XA9950032

ERES

A PC PROGRAM FOR NUCLEAR
DATA COMPILATION IN EXFOR FORMAT

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Abstract: This document describes the use of the personal computer software package ERES for compilation of experimental nuclear reaction data in the internationally agreed EXFOR format. The software is available upon request from the IAEA Nuclear Data Section.

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1. INTRODUCTION

EXFOR

EXFOR is the internationally agreed system for the compilation and exchange of nuclear reaction data in a uniform format (EXchange FORmat). It is maintained by a network of national and international nuclear data centers for the benefit of nuclear data users in all countries. The EXFOR system is documented in the following references:

- H.D. Lemmel (ed.), "NDS EXFOR Manual",
  report IAEA-NDS-3, rev. 85/8 (1985).

- O. Schwerer, H.D. Lemmel, "EXFOR Dictionaries",
  report IAEA-NDS-2, (frequently updated).

ERES

ERES is a PC software package assisting the nuclear data compilation in EXFOR. It has been developed at Chinese Nuclear Data Center (CNDC), IAE, in cooperation with Nankai University, Tianjin, under an IAEA research contract to help the EXFOR compilation using a standard PC IBM/XT, IBM/AT or compatible.

ERES software was written mostly in FOXBASE+ and FORTRAN 77, a few low level subroutines for on-line help and the editor were written in Assembler.

The main task of the software is to assist in the EXFOR compilation providing some useful and flexible tools like on-line EXFOR keywords abbreviation help etc.

The main functions of ERES:

- Editor: Includes input, output, merge, and editor.
- Check: Checks EXFOR data tape and generates file of error messages.
- Retrieve: retrieves by ENTRY, SUBENT, or REACTION.

If users of ERES encounter any deficiencies or have any suggestions, comments for improvements for ERES version 1.01, please contact:

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2. ERES STRUCTURE REQUIREMENTS AND CONVENTIONS

In the development of the package, the following considerations were dominant:

- Modular structure permits to expand, improve and modify parts of the software package, to add new blocks or update existing ones.

- The package was designed for a standard PC (IBM/XT or IBM-AT compatible) and an important effort was devoted to run the software within 640 Kbytes of Random Access Memory (RAM).

- Much effort was done to provide an "on-line" EXFOR compilation help system using the EXFOR manual and list of keywords abbreviation, etc.

- The software is "Menu Driven" and the compiler does not need a detailed manual to operate it.

The minimum requirements for using our software are:

- IBM XT,AT or PS/2 PC or compatible
- 640 KBytes of RAM
- CGA,EGA or VGA monitor
- hard disk with 2 MBytes free
- one floppy disk drive 5.25" or 3.5" High Density
- DOS 3.0 or higher version

A mathematical coprocessor is not necessary but will be useful.

Assumptions

1) The file extension ".DBF" is used for new entries or source files. Source files are created using the option "Edit" from the main menu.

2) The file extension ".TXT" is reserved for an EXFOR file consisting of one EXFOR entry. Every EXFOR entry is generated from a source file after running the (2) in "Edit" menu to generate N1,N2 and 67-79 col.

3) The file extension can be converted from ".DBF" to ".TXT", or from ".TXT" to ".DBF" by using the selection "Transfer" in Main Menu.

4) The EXFOR Dictionaries file should be in ASCII format and with fixed file name "DIC0.TXT" and index file "DICM.TXT".

5) The file "EXFOR.DBF" is standard structure for EXFOR data tape. Do not rename or delete any of them.

6) Listing of errors and warnings from the latest run of the check program are stored in the file with extension ".ERR".

3. INSTALLATION

ERES (ver 1.01) is available on two 5.25" double sided, high density diskettes (1.2MB) or two 3.5" double sided, high density diskettes (1.4MB).

For convenience, the program should be installed on hard disk. Approximately 2 MBytes free memory are needed !!!

The installation procedure is very easy, which means that you need only install those modules you need.

The master diskettes should contain the following files:

Disk #1

Files	Description
MFOXPLUS	FOXBASE+ system diskettes
MENU.PRG	master control program
EXFOR.DBF	EXFOR base
KEY.DBF	keywords abbreviation contrast base
SYSID.DBF	System keywords base
GET_NUM.EXE	Execution program of generated N1,N2 and 67-79 column
EXFOR.HLP	Description for ERES in Chinese
EXFOR.DOC	Description for ERES in English
10545.DBF	Example of EXFOR data base

Disk #2

Files	Description
CHECK.EXE	Execution program of Check program
Q.EXE	Quick editor Software
10545.TXT	Data text file
KEYHLP.COM	Help file of Keywords abbreviation
DIC0.TXT	Dictionaries information file (ASCII code)
DICM.TXT	Dictionaries contents file(ASCII code)
CHECK.FOR	Source programs of Check program in FOR sub-directory.

All these files should be installed in your hard disk.
Do not rename or delete any of them.

Installation procedure

Be sure that the desired sub-directory has been created before you run the installation procedure.

- Make sub-directory, type:

  MD EXFOR < Enter > (EXFOR is sub-directory name)

- Change sub-directory, type:

  CD EXFOR < Enter >

- Place the diskette #1 in the diskette drive A

  COPY A:*.* C: < Enter >

- Place the diskette #2 in the diskette drive A

  COPY A:*.* C: < Enter >

4. QUICK START

Before you start to use ERES as your software for EXFOR compilation, you must get used to it.

From the system prompt c: > type:

        cd exfor < Enter >   (exfor is a sub-directory name where you have installed the ERES software)

then type:

        exfor < Enter >   (exfor is a batch file which contents : mfoxplus menu)

The program starts reading EXFOR keyword abbreviations to memory, then the Main Menu will be displayed on top of the screen as follows:

ERES ver. 1.0 Main Menu

Return	Edit	Check	Retrieve	List	Transfer	Advance	Quit

Using keyboard arrows select the option you want, then press < Enter >. After that, ERES is ready to work properly.

5. COMPILING A NEW EXFOR ENTRY

Select "Edit" from the Main Menu, then the Edit menu will be displayed on the screen as follows:

```
*************************************************************
**                       EDIT MENU                       **
**-------------------------------------------------------**
**        (0) RETURN             DBASE                    **
**        (1) CREATE             EXFOR BASE               **
**        (2) GENERATE           N1,N2 AND 67-79 COL      **
**        (3) OUTPUT             EXFOR BASE               **
**        (4) MODIFY             EXFOR BASE               **
**        (5) MERGE              EXFOR BASE               **
*************************************************************
```

SELECT NUMBER :

Select (1) to create a new EXFOR entry, then select (2) to generate some needed information (only .dbf files). Select "Check" in Main Menu to check the EXFOR data tape according to the EXFOR rules, if errors are found, select "Update" in "List" of "Main Menu" to modify them, finally, select "Advance" in "Main Menu" to generate needed information (last two commands only for EXFOR entries with extension .txt). A correct EXFOR data tape is finished.

(I)   Establishment of EXFOR base

Below the main menu, type number (1), ERES comes into the establishing EXFOR base operation, the following menu appears:

```
*********************************************************
*         (0) Return                                  *
*         (1) Create exfor base                       *
*         (2) Append exfor record                     *
*         (3) Add keyword                             *
*********************************************************
```

Select number :

Input EXFOR base name: 10047 (as example)

In this menu, (1) stands for establishing a new EXFOR base, (2) stands for adding a record to the existing base, (3) stands for adding the table of abbreviations of keywords.

1.   Establishment of EXFOR data base

The name of the EXFOR base is a string consisting of letters and/or digits and may not exceed eight characters. We suggest that the entry number should be used as base name, for example, 10047 etc. After the base name has been typed, press <ENTER>.
If the base name already exists, ERES will remind you whether it will be overlaid, or replaced by a new base name, if you want to overlay it, press "Y". If not, i.e. to keep the base press "N". Then, after typing a new base name, the following graph appears:

RECORD NUMBER

1---10	11	12---22	23---33	34---44	45---55	56---66

Begin to input the record.

2.   Input of EXFOR data

Input the text into 1-66 columns row by row, every row consists of seven fields, press <Enter> key after a field has been completed, and ERES will come into the next field. Before pressing <ENTER> at the last field, you can use the <BACKSPACE> key and shift the arrow to correct the text. If there is no mistake, the arrow should shift to the last field, press the <ENTER> key, ERES will come into the next record. The empty space between the fields is to make the format clear. They do not exist in the EXFOR data actually.

3.   Adding a record

In the above Edit menu, choose (2) for adding a record to the existing base, if the input base name can not be found, ERES indicates that the base does not exist and lists all the base names on the current disk. After inputting the correct name of the base, ERES will show the number of the record entered and the contents of the last record. Press any key, the same picture as that of the input base appears.

4.   Technique of input

To simplify the input, ERES can adopt 1 or 2 character as keyword or system identifier. When the abbreviation is used, the first character should be "*", for example for system identifier "ENTRY" type "*E", for "SUBENT" just type "*S" etc.

Press two "Shift" keys simultaneously to get the keywords-abb. information on the screen at any time. When an incorrect abbreviation is typed, or the corresponding word cannot be found, the arrow remains in the first column of the row, then type the correct one again while the other columns need not to be input again.

For the table of abbreviations, see Appendix A.

Below the BIB of SUBENT '001', ERES automatically shows the most important keywords such as TITLE, AUTHOR, INSTITUTE, REFERENCE and HISTORY, without loosing generality. For example, if the row of TITLE is not long enough for the text and if another keyword appears in the next row, one can cancel the new keyword by using the space key and continue inputting the text in the next row.

For N1 and N2 fields in a row with system identifier such as ENTRY, SUBENT you can input justified left the numbers, ERES can automatically justify right.

N1 and N2, being statistical values (for example, N1, N2 in the row with BIB system identifier), need not be input. They can be generated by selecting (2) in the Edit Menu. But for system identifiers such as DATA and COMMON, the statistic value for N1 must be input.

When there are a lot of data, we suggest that you should first input the first row data, the rest of the data can be input "full-screen" (Quick Editor by selecting (4) in the Edit Menu, then selecting (1)), this will improve the input speed.

5.   To terminate input

When an EXFOR base input is finished or need to be stopped temporarily, type three "*" on the first field of the present record and press <ENTER> key (or press function key F10). The input mode will be ended, and the base file will be saved on disk.

(II)   Generation of N1,N2 and 67-79 columns

In the Edit Menu choose option (2), ERES will generate N1, N2, and 67-79 columns. First, input the name of the EXFOR base to be operated, then choose the option of outputs ,either on the printer or on the screen.

Finally, the sequence of system identifiers in the above base file is checked, N1,N2 and 67-79 columns are generated and the proper information is output.

(III) Output of the EXFOR data

In the Edit Menu, choose option (3), ERES will show the output Menu:

OUTPUT MODEL

```
********************************************************
*             (0)  RETURN                              *
*             (1)  ALL        OUTPUT                    *
*             (2)  PART       OUTPUT                    *
*             (3)  IN SUBENT  OUTPUT                    *
********************************************************
```

Select number: 1
Output drive   (1) screen   (2) printer:

Output can be generated in three ways: as a whole, partial, or according to SUBENT number (so called "IN SUBENT OUTPUT").
Partial output means output beginning at the n-th record and ending at (n+p)-th record, where n,p are integers given by the user.
"IN SUBENT OUTPUT" requires to type the SUBENT number, if this number does not exist ERES will remind you which numbers the base has. Type "0" (zero) to return to the main menu.

(IV) Editoring an EXFOR file

When you want to revise an EXFOR file or add, or delete a record in the file, choose (4) in the Edit Menu. ERES will show the following picture: (for a ".dbf" file).

EDIT MODEL

```
********************************************************
*             (0)  Return                              *
*             (1)  Full screen editing                 *
*             (2)  Menu mode editing                   *
********************************************************
```

Select number: 2

Input EXFOR base number: 10047

(1)   In the case of full-screen editing, ERES can shift the arrow up, down, left or right, and also add or delete the character or record. After revision, type CTRL-KX (CTRL IS CTRL key ,"-" indicates that the CTRL key and K should be pressed simultaneously), save the EXFOR base on the disk, and return to the main menu. For the operation of full-screen editing, see Appendix B.

(2)   Menu editing mode will show the following menu:

                        EDIT-SUB MENU


```
**********************************************
*          (0) Return master                *
*          (1) Delete records               *
*          (2) Insert records               *
*          (3) Modify records               *
*          (4) Delete a SUBENT              *
**********************************************
```


Select number:

Option (1) means to delete the records from the n-th record to the (p+n)-th records, where n,p are integers given by the user.

Option (2) means to insert a record before some other record, the way of input is the same as that of the establishing base.

Option (3) means that the user can shift the arrow and use the Pgup and Pgdn key to turn the page. Type CTRL-B to move the picture to the left. Type CTRL-Z to move to the right. With this option however one can not delete and insert a record. Type CTRL-W to exit editing and save on the disk. Type CTRL-Q to exit editing without saving on the disk.

(V)   Merging EXFOR bases into one TAPE

If one chooses (5) in the Edit Menu, one can merge one or several EXFOR bases into one TAPE. On the screen appears the following prompt:

            MERGE EXFOR TAPE
            Input merge tape number: 10000 <ENTER>
            Exfor base name: 10047 <ENTER>
            Exfor base name: 10057 <ENTER>
            Exfor base name: <ENTER>

The names of the merged EXFOR base should be entered according to the numbers of the base names in increasing order. Finally press the <ENTER> key, ERES will perform the merging.

In the generated EXFOR data TAPE, the first record is TRANS, the last one is ENDTRANS.

Note: The merged EXFOR data TAPE also could be combined with other bases to a new TAPE. Under DOS the file name extension of EXFOR data TAPE is <.txt>.

(VI)   Built-in protective measures

Whenever the computer waits for your response and if you have changed your mind, you only need to type "0" (zero) and to press the <ENTER> key. ERES will return to the main menu right away.

Whenever you want to stop the current operation, you only need to press the <ESC> key. On the screen appears the following prompt:

"Terminate command file ? (Y/N)", type "y" and press <ENTER>, dot (.) will appear.

Then type "DO MENU <ENTER>", the main menu will appear again.

6. EDITING AN EXISTING EXFOR ENTRY

Every EXFOR entry (.txt) is produced from the source file (.dbf) after selecting (2) in THE "EDIT MENU". In order to update, correct or list any < .txt > file, select the option "List" from the Main Menu, then the following picture will appear on the screen:

```
┌─────────┐
│Return   │
│List     │
│Update   │
│Help     │
└─────────┘
```

The file contents can be displayed by selecting "List" and modified by selecting "Update". In the case of option "Update", once you have selected the file to edit, you enter the editing environment (Quick editing "Q.EXE"), and can make use of the editing Commands (See Editing commands in chapter 7) to make any update or correction.

When the updating has been finished, press ^ks to save the file or press the ESC key to display the quick editing main menu on the top of the screen:

Quick editing Main Menu

File	Window	Block	Search	Print	Macro	Editing	Other	Quit

move the cursor to Quit, press twice " ↓ " then < Enter > , save file and return to ERES Main Menu.

Print and Search can be executed in the Quick editing as well.

7. EDITOR COMMANDS

Quick editing Q.EXE

To update a text file, select "List" in the main menu, you will come into the q.exe editing mode.

The ERES editor is a standard ASCII editor; it can load any file with a maximum width of 81 characters.

The loaded file will be shown on the screen using a full screen window with border.

Editor Commands

FUNCTION	COMMANDS
----- Cursor movement commands -----	
Bottom of Screen	^End
Cursor Down	Down arrow key
Cursor Left	Left arrow key
Cursor Right	Right arrow key
Cursor Up	Up arrow key
End of Line	End key
First of Line	Home key
Goto block end	^QK
Goto block begin	^QB
Return	Return key
Tab Left	Shift tab key
Tab Right	Tab key
Top of Screen	^Home
Word Left	^Left arrow
Word Right	^Right arrow

----- Scroll (move screen) commands -----	
Bottom of File	^PgDn
Goto Line	^J
Previous Position	^P
Make Top of Screen	F5
Make Ctr of Screen	Shift-F5
PgDn	PgDn
PgUp	PgUp
Screen right	Alt-F6
Screen left	Alt-F5
Scroll down	^Z
Scroll up	^W
Top of File	^PgUp

----- Delete and Insert commands -----

Add Line	F2
Align	^A
Back Space	Backspace key
Delete Char	Del key
Delete Line	^Y, Alt-D
Delete Right Word	^T
Delete to EOL	^QY, F6
Dup Line	F4
Join Line	Alt-J
Literal	^P
Undo Cursor Line	^QL
Return	Return key
Split Line	^N, Alt-S
Shift Left	Shift-F1
Shift Right	Shift-F8

----- Find and Replace commands -----

Find	^QF
Repeat Find	^L
Replace	^QA

----- File commands -----

Edit File	^KE, Alt-E
Exit	^KD
Change filename	^KF, Alt-O
File to System	^KX
Kill File	^KZ
Next File	^KN, Alt-N
PQuit to Main	^KQ
PQuit to System	F3
Prev File	^KP
Read File	^KR, Alt-R
Save File	^KS
Unkill	^U
Move Block	Alt-M, ^KV
Copy Block	Alt-C, ^KC
Mark Block Begin	F7, ^KB
Mark Block End	F8, ^KK
Mark Line	Alt-L
Kill Block	^KY
Read Block	Alt-R, ^KR
Unmark Block	Alt-U, ^KH
Write Block	^KW

----- Scratch Buffer commands -----

Load Scr Buff	^BL
Store Scr Buff	^BS
Zap Scr Buff	^BZ

----- Windowing commands -----

Split Screen	^OH
One Window	^OO
Next Window	^ON
Prev Window	^OP

----- Miscellaneous commands -----

To Edit Main Menu	ESC
Shell	F9
Toggle Tabs Expand	^QT
Toggle Ins	Ins key

8. CHECKING OF AN EXFOR DATA TAPE

(1)   Check EXFOR data tape

ERES can check an entire EXFOR data tape, which includes a TRANS in the first record and one or several EXFOR entries.

Select "Check" from the Main Menu, then select "Check" in the sub-Menu.

On the screen the following will appear:

> Input year (xx): 92 <cr> (as example)
> Input EXFOR file name
> 10545.txt <cr> (EXFOR data file full name with the extension)

The error information file 10545.err is saved on disk. Type ^c to suspend, type <ENTER> to return to main menu.

(2)   Syntax rules checked by ERES

The following syntax rules are checked in the present ERES ver. 1.01,

1. Whether the keyword or System identifier exists or not.
2. Whether the keyword or System identifier is obsolete or not.
3. Whether the keyword needs to have coded information.
4. If the keyword has coded information, whether the code is correct (including check whether it is obsolete or not).
5. If there is a code, whether the parenthesis in column 12 has the right position.
6. If there is an open parenthesis for coding, whether there exists a closing parenthesis.
7. Each keyword for the standard rules of EXFOR coding.

> (CODE1,CODE2)
> or (CODE1)
> (CODE2)

8. Numeration of the lines for cards BIB, ENDBIB, ENDSUBENT and ENDENTRY are checked.

9. Coding syntax is checked for the following keywords:

A) No code needed. Check for text only.

- COMMENT
- CORRECTION
- SAMPLE
- TITLE
- COVARIANCE
- INC-SPECT

B) Keywords with codes

- AUTHOR
- ANALYSIS
- INC-SOURCE
- INSTITUTE
- METHOD
- ADD-RES
- RESULT
- DETECTOR
- STATUS
- PART-DET
- REACTION

"Pointers" are checked partially only.

9. DICTIONARIES PROCEEDING

IMPORTANT:

This option has to be chosen only when you are running the ERES package for the first time or you have received an updated Dictionary file.

Select "Check" from the Main Menu, then select "NewDict" in the sub-menu. Input the Dictionary source name, for example DICTS.TXT. After running the "NewDict" option, DIC0.TXT and DICM.TXT are generated, it can save the storage space of hard disk and improve the index speed.

10. RETRIEVE

Retrieve EXFOR data

To retrieve an EXFOR dbf file, Select "Retrieve" from the main menu. On the screen the following picture will appear:

```
              ***    Retrieve Menu    ***
  0. RETURN                  1. Retrieve by ENTRY
  2. Retrieve by SUBENT      3. Retrieve by BIB
  4. Retrieve by COMMON      5. Retrieve by DATA
  6. LIST ALL ENTRY NUM      7. LIST ALL SUBENT NUM
  8. Retrieve by REACTION
```

Retrieve information is saved into a specialized file.

11. ADVANCED FEATURES

An EXFOR file should satisfy a standard format, which requires certain controlled information such as END records (ENDBIB, ENDSUBENT, ENDENTRY, ENDDATA etc.), N_1 and N_2 numbers and record numbers (in column 67 to 79). The END records have to be provided by the compiler. The N_1, N_2 and record numbers can be generated by selecting the option "Advanced" from the Main Menu for .txt entries (for .dbf files use GENERATE in EDIT MENU, see chapter 5 of manual).

Appendix A:

KEYWORDS ABBREVIATION TABLE

*AR	ADD-RES	*DT	DETECTOR	*FA	FACILITY	*NB	NOBIB
*AN	ANALYSIS	*EM	EMS-SEC	*FL	FLAG	*NC	NOCOMMON
*AS	ASSUMED	*EN	EN-SEC	*HL	HALF-LIFE	*ND	NODATA
*B	BIB	*EB	ENDBIB	*HI	HISTORY	*NS	NOSUBENT
*CM	COMMENT	*EC	ENDCOMMON	*IO	INC-SOURCE	*PD	PART-DET
*C	COMMON	*ED	ENDDATA	*IS	INC-SPECT	*RD	RAD-DET
*CR	CORRECTION	*EE	ENDENTRY	*LP	LEVEL-PROP	*RR	REL-REF
*CV	COVARIANCE	*ES	ENDSUBENT	*ME	METHOD	*RE	RESULT
*CI	CRITIQUE	*E	ENTRY	*MC	MISC-COL	*SA	SAMPLE
*DD	DECAY-DATA	*EY	EXP-YEAR	*MR	MONIT-REF	*S	SUBENT
*DM	DECAY-MON	*ET	ENDTRANS	*MO	MONITOR	*T	TRANS