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======================================================================= Mixer
                                                                        Mixer
     PROGRAM MIXER                                                      Mixer
                                                                        Mixer
     VERSION 76-1 (NOVEMBER 1976)                                       Mixer
     VERSION 81-1 (APRIL 1981)  *IBM VERSION                            Mixer
     VERSION 82-1 (AUGUST 1982) *COMPUTER INDEPENDENT VERSION           Mixer
     VERSION 84-1 (JUNE 1984)   *SPECIAL I/O ROUTINES TO GUARANTEE      Mixer
                                 ACCURACY OF ENERGY.                    Mixer
                                *DOUBLE PRECISION TREATMENT OF ENERGY   Mixer
                                 (REQUIRED FOR NARROW RESONANCES).      Mixer
     VERSION 86-1 (JANUARY 1986)*FORTRAN-77/H VERSION                   Mixer
     VERSION 88-1 (JULY 1988)   *OPTION...INTERNALLY DEFINE ALL I/O     Mixer
                                 FILE NAMES (SEE, SUBROUTINE FILIO1     Mixer
                                 AND FILIO2 FOR DETAILS).               Mixer
                                *IMPROVED BASED ON USER COMMENTS.       Mixer
     VERSION 89-1 (JANUARY 1989)*PSYCHOANALYZED BY PROGRAM FREUD TO     Mixer
                                 INSURE PROGRAM WILL NOT DO ANYTHING    Mixer
                                 CRAZY.                                 Mixer
                                *UPDATED TO USE NEW PROGRAM CONVERT     Mixer
                                 KEYWORDS.                              Mixer
                                *ADDED LIVERMORE CIVIC COMPILER         Mixer
                                 CONVENTIONS.                           Mixer
     VERSION 92-1 (JANUARY 1992)*UPDATED BASED ON USER COMMENTS         Mixer
                                *ADDED PHOTON CROSS SECTIONS            Mixer
                                *ADDED FORTRAN SAVE OPTION              Mixer
                                *OUTPUT IN ENDF/B-VI FORMAT             Mixer
                                *COMPLETELY CONSISTENT I/O ROUTINES -   Mixer
                                 TO MINIMIZE COMPUTER DEPENDENCE.       Mixer
                                *NOTE, CHANGE IN INPUT PARAMETER        Mixer
                                 FORMAT.                                Mixer
     VERSION 94-1 (JANUARY 1994)*VARIABLE ENDF/B DATA FILENAMES         Mixer
                                 TO ALLOW ACCESS TO FILE STRUCTURES     Mixer
                                 (WARNING - INPUT PARAMETER FORMAT      Mixer
                                 HAS BEEN CHANGED)                      Mixer
                                *CLOSE ALL FILES BEFORE TERMINATING     Mixer
                                 (SEE, SUBROUTINE ENDIT)                Mixer
                                *INCREASED INCORE PAGE SIZE FROM        Mixer
                                 1002 TO 4008.                          Mixer
     VERSION 96-1 (JANUARY 1996) *COMPLETE RE-WRITE                     Mixer
                                 *IMPROVED COMPUTER INDEPENDENCE        Mixer
                                 *ALL DOUBLE PRECISION                  Mixer
                                 *ON SCREEN OUTPUT                      Mixer
                                 *UNIFORM TREATMENT OF ENDF/B I/O       Mixer
                                 *IMPROVED OUTPUT PRECISION             Mixer
                                 *DEFINED SCRATCH FILE NAMES            Mixer
                                 *INCREASED INCORE PAGE SIZE FROM       Mixer
                                  4008 TO 12000.                        Mixer
     VERSION 99-1 (MARCH 1999)   *CORRECTED CHARACTER TO FLOATING       Mixer
                                  POINT READ FOR MORE DIGITS            Mixer
                                 *UPDATED TEST FOR ENDF/B FORMAT        Mixer
                                  VERSION BASED ON RECENT FORMAT CHANGE Mixer
                                 *GENERAL IMPROVEMENTS BASED ON         Mixer
                                  USER FEEDBACK                         Mixer
     VERSION 99-2 (JUNE 1999)    *ASSUME ENDF/B-VI, NOT V, IF MISSING   Mixer
                                  MF=1, MT-451.                         Mixer
     VERS. 2000-1 (FEBRUARY 2000)*GENERAL IMPROVEMENTS BASED ON         Mixer
                                  USER FEEDBACK                         Mixer
     VERS. 2002-1 (MAY 2002)     *OPTIONAL INPUT PARAMETERS             Mixer
     VERS. 2004-1 (MARCH 2004)   *ADDED INCLUDE FOR COMMON              Mixer
                                 *INCREASED INCORE PAGE SIZE FROM       Mixer
                                  12000 TO 60000.                       Mixer
                                                                        Mixer
     OWNED, MAINTAINED AND DISTRIBUTED BY                               Mixer
     ------------------------------------                               Mixer
     THE NUCLEAR DATA SECTION                                           Mixer
     INTERNATIONAL ATOMIC ENERGY AGENCY                                 Mixer
     P.O. BOX 100                                                       Mixer
     A-1400, VIENNA, AUSTRIA                                            Mixer
     EUROPE                                                             Mixer
                                                                        Mixer
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ORIGINALLY WRITTEN BY                                                  Mixer
-----------------------------------                                    Mixer
DERMOTT E. CULLEN                                                      Mixer
UNIVERSITY OF CALIFORNIA                                               Mixer
LAWRENCE LIVERMORE NATIONAL LABORATORY                                 Mixer
L-159                                                                  Mixer
P.O. BOX 808                                                           Mixer
LIVERMORE, CA 94550                                                    Mixer
U.S.A.                                                                 Mixer
TELEPHONE  925-423-7359                                                Mixer
E. MAIL    CULLEN1@LLNL.GOV                                            Mixer
WEBSITE    HTTP://WWW.LLNL.GOV/CULLEN1                                 Mixer
                                                                       Mixer
PURPOSE                                                                Mixer
-------                                                                Mixer
THIS PROGRAM IS DESIGNED TO CALCULATE THE ENERGY DEPENDENT CROSS       Mixer
SECTION FOR A COMPOSITE MIXTURE OF UP TO 10 DIFFERENT MATERIALS.       Mixer
                                                                       Mixer
THE PRESENT VERSION WILL ONLY CALCULATE THE CROSS SECTION FOR ONE      Mixer
FINAL REACTION (ENDF/B SECTION), E.G. TOTAL CROSS SECTION, BUT NOT     Mixer
ANY OTHER REACTION.                                                    Mixer
                                                                       Mixer
NOTE, THIS PROGRAM WILL NOT COMBINE ALL REACTIONS FOR A MIXTURE        Mixer
OF MATERIALS DURING A SINGLE RUN - ONLY ONE REACTION WILL BE           Mixer
CREATED PER RUN.                                                       Mixer
                                                                       Mixer
EVALUATED DATA FORMAT                                                  Mixer
---------------------                                                  Mixer
THE CROSS SECTIONS ARE READ FROM THE ENDF/B FORMAT AND THE             Mixer
COMPOSITE CROSS SECTION IS CONVERTED TO AN EQUIVALENT BARNS/ATOM       Mixer
FORM AND OUTPUT IN THE ENDF/B FORMAT WITH AN EQUIVALENT ATOMIC         Mixer
WEIGHT. THE USER MUST SPECIFY THE COMPOSITION BY GIVING THE ZA,        Mixer
MT AND GRAMS/CC OF EACH CONSTITUENT. IN ADDITION THE USER MUST         Mixer
IDENTIFY THE COMPOSITE CROSS SECTION BY SPECIFYING THE ZA, MAT         Mixer
AND MT TO BE USED IN THE ENDF/B FORMATTED OUTPUT.                      Mixer
                                                                       Mixer
SINCE ONLY THE CROSS SECTIONS IN FILE 3 AND 23 ARE USED, AND THE       Mixer
FORMAT FOR FILE 3/23 IS THE SAME IN ALL VERSIONS ON ENDF/B, THIS       Mixer
PROGRAM MAY BE USED WITH ANY VERSION OF ENDF/B DATA (I.E.,             Mixer
ENDF/B-I, II, III, IV, V OR VI). DURING A SINGLE RUN IT MAY EVEN       Mixer
BE USED TO READ AND COMBINE EVALUATIONS WHICH ARE IN DIFFERENT         Mixer
VERSIONS OF THE ENDF/B FORMAT.                                         Mixer
                                                                       Mixer
ENDF/B FORMATTED OUTPUT WILL BE IN THE ENDF/B-VI FORMAT REGARDLESS     Mixer
OF THE FORMAT OF THE INPUT ENDF/B DATA. THIS WILL ONLY EFFECT THE      Mixer
HOLLERITH SECTION (MF=1, MT=451). THE FORMAT OF CROSS SECTIONS         Mixer
(MF=3) IS THE SAME IN ALL VERSION OF THE ENDF/B FORMAT.                Mixer
                                                                       Mixer
IN ORDER TO GUARANTEE PROPER OPERATION OF THIS PROGRAM THE DATA        Mixer
MUST BE PROPERLY CODED IN THE ENDF/B FORMAT. NO ERROR CHECKING IS      Mixer
PERFORMED. IT IS PARTICULARLY IMPORTANT THAT THE FOLLOWING DATA        Mixer
BE CORRECT                                                             Mixer
                                                                       Mixer
(1) ZA, MF, MT - MUST BE CORRECT IN ORDER TO ALLOW PROGRAM TO          Mixer
    SELECT THE APPROPRIATE SECTIONS TO BE COMBINED.                    Mixer
(2) AWRE - ATOMIC WEIGHT RATIO MUST BE CORRECT TO ALLOW PROGRAM        Mixer
    TO CONVERT THE USER SPECIFIED GRAMS/CC INTO ATOMS/CC FOR           Mixer
    PROPER ATOM RATIO MIXING.                                          Mixer
(3) (ENERGIES, CROSS SECTIONS) - MUST BE CORRECT, LINEARLY             Mixer
                                                  ========             Mixer
    INTERPOLABLE, IN ASCENDING ENERGY ORDER OF (E, BARNS).             Mixer
    ============                                                       Mixer
                                                                       Mixer
    TO CONVERT ENDF/B FORMATTED DATA TO THE REQUIRED INPUT FORM        Mixer
    THE FOLLOWING PROGRAMS MAY BE USED,                                Mixer
    LINEAR - CONVERT TABULATED CROSS SECTIONS TO LINEARLY              Mixer
             INTERPOLABLE FORM.                                        Mixer
    RECENT - RECONSTRUCT RESONANCE CONTRIBUTION, ADD TO BACKGROUND     Mixer
             CROSS SECTION AND OUTPUT THE COMBINATION IN LINEARLY      Mixer
             INTERPOLABLE FORM.                                        Mixer
    SIGMA1 - DOPPLER BROADEN CROSS SECTIONS TO ANY TEMPERATURE AND     Mixer
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            OUTPUT THE RESULT IN LINEARLY INTERPOLABLE FORM.      Mixer
                                                                  Mixer
DOCUMENTATION                                                     Mixer
------------                                                      Mixer
THE FACT THAT THIS PROGRAM HAS COMBINED THE DATA IS DOCUMENTED    Mixer
IN THE OUTPUT ENDF/B FORMAT IN THE HOLLERITH SECTION BY FIRST     Mixer
IDENTIFYING THE VERSION OF THIS PROGRAM THAT WAS USED, IN THE FORM Mixer
                                                                  Mixer
********************( PROGRAM MIXER 2004-1) ********************** Mixer
                                                                  Mixer
THIS IS FOLLOWED BY THE TWO LINE IDENTIFICATION INPUT BY THE USER. Mixer
THIS IS FOLLOWED BY COMPOSITION INPUT BY THE USER.                Mixer
                                                                  Mixer
NEUTRON OR PHOTON DATA                                            Mixer
----------------------                                            Mixer
THIS PROGRAM WILL ALLOW YOU TO PROCESS EITHER NEUTRON OR PHOTON   Mixer
CROSS SECTIONS - BUT YOU CANNOT MIX THE TWO TYPES TOGETHER. BY    Mixer
INPUT YOU CAN SPECIFY THE OUTPUT MF = 3 (NEUTRONS) OR 23 (PHOTONS) Mixer
WHATEVER TYPE YOU SPECIFIED FOR OUTPUT IS THE ONLY TYPE OF DATA   Mixer
WHICH WILL BE PROCESSED BY THIS PROGRAM.                          Mixer
                                                                  Mixer
DEFINING THE COMPOSITION                                          Mixer
------------------------                                          Mixer
THE USER MAY SPECIFY UP TO 10 DIFFERENT SECTIONS OF DATA TO BE    Mixer
COMBINED, EACH SECTION IDENTIFIED BY ZA AND MT NUMBER. THE        Mixer
AMOUNT OF EACH MATERIAL IS SPECIFIED BY DEFINING THE NUMBER OF    Mixer
GRAMS/CC OF EACH MATERIAL IN THE COMPOSITE MIXTURE. THIS CAN BE   Mixer
DERIVED FROM THE VOLUME FRACTION SIMPLY BY MULTIPLYING THE STP    Mixer
DENSITY OF EACH MATERIAL BY ITS VOLUME FRACTION. NOTE, DO NOT     Mixer
INPUT ATOM FRACTIONS.                                             Mixer
                                                                  Mixer
THE LIST OF SECTIONS TO BE COMBINED MAY BE SPECIFIED IN ANY       Mixer
ORDER, I.E. THEY NEED NOT BE IN ZA ORDER OR THE ORDER THAT THE    Mixer
EVALUATED DATA APPEARS ON THE ENDF/B FORMATTED TAPE.              Mixer
                                                                  Mixer
IF ANY REQUESTED SECTION OF DATA IS NOT FOUND ON THE ORIGINAL     Mixer
ENDF/B FORMATTED FILE, THE PROGRAM WILL PRINT A LIST OF THE       Mixer
MISSING SECTIONS AND TERMINATE. IF ALL REQUESTED SECTIONS ARE     Mixer
FOUND THE PROGRAM WILL PRODUCE A COMPOSITE SECTION USING THE      Mixer
UNION OF ALL ENERGIES FOUND IN ANY SECTION. THE COMPOSITE SECTION Mixer
WILL NOT BE THINNED.                                              Mixer
                                                                  Mixer
PRIOR TO LATER USE IN ANY APPLICATION THE NUMBER OF ENERGY POINTS Mixer
IN THE COMPOSITE CROSS SECTION MAY BE MINIMIZED BY USING PROGRAM  Mixer
LINEAR, UCRL-50400, VOL. 17, PART B TO THIN THE DATA.             Mixer
                                                                  Mixer
ONLY LINEARLY INTERPOLABLE DATA                                   Mixer
-------------------------------                                   Mixer
THE CROSS SECTIONS TO BE COMBINED MUST BE IN LINEARLY INTERPOLABLE Mixer
TABULATED FORM (I. E., FILE 3 OR 23, INTERPOLATION LAW 2).        Mixer
                                                                  Mixer
TO CONVERT TABULATED CROSS SECTIONS TO LINEARLY INTERPOLABLE FORM  Mixer
SEE, PROGRAM LINEAR, UCRL-50400, VOL. 17, PART A.                 Mixer
                                                                  Mixer
TO CONVERT RESONANCE PARAMETERS TO LINEARLY INTERPOLABLE FORM SEE, Mixer
PROGRAM RECENT, UCRL-50400, VOL. 17, PART C.                      Mixer
                                                                  Mixer
TO DOPPLER BROADEN LINEARLY INTERPOLABLE DATA TO ANY TEMPERATURE   Mixer
SEE PROGRAM SIGMA1, UCRL-50400, VOL. 17, PART B.                  Mixer
                                                                  Mixer
PAGING SYSTEM                                                     Mixer
-------------                                                     Mixer
THERE IS NO LIMIT TO THE THE NUMBER OF DATA POINTS IN EACH OF THE  Mixer
SECTIONS TO BE COMBINED, NOR IS THERE A LIMIT TO THE NUMBER OF     Mixer
DATA POINTS IN THE COMPOSITE MIXTURE CROSS SECTION.               Mixer
                                                                  Mixer
ALL REQUIRED SECTIONS OF DATA ARE READ FROM THE ORIGINAL ENDF/B    Mixer
FORMATTED FILE. ANY SECTION OF 60000 OR FEWER POINTS WILL BE       Mixer
TOTALLY CORE RESIDENT. LARGER SECTIONS ARE LOADED INTO A PAGING    Mixer
SYSTEM USING A SCRATCH FILE WITH ONLY 60000 POINTS PER SECTION     Mixer
CORE RESIDENT AT ANY ONE TIME. SIMILARLY THE COMPOSITE SECTION     Mixer
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WILL BE TOTALLY CORE RESIDENT IF IT CONTAINS 60000 OR FEWER POINTS Mixer
AND LARGER COMPOSITE SECTIONS WILL BE LOADED INTO A PAGING         Mixer
SYSTEM WHERE ONLY 60000 POINTS ARE CORE RESIDENT AT ANY TIME. SINC Mixer
A PAGING SYSTEM MAY BE USED BY ANY SECTION OF DATA THERE IS NO     Mixer
LIMIT TO THE SIZE OF EITHER THE ORIGINAL SECTIONS, NOR TO THE      Mixer
COMPOSITE SECTION, E.G. A SECTION MAY CONTAIN 100,000 ENERGIES     Mixer
AND CROSS SECTIONS TO DESCRIBE A GIVEN REACTION.                   Mixer
                                                                   Mixer
PAGE SIZE                                                          Mixer
---------                                                          Mixer
THE PAGE SIZE USED IN THIS PROGRAM IS DEFINED BY THE PARAMETER     Mixer
NPAGE AND THE DIMENSIONS OF THE ARRAYS XTAB AND YTAB. IN ORDER     Mixer
TO ADAPT THIS PROGRAM FOR USE ON ANY COMPUTER THE PAGE SIZE MAY    Mixer
BE INCREASED OR DECREASED BUT THE FOLLOWING RULES MUST BE FOLLOWED Mixer
                                                  ====             Mixer
                                                                   Mixer
(1) NPAGE - MUST BE A MULTIPLE OF 3 IN ORDER TO ALLOW THE PROGRAM  Mixer
    TO READ FULL CARDS OF ENDF/B DATA (3 POINTS PER LINE). FAILURE Mixer
    TO FOLLOW THIS RULE CAN LEAD TO LOSS OF DATA AND/OR PROGRAM    Mixer
    ERRORS DURING EXECUTION.                                       Mixer
(3) YTAB  - THE DIMENSION OF YTAB MUST BE (NPAGE,11).              Mixer
(4) XTAB  - THE DIMENSION OF XTAB MUST BE (NPAGE,11).              Mixer
                                                                   Mixer
DOPPLER BROADENING                                                 Mixer
------------------                                                 Mixer
THE COMPOSITE CROSS SECTION OUTPUT FROM THIS PROGRAM SHOULD NOT    Mixer
BE DOPPLER BROADENED USING PROGRAM SIGMA1, OR THE EQUIVALENT. THE  Mixer
ATOMIC WEIGHT USED TO IDENTIFY THE COMPOSITE MIXTURE IS BASED ON   Mixer
THE ATOM FRACTION OF EACH CONSTITUENT AND CANNOT BE USED TO        Mixer
CHARACTERIZE THE BROADENING OF ANY GIVEN RESONANCE IN THE MIXTURE  Mixer
DUE TO THE CONTRIBUTION OF ONE CONSTITUENT. IN ORDER TO CONSIDER   Mixer
DOPPLER BROADENING FIRST USE PROGRAM SIGMA1 TO BROADEN THE CROSS   Mixer
SECTION FOR EACH OF THE CONSTITUENTS AND THEN COMBINE THE          Mixer
BROADENED DATA USING PROGRAM MIXER.                                Mixer
                                                                   Mixer
EXAMPLE USE                                                        Mixer
-----------                                                        Mixer
THE OUTPUT FROM THIS PROGRAM HAS BEEN FOUND TO BE EXTREMELY        Mixer
USEFUL IN THE FOLLOWING APPLICATIONS...                            Mixer
                                                                   Mixer
(1) CALCULATE A COMPOSITE TOTAL CROSS SECTON FOR LATER USE AS      Mixer
    A WEIGHTING FUNCTION IN SELF-SHIELDING THE CROSS SECTIONS      Mixer
    OF EACH CONSTITUENT OF THE MIXTURE SEPARATELY.                 Mixer
                                                                   Mixer
    PROGRAM GROUPIE CAN USE THE CALCULATED COMPOSITE TOTAL CROSS   Mixer
    SECTION AS THE TOTAL CROSS SECTION FOR EACH CONSTITUENT OF     Mixer
    THE MIXTURE IN ORDER TO CALCULATE  SELF-SHIELDED CROSS SECTION Mixer
    FOR EACH CONSTITUENT OF THE MIXTURE.                           Mixer
                                                                   Mixer
(2) CALCULATE COMPOSITE TOTAL AND FISSION CROSS SECTIONS IN        Mixer
    ORDER TO CALCULATE THE TRANSMISSION AND SELF-INDICATION        Mixer
    THROUGH COMPOSITE MATERIALS. GENERALLY IN THIS CASE THE        Mixer
    TOTAL CROSS SECTION WILL BE CALCULATED FOR THE COMPOSITION     Mixer
    OF THE SAMPLE AND THE FISSION CROSS SECTION WILL BE            Mixer
    CALCULATED FOR THE COMPOSITION OF THE FISSION CHAMBER          Mixer
    (WHICH GENERALLY WILL HAVE A DIFFERENT COMPOSITION THAN THE    Mixer
    SAMPLE).                                                       Mixer
                                                                   Mixer
    PROGRAM VIRGIN CAN USE THE OUTPUT FROM THIS PROGRAM TO         Mixer
    PERFORM TRANSMISSION AND SELF-INDICATION CALCULATIONS.         Mixer
    PROGRAM VIRGIN WILL ANALYTICALLY CALCULATE THE UNCOLLIDED      Mixer
    (I.E. VIRGIN) FLUX TRANSMITTED AND REACTION RATE DUE TO ANY    Mixer
    TABULATED LINEARLY INTERPOLABLE INCIDENT SPECTRUM. RESULTS     Mixer
    WILL BE PRESENTLY FOR UP TO 10 DIFFERENT SAMPLE THICKNESSES    Mixer
    AND BINNED INTO ENERGY GROUPS IN ORDER TO SIMULATE AN          Mixer
    EXPERIMENTAL MEASUREMENT.                                      Mixer
                                                                   Mixer
(3) THE OUTPUT FROM THIS PROGRAM IS VERY USEFUL TO PLOT IN ORDER   Mixer
    TO SEE THE IMPORTANCE OF SPECIFIC CROSS SECTION FEATURES IN    Mixer
    THE COMPOSITE CROSS SECTION.                                   Mixer
                                                                   Mixer
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    PROGRAM COMPLOT CAN BE USED TO PLOT THE OUTPUT FROM THIS       Mixer
    PROGRAM AND IF REQUIRED EXAMINE ANY PARTICULAR ENERGY RANGE    Mixer
    IN DETAIL. IN ORDER TO DO THIS THE (ZA, MT) EQUIVALENCE OPTION Mixer
    OF PROGRAM COMPLOT SHOULD BE USED. TO COMPARE ANY CONSTITUENT  Mixer
    CROSS SECTION TO THE COMPOSITE CROSS SECTION THE INPUT TO      Mixer
    COMPLOT SHOULD EQUATE THE (ZA,MT) OF THE COMPOSITE TO THE      Mixer
    (ZA,MT) OF ONE CONSTITUENT AND THE MULTIPLIER INPUT TO         Mixer
    COMPLOT SHOULD BE THE ATOM FRACTION FOR THE CONSTITUENT (THE   Mixer
    ATOM FRACTIONS ARE DEFINED IN THE OUTPUT LISTING FROM PROGRAM  Mixer
    MIXER).                                                        Mixer
                                                                   Mixer
 INPUT FILES                                                       Mixer
 -----------                                                       Mixer
 UNIT  DESCRIPTION                                                 Mixer
 ----  -----------                                                 Mixer
   2   INPUT CARDS (BCD - 80 CHARACTERS/RECORD)                    Mixer
  10   ORIGINAL EVALUATED DATA IN ENDF/B FORMAT                    Mixer
                  (BCD - 80 CHARACTERS/RECORD)                     Mixer
                                                                   Mixer
 OUTPUT FILES                                                      Mixer
 ------------                                                      Mixer
 UNIT  DESCRIPTION                                                 Mixer
 ----  -----------                                                 Mixer
   3   OUTPUT LISTING (BCD - 120 CHARACTERS/RECORD)                Mixer
  11   COMPOSITE EVALUATED DATA IN ENDF/B FORMAT                   Mixer
               (BCD - 80 CHARACTERS/RECORD)                        Mixer
                                                                   Mixer
 SCRATCH FILES                                                     Mixer
 -------------                                                     Mixer
 UNIT  DESCRIPTION                                                 Mixer
 ----  -----------                                                 Mixer
  12   SCRATCH FILE FOR EACH OF THE 10 SECTIONS WHICH              Mixer
  13   WILL BE ADDED TOGETHER TO DEFINE THE FINAL                  Mixer
   .   SECTION (BINARY - 60000 AND 480000 WORDS/RECORD)           Mixer
   . .                                                           Mixer
   . .                                                           Mixer
  20 .                                                           Mixer
  21 .                                                           Mixer
  22   SCRATCH FILE FOR COMBINED SECTION.                          Mixer
       (BINARY - 2004 WORDS/RECORD)                                Mixer
                                                                   Mixer
 STANDARD FILE NAMES (SEE SUBROUTINES FILIO1 AND FILIO2)           Mixer
 ---------------------------------------------------------------   Mixer
 UNIT  FILE NAME                                                   Mixer
 ----  ----------                                                  Mixer
   2   MIXER.INP                                                   Mixer
   3   MIXER.LST                                                   Mixer
  10   ENDFB.IN                                                    Mixer
  11   ENDFB.OUT                                                   Mixer
12-22  (SCRATCH)                                                   Mixer
                                                                   Mixer
 INPUT CARDS                                                       Mixer
 -----------                                                       Mixer
 LINE  COLS.  FORMAT  NAME    DESCRIPTION                          Mixer
 ----  -----  ------  ------- ----------                           Mixer
  1-2   1-66 16A4,A2  TITLE   TWO LINE TITLE DESCRIBING PROBLEM    Mixer
                              (THIS TITLE IS USED TO IDENTIFY THE  Mixer
                              OUTPUT LISTING AND IS ALSO WRITTEN   Mixer
                              IN MF=1, MT=451 (HOLLERITH SECTION)  Mixer
                              OF THE ENDF/B FORMATTED OUTPUT TO    Mixer
                              IDENTIFY THE COMPOSITE MIXTURE).     Mixer
    3   1-60                  ENDF/B INPUT DATA FILENAME           Mixer
                              (STANDARD OPTION = ENDFB.IN)         Mixer
    4   1-60                  ENDF/B OUTPUT DATA FILENAME          Mixer
                              (STANDARD OPTION = ENDFB.OUT)        Mixer
    5   1-11    I11   IZAOUT  ZA IDENTIFICATION FOR COMBINATION    Mixer
    5  12-17    I6    MATOUT  MAT IDENTIFICATION FOR COMBINATION   Mixer
    5  18-19    I2    MFOUT   MF IDENTIFICATION FOR COMBINATION    Mixer
    5  20-22    I3    MTOUT   MT IDENTIFICATION FOR COMBINATION    Mixer
  6-N   1-11    I11   IZAGET  ZA (1000*Z+A) OF MATERIAL            Mixer
  6-N  12-22    I11   MTGET   MT OF REACTION                       Mixer
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 6-N  23-33  E11.4   DENSE   DENSITY OF MATERIAL (GRAMS/CC)        Mixer
                                                                  Mixer
THE SIXTH LINE IS REPEATED FOR EACH SECTION (FROM 2 TO 10).       Mixer
SINCE THE ENDF/B FORMATTED OUTPUT IS IN BARNS/ATOM FORM A MINIMUM  Mixer
OF TWO SECTIONS MUST BE COMBINED (I.E., IF ONLY ONE SECTION IS    Mixer
SPECIFIED THE OUTPUT WOULD BE IDENTICAL TO THE INPUT AND AS SUCH  Mixer
THE PROGRAM WILL CONSIDER THIS TO BE AN ERROR AND NOT PERFORM THE  Mixer
CALCULATION). THE LIST OF SECTIONS IS TERMINATED BY A BLANK LINE.  Mixer
                                                                  Mixer
THE LIST OF SECTIONS TO BE COMBINED MAY BE SPECIFIED IN ANY       Mixer
ORDER, I.E. THEY NEED NOT BE IN ZA ORDER OR THE ORDER THAT THE    Mixer
EVALUATED DATA APPEARS ON THE ENDF/B FORMATTED TAPE.              Mixer
                                                                  Mixer
EXAMPLE INPUT NO. 1                                               Mixer
------------------                                                Mixer
CREATE THE TOTAL CROSS SECTION (MT=1) FOR STAINLESS STEEL AND     Mixer
IDENTIFY THE COMBINED MATERIAL WITH ZA=26800 AND MAT=4000,        Mixer
THE COMPOSITION BY VOLUME OF THE STEEL WILL BE...                 Mixer
                                                                  Mixer
THE DATA FROM \ENDFB6\K300\LIBRARY.DAT AND WRITE DATA TO          Mixer
\MIXER\STEEL.DAT                                                  Mixer
                                                                  Mixer
IRON      - 74.8 PER-CENT                                         Mixer
CHROMIUM  - 16.0                                                  Mixer
NICKEL    -  6.0                                                  Mixer
MANGANESE -  2.0                                                  Mixer
SILICON   -  1.0                                                  Mixer
CARBON    -  0.2                                                  Mixer
                                                                  Mixer
THE INPUT MUST SPECIFY THE COMPOSITION BY GRAMS/CC. THIS IS       Mixer
DEFINED AS THE PRODUCT OF THE STANDARD DENSITY (GRAMS/CC)         Mixer
TIMES THE VOLUME FRACTION. NOTE, DO NOT USE ATOM FRACTIONS.       Mixer
FOR THIS EXAMPLE THE FOLLOWING 12 INPUT CARDS ARE REQUIRED....    Mixer
                                                                  Mixer
STAINLESS STEEL. COMPOSITION BY PER-CENT VOLUME IS 74.8-IRON,     Mixer
16-CHROME, 6-NICKEL, 2-MANGANESE, 1-SILICON, 0.2-CARBON           Mixer
\ENDFB6\K300\LIBRARY.DAT                                          Mixer
\MIXER\STEEL.DAT                                                  Mixer
     26800  4000 3  1                                            Mixer
     26000          1 5.88676    (NOTE, GRAMS/CC INPUT FOR EACH   Mixer
     24000          1 1.150448    CONSTITUENT, E.G. FOR IRON THE  Mixer
     28000          1 0.533928    STP DENSITY IS 7.87 GRAMS/CC.   Mixer
     25055          1 0.1486      THE INPUT VALUE OF 5.88676 IS   Mixer
     14000          1 0.0233      0.748 X 7.87,I.E.  VOLUME       Mixer
      6012          1 0.0044958   FRACTION TIMES STP DENSITY).    Mixer
                                (BLANK LINE TERMINATES INPUT LIST) Mixer
                                                                  Mixer
EXAMPLE INPUT NO. 2                                               Mixer
------------------                                                Mixer
THE SAME EXAMPLE AS THE ABOVE PROBLEM, ONLY USE THE STANDARD      Mixer
ENDF/B DATA FILENAMES - ENDFB.IN AND ENDFB.OUT (THIS CAN BE       Mixer
DONE BY LEAVING THE THIRD AND FOURTH INPUT LINES BLANK).          Mixer
FOR THIS EXAMPLE THE FOLLOWING 12 INPUT CARDS ARE REQUIRED....    Mixer
                                                                  Mixer
STAINLESS STEEL. COMPOSITION BY PER-CENT VOLUME IS 74.8-IRON,     Mixer
16-CHROME, 6-NICKEL, 2-MANGANESE, 1-SILICON, 0.2-CARBON           Mixer
(NOTE - THIS LINE IS REALLY BLANK)                                Mixer
(NOTE - THIS LINE IS REALLY BLANK)                                Mixer
     26800  4000 3  1                                            Mixer
     26000          1 5.88676    (NOTE, GRAMS/CC INPUT FOR EACH   Mixer
     24000          1 1.150448    CONSTITUENT, E.G. FOR IRON THE  Mixer
     28000          1 0.533928    STP DENSITY IS 7.87 GRAMS/CC.   Mixer
     25055          1 0.1486      THE INPUT VALUE OF 5.88676 IS   Mixer
     14000          1 0.0233      0.748 X 7.87,I.E.  VOLUME       Mixer
      6012          1 0.0044958   FRACTION TIMES STP DENSITY).    Mixer
                                (BLANK LINE TERMINATES INPUT LIST) Mixer
                                                                  Mixer
================================================================== Mixer
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