

After years of supremacy at sea, Dönitz's wolf pack faced a new threat from the Allies' air forces



**“A STORM HAD WHIPPED UP THAT WAS SO FEROCIOUS THAT THE CONVOY, WITH DWINDLING FUEL, WAS FORCED TO KEEP STEAMING ALONG THE DOOMED COURSE FATE HAD SELECTED FOR IT – DIRECTLY INTO THE U-BOATS’ KILLING GROUND”**



SUB HUNTERS

# BATTLE OF THE ATLANTIC

Lasting almost six years, the struggle to control the shipping routes across the ocean was the longest-running campaign of World War II

WORDS NICK SOLDINGER

**T**he Anglo-Canadian convoy SC 42 left Nova Scotia bound for England on 30 August 1941. It consisted of more than 60 slow-moving merchant ships protected by four warships from the Royal Canadian Navy. Ahead of it lay 4,500 kilometres of wild ocean, temperatures cold enough to freeze the sea spray to the ships' handrails, and waves the size of tower blocks.

The crossing, which would take the ships a minimum of two and half weeks to complete, held a far deadlier threat than anything the environment could throw at them, however. Shortly after leaving port, the lumbering fleet got word from British intelligence that a vast wolf pack of German U-boats was prowling off the coast of Greenland. Ordinarily, such information would have allowed the convoy to reroute and avoid the waiting menace – but not this time. A storm had whipped up that was so ferocious that the convoy, with dwindling fuel, was forced to keep steaming along the doomed course fate had selected for it – directly into the U-boats' killing ground.

By now Britain had been at war with Nazi Germany for two years. Isolated from the rest of Europe for much of that time and blockaded by the German navy, it had relied on its ally Canada to keep it alive – literally. When Hitler's plan to invade the UK in 1940 faltered in the wake of the Battle of Britain, he switched tactics – if the island was a fortress, then he'd besiege it. Blitzed from the air and starved of supplies from the sea, the country was by this time nearing exhaustion. It was desperate for the supplies SC 42 was bringing. Much of it however, tragically never finished the journey.

The man Hitler had chosen to choke off Britain's food supply was Admiral Karl Dönitz.

A veteran U-boat commander from World War I, he was a brilliant tactician, ruthless in battle and respected by his men. It was his controlling nature over the U-boat fleet, however, that would cost him what would come to be known as the Battle of the Atlantic.

In the autumn of 1941, it was a weakness that had yet to manifest itself in the outcome of this war under the waves; Dönitz was apparently winning the struggle. His U-boats were sinking nearly 150,000 tons of Allied shipping a month, and Convoy SC 42 was about to significantly add to that tally when, ten days into the crossing, it blundered into the jaws of the lurking wolf pack.

In the early hours of 9 September, the U-boats attacked their first merchant ship. Surfacing under cover of darkness to both keep pace with the convoy and avoid detection by the underwater sonar devices on the warships, the British freighter *Empire Springbuck* was the first to be picked off – all 39 of its crew were lost. When night fell the following evening, the U-boats struck again. Next to go was *SS Mumeric*, with the loss of all 63 crewmen.

Hours later, another ship, the *SS Baron Pentland*, was damaged and abandoned by its crew. Within three hours, three more ships were destroyed. This continued for eight long days and nights. By the time SC 42 escaped the clutches of Dönitz's cut-throats, 16 ships had been sunk with the loss of more than 200 lives and thousands of tons of vital supplies. Back at his HQ in Brittany, where Dönitz had orchestrated the killings using charts and encrypted radio signals, these horrendous losses were toasted with fine local wines. Little was the Nazi admiral to know, however, that this was the last time his hunters would enjoy such overwhelming success.

# THE WAR UNDER THE WAVES

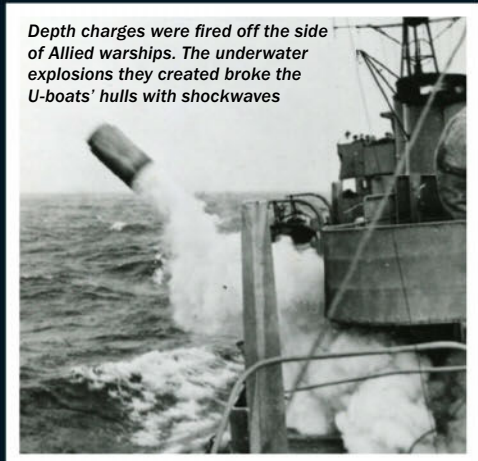
## INCREASINGLY SOPHISTICATED TECHNOLOGY PLAYED A KEY ROLE IN DETERMINING WHO EMERGED VICTORIOUS FROM THE DEADLY DUEL ON THE HIGH SEAS

Perhaps more than any battle in history, the one for control of the Atlantic shipping lanes during World War II demonstrated the importance of technology in warfare. Since humans first began engaging in organised conflict thousands of years ago, the victors have almost exclusively been those with the technological edge. When World War II began, it was the German navy, which had been preparing for war for years and who in Admiral Dönitz had a master strategist, that looked best prepared for victory. However, Britain, along with its ally Canada and later the US, developed an astonishingly rapid and sophisticated response to the U-boat threat that ultimately proved irresistible.

Dönitz insisted on a top-down command structure, ensuring he micro-managed every single engagement with Allied shipping from his war room, which from the summer of 1940 was in Lorient, Western France. This obsessive planning ultimately made his submarine crews vulnerable to intelligence leaks. With the cracking of Germany's supposedly unbreakable Enigma code in 1941, which Dönitz used to communicate with his U-boat commanders and move his wolf packs around his maritime maps, the fate of Germany's U-boat fleet was sealed. Then, with an array of ground-breaking detection devices and bespoke weaponry, it was eventually destroyed.



Above: Ramming U-boats was another tactic used by allied naval commanders – often resulting in considerable damage to their own ships



Depth charges were fired off the side of Allied warships. The underwater explosions they created broke the U-boats' hulls with shockwaves

### CATALINA FLYING BOAT



### LEIGH LIGHT

Dubbed 'the dustbin' because of its shape, this 22-million candlepower, 24-inch retractable searchlight was slung underneath the fuselage of sub-hunting Allied aircraft. When an unsuspecting U-boat was suddenly pounced upon from above while travelling on the surface, the light was switched on and the sub illuminated. This not only made it easier for the attacking aircraft to hit it, but it also blinded the U-boat's crew in the first few vital moments of the attack as they struggled to respond.



### RISING MINE

### SONAR

The British had developed sonar before the war, using directional sound waves to 'see' underwater. These bounced off the U-boats and were heard back as an echo. The quicker the return of the echo, the closer the submarine. Listened in to by a radio operator, they had a range of about 275 metres – ideal if a submarine was close, less so if it was at the limit of its torpedo range, which, at the outbreak of war, was about three kilometres.

### CORVETTE

Dubbed the "cheap and nasties" by Churchill because they were cheap to produce and supposedly nasty for the U-boats, these smaller warships were based on whaling ships, whose engines were thought to be ideal for chasing subs, which they could then attack with their four-inch guns and depth charges. Mass produced and rushed into service with the then tiny Royal Canadian Navy, they struggled badly in the rough seas and violent weather of the North Atlantic.

### DRIFTING/FLOATING MINES



### HEDGEHOG

This forward-firing mortar spat groups of 24 missiles up to 250 metres from the deck of a corvette or a destroyer as it chased down a submerging U-boat. Its shells would only explode if they actually made contact with the evading U-boat, which meant the sonar wasn't disturbed if the shell missed. More deadly than depth charges, which relied on hydrostatic shockwaves to score a kill, the hedgehogs' missiles would punch a hole directly into the U-Boat's hull.



### INTELLIGENCE

The work done by Alan Turing and his team of code breakers at Bletchley Park was key to the Allied victory, not just in the Battle of the Atlantic but the entire war. Their cracking of the Enigma code in 1941 enabled the Royal Navy's Western Approaches Command to effectively see every play Dönitz was making as he was making it, and simply steer the convoys away from or around his lurking wolf packs.

**THE CONVOY SYSTEM**

This was the key way merchant ships making the hazardous trip across the North Atlantic organised themselves. Travelling in large groups, they were protected by 'outriders' from the Royal Navy, the Royal Canadian Navy and the later the US Navy. Although there could be scores of ships in a convoy, because of shortages there were often just four warships accompanying them, which used a combination of sonar and radar to 'watch' for U-boats both above and below the waves.

**B24 LIBERATOR**



**AIRCRAFT**

Although aircraft were the U-boats' greatest adversary, early on in the war the Allies had no long-range planes capable of patrolling the entire north Atlantic. An area in the heart of the ocean known as the 'air gap' allowed the U-boats to hunt unhindered. As the war went on, however, planes such as the Consolidated PBY Catalina and bombers like the Consolidated B-24 Liberator were adapted so that they could fly longer distances.

**FIDO TORPEDO**

The US-built Mark 24 was a 310 kilogram torpedo that used two acoustic transducers (or antennae) that reacted to sound so that it could literally home in on its target. Measuring 215 centimetres long and 50 centimetres wide, it was dropped from aircraft and then, powered by a five-horsepower electric motor, propelled towards its target at a speed of 12 knots (the top speed of Dönitz's U-boats while submerged was just ten knots) delivering a 40 kilogram high-explosive warhead.

**DESTROYER**

The Royal Navy had about 180 destroyers when the war broke out. In the early stages of the conflict, these were the most effective weapon for defending convoys against submarine attacks. Fast moving and more heavily armed than the U-boats, they also had shallow hulls making them particularly difficult for U-boat commanders to torpedo them. By the end of the conflict, a further 277 destroyers had been commissioned, while 153 had been sunk - but only 28 to submarines.

**TORPEDO MINE**

**DEPTH CHARGES**

As they struggled to keep up with convoys while submerged, the U-boats often attacked on the surface and at night when their slender shape was hard to detect with binoculars. Once engaged by a warship or an aircraft, however, they'd need to dive to survive. Underwater, they were vulnerable to depth-charge attacks from above. These timer-controlled, high-explosive charges were jettisoned into the water in patterns, often exploding simultaneously above and below the submarine, sandwiching it in a blast.

**MOORED MINES**

**"SINCE HUMANS FIRST BEGAN ENGAGING IN ORGANISED CONFLICT THOUSANDS OF YEARS AGO, THE VICTORS HAVE ALMOST EXCLUSIVELY BEEN THOSE WITH THE TECHNOLOGICAL EDGE"**

# BIRDS OF PREY

## HOW AIRCRAFT BECAME THE KEY WEAPON FOR THE ALLIES IN CONTAINING AND DESTROYING THE MENACE OF DÖNITZ'S WOLF PACKS

The British rightly realised that air power was the key to defeating the U-boat scourge. Within weeks of war breaking out, HMS Courageous, one of the Royal Navy's seven aircraft carriers, was despatched to the Atlantic to hunt for subs. It had 48 Fairey Swordfish torpedo planes on board, and an escort of four destroyers. Courageous was patrolling the seas off northwest Ireland when, on 17 September 1939, it was sunk by U-29 with the loss of more than 500 crew. It was a devastating blow for the Royal Navy, which responded by restricting its remaining six carriers to areas where there was no risk of U-boat attack.

This presented a real problem, because Allied aircraft at that stage of the war simply didn't have the range to cover what was effectively a huge battlefield. The air gap that opened up in the heart of the Atlantic now became the wolf packs' chief hunting ground.

To counter this, the Allies established air bases on Iceland, Greenland and the Faroe Islands, and set about trying to source aircraft that could close the gap further. Britain had considerable pre-war experience of the flying boat and their versatility proved useful during the early stages of the battle, but the ideal long-range maritime patrol aircraft needed to be based on a bomber design. Unfortunately, such aircraft were hard to find as the strategic aerial bombing of occupied Europe was, for much of the war, the only means Britain and the Allies had of hitting back at the Germans. The answer came in the shape of the Consolidated B24 Liberator.

Unlike modern submarines, the German U-boats were not designed to spend weeks under the water. Rather they were viewed as torpedo boats that had the capability of diving as a defensive strategy, and once submerged

they were reliant on battery power to propel themselves through the water. These batteries needed regular recharging – something that could only be done by the boat's diesel motors acting as a dynamo when the vessel was on the surface. In the early stages of the war, the U-boats could prowl around on the surface in the air gap pretty much untroubled day or night. By 1942, however, once the Liberator had been fitted with both radar and Leigh Lights, and adapted to fly for longer, it was used, in conjunction with Dönitz's intercepted and decrypted communiqués, to effectively shut the air gap once and for all.

**“B-24 LIBERATORS MANAGED TO SINK MORE THAN 70 U-BOATS DURING THE BATTLE OF THE ATLANTIC”**

### SHORT SUNDERLAND

**OPERATOR:** RAF COASTAL COMMAND, ROYAL CANADIAN AIR FORCE  
**IN SERVICE:** 1938-59 **RANGE:** 2,848KM

With a crew of 11, equipped with Air-to-Surface Vessel radar (ASV), and armed with eight depth charges and as many as 16 .303 Browning machine guns, the Short Sunderland was used to provide top cover for merchant convoys, patrol harbour approaches and hunt down Dönitz's wolf packs. This they did with huge success – some 60 U-boats were destroyed during the war by this particular aircraft. They were also used to pick up survivors of torpedoed ships despite not being designed to land on rough open sea. This heroic yet dangerous practice was eventually outlawed by RAF Coastal Command in 1942.

A Short Sunderland prepares for take off



### CONSOLIDATED PBY CATALINA

**OPERATOR:** RAF COASTAL COMMAND, ROYAL CANADIAN AIR FORCE, US NAVY  
**IN SERVICE:** 1936-57 **RANGE:** 4,000KM

Armed with five .50-calibre machine guns – including two waist gunners in the plane's distinctive 'blister' pods on its sides – and capable of carrying as much as 1,800 kilograms on its wings' bomb racks, this beast of a machine was crewed by ten men. Like the Sunderland, it was also equipped with ASV and undertook sub-hunting duties as well as convoy-protection missions. This ubiquitous plane managed to destroy 40 U-boats during the Battle of the Atlantic with two Catalina pilots – Flying Officer John Cruickshank of the RAF and Flight Lieutenant David Hornell of the RCAF – winning Victoria Crosses in the process.

Catalina Z2147 was credited with nine successful U-boat attacks during its service



### CONSOLIDATED B-24 LIBERATOR

**OPERATOR:** RAF COASTAL COMMAND, ROYAL CANADIAN AIR FORCE, UNITED STATES ARMY AIR FORCE, US NAVY  
**IN SERVICE:** 1939-57 **RANGE:** 3,220KM

Produced in greater numbers than any other US bomber during World War II, the Consolidated B-24 Liberator was the key aerial weapon in the war against Dönitz's wolf packs. Crewed by ten men, once fitted with long-range fuel tanks from 1942 onwards it could stay airborne for up to 18 hours at a time. Armed with ten 12.7mm machine guns and equipped with ASV and the Leigh Light, it would attack with a formidable arsenal of weapons including torpedoes, bullets, bombs, rockets and depth charges. In all, B-24 Liberators managed to sink more than 70 U-boats during the Battle of the Atlantic.

Almost 19,000 Liberators were produced during its life span

**“THE AIR GAP THAT OPENED UP  
IN THE HEART OF THE ATLANTIC  
NOW BECAME THE WOLF PACKS’  
CHIEF HUNTING GROUND”**



*German submarine  
U-134 is attacked  
from the air*

# DEFENDING BRITAIN'S COAST

THE SYSTEM IMPLEMENTED TO KEEP THE U-BOATS OF BRITISH PORTS OUT WAS INGENUOUS AND COMPLEX

Britain's ports played a pivotal role in protecting the Atlantic convoys. After all, these were where the ships that confronted the U-boats sailed to and from, so it was little wonder that this might make them highly valuable targets for U-boat attacks themselves.

The British had actually been aware of this possibility long before hostilities broke out. Indeed some of the technology the British would use – such as steel anti-submarine netting known as indicator nets draped across harbour entrances – had proved their worth in World War I when a number of German U-boats became ensnared in them and were subsequently sunk with depth charges. In fact, preparations were being made for a revival of the defence around Britain's more important ports as early as 1938.

Work readying the Clyde Estuary for war, for example, was started in the wake of the notorious Munich Conference, which British PM Chamberlain had returned from promising the British people that war with Hitler had been averted. It hadn't, of course, and when hostilities broke out less than a year later, a huge steel indicator net had already been manufactured that was swiftly hauled into position by eight boom ships to seal off the Clyde from U-boats.

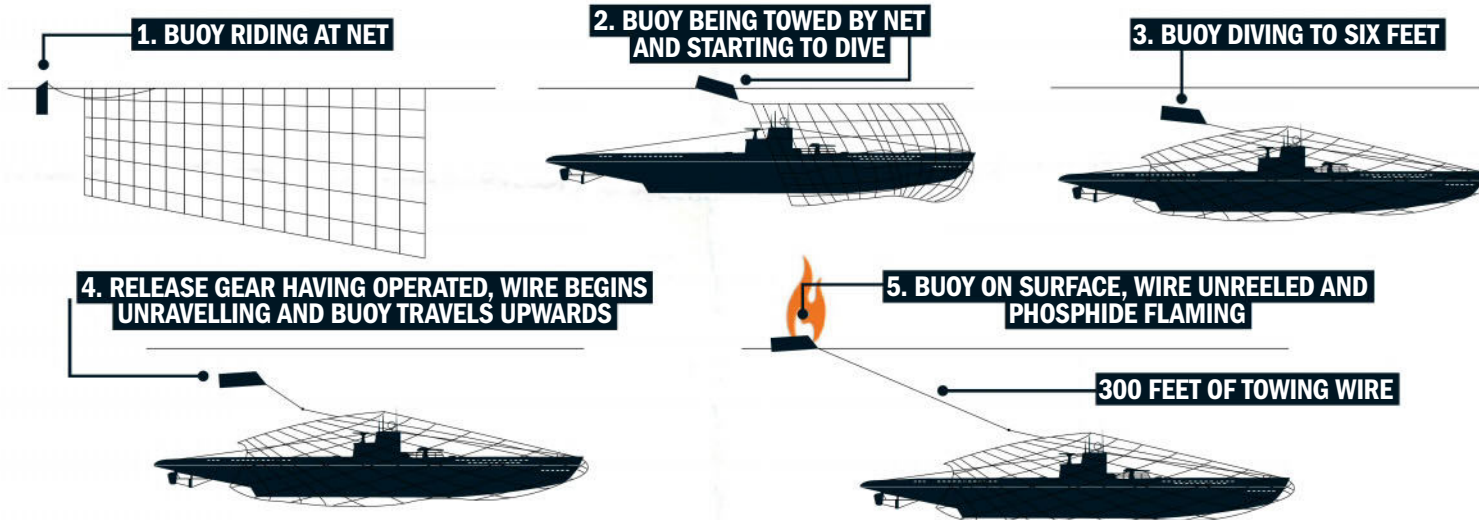
**“PREPARATIONS WERE BEING MADE FOR A REVIVAL OF THE DEFENCE AROUND BRITAIN'S MORE IMPORTANT PORTS AS EARLY AS 1938”**



Large wooden or metal floats, like these barrel floats, helped keep the huge suspended nets in place

## PRAM INDICATOR BUOY WITH HYDROSTATIC RELEASE

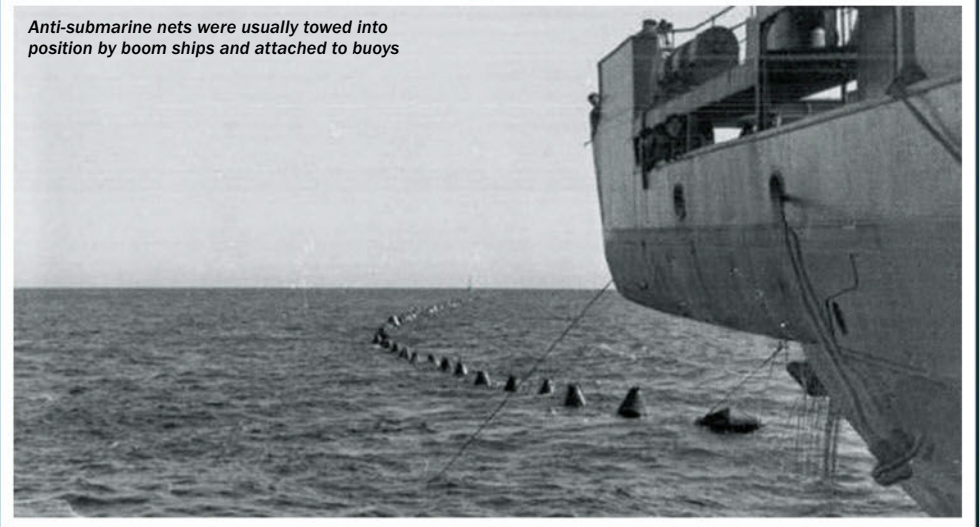
WHEN A U-BOAT BECAME ENSNARED IN AN INDICATOR NET, THE BURNING BUOY GAVE AWAY THE ENEMY BELOW



Elsewhere around Britain's coastline, and indeed across its empire, these indicator nets – which could be as long as 100 metres and as deep as the sea bed they were suspended over – and an increasingly complex series of defences would play their part in keeping the U-boats out.

The nets, which had a series of rocket flares attached to them that would go off if a submarine tried to breach the defences, were also sometimes attached to converted fishing boats armed with machine guns and depth charges. Other methods of defence around British harbours could include extensive minefields, sonar listening posts, radar stations, land-based gun emplacements, patrol ships, out-post observation ships, and of course regular sorties by aircraft from the RAF's Coastal Command. In combination, they proved a highly effective deterrent to Dönitz's U-boats.

Anti-submarine nets were usually towed into position by boom ships and attached to buoys



## THE GREATEST DISCOVERY OF THE WAR

WHEN ONE BRITISH OFFICER BOARDED AN ABANDONED U-BOAT, LITTLE DID HE KNOW HE WOULD MAKE A HISTORY-CHANGING FIND

On 9 May 1941, U-boat ace Fritz-Julius Lemp, commander of U-110, attacked a convoy just south of Iceland. He hit two ships before being spotted by the British destroyer HMS Bulldog, which turned and raced towards him. Lemp, realising the danger, dived, but it was too late. The Bulldog was soon on top of him, and he and his crew could hear depth charges crashing into the water.

Lemp's crew knew what was coming, and waited in agonising silence for the inevitable shockwaves from the explosions. When they came, they were horrific. "The vibrations were so bad," Georg Högel, Lemp's then 21-year-old radio operator, later recalled, "that we knew we couldn't escape. Lemp then gave the order to surface." As U-110 made its way up from the ocean floor to surrender, HMS Bulldog fired on it with every weapon it had. So

*Below: The discovery of the newer Enigma machine helped codebreakers break the cipher*



intense was the fire that rained down upon it that when it surfaced, U-110's terrified crew poured from its hatches and leapt into the sea.

"Lemp stood on the conning tower shouting, 'Get out, everybody get out,'" Högel remembered. "Us two radio operators were down in the control room so we called out, 'What about the secret machines?' [Lemp replied.] 'Leave everything in there, get out!' He just wanted to save every man."

Lemp was killed in the confusion as his crew abandoned U-110 believing that it was sinking. Somehow, though, the submarine stayed afloat. On HMS Bulldog, 20-year-old Sub-Lieutenant David Balme was then given the nod by his commander to lead a boarding party. "We rowed over," Balme recalled years later. "I got out and walked along the deck with my revolver pointing. All the hatches were open but you didn't know how many Germans might still be down below. That was the frightening thing because you needed both hands to go down those ladders. So I holster my revolver and gradually go down, and there I was in the control room. Absolutely silent, no Germans, just me. So I called my boarding party down and we started searching the U-boat."

What happened next was one of World War II's most significant events. As Balme's men searched the abandoned submarine, they found not only the U-boat's codebook but an intact Enigma machine – the secretive device used to encrypt and decrypt German radio signals.

The machines were raced back to the British codebreaking centre at Bletchley Park, where some of Britain's best minds had been struggling to crack Enigma's riddle. The machine, a more up-to-date version of the pre-war one they had been working with, swiftly provided a breakthrough.

Using it, Bletchley's star codebreaker Alan Turing identified a pattern in the first communiqués being intercepted each day between U-boat commanders and Dönitz. Realising that these messages were weather reports, he slowly began to unravel Enigma, eventually developing the Turing bombe – a huge proto-computer capable of working through thousands of code variations simultaneously – to crack it. The chance capture of Lemp's Enigma machine became one of the greatest pieces of good fortune in the history of warfare.

**"AS BALME'S MEN SEARCHED THE ABANDONED SUBMARINE, THEY FOUND NOT ONLY THE U-BOAT'S CODEBOOK BUT AN INTACT ENIGMA MACHINE"**

The destroyer HMS Bulldog gave U-110 such a pounding that its submerged crew believed it was sinking. It wasn't and the vessel was captured.

