**=======================================================================ACTIVATE**

**ACTIVATE**

**PROGRAM ACTIVATE ACTIVATE**

**================ ACTIVATE**

**VERS. 2000-1 (APRIL 2000) \*INITIAL VERSION. ACTIVATE**

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

**VERS. 2004-1 (JAN. 2004) \*CORRECTED ERROR - FIRST RECORD AFTER ACTIVATE**

**MF=10 WAS MISSING. ACTIVATE**

**\*ADDED INCLUDE TO DEFINE COMMON ACTIVATE**

**\*INCREASED MAX. POINTS FROM 100,000 ACTIVATE**

**TO 1,000,000. ACTIVATE**

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

**VERS. 2007-2 (DEC. 2007) \*72 CHARACTER FILE NAMES. ACTIVATE**

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

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

**\*Added ERROR stop ACTIVATE**

**\*32 and 64 bit Compatible ACTIVATE**

**VERS. 2015-1 (Jan. 2015) \*Corrected ERROR for missing or extra ACTIVATE**

**SEND and MEND lines. ACTIVATE**

**\*Changed MF=8 pointer from MF=9 to 10.ACTIVATE**

**\*INCREASED MAX. POINTS to 3,000,000. ACTIVATE**

**\*Added Consistency checks, e.g., ACTIVATE**

**Any MT in MF=9 requires data in MF=3.ACTIVATE**

**\*Extended OUT9 - OUT10 is not used. ACTIVATE**

**\*Only processes ONE ENDF Tape - this ACTIVATE**

**restriction is necessary to insure ACTIVATE**

**compatibility with ALL PREPRO codes. ACTIVATE**

**\*Changed to current ENDF sequence ACTIVATE**

**number convention, e.g., reset numberACTIVATE**

**for each section (MAT/MF/MT). ACTIVATE**

**\*Replaced ALL 3 way IF statements. ACTIVATE**

**VERS. 2017-1 (May 2017) \*Increased MAX. POINTS to 6,000,000. ACTIVATE**

**\*Do not create MF=10 for any MT that ACTIVATE**

**already has MF=10 data = copy MF=10 ACTIVATE**

**data in its original form. ACTIVATE**

**\*Message for every MF=7 output, ACTIVATE**

**whether created or copied from input.ACTIVATE**

**VERS. 2018-1 (Jan. 2018) \*Updated based on user feedback. ACTIVATE**

**\*Added on-line output for ALL ENDERRORACTIVATE**

**VERS. 2020-1 (Mar. 2020) \*Additional Interpolation Law Tesrs ACTIVATE**

**\*Checked consistency of Maximum ACTIVATE**

**tabulated energy for MF=3 and 9 data ACTIVATE**

**to be compbined - print WARNING if ACTIVATE**

**inconsistent. ACTIVATE**

**\*Added Target Isomer State ACTIVATE**

**VERS. 2021-1 (Jan. 2021) \*Updated for FORTRAN 2018 ACTIVATE**

**VERS. 2023-1 (Feb. 2023) \*Reduced page size from 6,000,000 ACTIVATE**

**to 120,000 ACTIVATE**

**ACTIVATE**

**Acknowledgement 2015 ACTIVATE**

**-------------------- ACTIVATE**

**Currently almost all improvements to this code are based upon ACTIVATE**

**feedback from code users who report problems. This feedback ACTIVATE**

**benefits ALL users of this code, and ALL users are encouraged ACTIVATE**

**to report problems. ACTIVATE**

**ACTIVATE**

**Improvements on the 2015 version of this code based on user ACTIVATE**

**feedback, including IMPORTANT feedback from Andrej Trkov, up ACTIVATE**

**to and including Feb. 2015. ACTIVATE**

**ACTIVATE**

**OWNED, MAINTAINED AND DISTRIBUTED BY ACTIVATE**

**------------------------------------ ACTIVATE**

**THE NUCLEAR DATA SECTION ACTIVATE**

**INTERNATIONAL ATOMIC ENERGY AGENCY ACTIVATE**

**P.O. BOX 100 ACTIVATE**

**A-1400, VIENNA, AUSTRIA ACTIVATE**

**EUROPE ACTIVATE**

**ACTIVATE**

**ORIGINALLY WRITTEN BY ACTIVATE**

**------------------------------------ ACTIVATE**

**Dermott E. Cullen ACTIVATE**

**ACTIVATE**

**PRESENT CONTACT INFORMATION ACTIVATE**

**--------------------------- ACTIVATE**

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**ACTIVATE**

**ACTIVATE**

**AUTHORS MESSAGE ACTIVATE**

**--------------- ACTIVATE**

**THE REPORT DESCRIBED ABOVE IS THE LATEST PUBLISHED DOCUMENTATION ACTIVATE**

**FOR THIS PROGRAM. HOWEVER, THE COMMENTS BELOW SHOULD BE CONSIDEREDACTIVATE**

**THE LATEST DOCUMENTATION INCLUDING ALL RECENT IMPROVEMENTS. PLEASEACTIVATE**

**READ ALL OF THESE COMMENTS BEFORE IMPLEMENTATION. ACTIVATE**

**ACTIVATE**

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

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

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

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

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

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

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

**COMPUTER. ACTIVATE**

**ACTIVATE**

**PURPOSE ACTIVATE**

**------- ACTIVATE**

**THIS PROGRAM IS DESIGNED TO CREATE FILE 10 ACTIVATION CROSS ACTIVATE**

**SECTIONS BY COMBINING FILE 3 CROSS SECTIONS AND FILE 9 MULTIPLIERSACTIVATE**

**ACTIVATE**

**IN THE FOLLOWING DISCUSSION FOR SIMPLICITY THE ENDF TERMINOLOGY ACTIVATE**

**---ENDF TAPE---WILL BE USED. IN FACT THE ACTUAL MEDIUM MAY BE ACTIVATE**

**TAPE, CARDS, DISK OR ANY OTHER MEDIUM. ACTIVATE**

**ACTIVATE**

**ASSUMPTIONS ACTIVATE**

**----------- ACTIVATE**

**IT IS ASSUMED THAT THE FILE 3 AND 9 DATA HAVE BEEN LINEARIZED ACTIVATE**

**BEFORE THIS CODE IS USED - FILE 3 AND 9 DATA CAN BE LINEARIZED ACTIVATE**

**USING PROGRAM LINEAR. ACTIVATE**

**ACTIVATE**

**IT IS ASSUMED THAT THE FILE 9 MULTIPLIERS ARE FAIRLY SMOOTH VERSUSACTIVATE**

**ENERGY, AND THAT THE ACTIVATION CROSS SECTIONS FOR FILE 10 CAN BE ACTIVATE**

**DEFINED AT EXACTLY THE SAME ENERGIES AS THE FILE 3 CROSS SECTIONS,ACTIVATE**

**AND THAT THESE NEED MERELY BE MULTIPLIED BY THE FILE 9 TO DEFINE ACTIVATE**

**THE FILE 10 ACTIVATION CROSS SECTIONS. ACTIVATE**

**ACTIVATE**

**ENDF FORMAT ACTIVATE**

**----------- ACTIVATE**

**THIS PROGRAM ONLY USES THE ENDF BCD OR CARD IMAGE FORMAT (AS ACTIVATE**

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

**OF THE ENDF FORMAT (I.E., ENDF-1, 2, 3, 4, 5 OR 6 FORMAT). ACTIVATE**

**ACTIVATE**

**IT IS ASSUMED THAT THE DATA IS CORRECTLY CODED IN THE ENDF ACTIVATE**

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

**ASSUMED THAT THE MAT, MF AND MT ON EACH LINE IS CORRECT. SEQUENCE ACTIVATE**

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

**CORRECTLY OUTPUT ON ALL LINES. THE FORMAT OF SECTION MF=1, MT=451 ACTIVATE**

**AND ALL SECTIONS OF MF=3 MUST BE CORRECT. THE PROGRAM COPIES ALL ACTIVATE**

**OTHER SECTION OF DATA AS HOLLERITH AND AS SUCH IS INSENSITIVE TO ACTIVATE**

**THE CORRECTNESS OR INCORRECTNESS OF ALL OTHER SECTIONS. ACTIVATE**

**ACTIVATE**

**OUTPUT FORMAT ACTIVATE**

**------------- ACTIVATE**

**ALL ENERGIES WILL BE OUTPUT IN F (INSTEAD OF E) FORMAT IN ORDER ACTIVATE**

**TO ALLOW ENERGIES TO BE WRITTEN WITH UP TO 9 DIGITS OF ACCURACY. ACTIVATE**

**COMPARISON OF THE NORMAL ENDF CONVENTION OF 6 DIGITS TO THE 9 ACTIVATE**

**DIGIT OUTPUT FROM THIS PROGRAM DEMONSTRATED THAT FAILURE TO USE ACTIVATE**

**THE 9 DIGIT OUTPUT CAN LEAD TO LARGE ERRORS IN THE DATA DUE TO ACTIVATE**

**TRUNCATION OF ENERGIES TO 6 DIGITS DURING OUTPUT. ACTIVATE**

**ACTIVATE**

**CONTENTS OF OUTPUT ACTIVATE**

**------------------ ACTIVATE**

**ENTIRE EVALUATIONS ARE OUTPUT, NOT JUST THE PROCESSED DATA, E.G., ACTIVATE**

**ANGULAR AND ENERGY DISTRIBUTIONS ARE ALSO INCLUDED. ACTIVATE**

**ACTIVATE**

**DOCUMENTATION ACTIVATE**

**------------- ACTIVATE**

**THE FACT THAT THIS PROGRAM HAS OPERATED ON THE DATA IS DOCUMENTED ACTIVATE**

**BY THE ADDITION OF 3 COMMENT LINES AT THE END OF EACH HOLLERITH ACTIVATE**

**SECTION IN THE FORM ACTIVATE**

**ACTIVATE**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* PROGRAM ACTIVATE (2023-1) \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* ACTIVATE**

**FILE 10 ACTIVATION CROSS SECTIONS HAVE BEEN DEFINED BY COMBINING ACTIVATE**

**FILE 3 CROSS SECTIONS AND FILE 9 MULTIPLIERS. FILE 9 DELETED. ACTIVATE**

**ACTIVATE**

**THE ORDER OF SIMILAR COMMENTS (FROM RECENT, SIGMA1 AND GROUPIE) ACTIVATE**

**REPRESENTS A COMPLETE HISTORY OF ALL OPERATIONS PERFORMED ON ACTIVATE**

**THE DATA BY THESE PROGRAMS. ACTIVATE**

**ACTIVATE**

**THESE COMMENT LINES ARE ONLY ADDED TO EXISTING HOLLERITH SECTIONS,ACTIVATE**

**I.E., THIS PROGRAM WILL NOT CREATE A HOLLERITH SECTION. THE FORMATACTIVATE**

**OF THE HOLLERITH SECTION IN ENDF-5 DIFFERS FROM THE THAT OF ACTIVATE**

**EARLIER VERSIONS OF ENDF. BY READING AN EXISTING MF=1, MT=451 ACTIVATE**

**IT IS POSSIBLE FOR THIS PROGRAM TO DETERMINE WHICH VERSION OF ACTIVATE**

**THE ENDF FORMAT THE DATA IS IN. WITHOUT HAVING A SECTION OF ACTIVATE**

**MF=1, MT=451 PRESENT IT IS IMPOSSIBLE FOR THIS PROGRAM TO ACTIVATE**

**DETERMINE WHICH VERSION OF THE ENDF FORMAT THE DATA IS IN, AND ACTIVATE**

**AS SUCH IT IS IMPOSSIBLE FOR THE PROGRAM TO DETERMINE WHAT FORMAT ACTIVATE**

**SHOULD BE USED TO CREATE A HOLLERITH SECTION. ACTIVATE**

**ACTIVATE**

**REACTION INDEX ACTIVATE**

**-------------- ACTIVATE**

**THIS PROGRAM DOES NOT USE THE REACTION INDEX WHICH IS GIVEN IN ACTIVATE**

**SECTION MF=1, MT=451 OF EACH EVALUATION. ACTIVATE**

**ACTIVATE**

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

**THIS CONVENTION HAS BEEN ADOPTED BECAUSE MOST USERS DO NOT ACTIVATE**

**REQUIRE A CORRECT REACTION INDEX FOR THEIR APPLICATIONS AND IT WASACTIVATE**

**NOT CONSIDERED WORTHWHILE TO INCLUDE THE OVERHEAD OF CONSTRUCTING ACTIVATE**

**A CORRECT REACTION INDEX IN THIS PROGRAM. HOWEVER, IF YOU REQUIRE ACTIVATE**

**A REACTION INDEX FOR YOUR APPLICATIONS, AFTER RUNNING THIS PROGRAMACTIVATE**

**YOU MAY USE PROGRAM DICTIN TO CREATE A CORRECT REACTION INDEX. ACTIVATE**

**ACTIVATE**

**SECTION SIZE ACTIVATE**

**------------ ACTIVATE**

**SECTIONS OF MF=9 MULTIPLIERS ARE LIMITED TO A MAXIMUM OF 3,000,000ACTIVATE**

**ENERGY POINTS. ACTIVATE**

**ACTIVATE**

**THERE IS NO LIMIT ON THE NUMBER OF ENERGY POINTS IN MF=3 AND 10 ACTIVATE**

**TABLES = THIS DATA IS READ AS CHARACTERS, ONE LINE AT A TIME. ACTIVATE**

**ACTIVATE**

**SELECTION OF DATA ACTIVATE**

**----------------- ACTIVATE**

**THE PROGRAM PROCESSES ALL ENDF DATA ON ONE ENDF TAPE. ACTIVATE**

**ACTIVATE**

**2015 - IT NOW ONLY DOES ONE ENDF TAPE. ACTIVATE**

**ACTIVATE**

**PROGRAM OPERATION ACTIVATE**

**----------------- ACTIVATE**

**PASS #1 ACTIVATE**

**------- ACTIVATE**

**THE ENTIRE MAT IS COPIED TO A SCRATCH FILE IN THE ENDF ASCII ACTIVATE**

**FORMAT AND WHILE COPYING IT TO SCRATCH MF=3, 9, AND 10 ARE ALSO ACTIVATE**

**COPIED TO SEPERATE SCRATCH FILES, I.E., THERE ARE A TOTAL OF 4 ACTIVATE**

**SCRATCH FILES - SEE THEIR DEFINITIONS BELOW. ACTIVATE**

**ACTIVATE**

**PASS #2 ACTIVATE**

**------- ACTIVATE**

**IF NO MF=9 MULTIPLIERS ARE FOUND DURING PASS #1, THE ENTIRE MAT ACTIVATE**

**IS COPIED FROM SCRATCH TO THE OUTPUT FILE, WITHOUT ANY CHECKS. ACTIVATE**

**ACTIVATE**

**IF MF=9 MULTIPLIERS ARE FOUND THEY ARE USED WITH MF=3 CROSS ACTIVATE**

**SECTIONS TO CREATE MF=10 ACTIVATION CROSS SECTIONS. ACTIVATE**

**ACTIVATE**

**FOR ANY SECTION OF MF=10 DATA FOR WHICH NO MF=9 MULTIPLIERS ARE ACTIVATE**

**FOUND, THE ORIGINAL MF=10 IS OUTPUT. ACTIVATE**

**ACTIVATE**

**FOR CONSISTENCY ALL MF=9 MULTIPLIERS ARE DELETED, I.E., THEY ARE ACTIVATE**

**NOT INCLUDED IN THE OUTPUT. ACTIVATE**

**ACTIVATE**

**KEEP EVALUATED DATA POINTS ACTIVATE**

**-------------------------- ACTIVATE**

**THE FILE 10 OUTPUT WILL BE AT EXACTLY THE SAME ENERGY POINTS AS ACTIVATE**

**THE FILE 3 CROSS SECTIONS USED TO DEFINE THE FILE 10 ACTIVATION ACTIVATE**

**CROSS SECTIONS. ACTIVATE**

**ACTIVATE**

**INPUT FILES ACTIVATE**

**----------- ACTIVATE**

**UNIT DESCRIPTION ACTIVATE**

**---- ----------- ACTIVATE**

**2 INPUT LINES (BCD - 80 CHARACTERS/RECORD) ACTIVATE**

**10 ORIGINAL ENDF DATA (BCD - 80 CHARACTERS/RECORD) ACTIVATE**

**ACTIVATE**

**OUTPUT FILES ACTIVATE**

**------------ ACTIVATE**

**UNIT DESCRIPTION ACTIVATE**

**---- ----------- ACTIVATE**

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

**11 FINAL ENDF DATA (BCD - 80 CHARACTERS/RECORD) ACTIVATE**

**ACTIVATE**

**SCRATCH FILES ACTIVATE**

**------------- ACTIVATE**

**UNIT DESCRIPTION ACTIVATE**

**---- ----------- ACTIVATE**

**12 SCRATCH FILE FOR ALL MAT (BCD - 80 CHARACTERS/RECORD) ACTIVATE**

**14 SCRATCH FILE FOR MF=3 DATA (BCD - 80 CHARACTERS/RECORD) ACTIVATE**

**15 SCRATCH FILE FOR MF=9 DATA (BCD - 80 CHARACTERS/RECORD) ACTIVATE**

**16 SCRATCH FILE FOR MF=10 DATA (BCD - 80 CHARACTERS/RECORD) ACTIVATE**

**ACTIVATE**

**OPTIONAL STANDARD FILE NAMES (SEE SUBROUTINE FILEIO) ACTIVATE**

**---------------------------------------------------- ACTIVATE**

**UNIT FILE NAME ACTIVATE**

**---- ---------- ACTIVATE**

**2 ACTIVATE.INP ACTIVATE**

**3 ACTIVATE.LST ACTIVATE**

**10 ENDFB.IN ACTIVATE**

**11 ENDFB.OUT ACTIVATE**

**12 (SCRATCH) ACTIVATE**

**14 (SCRATCH) ACTIVATE**

**15 (SCRATCH) ACTIVATE**

**ACTIVATE**

**INPUT PARAMETERS ACTIVATE**

**---------------- ACTIVATE**

**ACTIVATE**

**LINE COLS. DESCRIPTION ACTIVATE**

**---- ----- ----------- ACTIVATE**

**1 1-72 ENDF INPUT DATA FILENAME ACTIVATE**

**(STANDARD OPTION = ENDFB.IN) ACTIVATE**

**2 1-72 ENDF OUTPUT DATA FILENAME ACTIVATE**

**(STANDARD OPTION = ENDFB.OUT) ACTIVATE**

**ACTIVATE**

**ONE PAIR OF INPUT LINES MAY BE USED, TO PROCESS ANY ENDF TAPE. ACTIVATE**

**ACTIVATE**

**2015 - NOW ONLY DOES ONE ENDF TAPE. ACTIVATE**

**ACTIVATE**

**EXAMPLE INPUT NO. 1 ACTIVATE**

**------------------- ACTIVATE**

**PROCESS ENDF TAPE NAMED ACTIVATE.IN AND NAME THE OUTPUT FILE ACTIVATE**

**ACTIVATE.OUT. ACTIVATE**

**ACTIVATE**

**IN THIS CASE THE FOLLOWING 2 INPUT LINES ARE REQUIRED ACTIVATE**

**ACTIVATE**

**ACTIVATE.IN ACTIVATE**

**ACTIVATE.OUT ACTIVATE**

**ACTIVATE**

**EXAMPLE INPUT NO. 2 ACTIVATE**

**------------------- ACTIVATE**

**SAME AS THE ABOVE CASE, EXCEPT THAT IN THIS CASE THE ORIGINAL ACTIVATE**

**TAPE IS IN A DIRECTORY NAMED \ENDFB6\ORIGINAL, AND THE ACTIVATE**

**RESULTS WILL BE WRITTEN INTO A DIRECTORY NAMED \ENDFB6\ACTIVATE. ACTIVATE**

**ACTIVATE**

**IN THIS CASE THE FOLLOWING 6 INPUT LINES ARE REQUIRED ACTIVATE**

**ACTIVATE**

**\ENDFB6\ORIGINAL\ACTIVATE.IN ACTIVATE**

**\ENDFB6\ACTIVATE\ACTIVATE.OUT ACTIVATE**

**ACTIVATE**

**EXAMPLE INPUT NO. 3 ACTIVATE**

**------------------- ACTIVATE**

**IF THERE IS NO ACTIVATE.INP FILE, OR THE FILENAMES ARE BLANK ACTIVATE**

**THIS CODE WILL USE THE DEFAULT NAMES, ACTIVATE**

**ACTIVATE**

**ENDFB.IN ACTIVATE**

**ENDFB.OUT ACTIVATE**

**ACTIVATE**

**=======================================================================ACTIVATE**