

# **STANDARDS FOR MACHINE READABLE BIBLIOGRAPHIC DATA: ARE THEY INTERNATIONAL?**

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## **INTRODUCTION**

The motivation for this paper was the concern that the way bibliographic records are stored at many small research institute libraries might become a problem for future library systems. Indeed, the all pervasiveness of MARC format, and the apparent de facto assumption that only this format can insure a future working automated library system and facilitate the exchange of bibliographic records warranted an exploration into the realities of national and international bibliographic formats and record exchanging.

Recent publications in the library literature would seem to imply that only with MARC records can one load future library computer programs efficiently and sensibly. There is a fear that non-MARC records from antiquated online-catalogues or circulation systems would have to be painstakingly reformatted, if not rekeyed, to MARC format in order to take advantage of new soft-ware developments. No sensible librarian could possibly wish to condemn the future of its database to an outdated system or to the horror of converting the machine readable data all over again. This is what not conforming to MARC would seem to imply.

The use of non-MARC formats stigmatises the perpetrator of this heinous crime as an uncooperative egoist, who wishes to serve only personal interests without regard to resource sharing or mutual exchange of bibliographic records. Assumably most large academic libraries adhere only to MARC, which would mean that many of the special aquatic library collections not using MARC cannot input their records into the larger library system or consortium. This is, of course, detrimental to possible library users outside of the institutions own immediate clientele. Libraries utilising non-MARC formats could never be a source for original cataloging in future cooperative cataloging efforts nor would the merging of databases into a larger computerised system be possible. Meaning that the smaller system could never have the future advantages of technical sophistication and superiority that a larger library computer system could theoretically provide.

## ALFRED WEGENER INSTITUT BIBLIOGRAPHIC FORMATS

The library of the Alfred Wegener Institut has chosen the relational database management system (DBMS) DATAEASE to be the engine for its automated library system. Bibliographic records are captured and stored by DATAEASE using input forms developed by this author. There are three input forms for bibliographic records: monographs, reports and reprints, and serials. The form for monographs (fig.1) loosely follows the basic cataloging tenants implied in the Paris Principles of 1963 and International Standard Bibliographic Data (ISBD) which are also the basis of AACRII and the German rules of cataloging, RAK. The forms for reprints (fig.2) and reports are essentially analytics and correspond to no true standard. The serial form (fig.3) comply to the *Bibliographic Guide for Editors and Authors* published in 1974 by the American Chemical Society. The serial titles abbreviations are created using the ISO 4-1984 standards. The structure of the input forms has undergone constant development since they were first conceived early in 1986.

It is quite simple to create additional data fields, which has been done in the past. Further changes and additions are presently being considered. Language, document type and price fields, for example, are absent and their inclusion is being weighed. More difficult is the problem of subdividing existing fields without losing past input. The collation field is not subdivided for pages, plates and tables; nor is there a separate field for subtitles. Adding these new fields for future data collection poses no problem although it would be impractical to break down past input data into the new subfields.

The advantages and strengths of DATAEASE are the fact that it is a relational database thereby making the manipulation of fields within and between input forms easy to achieve. Bibliographic data may thus be reformatted in any number of variations for use in other DBMS or computer programs. Even MARC formats may be generated, albeit without the record label or the directory. This requires a separate computer program for their creation. DATAEASE is also necessary for the construction of the automated circulation system. The records stored in the Alfred Wegener Institut DATAEASE system have been successfully reformatted for other retrieval language software such as PROCITE (fig. 4), STATUS (fig. 5), SPRILIB (fig. 6), and PERSONAL LIBRARIAN (fig. 7).

Although DATAEASE is superior for storage and manipulation of bibliographic records, it is not a fast, simple, user friendly retrieval language. The retrieval language PERSONAL LIBRARIAN, previously called SIRE, is the software program for the Alfred Wegener Institut's online-catalogue. PERSONAL LIBRARIAN requires that each field name be preceded and followed with a hyphen (fig. 7a) and that the end of each record be terminated by the tag "-END-". It is easy to build flexible databases with PERSONAL LIBRARIAN and even MARC records may be utilised if the fields follow PERSONAL LIBRARIAN tenets. The Alfred Wegener Institut Library has chosen to create two separate databases for its

online-catalogue: one for monographs and one for reports and reprints. The databases are generated from the records stored in DATAEASE. Both databases may be searched simultaneously or separately as the library patron wishes.

Researchers at the Alfred Wegener Institut who require their own personal literature databases have two software programs to choose from: PERSONAL LIBRARIAN or PROCITE. As a majority of the scientists have Macintosh microcomputers at their disposal, they have opted for PROCITE. The Alfred Wegener Institut Library gives advice and assistance in the creation of personal databases. It offers support in downloading and reformatting bibliographic records from secondary sources such as ASFA CD-ROM for use in personal citation files.

PROCITE offers a number of ready made input forms of which the worksheets for books (fig. 8) and journal articles (fig. 9) are the most important to the Institute's researchers. Custom made forms may also be made. DATAEASE is able to generate PROCITE import format so that the Library has its holdings available for searching either by PERSONAL LIBRARIAN or PROCITE. Library users may have particular subject areas of interest downloaded from the library's online-catalogue, which are then uploaded to PROCITE.

### **NATIONAL BIBLIOGRAPHIC FORMATS**

MARC records have been used by the Alfred Wegener Institut Library for retrospective conversion (fig. 10). BIBLIOFILE was purchased in early 1988 and its collection of LC MARC has effectively been reformatted for entry into the DATAEASE library system for later conversion into PERSONAL LIBRARIAN. A special purpose conversion program, TRANS, was acquired in 1989 for easier reformatting of USMARC records into DATAEASE import format (fig. 11). The library holdings which have been retrospectively converted with BIBLIOFILE are stored in USMARC format by the simple fact of using the program.

A major source of MARC records in the aquatic sciences is the Scripps collection in MELVYL, the University of California online-catalogue (fig 11a). The Alfred Wegener Institut has not yet made use of Scripps' USMARC holdings for retrospective conversion although this has been under consideration.

UKMARC is quite similar to USMARC with largely a difference in the way authority and holdings/locations data are stored. CANMARC reflects the need to store large amounts of bilingual records and was developed by integrating aspects of LCMARC, UKMARC, and the University Library of Grenoble, France MONOCLE format. In the F.R. Germany MAB1 (fig. 12) became the equivalent to MARC. A major feature of this format is a complex compatibility to store and link varying bibliographic levels, especially analytics in monographs or volumes in multi-volume monographs. This aspect was added to USMARC only much later. The German National Library has made its MAB1 holdings, BIBLIODATA, available on CD-ROM or online via STN. Records may be downloaded in a bibliographic

format for cards or in MAB1.

### **INTERNATIONAL BIBLIOGRAPHIC FORMATS**

ISO 2709 is an international standard format for bibliographic information interchange on magnetic tape (fig. 13). It was based on USMARC format. One major departure of ISO 2709 from USMARC is the use of subrecord directories. Using this method permits the grouping of analytics following the bibliographic fields describing the item as a whole. UKMARC also permits this usage. Although originally developed for 1600 bpi 1/2" computer tape, the standard has also been adapted to CD-ROM. Microcomputer 5 1/4" and 3 1/2" diskettes have not been officially supported by ISO 2709 standard. The definition of data format tags or field names is not addressed by ISO 2709. The institutions wishing to exchange information using ISO 2709 must agree on before hand the way they want to organise their data, how to code the field names and what these fields should then contain. The simple use of ISO 2709 does not mean that data can actually be meaningfully exchanged rather only that an exchange with computer tape is now possible. To put it clearly, USMARC, UKMARC, and MAB1 are in the ISO 2709 format, but none of them is truly compatible with the other for direct data exchange.

The Structure of MINISIS and CDS/ISIS retrieval languages were shaped by ISO 2709. CDS/ISIS accepts data for batch entry only in ISO 2709 and it is able to output records into many different systems as well as ISO 2709 format. CDS/ISIS is promoted by Unesco for distribution free of charge to member nations. Unesco was also influential insuring that CDS/ISIS conform to international standards.

The MARC school of ISO 2709 formats were made for and by libraries, but the providers of secondary services who were using computers before the libraries also became active in developing an international format. This format is called UNISIST "Reference manual for machine-readable bibliographic descriptions" (fig. 14). This format had fields for the contents of serial publications and all levels of bibliographic data: analytics in monograph in series, monographs, monographs in series. Holdings data is excluded. The format is not hierarchical because equal importance is given to all bibliographical levels. This format was widely distributed by Unesco, and was also adopted for the MINISIS software system.

The database GEOREF of the American Geological Institute adopted the "Reference Manual" as the format for its information system. This decision enabled it to later merge documents from France input with the same format by the Centre National de la Recherche Scientifique (CNRS).

LC MARC spawned a plethora of clones nationally and

internationally. USMARC has any number of variants within the borders of the USA and even within the F.R. Germany each library cooperative has its own modification of MAB1. It was necessary to develop a general format, called UNIMARC, which would contain the common denominator of all MARC variants to enable exchange of biblio-graphic records across international borders. UNIMARC's basic feature is an adherence to the pure usage of the International Standard Bibliographic Descriptions (ISBD) to describe the data elements of the catalogue record. National libraries need only one software program to convert into and from UNIMARC thus reducing costly overhead for many different programs to convert numerous national MARC formats. The German National Library converts from MAB1 to UNIMARC and accepts USMARC that has been converted to UNIMARC.

### **CONVERSION AND EXCHANGING BIBLIOGRAPHIC RECORDS**

The quickly changing computer technology does create uncertainty for the librarians who must implement automation. Decisions made in the past might make it all but impossible to take advantage of new developments in computer systems or deal efficiently with mergers of institutions. The first microcomputer programs did not offer any way of loading MARC records and only a few have this capability now. MARC and ISO 2709 were originally conceived for computer tape and did not foresee the use of CD-ROM or floppy diskettes for the exchange and storage of bibliographic data. MARC was also created without concern for the retrieval language software to be used for online-catalogues. Card and COM catalogues were still the main use for MARC in its early years.

The advent of microcomputers gave small institute libraries and information centres capabilities to realise automation without mainframe computers and expensive hardware and software costs. Many institutes wanted modern library services without regard to national or international standards and many could not pay the high cost of MARC conversion. While it is true in large technological nations, like the U.S.A., that there are microcomputers which support USMARC, this is not the case of smaller nations using other national MARC formats. Even in the F.R.Germany the national format MAB1 is not supported in any similar small system programs. Only mainframe systems of less than advanced computer technology support MAB1. Microcomputers have made it possible for small libraries to automate but by doing so they have not been able to take advantage of national or international bibliographic standards.

CD-ROM technology entered the market late in 1986 and it saw the arrival of one major carrier of USMARC records, BIBLIOFILE, which supplied LC MARC records for retrospective conversion and generation of cards, pockets labels and spine labels. Unfortunately, this CD-ROM permits no sophisticated searching for keywords and no use is made of boolean operators. BIBLIOFILE does not even support any other output formats than USMARC in an ASCII file stripped of its header and directory. Other major CD-ROM products do not store records in

MARC or ISO 2709 standards making it all but impossible to download them into these formats (fig. 15).

### CONVERSION PROGRAMS

Recognising the need to download machine readable records for uploading into microcomputer based online-catalogues, conversion programs have come onto the market to make this task easier to perform. The program TRANS can be made to recognise any pattern of text format for reorganising and restructuring into a new format. The Alfred Wegener Institut has used TRANS to manipulate USMARC for inclusion in DATAEASE and PROCITE, and to reformat ASFA CD-ROM downloads into PROCITE or PERSONAL LIBRARIAN import formats. BIBLIO-LINKS programs have been developed by Personal Bibliographic Software, Inc. to assist building PROCITE databases. One important BIBLIO-LINKS is USMARC for reformatting this format into PROCITE import format.

DBMS programs can capture bibliographic data, store it for later manipulations, and serve as automated integrated library systems. These programs are able to accept any number of import formats and are also able to export data in a wide variety of formats. The input formats for DBMS if they are well planned out using ISBD and the Paris Principles of 1963 can make later conversion into ISO 2709 standards possible while making use of microcomputer technology.

### CONCLUSIONS

The Alfred Wegener Institut by deciding to use early micro-computer technology to modernise and offer computer services to its patrons, made the choice not to use accepted national or international bibliographic standard formats. It also perceived that the only available microcomputer program utilising ISO 2709, CDS/ISIS as being less sophisticated than the programs of choice: DATAEASE, PERSONAL LIBRARIAN, and PROCITE. The German National Library's collection of MAB1 records had little of relevance for assisting the library in its retrospective conversion of its holdings. This factor certainly did not encourage the use of MAB1. Although 80% of older library titles were found in BIBLIOFILE's LCMARC for retrospective conversion, it was not deemed appropriate for a German special library to actively use USMARC for later resource sharing with other German libraries. This dilemma made the decision to use an internal format more acceptable. The increasing power of new microcomputer technology and faster, flexible software tools would seem to encourage the possibilities of easy reformatting of data structures into inter-national or national formats so long as basic national or inter-national cataloging principles are upheld.

|   |                        |
|---|------------------------|
| Datum 21/12/88  | DocNr 00-04054         |
| Inventar-Nr 88/1259   | Signatur nat 870 1ch 3 |
| Standort  |                        |
| Autor   |                        |
| Titel   |                        |
| Environmental protection of the North Sea   |                        |
| Verfasserangabe   |                        |
| ed. by P.J.Newman and A.R.Agg   |                        |
| Ausgabe   |                        |
| Ort Oxford [u.a.]   |                        |
| Verlag Heinemann  |                        |
| Jahr 1988   |                        |
| Collation XXVIII, 886 S   |                        |
| -----Umblaettern-----   |                        |
| Gesamttitel   |                        |
| Fussnoten   |                        |
| ISBN  |                        |
| ISSN  |                        |
| NE Newman, P.J. [Ed.]   |                        |
| Schlagworte North Sea ; pollution ; control measures ; environmental protection ; pollution control ; chemical pollution ; oil pollution ; heavy metals pollution |                        |
| LOCC  |                        |
| DDC   |                        |
| -----Umblaettern-----   |                        |
| Band  |                        |

**Figure 1: DATAEASE entry form for monographs**

\*\*\*\*\* Datensatz 393 aus sonderdrucke \*\*\*\*\*

Datum 11/09/87  
DocNur 00400  
Sonderdruck-NR 13492

Dokumenttype JA  
JA = Zeitschriftenartikel  
BA = Buchartikel  
PA = Kongressartikel

Autor Harwood, David M.

Titel Do Diatoms Beneath the Greenland Ice Indicate Interglacials Warmer than present?

Jahr 1986  
In ARCTIC

Band 39 Heft 4 Seiten 0304-0308  
Herausgeber/Editor \_\_\_\_\_

Biblio \_\_\_\_\_

Ort \_\_\_\_\_

Verlag \_\_\_\_\_

.....(umblaettern).....

Abstract Basal sediment debris from the Greenland Ice Sheet was examined with hope of recovering microfossils that should be used to determine ice sheet through time. Basal debris and debris-laden ice from the lower 18 m of Camp Century

Sandort \_\_\_\_\_

Keywords diatoms; interglacial; Pleistocene; Camp Century ice core; Greenland

----- Ende -----

Figure 2



FORMULAR Zeitschriften

1    10    20    30    40    50    60    70    80

---

DocNr \_\_\_\_\_

Titel \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

fruehr \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Fortsetzung \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Abkerzung \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Bestand \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Sandort \_\_\_\_\_

\_\_\_\_\_

.....(umblaettern).....

Nachweis \_\_\_\_\_

ISSN \_\_\_\_\_ (X soll als 0 eingetragen werden)

**Figure 3**

21/12/88,00-04054,"88/1259","nat 870 1ch 3",,,,,,"Environmental protection of the North Sea",,,,,,"ed. by P.J.Newman and A.R.Agg",,,,,,"Oxford [u.a.],"Heinemann",1988,"XXCIII, 886 S.",,,,,,"Newman, P.J. [Ed.]",,,,,,"North Sea ; pollution ; control measures ; environmental protection ; pollution control" ; "chemical pollution ; oil pollution ; heavy metals pollution",,,,,,"

**Figure 4. PROCITE required import format which was generated by DATABASE.**

DQL-Abfrage

for Monographien  
with LONG:Titel2 = **\*\*North Sea\*\*** or LONG:Titel2 = **\*\*Nordsee\*\***;  
list records

LONG:Autor ;  
LONG:Autor2 ;  
LONG:Titel ;  
LONG:Titel2 ;  
LONG:Titel3 ;  
LONG:Titel4 ;  
any Nebeneintragungen LONG:NE ;  
any Nebeneintragungen LONG:NE2 ;  
any Nebeneintragungen LONG:NE3 ;  
Ausgabe ;  
Crt ;  
Verlag ;  
Jahr ;  
Collation ;  
ISBN ;  
any Gesamttitel LONG:Gesamttitel ;  
any Gesamttitel LONG:Gesamttitel2 ;  
any Schlagworte LONG:Schlagworte ;  
any Schlagworte LONG:Schlagworte2 ;  
any Schlagworte LONG:Schlagworte3 ;  
any Schlagworte LONG:Schlagworte4 .

FORMAT: PROZEDUR

1      10      20      30      40      50      60      70      80

+-----+-----+-----+-----+-----+-----+-----+-----+

.items

\$\$T

\$\$N AUTHOR

---

---

---

---

---

\$\$N TITLE

---

---

---

\$\$N REFERENCE

---

---

\$\$N SERIES

---

(fig. 5)

Figure 5: PROZEDUR Status

```

$$$N LOCATION
$$$N KEYS
#PDATE=D___
#AUTH=
#SSWB=
#SSWR=
#INPUT=
#ISBN=
$$$N SUBJECT

```

```

$$$N TOPIX
$$$N ADDAUTH
$$$N REGION
$$$N SHIP
$$$N ORDER
$$$N NOTES
$$$A
.end
.page

```

```

+-----+
| 1      | 10     | 20     | 30     | 40     | 50     | 60     | 70     |
+-----+

```

Feldbeshtreibungen

| Nr. | Name                 | Type   | Länge | Leerz. entf.? |
|-----|----------------------|--------|-------|---------------|
| 1   | LONG:Autor           | Text   | 80    | ja            |
| 2   | LONG:Autor2          | Text   | 80    | ja            |
| 3   | any Nebeneintragune  | Text   | 80    | ja            |
| 4   | any Nebeneintragune  | Text   | 80    | ja            |
| 5   | any Nebeneintragune  | Text   | 80    | ja            |
| 6   | Jahr                 | Nummer | 4     | ja            |
| 7   | LONG:Titel           | Text   | 80    | ja            |
| 8   | LONG:Titel2          | Text   | 80    | ja            |
| 9   | LONG:Titel3          | Text   | 80    | ja            |
| 10  | LONG:Titel4          | Text   | 15    | ja            |
| 11  | Ort                  | Text   | 50    | ja            |
| 12  | Verlag               | Text   | 70    | ja            |
| 13  | Collation            | Text   | 50    | ja            |
| 14  | any Gesamttitel LONG | Text   | 80    | ja            |
| 15  | any Gesamttitel LONG | Text   | 80    | ja            |
| 16  | Jahr                 | Nummer | 4     | ja            |
| 17  | ISBN                 | Text   | 13    | ja            |
| 18  | any Schlagworte LONG | Text   | 80    | ja            |
| 19  | any Schlagworte LONG | Text   | 80    | ja            |
| 20  | any Schlagworte LONG | Text   | 80    | ja            |
| 21  | any Schlagworte LONG | Text   | 15    | ja            |

Speicherbedarf:  
Prozedur-Definition: 3334

Figure 5a

Search Strategy: ((MARINE [ER]) AND (08\* [CN])) AND (ANTARCT\* [TI,SO,SD,GD,BA])

\$h \*art

\*a Clarke-A; Holmes-LJ

\*t Lipid content and composition of some midwater crustaceans from the Southern Ocean

\*j J. EXP. MAR. BIOL. ECOL

\*d 1986

\*pt 104(1-3) :31-51

\*abs The decapods *Pasiphaea scotiae* (Stebbing), *P. rathbunae* (Stebbing), *Petalidium foliaceum* Bate and *Acanthephyra pelagica* (Risso) and the mysid *Gnathopausia gigas* (W.-Suhm) have been sampled from the Southern Ocean. Lipid contents were generally very high, 5 to 25% fresh weight in immature and male *Pasiphaea scotiae*.....

\$

Figure 6. Output generate using Compact Cambridge: ASFA 1987.

-DOCNR-  
 00-04054  
 -SIGNATUR-  
 nat 870 1ch 3  
 -TITEL-  
 Environmental protection of the North Sea  
 -JAHR-  
 1988  
 -VERFASSEANGABE-  
 ed. by P.J.Newman and A.R.Agg  
 -\_ERCHEINUNGSORT-  
 Oxford [u.a.]  
 -VERLEGER-  
 Heinemann  
 -UMFANGSANGABE-  
 XXVIII, 886 S  
 -ISBN-  
 0-434-91370-7  
 -NEBENEINTRAGUNG-  
 Newman, P.J. [Ed.]  
 -SCHLAGWORTE-  
 North Sea ; pollution ; control measures ; environmental  
 protection ; pollution control ; chemical pollution ; oil  
 pollution ; heavy metals pollution  
 -DDC-  
 628.1'688'16336  
  
 The format of reprint documents for the AWI Online-Catalogue as required by the retrieval  
 language PERSONAL LIBRARIAN:  
  
 -Autor-  
 Van Damme, D. ; Heip, C. ; K.A. Willems ; (1984)  
 -Titel-  
 Influence of pollution on the harpacticoid copepods of two  
 North Sea estuaries.  
 -Jahr-  
 1984  
 -In-  
 Hydrobiologia, Vol. 112, 1984 : 143-160.  
 -Desk-  
 Copepoda ; pollution ; estuaries ; North Sea  
 -Abst-  
 Seasonal monitoring of the meiobenthos in the Dutch estuaries  
 revealed an anomaly in density and diversity of harpacticoid  
 copepods in the Westerschelde.  
 -Stan-  
 Sdr.: I.Z.W.O. 14 (pt. 2), 1984, Nr. 289  
 -SonderdruckNr-  
 289  
 -END-

**Figure 7 .The format of monograph documents for the AWI Online-  
 Catalogue as required by the retrieval language PERSONAL LIBRARIAN.**

Fields in workform A:Books - Long

|    |      |                              |
|----|------|------------------------------|
| 1  | Auth | Author (Analytic)            |
| 2  | AuRo | Author Role (Analytic)       |
| 3  | ---  | not used                     |
| 4  | Titl | Title (Analytic)             |
| 5  | Medm | Medium Designator            |
| 6  | CoPh | Connective Phrase            |
| 7  | Auth | Author (Monographic)         |
| 8  | AuRo | Author Role (Monographic)    |
| 9  | Titl | Title (Monographic)          |
| 10 | ---  | Not used                     |
| 11 | ---  | Not used                     |
| 12 | ---  | Not used                     |
| 13 | ---  | Not used                     |
| 14 | ---  | Not used                     |
| 15 | Edit | Edition                      |
| 16 | Auth | Author (Subsidiary)          |
| 17 | Auth | Author Role (Subsidiary)     |
| 18 | PIPu | Place of Publication         |
| 19 | Publ | Publisher Name               |
| 20 | Date | Date of Publication          |
| 21 | Copy | Date of Copyright            |
| 22 | VoID | Volume Identification        |
| 23 | ---  | Not used                     |
| 24 | IsID | Issue Identification         |
| 25 | Loc  | Location in Work             |
| 26 | Extn | Extent of Work               |
| 27 | PaMe | Packaging Method             |
| 28 | ---  | Not used                     |
| 29 | ---  | Not used                     |
| 30 | SrEd | Series Editor                |
| 31 | SrRo | Series Editor Role           |
| 32 | SrTi | Series Title                 |
| 33 | SrVo | Series Volume Identification |
| 34 | ---  | Not used                     |
| 35 | ---  | Not used                     |
| 36 | ---  | Not used                     |
| 37 | ---  | Not used                     |
| 38 | ---  | Not used                     |
| 39 | ---  | Not used                     |
| 40 | ---  | Not used                     |
| 41 | ISBN | ISBN                         |
| 42 | Note | Notes                        |
| 43 | Abst | Abstract                     |
| 44 | Call | Call Numbers                 |
| 45 | Indx | Index Terms                  |

Figure 8: Procite. Fields by workform for books

| Fields in workform C:Journals - Long |      |                           |
|--------------------------------------|------|---------------------------|
| 1                                    | Auth | Author (Analytic)         |
| 2                                    | AuRo | Author Role (Analytic)    |
| 3                                    | ---  | not used                  |
| 4                                    | Titl | Title (Analytic)          |
| 5                                    | Medm | Medium Designator         |
| 6                                    | CoPh | Connective Phrase         |
| 7                                    | Auth | Author (Monographic)      |
| 8                                    | AuRo | Author Role (Monographic) |
| 9                                    | Jrnl | Journal Title             |
| 10                                   | ---  | Not used                  |
| 11                                   | ---  | Not used                  |
| 12                                   | ---  | Not used                  |
| 13                                   | ---  | Not used                  |
| 14                                   | ---  | Not used                  |
| 15                                   | ---  | Not used                  |
| 16                                   | ---  | Not used                  |
| 17                                   | ---  | Not used                  |
| 18                                   | ---  | Not used                  |
| 19                                   | ---  | Not used                  |
| 20                                   | Date | Date of Publication       |
| 21                                   | ---  | Not used                  |
| 22                                   | VoID | Volume Identification     |
| 23                                   | ---  | Not used                  |
| 24                                   | IsID | Issue Identification      |
| 25                                   | Loc  | Location in Work          |
| 26                                   | ---  | Not used                  |
| 27                                   | ---  | Not used                  |
| 28                                   | ---  | Not used                  |
| 29                                   | ---  | Not used                  |
| 30                                   | ---  | Not used                  |
| 31                                   | ---  | Not used                  |
| 32                                   | ---  | Not used                  |
| 33                                   | ---  | Not used                  |
| 34                                   | ---  | Not used                  |
| 35                                   | ---  | Not used                  |
| 36                                   | ---  | Not used                  |
| 37                                   | ---  | Not used                  |
| 38                                   | ---  | Not used                  |
| 39                                   | CODN | CODEN                     |
| 40                                   | ISSN | ISSN                      |
| 41                                   | ---  | Not used                  |
| 42                                   | Note | Notes                     |
| 43                                   | Abst | Abstract                  |
| 44                                   | Call | Call Numbers              |
| 45                                   | Indx | Index Terms               |

**Figure 9: Procite. Fields by workform for journals.**

|                              |         |  |                |
|------------------------------|---------|--|----------------|
| HA2Rec Leader                | 000     | nam8a  |                |
| Control #                    | 001     | 89-77578   |                |
| Future Tag                   | 008     | 891212s1990                                      | enk b 00100eng |
| ISBN                         | 020     | @a1853334138                                     |                |
| Future Tag                   | 040     | @aDLC @cDLC                                      |                |
| Geog. Area                   | 043     | @aln---  |                |
| LC Call                      |         | 050 00 @aTD171.5.N775 @N67 1990                  |                |
| Dewey Class                  | 082 00  | @a363/73/9456/0916336 @220                       |                |
| AWI Signatur                 | 090 0   | @2   |                |
| Title                        | 245 04  | @aThe North Sea : @bperspectives on regional     |                |
| environmental                |         | co-operation / @cedited by David Freestone and   |                |
| Ton Ijstra.                  |         |  |                |
| Imprint                      |         | 260 0 @aLondon ; @aBoston : @bGraham &           |                |
| Trotman Martinus Nijhoff     |         | , @c1990.  |                |
| Projected Pub                | 263     | @a9002   |                |
| Note:General                 | 500     | @a"Special issue of the International journal of |                |
| estuarine and coastal        |         | law."  |                |
| Note:Bibliog                 | 504     | @aincludes bibliographic references              |                |
| Subj.Topical                 | 650 0   | @Environmental protection @zNorth Sea            |                |
| @xInternational cooperation. |         |  |                |
| Subj.Topical                 | 650 0   | @Marine pollution @zNorth Sea                    |                |
| Subj.Topical                 | 650 0   | @Marine pollution @xLaw and legislation          |                |
| @zNorth Sea                  |         |  |                |
| AE:Pers Name                 | 700 10  | @aFreestone, David                               |                |
| AE:Pers Name                 | 700 100 | @aijstra, Ton                                    |                |

Figure 10. USMARC format from BIBLIOPHILE



```
CONVERSION PROGRAM
FIELDNAME
'Control # 001'
' #'
FIELDLABELPOSTION
1
FIELDSEQUENCE
1
FIELDTRANSLATION
'!'
'!'
[DD][0]*{d*}
{1}^{2}
FIELDNAME
'Future Tag 008'
'^'
FIEELDLABELPSOTION
1
FIELDSEQUENCE
0
FIELDNAME
'LC Card'
'^'
FIELDLABELPSOTION
1
FIEELDSEQUENCE
0
FIELDNAME
'National Bib'
```

Figure 11

```

MELVYL MARC FORMAT RECORD

1. TD 6403817 BASE RV STS c REC am ENC DCF a ENT 88120
  INT REP GOV CNF 1 FSC 0 INX 1 CTY enk ILS a
  MEI 0 FIC 0 BIO MOD CSC d CON d LAN eng PD 1988
015 GB88-15063 <RV>
020 0434913707 : $c_65.00 : CIP confirmed <RV>
040 UKM $C UKM $D CU-Riv <RV>
043 In--- <RV>
082 04 628.1/688/16336 $2 19 <RV>
245 00 Environmental protection of the North Sea / $c edited by P.J. Newman and A.R. Agg.
<RV>
260 0 Oxford : $b Heinemann Professional, $c 1988. <RV>
300 xviii, 886 p. : $b maps, ill., $c 25 cm. <RV>
504 Includes bibliographical references and index. <RV>
650 0 Marine resources conservation $z North Sea <RV>
650 0 Marine pollution $z North Sea <RV>
650 0 Marine resources conservation $x Government policy $z North Sea
650 0 Marine pollution $x Government policy $z North Sea <RV>
651 0 North Sea <RV>
700 10 Newman, P. J. <RV>
700 10 Agg, A. R.

RV:
$a19900716185916.0 901 $aO$b17585805$cCRUP 902
904 $A19900716$b19900716 909 $a900716 1b -cg
Hol: 920 $aCRUP 922 $aUCR 924 $aCU-RivP 926
$aPhy
930 $cGC1023$c.425$cN6E68$c1988

```

Figure 11a.

Figure 12 is unavailable. For further information contact authors.

```

ISO 2709
Label 00101a_m_2200067__452_
Directory 001000700000**200001000023**300001600007**#
Data A12345#00@AJones@BJones#00@AGames#%

```

Figure 13. Label, directory, data and record separator

| Tag  | Name of Field/Data Element   | Status              |     |       |       |   |     |     |   |   |
|------|--|---------------------|-----|-------|-------|---|-----|-----|---|---|
|      |  | Bibliographic Level |     |       |       |   |     |     |   |   |
|      |  | A/S                 | A/M | A/M/S | A/M/C | M | M/S | M/C | S | C |
| A01  | ISBN   | E                   |     | E     |       |   | E   |     |   |   |
| A02* | CODEN  |                     |     |       |       |   |     |     | E |   |
| A03  | Title of Serial  | E                   |     | E     |       |   | E   |     | E |   |
| A04  | Serial Designation   |                     |     |       |       |   |     |     |   |   |
| A05  | Volume Identification Data<br>(First Order Designation)              | E                   | E   | E     | E     |   | E   | E   |   |   |
| A06  | Issue Identification Data<br>(Second Order Designation)              | E                   | E   | E     | E     |   | E   |     |   |   |
| A08  | Title of Analytic  | E                   |     | E     | E     |   |     |     |   |   |
| A09  | Title of Monograph   |                     | E   | E     | E     | E | E   | E   |   |   |
| A10  | Title of Collection  |                     |     |       | E     |   |     | E   |   | E |
| A11  | Person associated with<br>Analytic                                   | E                   | E   | E     | E     |   |     |     |   |   |
| A12  | Person associated with<br>Monograph                                  |                     | E   | E     | E     | E | E   | E   |   |   |
| A13  | Person associated with<br>Collection or Serial                       |                     |     |       |       |   |     |     |   | E |
| A14  | Affiliation-Analytic   | E                   | E   | E     | E     |   |     |     |   |   |
| A15  | Affiliation-Monograph  |                     |     |       |       |   | E   |     |   |   |
| A16* | Affiliation-Collection or Serial                                     |                     |     |       |       |   |     |     |   |   |
| A17  | Corporate Body associated<br>with Analytic                           | E                   | E   | E     | E     |   |     |     |   |   |
| A18  | Corporate Body associated<br>with Monograph                          |                     | E   | E     | E     | E | E   | E   |   |   |
| A19  | Corporate Body associated<br>with Collection or Serial               |                     |     |       |       |   |     |     |   | E |
| A20  | Collection - Analytic  | E                   | E   | E     | E     |   |     |     |   |   |
| A21  | Date of Publication  | E                   | E   | E     | E     | E | E   | E   | E | E |
| A22* | Date other than Date of<br>Publication                               |                     |     |       |       |   |     |     |   |   |
| A23  | Language of Text   | E                   | E   | E     | E     | E | E   | E   | E | E |
| A24* | Language of Summary  |                     |     |       |       |   |     |     |   |   |
| A25  | Publisher: Name and<br>Location (Monograph,<br>Collection or Serial) |                     | E   | E     | E     | E | E   | E   | E | E |
| A26  | ISBN   |                     | E   | E     | E     | E | E   | E   |   | E |
| A27  | Edition  |                     | E   | E     | E     | E | E   | E   |   | E |

**Figure 14. List of fields in Unesco's Reference manual for machine-readable bibliographic descriptions, 3rd. 1986.**

| Tag  | Name of Field/Data Element                            | Status              |     |       |       |    |     |     |   |   |
|------|---|---------------------|-----|-------|-------|----|-----|-----|---|---|
|      |   | Bibliographic Level |     |       |       |    |     |     |   |   |
|      |   | A/S                 | A/M | A/M/S | A/M/C | M  | M/S | M/C | S | C |
| A28  | Collation-Collection                                  |                     |     |       |       | E  | E   | E   |   | E |
| A29  | Collation-Monograph                                   |                     |     |       |       | E  | E   | E   |   | E |
| A30  | Name of Meeting*                                      | K                   | K   | K     | K     | K  | K   | K   | K | K |
| A31  | Location of Meeting*                                  | K                   | K   | K     | K     | K  | K   | K   | K | K |
| A32  | Date of Meeting*                                      | K                   | K   | K     | K     | K  | K   | K   | K | K |
| A33  | Identification of Patent Document                     | P                   |     |       |       | P  |     |     |   |   |
| A34  | Person Associated with Patent Document                | P                   |     |       |       | P  |     |     |   |   |
| A35  | Corporate Body associated with Patent Document        | P                   |     |       |       | P  |     |     |   |   |
| A36* | Domestic Filing Date of Patent Document               |                     |     |       |       |    |     |     |   |   |
| A37* | Convention Priority Date of Patent Document           |                     |     |       |       |    |     |     |   |   |
| A38* | Reference to Legally Related Domestic Patent Document |                     |     |       |       |    |     |     |   |   |
| A39  | Report Number   |                     | R   | R     |       | R  | R   |     |   |   |
| A40* | Name of Performing Organization                       |                     |     |       |       |    |     |     |   |   |
| A41  | University or Other Educational Institution           |                     | T   |       |       | T  | T   |     |   |   |
| A42* | Type of Degree  |                     |     |       |       |    |     |     |   |   |
| A43  | Availability of Document                              |                     | R   | R     |       | RT | RT  |     |   |   |
| A44* | Abstract  |                     |     |       |       |    |     |     |   |   |
| A45* | Number of References                                  |                     |     |       |       |    |     |     |   |   |
| A46  | "Summary Only" Note                                   |                     |     |       |       |    |     |     |   |   |
| A47* | Citation Number                                       |                     |     |       |       |    |     |     |   |   |
| A51  | Country of Publication Code                           |                     | E   | E     | E     | E  | E   | E   | E | E |
| A52* | Secondary Source Citation                             |                     |     |       |       |    |     |     |   |   |
| A69* | Source Data Base                                      |                     |     |       |       |    |     |     |   |   |
| A70* | Bibliography Note                                     |                     |     |       |       |    |     |     |   |   |
| A72* | Contract or Grant Number                              |                     |     |       |       |    |     |     |   |   |
| A80* | Target Audience Code                                  |                     |     |       |       |    |     |     |   |   |
| A90* | Related Record  |                     |     |       |       |    |     |     |   |   |
| A99* | Ancillary Data  |                     |     |       |       |    |     |     |   |   |

Figure 14a.

| Tag  | Name of Field/<br>Data Element          | Status              |     |       |       |   |     |     |   |   |
|------|---|---------------------|-----|-------|-------|---|-----|-----|---|---|
|      |   | Bibliographic Level |     |       |       |   |     |     |   |   |
|      |   | A/S                 | A/M | A/M/S | A/M/C | M | M/S | M/C | S | C |
| B01* | Broad System of Ordering Code           |                     |     |       |       |   |     |     |   |   |
| B02* | Dewey Decimal Classification Number     |                     |     |       |       |   |     |     |   |   |
| B04* | Universal Decimal Classification Number |                     |     |       |       |   |     |     |   |   |
| B05* | Other Classification Scheme Number      |                     |     |       |       |   |     |     |   |   |
| B21* | Controlled Index Term                   |                     |     |       |       |   |     |     |   |   |
| B22* | Uncontrolled Index Term                 |                     |     |       |       |   |     |     |   |   |
| B30  | Type of Bibliographic Entity            |                     |     |       |       |   |     |     |   |   |

NOTES

- (1) The symbols heading the column indicate single bibliographic levels or combinations of bibliographic levels in documents to be described. The meaning of the symbols is as follows:

A = analytical level  
M = Monographic level  
S = Serial level  
C = Collective level.

IN the columns of the table, the "mandatory" or essential" status of a data element in a particular field at a given bibliographic level or combination of bibliographic levels, is indicated by the

symbol "E". In principle a "status E" data element is essential for any type of bibliographic entity

described at the indicated bibliographic level or combination of bibliographic levels. When a data

element is essential only for either a conference document, patent, report or thesis, this has been

indicated by the symbols "K", "P", "R", and "T" respectively.

- (2) Essential only in the case of a multi-volume monograph of which the individual volumes and/or parts have an individual title and individual page numbering. In this case first and/or second order designation may apply.

- (3) Essential only in the case of a collection of numbered monographic items. Also, in that case, only a first order designation may be applicable.

- (4) Essential when the monographic level describes a serial issue of part treated as a single document (monograph) and when the issue or part carries a column and issue identification or equivalent.

Figure 14b.

Output generated from Compact Cambridge: ASFA 1987 - Sept 1990  
Search Strategy:  
"ENVIRONMENTAL PROTECTION OF THE NORTH SEA"(11)  
DOCUMENT 2 of 2:

TI: TITLE  
Environmental Protection of the North Sea, International Technical  
Conference, London, 24-27 March 1987.  
AU: AUTHOR  
Newman, P.J.; Agg, A.R. (eds.)  
SO: SOURCE  
HEINEMANN; OXFORD (UK); 1988; 914 pp  
LA: LANGUAGE  
English  
PY: PUBLICATION YEAR  
1988.  
DE: DESCRIPTORS  
marine pollution; environmental protection; pollution control; international  
cooperation; conferences; NNE, North Sea  
CC: CLASSIFICATION CODE  
1505 Pollution: Prevention and control; 1106 General Aspects: Conferences,  
meetings, etc.; 1109 General Aspects: New books, atlases and charts; 2444  
Pollution: Prevention and control; 2106 General Aspects: Conferences,  
meetings, etc.; 2109 General Aspects: New books, atlases and charts  
SF: SUB FILE  
nSFA-1: Biological Sciences and Living Resources; ASFA-2: Ocean Technology,  
Policy, and Non-Living Resources  
ER: ENVIRONMENTAL REGIME  
Marine  
CF: CONFERENCE NAME  
Environmental Protection of the North Sea, International Technical  
Conference  
CL: CONFERENCE LOCATION  
London (UK)  
CD: CONFERENCE DATE  
24-27 Mar 1987

Figure 15