British Sub-Aqua Club

Operation Sunrise – Expedition Plan

10th – 14th September 2009

By; **Andy Bennett** [redacted]

www.operationsunrise.co.uk

Expedition Overview

The West Coast of Scotland has many great and varied dive sites, of which many are suitable and would provide interest to all levels of diving qualification. In particular the waters and coast line around Kintyre has a multitude of ship wrecks, reefs and marine life that could be said to rival anywhere around the UK. In addition to this, for well in excess of 100 years these waters have been utilised as a major shipping route into the port of Glasgow via the Northern approaches around Ireland, and as such was the scene for many hostile actions taken against the allied cargo vessels during World War II.

With that said, this expedition sets out to take 13 divers of mixed ability (Minimum qualification – Sports Diver + BS-AC Advanced Nitrox (or equivalent) + 50 dives) and over a four day period undertake some of the more interesting & challenging diving in a remote location; the Island of Gigha. These dives will range from shore dives to conduct marine life studies for the Sea Search organisation, diving on ship wrecks ranging in depth from 8m – 35m, and locating / diving on / authentication of a vessel that is believed to be the U-482, an uncharted German U-Boat believed lost in the area and who's captain "Graf Von Hartmut Matuschka" received the Iron Cross for the sinking of the Hurstcastle, Jacksonville, Pinto and the Empire Heritage in a single tour of duty.

The water temperatures around the Island of Gigha can vary from around 9°C during winter and spring up to 15°C during summer and autumn. Typical weather patterns generally provide Gigha with south-westerly prevailing winds, and the conditions throughout the year can vary from beautiful blue skies to a full on storm, with sea conditions to match. With this said, as Gigha is a small island, and has so many interesting dive sites around its circumference, therefore it is generally possible to reach a dive site to suit the most discerning diver.

Considerable research is currently being undertaken into the whereabouts and the circumstances into these shipping losses, and it goes without saying that every effort will be made to publicise the findings and outcomes of the expedition; via Dive magazine, North West Regional conference and if possible a presentation at the Diving Officers Conference. In the mean time, a dedicated web site (www.operationsunrise.co.uk) has been developed by one of Operation Sunrise team members to promote the expedition and its objectives, plus the site will be regularly updated with the expedition's status.

Members from at least 3 branches (Mid Lancs SAC, Salford University and Manchester University) will make up the team members for this expedition, and the diving will be organised in such a way that all team member's abilities will be further developed through participation in the expedition at an appropriate level. This in turn will further strengthen inter-branch relationships and pooling of recourses for both the expedition and the long term futures of the branches.

Overview of the Diving

Given that this expedition will be open to a minimum standard of BSAC Sports Diver' who have already gained considerable experience, the diving will be challenging but also highly rewarding, so will include:

- To undertake a 4 day diving expedition in a remote area – Isle of Gigha
- To locate, dive on, verify and if required update the information supplied by the Hydrographic Office on the following ship wrecks:
    - HMS Riant – British Steam Drifter in 35m
    - Ospray II – Trawler in 31m
    - Moncousu – British Steam Ship in 8m
    - Kartli – Russian factory ship in 6m
    - U482 – German submarine in 70m (For those qualified and experienced)
- Drift diving – due to the water movement through the strait of Gigha can produce predictable, but strong currents
- Reef dive – due to the nutrient rich waters around this area, we can expect to see a wide variety of marine life, which may include wrasse, lobsters, octopus, cuttlefish, plus many forms of crab, therefore offering photographers an excellent opportunity.

Diving Methodology

The group will be divided into 2 teams of equal abilities, rotating during the expedition so all members will conduct a mixture of shore dives and boat dives from both of the RIB's that we will bringing on the expedition. In addition to this, individual's roles within the team will rotate on each dive, therefore giving the opportunity for everybody to develop skills from dive planning to dive management through to the refilling of cylinders on the expedition's portable compressor(s).

All boat diving will be conducted from the expedition rib; 'Little Mo' – A 2006 7.2m Bombard Explorer / 150hp Yamaha 4-stroke engine. Little Mo is fitted with a full suite of electronic navigational, location, & communication equipment plus back up vhf radios and GPS equipment, Oxygen therapy equipment and safety equipment to SOLAS V regulations.

All diving will be conducted with BS-AC's guidelines of 'safe diving practices' and were practicable a decompression trapeze will be deployed thereby enabling decompression to be conducted with greater safety & comfort. As part of the trapeze setup additional SCUBA sets containing 50% Nitrox will be suspended as a back up only. Each diver will be expected to carry sufficient gas for all stages of their dive, including any and all decompression. In addition to this each diver must carry their own DSMB and back up surface location device, as well as line cutting equipment and strobes. To further add to the safety of the expedition, a risk assessment will be conducted on all dive sites prior to the dive commencing.

The purpose of all the dives on this expedition is to collect information regarding the dive sites; such as general condition of the wreck(s) and signs of decay compared against known data. Marine life studies will be conducted and the data collected will be fed back to Sea Search to aid with their objectives of collating marine life data for the UK coast. With regards to the U482, all diving will be based upon 'Run Times with accelerated decompression' and conducted using tri-mix (17/45 btm gas, 30/30 travel gas and 60% deco gas), assuming a vessel is found; positive identification will be taken from the serial numbers located on the propellers, and traced back through archive records thus laying to rest speculation to the location of her final resting place, and helping to give closure to the families of the deceased crewmembers. Appendix 1 provides full breakdown of 'Run Times' and bail out options.

Although most of the diving that will be conducted will be within the normal range for air, but given the remoteness of our location Nitrox will be used by all divers for dives greater than 25m coupled with decompression requirements for air (21%). Thus increasing the level of safety for the divers involved with the expedition.

All blending will be conducted by partial pressure mixing, and to supplement the expedition equipment divers should bring their own gas analysers suitable for testing the range of the gases they will be using.

Buddy pairings will be selected on the basis of equipment configuration, gas mixes being used (i.e. Tri-Mix, Nitrox, Air), the type of re-breather being used (i.e. semi-closed circuit / closed circuit) and personal interests.

Dive Boat

For this expedition we will be bringing our own RIB; "Little Mo"

Little Mo – 7.2m Bombard Explorer / Yamaha 150hp 4-Stroke
90 Litres fuel (internal tank), 50 Litres (external tank) – (80mile range – fully laden)
Raymarine Digital Fish finder (To be fitted spring 2009)
Fix mounted Garmin GPS System
Hand held Lowerance GPS system
Fixed mounted VHF radio (25w)
Hand held VHF radio (6w)
Oxygen Therapy set
First aid kit
Coastal Flare kit
Radar Reflector
Shot line(s)
Deco Trapeze

The Accommodation

The accommodation is on a self catering basis, on the Island of Gigha, and based around the main village area of Ardminish, providing quick and easy access to the launch slip way, as-well-as close proximity to local amenities. The accommodation is based around three self contained holiday cottages which are clean, very comfortable and warm. The cottages also feature fully equipped kitchens and dinning areas and between them are suitable for 18 people. Plus should there be the requirement, the Gigha Hotel is also available, and can provide 3-star B & B accommodation at reasonable rates. The Hotel itself is at the centre of the local community where there are all the amenities you would need for this type of expedition, café, restaurant, small supper market, post office, petrol station, etc.

Gas supplies & equipment support

Due to the location there are no local dive shops / compressor stations within easy reach. Therefore the expedition will have to be as self sufficient as possible.

With regards to gas supplies, two compressors (1 x 7.5cfm, 1 x 8.4cfm) will be brought as part of the expeditions standard equipment; one the property of Mid Lancs SAC, the other a hire unit from Central Compressors of Stroud, Gloucestershire. With the combined output of the compressors being in the region of 450 litres / min, therefore the expedition will have the ability to fill 26 x 12L cylinders from 50 to 230bar in a little over 2 hours. Any and all Oxygen and Helium supplies will be transported to the Island, along with blending equipment and secondary filters to maintain oxygen service on diving cylinders.

Equipment wise, team members will be expected to provide their own diving equipment and a practicable range of back up equipment; these should typically include as a minimum O-rings, patches for dry suits, patches for dry suit seals, mask, fin straps, silicon grease, torch batteries, zip ties, etc; plus sufficient tools for 'field maintenance' of diving equipment.

However should there be a catastrophic equipment failure of diving equipment requiring professional repair / servicing, Puffin Divers based in Oban is the nearest facility offering such a service, which is approx 1.5hrs drive from Gigha.

Travel

Although members from the expedition will be travelling from different areas of the North West efforts will be made for as many members to travel together (share lifts), therefore reducing the cost of travel. All team members will meet up at Tebay service station just north of J38 of the M6 at 9.30am, and travel in convoy from this point onwards. Full details of the route can be found in appendix 2.

Project Equipment

1 x Rigid Hulled Inflatable Boats "Little Mo (As equipped & described above)
1 x Bauer Mariner 200 portable compressor (7.5 cfm)
1 x Bauer MIIB portable compressor (8.4 cfm)
Spare filter cartridges for compressor (2-off per compressor)
Spare oil for compressor (5 Litres)
Fuel
2 x 'J' size cylinders of Medical grade Oxygen
1 x 'J' size cylinder of Breathing grade Helium
1 x 2m Blending wip with gauge
1 x Vandergraph mixed gas analyser
3 x Lift bags
Charts
Decompression tables
Dive managers kit (dive slates, risk assessments, emergency contacts & procedures)
Laptop
Digital camera + underwater housing
(Additional to equipment carried on the RIB's)
2 x Oxygen Therapy Sets
2 x First Aid Kits
3 x Hand held VHF radios (5w)
2 x Hand held GPS units
2 x Coastal Flare kits

Personal Diving Equipment

(Dives to 35m or less)

Normal diving equipment (12 L @ 232bar cylinder minimum) - Cylinder to be in O2 service for Nitrox
Independent air source for bailout (minimum 3L)
Line cutting equipment
Delayed surface marker buoy – Orange (50m spool)
Surface location device
Strobe
Good quality torch & backup.
Underwater slate

(Equipment for Dives on U-482 – 70m)

Twin 12 L @ 232bar cylinders (minimum) for 'Back Gas'- Cylinder to be in O2 service for Nitrox & Tri-Mix
Single 80Cf (11.4L) @ 232bar cylinder (minimum) for 'Travel Gas' - Cylinder to be in O2 service for Nitrox & Tri-Mix
Single 80Cf (11.4L) @ 232bar cylinder (minimum) for 'Decompression Gas' - Cylinder to be in O2 service for Nitrox
Backup depth timer
Line cutting equipment
Delayed surface marker buoy – Orange (90m spool)
Delayed surface marker buoy – Yellow (50m spool)
Surface location device
Strobe
Good quality torch & backup.
Runtime slate
Underwater slate

(Additional)

Sun hat & Sun cream – Spf 30
Warm / waterproof clothing (for use on boat in foul weather)
Team members using re-breathers must provide their own scrubber medium (Sofno-lime), as the purchase of, cannot be guaranteed during the expedition.

Roles and Responsibilities

Expedition Leader - Andrew Bennett - Overall responsibility for organisational safety, local liaison, co-ordination, diving etc.

The team members will be split into 2 groups with an equal mix of abilities; each group will be a self managing entity with an overall purpose for the days diving. The day-to-day management of the duties will be delegated amongst the divers to ensure full participation and equal task loading for all team members. Specific duties will include:

Dive Marshal - Diving operations, record keeping, safety co-ordination (O2 equipment, emergency co-ordination, evacuation procedures, etc), obtaining weather forecasts, buddy pairings, liaison with skipper.

Assistant Dive Marshal - As necessary, to assist the dive marshal with all of the above. To assume the role of dive marshal when the appointed dive marshal is diving.

Boat marshal - Assist the Skipper as necessary with the day to day operational function of the boat, this will include, organise the loading / unloading of diving equipment, anchoring & mooring, organising the deployment and recovery of shot line and decompression trapeze, ensuring safe access at all times is available throughout the boat.

Food manager - Organise the procurement of food and supplies (in liaison with all team members). To ensure a rota for cooking, washing up and preparation of packed lunches.

Gas manager - Liaising with the dive marshal and ensuring the adequate supply of diving gas (Air, Nitrox or Tri-Mix) is available to the team for the following days diving. This may also include interaction with the filling station regarding out of normal hours use of their compressor and arranging transportation of cylinders to / from the filling station.

Day Plan - Overview

The day planning has been based upon a rota, allowing all team members the opportunity of both RIB's and shore diving, plus on day 1 time will be spent confirming; tidal calculations, the positions of known wrecks as well as conducting a structured search for the U-482.

	Little Mo	Shore Dive
Day 1	**Team 1** Riant Moncousu	**Team 2** Port Mor
Day 2	**Team 2** Riant Moncousu	**Team 1** Ardminish Bay
Day 3	**Team 1** U482 (2 Divers) Ospray II (4 Divers) Kartli (4 Divers)	**Team 2** Caolas Point
Day 4	**Team 2** Ospray II Kartli	**Team 1** Cara Bay

Proposed Dive Sites *- (Boat dives)*

HMS Riant – **Depth to sea bed** = 37m **Latitude** = 55 40'.303 N **Longitude** = 005 46'.926 W / **Position Accuracy** = 10.0m

The Riant was a 40nt. Steel steam drifter, built by Colby Bros., Lowestoft, launched in 1920 and originally named HMD Green Sea by order of the Admiralty. Within a year she was sold to the Fisheries Board for Scotland and registered in Aberdeen as A.639. In another short year was resold to a private owner and re-named for a third time to Gladys & Violet. She was sold for the fourth and final time in 1924 and re-named yet again to the Riant, registered in Inverness.

At the start of WWII she was requisitioned by the Admiralty, it was in their service she came to remain until her loss when she foundered off Gigha during the storm of 25th January 1940 after hitting rocks

She lies facing west, on a sloping rocky seabed, the wreck is shielded by a reef to the north, which can confuse an echo sounder as being the wreck. The Riant lies approximately 0.5 miles west of Carraig Mhor on the west side of Gigha. She lies upright and canted over to her port side, mostly intact, the bow section is beginning to distort and will eventually fall away according to recent sources.

Ospray II – **Depth to sea bed** = 31m **Latitude** = 55 30'.998 N **Longitude** = 005 45'.063 W / **Position Accuracy** = Approx.

The Ospray was an 114nt. Steel steam trawler, built by Smith's Dockyard, Middlesborough and launched in 1911. She was bound for the west coast of Scotland via the Sound of Jura in the command of her skipper, Kelly and 10 crew members when on 6th April 1935 another trawler from the same port, the Caldew skippered by Harris, busy fishing off the coast of Kintyre collided. The weather was calm and clear at the time, the two fishing boats collided at approx. 8.30 a.m. With no satisfactory explanation the Caldew crashed into the Ospray amidships and a huge hole was torn into her side. A member of the Ospray crew later stated the hole was so large that a stream of coal poured out into the sea. The Ospray was towed by the Caldew in an attempt to get her to land and beach her, the Ospray was lowered as a precaution, but it soon became clear that she was already sinking lower in the water. Crew bravely manned pumps until they were waist deep at which point they realised their efforts were in vain. The crew were forced to jump for their lives and in less than an hour after the collision the Ospray was sunk in a position at the time to be reported as approx. two miles from Ballochantuy shore.

Ospray II was found in 1995 by Gus & Ian Newman from the Islay Dive Centre. The wreck is oriented 330/150 degrees, with her stern to the north and rises 2 metres above the seabed. It can be possible when the tide has scoured out the shingle around the propeller, to swim between the prop and the rudder, which is covered in colourful orange and white anemones and soft corals forming a carpet effect. Visibility is normally very clear during the summer months and although the wreck is heavily broken up the sea life on and around the wreck is very colourful and it's normal to see bib, ling, conger as well as lythe. The tides run at over a knot on springs at mid tide, so delayed SMB's and good surface cover will be recommended.

Kartli – Depth to sea bed = 8m **Latitude** = 55 42'.229 N **Longitude** = 005 44'.913 W / **Position Accuracy** = 20.0m

The Kartli was a 1900t. Steel factory ship, built by Veb Volkswerft, Stralsund, launched in 1966. Her dimensions were 79.8 x 13.2 x 5.2m.

The fate of the Karlti came swiftly on one night in December 1991. Whilst her crew of fifty one and their commander Kaptain Vladimir Gayduk were having a well earned rest nine miles off the west coast of Islay after finishing their fishing trip in the fishing grounds off the west of Shetland and homeward bound for Bulgaria. The Karlti was hit by an enormous freak wave during a particularly violent storm, the conditions of which locals claimed to be the worst they had ever seen. The freak wave disabled the Kartli by smashing the bridge and flooding the engine room. The dreadful weather conditions and strong tides which swept the west coast of Islay without doubt combined to throw the massive thirty foot wave, which in turn tore the aluminium bridge structure as if paper.

Three crew members including; one of only three female crew were killed instantly as the bridge caved under the pressure of the wave. The first ship to respond to distress flares was the Drupa, which stood by and assisted in calming the crew whilst the RAF and the Navy rushed to help. Despite all efforts six crew members decided to leave the ship in a small boat, luckily they were rescued later suffering from hypothermia, but alive. The remaining crew were transferred safely via helicopter to the Olna or direct to hospital.

As the storm continued the ship drifted westward despite efforts of the naval tug Roysterer, she eventually came ashore on the north side of Gigha. Salvage was considered for several months, but the ship was looted for its electronic equipment, some of which the crew had acquired to take back to their homeland.

Up until 1993 it was still possible to board her as she lay ashore at Port Ban on the north west coast of Gigha parallel to the shore, even though her stern was gradually sinking beneath the surface, her port side towards land, listing heavily to starboard. In 1993 in winter gales she took such a pounding of the sea, she started to break up and slipped beneath the surface.

The Kartli's wreckage is no longer visible at the surface except for a few pieces inshore strum among the rocks, so any exploration will be an underwater exercise.

Moncousu – Depth to sea bed = 5m **Latitude** = 55 42'.629 N **Longitude** = 005 39'.880 W / **Position Accuracy** = 25m

The Moncousu was originally named Nestor, an 862nt. Steel steamship, built by Mackay Bros, Alloa, launched in 1912. Her dimensions were 235.2' x 36' x 16.3'.

It is unknown at this time as to when Nestor became Moncousu; this is currently being researched via Lloyds Register of Shipping. The origin as we know it to date is that the Moncousu was requisitioned by the Ministry of Shipping for war service and used as an ammunition storage ship in Plymouth, one of the key ports on the English Channel, often the target of German air raids. Under the cover of darkness on 28/29th April 1941 the Moncousu was badly damaged and foundered the following day at Bull Point.

The Moncousu was towed up the coast from Plymouth to be moored on the isle of Gigha on 14th October 1941. For months she was used as target practice using live bombs. By 5th January 1944 she was so badly damaged it was reported the Moncousu was sinking. The hope was that she could be beached and repaired enough to continue as a floating target, but as a tug was sent to tow her ashore to Gigha's East Tarbert Bay she settled and sank. The decision to leave her where she lay was made as the water is shallow and this enabled the Moncousu to continue to be used as a target, this she remained for the remainder of the war and was later salvaged for scrap after the hostilities of war ceased.

A small amount of the Moncousu wreckage remains, lying in shallow waters between Gigha and the west coast of Kintyre. Only a few pieces of tangled metal survived lying on a sand/silt seabed. The wreck is covered in dead men's fingers and large friendly wrasse can be seen. This wreck is best dived on days when the weather precludes the west side of Gigha, which is rough and the silty seabed means visibility can be poor as divers kick up the seabed as they explore in the shallows and close to shore.

U482 – Depth to sea bed = 65m **Latitude** = 55 29'.998 N **Longitude** = 005 53'.061 W / **Position Accuracy** = TBC

The U482 - type VII C U-Boat and had quite a notable history; her Keel was laid down 13th Feb 1942 at Deutsche Werke, Kiel, launched on the 23rd September 1943 and was finally commissioned 1st December of the same year.

As per all of her type she was 67m long, had a beam of 6.2m and displaced 1070 tons (total), she had a range of 8500 miles at 10kts whilst on the surface (max speed on surface = 17.1kts), and 80miles at 4kts whilst submerged (max speed submerged = 7.1kts). The U482 could also carry between 44 – 52 men, 17 torpedoes, 220 rounds for her main deck gun, and had the ability to dive to 220m. It is also reported that the U482 was retrofitted with a breathing snorkel in June of 1944 to increase her range whilst submerged.

She had a crew of 44men and was under the command of by Graf von Hartmut Matuschka; born 29th Dec 1914 Matuschka was only 29 when he took command of the

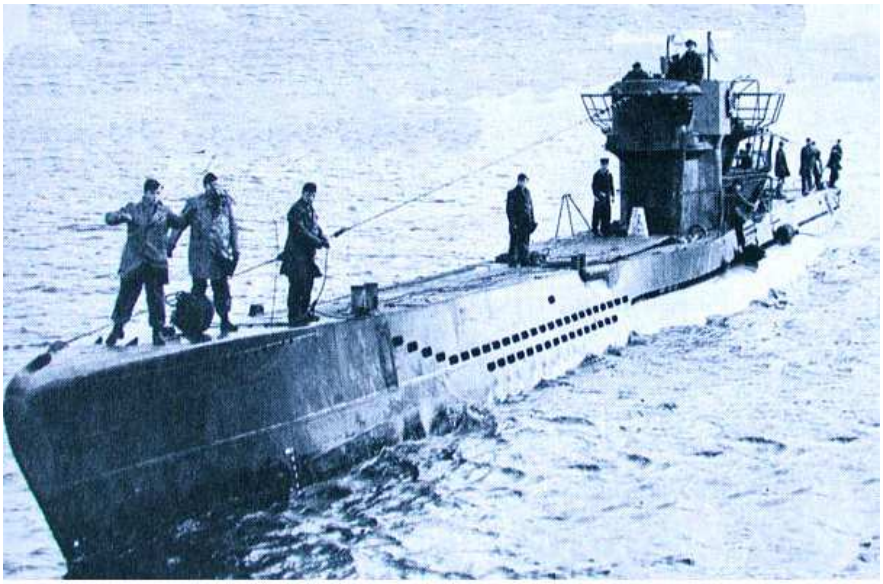
Graf von Hartmut Matuschka

U482 in 1943. From then onwards the orders were to sink enemy shipping in and around the northern approaches of Marlin Head, where she would lay in wait. On 4th September 1944 allied intelligence intercepted an emergency transmission from the German Bootwaffe warning the U482, U484 and U248 that the allied forces had stepped up the anti-submarine hunts in their operating areas, and to more seaward. However on the 11th September another transmission was intercepted confirming that theU482 had sunk the following vessels between the 30th Aug to 8th Sept;

1 x Destroyer – Hurstcastle
1 x 7000 ton tanker – Jacksonville (See appendix 3)
1 x 5000 ton freighter – Pinto
1 x 15000 ton freighter – Empire Heritage
However Naval Intelligence dispute that the U482 sank the Fjordheim on the 3rd September

Crew of U482 at her launch

With all of its torpedo's spent the U482 then had to endure the wrath of the allied forces, for 10 days she hid on the sea bed at 40m only returning to a depth were the snorkel could be used to replenish her air supplies whilst the allies forces dropped over 300 depth charges. In transmissions again intercepted by British Navel intelligence on the 11th September Matuschka was awarded the 'German Cross in Gold' and on the 12th September the 'Iron Cross 1st Class' for his bravery & accomplishments.



U482 - type VII C U-Boat

From the end of September to the end of December information to the U482's whereabouts become a little sketchy, with some quarters believing that the U482 was lost in the deep mines fields A1 & A2 off Marlin Head. However intercepted transmission show the U482 rendezvoused with escort vessel V5116 and headed back to Vadheim and then in convoy with the U398 to Bergen for re-arming. On the 25th November Matuschka received the order "Liberty of action in old operational area". Therefore it would be safe to assume that the U482 was to take up position in / around the northern approaches around Marlin Head to hunt down allied shipping along that route.

On the 16th January 1945, documents released from the British Naval archives state that a submarine believed to be the U482 was chased down by the vessels HMS Peacock, Starling, Hart, Amethyst & Loch Craggie to a position of 55.30N, 05.53W. Where a constant barage of depth charges prevented the U482 from ascending to a depth where the snorkel could be deployed, causing her crew to perish by aphixiation.

The caloberation of further research which includes; eye witness reports to her sinking, local knoweledge of fishermen from the Island of Gigha, further information from the Naval Acrhives, Hydrographic Office and sonar scans from HMS Bulldog (7th August 1985, HMS Bulldog reports a sonar shadow of 70.0m x 6.4m – a size of which could very easily be the that of a Type VII C u-boat) provide a compelling argument that would suggest the U482 is at the above position.

From day one, it is intended to begin the search for the U482 using both Ribs at the position stated above moving outwards in a grid pattern to cover an area as large as practicably possible over the 4 day period. However if the reports from the HMS Bulldog are proved correct, then a dive to confirm the existence of a submarine and if so its designation (designation will be attained from the serial numbers from the propellers) on day 3 of the expedition.

Proposed Dive Sites *- (Shore dives)*

Port Mor – Max Depth = 10m **Latitude** = 55 43'.500N **Longitude** = 005 43'.500W

Situated at the very north point of Gigha, Port Mor offers diving from 4 bays with pure white sand and crystal clear waters. Around this area there is a plethora of small reefs and the vestiges of an old pier, which should provide an excellent site for marine life, with sun stars, yellow sponges and dead mans fingers, while the rocky gullies and small caves provide a home for lobsters, conger eels and Pollock. In addition, a colony of seals inhabit this area, and are quite happy to interact with divers.

Ardminish Bay – Max Depth = 9m **Latitude** = 55 40'.500N **Longitude** = 005 44'.000W

Ardminish Bay is located centrally on the east coast of Gigha, and would provide shelter from all but the worst of weather. Like all of the bays of the island Ardminish Bay has many smaller bays within it (5 in total), all of which have pure white sand and crystal clear waters. Within the waters of Ardminish Bay there are several reefs which where it should be possible to see Cuckoo Wrasse, Pollock, and even Large Spotted Dog Fish. In addition a colony of seals now inhabit this area, and are quite happy to interact with divers. Although this is a relatively sheltered area where the maximum depth is 9metres some currents will be experienced further away from the island where the sea bed drops away to around 15m.

Caolas Point – Max Depth = 6m **Latitude** = 55 39'.150N **Longitude** = 005 44'.900W

Caolas Point is situated on the south east corner of Gigha with the small island of Gigalum only being a stones throw away. This site differs to the others as it is the only one of the selected sites that does not sit upon white sands, but a rocky shoreline. The diving will take place around the area of the pier and again should offer some interesting marine life. Along this area the rocks have been colonised by Brittle Stars, Sea Urchins and Dead Man's Fingers, as-well-as playing host to Lesser Spotted Dog Fish, shoals of Pollock and Whiting.

Cara Bay – Max Depth = 13m **Latitude** = 55 40'.000N **Longitude** = 005 46'.000W

Cara Bay is located on the South West point of the island, and as such is subjected to the worst of the winter storms have to offer. Again blessed with white sands and crystal clear waters, Cara Bay and its associated reefs should provide excellent hiding places for some of the more timid fish, such as Leopard Spotted Gobbies. In addition Tope have been spotted in this area, which realising their position in the food chain seem oblivious to the presents of divers.

Alternate Sites (Backup sites)

Name	Type of vessel	Depth	Latitude	Longitude
Aska	3995 Steel Steam Liner	6	55 38'.213 N	005 45'.646 W
Staffa II	154nt Iron Steam ship	6 - 15m	55 39.616 N	005 47.299W
Challenge	1255nt wooden barque	6	55 38.738 N	005 45.621 W
Albany	60nt Steel Steam trawler	8	55 29.666N	005 42.850 W
Englishman	Tug	64m	55 30'.192 N	005 51'.399 W

Tidal Predictions

With the obvious discrepancies in the tidal predictions, one of the first tasks will be to confirm which (if any) is correct. This will be conducted on the first day by deploying a shot line (with trail buoy) at a know dive site and then watching to see when slack water occurs. Any differences in the tidal calculations will be disseminated down to the dive managers, and day plans adjusted accordingly prior to the commencement of the diving.

Based from Oban (as per chart 2475) Corrected for BST & difference for Straight of Gigha	High water		Low water	
	Time	Height	Time	Height
Friday 11th September	09.26	3.3m	15.45	1.5m
Saturday 12th September	10.34	3.1m	17.03	1.7m
Sunday 13th September	12.22	3.0m	19.01	1.8m
Monday 14th September	14.11	3.2	07.39	1.7m

Gigha Slip Generated via GPS software for tide station 11710	High water		Low water	
	Time	Height	Time	Height
Friday 11th September	18.38	1.2m	12.38	0.6m
Saturday 12th September	18.52	1.1m	13.00	0.7m
Sunday 13th September	07.41	1.1m	13.15	0.9m
Monday 14th September	9.44	1.0m	11.49	1.0m

People so far:

1. Andy Bennett	Mid Lancs SAC	A658728	1st Class Diver
2. Jamie Heptonstall	Mid Lancs SAC	A634838	1st Class Diver
3. Sophie Dyhouse	Mid Lancs SAC	A705828	1st Class Diver
4. Gary Graham	Mid Lancs SAC	A773202	Dive Leader ⇨ Advanced Diver
5. Ann Miller	Mid Lancs SAC	A771307	Sports Diver ⇨ Dive Leader
6. Bruce Taylor	Mid Lancs SAC	A766468	Sports Diver ⇨ Dive Leader
7. Mark Weeks	Mid Lancs SAC	A739500	Dive Leader ⇨ Advanced Diver
8. Edward Canning	Mid Lancs SAC	A773706	Sports Diver ⇨ Dive Leader
9. Mark Scott	Mid Lancs SAC	A776798	Sports Diver ⇨ Dive Leader
10. Steve White	MUSAC	A756759	Dive Leader ⇨ Advanced Diver
11. Sven Evans	MUSAC	A756498	Dive Leader ⇨ Advanced Diver
12. Joe Thomas	SUDS	A772752	Dive Leader ⇨ Advanced Diver
13. Alvin Foye	SUDS	A725877	Dive Leader ⇨ Advanced Diver

General Notes

Dive sites & dive start times may change due to weather or tidal conditions.
All divers / buddy pairings are responsible to manage their own decompression schedules.
All divers are expected to manage their gas requirements via the rule of thirds.
All divers / buddy pairs are restricted to their qualified depth.
Expected water temp, in the region of 13-15°C
All wreck information provided by Operation Sunrise Team members

Emergency Contacts:

Emergency Recompression Help Line – 0151 648 8000 (24hrs)
Aberdeen City Hospital – 0845 4566000
Clyde Coast Guard – 01475 729988

Contacts:

Tony Philpin	Gigha Assistant Trust Manager	tonyphilpin@gigha.org.uk
Helen Lear	Local Diver on Gigha	0790807865
The Gigha Hotel		01583 505254
Weather Information		09014 737 472

Expected costs

Outgoings	
Accommodation	£1687.00
Boat Costs	£ 450.00
Fuel (Towing Boats)	£ 320.00
Fuel (Boats)	£ 315.00
Food	£ 300.00
Ferry crossings	£ 160.00
Compressor Hire	£ 250.00
Compressor consumables	£ 150.00
Research Costs	£ 250.00
Sundries	£ 200.00
Total	£4082.00
Less BS-AC (BEGS) grant (£1000)	£3082.00
Cost per person (based upon 13 persons)	**£ 237.07**

Promotion

It has always been the intension to promote the expedition, both pre and post of the event. As such research is currently being undertaken into the whereabouts and the circumstances of these shipping losses, and it goes without saying that every effort will be made to publicise the findings and outcomes of the expedition. It is our intention to use the following mediums to promote the expedition;

- Dedicated website – www.operationsunrise.co.uk
- Publicity via 'Dive' magazine
- Public talks:
  - Other Branches of the BS-AC
  - North West Regional Conference
  - Diving Officers Conference
  - Local Round Table groups
  - Local community groups
- Local Radio – Chorley FM

Appendix 1 - Decompression requirements for 70m dive on the U-482

Basic Dive Information
Depth = 65m
Bottom Time = 15min
Bottom Gas = 17 / 45 (O2 / He) ⇨ max PPO2 = 1.28 / Equivalent Narcotic Depth = 26m
Travel Gas = 30 / 30 (O2 / He) ⇨ max PPO2 = 1.19 / Equivalent Narcotic Depth = 10m
Decompression gas = 60% (O2) ⇨ max PPO2 = 1.49

Gas switches
Travel Gas ⇨ Bottom Gas (on descent) at 30m
Bottom Gas ⇨ Travel Gas (on ascent) at 30m
Travel Gas ⇨ Decompression Gas (on ascent) at 15m

Run times & Bailout Information
(Based upon VPM-B Decompression Model, with conservatism of +2)

Depth	As Planned	Lost Travel Gas	Lost Deco Gas	5 metres deeper 5 mins longer	Dive aborted < 10min
70	-	-	-	20	-
65	15	15	15	-	10
48	-	-	-	-	-
45	-	-	-	23	-
42	-	-	18	24	-
39	18	18	19	25	-
36	19	19	20	26	-
33	20	20	21	27	14
30	21	21	22	28	15
27	22	22	23	30	16
24	23	24	24	32	17
21	25	27	26	34	18
18	27	30	28	37	19
15	29	32	31	40	20
12	31	35	35	44	21
9	35	38	42	49	24
6	51	56	76	73	33
Bottom Gas	2210	2782	2299	**3172**	1450
Travel Gas	494	-	**2004**	671	388
Deco Gas	767	830	-	**1154**	448

Gas Requirements
(Based upon an RMV of 18 Ltr's / min)
Bottom Gas max requirement = **3172L** x 1.33 (safety factor) = 4219L
Travel Gas = **2004L** x 1.5 (safety factor) = 3006L
Deco Gas = **1154L** x 1.5 (safety factor) = 1731L

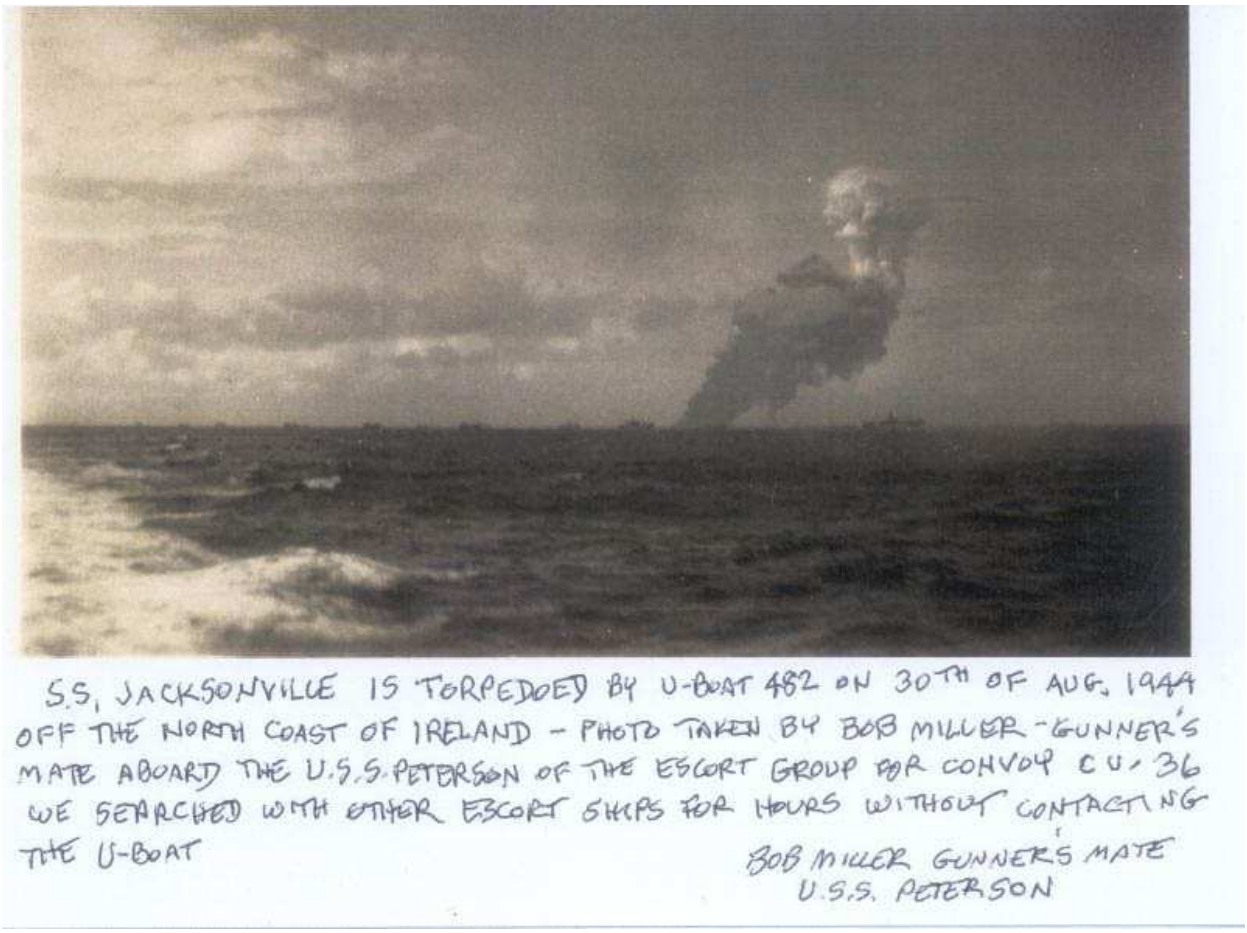
Note;
Should there be a catastrophic loss of the deep diver's decompression gas, signalling to the boat cover the requirement for additional decompression gas shall be via 'Yellow DSMB' deployed by the divers. Additional Decompression Gas shall be lowered to the divers via a 'drop line' and safety divers deployed into the water to assist the deep divers.

Appendix 2 – Directions – Wigan to Gigha

1.	At the roundabout, take the **3rd** exit onto the **M6** ramp to **Preston**	0.3 mi
2.	Merge onto **M6** Entering Scotland	110 mi
3.	Continue on **A74(M)** (signs for **Glasgow/Edinburgh**)	48.6 mi
4.	Continue on **M74**	28.7 mi
5.	At junction **4**, exit onto **M73** toward **Glasgow/M8/Stirling/A80**	1.4 mi
6.	Take the exit onto **M8** toward **Glasgow**	20.0 mi
7.	At junction **30**, exit onto **M898** toward **Erskine/Bishopton**	0.9 mi
8.	Continue on **A898** (signs for **Glasgow/Crianlarich/A82/A898**)	1.6 mi
9.	Exit onto **A82/Great Western Rd** toward **Crianlarich** Continue to follow A82 Go through 4 roundabouts	25.0 mi
10.	Continue on **A83** (signs for **Campbeltown/A83**) Go through 2 roundabouts	47.5 mi
11.	At the roundabout, take the **1st** exit onto **A83/Cossack St** Continue to follow A83 Go through 1 roundabout	0.6 mi
12.	At the roundabout, take the **1st** exit and stay on **A83**	31.6 mi
13.	Turn **right**	331 ft
14.	Turn **right**	0.5 mi
15.	Turn **left**	282 ft
15.	Take the **Tayinloan - Gigha** ferry to Isle Of Gigha	2.9 mi

Travel Synopsis
Distance = 321miles
Travel time = 6hrs 9mins

Appendix 3 – SS Jacksonville being torpedoed by the U482



Appendix 4 – Risk Assessment

Operation Sunrise - Risk Assessment Form

Assessment Date:	Diving activity to be assessed:	Assessed by:	Checked By:
	Operation Sunrise	Andrew Bennett	Jamie Heptonstall

Dive Site:	Boats used:	Weather Conditions:	Sea State:
Island of Gigha	Little Mo Space Hopper	**Predicted –** TBC **Actual –** TBC	**Predicted -** TBC **Actual -** TBC

Position of Dive Site:	Dive Marshal:	Deputy Dive Marshal:	Safe to Dive:
West coast of Kintyre	As stated on marshal sheet	As stated on marshal sheet	YES

Risk	Control measures	Response to occurrence	Risk level acceptable Y/N or N/A
Safe operation of Dive Ribs	Coxswains to be suitably experienced. Passage planning. Pre operational checks Monitoring of all onboard systems. Redundancy in essential equipment. Reporting of all faults. Contact with Coast Guard.	Suitably trained & experienced Coxswain's Advise coast guard to problem Switch to redundant systems, and return to base. Repair equipment as necessary	Yes
Drowning	Buddy monitoring, Alternative Air Source	Rescue casualty, administer 0^2 and if required AV / CPR, evacuate for treatment via emergency services	Yes
Cold	Wear thermal protective clothing suited to the diving environment.	Abandon dive if / when too cold	Yes
Running out of breathing gas	Pre dive planning, Self / Buddy monitoring Carry redundant gas Safety divers on diver(s) to U482	Abandon dive. Surface breathing from own redundant gas supply / Buddies AAS Additional gas to be suspended on deco trapeze. Additional gas to be carried / handed off by safety divers	Yes
Nitrogen narcosis	Pre dive planning Monitor depth Accurate blending of breathing gasses Pre-dive gas analysis Monitoring buddy for abnormal behaviour	Reduce depth Abandon dive if necessary	Yes
Oxygen Toxicity	Pre dive planning Accurate blending of breathing gasses Pre-dive gas analysis Monitor depth Monitoring buddy for abnormal behaviour	Reduce depth Abandon dive Rescue casualty, administer 0^2 and if required AV / CPR, evacuate for treatment via emergency services	Yes
Depth	Pre dive planning Monitor depth Monitoring buddy	Reduce depth Abandon dive if necessary	Yes
Ear damage	Pre dive check for the ability to clear ears Slow descent Constantly clear,	Abandon dive if necessary	Yes
Decompression Stops	Pre dive planning Adequate gas supply	Complete decompression as dictated by dive tables / computer	Yes

	Buddy monitoring of dive plan		
Missed decompression stops	Pre dive planning Adequate gas supply Buddy monitoring of dive plan	Administer O^2 and isotonic fluids, monitor condition, evacuate for treatment via emergency services	Yes
Fast ascent	Ensure correct weighting at start of dive. Ensure weight belt is secure	Release gas from BC & drysuit. Grasp shot line Administer O^2 and isotonic fluids, monitor condition, evacuate for treatment via emergency services if necessary	Yes
Free flow	Use regulator in line with manufactures recommendations. Maintain regulator as per manufactures recommendations	Perform shutdown drill (on twin set) Surface breathing from own redundant gas supply / Buddies AAS Abandon dive.	Yes
Computer failure	Pre dive check Change batteries as per manufactures recommendations	Use backup system Abandon dive	Yes
Equipment failure	Pre dive check Maintain all equipment as per manufactures recommendations	Abandon dive Assistance from buddy	Yes
Diver separation	Buddy monitoring Agreement on heading / change in direction	Look around for 1 min. Deploy delayed surface marker buoy Surface (performing deco & safety stops) Inform shore cover	Yes
Low / no visibility	Buddy monitoring Torch / strobe Buddy line Bottom line	Consider abandonment of dive	Yes
Disorientation	Use compass Delayed surface marker buoy	Attempt to regain bearings / heading Assistance from buddy Abandon dive	Yes
Entanglement	Observation Buddy monitoring Pre dive research	Carry cutting tools, knife, scissors Assistance from buddy	Yes
Boat / diver(s) separation	Surface using shot line Surface using delayed surface marker buoy Agree dive plan with dive boat skipper	Use DSMB / flag / strobe / whistle/ mirror (CD) to attract dive boat attention. Inform coast guard of overdue divers.	Yes
Weather / Sea conditions	Check prior to dive Monitor continuously	Constantly review, abandon dive if necessary	Yes
Ferry and Boat Traffic	Pre dive planning Use of SMB per diver pair Use dive boat cover if possible	Move to safe area Abandon dive if necessary	Yes
Loading / unloading of equipment	Use correct lifting and handling techniques	Use assistance to move all heavy objects. Ensure all objects are securely stored	Yes
Slip / Trip Hazards	Pre dive planning Be aware of condition of pathway to access point.	Find alternative rout Use extreme care when traversing rout Use guide / helper for assistance	Yes
Entry / Exit points	Pre dive planning Check suitability	Find alternative rout Include in briefing Use buddy / helper for assistance	Yes