Geophysical Survey on Approach Golf Course, High Common, Bath.
June 27th – July 5th, 2004
Bath and Camerton Archaeological Society

Background
Bath Archaeological Trust (BAT) performed a watching brief for Aquaterra as new irrigation work on the eastern portion of the Approach Golf Course at High Common, Bath in late June, 2004. During that exercise, evidence of occupation in Roman times was unearthed. BAT requested that the Bath and Camerton Archaeological Society (BACAS) perform a geophysical survey to observe more of this occupation.

It was expected that the golf course would be open to the public by the time of the survey, so it was set up as an evening exercise, from 6.30 pm to sunset. As it happened, the course remained closed so it was possible to work during the day, and in total, four evenings and two mornings were worked. The work was performed by volunteering members of BACAS under the direction of Mr Marek Lewcun of BAT.

Procedure
The area to be surveyed was marked out in advance by BAT. The area was to be laid out in 20 metre squares. These were set by vertical projection, while the instrumentation operated on over-ground measurements, so there is a slight discrepancy, up to 0.3m, between corners of the grids. The (grid) north-south baseline was set 6 metres east of the fence of the path from Julian Road to Syon Hill.

The intention was to survey an area 80 metres (grid) north by 60 metres (grid) east, and an extra area 40 metres by 40 metres attached to the north end, 20 to 60 metres east of the baseline. A further set of three grids was added at the south end of the area. A total number of 19 grids was surveyed. Grid coordinates were from 100, 480 to 160, 620 metres. Grid north was approximately 25 degrees east of compass north.

The possibility of a survey on the western part of the course was mooted, but it was not possible to coordinate a date between course closure and survey team availablity.

The survey was conducted using a TR/CIA twin-probe resistivity device (half metre frame) and also using a FM36 fluxgate gradiometer. Each 20 by 20 metre grid was laid out with strings 1 metre apart east-west, marked in half metre intervals north-south, giving 800 points per grid. First reading was 1 metre (grid) east of origin, 0.5 metre north of baseline.

All squares were of complete dimensions, but it proved impossible to take resistivity readings on the greens, and gradiometer readings on steep slopes next to greens, near metal tee-off points and close to some drain covers. Dummy zero readings were inserted at these points. The presence of iron railings immediately west of the grids had some limited effect on the gradiometer readings.

Resistivity was set nominally at about 20 ohms for base readings, with values rising up to about 100 for strong features. The gradiometer was zero'd for base readings, with features of interest causing swings typically of +5 nT. Very strong signals, such as iron covers and strong water flow could cause saturation over 200 nT.

A contour survey was also conducted using a dumpy level and staff. The very steepness of the terrain made this a complex operation, requiring many stations. Relative spot heights were measured at 10 metre intervals east and north from point 100, 480. Two grids not surveyed by instruments were included in the contour survey. The contour map obtained was tied into Ordnance Survey height above datum by means of a bench mark on the gate post of Ormonde Lodge, just outside the top gate of High Common. This was found by reference to First Edition Ordnance Survey 6" map to be 321.2 feet, that is 97.8 metres above datum.

The contours and a map of the site have been overlaid on the results presented here, so that the location of features of interest can be more readily mapped on the ground.

Results

Both instruments showed a high level of activity. The problem came in interpreting what was of archaeological interest from the effects of modern disturbance and from geological intrusion. The interpretation given is the responsibility of the author. As an instance, a strong, broad line of high resistivity heading north on the eastern edge of the lower grids, matched by a pair of ditch-like lines in the gradiometry looked reminiscent of a road, but as it went directly to a green, it was likely to be modern. Investigation in a small excavation revealed a gravel spread of no apparent age.

A plot of the gradiometer output is given in figure 1. Regular white patches indicate insertion of dummy readings. Bands with alternating black and white (top left, diagonal and bottom, horizontal) are most likely pipes with flowing water. Faint diagonal striping at the top of the plot is the effect of (mediaeval) rig and furrow still clearly visible on the flatter hilltop, but also extending south and east on to the steeper gradients. There are possible small circular features in this area. A stronger diagonal line descending to a green (upper centre) and a pair of diagonal lines perpendicular to these and heading south-east are most likely modern.

The contours indicate the severe gradients of this site. There is a 20 metre rise of the extent of the survey, suggesting an average gradient of about 1 in 9. However gradients of 1 in 6 are met on parts of the site, particularly lower down and heading in a north-easterly direction. The gradient eases at he top of the hill, where the rig and furrow is still clearly visible, but plough lines continue on to the steep slopes.

Most of the activity of archaeological interest appears in the lowest 60 metres, but across the entire width of the survey area. There are a number of lines, apparently ditches following a general alignment of (grid) south-east to north-west. Some of these possibly forming a sub – rectangular enclosure with a funnel entrance way to the south-east. This has been interrupted by a water pipe signal and by a green. There is a substantial circular feature bottom centre, just on the 84 metre contour.

A plot of resistivity output is shown in figure 2. The irregular dark diagonal bands at the top of the plot which follow the contours probably represent outcrops of stone near the surface at changes of gradient. The sub – rectangular feature at the very top of the plot straddling the 98 metre contour may be a building, but the signal is somewhat irregular. There were magnetic anomalies in this area. There is a pair of parallel lines below this, but they do not extend to the edge of the plot, so cannot be interpreted reliably as a road.

The much fainter diagonal lines perpendicular to the dark, irregular represent the mediaeval rig and furrow. The diagonal broad black band heading south-east to the lower right is most likely a modern feature associated with the golf course.

The principal feature of interest is apparently a house of Romano – British design to the left, a little below mid height, straddling the 88 metre contour, facing east-south-east. This appears to comprise two large outer rooms with a smaller central room. There is also a suggestion of a corridor along the south-east frontage. Overall dimensions are approximately 12.5 by 9 metres. Note that the contours spread a little wider at this point, indicating an easing of the gradient. There has probably been some scarping to accommodate the building. Very faint lines to the east between the 84 and 86 metre contours may represent an earlier building. These lines appear also on the gradiometer plot, but the signal is not strong enough to be definite.

Figure 3 shows a combination of the gradiometer, resistivity data overlaid together with map and contour data. This allows an appreciation of the relative positions of all features of interest, and their relative heights. The building can be seen in relation to the farmstead features.

Interpretation

The principal archaeological features of the survey area would appear to be mediaeval rig and furrow still clearly visible at the top of the hill but also extending downhill, and a Romano – British farmstead on the lower slopes. The latter may have been preceded by an Iron – Age dwelling. These latter were not in any way visible, but finds of Roman material in the irrigation trenches give confirmation. The rig and furrow appears to stop short of the farmstead, but this may be an artifice of the measurement, or of later interference.

The area of activity of the farmstead appears to go beyond the bounds of the survey, both to south and west.

The focus of the settlement was a house, apparently of three rooms and corridor, facing approximately south-east. The ground plan is very similar to that on the BACAS excavation site at Blacklands, Hemington. It is not possible to say from the plot whether the building was of one or two stories. The building has been placed where the gradient eases slightly. The farmstead is indicated by a number of (probable) ditches on the same orientation as the house. In at least one case, these form a sub-rectangular enclosure with an entrance. There are possible signs of an earlier rectangular building and also of a round feature, possibly pre – Roman.

There is a possibility of a building at the top of the hill and there are faint suggestions of a road nearby running across the top of the survey area but these are not confirmed.

Figure 4 shows an annotated plan of these interpreted features, combined with map and contours. This should be compared with the details of figures 1 and 2. Some features are definite, others more conjectural. This is an interpretation of the author only.

Future suggestions
Any further work would require access to the golf course when it is closed to the public. The summer is now too far gone to permit late evening working, so closure during the day would be needed. It is unlikely that any excavation would be allowed, so geophysical survey is the best method of exploration.

Providing the grid baseline has been retained, it would be relatively easy to continue the survey to the south to explore the farmstead further, although the next – south grids would be disrupted by a metalled public footpath. There would be little point in continuing to the bottom of the course, as likely colluvial build – up would take features out of depth range of the instruments.

The possibility of surveying the western course adjacent to this area should be considered. The fenced and metalled public footpath would cause significant obstruction, but any future survey would best pick up the present grid. This would make overlaying and interpreting data easier. Any further work should also include gradiometer, resistivity and contour survey.

Acknowledgments
Thanks to Aquaterra Ltd and their contractors M J Abbott for allowing access to the site for the survey during their civil engineering activities.

The survey was negotiated by Bob Whittaker of BACAS and Marek Lewcun of BAT and was led by John Oswin and Owen Dicker of BACAS. Thanks are also due to Keith Turner for preparing the graphics and Ken Appleby for organising the volunteers.

Thanks most of all to all those volunteers who gave time and effort to make the survey happen. These are listed in Appendix A.

John Oswin
Bath and Camerton Archaeological Society

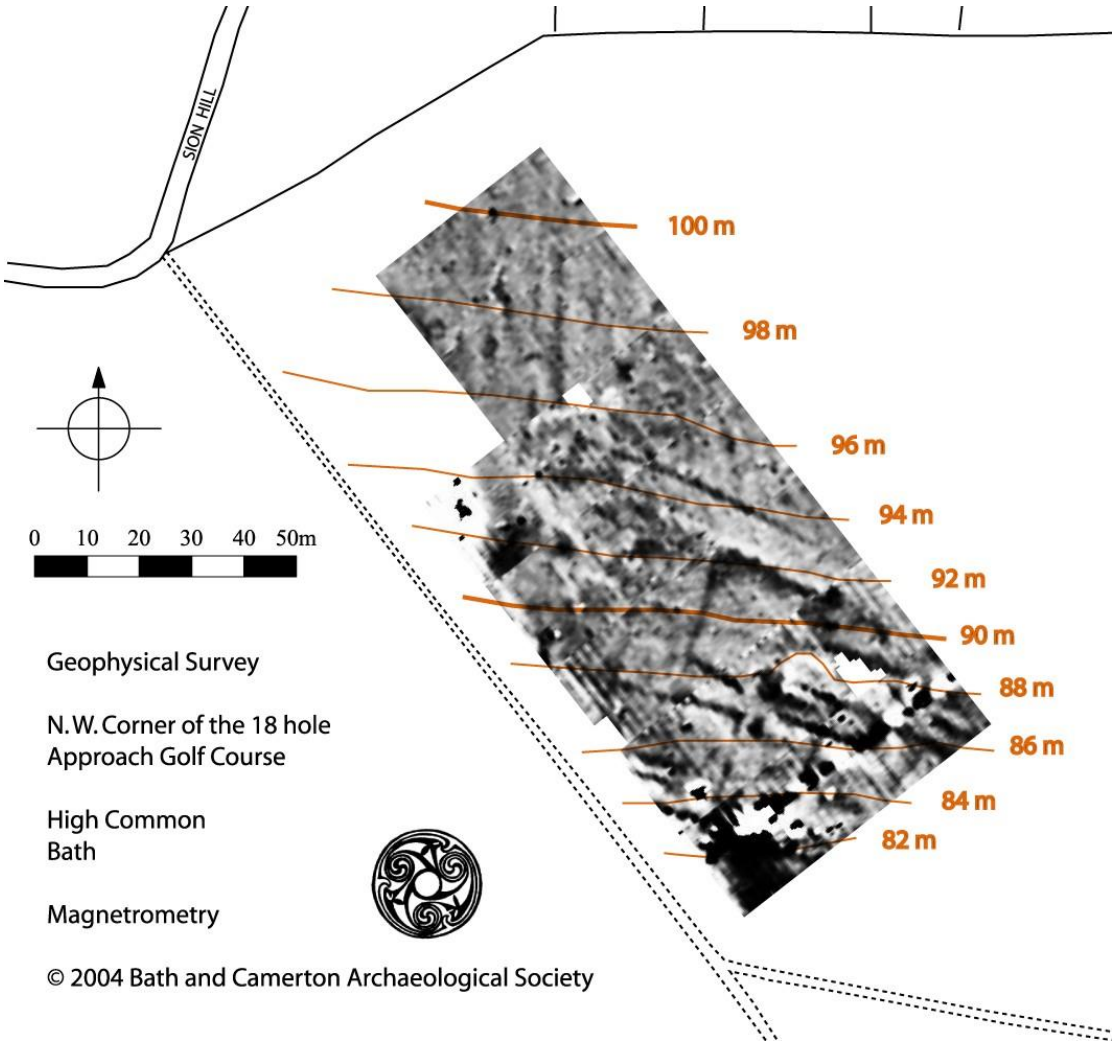

Figure 1. High Common. Plot of gradiometry results.

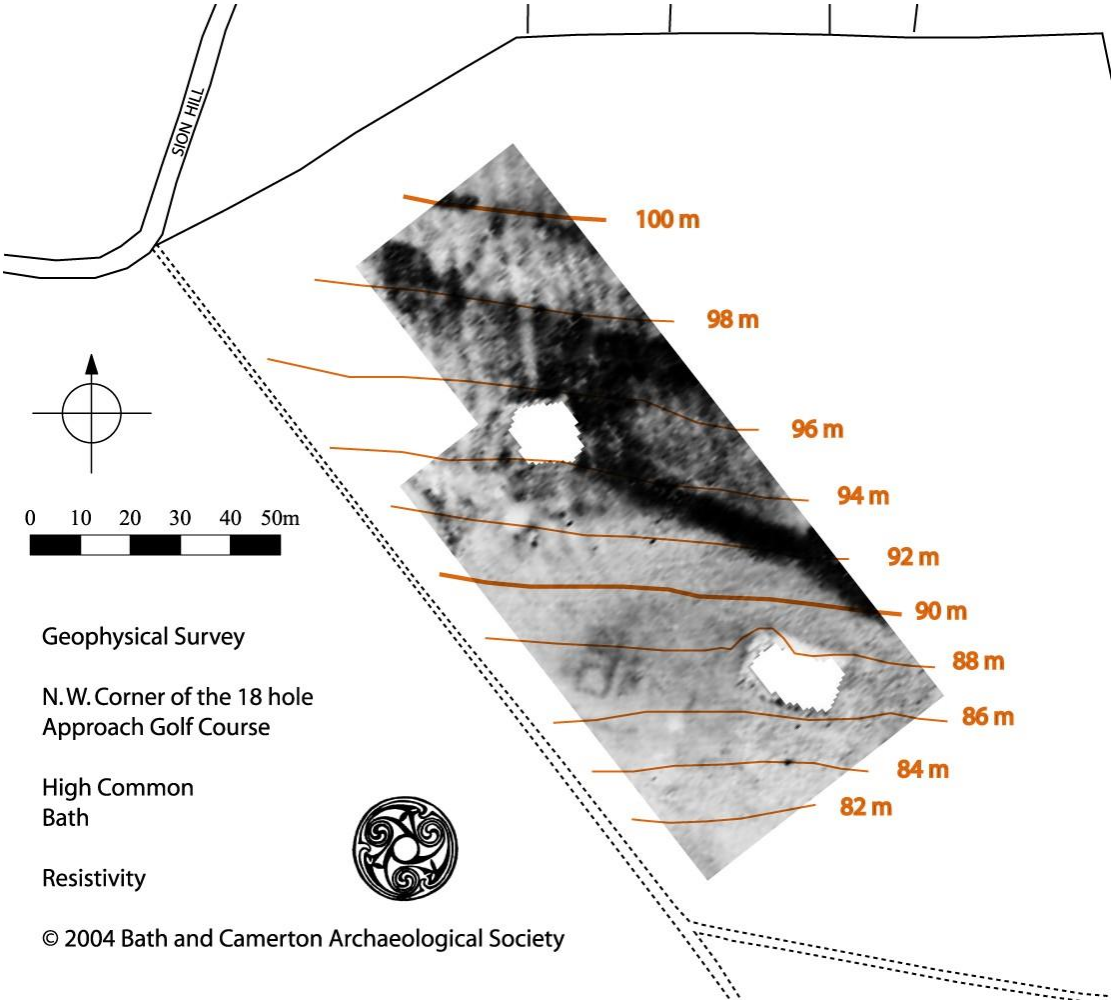

Figure 2 High Common. Plot of resistivity results.

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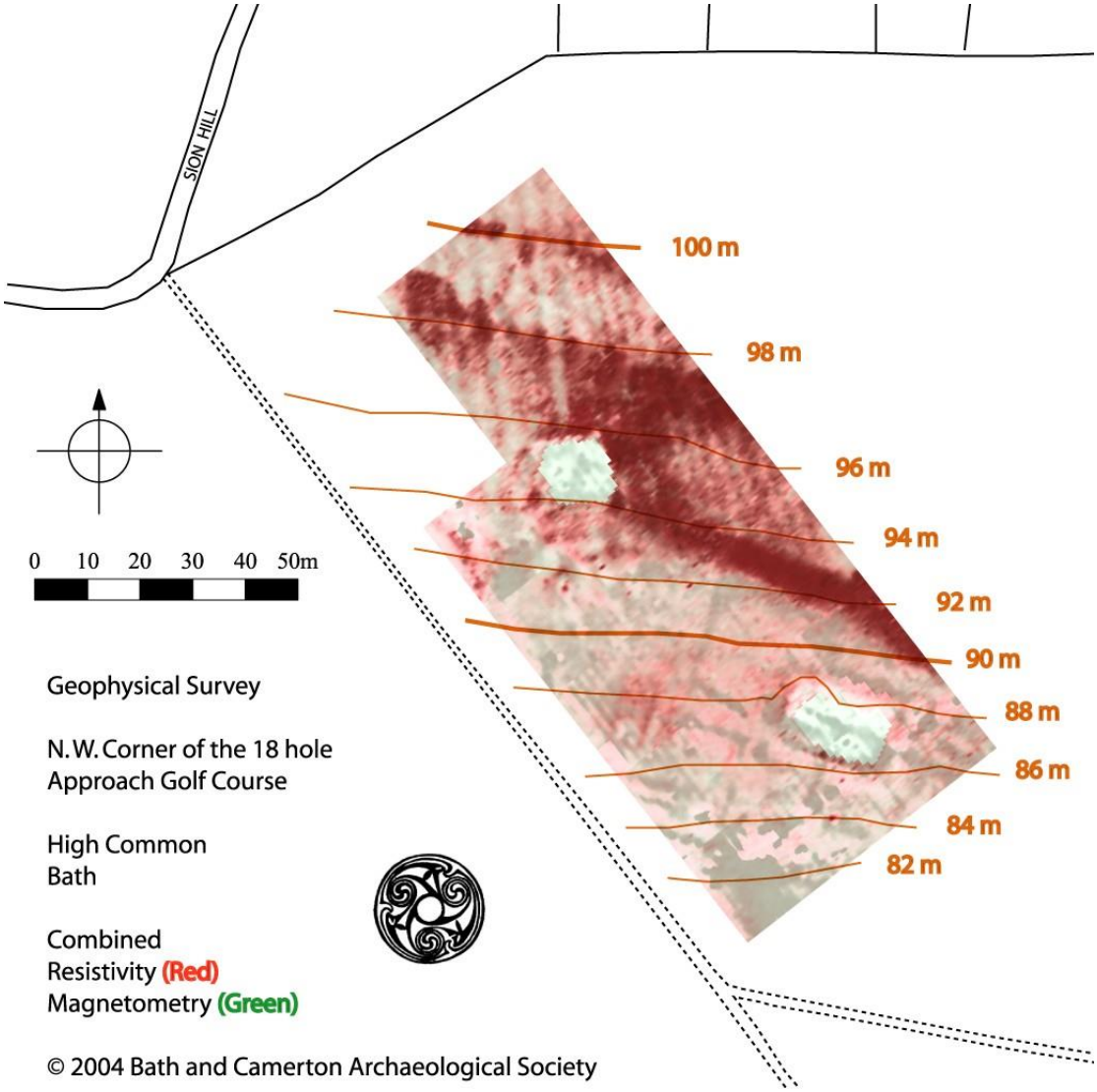

Figure 3 High Common. Overlay of gradiometer, resistivity data.

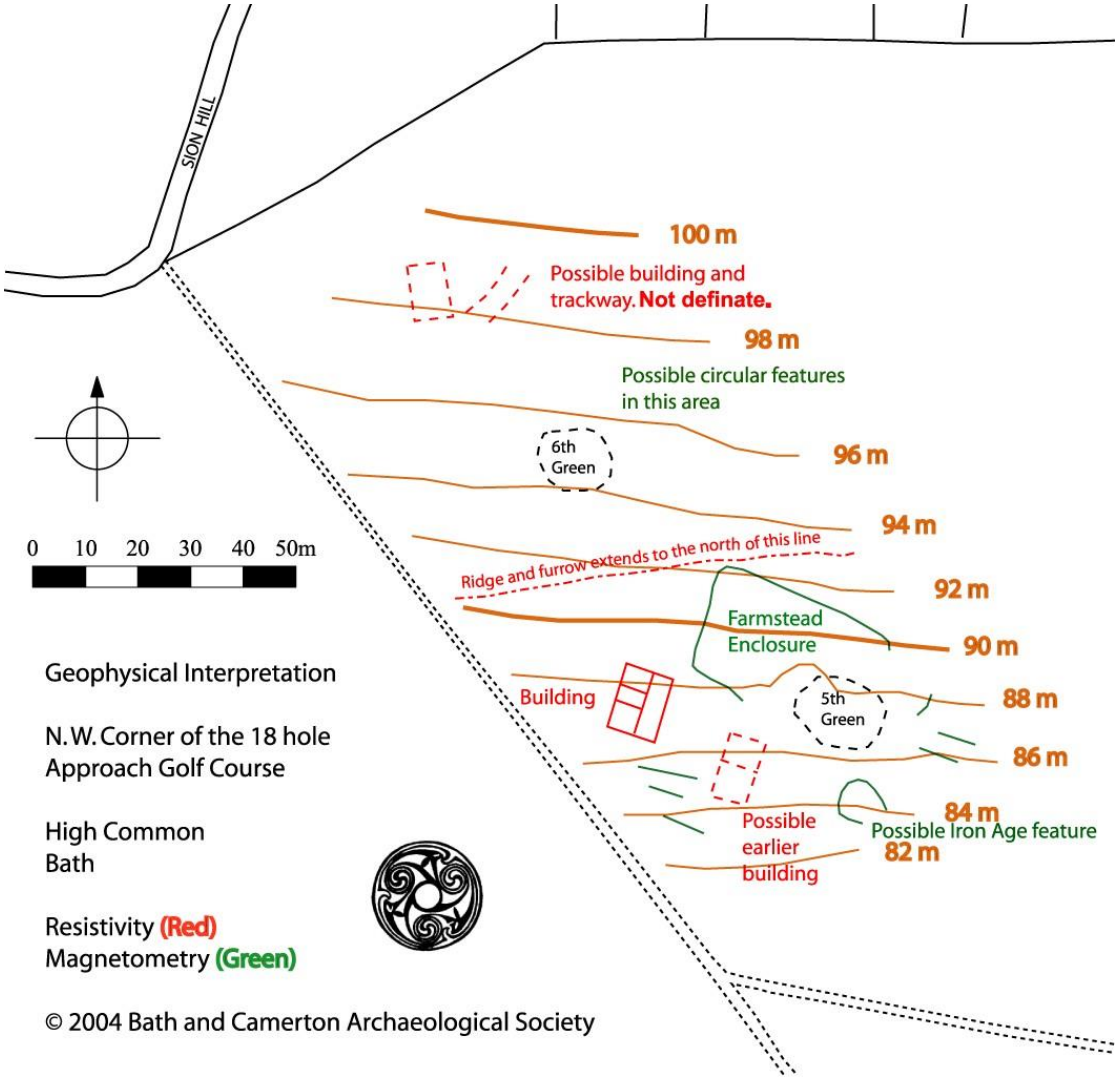

Figure 4. High Common. Interpretation of archaeological features.

Appendix A. Personnel

The survey was led by Dr John Oswin of the Bath and Camerton Archaeological Society, assisted throughout by Mr. Owen Dicker. The figures were prepared by Mr Keith Turner. Mr Marek Lewcun of the Bath Archaeological Trust was in attendance for most of the time.

There were many other volunteers from BACAS:

Dr Malcom Aylott
Mr Steve Drew
Miss Jennifer Harmsworth
Mrs Jude Harris
Mr Les Hayes
Mrs Dawn Hodgson
Mrs Mary Huntley
Mrs Jayne and Miss Hannah Lawes
Mr Tim Lunt
Mr Clive Peacock
Mr Bill Rowe
Mr Laurie Scott
Mr Simon Tyler
Mr Bob Whittaker
Mrs Tracey and Miss Sophie Williams