9

The National Archaeological Record

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9.1 Introduction

The National Archaeological Record (NAR) is a database of archaeological sites and historic buildings throughout England. Its history is a long one, but it may be directly traced back to the card index and map system developed in the late 1940s by Ordnance Survey for the depiction of antiquities on the nation's maps. It was transferred to the Archaeological Records Section of RCHME in 1983.The NAR currently includes about 140,000 sites and is constantly being updated by a team of ten recorders to include additional information on existing sites and information relating to previously unrecorded sites. This figure is not really an accurate guide to the size of the record because many site complexes (such as town defences and barrow groups) have hitherto not been broken down into their component parts as has been the case in other record systems. The record includes most known sites covering the medieval and earlier periods; for the post-medieval period recording is more selective.

The background to the computerisation of the NAR, the system analysis (or definition phases) and a statement of progress and intent up to 1986 was set out in an earlier contribution to these proceedings (Leech 1986). The purpose of this paper is to review developments since then, and to discuss the possibilities for future online access to the record. It is an appropriate time to do this because the main part of the NAR is now computerised, and online access is a reality.

The project for the computerisation of the NAR followed the Systems Development Methodology (SDM) supported by Hoskyns Group PLC, the company which provided the system initially. The development life-cycle of the project may be viewed as comprising four stages: definition, design, implementation and review (Fig. 9.1):

This stage involved tailoring the logical design into an integrated, computerised system capable of managing all aspects of the project from library book ordering and journal subscriptions through to full archaeological recording to enhance the NAR, using the ORACLE relational database. Future success and performance depends upon the quality of database design and how the system is implemented. Our consultants, Hoskyns, provided much help in the project management, database design and implementation planning stages. Database security, levels of access, user privileges and documentation were planned at this stage.

ORACLE is a major relational database product with a comprehensive set of tools for application development and end-user access and features the computer industry standard Structured Query Language (SQL). The SQL language is its core and determines how data is defined, manipulated and controlled. SQL is easy to use and

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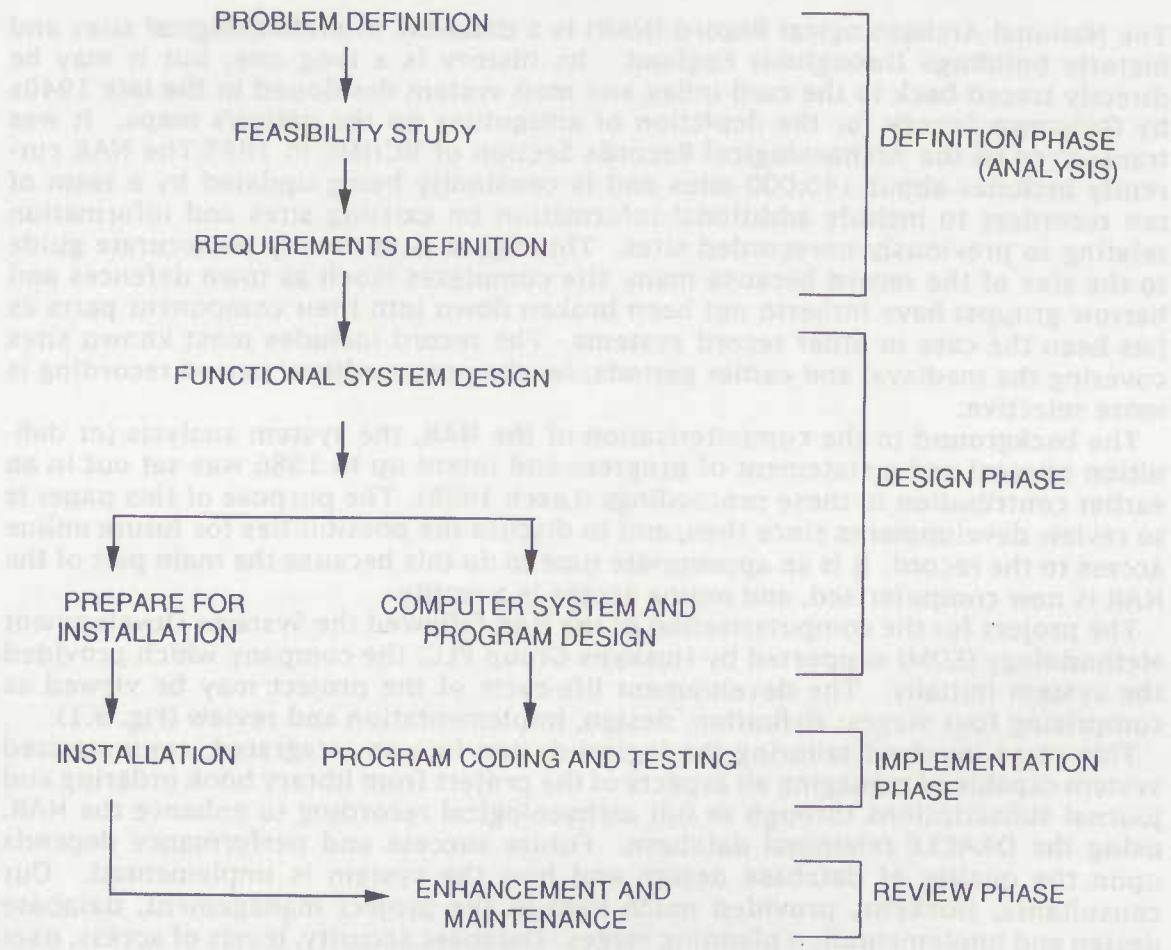

Figure 9.1: Development life-cycle

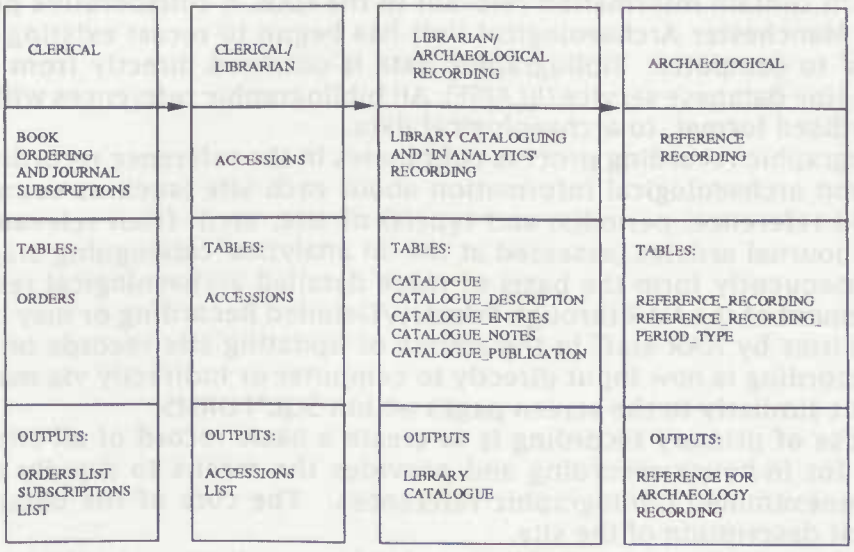

Figure 9.2: Simplified schema for bibliographic recording

has been adopted as the basis for numerous commercial implementations (ORACLE's is SQL*PLUS) and features increased user productivity, powerful operators, simple data structure, improved data independence and a short initial learning period (Date 1987). ORACLE also provides a system design dictionary tool for documenting all stages of system development. It has a large user base and runs on over 30 'hardware platforms' under more than 16 operating systems (Cronin 1988) and is claimed to be highly portable. ORACLE has proved to be a powerful and flexible database management system. On the debit side, however, installation of ORACLE at small sites is likely to have adverse effects, at least initially, in terms of expensive training and the need for a database administrator to organise it, liaise with users and provide database backup and security. It is also widely thought that some of the components of the ORACLE tool set are difficult to use, but this and other performance factors are expected to be improved with the release of version 6. A detailed review of ORACLE has been published elsewhere (CCTA 1988).

ORACLE's SQL*FORMS utility was used extensively at the implementation phase to create flexible, easy to use 'fill-in-the-blanks' type applications for interactive library management and archaeological recording via menu-driven interfaces. SQL*FORMS allows data input, query, update or deletion of data held in user-defined ORACLE tables. Such retrieval of data from a series of related tables is central to the relational model and is described in more detail below.

The computerisation of the NAR library and the recording of bibliographic references, which conforms to library cataloguing standards, is an integral part of the NAR and results from the following functional stages (Fig. 9.2). Each area of responsibility (clerical, librarian or archaeological recording) consists of a menu-driven list of options allowing interactive use of SQL*FORMS or the choice of various output formats using SQL*PLUS or ORACLE's report writingutility (RPT). In the librarian's account, for example, monthly or quarterly accessions lists or printed catalogues of monographs or serials are produced by 'joining' several relational tables to provide a comprehensive library catalogue and generate an awareness of source material. The catalogue number generated by computer for each monograph or serial relates to 'in analytic' catalogue records created for chapters within a book or for articles within a

journal which contain information relevant to the NAR. A collaborative project with the Greater Manchester Archaeological Unit has begun to recast existing records of 'in analytics' to computer. Bibliographic data is obtained directly from the British Library's on-line database service (BLAISE). All bibliographic references will be linked, in a standardised format, to archaeological data.

The bibliographic recording process culminates in the reference recording of basic locational and archaeological information about each site (such as county, parish, national grid reference, period(s) and type(s) of site, etc.) from relevant chapters of books or journal articles (assessed at the 'in analytics' cataloguing stage). These sources subsequently form the basis of more detailed archaeological research and the enhancement of the NAR through Primary/Detailed Recording or may be used for ad hoc enquiries by NAR staff in the course of updating site records or maps. All reference recording is now input directly to computer or indirectly via manual input forms set out similarly to the screen pages within SQL*FORMS.

The purpose of primary recording is to create a basic record of all sites relevant to the NAR for in-house recording and provides the means to rapidly reduce the backlog of unexamined bibliographic references. The core of the detailed record is the general description of the site.

In 1983 all basic NAR site data held on card index was digitised by the InterBuilding Record contract project, checked, reformatted and loaded into the relational database structure. In 1986 a large data processing contract was awarded to Optiram Ltd. to supply all the NAR site descriptions and bibliographic data in computer-readable form using a technique of automatic word recognition to convert hand-written and typed information to digital form. The processing of such large volumes of data proved to be problematic and required much investment of time. The text files supplied were checked and formatted via C programming and loaded into the database using ORACLE's Data Loader (ODL) utility. ORACLE does not lend itself easily to the storage and manipulation of large volumes of text. Consequently, the description of each site consists of a series of lines of text up to 70 characters in length which are sequentially numbered by computer and linked together by the same NAR_PRN (Fig. 9.4).

Each locational or archaeological attribute of a site is stored within a series of ORACLE tables or views. Views do not physically exist but provide a different way of looking at the data in the base tables. These tables may be accessed or indexed singly or in combination ('joined') as the user requires within the SQL*FORMS Primary/Detailed Recording application for data input or retrieval. Manual input forms provide an alternative, indirect method of data input at every stage of the project. The main archaeological tables and their purpose are are outlined in Fig. 9.3. Views are used to store national grid references as absolute values for mapping purposes and computer-generated map numbers at various scales on which a site falls, and provide data independence. Data received from RCHME field offices, currently on report forms, is input to computer at Southampton. Field survey data is stored in the FIELD_REPORT table.

Each site has a unique Primary Record Number (NAR_PRN) which links the data relating to that site held within various relational tables (Fig. 9.4). Such a system enables 'repeating' records to be stored and handled efficiently; for example, if a multi-period site falls in more than one parish, additional records need only be created in the two relevant tables ADMINISTRATIVE_LOCATION and PERIOD_TYPE_FORM to reflect this complexity and provide a comprehensive record.

SQL*FORMS allows validation checking to ensure accurate data entry and flexibility in accessing the various tables 'windowed' within it and auto-generates valid dates and numbering systems. On-line help and documentation is available at every stage and 'look-up' tables for those attributes stored as codes (such as county, period

TABLE	CONTENT
SITE_REGISTER	Basic details (apart from repeating data)
ADMINISTRATIVE_LOCATION	County, district, parish
PERIOD_TYPE_FORM	Period, site type and physical form
NATIONAL_GRID_REFERENCE	National Grid Reference and qualifier
SITE_DESCRIPTION	Textual description of each site
SITE_BIBLIOGRAPHY	Bibliographical and field sources
ARCHAEOLOGICAL_HISTORY	Basic details of surveys, excavations, etc.
FIELD_REPORT	Data recorded through RCHME fieldwork
RECORDERS	Details of NAR recording and date
SCHEDULED_MONUMENTS	Scheduled Monument numbering and county
SMR	SMR number of site (if applicable)
LINEARS	Basic data on linear sites, eg. roads, canals
AREA_STATUS	Status of area eg. NT (National Trust)
TENURE	Details of owner/occupier of site

Figure 9.3: Main archaeological recording tables

SITE_REGISTER TABLE:

NAR_PRN	1:10000	NAR_REF_NO	SITE_NAME
618630002	TQ 86 SW	2	Binbury Castle

ADMINISTRATIVE_LOCATION TABLE:

NAR_PRN	COUNTY	LOCAL_AUTHORITY	PARISH
618630002	Kent	Maidstone	Thurnham

PERIOD_TYPE_FORM TABLE:

NAR_PRN	PERIOD	TYPE
618630002	M	Motte And Bailey
618630002	PM	Manor House

NATIONAL_GRID_REFERENCE TABLE:

NAR_PRN	KM100	NGRE	NGRN
618630002	TQ	8115	6023

SITE_DESCRIPTION TABLE:

NAR_PRN	TEXT	LINE
618630002	[TQ 8115 6023] Motte & Bailey [NR] (1)	1
618630002		2
618630002	Binbury Castle consists of an oval artificial mound	3...

SITE_BIBLIOGRAPHY TABLE:

NAR_PRN	REF_NO	FOOTNOTE
618630002	1	OS 6" 1961
618630002	2	VCH Kent 1 1908 422 illus (I C Gould)
618630002	3	MHLG Ref Kent Hollingbourn R D Nov. 1960 85...

RECORDERS TABLE:

NAR_PRN	NUMBER	INITIALS	DATE	REFERENCE NUMBER REACHED
618630002	R1	ANG	04-SEP-61	1
618630002	R2	CFW	14-NOV-61	2
618630002	R3	MF	06-NOV-87	3...

Figure 9.4: Simplified example of archaeological data stored in relational tables, linked by NAR_PRN (TQ 86 SW 2 : Binbury Castle)

or form of site) can be accessed to ensure consistency in recording. All fields of information used within the NAR system and their definitions are held in ORACLE's system dictionary as part of the documentation process.

Other utilities available in the archaeological recording process include the Ordnance Survey 1:50000 gazetteer of place names—a valuable tool for place name research—and RCHME's Thesaurus of Archaeological Terms. The NAR now also holds data from English Heritage for about 12,000 Scheduled Ancient Monuments in a series of separate, yet similar, tables. Existing 1:10000 and larger scale map cover may be linked digitally to existing graphics software supplied by GIMMS which plots sites on

map overlays. Software to enable sites to be mapped at various scales by area, type, period, etc.—via the NAR database :sing digitised OS 1:625000 map base—is currently being installed at Southampton by the Northern Regional Research Laboratory at Lancaster University.

The data for all archaeological sites (except linear sites) is held both on computer and in the card index. The latter will continue to be maintained as a backup to the computer record. Data for linear sites, such as Roman roads and canals, is now held in computer-readable format and will be incorporated into the database.

Building a practical application to solve the problems posed by the computerisation of the NAR has been a complex, dynamic process, requiring thought and preparation in the early stages of analysis and design, hands-on experimentation in the implementation stage and thorough operational testing. In the current enhancement phase, a complete review of the database system has identified possible ways in which higher performance and productivity may be achieved in the future. The VAX 11/750 minicomputer has been reconfigured to hold the increasingly large database on a three-volume bound disk set. Nonetheless, a larger computer system will be necessary as the record expands over the next five years to include many more sites and to meet increased demand for access. A national index to more detailed information to be found in the archives of RCHME will also be supplied.

Such a large program of computerisation clearly forces us to reexamine the academic integrity and consistency of the record and current projects (which cannot be discussed in detail here) are underway to reexamine, for example, the recording of towns and to standardise the use of site type terminology within the NAR.

The computerised NAR, to be made available as NAR ONLINE, should be a major source for archaeologists and all users of archaeological information. NAR ONLINE enables the NAR to be searched whilst the user is interactively connected via a remote computer terminal linked into the national or international telecommunications network. Online access permits the user to select a search path and to choose between viewing records locally or being sent a printout from Southampton. Within RCHME the link between the Southampton and London offices is already established to provide access to NAR ONLINE for testing and live queries. Links with other RCHME offices will be implemented later in 1989.

The contents of the draft User Guide give some indication on how NAR ONLINE is used. The guide contains instructions on how to connect to NAR ONLINE, how to make a query, print the results of a query, print records from a menu system,and provides details of the record and print formats available.

It is intended to hold a series of seminars later in 1989 and early 1990 to introduce NAR ONLINE as a service available to other archaeological users. The service will be offered first in the United Kingdom to other government departments and agencies, national bodies, local government, regional or local bodies, county and major museums, Sites and Monuments Records, archaeological units, IFA members and all higher education institutions teaching archaeology. It is then intended to make the service available internationally. What was previously available only as copies of cards from an index in Southampton will then be available within minutes around the world.

Details of licensing arrangements and charging policy have yet to be finalised. For a licence to use the NAR, a charge will probably be made for the documentation, which will include the User Guide. The licence itself will relate to the use to be made of NAR ONLINE. For the viewing/printing of records, a scale of charges may relate to the different types of record format available. For printouts supplied offline from Southampton, the standard charges made elsewhere in RCHME will be levied. These are currently being reviewed.

Access via CD-ROM is also under consideration. CD-ROM offers an alternative path to online access and particularly for the overseas market, could offer it at lower cost.

One possible approach is to experiment first in the production of a trial disk, and then look further at the implications of making the databaseavailable in this form. NAR ONLINE could be made available both in CD-ROM and as a floppy PC disk, along the lines of the British Library experimental disk currently being circulated. We are hoping to interest a computer sciences postgraduate in the production of such an experimental disk.

Records from NAR ONLINE are available in the following formats: detailed, short, standard data format (for digital exchange of data) and map format (Figs. 9.5-9.8). The last two formats are for digital use. The standard data format is one agreed by RCHME with English Heritage for the exchange of data between SMRs and the national bodies (English Heritage / Royal Commission on Historical Monuments 1988). The map format is one intended primarily for RCHME's own system which supplies digitally produced maps directly from the NAR, but will be convenient to other users with similar mapping software. It will be possible to digitally download records under the appropriate licence conditions. Other services available from NAR ONLINE will include the supply of site plans and digitally produced site distribution maps.

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DATE, C. J. 1987. *A Guide to the SQL standard.* Addison Wesley.

ENGLISH HERITAGE / ROYAL COMMISSION ON HISTORICAL MONUMENTS 1988. "Site Specific Data—A Standard for Data Transfer". Unpublished, widely circulated, typescript. 19th May, 1988.

LEECH, R. 1986. "Computerisation of the National Archaeological Record". *in Computer Applications in Archaeology 1986.* University of Birmingham, Birmingham.

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RCHME                    NATIONAL
ARCHAEOLOGICAL RECORD

NAR NO: TQ 86 SW 2       FORMS PART OF:                LINEAR NO:
SMR NO:
COUNTY/DISTRICT/PARISH: Kent / Maidstone / Thurnham ;
SITE NAME: Binbury Castle
HEIGHT O.D.  (IN METRES):
NGR (WITH QUALIFIER): TQ 81156023 ( FCE ) ;

AREA STATUS:
SCHEDULED MONUMENT NO(S): Kent 186 / ;
GUARDIANSHIP NO:
LISTED BUILDING GRADE: II

TYPE/PERIOD/FORM:
Motte And Bailey / M /
Manor House      / PM /

LATEST CORRECT DESCRIPTION: Motte & Bailey Castle (remains of)
                            Remains of Manor House
RECOMMENDED OS PUBLICATION:

DESCRIPTION:

[TQ 8115 6023] Motte & Bailey [NR] (1)

Binbury Castle consists of an oval artificial mound 35 feet high,
surrounded by a ditch.  A courtyard protected by a stone wall existed
on the south-east, portions of the wall remain, also a small tower,
but there is no trace of a rampart and ditch to the bailey.  On the
west side is a small outer rampart or scarp [AO/61/285/6] (2)

There was a Norman Motte and Bailey castle here.  (3)

Binbury Castle is situated on the northern slope of the N. Downs,
its remains are scanty and consist of a large oval mound, the summit
of which measures 95 ft. by 160 ft. and it is surrounded by a deep
ditch about 60 ft. wide.  The mound has been somewhat reduced in
height, and its material used to fill up the ditch enclosing the
bailey, the site of which is occupied by the Manor House of Binbury
and its farm buildings, It is classed as an earth and timber motte
and bailey.
(A short history of the Manor of Binbury is given).  (4)

Published 25" survey correct.  (5)

Binbury Castle. Scheduled. No 186  (6)

Additional bibliography.  (7-10).

SOURCES:

2   VCH Kent 1 1908 422 illus (I C Gould)
3   M H L G Hollingbourn R D Kent Nov 1960 85
4   Memorials of Old Kent 1907 180-2 (ed P H Ditchfield)
5   Fl ASP 12.07.63
6   DOE (IAM) AMs Eng 2 1978 112
7   Norman Castles in Britain 1973 110 (D F Renn)
8   Castellarium Anglicanum 1 1983 235 (D J Cathcart King)
8a  The Builder 27 1869 350
8b  The Builder 32 1874 625-6 (Clark)
8c  Some Kentish Castles 1907 31)3 (H Sands)
9   Bldgs of Eng-NE & E Kent 1983 478 (J Newman)
10  Arch J 46 1889 206 (G T Clark)

RECORDERS:
Up to authority 3 recorded by recorder no.  1          ANG 04/09/61
Up to authority 4 recorded by recorder no.  2          CFW 14/11/61
Up to authority 10 recorded by recorder no.  3         MF 06/11/87

Royal Commission on the Historical Monuments of England
Green Lane, Maybush, Southampton, SO1 9FP        Telephone (0703) 780966
Printed 10/04/89

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REPORT COMPLETED

Records printed: 1
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Figure 9.5: NAR ONLINE detailed NAR report (TQ 86 SW 2 : Binbury Castle abbreviated text)

NAR NO	COUNTY	DISTRICT	PARISH	NGR	PERIOD AND TYPE
SE 79 SE 46	N Yorks	Ryedale	Pickering	SE 78809013	IA Barrow IA Chariot Burial
SE 88 NW 47	N Yorks	Ryedale	Thornton Dale	SE 84788521	IA Chariot Burial
SE 94 SW 4	Humbs	East Yorkshire	Market Weighton	SE 929414	IA Cemetery IA Chariot Burial U Square Enclosure
TA 03 NW 28	Humbs	The East Yorkshire Borough Of Beverley	Beverley	TA 0030	IA Barrows IA Chariot Burial
TA 06 SW 1	Humbs	East Yorkshire	Nafferton	TA 018633	IA Cemetery IA Chariot Burial
TA 08 SW 4	N Yorks	Scarborough	Seamer	TA 03298379	IA Chariot Burial
TA 11 NW 7	Humbs	Glanford	Ulceby	TA 1010	IA Chariot Burial
TA 17 NW 2	N Yorks	Scarborough	Hunmanby	TA 10257665	IA Chariot Burial

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Figure 9.6: NAR ONLINE short report (NAR chariot burial sites)

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618630001 TQ 82870 64040
618630002 TQ 81150 60230
618630003 TQ 83890 61560
618630004 TQ 83250 64190
618630005 TQ 82310 63310
          TQ 82540 63400
          TQ 82610 63250
618630006 TQ 83000 63000
618630007 TQ 83500 64000
618630008 TQ 83920 64280
618630009 TQ 84980 64990
618630010 TQ 84570 61640
618630011 TQ 84680 61680
618630012 TQ 80960 61500
618630013 TQ 82830 61080
618630014 TQ 81100 64540
618630015 TQ 81390 60800
618630016 TQ 83210 64750
          TQ 83130 64580
618630017 TQ 84610 63720
          TQ 84900 63960
618630018 TQ 81220 63060

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Figure 9.7: NAR ONLINE map format (1:10000 sheet TQ 86 SW)

```
02 186
03
04
06 TQ 86 SW 2
08
01 Kent
09 Maidstone
10 Thurnham
11 TQ
12 8115
13 6023
14 FCE
15
17 Binbury Castle
18 [TQ 8115 6023] Motte & Bailey [NR] (1)
18 -
18 Binbury Castle consists of an oval artficial mound 35 feet high,
18 surrounded by a ditch.  A courtyard protected by a stone wall existed
18 on the south-east, portions of the wall remain, also a small tower,
18 but there is no trace of a rampart and ditch to the bailey.  On the
18 west side is a small outer rampart or scarp [AO/61/285/6] (2)
18 -
18 There was a Norman Motte and Bailey castle here.  (3)
18 -
18 Binbury Castle is situated on the northern slope of the N. Downs,
18 its remains are scanty and consist of a large oval mound, the summit
18 of which measures 95 ft. by 160 ft. and it is surrounded by a deep
18 ditch about 60 ft. wide.  The mound has been somewhat reduced in
18 height, and its material used to fill up the ditch enclosing the
18 bailey, the site of which is occupied by the Manor House of Binbury
18 and its farm buildings, It is classed as an earth and timber motte
18 and bailey.
18 (A short history of the Manor of Binbury is given).  (4)
18 -
18 Published 25" survey correct.  (5)
18 -
18 Binbury Castle. Scheduled. No 186  (6)
18 -
18 Additional bibliography.  (7-10)
19 NAR
20 Motte And Bailey
21 M
23
19 NAR
20 Manor House
21 PM
23
29 SAM
36 1
39 OS 6" 1961
36 2T
36 3
39 M H L G Hollingbourn R D Kent Nov 1960 85
36 4
39 Memorials of Old Kent 1907 180-2 (ed P H Ditchfield)
36 5
39 Fl ASP 12.07.63
36 6
39 DOE (IAM) AMs Eng 2 1978 112
36 7
39 Norman Castles in Britain 1973 110 (D F Renn)
36 8
39 Castellarium Anglicanum 1 1983 235 (D J Cathcart King)
36 8a
39 The Builder 27 1869 350
36 8b
39 The Builder 32 1874 625-6 (Clark)
36 8c
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49 Up to authority 3 recorded by recorder no.  1        ANG 04/09/61
49 Up to authority 4 recorded by recorder no.  2        CFW 14/11/61
49 Up to authority 10 recorded by recorder no.  3       MF 06/11/87
50 10/04/89

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Figure 9.8: NAR ONLINE standard format for digital data exchange (TQ 86 SW 2 : BinburyCastle)