1 Introduction

The National Nuclear Data Center (NNDC) of the Brookhaven National Laboratory, New York, U.S.A. and the Nuclear Data Section (NDS) of the International Atomic Energy Agency, Vienna, Austria offer online computer access to their nuclear-physics and photo-atomic data bases and to other information in their computerized files. This service is currently available without cost to basic and applied researchers in the United States and Canada from NNDC and to the non-OECD countries from NDS. A similar service is available to researchers in the remaining OECD countries from the Nuclear Energy Agency Data Bank, Paris, France.

The information available in this online service includes bibliographic and numeric data covering the entire low and intermediate nuclear physics discipline, evaluated photo-atomic data, electronic and postal addresses for many scientists and engineers who develop and use such data, and a newsletter. These data bases are maintained at the NNDC and the NDS; the contents are supplied by the staff of these data centers and through numerous cooperative national and international exchange activities. Some of the data bases are updated frequently. Online access is the best way to obtain the latest information available at the centers.

The data bases and the online service programs reside on DEC ALPHA computers at each data center. Access to one of these computers can be accomplished over the INTERNET. The service is available 24 hours a day, 7 days a week. Potential users may obtain an overview of the online service without receiving authorization. Such users will be limited short accesses to the databases.

The online system consists of a number of components which can be activated by the user either by commands or by menu selection. The components include data base retrieval programs (Section 4.4) and file manipulation (Section 15), utility (Section **??**) functions. The first sections of this document describe general features of the online service. The later sections provide a detailed description of the operation of each component. Special features exist for users with advanced terminals. There is a video output option for use on ANSI-standard video terminals. Instead of sequential terminal output, users with these terminals will get screen-managed displays with menus, scrolled output, and highlighting. Several of the data base retrieval components have data plotting capability. Disk files in PostScript format can be created and downloaded for local plotting. For users with graphics terminals recognizing either Tektronix or Regis instructions, plots can also be generated directly on the terminal.

2 Gaining Access to the Service

2.1 Authorization

Researchers who wish to make use of the this online data service must obtain an **AUTHORIZATION** code. This code will identify a user to the service access control mechanism and permit us to analyze service usage. This authorization may be obtained either by contacting the NNDC or NDS by mail, electronic mail, FAX, or telephone. Alternatively, we have provided a self-sign-up feature by which authorization can be accomplished remotely without contacting the appropriate data center(see Section 2.5). You must use the self-sign-up procedure for service from NNDC.

Mail:	ONLINE DATA SERVICE National Nuclear Data Center Brookhaven National Laboratory P. O. Box 5000 Upton, NY 11973-5000 U.S.A.	ONLINE DATA SERVICE Nuclear Data Section International Atomic Energy Agency P.O. Box 100 A-1400 Wien, AUSTRIA
Telephone:	(516) 344-2901	(43) (1) 2060-21715
FAX:	(516) 344-2806	(43) (1) 2060-7
INTERNET:	"nndc@bnl.gov"	"online@iaeand.iaea.org"

Please supply your name, postal address, telephone number, electronic mail address, file transfer address, and a code of five or six characters which will be your personal authorization code. It will be useful if you supply your FAX number, terminal type and graphics capability of your terminal at the same time. This authorization code may be used by your colleagues. However, the person on record will have to agree to be the point of contact for their colleagues and will be the only one to receive information and documentation updates about the service. This code must be given during the log-in sequence for full access to the online services.

Persons without an authorization code may access the online service by using the code **GUEST**. This authorization code restricts the amount of computer processor time to 30 seconds. Most of the data bases as well as some of the utility features and the HELP files, can be used in this limited time. On log-out from this session, a user may sign up directly for full access service. See Section 2.5 for details.

2.2 Required Hardware and Software

It is possible to access the online service with a variety of hardware and software combinations. The first piece of hardware needed is a terminal. This can be anything from a PC to a workstation to a video terminal connected to a mainframe computer. The local computer must be linked to the INTERNET.

2.3 INTERNET Access

Use TCP/IP's `TELNET` command to access the NNDC computer complex

Location	Computer	Address
NNDC	DEC/ALPHA 4100	BNLND2.DNE.BNL.GOV (130.199.112.132)
NDS	DEC/ALPHA 2100	IAEAND.IAEA.ORG (195.212.98.83)

2.4 Logging In

All users of the online data service access the computer through the same VAX/VMS account. This account name (also known as Username) is **NNDC** at NNDC and **IAEANDS** at NDS. When the computer connection is made, the text, `BROOKHAVEN NATIONAL LAB. NNDC COMPUTER SYSTEM OpenVMS` will appear on your terminal at NNDC or `IAEA Nuclear Data Section VAX - VMS` at NDS. The VAX log-in prompt, `Username:`, immediately follows. *At the* `Username:` *prompt you should to enter* **NNDC** *or* **IAEANDS**, *followed by a RETURN key.* After online service "log-in" messages, you will be prompted for your authorization code. *Enter your assigned authorization code at this prompt.* If you do not have an authorization code and wish to try the features available to those without authorized access, you may enter **GUEST** instead.

The final step in the log-in process is for the user to supply his name. Any number of individuals may use an authorization code, so by supplying a name, each user can be uniquely identified by the system. This feature permits each user to set parameters which automatically customize the computing environment at log-in. If a user does not wish to be uniquely identified and does not desire to have automatic customization at log-in, then the **DEFAULT** response should be given.

For each authorization, there can be any number of users. These users can set up their customized access without referring to NNDC or NDS. The new user need only know the authorization code for an account. The first time that a new user name is encountered during log-in for an account, the user is asked to supply required information interactively. Once this information has been supplied, the new user is recognized and will not be asked to supply this accounting and environment information again. If a user decides to use the name **DEFAULT**, he will be prompted to supply the same information at each session.

A sample log-in dialog at the NNDC follows in which the user responses are given in underlined-boldface. The dialog at NDS is identical in structure.

```
 BROOKHAVEN NATIONAL LAB. NNDC COMPUTER SYSTEM

Username:  NNDC

  Welcome to OpenVMS AXP Operating System, version V7.1 on node BNLND2
  23-MAR-1999 15:25:27


                  WELCOME TO THE NNDC ONLINE DATA SERVICE
                       NATIONAL NUCLEAR DATA CENTER
                      BROOKHAVEN NATIONAL LABORATORY
                           UPTON, NEW YORK, USA


  12/10/92      Photon interaction cross sections and attenuation coeffi-
                 cients are now available. Use the XRAY command to ret-
                 rieve from the XCOM data base supplied by NIST. Elements,
                 compounds and mixtures may be specified. Plots are also
                 available.

   1/24/93      The XRAY command now gives access to polarized photon beam
                 scattering cross sections.

   2/14/93      A video version of the CINDA retrieval program is now
                 available.

NNDC assigned authorization code (or GUEST): MYCODE

Enter your last name (or DEFAULT or ?)  - MYNAME
```

2.5 Interactive Authorization Request

As mentioned previously, new accounts can be established during a session in which the authorization code **GUEST** is used. After trying out the service, at log-out time, the user is asked if he wishes to sign up for the online data service. If the response is positive, then you will be able to specify the required information interactively. This will be done in either sequential or video mode depending on the type of terminal selected at log-in.

The three video displays for entering the data required for establishing an account are illustrated as well as one of the non-video displays. This data should be entered one field at a time. The input is checked and invalid input rejected. On completion, the new account is established but flagged as inactive. Electronic mail is sent automatically to the online system manager who will activate the account if all information is verified. Normally, this action will be taken before the end of the next working day.

ONLINE SERVICE SIGN UP

First Video Panel

NNDC Online Service Sign Up

Authorization code : **FUZZY1**

USER IDENTIFICATION INFORMATION

User Name	**RONSEN,L.J.**
Affiliation	**UNIVERSITY OF LONG ISLAND**
Country	
OK/QUIT	**OK**

Enter your COUNTRY name.
For example, UNITED STATES, FRANCE, or BRAZIL.

Use the UP- and DOWN-ARROWS to move between fields.

ONLINE SERVICE SIGN UP

Second Video Panel

NNDC Online Service Sign Up

Authorization code : **FUZZY1**

USER ELECTRONIC ADDRESS INFORMATION

Telephone	**527-629-0001**
FAX	
E-Mail Address	**B:"RONSON@NPL.ULONG"**
File Transfer Address	**I:"RONSON@NPL.ULONG.EDU"**
OK/QUIT	**OK**

Enter your FAX number including the country code if outside the US and Canada. Use only digits without embedded blanks or dashes
For example, in the US, 5163442806,
outside the US, 033169413769

Use the UP- and DOWN-ARROWS to move between fields.

Third Video Panel

```
─────────────── NNDC Online Service Sign Up ───────────────

Authorization code : FUZZY1
───────────────────────────────────────────────────────────
              USER OUTPUT CUSTOMIZATION
Terminal Type          ANSI
Lines per Screen         24
Characters per Line      80
Graphics Capability    [Regis        ]
Expert Flag            ON
OK/QUIT                OK

   Use space bar to step through terminal graphics options.
      None
      Tektronix
      Regis

──────── Use the UP- and DOWN-ARROWS to move between fields. ────────
```

ONLINE SERVICE SIGN UP

Sample Non-video Panel

```
USER IDENTIFICATION INFORMATION

  1  User Name      -
  2  Affiliation    -
  3  Country        -


Select parameters to modify by entering their ID NUMBERS separated by a
comma or ALL or DONE or QUIT - ALL

    You will be prompted to supply new values for the selected parameters
one at a time. If you need help enter a question mark(?).

User Name :  - DUNFORD,C.L.
Affiliation :  - BROOKHAVEN NATIONAL LABORATORY
Country :  - UNITED STATES

USER IDENTIFICATION INFORMATION

  1  User Name      - DUNFORD,C.L.
  2  Affiliation    - BROOKHAVEN NATIONAL LABORATORY
  3  Country        - UNITED STATES


Select parameters to modify by entering their ID NUMBERS separated by a
comma or ALL or DONE or QUIT - DONE
```

3 User Interface

The environment within which the user interacts with the online service is determined by the user's terminal characteristics. There are two modes, **sequential** and **video**. The video environment is used with ANSI standard video terminals whereas the sequential environment is used with all other terminal types. Five terminal types are recognized by the system. Types 1 through 3 are ANSI standard video terminals. Types 4 and 0 are non-ANSI video and hardcopy terminals respectively. More details are available in Section **??**. If your terminal is an ANSI video terminal type, you will automatically activate the video interface; non-ANSI video terminals will result in activation of the sequential interface. Even if you have an ANSI video terminal, you may operate in a sequential mode by selecting terminal type 4. However, the video interface can **NEVER** be used on a terminal which is not ANSI standard video. The online service is made aware of your terminal type from your entry in the authorization file.

The service also provides some graphical capabilities. Video terminals which recognize Tektronix or Regis graphics instructions can be used to display graphs of selected data. The graphics capability of your terminal can also be set initially in the authorization data base.

All terminal characteristics, including terminal type, graphics capability, number of characters per line and number of lines per page may be revised by the user from the command level of the online system via the CUSTOMIZE command (see Section **??**).

3.1 Computer Environment

The overall control of the user interface relies on features of the VAX/VMS operating system. Many of the conventions and instructions used in this system are identical to those used in VMS. However, only a very limited set of the VMS capability, namely that required to support the functions of the online service is available to the user. Those familiar with VMS, UNIX or MS-DOS should have little difficulty in understanding and using this system.

3.2 Video Environment

In the video environment, the computer has significantly greater control over the presentation of information on the user's terminal. In this mode, portions of the display can remain unchanged while other parts are being modified to display new information. Thus information from earlier activity can be easily retained on the terminal and not lost from being scrolled off. Several highlighting capabilities such as boldface, reverse video and blinking are available to enhance the presentation of information to the user. The use of menu selection techniques is improved by using cursor movement to select menu items rather than character entry from the terminal keyboard.

This environment is characterized by a screen-by-screen rather that line-by-line presentation to the user. Selections are normally made from menus where a limited number of choices is possible, reducing the possibility of erroneous input. Highly structured input is still done on a character by character basis with checking done before additional input is possible. *Should any display become corrupted, enter a control-R to regenerate the display.* The main command level interaction is a four part menu listing all of the commands possible. *The commands to initiate various modules of the online service are selected by cursor movement and initiated by depressing the RETURN key. The* HELP *capability at the command level is initiated by selecting* `HELP` *from the menu* (see Section 5.5).

Most of the online service modules also employ video techniques. Nested levels of menus are employed to provide a clear indication of the options available at any point in the program. In cases where several fields of character input may be entered, cursor movement is used to select the field for entry; no particular order of entry is required. Current values of such things as the output format and file name remain displayed at all times. The current step in a retrieval program is often reached by making selections from one or more nested menu selection. The choices which have been made are clearly indicated on the first line of the video display as a sequence of words representing the successively selected options. Output, when displayed on the user's terminal rather than written in a disk file, can be scrolled both up and down until the user has completed the viewing.

3.2.1 Menus

Where possible, user selections are made from menus. There are two types of menus, one for making single selections of program options or data items and one for making multiple selections from a list of data items.

In the single item selection menus, the menu items appear in BOLDface. Use the ARROW keys to change the selected menu item. When the desired menu item has been selected, depress the RETURN, the ENTER or the SELECT key on your terminal to execute that menu item. Horizontal menus may be one or more lines in length. The line below the menu gives a brief description of the currently selected option. Vertical option menus use one line per menu item with the item description appearing on the same line as the item. Only menu items representing logically possible options are displayed. The currently selected item appears in bold-underline-reverse video.

For single-line horizontal and all vertical menus, the LEFT-ARROW and the UP-ARROW will move the selection to the prior menu item. The RIGHT-ARROW and DOWN-ARROW will move the selection to the next menu item. The movement as a result of an ARROW key is circular, that is, an attempt to select prior to the first menu item selects the last menu item whereas an attempt to select beyond the last menu item selects the first one. The combination of the keypad key, PF1, with the LEFT-ARROW(or UP-ARROW) or the RIGHT(or DOWN-ARROW) will move the selection to the first or last menu item respectively.

For a multi-line horizontal menu, the LEFT- and RIGHT-ARROW perform identically to that for the single-line horizontal menu. However, the UP-ARROW moves to the prior menu item in the current menu column and the DOWN-ARROW moves to the next menu item in a column. The combination of the keypad key, PF1, with the UP-ARROW or the DOWN-ARROW will move the selection to the first or last menu item in the current menu column respectively.

For all single selection menu types, depressing the space bar or the TAB key is equivalent to depressing the RIGHT-ARROW. Depressing the PF1 key before the space bar or TAB key is equivalent to depressing the LEFT-ARROW. Menu items can also be made the current selected item by depressing the key for the character for the next menu item beginning with that letter.

There are a few single-line horizontal menus where no "help line" appears. In this case only the ARROW keys will move the selected item and the movement is not circular as described above.

Multiple selection menus appear as a list in a scrolling window with the additional scroll menu items of CHOOSE, ALL and NONE. ALL preselects all of the menu items whereas NONE clears any previously selected items. When the SELECT, ALL or NONE option is chosen, the scroll menu is replaced with two lines of special key description. The current item is highlighted in inverse video. Use of the DOWN-ARROW and the UP-ARROW move the current position down or up in the menu respectively. To select or deselect the current menu item, depress the RETURN, the ENTER or the SELECT key as a toggle. The current menu item is displayed in bold-underlined characters if selected or normal characters if deselected and the next menu item becomes the current menu item. The scroll window moves when required to display the current item. Use the X-key to escape from the select/deselect mode.

3.2.2 Keyboard Data Entry

When keyboard data entry is required, a prompt will appear on the screen with the data field to be entered appearing in Bold-Reverse video. You may enter the required data or a question mark (?) for more information about the expected data and its format. The field may be edited before completion of the entry. Completion is signalled by the Return key or by exceeding the length of the input field.

3.2.3 Highlighting

Highlighting is often used to indicate the context of information displayed on the screen in video mode. The field and the data in that field where character data entry is required will be highlighted in Reverse-Bold. The value of some universal parameters set via user input will be displayed in Underlined-Bold. Error messages are output in Blinking-Reverse-Bold. Blinking-Reverse highlighting is used to indicate that the computer is performing the indicated task. Bold is used to highlight an item on the display. Messages which indicate that the computer is performing a task will disappear when the task has been completed. Error messages are followed by a time-out, generally of 10 second duration after which the programs continue; the time-out may be terminated by entering ANY character from the terminal keyboard.

3.2.4 Scrolled Output

All output of retrieved data to the user's terminal and all data selection list which may be long, are output in a common scrolled mode. In this mode, the data is displayed in a scroll window. Unchanging information such as data identification and column headers are displayed above the scroll window. Below the scroll window is an option menu. The basic options (at most the first four) are FORWARD, BACKWARD, START and END. These options page the scrolled output forward a page, backward a page, to the beginning or end of the output respectively. Only the logically possible scrolling options are displayed. The menu will contain at least one other option, DONE, the selection of which will terminate the data display. Depending on the display, one or more additional menu items may occur. The operation of the scrolling menu differs from the option menu previously described in only one respect, namely that the UP-ARROW will scroll backward one line only and the DOWN-ARROW will scroll forward one line only.

3.2.5 Screen Images

It is possible to put an image of any screen display into a disk file for further manipulation after a video version system component has been completed. The screen reproduction is accomplished by entering a control-P. Each control-P will produce a single image in a disk file, so you will need to enter this control sequence for EACH desired frame. The output file will have the name *command*_SCREEN.OUT, for example `ENDF_SCREEN.OUT` when generated from the ENDF component. See Section 3.4 for more information about user produced disk files and Section 15.1.3 for information about transmitting user produced files to your local computer.

3.3 Sequential Environment

The sequential environment mode of the user interface behaves, as suggested, in a sequential manner. Every attempt has been made to emulate the screen presentation and the interaction logic of the video mode. The user responds to prompts on the terminal. The system response to the user input follows sequentially on the terminal. Each of the modules operates also in a sequential mode of prompt, user response, and system response. The module prompt tailored to the expected response. Some of the prompts take the form of simple menus from which the user can select his next step. At all points in the dialog, **HELP** is available. This help occurs in the form of expanded instructions and/or explanation of the expected response and resulting activity. *At the option level help is activated by selecting* `HELp`. *Within the various modules of the online service, a question mark (?) response will activate the help dialog* (see Section 5.5).

The sequential mode of operation provides only simple capability for the computer to control and organize the presentation of information on the user's terminal. Except on a hard copy terminal or a video terminal with some kind of memory and a paging feature, only a limited number of lines of output can be viewed at one time. Information and user dialog scroll off the terminal and are lost. This mode of operation represents an older technology. However all capabilities available in the video environment described in the next section are also available in the sequential environment.

Where possible, user selections are made from option menus. In these menus, the user is given a list of the logically possible options. The default option which can be executed simply by depressing the RETURN key, is in upper case letters. The other options are in lower case letters except for the first letter which is upper case. These options can be executed by entering the upper case letter representing the option followed by a RETURN. When selecting the help option(by entering a ? and a RETURN), a list of one line descriptions of all the options is displayed.

3.4 Disk Storage

Disk storage has been allocated for each authorized online system user. Data files may be generated during the execution of one of the system modules. They will be stored in the user's allocated space. These data files may be transmitted to the user's local computer at a later time using the SEND module (see Section 15.1.3). All file manipulation commands will act on data files stored in this disk area. File names are constructed according to standard VAX/VMS conventions, that is, *name.type*;*version*. *Name* and *type* can be alphanumeric string containing up to 39 characters. *Version* is be numeric. It should not be given in response to the prompt for the specification of an output file, since version numbers are assigned by the operating system.

3.5 Graphics

Several of the data base retrieval modules support graphical output. Disk output is always in PostScript format with the name *Data_base*`_PLOT.PS`. The file is stored in the user's storage directory where it can be uploaded to the user's local computer with the SEND module (see Section 15.1.3). Plotting to a disk file is activated with the PLOT option. This option appears in every menu where plotting to disk is possible. Plotting is also possible on terminals which recognize Tektronix or Regis graphics instructions. This option is called VIEW. It will appear on the same menus as the PLOT option only if the user's entry in the authorization file indicates either a Tektronix or Regis capable terminal.

4 Choosing Your Module

Once the log-in and set-up steps have been completed, the user can then select the module to be executed. The method of selection for video and sequential modes is described. Each of the modules is described briefly below and in considerable detail later in this document.

4.1 Video Mode

Users operating in the video environment will be presented with a four part screen display, each time a module is selected. The top menu contains three categories of modules, `DATA BASES`, `UTILITIES` and `FILES` as well as the `HELP` and `LOGOUT` selections. Each of the categories of modules corresponds to one of the three option lists arranged left to right across the bottom of the display. When a category is selected, a vertical menu at the screen bottom is activated. The modules which are included in each of these menus are briefly described below. Each menu corresponding to one of the three categories contains two additional selections `DONE` and `LOGOUT`. By selecting `DONE`, the user is returned to the top menu; `LOGOUT` will terminate the connection to the online service. When a module is selected, that module is activated. When the user has finished with the module, the master display will reappear, initialized to the last selection made.

The master display also contains a line describing the authorization level, Full or Limited, the terminal type, the terminal width and lines per page. As mentioned previously, users without authorization (GUEST) may still have limited access the service. In this case, a restricted menu is presented in which only those modules accessible to the user appear in boldface. The inaccessible modules are displayed in normal font.

4.2 Sequential Mode

The sequential mode operates similar to the video mode. There two levels of option selection menus as in the video mode. The top level menu is illustrated below. Each option in the menu is followed by a brief description. An option is selected by entering the first three letters (those capitalized) of the option name. Three options, DATa bases, UTIlities and FILes are themselves a collection of related modules. Selection of one of these top level options will produce another menu from which to select. The use of these menus is identical to the that of the top level menu. The contents of these second level menus are identical to the contents illustrated in the video mode displays below.

Master Displays in Video Environment

Full Use Authorization

NNDC Online Data Service

Full Use Authorization **DEC-VT Terminal** **132 by 24**

DATA BASES **UTILITIES** **FILES** **PROBLEM** **HELP** **LOGOUT**

DATA BASES - Access to searchable online data bases

DATA BASES	UTILITIES	FILES
NSR	**NEW_FEATURES**	**DIRECTORY**
XUNDL	**CUSTOMIZE**	**VIEW**
ENSDF	**ADDRESS**	**SEND**
NUDAT	**PHYSCO**	**DELETE**
CINDA	**QCALC**	**CODES**
CSISRS	**POLSCAT**	**DOCUMENTS**
ENDF	**DONE**	**LIBRARIES**
XRAY	**LOGOUT**	**DONE**
RHID		**LOGOUT**
MIRD		
DONE		
LOGOUT		

Limited Use Authorization

NNDC Online Data Service

Limited Use Authorization **DEC-VT Terminal** **132 by 24**
Only BOLDFACE Selections are Available

DATA BASES **UTILITIES** **PROBLEM** **HELP** **LOGOUT**

DATA BASES - Access to searchable online data bases

DATA BASES	UTILITIES	FILES
NSR	**NEW_FEATURES**	DIRECTORY
XUNDL	**ADDRESS**	VIEW
ENSDF	**QCALC**	SEND
NUDAT	**POLSCAT**	DELETE
CINDA	**DONE**	CODES
CSISRS	**LOGOUT**	DOCUMENTS
ENDF		LIBRARIES
XRAY	CUSTOMIZE	
RHID	PHYSCO	
DONE		
LOGOUT		
MIRD		

Top Level Menu in Sequential Mode

```
  Select your next option from the following, ** indicated default:

    DATa Bases     - Access to searchable online data bases
    UTIlities      - Access to online service utilities
    FILes          - Access to user produced files
    PROblem        - Send online service problems or suggestions to manager
 ** HELp           - Access to online service HELP file
    LOGout         - Terminate access to online service

Enter only upper case letters of selected option - DAT
```

4.3 General Modules

There are three general modules which are available to all users.

PROBLEM – Users who wish to communicate the details of any difficulty encountered or comment on any aspect of the online service should use this option. The message is entered one line at a time in sequential mode. Only the current input line may be edited. In video mode, a simple editor is provided. When the message has been completed, it is sent via electronic mail to the online service manager. A copy also is sent to the user if a default electronic mailing address exists in the authorization file. Be sure that your authorization file entry contains your latest telephone number and electronic mail address. This data will be included in your message automatically and is needed if NDS or NNDC staff wishes to contact you regarding the message.

HELP – This option provides user access to the Help file for the online service (see Section 5.5).

LOGOUT – Use this option to terminate a session with the online data service. A CONFIRM window is provided to prevent accidental logout from the service.

4.4 Data Bases

There are at present seven data bases accessible in the online service and eight commands or menu items which activate the modules which access these data bases. The commands and their descriptions are given below. All but the **MIRD** modules are available to the limited authorization user. The data base names may be followed by one or two symbols to indicate either that they contain a terminal plotting capability, †, or that the disk output from the program may be used in the PLOT utility to generate a graphics file on the disk, ‡.

NSR – Nuclear Science References file – bibliographic data base for low and intermediate energy nuclear physics, covering the period from 1910 to the present. Information added to the data base is published three times a year in **Nuclear Data Sheets**. Each reference represents an entry in the data base. The entry contains the reference citation and for most references published after 1969 a keyword abstract and indexing parameters derived from the keyword abstract. The data base is updated weekly.

XUNDL†‡ – Experimental Unevaluated Nuclear Data List – experimental data on nuclear level properties, radiations, radioactive decay and reaction data. The information is organized in data sets, each data set representing a measurement of nuclear reaction, nuclear structure, or radioactive decay for a single nucleus. At the present time, most of the data comes from high-spin experiments. **Available from NNDC only.**

ENSDF†‡ – Evaluated Nuclear Structure Data File – evaluated experimental data on nuclear level properties, radiations, radioactive decay and reaction data for all known nuclides which have been published in the journal, **Nuclear Data Sheets** and **Nuclear Physics**. The information is organized in data sets, each data set representing a nuclear reaction, radioactive decay or recommended data for a single nucleus.

NUDAT – NUclear DATa – evaluated numeric data extracted or derived from the ENSDF for nuclear level properties and radiations, from the **Nuclear Wallet Cards** for nuclear ground and metastable state properties and evaluated thermal neutron cross sections and resonance integrals from **Neutron Cross Sections, Vol 1** published by Academic Press in 1981/1984.

CINDA – Computer Index of Neutron DAta – bibliographic references to neutron reaction data. This information is organized by reaction and the citations for a single experiment are linked ("blocked") together. The data base serves as an index to the neutron reaction portion of the experimental nuclear reaction data base, CSISRS.

CSISRS†‡ – Cross Section Information Storage and Retrieval System – experimental data on neutron, photon, and charged particle reactions. The data compilation is organized by publication with each entry containing one or more tables (subentries) with the measured data for a single quantity. The data exchange format is known as EXFOR and the data base is also known as EXFOR at NDS.

ENDF† – Evaluated Nuclear Data File – evaluated neutron-induced reaction and decay data. The data base is organized by target material or decaying nucleus. For each material, there are "files" for a single data type such as cross sections and angular distributions. Each file is divided into sections which give the data for a given reaction for that data type. Currently the data base contains the evaluated files, ENDF/B-VI, JEF-2, JENDL-3, BROND-2 and CENDL-2.

XRAY† – Photo Atomic Data – evaluated photo-atomic cross sections and attenuation coefficients for elements, compounds and mixtures and polarized scattering cross sections including Compton and Rayleigh scattering and Rayleigh scattering with anomalous corrections. The range covered is from a few keV up to 100 MeV.

RHID†‡ – Relativistic Heavy-Ion Data – experimental data on heavy-ion reactions. The data compilation is organized by publication with each entry containing one or more tables (subentries) with the measured data for a single quantity using the EXFOR format. There is only limited data available as this compilation has been done on a test basis. **Available from NNDC only.**

MIRD – Medical Internal Radiation Dose – MIRD-like tables and plots of nuclide decay radiations derived from the ENSDF data base.

4.5 Utilities

There are seven utility commands or menu items representing the utility modules of the online system. The commands and their descriptions are given below. Only the first three of these modules are available to the limited authorization user.

NEW_FEATURES – In order to inform users of changes and improvements to the online data service, a NEW_FEATURES utility has been included. The utility can display a description of the new service features added after a selected date. If you have supplied a default electronic mail address(see the CUSTOMIZE utility) then you may mail the text just retrieved to yourself.

CUSTOMIZE – The user has the ability to modify the environment setting parameters during a session with this command. These parameters include the user's name, affiliation, country, telephone number, FAX number, electronic mail address, expertise flag and terminal description.

Users who are not familiar with the online system should set the expert flag **OFF**. In this case, information is often presented in more detail and data input errors result automatically in the display of the HELP information for that query. Users who feel that they no longer require such additional dialog may tell the system to eliminate such responses by setting the expertise flag **ON**.

The online service recognized five terminal types, four video terminal types and a hardcopy terminal type. The number of lines per page and characters per line and lines per page for a terminal can be set or modified. Additionally, the system video terminals with graphics capability utilizing Tektronix 4010/4014 or Regis graphic instructions. This module permits the user to select the most appropriate description for his terminal including type, characters per line, lines per screen or page and graphics capability.

ADDRESS – The address list contains postal and electronic mail addresses as well as telephone, FAX or Telex numbers for many researchers. The list includes foreign as well as US scientists. The data base contents are not identical at at NNDC and NDS, but reflect the researchers in contact with the each centers.

PHYSCO – PHYSics COdes – This module is designed to provide a variety of calculational tools for physics quantities. At the present time, the module will calculate internal conversion coefficients and logft values from user supplied input. **Available from NNDC only.**

QCALC – Calculates nuclear reaction Q-values and threshold energies and decay Q-values from the 1993 Atomic Mass Evaluation of G. Audi and A. H. Wapstra. Selected quantities related to atomic masses may also be retrieved.

POLSCAT – Calculates scattering cross sections for a polarized xray beam incident on a multi-element target. This function was formerly a part of the XRAY data base retrieval program.

4.6 Files

There are seven commands or menu items representing the disk file manipulation modules of the online system. The commands and their descriptions are given below. None of these modules are available to the limited authorization user. See Section 3.4 for a brief description of user produced files.

DIRECTORY – This module will display a list of files which exist in the disk storage created by ALL users of the authorization code. An optional file specification with or without "wildcards" can be used to narrow the list of files being displayed.

VIEW – This module will display the contents of a file, a screen/page at a time. The user may select one or more files at a time. These files are displayed sequentially.

SEND – Disk files may be downloaded by an online user to another computer that is networked to the online service host via the INTERNET file transfer capability. The user must have write access to the receiving computer for the network file transfer options to be successful. The user may select one or more files. These files are processed one at a time with the user being prompted for transmission parameters for each file. At NNDC there is a KERMIT protocol file transfer capability also.

DELETE – The user may delete any file which exists in his disk storage with this option. The user may select one or more files at a time. These files are deleted sequentially with a CONFIRM window before each deletion.

CODES – The user may select one or more computer programs which are maintained and distributed by NNDC or NDS and download them using the network file transfer capabilities of the online service.

DOCUMENTS – The user may select one or more documents or sections of documents distributed by NNDC or NDS and download them using the network file transfer capabilities of the online service. Currently available are sections of the online service document in PostScript format.

LIBRARIES – The user may select one or more nuclear data library files distributed by NNDC or NDS and download them using the network file transfer capabilities of the online service. This file option provides user access to files of nuclear data which are not contained in searchable data bases (see Section 4.4).

5 Data Base Retrievals

There are many common features in the data base retrieval modules of the online service. This section describing these common features should be used in conjunction with the detailed descriptions for using each retrieval program which are given in subsequent sections.

5.1 Option Selection

The user is presented with menus by which the various features of each retrieval program can be activated. Each menu presents a list of options available at that point in the program. Upon selection of a menu item, the indicated option is executed. The selected option may itself contain a menu of options, some or all of which may contain menus. Within the description of each retrieval program, there is a diagram illustrating all of the menus and options in the program and the relationships between them. An option may appear on more than one menu at different levels.

Sequential The menu items are listed on the input terminal, ending with a dash. To select a menu item, simply enter the first character of the option name followed by a RETURN key. A question mark, ?, entered will produce HELP information for the menu.

Video The menu is presented in boldface with the selected item blinking. The selected menu item can be changed by using the cursor movement (Arrow) keys to move through the menu. In this case, the selection moves forward, backward, up or down one item each time the corresponding cursor movement key is depressed. By depressing the PF1 key before a cursor movement key, the selection will move to either the beginning or end of the menu as appropriate. A menu item can also be selected by entering enough characters from the item name to be unique followed by a RETURN key. When the selected menu item is to be executed, just depress the RETURN key.

The terminal display for each option contains the name of the selected menu item as the last word on the first line in boldface. If this option was selected from the top-level menu, only one word will appear. However, if the option has ben selected from a lower lying menu level, the item names previously selected from higher level menus are displayed preceding the current option in the order selected as normal characters.

The first option menu which appears after the selection of a data base retrieval module will be referred to as the top-level menu. These menus all contain the following two options in addition to options specific to the program.

HELP — This option permits the user to scan the HELP file for the retrieval program and its associated data base. See Section 5.5 for more information on how to use help files and their contents.

EXIT — When selected, this top-level menu item will terminate the retrieval program. No information from this module is saved unless the user has selected one of the disk file storage options.

Other menus which are activated as part of a selection from a higher level menu will have the following common menu item.

DONE — The selection of this menu item causes the termination of the option containing the menu and returns the user to the next higher level menu for the next option selection.

5.2 Keyboard Data Entry

User supplied information for items not amenable to menu selection is accomplished via entry of text string. In general, this kind of information is entered following a terminal prompt from the user's keyboard, one character at a time. When the text entry is complete, use a RETURN key to signal the completion to the retrieval program. If the text string entered contains a question mark, then HELP information for the input field is supplied and the entry prompt returns again so that the required data may be entered.

The text string is entered in "insert" mode with each character being echoed on the user's terminal as it is entered. It is possible to perform simple editing on this string during entry. Use the cursor control keys to move the cursor back and forth over the string. An character entered will appear at the cursor position with all existing characters moved to the right. If the delete key is depressed, the the character preceding the cursor position will be removed and all remaining character moved one position to the left.

Since the user is free to enter any character string desired in this data entry mode, the programs must check the input string to see if it is valid within the context of the prompt. If the string fails to pass the checking then the user will be informed of the error and asked to reenter the required data. There are two levels of system user recognized, Expert and Non-expert (see Section 5.4). For non-experts, the program will also display the HELP information for the required data.

Video The field prompt is followed by reverse-video field of the maximum possible length of the input string. The characters appear as boldface in that field as they are entered. When HELP is requested for an input field, a help window appears above or below the input line.

In cases where the window contains more than one data entry field, each prompt and corresponding input field appear on a different line. The user may move between input fields by using the up and down cursor (Arrow) keys. The current value of the field is displayed in the input field. When the cursor is located at the beginning of the input field, entry of any character will clear the field so that remainder of the input can be entered. If the input data is invalid, the word ERROR flashes at the end of the line and the cursor is moved to the beginning of the input field. At this point, the old string is restored to the input field if an up or down cursor key is depressed.

5.3 Interrupts

The keyboard keys control-Y, control-C, and control-Z can be used to interrupt a program execution on a VAX computer. The F6 function key on a keyboard also has the same functionality as control-Y.

Entering a control-Y while running a retrieval program will cause an immediate termination of the program and a return to the master control menu so that another retrieval program or utility may be selected.

The control-C key has an important function in the retrieval programs and the utility modules. When entered, the current action is terminated softly and control is returned to the point where another choice can be made. In cases when a QUIT option is supplied during the terminal output of a retrieval, the control-C is deactivated. In the case where the program is generating a plot on the user's terminal, a control-C entered will terminate the plot generation.

5.4 New Users

By default, the online service provides automatic help to users when input errors are made in any of the options. In addition, extra information is made available when entering a data base retrieval option. The extra information is available through a menu which appears only on start up of the data base retrieval option. In addition to CONTINUE which when selected, will begin the retrieval functions, this menu has an ABOUT item. When selected, general information about the data base is displayed in HELP mode. In video mode, there is an additional menu item, VIDEO. By selecting this menu item, more detailed information about the video interface is displayed in HELP mode. An experienced user can bypass these features, namely the initial HELP menu and the automatic HELP when a data entry error is made, by setting the EXPERT environment flag with the CUSTOMIZE utility.

5.5 Help

The online service supplies interactive assistance to users through DEC-style HELP files or from information contained within the module.

A DEC-style HELP file consists information about various topics. The organization is hierarchical in nature where any topic may have one or more subtopics under which more detailed information is available. If the user selects HELP from the top-level menu, then the complete HELP file for the module is accessible for view. At each input prompt in a retrieval program where HELP is activated by a question mark (?), the appropriate HELP information is displayed. In some cases, the user may also have access to more detailed information at a lower hierarchical level in the HELP file. Follow the instructions a the bottom of the screen when prompted by the online module.

HELP coming from data stored in the module program is not hierarchical in nature, but may exceed the number of lines available for viewing on the terminal. In this case the information is paged and the instruction

```
Press RETURN/ENTER to continue, any other key to QUIT.
```

will appear on the bottom line of the terminal. If the user can not continue without further action, the instruction

```
Enter any key to continue.
```

will appear on the bottom line of the terminal.

Sample HELP Display in Video Mode

Nuclear Science References

RETRIEVE **NEW_FILE**

Format : <u>In</u>creasing **<u>User</u>** File : **<u>User Terminal</u>**

Enter output file specs :

The default output file is the user's terminal. If you desire that the output be placed in a disk file, enter the full file specification (name.type as in PU239.DECAY) for the file which will contain your retrieval output. Retrievals will be appended to last file specified if a new file specification is not given before a retrieval is done. To return to default terminal output just enter a RETURN instead of a full file specification.

5.6 Citation

Each online service module which accesses a data base has a CITE option on the main menu of the program. When selected, this option presents a recommended method for citing any data retrieved from the data base. A sample video-mode display is shown on the following page.

Sample CITATION Display in Video Mode

Nuclear Science References

CITATION

To properly cite NSR information retrieved using this program, we suggest the following text:

National Nuclear Data Center, Nuclear Science References, version of 31-Aug-1998. Information extracted from the NSR data base of the NNDC Online Data Service.

For more information, see the Citation Guidelines (BNL-NCS-63381) which is available from this site.

Press any key to continue.