**======================================================================= Merger**

 **Merger**

 **PROGRAM MERGER Merger**

 **============== Merger**

 **VERSION 80-1 (JANUARY 1980) Merger**

 **VERSION 80-2 (DECEMBER 1980) Merger**

 **VERSION 82-1 (JANUARY 1982) Merger**

 **VERSION 83-1 (JANUARY 1983)\*NEW, MORE COMPATIBLE I/O UNIT NUMBERS. Merger**

 **VERSION 85-1 (AUGUST 1985) \*FORTRAN-77/H VERSION Merger**

 **VERSION 86-1 (JANUARY 1986)\*ENDF/B-VI FORMATS Merger**

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

 **FILE NAMES (SEE, SUBROUTINES FILIO1 Merger**

 **AND FILIO2 FOR DETAILS). Merger**

 **\*IMPROVED BASED ON USER COMMENTS. Merger**

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

 **INSURE PROGRAM WILL NOT DO ANYTHING Merger**

 **CRAZY. Merger**

 **\*UPDATED TO USE NEW PROGRAM CONVERT Merger**

 **KEYWORDS. Merger**

 **\*ADDED LIVERMORE CIVIC COMPILER Merger**

 **CONVENTIONS. Merger**

 **VERSION 92-1 (JANUARY 1992)\*UPDATED BASED ON USER COMMENTS Merger**

 **\*ADDED FORTRAN SAVE OPTION Merger**

 **VERSION 92-2 (JULY 1992) \*ALLOW UP TO 99 ENDF/B DATA FILES. Merger**

 **(TO ALLOW MANAGEMENT OF THE ENTIRE Merger**

 **ENDF/B SYSTEM). Merger**

 **VERSION 94-1 (JANUARY 1994)\*VARIABLE ENDF/B DATA FILENAMES Merger**

 **TO ALLOW ACCESS TO FILE STRUCTURES Merger**

 **(WARNING - INPUT PARAMETER FORMAT Merger**

 **HAS BEEN CHANGED) Merger**

 **\*ONLY SPECIFY FILENAMES - NO UNIT Merger**

 **NUMBERS ON INPUT (WARNING - INPUT Merger**

 **PARAMETERS FORMAT HAS BEEN CHANGED) Merger**

 **\*CLOSE ALL FILES BEFORE TERMINATING Merger**

 **(SEE, SUBROUTINE ENDIT) Merger**

 **\*REQUEST LOG DELETED Merger**

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

 **\*IMPROVED COMPUTER INDEPENDENCE Merger**

 **\*ALL DOUBLE PRECISION Merger**

 **\*ON SCREEN OUTPUT Merger**

 **\*UNIFORM TREATMENT OF ENDF/B I/O Merger**

 **\*IMPROVED OUTPUT PRECISION Merger**

 **VERSION 99-1 (MARCH 1999) \*GENERAL IMPROVEMENTS BASED ON Merger**

 **USER FEEDBACK Merger**

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

 **USER FEEDBACK Merger**

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

 **VERS. 2004-1 (MARCH 2004) \*ADDED INCLUDE TO DEFINE COMMON Merger**

 **\*ADDED TEND LINE IF NO DATA RETRIEVED Merger**

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

 **VERS. 2007-2 (JUNE 2007) \*UP, TO 1,000 ENDF/B FILES. Merger**

 **\*72 CHARACTER FILE NAMES. Merger**

 **VERS. 2010-1 (Apr. 2010) \*General update based on user feedback Merger**

 **VERS. 2012-1 (Aug. 2012) \*Added CODENAME Merger**

 **\*32 and 64 bit Compatible Merger**

 **\*Added ERROR stop Merger**

 **VERS. 2015-1 (Jan. 2015) \*Replaced ALL 3 way IF Statements. Merger**

 **VERS. 2017-1 (May 2017) \*Updated based on user feedbck. Merger**

 **Merger**

 **OWNED, MAINTAINED AND DISTRIBUTED BY Merger**

 **------------------------------------ Merger**

 **THE NUCLEAR DATA SECTION Merger**

 **INTERNATIONAL ATOMIC ENERGY AGENCY Merger**

 **P.O. BOX 100 Merger**

 **A-1400, VIENNA, AUSTRIA Merger**

 **EUROPE Merger**

 **Merger**

 **ORIGINALLY WRITTEN BY Merger**

 **------------------------------------ Merger**

 **Dermott E. Cullen Merger**

 **Merger**

 **PRESENT CONTACT INFORMATION Merger**

 **--------------------------- Merger**

 **Dermott E. Cullen Merger**

 **1466 Hudson Way Merger**

 **Livermore, CA 94550 Merger**

 **U.S.A. Merger**

 **Telephone 925-443-1911 Merger**

 **E. Mail RedCullen1@Comcast.net Merger**

 **Website RedCullen1.net/HOMEPAGE.NEW Merger**

 **Merger**

 **AUTHORS MESSAGE Merger**

 **--------------- Merger**

 **THE COMMENTS BELOW SHOULD BE CONSIDERED THE LATEST DOCUMENTATION Merger**

 **FOR THIS PROGRAM INCLUDING ALL RECENT IMPROVEMENTS. PLEASE READ Merger**

 **ALL OF THESE COMMENTS BEFORE IMPLEMENTATION, PARTICULARLY THE Merger**

 **COMMENTS CONCERNING MACHINE DEPENDENT CODING. Merger**

 **Merger**

 **AT THE PRESENT TIME WE ARE ATTEMPTING TO DEVELOP A SET OF COMPUTER Merger**

 **INDEPENDENT PROGRAMS THAT CAN EASILY BE IMPLEMENTED ON ANY ONE Merger**

 **OF A WIDE VARIETY OF COMPUTERS. IN ORDER TO ASSIST IN THIS PROJECT Merger**

 **IT WOULD BE APPECIATED IF YOU WOULD NOTIFY THE AUTHOR OF ANY Merger**

 **COMPILER DIAGNOSTICS, OPERATING PROBLEMS OR SUGGESTIONS ON HOW TO Merger**

 **IMPROVE THIS PROGRAM. HOPEFULLY, IN THIS WAY FUTURE VERSIONS OF Merger**

 **THIS PROGRAM WILL BE COMPLETELY COMPATIBLE FOR USE ON YOUR Merger**

 **COMPUTER. Merger**

 **Merger**

 **PURPOSE Merger**

 **------- Merger**

 **THIS PROGRAM IS DESIGNED TO SELECTIVELY RETRIEVE DATA OFF OF FROM Merger**

 **1 TO 10 ENDF/B DATA TAPES AND TO MERGE THE SELECTED DATA INTO A Merger**

 **SINGLE MAT/MF/MT ORDERED FINAL OUTPUT FILE. Merger**

 **Merger**

 **IN THE DISCUSSION THAT FOLLOWS FOR SIMPLICITY THE ENDF/B Merger**

 **TERMINOLOGY---ENDF/B TAPE---WILL BE USED. IN FACT THE ACTUAL Merger**

 **MEDIUM USED MAY BE TAPE, CARD, DISK OR ANY OTHER MEDIUM. Merger**

 **Merger**

 **ENDF/B FORMAT Merger**

 **------------- Merger**

 **THIS PROGRAM ONLY USES THE ENDF/B BCD OR CARD IMAGE FORMAT (AS Merger**

 **OPPOSED TO THE BINARY FORMAT) AND CAN HANDLE DATA IN ANY VERSION Merger**

 **OF THE ENDF/B FORMAT (I.E., ENDF/B-I, II,III, IV OR V FORMAT). Merger**

 **Merger**

 **THE ONLY NUMERICAL DATA THAT THIS PROGRAM READS IS THE ZA FROM THE Merger**

 **FIRST CARD OF EACH SECTION AND THE MAT/MF/MT FROM EACH CARD. Merger**

 **SEQUENCE NUMBERS ARE IGNORED ON INPUT AND ALL OTHER FIELDS ARE Merger**

 **READ AS HOLLERITH. AS SUCH THIS PROGRAM NEED NOT DISTINGUISH Merger**

 **BETWEEN DIFFERENT VERSIONS OF THE ENDF/B FORMAT. Merger**

 **Merger**

 **IT IS ASSUMED THAT THE DATA IS CORRECTLY CODED IN THE ENDF/B Merger**

 **FORMAT AND NO ERROR CHECKING IS PERFORMED. IN PARTICULAR IT IS Merger**

 **ASSUMED THAT THE MAT, MF AND MT ON EACH CARD IS CORRECT. SEQUENCE Merger**

 **NUMBERS (COLUMNS 76-80) ARE IGNORED ON INPUT, BUT WILL BE Merger**

 **CORRECTLY OUTPUT ON ALL CARDS. Merger**

 **Merger**

 **SECTION SIZE Merger**

 **------------ Merger**

 **SINCE THIS PROGRAM ONLY READS THE DATA ONE CARD AT A TIME THERE Merger**

 **IS NO LIMIT TO THE SIZE OF ANY GIVEN SECTION, E.G. THE TOTAL Merger**

 **CROSS SECTION MAY BE DESCRIBED BY 200,000 DATA POINTS. Merger**

 **Merger**

 **SELECTION OF DATA Merger**

 **----------------- Merger**

 **THE USER MAY CHOOSE TO MERGE ALL DATA OR THE USER MAY SPECIFY Merger**

 **THAT ONLY CERTAIN DATA SHOULD BE SELECTED. THE DATA TO BE Merger**

 **SELECTED IS DEFINED BY SPECIFYING UP TO 100 MAT/MF/MT OR Merger**

 **ZA/MF/MT RANGES. EACH RANGE IS DEFINED BY LOWER AND UPPER LIMITS Merger**

 **OF MAT/MF/MT OR ZA/MF/MT. Merger**

 **Merger**

 **REQUEST LIMITS Merger**

 **-------------- Merger**

 **IN ORDER TO SIMPLIFY THE INPUT OF SELECTION REQUESTS THE FOLLOWING Merger**

 **CONVENTIONS HAVE BEEN INTRODUCED IN ORDER TO DEFINE THE UPPER Merger**

 **LIMITS OF REQUESTS IF THEY ARE NOT DEFINED BY INPUT (I.E., IF THEY Merger**

 **ARE ZERO). Merger**

 **Merger**

 **(1) MAT OR ZA - IF THE UPPER LIMIT IS ZERO IT IS SET EQUAL TO THE Merger**

 **LOWER LIMIT. Merger**

 **(2) MF OR MT - IF THE UPPER LIMIT IS ZERO IT IS SET EQUAL TO THE Merger**

 **MAXIMUM POSSIBLE VALUE, 99 OR 999 RESPECTIVELY. Merger**

 **Merger**

 **WITH THESE CONVENTIONS AN ENTIRE EVALUATION MAY BE SELECTED BY Merger**

 **MERELY SPECIFYING THE LOWER LIMIT OF MAT OR ZA. THE UPPER MAT OR Merger**

 **ZA LIMIT WILL BE SET EQUAL TO THE LOWER LIMIT, THE LOWER LIMITS OF Merger**

 **MF/MT WILL BE 0/0 AND THE UPPER LIMITS OF MF/MT WILL BE SET TO Merger**

 **99/999. THIS WILL CAUSE ALL SECTIONS OF A SINGLE EVALUATION TO BE Merger**

 **SELECTED. Merger**

 **Merger**

 **SATISFYING SELECTION CRITERIA Merger**

 **----------------------------- Merger**

 **IN ORDER FOR A SECTION TO MEET THE SELECTION CRITERIA SPECIFIED Merger**

 **BY ONE OF THE RETRIEVAL REQUESTS, EACH OF THE THREE FIELDS ( Merger**

 **MAT/MF/MT OR ZA/MF/MT) MUST INDIVIDUALLY SATISFY THE CORRESPONDING Merger**

 **LIMITS OF THE REQUEST. IT IS NOT SUFFICIENT THAT THE MAT OF A Merger**

 **SECTION LIE BETWEEN THE MINIMUM AND MAXIMUM MATS OF A REQUEST. THE Merger**

 **MF AND MT WILL ALSO BE INDIVIDUALLY COMPARED TO THE MF AND MT Merger**

 **LIMITS OF THE REQUEST. FOR EXAMPLE, A SECTION WITH MAT/MF/MT= Merger**

 **2500/3/2 DOES NOT SATISFY A REQUEST THAT SPECIFIES A REQUEST USING Merger**

 **THE RANGE 2000/3/1 THROUGH 3000/3/1. THIS REQUEST SPECIFIES ALL Merger**

 **MATERIALS WITH MAT BETWEEN 2000 AND 3000, BUT ONLY THOSE SECTIONS Merger**

 **WITH MF/MT=3/1. SIMILARLY A REQUEST FOR 2000/3/1 THROUGH 3000/99/ Merger**

 **999 WILL NOT SELECT ANY SECTIONS WITH MF=1 OR 2, SINCE THE Merger**

 **REQUEST SPECIFIES ALL MATERIALS WITH MAT BETWEEN 2000 AND 3000, Merger**

 **BUT ONLY THOSE SECTIONS WITH MF= 3, OR MORE. Merger**

 **Merger**

 **DUPLICATE SECTIONS Merger**

 **------------------ Merger**

 **IF TWO OR MORE SECTIONS WITH THE SAME MAT/MF/MT ARE FOUND EITHER Merger**

 **ON THE SAME OR DIFFERENT TAPES, THE SECTION FROM THE TAPE DEFINED Merger**

 **EARLIEST IN THE INPUT CARDS WILL BE COPIED TO THE FINAL TAPE AND Merger**

 **ALL OTHER SECTIONS WITH THE SAME MAT/MF/MT WILL BE SKIPPED. THE Merger**

 **OUTPUT REPORT WILL INDICATE WHICH SECTIONS WERE COPIED FROM WHICH Merger**

 **TAPES, AS WELL AS WHICH SECTIONS ARE DUPLICATE AND WERE SKIPPED. Merger**

 **Merger**

 **REACTION INDEX Merger**

 **-------------- Merger**

 **THIS PROGRAM DOES NOT UPDATE THE REACTION INDEX IN MF=1, MT=451. Merger**

 **FOR EACH MATERIAL THE PROGRAM WILL FOLLOW THE CONVENTIONS Merger**

 **DEFINED ABOVE AND ONLY COPY ONE SECTION MF=1, MT=451 AND SKIP Merger**

 **ALL OTHERS (IF MORE THAN ONE). THIS CONVENTION HAS BEEN ADOPTED Merger**

 **BECAUSE MOST USERS DO NOT REQUIRE A CORRECT REACTION INDEX FOR Merger**

 **THERE APPLICATIONS AND IT WAS NOT CONSIDERED WORTHWHILE TO INCLUDE Merger**

 **THE OVERHEAD OF CONSTRUCTING A CORRECT REACTION INDEX IN THIS Merger**

 **PROGRAM. HOWEVER, IF YOU REQUIRE A REACTION INDEX FOR YOUR Merger**

 **APPLICATION AFTER RUNNING THIS PROGRAM YOU MAY USE PROGRAM Merger**

 **DICTIN TO CREATE ONE. Merger**

 **Merger**

 **RETRIEVAL STATISTICS Merger**

 **-------------------- Merger**

 **THERE WILL ALWAYS BE AN OUTPUT REPORT LISTING INDICATING WHICH Merger**

 **SECTIONS WHERE SELECTED, WHICH DUPLICATE SECTIONS WERE SKIPPED, Merger**

 **WHICH TAPE THE SECTION WAS ON, WHICH REQUEST (MAT/MF/MT OR Merger**

 **ZA/MF/MT RANGE) CAUSED THE SECTION TO BE SELECTED AND HOW MANY Merger**

 **CARDS WERE IN THE SECTION. IN ADDITION THE USER MAY OPTIONALLY Merger**

 **OBTAIN A FILE CONTAINING THE SAME INFORMATION. THIS FILE MAY BE Merger**

 **COMBINED WITH OTHER SIMILAR FILES OUTPUT BY THIS PROGRAM IN ORDER Merger**

 **TO ACCUMULATE RETRIEVAL STATISTICS OVER A PERIOD OF TIME. IF Merger**

 **SPECIFIED THIS FILE WILL CONTAIN THE FOLLOWING INFORMATION IN Merger**

 **6I7 FORMAT. Merger**

 **Merger**

 **(1) ZA Merger**

 **(2) MAT Merger**

 **(3) MF Merger**

 **(4) MT Merger**

 **(5) NUMBER OF CARDS IN SECTION Merger**

 **(6) REQUEST NUMBER THAT CAUSED SECTION TO BE SELECTED Merger**

 **Merger**

 **INPUT FILES Merger**

 **----------- Merger**

 **UNIT DESCRIPTION Merger**

 **---- ----------- Merger**

 **2 INPUT CARDS (BCD - 80 CHARACTERS/RECORD) Merger**

 **VARY FROM 1 TO 99 ENDF/B DATA FILES (BCD - 80 CHARACTERS/RECORD) Merger**

 **Merger**

 **OUTPUT FILES Merger**

 **------------ Merger**

 **UNIT DESCRIPTION Merger**

 **---- ----------- Merger**

 **3 OUTPUT REPORT LISTING (BCD - 120 CHARACTERS/RECORD) Merger**

 **10 MERGED ENDF/B DATA (BCD - 80 CHARACTERS/RECORD) Merger**

 **Merger**

 **OPTIONAL STANDARD FILE NAMES (SEE SUBROUTINES FILIO1 AND FILIO2) Merger**

 **---------------------------------------------------------------- Merger**

 **UNIT FILE NAME DESCRIPTION Merger**

 **---- ---------- ----------- Merger**

 **2 MERGER.INP INPUT PARAMETERS Merger**

 **3 MERGER.LST OUTPUT LISTING Merger**

 **11 ENDFB.OUT RETRIEVED ENDF/B DATA Merger**

 **12 ENDFB.IN1 ENDF/B DATA TO READ...FILENAMES WILL BE DEFINED Merger**

 **13 ENDFB.IN2 IN THE ORDER ENDFB.IN1, ENDFB.IN2,...ENDFB.I99 Merger**

 **14 ENDFB.IN3 CORRESPONDING TO THE FIRST, SECOND,...99-TH Merger**

 **15 ENDFB.IN4 ENDF/B DATA FILE TO READ. Merger**

 **16 ENDFB.IN5 Merger**

 **17 ENDFB.IN6 Merger**

 **18 ENDFB.IN7 Merger**

 **. Merger**

 **. Merger**

 **110 ENDFB.I99 Merger**

 **Merger**

 **INPUT CARDS Merger**

 **----------- Merger**

 **CARD COLUMNS FORMAT DESCRIPTION Merger**

 **---- ------- ------ ----------- Merger**

 **1 1-72 A72 FILENAME FOR MERGED OUTPUT. Merger**

 **(LEAVE BLANK FOR STANDARD = ENDFB.OUT) Merger**

 **2 1-66 16A4,A2 MERGED FILE LABEL Merger**

 **IF BLANK - LABEL FROM FIRST FILE READ WILL Merger**

 **BE OUTPUT Merger**

 **67-70 I4 MERGED FILE ENDF/B NUMBER Merger**

 **IF ZERO - NUMBER OF FIRST FILE READ WILL Merger**

 **BE OUTPUT. Merger**

 **71-72 I2 RETRIEVAL CRITERIA Merger**

 **= 0 - MAT/MF/MT RANGES Merger**

 **= 1 - ZA/MF/MT RANGES Merger**

 **3-N 1-72 A72 FILENAME FOR FILE TO RETRIEVE DATA FROM Merger**

 **(LEAVE BLANK FOR STANDARD..ENDFB.IN1,ETC.) Merger**

 **TERMINATE LIST OF FILES WITH A LINE THAT Merger**

 **SAYS END OR end Merger**

 **VARY 1- 6 I6 LOWER PRIMARY LIMIT (MAT OR ZA) Merger**

 **7- 8 I2 LOWER MF LIMIT Merger**

 **9-11 I3 LOWER MT LIMIT Merger**

 **12-17 I6 UPPER PRIMARY LIMIT (MAT OR ZA) Merger**

 **18-19 I2 UPPER MF LIMIT Merger**

 **20-22 I3 UPPER MT LIMIT Merger**

 **RANGES OF MAT/MF/MT OR ZA/MF/MT TO BE Merger**

 **RETRIEVED ARE SPECIFIED BY DEFINING Merger**

 **ONE RANGE (LOWER AND UPPER LIMITS) PER Merger**

 **CARD. THE USER MAY SPECIFY 0 TO 100 Merger**

 **RANGES AND THE LIST OF REQUEST RANGES Merger**

 **IS TERMINATED BY A BLANK CARD. IF Merger**

 **THE FIRST CARD IS BLANK (0 REQUESTS) Merger**

 **ALL DATA WILL BE RETRIEVED. IF THE UPPER Merger**

 **PRIMARY CRITERIA (MAT OR ZA) IS LESS THAN Merger**

 **THE LOWER PRIMARY CRITERIA, THE UPPER Merger**

 **PRIMARY CRITERIA WILL BE SET EQUAL TO Merger**

 **THE LOWER PRIMARY CRITERIA. IF THE UPPER Merger**

 **MF OR MT LIMIT IS ZERO, OR BLANK, IT Merger**

 **WILL BE SET TO THE MAXIMUM POSSIBLE Merger**

 **VALUE, I.E. MF=99 OR MT=999 (SEE Merger**

 **EXAMPLE INPUT). Merger**

 **Merger**

 **EXAMPLE INPUT NO. 1 Merger**

 **------------------- Merger**

 **MERGE ENDF/B DATA ONTO UNIT 10 FROM UNITS 11, 12, 13 AND 14. Merger**

 **RETRIEVE DATA BY MAT NUMBER. RETRIEVE MATS 1103, 1106, ALL MATS Merger**

 **BETWEEN 1204 AND 1215, MF=1, 3, 4 AND 5 OF MAT 1219 AND MF=3, Merger**

 **MT=1 OF MAT 1304. USE STANDARD FILENAMES. Merger**

 **Merger**

 **THE FOLLOWING 13 INPUT CARDS ARE REQUIRED. Merger**

 **Merger**

 **ENDFB.OUT Merger**

 **EXAMPLE FILE LABEL FOR MERGER 0 0 Merger**

 **ENDFB.IN1 Merger**

 **ENDFB.IN2 Merger**

 **ENDFB.IN3 Merger**

 **ENDFB.IN4 Merger**

 **END Merger**

 **1103 4317 (UPPER LIMIT SET TO 1103/99/999) Merger**

 **1106 4317 (UPPER LIMIT SET TO 1106/99/999) Merger**

 **1204 1215 4317 (UPPER LIMIT SET TO 1215/99/999) Merger**

 **1219 1 1219 1 4317 (UPPER LIMIT SET TO 1219/ 1/999) Merger**

 **1219 3 1219 5 4317 (UPPER LIMIT SET TO 1219/ 5/999) Merger**

 **1304 3 1 1304 3 1 4317 (UPPER LIMIT COMPLETELY DEFINED) Merger**

 **(BLANK CARD TERMINATES REQUESTS) Merger**

 **Merger**

 **EXAMPLE INPUT NO. 2 Merger**

 **------------------- Merger**

 **THE SAME AS EXAMPLE 1, EXCEPT SPECIFY FILENAMES Merger**

 **Merger**

 **\ENDFB6\MERGED.LIB Merger**

 **EXAMPLE FILE LABEL FOR MERGER 0 0 Merger**

 **ENDFB6.PART1 Merger**

 **ENDFB6.PART2 Merger**

 **ENDFB6.PART3 Merger**

 **ENDFB6.PART4 Merger**

 **END Merger**

 **1103 4317 (UPPER LIMIT SET TO 1103/99/999) Merger**

 **1106 4317 (UPPER LIMIT SET TO 1106/99/999) Merger**

 **1204 1215 4317 (UPPER LIMIT SET TO 1215/99/999) Merger**

 **1219 1 1219 1 4317 (UPPER LIMIT SET TO 1219/ 1/999) Merger**

 **1219 3 1219 5 4317 (UPPER LIMIT SET TO 1219/ 5/999) Merger**

 **1304 3 1 1304 3 1 4317 (UPPER LIMIT COMPLETELY DEFINED) Merger**

 **(BLANK CARD TERMINATES REQUESTS) Merger**

 **Merger**

 **======================================================================= Merger**