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BINX - BCD Interpretation of Neutron X-Sections

by

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BINX - BCD INTERPRETATION OF NEUTRON X-SECTIONS

by

Patrick D. Soran

The BINX code has been developed to permit translation of data libraries from BCD to binary or vice versa. The code is written in FORTRAN and performs translations on the ISOTXS or BROKXS files of the CCCC interface system.

I. INTRODUCTION

BINX is a computer code for converting neutron multigroup data libraries from binary to BCD or vice versa. The libraries which are operated upon are those which have been written in the CCCC¹ interface file format. The present version of BINX only processes version II of the ISOTXS¹ interface file and both versions II and III of the BRKXS¹ interface file. The code was designed to operate on a CDC 7600 machine.

II. DISCUSSION

When calculating neutron multigroup cross section codes using the MINX² code the CCCC interface files are written in binary form. To distribute either the ISOTXS (infinite dilution and 0°K multigroup data) or the BRKXS (self shielded or f-factor tables) interface data files the master libraries must be in a BCD format. Master libraries are created from several MINX runs and these libraries consolidated into one library by use of the LINK³ code. The BINX code can then transform the master binary LINK library to a BCD library for external distribution. Since binary records are much more efficient means of handling data the BINX code can also transform a master BCD library back to a master binary library.

The BINX code operates from a master ISOTXS or BRKXS interface file and translates from one language to another; the end result is two master tapes, one in binary and one in BCD. BINX correctly

translates the files with a minimum of user intervention. BINX was designed to be used primarily with the Los Alamos Scientific Laboratory code MINX and for use in the distribution of multigroup libraries created by MINX.

III. GUIDE TO USER APPLICATION

The present version of BINX requires six input/output units, one of which is card input unit (unit 5) and one which is a printer output unit (unit 6). The remaining four units concern the manipulation of the data:

- unit 3 - Input ISOTXS library (BCD or binary)
- unit 8 - Output ISOTXS library (binary or BCD)
- unit 4 - Input BRKXS library (BCD or binary)
- unit 9 - Output BRKXS library (binary or BCD)

The user input requirements are minimal as seen below

Number of Word on Card	Name of Variable	Comment
1	NTYPE	0 - binary to BCD 1 - BCD to binary
2	ICRM	0 - work on ISOTXS file 1 - work on BRKXS file

The entire program resides in core of a CDC 7600 and requires 12 to 20 seconds to execute. The code at LASL exists as an UPDATE file (BINX) with a backup checksum tape XX013695 assigned to P. D. Soran, T-1.

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REFERENCES

1. B. M. Carmichael, D. A. Menley, and D. R. Vondy, "Report of the Subcommittee on Standard Interface Files," prepared for the Committee on Computer Code Coordination and issued as Los Alamos Scientific report LA-5324-MS (July 1973).
2. C. R. Weisbin, P. D. Soran, R. J. LaBauve, D. R. Harris and J. S. Hendricks, "MINX - A Multi-group Interpretation of Nuclear Cross Sections from ENDF/B," Los Alamos Scientific Laboratory report, to be published.
3. P. D. Soran, "LINX - Library Interpretation of Neutron X-Sections," Los Alamos Scientific Laboratory report LA-5629-MS (June 1974).

LP-0314

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PROGRAM CCCRG (INP,OUT,PLN,FILM,FSET3,FSET4,FSET6,FSET9,FSET10,FS BINX      2
1FYS=INP,FSET16=OLT,FSET17=PLN)      BINX      3
THIS PROGRAM MENGES ISOTXS AND BRKXNS CCCC FILES      BINX      4
C                                          BINX      5
C                                          BINX      6
2 COMMON A(30000)      BINX      7
2 COMMON /XTYPE/ XTYPE,ICPM,IEDIT,NRSP,IRD(10)      BINX      8
C                                          BINX      9
C                                          BINX     10
C                                          BINX     11
2 CALL UDEFIN (IU3,IU4,IU5,IU6,IU7,IU8,IU9,IU10)      BINX     12
12 CALL STYP (IU5,IU6)      BINX     13
14 CALL PRUNT (IL6,IU3,IU4,IU8,IU9)      BINX     14
20 CALL RWIN (IU3)      BINX     15
22 CALL RWIN (IU4)      BINX     16
24 CALL RWIN (IU8)      BINX     17
26 CALL RWIN (IU9)      BINX     18
30 IF (ICPM.EQ.0) CALL DISCTX (IU6,IL3,IL8)      BINX     19
34 IF (ICPM.EQ.1) CALL BRKRX (IU6,IU4,IU9)      BINX     20
41 STOP      BINX     21
43 END

SUBROUTINE UDEFIN(IU3,IU4,IU5,IU6,IU7,IU8,IU9,IU10)      BINX     22
C      DEFINE UNITS      BINX     23
20 IU3=3      BINX     24
20 IU4=4      BINX     25
21 IU5=5      BINX     26
22 IU6=6      BINX     27
23 IU7=7      BINX     28
24 IU8=8      BINX     29
25 IU9=9      BINX     30
26 IU10=10      BINX     31
C      BINX     32
C      IU3 IS OLD MASTER TAPE, IL4 IS DATA TO BE ACQED, IU4 AND IU6 ARE      BINX     33
C      STANDARD I/C UNITS,IU7 PUNCH UNIT,IL4 IS NEW MASTER TAPE,IU9 AND I      BINX     34
C      ARE SCRATCH UNITS      BINX     35
30 CALL RWIN (3)      BINX     36
32 CALL RWIN (4)      BINX     37
34 CALL RWIN (8)      BINX     38
36 RETURN      BINX     39
37 END      BINX     40

SUBROUTINE RWIN(IX)      BINX     41
3 REWIND IX      BINX     42
5 RETURN      BINX     43
6 END      BINX     44

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6		SUBROUTINE STYP(IU5,IU6)			BINX	45
6		COMMON /XTYPE/ IATYPE,ICHM,IEDIT,NRSKP,IRD(10)			BINX	46
12	10	DO 10 I=1,10			BINX	47
14		IRD(I)=1			BINX	48
24		READ (IL5,20) IATYPE,ICHM			BINX	49
36		WRITE (IU6,30) IATYPE,ICHM			BINX	50
		RETURN			BINX	51
	C				BINX	52
	C				BINX	53
	20	FORMAT (2I5)			BINX	54
	30	FORMAT (39H1 IATYPE (BIN TO BCD=0)/(BCD TO BIN=1),15/26H ICHM			BINX	55
37		10/I=ISCTXS/BRKX5,15)			BINX	56
		END			BINX	57

14		SUBROUTINE PRINT(IU6,IU3,IU4,IU8,IU9)			BINX	58
14		COMMON /XTYPE/ IATYPE,X2(13)			BINX	59
20		WRITE (IU6,20)			BINX	60
25		IF (IATYPE,EG,1) GO TO 10			BINX	61
35		WRITE (IU6,30) IL3,IL8			BINX	62
50		WRITE (IU6,40) IL4,IL8			BINX	63
51	10	RETURN			BINX	64
51		CONTINUE			BINX	65
61		WRITE (IU6,50) IL3,IL8			BINX	66
74		WRITE (IU6,60) IL4,IL8			BINX	67
		RETURN			BINX	68
	C				BINX	69
	C				BINX	70
	20	FORMAT (1H0)			BINX	71
	30	FORMAT (36H0 THE ISCTXS BINARY INPUT IS ON UNIT,I4,26H THE BCD OUT			BINX	72
		INPUT IS ON UNIT,I4)			BINX	73
40		FORMAT (36H0 THE BRKX5 BINARY INPUT IS ON UNIT,I4,26H THE BCD OUT			BINX	74
		INPUT IS ON UNIT,I4)			BINX	75
50		FORMAT (36H0 THE ISCTXS BCD INPUT IS ON UNIT ,I4,29H THE BINARY OL			BINX	76
		INPUT IS ON UNIT,I4)			BINX	77
60		FORMAT (33H0 THE BRKX5 BCD INPUT IS ON UNIT,I4,29H THE BINARY OUT			BINX	78
		INPUT IS ON UNIT,I4)			BINX	79
75		END			BINX	80

		SUBROUTINE BISCTX(ABCD,N4,ABCD)			BINX	81
	C	CONTROLS BCD WRITTING ON UNIT N4			BINX	82
10		DIMENSION MCDE(3)			BINX	83
10		COMMON A(1)			BINX	84
10		DIMENSION IA(1)			BINX	85
10		COMMON /XTYPE/ IATYPE,ICHM,IEDIT,NRSKP,IRD(10)			BINX	86
10		EQUIVALENCE (A(1),IA(1))			BINX	87
		DATA TOTAL,ELAS,AINEL,ANZN/6MTOTAL ,6H ELASTC,6H INELAS,6H N2N/			BINX	88
		DATA MCDE(1),MCDE(2),MCDE(3)/1,1,1/			BINX	89
		DATA P0,M1,M9/0,1,9/			BINX	90
10		IREF=1			BINX	91
10		IF (IATYPE,EG,0) CALL WREF (A4,1,A(1),4,1)			BINX	92
15		IF (IATYPE,EG,1) READ (A4,200) (A(I),I=1,3),IA(4)			BINX	93
33		IF (IATYPE,EG,0) WRITE (ABCD,210) (A(I),I=1,3),IA(4)			BINX	94
46		IF (IATYPE,EG,1) CALL WITE (ABCD,IREF,1,A(1),4,MCDE(1))			BINX	95
55		FN=A(1)			BINX	96
56		HU=A(2)			BINX	97
60		HS=A(3)			BINX	98
61		IVER=IA(4)			BINX	99
63		WRITE (AOLT,560) FN,IVER,N4			BINX	100
77		WRITE (AOLT,570) HU,FS			BINX	101
	C				BINX	102
	C	---FILE CONTRCL			BINX	103
	C				BINX	104

Line	Code	Statement	BinX	Page
111		IREC1=IREC1+1	BINX	105
113		IF (INTYPE.EG.0) CALL REED (N4,IREC1,A(1),M9,MODE(1))	BINX	106
123		IF (INTYPE.EG.1) READ (N4,220)(IA(I),I=1,M9)	BINX	107
140		IF (INTYPE.EG.0) WRITE (ABCD,230)(IA(I),I=1,M9)	BINX	108
152		IF (INTYPE.EG.1) CALL RITE (ABCD,IREC1,A(1),M9,MODE(1))	BINX	109
161		NGROUP=IA(1)	BINX	110
162		NISO=IA(2)	BINX	111
164		MAXUP=IA(3)	BINX	112
165		MAXDN=IA(4)	BINX	113
167		MAXORD=IA(5)	BINX	114
170		ICHIST=IA(6)	BINX	115
172		NSCMAX=IA(7)	BINX	116
173		NCBLOK=IA(8)	BINX	117
175		NSBLOK=IA(9)	BINX	118
176		IF (IRD(1).NE.1) GO TO 10	BINX	119
203		WRITE (AOUT,360)(IA(I),I=1,9)	BINX	120
	C		BINX	121
	C	---FILE DATA	BINX	122
	C		BINX	123
213	10	NWDS=(ICHIST*(1/NCBLOK)+2)*NGROUP+2*NISC+13	BINX	124
224		IREC1=IREC1+1	BINX	125
226		NWR=12*NISO	BINX	126
227		IF (INTYPE.EG.0) CALL REED (N4,IREC1,A(1),NWDS,MODE(1))	BINX	127
236		IF (INTYPE.EG.1) READ (N4,250)(A(I),I=1,NWR)	BINX	128
253		IF (IRD(2).NE.1) GO TO 40	BINX	129
255		WRITE (AOUT,370)(A(I),I=1,12)	BINX	130
263		WRITE (AOUT,380)	BINX	131
271		DO 20 I=1,NISO	BINX	132
275		J=I+12	BINX	133
276	20	WRITE (AOUT,390)I,A(J)	BINX	134
314		IF (INTYPE.EG.0) WRITE (ABCD,240)(A(I),I=1,NWR)	BINX	135
326		NEXT=13+NISC	BINX	136
330		IF (NCBLOK.GT.1) GO TO 30	BINX	137
334		NWR=NEXT*NGROUP+1	BINX	138
335		IF (INTYPE.EG.1) READ (N4,260)(A(I),I=NEXT,NWR)	BINX	139
351		WRITE (AOUT,400)	BINX	140
355		CALL WCT (A(NEXT),ICHIST,NGROUP,M1,6HIN GP,6HOUT GP,M1,NOUT)	BINX	141
370		IF (INTYPE.EG.0) WRITE (ABCD,260)(A(I),I=NEXT,NWR)	BINX	142
405		NEXT=NEXT+NGROUP*ICHIST	BINX	143
410	30	WRITE (AOUT,410)	BINX	144
414		NWR=NEXT*NGROUP*NGROUP+NISO	BINX	145
417		IF (INTYPE.EG.1) READ (N4,260)(A(I),I=NEXT,NWR)	BINX	146
435		CALL WCT8 (A(NEXT),NGROUP,A,M0,A,M0,A,M0,A,M0,A,M0,A,M0,A,M0,NOUT)	BINX	147
460		NWT=NEXT	BINX	148
461		NEXT=NEXT+NGROUP	BINX	149
463		WRITE (AOUT,420)	BINX	150
471		CALL WCT8 (A(NEXT),NGROUP,A,M0,A,M0,A,M0,A,M0,A,M0,A,M0,A,M0,NOUT)	BINX	151
515		NEXT=NEXT+NGROUP	BINX	152
517		WRITE (AOUT,430)A(NEXT)	BINX	153
530		NEXT=NEXT+1	BINX	154
532		WRITE (AOUT,440)	BINX	155
540		CALL WCT8 (A(NEXT),NISO,A,M0,A,M0,A,M0,A,M0,A,M0,A,M0,A,M0,NOUT)	BINX	156
564		NWR=NEXT+NISO-1	BINX	157
566		IF (INTYPE.EG.0) WRITE (ABCD,260)(A(I),I=NWT,NWR)	BINX	158
604		IF (INTYPE.EG.1) CALL RITE (ABCD,IREC1,A(1),NWDS,MODE(1))	BINX	159
	C		BINX	160
	C	---SET CHI DATA	BINX	161
	C		BINX	162
615	40	IF (NCPLNK.EG.1) GO TO 60	BINX	163
617		NWDS=(NGROUP-1)/NCBLOK+1*ICHIST	BINX	164
624		NPT=1	BINX	165
626		DO 50 I=1,NCBLOK	BINX	166
627		IREC1=IREC1+1	BINX	167
630		CALL REED (N4,IREC1,A(NPT),NWDS,MODE(1))	BINX	168
640	50	NPT=NPT+NWDS	BINX	169
644		IF (IRD(3).NE.1) GO TO 60	BINX	170
646		WRITE (AOUT,450)	BINX	171
652		CALL WCT (A(1),ICHIST,NGROUP,M1,6HIN GP,6HOUT GP,M1,NOUT)	BINX	172

C			BINX	173
C		---ISCTCPE CONTROL AND GROUP INDEPENDENT DATA	BINX	174
C			BINX	175
666	AO	DO 190 I=1,NIISC	BINX	176
670		NWDS=(2*NGNCUP+2)*NSCMAX+15	BINX	177
674		IREF1=IREF1+1	BINX	178
676		IF (INTYPE.EG.0) CALL REED (N4,IREF1,A(1),NWDS,MODE(1))	BINX	179
704		IF (INTYPE.EG.1) READ (N4,280) (A(J),J=1,6), (IA(J),J=7,NWDS)	BINX	180
723		IF (INTYPE.EG.0) WRITE (ABCD,270) (A(J),J=1,6), (IA(J),J=7,NWDS)	BINX	181
737		IF (INTYPE.EG.1) CALL WITE (ABCD,IREF1,A(1),NWDS,MODE(1))	BINX	182
746		JREAD=1+NWDS	BINX	183
750		NCIBLK=IA(8)	BINX	184
751		ICHI=IA(9)	BINX	185
753		IFIS=IA(10)	BINX	186
754		IALF=IA(11)	BINX	187
756		INP=IA(12)	BINX	188
757		IN2N=IA(13)	BINX	189
761		IND=IA(14)	BINX	190
762		INT=IA(15)	BINX	191
764		IF (IRP(4),NE.1) GO TO 70	BINX	192
770		WRITE (NOUT,460) I	BINX	193
776		WRITE (NOUT,470) (A(J),J=1,6), (IA(J),J=7,9)	BINX	194
1010		WRITE (NOUT,480) (IA(J),J=10,15)	BINX	195
1020		NEX1=16	BINX	196
1021		WRITE (NOUT,490)	BINX	197
1027		CALL WOTB (A(NEX1),NSCMAX,A,M0,A,M0,A,M0,A,M0,A,M0,A,M0,NOUT)	BINX	198
1053		NEX2=NSCMAX+16	BINX	199
1055		WRITE (NOUT,500)	BINX	200
1063		CALL WOTB (A(NEX2),NSCMAX,A,M0,A,M0,A,M0,A,M0,A,M0,A,M0,NOUT)	BINX	201
1107		J1=NEX2+NSCMAX	BINX	202
1111		WRITE (NOUT,510)	BINX	203
1117		CALL WOTI (A(J1),NGROUP,NSCMAX,M1,6H GRP ,6H BLOCK,M1,NOUT)	BINX	204
1132		J1=J1+NGROUP*NSCMAX	BINX	205
1135		WRITE (NOUT,520)	BINX	206
1143		CALL WOTI (A(J1),NGROUP,NSCMAX,M1,6H GROUP,6H BLOCK,M1,NOUT)	BINX	207
C			BINX	208
C		---PRINCIPAL CROSS SECTIONS	BINX	209
C			BINX	210
1160	70	NWDS=(4*IFIS*(ICHI*(1/NCIBLK)+2)*IALF+IAP+IN2N+IND+INI)*NGROUP	BINX	211
1176		IREF1=IREF1+1	BINX	212
1200		NWR=NWDS-JREAD-1	BINX	213
1201		IF (INTYPE.EG.0) CALL REED (N4,IREF1,A(JREAD),NWDS,MODE(1))	BINX	214
1210		IF (INTYPE.EG.1) READ (N4,300) (A(I),I=JREAD,NWR)	BINX	215
1226		IF (INTYPE.EG.0) WRITE (ABCD,290) (A(I),I=JREAD,NWR)	BINX	216
1241		IF (INTYPE.EG.1) CALL WITE (ABCD,IREF1,A(JREAD),NWDS,MODE(1))	BINX	217
1251		IF (IRP(5),NE.1) GO TO 80	BINX	218
1255		WRITE (NOUT,530)	BINX	219
1261		NKIND=NWDS/NGROUP	BINX	220
1265		CALL WOT(A(JREAD),NGROUP,NKIND,M1,6H GROUP,6H TYPE ,M1,NOUT)	BINX	221
C			BINX	222
C		---ISCTCPE CHI DATA	BINX	223
C			BINX	224
1302	AO	IF (NCIPLK.EG.1) GO TO 100	BINX	225
1304		IF (IFIS.LI.1) GO TO 100	BINX	226
1306		IF (ICHI.LI.1) GO TO 100	BINX	227
1310		NWDS=(NGROUP-1)/NCIBLK+1+ICHI	BINX	228
1315		NPT=JREAD	BINX	229
1317		DO 90 K=1,NCIBLK	BINX	230
1321		IREF1=IREF1+1	BINX	231
1322		NWR=NPT+NWDS-1	BINX	232
1324		IF (INTYPE.EG.0) CALL REED (N4,IREF1,A(NPT),NWDS,MODE(1))	BINX	233
1332		IF (INTYPE.EG.0) READ (N4,320) (A(I),I=NPT,NWR)	BINX	234
1347		IF (INTYPE.EG.1) READ (N4,320) (A(I),I=NPT,NWR)	BINX	235
1363		IF (INTYPE.EG.0) WRITE (ABCD,310) (A(I),I=NPT,NWR)	BINX	236
1376		IF (INTYPE.EG.1) CALL WITE (ABCD,IREF1,A(NPT),NWDS,MODE(1))	BINX	237
1410	AO	NPT=NPT+NWDS	BINX	238
1414		IF (IRP(6),NE.1) GO TO 100	BINX	239
1416		WRITE (NOUT,540)	BINX	240
1422		CALL WOT (A(JREAD),ICHI,NGROUP,M1,6H I A GP ,6HOUT GP,M1,NOUT)	BINX	241
C			BINX	242
C		---SCATTERING CROSS SECTIONS	BINX	243
C			BINX	244
1437	100	DO 190 K=1,NSCMAX	BINX	245

1441		K=N+15	BINX	246
1442		IDSC7=YA(K)	BINX	247
1444		K=K+NSCMAX	BINX	248
1445		LORDN=YA(K)	BINX	249
1447		IDSC7=IDSC7/100.1	BINX	250
1454		GO TO (110,120,130,140), IDSC7	BINX	251
1463	110	BLOCK=TCTAL	BINX	252
1465		GO TO 150	BINX	253
1465	120	BLOCK=ELAS	BINX	254
1467		GO TO 150	BINX	255
1467	130	BLOCK=ATNEL	BINX	256
1471		GO TO 150	BINX	257
1471	140	BLOCK=AN2N	BINX	258
1473	150	IF (LORDN.NE.0) GO TO 160	BINX	259
1474		WRITE (AOUT,550)N,BLOCK	BINX	260
1504		GO TO 190	BINX	261
1507	160	KMAX=0	BINX	262
1510		K=2*NSCMAX+15+(N-1)*NGROUP	BINX	263
1515		INC=(NGROUP-1)/NSBLCK+1	BINX	264
1521		NPT=JRFAD	BINX	265
1523		DO 180 J=1,NSBLCK	BINX	266
1524		JL=(J-1)*INC+1	BINX	267
1527		JL=J*INC	BINX	268
1530		NWDS=0	BINX	269
1531		DO 170 JJ=JL,JL	BINX	270
1540		L=K+JJ	BINX	271
1541		NWDS=NWDS+IA(L)	BINX	272
1542	170	KMAX=KMAX+IA(L)	BINX	273
1545		NWDS=NWDS+LCRDN	BINX	274
1547		IREC=IREC+1	BINX	275
1551		NWR=NPT+NWDS-1	BINX	276
1553		IF (INTYPE.EG.0) CALL REED (N4,IREC1,A(NPT),NWDS,MODE(1))	BINX	277
1563		IF (INTYPE.EG.1) REAC (N4,340)(A(I),I=NPT,NWR)	BINX	278
1601		IF (INTYPE.EG.0) WRITE (ABCD,330)(A(I),I=NPT,NWR)	BINX	279
1614		IF (INTYPE.EG.1) CALL WITE (ABCD,IREC1,A(NPT),NWDS,MODE(1))	BINX	280
1624		IF (IREC(7).NE.1) GO TO 180	BINX	281
1630		WRITE (AOUT,350)J	BINX	282
1636		CALL WCT (A(NPT),LORDN,IA(L),M1,6H CRDER,6H POSA ,M1,NOLT)	BINX	283
1654	180	CONTINUE	BINX	284
1657	190	CONTINUE	BINX	285
1664		RETURN	BINX	286
		C	BINX	287
		C	BINX	288
		C	BINX	289
200		FORMAT (11X,A6,1X,2A6,1X,16)	BINX	290
210		FORMAT (11H 0V ISOTXS ,A6,1H*,2A6,1H*,16)	BINX	291
220		FORMAT (4X,9I6)	BINX	292
230		FORMAT (4H 1D *9I6)	BINX	293
240		FORMAT (4H 2D ,1H*,11A6,1H*/1H*,A6,1H*,9(1X,A6)/(10(1X,A6)))	BINX	294
250		FORMAT (4X,1X,11A6,1X/1X,A6,1X,9(1X,A6)/(10(1X,A6)))	BINX	295
260		FORMAT (1P6E12.5)	BINX	296
270		FORMAT (4H 4D ,A6,/1P5E12.5/(12I6))	BINX	297
280		FORMAT (4X,A6,/1P5E12.5/(12I6))	BINX	298
290		FORMAT (4H 5D ,1P5E12.5/(6E12.5))	BINX	299
300		FORMAT (4X,1P5E12.5/(6E12.5))	BINX	300
310		FORMAT (4H 6D ,1P5E12.5/(6E12.5))	BINX	301
320		FORMAT (4X,1P5E12.5/(6E12.5))	BINX	302
330		FORMAT (4H 7D ,1P5E12.5/(6E12.5))	BINX	303
340		FORMAT (4X,1P5E12.5/(6E12.5))	BINX	304
350		FORMAT (1H ,6X,5HGROUP,I4)	BINX	305
360		FORMAT (24HFILE CONTROL PARAMETERS//51H NGROUP NUMBER OF ENER	BINX	306
		1GY GROUPS IN SET I12/51H NISC NUMBER OF ISOTOPIES IN	BINX	307
		2SET I12/51H MAXUP MAXIMUM NUMBER OF UPSCATTER GR	BINX	308
		3OUPS I12/51H MAXDN MAXIMUM NUMBER OF DOWNSCATTER GROUPS	BINX	309
		4 I12/51H MAXOWC MAXIMUM SCATTERING CROSS I12/51H	BINX	310
		* ICHIST SET FISSION SPECTRUM FLAG I12/51H	BINX	311
		6 ICHIST=1 SET VECTOR /51H	BINX	312
		7 =NGROUP, SET MATRIX /51H NSCMAX MAXIMUM NUMBER CF	BINX	313
		ERLOCKS CF I12/51H SCATTERING DATA	BINX	314
		9 /51H ACBLCK BLOCKING CONTROL FOR SET CHI DATA	BINX	315
		* I12/51H NSBLCK BLOCKING CONTROL FOR SCATTERING DATA I12	BINX	316

370	FORMAT (1H0,12(A6))	BINX	317
380	FORMAT (1H0,4X,7HISCTOPE,4X,4HNAME)	BINX	318
390	FORMAT (3X,13,6X,A6)	BINX	319
400	FORMAT (17HOFISSION SPECTRUM)	BINX	320
410	FORMAT (33H0MEAN NEUTRON VELOCITY IN GROUP J/9X,1HJ)	BINX	321
420	FORMAT (21H0MAXIMUM ENERGY BOUND/3X,6HGROUP,1HJ)	BINX	322
430	FORMAT (28H0MINIMUM ENERGY BOUND OF SET//16X,E12,5)	BINX	323
440	FORMAT (32H0NUMBER OF RECCDS TO BE SKIPPED//5X,7HISCTOPE,2X,6HNUM	BINX	324
	1BER)	BINX	325
450	FORMAT (21H0SET FISSION SPECTRUM)	BINX	326
460	FORMAT (8H0ISCTOPE,13)	BINX	327
470	FORMAT (27H0ISOTOPE CONTRL PARAMETERS//51H HABSID ABSOLUTE ISOT	BINX	328
	1OPE LABEL 7X,A6/51H AMASS GRAM ATOMIC WEIGHT	BINX	329
	2 E12.5/51H EFISS TOTAL THERMAL ENERGY YI	BINX	330
	3ELD/FISSION E12.5/51H (W,SEC/FISS)	BINX	331
	4 /51H TEMP TEMPERATURE (DEG K) E	BINX	332
	512.5/51H SIGPCT AV POTENTIAL SCATTERING (BARN/ATOM) E12.5/5	BINX	333
	61H ADENS REFERENCE ATOM DENSITY E12.5/51H KE	BINX	334
	7R ISOTOPE CLASSIFICATION I12/51H	BINX	335
	8 0=UNDEFINED /51H 1=FISSILE	BINX	336
	9 /51H 2=PERTILE	BINX	337
	3=OTHER ACTINIDE	BINX	338
	4=FISSION PRODLCT /51H	BINX	339
	5=STRUCTURE /51H	BINX	340
	6=COOLANT /51H 7=CONTROL	BINX	341
	8 /51H NCIBLK ISOTOPF CHI BLOCKING FAC	BINX	342
	912/51H ICHI ISOTOPE FISSION SPECTRUM FLAG	BINX	343
	10 I12/51H ICHI=0 USE SET CHI	BINX	344
	11)	BINX	345
480	FORMAT (51H =1 CHI VECTOR /51H	BINX	346
	1 =NGROUP, CHI MATRIX /51H IFIS	BINX	347
	2 (N,F) X-SECTION PRESENT (1=YES/0=NO) I12/51H IALF (N,ALPHA)	BINX	348
	3 X-SECTION PRESENT (1=YES/0=NO) I12/51H INF (N,P) X-SECTION	BINX	349
	4PRESENT (1=YES/0=NO) I12/51H IAN (N,2N) X-SECTION PRESENT	BINX	350
	5(1=YES/0=NO) I12/51H INC (N,D) X-SECTION PRESENT (1=YES/0	BINX	351
	6=NO) I12/51H INT (N,T) X-SECTION PRESENT (1=YES/0=NO)	BINX	352
	7I12)	BINX	353
490	FORMAT (28H0SCATTERING TYPE FOR BLOCK N/9X,1HN,6X,4HTYPE)	BINX	354
500	FORMAT (39H0NUMBER OF SCATTERING ORDERS IN BLOCK N/9X,1HN,6X,4HTYP	BINX	355
	1E)	BINX	356
510	FORMAT (53H0SCATTERING BANDWIDTH FOR GROUP L, SCATTERING BLOCK N)	BINX	357
520	FORMAT (97H0POSITION OF IN-GROUP SCATTERING CROSS SECTION IN SCATT	BINX	358
	1ERING DATA FOR GROUP J, SCATTERING BLOCK N)	BINX	359
530	FORMAT (25H0PRINCIPAL CROSS-SECTIONS)	BINX	360
540	FORMAT (25H0ISOTOPE FISSION SPECTRUM)	BINX	361
550	FORMAT (6H0BLCK,13,2X,A6,19H SCATTERING OMITTED)	BINX	362
560	FORMAT (9H0*** FILE,A6,11H -- VERSION,13,8H -- UNIT,13,3H***)	BINX	363
570	FORMAT (24H **USER IDENTIFICATION**,A6,3X,A6)	BINX	364
1665	END	BINX	365

	SUBROUTINE BBKX(NCUT,A4,NBCD)	BINX	366
	CONTROL BCD WRITING ON UNIT NBCD)	BINX	367
10	DIMENSION A(1), IA(1)	BINX	368
10	DIMENSION MCODE(3)	BINX	369
10	COMMON /XTYPE/ IATYPE,ICRM,IEDIT,NRSKP,IRD(10)	BINX	370
10	COMMON A	BINX	371
10	EQUIVALENCE (A(1),IA(1))	BINX	372
	DATA M0,M4/0,4/	BINX	373
	DATA MCODE(1),MCODE(2),MCODE(3)/1,1,1/	BINX	374
10	IF (NTYPE.EG.0) CALL REED (N4,I,IA(1),4,1)	BINX	375
14	IF (NTYPE.EG.1) READ (N4,110)(A(I),I=1,3),IA(4)	BINX	376
32	FN=A(1)	BINX	377
33	HU=A(2)	BINX	378
35	HS=A(3)	BINX	379
36	IVER=IA(4)	BINX	380
40	WRITE (NOUT,420)FN,IVER,N4	BINX	381
52	WRITE (NOUT,430)HU,HS	BINX	382
64	IF (NTYPE.EG.0) WRITE (NBCD,100)(A(I),I=1,3),IA(4)	BINX	383
101	IPECI=1	BINX	384
102	IF (NTYPE.EG.1) CALL WITE (NBCD,IPECI),A(1),M4,MCODE(1)	BINX	385

727		IF (NTYPE.EG.0) WRITE (ABCD,170) (IA(J),J=NEX2,LL)	BINX	456
742		NEX3=NEX2+NISCSH	BINX	457
744		LL=NISOSH-1+NEX3	BINX	458
746		WRITE (AOUT,330)	BINX	459
752		NM=1	BINX	460
753		IF (NTYPE.EG.1) READ (N4,170) (IA(J),J=NEX3,LL)	BINX	461
771		DO 60 J=NEX3,LL	BINX	462
773		WRITE (AOUT,310) NM,IA(J)	BINX	463
1006	60	NM=NM+1	BINX	464
1012		IF (NTYPE.EG.0) WRITE (ABCD,170) (IA(J),J=NEX3,LL)	BINX	465
1025		NEX4=NEX3+NISCSH	BINX	466
1027		LL=NISOSH-1+NEX4	BINX	467
1031		WRITE (AOUT,340)	BINX	468
1035		NM=1	BINX	469
1036		IF (NTYPE.EG.1) READ (N4,170) (IA(J),J=NEX4,LL)	BINX	470
1054		DO 70 J=NEX4,LL	BINX	471
1056		WRITE (AOUT,310) NM,IA(J)	BINX	472
1071	70	NM=NM+1	BINX	473
1075		IF (NTYPE.EG.0) WRITE (ABCD,170) (IA(J),J=NEX4,LL)	BINX	474
1110		NEXT=NYSOSH-1+NSIGPT+NTEMP+NGROUP	BINX	475
1114		NFX1=NEXT+1	BINX	476
1115		NEX2=NFX1+NISCSH	BINX	477
1115		NEX3=NEX2+NISCSH	BINX	478
1116		NEX4=NEX3+NISCSH	BINX	479
1117		IF (NTYPE.EG.1) CALL MITE (ABCD,IREC1,A(1),NWDS,MODE(1))	BINX	480
	C		BINX	481
	C	---SELF-SHIELDING FACTORS	BINX	482
	C		BINX	483
1126		JSSF=NEX4+NISCSH	BINX	484
1130		DO 90 I=1,NISOSH	BINX	485
1134		K=NEX3-1+I	BINX	486
1136		NBINT=YA(K)	BINX	487
1137		K=NEX4-1+I	BINX	488
1141		NBTEM=YA(K)	BINX	489
1142		K=NEX1-1+I	BINX	490
1144		JBFL1=YA(K)	BINX	491
1145		K=NEX2-1+I	BINX	492
1147		JBFL1=YA(K)	BINX	493
1150		NDIFF=JBFL1-JBFL1+1	BINX	494
1152		NPRO=NBINT+NBTEM+NDIFF	BINX	495
1155		NWDS=5+APRO	BINX	496
1157		IF (NWDS.LE.0) GO TO 80	BINX	497
1161		IREC1=IREC1+1	BINX	498
1163		NWR=JSSF+NWDS-1	BINX	499
1164		IF (NTYPE.EG.0) CALL MITE (N4,IREC1,A(JSSF),NWDS,MODE(1))	BINX	500
1172		IF (NTYPE.EG.1) READ (N4,190) (A(J),J=JSSF,NWR)	BINX	501
1210		IF (NTYPE.EG.1) CALL MITE (ABCD,IREC1,A(JSSF),NWDS,MODE(1))	BINX	502
1220		IF (NTYPE.EG.0) WRITE (ABCD,180) (A(J),J=JSSF,NWR)	BINX	503
1235		IF (IRP(3),NE.1) GO TO 80	BINX	504
1237		J7=JSSF+NPRO	BINX	505
1241		J3=J7+APRO	BINX	506
1241		J4=J3+APRO	BINX	507
1242		J5=J4+APRO	BINX	508
1244		WRITE (AOUT,350)	BINX	509
1252		CALL WCT (A(JSSF),NBINT,NBTEM,NDIFF,1+N,1+K,1+J,NOUT)	BINX	510
1265		WRITE (AOUT,360)	BINX	511
1275		CALL WCT (A(J2),NBINT,NBTEM,NDIFF,1+N,1+K,1+J,NOUT)	BINX	512
1310		WRITE (AOUT,370)	BINX	513
1320		CALL WCT (A(J3),NBINT,NBTEM,NDIFF,1+N,1+K,1+J,NOUT)	BINX	514
1333		WRITE (AOUT,380)	BINX	515
1343		CALL WCT (A(J4),NBINT,NBTEM,NDIFF,1+N,1+K,1+J,NOUT)	BINX	516
1356		WRITE (AOUT,390)	BINX	517
1366		CALL WCT (A(J5),NBINT,NBTEM,NDIFF,1+N,1+K,1+J,NOUT)	BINX	518
1403	80	CONTINUE	BINX	519
	C		BINX	520
	C	---CROSS SECTIONS	BINX	521
	C		BINX	522
1403		NWDS=6+AGROLP	BINX	523
1405		IREC1=IREC1+1	BINX	524

1407	NHR=JSSF+NWDS-1	BINX	525
1410	IF (NTYPE.EG.0) CALL WEED (N4,IREC1,A(JSSF),NWDS,MODE(1))	BINX	526
1417	IF (NTYPE.EG.1) READ (N4,200)(A(J),J=JSSF,NHR)	BINX	527
1435	IF (NTYPE.EG.1) CALL RITE (ABCD,IREC1,A(JSSF),NWDS,MODE(1))	BINX	528
1445	IF (NTYPE.EG.0) WRITE (ABCD,200)(A(J),J=JSSF,NHR)	BINX	529
1462	IF (IRD(4),NE.1) GO TO 90	BINX	530
1464	J2=JSSF+NGRCUP	BINX	531
1466	J3=J2+NGROUP	BINX	532
1466	J4=J3+NGROUP	BINX	533
1467	J5=J4+NGROUP	BINX	534
1470	J6=J5+NGROUP	BINX	535
1472	WRITE (AOUT,400)	BINX	536
1476	WRITE (AOUT,410)(II,II=1,6)	BINX	537
1511	CALL WOTB (A(JSSF),NGHOLP,A(J2),NGRCUP,A(J3),NGROUP,A(J4),NGROUP,A	BINX	538
	1(J5),NGROUP,A(J6),NGROUP,A+P0,A+M0,AOLT)	BINX	539
1551	CONTINUE	BINX	540
1554	RETURN	BINX	541
C		BINX	542
C		BINX	543
C		BINX	544
100	FORMAT (11H OV BRKONS ,A6,1P*,2A6,1P*,16)	BINX	545
110	FORMAT (11X,A6,1X,2A6,1X,16)	BINX	546
120	FORMAT (4H ID ,4I6)	BINX	547
130	FORMAT (4X,4I6)	BINX	548
140	FORMAT (4H 2D ,9(1X,A6)/(10(1X,A6)))	BINX	549
150	FORMAT (4X,9(1X,A6)/(10(1X,A6)))	BINX	550
160	FORMAT (1P6E12,5)	BINX	551
170	FORMAT (12I6)	BINX	552
180	FORMAT (4H 3D ,1P5E12,5/(6E12,5))	BINX	553
190	FORMAT (4X,1P5E12,5/(6E12,5))	BINX	554
200	FORMAT (4H 4D ,1P5E12,5/(6E12,5))	BINX	555
210	FORMAT (4X,1P5E12,5/(6E12,5))	BINX	556
220	FORMAT (24HOFIL CONTROL PARAMETERS//51H NGROUP NUMBER OF ENER	BINX	557
	1GY GROUPS IN SET 112/51H NISOSH NUMBER OF ISOTOPES WIT	BINX	558
	2H SELF- /51H SHIELDING FACTORS	BINX	559
	3 112/51H NSIGHT TOTAL NUMBER OF VALUES OF VARIABLE X /5	BINX	560
	41H WHICH ARE GIVEN. NSIGHT IS EQUAL TO /51H	BINX	561
	5 THE SUM FROM 1 TO NISOSH OF NTARP(1) 112/51H NTMPT TOTAL	BINX	562
	A NUMBER OF VALLES OF VARIABLE TH /51H WHICH ARE GIVE	BINX	563
	7N. NTMPT IS EQUAL TO /51H THE SUM FROM 1 TO NISOSH	BINX	564
	8OF NTARP(1) 112)	BINX	565
230	FORMAT (1HV,4X,7HISOTOPE,4X,4HNAME)	BINX	566
240	FORMAT (5X,13,(1X,A6)	BINX	567
250	FORMAT (41HOLA(SIGPC)/LA(10) VALUES FOR ALL ISOTOPES/5X,7HISOTOPE,	BINX	568
	17X,5HVALUE)	BINX	569
260	FORMAT (7X,13,6X,E12,5)	BINX	570
270	FORMAT (30HTEMPERATURES FOR ALL ISOTOPES/5X,7HISOTOPE,5X,9HDEGREE	BINX	571
	1S C)	BINX	572
280	FORMAT (21HOMAXIMUM ENERGY BOUND/3X,6HGROUP ,1HV)	BINX	573
290	FORMAT (28HOMINIMUM ENERGY BOUND OF SET//16X,E12,5)	BINX	574
300	FORMAT (69HONUMBER OF LOWEST ENERGY GROUP FOR WHICH SELF-SHIELDING	BINX	575
	1 FACTORS GIVEN/5X,7HISOTOPE,7X,5HGRUP)	BINX	576
310	FORMAT (7X,13,8X,I3)	BINX	577
320	FORMAT (70HONUMBER OF HIGHEST ENERGY GROUP FOR WHICH SELF-SHIELDING	BINX	578
	1G FACTORS GIVEN/5X,7HISOTOPE,7X,5HGRUP)	BINX	579
330	FORMAT (66HONUMBER OF SIGPO VALUES FOR WHICH SELF-SHIELDING FACTOR	BINX	580
	1S ARE GIVEN/5X,7HISOTOPE,6X,6HNUMBER)	BINX	581
340	FORMAT (72HONUMBER OF TEMPERATURE VALUES FOR WHICH SELF-SHIELDING	BINX	582
	1FACTORS ARE GIVEN/5X,7HISOTOPE,6X,6HNUMBER)	BINX	583
350	FORMAT (29HOTAL SELF-SHIELDING FACTORS,10X,7HISOTOPE,I3)	BINX	584
360	FORMAT (31HOCAPTURE SELF-SHIELDING FACTORS,10X,7HISOTOPE,I3)	BINX	585
370	FORMAT (31HOFISSION SELF-SHIELDING FACTORS,10X,7HISOTOPE,I3)	BINX	586
380	FORMAT (33HOTRANSPORT SELF-SHIELDING FACTORS,10X,7HISOTOPE,I3)	BINX	587
390	FORMAT (31HOLELASTIC SELF-SHIELDING FACTORS,10X,7HISOTOPE,I3)	BINX	588
400	FORMAT (15HOCROSS SECTIONS)	BINX	589
410	FORMAT (9HOPPOSITION,4X,13HCROSS SECTION//4X,1H1,4X,20HPOTENTIAL SC	BINX	590
	1ATTERING/4X,1H2,4X,9HINELASTIC/4X,1H3,4X,7HRELASTIC/4X,1H4,4X,42HAY	BINX	591
	2ERAGE COSINE OF ELASTIC SCATTERING ANGLE/4X,1H5,4X,41HINELASTIC DCWA	BINX	592
	3SCATTERING TO ADJACENT GROUP/4X,1H6,4X,45H AVERAGE ELASTIC SCATTER	BINX	593
	4ING LETHARGY INCREMENT//4X,5HGROUP,39X,4HPOSITION/18X,6(I2,11X))	BINX	594

420	FORMAT (9H0+## FILE, A6, I1+ -- VERSION, I3, 0+ -- UNIT, I3, 3H###)	B1NX	595
1555 430	FORMAT (24H ##USER IDENTIFICATION##, A6, I3, A6)	B1NX	596
	END	B1NX	597
	SUBROUTINE WCT1(X, I1, JJ, KK, TOP1, TOP2, TOP3, NCU)	B1NX	598
C	PRINTS A SINGLE ONE-, TWO-, OR THREE-DIMENSIONAL REAL ARRAY.	B1NX	599
C		B1NX	600
C	---WOT PRINTS 1,2, OR 3-DIMENSIONAL ARRAYS	B1NX	601
C		B1NX	602
20	DIMENSION X(I1, JJ, KK)	B1NX	603
20	DO 110 K=1, KK	B1NX	604
21	J02=0	B1NX	605
21	J03=(JJ+8)/9	B1NX	606
25	IF (KK, LE, 1) GO TO 10	B1NX	607
30	WRITE (AOL, 120) TOP3, K	B1NX	608
44 10	DO 100 JK=1, JC2	B1NX	609
46	J01=J02+1	B1NX	610
47	J02=MIN0(J01+8, JJ)	B1NX	611
53	WRITE (AOL, 130) TOP1, (TOP2, J, J=J01, J02)	B1NX	612
72	NFLAG=0	B1NX	613
73	DO 90 I=1, I1	B1NX	614
100	SSUM=0.0	B1NX	615
101	DO 20 J=J01, J02	B1NX	616
115 20	SSUM=SSUM+ABS(X(I, J, K))	B1NX	617
120	IF (SSUM, NE, 0.0) GO TO 30	B1NX	618
125	NFLAG=NFLAG+1	B1NX	619
126	IF (I, LT, I1) GO TO 90	B1NX	620
130 30	IF (NFLAG=1) GO, 60, 40	B1NX	621
133 40	N=NFLAG	B1NX	622
135	IM1=1	B1NX	623
136	IF ((I, LT, I1).OR. (SSUM, NE, 0.0)) GO TO 50	B1NX	624
146	N=N+1	B1NX	625
147	IM1=I	B1NX	626
151 50	WRITE (AOL, 160) N, IM1, (X(IM1, J, K), J=J01, J02)	B1NX	627
201	GO TO 70	B1NX	628
205 60	IF (SSUM, LE, 0.0) GO TO 80	B1NX	629
207	IM1=I=1	B1NX	630
211	WRITE (AOL, 140) IM1, (X(IM1, J, K), J=J01, J02)	B1NX	631
243 70	CONTINUE	B1NX	632
243	NFLAG=0	B1NX	633
244	IF (SSUM, LE, 0.0) GO TO 90	B1NX	634
246 80	WRITE (AOL, 140) 1, (X(I, J, K), J=J01, J02)	B1NX	635
274	WRITE (AOL, 150)	B1NX	636
310 90	CONTINUE	B1NX	637
313 100	CONTINUE	B1NX	638
315 110	CONTINUE	B1NX	639
320	RETURN	B1NX	640
C		B1NX	641
C		B1NX	642
C		B1NX	643
120	FORMAT (/1H0, 6X, A6, I5)	B1NX	644
130	FORMAT (/1H0, 6X, A6, 5(4X, A6, I3))	B1NX	645
140	FORMAT (1H, 11H, 4X, 1P9E13, 5)	B1NX	646
150	FORMAT (1H)	B1NX	647
160	FORMAT (1H, 17, 3H TC, I4, 1P9E13, 5)	B1NX	648
321	END	B1NX	649
	SUBROUTINE WCT6(A, L1, P, L2, C, L3, D, L4, E, L5, F, L6, G, L7, H, L8, NCU)	B1NX	650
C		B1NX	651
C	---SUBROUTINE WCT6 PRINTS UP TO A ONE-DIMENSIONAL ARRAYS.	B1NX	652
C		B1NX	653
31	DIMENSION FNT(19), FNT(6), L(8), Z(8), V(8), A(1), B(1), C(1), D(1)	B1NX	654
	), E(1), F(1), G(1), H(1)	B1NX	655
31	EQUIVALENCE (Z, V)	B1NX	656
	DATA X, K, FNT(1), FNT(2), FNT(19)/4H, 100000, 4H, 1P1, 4H10, 4H, /	B1NX	657
	DATA FNT(1), FNT(2), FNT(3), FNT(4), FNT(5), FNT(6)/4H, E13, 4H, 5, 4H, 12	B1NX	658
	1, 4H5X, 4H, 9X, 4H, A4 /	B1NX	659
31	L(1)=L1	B1NX	660
31	L(2)=L2	B1NX	661

Line	Code	Statement	Address
32		L(3)=L3	852
33		L(4)=L4	853
35		L(5)=L5	854
36		L(6)=L6	855
40		L(7)=L7	856
41		L(8)=L8	857
43		N=0	858
44		DO 10 I=1,8	859
51		N=MAX0(L,L(1))	870
54	10	CONTINUE	871
55		DO 120 I=1,N	872
62		DO 110 J=1,8	873
63		IF (L(J).GE.1) GO TO (20,30,40,50,60,70,80,90), J	874
104		Z(J)=X	875
106		FPT(2,J)=FPT(1)	876
110		FPT(2,J)=FPT(1)	877
111		GO TO 110	878
112	20	Z(J)=A(I)	879
115		GO TO 100	880
116	30	Z(J)=B(I)	881
121		GO TO 100	882
122	40	Z(J)=C(I)	883
125		GO TO 100	884
126	50	Z(J)=D(I)	885
132		GO TO 100	886
132	60	Z(J)=E(I)	887
136		GO TO 100	888
136	70	Z(J)=F(I)	889
142		GO TO 100	890
142	80	Z(J)=G(I)	891
146		GO TO 100	892
146	90	Z(J)=H(I)	893
154	100	FPT(2,J)=FPT(1)	894
156		FPT(2,J)=FPT(2)	895
157		IF (K.LE.IABS(F(J))) GO TO 110	896
163		IF (Z(J).EQ.0,U) M(J)=0	897
167		FPT(2,J)=FPT(3)	898
171		FPT(2,J)=FPT(4)	899
173	110	CONTINUE	900
175		WRITE (AOU,FPT11,(Z(J),J=1,8)	901
212	120	CONTINUE	902
214		RETURN	903
215		END	904
		SUBROUTINE WCI(IK,II,JJ,KK,TOPI,TCPI,TOPI,NOU)	905
	C	PRINTS A SINGLE ONE-, TWO-, OR THREE-DIMENSIONAL INTEGER ARRAY,	906
20		DIMENSION I2(11,JJ,KK)	907
20		DO 20 M=1,KK	908
21		J02=0	909
21		J03=(JJ+24)/25	910
25		IF (KK.LE.1) GO TO 10	911
30		WRITE (AOU,30) TCPI,M	912
44	10	DO 20 J=1,NO	913
46		J01=J02+1	914
47		J02=MIN0(J01+24,JJ)	915
53		WRITE (AOU,40) M=1,TOPI,(J,J=J01,J02)	916
71		DO 20 I=1,11	917
76		WRITE (AOU,50) I,(IK(I,J,K),J=J01,J02)	918
130	20	CONTINUE	919
137		RETURN	920
	C		921
	C		922
	C		923
70		FORMAT (/1H0,61,A6,15)	924
40		FORMAT (/1H0,A6,1H/,A6,2514)	925
40		FORMAT (1H .16,1H,4514)	926
140		END	927

14		SUBROUTINE RECD(N,IREC,X,L,MODE)	BINX	728
14		DIMENSION A(L)	BINX	729
24		READ (A)(X(I),I=1,L)	BINX	730
24		RETURN	BINX	731
25		END	BINX	732
14		SUBROUTINE RTE(N,IREC,X,L,MODE)	BINX	733
14		DIMENSION A(L)	BINX	734
24		WRITE (A)(X(I),I=1,L)	BINX	735
24		RETURN	BINX	736
25		END	BINX	737
10		SUBROUTINE STCH(A,B,NWDS)	BINX	738
10		DIMENSION A(NWDS), B(NWDS)	BINX	739
12		IF (NWDS.LE.0) RETURN	BINX	740
12		DO 10 I=1,NWDS	BINX	741
16	10	B(I)=A(I)	BINX	742
20		RETURN	BINX	743
21		END	BINX	744
10		SUBROUTINE STCH1(A,IN,NWDS)	BINX	745
10		DIMENSION IA(NWDS), IB(NWDS)	BINX	746
12		IF (NWDS.LE.0) RETURN	BINX	747
12		DO 10 I=1,NWDS	BINX	748
16	10	IB(I)=IA(I)	BINX	749
20		RETURN	BINX	750
21		END	BINX	751
16		SUBROUTINE CCYPR(N4,NB,NRCUP,NSCHAX,NISC,IREC1)	BINX	752
16		DIMENSION A(11), IA(11), MODE(3)	BINX	753
16		COMMON A	BINX	754
16		EQUIVALENCE (A(1),IA(1))	BINX	755
16		DATA MODE(1),MODE(2),MODE(3)/1,1,1/	BINX	756
16		NSRLOK=1	BINX	757
17		DO 60 I=1,NISC	BINX	758
20		NWDS=(2*NRCUP+2)*NSCHAX+15	BINX	759
23		IREC1=IREC1+1	BINX	760
25		CALL RECD (N4,IREC1,A(1),NWDS,MODE(1))	BINX	761
33		CALL RTE (NB,IREC1,A(1),NWDS,MODE(2))	BINX	762
51		JREAD=1,NWDS	BINX	763
52		NCIBLK=IA(8)	BINX	764
54		ICH=IA(9)	BINX	765
55		IFIS=IA(10)	BINX	766
57		IALF=IA(11)	BINX	767
60		INP=IA(12)	BINX	768
62		IN2N=IA(13)	BINX	769
63		IND=IA(14)	BINX	770
65		INT=IA(15)	BINX	771
C			BINX	772
C		---PRINCIPAL CROSS SECTIONS	BINX	773
C			BINX	774
66		NWDS=(4*IFIS*(ICH*(1/NCIBLK)+2)+IALF+INP+IN2N*IND+INT)*NRCUP	BINX	775
103		IREC1=IREC1+1	BINX	776
105		CALL RTE (NB,IREC1,A(JREAD),NWDS,MODE(1))	BINX	777
C			BINX	778
C		---ISOCPE CHI DATA	BINX	779
C			BINX	780

114		IF (ICIBLK.EQ.1) GO TO 20	BINX	781
122		IF (IFIS.LT.1) GO TC 20	BINX	782
124		IF (ICHI.LT.1) GO TC 20	BINX	783
126		NWDS=((NGROUP-1)/NCIBLK+1)*ICHI	BINX	784
133		NPT=JREAD	BINX	785
135		DO 10 N=1,NCIBLK	BINX	786
136		IREFC=IREFC+1	BINX	787
137		CALL REED (A4,IREFC,A(NPT),NWDS,MCDF(1))	BINX	788
146		CALL RTE (A8,IREFC,A(NPT),NWDS,MCDF(1))	BINX	789
165		NPT=NPT+NWDS	BINX	790
C		---	BINX	791
C		SCATTERING CROSS SECTIONS	BINX	792
C		---	BINX	793
171	20	DO 60 A=1,NSCHAX	BINX	794
173		K=N+15	BINX	795
174		K=K+NSCHAX	BINX	796
175		LORDN=IA(K)	BINX	797
177		IF (LORDN.NE.0) GO TO 30	BINX	798
201		GO TO 40	BINX	799
201	30	KMAX=0	BINX	800
202		K=2*NSCHAX+15+(A-1)*NGROUP	BINX	801
206		INC=(AGROUP-1)/ASBLCK+1	BINX	802
212		NPT=JREAD	BINX	803
214		DO 50 J=1,NSBLCK	BINX	804
215		JL=(J-1)*INC+1	BINX	805
220		JJ=J+INC	BINX	806
221		NWDS=0	BINX	807
222		DO 40 JJ=JJ,JL	BINX	808
231		L=K+JJ	BINX	809
232		NWDS=NWDS+IA(L)	BINX	810
233	40	KMAX=KMAX+IA(L)	BINX	811
242		NWDS=NWDS/LCRDN	BINX	812
244		IREFC=IREFC+1	BINX	813
245		CALL REFD (A4,IREFC,A(NPT),NWDS,MCDF(1))	BINX	814
254		CALL RTE (A8,IREFC,A(NPT),NWDS,MCDF(1))	BINX	815
273	50	NPT=NPT+NWDS	BINX	816
277	60	CONTINUE	BINX	817
304		RETURN	BINX	818
305		END	BINX	819
6		SUBROUTINE PIPID(INCT,AIN)	BINX	820
7		RETURN	BINX	821
7		END	BINX	822