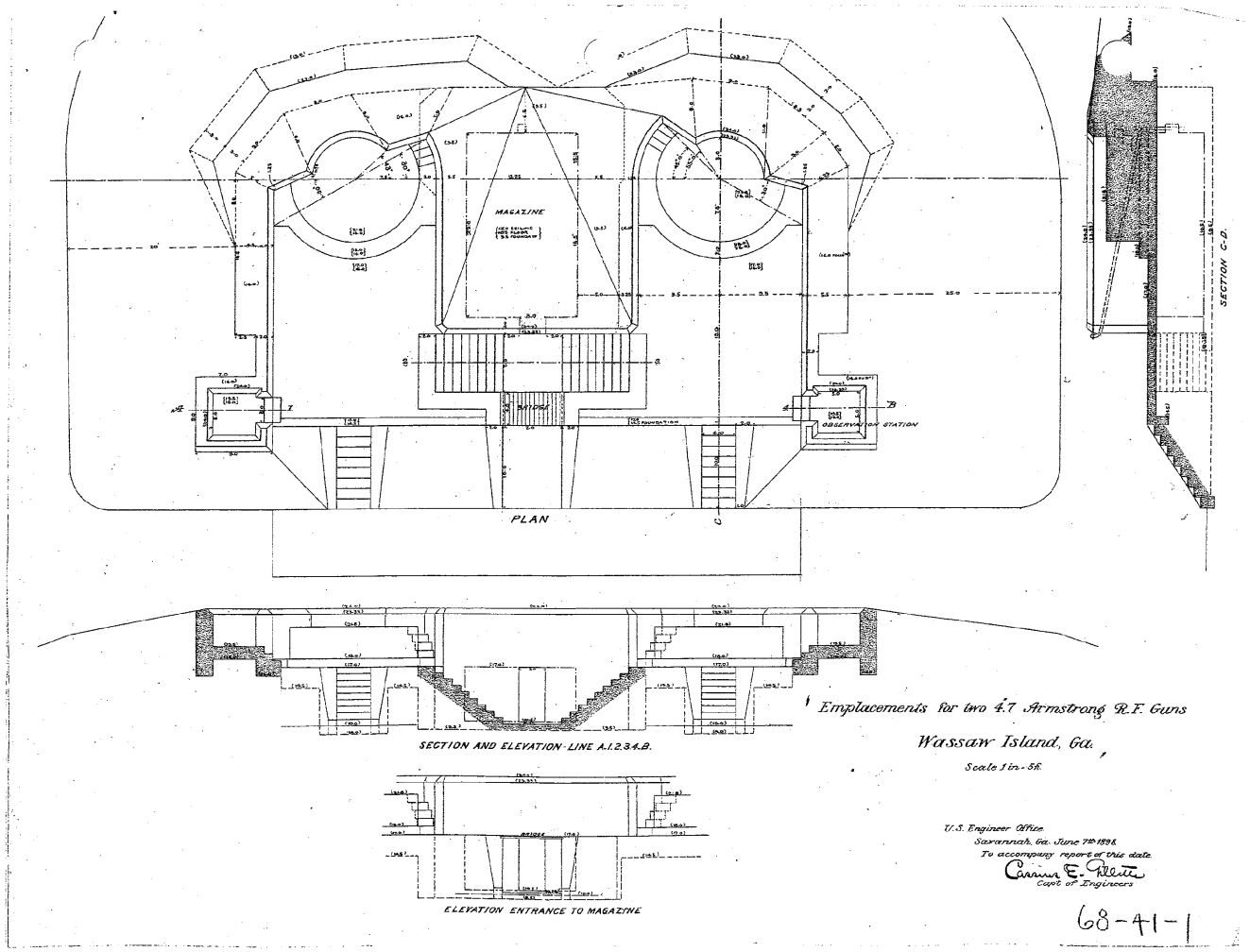
32 & 33. Gibraltar, showing locations covered in this article: #1 O'Hara's, Lord Airey's, and Breakneck Batteries, #2 Royal Navy Yard, #3 Devil's Gap Battery, #4 Princess Anne's Battery, #5 Stay-Behind Tunnel. (Courtesy Gibraltar Museum)



34. (Left) O'Hara's Battery (closest to camera) and Lord Airey's Battery. Stay-Behind Tunnel is in the ridge behind Lord Airey's Battery. The gun muzzle of Breakneck Battery can be seen on the skyline to the right of Stay-Behind Tunnel. (Courtesy Gibraltar Museum)



4.7 inch Armstrong gun and carriage



Drawing of the 4.7-inch battery on Wassaw Island (NARA)