7 ENSDF

The Evaluated Nuclear Structure Data File contains evaluated experimental nuclear structure and radioactive decay data. The evaluated data stored in the file is prepared as a cooperative effort by an international network of nuclear physicists. The evaluations are prepared for all nuclides with the same mass number and published after completion and review. The evaluations for masses of 45 and above are published in the NUCLEAR DATA SHEETS journal. The contents of the data file are the source for a computer produced manuscript. At the time of publication, the data for all nuclides of the mass is replaced in the data base. Evaluations for mass numbers 44 and below are published in NUCLEAR PHYSICS. The manuscript is not prepared from an ENSDF formatted data file. Therefore, the contents of this file for these mass numbers must be generated after the publication appears. Recently the data base has been expanded to include new evaluations that have been completed and checked but not yet reviewed in order to make the new evaluations available in a preliminary, prepublication form.

7.1 An ENSDF Data Set

The ENSDF data base consists of a large number of "data sets". These data sets generally record the nuclear physics properties of a nucleus which have been observed in a nuclear reaction or a radioactive decay in which that nucleus has been produced. For each nucleus, there also exists a data set which contains the adopted properties of a nucleus as deduced by an evaluator from all of the information in the reaction and decay data sets. These data sets are the basic unit of information retrieval from the ENSDF data base. The format of an ENSDF data set is described in detail in BNL-NCS-51655, "EVALUATED NUCLEAR STRUCTURE DATA FILE – A Manual for Preparation of Data Sets".

All records of a data set are 80 characters in length. The first five characters are used for the nucleus identification. For example, `155SM` represents ^{155}Sm. In character position 8, there is a letter which indicates the type of information contained in the record. A non-blank character in character position 7 indicates that the record is a comment record rather than a data record. Character position 6 is used to indicate a continuation record. Each data begins with an identification record and is terminated by a blank record.

7.2 ENSDF Options

The main menu and the associated options are summarized in the following diagram. The options listed on the top line of the diagram represent the top-level menu. Where an option is itself a menu of sub-options, the secondary menu items are listed vertically below the top-level option. Each option and sub-option will be described in detail below. All top-level options will be given in the text all in capital letters; sub-options will also be given in capital letters with a slash between the option and sub-option. For example SELECT and SELECT/NUCLIDE. See Section 5.6 and Section 5.5 for a discussion of the CITE and HELP options respectively.

Select	Retrieve	Plot	New_file	Format	Mass_Status	Cite	Help	Exit
Mass	Output	Simple						
Charge	Send	Tables-Figures						
Nuclide	New_file	Done						
Index	Format							
Existing	Done							
Done								

The SELECT option is used to select one or more data sets from the ENSDF data file. The options listed under SELECT give the user severals ways of selecting data sets. The SELECT/EXISTING option is available only if a list of data sets has already been created. These lists are created during the execution of one of the other SELECT options. The RETRIEVE/OUTPUT option will retrieve and display the selected data sets. If a dish file is created, the RETRIEVE/SEND option is active, permitting the user to download the retrieved data. The RETRIEVE option will not appear in the top level menu if there are not any selected data sets. The PLOT option will allow the production of simple level scheme plots (PLOT/SIMPLE) or NDS-style plots (PLOT/TABLES). The NEW_FILE and FORMAT options select the output media and output format respectively. The MASS_STATUS option the user to view the publication status for selected mass-chains.

7.3 Retrieval Strategy

In general, the user should select one or more ENSDF data sets which contain desired information. The most simple approach to this selection of data sets is to select a nucleus. The program then will display a list of all data sets for the chosen nucleus from which the user can then select the data sets to be received. A nucleus may be chosen directly with the SELECT/NUCLIDE option. However, alternate paths to this selection are provided by the SELECT/MASS and SELECT/CHARGE options. In these cases, a mass number or charge number is entered causing a menu of possible nuclides with the appropriate mass or charge number to be displayed. Then a nucleus can be chosen. The data sets in a list generated by the approach always refer to the same nucleus.

A more flexible approach to data set selection is provided by the SELECT/INDEX option. In this case, many more selection criteria can be used to create the data set list from which the data sets to be retrieved will be chosen. The data set list now will contain data set from one or more different nuclides which satisfy the selection criteria.

When you are ready to look at one or more of selected data sets, first you must chose the SELECT/DONE option in order to return to the top-level menu where the RETRIEVE and PLOT options now appear. With the NEW_FILE option,you may specify whether terminal or disk output is desired; with the FORMAT option, you can select the output format. Then select the RETRIEVE option to retrieve the selected data sets in the chosen format and either displayed on the user's terminal or stored in a disk file. Select the PLOT option to output level diagrams or NDS-style pages. The simple level diagrams may be plotted on the user's terminal if the online service CUSTOMIZATION feature has specified one of the supported graphic terminal types.

ENSDF Record Types

Character	Record Type	Meaning
blank	Identification	Data set identification
H	History	Record of a revision to the data set
Q	Q-value	Q-value and particle separation energies
N	Normalization	Normalization for radiation intensities
L	Level	Nuclear level parameters
B	Beta	β^- decay properties
E	EC	Electron conversion or β^+ decay properties
A	Alpha	α decay properties
D	Delayed-Particle	Other particle decay properties
G	Gamma	Gamma-ray properties
X	Cross-Reference	Indicates data sets in which level is observed
R	Reference	NSR Reference

Sample ENSDF Data Set

```
244PU    ADOPTED LEVELS, GAMMAS                                  86NDS     870210
244PU  H TYP=FUL$AUT=E. N. SHURSHIKOV$CIT=NDS 49,785 (1986)$CUT=1-May-1985$
244PU  Q   -75      5 6021    4 7409    104665.5  10    85WA02
244PU CL BAND(A)   K=0+ GROUND-STATE BAND, A=7.68, B=-0.0032
244PU CL E(B)      SEE COULOMB EXCITATION FOR THE MEASURED BE2,BE3 VALUES.
244PU CG E         FROM 83SP03 UNLESS OTHERWISE NOTED.
244PU  L 0.0         0+                8.08E+7 Y 10                    A
244PU2 L %SF=0.123 6$ %A=99.877 6
244PU CL T         7.5E+7  Y 20 (240NP ACTIVITY (56BU92));
244PU2CL 7.6E+7  Y 20 (240NP ACTIVITY (56DI09));
244PU3CL 8.11E+7 Y 25 (FROM 240PU/244PU AND 242PU/244PU A'S (66FI07));
244PU4CL 8.05E+7 Y 17 (FROM  242PU/244PU A'S (69BE06)).
244PU5CL ORIGINAL T VALUES OF 69BE06 AND 66FI07 WERE CORRECTED FOR ADOPTED
244PU6CL  T1/2(242PU)=3.733E+5 Y 12  (85SH15) AND T1/2(240PU)=6569 Y 6 (84SH34).
244PU CL           T(SF)=6.55E+10 Y 32 (66FI07); 6.8E+10 Y 8 (77GO03);
244PU2CL 6.56E+10 Y 30 (83MOZL).
244PU3CL              OTHER MEASUREMENT: 55FI36
244PU  L 46        2 2+                155 PS    2                     A
244PU CL T         FROM BE2 =13.61 18 IN COUL. EX.
244PU CL           BE2 FROM COULOMB EXCITATION.
244PU  G 46.1      CA            IF E2                     642            S
244PU2 G              LC=    469   $MC=    130   $
244PU3 G BE2W=300 5
244PU  L 153       2 4+                                                A
244PU2 L BE4=0.09 +55-9
244PU CL           BE4 FROM COULOMB EXCITATION.
244PU  G 106.2     CA                                                     S
```

7.4 SELECT

The SELECT option which appears in the top-level menu should be used to choose one or more data sets for retrieval. The actual retrieval is done by selecting the RETRIEVE option in the top-level menu. The selection of data sets for retrieval proceeds from a list of data sets satisfying some more general criteria. In simplest form, the list is all data sets for a chosen nucleus. A nucleus can be selected using either the SELECT/NUCLIDE, the SELECT/MASS or the SELECT/CHARGE options described below. Alternately, a data set list can be created with the SELECT/INDEX option using more complex criteria. When a data set list already exists, then the SELECT/EXISTING option can be used to indicate that the previously generated data set list should be use for selection. The second-level menu allows the user to generate the initial data set list according to one of these methods. Each of these options is described in detail below

7.4.1 SELECT/MASS

This option allows the user to create an initial data set list via the nuclide's mass number. When a mass number is entered at the prompt, a list of all nuclides for that mass number for which data sets exist is displayed. If, in addition, there are nuclides for that mass for which a prepublication version of the evaluation is available, they will also be listed. The user then selects a nuclide or ALL nuclides listed. If both published and prepublished versions exist, then the user must select between them. The initial data set list is created and the user is then asked to make his final data set selection as described above.

Video

The user is prompted to supply a nuclear mass number. Data currently exist for nuclides with mass between 1 an 266. By entering a ?-mark, instead of a number, a help screen will appear. After entering a valid mass number, a list of all nuclides with that mass number is displayed as a menu (symbols in boldface). In addition, there are menu items, ALL, and DONE. Select the desired nuclide from the menu. The initial data set list is then created for this nuclide and the user selects the sets to be retrieved as described above. If All is selected, then all data sets for all nuclides are selected. This initial data set list is considered the final selected list and the program immediately returns to the top-level menu. When DONE is selected, the option terminates with no initial data set list.

In the case where the data base also contains a prepublication version of the evaluation for the chosen mass, a list of the nuclides for which preliminary new evaluations are available are listed below the menu. If a nuclide is selected for which there both a published and a prepublication version, a menu for selecting between the two appears at the bottom of the screen. After selecting from this menu, the initial data set list is created and data set selection occurs as described above.

Sequential

First the user is prompted to supply a mass number. Data currently exist for nuclides with mass between 1 an 266. By entering a ?-mark, instead of a number, a help will appear on the screen followed by the original input prompt. After entering a valid mass number, a list of all nuclides with that mass number is displayed followed by a prompt to select one of the nuclides. A nucleus is usually entered as the mass number followed by the chemical symbol, exactly as it appears in the list on the user's terminal. However, it is possible to enter a nuclide as a chemical symbol followed by a dash and then the mass number (either 53CR or CR-52). The initial data set list is then created for this nuclide and the user selects the sets to be retrieved as described above. If All is entered at the nuclide prompt, then all data sets for all nuclides are selected. This initial data set list is considered the final selected list and the program immediately returns to the top-level menu. When a blank is entered, the option terminates with no initial data set list.

In the case where the data base also contains a prepublication version of the evaluation for the chosen mass, a list of the nuclides for which preliminary new evaluations are available are listed below the list of all nuclides in the data base for the chosen mass. If a nuclide is selected for which there both a published and a prepublication version, a menu for selecting between the two is presented. After selecting from this menu, the initial data set list is created and data set selection occurs as described above.

SELECT/MASS Display in Video Environment

```
---------------- Evaluated Nuclear Structure Data File ----------------
SELECT   MASS
------------------------------------------------------------------------
Format : Narrow Table     File : User Terminal        Selected : None
------------------------------------------------------------------------
                       Nuclides with mass 110

  110      110MO    110TC    110RU    110RH    110PD    110AG
  110CD    110IN    110SN    110SB   [110TE]   110I     110XE
  110BA    ALL      DONE

           NUCLIDES WITH PREPUBLICATION EVALUATIONS
110     110MO  110TC  110RU  110RH  110PD  110AG  110CD  110IN
110SN   110SB  110TE  110I   110XE  110BA

------------------------------- 110TE ----------------------------------
 [ARCHIVE]        PREPUBLICATION
ARCHIVE - Select the published version of the desired data.
```

7.4.2 SELECT/CHARGE

This option allows the user to create an initial data set list via the nuclide's charge number. When a charge number is entered at the prompt, a list of all nuclides for that charge number for which data sets exist is displayed. If, in addition, there are nuclides for that charge for which a prepublication version of the evaluation is available, they will also be listed. The user then selects a nuclide or ALL nuclides listed. If both published and prepublished versions exist, then the user must select between them. The initial data set list is created and the user is then asked to make his final data set selection as described above. The operation in both video and sequential mode is identical to that of the SELECT/MASS option.

7.4.3 SELECT/NUCLIDE

If this option is chosen, the user immediately selects a nuclide by entering the nuclide symbol. No nuclide lists are displayed. A nucleus is entered as the mass number followed by the chemical symbol or the chemical symbol and the mass number separated by a minus (`56FE` or `FE-56`). If an invalid symbol is entered or the symbol for which no data set exist, a message appears on the terminal and the user may enter another choice. When a valid nucleus symbol is entered, either the initial data set list is created or if a prepublication version of the evaluation for the nuclide exists, then a menu is given by which the user can choose. The user selection of data sets from the initial data set list continues as above. When a blank is entered, the option terminates with no initial data set list. The video and sequential modes for this option operate in an identical manner.

7.4.4 SELECT/INDEX

By choosing this option, the user has access to an index to the ENSDF data base in which many data set parameters are stored. The indexed retrieval module is described in detail in Section 7.6. The module operates in a manner similar to the NSR retrieval program described in Section 6. The module returns a list of data sets which are then displayed for final selection by the user as in the other data set SELECT options. When a no data set list is returned by the indexed data set selection module, the option terminates with no initial data set list. No prepublication data sets can be accessed by the option.

7.4.5 SELECT/EXISTING

This option appears in the SELECT menu only if an initial data set list has been created using one of the other SELECT options. The user will then be able to select data sets for retrieval from the initial data set list last created.

7.5 Final Data Set Selection

Once an initial data set list has been generated by any one of the above mentioned techniques, the final data set selection is independent of selection criteria. The data set selection steps are described here.

Video

The initial list of data sets is displayed in a scrolling window on the terminal with a menu on the bottom of the screen. Each data set is given on a single line of the window, including the data set's ID and the number of records in the data set. If there are more data sets than can be displayed in the scrolling window, then the scrolling options, FORWARD, BACKWARD, START and END are added to the bottom menu to move the window over the list. In all cases, the options CHOOSE, ALL, NONE, and DONE appear in the menu.

To choose one or more ENSDF data sets, select CHOOSE, ALL or NONE. The CHOOSE option begins the selection process without changing any prior selections. If ALL is selected, all data sets are preselected. If NONE is selected, no data sets are preselected and any previously selected data sets are deselected. A sample display is given in the following figure. This is a multiple selection menu which is described in detail in Section 3.2.1 as is the use of the keys to make the desired data set selections. These keys are also briefly described below the scrolling window. The current menu item is given in inverse video. Selected items are given in bold-underline. Initially, the current menu item is the first menu item in the list. When selection is completed, use the X-key to return to the scrolling menu.

SELECT/NUCLIDE/DATA_SETS Display in Video Environment

Evaluated Nuclear Structure Data File

SELECT NUCLIDE **DATA_SETS**

Archive Data Set ID's		**Records**
59CO	**ADOPTED LEVELS, GAMMAS**	**297**
59CO	59FE B- DECAY	75
59CO	59NI EC DECAY	13
55CO	48CA(15N,4NG)	59
59CO	56FE(A,P)	14
59CO	56FE(A,PG)	56
59CO	**58FE(P,G)**	**168**
55CO	58FE(P,P')	75
59CO	58FE(3HE,D)	14
59CO	58FE(A,T)	14
59CO	59CO(G,G)	27
59CO	59CO(N,N')	4
59CO	59CO(N,N'G)	172

UP_ARROW – move up one line.	DOWN_ARROW – move down one line.
RETURN – Toggle SELECT/DESELECT.	X – selection completed.

Sequential

The initial list of data sets is displayed on the screen in a non-video scrolling window. The mode of operation and available options are identical to those described in the video mode operation above. When the CHOOSE option is selected, a prompt appears and data sets to be retrieved are entered one at a time. Enter the set numbers for the data sets you wish to select. A negative number will deselect a data set. Entering a blank will complete the CHOOSE option. The CHOOSE option may be selected again if changes are desired. If the ALL menu item is selected, all data sets are selected for retrieval. If the NONE menu item is selected, all data sets are deselected for retrieval. Then use CHOOSE to deselect particular undesired data sets or to select particular desired data sets. Select DONE to complete the data set selection process.

7.6 Indexed Retrieval Module

Users may select ENSDF data sets based on wide variety of criteria by using the SELECT/INDEX option. These criteria include entry date into the data base; nuclide, parent, target, and residual ranges; type of data set (Adopted, Comments, Decay, Mossbauer, Muonic Atom, Reaction, and Reference); and specific types of decay or reaction data.

The first time the SELECT/INDEX option is selected there will be a delay in response as the indexed retrieval module is initialized.

7.6.1 SELECT/INDEX Options

The main menu and the associated options are summarized in the following diagram. The options listed on the top line of the diagram represent the top-level menu for the SELECT/INDEX option. Where an option is itself a menu of sub-options, the secondary menu items are listed vertically below the top-level option. Each option and sub-option will be described in detail below. Several of the sub-options will have additional menus associated with them. These will also be illustrated or described in detail below.

Browse	Get List	Show Lists	Return	Help
Initialize	Select List	Next Screen		
Extract	Show Lists	Previous Screen		
Combine	Return	Details		
Show Lists	Done	Done		
Done	Help	Return		
Return		Help		
Help				

The BROWSE option is designed to create one or more lists of data sets based on user selected retrieval criteria.

The GET LIST option is designed to select one of the data set lists created in the BROWSE option. This list will serve as the initial data set list for the SELECT/INDEX option.

Video The SHOW LISTS options, which also appear within several of the other options for convenience, allows the user to obtain additional details on the lists created.

Sequential In the sequential mode the Show Lists option is replaced be a SUMMARIZE option which also appear within several of the other options for convenience.

The RETURN option, which also appear within several of the other options for convenience, returns control to the SELECT option; the next time SELECT/INDEX option is chosen, the user will enter the indexed retrieval module at the same point as when the RETURN option was last executed.

7.6.2 SELECT/INDEX Use Strategy

The retrieval of the data set lists will, in general, take less time and produce a smaller and more useful list of data sets if you follow some of the suggestions made here. Start by specifying the general criteria using the BROWSE/INITIALIZE option. For example, if you are regularly accessing ENSDF for the same type of information, it would be useful to set a lower limit on the entry date (See page 7.12) corresponding to the last date on which you previously selected data sets for the same criteria. Setting limits on nuclides to be considered may be useful. For example, if a user is interested in the properties of the even–even Nd nuclides, this may be specified (See page 7.12).

More detailed selection may be made *via* the BROWSE/EXTRACT options. Retrieval of Comments and Reference data sets is useful only for documentation purposes; the Comments data set contains the general information about the mass-chain evaluation and the Reference data set, all references cited in the evaluation. Individual reference citations may be displayed during retrieval and display of a data set. Except for specific applications (*e.g.*, nuclear medicine or reactor heat calculations) or interests (*e.g.*, the study of heavy-ion fusion-evaporation reactions), the Adopted data sets should be of most interest since they contain all the recommended nuclear structure properties of the nuclide and the justifications for the recommendations. If other data sets are retrieved, the Adopted data sets may still be of use (*e.g.*, the justification for the J^{π} assignments given in the Decay data sets may only appear in the Adopted.).

Retrieval criteria for reaction data sets may be the most difficult to specify . Some of the specific problems are:

- Reactions with multiple outgoing particles may be indexed in a variety of ways. It is presumed in the indexing that the order of these outgoing particles in the data set identification has relevance. For example, an (α,np) reaction might be indexed as "(α,np)," "(α,pn)," or "(α,d)." One should be patient and try the relevant possible combinations.

- Heavy-ion fusion-evaporation reactions are indexed as (HI,XNG) if the data set is identified as "(HI,XNG)" or if the reaction (*e.g.,* (^{16}O,4nγ)) has been identified specifically. In the later case, the data set will also be indexed for the specific reaction and incident and outgoing particles. "(HI,XNG)" is used when the data set combines information from a group of target and incident and outgoing particles. Thus, a retrieval on "(HI,XNG)" will always be complete while that for a specified incident particle or reaction may not be.

- Thermal and resonance neutron capture, and average resonance capture data sets are indexed as such only if they are identified as such in the data set identification. Therefore, retrievals using these selectors may be incomplete. If this is suspected, it may be better to retrieve a list of all the (n,γ) data sets and lists of the data sets not of interest and use the BROWSE/COMBINE option to reduce the initial list.

The SHOW LISTS (video mode) or SUMMARIZE (sequential mode) options should be used as a guide in developing a retrieval strategy.

Additional data set lists may be made using Boolean combinations of existing lists through the BROWSE/COMBINE option. For some retrievals fewer steps may be required if this option is used. In other cases, it may be necessary to use this option to construct more complicated retrieval criteria than available within. An example of the first case would be a retrieval of all Decay data sets for a specific parent range excluding spontaneous fission. The user would retrieve lists of data sets for all decay and for spontaneous fission decay and use the Boolean `.NOT.` to obtain the final list.

In many cases, the indices will be checked as specific criteria are selected. If there are no current entries matching the specified criteria, the user is informed immediately and no changes are made in the selection criteria. Some of the sub-options will list only the currently indexed quantities; these include the DECAY MODE and MULTIPARTICLE DECAY sub-options (See table on page 7.16) and the CLASS sub-options (See table on page 7.17).

7.6.3 SELECT/INDEX BROWSE (B)

The BROWSE option should be used to prepare one or more data set lists.

Video

The BROWSE display includes a list of applicable general selection criteria (see BROWSE/INITIALIZE), a list of previously generated data set lists (see BROWSE/EXTRACT and BROWSE/COMBINE), and the BROWSE menu itself.

The display of previously saved lists is titled **DATA LISTS SAVED** and consists of five columns of information. For each list saved there are two lines of information.

Col.	Description
1	List number and entry date; the list number appears in inverse video.
2	The data type. The first line will give the major selection criteria (*e.g.*, Reaction) and the second, the secondary selection criteria (*e.g.*, (HI,XNG)).
3	The nuclides or residuals selection criteria. The first line gives the range (*e.g.*, $A = 200 - 266$) and the second, the type (*e.g.*, odd–even). If residuals have been selected, the data in this column appear in inverse video.
4	The targets or parents selection criteria. The first line gives the range (*e.g.*, $A = 200 - 266$) and the second, the type (*e.g.*, odd–even). If parents have been selected, the data in this column appear in inverse video.
5	Number of data sets in the list and the total number of records contained in the data sets.

Sequential

The user is prompted to specify an option. Additional prompts follow depending on the option chosen. Data set lists previously saved may be seen by using the Summarize option.

BROWSE/INITIALIZE (I)

Users may select to restrict the dates of entry into the data base, the range of nuclides, or to return to the SELECT option. The selection criteria are compared to the indices for entry dates and nuclides. If the entry dates or nuclides selected are not currently indexed, the user is informed of this and no changes are made in the selection criteria. If a range is specified, the actual selection criteria will be based on the contents of the indices.

Video The BROWSE/INITIALIZE display includes a list of current general selection criteria, the BROWSE/INITIALIZE menu and a list of previously generated data set lists (see BROWSE/EXTRACT and BROWSE /COMBINE).

The initial display shows the current range of entry dates in the data base and that all nuclides have been selected. The entry dates and nuclides in the display are updated when the DONE sub-menu item is selected.

Sequential The BROWSE/INITIALIZE option will prompt first for the entry date and then for the nuclide range.

Entry Date

The entry date of a data set in ENSDF is the date when it was entered into the data base or last revised. Selection of the entry date may be as a date (in the form of YYMMDD), a range of dates, or a lower or upper limit on the date.

ALL	ALL or blank	No entry date selection (default)
YYMMDD	850401	A single date (April 1, 1985)
YYMMDD_1–YYMMDD_2	850401-850530	A range of entry dates (April 1 through May 30, 1985)
YYMMDD–	850401-	The date entered and all later dates (April 1, 1985 to present)
–YYMMDD	-850401	All dates up to and including the one entered (From the earliest entry date through April 1, 1985)

Nuclide

Selections may be for a specific nuclide, mass, or element; a mass, element, or nuclide range; or an upper or lower limit on mass or element. In the case of a mass, charge, or range selection, the user has the option of specifying all nuclei within the range or odd–odd, odd–even, even–even, or even–odd nuclei.

Video When nuclide is selected a Range menu will appear with the following entries:

MASS	A specific mass, a range of masses, or an upper or lower limit on mass
ELEMENT	A specific element, a range of elements, or an upper or lower limit on element
NUCLIDE	A specific nuclide or a range of nuclides
ALL	All nuclides

Unless ALL is selected, a prompt(A:, Z:, or AZ:) will appear and a single quantity, a range, or an upper or lower limit may be entered. Elements may be specified by either the chemical symbol or charge (*e.g.*, C or 6); nuclides are entered as AAAZZ where AAA is the mass and ZZ is the chemical symbol (*e.g.*, 12C for ^{12}C). For $Z \geq 104$, use the last two digits of the Z as the chemical symbol, *e.g.* 25304 for $Z = 104, A = 253$. Ranges and limits are given as for entry dates.

If a range is specified, it may be followed optionally by a qualifier specifying odd–odd, odd–even, even–even, or even-odd nuclei as in the sequential mode (see page 7.13). If the qualifier is not given, a Type menu will appear with the following entries:

ALL	All nuclides within the range
ODD–ODD	All odd–odd nuclides within the range
ODD–EVEN	All odd–even nuclides within the range
EVEN–EVEN	All even–even nuclides within the range
EVEN–ODD	All even–odd nuclides within the range

The display showing the retrieval criteria for nuclides will be updated when the DONE sub-menu item is selected.

Sequential Respond to the prompt by entering `A:`, `Z:`, or `AZ:` for mass, element, and nuclide, respectively followed by the mass, element, nuclide, or range as described for the video mode on page 7.12 and, optionally by `/OO`, `/OE`, `/EE`, or `/EO`, for odd–odd, odd–even, even–even, or even–odd nuclei, respectively. `ALL` or a blank entry will select all nuclides.

BROWSE/EXTRACT (EXT)

The creation of lists of data sets for user selected values of indexing variables is accomplished by this option. The options associated with the EXTRACT option are summarized in the following figure. options listed on the top line of the diagram represent the top-level menu for this option or the options available at the prompt. Where an option is itself a menu of sub-options or a prompt for sub-options, the secondary items are listed vertically below the top-level option. Each option and sub-option will be described in detail below. Several of the sub-options will have additional choices associated with them. These will also be illustrated or described below.

Adopted   Comments   Decay   Mossbauer   Muonic Atom   Reaction
References   All   Done   Return   Help

Adopted	Decay	Reaction
Levels	Parent range	Target
Gammas	Decay Mode	Residual
Levels .OR. Gammas	Multiparticle Decay	Class
Levels .AND. Gammas	All	Specific
All	Execute	Incident
Done	Done	Outgoing
Return	Return	All
Help	Help	Execute
		Done
		Return

Video The BROWSE/EXTRACT display and its sub-menu displays includes a list of general selection criteria (see BROWSE/INITIALIZE), the current specific selection criteria, a list of data set lists generated previously by this option or the BROWSE/COMBINE, and the BROWSE/EXTRACT menu or sub-menu itself.

When the retrieval of a data set list is begun, a blinking "Working" will appear within the menu window. After the first match, this will be replaced by a line showing the number of matches and total number of records. This line is updated with each new match. When the retrieval is complete, a menu containing SAVE and NOSAVE will appear at the end of the line. Select SAVE to save the data set list and NOSAVE if the list is not to be saved.

BROWSE/EXTRACT Sub-display in the Video Environment

Evaluated Nuclear Structure Data File

SELECT INDEX BROWSE EXTRACT DECAY **SF**

Nuclides: **All** **All**
Entry Date: **750430-910807** **Parents:** **A:200-266** **All**

Parent range	**Decay Mode**	**Multiparticle Decay**
All	**Execute**	**Done**
Return	**Help**	

DATA LISTS SAVED

No. and Entry Date	Data Type	Nuclides or *Residuals*	Targets or *Parents*	Matches and Records
1	DECAY	All	*A:200-266*	669
750430-910807	All	All	*All*	39262
2	DECAY	All	*A:200-266*	66
750430-910807	Spontaneous F	All	*All*	1447

Information which is shown in inverse video on a VT-100 terminal are represented by italics in this figure (*e.g.*, *No. and*).

Sequential The user will be prompted to select one of the options. Depending on the option chosen, additional prompts may follow or the list retrieval may begin immediately.

The current selection criteria may be obtained by using the Summarize option.

When the retrieval of a data set list is begun, "Working" will be printed out. When the retrieval is complete, The total number of matches and records will be printed out along with the question "Do you wish to save this list?". Answer yes (Y) to save the list. Any other response will not save the list.

Adopted (AD)

This option selects adopted data sets based on the criteria chosen from the sub-menu or entered at the prompt and on the criteria specified in BROWSE/INITIALIZE.

Video Execution of the list retrieval begins when the sub-menu item is selected. Select DONE to return to the BROWSE/EXTRACT menu.

Sequential Execution of the list retrieval begins when the prompt has been answered. After the retrieval is completed, the user will be asked if he wishes to continue retrieving adopted data. An answer of yes (Y) will continue; any other response will return the user to the BROWSE

/EXTRACT prompt.

BROWSE/EXTRACT Adopted Data Options

LEVELS	(L)	All adopted data sets containing level data
GAMMAS	(G)	All adopted data sets containing gamma data
LEVELS .OR. GAMMAS	(OR)	All adopted data sets containing level or gamma data
LEVELS .AND. GAMMAS	(AN or blank)	All adopted data sets containing level and gamma data (default)
ALL	(AL)	All adopted data sets (default in sequential mode)
DONE	(D)	Return to BROWSE option
RETURN	(R)	Return to SELECT option

Comments (C)

This option selects the comments data sets based on the criteria specified in BROWSE /INITIALIZE. Execution of the list retrieval begins when this option is selected.

Decay (DE)

This option selects decay data sets based on the criteria selected here and on the criteria specified in BROWSE/INITIALIZE.

Video A menu will appear listing the options described given below. After the decay data criteria have been selected, select Execute to do the retrieval. Select Done when finished.

Sequential The user will be prompted first for the parent range and then for selecting decay data sets be either decay mode or multiparticle decay. Retrieval will begin when the prompts have been answered. After the retrieval is completed, the user will be asked if he wishes to continue retrieving decay data. An answer of yes (Y) will continue; any other response will return the user to the BROWSE/EXTRACT prompt.

PARENT RANGE		Select the parent ranges. **Video** Menus similar to those for nuclides (see page 7.12) will appear. **Sequential** Respond to the prompt in the same manner as for nuclides (see page 7.13).
DECAY MODE	(MO)	Select the decay mode (*e.g.*, β^- decay).[a] **Video** A menu listing the currently indexed decay modes will appear. **Sequential** The decay modes currently indexed will be listed and the user will be prompted to enter the desired decay mode. The list will contain abbreviated codes for the decay modes; these codes are: `A` α decay; `IT` Isomeric transition decay `B+` β^+ decay; `N` Neutron decay `B-` β^- decay; `P` Proton decay `EC` ϵ decay; `SF` Spontaneous fission Multiparticle decays are listed as a combination of these; for example, `AP` is an α particle decay followed by proton decay and `B-2` is a double β^- decay. If the selected decay mode is enclosed in `""`, only that decay mode is selected. If there are no quotation marks, all decay modes starting with the mode entered will be selected. Thus, `"B-"` will select only β^- decay while `B-` will select β^-, $2\beta^-$, $\beta^- n$, *etc.*
Multiparticle Decay	(MU)	Select the multiparticle decay mode (*e.g.*, β^-n decay).[b] **Video** A menu listing the currently indexed decay modes will appear. **Sequential** The multiparticle decay modes currently indexed will be listed and the user will be prompted to enter the desired decay mode.[b] See DECAY MODE for an explanation of the list and wild card structure.
ALL	(A)	Select all decay data sets
EXECUTE		Create a data set list based on the current retrieval criteria (Video mode only)
Done	(D)	Return to BROWSE/EXTRACT option
Return	(R)	Return to SELECT option

[a] In the case of β^+ or ϵ decay, the data sets are indexed based on the data contained within the data sets. Therefore, data sets containing information on β^+'s will be indexed under β^+; those, on ϵ's under ϵ; and those containing information on both β^+'s and ϵ's under $\epsilon + \beta^+$.

[b] For the purposes of sorting decay modes such as $2\beta^-$ are indexed as `B-2`.

Target Residual		Select the target[a] or residual[a,b] ranges. **Video** Menus as described on page 7.12 will appear. **Sequential** Respond to the prompt as described on page 7.13.
CLASS	(C)	Select a class of reaction or experiment. The following 16 classes are recognized: Alpha particle transfer; Inelastic scattering Average resonance capture; Isobaric analog resonance Charge exchange; Thermal neutron capture Coulomb excitation; Pickup Elastic scattering; Polarization Giant dipole resonance; Resonances Giant quadrupole resonance; Stripping Heavy-ion fusion-evaporation; Two nucleon transfer Only those classes currently indexed will be displayed or listed. **Video** Select from the menu displayed. **Sequential** After the classes are listed a prompt will appear. Enter enough characters to ensure uniqueness (*e.g.*, S for Stripping).
SPECIFIC	(S)	Select a specific reaction.[c] Enter the reaction in nuclear physics notation: *(projectile,ejectiles)*. Wild card selection of reactions may be done by typing only part of the reaction. For example, (A, selects all reactions with an α incident; (A,N selects all reactions with an α incident and a neutron as the first listed outgoing particle. In contrast to the NSR retrieval, trailing γ's are indexed. Thus, (A,P) is a different retrieval criterion from (A,PG).
INCIDENT	(I)	Select a specific incident particle.[c]
OUTGOING	(O)	Select a specific set of outgoing particles.[c] Enter the outgoing particle in the order desired. Wild cards are specified in the same manner as in DECAY MODE (See table on page 7.16.).
ALL	(A)	Select all reaction data sets
EXECUTE		Create a data set list based on the current retrieval criteria (Video mode only)
DONE	(D)	Return to BROWSE/EXTRACT option
RETURN	(R)	Return to SELECT option

[a]Targets and residuals are given in the same format. Both may be specified as isotopes; targets may also be specified as elements. See page 7.12 for the formats. Valid examples are:

47TI	^{47}Ti
NI	Nickel (targets only)
25904	Element-104, mass 259

[b]Usually the residual is the same as the nuclide; however, for some resonance studies they differ.

[c]Incident or outgoing particles are generally entered in the same form as a nuclide (*e.g.*, 7LI for ^{7}Li). However, gamma rays and some light particles are represented with these special symbols:

gamma ray (γ)	G	kaons (K)	K-, K0, or K+	triton (t or ^{3}H)	T
electrons (e)	E or E+	neutron (n or ^{1}n)	N	alpha (α or ^{4}He)	A
muons (μ)	MU	proton (p or ^{1}H)	P		
pions (π)	PI, PI+, or PI-	deuteron (d or ^{2}H)	D		

Mossbauer (MO)

This option selects the Mossbauer data sets based on the criteria specified in BROWSE/INITIALIZE. Execution of the list retrieval begins when this option is selected.

Muonic Atom (MU)

This option selects the muonic atom data sets based on the criteria specified in BROWSE/INITIALIZE. Execution of the list retrieval begins when this option is selected.

Reaction (REA)

This option selects reaction data sets based on the criteria selected here and on the criteria specified in specified in BROWSE/INITIALIZE. Execution of the list retrieval begins when the Execute item is selected.

Video Execution of the list retrieval begins when the EXECUTE item is selected. Selection of the DONE item returns the user to the BROWSE/EXTRACT menu.

Sequential The user will be prompted

1. to select the desired target range,
2. to select the desired residual range,
3. and to select the class of reaction or experiment, specific reaction, or incident and outgoing particles.

After all the prompts have been answered, the list retrieval begins. When the retrieval is complete, the user will be asked if he wishes to continue selecting reaction data. An answer of yes (Y) will continue the selection of reaction data. Any other response will return to the BROWSE/EXTRACT prompt.

Reference (REF)

This option selects the reference data sets based on the criteria specified in BROWSE/INITIALIZE. Execution of the list retrieval begins when this option is selected.

All (AL)

This option selects all data sets satisfying the criteria specified in BROWSE/INITIALIZE. Execution of the list retrieval begins when this option is selected.

Done (DO)

Return to the BROWSE option.

Return (RET)

Return to the SELECT option.

BROWSE/COMBINE (C)

This option should be used to logically combine data set lists previously created with the BROWSE/EXTRACT or BROWSE/COMBINE options. The combining operation is limited to the following logical functions:

.AND.	Create a list of data sets containing those sets which are listed in both the input lists
.OR.	Create a list of data sets containing those sets which are listed in either of the input lists or in both of the input lists
.XOR.	Create a list of data sets containing those sets which are listed in either of the input lists but not in both of the input lists
.NOT.	Create a list of data sets containing those sets which are listed in the first input list but not the second input list

For example, if one wished to retrieve all decay data sets for parents with $A \geq 200$ except for spontaneous fission, a list would be retrieved for all decay data sets with parent $A \geq 200$ and another list, for all spontaneous fission decay data sets with parent $A \geq 200$.

The format for a logical expression is

list_number.operation.list_number

If data set lists 1 through 4 have been previously generated then the following are valid examples of logical expressions.

3.OR.4	All data sets listed in either list 3 or 4
1.NOT.4	All data sets listed in list 1 which are not listed in 4
4.AND.2	All data sets listed in both list 1 and 2
2.XOR.3	All data sets listed in either list 1 or 2 but not in both

The new combined list would be 5.

Video A menu will appear with the items: New List, Show Lists, Done, and Return. See figure on 7.20.

The NEW LIST option allows the creation of a new list which is the logical combination of two previously saved lists. A display containing a prompt line and a menu of the Boolean operations will appear. The first list number should be entered followed by selection of the Boolean operator. Initially the menu will appear with AND selected. Subsequent NEW LIST displays will have the operator last selected as the default selection. and the entering of the second list number.

Other Options:

SHOW LISTS	See Section 7.6.5.
DONE	Return to the BROWSE option.
RETURN	See Section 7.6.7.

When the retrieval of a data set list is begun, a blinking "Working" will appear within the menu window. After the first match, this will be replaced by a line showing the number of matches and total number of records. This line is updated with each new match. When the retrieval is complete, a menu containing SAVE and NOSAVE will appear at the end of the line. Select SAVE to save the data set list and NOSAVE if the list is not to be saved.

Sequential The user will be prompted to enter an operation. A carriage return at the prompt will return the user to the BROWSE option. After the combine option has completed the user will be asked if the list should be saved and then returned to the BROWSE option.

When the retrieval of a data set list is begun, "Working" will be printed out. When the retrieval is complete, The total number of matches and records will be printed out along with the question "Do you wish to save this list?". Answer yes (Y) to save the list. Any other response will not save the list.

BROWSE/COMBINE Display in the Video Environment

Evaluated Nuclear Structure Data File

SELECT   INDEX   BROWSE   **COMBINE**

New List   **Show Lists**   **Done**   **Return**   **Help**

DATA LISTS SAVED

No. and Entry Date	Data Type	Nuclides or *Residuals*	Targets or *Parents*	Matches and Records
1	DECAY	All	*A:200-266*	669
750430-910807	All	All	*All*	39262
2	DECAY	All	*A:200-266*	66
750430-910807	Spontaneous F	All	*All*	1447

Information which is shown in inverse video on a VT-100 terminal are represented by italics in this figure (*e.g.*, *No. and*).

Combine Display

Evaluated Nuclear Structure Data File

SELECT   INDEX   BROWSE   COMBINE   **NEW LIST**

Enter First List Number

AND
OR
■ . **XOR** . ■
NOT

New List Display (partial display shown)

7.6.4 GET_LIST (G)

The GET_LIST option allows the selection of a data set list for sorting and retrieval. After a list is selected and sorted, the user is returned to the SELECT option where he may specify which of the data sets in the list should be retrieved.

GET_LIST/SELECT_LIST

The SELECT_LIST option allows the user to select a list for retrieval. If only one list exists, processing begins immediately. If there are more that one list, the user will be prompted for a list number. A prompt or menu will than appear asking for a sort order; the possible choices are: NUCLIDE, PARENT, TARGET, or RESIDUAL. After the sort, the program returns to SELECT, allowing further selection and retrieval. If SELECT/INDEX is selected again, the user will return to GET_LIST.

GET_LIST Other Options

SHOW LISTS	See Section 7.6.5 (Video Mode only).
SUMMARIZE (S)	See Section 7.6.6 (Sequential Mode only).
DONE (D)	Return to the SELECT/INDEX option.
RETURN (R)	See Section 7.6.7.

7.6.5 SHOW_LISTS (Video Mode only)

The SHOW_LISTS option allows the user to scroll through the list of data sets saved if there are too many to fit on the display and to obtain additional details about the lists. These additional details may be obtained by selecting the sub-menu item Details.

SHOW_LISTS/NEXT_SCREEN

Display the next screen of the data lists.

SHOW_LISTS/PREVIOUS_SCREEN

Display the previous screen of the data lists.

SHOW_LISTS/DETAILS

When the DETAILS sub-menu item is selected, the user may move through the display of data set lists and select a list to obtain the details of what is in the list. The details consist of the identification of the data sets retrieved, the number of records in each data set, and the types of records contained in each data set.

Movement through the display is accomplished by the up and down cursor keys and, for terminals with an edit keypad, by the previous screen and next screen keys. Press return to see the details of the highlighted list of data sets. The `delete` key, the right uppermost key on VT-series terminals (may differ with various emulators), will return the user to the SHOW_LISTS.

The display of the details consists of a window showing the retrieval criteria for the list and a tabular display consisting of the following columns:

1. Nuclide
2. Data Set Identification
3. Total number of records
4. Number of level records
5. Number of gamma records
6. Number of radiation records
7. Number of parent records
8. Existence of Q records
9. Existence of N records
10. Number of comment records
11. Number of continuation records

Movement within the tabular display is by the cursor and edit keys, previous and next. The first two columns are fixed and the remaining columns will scroll horizontally as the left and right cursor keys are used. To terminate this display press the delete key.

SHOW_LISTS Other Options

DONE (D)	Return to the SELECT/INDEX option.
RETURN (R)	See Section 7.6.7.

7.6.6 SUMMARIZE (S; Sequential Mode only)

The SUMMARIZE option, which also appear within several of the other options for convenience, will show the current general selection criteria (entry date and nuclides); the data type, reaction class, or incident particle; and the number of lists which have been saved. If any lists have been saved, the question "Summarize?" will be asked. If the answer is yes (Y), for each list the selection criteria, number of data sets, and total number of records will be listed and the question "Show the list?" asked. If the answer is yes (Y), the contents of the list will be output.

7.6.7 RETURN

The RETURN option, which also appear within several of the other options for convenience, goes back to the SELECT option; the next time SELECT/INDEX option is selected the user will reenter the option at the same point he was at when RETURN was selected.

7.7 RETRIEVE

The RETRIEVE option supports ENSDF output in text form. It appears in the top-level menu only after the user has selected one or more ENSDF data sets using the SELECT option. A submenu appears on the screen with the options OUTPUT, NEW_FILE, FORMAT and DONE. There will be an additional option, SEND, if the current output is to a disk file and this disk file is not empty.

7.7.1 RETRIEVE/OUTPUT

When selected, this option will output the selected ENSDF data sets to the currently selected output device (user's terminal or disk) in the currently selected format (table or ENSDF).

When output is to the user's terminal, the selected data sets are retrieved one at a time and displayed in the format selected using the FORMAT option (default is Narrow Table). The user can page through the output for each data set. When finished with the current data set, the user can move either forward or backward in the selected data sets. If the output terminal has a graphical display capability, then level and decay diagrams may be displayed with the RETRIEVE/OUTPUT/VIEW option. During terminal output, the user may also select the RETRIEVE/OUTPUT/REFERENCE option in order to request display of a reference citation from the Nuclear Science References (NSR) data base.

When output to disk, the retrieval proceeds uninterrupted in the format selected in the FORMAT option. Upon completion, a message is displayed giving the number of data sets retrieved and written into the output disk file.

Sample output for both the Narrow Table and the ENSDF format in video mode are shown in the figure on the following page. The sequential mode output looks nearly identical, both having a menu at the bottom of the screen to control viewing of the data set.

Video In video mode, the movement within the output of a data set is controlled by four scrolling options in the menu:

FORWARD — to move forward a page,
BACKWARD — to move backward a page,
START — to move to the first page,
END — to move to the last page.

When one of the options is not logically possible because of the current position within the data set, then it does not appear in the menu. For example, FORWARD and END do not appear when the window is displaying the last page of the data set output.

One can also move to the next data set using the NEXT_SET and to the previous data set using the PRIOR_SET options. By choosing the Quit option, the retrieval of the current and all other data sets is terminated and the program returned to the top-level menu.

Sequential In sequential mode, the display is nearly identical to that of the video mode. The menu items are displayed at the bottom of the screen are are identical in both modes. Select a menu item by entering the first character of the item name.

VIEW For users with a graphics terminal recognizing either Tektronix or Regis graphics instructions, it is possible to display a series of level diagrams and decay schemes representing the data in the data set currently being viewed. The user must have previously set his terminal graphics capability using the CUSTOMIZE module.

When the VIEW option is selected, a description of the first plot is presented along with a menu by which the user can execute the plot (PLOT), go to the next plot (SKIP) or stop the plotting option (QUIT). If selected, the plot will remain on the terminal until a RETURN-key is pressed. Each plot is described in turn and the user selection menu given until all plots are finished or QUIT is selected.

REFERENCE

When viewing a data set in either video or sequential mode, it is possible to display a reference from the Nuclear Science References data base (see Section 6). When selected, the user is asked to supply the 6-character reference keynumber (*e.g.* 88AJ01). The requested NSR entry, if the entered keynumber is valid, will be displayed on the user's terminal.

7.7.2 RETRIEVE/SEND

Use this option to download the data file containing the current retrieval. This option appears in the RETRIEVE menu only when a file of retrieved data exists. This option is identical to the FILE/SEND option described in Section 15.1.3.

7.7.3 RETRIEVE/NEW_FILE

Use this option to change where the retrieval output will go. This option is identical to the NEW_FILE option described in Section 7.9.

7.7.4 RETRIEVE/FORMAT

Use this option to change the format of the retrieval output. This option is identical to the FORMAT option described in Section 7.10.

Output for Table Format in Video Environment

```
        8BE       ADOPTED LEVELS, GAMMAS    Archive          FIRST SET

     8Be              8Be   Adopted levels   88AJ01 (cont)             Page   6
                 ============================

 E(level)     Jpi        XREF        T1/2              Comments
 ----------- -------   ----------- -----------  -----------------------------
                                                 DECAY:D,A
 27494.1 18  0+            I    M   5.5 KEV 20  ISPIN=2
                                                 DECAY: G,N,P,D,T,3HE,A
                                                 E: FOR PARAMETERS OF THIS
                                                  STATE SEE TABLE 8.5:
                                                  PARAMETERS OF THE FIRST
                                                   T=2 STATE IN 8BE (84AJ01)
 28600?                                          WIDTH: BROAD
                                                 DECAY: G,P

 [*] GIANT RESONANCE:  SEE REACTION 7LI(P,G)

 FORWARD  BACKWARD  START  END  NEXT_SET  VIEW  REFERENCE  QUIT
 BACKWARD - Go to the prior window of scrolled information.
```

Output for ENSDF Format in Video Environment

```
        8BE       ADOPTED LEVELS, GAMMAS    Archive          FIRST SET

 8BE   L 25500       4+
 8BE2 L ISPIN=0
 8BEX L XREF=M
 8BE CL WIDTH     BROAD
 8BE CL           DECAY:D,A
 8BE   L 27494.1   180+                5.5 KEV   20
 8BE2 L ISPIN=2
 8BEX L XREF=M
 8BE CL           DECAY: G,N,P,D,T,3HE,A
 8BE CL E         FOR PARAMETERS OF THIS STATE SEE TABLE 8.5;
 8BE2CL PARAMETERS OF THE FIRST T=2 STATE IN 8BE (84AJ01)
 8BE   G 9847.6              M1
 8BE2 G WIDTHG=21.9 EV 39$BM1W=1.1 2
 8BE   L 28600                                                    ?
 8BEX L XREF=I
 8BE CL WIDTH     BROAD
 8BE CL WIDTH     DECAY: G,P

   BACKWARD     START     NEXT_SET    VIEW     REFERENCE     QUIT
 BACKWARD - Go to the prior window of scrolled information.
```

NSR Reference Output in Video Environment

8BE ADOPTED LEVELS, GAMMAS Archive FIRST SET

88Aj01

Nucl.Phys. A490, 1 (1988)
F.Ajzenberg-Selove
Energy Levels of Light Nuclei A = 5-10

<KEYWORDS>COMPILATION A=5-10; compiled,evaluated structure data

DONE

DONE - Viewing completed.

7.8 PLOT

The PLOT option supports ENSDF output in graphical form. It appears in the top-level menu only after the user has selected one or more ENSDF data sets using the SELECT option. A submenu appears on the screen with the options SIMPLE, TABLES-FIGURES and DONE.

7.8.1 PLOT/SIMPLE

It is possible to plot a series of level diagrams and decay schemes representing the data in the currently selected data sets. The plots will be stored in PostScript format in the user's storage area in a file with the name `ENSDF_PLOT.PS` unless another name is supplied when prompted immediately after selection of this option. All plots will be placed in a single file. When finished, the user is prompted as to whether or not to download the plot file for output on a local laser printer. If the response is positive, then a form is presented for entry of the transmission parameters (See Section 15.1.3 for details).

7.8.2 PLOT/TABLES-FIGURES

The TABLES/FIGURES option is used to creates a disk file in Postscript format containing displays of the selected data sets in Nuclear Data Sheets style. The output file is stored in the user's disk storage area with the name `NDS_PLOT.PS` unless another name is supplied when prompted immediately after selection of this option. All plots will be placed in a single file.

There are four options for displaying the information in the selected data sets.

TABLE	displays only the numerical tables
DRAW	displays only the gamma-decay schemes
BANDS	displays only the nuclear band structures
ALL	display all three types output properly interleaved

After selecting the type of displays desired, the plots are generated and stored in the user selected disk file. When finished, the user is prompted as to whether or not to download the plot file for output on a local laser printer. If the response is positive, then a form is presented for entry of the transmission parameters (See Section 15.1.3 for details).

7.9 NEW_FILE

The output from the retrieval can be displayed on the user's terminal or stored in a disk file. This option can be used to change the currently selected output destination. The default destination is the user's terminal. If you wish to direct output to a disk file, you MUST use this option to supply a name for the file before proceding with the retrieval. The disk storage of output files and their naming conventions are discussed in Section 3.4. The user's terminal can be indicated by specifying a file `TT:` or `TTY:`.

When this option is selected, a prompt appears and the user enters a new file specification. Entering a RETURN without a file specification is interpreted as selecting the user terminal for output. The video and sequential mode operation is the same.

7.10 FORMAT

The output can be generated in one of three formats. This option permits the selection of the output format from the three choices. The default selection is **Narrow Table** format.

Narrow Table Format

The **Narrow Table** format is an expanded human-readable format in which the ENSDF formatted data set is presented as data tables similar to what would be published in the Nuclear Data Sheets. The width of a line of output is 80 characters. An example of this format is shown in the figure on page 7.25.

Wide User Format

The **Wide Table** format is identical to the **Narrow Table** format except that it is designed for 132 character line output. Unless the user has specified that his output device is 132 character capable (see Section **??**), the output will revert to standard **Narrow**

Table format.

ENSDF Format

The **ENSDF** format is described and illustrated in Section 7.1. This is format of the data in the ENSDF data base and is used by evaluators to prepare their evaluated data for processing. An example of this format is shown in the figure on page 7.25.

Video In the video mode, a menu of the three format options is displayed. Upon selection of a format, the option terminates and the file specification in the screen display is updated.

Sequential The new output format is selected by entering the first character of the format name at the prompt. Entry of a RETURN will select the default format, the **Narrow Table** format.

7.11 MASS_STATUS

The ENSDF data evaluations are carried out simultaneously for all nuclides with the same mass number (mass chain). When the evaluation for a mass chain has been completed, it is reviewed and then published in the Nuclear Data Sheets Journal or in the case of A less than 45, in Nuclear Physics. When submitted for publication in Nuclear Data Sheets, the evaluation is added to the ENSDF data base maintained by the National Nuclear Data Center of Brookhaven National Laboratory. In the case for A less than 45, there can be a significant delay between publication and entry into the data base since the evaluations are coded in ENSDF format by other evaluators after publication.

The MASS_STATUS option is designed to provide the user with information about the publication status of a mass chain. After selecting this option, the user is asked to supply a valid mass number. Information about the mass chain evaluation is then displayed on the terminal. The information includes the publication citation and the cutoff date for literature included in the publication. If a revised evaluation is available in prepublication form, it is so indicated. The user may select any number of mass chains in this option. If a blank mass number is entered the option terminates.

Video The user enters a mass number and a display similar to the one below is output to the terminal. When finished with the display, depress the RETURN-key and then enter another mass number or the RETURN-key again to terminate the option.

Sequential In this mode, after the user enters a mass number, the information appears on the terminal and looks just like the video mode display except that the mass number prompt appears immediately at the bottom of the screen.

MASS_STATUS Display in Video Environment

```
------------------ Evaluated Nuclear Structure Data File ------------------
MASS_STATUS
------------------------- Status for Mass 110 ----------------------------

  This evaluation was originally  published in the  Nuclear Data
  Sheets. Data may be incomplete or superceded by work published
  since  the literature  cutoff date.  For  references to  later
  information  on the  mass  chain, see  the  Nuclear  Science
  References data base.

---------------------------------------------------------------------------

  Evaluation published in the Nuclear Data Sheets:
      Volume:38     Page:545          Year:1983
  Literature cutoff date for this evaluation:  1-Oct-1982

   Revised pre-publication evaluation also available

------------------------- Press any key to continue. ----------------------
```