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# NUCLEAR DATA SERVICES

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# ANDEX

## A PC SOFTWARE ASSISTING THE NUCLEAR DATA COMPILATION IN EXFOR

by V. Osorio

IAEA Nuclear Data Section

**Abstract** : This document describes the use of personal computer software ANDEX which assists the compilation of experimental nuclear reaction data in the internationally agreed EXFOR format. The software is available upon request, on a set of two diskettes, free of charge.

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# ANDEX

A PC software assisting the nuclear data compilation in EXFOR.
by V.Osorio.
IAEA.   Nuclear Data Section.

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# 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 the benefit of nuclear data users in all countries. The EXFOR system is documented in the following references :

- V. McLane (ed.), " EXFOR Manual", report IAEA-NDS-103 (1989).
- 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 (frecuently updated).
- P.M. Attree, P.M. Smith, "System Specifications for the NDS Dictionary System", report IAEA-NDS-5, Rev. 1 (1982).
- H.D. Lemmel , "Short Guide to EXFOR", report IAEA-NDS-1, Rev. 5 (1986).

## ANDEX

ANDEX is a PC software package Assisting the Nuclear Data compilation in EXfor. It has been developed in the Nuclear Data Section (NDS) of the International Atomic Energy Agency (IAEA) to help the Exfor compilation using a standard PC IBM/AT or compatible.

The main task of the software is to assist in the Exfor compilation providing some useful and flexible tools like on-line Exfor keywords, codes and a help system.

This Manual is designed to give guidance to the use of the ANDEX package.

ANDEX in it present first version (1.01 TEST) is distributed under the expectation that users of ANDEX report any encountered deficiencies or suggestions for improvements to the address given bellow. Several options and modules in the package are still under development. For any comments, please write to or contact:

| | | |
|---|---|---|
| Nuclear Data Section (NDS) | e-mail: | RNDS@IAEA1 |
| International Atomic Energy Agency | fax: | (43-1)234564 |
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| Austria | telephone: | (43-1)2360-1714 |

# 2. ANDEX 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 / AT compatible) and an important effort was devoted trying to run the software within 640 Kbytes of Random Access Memory (RAM).

- Much effort was put to provide an "*on-line*" Exfor compilation Help system using the Exfor Manual and Dictionaries, list of keywords, codes, etc.

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

- Self-updating: As the Exfor extructure (coding, rules, etc) are continuously developing, **ANDEX** does not need reprogramming to be updated. Several modules related with Exfor compilation, on-line help system, etc; are updated automatically from the latest version of the Exfor Manual or Dictionaries. These files will be distributed by the **IAEA Nuclear Data Section**.

## System Requirements

The minimum requirements for using our software are :

- IBM XT, AT or PS/2 PC or compatible.
- 640 KBytes of RAM ( **IMPORTANT !!!** ).
- CGA,EGA or VGA monitor.
- hard disk with 2 MBytes free.
- one floppy disk driver 5 1/4 " High Density or 3 1/2 " High Density.
- DOS 3.0 or higher version.

A mathematical coprocessor is not necessary, but it would be useful.

## Assumptions.

1) The file extension ".SRC" is used for new entries or sources files. Sources files are created using the option "*Compile* " from the Main Menu and do not contain any numeration.

2) The file extension ".X4" is reserved for an Exfor file consisting of one Exfor entry. Every Exfor entry is generated from a source file after running the Bookkeeping program.

Every ".X4" file should be edited using "*Edit*" option from the Main Menu.

*For better organization we suggest to use one Exfor entry in one file* .

3) The Exfor Dictionaries file should be in ASCII format  (same format adopted for exchange between Nuclear Data Centers ) and with fixed file name  "**DICTS.TXT**".

4) The  Exfor form for new entries is stored in file "**x4.frm**" and used for internal purposes only.

*Do not  overwrite  or corrupt this file.*

5) Listing of  errors  and  warnings  from  the  latest  run  of the check program are stored in the file  "**X4PROJ.ERR**".

6) Compilation rules (from the Lexfor part of the EXFOR Manual) are contained in the file with  fixed name "**LEXFOR.TXT**". The file "**LEXFOR.POS**" is a binary file generated after running "*Update Lexfor* " option from the Main Menu. These files should always exist to be able to use  Lexfor on-line.

### Some conventions adopted in this Manual.

\* In this Manual detailed information about technical EXFOR matters, exchange of data between Nuclear Data Centers , etc is not given but some references are provided.

\* The word "*compiler*" is used in this Manual referring to the physicist ( or specialist ) who performs Exfor compilation. He will be the user of this package.

# 3. INSTALLATION

ANDEX (ver 1.01 TEST) is available on two 5 1/4 " doubled sided, high density diskettes (1.2 MB) or two 3 1/2 " doubled sided, high density diskettes (1.4 MB).

For convenience, the program should be installed on the hard disk.

**Approximately 2 MBytes free memory are needed !!!.**

The installation procedure is modular, meaning that you can install independently only those modules which you need .

The master diskettes should contain the following files:

### Disk # 1

| Files | Description |
| --- | --- |
| topmenu.win | Data for some windows (binary file). |
| x4.frm | Exfor form file for new entries. |
| test1.x4 | Test Exfor entry for check program. |
| 00001.src | An example of source file. |
| 00001.bok | An example of an Exfor file generated  by the bookkeeping pogram from 00001.src. |
| ANDEX.EXE | Main Program (EXE module). |
| Install.exe | Installation program. |
| lexfor.txt | Lexfor file (ASCII format). |
| lexfor.pos | Data for Lexfor on-line help (binary format). |
| exfor.pos | Data for Exfor on-line Dictionaries (binary format). |
| fcalcpos.exe | Program for on-line help system. |
| hyptext.exe | Program for on-line help system. |

### Disk # 2

| Files | Description |
|-------|-------------|
| Dicts.txt | Exfor Dictionaries file (ASCII format). |
| readme.txt | File containing last information not included in the manual. |

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.

Place the master diskette # 1 in the diskette drive .

From the system prompt a: type

### install

The installation program will start; it is "user friendly" and does not need any detailed explanation in this Manual.

From the beginning the following screen will appear:
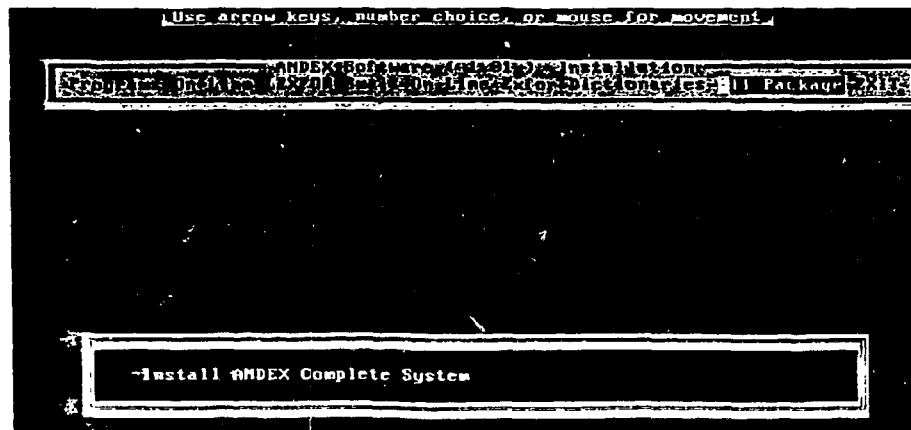
Using the mouse or keyboard arrows select your option, which better fits to you.

For the first time installing you have to choose the option "**all package**".

From the installation menu select your desired path in the hard disk where **ANDEX** will be installed.

For any problem during the installation of the **ANDEX** refer to the file "README.TXT".

# 4. QUICK  START

Before you start to use **ANDEX** as your software for Exfor compilation, you must get used to it.

We recommend this Chapter to get some training or to start for first time.
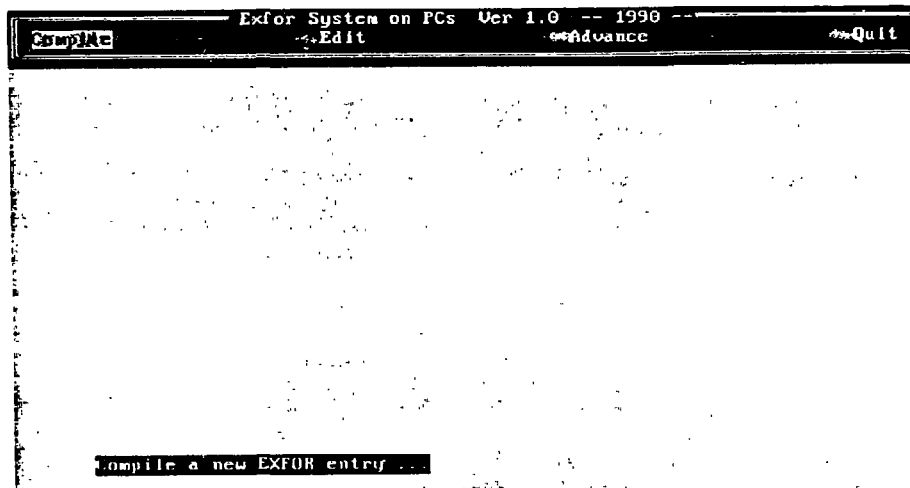
From the system prompt *c:>* type:
        **cd EXFOR** (or sub-directory name where you have installed **ANDEX** software)

then type:
        **ANDEX**

The program starts reading Exfor Dictionaries to get all the needed information (codes, keywords, etc). Then the **Main Menu** will be displayed on top of the screen as follows:

```
=============== Exfor System on PCs   Ver 1.0  -- 1990 --==========
| Compile |          - ·*·Edit                 ***Advance                 ***Quit |
```

```
Compile a new EXFOR entry ...
```

Once you have **ANDEX Main Menu** on the screen and it is the first time that you are running this package after installation; **you must select the option** "*Update Dictionaries*". This option will create the needed file for the Exfor Dictionaries on-line help system.

To run the on-line help system you must have 2 MB free in your hard disk. !!!

In the screen you will see a graphical interface showing you what is going on (for the meaning of displayed information see Chapter 8 "**Advanced Features**").

Then you must select the option "*Update Lexfor ...*", which allows you to reconstruct the Lexfor on-line help system for using a particular file `Lexfor.txt` .

After that, **ANDEX** is ready to work properly.

To get some training in compiling new Exfor entries we put an example of a new entry in file "00001.src".

Select from the Main Menu "*Compile*" option and start.

To get some training in editing an existing Exfor entry we put an example file "TEST1.X4".

Select from the Main Menu "*Edit*" and start.

For testing the software, particulary Check and Bookkeeping programs, you can use the file "TEST1.X4". Compare the results that you have obtained with those in the files :

         ● X4PROJ.ERR -- list of Errors and warnings on TEST1.X4

         ● 00001.BOK -- file generated by Bookkeeping program from 00001.SRC

See also Appendix A.

# 5. Compiling a new Exfor entry

Select from the **Main Menu** the option "*Compile*". You will be prompted to a box asking for the name of the file for the new Exfor entry[*].

Remember to supply the full name with the extension.

If the file already exists you will be prompted to the "answer box" asking you to supersede it or to use the existing file.

Use the second choice for editing an existing new entry file.

Once you have made your choice, you will enter into the editor. In the first choice the editor will load a copy of the standard Exfor compilation form.

Use editor's commands (see Chapter 7 Editor's commands) to fill up the compilation form as required in the Exfor entry.

On top of the editor a **Menu** similar to the **Main Menu** will be displayed but with different options. Use the combination key **ALT-M** to exit temporarily from the editor to the top **Menu** and press **ESC** key to return to the edit mode again.

It is easy to know which status (Menu or editing) you are in . When you are editing the cursor is shown and the **Menu** is displayed in full color. When you are in the **top Menu** one of the options is displayed in reverse color and the cursor from the editor window "usually" disappears.

Using the options displayed in this **Menu** you can perform your compilation very easily (see Chapter 11 for Menu's Options).

Once you have finished, **save** the last changes with **ALT-S** command (or quit with **ESC** key and answer Y when you are asked for SAVE (Y/N) ?).

For any further updates or corrections for this new entry use the same option "*Compile*" from the **Main Menu**.

When your Exfor entry is complete, you must run Bookkeeping and Checking Programs (see corresponding Chapters).

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* We strongly suggest to use the Exfor accession number as the name of the file together with the conventional extension ".SRC" for new entries. Note that the Exfor accesion numbers (five digits of which the first may be a character or digit) must be worldwide unique. Get in contact with the IAEA **Nuclear Data Section** to obtain a series of accesion numbers reserved for your compilation work.

# 6. Editing an existing Exfor entry

Every Exfor entry (.X4) is produced from the source file (.SRC) after running the Bookkeeping program.

To update / correct any ".X4" file, implement ANDEX in the option "*Edit*" from the Main Menu.

After you have chosen this option a file box containing the available ".X4" files will be displayed for your selection.

Once you have selected the file (only exfor file .X4) to edit you will be entered into the editor.

Use the editor's commands (see Chapter 7 Editor's commands) to make any update or correction.

On top of the editor a Menu similar to the Main Menu will be displayed but with different options.

Use the key combination ALT-M to exit temporarily from the editor to the top Menu and press the ESC key to return to the edit mode again.

Using the options displayed in this Menu you can perform the corrections or updates very easily (see Chapter 11 for Menu's Options ).

When you have finished, save the file (ALT-S from the editor or ESC and 'Y' when leaving the editor).

To produce a final Exfor file you must run the Bookkeeping option from the Main Menu to generate all the Exfor needed information.

If you want to check some Exfor rules, select the option "*Check Program*" either from the Main Menu or from the top Menu while you are working in the editor.

Note that if you select this option while you are into the editor, ANDEX assume the current file name as the name of the file to be checked. Therefore you must save the file (ALT-S) before running it.

# 7. Editor's Commands

The Andex editor is a standard ASCII editor; it can load any file (maximum 500 Kbytes) with a maximun width of 81 characters.

The loaded file will be shown on the screen using a full screen window with border. The current position of the cursor, the status mode of certain keys and some messages will be displayed at the end of the border line.

The Editor's commands and funtions are shown in *TABLE 1*.

The **INSERT** key changes the cursor shape. When editor is out of INSERT mode the cursor will have a full line blinking block. When it is into INSERT mode shape changes to underscore blinking line .

## IMPORTANT NOTE

Use only TAB keys to move the cursor in the already filled lines.  When you use TAB movements in new empty lines cursor jumps over "null" characters without marking them as blank spaces. This fact could introduce unpredictable errors when you run Bookkeeping and Check programs.

Use **SPACE BAR** to fill those positions in the new lines that should be blank.

### Table 1. " Editor's Commands ".

| COMMANDS | FUNCTION |
|---|---|
| ESCAPE | Exits from editor. |
| RIGHT ARROW | moves the cursor position one column to the right. |
| CTRL-RIGHT ARROW | moves the cursor position to the begining of the next word to the rigth. |
| LEFT ARROW | moves the cursor position one column to the left. |
| CTRL-LEFT ARROW | moves the cursor position to the begining of the next word to the left. |
| UP ARROW | moves the cursor position one row up. |
| PAGE UP | moves the cursor position up the number of lines in the display window (one page screen up). |
| DOWN ARROW | same as UP ARROW but down. |
| PAGE DOWN | same as PAGE UP but down. |
| END | moves 1 column pats the last non-blank character in the current row. |
| CTRL-END | moves to the END of file. |
| HOME | moves to the first column in the current row. |
| CTRL-HOME | moves to the beginning of file. |
| ENTER | When the INSERT mode is off moves to the first column in the next row. When the INSERT mode is on takes the remaining characters and makes a new line out of them. |
| ALT-T | will prompt the user to enter a new field width for the TAB key. The default is the standard Exfor field width of 11 positions. |
| ALT-F | find a text string. |

| COMMANDS | FUNCTION |
|---|---|
| **ALT-L** | load a file. You will be prompted to save the current file before loading a new one. |
| **ALT-D** | Deletes the entire current row. |
| **ALT-R** | Rename the current file. |
| **ALT-S** | Save the current file. |
| **BACKSPACE** | shift the current row one column to the left, deleting the character at the cursor position. |
| **INSERT** | toggles the editor into or out of insert mode. |
| **DELETE** | deletes the character at the current position and moves the rest of the row one column to the left. |

# 8. Advanced Features

ANDEX has some built-in "Advanced features". Most of them are available from the Main Menu.

## 8.1 Update Dictionaries.

The update procedure of the keywords, codes and Exfor on-line help system is done in **ANDEX** by the option: *"Update Exfor Dictionaries"* from the Main Menu under choice *"Advance"*.

When the compiler receives a new edition of the Exfor dictionaries, he will have to run this option to update the **ANDEX** software and to be able to perform an uptodate Exfor compilation.

Once you have received an Exfor Dictionaries file select *"Advance"* from the Main Menu and then select *"Update Dictionaries"* from displayed sub-menu.

After that a file box will display a list of files with the extension ".TXT" (which is the file extension assumed by **ANDEX** for the text-information files).

Be sure that the received Exfor Dictionaries file has this particular file extention ".TXT".

Select the new Exfor dictionaries file.

While running the update procedure a window (graphical interface) will display what is going on .

On the top of the window the number of the dictionary that is currently being updated will be displayed; below it the date of its last update.

A scale of colored dots will show graphically the number of lines being read from the current dictionary. Some times this can be used by the compiler to check whether the dictionary received is correct or not. For example, an experienced compiler knows how big dictionaries # 3, 5, 6 etc are; this could be checked easily looking at the line scale.

At the bottom of the window a scale of 42 positions will show which dictionary has been updated. The number of positions in the scale corresponds to the number of the dictionary. The dictionaries that are updated change the color from white to red.

After the update procedure finished, the program pauses until you press the Enter key again , allowing you to see the results of the updates.

IMPORTANT : After you have finished quit from ANDEX to DOS and rename the new Exfor dictionaries file to the name "DICTS.TXT", then start again ANDEX.

This step is inconvenient but necessary in order to load in RAM the updated list of Exfor keywords and codes.

## 8.2 Update LEXFOR.

The update of the Lexfor on-line help can be done in **ANDEX** using the option *"Update Lexfor"* from the **Main Menu** under *"Advance"*.

When the compiler receives a new edition of Lexfor, he will have to run this option in order to update **ANDEX** on-line help system and to be able to perform an uptodate Exfor compilation.

Once you have received the Lexfor file select "Advance" from the **Main Menu** and then "Update Lexfor" from the displayed sub-menu.

**IMPORTANT NOTE :** rename the received new Lexfor file to the conventional name "LEXFOR.TXT" before going into this task.

## 8.3 Check Program.

For several reasons it is not the main task of the **ANDEX** to perform an accurate check of the Exfor syntaxes; partly because of the existence of sophisticated checking programs in the NDCs running basically on mainframes. Taking into account that any Exfor compilation produced using **ANDEX** has to be included in the Exfor Master Library and for that such a program has to be run.

With the idea to help the compilers and reduce the time spent correcting some "obvious" Exfor errors, **ANDEX** offers the possibility of checking Exfor files with some rules. This option is available from the **Main Menu** or from the **top Menu** while working in the editor. The difference is that from the **Main Menu** you can select the Exfor file to be checked from a "file box" without loading it into the editor; when you select this option from the **top Menu** the file that is being edited will be checked.

While the Checking program is running, a graphical interface (window) on the screen will show what is going on.

When it is finished another window will show the total number of lines and Subentries checked.

After you pressed the **Enter** key another scroll window would appear with the list of checking results using the following syntaxes:

*sn:ln* : E/W : < **cause** > msg.

where :

        *sn* - subentry number.
        *ln* - line number where the program has found an error.
        E/W - ERROR or Warning word indicating the type of Exfor syntax error.
        **cause** - what causes the error.
        msg - Error/Warning message.

for example :

1 : 23  : ERROR : < **TOFE** > Code not found.

This means that in Subentry 001, line 00023 the code **TOFE** is not in the list of codes for that keyword.

## NOTE:

**In the present ANDEX version you will get some unnecessary warnings because of the incomplete version of the checking software.**

To browse all errors use the same editors commands and keyboard's keys (Chapter 7).

Once you've finished browsing the list of errors; exit from that window using **ESC** key.

See Chapter 9 for the Exfor rules and syntaxes that **ANDEX** checks in the present version.

## 8.4 Bookkeeping Program .

An Exfor file should satisfy a standard format (described in details in the references given in Chapter 1), which requires certain bookkeeping and control information such as END records  like ENDBIB, ENDSUBENT, ENDENTRY, ENDDATA. The number of lines in each Subentry, Bib section or Data section; etc.This information is added by **ANDEX**  with the option "*Bookkeeping*" from the Main Menu.

The Bookkeeping program inserts automatically all Exfor required information for  records ENTRY, SUBENT, BIB, COMMON  and DATA blocks.

 Nevertheless some considerations have to be taken by the compiler as follows :

1.- Every END card is automatically inserted by **ANDEX** but _only_ if the corresponding System Identifier exist in the file. For example the cards (lines) ENDENTRY, ENDSUBENT, ENDBIB, ENDCOMMON, ENDDATA will be generated (with the corresponding information and correct numeration) _only_ if their corresponding system identifiers ENTRY, SUBENTRY, BIB, COMMON and DATA were present in the file.

This means that the compiler should enter these System Identifiers himself, except for the BIB record which will be inserted ( or superseded in the case that the compiler had  put it before ) automatically with the corresponding numbers.

2.- NOcards are not inserted by **ANDEX** bookkeeping program. This means that System Identifiers like NOBIB, NODATA, NOCOMMON, etc have to be introduced by the compiler before running the bookkeeping option.

3.- In COMMON and DATA sections the number of data columns has to be introduced by the compiler manually !!!;  the program will not generate them.

We stress this to the compilers because in this **ANDEX** version there is no way to detect such a mistake.

**ADVANCED FEATURES**                                                                                  **CHAPTER 8**

For other information and numbers the **ANDEX** Bookkeeping program will do it automatically for you.

To run this option select from the **Main Menu** the option "*Advance*" and then "*Bookkeeping*". A sub-menu will ask you for the sort of file to be "bookkept" (".SRC" or ".X4" file), then a file box will display a list of files (".SRC" or ".X4" ) from which **ANDEX** will generate the Exfor file.

During the bookkeeping process two windows will display, first the current numbers and then some total numbers (such as total of keywords, lines, subentries, etc).

After successful run, an Exfor file with all the required numerations and System Identifiers will be created from the source file. The new file will have the same file name as the source had but with the extension ".X4" .

If after that you still have some corrections to do use the "*Edit*" option (see Chapter 6 ).

The source (.SRC) file will not be deleted by **ANDEX**. When you are <u>sure</u> you will not need it, delete using DOS command "del" from the system prompt or from the **ANDEX** option "*Dos Shell*" (see Chapter 11).

# 9. Exfor and syntax rules checked by ANDEX

The following Exfor and syntax rules are checked in the present **ANDEX** version:

1.- Check whether the keyword or System Identifier exists or not.

2.- Check whether the keyword or System Identifier is obsolete or not.

3.- Check whether the keyword needs to have coded information (RCOD).

4.- If the keyword has coded information, check if the code is correct (including a check whether it is obsolete or not ).

5.- If there is a code, check the right position of the parenthesis in column 12 .

6.- If there is an open parenthesis for coding, check the closing parenthesis.

7.- Check the standard rules of EXFOR coding for each keyword.

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

8.- Numeration of the lines for cards ENDSUBENT and ENDENTRY are checked.

9.- Coding syntax is checked for the following keywords:

### A) No code needed. Check for text only.

- COMMENT

- CORRECTION

- CRITIQUE

- SAMPLE

- TITLE

- COVARIANCE

- AUTHOR

- INC-SPECT

**B) Keywords with codes as in item 7 of above list when CODE1 and CODE2 are from the same Exfor dictionary.**

- ANALYSIS

- INC-SOURCE

- INSTITUTE

- METHOD

- ADD-RES

- RESULT

- DETECTOR (COIN and TELES syntaxes also is checked).

- PART-DET (without pointers).

- STATUS (without cross references).

For all other keywords (that are not checked) a warning message will be given.

The COMMON and DATA Sections are not checked. There will be warning messages, "DATA (or COMMON) Section check not yet implemented".

"Pointers" are not checked.

*Additional checks are envisazed for the next version of ANDEX..*

# 10. On-Line Help

One of the most important tasks of the **ANDEX** package is to assist the compiler to perform easy and flexible Exfor compilation. Mainly for that purpose the on-line Help features were designed, which are described in this chapter.

The **ANDEX** on-line Help system consists of several updated files with Exfor Dictionaries, Lexfor, etc. The information contained in these files can easily be accessed without exiting from the editor (while compiling/updating an Exfor entry) using the option "*Help*" from the **top Menu**.

## 10.1 Exfor Dictionaries.

The **ANDEX** package provides the compiler with the useful option of on-line Exfor Dictionaries; this means that without exiting the current compilation the compiler could access the content of any Exfor dictionary.

While you are working inside the editor press the combination key **ALT-M** to exit temporarily from the editor into the **top Menu**. From the **top Menu** select the option "*Help*" and then "*Exfor Dict.*". After that a list of Dictionaries will be displayed in the scroll sub-menu. Make your selection by using key arrows up, down and keys home and end. If the wrong key is pressed a beep sounds.

The selected Exfor Dictionary will be displayed on the overlapping window with scroll facility.

Use the combination key **ALT-H** to display the available commands to browse the content of the selected information.

Special interest could represent the command **ALT-F** (search for text ). Usually the compiler knows part of the information and this particular command could assist him to find the rest of the needed information very fast.

For example:

One paper from Kossuth University is being compiled so the compiler knows, as an example, that the LAB code will start with the country code which is 3HUN for Hungary, but does not know the Institute Code. Here the on-line Help System will be useful.

Going to that option (without exiting the compilation work from the editor) select the options " *Help* ", then " *Exfor Dict ....*" From the list of Dictionaries select Dictionary # 3 which contains the Lab codes. If the compiler does not remember in which Dict. number the needed information is stored, there is a "*List*" option under "*Exfor Dict..*", which contains list of the Exfor Dictionaries.

Once he is in Dict # 3, press **ALT-F**, and a prompt question will be displayed at the bottom of the current window asking for the text to search.

In this example the compiler will type 3HUN and in the window the group of labs will be displayed which contain 3HUN as part of their codes.

In such a way the compiler can find very easily and fast the needed code or information without going through the whole dictionary.

To exit from the Help window press the ESC key and then again ESC to exit from the menu and return to the editor.

## 10.2 Lexfor ( Small ).

ANDEX *offers also on-line help for some concepts and definitions of nuclear physics and the Exfor format. This is a standard* international agreement and is stored under "**Lexfor**".

For compatibility reasons (a Lexfor file often contains some graphic information and some formulae which are very difficult to represent using ASCII files) **ANDEX** Lexfor contains limited information about some topics. Therefore we called it "Lexfor (Small)".

To use this option select "*Lexfor (Small)* " from the Help option.

A scrolling sub-menu will display the main topics available (usually the topic's name is the Chapter's name from the original Lexfor document.,see "NDS EXFOR Manual" Part Two).

After your selection an overlapping window will show the required information. Press **ALT-H** to see the commands available for browsing.

Usually Lexfor contains cross references and taking this into account **ANDEX** offers the possibility to browse several topics without exiting from the HELP system for each topic.

If you have selected the topic "Cross Section" and you would like to see the topic "ISOMERS"; just press key **F1** while you are in Lexfor window and again the list of all the Lexfor (Small) topics will be displayed.

Once you have chosen the new topic the corresponding information will be loaded into the existing browsing window.

To exit from the Lexfor Help window press the ESC key and then again **ESC** to exit from the menu and return to the editor.

# 11. Resume of Options

ANDEX is a full menu-driven software package and is therefore "user friendly", but nevertheless in this chapter we present a resume of all the options available in each menu, their functions and how to use it.

## 11.1 Options under the Main Menu.

The **Main Menu** is the first window with 4 choices (see fig 2 in Chapter 4). This Menu is full screen wide and will be displayed at the top of the screen, in the first 3 lines. The selection bar will point to one of the options which will be displayed in inverse colors. Move the selector bar using keyboard arrows or space bar. Use **ESC** key or option " *Quit* " to exit to DOS.

### 1. COMPILE option

Allows you to compile a new Exfor entry or edit an existing Exfor entry source file (".SRC").

If you select this option you will enter into the editor with the already existing Exfor form "x4.frm". Fill in this form using the editor's commands (see Chapter 7).

Also use this option when you want to continue the compilation with a new entry that you started before but haven't finished yet (see Chapter 5 ).

### 2 . EDIT option

Allows you to edit an existing Exfor file (".X4").

This option will enter your selected file into the Exfor editor.

### 3. ADVANCE option

Some advanced features of **ANDEX**.

#### 3 a)  ADVANCE option : Check Program

Allows you to check some of the Exfor syntax of an existing file without going into the editor. This option works only on existing Exfor files (".X4" files) that had already passed through the "*Bookkeeping*" option .

#### 3 b)  ADVANCE option : Bookkeeping Program

Adds or updates the Exfor bookkeeping information to new or existing entries.

This option works for any ".X4" and ".SRC" file.

See Chapter 8 for more details.

RESUME of OPTIONS                                                      CHAPTER 11

### 3 c)  ADVANCE option : Update Dictionaries

Updates  the  Exfor on-line Help system  and creates/updates Dict. help files.

<u>IMPORTANT</u> : **This option has to be chosen only when you are running the ANDEX package for the first time or you receive an updated Dictionary file.**

The received Exfor dictionary file must have the  file name "`DICTS.TXT`". If not, rename it.

Once you have finished the update procedure start again the **ANDEX** package in order to be able to use new received codes and keywords.

<u>IMPORTANT</u> :  When you run this option for the first time it will  generate several files in your hard disk. <u>Be sure that you have 1 Mbyte at least free</u> .

### 4 d)  ADVANCE option : Update Lexfor on-line Help.

Updates  the  Lexfor on-line Help system  and creates/updates the "`Lexfor.pos`" file.

<u>IMPORTANT</u> : **This option has to be chosen only when you are running the ANDEX package for the first time or you receive an updated Lexfor  file.**

The received Lexfor file must have the file name "`LEXFOR.TXT`". If not, rename it.

### 4. QUIT option

Quit from the **ANDEX** software  to DOS.

## 11.2 Options under top  Menu.

The " **top Menu** " is a window with 5 choices. This Menu is full screen wide and will be displayed at the top of the screen, in the first 3 lines. The selection bar will point to one of the options which will be displayed in inverse colors. Move the selection bar using keyboard arrows or space bar. Use the **ESC** key to return to the editor.

This Menu offers several options to assist the compilation work.

### 1. FILE option

Several options are available under this choice .

## 1 a)  FILE option : Window

Allows to open another window with another Exfor entry (or even with the same Exfor entry ) while you are working in the editor. This second window will be displayed at the second half of the screen.

This option is very useful when compiling or correcting an Exfor entry because it allows you to consult the information contained in another Exfor entry.

The most powerful feature would be the possibility to "cut and paste" from this window to the editor, but unfortunately **it is not ready for this ANDEX version.**

For the new opened window all the top Menu options are available as normal.

Close this window using the  ESC key.

## 1 b)  FILE option : Print

Allows you to print any **ANDEX** file.

Once you have selected this option a sub-menu will display the sort of **ANDEX** files that you might want to print. Make your selection from the following options:

> * *Source files* : for a list of existing Exfor source files (.SRC).
> * *Exfor files*   : for a list of existing Exfor files  (.X4).
> * *Error file*    : for printing the list of errors and  warnings of the last check.

In the first two cases a file box with a list of corresponding existing file names will be displayed for your choice.

## 1 c)  FILE option :  DOS Shell

Allows you to exit temporarily  to DOS. This is a very useful option because it allows the user to perform any DOS command without leaving **ANDEX.**

Type **EXIT** to the DOS prompt to return .

## 1 d)  FILE option : Disk Space

This option will figure out, fast and without leaving the compilation work, how much hard disk space is left .

### 2. KEYWORD option

This option will display the list of Exfor keywords (Dict #2) or Sistem Identifier keywords (Dict #1).

The list of keywords will be displayed into the scroll window. Use the arrow keys or Home, Page Up, Page Down and End keys to position the selection bar.

*How to use them during compilation work ?.*

To select a keyword press ENTER and then press the ESC key to return to the editor. The selected keyword will be typed into the editor starting at the position where the cursor was before you left the editor.

At first this procedure might appear awful and too slow (having to go through all these menus to select one word); but once you get used to it will be helpful in the compilation work.

### 3. CODES option

This option will display the list of Exfor codes for each BIB keyword (Dict #3 to # 42).

After selection of a keyword the list of corresponding codes will be displayed into scroll window. Use the arrow keys up and down or the keys Home, Page Up, Page Down and End to position the selection bar.

Do your compilation using this option in the same way that was explained for the KEYWORD option.

### 4. ADVANCE option

Allows you to run the check program for the Exfor file currently being edited. This is the only difference between this option *under* top Menu and that *under* Main Menu.

Note : Before you run this option be sure that the last changes to the file have been saved. In other words always save a file (ALT-S) before jumping to the top menu to select "*Advance*" option .

### 5. HELP option

Allows you to use ANDEX on-line Help System which contains the following options :

### 5 a) HELP option : Exfor Dictionaries

Allows you to browse an Exfor Dictionary while you are compiling.

Once you have chosen this option a scroll menu will display the list of Dictionaries (the first option "LIST" contain the list of all Exfor Dictionaries and their topics). Make your choice using the ENTER key. An overlapping window will display the content of the selected dictionary. Use the combination key ALT-H for browsing commands.

### 5 b) HELP option:  Editor's Help

Allows you to browse all available editor's commands (see Chapter 7).

An overlapping window will display a list of editor's commands. Press **ESC** to exit.

### 5 c ) HELP option:  Lexfor ( Small )

Allows you to browse some topics of Lexfor while you are compiling.

Once you have chosen this option a scroll menu will display the list of Lexfor available topics. Make your selection using the **ENTER** key. An overlapping window will display the content of the selected topic.

If you want to see another topic, press the **F1** function key and the list of topics will be displayed again. Select the new one by using the **ENTER** key and the corresponding information will be loaded in the same window.

Use the combination keys **ALT-H** for the browsing commands available in this option.

# 12. Technical Figures

**ANDEX Software** was written mostly in C language. A few low level subroutines for the editor were written in Assembler.

The following technical figures were used in programing **ANDEX** package :

- **Computers** : PC/XT,AT or PS/2 IBM compatibles.

- **Language** : C and MacroAssembler.

- **Operating System** : DOS 4.01

- **Compiler** : Microsoft C (version 6.00).

- **Library Model** : HUGE.

- **Memory Size of the Main Program** : 150 KBytes.

    ANDEX uses a dynamic memory allocation, therefore it loads mora than 200 KBytes while is running.

- **Stack size** : 30 Kb.

- **Segments size** : 256 .

- **Others** : The Linker option PACK was chosen in order to get

    small executable modules.

- **Numbers of lines** : Approximately 25 000.

- **Numbers of Subroutines** : 24.

- **Others Programs in the**

**ANDEX package and their size:**

|              |          |        |
|--------------|----------|--------|
| . . . . . . . . . . . . . . . . | INSTALL  | 69 Kb. |
| . . . . . . . . . . . . . . | FCALCPOS | 10 Kb. |
| . . . . . . . . . . . . . . | HYPERTXT | 79 Kb. |

TECHNICAL FIGURES                                                                    CHAPTER 12

The **ANDEX** package has been tested  for several computers like IBM AT compatibles and PS/2 models 70 and 80. The following video cards and monitors were used: EGA, VGA, NEC Multysinc video graphics. During the test no major problems were detected.

 Note : Very important is the condition to have 640 KBytes of RAM for running **ANDEX**. Therefore, any TSR (Terminated and Stay Resident) programs in RAM must be avoided while running **ANDEX**.

msg - Error/Warning message.

# Appendix A : List of some Examples files.

Listing of the TEST1.X4 Exfor file for checking purpose.
-----------------------------------------------------------------

```
ENTRY          TEST1      910226                                    TEST100000001
SUBENT         TEST1001   910226                                    TEST100100001
BIBE               15        22                                     TEST100100002
TITLE          ANGULAR DISTRIBUTION OF TRITONS FROM LI-6(N,T)HE-4   TEST100100003
               REACTION AT 18.13 MEV.                               TEST100100004
AUTHOR         TRZCINSKI A.)                                        TEST100100005
INSTITUTE      (3POLIRJ)                                            TEST100100006
               (3POLJAD)                                            TEST100100007
REFERENCE      (W,TURKIEWICZ J.,8902)                               TEST100100008
SAMPLE         METALIC LI-6 , 0.64 MG/CM2 EVAPORATED ONTO TA FOIL.  TEST100100009
STANDARD       OBSOLUTE MEASUREMENTS.                               TEST100100010
FACILITY       (VDG,3POLRPJ) 2 MEV ENERGY BEAM.                     TEST100100011
INC-SOURCE     (D-B)                                                TEST100100012
METHOD         (TOFE)                                               TEST100100013
               DETECTION OF TRITONS IN DE1+DE2+E TELESCOPE IN       TEST100100014
               COINCIDENCE WITH RECOIL ALPHA PARTICLES.             TEST100100015
DETECTOR       (TELES,SOLST,SOLST,SOLT) DE1 + DE2 + E TELESCOPE     TEST100100016
               (GELI                                                TEST100100017
CORRECTION ANGULAR SPREAD CALCULATED USING MONTE CARLO SIMULATION   TEST100100018
ANALYSIS       ANALYSIS IN FRAME OF THE DWBA.                       TEST100100019
COMMENTS       NO FURTHER INFORMATION AVAILABLE.DATA OF PHD THESIS OF TEST100100020
               DR. TRZCINSKI TO BE PUBLISH.                         TEST100100021
STATUS         DATA TAKEN FROM PRIVATE COMMUNICATION DR. TURKIEWICZ TEST100100022
               WHICH CORRESPONDS TO PHD THESIS OF A.TRZCINSKI.      TEST100100023
HISTORY        (910105C) THIS IS A TEST FOR CHECK ROUTINE IN ANDEX  TEST100100024
ENDBIB             22                                               TEST100100025
COMMON              1         3                                     TEST100100026
EN                                                                  TEST100100027
MEV                                                                 TEST100100028
18.13                                                              TEST100100029
ENDCOMMON           3                                               TEST100100030
ENDSUBENT          29                                               TEST100199999
SUBENT         TEST1002   910226                                    TEST100200001
BIB                 2         2                                     TEST100200002
REACTION       (3-LI-6(N,T)2-HE-4,,DA)                              TEST100200003
ERR-ANALYS STATISTICAL ONLY.                                       TEST100200004
ENDBIB              2                                               TEST100200005
NOCOMMON                                                            TEST100200006
DATA                5        16                                     TEST100200007
ANG-CM     -ANG-RSL   +ANG-RSL    DATA       ERR-S                  TEST100200008
ADEG       ADEG       ADEG        MB/SR      MB/SR                  TEST100200009
  10.5       7.9       10.4        5.74       0.115                 TEST100200010
  18.3       9.1        9.8        3.82       0.165                 TEST100200011
  28.9       9.1        9.0        1.87       0.070                 TEST100200012
  40.7       8.4        8.2        1.28       0.055                 TEST100200013
  52.6       8.1        8.0        1.53       0.060                 TEST100200014
  64.6       7.6        7.4        1.44       0.060                 TEST100200015
  76.2       6.5        6.3        1.11       0.065                 TEST100200016
  87.4       5.6        5.5        1.32       0.110                 TEST100200017
  98.1       5.0        5.0        1.22       0.105                 TEST100200018
 108.3       4.3        4.2        1.38       0.115                 TEST100200019
 118.0       3.8        3.7        1.65       0.125                 TEST100200020
 127.2       3.6        3.5        1.25       0.220                 TEST100200021
 135.8       3.2        3.1        0.88       0.320                 TEST100200022
 148.9       8.9        9.1        1.36       0.050                 TEST100200023
 160.5       9.8        9.9        3.37       0.080                 TEST100200024
 168.7      11.3        8.5        4.73       0.080                 TEST100200025
ENDDATA            18                                               TEST100200026
ENDSUBENT          25                                               TEST1002 9999
ENDENTRY            2                                               TEST199999999
```

List of Errors and Warnings detected in the Exfor file TEST1.X4 by ANDEX.
----------------------------------------------------------------------

```
1 : 2  : ERROR :   HEADER not found
1 : 5  : ERROR :   < AUTHOR      > Needs code information
1 : 6  : ERROR :   < 3POLIRJ     > Code not found
1 : 7  : ERROR :   < 3POLJAD     > Code OBSOLETE
1 : 8  : Warning : < REFERENCE    >  Check for that not implemented
1 : 10 : ERROR :   < STANDARD    > Keyword OBSOLETE
1 : 11 : Warning : < FACILITY     >  Check for that not implemented
1 : 12 : ERROR :   < D-H         > Code not found
1 : 13 : ERROR :   < TOFE        > Code not found
1 : 16 : ERROR :   < SOLT > Code not found
1 : 17 : ERROR :   Closing  )  not found
1 : 20 : ERROR :   < COMMENTS    > Keyword not found
1 : 24 : Warning : < HISTORY      >  Check for that not implemented
1 : 26 : Warning :   COMMON and DATA sections are not checked
2 : 3  : Warning : < REACTION    >  Check for that not implemented
2 : 4  : Warning : < ERR-ANALYS  >  Check for that not implemented
2 : 7  : Warning :   COMMON and DATA sections are not checked
2 : 9999 Error coding ENDSUBENT line
```