======================================================================= Fixup

Fixup

PROGRAM FIXUP Fixup

============= Fixup

VERSION 84-1 (NOVEMBER 1984) Fixup

VERSION 86-1 (JANUARY 1986) \*IMPROVED BASED ON USER COMMENTS Fixup

\*FORTRAN-77/H VERSION Fixup

VERSION 86-2 (JUNE 1986) \*ALLOW CREATION OF SECTIONS OF CROSS Fixup

SECTIONS WHICH ARE NOT PRESENT IN Fixup

THE ORIGINAL EVALUATION Fixup

VERSION 88-1 (JULY 1988) \*OPTION...INTERNALLY DEFINE ALL I/O Fixup

FILE NAMES (SEE, SUBROUTINE FILEIO Fixup

FOR DETAILS). Fixup

\*IMPROVED BASED ON USER COMMENTS. Fixup

VERSION 89-1 (JANUARY 1989) \*PSYCHOANALYZED BY PROGRAM FREUD TO Fixup

INSURE PROGRAM WILL NOT DO ANYTHING Fixup

CRAZY. Fixup

\*UPDATED TO USE NEW PROGRAM CONVERT Fixup

KEYWORDS. Fixup

\*ADDED LIVERMORE CIVIC COMPILER Fixup

CONVENTIONS. Fixup

VERSION 89-2 (MARCH 1989) \*ADDED ENDF-6 SUMMATION RULES AND Fixup

DEFINED MF AND MT NUMBERS. PROGRAM Fixup

WILL NOW USE MF=1, MT=451 TO DEFINE Fixup

THE ENDF FORMAT OF THE DATA (E.G., Fixup

ENDF-6 OR EARLIER) AND USE THE Fixup

CORRECT SUMMATION RULES FOR EACH Fixup

VERSION OF THE ENDF FORMAT. IF Fixup

MF=1, MT=451 IS NOT PRESENT PROGRAM Fixup

WILL USE ENDF-6 SUMMATION Fixup

CONVENTIONS AS A DEFAULT. Fixup

VERSION 90-1 (JUNE 1990) \*UPDATED BASED ON USER COMMENTS Fixup

\*ADDED PHOTON INTERACTION, MF=23 Fixup

VERSION 91-1 (JUNE 1991) \*ADDED FORTRAN SAVE OPTION Fixup

\*NEW MORE CONSISTENT ENERGY OUTPUT Fixup

ROUTINE Fixup

VERSION 92-1 (JANUARY 1992) \*ADDED OPTION TO CALCULATE RATIOS, Fixup

E.G., CAPTURE/FISSION AND PRODUCTS, Fixup

NU-BAR\*FISSION - AND OUTPUT THE Fixup

RESULTS IN THE ENDF FORMAT (SEE, Fixup

BELOW - CREATING RATIOS AND PRODUCTS) Fixup

\*ALLOW TOTAL NU-BAR (MF=1, MT=452) TO Fixup

BE USED IN DEFINING RATIOS OR Fixup

PRODUCTS. Fixup

\*ALLOW ALL CROSS SECTIONS TO BE PUT Fixup

ON A UNIFORM ENERGY GRID. Fixup

\*NOTE, CHANGE IN INPUT FORMAT FOR Fixup

RANGES OF MT NUMBERS Fixup

\*COMPLETELY CONSISTENT I/O ROUTINES - Fixup

TO MINIMIZE COMPUTER DEPENDENCE. Fixup

VERSION 93-1 (JULY 1993) \*CORRECTED ALGORITHM TO CREATE UNIFORM Fixup

ENERGY GRID. Fixup

VERSION 94-1 (JANUARY 1993) \*VARIABLE ENDF/B DATA FILENAMES Fixup

TO ALLOW ACCESS TO FILE STRUCTURES Fixup

(WARNING - INPUT PARAMETER FORMAT Fixup

HAS BEEN CHANGED) Fixup

\*INCREASED PAGE SIZE FROM 1002 TO Fixup

12000 DATA POINTS. Fixup

\*CLOSE ALL FILES BEFORE TERMINATING Fixup

(SEE, SUBROUTINE ENDIT) Fixup

VERSION 96-1 (JANUARY 1996) \*COMPLETE RE-WRITE Fixup

\*IMPROVED COMPUTER INDEPENDENCE Fixup

\*ALL DOUBLE PRECISION Fixup

\*ON SCREEN OUTPUT Fixup

\*UNIFORM TREATMENT OF ENDF I/O Fixup

\*IMPROVED OUTPUT PRECISION Fixup

\*DEFINED SCRATCH FILE NAMES Fixup

\*INCREASED PAGE SIZE FROM 12000 TO Fixup

36000 DATA POINTS. Fixup

VERSION 99-1 (MARCH 1999) \*CORRECTED CHARACTER TO FLOATING Fixup

POINT READ FOR MORE DIGITS Fixup

\*UPDATED TEST FOR ENDF FORMAT Fixup

VERSION BASED ON RECENT FORMAT CHANGE Fixup

\*GENERAL IMPROVEMENTS BASED ON Fixup

USER FEEDBACK Fixup

VERSION 99-2 (JUNE 1999) \*ASSUME ENDF-6, NOT 5, IF MISSING Fixup

MF=1, MT-451. Fixup

\*FIXED CREATION OF SECTIONS Fixup

VERS. 2000-1 (FEBRUARY 2000)\*GENERAL IMPROVEMENTS BASED ON Fixup

USER FEEDBACK Fixup

VERS. 2002-1 (MAY 2002) \*OPTIONAL INPUT PARAMETERS Fixup

\*SUMMATION RULES ARE DEFINED BASED Fixup

ON CONTENTS OF TABLES. Fixup

VERS. 2004-1 (JAN. 2004) \*GENERAL UPDATE BASED ON USER FEEDBACK Fixup

\*INCREASED PAGE SIZE FROM 36000 TO Fixup

60000 DATA POINTS. Fixup

VERS. 2005-1 (JAN. 2005) \*UPDATED MT CREATION TO ALLOW MAT =0 Fixup

INDICATING CREATE FOR ALL MATS. Fixup

VERS. 2007-1 (JAN. 2007) \*CHECKED AGAINST ALL ENDF/B-VII DATA Fixup

\*INCREASED PAGE SIZE FROM 60,000 TO Fixup

600,000 DATA POINTS. Fixup

VERS. 2007-2 (OCT. 2007) \*ADDED MT=16 AS SUM MT=875 THRU 891 Fixup

\*72 CHARACTER FILE NAMES Fixup

VERS. 2010-1 (Apr. 2010) \*Defining cross sections by summation Fixup

to now mandatory - either build-in Fixup

rules or by user input. Fixup

VERS. 2011-1 (March 2011) \*Added new MT # to allowed and Fixup

summation rules. Fixup

VERS. 2012-1 (Aug. 2012) \*Corrected definition of MT=3 to avoid Fixup

double counting of MT=18. Fixup

\*Extended incident particle list to Fixup

include photon (ZA = 0). Fixup

\*Added CODENAME Fixup

\*32 and 64 bit Compatible Fixup

\*Added ERROR stops. Fixup

VERS. 2015-1 (Jan. 2015) \*Extended OUT9. Fixup

\*Replaced ALL 3 way IF Statements Fixup

Fixup

OWNED, MAINTAINED AND DISTRIBUTED BY Fixup

------------------------------------ Fixup

THE NUCLEAR DATA SECTION Fixup

INTERNATIONAL ATOMIC ENERGY AGENCY Fixup

P.O. BOX 100 Fixup

A-1400, VIENNA, AUSTRIA Fixup

EUROPE Fixup

Fixup

ORIGINALLY WRITTEN BY Fixup

------------------------------------ Fixup

Dermott E. Cullen Fixup

Fixup

PRESENT CONTACT INFORMATION Fixup

--------------------------- Fixup

Dermott E. Cullen Fixup

1466 Hudson Way Fixup

Livermore, CA 94550 Fixup

U.S.A. Fixup

Telephone 925-443-1911 Fixup

E. Mail RedCullen1@Comcast.net Fixup

Website http://home.comcast.net/~redcullen1 Fixup

Fixup

PURPOSE Fixup

======= Fixup

THIS PROGRAM IS DESIGNED TO READ EVALUATED DATA IN THE ENDF Fixup

FORMAT, PERFORM CORRECTIONS AND OUTPUT THE RESULT IN THE ENDF Fixup

FORMAT. TWO TYPES OF CORRECTIONS ARE POSSIBLE (1) AUTOMATIC AND Fixup

(2) OPTIONAL (BASED ON USER INPUT) CORRECTIONS. Fixup

Fixup

ONE OF THE MOST IMPORTANT FUNCTIONS OF THIS PROGRAM IS TO Fixup

RE-DEFINE ALL REDUNDANT CROSS SECTIONS (E.G. TOTAL) TO BE EXACTLY Fixup

EQUAL TO THE SUM OF ITS PARTS. THIS PROCEDURE ELIMINATES THE Fixup

PROBLEM WITH MANY ENDF EVALUATIONS, WHERE DUE TO THE USE OF Fixup

NON-LINEAR INTERPOLATION LAWS THE TOTAL MAY BE EQUAL TO THE SUM Fixup

OF ITS PARTS AT ALL TABULATED ENERGIES, BUT BASED ON THE Fixup

INTERPOLATION LAWS IT CAN BE QUITE DIFFERENT AT ENERGIES BETWEEN Fixup

TABULATED ENERGIES. Fixup

Fixup

AUTOMATIC CHECKS/CORRECTIONS Fixup

============================ Fixup

(1) CHECK THAT MAT/MF/MT DOES NOT CHANGE UNLESS A MEND/FEND/SEND Fixup

LINE IS READ. IF MAT/MF/MT CHANGES A WARNING MESSAGE IS Fixup

PRINTED BUT NO CORRECTIVE ACTION IS TAKEN. Fixup

(2) ALL LINES WITHIN A GIVEN MAT WILL BE SEQUENTIALLY NUMBERED Fixup

ON OUTPUT. Fixup

Fixup

OPTIONAL CHECKS/CORRECTIONS Fixup

=========================== Fixup

THE FOLLOWING NUMBERS CORRESPOND TO THE INPUT DATA OPTION COLUMNS Fixup

(SEE THE DESCRIPTION OF THE INPUT BELOW) Fixup

Fixup

(1) CORRECT ZA AND AWR IN ALL SECTIONS. CHECK TO INSURE THAT THE Fixup

C1 AND C2 VALUES (ZA AND AWR) ARE THE SAME IN ALL SECTIONS. Fixup

THE C1 AND C2 OF THE FIRST SECTION READ ARE ASSUMED TO BE Fixup

CORRECT AND ARE USED FOR COMPARISON. IF THE C1 AND/OR C2 OF Fixup

THE FIRST SECTION ARE NOT POSITIVE AN ERROR MESSAGE IS OUTPUT Fixup

AND THE MATERIAL IS COPIED WITHOUT CHANGE. Fixup

NOTE....TO CHANGE THE ZA AND/OR AWR OF ANY MATERIAL IT IS Fixup

MERELY NECESSARY TO CHANGE THE ZA AND/OR AWR IN THE FIRST Fixup

SECTION OF THE MATERIAL AND USE THIS OPTION TO AUTOMATICALLY Fixup

CHANGE ALL OTHER SECTIONS. Fixup

(2) CORRECT CROSS SECTION (MF=3) THRESHOLDS. THE Q-VALUE AND AWR Fixup

ARE USED TO DERIVE THE REACTION THRESHOLD USING THE RELATION, Fixup

Fixup

E-THRESHOLD = -(Q-VALUE)\*(AWRE+1.0)/AWRE Fixup

Fixup

IF THE THRESHOLD IS POSITIVE THE CROSS SECTION IS CHECKED TO Fixup

INSURE THAT THE FIRST TABULATED POINT IS AT THE THRESHOLD AND Fixup

HAS A ZERO CROSS SECTION. IF NOT, THE CROSS SECTION WILL BE Fixup

CHANGED. Fixup

(A) IF THE FIRST TABULATED POINT IS ABOVE THE THRESHOLD AND Fixup

HAS A ZERO CROSS SECTION, THE POINT IS DELETED AND A POINT Fixup

IS INSERTED AT THE THRESHOLD. Fixup

(B) IF THE FIRST TABULATED POINT IS ABOVE THE THRESHOLD AND Fixup

HAS A NON-ZERO CROSS SECTION, A POINT WITH ZERO CROSS Fixup

SECTION IS INSERTED AT THE THRESHOLD. Fixup

(C) IF THE FIRST TABULATED POINT IS BELOW THE THRESHOLD AND Fixup

HAS A NON-ZERO CROSS SECTION, ALL POINTS BELOW THE Fixup

THRESHOLD ARE DELETED AND A POINT WITH ZERO CROSS SECTION Fixup

IS INSERTED AT THE THRESHOLD. Fixup

(3) EXTEND ALL CROSS SECTIONS (MF=3) TO 20 MEV. IF THE TABULATED Fixup

CROSS SECTION ENDS BELOW 20 MEV IT WILL BE EXTENDED TO 20 MEV Fixup

AS EITHER ZERO (IMOPS(3)=1) OR CONSTANT (IMOPS(3)=2) EQUAL Fixup

TO THE LAST TABULATED VALUE. Fixup

(4) ALLOW REACTION (MF=3, ANY MT) DELETION. ALL SPECIFIED Fixup

REACTIONS WILL BE DELETED WHEN THE DATA IS READ FROM THE Fixup

INPUT ENDF DATA FILE AND WILL NOT BE IN THE OUTPUT ENDF Fixup

DATA FILE. WARNING DELETED REACTIONS MAY NOT BE USED TO DEFINE Fixup

ANY RECONSTRUCTED REACTIONS (I.E. REACTIONS DEFINED BY SUMMING Fixup

OTHER REACTIONS). SINCE DELETED REACTIONS ARE DELETED DURING Fixup

READING IT IS AS IF THEY NEVER EXISTED AND IF ANY DELETED Fixup

REACTION IS REQUIRED LATER TO DEFINE ANY SUM AN ERROR WILL Fixup

RESULT. THE USER MAY SPECIFY THAT THE DELETION RULES ARE TO BE Fixup

READ FROM INPUT (IMOPS(4)=1) OR THAT THE BUILT IN SUMMATION Fixup

RULES ARE TO BE USED (MOPS(4)=2). AT THE PRESENT TIME THE Fixup

BUILT-IN DELETION RULES ARE THAT NO SECTIONS SHOULD BE DELETED Fixup

(THE USER MAY OVERRIDE THIS CONVENTION BY INPUT). Fixup

(5) ALLOW REACTION (MF=3, ANY MT) RECONSTRUCTION BY SUMMING OTHER Fixup

REACTIONS. IN ORDER TO OPTIMIZE THE RUNNING TIME OF THIS Fixup

PROGRAM CARE SHOULD BE EXERCISED TO MINIMIZE THE NUMBER OF Fixup

TIMES THAT EACH CONTRIBUTING CROSS SECTION MUST BE USED. Fixup

THE USED MAY SPECIFY THAT THE SUMMATION RULES ARE TO BE READ Fixup

AS INPUT (IMOPS(5)=1) OR THAT THE BUILT IN SUMMATION RULES Fixup

ARE TO BE USED (IMOPS(5)=2). THE BUILT IN SUMMATION RULES ARE Fixup

DESIGNED TO USE ENDF CONVENTIONS AND TO MINIMIZE THE NUMBER Fixup

OF TIMES THAT EACH CROSS SECTION IS USED. Fixup

(6) INSURE THAT ALL CROSS SECTIONS ARE NON-NEGATIVE (I.E. ARE Fixup

ZERO OR POSITIVE). DURING READING ALL NEGATIVE CROSS SECTIONS Fixup

WILL BE SET EQUAL TO ZERO AND TREATED AS SUCH DURING ALL Fixup

SUBSEQUENT SUMMATIONS AND ENDF OUTPUT. Fixup

NOTE...THIS OPTION SHOULD NEVER BE USED WITH DATA CONTAINING Fixup

BACKGROUND CROSS SECTIONS WHICH MAY BE NEGATIVE. ONLY AFTER Fixup

THE RESONANCE CONTRIBUTION HAS BEEN ADDED TO THE BACKGROUND Fixup

TO DEFINE THE ACTUAL CROSS SECTION IS IT VALID TO ELIMINATE Fixup

NEGATIVE CROSS SECTIONS. Fixup

NOTE...THIS OPTION MAY BE USED TO DELETE NEGATIVE ELASTIC Fixup

CROSS SECTIONS THAT MAY RESULT FROM RECONSTRUCTING CROSS Fixup

SECTIONS FROM SINGLE LEVEL BREIT-WIGNER PARAMETERS. IF THE Fixup

TOTAL CROSS SECTION IS THEN RECONSTRUCTED USING THE CORRECTED Fixup

ELASTIC CROSS SECTION THE TOTAL WILL BE POSITIVE DUE TO THE Fixup

CONTRIBUTIONS OF CAPTURE AND FISSION (THUS AVOIDING NUMERICAL Fixup

INSTABILITY PROBLEMS DURING SELF-SHIELDING CALCULATIONS). Fixup

(7) WITHIN EACH SECTION OF CROSS SECTIONS DELETE ENERGIES THAT Fixup

ARE NOT IN ASCENDING ENERGY ORDER (ENERGY REPETITION IS O.K.) Fixup

(8) WITHIN EACH SECTION OF CROSS SECTIONS ELIMINATE DUPLICATE Fixup

POINTS (SUCCESSIVE POINTS WITH THE SAME ENERGY-CROSS SECTION). Fixup

(9) TEST THAT ALL SECTIONS ARE IN ASCENDING MAT/MF/MT ORDER. Fixup

IF NOT, NO CORRECTIVE ACTION WILL BE TAKEN, ONLY AN ERROR Fixup

MESSAGE WILL BE OUTPUT. Fixup

(10) CHECK MF/MT FOR EACH SECTION TO INSURE THAT THEY ARE DEFINED Fixup

IN THE ENDF FORMAR MANUAL. IF THEY ARE NOT DEFINED AN ERROR Fixup

MESSAGE IS PRINTED, BUT NO CORRECTIVE ACTION IS TAKEN. Fixup

(11) ALLOW SECTIONS WHICH ARE NOT PRESENT IN THE ORIGINAL (INPUT) Fixup

EVALUATION TO BE CREATED. NORMALLY THIS PROGRAM WILL ONLY Fixup

RECONSTRUCT AND OUTPUT SECTIONS IF THE SECTION IS PRESENT Fixup

IN THE ORIGINAL EVALUATION. THIS PROCEDURE IS FOLLOWED BECAUSE Fixup

NORMALLY THE PROGRAM DOES NOT KNOW HOW TO DEFINE THE CONTENTS Fixup

OF THE FIRST TWO LINES OF THE SECTION (E.G., Q-VALUE, Fixup

TEMPERATURE, INITIAL AND FINAL STATES). THIS OPTION MAY BE Fixup

USED TO ALLOW THE PROGRAM TO READ AND SAVE A TABLE DEFINING Fixup

THE CONTENTS OF THE FIRST TWO LINES OF EACH SECTION TO BE Fixup

CREATED. Fixup

NOTE...IF A SECTION IS PRESENT ANY COMMAND TO CREATE IT WILL Fixup

BE IGNORED. Fixup

(12)ALLOW ENERGY POINTS TO BE INSERTED. THE PROGRAM CAN READ UP Fixup

TO 50, ENERGIES, MAT, MT AND USE LINEAR INTERPOLATION TO Fixup

INSERT ENERGY POINTS INTO TABLES AS THEY ARE READ, E.G., Fixup

INSERT AN ENERGY POINT AT THERMAL ENERGY (0.0253 EV). IF Fixup

AN MAT AND/OR MT IS ZERO THIS IMPLIES = ALL - INSERT THE Fixup

ENERGY IN ALL TABLES. Fixup

(13)PUT ALLOW CROSS SECTIONS ON A UNIFORM ENERGY GRID = EACH Fixup

SECTION (MT) OF CROSS SECTIONS WILL INCLUDE ALL ENERGIES Fixup

WHICH APPEAR IN AT LEAST ONE SECTION OF DATA. PARAMETERS Fixup

(MT=251 THROUGH 255) ARE NOT INCLUDED IN THE UNIFORM ENERGY Fixup

GRID. Fixup

(14)DELETE SECTION IF CROSS SECTION = 0 AT ALL ENERGIES. THIS Fixup

SOUNDS LIKE AN ABSURD OPTION, BUT IS REQUIRED BECAUSE SUCH Fixup

SECTIONS EXIST IN ENDF/B-VI DATA. Fixup

Fixup

CREATING RATIOS AND PRODUCTS Fixup

============================ Fixup

IN ORDER TO CREATE RATIOS AND PRODUCTS = NEW MT NUMBERS, YOU MUST Fixup

DO TWO THINGS, Fixup

Fixup

1) DEFINE EACH NEW MT NUMBER AS A RATIO OR PRODUCT OF TWO MT Fixup

NUMBERS. Fixup

Fixup

2) USE THE CREATE MT NUMBER OPTION AND INPUT THE FIRST TWO LINES Fixup

OF THE SECTION Fixup

Fixup

WARNING - UNLESS YOU DO BOTH OF THESE YOU WILL NOT OBTAIN OUTPUT Fixup

IN THE ENDF FORMAT. Fixup

Fixup

TWO SPECIAL MT NUMBERS HAVE BEEN DEFINED BY CSEWG INVOLVING Fixup

RATIOS AND PRODUCTS, Fixup

Fixup

ALPHA (MT=254)= CAPTURE (MT=102)/FISSION (MT=18) Fixup

Fixup

ETA (MT=255) = NU-BAR (MT=452)\*FISSION (MT=18)/ABSORPTION (MT=27) Fixup

Fixup

ABSORPTION (MT=27) = FISSION (MT=18) + SUM (MT=102 THROUGH 116) Fixup

Fixup

AS YET THERE IS NO STANDARD DEFINITION OF MT NUMBERS FOR RATIO Fixup

OR PRODUCT DATA. YOU ARE FREE TO USE ANY MT NUMBERS NORMALLY NOT Fixup

USED IN THE ENDF. HOWEVER, IT WILL THEN BE YOUR RESPONSIBILITY Fixup

TO PROPERLY INTERPRET THE RESULTS, I.E., NOBODY ELSE WILL HAVE Fixup

ANY IDEA HOW TO INTERPRET A TABLE OF DATA ASSOCIATED WITH THE MT Fixup

NUMBERS YOU HAVE USED. Fixup

Fixup

THIS PROGRAM CAN BE ONLY DIRECTLY DEFINE RATIOS AND PRODUCTS Fixup

USING TWO MT NUMBERS = BINARY OPERATIONS, E.G., DEFINE THE CAPTURE Fixup

TO FISSION RATIO, OR DEFINE THE PRODUCT NU-BAR\*FISSION. Fixup

Fixup

THIS PROGRAM CANNOT DIRECTLY DEFINE RATIO OR PRODUCT OF A SUM OF Fixup

SECTIONS TO THE SUM OF ANOTHER SET OF SECTIONS. HOWEVER, THIS CAN Fixup

BE DONE INDIRECTLY BY FIRST DEFINING A DUMMY MT NUMBER (ANY MT Fixup

NUMBER NOT NORMALLY USED IN ENDF) TO BE A SUM OF SECTIONS AND Fixup

A SECOND DUMMY MT NUMBER TO BE A SECOND SUM OF SECTIONS. YOU CAN Fixup

THEN DEFINE RATIO OR PRODUCT YOU REQUIRE TO BE THE RATIO OF THESE Fixup

TWO DUMMY MT NUMBERS. Fixup

Fixup

FOR EXAMPLE, TO DEFINE ETA, Fixup

1) FIRST DEFINE (MT=27) = (MT=27) + (SUM OF MT=102 THROUGH 116) Fixup

2) NEXT DEFINE (MT=333) = (MT=452)\*(MT=18) Fixup

3) LAST DEFINE (MT=255) = (MT=333)/(MT=27) Fixup

DO NOT FORGET TO TURN ON THE CREATE SECTION OPTION (ON THE FIRST Fixup

INPUT LINE) AND INPUT THE FIRST TWO LINES OF SECTION MT=255 - Fixup

OTHERWISE YOU WILL NOT GET ANY ENDF FORMATTED OUTPUT. Fixup

Fixup

THE ONLY SPECIAL CONVENTIONS USED BY THIS PROGRAM IN CALCULATING Fixup

RATIOS ARE WHEN THE DENOMINATOR OF THE RATIO IS ZERO. IN THIS Fixup

CASE IF THE NUMERATOR IS ALSO ZERO THE RATIO IS DEFINED TO BE ONE. Fixup

IN THIS CASE IF THE NUMERATOR IS NOT ZERO THE RATIO IS DEFINED Fixup

TO BE ZERO. Fixup

Fixup

ENDF FORMAT Fixup

=========== Fixup

THIS PROGRAM MAY BE USED WITH DATA IN ANY VERSION OF THE ENDF Fixup

FORMAT (I.E. ENDF-1, 2, 3, 4, 5 OR 6 FORMAT). SINCE A Fixup

PAGING SYSTEM IS USED STORE CROSS SECTION TABLES ON SCRATCH FILES Fixup

THERE IS NO LIMIT TO THE SIZE OF TABLES (E.G. THE TOTAL CROSS Fixup

SECTION MAY BE REPRESENTED BY 200,000 TABULATED POINTS). Fixup

Fixup

WARNING Fixup

======= Fixup

(1) FOR EACH SECTION OF CROSS SECTIONS (I.E. EACH MT, MF=3) IN Fixup

THE ORIGINAL EVALUATION (I.E. ENDF/B DATA READ) ONE SECTION Fixup

OF DATA WILL BE OUTPUT, UNLESS THE SECTION HAS BEEN DELETED. Fixup

THIS INCLUDES ANY SECTIONS WHICH ARE NOT PRESENT IN THE Fixup

ORIGINAL EVALUATION, BUT THE USER INDICATES (BY INPUT) SHOULD Fixup

BE CREATED. Fixup

Fixup

THE PROGRAM WILL NOT OUTPUT ANY SECTION RECONSTRUCTED BY Fixup

SUMMATION UNLESS THE CORRESPONDING SECTION (MT NUMBER) IS Fixup

PRESENT IN THE ORIGINAL EVALUATION OR USER INPUT INDICATES Fixup

SHOULD BE CREATED AND OUTPUT. THIS IS (A) BECAUSE THE Fixup

PROGRAM CANNOT DEFINE THE PARAMETERS TO APPEAR ON THE FIRST Fixup

TWO LINES OF THE SECTION, (B) TO AVOID OUTPUTTING TOO MUCH Fixup

DATA WHICH THE USER MAY NOT BE INTERESTED IN. Fixup

Fixup

(2) FOR ANY SECTIONS THAT DO NOT APPEAR IN THE ORIGINAL DATA THE Fixup

USER MAY SPECIFY THAT THEY BE DEFINED BY SUMMATION. ANY SUCH Fixup

SECTION MAY BE USED BE DEFINE SUBSEQUENT SUMS, BUT THE SECTION Fixup

ITSELF WILL NOT BE OUTPUT (E.G. GENERALLY MT=27 AND 101 ARE Fixup

NOT PRESENT IN EVALUATIONS. HOWEVER, THE BUILT-IN SUMMATION Fixup

RULES OF THIS PROGRAM USES THE ENDF SUMMATION RULES TO Fixup

DEFINE MT=27 AND 101, WHICH IN TURN ARE USED TO DEFINE THE Fixup

NON-ELASTIC CROSS SECTION, MT=3. SECTIONS MT=27 AND 101 ARE Fixup

NOT OUTPUT). Fixup

Fixup

(3) ALL DATA IN FILE 3 AND 23 MUST BE LINEARLY INTERPOLABLE. IF Fixup

THE DATA IS NOT LINEARLY INTERPOLABLE THIS PROGRAM WILL Fixup

TERMINATE. Fixup

Fixup

PROGRAM OPERATION Fixup

================= Fixup

ALL MAT NUMBER ON AN ENDF TAPE ARE PROCESSED. EACH MAT IS Fixup

TREATED SEPARATELY. WITHIN EACH MAT, EACH SECTION BEFORE MF=3 Fixup

IS READ, CHECKED/CORRECTED (BASED ON INPUT OPTIONS) AND OUTPUT. Fixup

WHEN MF=3 IS LOCATED ALL CROSS SECTIONS ARE READ, SECTIONS TO BE Fixup

DELETED ARE DELETED, SECTIONS WHICH ARE NOT PRESENTED AND USER Fixup

INPUT INDICATES SHOULD BE CREATED ARE CREATE, SECTIONS TO BE KEPT Fixup

ARE CHECKED/CORRECTED (BASED ON INPUT OPTIONS) AND WRITTEN TO A Fixup

SCRATCH FILE. NEXT, IF THE USER SPECIFIES THAT THEY SHOULD, Fixup

SECTIONS ARE RECONSTRUCTED. FINALLY ALL CROSS SECTIONS (OLD AND Fixup

NEW) ARE OUTPUT. WITHIN THE SAME MAT, EACH SECTION AFTER MF=3 IS Fixup

READ, CHECKED/CORRECTED (BASED ON INPUT OPTIONS) AND OUTPUT. Fixup

Fixup

MF=3 Fixup

==== Fixup

THE TREATMENT OF THE CROSS SECTIONS REQUIRES UP TO 4 PASSES FOR Fixup

CROSS SECTIONS. IN THE PROGRAM THEY CORRESPOND TO SUBROUTINES Fixup

PASS1, PASS2, PASS3 AND PASS4. THE ORIGINAL AND FINAL ENDF DATA Fixup

FILES, 5 SCRATCH FILES AND 3 IN CORE ARRAYS ARE USED. OPERATIONS Fixup

PERFORMED DURING EACH PASS ARE, Fixup

Fixup

PASS1 Fixup

===== Fixup

READ ALL CROSS SECTIONS FROM ITAPE. DELETED ANY SECTIONS. CREATE Fixup

ANY SECTIONS. CHECK/CORRECT THEM AND WRITE THEM TO SCRATCH FILE. Fixup

DATA IS READ INTO ARRAY A, TRANSFERRED TO ARRAY C (AFTER EDITING) Fixup

AND OUTPUT TO ISCRC FROM ARRAY C. Fixup

ITAPE - UNIT ORIGINAL ENDF DATA IS READ FROM. Fixup

ISCRC - SCRATCH UNIT THAT EDITED DATA IS WRITTEN ON. Fixup

TABA - ARRAY INTO WHICH ORIGINAL DATA IS READ. Fixup

TABC - ARRAY INTO WHICH EDITED DATA IS TRANSFERRED TO AND Fixup

FROM WHICH IT IS WRITTEN TO ISCRC. Fixup

Fixup

PASS2 Fixup

===== Fixup

IF A UNIFORM ENERGY GRID IS REQUESTED IT IS CREATED DURING THIS Fixup

PASS. FIRST ALL OF THE CROSS SECTIONS FROM PASS1 ARE READ AND A Fixup

UNIFORM ENERGY GRID IS CREATED = ALL ENERGIES THAT ARE INCLUDED Fixup

IN AT LEAST ONE SECTION (MT) OF CROSS SECTIONS. Fixup

ISCRA - SCRATCH UNIT CONTAINING UNIFORM ENERGY GRID. Fixup

ISCRB - SCRATCH UNIT CONTAINING UNIFORM ENERGY GRID. Fixup

ISCRC - SCRATCH UNIT THAT EDITED DATA IS READ FROM. Fixup

TABA - ARRAY CONTAINING UNIFORM ENERGY GRID. Fixup

TABB - ARRAY CONTAINING UNIFORM ENERGY GRID. Fixup

TABC - ARRAY CONTAINING EDITED DATA. Fixup

Fixup

THE UNIFORM ENERGY GRID ENDS UP ON ISCRB. NEXT EACH SECTION OF Fixup

CROSS SECTIONS FROM PASS1 IS READ FROM ISCRC, INTERPOLATED TO Fixup

THE UNIFORM ENERGY GRID AND OUTPUT TO ISCRA. FINALLY ISCRA AND Fixup

ISCRC ARE SWITCH, SO THAT AT THE END OF THIS PASS THE DATA WILL Fixup

AGAIN BE ON ISCRC (EXACTLY AS AT THE END OF PASS1), WITH UPDATED Fixup

POINT COUNTS. Fixup

ISCRA - SCRATCH UNIT THAT UNIFORM ENERGY GRID DATA IS WRITTEN ON. Fixup

ISCRB - SCRATCH UNIT CONTAINING UNIFORM ENERGY GRID. Fixup

ISCRC - SCRATCH UNIT THAT EDITED DATA IS READ FROM. Fixup

TABA - ARRAY CONTAINING UNIFORM ENERGY GRID DATA. Fixup

TABB - ARRAY CONTAINING UNIFORM ENERGY GRID. Fixup

TABC - ARRAY CONTAINING EDITED DATA. Fixup

Fixup

PASS3 Fixup

===== Fixup

SUMMATION CROSS SECTIONS ARE DEFINED BY READING DATA FROM ISCRC Fixup

AND MERGING THEM ONTO ISCRA. THE FIRST SECTION THAT CONTRIBUTES Fixup

TO A SUM IS MERELY COPIED FROM C TO A. IF MORE SECTIONS WILL Fixup

CONTRIBUTE TO THE SUM THE DATA IN A IS TRANSFERRED TO B, A Fixup

SECTION OF DATA FROM C IS ADDED TO THE DATA IN B AND STORED IN Fixup

A. THE CYLE OF ADDED C AND B TO A, FOLLOWED BY MOVING A TO B Fixup

IS CONTINUED UNTIL ALL CONTRIBUTING SECTIONS HAVE BEEN ADDED. Fixup

THE SUM IS THEN COPIED FROM A TO D. IF NEWLY CONSTRUCTED SECTION Fixup

IS REQUIRED FOR ANY LATER SUMMUATIONS IT IS ALSO COPIED TO E. Fixup

THE CYCLE OF ADDED SECTIONS FROM C AND B TO A IS REPEATED FOR Fixup

EACH REQUIRED SUMMATION REACTION. IN ADDITION TO SECTIONS FROM Fixup

C, AFTER THE FIRST SUMMATION SECTIONS MAY ALSO BE ADDED TO A Fixup

FROM E (THE CONTRIBUTION OF NEW RECONSTRUCTED CROSS SECTIONS). Fixup

WHEN ALL REQUIRED SECTIONS HAVE BEEN RECONSTRUCTED THE NEW Fixup

SECTIONS WILL BE ON E AND THE ORIGINAL SECTIONS ON C. Fixup

ISCRC - SCRATCH FILE FROM WHICH ORIGINAL DATA IS READ. Fixup

ISCRA - SCRATCH FILE ONTO WHICH SUM FOR ONE SECTION IS WRITTEN. Fixup

ISCRD - SCRATCH FILE ONTO WHICH ALL SUM CROSS SECTIONS ARE Fixup

WRITTEN. Fixup

ISCRE - SCRATCH FILE ONTO WHICH ALL SUM CROSS SECTIONS WHICH Fixup

ARE REQUIRED FOR LATER SUMS ARE WRITTEN. Fixup

ISCRB - UTILITY SCRATCH FILE USED TO CREATE SUM CROSS SECTIONS. Fixup

TABA - ARRAY INTO WHICH SUMS ARE WRITTEN. Fixup

TABB - ARRAY INTO WHICH PARTIAL SUMS ARE WRITTEN. Fixup

TABC - ARRAY INTO WHICH ORIGINAL DATA IS READ. Fixup

Fixup

PASS4 Fixup

===== Fixup

CROSS SECTIONS ARE READ FROM ISCRC (ORIGINAL) AND ISCRD (NEW) Fixup

AND ARE WRITTEN IN THE ENDF FORMAT ON OTAPE. THE BEGINNING OF Fixup

EACH SECTION OF ORIGINAL DATA IS READ FROM ISCRC (TO DEFINE Fixup

SECTION HEADER INFORMATION). IF THIS MT HAS NOT BEEN RECOSTRUCTED Fixup

ON ISCRD THE ORIGINAL SECTION IS OUTPUT. IF THE SECTION HAS BEEN Fixup

RECONSTRUCTED THE ORIGINAL SECTION IS SKIPPED AND THE NEW SECTION Fixup

IS OUTPUT. Fixup

OTAPE - OUTPUT DATA IN THE ENDF FORMAT. Fixup

ISCRC - SCRATCH FILE FROM WHICH ORIGINAL DATA IS READ. Fixup

ISCRD - SCRATCH FILE FROM WHICH NEW DATA IS READ. Fixup

TABC - ARRAY INTO WHICH CROSS SECTIONS ARE READ FROM SCRATCH Fixup

AND WRITTEN TO OTAPE Fixup

Fixup

I/O FILE DEFINITIONS Fixup

==================== Fixup

UNIT DESCRIPTION Fixup

==== =========== Fixup

2 INPUT PARAMETERS. Fixup

3 OUTPUT REPORT. Fixup

10 ORIGINAL DATA IN THE ENDF FORMAT. Fixup

11 FINAL DATA IN THE ENDF FORMAT. Fixup

12 SCRATCH FILE Fixup

14 SCRATCH FILE Fixup

15 SCRATCH FILE Fixup

16 SCRATCH FILE Fixup

17 SCRATCH FILE Fixup

Fixup

OPTIONAL STANDARD FILE NAMES (SEE SUBROUTINE FILIO1 AND FILIO2) Fixup

=============================================================== Fixup

UNIT FILE NAME FORMAT Fixup

==== ========== ====== Fixup

2 FIXUP.INP BCD Fixup

3 FIXUP.LST BCD Fixup

10 ENDFB.IN BCD Fixup

11 ENDFB.OUT BCD Fixup

12-17 (SCRATCH) BINARY Fixup

Fixup

INPUT LINES Fixup

=========== Fixup

LINE COLUMNS FORMAT DESCRIPTION Fixup

==== ======= ====== =========== Fixup

1 1-14 14I1 INPUT OPTIONS AS DESCRIBED ABOVE. Fixup

EACH COLUMN OF THE INPUT LINE CONTROLS Fixup

ONE OF THE TESTS/CORRECTIONS DESCRIBED Fixup

ABOVE. TESTS/CORRECTION 1-14 (NOT ALL Fixup

IMPLEMENTED YET) CORRESPOND TO COLUMNS Fixup

1-14 OF THIS INPUT LINE AND ARE TREATED Fixup

AS FOLLOWS, Fixup

= 0 - DO NOT PERFORM TEST/CORRECTION. Fixup

= 1 - PERFORM TEST/CORRECTION. Fixup

FOR MT EXCLUSION FROM THRESHOLD TESTS Fixup

(COLUMN 2), DELETION (COLUMN 4), OR Fixup

SUMMATION (COLUMN 5) THE INPUT OPTION Fixup

MAY BE, Fixup

= 1 - READ RULES FROM INPUT Fixup

= 2 - USE BUILT-IN RULES Fixup

2 1-72 A72 ENDF INPUT DATA FILENAME Fixup

(STANDARD OPTION = ENDFB.IN) Fixup

3 1-72 A72 ENDF OUTPUT DATA FILENAME Fixup

(STANDARD OPTION = ENDFB.OUT) Fixup

4-M 1-5 FREE CHARACTER (S,D,T,R,\*) FOLLOWED BY BLANK OR Fixup

FORM MT NUMBER Fixup

- THE ALLOWED CHARACTERS ARE, Fixup

- S OR BLANK = SUM (OR DIFFERENCES) Fixup

- D = DELETE Fixup

- T = NO THRESHOLD ENERGY CORRECTIONS Fixup

- R = RATIO Fixup

- \* = PRODUCT Fixup

6-72 FREE UP TO 10 LOWER AND UPPER MT RANGES WHICH Fixup

FORM WILL BE USED TO DEFINE THE RECONSTRUCTED Fixup

CROSS SECTION OR TO DEFINE MT RANGES WHICH Fixup

ARE EXCLUDED FROM THRESHOLD TESTS. Fixup

Fixup

EACH MT NUMBER IS DEFINED BY A CONTINUOUS Fixup

STRING OF DIGITS, POSSIBILITY PRECEEDED BY Fixup

A - (MINUS SIGN). EACH MT NUMBER MUST BE Fixup

BLANK OR OTHERWISE (NOT A DIGIT) DELIMITED. Fixup

Fixup

COLUMNS 6-72 MAY CONTAIN STRINGS OF DIGITS Fixup

THE FIRST DIGIT STRING OF EACH PAIR MAY BE Fixup

PRECEEDED BY A - (MINUS SIGN). Fixup

Fixup

EACH LINE WILL BE INTERPRETED AS FOLLOWS, Fixup

Fixup

\*SUMMATION (OR DIFFERENCES) Fixup

-------------------------- Fixup

COLUMNS 1-5 = S OR BLANK FOLLOWED BY THE Fixup

MT NUMBER TO BE DEFINED BY SUMMATION Fixup

Fixup

COLUMNS 6-72 = UP TO 10 MT RANGE (PAIRS OF Fixup

MT NUMBERS) TO BE USED TO DEFINED THE SUM. Fixup

IF THE FIRST MT NUMBER OF A PAIR IS Fixup

NEGATIVE THE RANGE OF MT NUMBERS IS Fixup

SUBTRACTED - AT LEAST ONE RANGE MUST BE Fixup

SPECIFIED. Fixup

Fixup

\*DELETIONS Fixup

--------- Fixup

COLUMNS 1-5 = D FOLLOWED BY BLANKS Fixup

Fixup

COLUMNS 6-72 CONTAIN UP TO 10 MT RANGE Fixup

(PAIRS OF MT NUMBERS), EACH RANGE DEFINING Fixup

A RANGE OF MT NUMBERS TO BE DELETED - AT Fixup

LEAST ONE RANGE MUST BE SPECIFIED. Fixup

Fixup

\*EXCLUSION FROM THRESHOLD TESTS Fixup

------------------------------ Fixup

COLUMNS 1=5 = T FOLLOWED BY BLANKS Fixup

Fixup

COLUMNS 6-72 CONTAIN UP TO 10 MT RANGE Fixup

(PAIRS OF MT NUMBERS), EACH RANGE DEFINING Fixup

A RANGE OF MT NUMBERS WHOSE THRESHOLD Fixup

ENERGY WILL NOT BE CHECKED - AT LEAST ONE Fixup

RANGE MUST BE SPECIFIED. Fixup

Fixup

\*RATIO Fixup

----- Fixup

COLUMNS 1-5 = R FOLLOWED BY THE MT NUMBER Fixup

TO BE DEFINED BY A RATIO Fixup

Fixup

COLUMNS 6-72 CONTAINS 2 MT NUMBERS TO BE Fixup

USED TO DEFINE THE RATIO. Fixup

Fixup

\*PRODUCT Fixup

----- Fixup

COLUMNS 1-5 = \* FOLLOWED BY THE MT NUMBER Fixup

TO BE DEFINED BY A PRODUCT Fixup

Fixup

COLUMNS 6-72 CONTAINS 2 MT NUMBERS TO BE Fixup

USED TO DEFINE THE PRODUCT. Fixup

Fixup

CONVENTIONS Fixup

----------- Fixup

\*UP TO 20 DELETIONS AND 20 SUMMATIONS OR Fixup

RATIOS OR PRODUCTS MAY BE SPECIFIED. Fixup

\*ONLY 1 EXCLUSION FROM THRESHOLD TESTS Fixup

MAY BE SPECIFIED (THE 1 LINE MAY CONTAIN Fixup

UP TO 10 MT RANGES TO EXCLUDE FROM TESTS). Fixup

\*INPUT IS TERMINATED BY INPUTTNG 0 OR Fixup

BLANK IN COLUMNS 1-72 (I.E. THE LAST Fixup

INPUT LINE MUST BE BLANK). Fixup

\*THE UPPER LIMIT OF EACH RANGE MUST BE AT Fixup

LEAST AS BIG AS THE LOWER LIMIT (IN Fixup

ABSOLUTE VALUE). Fixup

\*FOR RECONSTRUCTION POSITIVE MT RANGES WILL Fixup

BE ADDED TO THE SUM AND NEGATIVE MT RANGES Fixup

WILL BE SUBTRACTED. Fixup

\*IF INPUT OPTION 2 (FIRST INPUT LINE) IS Fixup

0 THRESHOLD EXCLUSION IS NOT ALLOWED. Fixup

\*IF INPUT OPTION 4 (FIRST INPUT LINE) IS Fixup

0 DELETIONS ARE NOT ALLOWED. Fixup

\*IF INPUT OPTION 5 (FIRST INPUT LINE) IS Fixup

0 SUMMATIONS AND RATIOS ARE NOT ALLOWED. Fixup

N-K IF THE USER SPECIFIES THAT SECTIONS WHICH Fixup

ARE NOT PRESENT IN THE ORIGINAL EVALUATION Fixup

MAY BE CREATED, TWO LINES MUST BE INPUT FOR Fixup

EACH SECTION TO BE CREATED. THE TWO LINES Fixup

DEFINE (C1, C2, L1 AND L2) FOR EACH OF THE Fixup

FIRST TWO LINES OF THE SECTION TO BE Fixup

CREATED. THE FIRST LINE ALSO DEFINES (MAT Fixup

AND MT). (N1, N2) ARE ALWAYS ZERO ON THE Fixup

FIRST LINE AND WILL BE CALCULATED BY THE Fixup

PROGRAM FOR THE SECOND LINE. Fixup

FIRST 1-11 E11.4 ZA OF SECTION TO BE CREATED Fixup

LINE 12-22 E11.4 AWRE OF SECTION TO BE CREATED Fixup

23-33 I11 L1 OF SECTION TO BE CREATED Fixup

34-44 I11 L2 OF SECTION TO BE CREATED Fixup

45-48 I4 MAT OF SECTION TO BE CREATED Fixup

49-51 I3 MT OF SECTION TO BE CREATED Fixup

SECOND 1-11 E11.4 C1 OF SECTION TO BE CREATED Fixup

LINE 12-22 E11.4 C2 OF SECTION TO BE CREATED Fixup

23-33 I11 L1 OF SECTION TO BE CREATED Fixup

34-44 I11 L2 OF SECTION TO BE CREATED Fixup

\*PAIRS OF LINES MAY BE IN ANY MAT/MT ORDER Fixup

(E.G., THEY NEED NOT BE IN ASCENDING Fixup

MAT/MT ORDER). Fixup

\*UP TO 50 PAIRS OF LINES MAY BE USED TO Fixup

DEFINE SECTIONS TO BE CREATED. THE LIST Fixup

IS TERMINATED WHEN THE FIRST LINE OF A Fixup

PAIR CONTAINS A ZERO (OR BLANK) MAT AND/OR Fixup

MT. Fixup

M-N IF THE USER SPECIFIES THAT ENERGIES WHICH Fixup

ARE NOT PRESENT IN THE ORIGINAL EVALUATION Fixup

MAY BE INSERTED, ONE LINE MUST BE INPUT FOR Fixup

EACH ENERGY TO BE INSERTED. Fixup

1-11 E11.4 ENERGY TO BE INSERTED Fixup

12-15 I4 MAT IN WHICH TO INSERT ENERGY = 0 = ALL Fixup

16-18 I3 MT IN WHICH TO INSERT ENERGY = 0 = ALL Fixup

\*UP TO 50 (ENERGY, MAT, MT) LINES MAY BE Fixup

USED. THE LIST IS TERMINATED BY A BLANK Fixup

LINE. Fixup

\*INPUT MAY BE IN ANY (ENERGY, MAT, MT) Fixup

ORDER. Fixup

\*ENERGY POINTS CAN ONLY BE INSERTED WITHIN Fixup

THE ORIGINAL ENERGY RANGE OF A SECTION - Fixup

THIS OPTION CANNOT BE USED TO EXTEND THE Fixup

CROSS SECTION EITHER BELOW OR ABOVE THE Fixup

ORIGINAL TABULATED ENERGY RANGE. Fixup

Fixup

EXAMPLE INPUT NO. 1 Fixup

=================== Fixup

(1) USE OPTIONS 1-11 (ALL OPTIONS, EXCEPT INSERT ENERGY POINTS) Fixup

(2) DELETE MT=900 (FOR EXAMPLE PURPOSES ONLY) Fixup

(3) DEFINE THE FOLLOWING MT NUMBERS TO BE RECONSTRUCTED, Fixup

(MT= 4) = THE SUM OF MT= 51 THROUGH 91 Fixup

(MT=103) = THE SUM OF MT=700 THROUGH 718 (NOT 719) Fixup

(MT=104) = THE SUM OF MT=720 THROUGH 738 (NOT 739) Fixup

(MT=105) = THE SUM OF MT=740 THROUGH 758 (NOT 759) Fixup

(MT=106) = THE SUM OF MT=760 THROUGH 778 (NOT 779) Fixup

(MT=107) = THE SUM OF MT=780 THROUGH 798 (NOT 799) Fixup

NEW (MT= 16) = THE SUM OF MT=875 THROUGH 891 Fixup

(MT=101) = THE SUM OF MT=102 THROUGH 114 Fixup

(MT= 18) = (MT=19) + (MT=20 AND 21) + (MT=38) Fixup

(IF TOTAL FISSION, MT=18, IS NOT PRESENT, DEFINE Fixup

IT BY SUMMING FIRST, SECOND, ETC. CHANCE - NOTE Fixup

THAT THIS MUST BE DONE IN THIS ORDER, SINCE THE Fixup

NEXT SUM INVOLVES USING MT=18. Fixup

(MT= 27) = THE SUM OF MT= 18 AND 101 Fixup

(MT=101 RECONSTRUCTED ABOVE USED IN SUM). Fixup

(MT= 3) = THE SUM OF (MT=4)+(MT=6-9)+(MT=16-17)+(MT=22-37)+ Fixup

(MT=41-45) Fixup

(MT=4 AND 27 RECONSTRUCTED ABOVE USED IN SUM). Fixup

(MT= 19) = (MT=18) - (MT=20 AND 21) - (MT=38) Fixup

(DEFINE FIRST CHANGE FISSION BY SUBTRACTION TO Fixup

ALLOW RESONANCE CONTRIBUTION FROM MT=18 TO BE Fixup

INCLUDED IN MT=19). Fixup

(MT= 1) = THE SUM OF MT=2 AND 3 Fixup

(MT=3 RECONSTRUCTED ABOVE USED IN SUM). Fixup

(4) THRESHOLD ENERGIES OF THE FOLLOWING MT NUMBERS WILL NOT BE Fixup

TESTED OR CORRECTED. Fixup

MT=1, 4, 18, 19, 91, 103 THROUGH 114. Fixup

(5) DEFINE MT=254 TO BE THE CAPTURE TO FISSION RATIO (MT=102/18) Fixup

(6) CREATE MAT=1300/MT=254 - NOTE, THIS IS NECESSARY IN ORDER TO Fixup

HAVE THE CAPTURE TO FISSION RATIO OUTPUT IN THE ENDF FORMAT Fixup

Fixup

NOTE, ON THE FOLLOWING INPUT LINES THE CHARACTERS = ( ) + , HAVE Fixup

BEEN USED ONLY TO MAKE THE INPUT MORE READABLE - THESE CHARACTERS Fixup

WILL BE SKIPPED BY THE PROGRAM IN READING INPUT - THE RESULTS Fixup

WOULD BE THE SAME IF THESE CHARACTERS WERE OMITTED, AS LONG AS Fixup

ALL OF THE MT NUMBERS ARE DELIMITED, I.E., THERE IS AT LEAST ONE Fixup

NON-DIGITAL CHARACTER BETWEEN MT NUMBERS. NOTE, THAT - (MINUS Fixup

SIGN) IS IMPORTANT AND IS USED DURING INPUT TO DEFINE MT RANGES Fixup

WHICH SHOULD BE SUBTRACTED, E.,G., SEE THE DEFINITION OF MT=19. Fixup

Fixup

READ FILE /ENDFB6/K300/LEAD.IN AND WRITE /ENDFB6/K300/LEAD.OUT Fixup

Fixup

THE FOLLOWING 21 INPUT LINES ARE REQUIRED. Fixup

Fixup

11111111111 Fixup

/ENDFB6/K300/LEAD.IN Fixup

/ENDFB6/K300/LEAD.OUT Fixup

D900 Fixup

4=( 51, 91) Fixup

103=(700,718) Fixup

104=(720,738) Fixup

105=(740,758) Fixup

106=(760,778) Fixup

107=(780,798) Fixup

16=(875,891) Fixup

101=(102,114) Fixup

18=( 19, 19)+( 20, 21)+( 38, 38) Fixup

27=( 18, 18)+(101,101) Fixup

3=( 4, 4)+( 6, 9)+( 16, 17)+( 22, 37)+( 41, 45) Fixup

19=( 18, 18)-( 20, 21)-( 38, 38) Fixup

1=( 2, 3) Fixup

T ( 1, 1)+( 4, 4)+( 18, 18)+( 91, 91)+(103,114) Fixup

R254=(102/ 18) Fixup

(BLANK LINE TO TERMINATE SUMMATION/DELETION RULES) Fixup

2.00400+ 3 0.00000+ 0 0 01300254 Fixup

0.00000+ 0 0.00000+ 0 0 0 Fixup

(BLANK LINE TO TERMINATE SECTION CREATION RULES) Fixup

Fixup

NOTE, THE DELETION AND THRESHOLD EXCLUSION LINES MAY APPEAR IN Fixup

IN ANY ORDER. HOWEVER, SUMMATION AND RATIO RULES MUST APPEAR IN Fixup

THE ORDER IN WHICH YOU WANT THEM TO BE EXECUTED - E.G., THE Fixup

ABOVE INPUT WILL FIRST RECONSTRUCT MT=4, WHICH CAN THEN BE USED Fixup

TO CONTRIBUTE TO THE FOLLOWING SUM TO DEFINE MT=3, WHICH IN TURN Fixup

CAN THEN BE USED TO CONTRIBUTE TO THE FOLLOWING SUM TO DEFINE Fixup

MT=1. IF THE ORDER OF THE INPUT LINES IS CHANGED SUCH THAT MT=3 Fixup

IS RECONSTRUCTED BEFORE MT=4, THE ORIGINAL MT=4 WILL BE USED IN Fixup

THE SUMMATION TO DEFINE MT=3. THE SAME RULES APPLY TO CALCULATING Fixup

RATIOS, IF EITHER THE NUMERATOR OR DENOMINATOR IS TO BE DEFINED Fixup

BY SUMMATION, THIS SHOULD BE DONE BEFORE DEFINING THE RATIO BY Fixup

INPUT PARAMETERS. Fixup

Fixup

EXAMPLE INPUT NO. 2 Fixup

=================== Fixup

(1) USE OPTIONS 1-11 (ALL OPTIONS, EXCEPT INSERT ENERGY POINTS) Fixup

(2) USE BUILT-IN TABLES FOR SUMMATION/DELETION/THRESHOLD EXCLUSION Fixup

(THIS ONLY REQUIRES COLUMNS 2, 4 AND 5 TO BE SET =2 ON THE Fixup

FIRST INPUT LINE. THE BUILT-IN RULES EXACTLY CORRESPOND TO Fixup

THE INPUT ABOVE UNDER EXAMPLE NO. 1, EXCEPT THAT NO MT NUMBERS Fixup

WILL BE DELETED. Fixup

(3) IF NOT PRESENT, CREATE MAT=1300/MT=1 Fixup

Fixup

USE THE STANDARD FILE NAMES ENDFB.IN AND ENDFB.OUT (THIS CAN BE Fixup

DONE BY LEAVING THE SECOND AND THIRD INPUT LINES BLANK). Fixup

Fixup

THE FOLLOWING 6 INPUT LINES ARE REQUIRED. Fixup

Fixup

12122111111 Fixup

Fixup

Fixup

2.00400+ 3 0.00000+ 0 0 01300 1 Fixup

0.00000+ 0 0.00000+ 0 0 0 Fixup

(BLANK LINE TO TERMINATE SECTION CREATION RULES) Fixup

Fixup

EXAMPLE INPUT NO. 3 Fixup

=================== Fixup

(1) USE OPTIONS 1-10 (ALL OPTIONS PRESENTLY IMPLEMENTED, EXCEPT Fixup

DO NOT ALLOW SECTION CREATION AND INSERT ENERGY POINTS). Fixup

(2) USE BUILT-IN TABLES FOR SUMMATION/DELETION/THRESHOLD EXCLUSION Fixup

(THIS ONLY REQUIRES COLUMNS 2, 4 AND 5 TO BE SET =2 ON THE Fixup

FIRST INPUT LINE. THE BUILT-IN RULES EXACTLY CORRESPOND TO Fixup

THE INPUT ABOVE UNDER EXAMPLE NO. 1, EXCEPT THAT NO MT NUMBERS Fixup

WILL BE DELETED. Fixup

(3) DO NOT CREATE ANY SECTIONS. Fixup

Fixup

READ FILE /ENDFB6/K300/LEAD.IN AND WRITE /ENDFB6/K300/LEAD.OUT Fixup

Fixup

THE FOLLOWING 3 INPUT LINES ARE REQUIRED. Fixup

Fixup

1212211111 Fixup

/ENDFB6/K300/LEAD.IN Fixup

/ENDFB6/K300/LEAD.OUT Fixup

Fixup

EXAMPLE INPUT NO. 4 Fixup

=================== Fixup

SAME AS EXAMPLE NO. 3, ABOVE, EXCEPT INSERT AN ENERGY POINT AT Fixup

THERMAL FOR ALL REACTIONS WHICH SPAN THE THERMAL ENERGY RANGE. Fixup

Fixup

USE THE STANDARD FILE NAMES ENDFB.IN AND ENDFB.OUT (THIS CAN BE Fixup

DONE BY LEAVING THE SECOND AND THIRD INPUT LINES BLANK). Fixup

Fixup

THE FOLLOWING 5 INPUT LINES ARE REQUIRED. Fixup

Fixup

121221111101 Fixup

Fixup

Fixup

2.53000- 2 0 0 Fixup

(BLANK LINE TO TERMINATE ENERGY INSERTS) Fixup

Fixup

WARNING Fixup

======= Fixup

ALTHOUGH THIS PROGRAM IS DESIGNED TO ALLOW REACTIONS TO BE DEFINED Fixup

BY ADDING OR SUBTRACTING REACTIONS THE USER SHOULD ALWAYS TRY TO Fixup

DEFINE REACTIONS BY SUMMING TO AVOID NEGATIVE CROSS SECTIONS. FOR Fixup

EXAMPLE, IT IS POSSIBLE TO CALCULATE MT=3 AND DEFINE MT=1 AS THE Fixup

SUM OF MT=2 AND 3 (THE RECOMMENDED APPROACH AS USED IN THE ABOVE Fixup

INPUT). ALTERATIVELY IT IS POSSIBLE TO CALCULATE MT=1 AND DEFINE Fixup

MT=3 AS MT=1 MINUS MT=2 (THIS APPROACH IS NOT RECOMMENDED). Fixup

Fixup

THE ONLY BUILT-IN SUMMATION RULE THAT USES SUBTRACTION IS THE Fixup

CALCULATION OF THE FIRST CHANGE FISSION (MT=19) AS THE TOTAL Fixup

FISSION (MT=18) MINUS THE SECOND, THIRD AND FOURTH CHANGE FISSION Fixup

(MT=20, 21, 38). THIS HAS BEEN DONE TO ALLOW THE RESONANCE Fixup

CONTRIBUTION, CALCULATED BY MANY CODES AND INCLUDED IN MT=18, Fixup

TO BE CONSISTENTLY INCLUDED IN THE FIRST CHANCE FISSION. Fixup

Fixup

======================================================================= Fixup