ABSTRACT
               The report prepared for the Five Associated
University Libraries (FAUL) by the Technical Information
Dissemination Bureau (TIDB) at Suny-Buffalo is divided into nine
sections: (1) a summary of procedures used to accomplish the
specified MASFILE-II tasks; (2) a graphic comparison of the MARC-II
and the MASFILE-II formats; (3) recommend modifications to the FAUL
MASFILE-II record needed to transmit records from the MASFILE
computer to local terminals or line printers in the MARC-II format;
(4) recommend data elements which must be resident in a MASFILE-II
record to produce products as specified by the FAUL Systems
Committee; (5) recommend workable procedures for each FAUL Library to
modify MASFILE-II records in a central computer on a routine basis;
(6) recommend workable procedures for adding current local records
into MASFILE; (7) recommend workable methods for identifying and
selecting specific records and groups of records from MASFILE to
produce lists organized by subject, class number, or main entry; (8)
isolate major problem areas resulting from this project and (9)
summarize time spent and activities performed in computer testing,
program runs, clerical operations, and professional time. (MASFILE-I
Pilot Project is available as ED 028 801). (Author/NH)

ED051826

MASFILE-II PILOT PROJECT

FINAL REPORT

submitted to the
        Board of Directors
        Five Associated University Libraries

by the
        Technical Information Dissemination Bureau
        State University of New York at Buffalo

JUNE 1970

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CONTENTS

LIST OF FIGURES

1.0 INTRODUCTION

In response to a request from the Five Associated University
Libraries (FAUL), the Technical Information Dissemination
Bureau (TIDB) at SUNY-Buffalo undertook project MASFILE-II.
The tasks specified in the FAUL Work Statement (section II.1)
were undertaken. As part of the project, TIDB was directed
by FAUL to prepare a report which would include:

1. A summary of procedures used to accomplish the
    specified MASFILE-II tasks.

2. A graphic comparison of the MARC-II format and the
    MASFILE-II format.

3. Recommend modifications to the FAUL MASFILE-II re-
    cord needed to transmit records (by magnetic tape or
    by IBM 2741 communications terminals) from the
    MASFILE computer to local terminals or line printers
    in the MARC-II format.

4. Recommend data elements which must be resident in a
    MASFILE-II record to produce products as specified
    by the FAUL Systems Committee.

5. Recommend workable procedures for each FAUL Library
    to modify MASFILE-II records in a central computer
    on a routine basis which have been input from either
    the MARC Tape Distribution Service or from local
    cataloging systems.

6. Recommend workable procedures for adding current
    local records into MASFILE.

7. Recommend workable methods for identifying and selec-
    ting specific records and groups of records from
    MASFILE to produce lists organized by subject, class
    number, or main entry.

8. Isolate major problem areas resulting from this
    project which FAUL library staff members, committees
    or contractors should solve.

9. Summarize time spent and activities performed in
    computer testing, program runs, clerical operations,
    and professional time.

This report is divided into 9 Sections, each dealing with one
of the above areas.

2.0   A SUMMARY OF PROCEDURES USED TO ACCOMPLISH MASFILE-II TASKS

2.1   *Task 1.   Convert MASFILE-I Records to MASFILE-II Format*

Records produced during the MASFILE-I project [1,2,3] were pre-
viously stored on magnetic tape in the SUNYAB master file format.
Since the SUNYAB master file format is a modified MARC-I format,
conversion to the MASFILE-II format (essentially a MARC-II format)
could not be performed by computer alone.   The SUNYAB master file
format contains less detail than the MARC II format.   Because
of this, appropriate bibliographic items require human modifica-
tion of certain tagged fields in order to transform them into
the MARC-II format.

In order to accomplish this task, a computer program (P-1)[4]
was written which converted MASFILE-I tags to the most probable
MARC-II tags and then formatted the data into the IBM Adminis-
trative Terminal System (ATS) format.   A computer listing of
the converted file was printed (P-2) and used by an editor to
correct tags, delimiters and indicators, then the file was
loaded into ATS (P-3).   After correction, the ATS file was
transferred to magnetic tape (P-4) and reformatted into the
MASFILE-II format (P-5).   About 1,800 records were converted in
this manner.

2.2   *Task 2.   Extraction of Marc II Z Class Records*

A computer program was written (P-6) and used to search 21,480
MARC-II records for those records in the Library of congress
Z Class.   As a result, 528 records were extracted.   Each record
was then converted from the MARC-II format to the MASFILE-II
format (P-6).   This task merely involved moving the LC card
number tagged field.   A MASFILE-II control number was then
inserted in the control number portion of the MARC-II record.

1/   Masfile-I Pilot Project Final Report, April 11, 1969
     (available from the ERIC Document Reproduction Service as
     ED-028 801).
2/   An Experimental Holdings List of Selected Research Mono-
     graphs in the Five Associated University Libraries: Book
     Trade and Library Service.   January 1969.
3/   Same, in microfiche form
4/   Computer programs are indicated by program numbers beginning
     with the letter P.   A list of programs used for the MASFILE-
     II Pilot Project is in Section 11.3.

2.3 Task 3. Extraction and Listing of Z Class SUNYAB Records

A computer program program was written (P-7) and used to extract
all Z Class entries which had been added to the SUNYAB master
file between September I, 1965 - July I, 1969. Z Class records
were stored on magnetic tape (P-7). These records were then
passed through a SUNYAB program (P-8) which generated a main
entry filing field. The file was then sorted on this field (P-9)
and on the extant title/main-entry fields in the records accord-
ing to a main-entry filing program (P-10). A listing of 581
records was printed (P-11) and sent to the Cornell University
Library.

2.4 Task 4. Cornell Updating of SUNYAB Records

Cornell holdings information was added manually to each of the
records on the list produced as described in Section 2.3 above.
The list was then returned to TIDB by Cornell.

2.5 Task 5. Addition of Cornell Holdings to Extracted
SUNYAB Z Class Records

The computer program used to convert MASFILE-I records (P-I)
to the MASFILE-II format (Task I) was modified and used to con-
vert the Task 3 records to a close approximation of the MARC-II
tagging scheme. These records were converted to the ATS format
and loaded into ATS. Again an editor corrected tags, delimiters
and indicators. A typist corrected the records using ATS and
added the appropriate Cornell holdings statements. These re-
cords were transferred to magnetic tape (P-4) and formatted
into the MASFILE-II format using the program described in
Section 2.I (P-5).

2.6 Task 6. Conversion of SUNYAB Z Class Cataloged Items

Upon receipt of FAUL Cataloging Worksheets from SUNYAB, con-
taining Z class records of items cataloged from July I, 1969 -
September 31, 1969, the records were entered on ATS, proofread
and corrected. Special coding was required for certain dia-
critical marks. This diacritical coding is described in Sec-
tion II.2. These records were transferred to magnetic tape
(P-4) and formatted into the MASFILE-II format (P-5).

2.7 Tasks 7 and 8. Conversion of Cornell Z Class Cataloged
Items

The procedure for these tasks is identical to that described in
Section 2.6; the Z class items from Cornell were cataloged dur-
ing the period July I, 1969 through September 31, 1969.

2.8   Task 9.   Merging of Records and Addition of "Not Checked for Holdings" Statements

All records described above were merged into a single file. A "Not Checked for Holdings" statement was added to each of the files described below (P-12):

SOURCE OF RECORD	"NOT CHECKED FOR HOLDINGS" ADDED FOR
MARC	All Libraries
MASFILE-1	No Libraries
SUNYAB Master File	Binghamton, Rochester, Syracuse
SUNYAB Current	Binghamton, Cornell, Rochester, Syracuse
Cornell Current	Binghamton, Buffalo, Rochester, Syracuse

2.9   Task 10.   MASFILE-II Listing in Main Entry Order

A computer program was written (P-13) which generated main entry sorting fields from MARC-II format records. A sort was performed using this field (P-9). A program was written which listed the file (P-II). The entire file was then listed and sent to the FAUL Central office.

Subsequently the print tape was used to generate 200 Computer Output Microfiche set using a KOM-90 machine in Rochester. This product was not a part of the original work statement. One fiche set forms Part II of this report and is inserted on the inside back cover.

3.0 GRAPHIC COMPARISON OF MARC-II AND MASFILE-II FORMAT

The MASFILE-II and MARC-II formats are quite similar since
only a few additions and changes were made to the MARC-II for-
mat to adapt it to the MASFILE-II application. Logically, the
two record formats appear identical on magnetic tape with the
record structure shown in Figure I. Both are variable length
records with leading information containing record length and
other descriptive information. Both have a tag table contain-
ing tag numbers, location, and length of data for each tagged
piece of information. In both, the remainder of the record
contains variable length data items each preceded by two indi-
cators. Subfields of the items are separated by standard MARC-
II delimiters.

The contents of the data item for each tag is, in most cases,
the same for the MARC and MASFILE formats. The content of
the fields tagged from 011 through 899 are identical in the
two formats. The major differences between the two formats
occur in the fields tagged 001 (Fixed Length Data Elements),
008 (Fixed Length Fields), 010 (LC Card Number) and 910 (Local
Holdings).

The fields tagged 900 and above are provided by the Library of
Congress for local use and therefore do not appear as fields
in any MARC-II records distributed by LC. In the MASFILE-II
format, the 910 field was assigned to contain local call
numbers and holdings information for FAUL libraries.

As used in MASFILE-II, the 910 field has two indicators which
are interpreted as a single two-digit number and a single ($a)
data subfield. The number formed by the indicators is a code
number for the FAUL libraries.

Field	Indicator	Subfield	Library
910	01	$a	Buffalo
910	02	$a	Rochester
910	03	$a	Syracuse
910	04	$a	Binghamton
910	05	$a	Cornell

The data field contains the National Union Catalog code for the
member libraries followed by a character "/" and either the
phrase, "not checked for holdings" or the local call number and
number of copies separated by another character "/". Example
of a holdings statement: 91001$aNBU/Z116/(3) means that SUNY-
Buffalo owns three copies of an item classed as Z116. Example:
91005$aNIC/NOT CHECKED FOR HOLDINGS, means that the item has not
been checked by Cornell to determine if Cornell owns it. If
Cornell had done so and a copy was in its collection, the hold-
ings statement would reflect that fact similar to the preceding
statement for Buffalo.

The 008 tagged field which for both MARC-II and MASFILE-II
contains fixed length data elements is identical in structure
for both formats. The full list of MARC-II elements is pre-
sented in Figure 2.

MARC-II elements which are omitted in MASFILE-II are the
intellectual Level Code, the Government Publication Indicator,
and (for Cornell and SUNY-Buffalo) the Main Entry in Body of
Entry Indicator. The Cataloging Source Code has these addi-
tional values in MASFILE-II:

> x   original cataloging (i.e. FAUL)
> y   Title II: shared cataloging
> z   NUC entry

In the MARC-II records, the 001 tag is used for the LC Control
Number which is a formatted version of the LC Card Number. The
010 tagged field in MARC-II is reserved for the LC Card Number
but it has never actually been entered in the record by LC so
far.

For MASFILE-II, the 001 tag is used for the MASFILE Control
Number. This eleven digit number is constructed in the
format SSSYYNNNNNN, where S represents a three letter source
file code (MRC for MARC, RBU for retrospective Buffalo records,
NBU for newly cataloged Buffalo records, NIC for newly cataloged
Cornell records, and MFI for MASFILE-I), Y a two-digit year, and
N represents six-digit accession number. The result could ap-
pear as this example illustrates:

> 001   ØØ   RBU 69   000492

> └──────── accession number
> └─ 1969, year of accession
> └─ retrospective record from SUNY-Buffalo
> └─ blank indicators
> └── MARC/MASFILE tag for MASFILE Control number
> field

In the MASFILE format the 010 field contains the LC Card
Number.

leader	record directory	control fields	variable fields	

A. Complete record

record length	status	record type	biblio level	indicator count	subfield code count	base address of data

B. Structure of leader

tag 1	field length	starting position	tag 2	field length	starting position	...F/T

C. Structure of record directory

data element 1	data element 2	...F/T

D. Structure of a control field

indicators	subfield code	data element 1	subfield code	data element 2	...F/T

E. Structure of a variable field

N.B. More detailed layout information is contained in <u>MARC</u>
<u>Manuals Used by the Library of Congress</u>. ALA-ISAD, 1969,
and changes as provided to subscribers by the MARC Tape
Distribution Service (LC).

FIGURE I. MARC II Record Structure

1. date entered on file

2. type of publication date code

3. date 1

4. date

5. country of publication code

6. illustration code

7. intellectual level code

8. form of reproduction code

9. form of content code

10. government publication indicator

11. conference or meeting

12. festschrift indicator

13. index indicator

14. main entry in body of entry indicator[1]

15. fiction indicator

16. biography code

17. language code

18. modified record indicator

19. cataloging source code[2]

Source: Ibid. "MARC Manual Vol. 1," p. 32.

[1] omitted from Cornell and SUNY-Buffalo records since work-
sheets did not contain them
[2] x, y, z codes added (see text, p. 6.)

FIGURE 2. MARC II Fixed Length Data Elements (Tag 008)

4.0 TRANSMISSION OF MASFILE-II RECORDS

The transmission of MASFILE-II records to and from local
libraries either by mail or by terminal would require only a
straight-forward reformatting of the MASFILE records. It
would not be necessary to modify the contents of the records
or the order and arrangement of the tagged fields. Figure 3
shows a general outline of the transmission procedures.

To transmit to local terminals or line printers, a format
similar to that used for editing and correction as described
in Section 2.0 would be usable. In this format each record
is broken up into the component tagged fields and entered as
a series of 85 character lines (maximum) with each newly
tagged field beginning on a new line. Each line would con-
tain the three-character tag, the two characters for the
indicators, and 80 characters of data from the field. If
fields contain more than 80 characters of data, succeeding
continuation lines contain blank tag and indicators and the
remaining data of the field. This format can be entered di-
rectly into ATS storage.

The system to accomplish this type of transmission to terminals
must include a method to receive identifying descriptions of
the desired records, locate them in the file, reformat the re-
cords to the form acceptable for terminal output, and transmit
the reformatted records to the intended recipient through ATS
(or some similar system).

The transmission of MASFILE record data by mail could use the
same format and procedure described above, except that printed
copy would be generated by the reformatting program. It is
possible to define practically any format for printing (even
one similar in appearance to a catalog card) and concomitantly
to design a special procedure for using that particular format.

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Local Library   Local Library

```
┌─────────────────────────────┐
│  Central Computer facility  │
│  receives list of           │
│  records from local         │
│  terminal or by mail        │
└─────────────────────────────┘
```

```
┌─────────────────────────────┐
│  search MASFILE file and    │
│  extract desired records    │
└─────────────────────────────┘
```

```
┌─────────────────────────────┐
│  reformat records for       │
│  transmission               │
└─────────────────────────────┘
```

```
┌─────────────────────────────┐
│  transmit formatted records │
│  by loading into ATS or     │
│  mailing printed copy       │
└─────────────────────────────┘
```
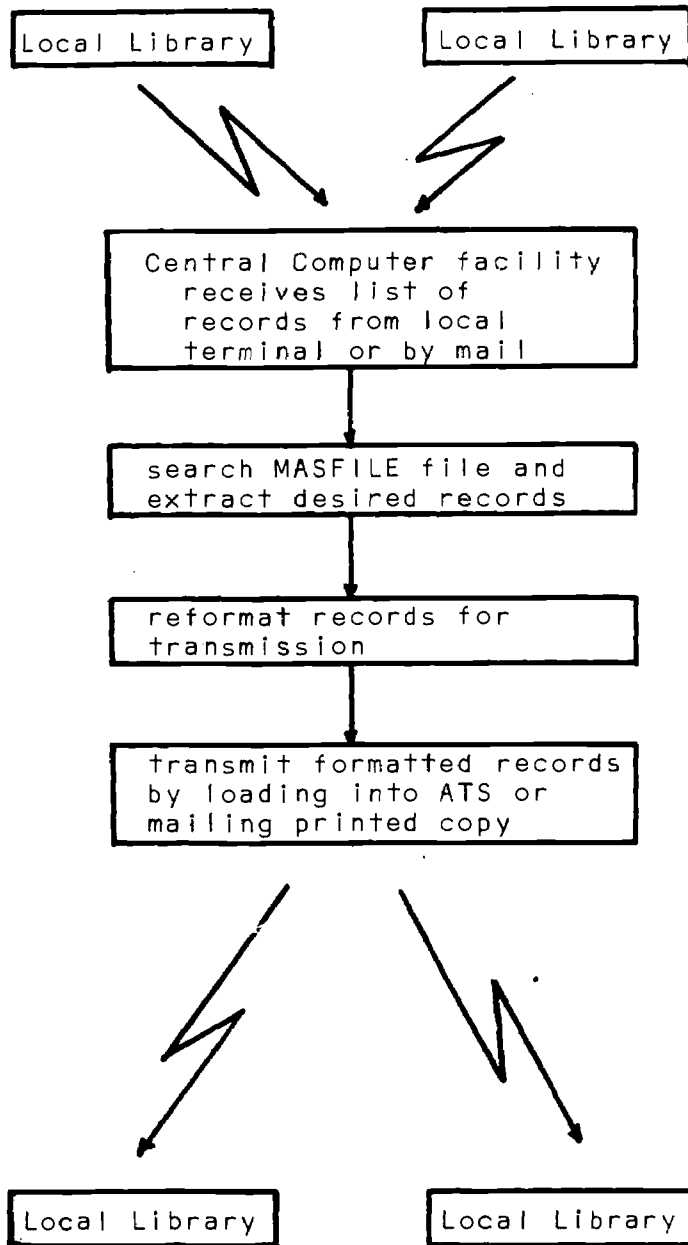
Local Library   Local Library

FIGURE 3.   Procedure for Transmitting MASFILE Records to and
from Local Libraries

5.0 *FIELDS NEEDED IN MASFILE FOR SPECIFIC BIBLIOGRAPHICAL SERVICES*

5.1 *Bibliographical Services*

FAUL document MF-15.4 outlined the following uses and their priorities in a centralized store of bibliographic information in machine-readable form. The priorities were determined by iterative questionnaire to selected personnel in each library.

Item	Uses	Priority
A	Locate documents in all FAUL libraries	1.0
B	Print selected bibliographies	1.2
C	Eliminate duplication of seldom used materials	1.4
D	Provide lists for exchange of duplicates	1.6
E	Print out-of-print titles for OP searching	1.6
F	Aid in book selection by displaying recent acquisitions	1.7
G	Search and print cataloging copy	1.8
H	Print book catalogs and indexes	1.9
I	Extract pertinent data and print orders to vendors	2.2
J	Statistics for library management regarding overlaps, acquisition subject areas	2.3
K	Circulation transactions	2.3
L	Combined Accession Lists	2.5
M	SDI to faculty	2.6
N	Profile collection by subject areas	2.6

Control Numbers

0 1 0 LC Card Number
0 1 1 Linking LC Card Number
0 1 5 National Bibliography Number
0 1 6 Linking NBN
0 2 0 Standard Book Number
0 2 1 Linking SBN
0 2 5 Overseas Acquisitions Number
        (PL 480, LACAP, etc.)
0 2 6 Linking OAN Number
0 3 5 Local System Number
0 3 6 Linking Local Number
0 4 0 Cataloging Source
0 4 1 Languages
0 4 2 Search Code

Knowledge Numbers

0 5 0 LC Call Number
0 5 1 Copy Statement
0 6 0 NLM Call Number
0 7 0 NAL Call Number
0 7 1 NAL Subject Category Number
0 8 0 UDC Number
0 8 1 BNB Classification Number
0 8 2 Dewey Decimal Classification No.
0 8 6 Supt. of Documents Classification
0 9 0 Local Call Number

Main Entry

1 0 0 Personal Name
1 1 0 Corporate Name
1 1 1 Conference or Meeting
1 3 0 Uniform Title Heading

Supplied Titles

2 4 0 Uniform Title
2 4 1 Romanized Title
2 4 2 Translated Title

Title Paragraph

2 4 5 Title
2 5 0 Edition Statement
2 6 0 Imprint

Collation

3 0 0 Collation
3 5 0 Bibliographic Price
3 6 0 Converted Price

Series Notes

4 0 0 Personal Name-Title
        (Traced Same)
4 1 0 Corporate Name-Title
        (Traced Same)
4 1 1 Conference-Title
        (Traced Same)
4 4 0 Title (Traced Same)
4 9 0 Series Unitraced or
        Traced Differently

Bibliographic Notes

5 0 0 General Notes
5 0 1 "Bound With" Note
5 0 2 Dissertation Note
5 0 3 Bibliographic Hist. Note
5 0 4 Bibliography Note
5 0 5 Contents Note (Formatted)
5 0 6 "Limited Use" Note
5 2 0 Abstract or Annotation

Subject Added Entries

6 0 0 Personal Name
6 1 0 Corporate Name (ex-
        cluding political
        jurisdiction alone)
6 1 1 Conference or Meeting
6 3 0 Uniform Title Heading

LC Subject Headings

6 5 0 Topical
6 5 1 Geographic Names
6 5 2 Political Jurisdictions
        Alone or with Subject
        Subdivisions

Other Subject Headings

6 6 0 NLM Subject Headings
        (MESH)
6 7 0 NAL Subject Headings
6 9 0 Local Subject Heading
        Systems

Other Added Entries

7 0 0 Personal Name
7 1 0 Corporate Name
7 1 1 Conference or Meeting
7 3 0 Uniform Title Heading
7 4 0 Title Traced Differently
7 5 0 Name Not Capable of
        Authorship

Source: Ibid. p. 42.

FIGURE 4. MARC-II Variable Field Tags

Series Added Entries

8 0 0   Personal Name-Title
8 1 0   Corporate Name-Title
8 1 1   Conference or Meeting-Title
8 4 0   Title

Local

9 1 0   FAUL library holdings statements

FIGURE 4.   MARC-II Variable Field Tags (cont.)

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Specified Priority Use	Record Level		
	1 MASFILE II tags	2 (Includes tagged fields from Level 1, plus)	3 (Includes tagged fields from Levels 1 and 2, plus)
A	001, 100, 100, 111, 130, 245,* 250, 260, 910	010, 050, 245, 600, 610, 611, 630, 650, 651, 652, 700, 710, 711, 730, 800, 810, 811, 840	015, 020, 025, 040, 041, 060, 070, 400, 410, 411, 440, 490
B	001, 100, 110, 111, 130, 245,* 250, 260, 910	Not Needed	Not Needed
C		As specified for B Above	
D		As specified for B above	
E		As specified for B above	
F	001, 100, 110 111, 130, 245,* 250, 260, 910	Not Needed	Not Needed
G	001, 010, 100, 110, 111, 130, 240, 241, 245, 250, 260, 300, 400, 410, 411, 440, 490, 500, 502, 600, 610, 611, 630, 650, 651, 652, 700, 710, 711, 730, 800, 810, 811, 840, 910	Does Not Apply	Does Not Apply
H (Catalogs)		Same as G Above	
H (Author) (Indexes)	001, 100, 110, 111, 130, 245,* 250, 260, 700, 710, 711, 910	Not Needed	Not Needed
H (Title) (Index)	001, 100, 110, 111, 130, 245,* 250, 260, 730, 740, 910	Not Needed	Not Needed

* denotes title only; not the complete title statement

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Specified Priority Use	Record Level		
	1 MASFILE II tags	2 (Includes tagged fields from Level 1, plus)	3 (Includes tagged fields from Levels 1 and 2, plus)
H (Subject) (Index)	001, 100, 110, 111, 130, 245,* 250, 260, 600, 610, 611, 630, 650, 651, 652, 910	Not Needed	Not Needed
H (Series)	001, 100, 110, 111, 130, 245,* 250, 260, 800, 810, 811, 840, 910	Not Needed	Not Needed
I	001, 100, 110, 111, 130, 245,* 250, 260, 910	350, 400, 410, 411, 440, 490, 502, 700, 710, 711, 730	Not Needed
J	Same as Level 1 for A	600, 610, 611, 630, 650, 651, 652	Not Needed
K	001, 910	245*	100, 110, 111, 130
L	Same as B Above		
M (by Class) (Author) (or) (Terms In) (Title)	001, 100, 110, 111, 130, 245,* 250, 260, 910	Not Needed	
M (by) (Subject)	001, 100, 110, 111, 130, 245,* 250, 260, 600, 610, 611, 630, 650, 651, 652, 910	Not Needed	
N	001, 600, 610, 611, 630, 650, 651, 652, 910	Not Needed	
O	Same as A Above		

* denotes title only; not the complete title statement

Specified Priority Use	I MASFILE II tags	Record Level 2 (Includes tagged fields from Level 1, plus)	3 (Includes tagged fields from Levels I and 2, plus)
P	Same as A Above		
Q	001, 910	100, 110, 111, 130, 245*	Not Needed

* denotes title only; not the complete title statement

5.3 _Recommended Record Size_

It is recommended that FAUL consider adopting a Level I record suitable for all uses except priority item G ("Search and print cataloging copy") and priority item H ("Print book catalogs and indexes"). If this is done, a Level 3 record will be generated which will satisfy 20 out of the 22 uses outlined above, at perhaps 30 to 40 percent of the cost of generating a Level I record for products G and H.

6.0 PROCEDURES FOR MODIFICATION OF MASFILE-II RECORDS

Modification of MASFILE-II records by FAUL libraries could be performed in a manner similar to the conversion of data from MASFILE-I to MASFILE-II. This procedure involves the selection of the needed records from the master file or MARC Distribution Service file, reformatting these records and loading them into ATS, making desired modifications in ATS, and returning the output from ATS to the MASFILE-II record structure. A simple flow chart of this process is presented in Figure 5.*

The primary difficulty involved in the implementation of this procedure is loading the special characters used in the MARC Distribution Service tapes into the ATS system. Special characters do not exist in ATS as a single bit string, and special translation facilities would have to exist in the formatting and returning programs to convert the special characters (alphabetic characters and diacriticals) into some understandable and legal character combination. The acceptable way of entering these characters from the keyboard requires typing the first character of the hexadecimal code for the character, backspace, and type the second character of the code. As a general practice this is awkward and un-acceptable because the hexcode equivalence table is unwieldy and it is impossible to tell from reading printed copy which of the hex characters was entered first, thereby making proofreading very difficult.

Given that the special character translation problem is re-solved, the modification of records can be made into a rou-tine procedure. For instance, one day a FAUL library could transmit lists of desired records to the ATS tape queue. This tape would be input with the master file to the program to select and format MASFILE-II or MARC records, and selection, formatting and loading of records into ATS for the library could take place, say, overnight. The library staff could then modify the records at their convenience through ATS and, when the modified records are in final form, transmit them to the tape queue. The reformatting program would then be run overnight to return the records to the MASFILE-II form for the library's use. This process would take a minimum of two days in a typical installation, but could be a regular routine of processing and should run in a reliable manner.

---

* See also Searching and Editing Bibliographic Records Using the IBM Administrative Terminal System (ATS), by Linda Webb and James Turner. FAUL Technical Memorandum FTM 70-I, May 1970.

```
┌─────────────────────────────┐
│ central computer facility   │
│ receives list of records    │
│ from local library          │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐
│ extract records from        │
│ MASFILE master file         │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐
│ format records and trans-   │
│ mit to local library        │
│ through ATS                 │
└─────────────────────────────┘
              ╱
┌─────────────────────────────┐
│ local library staff         │
│ modifies records in ATS     │
└─────────────────────────────┘
              ╱
┌─────────────────────────────┐
│ local staff transmits       │
│ modified records through    │
│ ATS for processing          │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐
│ return modified records     │
│ to MASFILE format           │
└─────────────────────────────┘
```
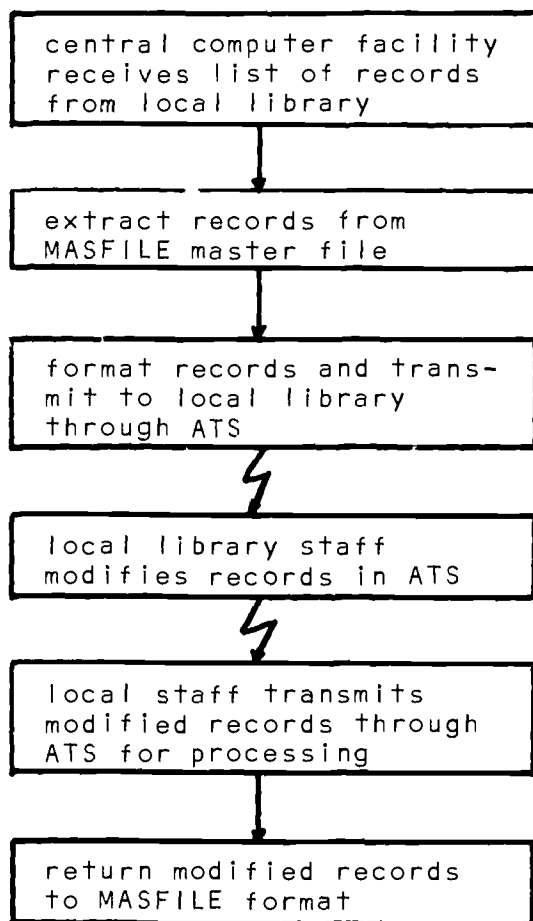
FIGURE 5.   Procedure for Local Library Modification of
             MASFILE Records

7.0 PROCEDURE FOR INPUTTING CURRENT RECORDS

The regular inputting of current local records into the
MASFILE master file could be accomplished using ATS by a
system similar to that used for the shelf list conversion
project at SUNYAB. Records could be cataloged and then
typed into ATS at each local FAUL library and regularly
transmitted to some central processing system for formatting
and incorporation into the file. On campuses which supported
ATS as a local text editing system, records could be mailed
in ATS format in lieu of transmitting them.

Data to be entered into the file would be filled in on the
Cataloger's worksheets as used for MASFILE-II. Two methods
were used to input data in the MASFILE-II project: 1) filling
in the worksheet line by line with required data, and 2) entering
all data from the catalog card on the worksheet and adding tags
and delimiters. The first method tends to yield data which is
easier to input and with relatively few errors.

The data, when proofread and corrected at the local library,
would be transmitted through ATS to the tape queue at a cen-
tral location. Then, regularly, probably every night,
programs would be run which receive the data from the tape
queue, convert it to the MASFILE record format, and enter it
in the MASFILE master file for future output processing.

8.0 METHOD FOR IDENTIFICATION AND SELECTION

The system for extracting records and groups of records from
MASFILE for various types of listings involves two separate
problems: the problem of record selection and the filing
problem for each type of listing. The software exists as
part of the MASFILE-II project to solve the filing problem
for main entry and class number listings, but the filing
problem for subject headings is not solved and may be unsolvable
for data in the MASFILE-II format.

To use the filing rules defined by Theodore Hines* for subject
headings, subfields of the subject headings must be entered
manually in the records in the order prescribed by Hines. Un-
fortunately this order is quite different from the order used
by the Library of Congress for entering data for MARC tape
distribution, and there is no automatic way to rearrange the
data subfields for correct filing. Some work has been done
in this area by Jessica Harris as part of her dissertation at
Columbia University, and if it is desired to try listing by
subject headings, her work is the best place to start.

The record selection problem is solvable in the most straight
forward manner by providing a selection program with lists
of acceptable data combinations (and possibly a series of
Boolean combinations of lists). The program would then be
designed to select those records which contain exactly those
specified data combinations. For example, if it were desired
to select all records with main entry Smith, Jones or McMurtrie,
the program would be provided with the list of names, the tag
of the field to be searched, and the desired subfield code.
The program would then search every record of the file for
every entry of the data list in the specified field and subfield.

This technique has one advantage and several disadvantages. The
advantage is that it can be made to work. The disadvantages
are that it would be very expensive in processing time because
of the linear file, is awkward to program and control, and de-
pends on exact matching of list entries and record data elements
which require precise uniformity of data (see Section 9.2 below).

It would be advisable, before trying this brute-force technique
for record selection, to try defining as specifically as possible
those criteria to be used for record selection. Then depending
on the criteria, various orderings of the file or various types
of indexes could be produced to make possible relatively effici-
ent searches for these specific types of criteria.

*Computer Filing of Index, Bibliographic, and Catalog Entries,
  by T. Hines and J. Harris, Newark: Bro-Dart Foundation, 1966

9.0 MAJOR PROBLEM AREAS

The major problem areas encountered in this project fall into
two general categories, the problems of handling diacriticals
and special characters and the problems of getting clean,
uniform data into the file. In the first case, problems include
the entering of special characters into the file, filing of
entries containing special characters, and printing of words
containing special characters. The problems of data which
contain errors or is not entered uniformly appear mainly in
filing and in defining search criteria for the master file.

9.1 Special Characters

Special characters are defined for this report as those charac-
ters which appear in the MARC character set but which do not ap-
pear on the ATS keyboard or the IBM full TN print chain. These
characters include diacritical marks (umlaut,circumflex, title,
etc.), letters from non-English alphabets (Polish *Ł*, Icelandic
thorn, Scandinavian *Ø*, etc.), dipthongs, some punctuation marks
(braces, high comma, British pound symbol, etc.), and MARC con-
trol characters (delimiter, field terminator, record terminator).

The first problem is that of entering data containing these
special characters into the MASFILE file. For the MASFILE-II
project, this was done by entering the hex code for these
characters directly at the terminal. Appendix II.2 presents
a table containing the hex codes for each legal character in
the file. To enter an umlaut, for example, one would type C
(the first character of the hex code), backspace, and then
type A (the second character of the code).

This technique does record the special characters in the file,
but it has several disadvantages. First, the procedure is
awkward: both the person who translates from character to
code and the typist doing the transcribing are likely to make
mistakes. Second, it is not possible to tell from the printed
copy which character of the code was entered first, and proof-
reading of the characters becomes impossible. Third, in ATS,
if a line of text exceeds the ATS fixed line length the last
characters of data may be last. Lines containing special
characters entered this way are difficult to determine because
line length character counts are awkward to perform.

A technique should be developed for entering special characters
by discrete, easy to remember substitute characters or possibly
by an escape code character followed by the substitute characters.
Some clear and easy to understand system for entering these
characters would make it at least possible to get the characters
in the file reasonably correctly and with a minimum of frustration.

The second problem is that of filing entries containing these
special characters correctly. Since all punctuation, including
diacriticals, is ignored in the filing system proposed by Hines,
the primary difficulty occurs with letters of foreign alphabets
and with dipthongs.

For filing in the MASFILE-II project, each of the foreign letters
was made to file immediately after its English equivalent. That
is, a Polish Ł files between L and M; a Scandinavian Ø files
between O and P and a Ð files between D and E, and a Turkish ı
files between I and J. The dipthongs AE and OE file as the two-
letter combinations AE and OE respectively. The umlaut, when
it exists in the file preceeding a letter, causes the word to
file as if there were a letter E following that letter, as in
ALA filing rules.

This procedure may or may not be acceptable to FAUL library
staff members. It would be appropriate for library staff
within FAUL to define rigorous rules for the filing of all
special characters appearing in the MARC-II files, or adopt
some external standard acceptable to all.

The third problem is that of printing records which contain
the special characters. This could be solved most easily by
a computer manufacturer marketing a printing device which would
produce the special alphabetic characters and permit superimposing
diacritical marks on the letters they are supposed to modify.
With the equipment currently available it is barely possible
and using extremely costly procedures to produce a small group
of special alphabetic characters and simulate a few of the dia-
critical marks. Special library print trains and CRT-based
printing devices have already pointed the way to future tech-
niques for attacking the problem, but should be employed
cooperatively because of their high cost.

For the final listing of the MASFILE-II project the following
conventions were used. Non-English letters were printed as
their unmodified English equivalents. Dipthongs were printed
as if written as two letters, and an umlaut modifying a letter
caused a lower case e to be printed following the letter. These
substitutions permitted the relatively efficient printing of the
file, but they make it impossible to tell from the final print-
out whether or not the special characters are actually present
in the file.

Staff members of the FAUL libraries should set up conventions
for the printing of the special characters to make it possible
to distinguish between English and foreign letters. Printing
conventions (i.e. substitute characters) should also be set up
for the diacritical marks which are unprintable so that their
presence in the record would also be discernable from the printout.

9.2 *Uniformity of Data*

In order to insure that the data in the MASFILE files are usable and generally acceptable for automatic data processing, the FAUL library staff members and committees must set up conventions and procedures to insure that data is entered into the file in a uniform manner.

For automatic data identification and correct filing it is necessary that whenever a given piece of information appears in the file it appears in exactly the same form. Differences in spelling, punctuation, capitalization, and even spacing will cause two items intended to be the same to be considered different in processing. The likelihood of such variation requires high quality control, probably a team of central editors.

The most glaring example of difficulty in filing when data are not entered uniformly appears in the MASFILE-II file with entries beginning with U.S. For all data entered in MASFILE through the MARC Distribution Service, the initials U.S. are not separated by a space. For all data entered from FAUL member libraries, the initials are separated by a space. This difference causes all U.S. entries from LC to file after all U.S. entries from FAUL member libraries.

Furthermore, the presence of extra or additional information in some versions of an entry will cause it to be considered different from other versions of the same entry. This is most obvious in the MASFILE-II listing in the entries for McMurtrie, Douglas Crawford. All records for which the dates in the main entry are 1888 - file before all entries for which the dates are 1888 - 1944. And, of course, the two records in which this gentleman's name is spelled McMurtie file before all entries in which it is spelled McMurtrie.

Two items, intended to be the same, must appear identical whenever they appear in any record in the file. Note the MASFILE-II list (Section 12.0), where see references are generated from added entries and interfiled with main entries. Personal and corporate authors must be entered in the same format for both main and added entries.

9.3 *General Comments*

The problems outlined above are resolvable if libraries which plan to use the file or enter data into the file cooperate and agree to certain minimum standards and system objectives. In most machine-readable data base creation projects no purpose seems to be specified. A data base which is being constructed to provide machine access to the base (search and retrieval) should be constructed in a much different way than

one which is to be used for the production of catalogs and
indexes. The need for diacriticals is one area where, TIDB
believes, there is such a distinct dichotomy. A library
patron at a terminal searching in a data base, we feel, will
not remember nor perhaps know how to use diacriticals such as
the Polish Ł. He will miss those entries. On the other hand,
not including some diacriticals does violence to the original
language. Nevertheless, entries may be missed by patrons
using a retrieval system in which there is a blind insertion of
some diacriticals particularly if there is a complex procedure
required at his terminal to enter the character. Similar prob-
lems will exist because of the use, or lack of use, of abbrevi-
ations.

The answer to the diacritical and abbreviation question is rel-
atively simple: don't use any. This area is rather easily
resolved because no present system (non-machine based) can be
affected by it. Entries can still be humanly filed into exist-
ing card catalogs in the proper place. Future conversion pro-
jects should take these into consideration. The non-use of
diacriticals and abbreviations will resolve many of the problems
outlined above. MARC characters would have to be converted to
this standard but this is a much easier problem than entering
and converting to MARC particularly when one keeps in mind the
purpose of the file.

The libraries (FAUL) should, perhaps, constrain themselves to
using only characters on a standard print chain such as the
TN chain. If this is done, the internal representation of the
character will always be equivalent to the external representa-
tion and entering, proofing and queries will become much easier.

The standardization of entries can also be resolved. Perhaps
rules of uniformity will have to be established among coopera-
ting libraries. The adoption of Hines rules would be a solu-
tion, although probably unacceptable. One possible solution
here would be to enter authors, titles, and added entries in
both forms. This would provide both a mechanism of listing in
the traditional form and resolve filing problems which are
created by non-uniformity. The retrieval problem would also be
resolved. This is a very expensive procedure both in the cost
of storing and manipulating the entries. It should, however,
be explored. This alternative may be less expensive than attemp-
ting to standardize entries in FAUL libraries.

Despite all the problems described in this section, one must
keep in mind the purpose of the file. If it is to be used for
a retrieval system even with the data as presently entered, one
must ask the question, "Is it better to have a retrieval system
with 60% recall or no retrieval system?"

10.0   SUMMARY OF ACTIVITIES

Time spent in the MASFILE-II project can be divided into
three activities: (1) time spent in preparing and entering
new data from Cornell and SUNY-Buffalo, (2) time spent in
the conversion of retrospective SUNY -Buffalo data and MASFILE-
I data, and (3) professional time spent in programming, testing,
setting up computer runs and general supervision.

Of the new data input, time spent in completing cataloger's
worksheets at SUNY-Buffalo was 23-1/2 hours, and time spent
tagging data on cataloger's worksheets at Cornell was 28
hours. For the input of these new records into the files,
28-1/2 hours were spent in typing, 6 hours in proofreading,
5 hours in coding diacriticals and special characters, and
15-1/2 hours in corrections and addition of special character
codes.

For the conversion of retrospective SUNY-Buffalo and MASFILE-
I data, 142 hours were spent in proofreading, correction,
and conversion to MASFILE-II tagging; and 204 hours were spent
in typing of these corrections into ATS. The addition of the
Cornell holdings information to the retrospective SUNY-Buffalo
records consumed 20 hours of Cornell staff effort.

Of the TIDB professional time spent in the project, a total
of 375 hours were spent in writing and testing of the eleven
programs required for the project. An additional 71 hours
were required for setting up of production runs of the systems,
and 93 hours were spent in organizing, supervising and checking
the data.

This information is presented in tabular form in Figure 6.

INPUT OF NEW ACQUISITIONS	HOURS
UB cataloging	23.5
Cornell cataloging	28
input typing	28.5
proofreading	6
coding of special characters	5
correction typing	15.5

CONVERSION OF RETROSPECTIVE SUNY-BUFFALO
AND MASFILE-I RECORDS

addition of Cornell holdings	20
conversion and proofreading	142
correction typing	204

EXPENDED PROFESSIONAL TIME AT TIDB

program generation and debugging	375
setting up production runs	71
general supervision	93
Report Preparation	100
TOTAL	1111.5

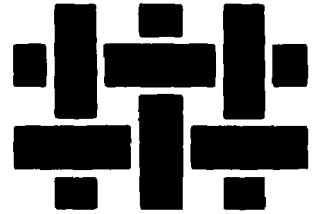FIGURE 6. Summary of Time Expended on the MASFILE-II
Project

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11.0 APPENDICES

Appendix 11.1 *MASFILE-II Work Statement*

Five Associated University Libraries

Binghamton / Buffalo / Cornell / Rochester / Syracuse

Office of the Coordinator of Library Systems

July 11, 1969

To: Ryburn Ross, Chairman
F.A.U.L. Systems Committee

Gerald Lazorick, Director
Technical Information Dissemination Bureau
SUNY-Buffalo

From: Ron Miller, Coordinator of Library Systems
F.A.U.L.

Subject: <u>MASFILE-II Phase I work statement</u>

The following tasks will be performed in order to satisfy the
objectives of the MASFILE-II Phase I Project as authorized and
funded at the May 12, 1969 meeting of the F.A.U.L. Board of
Directors. This statement incorporates revisions made by R. Miller,
G. Lazorick, and R. Ross on June 24, and the Systems Committee on
June 5-6. The Board of Directors has approved these revisions at
its meeting on July 7, 1969. The work as stated below is to be
accomplished under the general monitorship of the Systems Committee.
The names of persons assuming primary responsibility for specific
tasks are noted in the left margin.

WORK STATEMENT

Lazorick 1. All MASFILE-I records will be converted into the MARC-II
Communications Format as closely as possible. This conversion will
require computer programming and human intervention to accomplish.
The resultant format will be called the MASFILE-II Format.

Lazorick 2. Up to 1000 bibliographic records in the Library of Congress <u>Z</u>
Classification will be extracted from the tapes distributed by the
Library of Congress by the MARC Tape Distribution Service. These
records will be converted into the MASFILE-II Format, identified
and merged with the records converted in Step 1 above.

Lazorick 3. All records in the Z classification which were converted to
machine-readable form by the TIDB for the SUNYAB Library between
September 1, 1968 and July 1, 1969 will be extracted from the
SUNYAB tape files, listed by main entry in alphabetical order
arranged by the collation rules contained in <u>Computer Filing of
index, bibliographic, and catalog entries</u> by T. Hines and J. Harris
(Newark, Bro-Dart Foundation, 1966), and mailed to R. Ross at
Olin Library, Cornell University.

Ross   4. Cornell Library staff will add holdings statements to records
       extracted in item 3 composed of NUC #, Cornell's class # and
       quantity of copies owned in a tagging format to be determined by
       representatives of the Systems Committee, and return the above
       list to G. Lazorick. Time and cost measurements will be recorded
       by Cornell for inclusion in the project report.

Lazorick 5. Records extracted in step 3 and modified in step 4 above will
          be converted into the MASFILE-II Format and merged with the
          records previously converted.

Lazorick 6. All records processed in the Z classification between July 1 –
          October 31 will be input from F.A.U.L. Cataloger's worksheets by
          SUNYAB cataloging staff via ATS terminals at Buffalo. These records
          will also be merged with previously converted records.

Ross   7. All records processed onto F.A.U.L. Cataloger's worksheets in
       the Z classification between July 1 – October 31 will be sent from
       Cornell to Buffalo by mail.

Lazorick 8. These records will be input at Buffalo by ATS, and merged with
          records previously converted above.

Lazorick 9. Each record converted in this project will contain holdings
          statements where they exist as tagged 900 fields, and a "Not
          checked for holdings" statement will appear where holdings are
          unknown.

       10. A report will be written which will include the following:

          A. A summary of procedures used to accomplish the above tasks.

          B. A graphic comparison of the MARC-II format and the MASFILE-II
          Format, indicating literal identities, variations, omissions
          and additions between the two formats.

          C. Recommend what modifications to the F.A.U.L. MASFILE-II
          record are needed to transmit records (by mail or by IBM 2741
          communications terminal) from MASFILE to local terminals or
          line printers in the MARC II format.

          D. Recommend which data elements must be resident in a
          MASFILE-II record to perform by the Systems Committee-specified
          priority uses.

          E. Recommend workable procedures for each F.A.U.L. Library to
          modify MASFILE-II records whether input from the MARC Tape
          Distribution Service or from local cataloging systems in a
          central computer on a routine basis. (These procedures may be
          implemented in Phase II). Modifications may include the addition
          of local NUC codes, class numbers, holdings, and added entries.

          F. Recommend workable procedures for inputting current local
          records into MASFILE, omitting retrospective conversion unless
          clean data already exists in machine readable form, from each
          F.A.U.L. library.

G. Recommend a workable method for identifying and selecting
specific records and groups of records in MASFILE for listing
by subject, class numbers, and main entry.

H. Isolate major problem areas resulting from this project
which appropriate F.A.U.L. library staff members and committees
should solve.

I. Summarize time spent and activities performed in computer
testing, program runs, clerical operations, and professional time.

J. A printout containing a merged list of MASFILE-II records
arranged by the collation rules contained in Computer filing of
index, bibliographic, and catalog entries, by T. Hines and
J. Harris (Newark, Bro-Dart Foundation, 1966). The list will be
in main entry order, possibly with KWIC or KWOC title and
subject indexes.

This procedure will
1. Produce a merged tape file of records in the MASFILE-II
Format from five sources: MASFILE-I, LC, SUNYAB (retrospective),
SUNYAB (current), and Cornell, increasing the quantity of F.A.U.L.
records in the Z classification.

2. These records will be in a unified, revised format as close
to MARC-II as possible.

3. Duplicated items will appear as separate items in the file --
an unfortunate circumstance in the long run in my view, since
records in the file will not be checked locally by all F.A.U.L.
libraries during this phase. If we persist in the present direction
of developing an on-line query system for interlibrary loan and
other uses this updating work will have to be done sometime.
The question HOW will be answered as part of the F.A.U.L. contract
with the Technical Information Dissemination Bureau.

This means that these additional tasks must be done by other F.A.U.L. member
personnel:
1. Cornell and Buffalo must redesign the F.A.U.L. Cataloger's
Worksheet to permit the addition of MARC-II tags, delimiters
and indicators, as well as mandatory and optional fields. (Johnston
and Hacker meet in my office on July 15.)

2. Three tags unique to each library must be assigned to
contain NUC code, local call number, and quantity of copies held
by each library. These tags should come from the 900-999 tags
reserved for local use in the MARC-II Communications Format.
The information contained in them may be inserted by machine
if the data appears elsewhere on the worksheet.

3. Cataloging staff should be assigned at Cornell and Buffalo
to fill in the revised worksheet with data elements as part
of the cataloging operation, for Z classed items at each
institution. Myles Slatin has approved use of library staff and
worksheets for this purpose.

The details and unforeseen problems will be worked out as the work progresses. In general, the above tasks lay out the operational areas and output requirements of F.A.U.L.' agreement with The Technical Information Dissemination Bureau at SUNY-Buffalo. A letter of intent has been sent and accepted by Gerry.

This work statement and the letter of intent constitute a formal arrangment between the F.A.U.L. Board of Directors and the Technical Information Dissemination Bureau.

Copies to: D. Kaser, M. Slatin

Appendix II.2 *Hex-Code MARC Character Equivalency Table*

HEX CODE-MARC CHARACTER

HEX CODE	MARC-II CHARACTER
'00'	NULL
'01'	START OF HEADING
'02'	START OF TEXT
'03'	END OF TEXT
'37'	END OF TRANSMISSION
'2D'	ENQUIRY
'2E'	ACKNOWLEDGE
'2F'	BELL
'16'	BACKSPACE
'05'	HORIZONTAL TABULATION
'25'	LINE FEED
'0B'	VERTICAL TABULATION
'0C'	FORM FEED
'0D'	CARRIAGE RETURN
'0E'	SHIFT OUT
'0F'	SHIFT IN
'10'	DATA LINK ESCAPE
'11'	DEVICE CONTROL 1
'12'	DEVICE CONTROL 2
'13'	DEVICE CONTROL 3
'3C'	DEVICE CONTROL 4
'3D'	NEGATIVE ACKNOWLEDGE
'32'	SYNCHRONOUS IDLE
'26'	END OF TRANSMISSION BLOCK
'18'	CANCEL
'19'	END OF MEDIUM
'3F'	SUBSTITUTE
'27'	ESCAPE
'1C'	END OF FILE
'1D'	END OF RECORD
'1E'	FIELD TERMINATOR
'1F'	DOUBLE DAGGER
'40'	SPACE
'5A'	EXCLAMATION POINT, OR SIGN (4F) 5-20-
'7F'	DOUBLE QUOTE
'7B'	NUMBER SIGN
'5B'	DOLLAR SIGN
'6C'	PERCENT SIGN, CENT SIGN
'50'	AMPERSAND
'7D'	SINGLE QUOTE
'4D'	LEFT PARENTHESIS
'5D'	RIGHT PARENTHESIS
'5C'	ASTERISK
'4F'	PLUS SIGN
'6B'	COMMA
'60'	MINUS SIGN

HEX CODE	MARC-II CHARACTER
'4B'	PERIOD
'61'	SLASH
'F0'	ZERO
'F1'	ONE
'F2'	TWO
'F3'	THREE
'F4'	FOUR
'F5'	FIVE
'F6'	SIX
'F7'	SEVEN
'F8'	EIGHT
'F9'	NINE
'7A'	COLON
'5E'	SEMI-COLON
'4C'	LESS THAN
'7E'	EQUAL SIGN
'6E'	GREATER THAN
'6F'	QUESTION MARK
'7C'	AT SIGN
'C1'	A
'C2'	B
'C3'	C
'C4'	D
'C5'	E
'C6'	F
'C7'	G
'C8'	H
'C9'	I
'D1'	J
'D2'	K
'D3'	L
'D4'	M
'D5'	N
'D6'	O
'D7'	P
'D8'	Q
'D9'	R
'E2'	S
'E3'	T
'E4'	U
'E5'	V
'E6'	W
'E7'	X
'E8'	Y
'E9'	Z

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HEX CODE	MARC-II CHARACTER
'AD'	LEFT BRACKET (4A) 5-20-69
'EO'	INVERTED SLASH
'BD'	RIGHT BRACKET (5A) 5-20-69
'5F'	CAP, NOT SIGN
'6D'	
'79'	
'81'	A, LOWER CASE
'82'	B, LOWER CASE
'83'	C, LOWER CASE
'84'	D, LOWER CASE
'85'	E, LOWER CASE
'86'	F, LOWER CASE
'87'	G, LOWER CASE
'88'	H, LOWER CASE
'89'	I, LOWER CASE
'91'	J, LOWER CASE
'92'	K, LOWER CASE
'93'	L, LOWER CASE
'94'	M, LOWER CASE
'95'	N, LOWER CASE
'96'	O, LOWER CASE
'97'	P, LOWER CASE
'98'	Q, LOWER CASE
'99'	R, LOWER CASE
'A2'	S, LOWER CASE
'A3'	T, LOWER CASE
'A4'	U, LOWER CASE
'A5'	V, LOWER CASE
'A6'	W, LOWER CASE
'A7'	X, LOWER CASE
'A8'	Y, LOWER CASE
'A9'	Z, LOWER CASE
'CO'	LEFT BRACE
'6A'	
'DO'	RIGHT BRACE
'AI'	
'07'	DELETE
'20'	(unassigned)
'21'	(unassigned)
'22'	(unassigned)
'23'	(unassigned)
'24'	(unassigned)
'15'	(unassigned)
'06'	(unassigned)

HEX CODE	MARC-II CHARACTER
'17'	(unassigned)
'28'	(unassigned)
'29'	(unassigned)
'2A'	(unassigned)
'2B'	(unassigned)
'2C'	(unassigned)
'09'	(unassigned)
'0A'	(unassigned)
'1B'	(unassigned)
'30'	(unassigned)
'31'	(unassigned)
'1A'	(unassigned)
'33'	(unassigned)
'34'	(unassigned)
'35'	(unassigned)
'36'	(unassigned)
'08'	(unassigned)
'38'	(unassigned)
'39'	(unassigned)
'3A'	(unassigned)
'3B'	(unassigned)
'04'	(unassigned)
'14'	(unassigned)
'3E'	(unassigned)
'E1'	(unassigned)
'41'	(unassigned)
'42'	POLISH L, UPPER CASE
'43'	SCANDINAVIAN O, UPPER CASE
'44'	D WITH CROSS BAR, UPPER CASE
'45'	ICELANDIC THORN, UPPER CASE
'46'	AE
'47'	OE
'48'	MAIGKIY ZNAK
'49'	DOT IN MIDDLE OF LINE
'51'	MUSICAL FLAT
'52'	SUBSCRIPT PATENT MARK
'53'	PLUS OR MINUS
'54'	(unassigned)
'55'	(unassigned)
'56'	ALIF
'57'	(unassigned)
'58'	AYN
'59'	POLISH L, LOWER CASE
'62'	SCANDINAVIAN O, LOWER CASE
'63'	D WITH CROSS BAR, LOWER CASE
'64'	ICELANDIC THORN, LOWER CASE
'65'	AE, LOWER CASE
'66'	OE, LOWER CASE
'67'	TVERDYI ZNAK
'68'	TURKISH I, LOWER CASE
'69'	BRITISH POUND SIGN
'70'	ETH

APPENDIX II.2

HEX CODE	MARC-II CHARACTER	
'71'	(unassigned)	
'72'	(unassigned)	
'73'	(unassigned)	
'74'	(unassigned)	
'75'	(unassigned)	
'76'	(unassigned)	
'77'	(unassigned)	
'78'	(unassigned)	
'80	(unassigned)	
'8A'	(unassigned)	
'8B'	(unassigned)	
'8C'	(unassigned)	
'8D'	(unassigned)	
'8E'	(unassigned)	
'8F'	(unassigned)	
'90'	(unassigned)	
'9A'	(unassigned)	
'9B'	(unassigned)	
'9C'	(unassigned)	
'9D'	(unassigned)	
'9E'	(unassigned)	
'9F'	(unassigned)	
'A0'	(unassigned)	
'AA'	(unassigned)	
'AB'	(unassigned)	
'AC'	(unassigned)	
'AD'	(unassigned)	
'AE'	(unassigned)	
'AF'	(unassigned)	
'B0'	(unassigned)	
'B1'	(unassigned)	
'B2'	(unassigned)	
'B3'	(unassigned)	
'B4'	(unassigned)	
'B5'	(unassigned)	
'B6'	(unassigned)	
'B7'	(unassigned)	
'B8'	PSEUDO QUESTION	
'B9'	GRAVE	
'BA'	ACUTE	
'BB'	CIRCUMFLEX	
'BC'	TILDE	
'BD'	MACRON	BD 5-20-69
'BE'	BREVE	
'BF'	SUPERIOR DOT	
'CA'	UMLAUT	
'CB	HACEK	
'CC'	ANGSTROM	
'CD'	LEFT LIGATURE	
'CE'	RIGHT LIGATURE	
'CF'	HIGH COMMA, DIACRITICAL	

HEX CODE	MARC-II CHARACTER
'DA'	DOUBLE ACUTE
'DB'	CANDRABINDU
'DC'	CEDILLA
'DD'	RIGHT HOOK
'DE'	DOT BELOW CHARACTER
'DF'	DOUBLE DOT BELOW CHARACTER
'EA'	CIRCLE BELOW CHARACTER
'EB'	DOUBLE UNDERSCORE
'EC'	UNDERSCORE
'ED'	LEFT HOOK
'EE'	RIGHT CEDILLA
'EF'	UPADHMANIYA
'FA'	DOUBLE TILDE, LEFT
'FB'	DOUBLE TILDE, RIGHT
'FC'	DIERESIS
'FD'	(unassigned)
'FE'	HIGH COMMA, CENTERED
'FF'	(unassigned)

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Appendix 11.3 Computer Programs Used for
the MASFILE-II Project

11.3 COMPUTER PROGRAMS USED FOR THE MASFILE-II PROJECT

I.D.	NAME	DESCRIPTION	LANGUAGE	DOCUMENTATION AVAILABLE
P-1	MCATS	Converts MASFILE I or SUNYAB tags in a file to approx. MASFILE-II tags, and formats file for ATS input	COBOL	NO
P-2	ATSLIST	Prints a list from ATS format	COBOL	NO
P-3	SUNYAB ATS Utility	Loads MARC-II (MAS-FILE-II) coded records into ATS	360 Assembler	NO
P-4	ATS QUEUE DUMP Utility	Transfers ATS file to Magnetic tape	(ATS Syst. Prog.)	
P-5	ATS MARC	Converts ATS record format into MASFILE-II format	COBOL	NO
P-6	Z OUT	Searches and extracts Z-class records from merged MARC-II tapes; converts MARC-II to MASFILE-II format	COBOL	NO
P-7	Z EXTRA	Extracts Z-class records from SUNYAB master file and stores them on magtape	COBOL with FORTRAN subroutine	NO
P-8	SLAUTHR	Extracts main entry up to first delimiter & places field at beginning of record for sorting	COBOL	NO
P-9	360 Utility	Sorts records from P-8 operation	360 Assembler	YES
P-10	MF STRIP	Strips off P-8 sort field after sorting so that it will not print	COBOL	NO

I.D.	NAME	DESCRIPTION	LANGUAGE	DOCUMENTATION AVAILABLE
P-11	MASPRNT	Prints MASFILE-II records, with wide options for field se-lection and formatting	COBOL	YES
P-12	NO HOLD	Adds "not checked for holdings" to "speci-fied"	COBOL	NO
P-13	M FILE	Extracts main entry sorting field from MARC-II or MASFILE-II records	PL-I	NO

A Microfiche copy of the Masfile - II
Experimental Holdings List, included in
the original report, is not reproduced
here. Users interested in this List
should contact Five Associated University
Libraries.