HMS COLOSSUS



CISMAS DEBRIS FIELD SURVEY 2004

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COLOSSUS DEBRIS FIELD SURVEY 2004

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Interim Report

Introduction

The Cornwall and Isles of Scilly Maritime Archaeological Society was formed in March 2004, and currently has over 30 members. The society's first project is to survey the debris field of the Colossus wreck site in the Isles of Scilly.

Outline history of the ship

HMS Colossus, a 74-gun 3rd rate ship-of-the-line, was built in 1787 and wrecked off Samson in the Isles of Scilly only eleven years later on 10th December 1798. Colossus was involved in a number of famous naval actions including Groix and Cape St Vincent. She was returning to England with wounded from Nelson's Battle of the Nile when wrecked. On board at the time was part of Sir William Hamilton's second collection of Greek funerary pottery; Sir William Hamilton was the husband of Emma Hamilton, Nelson's mistress.

Vital Statistics	Length (main gun deck) Broadth	172.3 ft (52.5m) 47.9 ft (14.6m)
	Tonnage	1703 tons
	Main armament	28 x 32lb main gun deck
		28 x 18lb upper gun deck
		14 x 9lb quarter & forecastle

Project outline

The aim of the project is to identify and survey surviving elements of the Colossus wreck site, and in particular to establish the extent and precise nature of the debris field of the wreck. The field work of the project is in three parts.

Firstly, there was a physical survey of the anomalies identified by the magnetometer survey conducted in 2002 by the Archaeological Diving Unit. This phase of the project was carried out by CISMAS in the first two weeks of September 2004 and is the subject of this report. Secondly, we plan to undertake further geophysical survey in the early part of 2005. This will entail a magnetic survey of the areas not covered by the ADU survey, possibly with the addition of a sidescan sonar survey if funds allow. A caesium vapour magnetometer will be deployed for the magnetic survey. It is proposed that the parts of the designated area not covered by the ADU magnetic survey will be surveyed as well as additional areas to the south, east and south west of the designated area. Lastly, the anomalies detected by the additional geophysical survey will be investigated and recorded. This work will take place in the second half of 2005.

A report of the debris field survey will be prepared and deposited with English Heritage, the National Monuments Record and the Cornwall and Isles of Scilly Historic Environment Record. In addition, a website is in preparation by CISMAS detailing the work on the debris field survey. CISMAS will also produce a small 'popular' booklet on the project, a temporary display which will probably be housed in the St Mary's Museum on the Isles of Scilly and a short video of the project.

The ADU magnetometer survey

In 2002 the ADU conducted a magnetometer survey over part of the designated area. The survey was conducted using a Geometrics caesium vapour magnetometer. The data was collected on two separate days; on the 9th June the stern area was surveyed and on 14th of June part of the bow area was covered. The data set as presented was a single tab delimited text file. The data set includes corrected positions for tow fish layback, tow fish depth, time/date and field strength in nT. There is no record of water depth in the data set.

The data was first split by the two separate dates collected, then split into separate files for the individual tracks. These were then imported into Excel and graphs of magnetic field strength were plotted against latitude (the track lines were approximately north-south). The resultant graphs are reproduced below, as is the plan of the individual track lines.

Determining the likely size of the iron objects causing the anomalies was problematical. As there was no associated bathymetric data recorded and the recorded tow fish height varied between 1.6m - 8.8m, it was necessary to estimate the depth of water using the chart depths and the tide height at the time of the magnetometer reading. Using the recorded tow fish depth it was then possible to estimate the tow fish to seabed distance. The approximate predicted weight of iron was then derived using the algorithms outlined in Hacon, 1980¹. The estimated weights are reproduced in tables 1 and 2 below. It is clear from the predicted weights that where the original weight of the object is known, the predicted weights are considerably lower. An example of this are guns 8, 9 and 10, all 32lb Blomefield guns which would have weighed 55cwt² (2794kg) when manufactured. Reference to the table shows that predicted weights for these guns vary between 100-500kg. There are a number of technical reasons why these estimates of weight derived from the magnitude of the magnetic anomaly can only be approximations, especially when the tow fish to target distance is itself an approximation, as is the case here. Nevertheless the estimates give some indication of the relative sizes of the objects which caused the magnetic anomalies detected.

Wessex Archaeology survey

Wessex Archaeology, the current archaeological diving contractor, spent three weeks this year diving on Colossus and the associated debris field. A plan of their search areas, constructed from information given to me by them, is reproduced below. It is clear from this plan that a considerable area of the debris field was investigated by them this year. When their report of this work is available it should be possible to integrate their findings with those presented here. As far as I am aware their findings consisted mainly of a copper alloy fastening pin (WA 260167.3E 5535629.2N) and an iron gun (WA 260211.9E 5535542.5N), possibly our Gun 10 – see discussion of CISMAS target 16/2035 below.

¹ M.P. Postle Hacon. *The Proton Procession Magnetometer and its role in Marine Magnetic Searches.* The Hydrographic Journal No 17, 1980.

² Adrian B. Caruana. *The History of English Sea Ordnance 1523-1875*. England 1997



Project methodology

The principal aim of this year's survey was to investigate each of the magnetic anomalies identified in the ADU magnetic data. To achieve this the position of each anomaly was entered by USB link directly from computer to a hand held Garmin 76C GPS unit³, which avoided any possible keying errors in entering the positions manually. In practice the GPS unit proved to be extraordinarily accurate, the mean distance from shot to located iron object being only 5.5m over all dives where iron objects were detected. A validation dive was also made by dropping the shot onto one of the positions reported by Wessex Archaeology for their acoustic beacon array, deployed by them during their work on site in June-July this year. The acoustic beacons were anchored in position with sand bags, which remained on the seabed after the beacons were recovered, so the position of one of these beacons⁴ - it was found to be only 0.75m from the sandbags on the seabed.

A 25kg shot line was dropped into the water when the GPS unit indicated it was 2m or less from the target position. A pair of divers descended the shot line and conducted a circular search of the seabed using a distance line marked in meters attached to the shot line. The position of any artefacts located was recorded by the measurement indicated on the distance line and a compass bearing taken with a hand-held compass back along the distance line to the shot. Any artefacts were also sketched, measured and described. All recording was done on pre-printed underwater sheets to assist volunteers in the recording process (see record sheet example appendix II). The resulting records were entered daily into the computerised record using 3H Site Recorder and AutoCAD for the master site plan. The mechanics of the search technique were perfected in two practice searches undertaken in Mounts Bay prior to the start of the project.

Great emphasis was placed on the need to search each area thoroughly. Seabed searches can be very difficult to undertake effectively. This is especially important when using volunteer recreational divers; each diver was repeatedly briefed on the need to search thoroughly and systematically. An illustration of the difficulties of searching is given by a dive by professional archaeological divers (Wessex Archaeology dive 205) in the Colossus debris field this year, where gun 7 and a 4m long iron spar were both missed. This is all too easy to do as objects are often obscured by weed and kelp.

 $^{^{3}}$ The unit is EGNOS enabled (the European version of WAAS); when the EGNOS satalite is functioning the unit is said to be capable of accuracy of 2-3m.

⁴ Wessex Archaeology Dive 192, beacon B position 260038.83E 5535519.86N UTM zone 30, WGS84 datum. CISMAS dive DFS17.





The targets

In total, 42 magnetic anomalies were identified from the survey data. These varied in magnitude from 4nT to 30nT. All anomalies smaller than 4nT were disregarded.

Targets investigated

Although the main aim of the survey was to ground-truth the anomalies identified in the magnetometer survey conducted by the ADU in 2002, a number of other dives were also undertaken. These included two dives on the main stern section of wreckage. The first of these was to make an underwater video record of the wreck. Unfortunately, however, most of the site was obscured by loose kelp during this dive. The second visit was to obtain samples of the copper alloy sheathing and fastening bolts for analysis (agreed with EH beforehand). Accordingly, samples were obtained of sheathing, a copper fastening bolt and a bolt-washer. Tim Allsop reported an area of surviving timber to the south of the stern site (position 260085E 5535373N⁵), but a search of this area revealed no visible timber.

Of the 42 anomalies identified, 26 were investigated during the 2004 debris field survey. The area searched varied according to the type of seabed encountered. It was usually possible to search a circle of radius 25m on flat sand (an area of just under 2000 m²) whereas in thick kelp it was rarely possible to search more than a 10m radius circle (just over 300 m²). Of the 26 anomalies investigated, 16 resulted in the identification of significant iron objects, which were recorded and surveyed. The remaining 10 searches did not locate anything likely to have caused the magnetic anomaly. In these cases, either the object was buried beneath the seabed or the anomaly was not caused by a seabed artefact.

It was not possible to investigate all the identified anomalies, mainly due to five days which were lost because of bad weather. We intend to investigate the remaining 16 anomalies during the 2005 debris field survey.

Targets identified

The following are the magnetic anomalies where artefactual material was identified. The target numbers consist of the track number separated from the data point number by a slash.

5/884

Position: 260145.7E 5535814.4N Seabed: Flat sand Dive No: DFS12

Anchor and chain : A small iron anchor with folding iron stock, approximately 3m of iron chain still attached to the anchor. Anchor shank 2.76m long, 1.16m from fluke to fluke. The anchor is of the round-crown type and thus is later in date than Colossus. The anchor was located c.3m south of the position indicated by the magnetic anomaly.

Iron object : A concreted iron metal bar, square in section and approximately $2 \times 0.01 \times 0.01m$. Located c.12m NNE of the position indicated by the magnetic anomaly. It seems unlikely that this item derives from Colossus.

 $^{^{5}}$ NB All positions in this report are given in UTM zone 30 using the WGS84 datum

8/1419

Position: 260118.3E 5535599.9N

Seabed: Sand

Dive No: DFS20

Iron object : Complex in shape and heavily concreted. C.20 SE of the position indicated by the magnetic anomaly. This object is fairly close to the stern section of Colossus and is therefore probably derived from Colossus.

9/5048

Position: 259827.8E 5535456.7N

Seabed: Rock and kelp

Dive No: DFS10

Iron object : Heavily concreted iron 'bar', 1.3m long and c. $0.06 \times 0.03m$ in section, tapering to a point at one end. Found 7m SE of the position indicated by the magnetic anomaly.

Shot : A group of approximately 35 concreted iron shot situated approximately 8m west of the position indicated by the magnetic anomaly. The concreted shot was approximately 0.016m in diameter. Depending on the thickness of the concretion, this could be any weight of shot between 18lb and 32lb. The location of these items fairly close to the area where Roland Morris located Colossus material increases the likelihood that this shot was from Colossus.

10/942

Position 259940.4E 5535405.2N

Seabed: Flat sand with small rock outcrops, some kelp & weed Dive No: DFS22

Iron gun[Gun 9]: Concreted iron gun lying upside-down on the seabed. Remains of the iron fastenings of the gun carriage are evident beneath the gun. In addition the trunnion straps and parts of the strap bolts also survive. The gun's muzzle lies 3.9m NE of the position indicated by the magnetic anomaly. The cascabel button of the gun has the loop characteristic of the Blomefield pattern gun. The dimensions (see below) are consistent with a Blomefield 32lb gun.

Length (base ring to muzzle face)	2.89m
Diameter of base ring	0.60m
Diameter of trunnions	0.18m
Base ring to trunnion (centre)	1.22m
Diameter of bore	0.17m

11/3447

Position: 260173.8E 5535535.6N

Seabed: Sand with occasional kelp Iron gun [Gun 8]: This is a 32lb Blomefield gun, previously recorded during the survey work undertaken in 2003 (See Colossus Progress Report 2003).

Length (base ring to muzzle face)	2.90m
Diameter of base ring	0.63m
Diameter of trunnions	0.17m
Base ring to trunnion (centre)	1.25m
Diameter of bore	0.15m

11/5880

Position: 260000.5E 5535275.9N

Seabed: Flat sand

Dive No: DFS1, DFS4 & DFS26

Anchor: Iron anchor with one fluke buried in the seabed, the other standing upright. The shank of the anchor lies flat on the seabed. The anchor ring is still in place but the stock (originally wood) is now missing. This anchor is of the round-crown type (introduced in the early 19th C) and as such is later in date than Colossus. The anchor ring was located some 0.50m from the position indicated by the magnetic anomaly.

5 5 5	
Shank length	3.20m
Arm length (crown to fluke tip)	1.20m
Ring diameter	0.30m

12/1788

Position: 260094.4E 5535529.7N Seabed: Coarse sand with pebbles and broken shell

Dive No: DFS11 & DFS27

Anchor : Iron anchor with one arm missing; the shank and surviving arm are lying flat on the seabed. The anchor ring lies 0.20m SSW from the position indicated by the magnetic anomaly. The anchor is of the angle-crown type and as such is earlier than c.1815. If this were an anchor from Colossus it would have to be the kedge anchor, which was the smallest of the five anchors a 74 would normally have carried. The dimensions of this anchor accord very well with the published dimensions of the kedge anchor of a 74⁶.

Shank length	2.90m
Arm length (crown to fluke tip)	1.15m
Ring diameter	0.45m

It should, however be born in mind that St Mary's Roads has been an anchorage for many centuries and anchors are to be expected in the area. The record of the loss of Colossus⁷ tells us that the three bower anchors were deployed but no mention is made of the stream or kedge anchors being used. It is hard therefore to account for the missing arm of this anchor if it was from Colossus.

12/2061

Position: 260128.6E 5535581.6N Seabed: Sand with small rocks and some weed Dive No: DFS18 Iron object: Heavily concreted iron object 1.8m long x 0.60m x 0.10m. Found 7m ENE of the position indicated by the magnetic anomaly. This is very close to the edge of the known stern wreckage and is therefore probably material derived from Colossus.

⁶ Lavery The Arming and fitting of English ships of War 1600-1815.

The kedge anchor of a 74

Shank 9' 6" (2.89m)

⁷ Captain Murray's account of the loss of Colossus ADM 1/5348 and Letter from Murray to Napean ADM 1/2136

Arm3' 2"(0.96m)Ring1' 3"(0.38m)

Ring
 1' 3"
 (0.38m)

 Weight
 8cwt
 (406kg)

13/4708

Position: 259877.0E 5535455.5N Seabed: Rock, boulders and thick kelp Dive No: DFS2

Dive NU. DF32

Iron shot : An area approximately 2m x 3m of concreted cannon balls – at least 14 were counted. They were situated 3m south of the position indicated by the magnetic anomaly. It was not possible to get a meaningful measurement of the shot due to the irregular nature of the concretion but the divers felt these were probably 32lb shot.⁸

15/4448

Position 259941.5E 5535407.3N

Seabed: Flat sand with small rock outcrops, some kelp & weed Dive No: DFS22

Iron gun [Gun 9]: The muzzle of gun 9 lies 2m WNW of the position indicated by the magnetic anomaly. See 10/942 above.

16/2035

Position: 260209.3E 5535554.3N

Seabed: Flat sand

Dive No: DFS9 & DFS19

Iron gun [Gun 10]: Concreted iron gun lying upside-down on the seabed. This is probably the same gun located by the archaeological diving contractors in their work earlier this year⁹. The muzzle of the gun was 1m south of the position indicated by the magnetic anomaly. The gun has a small pile of light-weight, heavily concreted chain lying on the seabed on its south side. This chain is also evident lying over the top of the gun in the region of the trunnions (three strands). The chain is not continuous but appears to be wrapped around the trunnions rather than around the gun barrel. The cascabel button of the gun has the loop characteristic of the Blomefield pattern gun. The dimensions (see below) are consistent with a Blomefield 32lb gun.

Length (base ring to muzzle face)	2.88m
Diameter of base ring	0.68m
Diameter of trunnions	0.18m
Base ring to trunnion (centre)	1.25m

B3/2790

Position: 259893.4E 5535436.6N Seabed: Rock, large boulders and kelp Dive No: DFS5

Shot : Heavily concreted cannonballs lying 6m SSW of the position indicated by the magnetic anomaly. Five complete and several broken shot were observed. There was evidence that shot had been removed from the seabed. Copper sheet : A rectangular piece of copper alloy sheeting 0.48m x 0.22m with two nail holes – possibly copper sheathing. This area is very close to the supposed 'galley' area and the SW end of the 'Morris gulley', so these objects are likely to be from Colossus.

⁸ This estimate should be treated with caution as the difference in diameter between 18lb and 32lb shot is only just over 1", it is very difficult to estimate the size of heavily concreted shot.

⁹ The position given to me by the diving contractor is some 10m south of where the gun actually lies – a search of the surrounding area failed to locate any other gun. The contractor told me that their position was only approximate (personal correspondence with Graham Scott).

B6/2097

Position 259941.4E 5535405.3N Seabed: Flat sand with small rock outcrops, some kelp & weed Dive No: DFS22 Iron gun [Gun 9]: The muzzle of gun 9 lies 3.2m NE of the position indicated by the magnetic anomaly. See 10/942 and 15/4448 above.

B7/216

Position 260207.7E 5535547.5N Seabed: Flat sand Dive No: DFS9 & DFS19 Iron gun [Gun 10]: The muzzle of gun 10 lies 5.8m SSW of the position indicated by the magnetic anomaly. See 16/2035 above.

B7/414

Position 260184.5E 5535531.3N Iron gun [Gun 8] : The muzzle of gun 8 lies 12.55m WNW of the position indicated by the magnetic anomaly. See 11/3447 above.

B9/3296

Position: 259736.9E 5535364.3N Seabed: Large boulders and thick kelp Dive No: DFS23 Iron object : Concreted iron object, roughly cylindrical in shape 1m long by 0.05m diameter. This object was 3m SSE of the position indicated by the

magnetic anomaly.

Copper alloy strip : small piece of copper alloy 0.20m x 0.04m x 0.005m found 2m north of the position indicated by the magnetic anomaly.

Copper sheathing : A small piece of copper sheathing (with nail holes) $0.01m \times 0.05m \times 0.001m$ situated 4m east of the position indicated by the magnetic anomaly.

Gun 7

Position: 260191.26E 5535576.91N

Seabed: Sand and small stones, some kelp

Dive No: DFS29

Gun 7 cascabel formed the centre of the search area.

Copper alloy object: Square in shape 0.058m x 0.058m x 0.007m with 0.02m hole in the centre (see photo). Found 12m ENE of gun 7 cascabel.

Iron objects: Two heavily concreted iron objects a) 0.55m x 0.20m b) 0.35m x 0.20m. Found 3.5m NW of gun 7 cascabel.



Summary of	anomalies	investigated	[Table	1]
J		3	-	

Anomaly	Magnitude (nT)	Fish Depth (m)	Distance Fish to Anomaly (m)	Approx. Predicted Weight of Iron (Kg)	Search Diameter (m)	Dive No	Observed
2/1135	+12	7.8	3	10	32	3	Nothing visible on the seabed
5/884	+25	6.8	5	50	30	12	Anchor, chain and Fe concretion
5/1831	+6	6.9	5	10	38	25	Nothing visible on the seabed
8/1219	±3 (6)	5.2	10	100	30	16	Nothing visible on the seabed
8/1419	-5	5.4	10	100	40	20	Fe object
9/4874	+10	9.3	6	30	30	21	Nothing visible on the seabed
9/5048	-35	9.4	6	100	24	10	Shot and Fe object
10/942	±9 (18)	5.4	11	500		22	Gun 9 (32lb Blomefield & carriage parts
11/2782	±9 (18)	7.6	7	100	20	15	Nothing visible on the seabed
11/3447	+15	7.2	8	100			Gun 8
11/5880	+16	7.6	9	200	20	4 & 28	Anchor (radial arm) ? early 19 th C
12/1788	-11	5	10	200	50	11 & 27	Anchor (straight arm with one arm missing) ? 18 th C
12/2061	-30	5.1	10	500	20	18	Fe concretion
13/4125	+ 4	7	3	1	30	24	Nothing visible on the seabed
13/4708	+12/-6 (18)	8.2	6	50	6	2	Shot
14/2342	±1.5 (3)	4.7	6	10	12	6	Nothing visible on the seabed
15/4448	±11 (22)	6.6	10	350		22	Gun 9
16/2035	-6	4.4	12	150	40	9 & 19	Gun 10 & part of an anchor
16/2301	+4	4.5	11	100	40	13	Nothing visible on the seabed
16/2175	+4/-6 (10)	4.6	11	200	44	14	Nothing visible on the seabed
B3/2790	+15	2.4	9	150	16	5	Shot & Cu objects
B6/2097	+13/-10 (23)	2.3	11	500	5	22	Gun 9
B7/216	-13	2.4	12	300	40	9 & 19	Gun 10
B7/414	-13/+5 (18)	2.6	12	500			Gun 8
B9/1660	+ 4	2.4	10	50	30	24	Nothing visible on the seabed
B9/3296	+15	2.7	10	200	20	23	Fe bar
G7						29	Gun 7, Iron object & Copper object.

Anomalies yet to be investigated [Table 2]

Anomaly	Size (nT)	Fish Depth (m)	Distance Fish to Anomaly (m)	Predicted Weight of Iron (Kg)
2/255	+ 4	8.3	2	1
5/3513	+6	7.5	5	10
7/3871	+ 4	7.6	5	1
9/1971	+10	7.8	3	5
9/3957	+5	8.8	2	1
11/680	+5	7.2	4	50
11/2611	+9	6.9	7	50
11/3027	-9	8.2	6	30
13/2378	+6	7.6	4	5
13/3705	+4	7.9	3	1
14/2786	+5	4.7	6	10
14/3008	+5	4.9	6	10
16/610	+5	4.9	13	150
B3/3186	+4	2.3	11	100
B7/1220	+5	2.6	12	100
B9/2935	+18	2.6	10	250

The Photographs







Top left : Angle-crown anchor [12/1788]

Top right : Detail of the angle-crown anchor [12/1788] showing the arm and fluke.

Left : Gun 9 [10/942] Scale 0.50m

Bottom right : Round-crown anchor with one arm buried in the seabed [11/5880]

Bottom left : Trunnion of gun 9 showing the trunnion strap [15/4448]









Top left : Gun 10 [16/2035]



Left : Detail of gun 10 showing the concreted chain around the trunnions (arrowed)

Bottom right : Gun 7 muzzle

Bottom left : Blomefield 32lb gun on the Garrison, St Mary's

Scale 0.50m





CISMAS

Colossus debris field survey 2004

Conclusions

It is difficult to make any conclusive statements about the Colossus debris field at this stage of the project. There are still magnetic anomalies identified by the ADU survey to be investigated. Furthermore the ADU survey does not cover the whole of the designated area; clearly we must wait until the debris field project has been finished before proper conclusions can be reached. That said, it is already apparent from the work so far that much material from Colossus lies outside the current designated area and as such is not 'protected'.

There is also evidently a cluster of material, including three guns (Guns 7,8 & 10) lying to the south east of the stern of Colossus which indicate that the debris field is more complex than the hitherto perceived debris trail between Roland Morris' old site and the stern site. See the plan of the targets identified.

The Colossus anchors are another potentially interesting part of the story. We know from Murray's account that Colossus deployed all three of her bower anchors prior to her loss. One, at the original anchorage in St Mary's Roads, was lost when the cable parted. We are also told that Colossus was riding to the other two on 'half a cable'¹⁰ when she foundered. Locating any of these anchors would give invaluable information concerning the position of the vessel. None of the Colossus bower anchors has yet been located. The three anchors noted by Morris as leading him to the site are all far too small to have been bowers from Colossus¹¹. The largest of the Morris anchors had a recorded shank length of only 3m. The bower of a 74 had a shank length of 18'6" (5.63m)¹². Unfortunately we know that at least one of the Colossus bowers was recovered in contemporary salvage of the wreck¹³ and the possibility that the other two were also salvaged must be considered. That said, should any of the bowers from Colossus remain on the seabed their location would offer invaluable information.

By conducting a systematic survey of the whole area around Colossus some estimate of how much material remains and just how much has been salvaged will be gained. This will be particularly true for the larger iron objects, guns and anchors where it should be possible to detect all such objects by finishing the magnetic survey started by the ADU (phase II of the CISMAS project).

¹⁰ A cable is defined as 120 fathoms, however Bellona, a sister ship of Colossus, had seven cables on board, all of 100 fathoms (Lavery *The 74-Gun Ship Bellona* 2003)

¹¹ Wessex Archaeology Colossus DBA 2003 and original notes by Slim Macdonald

¹² Lavery The Arming and Fitting of English ships of War 1600-1815.

¹³ Wessex Archaeology Colossus DBA 2003 – 3.2.20 p13.

Acknowledgements

I would like to thank everyone involved with this project for the time and effort so freely given which has made the project possible. Many of the individuals concerned have given up significant amounts of their annual leave and spare time to take part. The whole project has been carried out by volunteers; no one has received any payment for their contribution.

The following all deserve special mention

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All the members of CISMAS, but especially the following:

Robin and Janet Witheridge, who took part in the survey and provided the RIB which was used for the survey. Brendon Rowe, the treasurer of CISMAS who has given invaluable help with the logistics of the project as well as taking part in the survey. Geoff Fuller, the chairman of CISMAS who has given much support. Peter Holt, who provided a copy of Site Recorder as well as a week of his time to help with the survey. CISMAS members Sharon Austin, Helen Butcher, John Macken, Luke Randall, Honor Thorley and Andrew Weber who all spent at least a week working on the survey. Conducting circular searches of often barren seabed in poor weather conditions is not high on most divers list of must do activities. That some of the CISMAS divers did this cheerfully for one or two weeks is a testament to their dedication.

Thanks are due to the following for assistance and hospitality: Dave McBride, Richard & Bridget Larn, Phil Rees, John Ives, Truan Hicks, Tim Allsop, Alec Colyer, Geoff Penhaligan and Jim Heslin.

Kevin Camidge October 2004









Appendix II Colossus debris field survey – Diver record sheet

Dive No	Mag hit number	
Date	Target position	
Diver 1	Measured position	
Diver 2	Search radius	
Time in	Seabed type	
Time out	Kelp / weed	
Recorded by	Viz	

Observed anomalies

No	Distance	Bearing	Dimensions	Description
	(Shot to obj)	(UDJ to shot)	(LXWXD)	

Location

Gun measurements

Alignment Cascabel to muzzle	Carriage parts	
Attitude Right side up?	Other features & Comments	
Cascabel type Button or ring?		

Sketch / Comments

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