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=========================================================================COMPLOT
                                                                        COMPLOT
     PROGRAM COMPLOT                                                    COMPLOT
     ===============                                                    COMPLOT
     VERSION 83-1 (FEBRUARY, 1983)                                      COMPLOT
     VERSION 83-2 (MAY, 1983)                                           COMPLOT
     VERSION 83-3 (DECEMBER, 1983) *MAJOR MODIFICATION.                 COMPLOT
                                   *ADDED SELECTION OF PLOTS BY MAT OR  COMPLOT
                                    ZA/MT/ENERGY RANGE (EV).            COMPLOT
                                   *ADDED VARIABLE AXIS UNITS (PROGRAM  COMPLOT
                                    CONTROLLED..X=MILLI-EV, EV, KEV,    COMPLOT
                                    MEV...Y=MILLI-BARNS, BARNS).        COMPLOT
     VERSION 84-1 (APRIL, 1984)    *ADDED SELECTION BY REACTION/ENERGY  COMPLOT
                                    RANGE.                              COMPLOT
                                   *ADDED IDENTIFY DATA POINTS OPTION   COMPLOT
                                    (SMALL BOX DRAWN AROUND EACH CROSS  COMPLOT
                                     SECTION AND RATIO POINT).          COMPLOT
                                   *IMPROVED NON-IBM GRAPHICS INTERFACECOMPLOT
                                    (ALL CHARACTER POSITIONING NOW      COMPLOT
                                     BASED ON CHARACTER, NOT RASTER,    COMPLOT
                                     SIZE).                             COMPLOT
     VERSION 85-1 (APRIL, 1985)    *SPECIAL I/O ROUTINES TO GUARANTEE   COMPLOT
                                    ACCURACY OF ENERGY.                 COMPLOT
                                   *DOUBLE PRECISION TREATMENT OF       COMPLOT
                                    ENERGY (REQUIRED FOR NARROW         COMPLOT
                                    RESONANCES).                        COMPLOT
                                   *ADDED (ZA,MT) EQUIVALENCE OPTION.   COMPLOT
                                   *ADDED SMALL PLOT OPTION.            COMPLOT
     VERSION 85-2 (AUGUST, 1985)   *FORTRAN-77/H VERSION                 COMPLOT
     VERSION 86-1 (JANUARY, 1986)  *ENERGY DEPENDENT SCATTERING RADIUS  COMPLOT
     VERSION 86-2 (DECEMBER, 1986) *DOUBLE PRECISION PLOT SCALING       COMPLOT
                                    (REQUIRED FOR NARROW ENERGY RANGES)COMPLOT
     VERSION 88-1 (JULY 1988)      *MAJOR REVISION TO MAKE CODE EASILY  COMPLOT
                                    INTERFACEABLE TO ALMOST ANY PLOTTERCOMPLOT
                                   *WARNING..INPUT PARAMETERS FROM BEENCOMPLOT
                                    CHANGED (SEE, DESCRIPTION BELOW)    COMPLOT
                                   *COMPUTER INDEPENDENT SOFTWARE       COMPLOT
                                    CHARACTERS.                         COMPLOT
                                   *COLOR PLOTS.                        COMPLOT
                                   *MT NUMBER DEFINITIONS FROM DATA     COMPLOT
                                    FILE READ BY PROGRAM                COMPLOT
                                   *FORTRAN-77 REQUIRED (FORTRAN-H NO   COMPLOT
                                    SUPPORTED BY THIS PROGRAM).         COMPLOT
                                   *OPTION...INTERNALLY DEFINE ALL I/O  COMPLOT
                                    FILE NAMES (SEE, SUBROUTINE FILEIO  COMPLOT
                                    FOR DETAILS).                       COMPLOT
                                   *IMPROVED BASED ON USER COMMENTS.    COMPLOT
     VERSION 88-2 (OCTOBER 1988)   *IMPROVED BASED ON USER COMMENTS.    COMPLOT
                                   *ADDED LIVERMORE CIVIC COMPILER      COMPLOT
                                    CONVENTIONS.                        COMPLOT
                                   *UPDATED TO USE NEW PROGRAM CONVERT  COMPLOT
                                    KEYWORDS.                           COMPLOT
     VERSION 89-1 (JANUARY 1989)   *PSYCHOANALYZED BY PROGRAM FREUD TO  COMPLOT
                                    INSURE PROGRAM WILL NOT DO ANYTHINGCOMPLOT
                                    CRAZY.                              COMPLOT
                                   *FORTRAN-77/FORTRAN-H COMPATIBLE     COMPLOT
                                   *SPECIAL ENDF/B MATERIAL DEFINITIONSCOMPLOT
                                    (ZA.LT.1000) FROM DATA FILE READ    COMPLOT
                                    BY PROGRAM.                         COMPLOT
     VERSION 89-2 (MARCH 1989)     *ADDED ENDF/B-V AND VI MT            COMPLOT
                                    DEFINITIONS. PROGRAM WILL DETERMINECOMPLOT
                                    ENDF/B FORMAT BASED ON MF=1,        COMPLOT
                                    MT=451 AND USE AS PPROPRIATE MT     COMPLOT
                                    DEFINITIONS. IF NO MF=1, MT=451     COMPLOT
                                    PROGRAM WILL USE ENDF/B-VI          COMPLOT
                                    MT DEFINITIONS.                     COMPLOT
     VERSION 90-1 (AUGUST 1990)    *A NEW PROGRAM                       COMPLOT
                                   *ADDED INTERACTIVE MOUSE INPUT       COMPLOT
                                   *ADDED 3 CHARACTER FONTS             COMPLOT
                                   *ADDED PHOTON DATA, MF=23 AND 27     COMPLOT
                                   *ADDED FORTRAN SAVE OPTION.          COMPLOT
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                              *ADDED MAXIMUM RATIO RANGE WHEN     COMPLOT
                               PLOTTING RATIOS.                   COMPLOT
                              *ADDED GRID TYPES                   COMPLOT
                              *ADDED VARIABLE LINE THICKNESS      COMPLOT
                              *WARNING...INPUT PARAMETER FORMAT   COMPLOT
                               HAS BEEN CHANGED...SEE DESCRIPTION COMPLOT
                               BELOW.                             COMPLOT
VERSION 92-1 (JANUARY 1992)   *ADDED INCIDENT CHARGED PARTICLES   COMPLOT
                               (IDENTIFIED IN PLOT TITLES)        COMPLOT
                              *ADDED COMPLETELY COMPATIBLE I/O    COMPLOT
                               FOR READING FLOATING POINT NUMBERS.COMPLOT
VERSION 92-2 (MAY 1992)       *CORRECTED DESCRIPTION OF INPUT     COMPLOT
                               PARAMETERS AND EXAMPLE PROBLEMS.   COMPLOT
                              *ADDED VARIABLE CHARACTER SIZE INPUTCOMPLOT
VERSION 93-1 (MARCH 1993)     *UPDATE FOR ON SCREEN GRAPHIC       COMPLOT
                               OUTPUT USING THE LAHEY COMPILER    COMPLOT
                              *ADDED NU-BAR (TOTAL, DELAYED,      COMPLOT
                               PROMPT).                           COMPLOT
VERSION 94-1 (JANUARY 1994)   *VARIABLE ENDF/B DATA FILENAMES     COMPLOT
                               TO ALLOW ACCESS TO FILE STRUCTURES COMPLOT
                               (WARNING - INPUT PARAMETER FORMAT  COMPLOT
                               HAS BEEN CHANGED)                  COMPLOT
                              *CLOSE ALL FILES BEFORE TERMINATING COMPLOT
                               (SEE, SUBROUTINE ENDIT)            COMPLOT
VERSION 95-1 (MARCH 1995)     *CORRECTED CROSS SECTION            COMPLOT
                               MULTIPLIER FOR EQUIVALENCES        COMPLOT
                              *CORRECTED RATIO SCALING, FOR       COMPLOT
                               MAXIMUM RATIO LESS THAN 1.0        COMPLOT
VERSION 96-1 (JANUARY 1996)   *COMPLETE RE-WRITE                  COMPLOT
                              *IMPROVED COMPUTER INDEPENDENCE     COMPLOT
                              *ALL DOUBLE PRECISION               COMPLOT
                              *UNIFORM TREATMENT OF ENDF/B I/O    COMPLOT
                              *IMPROVED OUTPUT PRECISION          COMPLOT
                              *DEFINED SCRATCH FILE NAMES         COMPLOT
                              *INCREASED PAGE SIZE FROM 24000     COMPLOT
                               TO 48000 POINTS                    COMPLOT
VERSION 97-1 (APRIL 1997)     *INCREASED PAGE SIZE FROM 48000     COMPLOT
                               TO 480000 POINTS                   COMPLOT
VERSION 99-1 (MARCH 1999)    *CORRECTED CHARACTER TO FLOATING     COMPLOT
                              POINT READ FOR MORE DIGITS          COMPLOT
                             *UPDATED TEST FOR ENDF/B FORMAT      COMPLOT
                              VERSION BASED ON RECENT FORMAT CHANGECOMPLOT
                             *GENERAL IMPROVEMENTS BASED ON       COMPLOT
                              USER FEEDBACK                       COMPLOT
VERS. 2000-1 (FEBRUARY 2000)*GENERAL IMPROVEMENTS BASED ON        COMPLOT
                              USER FEEDBACK                       COMPLOT
VERS. 2002-1 (MAY 2002)      *INPUT PARAMETERS OPTIONAL           COMPLOT
                             *CONTROL MINIMUM RATIO RANGE BY INPUT COMPLOT
                             *OPTIONAL BLACK OR WHITE BACKGROUND  COMPLOT
VERS. 2004-1 (SEPT. 2004)    *ADDED INCLUDE FOR COMMON            COMPLOT
                             *INCREASED PAGE SIZE FROM 480000     COMPLOT
                              TO 600000 POINTS                    COMPLOT
                             *ADDED NEW REICH-MOORE TO FILE2 TO   COMPLOT
                              ALLOW IDENTIFICATION OF RESOLVED AND COMPLOT
                              ANY FOLLOWING UNRESOLVED RESONANCE  COMPLOT
                              REGIONS.                            COMPLOT
VERS. 2007-1 (JAN.  2007)    *CHECKED AGAINST ALL ENDF/B-VII.     COMPLOT
                             *INCREASED MAXLOAD TO 600,000 FROM   COMPLOT
                              12,000                              COMPLOT
VERS. 2009-1 (JAN.  2009)    *IGNORED DIFFERENCES NEAR RESONANCE  COMPLOT
                              REGION BOUNDARIES (RESOLVED AND     COMPLOT
                              UNRESOLVED).                        COMPLOT
VERS. 2010-1 (July  2010)    *Allow comparison plot even if there COMPLOT
                              is no difference (just see data).   COMPLOT
                             *ONLY plot linearly interpoolable dataCOMPLOT
                             *Include threshold energy points to  COMPLOT
                              show cross sections, but NOT ratios COMPLOT
                              near threshold.                     COMPLOT
VERS. 2011-1 (Jan.  2011)    *Increased MT.DAT from 200 to 1,000  COMPLOT
                              entries, to accommodate new MTs.    COMPLOT
VERS. 2012-1 (Aug.  2012)    *Increased incident particle list to COMPLOT
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                          include photon (ZA = 0).              COMPLOT
                         *Added CODENAME                        COMPLOT
                         *32 and 64 bit Compatible              COMPLOT
                         *Added ERROR stop                      COMPLOT
VERS. 2013-1 (Nov. 2013) *ONLY use min/max ratios to decide     COMPLOT
                          whether or not to plot - non-positiveCOMPLOT
                          cross sections are no longer used.    COMPLOT
                         *Limited per-cent differences to fit   COMPLOT
                          output format = -9999 to +9999 %.     COMPLOT
                         *OUT9 replaced NORMX                   COMPLOT
VERS. 2015-1 (Jan. 2015) *Added MF=10 Radionuclide Production   COMPLOT
                          which requires longer plot titles.    COMPLOT
                         *Restricted character size multiplier COMPLOT
                          to 0.5 to 1.5 to accommodate longer   COMPLOT
                          plot titles.                          COMPLOT
                         *Replaced ALL 3 way if statements.     COMPLOT
VERS. 2015-2 (Mar. 2015) *Corrected tables for X and Y axis     COMPLOT
                          labels = see change search for 2015-2COMPLOT
VERS. 2015-3 (Oct. 2015) *Allow multiple LRF=7 regions plus     COMPLOT
                          unreslved region - earlier assumed    COMPLOT
                          LRF=7 never used unrsesolved.         COMPLOT
VERS. 2017-1 (May  2017) *For MF=2 use MT=151 to define         COMPLOT
                          Unresolved Resonance Region (URR).    COMPLOT
                          Ignore NJOY MT=152 and 153.           COMPLOT
                         *All floating input parameters changedCOMPLOT
                          to character input + IN9 conversion.  COMPLOT
                         *Added MF=4 Legendre Coefficient       COMPLOT
                          Comparison: f1 through f6             COMPLOT
Vers. 2018-1 (Jan. 2018) *Doubled in core storage to 1,200,000.COMPLOT
                         *Replaced Q MeV by MT= at top of plotsCOMPLOT
                          (Q value in ENDF is now only defined COMPLOT
                           in MF=3, making it difficult for allCOMPLOT
                           other MF now treated by this code)   COMPLOT
                         *Initial Linear X scaling for MF=1     COMPLOT
                          (nu-bar) and MF=4 (Legendre) =        COMPLOT
                          this can be turned OFF by ZOOM        COMPLOT
                         + Unless energy range is requested =   COMPLOT
                          allows MF=1 and 4 default Linear X    COMPLOT
                          scaling to be turned off by input     COMPLOT
                          parameters, i.e., by COMHARD          COMPLOT
                         *Zoom lower energy limit restricted    COMPLOT
                          1.0d-5 eV - to lower zoom of linear   COMPLOT
                          energy plots (otherwise cannot find   COMPLOT
                          actual lower limit on plot).          COMPLOT
                         *Added NRO = energy dependent scatter COMPLOT
                          radius to reading FILE2 parameters    COMPLOT
                          to define unresolved energy range.    COMPLOT
                         *Corrected energy dependent scatter    COMPLOT
                          for all resonance types (see, above   COMPLOT
                          remarks).                             COMPLOT
Vers. 2019-1 (June 2019) *Additional Interpolation Law Tests    COMPLOT
                         *Checked Maximum Tabulated Energy to   COMPLOT
                          insure it is the same for all MTs -   COMPLOT
                          if not, print WARNING messages.       COMPLOT
Vers. 2020-1 (Dec. 2020) *Corrected Treatment of Threshold      COMPLOT
                          cross sections, to include threshold COMPLOT
                          (Previously code only used positive   COMPLOT
                           cross sections = skipped threshold)  COMPLOT
                         *Added isomeric state (m or n) to ZA   COMPLOT
                          interpretation.                       COMPLOT
                         *Increased MAXIZA to 100,000 from      COMPLOT
                          10,000 to allow searching longer      COMPLOT
                          ENDF data fils with many MATs =       COMPLOT
                          NOT RECOMMENDED!!!!                   COMPLOT
Vers. 2021-1 (Jan. 2021) *SHOW ALL = mouse click above the      COMPLOT
                          plotting area.                        COMPLOT
                         *Updated for FORTRAN 2018              COMPLOT
Vers. 2023-1 (Feb. 2023) *Reduced page size from 2,400,000 to   COMPLOT
                          120,000                               COMPLOT
                                                                COMPLOT
2020-1 Acknowledgment                                           COMPLOT
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I thank Jean-Christophe Sublet (NDS, IAEA, Vienna, Austria) for   COMPLOT
reporting the ERROR in COMPLOT (2019-1) that led to the update in COMPLOT
COMPLOT (2020-1) to correctly handle threshold reactions.         COMPLOT
                                                                  COMPLOT
2015-2 Acknowledgment                                             COMPLOT
====================                                              COMPLOT
I thank Chuck Whitmer (TerraPower,WA) for reporting the errors    COMPLOT
that led to the 2015-2 Improvements in this code.                 COMPLOT
                                                                  COMPLOT
I thank Jean-Christophe Sublet (UKAEA) for contributing MAC       COMPLOT
executables and Bojan Zefran (IJS, Slovenia) for contributing     COMPLOT
LINUX (32 or 63 bit) executables. And most of all I must thank    COMPLOT
Andrej Trkov (NDS, IAEA) for overseeing the entire PREPRO project COMPLOT
at IAEA, Vienna. This was a truly International team who worked   COMPLOT
together to produce PREPRO 2015-2.                                COMPLOT
                                                                  COMPLOT
OWNED, MAINTAINED AND DISTRIBUTED BY                              COMPLOT
------------------------------------                              COMPLOT
THE NUCLEAR DATA SECTION                                          COMPLOT
INTERNATIONAL ATOMIC ENERGY AGENCY                                COMPLOT
P.O. BOX 100                                                      COMPLOT
A-1400, VIENNA, AUSTRIA                                           COMPLOT
EUROPE                                                            COMPLOT
                                                                  COMPLOT
ORIGINALLY WRITTEN BY                                             COMPLOT
------------------------------------                              COMPLOT
Dermott E. Cullen                                                 COMPLOT
                                                                  COMPLOT
PRESENT CONTACT INFORMATION                                       COMPLOT
---------------------------                                       COMPLOT
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Telephone  925-443-1911                                           COMPLOT
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                                                                  COMPLOT
AUTHORS MESSAGE                                                   COMPLOT
---------------                                                   COMPLOT
THE COMMENTS BELOW SHOULD BE CONSIDERED THE LATEST DOCUMENTATION  COMPLOT
ALL RECENT IMPROVEMENTS. PLEASE READ ALL OF THESE COMMENTS BEFORE,COMPLOT
PARTICULARLY THE COMMENTS CONCERNING MACHINE DEPENDENT CODING.    COMPLOT
                                                                  COMPLOT
AT THE PRESENT TIME WE ARE ATTEMPTING TO DEVELOP A SET OF COMPUTERCOMPLOT
INDEPENDENT PROGRAMS THAT CAN EASILY BE IMPLEMENTED ON ANY ONE    COMPLOT
OF A WIDE VARIETY OF COMPUTERS. IN ORDER TO ASSIST IN THIS PROJECTCOMPLOT
IT WOULD BE APPECIATED IF YOU WOULD NOTIFY THE AUTHOR OF ANY      COMPLOT
COMPILER DIAGNOSTICS, OPERATING PROBLEMS OR SUGGESTIONS ON HOW TO COMPLOT
IMPROVE THIS PROGRAM. HOPEFULLY, IN THIS WAY FUTURE VERSIONS OF   COMPLOT
THIS PROGRAM WILL BE COMPLETELY COMPATIBLE FOR USE ON YOUR        COMPLOT
COMPUTER.                                                         COMPLOT
                                                                  COMPLOT
PURPOSE                                                           COMPLOT
-------                                                           COMPLOT
COMPARE ENDF/B FORMATTED DATA FROM TWO SEPARATE INPUT TAPES.      COMPLOT
REACTIONS ARE CONSIDERED TO BE COMPARABLE IF THEY HAVE THE SAME   COMPLOT
(ZA,MF,MT). RESULTS ARE PRESENTED IN GRAPHICAL FORM.              COMPLOT
                                                                  COMPLOT
IN THE FOLLOWING FOR SIMPLICITY THE ENDF/B TERMINOLOGY--ENDF/B    COMPLOT
TAPE--WILL BE USED. IN FACT THE ACTUAL MEDIUM MAY BE TAPE, CARDS, COMPLOT
DISK OR ANY OTHER MEDIUM.                                         COMPLOT
                                                                  COMPLOT
ON WHAT COMPUTERS WILL THE PROGRAM RUN                            COMPLOT
------------------------------------------------------------------COMPLOT
THE PROGRAM HAS BEEN IMPLEMENTED ON A VARIETY OF COMPUTERS FROM   COMPLOT
CRAY AND IBM MAINFRAME TO SUN WORKSTATIONS TO AN IBM-AT PC. THE   COMPLOT
PROGRAM IS SMALL ENOUGH TO RUN ON VIRTUALLY ANY COMPUTER.         COMPLOT
                                                                  COMPLOT
THE PROGRAM USES A SIMPLE CALCOMP LIKE GRAPHICS INTERFACE         COMPLOT
```

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(DESCRIBED BELOW) AND ALLOWS THE USER SPECIFY THE PHYSICAL SIZE   COMPLOT
OF THE PLOTTER BEING USED, BY INPUT PARAMETERS. USING THESE       COMPLOT
CONVENTIONS THIS PROGRAM CAN BE EASILY INTERFACED TO VIRTUALLY    COMPLOT
ANY PLOTTER.                                                      COMPLOT
                                                                  COMPLOT
FOR SPECIAL CONSIDERATIONS SEE THE SECTIONS BELOW ON,             COMPLOT
(1) COMPUTER DEPENDENT CODING                                     COMPLOT
(2) PLOTTER/GRAPHICS TERMINAL INTERFACE                           COMPLOT
                                                                  COMPLOT
GRAPHICS INTERFACE                                                COMPLOT
------------------------------------------------------------------COMPLOT
THIS PROGRAM USES A SIMPLE CALCOMP LIKE GRAPHICS INTERFACE WHICH  COMPLOT
REQUIRES ONLY 3 SUBROUTINES...PLOTS, PLOT AND PEN (DESCRIBED IN   COMPLOT
DETAIL BELOW). ALL CHARACTERS AND SYMBOLS ARE DRAWN USING TABLES  COMPLOT
OF PEN STROKES (SUPPLIED WITH THIS PROGRAM). USING THIS METHOD    COMPLOT
THE PROGRAM SHOULD BE SIMPLE TO INTERFACE TO VIRTUALLY ANY PLOTTERCOMPLOT
OR GRAPHICS TERMINAL AND THE APPEARANCE AND LAYOUT OF THE PLOTS   COMPLOT
SHOULD BE INDEPENDENT OF WHICH PLOTTER IS USED.                   COMPLOT
                                                                  COMPLOT
2015 PLOTTER DIMENSIONS                                           COMPLOT
==================================================================COMPLOT
PLOTTER DIMENSIONS ARE IN INCHES - NOT CM, MM, OR CUBITS.         COMPLOT
THIS IS DONE FOR HISTORICAL REASONS AND HOPEFULLY THIS WILL       COMPLOT
NOT INCONVENIENCE ANYONE - IN PRACTICE I HAVE USED EXACTLY THE    COMPLOT
SAME DIMENSION = X = 0 to 12.5 and Y = 0 to 10 FOR DECADES        COMPLOT
TO PRODUCE BOTH ON-SCREEN AND HARDCOPY POSTSCRIPT PLOTS.          COMPLOT
                                                                  COMPLOT
I STRONGLY SUGGEST THAT YOU NOT CHANGE THESE DIMENSIONS UNLESS    COMPLOT
YOU MUST = BASED ON THE PLOT SIZE YOU OBTAIN WHEN YOU FIRST RUN   COMPLOT
THIS CODE.                                                        COMPLOT
                                                                  COMPLOT
PROGRAM IDENTIFICATION                                            COMPLOT
----------------------                                            COMPLOT
AS DISTRIBUTED THE FIRST FRAME OF PLOTTED OUTPUT WILL DOCUMENT    COMPLOT
THE PROGRAM NAME, VERSION AND INSTALLATION. THIS INFORMATION IS   COMPLOT
STORED AS DATA IN THE ARRAY VERSES NEAR THE BEGINNING OF          COMPLOT
SUBROUTINE FRAME1. IF YOU WISH TO CUSTOMIZE THE OUTPUT TO IDENTIFYCOMPLOT
YOUR INSTALLATION CHANGE THE LAST TWO LINES OF THE ARRAY (VERSES).COMPLOT
                                                                  COMPLOT
ENDF/B FORMAT                                                     COMPLOT
-------------                                                     COMPLOT
THIS PROGRAM ONLY USES THE ENDF/B BCD OR CARD IMAGE FORMAT (AS    COMPLOT
OPPOSED TO THE BINARY FORMAT) AND CAN HANDLE DATA IN ANY VERSION  COMPLOT
OF THE ENDF/B FORMAT (I.E., ENDF/B-I, II,III, IV, V OR VI FORMAT).COMPLOT
                                                                  COMPLOT
BOTH SETS OF EVALUATED DATA MUST BE IN THE ENDF/B FORMAT. ONLY    COMPLOT
SECTIONS OF FILE 2 (RESONANCE PARAMETERS) AND FILES 3, 23 AND 27  COMPLOT
(TABULATED DATA) WILL BE READ AND ALL OTHER SECTIONS WILL BE      COMPLOT
SKIPPED. IN FILE 2 THE ONLY IMPORTANT INFORMATION IS THE ENERGY   COMPLOT
LIMITS OF THE RESOLVED AND UNRESOLVED RESONANCE REGION WHICH IS   COMPLOT
LOCATED IN THE SAME FIELDS IN ALL VERSIONS OF THE ENDF/B FORMAT.  COMPLOT
SIMILARLY THE FORMAT OF FILES 3, 23 AND 27 IS THE SAME IN ALL     COMPLOT
VERSIONS OF ENDF/B. THEREFORE THIS PROGRAM CAN BE USED WITH DATA  COMPLOT
IN ANY ENDF/B FORMAT (I.E. ENDF/B-I, II, III, IV, V OR VI).       COMPLOT
                                                                  COMPLOT
CROSS SECTION INTERPOLATION                                       COMPLOT
---------------------------                                       COMPLOT
CROSS SECTIONS MUST BE IN EITHER HISTOGRAM (I.E., INTERPOLATION   COMPLOT
LAW 1) OR LINEARLY INTERPOLABLE (I.E. INTERPOLATION LAW 2) FORM.  COMPLOT
IF THEY ARE NOT A WARNING MESSAGE WILL BE PRINTED AND EXECUTION   COMPLOT
WILL BE TERMINATED. SEE INSTRUCTIONS BELOW ON HOW TO CONVERT      COMPLOT
DATA TO HISTOGRAM OR LINEARLY INTERPOLABLE FORM.                  COMPLOT
                                                                  COMPLOT
REACTION INDEX                                                    COMPLOT
--------------                                                    COMPLOT
THIS PROGRAM DOES NOT USE THE REACTION INDEX WHICH IS GIVEN IN    COMPLOT
SECTION MF=1, MT=451 OF EACH EVALUATION.                          COMPLOT
                                                                  COMPLOT
SECTION SIZE                                                      COMPLOT
------------                                                      COMPLOT
SINCE THIS PROGRAM USES A LOGICAL PAGING SYSTEM THERE IS NO LIMIT COMPLOT
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TO THE NUMBER OF POINTS IN ANY SECTION, E.G., THE TOTAL CROSS     COMPLOT
SECTION MAY BE REPRESENTED BY 200,000 DATA POINTS.                COMPLOT
                                                                  COMPLOT
DATA SELECTION                                                    COMPLOT
--------------                                                    COMPLOT
THE USER MAY SPECIFYING THE DATA TO BE COMPARED BY INPUTTING UP   COMPLOT
TO 100 MAT/MT/ENERGY OR ZA/MT/ENERGY RANGES. IF THE UPPER LIMIT   COMPLOT
OF THE MAT OR ZA RANGE IS LESS THAN THE LOWER LIMIT IT WILL BE SETCOMPLOT
EQUAL TO THE LOWER LIMIT (I.E. THIS INDICATE ONLY COMPARE ONE     COMPLOT
MAT OR ZA). IF THE UPPER LIMIT IS STILL ZERO IT WILL BE SET TO    COMPLOT
9999 (NO LIMIT). IF THE UPPER MF OR MT LIMIT IS ZERO IT WILL BE   COMPLOT
SET TO 99 OR 999, RESPECTIVELY (NO LIMIT). IF THE UPPER ENERGY    COMPLOT
LIMIT IS ZERO IT WILL BE SET TO A LARGE NUMBER (NO LIMIT).        COMPLOT
                                                                  COMPLOT
THE LIST OF RANGES MUST BE TERMINATED BY A BLANK LINE (I.E. ZERO  COMPLOT
LOWER AND UPPER MAT/MF/MT OR ZA/MF/MT LIMITS).                    COMPLOT
                                                                  COMPLOT
IF THE FIRST RANGE LINE IS BLANK THIS LINE WILL TERMINATE THE     COMPLOT
LIST OF REQUESTS (I.E. A SECOND BLANK LINE NEED NOT BE INPUT)     COMPLOT
AND ALL PHYSICALLY COMPARABLE DATA WILL BE PLOTTED.               COMPLOT
                                                                  COMPLOT
WHICH REACTIONS WILL BE PLOTTED                                   COMPLOT
-------------------------------                                   COMPLOT
THOSE REACTIONS WITH THE SAME (ZA, MF, MT) WILL BE COMPARED, BUT  COMPLOT
ONLY THOSE DATA WHICH DIFFER BY A USER SPECIFIED ALLOWABLE        COMPLOT
DIFFERENCE WILL BE PLOTTED. IN ORDER TO FORCE ALL COMPARABLE      COMPLOT
REACTIONS TO BE PLOTTED THE USER NEED ONLY SPECIFY AN ALLOWABLE   COMPLOT
DIFFERENCE OF ZERO.                                               COMPLOT
                                                                  COMPLOT
EQUIVALENT REACTIONS                                              COMPLOT
--------------------                                              COMPLOT
IN ORDER TO COMPARE REACTIONS WHICH HAVE DIFFERENT ZA, MF OR MT   COMPLOT
THE USER IS ALLOWED TO SPECIFY AN EQUIVALENCE LIST OF UP TO       COMPLOT
100 (ZA,MF,MT) COMBINATIONS ON THE MASTER FILE WHICH ARE TO BE    COMPLOT
EQUATED TO DIFFERENT (ZA,MF,MT) ON THE SECOND FILE. THIS OPTION   COMPLOT
MAY BE USED TO COMPARE SIMILAR REACTIONS FROM DIFFERENT MATERIALS COMPLOT
(E.G. IRON AND NICKEL INELASTIC SCATTERING) OR DIFFERENT REACTIONSCOMPLOT
FROM THE SAME OR DIFFERENT MATERIALS (E.G. U-235 CAPTURE AND      COMPLOT
FISSION - IN WHICH CASE THE RATIO WILL BE THE CAPTURE TO FISSION  COMPLOT
RATIO) OR THE SAME REACTION IN DIFFERENT VERSIONS OF THE ENDF/B   COMPLOT
FORMAT WHICH MAY BE ASSIGNED DIFFERENT MT NUMBERS, E.G., THE      COMPLOT
PHOTOELECTRIC CROSS SECTION IS MT=602 IN ENDF/B-V AND EARLIER     COMPLOT
VERSIONS OF ENDF/B, BUT IS MT=522 IN ENDF/B-VI.                   COMPLOT
                                                                  COMPLOT
IN THESE EQUIVALENCE LISTS A ZERO FIELD IMPLIES ALL. FOR EXAMPLE, COMPLOT
TO EQUATE MT=522 FROM ONE FILE TO MT=602 ON THE OTHER, FOR ALL    COMPLOT
MATERIALS, ONE NEED ONLY SPECIFY ZA=0, MF=23, MT=522 EQUIVALENT   COMPLOT
TO ZA=0, MF=23 AND MT=602.                                        COMPLOT
                                                                  COMPLOT
PLOT FORMATS                                                      COMPLOT
------------                                                      COMPLOT
THE TWO CROSS SECTIONS ARE CONSIDERED TO BE A STANDARD (THE FIRST COMPLOT
CROSS SECTION) AND A CROSS SECTION TO BE COMPARED TO THE STANDARD COMPLOT
(THE SECOND CROSS SECTION). THE OUTPUT FROM THIS PROGRAM IS A     COMPLOT
SERIES OF PLOTS. EACH PLOT WILL CONTAIN THE STANDARD CROSS SECTIONCOMPLOT
AND IN ADDITION THE USER MAY SPECIFY THAT EACH PLOT ALSO CONTAIN  COMPLOT
THE SECOND CROSS SECTION AND/OR THE RATIO OF THE SECOND CROSS     COMPLOT
SECTION TO THE FIRST CROSS SECTION.                               COMPLOT
                                                                  COMPLOT
THE USER MAY SELECT ONE OF THE FOLLOWING FIVE PLOT FORMATS (THE   COMPLOT
NUMBER PRECEDING THE OPTION IS THE VALUE OF THE PLOT MODE SELECTORCOMPLOT
THAT THE USER SHOULD SPECIFY AS INPUT ON THE FIRST LINE).         COMPLOT
                                                                  COMPLOT
(0) THE STANDARD CROSS SECTION (I.E. FIRST EVALUATION) AND THE    COMPLOT
    RATIO OF THE SECOND EVALUATION TO THE FIRST EVALUATION. THE   COMPLOT
    DATA WILL BE PRESENETED AS TWO SUB-PLOTS PER PLOT WITH THE    COMPLOT
    STANDARD CROSS SECTION IN THE UPPER HALF OF THE PLOT AND THE  COMPLOT
    RATIO IN THE LOWER HALF OF THE PLOT.                          COMPLOT
                                                                  COMPLOT
(1) THE STANDARD CROSS SECTION (I.E. FIRST EVALUATION) AND THE    COMPLOT
    SECOND EVALUATION. THE DATA WILL BE PRESENTED AS TWO SUB-PLOTSCOMPLOT
```

```
    PER PLOT WITH THE STANDARD CROSS SECTION ON THE UPPER HALF    COMPLOT
    OF THE PLOT AND THE SECOND CROSS SECTION IN THE LOWER HALF OF COMPLOT
    THE PLOT.                                                     COMPLOT
                                                                  COMPLOT
(2) THE STANDARD CROSS SECTION (I.E. FIRST EVALUATION) AND THE    COMPLOT
    SECOND EVALUATION. THE DATA WILL BE PRESENTED AS ONE PLOT     COMPLOT
    CONTAINING BOTH THE STANDARD AND SECOND CROSS SECTION. THE    COMPLOT
    STANDARD CROSS SECTION WILL BE PRESENTED AS A SOLID LINE AND  COMPLOT
    THE SECOND CROSS SECTION WILL BE PRESENTED AS A DASHED LINE.  COMPLOT
                                                                  COMPLOT
(3) THE STANDARD CROSS SECTION, SECOND CROSS SECTION AND RATIO OF COMPLOT
    THE SECOND CROSS SECTION TO THE FIRST CROSS SECTION. THE DATA COMPLOT
    WILL BE PRESENTED AS THREE SUB-PLOTS PER PLOT WITH THE        COMPLOT
    STANDARD CROSS SECTION IN THE UPPER THIRD OF THE PLOT, THE    COMPLOT
    SECOND CROSS SECTION IN THE MIDDLE THIRD AND THE RATIO OF THE COMPLOT
    TWO IN THE LOWER THIRD OF THE PLOT (RECOMMENDED OPTION).      COMPLOT
                                                                  COMPLOT
(4) THE STANDARD CROSS SECTION, SECOND CROSS SECTION AND RATIO OF COMPLOT
    THE SECOND CROSS SECTION TO THE FIRST CROSS SECTION. THE DATA COMPLOT
    WILL BE PRESENTED AS TWO SUB-PLOTS PER PLOT WITH THE STANDARD COMPLOT
    AND SECOND CROSS SECTION ON THE SAME SUB-PLOT IN THE UPPER    COMPLOT
    TWO THIRDS OF THE PLOT AND THE RATIO OF THE TWO IN THE LOWER  COMPLOT
    THIRD OF THE PLOT. THE STANDARD CROSS SECTION WILL BE         COMPLOT
    PRESENTED AS A SOLID LINE AND THE SECOND CROSS SECTION WILL BECOMPLOT
    PRESENTED AS A DASHED LINE.                                   COMPLOT
                                                                  COMPLOT
ADDITIONAL PLOT FEATURES                                          COMPLOT
------------------------                                          COMPLOT
IN ADDITION TO THE CROSS SECTIONS AND/OR RATIO THE FOLLOWING      COMPLOT
INFORMATIONS WILL BE INCLUDED ON EACH PLOT.                       COMPLOT
                                                                  COMPLOT
(1) AN IDENTIFICATION FOR EACH SET OF CROSS SECTIONS (UP TO 30    COMPLOT
    CHARACTERS FOR EACH SET).                                     COMPLOT
                                                                  COMPLOT
(2) THE MAXIMUM NEGATIVE AND POSITIVE PER-CENT DIFFERENCE BETWEEN COMPLOT
    THE TWO CROSS SECTIONS.                                       COMPLOT
                                                                  COMPLOT
(3) ARROWS INDICATING THE ENERGY AT WHICH THE MAXIMUM DIFFERENCES COMPLOT
    (MINIMUM AND MAXIMUM RATIO) OCCUR.                            COMPLOT
                                                                  COMPLOT
(4) THE ENERGY LIMITS OF THE RESOLVED AND UNRESOLVED RESONANCE    COMPLOT
    REGION (IF THEY FALL WITHIN THE ENERGY LIMITS OF THE PLOT).   COMPLOT
                                                                  COMPLOT
RATIO DATA                                                        COMPLOT
----------                                                        COMPLOT
IF RATIO OUTPUT IS REQUESTED THE RATIO WILL BE DEFINED AT EACH    COMPLOT
ENERGY THAT APPEARS IN EITHER EVALUATION. BETWEEN THESE ENERGIES  COMPLOT
THE RATIO WILL BE PLOTTED ASSUMING LINEAR DEPENDENCE BETWEEN      COMPLOT
TABULATED VALUES. FOR HISTOGRAM OR LINEARLY INTERPOLABLE CROSS    COMPLOT
SECTIONS THIS REPRESENTATION WILL POINT OUT ALL EXTREMA OF THE    COMPLOT
RATIO, BUT NOT NECESSARILY THE ENERGY DEPENDENCE BETWEEN TABULATEDCOMPLOT
VALUES.                                                           COMPLOT
                                                                  COMPLOT
IF THE EVALUATED DATA IS NOT IN EITHER HISTOGRAM OR LINRARLY      COMPLOT
INTERPOLABLE FORM THE RATIO MAY NOT EVEN FIND ALL EXTREMA. FOR    COMPLOT
EXAMPLE, IF ONE EVALUATION IS LINEARLY INTERPOLABLE AND THE       COMPLOT
OTHER NON-LINEAR, BUT BOTH AGREE AT ALL TABULATED ENERGIES THE    COMPLOT
RATIO WILL APPEAR TO BE EQUAL TO UNITY AT ALL ENERGIES, BUT IN    COMPLOT
FACT THE CROSS SECTION BETWEEN TABULATED ENERGIES MAY BE QUITE    COMPLOT
DIFFERENT USING LINEAR VS. NON-LINEAR INTERPOLATION. FOR THIS     COMPLOT
REASON ONLY LINEARLY INTERPOLABLE OR HISTOGRAM DATA IS ALLOWED    COMPLOT
AS INPUT TO THIS PROGRAM.                                         COMPLOT
                                                                  COMPLOT
LINEAR INTERPOLABLE                                               COMPLOT
-------------------                                               COMPLOT
ALL CROSS SECTIONS MAY BE CONVERTED TO LINEARLY INTERPOLABLE FORM COMPLOT
BE USING PROGRAM LINEAR (UCRL-50400, VOL. 17, PART A).            COMPLOT
                                                                  COMPLOT
HISTOGRAM                                                         COMPLOT
---------                                                         COMPLOT
ALL LINEARLY INTERPOLABLE CROSS SECTION MAY BE CONVERTED TO       COMPLOT
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HISTOGRAM (I.E. MULTIGROUP) FORM BY USING PROGRAM GROUPIE         COMPLOT
(UCRL-50400, VOL. 17, PART D).                                    COMPLOT
                                                                  COMPLOT
INPUT UNITS                                                       COMPLOT
-----------                                                       COMPLOT
UNIT  DESCRIPTION                                                 COMPLOT
----  -----------                                                 COMPLOT
  2   INPUT LINE                                                  COMPLOT
  9   MT DEFINITIONS.                                             COMPLOT
 10   FIRST ENDF/B FORMATTED EVALUATION (STANDARD).               COMPLOT
 11   SECOND ENDF/B FORMATTED EVALUATION.                         COMPLOT
 17   SOFTWARE CHARACTERS.                                        COMPLOT
 18   SOFTWARE SYMBOLS AND LINE TYPES                             COMPLOT
                                                                  COMPLOT
OUTPUT UNITS                                                      COMPLOT
------------                                                      COMPLOT
UNIT  DESCRIPTION                                                 COMPLOT
----  -----------                                                 COMPLOT
  3   NORMAL OUTPUT REPORT.                                       COMPLOT
 16   PLOTTER UNIT                                                COMPLOT
                                                                  COMPLOT
SCRATCH UNITS                                                     COMPLOT
-------------                                                     COMPLOT
UNIT  DESCRIPTION                                                 COMPLOT
----  -----------                                                 COMPLOT
 12   SCRATCH UNIT FOR FIRST EVALUATION                           COMPLOT
 13   SCRATCH UNIT FOR SECOND EVALUATION                          COMPLOT
 14   SCRATCH UNIT FOR RATIO (ONLY USED IF RATIOS REQUESTED).     COMPLOT
                                                                  COMPLOT
OPTIONAL STANDARD FILE NAMES (SEE SUBROUTINE FILIO1 AND FILIO2)   COMPLOT
-----------------------------------------------------------------  COMPLOT
UNIT  FILE NAME                                                   COMPLOT
----  ----------                                                  COMPLOT
  2   COMPLOT.INP                                                 COMPLOT
  3   COMPLOT.LST                                                 COMPLOT
  9   MT.DAT                                                      COMPLOT
 10   ENDFB.IN1    (OR AS READ FROM INPUT)                        COMPLOT
 11   ENDFB.IN2    (OR AS READ FROM INPUT)                        COMPLOT
12-14 (SCRATCH)                                                   COMPLOT
 15   PLOT.CHR                                                    COMPLOT
 16   (PLOTTER UNIT...USUALLY A DUMMY)                            COMPLOT
                                                                  COMPLOT
INPUT PARAMETERS                                                  COMPLOT
-----------------------------------------------------------------COMPLOT
LINE  COLUMNS  FORMAT  DESCRIPTION                                COMPLOT
----  -------  ------  -----------                                COMPLOT
  1     1-11    E11.4  LOWER X LIMIT OF PLOTTER                   COMPLOT
       12-22    E11.4  UPPER X LIMIT OF PLOTTER                   COMPLOT
       23-33    E11.4  LOWER Y LIMIT OF PLOTTER                   COMPLOT
       34-44    E11.4  UPPER Y LIMIT OF PLOTTER                   COMPLOT
       45-55     I11   NUMBER OF PLOTS PER FRAME IN X DIRECTION   COMPLOT
       56-66     I11   NUMBER OF PLOTS PER FRAME IN Y DIRECTION   COMPLOT
       67-70     F4.1  CHARACTER SIZE MULTIPLIER                  COMPLOT
                       = 0 TO 1    - NORMAL CHARACTER SIZE       COMPLOT
                       = OTHERWISE - CHARACTERS SCALED BY THIS   COMPLOT
                                     FACTOR                      COMPLOT
                                                                 COMPLOT
                       PLOT ORIENTATION IS BASED ON THE UPPER X  COMPLOT
                       LIMIT                                     COMPLOT
                       = .GT.0 - X HORIZONTAL/Y VERTICAL         COMPLOT
                       = .LT.0 - Y HORIZONTAL/X VERTICAL         COMPLOT
                       AFTER TESTING THE UPPER X LIMIT WILL BE   COMPLOT
                       SET TO ITS ABSOLUTE VALUE.                COMPLOT
  2      1-72     A72   FILENAME FOR FIRST ENDF/B DATA FILE      COMPLOT
                       (LEAVE BLANK FOR ENDFB.IN1)               COMPLOT
  3      1-72     A72   FILENAME FOR SECOND ENDF/B DATA FILE     COMPLOT
                       (LEAVE BLANK FOR ENDFB.IN2)               COMPLOT
  4     1-11      I11   RETRIEVAL MODE (0=MAT, 1=ZA)             COMPLOT
       12-22      I11   GRID (SPEED) OPTION.                     COMPLOT
                       = 0 - TICK MARKS ON BORDER                COMPLOT
                       = 1 - SOLID AT COARSE INTERVALS           COMPLOT
```

```
                    = 2 - DASHED AT COARSE INTERVALS           COMPLOT
                    = 3 - SOLID AT COARSE AND FINE INTERVALS   COMPLOT
                    = 4 - DASHED AT COARSE AND FINE INTERVALS  COMPLOT
                    = 5 - SOLID COARSE/DASHED FINE INTERVALS   COMPLOT
       23-33    I11 SHOULD BORDER BE PLOTTED AROUND EACH PLOT  COMPLOT
                    = 0 - NO                                   COMPLOT
                    = 1 - YES                                  COMPLOT
       34-44    I11 LINE THICKNESS                             COMPLOT
                    = 0 TO  5 - LINES AND CHARACTERS           COMPLOT
                    =-1 TO -5 - ONLY LINES                     COMPLOT
       45-55    I11 OUTPUT MODE                                COMPLOT
                    =-1 - ONLY COMPARISON LISTING. NO PLOTS.   COMPLOT
                    = 0 - CROSS SECTION OVER RATIO.            COMPLOT
                    = 1 - CROSS SECTION OVER CROSS SECTION.    COMPLOT
                    = 2 - TWO CROSS SECTIONS ON SAME PLOT.     COMPLOT
                    = 3 - CROSS SECTION OVER CROSS SECTION OVERCOMPLOT
                          RATIO.                               COMPLOT
                    = 4 - TWO CROSS SECTIONS ON SAME PLOT OVER COMPLOT
                          RATIO.                               COMPLOT
       56-66    I11 STARTING PLOT NUMBER                       COMPLOT
                    = 0     - DO NOT NUMBER PLOTS              COMPLOT
                    = .GT.0 - NUMBER PLOTS IN LOWER LEFT HAND  COMPLOT
                              CORNER STARTING WITH INPUT NUMBERCOMPLOT
       67-70    I41 BACKGROUND COLOR                           COMPLOT
                    = 0         = BLACK                        COMPLOT
                    = OTHERWISE = WHITE                        COMPLOT
    5   1-11  E11.4 ALLOWABLE FRACTIONAL DIFFERENCE. USED WHEN COMPLOT
                    PLOTTING RATIOS. ANY REACTION WHERE THE    COMPLOT
                    TWO EVALUATIONS DIFFER BY MORE THAN THE    COMPLOT
                    ALLOWABLE DIFFERENCE WILL BE PLOTTED. IF   COMPLOT
                    ZERO IS INPUT THE STANDARD ALLOWABLE       COMPLOT
                    DIFFERENCE OF 0.001 (0.1 PER-CENT) WILL BE COMPLOT
                    USED.                                      COMPLOT
       12-22  E11.4 MAXIMUM ALLOWABLE RATIO. IF RATIOS ARE     COMPLOT
                    PLOTTED THEY WILL BE IN THE RANGE RATMAX   COMPLOT
                    TO 1/RATMAX. IF 0.0 IS INPUT THERE WILL    COMPLOT
                    BE NO LIMIT ON THE RANGE OF THE RATIOS.    COMPLOT
                    THIS OPTION MAY BE USED TO IGNORE LARGE    COMPLOT
                    DIFFERENCES OVER VERY NARROW ENERGY RANGES COMPLOT
                    (WHICH MAY BE UNIMPORTANT) AND ALLOW ONE   COMPLOT
                    TO SEE IMPORTANT, BUT SMALLER DIFFERENCES, COMPLOT
                    OVER EXTENDED ENERGY RANGES.               COMPLOT
    6   1-40   40A1 IDENTIFICATION FOR UPPER EVALUATIONS       COMPLOT
    7   1-40   40A1 IDENTIFICATION FOR LOWER EVALUATIONS       COMPLOT
                    (IDENTIFICATIONS SHOULD BE LEFT ADJUSTED   COMPLOT
                    TO START IN COLUMN 1).                     COMPLOT
8-N     1- 6    I6  LOWER MAT OR ZA LIMIT (SEE SELECTION MODE, COMPLOT
                    INPUT LINE 1, COLUMNS 1-11).               COMPLOT
        7- 8    I2  LOWER MF LIMIT                             COMPLOT
        9-11    I3  LOWER MT LIMIT                             COMPLOT
       12-22  E11.4 LOWER ENERGY LIMIT                         COMPLOT
       23-28    I6  UPPER MAT OR ZA LIMIT (SEE SELECTION MODE, COMPLOT
                    INPUT LINE 1, COLUMNS 1-11).               COMPLOT
       29-30    I2  UPPER MF LIMIT                             COMPLOT
       31-33    I3  UPPER MT LIMIT                             COMPLOT
       34-44  E11.4 UPPER ENERGY LIMIT                         COMPLOT
       45-55    I11 IDENTIFY EVALUATED DATA POINTS OPTION.     COMPLOT
                    = 0 - DO NOT IDENTIFY DATA POINTS.         COMPLOT
                    = 1 - IDENTIFY DATA POINTS (BY DRAWING A   COMPLOT
                          SMALL BOX AROUND EACH POINT).        COMPLOT
       56-66    I11 INTERACTIVE INPUT FLAG                     COMPLOT
                    = 0 - NO INTERACTIVE INPUT ALLOWED         COMPLOT
                    = 1 - INTERACTIVE INPUT ALLOWED            COMPLOT
                   *SETTING THIS OPTION =1 WILL TURN ON THE    COMPLOT
                    MOUSE AFTER EACH PLOT AND ALLOW YOU TO     COMPLOT
                    INTERACTIVELY SPECIFY PLOT LIMITS.         COMPLOT
                   *IF YOU DO NOT WISH TO INTERACT WITH A PLOT COMPLOT
                    OR IF YOU HAVE NO INTERACTIVE CAPABILITY   COMPLOT
                    THIS OPTION SHOULD BE SET = 0.             COMPLOT
                                                               COMPLOT
                   *WARNING...DATA POINTS IDENTIFIED OPTION IS COMPLOT
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                          NOT RECOMMENDED FOR PLOTS CONTAINING MANY  COMPLOT
                          (I.E. THOUSANDS) OF DATA POINTS SINCE IT   COMPLOT
                          WILL MERELY INCREASE THE RUNNING TIME OF   COMPLOT
                          THE PROGRAM AND STILL NOT ALLOW ONE TO     COMPLOT
                          ACCURATELY SEE DATA POINTS.                COMPLOT
                                                                     COMPLOT
                         *UP TO 100 MAT OR ZA RANGES ARE ALLOWED.    COMPLOT
                          THE LIST IS TERMINATED BY A BLANK LINE.    COMPLOT
                          IF THE UPPER LIMIT IS LESS THAN THE LOWER  COMPLOT
                          LIMIT IT WILL BE SET EQUAL TO THE LOWER    COMPLOT
                          LIMIT. IF THE FIRST RANGE LINE IS BLANK    COMPLOT
                          ALL DATA WILL BE RETRIEVED. IF THE UPPER   COMPLOT
                          MT LIMIT IS ZERO IT WILL BE SET EQUAL TO   COMPLOT
                          999 (NO LIMIT). IF THE UPPER ENERGY LIMIT  COMPLOT
                          IS ZERO IT WILL BE INTREPRETED TO MEAN NO  COMPLOT
                          LIMIT. IF THE FIRST RANGE LINE SPECIFIES   COMPLOT
                          ZERO LOWER AND UPPER MAT OR ZA RANGE IT    COMPLOT
                          WILL TERMINATE THE LIST BE RANGE LINES     COMPLOT
                          (A SECOND BLANK LINE NEED NOT BE INPUT)    COMPLOT
                          AND THE ENTIRE RANGE OF MATS WILL BE       COMPLOT
                          COMPARED FOR THE SPECIFIED MT AND ENERGY   COMPLOT
                          RANGES.                                    COMPLOT
                                                                     COMPLOT
N+1-M                     EQUIVALENCES                               COMPLOT
          1- 6      I6    MASTER ZA.                                 COMPLOT
          7- 8      I2    MASTER MF.                                 COMPLOT
          9-11      I3    MASTER MT.                                 COMPLOT
         12-17      I6    EQUIVALENT ZA FROM SECOND FILE.            COMPLOT
         18-19      I2    EQUIVALENT MF FROM SECOND FILE.            COMPLOT
         20-22      I3    EQUIVALENT MT FROM SECOND FILE.            COMPLOT
         23-33    E11.4   MULTIPLICATION FACTOR. ANY EQUATED ZA,MF,  COMPLOT
                          MT DATA WILL BE MULTIPLIED BY THIS FACTOR. COMPLOT
                         *THIS OPTION MAY BE USED TO RE-NORMALIZE    COMPLOT
                          THE SECOND CROSS SECTION OR IF COMPARING   COMPLOT
                          ONE CONSTITUENT OF A MIXTURE TO THE MIXED  COMPLOT
                          CROSS SECTION THIS MAY BE USED TO CONVERT  COMPLOT
                          THE SECOND CROSS SECTION TO BARNS PER MIXEDCOMPLOT
                          ATOM BY USING A MULTIPLICATION FACTOR WHICHCOMPLOT
                          IS EQUAL TO THE NUMBER OF ATOMS OF THE ONE COMPLOT
                          CONSTITUENT PER ATOM OF THE MIXTURE.       COMPLOT
                          = 0.0 - ON INPUT WILL BE INTERPRETED AS 1.0COMPLOT
                          (WITH THIS CONVENTION THE USER NEED ONLY   COMPLOT
                          INPUT MULTIPLICATION FACTORS IF THEY ARE   COMPLOT
                          NOT 1.0).                                  COMPLOT
                         *UP TO 100 MAT OR ZA EQUIVALENCES ARE       COMPLOT
                          ALLOWED.                                   COMPLOT
                         *THE LIST IS TERMINATED BY A BLANK LINE.    COMPLOT
                         *A ZERO INPUT FIELD IMPLIES ALL. TO EQUATE  COMPLOT
                          A GIVEN MT NUMBER TO ANOTHER MT NUMBER YOU COMPLOT
                          NEED MERELY SPECIFY ZA=0 ON INPUT.         COMPLOT
                         *NOTE, IN ALL CASES THE TITLE AT TOP OF PLOTCOMPLOT
                          WILL ONLY INDENTIFY MASTER (ZA,MF,MT). THE COMPLOT
                          USER INPUT TITLES MUST BE USED TO IDENTIFY COMPLOT
                          THE SECOND REACTION (SEE, EXAMPLE INPUT 4  COMPLOT
                          BELOW).                                    COMPLOT
                                                                     COMPLOT
  EXAMPLE DEFINITION OF PLOTTER                                      COMPLOT
  ----------------------------                                       COMPLOT
  2015 - WARNING - THE FOLLOWING DESCRIPTION IS OUT-OF-DATE.         COMPLOT
  TODAY THE DIMENSIONS OF THE PLOTTER ARE IN INCHES.                 COMPLOT
                                                                     COMPLOT
  THE FIRST INPUT LINE DEFINES THE DIMENSIONS OF THE PLOTTER BEING   COMPLOT
  USED IN ANY UNITS (INCHES, CENTIMETERS, MILLIMETERS, ANYTHING)     COMPLOT
  WHICH APPLY TO THE PLOTTER. IN ADDITION THE FIRST LINE DEFINES     COMPLOT
  HOW MANY PLOTS SHOULD APPEAR ON EACH FRAME. THE PLOTTING AREA      COMPLOT
  DEFINED ON THE FIRST INPUT LINE MAY BE SUBDIVIDED INTO ANY NUMBER  COMPLOT
  OF PLOTS IN THE X AND Y DIRECTION. FOR EXAMPLE, TO PRODUCE A       COMPLOT
  SERIES OF FRAMES EACH CONTAINING 3 PLOTS IN THE X DIRECTION AND    COMPLOT
  2 PLOTS IN THE Y DIRECTION (6 PLOTS PER FRAME) COLUMN 45-55 OF     COMPLOT
  THE FIRST INPUT LINE SHOULD BE 3 AND COLUMNS 56-66 SHOULD BE 2.    COMPLOT
                                                                     COMPLOT
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   IF THE LOCAL PLOTTER USES DIMENSIONS OF INCHES IN ORDER TO OBTAIN COMPLOT
   10 X 10 INCH FRAMES WITH 3 X 2 PLOTS PER FRAME THE FIRST INPUT    COMPLOT
   LINE SHOULD BE,                                                   COMPLOT
                                                                     COMPLOT
     0.0       10.0      0.0     10.0              3          2      COMPLOT
                                                                     COMPLOT
   IF THE LOCAL PLOTTER USES DIMENSION OF MILLIMETERS THE SAME       COMPLOT
   PHYSICAL SIZE PLOT MAY BE OBTAINED IF THE FIRST INPUT LINE IS,    COMPLOT
                                                                     COMPLOT
     0.0      254.0      0.0    254.0              3          2      COMPLOT
                                                                     COMPLOT
   FOR SIMPLICITY THE FOLLOWING EXAMPLE INPUTS WILL NOT DISCUSS THE  COMPLOT
   PHYSICAL DIMENSIONS OF THE PLOTTER AND THE FIRST INPUT LINE WILL  COMPLOT
   IN ALL CASES INDICATE 10 X 10 INCH PLOTS WITH ONLY 1 PLOT PER     COMPLOT
   FRAME.                                                            COMPLOT
                                                                     COMPLOT
   IN THE FOLLOWING EXAMPLES IN ALL CASES THESE OPTIONS WILL BE USED,COMPLOT
   1) DASHED GRID       - COLUMNS 12-22 OF SECOND INPUT LINE =  1    COMPLOT
   2) NO BORDER         - COLUMNS 23-33 OF SECOND INPUT LINE =  0    COMPLOT
   3) LINE THICKNESS    - COLUMNS 34-44 OF SECOND INPUT LINE = -2    COMPLOT
   4) OUTPUT MODE       - COLUMNS 45-55 OF SECOND INPUT LINE =  3    COMPLOT
   5) FIRST PLOT NUMBER - COLUMNS 56-66 OF SECOND INPUT LINE =  1    COMPLOT
                                                                     COMPLOT
   EXAMPLE INPUT 1                                                   COMPLOT
   ---------------                                                   COMPLOT
   RETRIEVE MATS 1023, 1056 AND 1065 THROUGH 1072, MT = 1 AND 2      COMPLOT
   (TOTAL AND ELASTIC) FROM THE FIRST INPUT FILE AND COMPARE TO      COMPLOT
   ANY SECTION FROM THE SECOND FILE THAT HAS THE SAME ZA/MF/MT. ONLY COMPLOT
   COMPARE DATA OVER THE ENERGY RANGE 0.1 EV TO 1 KEV. IDENTIFY      COMPLOT
   THE TWO SETS OF DATA AS ENDF/B-V AND ENDF/B-IV, RESPECTIVELY.     COMPLOT
   ONLY PLOT THOSE REACTIONS WHICH DIFFER AT ONE OR MORE ENERGIES    COMPLOT
   BY MORE THAN 1 PER-CENT (NOTE, 1 PER-CENT = 0.01 AS INPUT         COMPLOT
   FRACTION). NO EQUIVALENT REACTIONS ARE SPECIFIED. FILERNAMES      COMPLOT
   ARE STANDARD (THSE CAN EITHER BE EXPLICITLY INCLUDED, OR SIMPLY   COMPLOT
   LEFT BLANK).                                                      COMPLOT
                                                                     COMPLOT
   THE FOLLOWING 12 INPUT LINES ARE REQUIRED.                        COMPLOT
                                                                     COMPLOT
      0.0       10.0      0.0     10.0              3          2     COMPLOT
 ENDFB.IN1                                                           COMPLOT
 ENDFB.IN2                                                           COMPLOT
        0          1        0       -2              3          1     COMPLOT
     0.01        0.0                                                COMPLOT
 ENDF/B-V DATA (STANDARD)                                            COMPLOT
 ENDF/B-IV DATA                                                      COMPLOT
 1023 3  1 0.1            3  2 1000.0               0               COMPLOT
 1056 3  1 0.1            3  2 1000.0               0               COMPLOT
 1065 3  1 0.1       1072 3  2 1000.0               0               COMPLOT
                                    (TERMINATES REQUEST LIST)        COMPLOT
                                    (TERMINATES EQUIVALENCE LIST)    COMPLOT
                                                                     COMPLOT
   EXAMPLE INPUT 2                                                   COMPLOT
   ---------------                                                   COMPLOT
   TO USE ALL OF THE SAME OPTIONS AS SPECIFIED IN EXAMPLE INPUT 1,   COMPLOT
   EXCEPT TO RETRIEVE U-235, U-238 AND PU-239 THROUGH PU-242 THE     COMPLOT
   FOLLOWING 12 INPUT LINES ARE REQUIRED.                            COMPLOT
                                                                     COMPLOT
      0.0       10.0      0.0     10.0              3          2     COMPLOT
 ENDFB.IN1                                                           COMPLOT
 ENDFB.IN2                                                           COMPLOT
        1          1        0       -2              3          1     COMPLOT
     0.01        0.0                                                COMPLOT
 ENDF/B-V DATA (STANDARD)                                            COMPLOT
 ENDF/B-IV DATA                                                      COMPLOT
92235 3  1 0.1            3  2 1000.0               0               COMPLOT
92238 3  1 0.1            3  2 1000.0               0               COMPLOT
94239 3  1 0.1      94242 3  2 1000.0               0               COMPLOT
                                    (TERMINATES REQUEST LIST)        COMPLOT
                                    (TERMINATES EQUIVALENCE LIST)    COMPLOT
   EXAMPLE INPUT 3                                                   COMPLOT
   ---------------                                                   COMPLOT
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    TO USE ALL OF THE SAME OPTIONS AS SPECIFIED IN EXAMPLE INPUT 1,   COMPLOT
    EXCEPT TO RETRIEVE AND COMPARE ALL MATS THE FOLLOWING 10 INPUT    COMPLOT
    LINES ARE REQUIRED.                                               COMPLOT
                                                                      COMPLOT
      0.0       10.0      0.0     10.0              3          2      COMPLOT
 ENDFB.IN1                                                            COMPLOT
 ENDFB.IN2                                                            COMPLOT
       0          1        0       -2              3          1      COMPLOT
     0.01        0.0                                                  COMPLOT
ENDF/B-V DATA (STANDARD)                                              COMPLOT
ENDF/B-IV DATA                                                        COMPLOT
    1 1  1 0.0       999999999 0.0                  0                 COMPLOT
                                    (TERMINATES REQUEST LIST)         COMPLOT
                                    (TERMINATES EQUIVALENCE LIST)     COMPLOT
                                     NOTE, ZERO LOWER AND UPPER       COMPLOT
                                     MAT LIMITS INDICATES NO LIMIT.   COMPLOT
                                                                      COMPLOT
    EXAMPLE INPUT 4                                                   COMPLOT
    ---------------                                                   COMPLOT
    RETRIEVE U-235 AND EQUATE THE FISSION CROSS SECTION (MT=18) ON    COMPLOT
    THE MASTER FILE TO CAPTURE (MT=102) ON THE SECOND FILE. PLOT      COMPLOT
    THE CAPTURE, FISSION AND CAPTURE TO FISSION RATIO OVER THE ENERGY COMPLOT
    RANGE 0.0253 EV TO 1 KEV. THE FOLLOWING 11 INPUT LINES ARE        COMPLOT
    REQUIRED.                                                         COMPLOT
                                                                      COMPLOT
      0.0       10.0      0.0     10.0              3          2     COMPLOT
 ENDFB.IN1                                                            COMPLOT
 ENDFB.IN2                                                            COMPLOT
        1          1        0       -2              3          1     COMPLOT
     0.01        0.0                                                  COMPLOT
 FISSION                                                              COMPLOT
 CAPTURE                                                              COMPLOT
92235 3 18 0.0253   92235 3 18 1000.0                 0               COMPLOT
                                    (TERMINATES REQUEST LIST)         COMPLOT
92235 3 18 92235 3102               (MULTIPLICATION OF 1.0 INFERRED)COMPLOT
                                    (TERMINATES EQUIVALENCE LIST)     COMPLOT
                                                                      COMPLOT
    EXAMPLE INPUT 5                                                   COMPLOT
    ---------------                                                   COMPLOT
    IN DIFFERENT VERSIONS OF THE ENDF/B FORMAT DIFFERENT MT NUMBERS   COMPLOT
    ARE ASSIGNED TO THE SAME REACTION. FOR EXAMPLE, IN ENDF/B-V AND   COMPLOT
    EARLIER VERSIONS OF ENDF/B THE PHOTOELECTRIC CROSS SECTION IS     COMPLOT
    MT=602, WHILE IN ENDF/B-VI IT IS MT=522. IN ORDER TO COMPARE      COMPLOT
    ASSUMING THAT THE MASTER IS ENDF/B-VI AND THE OTHER ENDF/B FILE   COMPLOT
    IS ENDF/B-V (OR EARLIER) YOU MAY EQUATE MT=522 TO 602.            COMPLOT
                                                                      COMPLOT
    WHEN COMPARING PHOTOELECTRIC CROSS SECTIONS WE EXPECT THERE TO BE COMPLOT
    LARGE DIFFERENCES NEAR EDGES, SINCE IT IS UNLIKELY THAT TWO       COMPLOT
    INDEPENDENT EVALUATIONS USE EXACTLY THE SAME EDGE ENERGIES. FROM  COMPLOT
    A PRACTICAL VIEWPOINT THESE DIFFERENCES ARE NOT IMPORTANT IF THEY COMPLOT
    ONLY OCCUR OVER NARROW ENERGY RANGES NEAR ENERGIES. HOWEVER THESE COMPLOT
    LARGE DIFFERENCES MAY MAKE IT DIFFICULT TO SEE DIFFERENCES OVER   COMPLOT
    OTHER ENERGY RANGES, WHICH MAY BE IMPORTANT. IN ORDER TO BE ABLE  COMPLOT
    TO SEE IMPORTANT DIFFERENCES IN THE FOLLOWING COMPARISON WE WILL  COMPLOT
    CONSTRAIN THE PLOTTED RATIO TO THE RANGE ABOUT 0.9 TO 1.1 IN      COMPLOT
    ORDER TO BE ABLE TO SEE DIFFERENCES OF UP TO 10 PER-CENT. WE WILL COMPLOT
    DO THIS BY SPECIFYING A MAXIMUM RATIO OF 1.1, WHICH WILL IN TURN  COMPLOT
    DEFINE A MINIMUM RATIO OF 1/1.1, OR ABOUT 0.9.                    COMPLOT
                                                                      COMPLOT
    IN ORDER TO COMPARE THE PHOTOELECTRIC CROSS SECTION FOR ALL       COMPLOT
    MATERIALS THE FOLLOWING 11 INPUT LINES ARE REQUIRED.              COMPLOT
                                                                      COMPLOT
      0.0       10.0      0.0     10.0              3          2     COMPLOT
 ENDFB.IN1                                                            COMPLOT
 ENDFB.IN2                                                            COMPLOT
       0          1        0       -2              3          1     COMPLOT
     0.01        1.1                                                  COMPLOT
ENDF/B-VI                                                             COMPLOT
ENDF/B-V                                                              COMPLOT
   023522           999923522                      0                 COMPLOT
                                    (TERMINATES REQUEST LIST)         COMPLOT
```

```
   023522     023602                  (MULTIPLICATION OF 1.0 INFERRED)COMPLOT
                                      (TERMINATES EQUIVALENCE LIST)   COMPLOT
                                                                      COMPLOT
    EXAMPLE INPUT 6                                                   COMPLOT
    ---------------                                                   COMPLOT
    THE SAME EXAMPLE AS ABOVE, EXCEPT THAT DIFFERENT FILENAMES WILL   COMPLOT
    BE USED TO READ THE DATA FROM A FILE TREE STRUCTURE. THE FOLLOWINGCOMPLOT
    11 INPUT LINES ARE REQUIRED.                                      COMPLOT
                                                                      COMPLOT
      0.0       10.0      0.0     10.0              3          2      COMPLOT
 /Evaluated/ENDFB6/PHOTON.IN                                          COMPLOT
 /Evaluated/ENDFB5/PHOTON.IN                                          COMPLOT
        0          1        0       -2              3          1      COMPLOT
     0.01        1.1                                                  COMPLOT
ENDF/B-VI                                                             COMPLOT
ENDF/B-V                                                              COMPLOT
   023522           999923522                      0                 COMPLOT
                                      (TERMINATES REQUEST LIST)       COMPLOT
   023522     023602                  (MULTIPLICATION OF 1.0 INFERRED)COMPLOT
                                      (TERMINATES EQUIVALENCE LIST)   COMPLOT
                                                                      COMPLOT
    EXAMPLE INPUT 7                                                   COMPLOT
    ---------------                                                   COMPLOT
    THE OUTPUT FOR ALL OF THE ABOVE EXAMPLES ARE ORIENTED WITH X      COMPLOT
    HORIZONTAL AND Y VERTICAL. TO CHANGE THE ORIENTATION OF THE PLOTS COMPLOT
    YOU NEED MERELY SPECIFY A NEGATIVE UPPER X LIMIT OF THE SIZE OF   COMPLOT
    THE PLOTS ON THE FIRST INPUT LINE.                                COMPLOT
                                                                      COMPLOT
    THE FOLLOWING EXAMPLE IS EXACTLY THE SAME AS THE ABOVE EXAMPLE,   COMPLOT
    EXCEPT THAT THE ORIENTATION OF THE PLOTS HAS BEEN CHANGED. THE    COMPLOT
    FOLLOWING 11 INPUT LINES ARE REQUIRED.                            COMPLOT
                                                                      COMPLOT
      0.0      -10.0      0.0     10.0              3          2      COMPLOT
 /Evaluated/ENDFB6/PHOTON.IN                                          COMPLOT
 /Evaluated/ENDFB5/PHOTON.IN                                          COMPLOT
        0          1        0       -2              3          1      COMPLOT
     0.01        1.1                                                  COMPLOT
ENDF/B-VI                                                             COMPLOT
ENDF/B-V                                                              COMPLOT
   023522           999923522                      0                 COMPLOT
                                      (TERMINATES REQUEST LIST)       COMPLOT
   023522     023602                  (MULTIPLICATION OF 1.0 INFERRED)COMPLOT
                                      (TERMINATES EQUIVALENCE LIST)   COMPLOT
                                                                      COMPLOT
===== PLOTTER/GRAPHICS TERMINAL INTERFACE ============================COMPLOT
                                                                      COMPLOT
     NON-INTERACTIVE                                                  COMPLOT
     -----------------------------------------------------------------COMPLOT
     THIS PROGRAM USES A SIMPLE CALCOMP LIKE INTERFACE INVOLVING      COMPLOT
     ONLY 5 SUBROUTINES,                                              COMPLOT
                                                                      COMPLOT
     STARPLOT     - INITIALIZE PLOTTER                                COMPLOT
     NEXTPLOT     - CLEAR SCREEN FOR NEXT PLOT                        COMPLOT
     ENDPLOTS     - TERMINATE PLOTTING                                COMPLOT
                                                                      COMPLOT
     PLOT(X,Y,IPEN)        - DRAW OR MOVE FROM LAST LOCATION TO (X,Y),COMPLOT
                             END OF CURRENT PLOT OR END OF PLOTTING.  COMPLOT
           IPEN =   2 - DRAW                                          COMPLOT
                =   3 - MOVE                                          COMPLOT
                                                                      COMPLOT
     PEN(IPEN)             - SELECT COLOR.                            COMPLOT
         IPEN- COLOR = 1 TO N (N = ANY POSITIVE INTEGER)              COMPLOT
                                                                      COMPLOT
     BOXCOLOR(X,Y,IFILL,IBORDER) - FILL A RECTANGLE WITH COLOR        COMPLOT
              X,Y                = DEFINE THE CORNERS OF THE BOX      COMPLOT
                  IFILL          = COLOR TO FILL BOX WITH             COMPLOT
                        IBORDER  = COLOR OF BORDER OF BOX             COMPLOT
                                                                      COMPLOT
     INTERACTIVE                                                      COMPLOT
     -----------------------------------------------------------------COMPLOT
     THIS PROGRAM INCLUDES AN INTERACTIVE INTERFACE FOR USE WITH A    COMPLOT
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 MOUSE. THE INTERFACE INVOLVES 2 SUBROUTINE,                          COMPLOT
                                                                      COMPLOT
 INTERACT(MYACTION)              - WHETHER OR NOT INTERACTION         COMPLOT
          MYACTION               = 0 - NO (RETURNED BY INTERACT)      COMPLOT
                                 = 1 - YES (RETURNED BY INTERACT)     COMPLOT
                                                                      COMPLOT
 MOUSEY(IWAY,XI,YI,IWAY1,IWAY2) - READ POSITION OF MOUSE              COMPLOT
                         IWAY    = 0 - NO INPUT                       COMPLOT
                                 = 1 - LEFT BUTTON                    COMPLOT
                                 = 2 - MIDDLE BUTTON                  COMPLOT
                                 = 3 - RIGHT BUTTON                   COMPLOT
                                 = 4 - KEYBOARD INPUT                 COMPLOT
                         XI      = real*4 X POSITION IN LOCAL UNITSCOMPLOT
                         YI      = real*4 Y POSITION IN LOCAL UNITSCOMPLOT
                         IWAY1   = MINIMUM ALLOWABLE IWAY             COMPLOT
                         IWAY2   = MAXIMUM ALLOWABLE IWAY             COMPLOT
                                                                      COMPLOT
AS USED BY THIS PROGRAM IWAY1   = 1                                   COMPLOT
                         IWAY2   = 4                                  COMPLOT
KEYBOARD INPUT (IWAY=4) MEANS NO ZOOMED PLOT REQUESTED.               COMPLOT
MOUSE INPUT (IWAY=1 TO 3) MEANS A ZOOMED PLOT IS REQUESTED.           COMPLOT
MOUSEY WILL BE CALLED ONCE TO SEE IF A ZOOMED PLOT IS REQUESTED.      COMPLOT
IF IT IS XI WILL BE USED TO DEFINE ONE X (E.G., ENERGY) LIMIT OF      COMPLOT
THE ZOOMED PLOT. MOUSEY WILL THEN BE CALLED A SECOND TIME TO          COMPLOT
DEFINE A SECOND XI TO DEFINE THE OTHER X LIMIT OF THE ZOOMED          COMPLOT
PLOT.                                                                 COMPLOT
                                                                      COMPLOT
IF YOU DO NOT WANT INTERACTION YOU SHOULD INCLUDE THE FOLLOWING       COMPLOT
SUBROUTINES IN YOUR GRAPHIC INTERFACE,                                COMPLOT
                                                                      COMPLOT
SUBROUTINE INTERACT(MYACTION)                                         COMPLOT
MYACTION=0                                                            COMPLOT
RETURN                                                                COMPLOT
END                                                                   COMPLOT
SUBROUTINE MOUSEY(IWAY,XI,YI,IWAY1,IWAY2)                             COMPLOT
IWAY=4                                                                COMPLOT
XI=0.0                                                                COMPLOT
YI=0.0                                                                COMPLOT
RETURN                                                                COMPLOT
END                                                                   COMPLOT
                                                                      COMPLOT
ALTERNATIVE INTERACTIVE                                               COMPLOT
----------------------------------------------------------------------COMPLOT
IF YOU DO NOT HAVE A MOUSE BUT WOULD STILL LIKE TO INTERACTIVE        COMPLOT
INPUT YOU CAN REPLACE SUBROUTINE ACTION IN THIS PROGRAM.              COMPLOT
                                                                      COMPLOT
AS DISTRIBUTED SUBROUTINE ACTION USES A MOUSE TO DEFINE LOWER         COMPLOT
AND UPPER ENERGY (OR X) LIMITS WHICH ARE USED TO PRODUCE THE          COMPLOT
NEXT PLOT. A CALL TO ACTION IS OF THE FORM,                           COMPLOT
                                                                      COMPLOT
CALL ACTION(KACTV,XACT1,XACT2)                                        COMPLOT
                                                                      COMPLOT
            KACTV   = 0 - NO INTERACTIVE INPUT                        COMPLOT
                    = 1 - INTERACTIVE INPUT                           COMPLOT
            XACT1   = LOWER ENERGY LIMIT                              COMPLOT
            XACT2   = UPPER ENERGY LIMIT                              COMPLOT
                                                                      COMPLOT
IF THERE IS NO INTERACTIVE INPUT THE PROGRAM WILL PROCEED TO THE      COMPLOT
NEXT PLOT REQUESTED BY NON-INTERACTIVE INPUT.                         COMPLOT
                                                                      COMPLOT
IF THERE IS INTERACTIVE INPUT THE PROGRAM WILL USE XACT1 AND          COMPLOT
XACT2 TO DEFINE THE ENERGY LIMITS OF THE NEXT PLOT USING THE          COMPLOT
SAME DATA AS APPEARED ON THE LAST PLOT. AS WITH NON-INTERACTIVE       COMPLOT
INPUT, IF YOU SELECT AN ENERGY RANGE WHERE THE MAXIMUM DIFFERENCE     COMPLOT
IS LESS THAN THAT SPECIFIED BY INPUT NO PLOT WILL BE PRODUCED         COMPLOT
AND THE CODE WILL PROCEED TO THE NEXT PLOT REQUESTED BY               COMPLOT
NON-INTERACTIVE INPUT.                                                COMPLOT
                                                                      COMPLOT
YOU CAN REPLACE SUBROUTINE ACTION FOLLOWING THE ABOVE CONVENTIONS     COMPLOT
TO ALLOW INTERACTION VIA DIRECT READ OF X LIMITS, LIGHTPEN OR         COMPLOT
WHATEVER FACILITIES YOU HAVE AVAILABLE.                               COMPLOT
```

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                                                                    COMPLOT
INTERFACING                                                         COMPLOT
-------------------------------------------------------------------COMPLOT
IN ORDER TO INTERFACE THIS PROGRAM FOR USE ON ANY PLOTTER WHICH     COMPLOT
DOES NOT USE THE ABOVE CONVENTIONS IT IS MERELY NECESSARY FOR THE   COMPLOT
THE USER TO WRITE 5 SUBROUTINES DESCRIBED ABOVE AND TO THEN CALL    COMPLOT
THE LOCAL EQUIVALENT ROUTINES.                                      COMPLOT
                                                                    COMPLOT
COLOR PLOTS                                                         COMPLOT
-------------------------------------------------------------------COMPLOT
TO SELECT PLOTTING COLORS SUBROUTINE PEN (DESCRIBED ABOVE) IS USEDCOMPLOT
TO SELECT ONE OF THE AVAILABLE COLORS. WHEN RUNNING ON A MAINFRAMECOMPLOT
USING AN IBM GRAPHICS TERMINAL OR ON AN IBM-PC USING A HEWLETT-     COMPLOT
PACKARD PLOTTER THE GRAPHICS INTERFACE (DESCRIBED ABOVE) WILL       COMPLOT
PRODUCE COLOR PLOTS.                                                COMPLOT
                                                                    COMPLOT
BLACK AND WHITE PLOTS                                               COMPLOT
-------------------------------------------------------------------COMPLOT
WHEN PRODUCING BLACK AND WHITE HARDCOPY ON A MAINFRAME THE USER     COMPLOT
SHOULD ADD A DUMMY SUBROUTINE PEN TO THE END OF THE PROGRAM TO      COMPLOT
IGNORE ATTEMPTS TO CHANGE COLOR. ADD THE FOLLOWING SUBROUTINE,      COMPLOT
                                                                    COMPLOT
SUBROUTINE PEN(IPEN)                                                COMPLOT
RETURN                                                              COMPLOT
END                                                                 COMPLOT
                                                                    COMPLOT
CHARACTER SET                                                       COMPLOT
-------------------------------------------------------------------COMPLOT
THIS PROGRAM USES COMPUTER AND PLOTTER DEVICE INDEPENDENT SOFTWARECOMPLOT
CHARACTERS. THIS PROGRAM COMES WITH A FILE THAT DEFINES THE PEN     COMPLOT
STROKES REQUIRED TO DRAW ALL CHARACTERS ON AN IBM KEYBOARD (UPPER COMPLOT
AND LOWER CASE CHARACTERS, NUMBERS, ETC.) PLUS AN ALTERNATE SET OFCOMPLOT
ALL UPPER AND LOWER CASE GREEK CHARACTERS AND ADDITIONAL SPECIAL    COMPLOT
SYMBOLS.                                                            COMPLOT
                                                                    COMPLOT
THE SOFTWARE CHARACTER TABLE CONTAINS X AND Y AND PEN POSITIONS TOCOMPLOT
DRAW EACH CHARACTER. IF YOU WISH TO DRAW ANY ADDITIONAL CHARACTERSCOMPLOT
OR TO MODIFY THE FONT OF THE EXISTING CHARACTERS YOU NEED ONLY      COMPLOT
MODIFY THIS TABLE.                                                  COMPLOT
                                                                    COMPLOT
CONTROL CHARACTERS                                                  COMPLOT
-------------------------------------------------------------------COMPLOT
IN THE SOFTWARE CHARACTER TABLE ALL CHARACTERS TO BE PLOTTED WILL   COMPLOT
HAVE PEN POSITION = 2 (DRAW) OR = 3 (MOVE). IN ADDITION THE TABLE   COMPLOT
CURRENTLY CONTAINS 4 CONTROL CHARACTERS,                            COMPLOT
                                                                    COMPLOT
PEN POSITION = 0                                                    COMPLOT
----------------                                                    COMPLOT
SHIFT THE NEXT PRINTED CHARACTER BY X AND Y. 3 CONTROL CHARACTERS   COMPLOT
ARE PRESENTLY INCLUDED IN THE SOFTWARE CHARACTER TABLE TO ALLOW     COMPLOT
SHIFTING.                                                           COMPLOT
                                                                    COMPLOT
{   = SHIFT UP (FOR SUPERSCRIPTS.............X= 0.0, Y= 0.5)       COMPLOT
}   = SHIFT DOWN (FOR SUBSCRIPTS.............X= 0.0, Y=-0.5)       COMPLOT
\   = SHIFT LEFT 1 CHARACTER (FOR BACKSPACE...X=-1.0, Y= 0.0)      COMPLOT
                                                                    COMPLOT
PEN POSITION =-1                                                    COMPLOT
----------------                                                    COMPLOT
SELECT THE NEXT PRINTED CHARACTER FROM THE ALTERNATE CHARACTER      COMPLOT
SET. AT PRESENT THIS CONTROL CHARACTER IS,                          COMPLOT
                                                                    COMPLOT
]   = SWITCH TO ALTERNATE CHARACTER SET                             COMPLOT
                                                                    COMPLOT
THESE 4 CONTROL CHARACTERS ARE ONLY DEFINED BY THE VALUE OF THE     COMPLOT
PEN POSITION IN THE SOFTWARE CHARACTER TABLE (I.E., THEY ARE NOT    COMPLOT
HARD WIRED INTO THIS PROGRAM). AS SUCH BY MODIFYING THE SOFTWARE    COMPLOT
CHARACTER TABLE THE USER HAS THE OPTION OF DEFINING ANY CONTROL     COMPLOT
CHARACTERS TO MEET SPECIFIC NEEDS.                                  COMPLOT
                                                                    COMPLOT
THESE CHARACTERS MAY BE USED IN CHARACTER STRINGS TO PRODUCE        COMPLOT
SPECIAL EFFECTS. FOR EXAMPLE, TO PLOT SUBSCRIPT 5, B, SUPERSCRIPT COMPLOT
```

```
     10 USE THE STRING,                                                    COMPLOT
                                                                           COMPLOT
     }5B{1{0                                                               COMPLOT
                                                                           COMPLOT
     TO PLOT B, SUBSCRIPT 5 AND SUPERSCRIPT 10 WITH THE 5 DIRECTLY         COMPLOT
     BELOW THE 1 OF THE 10 WE CAN USE THE BACKSPACE CHARACTER TO           COMPLOT
     POSITION THE 1 DIRECTLY ABOVE THE 5 USING THE STRING,                 COMPLOT
                                                                           COMPLOT
     B}5\{1{0                                                              COMPLOT
                                                                           COMPLOT
     TO PLOT UPPER CASE GREEK GAMMA FOLLOWED BY THE WORD TOTAL (I.E.,      COMPLOT
     RESONANCE TOTAL WIDTH) USE THE STRING.                                COMPLOT
                                                                           COMPLOT
     ]G TOTAL                                                              COMPLOT
                                                                           COMPLOT
     NOTE, WHEN THESE CONTROL CHARACTERS ARE USED THEY ONLY EFFECT THE     COMPLOT
     NEXT 1 PRINTED CHARACTER (SEE, ABOVE EXAMPLE OF PLOTTING SUPER-       COMPLOT
     SCRIPT 10 WHERE THE SHIFT UP CONTROL CHARACTER WAS USED BEFORE THE    COMPLOT
     1 AND THEN AGAIN BEFORE THE 0 AND THE BACKSPACE AND SHIFT UP          COMPLOT
     CONTROL CHARACTERS WERE USED IN COMBINATION).                         COMPLOT
                                                                           COMPLOT
     IF THESE 4 CONTROL CHARACTERS ARE NOT AVAILABLE ON YOUR COMPUTER      COMPLOT
     YOU CAN MODIFY THE SOFTWARE CHARACTER TABLE TO USE ANY OTHER 4        COMPLOT
     CHARACTERS THAT YOU DO NOT NORMALLY USE IN CHARACTER STRINGS (FOR     COMPLOT
     DETAILS SEE THE SOFTWARE CHARACTER TABLE).                            COMPLOT
                                                                           COMPLOT
     STANDARD/ALTERNATE CHARACTER SETS                                     COMPLOT
     ----------------------------------------------------------------------COMPLOT
     THE SOFTWARE CHARACTER TABLE CONTAINS 2 SETS OF CHARACTERS WHICH      COMPLOT
     ARE A STANDARD SET (ALL CHARACTERS ON AN IBM KEYBOARD) AND AN         COMPLOT
     ALTERNATE SET (UPPER AND LOWER CASE GREEK CHARACTERS AND SPECIAL      COMPLOT
     CHARACTERS). TO DRAW A CHARACTER FROM THE ALTERNATE CHARACTER SET     COMPLOT
     PUT A RIGHT BRACKET CHARACTER (]) BEFORE A CHARACTER (SEE THE         COMPLOT
     ABOVE EXAMPLE AND THE SOFTWARE CHARACTER TABLE FOR DETAILS). THIS     COMPLOT
     CONTROL CHARACTER WILL ONLY EFFECT THE NEXT 1 PLOTTED CHARACTER.      COMPLOT
                                                                           COMPLOT
     SUB AND SUPER SCRIPTS                                                 COMPLOT
     ----------------------------------------------------------------------COMPLOT
     TO DRAW SUBSCRIPT PRECEED A CHARACTER BY }. TO DRAW SUPERSCRIPT       COMPLOT
     PRECEED A CHARACTER BY { (SEE THE ABOVE EXAMPLE AND THE SOFTWARE      COMPLOT
     CHARACTER TABLE FOR DETAILS). THESE CONTROL CHARACTER WILL ONLY       COMPLOT
     EFFECT THE NEXT 1 PLOTTED CHARACTER.                                  COMPLOT
                                                                           COMPLOT
     BACKSPACING                                                           COMPLOT
     ----------------------------------------------------------------------COMPLOT
     TO BACKSPACE ONE CHARACTER PRECEED A CHARACTER BY \ (SEE, THE         COMPLOT
     ABOVE EXAMPLE AND THE SOFTWARE CHARACTER TABLE FOR DETAILS). THIS     COMPLOT
     CONTROL CHARACTER WILL PERFORM A TRUE BACKSPACE AND WILL EFFECT       COMPLOT
     ALL FOLLOWING CHARACTERS IN THE SAME CHARACTER STRING.                COMPLOT
                                                                           COMPLOT
     PLOT DIMENSIONS                                                       COMPLOT
     ---------------                                                       COMPLOT
     ARE DEFINED BY USER INPUT. INTERNALLY THE PROGRAM WILL CREATE A       COMPLOT
     PLOT IN APPROXIMATELY A4 OR 8-1/2 BY 11 INCH FORMAT. DURING           COMPLOT
     OUTPUT THE PLOT IS TRANSFORMED TO THE UNITS (INCHES, CENTIMETERS,     COMPLOT
     MILLIMETERS, WHATEVER) OF THE PLOTTER BEING USED AND OUTPUT.          COMPLOT
                                                                           COMPLOT
===== PLOTTER/GRAPHICS TERMINAL INTERFACE ==============================COMPLOT
=======================================================================COMPLOT
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