

**Reference Code:** 3413/ Mss.30

**Title:** Ray Cossum - Laurentic Collection

**Creation Dates:** 1945-2016

**Level of Description:** File level description

**Extent & Medium:** 2 Boxes

**Creator(s):** Ray Cossum

### **Scope & Content**

The collection has two subject themes, the Laurentic and the Royal Navy. The first box contains items relating to the Laurentic, its purchase and researching the vessel. It also contains original documents relating to the salvage and the hunt for the remaining gold bars. The majority of the items are photocopies of originals. The second box contains items relating to Ray's service in the Royal Navy at Ebrington, including detailed diagrams of submarines and their wirings.

The collection includes digital items.

The collection was donated by Ray Cossum.

### **Item level descriptions**

**Mss.30.1      Research Publications - 2000, 2002, 2012**

**Mss.30.1.1**

**Reagan, Geoffrey, (2012) *Great Naval Blunders*, Andre Deutsch**

Book detailing worst naval blunders from ancient times to present day. Signed by Ray Cossum.

**Mss.30.1.2**

**Cameron, Stephen, (2002) *Death in the North Channel, The loss of the Princess Victoria January 1953* Colourpoint Books**

Book detailing the sinking of the Princess Victoria 1953 which was the worst maritime disaster off the British Isles. This book was given to Ray by his son Des, who both have signed the front page. Also includes a note 'Thanks Our Des'.

**Mss.30.1.3**

**Cossum, Ray and Scoltock, Jack, (2000) *We Own Laurentic, The Story of “the Gold Ship”*, Impact Printing**

Book detailing Ray Cossum’s journey with the Laurentic and how he gained the salvaging rights in 1969, to his discovery of the missing bell and his search for the missing gold bars. The book also includes details of the Laurentic’s final voyage in 1917 and the salvaging operations that followed until 1924 when all but 20 gold bars were recovered.

**Mss.30.1.4**

**Cossum, Des, Ray and Eric, (undated) *S.S. Laurentic, the gold bullion ship* (3 items)**

This book is a condensed version of *We Own Laurentic* with some added extras such as details of her construction in 1907 and detailed accounts of how the dead were recovered and washed ashore as well as the burial and memorial services held for them. The *SS. Laurentic* also includes the story of how Doctor Hawley Crippen, a famous 20<sup>th</sup> Century murderer was captured by Inspector Walter Dew on the Laurentic on a previous voyage in 1910.

**Mss.30.2      Video Tapes**

**Mss.30.2.1      S.S. Laurentic - (undated)**

**Mss.30.2.2      Confession Laurentic - (undated)**

**Mss.30.2.3      The Laurentic Saga I and II - (undated)**

**Mss.30.2.4      Laurentic Trip no.2 - September 1993**

**Mss.30.2.5      Cossum Diving Syndicate Laurentic I – (undated)**

**Mss.30.3      Audio and visual recordings on CD’s**

**Mss.30.3.1**

**Launch photos on HMS Caroline (53 items) – 2008**

Photographs of a champagne reception held on HMS Caroline to mark the 99<sup>th</sup> anniversary of the Laurentic’s maiden voyage and to gain support for the launch of a new website for the Laurentic.

**Mss.30.3.2-3**

**S.S. Laurentic gun lift Downings Divers (2 items) - September 2007 (CD marked with M)**

The CD begins with a video of the wreckage focusing on one of the guns the divers were trying to recover. The CD also shows photos compiled into a video of the recovery and restoration of the gun which was mounted for public display on the pier at Downings Bay.

**Mss.30.3.4**

**S.S. Laurentic video – 2008**

Detailed video footage of the wreckage which explores the deck of the ship showing images of ropes and cables. Towards the end of the video it explores below deck where it is unclear to depict what is what.

**Mss.30.3.5**

**Photos on Pier copy no. 2 (190 items) - September 2007**

Photographs of the recovery of one of the Laurentic's guns which is now mounted at Downings bay.

**Mss.30.3.6**

**Mallet salvage interview with Don Gillespie (2 items) – 21<sup>st</sup> September 1979**

Audio interview

**Mss.30.3.7**

**S.S. Laurentic, the Gold Bullion Ship – 2008**

Pdf document

**Mss.30.3.8-17**

**Recollections of Henry Augustus Dent and Paddy Murphy (3 items) – January 1995 (Blank CD's + Laurentic Limited CD)**

First two tracks are recollections of Henry Augustus Dent RN who served on S.S. Laurentic when she sank 1917 and then later as a naval salvage diver under Commander Damant. The last track is the recollection of Paddy Murphy who watched S.S Laurentic slip her moorings in Lough Swilly.

**Mss.30.3.18**

**Carthaginian – July 2013**

Video footage of the wreckage of 4444 GRT Alla Line Liner Carthaginian which hit a mine in June 1917. The wreck now lies 2.5 miles NW of Inistrahull. Video includes detailed footage of the wreck as well as shots of the bow of the ship on the seabed floor.

**Mss.30.3.19**

**Laurentic Story Laurentic CD 1 (4 items)**

Mr Murphy being interviewed about the Laurentic, he worked on the ship 'the Morning Star.' Item 1

**Mss.30.3.20**

**Laurentic Story Laurentic CD 2 (1 item)**

Interview

**Mss.30.3.21**

**Laurentic Story Memories of Mallet Salvage Co working the Laurentic Don Gillespie (2 items)**

**Mss.30.3.22**

**Laurentic Story Henry Augustus Dent (3 items)**

Interview with Henry Augustus Dent about the sinking of the Laurentic

**Mss.30.4 Digital Images**

**Mss.30.4.1**

**Submarine subtle (undated)**

A digital photograph of submarine subtle which was the first submarine Ray Cossum served on.

**Mss.30.4.2**

**Ray Cossum and friends in Royal Navy uniform (undated)**

A digital photograph of Ray and his friends in the Royal Navy uniform.

**Mss.30.4.3**

#### **Ray Cossum aboard Submarine Subtle (undated)**

A digital photograph of Ray Cossum and his fellow crew members aboard submarine Subtle in the Port of Derry. Ray is on the top conning tower third from right.

#### **Mss.30.4.4**

##### **Ray Cossum in the Royal Navy (undated)**

A digital photograph of a headshot of Ray Cossum in his uniform when he served in the Royal Navy.

#### **Mss.30.4.5**

##### **Ray Cossum and crew in Submarine Subtle (undated)**

A digital photograph of Ray Cossum with his crew members in Submarine Subtle after a month . Ray is second left.

#### **Mss.30.4.6**

##### **Newspaper cutting of H.M.S Dolphin's anniversary march- Mid 1950's (undated)**

A digital photograph of Ray Cossum in a guard of honour past Capt. J. Enright of the United States Navy after the 55<sup>th</sup> submarine anniversary H.M.S Dolphin. Ray is fourth from the front in the left row.

#### **Mss.30.4.7**

##### **R.N and R.M Pensioner's and Reservist's Instruction Book- 14<sup>th</sup> March 1962**

A digital photograph of a Ray Cossum's instruction book when he became a R.N Pensioner in 1962.

#### **Mss.30.4.8**

##### **H.M.S Artful (undated)**

A digital photograph of H.M.S Artful which Ray served on during the 1950's working from Rothesay Isle of Bute.

#### **Mss.30.4.9**

##### **Newspaper cutting of Ray Cossum swimming (undated)**

A digital photograph of a newspaper cutting of Ray being helped out of the water at Carrickfergus Harbour after winning a four-mile swim from Greypoint, Co. Down to Carrick.

#### **Mss.30.4.10**

##### **Newspaper cutting of Ray coaching and swimming (undated)**

A digital photograph of Ray and his son Des coaching Bernadette Casey and Adrian Kelly who represented Ireland in the Mini-World Championships. Also a picture of Ray about to enter the water at Cap Gris Nez for a long distance swim.

#### **Mss.30.4.11**

##### **Ray Diving- late 1950's early 1960's**

A digital photograph of Ray Cossum with Denis Pearse about to dive a wreck just off Folkestone near Dover.

#### **Mss.30.4.12**

##### **St. Bedan- 1982**

A digital photograph of St. Bedan a British ship sunk by the IRA in Lough Foyle in 1982. Ray worked as a diver on the recovery of this wreck with the Salvage Company Euro-Salve, owned by Jim Rowland who was also a good friend of Ray's.

#### **Mss.30.4.13**

##### **Torpedo (undated)**

A digital photograph of the type of torpedo that sank the Sidon. The hydrogen peroxide propellant exploded whilst being withdrawn from the tubes. They often exploded with Ray but luckily after they were fired.

#### **Mss.30.4.14**

##### **Photograph of Ray with some divers (undated)**

A digital photograph of Ray when he was older on the back of a diving ship with some divers.

#### **Mss.30.4.15**

##### **Certificate of Service in the Royal Navy**

A digital photograph of the first page of Ray's certificate of service in the Royal Navy, which list his personal information and swimming qualifications.

#### **Mss.30.4.16**

##### **Certificate of Service in the Royal Navy**

A digital photograph of the last page of Ray's certificate of service in the Royal Navy which list Ray's character and efficiency.

#### **Mss.30.4.17**

##### **Certificate of Service in the Royal Navy**

A digital photograph of the second page of Ray's certificate of service in the Royal Navy where it lists all the ships Ray served on during his time in the Royal Navy.

#### **Mss.30.4.18**

##### **Certificate of Service in the Royal Navy**

A digital photograph of the third page of Ray's certificate of service in the Royal Navy where it lists the notation of qualifications and examinations he passed.

#### **Mss.30.4.19**

##### **H.M.S Vanguard (undated)**

#### **Mss.30.4.19.1**

##### **Photograph of H.M.S Vanguard**

A digital photograph of the last ship Ray served on with the Royal Navy early 1957, H.M.S Vanguard which had 16 inch guns.

#### **Mss.30.4.19.2**

##### **Notes about H.M.S Vanguard photo**

Notes made by Ray about the photograph taken of H.M.S Vanguard in Derry late 1949 when Ray joined the crew of H.M.S Creole an 'anti' submarine destroyer.

#### **Mss.30.4.20**

##### **An agreement between Ministry of Defence and Eric Cossum**

A digital photograph of the agreement signed by Reginald John Penney, an assistant under Secretary of State of the Ministry of Defence transferring the Ministry of Defence's title of the wreck of the Laurentic to Eric Cossum.

**Mss.30.4.21**

**H.M.S Artful, H.M.S Subtle and H.M.S Tiptoe**

A digital photograph of three Royal Navy submarines, H.M.S Artful, H.M.S Subtle and H.M.S Tiptoe, which Ray served on at various times throughout his career.

**Mss.30.4.22**

**H.M.S Subtle (undated)**

A digital photograph of submarine Subtle, Ray's first submarine.

**Mss.30.4.23**

**H.M.S Sidon- 16<sup>th</sup> June 1955- 23<sup>rd</sup> July 1955**

A digital photograph of H.M.S Sidon which Ray has written beside, 'we were alongside the Sidon just an hour or so before she sank, we and four crew were dumbfounded a hydrogen peroxide propellant exploded in her torpedo tale. She was as we were earlier alongside the submarine depot, about half the crew were killed, we were then in through the English Channel heading for Belgium.

**Mss.30.4.24**

**H.M.S Sidon- 16<sup>th</sup> June 1955- 23<sup>rd</sup> July 1955**

A digital photograph of H.M.S Sidon being salvaged 16<sup>th</sup> June 1955. Beside the photograph Ray wrote, 'we were alongside her that fateful morning she had slipped her stern ropes to let us, we proceed up channel.'

**Mss.30.4.25**

same

**Mss.30.4.26**

**Pictorial History of Royal Navy Submarines (undated)**

Brief history of the Royal Navy Submarine A13 taken from the Royal Navy Submarine Museum.



**Mss.30.4.27**

**Pictorial History of Royal Navy Submarines (undated)**

Brief history of the Royal Navy Submarine B10 taken from the Royal Navy Submarine Museum.

**Mss.30.4.28**

**Pictorial History of Royal Navy Submarines (undated)**

Brief history of the Royal Navy Submarine D2 taken from the Royal Navy Submarine Museum.

**Mss.30.4.29**

**Pictorial History of Royal Navy Submarines (undated)**

Brief history of the Royal Navy Submarine J4 taken from the Royal Navy Submarine Museum.

**Mss.30.4.30**

**Pictorial History of Royal Navy Submarines (undated)**

Brief history of the Royal Navy Submarine Swordfish taken from the Royal Navy Submarine Museum.

**Mss.30.4.31**

**Pictorial History of Royal Navy Submarines (undated)**

Brief history of the Royal Navy Submarine F2 taken from the Royal Navy Submarine Museum.

**Mss.30.4.32**

**Pictorial History of Royal Navy Submarines (undated)**

Brief history of the Royal Navy Submarine G14 taken from the Royal Navy Submarine Museum.

**Mss.30.4.33**

**Pictorial History of Royal Navy Submarines (undated)**

Brief history of the Royal Navy Submarine M1 taken from the Royal Navy Submarine Museum.

**Mss.30.4.34**

**Pictorial History of Royal Navy Submarines (undated)**

Brief history of the Royal Navy Submarine R4 taken from the Royal Navy Submarine Museum.

**Mss.30.4.35**

**Pictorial History of Royal Navy Submarines (undated)**

Brief history of the Royal Navy Submarine H49 taken from the Royal Navy Submarine Museum.

**Mss.30.4.36**

**Pictorial History of Royal Navy Submarines (undated)**

Brief history of the Royal Navy Submarine L56 taken from the Royal Navy Submarine Museum.

**Mss.30.4.37**

**Pictorial History of Royal Navy Submarines (undated)**

Brief history of the Royal Navy Submarine Pandora taken from the Royal Navy Submarine Museum.

**Mss.30.4.38**

**Pictorial History of Royal Navy Submarines (undated)**

Brief history of the Royal Navy Submarine Thames taken from the Royal Navy Submarine Museum.

**Mss.30.4.39**

**Pictorial History of Royal Navy Submarines (undated)**

Brief history of the Royal Navy Submarine Rorqual taken from the Royal Navy Submarine Museum.

**Mss.30.4.40**

**Pictorial History of Royal Navy Submarines (undated)**

Brief history of the Royal Navy Submarine Safari taken from the Royal Navy Submarine Museum.

**Mss.30.4.41**

**Pictorial History of Royal Navy Submarines (undated)**

Brief history of the Royal Navy Submarine Upshot taken from the Royal Navy Submarine Museum.

**Mss.30.4.42**

**Pictorial History of Royal Navy Submarines (undated)**

Brief history of the Royal Navy Submarine Truncheon (pre conversion) taken from the Royal Navy Submarine Museum.

**Mss.30.4.43**

**Pictorial History of Royal Navy Submarines (undated)**

Brief history of the Royal Navy Submarine Truncheon (post conversion) taken from the Royal Navy Submarine Museum.

**Mss.30.4.44**

**The Royal Navy Submarine Service, a Pictorial history 1901-1956**

Digital photograph of the front cover of the Royal Navy Submarine Service pictorial history 1901-1956 book.

**Mss.30.4.45**

**The Royal Navy Submarine Service, a Pictorial history 1901-1956**

Digital photograph of the first page of the Royal Navy Submarine Services book, pictorial history 1901-1956. The first page is titled The History of Royal Navy Submarine Operations.

**Mss.30.4.46**

**The Royal Navy Submarine Service, a Pictorial history 1901-1956**

Digital photograph of the second page of the Royal Navy Submarine Services book, pictorial history 1901-1956. This page is a continuation of the history of Royal Navy Submarine Operations.

**Mss.30.4.47**

**Ray Cossum swimming (undated)**

A digital photograph of Ray Cossum coming out of the water looking like he just finished a race. Details are unknown of where he was swimming.

**Mss.30.4.48**

**Ration Book from World War II- 7 July 1941**

A digital photograph of the front cover of a ration book belonging to William R. Herring, Walton Way Mitcham.

**Mss.30.4.49**

**Ration Book from World War II- 7 July 1941**

A digital photograph of pages 2 and 3, which are blank, of a ration book belonging to William R. Herring.

**Mss.30.4.50**

**Ration Book from World War II- 7 July 1941**

A digital photograph of pages 4 and 5, which are blank, of a ration book belonging to William R. Herring.

**Mss.30.4.51**

**Ration Book from World War II- 7 July 1941**

A digital photograph of pages 6 and 7 of a ration book belonging to William R. Herring. On page 6 the Monthly "A" section from June to July are marked out.

**Mss.30.4.52**

**Ration Book from World War II- 7 July 1941**

A digital photograph of pages 8 and 9, which are blank, of a ration book belonging to William R. Herring.

**Mss.30.4.53**

**Ration Book from World War II- 7 July 1941**

A digital photograph of pages 10 and 11, which are blank, of a ration book belonging to William R. Herring.

**Mss.30.4.54**

**Ration Book from World War II- 7 July 1941**

A digital photograph of pages 12 and 13 of a ration book belonging to William R. Herring. Page 13 is filled out with W.R. Herrings personal details.

**Mss.30.4.55**

**Ration Book from World War II- 7 July 1941**

A digital photograph of pages 14 and 15, which are blank, of a ration book belonging to William R. Herring.

**Mss.30.4.56**

**Ration Book from World War II- 7 July 1941**

A digital photograph of the last page, which is blank, of a ration book belonging to William R. Herring.

**Mss.30.4.57**

**Daily Mail- Monday November 9, 1942**

A digital photograph of the top half of the front page of the Daily Mail's late war news special.

**Mss.30.4.58**

**Daily Mail- Monday November 9, 1942**

A digital photograph of the bottom half of the front page of the Daily Mail's late war news special.

**Mss.30.4.59**

**Daily Mail- Monday November 9, 1942**

A digital photograph of the top half of the second page of the Daily Mail's late war news special.

**Mss.30.4.60**

**Daily Mail- Monday November 9, 1942**

A digital photograph of the bottom half of the second page of the Daily Mail's late war news special.

**Mss.30.4.61**

**Daily Mail- Monday November 9, 1942**

A digital photograph of the top half of the third page of the Daily Mail's late war news special.

**Mss.30.4.62**

**Daily Mail- Monday November 9, 1942**

A digital photograph of the bottom half of the third page of the Daily Mail's late war news special.

**Mss.30.4.63**

**Daily Mail- Monday November 9, 1942**

A digital photograph of the top half of the fourth page of the Daily Mail's late war news special.

**Mss.30.4.64**

**Daily Mail- Monday November 9, 1942**

A digital photograph of the bottom half of the fourth page of the Daily Mail's late war news special.

**Mss.30.4.65**

**Channel Straits Shipwrecks (undated)**

A digital photograph showing one half of a map of all the shipwrecks in the Channel Straits from the coast of the Isle of Sheppey to Rye.

**Mss.30.4.66**

**Channel Straits Shipwrecks (undated)**

A digital photograph showing the other half of a map of all the shipwrecks in the Channel Straits from the coast of the Isle of Sheppey to Rye.

**Mss.30.4.67**

**Attack Routine for boats and subs-1950**

A digital photograph of a list of duties of key ratings on-board a ship. For example a 2<sup>nd</sup> Coxswain is responsible for the appearance of the upper deck and upkeep of the cable gear.

**Mss.30.4.68**

**Attack Routine for boats and subs-1950**

A digital photograph of a continuation of a list of duties of key ratings onboard a ship. There is also information given on passing, reporting and repeating orders.

**Mss.30.4.69**

**Shutting off for Depth Charging- Early 1950s**

A digital photograph of notes on shutting off for Depth Charging, which is to achieve the submarine equivalent of Damage Control State 1 and to reduce the submarines noise to a minimum. Ray has wrote at the bottom, '(boats) submarines early 1950. The drill to shut down for depth charges, all the drills I had to second nature. Ray Cossum subs and boats.'

**Mss.30.4.70**

**Shutting off for Depth Charging- Early 1950s**

A digital photograph of the continuation of notes on shutting off for Depth Charging. Ray has wrote at the bottom, 'The drill for silent routine everything stopped. No talking, rags around your shoes, spanners coated with

**Mss.30.4.71**

**Preparations for running and shutting down main machinery- 1953**

A digital photograph of the first page of guidance notes for Engineer officers which gives detailed notes of how to prepare main engines for sea.

**Mss.30.4.72**

**Preparations for running and shutting down main machinery-1953**

A digital photograph of the second page of guidance notes for Engineer officers which gives detailed notes on charging batteries, shutting down for diving and the normal position for engine when shut down.

**Mss.30.4.73**

**Diagrammatic Arrangement of Steering Gear**

A digital photograph of a drawing by Ray of a diagrammatic arrangement of a steering gear.

**Mss.30.4.74**

**Chydraulig Steering Gear**

A digital photograph of a drawing by Ray of a chydraulig steering gear drawing.

**Mss.30.4.75**

**Electoral Distributing**

A digital photograph of notes made by Ray on electoral distributing.

**Mss.30.4.76**

**Distilling Plant**

A digital photograph of a drawing by Ray of a distilling plant.

**Mss.30.4.77**

**150 lb per square inch**

A digital photograph of notes by Ray, includes a list of numbers at the bottom. 150lb per square inch.

**Mss.30.4.78**

**Screw Steering Gear**

A digital photograph of a screw steering gear drawn by Ray.

**Mss.30.4.79**

**Telemotors**

A digital photograph of a telemotor drawn by Ray.

**Mss.30.4.80**

**Detailed notes about submarines**

A digital photograph of detailed notes by Ray about replenishing tanks, relief valves, air boost and the methods of steering.

**Mss.30.4.81**

**Detailed notes about submarines**



A digital photograph of detailed notes made by Ray about main engines and telemotors.

**Mss.30.4.82**

**Routine for Starting L.P. Blower**

A digital photograph of a step by step routine written by Ray for starting a H.P Blower.

**Mss.30.4.83**

**Sea Relief Value and H.P Air System**

A digital photograph of detailed notes by Ray of sea relief values and H.P air systems.

**Mss.30.4.84**

**External Oil Fuel System 'T' Class**

A digital photograph of a detailed drawing by Ray of an external oil fuel system 'T' class.

**Mss.30.4.85**

**External Oil Fuel System 'T' Class**

A digital photograph of notes made by Ray about the external oil fuel system 'T' class.

**Mss.30.4.86**

**Shutting off for Depth Changing**

A digital photograph of notes made by Ray about shutting off for depth changing and the Oleo System.

**Mss.30.4.87**

**Running Charge**

**Mss.30.4.88**

**'A' Class H.P Air and H.P Direct Blow Panel**

A digital photograph of a drawing by Ray of a H.P Direct Blow Panel and an 'A' Class H.P Air.

**Mss.30.4.89**

**Main and Aux Diving Panel**

A digital photograph of a drawing by Ray of a main and aux diving panel.

**Mss.30.4.90**

**Hydroplanes**

A digital photograph of notes made by Ray about Hydroplanes.

**Mss.30.4.91**

**'A' Class**

A digital photograph of notes made by Ray on 'A' class

**Mss.30.4.92**

**'A' Class Trimm Line**

A digital photograph of a drawing by Ray of a submarine's 'A' class trimm line.

**Mss.30.4.93**

**"Routine**

A digital photograph of notes made by Ray

**Mss.30.4.94**

**Continuation of " Routine**

**Mss.30.4.95**

**Internal Oil Group**

A digital photograph of a drawing by Ray of an internal oil group

**Mss.30.4.96**

**Oil Fuel System**

A digital photograph of notes made by Ray about an Oil fuel system.

**Mss.30.4.97**

**Upper Deck Maintenance**

A digital photograph of notes made by Ray about Upper deck maintenance.

**Mss.30.4.98**

**Upper Deck Maintenance**

A digital photograph of a continuation of notes on upper deck maintenance made by Ray.

**Mss.30.4.99**

**Compensating Tanks**

A digital photograph of notes made by Ray about Compensating tanks 'T' and 'S' Class, Auxillary Tanks 'T' and 'S' class and fittings on the tank.

**Mss.30.4.100**

**Tillings and W.R.T**

A digital photograph of notes made by Ray about Tillings and W.R.T

**Mss.30.4.101**

**Main Ballest Tanks**

A digital photograph of notes and drawings of ballest tanks made by Ray.

**Mss.30.4.102**

**Hand Operated Kingston 'S' Class**

A digital photograh of a drawing by Ray of nine main ballast tanks, no. Three main ballest in a hand operated Kingston.

**Mss.30.4.103**

**Notes made in blue pen**

A digital photograph of notes made by Ray about cleaning. How to check oil level in sump, check that the break is off

**Mss.30.4.104**

**Notes made in blue pen**

**Mss.30.4.105**

**Changing batteries and battery ventilation**

**Mss.30.4.106**

**Continuation of changing batteries and battery ventilation**

**Mss.30.4.107**

**Notes about cleaning (made in blue pen)**

A digital photograph of notes made by Ray about removing and replacing plugs from the top of the hood.

**Mss.30.4.108**

**Refrigerator system**

**Mss.30.4.109**

**Diagram of Ford Plane Housing Gear**

A digital photograph of the general lay out for planes of 'S', 'A' and 'T' class submarine by Ray.

**Mss.30.4.110**

**Layout of Bathrooms and WC's**

A digital photograph of a diagram showing the layout of bathrooms and WC's.

**Mss.30.4.111**

**Tank fitting W.R.T T.O.T**

A digital photograph of notes made by Ray about Tank fittings and Fresh water tanks.

**Mss.30.4.112**

**Ring Main**

A digital photograph of notes made by Ray about Ring Mains.

**Mss.30.4.113**

**Engine Circulating Water**

A digital photograph of a drawing of an engine circulating water drawn by Ray.

**Mss.30.4.114**

**Notes about engine circulating water**

A digital photograph of notes made by Ray about engines circulating water.

**Mss.30.4.115**

**Steering gear for 'S' boat, 'A' class and 'T' class submarines**

A digital photograph of a drawing by Ray about the steering gear for 'S' boat, 'A' class and 'T' class submarines.

**Mss.30.4.116**

**Air conditioning Plans**

A digital photograph of notes made by Ray about air conditioning plans and air purification.

**Mss.30.4.117**

**Air Conditioning and Pyrometers**

A digital photograph of notes made by Ray about air conditioning and Pyrometers.

**Mss.30.4.118**

**L.P Airline, 'A' class submarine 'R' class boat**

A digital photograph of a drawing by Ray of a L.P airline, 'A' class and 'R' class boat submarine.

**Mss.30.4.119**

### **L.P Blower**

A digital photograph of notes made by Ray about a L.P Blower.

### **Mss.30.4.120**

#### **Sewage tank**

A digital photograph of notes mad by Ray about sewage and loot tanks and how to clean oil fuel centrifuge.

### **Mss.30.4.121**

#### **Notes about drain tanks (blue pen)**

### **Mss.30.4.122**

#### **'T' class main line- 1940's-1950's**

A digital photograph of one half of a plan for a 'T' class main line submarine. The plan includes N.R.D.V, 'B' pump and oily bilage sucns.

### **Mss.30.4.123**

#### **'T' class main line**

A digital photgraph of the second half of a plan for a 'T' class main line submarine. The plan includes deatil of N.R.D.V, 'A' pump and bilge sucns.

### **Mss.30.4.124**

#### **'T' class submarine-1939**

A digital photograph of a sectional drawing of a 'T' class submarine.

### **Mss.30.4.125**

#### **Starting H.P Air Comp and Trim Line**

A digital photograph of notes made by Ray about starting Air comp and Trim lines.

### **Mss.30.4.126**

#### **H.P Air Compressors and water line**

A digital photograph of notes made by Ray about H.P Air compressors and water lines.

**Mss.30.4.127**

**Engine tail breaks on all 'A' class submarines**

A digital photograph of a drawing by Ray of an engine on all 'A' class submarines and 'T' and 'S' class.

**Mss.30.4.128**

**Propeller and shafting**

A digital photograph of notes made by Ray about propellers and shafting.

**Mss.30.4.129**

**External of System 'T' Class submarines**

A digital photograph of a diagram of the external of a system 'T' class submarine.

**Mss.30.4.130**

**Schematic arrangement of interlocks for forward hydroplanes for 'T' class submarines and boats.**

A digital photograph of the schematic arrangement of interlocks for forward hydroplanes for 'T' class submarines and boats.

**Mss.30.4.131**

**Notes about schematic arrangement of interlocks**

A digital photograph of notes made by Ray about schematic arrangement of interlocks for forward hydroplanes for 'T' class submarines and boats.

**Mss.30.4.132**

**Layout of internal tanks 'T' class submarines**

A digital photograph of a diagram of the layout of internal tanks 'T' class submarine.

**Mss.30.4.133**

**Layout of internal tanks 'T' class submarines**

A digital photograph of the second half of a diagram of the layout of internal tanks 'T' class submarine.

**Mss.30.4.134**

**General Arrangement of snort system**

A digital photograph of a diagram of the general arrangement of a snort system for all class of boats submarines.

**Mss.30.4.135**

**Telemotor system**

A digital photograph of notes made by Ray about telemotor systems.

**Mss.30.4.136**

**General Oil line of system**

A digital photograph of notes made by Ray about general oil line of system.

**Mss.30.4.137**

**Same**

**Mss.30.4.138**

**Same**

**Mss.30.4.139**

**AMAL Tank**

A digital photograph of notes made by Ray about AMAL tanks.

**Mss.30.4.140**

**S331 and S126**

A digital photograph of notes made by Ray about S331, S126 and S1096.



**Mss.30.4.141**

**S1091, S134, S7339 and 2320**

A digital photograph of notes made by Ray about S1091, S134, S7339 and 2320.

**Mss.30.4.142**

**2320. A, D2122, 5549 and BR 800**

A digital photograph of notes made by Ray about 2320.A, D2122, 5549 and BR 800.

**Mss.30.4.143**

**Continuation of notes about 2320.A, D2122, 5549 and BR 800**

A digital photograph of notes made by Ray about 2320.A, D2122, 5549 and BR 800.

**Mss.30.4.144**

**Drysdale rotary Centrex ballast pump 2 impeller series- parallel**

A digital photograph of diagram about drysdale rotary Centrex ballast pump 2 impeller series-parallel, for all classes of boat submarine.

**Mss.30.4.145**

**Drysdale rotary Centrex ballast pump 2 impeller series- parallel**

A digital photograph of notes made by Ray about drysdale rotary Centrex ballast pump 2 impeller series-parallel, for all classes of boat submarine.

**Mss.30.4.146**

**Diagram arrangement of internal oil fuel group**

A digital photograph of a diagram of the general lay of internal oil fuel group for 'S', 'A' and 'T' class submarines.

**Mss.30.4.147**

**Different colours for several pipes fitted on board H.M Submarines**

A digital photograph of a diagram showing the colours to be used in painting several pipes fitted on board H.M Submarines.

**Mss.30.4.148**

**Supply to Main Bearings**

A digital photograph of a drawing by Ray of the supply to main bearings.

**Mss.30.4.149**

**Lubricant Oil System**

A digital photograph of notes made by Ray about the lub oil system for engines.

**Mss.30.4.150**

**Diagram Arrangement of Distilling Plant**

A digital photograph of a diagram of a distilling plant with notes made by Ray.

**Mss.30.4.151**

**Vickers and Submerged Signal Ejector**

A digital photograph of drawings done by Ray of Vickers and submerged signal ejectors.

**Mss.30.4.152**

**Under water signal system**

A digital photograph of notes made by Ray about underwater signal systems.

**Mss.30.4.153**

**Draining system**

A digital photograph of a drawing of a draining system done by Ray. The drawing shows the front controlled valve and an air locking mast.

**Mss.30.4.154**

**Notes on draining system**

A digital photograph of notes made by Ray on the back of the drawing of a draining system.

**Mss.30.4.155**

**Calculating Data Systems**

A digital photograph of notes made by Ray about calculating data systems and spray valves.

**Mss.30.4.156**

**Calculating Data Systems**

A digital photograph of continues notes made by Ray about calculating data systems and spray valves.

**Mss.30.4.157**

**Trimming Line 'A' Class**

A digital photograph of a drawing done by Ray of trimming line 'A' class.

**Mss.30.4.158**

**'A' Class Arrangement of Main and Trimming Lines**

A digital photograph of a drawing done by Ray of an 'A' class arrangement of main and trimming lines.

**Mss.30.4.159**

**'A' Class Arrangement of Main and Trimming Lines**

A digital photograph of notes made by Ray about an 'A' class arrangement of main and trimming lines.

**Mss.30.4.160**

**'A' Class submarine**

A digital photograph of a drawing by Ray of an 'A' class submarine.

**Mss.30.4.161**

**Steering Gear**

A digital photograph of notes made by Ray about steering hears.

**Mss.30.4.162**

**Electric distiller**

A digital photograph of notes made by Ray about an electric distiller.

**Mss.30.4.163**

**Types of Candles**

**Mss.30.4.164**

**Preparing Main engines for sea**

**Mss.30.4.165**

**Preparing for a landing change**

**Mss.30.4.166**

**Normal position for engine when shut down**

**Mss.30.4.167**

**Continuation of normal position for engine when shut down**

**Mss.30.4.168**

**Main motor battery routines**

**Mss.30.4.169**

**Low power ( ) 24 Volts**

**Mss.30.4.170**

**Main engine**

**Mss.30.4.171**

**Cylinder head**

**Mss.30.4.172**

**Admiralty induction**

A digital photograph of a drawing by Ray of a submarine main engine.

**Mss.30.4.173**

**Continuation of admiralty induction**

**Mss.3.4.174**

same

**Mss.30.4.175**

same

**Mss.30.4.176**

**T.O.T**

A digital photograph of notes made by Ray about T.O.T and a drawing of the hull and hull valve.

**Mss.30.4.177**

**Replay valve**

A digital photograph of a drawing by Ray showing a replay valve.

**Mss.30.4.178**

**U80**

Print out of notes taken from a website about World War I U boats about the history of U80. Ray has written note on the side, 'Captain Lt. Alfred Von Glasenapp in command of U80 laid the six mines outside Lough Swilly which sank Laurentic.'