VERSION 9: VERSION 9: VERSION 9: VERSION 9:	<pre>====== 2-1 (JANUAI 2-2 (FEBRU; 2-3 (APRIL 2-4 (SEPT. 4-1 (JANUAI 6-1 (JANUAI</pre>	ARY 1992) 1992) 1992) RY 1994) RY 1996)	ACCOMMODATE JEF AND EFF EVALUATIONS. *ADDED ADDITIONAL DATA TESTS. *CORRECTED KALBACH-MANN CALCULATIONS. *FOR PHOTON PRODUCTION OUTPUT MF=12 (MULTIPLICITY), MF=14 (ISOTROPIC ANGULAR DISTRIBUTIONS) AND MF=15 (SPECTRA) - PREVIOUSLY ONLY MF=15. *FIRST ORDER CORRECTIONS TRANSFORMING CENTER-OF-MASS SPECTRA TO LAB SYSTEM FOR OUTPUT IN MF=5 *CORRECTED ISOTROPIC ANGULAR DISTRIBUTION FLAG (LI) *VARIABLE ENDF/B INPUT DATA FILENAME TO ALLOW ACCESS TO FILE STRUCTURES (WARNING - INPUT PARAMETER FORMAT HAS BEEN CHANGED) *CLOSE ALL FILES BEFORE TERMINATING (SEE, SUBROUTINE ENDIT) *INCREASED MAXIMUM TABLE SIZE FROM 2000 TO 6000. *COMPLETE RE-WRITE *IMPROVED COMPUTER INDEPENDENCE *ALL DOUBLE PRECISION *ON SCREEN OUTPUT *UNIFORM TREATMENT OF ENDF/B I/O	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
VERSION 92 VERSION 92 VERSION 92 VERSION 92 VERSION 94	<pre>====== 2-1 (JANUAI 2-2 (FEBRU; 2-3 (APRIL 2-4 (SEPT. 4-1 (JANUAI 6-1 (JANUAI</pre>	ARY 1992) 1992) 1992) RY 1994) RY 1996)	ACCOMMODATE JEF AND EFF EVALUATIONS. *ADDED ADDITIONAL DATA TESTS. *CORRECTED KALBACH-MANN CALCULATIONS. *FOR PHOTON PRODUCTION OUTPUT MF=12 (MULTIPLICITY), MF=14 (ISOTROPIC ANGULAR DISTRIBUTIONS) AND MF=15 (SPECTRA) - PREVIOUSLY ONLY MF=15. *FIRST ORDER CORRECTIONS TRANSFORMING CENTER-OF-MASS SPECTRA TO LAB SYSTEM FOR OUTPUT IN MF=5 *CORRECTED ISOTROPIC ANGULAR DISTRIBUTION FLAG (LI) *VARIABLE ENDF/B INPUT DATA FILENAME TO ALLOW ACCESS TO FILE STRUCTURES (WARNING - INPUT PARAMETER FORMAT HAS BEEN CHANGED) *CLOSE ALL FILES BEFORE TERMINATING (SEE, SUBROUTINE ENDIT) *INCREASED MAXIMUM TABLE SIZE FROM 2000 TO 6000. *COMPLETE RE-WRITE *IMPROVED COMPUTER INDEPENDENCE *ALL DOUBLE PRECISION *ON SCREEN OUTPUT *UNIFORM TREATMENT OF ENDF/B I/O	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
VERSION 93 VERSION 93 VERSION 93 VERSION 94 VERSION 94	2-1 (JANUA) 2-2 (FEBRU) 2-3 (APRIL 2-4 (SEPT. 4-1 (JANUA) 6-1 (JANUA)	ARY 1992) 1992) 1992) RY 1994) RY 1996)	ACCOMMODATE JEF AND EFF EVALUATIONS. *ADDED ADDITIONAL DATA TESTS. *CORRECTED KALBACH-MANN CALCULATIONS. *FOR PHOTON PRODUCTION OUTPUT MF=12 (MULTIPLICITY), MF=14 (ISOTROPIC ANGULAR DISTRIBUTIONS) AND MF=15 (SPECTRA) - PREVIOUSLY ONLY MF=15. *FIRST ORDER CORRECTIONS TRANSFORMING CENTER-OF-MASS SPECTRA TO LAB SYSTEM FOR OUTPUT IN MF=5 *CORRECTED ISOTROPIC ANGULAR DISTRIBUTION FLAG (LI) *VARIABLE ENDF/B INPUT DATA FILENAME TO ALLOW ACCESS TO FILE STRUCTURES (WARNING - INPUT PARAMETER FORMAT HAS BEEN CHANGED) *CLOSE ALL FILES BEFORE TERMINATING (SEE, SUBROUTINE ENDIT) *INCREASED MAXIMUM TABLE SIZE FROM 2000 TO 6000. *COMPLETE RE-WRITE *IMPROVED COMPUTER INDEPENDENCE *ALL DOUBLE PRECISION *ON SCREEN OUTPUT *UNIFORM TREATMENT OF ENDF/B I/O	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
VERSION 9: VERSION 9: VERSION 9: VERSION 9:	2-2 (FEBRU 2-3 (APRIL 2-4 (SEPT. 4-1 (JANUA) 6-1 (JANUA)	ARY 1992) 1992) 1992) RY 1994) RY 1996)	ACCOMMODATE JEF AND EFF EVALUATIONS. *ADDED ADDITIONAL DATA TESTS. *CORRECTED KALBACH-MANN CALCULATIONS. *FOR PHOTON PRODUCTION OUTPUT MF=12 (MULTIPLICITY), MF=14 (ISOTROPIC ANGULAR DISTRIBUTIONS) AND MF=15 (SPECTRA) - PREVIOUSLY ONLY MF=15. *FIRST ORDER CORRECTIONS TRANSFORMING CENTER-OF-MASS SPECTRA TO LAB SYSTEM FOR OUTPUT IN MF=5 *CORRECTED ISOTROPIC ANGULAR DISTRIBUTION FLAG (LI) *VARIABLE ENDF/B INPUT DATA FILENAME TO ALLOW ACCESS TO FILE STRUCTURES (WARNING - INPUT PARAMETER FORMAT HAS BEEN CHANGED) *CLOSE ALL FILES BEFORE TERMINATING (SEE, SUBROUTINE ENDIT) *INCREASED MAXIMUM TABLE SIZE FROM 2000 TO 6000. *COMPLETE RE-WRITE *IMPROVED COMPUTER INDEPENDENCE *ALL DOUBLE PRECISION *ON SCREEN OUTPUT *UNIFORM TREATMENT OF ENDF/B I/O	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
VERSION 92 VERSION 94 VERSION 94	2-3 (APRIL 2-4 (SEPT. 4-1 (JANUA) 6-1 (JANUA)	1992) 1992) RY 1994) RY 1996)	ACCOMMODATE JEF AND EFF EVALUATIONS. *ADDED ADDITIONAL DATA TESTS. *CORRECTED KALBACH-MANN CALCULATIONS. *FOR PHOTON PRODUCTION OUTPUT MF=12 (MULTIPLICITY), MF=14 (ISOTROPIC ANGULAR DISTRIBUTIONS) AND MF=15 (SPECTRA) - PREVIOUSLY ONLY MF=15. *FIRST ORDER CORRECTIONS TRANSFORMING CENTER-OF-MASS SPECTRA TO LAB SYSTEM FOR OUTPUT IN MF=5 *CORRECTED ISOTROPIC ANGULAR DISTRIBUTION FLAG (LI) *VARIABLE ENDF/B INPUT DATA FILENAME TO ALLOW ACCESS TO FILE STRUCTURES (WARNING - INPUT PARAMETER FORMAT HAS BEEN CHANGED) *CLOSE ALL FILES BEFORE TERMINATING (SEE, SUBROUTINE ENDIT) *INCREASED MAXIMUM TABLE SIZE FROM 2000 TO 6000. *COMPLETE RE-WRITE *IMPROVED COMPUTER INDEPENDENCE *ALL DOUBLE PRECISION *ON SCREEN OUTPUT *UNIFORM TREATMENT OF ENDF/B I/O	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
VERSION 94	2-4 (SEPT. 4-1 (JANUA) 6-1 (JANUA)	1992) RY 1994) RY 1996)	<pre>*CORRECTED KALBACH-MANN CALCULATIONS. *FOR PHOTON PRODUCTION OUTPUT MF=12 (MULTIPLICITY), MF=14 (ISOTROPIC ANGULAR DISTRIBUTIONS) AND MF=15 (SPECTRA) - PREVIOUSLY ONLY MF=15. *FIRST ORDER CORRECTIONS TRANSFORMING CENTER-OF-MASS SPECTRA TO LAB SYSTEM FOR OUTPUT IN MF=5 *CORRECTED ISOTROPIC ANGULAR DISTRIBUTION FLAG (LI) *VARIABLE ENDF/B INPUT DATA FILENAME TO ALLOW ACCESS TO FILE STRUCTURES (WARNING - INPUT PARAMETER FORMAT HAS BEEN CHANGED) *CLOSE ALL FILES BEFORE TERMINATING (SEE, SUBROUTINE ENDIT) *INCREASED MAXIMUM TABLE SIZE FROM 2000 TO 6000. *COMPLETE RE-WRITE *IMPROVED COMPUTER INDEPENDENCE *ALL DOUBLE PRECISION *ON SCREEN OUTPUT *UNIFORM TREATMENT OF ENDF/B I/O</pre>	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
VERSION 94	4-1 (JANUA) 6-1 (JANUA)	RY 1994) RY 1996)	<pre>*FOR PHOTON PRODUCTION OUTPUT MF=12 (MULTIPLICITY), MF=14 (ISOTROPIC ANGULAR DISTRIBUTIONS) AND MF=15 (SPECTRA) - PREVIOUSLY ONLY MF=15. *FIRST ORDER CORRECTIONS TRANSFORMING CENTER-OF-MASS SPECTRA TO LAB SYSTEM FOR OUTPUT IN MF=5 *CORRECTED ISOTROPIC ANGULAR DISTRIBUTION FLAG (LI) *VARIABLE ENDF/B INPUT DATA FILENAME TO ALLOW ACCESS TO FILE STRUCTURES (WARNING - INPUT PARAMETER FORMAT HAS BEEN CHANGED) *CLOSE ALL FILES BEFORE TERMINATING (SEE, SUBROUTINE ENDIT) *INCREASED MAXIMUM TABLE SIZE FROM 2000 TO 6000. *COMPLETE RE-WRITE *IMPROVED COMPUTER INDEPENDENCE *ALL DOUBLE PRECISION *ON SCREEN OUTPUT *UNIFORM TREATMENT OF ENDF/B I/O</pre>	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
VERSION 9	6-1 (JANUA)	RY 1996)	<pre>(MULTIPLICITY), MF=14 (ISOTROPIC ANGULAR DISTRIBUTIONS) AND MF=15 (SPECTRA) - PREVIOUSLY ONLY MF=15. *FIRST ORDER CORRECTIONS TRANSFORMING CENTER-OF-MASS SPECTRA TO LAB SYSTEM FOR OUTPUT IN MF=5 *CORRECTED ISOTROPIC ANGULAR DISTRIBUTION FLAG (LI) *VARIABLE ENDF/B INPUT DATA FILENAME TO ALLOW ACCESS TO FILE STRUCTURES (WARNING - INPUT PARAMETER FORMAT HAS BEEN CHANGED) *CLOSE ALL FILES BEFORE TERMINATING (SEE, SUBROUTINE ENDIT) *INCREASED MAXIMUM TABLE SIZE FROM 2000 TO 6000. *COMPLETE RE-WRITE *IMPROVED COMPUTER INDEPENDENCE *ALL DOUBLE PRECISION *ON SCREEN OUTPUT *UNIFORM TREATMENT OF ENDF/B I/O</pre>	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
JERSION 9	6-1 (JANUA)	RY 1996)	ANGULAR DISTRIBUTIONS) AND MF=15 (SPECTRA) - PREVIOUSLY ONLY MF=15. *FIRST ORDER CORRECTIONS TRANSFORMING CENTER-OF-MASS SPECTRA TO LAB SYSTEM FOR OUTPUT IN MF=5 *CORRECTED ISOTROPIC ANGULAR DISTRIBUTION FLAG (LI) *VARIABLE ENDF/B INPUT DATA FILENAME TO ALLOW ACCESS TO FILE STRUCTURES (WARNING - INPUT PARAMETER FORMAT HAS BEEN CHANGED) *CLOSE ALL FILES BEFORE TERMINATING (SEE, SUBROUTINE ENDIT) *INCREASED MAXIMUM TABLE SIZE FROM 2000 TO 6000. *COMPLETE RE-WRITE *IMPROVED COMPUTER INDEPENDENCE *ALL DOUBLE PRECISION *ON SCREEN OUTPUT *UNIFORM TREATMENT OF ENDF/B I/O	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
TERSION 9	6-1 (JANUA)	RY 1996)	<pre>(SPECTRA) - PREVIOUSLY ONLY MF=15. *FIRST ORDER CORRECTIONS TRANSFORMING CENTER-OF-MASS SPECTRA TO LAB SYSTEM FOR OUTPUT IN MF=5 *CORRECTED ISOTROPIC ANGULAR DISTRIBUTION FLAG (LI) *VARIABLE ENDF/B INPUT DATA FILENAME TO ALLOW ACCESS TO FILE STRUCTURES (WARNING - INPUT PARAMETER FORMAT HAS BEEN CHANGED) *CLOSE ALL FILES BEFORE TERMINATING (SEE, SUBROUTINE ENDIT) *INCREASED MAXIMUM TABLE SIZE FROM 2000 TO 6000. *COMPLETE RE-WRITE *IMPROVED COMPUTER INDEPENDENCE *ALL DOUBLE PRECISION *ON SCREEN OUTPUT *UNIFORM TREATMENT OF ENDF/B I/O</pre>	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
TERSION 9	6-1 (JANUA)	RY 1996)	<pre>*FIRST ORDER CORRECTIONS TRANSFORMING CENTER-OF-MASS SPECTRA TO LAB SYSTEM FOR OUTPUT IN MF=5 *CORRECTED ISOTROPIC ANGULAR DISTRIBUTION FLAG (LI) *VARIABLE ENDF/B INPUT DATA FILENAME TO ALLOW ACCESS TO FILE STRUCTURES (WARNING - INPUT PARAMETER FORMAT HAS BEEN CHANGED) *CLOSE ALL FILES BEFORE TERMINATING (SEE, SUBROUTINE ENDIT) *INCREASED MAXIMUM TABLE SIZE FROM 2000 TO 6000. *COMPLETE RE-WRITE *IMPROVED COMPUTER INDEPENDENCE *ALL DOUBLE PRECISION *ON SCREEN OUTPUT *UNIFORM TREATMENT OF ENDF/B I/O</pre>	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
TERSION 9	6-1 (JANUA)	RY 1996)	CENTER-OF-MASS SPECTRA TO LAB SYSTEM FOR OUTPUT IN MF=5 *CORRECTED ISOTROPIC ANGULAR DISTRIBUTION FLAG (LI) *VARIABLE ENDF/B INPUT DATA FILENAME TO ALLOW ACCESS TO FILE STRUCTURES (WARNING - INPUT PARAMETER FORMAT HAS BEEN CHANGED) *CLOSE ALL FILES BEFORE TERMINATING (SEE, SUBROUTINE ENDIT) *INCREASED MAXIMUM TABLE SIZE FROM 2000 TO 6000. *COMPLETE RE-WRITE *IMPROVED COMPUTER INDEPENDENCE *ALL DOUBLE PRECISION *ON SCREEN OUTPUT *UNIFORM TREATMENT OF ENDF/B I/O	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
TERSION 9	6-1 (JANUA)	RY 1996)	FOR OUTPUT IN MF=5 *CORRECTED ISOTROPIC ANGULAR DISTRIBUTION FLAG (LI) *VARIABLE ENDF/B INPUT DATA FILENAME TO ALLOW ACCESS TO FILE STRUCTURES (WARNING - INPUT PARAMETER FORMAT HAS BEEN CHANGED) *CLOSE ALL FILES BEFORE TERMINATING (SEE, SUBROUTINE ENDIT) *INCREASED MAXIMUM TABLE SIZE FROM 2000 TO 6000. *COMPLETE RE-WRITE *IMPROVED COMPUTER INDEPENDENCE *ALL DOUBLE PRECISION *ON SCREEN OUTPUT *UNIFORM TREATMENT OF ENDF/B I/O	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
VERSION 9	6-1 (JANUA)	RY 1996)	<pre>*CORRECTED ISOTROPIC ANGULAR DISTRIBUTION FLAG (LI) *VARIABLE ENDF/B INPUT DATA FILENAME TO ALLOW ACCESS TO FILE STRUCTURES (WARNING - INPUT PARAMETER FORMAT HAS BEEN CHANGED) *CLOSE ALL FILES BEFORE TERMINATING (SEE, SUBROUTINE ENDIT) *INCREASED MAXIMUM TABLE SIZE FROM 2000 TO 6000. *COMPLETE RE-WRITE *IMPROVED COMPUTER INDEPENDENCE *ALL DOUBLE PRECISION *ON SCREEN OUTPUT *UNIFORM TREATMENT OF ENDF/B I/O</pre>	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
JERSION 9	6-1 (JANUA)	RY 1996)	DISTRIBUTION FLAG (LI) *VARIABLE ENDF/B INPUT DATA FILENAME TO ALLOW ACCESS TO FILE STRUCTURES (WARNING - INPUT PARAMETER FORMAT HAS BEEN CHANGED) *CLOSE ALL FILES BEFORE TERMINATING (SEE, SUBROUTINE ENDIT) *INCREASED MAXIMUM TABLE SIZE FROM 2000 TO 6000. *COMPLETE RE-WRITE *IMPROVED COMPUTER INDEPENDENCE *ALL DOUBLE PRECISION *ON SCREEN OUTPUT *UNIFORM TREATMENT OF ENDF/B I/O	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
VERSION 9	6-1 (JANUA)	RY 1996)	<pre>*VARIABLE ENDF/B INPUT DATA FILENAME TO ALLOW ACCESS TO FILE STRUCTURES (WARNING - INPUT PARAMETER FORMAT HAS BEEN CHANGED) *CLOSE ALL FILES BEFORE TERMINATING (SEE, SUBROUTINE ENDIT) *INCREASED MAXIMUM TABLE SIZE FROM 2000 TO 6000. *COMPLETE RE-WRITE *IMPROVED COMPUTER INDEPENDENCE *ALL DOUBLE PRECISION *ON SCREEN OUTPUT *UNIFORM TREATMENT OF ENDF/B I/O</pre>	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
TERSION 9	6-1 (JANUA)	RY 1996)	TO ALLOW ACCESS TO FILE STRUCTURES (WARNING - INPUT PARAMETER FORMAT HAS BEEN CHANGED) *CLOSE ALL FILES BEFORE TERMINATING (SEE, SUBROUTINE ENDIT) *INCREASED MAXIMUM TABLE SIZE FROM 2000 TO 6000. *COMPLETE RE-WRITE *IMPROVED COMPUTER INDEPENDENCE *ALL DOUBLE PRECISION *ON SCREEN OUTPUT *UNIFORM TREATMENT OF ENDF/B I/O	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
			 HAS BEEN CHANGED) *CLOSE ALL FILES BEFORE TERMINATING (SEE, SUBROUTINE ENDIT) *INCREASED MAXIMUM TABLE SIZE FROM 2000 TO 6000. *COMPLETE RE-WRITE *IMPROVED COMPUTER INDEPENDENCE *ALL DOUBLE PRECISION *ON SCREEN OUTPUT *UNIFORM TREATMENT OF ENDF/B I/O 	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
			*CLOSE ALL FILES BEFORE TERMINATING (SEE, SUBROUTINE ENDIT) *INCREASED MAXIMUM TABLE SIZE FROM 2000 TO 6000. *COMPLETE RE-WRITE *IMPROVED COMPUTER INDEPENDENCE *ALL DOUBLE PRECISION *ON SCREEN OUTPUT *UNIFORM TREATMENT OF ENDF/B I/O	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
			(SEE, SUBROUTINE ENDIT) *INCREASED MAXIMUM TABLE SIZE FROM 2000 TO 6000. *COMPLETE RE-WRITE *IMPROVED COMPUTER INDEPENDENCE *ALL DOUBLE PRECISION *ON SCREEN OUTPUT *UNIFORM TREATMENT OF ENDF/B I/O	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
			*INCREASED MAXIMUM TABLE SIZE FROM 2000 TO 6000. *COMPLETE RE-WRITE *IMPROVED COMPUTER INDEPENDENCE *ALL DOUBLE PRECISION *ON SCREEN OUTPUT *UNIFORM TREATMENT OF ENDF/B I/O	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
			2000 TO 6000. *COMPLETE RE-WRITE *IMPROVED COMPUTER INDEPENDENCE *ALL DOUBLE PRECISION *ON SCREEN OUTPUT *UNIFORM TREATMENT OF ENDF/B I/O	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
			*COMPLETE RE-WRITE *IMPROVED COMPUTER INDEPENDENCE *ALL DOUBLE PRECISION *ON SCREEN OUTPUT *UNIFORM TREATMENT OF ENDF/B I/O	SIXPAK SIXPAK SIXPAK SIXPAK
			*IMPROVED COMPUTER INDEPENDENCE *ALL DOUBLE PRECISION *ON SCREEN OUTPUT *UNIFORM TREATMENT OF ENDF/B I/O	SIXPAK SIXPAK SIXPAK
VERSION 99	9-1 (MARCH	1999)	*ALL DOUBLE PRECISION *ON SCREEN OUTPUT *UNIFORM TREATMENT OF ENDF/B I/O	SIXPAK SIXPAK
ERSION 9	9-1 (MARCH	1999)	*ON SCREEN OUTPUT *UNIFORM TREATMENT OF ENDF/B I/O	SIXPAK
VERSION 9	9-1 (MARCH	1999)	*UNIFORM TREATMENT OF ENDF/B I/O	
TERSION 9	9-1 (MARCH	1999)		
ERSION 9	9-1 (MARCH	1999)	*IMPROVED OUTPUT PRECISION	SIXPAK
			*CORRECTED CHARACTER TO FLOATING	SIXPAK
			POINT READ FOR MORE DIGITS	SIXPAK
			•	SIXPAK
			VERSION BASED ON RECENT FORMAT CHANGE	
			*GENERAL IMPROVEMENTS BASED ON	SIXPAK
EDGTON O	0.0 (1000	USER FEEDBACK	SIXPAK
ERSION 9	9-2 (JUNE)	1999)	*ASSUME ENDF/B-VI, NOT V, IF MISSING MF=1, MT-451.	SIXPAK
EBS 200	0-1 (FEBRU	ARY 2000)*GENERAL IMPROVEMENTS BASED ON	SIXPAK
2100. 2000	0 1 (1221:0		USER FEEDBACK	SIXPAK
ERS. 2003	2-1 (JANUA	RY 2002)	*CORRECTED ANGULAR DISTRIBUTION (MF=4)	
	-		OUTPUT TO INSURE USED FIELDS ARE 0	SIXPAK
	(MAY 2			SIXPAK
	(NOV.	2002)	*EXTENDED TO ALLOW CHARGED PARTICLE	SIXPAK
				SIXPAK
			WARNING - STRICTLY SPEAKING THIS IS	
			NOT LEGAL, SINCE MF=4 IS SUPPOSED TO	
			BE USED ONLY FOR NEUTRON ANGULAR DISTRIBUTIONS - BUT WHERE MT MAKES	SIXPAK
			IT OBVIOUS THAT THE OUTGOING PARTICLE	SIXPAK
			IS NOT A NEUTRON HOPEFULLY IT WILL	SIXPAK
			NOT CAUSE A PROBLEM IF MF=4 IS USED	SIXPAK
			FOR CHARGED PARTICLES.	SIXPAK
ERS. 2004	4-1 (MARCH	2004)	*ADDED INCLUDE FOR COMMON	SIXPAK
			*INCREASED MAXIMUM TABLE SIZE FROM	SIXPAK
			6,000 TO 12,000.	SIXPAK
			*ADDED DUMMY A FOR ELEMENTS	SIXPAK
			*CORRECTED OUTPUT INTERPOLATON LAWS	SIXPAK
ERS. 200'	7-1 (JAN.	2007)	*CHECKED AGAINST ALL ENDF/B-VII.	SIXPAK
			*INCREASED MAXIMUM TABLE SIZE FROM	SIXPAK
	7-0 (550	20071	12,000 TO 120,000.	SIXPAK
	7-2 (DEC.	2007)	*72 CHARACTER FILE NAMES.	SIXPAK
	0-1 (Apr. 1-1 (May	2010) 2011)	*General update based on user feedback *Added MF/MT=9/5 yield output starting	
ERS. 201.	T T (May	2011)	<pre>*Added MF/MT=9/5 yield output starting from MF/MT=6/5 distributions.</pre>	SIXPAN
			*Increased maximum Legendre order from	
			30 to 1,000 - WARNING - using more	SIXPAK
			than 30 results in NONSENSE = NOISE!!	
ERS. 2012				SIXPAK

==:

		*Added CODENAME	SIXPAK
		*32 and 64 bit Compatible	SIXPAK
		*Added ERROR stop	SIXPAK
		*For photons, combine discrete and	SIXPAK
		continuum into tabulated increasing	SIXPAK
		energy order.	SIXPAK
		*Check energy output order increasing	.SIXPAK
		Print WARNING if not increasing - do	SIXPAK
		not STOP- stopping would prevent ALL	SIXPAK
		output - the user may not be at all	SIXPAK
		interested in the BAD data, but may	SIXPAK
		be interested in other output data	SIXPAK
		that is o.k.	SIXPAK
VERS. 2015-1 (Jan.	2015)	*Extended OUT9.	SIXPAK
		*Replaced ALL 3 way IF Statements.	SIXPAK
		*Deleted unused coding.	SIXPAK
VERS. 2017-1 (May	2017)	*Increased max. point to 600,000	SIXPAK
· -		*Updated based on user feedback	SIXPAK
VERS. 2017-2 (Oct.	2017)	*Updated for new P(nu) formats =	SIXPAK
		Recognized and ignored = no MF=5	SIXPAK
		equivalent.	SIXPAK
VERS. 2018-1 (Jan.	2018)	*Updated to skip Nu-Bar Data = there	SIXPAK
••••		is no double-differential data to	SIXPAK
		process.	SIXPAK
		*On-linr report for ALL ENDERROR	SIXPAK
VERS. 2019-1 (June	2019)	*Additional Interpolation Law Tests	SIXPAK
V2165: 2019 1 (0une	2019)	*Checked Maximum Tabulated Energy to	SIXPAK
		insure it is the same for all MTs -	SIXPAK
		if not, print WARNING messages.	SIXPAK
		*WARNING MT=5 - not allowed in MF=4/5	
		see ENDF102 - but will translate here	
		to allow diagnostic use ONLY.	SIXPAK
		*Corrected END Histogram - guarantee	
		it ends with zero cross section, e.g.,	
		(E,Y) only defines upper energy of	SIXPAK
		the last group - Y has no meaning,	SIXPAK
1750 2020 1 (Mar	20203	by ENDF convention it should be $Y = ($	
VERS. 2020-1 (Mar.	2020)	*Added ENDFB.MF3 for MF/MT=3/5 parta	SIXPAK
		based on MF=6/5.	SIXPAK
	0001	*Added Target Isomer State	SIXPAK
VERS. 2021-1 (Jan.	2021)	*Updated for FORTRAN 2018	SIXPAK
			SIXPAK
OWNED, MAINTAINED A	ND DISTR	IBUTED BY	SIXPAK
			SIXPAK
THE NUCLEAR DATA SE			SIXPAK
INTERNATIONAL ATOMIC	C ENERGY	AGENCY	SIXPAK
P.O. BOX 100			SIXPAK
A-1400, VIENNA, AUS	TRIA		SIXPAK
EUROPE			SIXPAK
			SIXPAK
ORIGINALLY WRITTEN	BY		SIXPAK
			SIXPAK
Dermott E. Cullen			SIXPAK
			SIXPAK
PRESENT CONTACT INF	ORMATION		SIXPAK
			SIXPAK
Dermott E. Cullen			SIXPAK
1466 Hudson Way			SIXPAK
Livermore, CA 94550			SIXPAK
U.S.A.			SIXPAK
Telephone 925-443-	1911		SIXPAK
E. Mail RedCuller		st.net	SIXPAK
			SIXPAK
Website RedCuller	n1.net/H		
Website RedCuller	n1.net/H	OMERAGE . NEW	
	n1.net/H	ONLEAGE . NEW	SIXPAK
Website RedCuller COLLABORATION	n1.net/H		SIXPAK SIXPAK
COLLABORATION			SIXPAK SIXPAK =SIXPAK
COLLABORATION			SIXPAK SIXPAK SIXPAK SIXPAK
COLLABORATION DEVELOPED IN COLLABO	ORATION	with,	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
COLLABORATION DEVELOPED IN COLLABO	ORATION		SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
COLLABORATION 	ORATION	with,	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK

	SIXPAK
*CENTRO TECNICO AEROSPACIAL, SAO JOSE DOS CAMPOS, BRAZIL	SIXPAK
	SIXPAK
AS A PART OF AN INTERNATIONAL PROJECT ON THE EXCHANGE OF NUCLEAR DATA	SIXPAK SIXPAK
NOCHEAN DATA	SIXPAK
ACKNOWLEDGEMENT (VERSION 92-1)	SIXPAK
	-SIXPAK
THE AUTHOR THANKS SOL PEARLSTEIN (BROOKHAVEN NATIONAL LAB) FOR	SIXPAK
SIGNIFICANTLY CONTRIBUTING TOWARD IMPROVING THE ACCURACY AND	SIXPAK
COMPUTER INDEPENDENCE OF THIS CODE - THANKS, SOL	SIXPAK SIXPAK
ACKNOWLEDGEMENT (VERSION 92-4)	SIXPAK
	-SIXPAK
THE AUTHOR THANKS BOB MACFARLANE (LOS ALAMOS) FOR SUGGESTING HOW	SIXPAK
TO PROPERLY OUTPUT THE PHOTON PRODUCTION DATA TO PUT IT INTO	SIXPAK
EXACTLY THE FORM NEEDED FOR USE IN PROCESSING CODES.	SIXPAK SIXPAK
THE AUTHOR THANKS CHRIS DEAN (WINFRITH) FOR POINTING OUT ERRORS	SIXPAK
IN THE EARLIER TREATMENT OF THE KALBACH-MANN FORMALISM AND IN	SIXPAK
THE DEFINITION OF THE ISOTROPIC ANGULAR DISTRIBUTION FLAG (LI).	SIXPAK
	SIXPAK
AUTHORS MESSAGE	SIXPAK
THE COMMENTS BELOW SHOULD BE CONSIDERED THE LATEST DOCUMENTATION INCLUDING ALL RECENT IMPROVEMENTS. PLEASE READ ALL OF THESE	SIXPAK SIXPAK
COMMENTS BEFORE IMPLEMENTING AND USING THESE CODES.	SIXPAK
	SIXPAK
AT THE PRESENT TIME WE ARE ATTEMPTING TO DEVELOP A SET OF COMPUTER	SIXPAK
INDEPENDENT PROGRAMS THAT CAN EASILY BE IMPLEMENTED ON ANY ONE	SIXPAK
OF A WIDE VARIETY OF COMPUTERS. IN ORDER TO ASSIST IN THIS PROJECT	
IT WOULD BE APPECIATED IF YOU WOULD NOTIFY THE AUTHOR OF ANY	SIXPAK
COMPILER DIAGNOSTICS, OPERATING PROBLEMS OR SUGGESTIONS ON HOW TO IMPROVE THIS PROGRAM. HOPEFULLY, IN THIS WAY FUTURE VERSIONS OF	SIXPAK
THIS PROGRAM WILL BE COMPLETELY COMPATIBLE FOR USE ON YOUR	SIXPAK
COMPUTER.	SIXPAK
	SIXPAK
PURPOSE	SIXPAK
1) CHECK ALL DOUBLE-DIFFERENTIAL DATA (MF=6)	SIXPAK SIXPAK
2) OUTPUT EQUIVALENT MF = 4, 5, 12, 14 AND 15 DATA.	SIXPAK
	SIXPAK
DATA CHECKING	SIXPAK
ALL OF THE ENDF/B-VI MF=6 DATA IS CHECKED - FOR DETAILS SEE BELOW.	
	SIXPAK
THE MF=6 DATA IS NOT CORRECTED AND OUTPUT IN THE ENDF/B FORMAT. IT IS MERELY CHECKED. IF ERRORS ARE FOUND IT IS UP TO THE USER	SIXPAK SIXPAK
TO TAKE CORRECTIVE ACTION ON THE MF=6 DATA.	SIXPAK
	SIXPAK
IN CONTRAST WHEN PROBLEMS ARE FOUND IN DATA WHICH WILL BE OUTPUT	
IN THE ENDF/B FORMAT (MF=4, 5, 12, 14 AND 15), WHENEVER POSSIBLE	
CORRECTIVE ACTION WILL BE TAKEN.	SIXPAK
FURTHER CHECKS AND CORRECTIONS	SIXPAK SIXPAK
ONCE THE DATA HAS BEEN OUTPUT IN MF = 4, 5, 12, 14 AND 15 FORMATS	
FURTHER CORRECTIVE ACTION CAN BE TAKEN AS FOLLOWS,	SIXPAK
	SIXPAK
PROGRAM LEGEND	SIXPAK
CAN BE HORD TO CODDECT ANCHIAD DICEDITINTONE MUTCH ADD MECANTITE	SIXPAK
CAN BE USED TO CORRECT ANGULAR DISTRIBUTIONS WHICH ARE NEGATIVE, TO CONVERT FROM LEGENDRE COEFFICIENTS TO TABULATED ANGULAR	SIXPAK
CAN BE USED TO CORRECT ANGULAR DISTRIBUTIONS WHICH ARE NEGATIVE, TO CONVERT FROM LEGENDRE COEFFICIENTS TO TABULATED ANGULAR DISTRIBUTIONS AND GENERALLY PERFORM MORE EXTENSIVE TESTS OF	
TO CONVERT FROM LEGENDRE COEFFICIENTS TO TABULATED ANGULAR	SIXPAK SIXPAK
TO CONVERT FROM LEGENDRE COEFFICIENTS TO TABULATED ANGULAR DISTRIBUTIONS AND GENERALLY PERFORM MORE EXTENSIVE TESTS OF ALL MF=4 DATA.	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
TO CONVERT FROM LEGENDRE COEFFICIENTS TO TABULATED ANGULAR DISTRIBUTIONS AND GENERALLY PERFORM MORE EXTENSIVE TESTS OF ALL MF=4 DATA. PROGRAM EVALPLOT	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
TO CONVERT FROM LEGENDRE COEFFICIENTS TO TABULATED ANGULAR DISTRIBUTIONS AND GENERALLY PERFORM MORE EXTENSIVE TESTS OF ALL MF=4 DATA. PROGRAM EVALPLOT	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
TO CONVERT FROM LEGENDRE COEFFICIENTS TO TABULATED ANGULAR DISTRIBUTIONS AND GENERALLY PERFORM MORE EXTENSIVE TESTS OF ALL MF=4 DATA. PROGRAM EVALPLOT	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK

GRAPHICS IS AN EXCELLENT WAY TO CHECK THIS DATA.	SIXPAK
PROGRAM PLOTTAB	SIXPAK SIXPAK
	SIXPAK
THIS IS A GENERAL PLOTTING PROGRAM AND THERE IS AN INTERFACE IN	SIXPAK
THIS CODE TO PRODUCE OUTPUT FOR ANY MF=6 DATA IN THE PLOTTAB INPUT FORMAT. THIS PROGRAM CAN BE USED TO CHECK ALL OF THE MF=6	SIXPAK SIXPAK
DATA AS WELL AS THE EQUIVALENT MF=4, 5, 12, 14 AND 15 DATA - AS	SIXPAK
WELL AS COMPARING THE ORIGINAL MF=6 AND EQUIVALENT DATA.	SIXPAK
	SIXPAK
DATA OUTPUT ==================================	SIXPAK SIXPAK
THE ENDF/B MF=4, 5, 12, 14 AND 15 FORMATS ONLY ALLOW FOR NEUTRONS	
INCIDENTS	SIXPAK
THE ENDF/B MF=4 AND 5 FORMATS ONLY ALLOW FOR NEUTRONS OUTGOING.	SIXPAK SIXPAK
	SIXPAK
THE ENDF/B MF=12, 14 AND 15 ONLY ALLOWS FOR PHOTONS OUTGOING.	SIXPAK
THESE ARE THE ONLY COMBINATIONS OF DATA OUTPUT BY THIS CODE.	SIXPAK
THESE ARE THE ONLY COMMINATIONS OF DATA OUTFUT BY THIS CODE.	SIXPAK SIXPAK
ALL OTHER COMBINATIONS OF INCIDENT AND OUTGOING PARTICLES ARE	SIXPAK
CHECKED, BUT THE RESULTS CANNOT BE OUTPUT IN THE ENDF/B FORMAT.	SIXPAK
HOWEVER, USING THE PLOTTAB INTERFACE BUILT INTO THIS CODE THIS DATA CAN, AND HAS BEEN, OUTPUT AND CHECKED.	SIXPAK SIXPAK
DATA CAR, AND MAD DEEN, COTTOT AND CHICKED.	SIXPAK
THE NEUTRON DATA IN MF=4 CAN BE IN THE FORM OF EITHER TABULATED	SIXPAK
ANGULAR DISTRIBUTIONS OR LEGENDRE COEFFICIENTS.	SIXPAK
THE NEUTRON (MF=5) OR PHOTON (MF=15) SPECTRA ARE BOTH IN EXACTLY	SIXPAK SIXPAK
THE SAME FORMAT = ARBITRARY TABULATED FUNCTIONS - ENDF/B OPTION	SIXPAK
LF=1.	SIXPAK
ENDF/B DATA OUTPUT ORDER	SIXPAK SIXPAK
ENDF/B DATA IS OUTPUT IN ASCENDING MAT, MF, MT ORDER. IN ORDER TO	
ALLOW THIS PROGRAM TO PRODUCE ALL OUTPUT IN A SINGLE PASS THROUGH	
THE MF=6 DATA, OUTPUT FOR EACH (MAT, MT) IS OUTPUT TO SEPERATE FILES FOR MF=4, 5, 12, 14 AND 15.	SIXPAK SIXPAK
	SIXPAK
FOR SUBSEQUENT USE THE ENDF/B FORMATTED DATA OUTPUT BY THIS CODE	SIXPAK
CAN BE MERGED TOGETHER USING PROGRAM MERGER (CONTAIN THE AUTHOR OF THIS CODE FOR A COPY OF MERGER), E.G., MERGE MF=12, 14 AND 15	SIXPAK SIXPAK
DATA IN ORDER TO THEN CALCULATE PHOTON PRODUCTION DATA OR MF=4	SIXPAK
AND 5 CAN BE MERGED TOGETHER TO CALCULATE NEUTRON TRANSFER - OR	SIXPAK
ALL OF THEM CAN BE MERGED TOGETHER TO PERFORM NEUTRON AND PHOTON	SIXPAK
CALCULATIONS.	SIXPAK SIXPAK
CORRELATED (MF=6) VS. UNCORRELATED (MF=4 AND 5) DATA	SIXPAK
	SIXPAK
THE ENDF/B DOUBLE DIFFERENTAL = CORRELATED - DATA IN MF=6 REPRESENTS DATA IN THE FORM,	SIXPAK SIXPAK
MERIDDATIO DATA TA THE FORM,	SIXPAK
F(E,EP,COS) = SIG(E)*Y(E)*G0(E,EP)*F(E,EP,COS)	SIXPAK
	SIXPAK
SIG(E) = MF=3 CROSS SECTIONS Y(E) = YIELD (MULTIPLICITY)	SIXPAK SIXPAK
GO(E,EP) = ENERGY SPECTRUM	SIXPAK
F(E,EP,COS) = ANGULAR DISTRIBUTION	SIXPAK
IN A SITUATION WHERE YOU HAVE MONOENERGETIC AND MONODIRECTIONAL	SIXPAK SIXPAK
NEUTRONS INCIDENT YOU WILL BE ABLE TO OBSERVE CORRELATION EFFECTS	
	SIXPAK
	SIXPAK
EVEN IN SITUATIONS WHERE YOU HAVE A NARROW SPECTRUM OF NEUTRONS THAT ARE HIGHLY DIRECTIONALLY ORIENTED YOU MAY BE ABLE TO OBSERVE	SIXPAK
	SIXPAK
INCIDENT ON THE FIRST WALL OF A CTR DEVICE.	SIXPAK
FOR SUCH SITUATIONS USE OF THE CORRELATED (MF=6) DATA IS REQUIRED	SIXPAK
IN CALCULATIONS.	SIXPAK

	SIXPAK
υρωένερ τη μαίν αρρίτραπτρής ωμέρε πμέρε το α ορόαρ ορέρποιμ ότ	SIXPAK
HOWEVER, IN MANY APPLICATIONS WHERE THERE IS A BROAD SPECTRUM OF NEUTRONS AND THE NEUTRON FLUX IS NOT HIGHLY DIRECTIONALLY	SIXPAK
ORIENTED, THE NEUTRON MULTIPLICATION, SPECTRUM AND ORIENTATION	SIXPAK
CAN BE FAIRLY ACCURATELY CALCULATED WITHOUT CONSIDERING	SIXPAK
CORRELATION EFFECTS.	SIXPAK
	SIXPAK
THE UNCORRELATED DATA PRODUCED BY THIS CODE REPLACES THE	SIXPAK
CORRELATED DATA,	SIXPAK
	SIXPAK
F(E, EP, COS) = SIG(E) * Y(E) * GO(E, EP) * F(E, EP, COS)	SIXPAK
- (-,,,, -(-,-,-,	SIXPAK
BY THE UNCORRELATED DATA,	SIXPAK
	SIXPAK
F(E,EP,COS) = SIG(E)*Y(E)*G0(E,EP)*F0(E,COS)	SIXPAK
	SIXPAK
BY INTEGRATING G0(E,EP)*F(E,EP,COS) OVER SECONDARY ENERGY (EP)	SIXPAK
TO DEFINE AN AVERAGE ANGULAR DISTRIBUTION, F0(E,COS).	SIXPAK
	SIXPAK
WHAT IS LOST IN THIS PROCESS IS THE CORRELATION BETWEEN EP AND COS	SSIXPAK
SO THAT IN A TRANSPORT CALCULATION ALL MOMENTS OF THE FLUX WILL	SIXPAK
HAVE THE SAME SPECTRUM, GO(E, EP) AND EACH WILL BE EFFECTED BY THE	
AVERAGE ANGULAR DISTRIBUTION.	SIXPAK
	SIXPAK
FOR APPLICATIONS TO HIGH ENERGY FUSION APPLICATIONS CORRELATED	SIXPAK
DATA SHOULD BE USED. HOWEVER, FOR LOWER ENERGY APPLICATIONS,	SIXPAK
SUCH AS FISSION REACTORS, IT SHOULD BE ADEQUATE TO USE THE	SIXPAK
UNCORRELATED DATA - IN THIS CASE THE MOST IMPORTANT EFFECT	SIXPAK
WILL BE THE OVERALL NEUTRON MULTIPLICATION AND SPECTRUM.	SIXPAK
AN IMPORTANT CONSIDERATION IN DESIGNING THIS PROGRAM IS THAT	SIXPAK SIXPAK
MANY COMPUTER CODES - DATA PROCESSING AND TRANSPORT CODES -	SIXPAK
CANNOT USE THE CORRELATED (MF=6) DATA - NOR ARE THEY INTENDED	SIXPAK
FOR HIGH ENERGY USE. FOR THESE CODES THE UNCORRELATED DATA	SIXPAK
PRODUCED BY THIS CODE SHOULD BE ADEQUATE TO MEET THEIR NEEDS.	SIXPAK
	SIXPAK
WARNING - IT CANNOT BE STRESSED ENOUGH THAT THE OUTPUT OF THIS	SIXPAK
CODE SHOULD ONLY BE USED FOR LOW ENERGY APPLICATIONS - FAILURE	SIXPAK
CODE SHOULD ONLY BE USED FOR LOW ENERGY APPLICATIONS - FAILURE TO HEED THIS WARNING CAN LEAD TO COMPLETELY UNRELIABLE RESULTS.	SIXPAK SIXPAK
	SIXPAK
TO HEED THIS WARNING CAN LEAD TO COMPLETELY UNRELIABLE RESULTS. ENDF/B FORMAT	SIXPAK SIXPAK SIXPAK SIXPAK
TO HEED THIS WARNING CAN LEAD TO COMPLETELY UNRELIABLE RESULTS. ENDF/B FORMAT THIS PROGRAM ONLY USES THE ENDF/B BCD OR CARD IMAGE FORMAT (AS	SIXPAK SIXPAK SIXPAK =SIXPAK SIXPAK
TO HEED THIS WARNING CAN LEAD TO COMPLETELY UNRELIABLE RESULTS. ENDF/B FORMAT THIS PROGRAM ONLY USES THE ENDF/B BCD OR CARD IMAGE FORMAT (AS OPPOSED TO THE BINARY FORMAT) AND CAN HANDLE DATA IN ANY VERSION	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
TO HEED THIS WARNING CAN LEAD TO COMPLETELY UNRELIABLE RESULTS. ENDF/B FORMAT THIS PROGRAM ONLY USES THE ENDF/B BCD OR CARD IMAGE FORMAT (AS	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
TO HEED THIS WARNING CAN LEAD TO COMPLETELY UNRELIABLE RESULTS. ENDF/B FORMAT THIS PROGRAM ONLY USES THE ENDF/B BCD OR CARD IMAGE FORMAT (AS OPPOSED TO THE BINARY FORMAT) AND CAN HANDLE DATA IN ANY VERSION OF THE ENDF/B FORMAT (I.E., ENDF/B-I, II,III, IV, V OR VI FORMAT)	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
TO HEED THIS WARNING CAN LEAD TO COMPLETELY UNRELIABLE RESULTS. ENDF/B FORMAT THIS PROGRAM ONLY USES THE ENDF/B BCD OR CARD IMAGE FORMAT (AS OPPOSED TO THE BINARY FORMAT) AND CAN HANDLE DATA IN ANY VERSION OF THE ENDF/B FORMAT (I.E., ENDF/B-I, II,III, IV, V OR VI FORMAT) IT IS ASSUMED THAT THE DATA IS CORRECTLY CODED IN THE ENDF/B	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
TO HEED THIS WARNING CAN LEAD TO COMPLETELY UNRELIABLE RESULTS. ENDF/B FORMAT THIS PROGRAM ONLY USES THE ENDF/B BCD OR CARD IMAGE FORMAT (AS OPPOSED TO THE BINARY FORMAT) AND CAN HANDLE DATA IN ANY VERSION OF THE ENDF/B FORMAT (I.E., ENDF/B-I, II,III, IV, V OR VI FORMAT) IT IS ASSUMED THAT THE DATA IS CORRECTLY CODED IN THE ENDF/B FORMAT AND NO ERROR CHECKING IS PERFORMED. IN PARTICULAR IT IS	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
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TO HEED THIS WARNING CAN LEAD TO COMPLETELY UNRELIABLE RESULTS. ENDF/B FORMAT THIS PROGRAM ONLY USES THE ENDF/B BCD OR CARD IMAGE FORMAT (AS OPPOSED TO THE BINARY FORMAT) AND CAN HANDLE DATA IN ANY VERSION OF THE ENDF/B FORMAT (I.E., ENDF/B-I, II,III, IV, V OR VI FORMAT) IT IS ASSUMED THAT THE DATA IS CORRECTLY CODED IN THE ENDF/B FORMAT AND NO ERROR CHECKING IS PERFORMED. IN PARTICULAR IT IS ASSUMED THAT THE MAT, MF AND MT ON EACH LINE IS CORRECT. SEQUENCE NUMBERS (COLUMNS 76-80) ARE IGNORED ON INPUT, BUT WILL BE	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
TO HEED THIS WARNING CAN LEAD TO COMPLETELY UNRELIABLE RESULTS. ENDF/B FORMAT THIS PROGRAM ONLY USES THE ENDF/B BCD OR CARD IMAGE FORMAT (AS OPPOSED TO THE BINARY FORMAT) AND CAN HANDLE DATA IN ANY VERSION OF THE ENDF/B FORMAT (I.E., ENDF/B-I, II,III, IV, V OR VI FORMAT) IT IS ASSUMED THAT THE DATA IS CORRECTLY CODED IN THE ENDF/B FORMAT AND NO ERROR CHECKING IS PERFORMED. IN PARTICULAR IT IS ASSUMED THAT THE MAT, MF AND MT ON EACH LINE IS CORRECT. SEQUENCE NUMBERS (COLUMNS 76-80) ARE IGNORED ON INPUT, BUT WILL BE CORRECTLY OUTPUT ON ALL LINES. THE FORMAT OF SECTION MF=1, MT=451	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
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NEUTRONS	SIXPAK SIXPAK
IN MF=6 THE YIELD FOR EACH REACTION IS THE ACTUAL MULTIPLICITY OF THE REACTION, E.G., $(N,2N) = 2$. IN USING MF=4 AND 5 DATA THE ENDF/B CONVENTION IS THAT THE MULTIPLICITY IS IMPLIED BY THE MT NUMBER, E.G., MT=16 = $(N,2N) = 2$.	SIXPAK SIXPAK SIXPAK
THE ONLY EXCEPT IN ENDF/B-VI IS MT=201 = TOTAL NEUTRON PRODUCTION WHERE AN ACTUAL ENERGY DEPENDENT YIELD IS INCLUDED IN MF=6. HOWEVER, IN THIS CASE THE MF=3 CROSS SECTION INCLUDES THE	SIXPAK SIXPAK SIXPAK SIXPAK
<pre>MULTIPLICITY (S. PEARLSTEIN, PRIVATE COMMUNICATION, JAN. 1992), SIG(MT=201) = 2*SIG(N,2N)+3*SIG(N,3N)ETC.</pre>	SIXPAK SIXPAK SIXPAK
SO THAT FOR ALL ENDF/B-VI DATA AS OF JANUARY 1992 THE MF=4 AND 5 DATA OUTPUT BY THIS CODE CAN BE USED IN CONJUNCTION WITH THE MF=3 CROSS SECTIONS - WITHOUT ANY REFERENCE TO THE MF=6 YIELD.	SIXPAK SIXPAK SIXPAK SIXPAK
PHOTONS	SIXPAK
UNLIKE THE NEUTRONS WHERE WITH ONLY ONE EXCEPTION (MT=201) THE MF=6 YIELD IS ENERGY INDEPENDENT, IN THE CASE OF PHOTON EMISSION ALMOST ALL OF THE PHOTONS HAVE AN ENERGY DEPENDENT YIELD.	SIXPAK SIXPAK SIXPAK
THIS PROGRAM WILL OUTPUT THE PHOTON MULTIPLICITY IN MF=12 AND INDICATE THAT THERE IS A NORMALIZED DISTRIBUTION IN MF=15 (LF=1 IN MF=12).	SIXPAK SIXPAK SIXPAK SIXPAK
THIS PROGRAM WILL OUTPUT THE NORMALIZED PHOTON SPECTRA IN MF=15. CONTINUOUS ENERGY SPECTRA AND DISCRETE PHOTONS WILL ALL BE OUTPUT AS NORMALIZED SPECTRA.	SIXPAK
THIS PROGRAM WILL ALSO OUTPUT MF=14 PHOTON ANGULAR DISTRIBUTION DATA, ALWAYS USING THE ISOTROPIC FLAG TO MINIMIZE OUTPUT.	SIXPAK SIXPAK SIXPAK SIXPAK
WARNING OF ENERGY DEPENDENT YIELD	SIXPAK SIXPAK
THIS PROGRAM WILL PRINT A WARNING MESSAGE IF A SECTION OF DATA BEING OUTPUT IN THE ENDF/B FORMAT HAS AN ENERGY DEPENDENT MF=6 YIELD AND THE EMITTED PARTICLE IS A NEUTRON - SINCE THE ENDF/B CONVENTION IS THAT FOR EACH MT NUMBER THE MULTIPLICITY IS IMPLIED WE DO NOT EXPECT AN ENERGY DEPENDENT MULTIPLICITY FOR NEUTRON EMISSION.	SIXPAK SIXPAK SIXPAK
USING THE OUTPUT	SIXPAK
	SIXPAK
F(E,EP,COS) = SIG(E)*Y(E)*G0(E,EP)*F0(E,COS)	SIXPAK SIXPAK
USING THE ENDF/B CONVENTION THAT THE MULTIPLICITY IS EITHER	SIXPAK SIXPAK
IMPLIED BY THE MT NUMBER (E.G., MT=16 = N, 2N - MULTIPLICITY = 2)	SIXPAK
OR INCLUDED IN THE CROSS SECTION (E.G., MT=201 = TOTAL NEUTRON PRODUCTION) ALL THE INFORMATION REQUIRED FOR A CALCULATION IS	SIXPAK SIXPAK
AVAILABLE IN,	SIXPAK SIXPAK
MF=3 - SIG(E) MF=4 - F0(E,COS) - FOR OUTGOING NEUTRONS	SIXPAK SIXPAK
MF=5 - G0(E,EP) - FOR OUTGOING NEUTRONS MF=12 - Y(E) - FOR OUTGOING PHOTONS	SIXPAK SIXPAK
MF=14 - F0(E,COS) - FOR OUTGOING PHOTONS (ALWAYS ISOTROPIC)	SIXPAK
MF=15 - G0(E,EP) - FOR OUTGOING PHOTONS	SIXPAK SIXPAK
DOCUMENTATION	SIXPAK SIXPAK
ONLY SECTIONS OF MF=4, 5, 12, 14, 15 ARE OUTPUT ON A ENDF/B FILE.	SIXPAK
THE ONLY DOCUMENTATION IS THE ENDF/B TAPE LABEL (FIRST RECORD OF EACH FILE) WHICH IDENTIFIES THE DATA AS SIXPAK OUTPUT.	SIXPAK SIXPAK
REACTION INDEX	SIXPAK SIXPAK
THIS PROGRAM DOES NOT USE THE REACTION INDEX WHICH IS GIVEN IN	SIXPAK

SECTION MF=1, MT=451 OF EACH EVALUATION. SIXPAK SIXPAK SECTION SIZE SIXPAK STXPAK ALL OF THE DATA IN ENDF/B-VI, MF=6 ARE QUITE SMALL TABLES. AS SUCHSIXPAK THIS PROGRAM ONLY ALLOWS TABLES OF UP TO 12000 POINTS (12,000 X, SIXPAK Y VALUES). THIS SIZE IS MORE THAN ADEQUATE TO HANDLE ALL OF THE STYPAK CURRENT ENDF/B-VI DATA, AND IT CAN BE EASILY INCREASED TO HANDLE SIXPAK ANY NEWER DATA AS IT BECOMES AVAILABLE. SIXPAK SIXPAK PLEASE CONTACT THE AUTHOR IF YOU HAVE AN EVALUATION WHICH EXCEEDS SIXPAK THIS LIMIT. SIXPAK STXPAK SELECTION OF DATA STXPAK ==SIXPAK THE PROGRAM SELECTS DATA TO BE PROCESSED BASED ON MAT/MT RANGES SIXPAK (MF=6 ASSUMED). THIS PROGRAM ALLOWS UP TO 100 MAT/MT RANGES TO BE SIXPAK SPECIFIED BY INPUT PARAMETERS. THE PROGRAM WILL ASSUME THAT THE SIXPAK ENDF/B TAPE IS IN MAT ORDER. THE PROGRAM WILL TERMINATE EXECUTION SIXPAK WHEN A MAT IS FOUND THAT IS ABOVE ALL REQUESTED MAT RANGES. SIXPAK STYPAK PROGRAM OPERATION SIXPAK EACH SECTION (MT) OF MF=6 DATA IS SUBDIVIDED INTO SUBSECTIONS -SIXPAK ONE SUBSECTION FOR EACH EMITTED PARTICLE. SIXPAK SIXPAK EACH SUBSECTION OF DATA IS CONSIDERED SEPARATELY. EACH SUBSECTION SIXPAK OF ENDF/B MF=6 DATA TO PROCESS IS IN THE FORM, SIXPAK SIXPAK F(E, EP, COS) = SIG(E) * Y(E) * GO(E, EP) * F(E, EP, COS)STYPAK SIXPAK = MF=3 CROSS SECTIONS SIG(E) SIXPAK Y(E) = YIELD (MULTIPLICITY) SIXPAK = ENERGY SPECTRUM G0(E,EP) SIXPAK F(E,EP,COS) = ANGULAR DISTRIBUTION SIXPAK SIXPAK GO(E, EP) = 1 WHEN INTEGRATED OVER EP (SECONDARY ENERGY) STXPAK G0(E,EP)*F(E,EP,COS) = 1 WHEN INTEGRATED OVER EP AND COS SIXPAK SIXPAK THIS PROGRAM WILL DEFINE THE ZEROTH ORDER MOMENTS OF THE SIXPAK ENERGY AND ANGULAR DISTRIBUTIONS, SIXPAK SIXPAK GO(E,EP) = GO(E,EP)*F(E,EP,COS) INTEGRATED OVER COS SIXPAK F0(E,COS) = G0(E,EP)*F(E,EP,COS) INTEGRATED OVER EP SIXPAK SIXPAK FOR NEUTRON INDUCED REACTIONS THE ENDF/B FORMATTED OUTPUT WILL BE SIXPAK SIXPAK F0(E,COS) - IN ENDFB.MF4 FOR NEUTRONS OUT OF A REACTION SIXPAK GO(E,EP) - IN ENDFB.MF5 FOR NEUTRONS OUT OF A REACTION SIXPAK - IN ENDFB.M15 FOR PHOTONS OUT OF A REACTION SIXPAK STXPAK FOR NEUTRONS INCIDENT AND NEUTRONS EMITTED THIS DATA WILL BE SIXPAK OUTPUT IN MF=4 AND 5 FORMATS. SIXPAK SIXPAK FOR NEUTRONS INCIDENT AND PHOTONS EMITTED THIS DATA WILL BE SIXPAK OUTPUT IN MF=15 FORMAT - THE SPECTRA ARE OUTPUT AND THE SIXPAK SIXPAK ANGULAR DISTRIBUTION IS IGNORED. SIXPAK ALL PHOTON EMISSION IN THE ENDF/B-VI LIBRARY AS OF JANUARY 1992 SIXPAK IS ISOTROPIC AND AS SUCH NO DISTRIBUTION OF PHOTON ANGULAR STXPAK DISTRIBUTIONS NEED BE OUTPUT - IT IS ALWAYS ISOTROPIC. SIXPAK SIXPAK FOR ALL OTHER COMBINATIONS INCIDENT AND EMITTED PARTICLES SIXPAK THERE WILL BE NO ENDF/B FORMATTED OUTPUT. SIXPAK SIXPAK VARIATIONS FROM ENDF/B MANUAL SIXPAK SIXPAK LAW=1, LANG=2 = KALBACH-MANN SIXPAK SIXPAK FOR THE DISTRIBUTIONS, SIXPAK SIXPAK

F(MU, E, EP) = GO(E, EP) *A*(COSH(MU*A) + R(E, EP) *SINH(MU*A))	SIXPAK
$\Gamma(MO, H, H) = OO(H, H) \times (COOM(HO K) \times (H, H)) OTMI(HO K))$	SIXPAK
GO(E, EP) = 1 - WHEN INTEGRATED OVER EP.	SIXPAK
	SIXPAK
A*(COSH(MU*A)+R(E,EP)*SINH(MU*A)) = 2 - WHEN INTEGRATD OVER MU	SIXPAK
	SIXPAK
THIS MEANS AS DEFINED IN THE ENDF/B MANUAL THE DISTRIBUTIONS	SIXPAK
ARE NORMALIZED TO 2, INSTEAD OF 1. IN ORDER TO OBTAIN CORRECTLY	SIXPAK
NORMALIZED DISTRIBUTIONS THE DISTRIBUTION SHOULD BE DEFINED	SIXPAK
TO INCLUDE A FACTOR OF 1/2 MULTIPLYING THE ANGULAR PART OF	SIXPAK
THE DISTRIBUTION.	SIXPAK
	SIXPAK
F(MU,E,EP) = G0(E,EP)*0.5*A*(COSH(MU*A)+R(E,EP)*SINH(MU*A))	SIXPAK
	SIXPAK
THIS IS THE FORM USED IN THIS CODE	SIXPAK
	SIXPAK
LAW=1, ND NOT 0 = DISCRETE SECONDARY ENERGY DISTRIBUTION	SIXPAK
	SIXPAK
THE ENDF/B MANUAL SAYS THESE ARE FLAGGED WITH NEGATIVE ENERGIES.	SIXPAK
IN ENDF/B-VI ALL OF THESE HAVE POSITIVE ENERGY. THIS CODE DOES	SIXPAK
NOT CONSIDER THE ENDF/B-VI DATA TO BE IN ERROR.	SIXPAK
NTER ECONTENETON ACETATIV HORD IN ENDERD VIT ALL ORCONDADY	SIXPAK SIXPAK
WITH THE CONVENTION ACTUALLY USED IN ENDF/B-VI ALL SECONDARY ENERGIES SHOULD BE NON-NEGATIVE AND IN ASCENDING ENERGY ORDER	SIXPAR
FOR EACH INCIDENT ENERGY.	SIXPAR
FOR EACH INCIDENT ENERGY.	SIXPAK
FROM THE ENDF/B MANUAL IT IS NOT OBVIOUS WHAT G0(E,EP) SHOULD BE	SIXPAK
FOR DISCRETE PHOTONS - PHYSICALLY THIS IS A DELTA FUNCTION. IN	SIXPAK
ENDF/B-VI IT IS ENTERED AS 1.0 = INTERPRETING IT AS INTEGRATED	SIXPAK
OVER SECONDARY ENERGY - IN WHICH CASE THE DELTA FUNCTION = 1.0.	SIXPAK
	SIXPAK
LIMITATIONS	SIXPAK
	-SIXPAK
CHECKING DATA	SIXPAK
THIS PROGRAM CHECKS ALL ENDF/B-VI MF=6 DATA. THE FOLLOWING CHECKS	SIXPAK
ARE PERFORMED.	SIXPAK
	SIXPAK SIXPAK
PARAMETERS	SIXPAK SIXPAK SIXPAK
PARAMETERS	SIXPAK SIXPAK SIXPAK SIXPAK
PARAMETERS ====================================	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
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PARAMETERS ====================================	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
PARAMETERS ====================================	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
PARAMETERSALL PARAMETERS ARE CHECKED FOR CONSISTENCY. IF PARAMETERS ARE NOT CONSISTENT THE PROGRAM MAY NOT BE ABLE TO PERFORM THE FOLLOWING TESTS AND WILL MERELY SKIP A SECTION OF DATA. INTERPOLATION LAWSALL INTEGRATIONS ARE PERFORMED USING THE INTERPOLATION LAW GIVEN FOR SECONDARY ENERGY AND/OR COSINE. INTEGRATIONS ARE NOT PERFORMED OVER INCIDENT - ONLY INTEGRATION OVER SECONDARY ENERGY AND/OR COSINE ARE PERFORMED AT EACH INCIDENT ENERGY. THEREFORE THE INTERPOLATION LAW FOR INCIDENT ENERGY IS NOT USED BY THIS CODE.	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
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INTERPOLATION IN G0(E, EP) TO SIMULATE CASES WHERE THE INPUT ENERGYSIXPAK LIMIT IS DEFINED BY E-EP = A DIAGONAL CURVE ACROSS (E, EP) SPACE. SIXPAK THIS INTERPOLATION CODE CANNOT BE SPECIFIED IN THE MF=5 OUTPUT SIXPAK OF THIS CODE - MF=5 ONLY ALLOWS THE OLDER INTERPOLATION LAWS STXPAK INT=1 THROUGH 5. THEREFORE THIS PROGRAM WILL USE THE CLOSEST SIXPAK CORRESPONDING INTERPOLATION CODE FOR OUTPUT TO MF=5. FOR USE SIXPAK WHERE THE OUTPUT OF THIS CODE = LOW ENERGY APPLICATIONS - THIS SIXPAK SHOULD HAVE LITTLE EFFECT ON RESULTS. SIXPAK SIXPAK FOR CONSISTENCY WITH EARLIER VERSIONS OF ENDF/B IN CREATING THE SIXPAK ENDF/B OUTPUT, IF ANY INPUT INTERPOLATION LAW IS NOT IN THE SIXPAK RANGE 1-5, IT WILL FIRST BE TESTED TO SEE IF MOD(10) IT IS STXPAK IN THIS RANGE, FINALLY IF EVEN THIS DOESN'T WORK IT IS SET STXPAK EQUAL TO 2 (LINEARLY INTERPOLATION). THIS METHOD WILL EFFECTIVELY SIXPAK REPLACE CORRESPONDING POINT AND UNIT BASE TRANSFORMATION BY THE SIXPAK CLOSEST RELATED INTERPOLATION LAW 1 THROUGH 5 - AGAIN NOTE, AS SIXPAK OF JANUARY 1992 NONE OF THESE NEW LAWS ARE USED IN ENDF/B-VI. IF SIXPAK THIS MUST BE DONE FOR INTERPOLATION IN SECONDARY ENERGY OR COSINE SIXPAK AN ERROR MESSAGE WILL BE PRINTED - SINCE THIS WOULD EFFECT THE SIXPAK ACCURACY OF THE INTEGRALS PERFORMED BY THIS PROGRAM. IF THIS MUST SIXPAK BE DONE FOR INCIDENT ENERGY NO MESSAGE IS PRINTED - SINCE THIS STYPAK WILL NOT EFFECT THE ACCURACY OF THE INTEGRALS PERFORMED BY THIS SIXPAK PROGRAM. STXPAK SIXPAK SPECTRA AND ANGULAR DISTRIBUTIONS SIXPAK SIXPAK _____ ALL SPECTRA AND ANGULAR DISTRIBUTIONS ARE CHECKED TO INSURE SIXPAK THEY ARE NORMALIZED AND DO NOT INCLUDE ANY NEGATIVE VALUES. SIXPAK SIXPAK LEGENDRE COEFFICIENTS STYPAK SIXPAK THE NORMALIZATION, F0, CANNOT BE NEGATIVE. SIXPAK SIXPAK LEGENDRE COEFFICIENTS IN NORMAL FORM ARE CHECKED TO INSURE SIXPAK THEY ARE IN THE RANGE -1 to +1 = the legendre expansion of a SIXPAK DELTA FUNCTION AT COS=+1 OR -1 - COEFFICIENTS SHOULD NOT SIXPAK EXCEED WHAT YOU GET FROM A DELTA FUNCTION. STXPAK SIXPAK ANGULAR DISTRIBUTIONS ARE CHECKED AT $\cos = -1$, 0 and +1. SIXPAK SIXPAK CREATING ENDF/B OUTPUT SIXPAK SIXPAK= THIS PROGRAM CAN CREATE EQUIVALENT MF =4, 5, 12, 14, 15 DATA FOR SIXPAK ALL OF THE DATA INCLUDED IN ENDF/B-VI AS OF JANUARY 1992, EXCEPT SIXPAK FOR 1 SECTION OF LAW=6 DATA (SEE DETAILS BELOW). SIXPAK SIXPAK THIS PROGRAM HAS NOT BEEN TESTED ON OTHER DATA LIBRARIES, E.G., SIXPAK JEF, JENDL, ETC. SIXPAK SIXPAK THE PROGRAM HAS THE FOLLOWING LIMITATION AS FAR AS CREATING STXPAK ENDF/B FORMATTED OUTPUT. STXPAK SIXPAK ISOTROPIC PHOTON EMISSION SIXPAK SIXPAK FOR PHOTON EMISSION THE DISTRIBUTIONS ARE ASSUMED TO BE ISOTROPIC SIXPAK AND ONLY THE MULTIPLICITY IS OUTPUT IN MF=12, ISOTROPIC ANGULAR SIXPAK DISTRIBUTIONS IN MF=14 AND THE SPECTRA IN MF=15. ALL ENDF/B-VI SIXPAK MF=6 DATA AS OF JANUARY 1992 INCLUDE ONLY ISOTROPIC PHOTON SIXPAK EMISSION - SO THAT THIS IS NOT A LIMITATION ON TRANSLATING SIXPAK ENDF/B-VI DATA. STXPAK SIXPAK EITHER TABULATED OR LEGENDRE COEFFICIENTS SIXPAK SIXPAK FOR LAW=2 THE REPRESENTATION, EITHER TABULATED OR LEGENDRE SIXPAK COEFFICIENTS, CAN BE SPECIFIED FOR EACH INCIDENT ENERGY. SIXPAK SIXPAK IN ORDER TO OBTAIN CORRECT ENDF/B OUTPUT THE REPRESENTATION SIXPAK MUST BE THE SAME FOR ALL INCIDENT ENERGIES = MF=4 DATA CAN ONLY SIXPAK BE TABULATED OR LEGENDRE OVER THE ENTIRE ENERGY RANGE. SIXPAK SIXPAK YIELD AND OUTPUT NORMALIZATION SIXPAK

	SIXPAK
THE YIELD INCLUDED WITH EACH SECTION OF DATA IS NOT USED FOR	SIXPAK
OUTPUT FOR NEUTRONS, BUT IS INCLUDED IN THE OUTPUT FOR PHOTONS.	SIXPAK
IN ALL CASES THE ANGULAR DISTRIBUTIONS AND SPECTRA OUTPUT ARE	SIXPAK
NORMALIZED TO UNITY.	SIXPAK
	SIXPAK
LAW=0	SIXPAK
=====	SIXPAK
NO OUTPUT - INCIDENT NEUTRON - EMITTED PHOTON OR NEUTRON	SIXPAK
REACTIONS ARE NOT EXPECTED.	SIXPAK
	SIXPAK
LAW=1	SIXPAK
=====	SIXPAK
FOR EACH INCIDENT ENERGY DISCRETE AND CONTINUOUS EMISSION SPECTRA	SIXPAK
CANNOT BE MIXED TOGETHER - THEY MUST BE ALL EITHER DISCRETE OR	SIXPAK
CONTINUOUS. IF DISCRETE EMISSION IS GIVEN ONLY 1 SECONDARY	SIXPAK
ENERGY (NEP=1) MAY BE GIVEN = A NORMALIZED DISTRIBUTION FOR A	SIXPAK
SINGLE DISCRETE EMISSION ENERGY. ALL OF THE ENDF/B-VI DATA AS	SIXPAK
OF JANUARY 1992 CONFORM TO THESE LIMITATIONS.	SIXPAK
	SIXPAK
SINCE THE FLAG NA, TO INDICATE ISOTROPIC DISTRIBUTIONS, IS ONLY	SIXPAK
GIVEN FOR EACH SECONDARY ENERGY (EP) THE PROGRAM CANNOT DECIDE	SIXPAK
IN ADVANCE WHETHER OR NOT THE DISTRIBUTION WILL BE ISOTROPIC	SIXPAK
AT ALL INCIDENT ENERGIES. THEREFORE ISOTROPIC DISTRIBUTIONS	SIXPAK
WILL BE OUTPUT EITHER: LANG = 1 - AS 1 LEGENDRE COEFFICIENT = 0.0	SIXPAK
OR LANG = NOT 1 - AS A 2 POINT ANGULAR DISTRIBUTION AT COS = -1.0	SIXPAK
AND +1.0 WITH BOTH VALUES EQUAL TO 0.5 (A NORMALIZED ISOTROPIC	SIXPAK
DISTRIBUTION).	SIXPAK
	SIXPAK
DISCRETE PHOTONS ARE OUTPUT IN MF=15 AS 3 POINT DISTRIBUTIONS	SIXPAK
WITH SECONDARY ENERGY POINTS AT EP-DEP, EP, EP+DEP, WHERE	SIXPAK
DEP=0.001*EP. THE VALUES AT EP-DEP AND EP+DEP ARE 0.0, AND	SIXPAK
AT EP THE VALUE IS 1000.0/EP TO NORMALIZE THE DISTRIBUTION.	SIXPAK
	SIXPAK
LAW=2	SIXPAK
=====	SIXPAK
NO LIMITATION ON REPRESENTATIONS.	SIXPAK
	SIXPAK
LAW=3	SIXPAK
====	SIXPAK
===== NO LIMITATION ON REPRESENTATIONS.	SIXPAK SIXPAK
	SIXPAK
NO LIMITATION ON REPRESENTATIONS.	SIXPAK SIXPAK
NO LIMITATION ON REPRESENTATIONS. LAW=4 ====== NO OUTPUT - INCIDENT NEUTRON - EMITTED PHOTON OR NEUTRON	SIXPAK SIXPAK SIXPAK
NO LIMITATION ON REPRESENTATIONS. LAW=4 ======	SIXPAK SIXPAK SIXPAK SIXPAK
NO LIMITATION ON REPRESENTATIONS. LAW=4 ====== NO OUTPUT - INCIDENT NEUTRON - EMITTED PHOTON OR NEUTRON	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
NO LIMITATION ON REPRESENTATIONS. LAW=4 ====== NO OUTPUT - INCIDENT NEUTRON - EMITTED PHOTON OR NEUTRON	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
NO LIMITATION ON REPRESENTATIONS. LAW=4 ====== NO OUTPUT - INCIDENT NEUTRON - EMITTED PHOTON OR NEUTRON REACTIONS ARE NOT EXPECTED. LAW=5 =====	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
NO LIMITATION ON REPRESENTATIONS. LAW=4 ====== NO OUTPUT - INCIDENT NEUTRON - EMITTED PHOTON OR NEUTRON REACTIONS ARE NOT EXPECTED. LAW=5 ====== NO OUTPUT - INCIDENT NEUTRON - EMITTED PHOTON OR NEUTRON	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
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NO LIMITATION ON REPRESENTATIONS. LAW=4 ====== NO OUTPUT - INCIDENT NEUTRON - EMITTED PHOTON OR NEUTRON REACTIONS ARE NOT EXPECTED. LAW=5 ===== NO OUTPUT - INCIDENT NEUTRON - EMITTED PHOTON OR NEUTRON REACTIONS ARE NOT EXPECTED. LAW=6	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
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NO LIMITATION ON REPRESENTATIONS. LAW=4 ====== NO OUTPUT - INCIDENT NEUTRON - EMITTED PHOTON OR NEUTRON REACTIONS ARE NOT EXPECTED. LAW=5 ====== NO OUTPUT - INCIDENT NEUTRON - EMITTED PHOTON OR NEUTRON REACTIONS ARE NOT EXPECTED. LAW=6 ====== NO OUTPUT - ENDF/B-VI ONLY INCLUDES 1 SECTION OF THIS TYPE OF DATA FOR (N,D) 2N,P.	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
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NO LIMITATION ON REPRESENTATIONS. LAW=4 ====== NO OUTPUT - INCIDENT NEUTRON - EMITTED PHOTON OR NEUTRON REACTIONS ARE NOT EXPECTED. LAW=5 ====== NO OUTPUT - INCIDENT NEUTRON - EMITTED PHOTON OR NEUTRON REACTIONS ARE NOT EXPECTED. LAW=6 ====== NO OUTPUT - ENDF/B-VI ONLY INCLUDES 1 SECTION OF THIS TYPE OF DATA FOR (N,D) 2N,P. LAW=7 ====== FOR EACH INCIDENT ENERGY THE REPRESENTATION MUST BE EITHER, 1) SQUARE = FOR EACH INCIDENT COSINE EXACTLY THE SAME SECONDARY ENERGIES. 2) LINEAR = FOR EACH INCIDENT COSINE THE INTERPOLATION LAW BETWEEN SECONDARY ENERGIES MUST BE LINEAR. THESE 2 PRESENTATIONS ARE THE ONLY ONES PRESENTED IN ENDF/B-VI	SIXPAK SIXPAK

LABORATORY VS. CENTER-OF-MASS SYSTEM	SIXPAK
IN MANY CASES PEOPLE ASSUME THAT FOR HEAVY (HIGH ATOMIC WEIGHT)	SIXPAR
MATERIALS THE CENTER-OF-MASS AND LAB SYSTEMS ARE ALMOST IDENTICAL,	SIXPAK
SINCE IN THIS CASE THE CENTER-OF-MASS ENERGY WILL BE MUCH SMALLER	SIXPAK
THAN THE INCIDENT ENERGY. FOR A PROCESS SUCH AS ELASTIC SCATTERING	SIXPAK
WHERE FOR HEAVY MATERIALS THE SECONDARY ENERGY, EP, WILL ALWAYS	SIXPAK
BE A LARGE FRACTION OF THE INCIDENT ENERGY, THIS ASSUMPTION IS	SIXPAK
VALID. HOWEVER, FOR THE TYPICAL REACTIONS INCLUDED IN MF=6 THIS IS NOT ALWAYS TRUE - IN MANY OF THESE CASES THE SECONDARY ENERGY	SIXPAK SIXPAK
CAN EXTEND ALL THE WAY DOWN TO ZERO, AND IN PARTICULAR IT CAN	SIXPAK
BE SMALL COMPARED TO THE CENTER-OF-MASS ENERGY - WHICH MAKES THE	SIXPAK
TRANSFORMATION FROM CENTER-OF-MASS TO LAB IMPORTANT. THEREFORE	SIXPAK
GENERALLY TO TREAT MF=6 DATA WE MUST CONSIDER THIS TRANSFORMATION.	SIXPAK
	SIXPAK
THE FOLLOWING DISCUSSING ONLY APPLIES TO SPECTRA THAT MAY BE OUTPUT IN MF=5 = ONLY DATA FOR NEUTRONS INCIDENT AND EMITTED -	SIXPAK SIXPAK
IN PARTICULAR THE FOLLOWING DEFINITIONS ARE NOT GENERAL - THEY	SIXPAR
ARE ONLY VALID FOR INCIDENT AND EMITTED NEUTRONS.	SIXPAK
	SIXPAK
DOUBLE DIFFERENTIAL DATA IN MF=6 MAY BE GIVEN IN EITHER THE LAB	SIXPAK
OR C.M. SYSTEM. SIMILARLY ANGULAR DISTRIBUTIONS IN MF=4 MAY BE	SIXPAK
GIVEN IN EITHER THE LAB OR C.M. SYSTEM. IN CONTRAST ENERGY	SIXPAK
SPECTRA IN MF=5 CAN ONLY BE GIVEN IN THE LABORATORY SYSTEM.	SIXPAK SIXPAK
THE ANGULAR DISTRIBUTIONS OUTPUT BY THIS CODE IN MF=4 ARE IN THE	SIXPAK
SAME SYSTEM IN WHICH THEY ARE GIVEN IN MF=6 - EITHER LAB OR	SIXPAK
CENTER-OF-MASS SYSTEM.	SIXPAK
	SIXPAK
The energy spectra output by this code in MF=5 must be in the lab	SIXPAK
SYSTEM - THIS IS THE ONLY ALLOWED FORM FOR MF=5 DATA.	SIXPAK
EOD ME-4 CDECMDA CIVEN IN MUE IAD CVCMEN MUIC MEDELY DECUIDED	SIXPAK
FOR MF=6 SPECTRA GIVEN IN THE LAB SYSTEM THIS MERELY REQUIRES COPYING THE GIVEN SPECTRA TO MF=5 OUTPUT.	SIXPAK SIXPAK
	SIXPAK
FOR MF=6 SPECTRA GIVEN IN THE CENTER-OF-MASS SYSTEM ONLY FIRST	SIXPAK
ORDER CORRECTIONS IN THE SPECTRA AND USED AND THEY ARE THEN	SIXPAK
OUTPUT IN MF=5 AS IN THE LAB SYSTEM - THE FIRST ORDER CORRECTIONS	
ARE DESCRIBED BELOW.	SIXPAK
DEFINING,	SIXPAK SIXPAK
MM = CENTER OF MASS MOTION	SIXPAK
CM = OUTGOING (EMITTED) PARTICLE IN CENTER OF MASS	SIXPAK
LAB = OUTGOING (EMITTED) PARTICLE IN LAB	SIXPAK
THETA = CM SCATTERING ANGLE RELATIVE TO INCIDENT DIRECTION	SIXPAK
COS(CM) = COSINE OF THE CM SCATTERING ANGLE	SIXPAK
FOR NEUTRONS INCIDENT WITH AN ENERGY, E, AND THEREFORE A SPEED,	SIXPAK SIXPAK
FOR NEOIRONS INCIDENT WITH AN ENERGY, E, AND THEREFORE A SPEED,	SIXPAK
$VN(E) = 2 \times SQRT(E) / MASS(IN)$	SIXPAK
	SIXPAK
THE CENTER-OF-MASS SPEED IS GIVEN BY,	SIXPAK
	SIXPAK
V(MM) = VN(E) / (1 + A)	SIXPAK
AND THE CENTER OF MASS ENERGY BY,	SIXPAK SIXPAK
	SIXPAK
E(MM) = 1/2*MASS(IN)*V(MM)**2	SIXPAK
= 1/2*MASS(IN)*VN(E)**2/(1 + A)**2	SIXPAK
= E/(1 + A) **2	SIXPAK
	SIXPAK
FOR DISTRIBUTIONS GIVEN IN MF=6 IN THE CM, THE SPEED, V(CM), SHOULD BE VECTORIALLY ADDED TO THAT OF OUTGOING PARTICLES TO	SIXPAK SIXPAK
DEFINE THE OUTGOING PARTICLES LAB VELOCITY, AND IN TURN IT'S	SIXPAK
ENERGY,	SIXPAK
	SIXPAK
V(LAB) *COS(LAB) = V(MM) + V(CM) *COS(CM)	SIXPAK
V(LAB) * SIN(LAB) = V(CM) * SIN(CM)	SIXPAK
V(LAB) **2 = V(MM) **2 + V(CM) **2 + 2*COS(CM) *V(MM) *V(CM)	SIXPAK SIXPAK
	SIXPAK
	~

EP(LAB) = 0.5*MASS(OUT)*V(LAB)**2	SIXPAK
	SIXPAK
= E(MM) + EP(CM) + 2*COS(CM)*SQRT(E(MM)*EP(CM))	SIXPAK SIXPAK
WE CAN ALSO DEFINE THE REVERSE TRANSFORMATION USING,	SIXPAK
	SIXPAK
V(CM) * COS(CM) = V(LAB) * COS(LAB) - V(MM) V(CM) * SIN(CM) = V(LAB) * SIN(LAB)	SIXPAK SIXPAK
	SIXPAK
V(CM) **2 = V(MM) **2 + V(LAB) **2 - 2*COS(LAB) *V(MM) *V(LAB)	SIXPAK
EP(CM) = 0.5*MASS(OUT)*V(CM)**2	SIXPAK SIXPAK
	SIXPAK
= E(MM) + EP(LAB) - 2*COS(LAB)*SQRT(E(MM)*EP(LAB))	SIXPAK SIXPAK
WE CAN DEFINE COS(LAB) FROM THE RELATIONSHIP,	SIXPAK
$V(LAB) \star COS(LAB) = V(MM) + V(CM) \star COS(CM)$	SIXPAK SIXPAK
	SIXPAK
COS (LAB) = [V (MM) + V (CM) * COS (CM)] / V (LAB)	SIXPAK SIXPAK
[V (MM) + V (CM) *COS (CM)]	SIXPAK
COS (LAB) =	SIXPAK
SQRT [V (MM) **2+V (CM) **2+2*COS (CM) *V (MM) *V (CM)]	SIXPAK SIXPAK
OR COS(CM) FROM THE RELATIONSHIP,	SIXPAK
V(CM) * COS(CM) = V(LAB) * COS(LAB) - V(MM)	SIXPAK SIXPAK
	SIXPAK
COS(CM) = [V(LAB) * COS(LAB) - V(MM)] / V(CM)	SIXPAK
[V(LAB) *COS(LAB) - V(MM)]	SIXPAK SIXPAK
	SIXPAK
SQRT[V(LAB)**2+V(CM)**2-2*COS(LAB)*V(LAB)*V(MM)]	SIXPAK SIXPAK
THE JACOBIAN CAN BE DEFINED FROM,	SIXPAK
	SIXPAK
V(LAB) * COS(LAB) = V(MM) + V(CM) * COS(CM)	SIXPAK SIXPAK
J = D[COS(CM)]/D[COS(LAB)] = V(LAB)/V(CM)	SIXPAK
= SQRT[EP(LAB)/EP(CM)]	SIXPAK
WITH THESE DEFINITIONS OF EP(LAB) AND COS(LAB) IN TERMS OF E(MM),	SIXPAK SIXPAK
EP(CM) AND COS(CM) IT IS POSSIBLE TO PERFORM A POINT-BY-POINT	SIXPAK
TRANSFORMATION OF DISTRIBUTIONS FROM THE CM TO LAB SYSTEM USING THESE DEFINITIONS - OR IF WE WISHED WE COULD PERFORM THE REVERSE	SIXPAK SIXPAK
TRANSFORMATION USING THE ABOVE RELATIONSHIPS AND THE IDENTITY,	SIXPAK
	SIXPAK
F(E, EP(LAB), COS(LAB)) *D(COS(LAB)) = F(E, EP(CM), COS(CM)) *D(COS(CM))	SIXPAK SIXPAK
THIS IS NOT WHAT WILL BE DONE HERE, SINCE WE WILL ONLY BE	SIXPAK
INTERESTED IN THE ZEROTH ORDER MOMENTS OF THESE DISTRIBUTIONS, BUT WE WILL BE INTERESTED IN DEFINING THOSE MOMENTS IN THE	SIXPAK SIXPAK
LAB SYSTEM IN TERMS OF MF=6 SPECTRA GIVEN IN THE CM SYSTEM USING,	
	SIXPAK
F(E, EP(LAB), COS(LAB)) = F(E, EP(CM), COS(CM)) * J	SIXPAK SIXPAK
THE LIMITS OF EP(LAB) ARE DEFINED BY SETTING $\cos(CM) = +1$ or -1 ,	SIXPAK
EP(LAB) = (SQRT(EP(CM)) + SQRT(E(MM))) **2 FOR COS(CM) = +1	SIXPAK SIXPAK
= (SQRT (EP (CM)) - SQRT (E (MM))) **2 FOR COS (CM) = -1	SIXPAK
דא קרא ארע גערע ארא ארא אין אין גער ארא ארא אין גער אין ארא אין אין אין אין אין אין אין אין אין אי	SIXPAK
IN THIS FORM WE CAN SEE THAT AS LONG AS THE SECONDARY ENERGY IN THE CENTER-OF-MASS SYSTEM, EP(CM), IS MUCH LARGER THAN THE	SIXPAK SIXPAK
ENERGY OF THE CENTER-OF-MASS, E(MM), THE CENTER-OF-MASS AND LAB	SIXPAK
ENERGIES WILL BE ALMOST EQUAL - SIMILARLY FOR THE COSINE, IN THIS CASE COS(LAB) AND COS(CM) WILL BE ALMOST EQUAL - HOWEVER,	SIXPAK SIXPAK
FOR THE MF=6 DATA WE CANNOT ASSUME THAT THIS IS TRUE.	SIXPAK
	SIXPAK
TO FIRST ORDER THE ANGULAR DEPENDENCE CAN BE IGNORED,	SIXPAK SIXPAK
	-

EP(LAB) = E(MM) + EP(CM)	SIXPAK
	SIXPAK
ALL THIS SAYS IS THAT TO FIRST ORDER THE EFFECT OF TRANSFORMING FROM THE CM TO LAB SYSTEM IS TO INCREASE THE ENERGY OF THE	SIXPAK SIXPAK
EMITTED PARTICLE IN THE CENTER-OF-MASS SYSTEM BY THE ENERGY OF	SIXPAK
THE CENTER-OF-MASS TO DEFINE THE LAB ENERGY.	SIXPAK
	SIXPAK
NOT ONLY THE ENERGY, BUT ALSO THE SPECTRA MUST BE TRANSFORMED.	SIXPAK
STARTING FROM THE DOUBLE DIFFERENTIAL DATA IN THE LAB SYSTEM, F(E,EP,COS(LAB)), WE CAN DEFINE THE LAB SCALAR SPECTRUM AS,	SIXPAK SIXPAK
	SIXPAK
G0 (E, EP) = INTEGRAL F (E, EP, COS (LAB)) *D (COS (LAB))	SIXPAK
	SIXPAK
THIS IS THE NORMAL CALCULATION DEFINED ABOVE AND USED FOR DATA GIVEN IN THE LAB SYSTEM.	SIXPAK SIXPAK
GIVEN IN THE HAD SISTEM.	SIXPAK
STARTING FROM DATA IN THE CENTER OF MASS SYSTEM F(E,EP,COS(CM)),	SIXPAK
WE CAN USE THE RELATIONSHIP,	SIXPAK
	SIXPAK
F(E, EP, COS(LAB)) *D(COS(LAB)) = F(E, EP, COS(CM)) *J*D(COS(LAB))	SIXPAK SIXPAK
J = SQRT(EP(LAB)/EP(CM)) - THE JACOBIAN	SIXPAK
	SIXPAK
= $E(MM)/EP(CM) + 1 + 2*COS(CM)*SQRT(E(MM)/EP(CM))$	SIXPAK
	SIXPAK
AS IN THE CASE OF THE ENERGY, IN THIS FORM WE CAN SEE THAT AS LONG AS THE SECONDARY ENERGY IN THE CENTER-OF-MASS SYSTEM,	SIXPAK SIXPAK
EP(CM), IS LARGE COMPARED TO THE CENTER-OF-MASS ENERGY, E(MM),	SIXPAK
THE JACOBIAN IS ESSENTIALLY UNITY AND THE CENTER-OF-MASS AND LAB	SIXPAK
SPECTRA WILL BE VERY SIMILAR - AGAIN, GENERALLY WE CANNOT	SIXPAK
ASSUME THAT THIS IS TRUE FOR THE MF=6 SPECTRA.	SIXPAK
THEREFORE WE CAN ALSO DEFINE THE LAB SCALAR SPECTRUM IN TERMS OF	SIXPAK SIXPAK
THE CM SPECTRUM IN THE FORM,	SIXPAK
	SIXPAK
G0 (E, EP) = INTEGRAL F (E, EP, COS (CM)) * J*D (COS (LAB))	SIXPAK
	SIXPAK
CONSISTENT WITH THE ABOVE ASSUMPTION THAT THE ANGULAR DEPENDENCE OF EP(LAB) CAN BE IGNORED THE JACOBIAN WILL NOT BE USED IN	SIXPAK SIXPAK
PERFORMING THESE INTEGRALS - IN WHICH CASE THE INTEGRAL REDUCES	SIXPAK
TO EXACTLY THE SAME FORM AS IF THE DATA WERE IN THE LAB SYSTEM.	SIXPAK
	SIXPAK
IT SHOULD BE NOTED THAT SINCE IN THIS CASE THE MF=4 ANGULAR	SIXPAK
DISTRIBUTIONS ARE GIVEN IN THE CM SYSTEM AND WHEN USED IN ANY APPLICATION THEY WILL BE TRANSFORMED TO THE LAB SYSTEM - WHEN	SIXPAK SIXPAK
THIS IS DONE THE JACOBIAN WILL BE APPLIED.	SIXPAK
	SIXPAK
IN THIS CODE WHERE WE ARE MOSTLY CONCERNED WITH CONSERVING THE	SIXPAK
NUMBER OF EMITTED PARTICLES AND AVERAGE ENERGIES THE NEUTRON	SIXPAK
SPECTRA OUTPUT IN MF=5 WILL NOT BE COMPLETELY CONVERTED TO THE LAB SYSTEM - ONLY FIRST ORDER CORRECTIONS WILL BE INCLUDED BY	~
	SIXPAK
	SIXPAK
INCREASING THE EMITTED PARTICLE ENERGY BY THE CENTER OF MASS ENERGY, I.E., FOR A CENTER OF MASS SPECTRUM TABULATED AT CENTER	
INCREASING THE EMITTED PARTICLE ENERGY BY THE CENTER OF MASS ENERGY, I.E., FOR A CENTER OF MASS SPECTRUM TABULATED AT CENTER OF MASS ENERGIES EP(CM) THESE WILL ALL BE UNIFORMLY INCREASED	SIXPAK SIXPAK
INCREASING THE EMITTED PARTICLE ENERGY BY THE CENTER OF MASS ENERGY, I.E., FOR A CENTER OF MASS SPECTRUM TABULATED AT CENTER OF MASS ENERGIES EP(CM) THESE WILL ALL BE UNIFORMLY INCREASED BY E(MM) TO ACCOUNT FOR THE CENTER OF MASS MOTION - THE SPECTRA	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
INCREASING THE EMITTED PARTICLE ENERGY BY THE CENTER OF MASS ENERGY, I.E., FOR A CENTER OF MASS SPECTRUM TABULATED AT CENTER OF MASS ENERGIES EP(CM) THESE WILL ALL BE UNIFORMLY INCREASED BY E(MM) TO ACCOUNT FOR THE CENTER OF MASS MOTION - THE SPECTRA WILL NOT BE MODIFIED BY THE JACOBIAN FACTOR SQRT(EP(LAB)/EP(CM))	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
INCREASING THE EMITTED PARTICLE ENERGY BY THE CENTER OF MASS ENERGY, I.E., FOR A CENTER OF MASS SPECTRUM TABULATED AT CENTER OF MASS ENERGIES EP(CM) THESE WILL ALL BE UNIFORMLY INCREASED BY E(MM) TO ACCOUNT FOR THE CENTER OF MASS MOTION - THE SPECTRA WILL NOT BE MODIFIED BY THE JACOBIAN FACTOR SQRT(EP(LAB)/EP(CM)) SINCE THIS WOULD REQUIRE A DETAILED TRANSFORMATION IN ENERGY AND	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
INCREASING THE EMITTED PARTICLE ENERGY BY THE CENTER OF MASS ENERGY, I.E., FOR A CENTER OF MASS SPECTRUM TABULATED AT CENTER OF MASS ENERGIES EP(CM) THESE WILL ALL BE UNIFORMLY INCREASED BY E(MM) TO ACCOUNT FOR THE CENTER OF MASS MOTION - THE SPECTRA WILL NOT BE MODIFIED BY THE JACOBIAN FACTOR SQRT(EP(LAB)/EP(CM))	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
INCREASING THE EMITTED PARTICLE ENERGY BY THE CENTER OF MASS ENERGY, I.E., FOR A CENTER OF MASS SPECTRUM TABULATED AT CENTER OF MASS ENERGIES EP(CM) THESE WILL ALL BE UNIFORMLY INCREASED BY E(MM) TO ACCOUNT FOR THE CENTER OF MASS MOTION - THE SPECTRA WILL NOT BE MODIFIED BY THE JACOBIAN FACTOR SQRT(EP(LAB)/EP(CM)) SINCE THIS WOULD REQUIRE A DETAILED TRANSFORMATION IN ENERGY AND COS(THETA) SPACE - WHICH IS JUDGED NOT TO BE WORTH PERFORMING	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
INCREASING THE EMITTED PARTICLE ENERGY BY THE CENTER OF MASS ENERGY, I.E., FOR A CENTER OF MASS SPECTRUM TABULATED AT CENTER OF MASS ENERGIES EP(CM) THESE WILL ALL BE UNIFORMLY INCREASED BY E(MM) TO ACCOUNT FOR THE CENTER OF MASS MOTION - THE SPECTRA WILL NOT BE MODIFIED BY THE JACOBIAN FACTOR SQRT(EP(LAB)/EP(CM)) SINCE THIS WOULD REQUIRE A DETAILED TRANSFORMATION IN ENERGY AND COS(THETA) SPACE - WHICH IS JUDGED NOT TO BE WORTH PERFORMING WITHIN THE LIMITS OF WHERE THE OUTPUT FROM THIS CODE IS INTENDED TO BE USED.	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
INCREASING THE EMITTED PARTICLE ENERGY BY THE CENTER OF MASS ENERGY, I.E., FOR A CENTER OF MASS SPECTRUM TABULATED AT CENTER OF MASS ENERGIES EP(CM) THESE WILL ALL BE UNIFORMLY INCREASED BY E(MM) TO ACCOUNT FOR THE CENTER OF MASS MOTION - THE SPECTRA WILL NOT BE MODIFIED BY THE JACOBIAN FACTOR SQRT(EP(LAB)/EP(CM)) SINCE THIS WOULD REQUIRE A DETAILED TRANSFORMATION IN ENERGY AND COS(THETA) SPACE - WHICH IS JUDGED NOT TO BE WORTH PERFORMING WITHIN THE LIMITS OF WHERE THE OUTPUT FROM THIS CODE IS INTENDED TO BE USED. SINCE THE ANGULAR DISTRIBUTION IS ALWAYS OUTPUT IN THE SAME	SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK SIXPAK
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PLOTT		SIXPAK SIXPAK
	:======================================	SIXPAK
THIS E	PROGRAM CONTAINS ROUTINES TO PRODUCE OUTPUT THAT CAN BE USED S	SIXPAK
AS INE	PUT TO THE PLOTTAB CODE TO OBTAIN GRAPHIC RESULTS.	SIXPAK
		SIXPAK
		SIXPAK
		SIXPAK
	NES. UNLESS YOU COMPLETELY UNDERSTAND THIS CODE THE RESULTS	
CAN BE		SIXPAK
TNIDIIM		SIXPAK
INPUT	FILES 5	SIXPAK
		SIXPAR
		SIXPAK
2		SIXPAK
		SIXPAK
		SIXPAK
OUTPUI	FILES S	SIXPAK
=====		SIXPAK
UNIT	DESCRIPTION S	SIXPAK
	8	SIXPAK
3	OUTPUT REPORT (BCD - 120 CHARACTERS/RECORD)	SIXPAK
		SIXPAK
10		SIXPAK
CD3mC		SIXPAK SIXPAK
NONE		SIXPAK
HONE		SIXPAK
OPTION		SIXPAK
UNIT		SIXPAK
	5	SIXPAK
2	SIXPAK.INP S	SIXPAK
3	SIXPAK.LST S	SIXPAK
10	ENDFB.IN S	SIXPAK
11	ENDFB.MF4 S	SIXPAK
		SIXPAK
10		SIXPAK SIXPAK
		SIXPAR
тиргит		SIXPAK
		SIXPAR
		SIXPAK
		SIXPAK
		SIXPAK
2-N		SIXPAK
-	-	SIXPAK
	-	SIXPAK
	-	SIXPAK
	_	SIXPAK
LEAVE	THE DEFINITION OF THE FILENAME BLANK - THE PROGRAM WILL	SIXPAK
THEN (JSE THE STANDARD FILENAME (ENDFB.IN).	SIXPAK
		SIXPAK
	100 MAT/MT RANGES MAY BE SPECIFIED. THE LIST OF RANGES IS	
	NATED BY A BLANK LINE. IF THE FIRST INPUT LINE IS COMPLETELY S	
BLANK		SIXPAK
	S	SIXPAK

DATA FILENAME ENDFB.IN IN THIS CASE THE USER CAN EITHER EXPLICIT	SIXP
SPECIFY THE FILENAME AND MAT/MT RANGE BY THE FOLLOWING 2 INPUT	SIXP
• • • • • • •	SIXP
,	SIXP
	SIXP
ENDFB.IN 1 1 9999 999	
(BLANK LINE, TERMINATES REQUEST LIST)	SIXP
	SIXP
	SIXP
	SIXP
	SIXP
EXAMPLE INPUT NO. 2	SIXP
	SIXP
PROCESS BE-9, MAT=425, MT=16. READ THE DATA FROM ENDFB6\BE9.	SIXP
IN THIS CASE THE FOLLOWING 3 INPUT LINES ARE REQUIRED,	SIXP
	SIXP
ENDFBB6\BE9	SIXP
425 16 425 16	SIXP
	SIXP
	SIXP
EXAMPLE INPUT NO. 3	SIXP
	SIXP
PROCESS ALL MT=16 (N,2N) DATA. THIS CAN BE DONE BY SPECIFYING TH	
MAXIMUM MAT RANGE = 1 TO 9999, AND MT=16 FOR THE MINIMUM AND	SIXP
MAXIMUM MT RANGE. READ THE DATA FROM ENDFB6\K300. IN THIS CASE	SIXP
CASE THE FOLLOWING 3 INPUT LINES ARE REQUIRED,	SIXP
	SIXP
ENDFB6\K300	SIXP
1 16 9999 16	SIXP
	SIXP
(BLANK LINE, TERMINATES REQUEST LIST)	SIXP