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User's Manual for the CDC-6600 Version of AMPX

MASTER

Paul S. Pickard, Walter H. Vandevender

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USER'S MANUAL FOR THE
CDC-6600 VERSION OF AMPX

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ABSTRACT

A CDC-6600 version of AMPX-I, the Oak Ridge National Laboratory's modular code system for generating coupled multigroup neutron-gamma libraries from ENDF/B data is described. The AMPX modules can (1) generate multigroup neutron cross sections; (2) generate multigroup gamma cross sections; (3) generate gamma yields for gamma-producing neutron interactions; (4) combine neutron cross sections, gamma cross sections, and gamma yields into "coupled sets"; (5) perform one-dimensional discrete ordinates transport or diffusion theory calculations for neutrons and gammas and, on option, collapse the cross sections to broad-group structure, using the one-dimensional results as weighting functions; and (6) output multigroup cross sections in convenient formats for other codes.

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USER'S MANUAL FOR THE CDC-6600 VERSION OF AMPX

I. Introduction

This report describes the use of the Sandia Laboratories' (SLA) version of AMPX-I, the Oak Ridge National Laboratory's (ORNL) modular code system for generating coupled neutron-gamma libraries from ENDF/B data. The SLA version of AMPX-I operates on the CDC-6600 system and is based on the ORNL IBM version of January 1975. Updating of AMPX-I has been a continuing process, and some of the more recent modifications or additions have been included in the SLA version. These modifications or additions are discussed briefly in Chapter II.

The applications for AMPX-I at SLA include reactor design, radiation shielding, and reactor experiment modeling studies. The primary use of AMPX-I at SLA to date is for the generation of neutron cross sections for reactor design studies. The neutron cross section generation modules have, therefore, been more thoroughly tested at SLA than the gamma cross section routines. AMPX-I is a large code system ($\approx 50,000$ card images), and even a large problem does not exercise a significant fraction of the available options. The SLA version does reproduce the ORNL sample problems, and these are included in this report. In addition, a large neutron cross section problem generated at SLA is also included to illustrate detailed examples of neutron cross section generation.

The basic calculational modules of AMPX-I have all been converted to the CDC-6600 system. Some of the service routines have not been converted at this time. Table I-1 summarizes the status of the AMPX-I modules and indicates which of these are available for routine use in the CDC-6600 version. In addition to the modules indicated in Table I-1, several service routines have been written at SLA or adapted from ORNL routines which facilitate data handling and format conversion for other SLA codes. These routines are described in Appendix B.

The input instructions for each module are given in the AMPX-I user's manual [1]. The input instructions have not been altered in modifying AMPX for the CDC-6600 system.

The library of neutron cross section data available for use with AMPX-I is given in Appendix A. The basic libraries are in several formats, depending primarily on the stage of processing. The variety of neutron cross section libraries processed and produced by AMPX-I are shown in Table I-2.

The basic ENDF/B data tapes available at SLA are given in Appendix A. These form the basic data base for a new neutron cross section library. Considerable computer time can be saved

if use can be made of cross-section sets which have already been processed by XLACS or XLACS/NITAWL. A library of XLACS cross-section sets produced from the old XSDRN data is also included in Appendix A. These data from ORNL are also available at SLA and can be used after processing with the auxiliary codes JUANITA/CONVERT, described in Appendix B. Routines written at SLA are also described in Appendix B, which allow conversion from ANISN to DTF multigroup neutron formats.

TABLE I-1

Module	Primary Function	Status
DRIVER	Managing routine for AMPX-I.	Available in routine use: A-RU.
XLACS	Produces weighted multigroup cross sections from ENDF/B.	A-RU
LAPHNGAS	Generates secondary multigroup gamma production cross sections.	-- Available (checked on sample problems only): A-SPO
SMUG	Generates multigroup photon cross sections.	A-SPO
CHOX	Produces coupled neutron gamma cross section libraries.	A-SPO
NITAWL	Neutron resonance calculations.	A-RU
XSDRNDM	One-dimensional S_N calculations and spatial cross section weighting.	A-RU
NPTXS	Prepares point cross sections for resonance nuclides.	Not Available
LAVA	Convert ANISN format library to AMPX format.	A-RU
COMMAND	Collapse ANISN format libraries.	A-RU
ARID	Collapse ANISN format DNA libraries.	NA
CONVERT	Convert old XSDRN libraries to AMPX format.	A-RU
REVERT	Convert AMPX format libraries to old XSDRN format.	NA
VASELINE	Plot cross section data.	NA
OCTAGN	Generate cross sections for diffusion code, CITATION.	NA
RADE	AMPX cross section check routine.	A-RU
MALOCs	Collapse AMPX library.	A-SPO
AID	ANISN to DTF converter.	A-RU

TABLE I-2

Summary of Neutron Cross Section Library Formats

Input Library Format	Processor	Output Library Format
ENDF/B	XLACS	AMPX-MASTER
AMPX-MASTER	NITAWL	AMPX-WORKING
AMPX-WORKING	XSDRNPM	ANISN AMPX-WORKING IXOTXS
ANISN	AID Converter	DTF-TWOTRAN
Old XSDRN	JUANITA-CONVERT	AMPX-MASTER

II. Code Structure

AMPX was originally written for the IBM 360 Series Computer, although some versions have been made operational on a CDC-6600 and a UNIVAC 1108. The modular design of AMPX was utilized in defining the overlay program structure on the 6600. On the 6600, an overlay is defined as a program combined with its subprograms which is converted to absolute form and written on mass storage before program execution and called into central memory and executed as requested [2]. There are only three levels of overlay allowed.

1. The initial or main overlay (0, 0)
2. Primary overlay (I, 0) $I = 0, 77_8$
3. Secondary overlay (I, J) $I, J = 0, 77_8$

Since the main overlay must reside in memory at all times during program execution, there are essentially only two overlay levels available for use with subsequent modules. The main overlay of AMPX consists of the driver module, WALTER. The primary and secondary overlays consist of the AMPX modules as described in Chapter I. Figure II-1 shows the complete overlay structure for the CDC version of AMPX.

The main overlay, WALTER, provides essentially the same features as the original IBM module, DRIVER. It allows for an arbitrary execution path specified by the user through the use of the "=" module" name card. It can dynamically allocate core storage through a machine language routine REQCM which changes the central memory requirement to the minimum amount required for each module. This feature allows the user to execute, for example, XLACS, which requires 236K(octal) words, RADE, which requires 110K words and NITAWL, which requires 205K words, without using the maximum 236K throughout the entire job.

Communication of data between modules is accomplished via well-defined interfaces (tapes, disks). Table II-1 shows the various I/O units required for each module. With the exception of units 6, 7, 8, 9, and 50, any unit can be either a disk file or a magnetic tape. Unit 50 is the card reader, unit 6 is the line printer, unit 7 is the on-line card punch, and units 8 and 9 are Extended Core Storages (ECS) arrays used to simulate the IBM random access facility. Units 8 and 9 are used only by the modules NITAWL and XSDRNPM. In NITAWL, 400K (decimal) words of ECS are used to simulate unit 9, while in XSDRNPM, the first 150K (decimal) words are used to simulate unit 9 and the remaining 250K (decimal) words (or whatever remains of the amount specified by the user on the JOB card) are used to simulate unit 8.

Communication of variables between the primary and secondary overlays is via blank common. The CDC-6600 overlay structure allows the size of blank common to be changed at execution time, thus facilitating allocation of core storage. Since blank common resides between the main overlay (0, 0) and each primary overlay, this in effect optimally allocates core storage. Figure II-1 shows the various sizes of blank common currently specified for each module. The user can change

Figure II-1. AMPX Overlay Structure

TABLE II-1

Module I/O Unit Assignments

UNIT	MODULE											
	XLACS	SMUG	LAPHNGAS	CHOX	MTAWL	YSDRNPM	CONVERT	RADE	LAVA	COMAND	MALOCs	AID
	1	2	3	4	5	6	7	8	9	10	11	12
1				W	R		R	W			R	
2					R			R		W		
3					R	W						
4					W	R			W			
5	R	R	R	R	R	R	R	R	R	R	R	R
6	P	P	P	P	P	P	P	P	P	P	P	P
7	CP	CP	CP	CP	CP	CP	CP	CP	CP	CP	CP	CP
8						ECS						
9					ECS	ECS						
10												
11	R	R	R									
12	R											
13												
14	S	S	S									
15	S	S	S		S							
16	S		S			W						
17	S		S	S		W						
18	S		S	S	S	S	S	S	S		S	
19					S	S	S	S	S		S	W
20					W	W	R		R	R		R
21	R											S
22	W										W	
23	W			R								
24	W		W	R								
25												
26		W		R								
27												
28				R								
29	R		R									
30		R										R
31	R		R									
50	CR	CR	CR	CR	CR	CR	CR	CR	CR	CR	CR	CR

Legend

W=Write

R=Read

P=Print

S=Scratch

ECS=Extended

Core

Storage

CP=Card Punch

CR=Card Reader

these preset values by utilizing the UPDATE processor [3]. However, not only must the variables in data block LCOM be updated, but also the OVERLAY cards for that module must be changed.

Any number of additional modules could be incorporated into our AMPX system (a maximum of 63₁₀ are allowed). Essentially only subroutine AMPX of the main overlay need be changed. The general information in section 11.2.3 of reference [1] remains valid for the CDC version.

The main overlay was designed to facilitate the use of LGO versions of the various modules in the system. Figure II-2 shows a sample deck that creates individual LGO versions of each module. These LGO files were used to run the sample problems in Section 3. One of the nuances of the Sandia 6600 system is that the "FTN" (Fortran Extended) compiler is not the standard compiler. Thus the "Collect" control card must be used to provide the appropriate system library FTNLIB. The main overlay is structured so that every system routine needed by any module is included in (0, 0). As a result, only the driver LGO file, WALTER-LGO in the example, needs to have FTNLIB collected into it, as illustrated in Figure II-2.

The approximate Central Processor (CP) time required to compile each module with the FTN, OPT = 1, compiler option and no list is shown in Table II-2. As can be seen from the table, only modules 1, 2, 3, 5, and 6 have significant compile times, so it may be that LGO files should be maintained only for these modules. That decision is up to the individual user, however, since only the update file AMPX - Update will be maintained in the Sandia Permanent File System.

TABLE II-2
Compilation Times for AMPX Modules

<u>Module Number</u>	<u>Module Name</u>	<u>Compile Time (FTN, OPT = 1 No list (Decimal Seconds))</u>
1	XLACS	155
2	SMUG	75
3	LAPHOR	65
4	CHOX	6
5	NITAWL	48
6	XSDRNPM	87
7	CONVERT	3
8	RADE	11
9	LAVA	10
10	COMMAND	3
11	MALOCs	10
12	AID	2
--	WALTER (DRIVER)	16

```

UPDATE(P=MASTER).
CATALOG, DUM9, RADE-LGO, CN=AMP, RP=100.
FTN, (=COMPILE, L=0, B=DUM9.
UPDATE(P=MASTER).
CATALOG, DUM8, CONVERT-LGO, CN=AMP, RP=100.
FTN, (=COMPILE, L=0, B=DUM8.
UPDATE(P=MASTER).
CATALOG, DUM7, XSDRNPM-LGO, CN=AMP, RP=100.
FTN, (=COMPILE, L=0, B=DUM7.
UPDATE(P=MASTER).
CATALOG, DUM6, NITAWL-LGO, CN=AMP, RP=100.
FTN, (=COMPILE, L=0, B=DUM6.
UPDATE(P=MASTER).
CATALOG, DUM5, CHOX-LGO, CN=AMP, RP=100.
FTN, (=COMPILE, L=0, B=DUM5.
UPDATE(P=MASTER).
CATALOG, DUM4, SRUG-LGO, CN=AMP, RP=100.
FTN, (=COMPILE, L=0, B=DUM4.
UPDATE(P=MASTER).
CATALOG, DUM3, LAPM-LGO, CN=AMP, RP=100.
FTN, (=COMPILE, L=0, B=DUM3.
UPDATE(P=MASTER).
CATALOG, DUM2, XLACS-LGO, CN=AMP, RP=100.
FTN, (=COMPILE, L=0, B=DUM2.
UPDATE(P=MASTER).
CATALOG, A, WALTER-LGO, CN=AMP, RP=100.
COPYOF(DUM1, A).
REWIND, DUM1.
COLLECT, DUM1, FTNLIB.
FTN, (=COMPILE, L=0, B=DUM1.
UPDATE(P=MASTER).
REQUEST, DUM12, MPF.
REQUEST, DUM11, MPF.
REQUEST, DUM10, MPF.
REQUEST, DUM9, MPF.
REQUEST, DUM8, MPF.
REQUEST, DUM7, MPF.
REQUEST, DUM6, MPF.
REQUEST, DUM5, MPF.
REQUEST, DUM4, MPF.
REQUEST, DUM3, MPF.
REQUEST, DUM2, MPF.
REQUEST, A, MPF.
ATTACH, MASTER, AMPX-UPDATE.
--YOUR ACCOUNT CARD HERE--
AMPV, T1000, C175000.
VANDEVENDER BOX 620 ORG 2642

```

Figure II. 1. Input for Compilation of AMPX Modules

Figure II-2. (cont'd)

III. Sample Problems

The CDC version of AMPX-I has been checked with a variety of sample problems. Although none of these problems exercise all options, they are useful in providing preliminary comparisons and examples of deck structures. Sample problem #1 is an ORNL-generated problem exercising most of the available AMPX modules. Sample problem #2 is an SLA problem, typical of those used to generate neutron cross section sets for reactor design or shielding calculations. Both of these examples are illustrated with a problem description, sample input, and a brief section of the output from each module.

Sample Problem #1

(a) Problem Description

- (1) Produce a standard 100 group neutron cross section set with 1/E weighting for oxygen. (XLACS)
- (2) Produce a standard 18-group gamma cross section set. (SMUG)
- (3) Couple neutron-gamma data. (CHOX)
- (4) Collapse 100-group set to 10-group set. (NITAWL, XSDRNPM)
- (5) Generate ANISN output. (NITAWL)
- (6) Collapse ANISN output. (COMMAND)
- (7) Convert ANISN data to AMPX format data. (LAVA)
- (8) Collapse AMPX data to 10 groups. (MALOCS)

(b) Sample Input: See Figure III-1.

(c) Sample Output: Listed below.

```

1055 4134 5 11 2 -1 T
155 18 1 5 T
VANDEVENDER TRY AT SMUG
=SMUG
1155 F0 E T
7055 2R4134 0 3 E T
OXYGEN DNR 4134
355 F1 T
255 75 2 E
155 11 100 1 0 T
XLACS RUN
FIRST
WALTS
IS
THIS
=XLACS
0
EXECUTE,SMPX,LC=200000.
LOAD.J.
LOAD.I.
LOAD.H.
LOAD.G.
LOAD.F.
LOAD.E.
LOAD.D.
LOAD.C.
LOAD.B.
LOAD.A.
LOAD.DRIVER.
ATTACH.J.MALOC5-LGO.
ATTACH.I.COMAND-LGO.
ATTACH.H.LAVA-LGO.
ATTACH.G.RADE-LGO.
ATTACH.F.XSDRNPM-LGO.
ATTACH.E.NITAML-LGO.
ATTACH.D.CHOX-LGO.
ATTACH.C.LAPH-LGO.
ATTACH.B.SMUG-LGO.
ATTACH.A.XLACS-LGO.
ATTACH.DRIVER.WALTER-LGO.
REWIND.TAPE11.
REQUEST.TAPE11.MI. VSN=16520
ACCOUNT.S410681466.666.03002082.RT.D5231.KUNC.
NHV.T0700.CH275000.MT1.EC400. VANDEVENDER BOX 620 ORC 2642

```

Figure III-1. Sample Problem #1 - Input

```

199 23 E T
-RADE
199 1 E T
-RADE
500 10001 T
499 1 2 3 4 5 6 7 8 8 9 F10
299 23 22 T
199 100 10 0 0 0 0
-RADE
299 1 399 9 499 016 T
199 1 10 3 4 8 10 0 -1 T
699 24 E
-LAVA
400 FI 599 1 2 3 4 5 6 7 8 9 F10 T
399 20 E T
299 1 R6 24 E
199 100 3 4 103 10 3 4 8
-COMAND
299 4134 T
199 0 1 R5 2 3 4 8 103 E T
899 23 2 3 4 10 19 9 15 20
-NITRAL
5199 1 2 3 4 5 6 7 8 9209 F10 T
3500 1910 25 3899 FI 3999 1 4899 F5
3300 F0 T
3099 1 F0 9100 1 F0 T
1999 1 1499 4134 1500 0.025 T
399 1 1 E 499 0 10 0 E
199 9 1 20 10 1 10 5 0 25 1 E
THIS IS A 14 MEV SOURCE IN OXYGEN
-ASURFPI
299 4134 T
199 0 1 E T
-NITRAL
299 4134 399 4134 499 4134 599 4134 T
199 1 0 1
-CHIX
1499 4134 5 11 2 E T
199 1 100 10 4 T
TEST RUN
-LAPHOR

```

Figure III-1. (cont'd)

TOP OF AMPX	1	
MCK+JCK	1	0
MCK+JCK THIS	0	1
MCK+JCK IS	0	1
MCK+JCK WALTS	0	1
MCK+JCK FIRST	0	1
MCK+JCK XLACS RUN	0	1
MCK+JCK 18% 1 1 100 1 0 T	0	1
MCK+JCK 25% 75 2 F	0	1
MCK+JCK 35% F1 T	0	1
MCK+JCK OXYGEN DNA 41.34	0	1
MCK+JCK 70% 224134 0 3 F T	0	1
MCK+JCK 11% F0 F T	0	1
MCK+JCK	2	1
MCK+JCK VANDEVENDER TRY AT SMUG	0	2

Sample Output for
Problem #1

1

1

DRIVER - Listing of
all Input Cards

1

1

1

1

1

1

1

1

1

2

MCA+JCK	0	2	
18% 1- 1 5 1			2
MCA+JCK	0	2	
T			2
MCA+JCK	0	2	
10% 4134 > 11 2 -1 T			2
MCA+JCK	3	2	
MCA+JCK	0	3	
TEST RUN			3
MCA+JCK	0	3	
18% 1 100 18 4 T			3
MCA+JCK	0	3	
T			3
MCA+JCK	0	3	
14% 4134 > 11 2 E T			3
MCA+JCK	4	3	
MCA+JCK	0	4	
18% 1 0 1			4
MCA+JCK	0	4	
2% 4134 3% 4134 4% 4134 5% 4134 T			4
MCA+JCK	5	4	
MCA+JCK	0	5	
18% 0 1 F 1			5
MCA+JCK	0	5	
2% 4134 T			5
MCA+JCK	6	5	
MCA+JCK	0	6	
THIS IS A 14 MEV SOURCE IN OXYGEN			6
MCA+JCK	0	6	
18% 3 1 20 1 0 1 1 8 5 0 2 1 E			6
MCA+JCK	0	6	
3% 1 1 F 4% 0 10 0 E			6
MCA+JCK	0	6	
T			6
MCA+JCK	0	6	
13% 1 14% 4134 15% 0.025 T			6
MCA+JCK	0	6	
30% 1 F0 31% 1 F0 T			6
MCA+JCK	0	6	
33% F0 T			6
MCA+JCK	0	6	
35% 1910 25 36% F1 39% 1 40% F5			6

AN XSDRN TAPE WILL BE WRITTEN WITH THE AUSPICIOUS TITLE

THIS
IS
WALTS
FIRST
XLACS RUN

XSDRN TAPE IDENTIFICATION	1	TRANSFER INTEGRATION MESH-SRCF	0
NUMBER OF NUCLIDES	1	TRANSFER INTEGRATION MESH-SINK	0
NUMBER OF ENERGY GROUPS	100	ENDF TAPE IDENTIFICATION	0
NUMBER OF THERMAL GROUPS	1	ENDF TAPE MODE (FAST DATA)	2
WEIGHTING OPTION	0	PEAK TEMPERATURE (MAXWELLIAN)	0

OUTPUT LISTING OPTIONS

RESONANCE DATA	1
1-DIMENSIONAL ARRAYS	1
ELASTIC SCATTERING	1
THERMAL SCATTERING	1
INELASTIC SCATTERING	1
N2N TRANSFERS	1

COMMENCE PROCESSING DATA FOR
OXYGEN DNA 4134

OT

23

AN XSDRN MASTER LIBRARY TAPE WILL BE CREATED ON LOGICAL UNIT 23

- * ITS IDENTIFICATION NUMBER IS 1
- * 1 NUCLIDES HAVE BEEN PROCESSED
- * 100 ENERGY GROUPS *100 1ST THERMAL GRP

PERTINENT INFORMATION CONCERNING THIS TAPE IS

```

*****
*
*   THIS
*   IS
*   *ALTS
*   FIRST
*   ALACS RUN
*
*****

```

TABLE OF CONTENTS

	NUCLIDE TITLE	IDENTIFICATION NUMBER
1	OXYGEN DNA 4134	4134

THIS
IS

WALTS
FIRST

XLACS RUN

TAPE ID

NUMBER OF NEUTRON GROUPS

FIRST THERMAL GROUP

1

100

100

NUMBER OF NUCLIDES

NUMBER OF GAMMA GROUPS

1

0

TABLE OF CONTENTS

OXYGEN OXA 4134

10

4134

-----ACCUMULATED CPU TIME-- 136.194 SEC.

115 ARRAY 6 ENTRIES READ

OT

GENERAL INFORMATION CONCERNING UPDATE OPTION

NEWID	IDENTIFICATION OF NEW AMPX LIBRARY	0
ITRGUP	UPDATE TRIGGER 0/1/2 NO/ADD 21 TO 23/COPY 21	0
IEUIT	PRODUCE EDITS OF CROSS-SECTIONS	0
IPLOT	PLOT CROSS-SECTIONS	0
IPART	UPDATE PARTIAL CROSS-SECTIONS	0
IOLD	IS AN OLD AMPX LIBRARY MOUNTED (0/1 NO/YES)	0

YOU HAVE COME TO THE END OF A PERILOUS FLIGHT THROUGH THAT MAGNIFICENT
PROGRAM....X L A C S.....I TRUST IT HAS BEEN A MOVING PERFORMANCE
SEE YOU ON THE NEXT TIME THROUGH

-----ACCUMULATED CPU TIME-- 136.310 SEC.

AMPX DRIVER XLACS COMPLETE

-----ACCUMULATED CPU TIME-- 136.312 SEC.

AMPX DRIVER NEXT MODULE TO BE EXECUTED IS 2 2 1 3 12 11 5

***THE CENTRAL MEMORY REQUESTED IS NOW 65536

VANDEVENDER TRY AT SMUG

1\$ ARRAY 3 ENTRIES READ

0T

NGG	NO. GAMMA GROUPS	14
MF	1/2/6 FLAT/1/E/FLUX IN 7	1
LMAX	ORDER OF P-N	5
NHF	0/1/2 ENERGY PHOTON NUMBER/1-COMPTON ONLY	1
NSP	NO. INTERVALS IN OUTER INTEGRAL	31
PHI	NO. INTERVALS IN INNER INTEGRAL	51
NNUC	NO. NUCLIDES	1
NDS	NO. DOWNSCATTERS REQD	17
MX	0/2 BINARY/BCD TAPES	0
NDF	0/1/2 NO FFF/PRINT JOSE FACT/PRINT AND PUN	1

A STANDARD 18 GAMMA GROUP STRUCTURE HAS BEEN INSERTED FOR YOU AND WILL BE USED UNLESS YOU OVERRIDE IT

0T

PHOTON CROSS SECTIONS

F(N)

ENERGY LEVELS

.1000000D-01	.3000000D-01	.6000000D-01	.1500000D+00
.3000000D+00	.4500000D+00	.7000000D+00	.1000000D+01
.1500000D+01	.2000000D+01	.2500000D+01	.3000000D+01
.4000000D+01	.5000000D+01	.6000000D+01	.7000000D+01
.8000000D+01	.1000000D+02	.1400000D+02	

AVERAGE 1/E FOR ENERGY BAND

.5493062D+02	.2310491D+02	.1018101D+02	.4620981D+01
.2703101D+01	.1767331D+01	.1188916D+01	.8109302D+00
.5753041D+00	.4462871D+00	.3646431D+00	.2876821D+00
.2231436D+00	.1823216D+00	.1541507D+00	.1335314D+00
.1115718D+00	.8411806D-01		

SG(N)

COLLISION

.6181240D-24	.5702998D-24	.4894347D-24	.3933448D-24
.3256776D-24	.2735272D-24	.2290039D-24	.1896057D-24
.1581051D-24	.1369374D-24	.1214776D-24	.1048288D-24
.8902301D-25	.7779599D-25	.6934444D-25	.6271854D-25
.5515119D-25	.4482522D-25		

10% ARRAY

5 ENTRIES READ

OT

THE KERMA FACTOR AND ITS COMPONENTS PAIR PRODUCTION PHOTOELECTRIC COMPTON ABSORPTION

1	4.76341E+00	1.81033E+00	3.45241E-05	2.97305E+00
2	3.72923E+00	1.05332E+00	3.54255E-05	2.67588E+00
3	3.20054E+00	7.11721E-01	3.64425E-05	2.44919E+00
4	2.8663E+00	5.23036E-01	3.72700E-05	2.34296E+00
5	2.53770E+00	3.63289E-01	3.82605E-05	2.17437E+00
6	2.19931E+00	2.23853E-01	4.00100E-05	1.97562E+00
7	1.84333E+00	1.07250E-01	4.29291E-05	1.73404E+00
8	1.56116E+00	4.63718E-02	4.65575E-05	1.51475E+00
9	1.35944E+00	1.97509E-02	5.09093E-05	1.33964E+00
10	1.13898E+00	5.00555E-03	5.74988E-05	1.13391E+00
11	8.85990E-01	1.61122E-04	7.69890E-05	8.85752E-01
12	6.46654E-01	0.	1.20204E-04	6.46534E-01
13	4.52068E-01	0.	2.38154E-04	4.51830E-01
14	2.92936E-01	0.	5.22990E-04	2.92413E-01
15	1.64321E-01	0.	1.57447E-03	1.62747E-01
16	6.80625E-02	0.	8.93260E-03	5.91299E-02
17	6.95304E-02	0.	5.40946E-02	1.54358E-02
18	4.23894E-01	0.	4.20115E-01	3.77897E-03

PHOTON INTERACTION CROSS SECTIONS

GROUP	GROUP LIMITS (MEV)		SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	1.00000E+01	1.40000E+01	1.63814E-01	2.90549E-06	1.63811E-01	4.78341E+00
2	8.00000E+00	1.00000E+01	1.31391E-01	3.95506E-06	1.31387E-01	3.72923E+00
3	7.00000E+00	8.00000E+00	1.04653E-01	4.86736E-06	1.09648E-01	3.20094E+00
4	6.00000E+00	7.00000E+00	9.52307E-02	5.74699E-06	9.52249E-02	2.86603E+00
5	5.00000E+00	6.00000E+00	8.08308E-02	6.97875E-06	8.08239E-02	2.53770E+00
6	4.00000E+00	5.00000E+00	6.38724E-02	8.93830E-06	6.38634E-02	2.19951E+00
7	3.00000E+00	4.00000E+00	4.33491E-02	1.23737E-05	4.33357E-02	1.84333E+00
8	2.50000E+00	3.00000E+00	2.65202E-02	1.69977E-05	2.65033E-02	1.56116E+00
9	2.00000E+00	2.50000E+00	1.57734E-02	2.27620E-05	1.57507E-02	1.35944E+00
10	1.50000E+00	2.00000E+00	6.40290E-03	3.44118E-05	6.36848E-03	1.13898E+00
11	1.00000E+00	1.50000E+00	4.52115E-04	6.30799E-05	3.89035E-04	8.85990E-01
12	7.00000E-01	1.00000E+00	1.45419E-04	1.45419E-04	0.	6.46654E-01
13	4.50000E-01	7.00000E-01	4.33225E-04	4.33225E-04	0.	4.52068E-01
14	3.00000E-01	4.50000E-01	1.45124E-03	1.45124E-03	0.	2.92936E-01
15	1.50000E-01	3.00000E-01	7.89174E-03	7.89174E-03	0.	1.64321E-01
16	6.00000E-02	1.50000E-01	1.05614E-01	1.05614E-01	0.	6.80625E-02
17	3.00000E-02	6.00000E-02	1.36554E+00	1.36554E+00	0.	6.95304E-02
18	1.00000E-02	3.00000E-02	2.86269E+01	2.86269E+01	0.	4.23894E-01

GROUP DOSE FACTORS

UNITS

HENDERSON--RADS/HR PER PHOTONS/CM2/SEC
 SILICON --RADS/SEC PER PHOTONS/CM2/SEC
 HCC/DKT --RADS/HR PER PHOTONS/CM2/SEC

	HENDERSON	SILICON	HCC/DKT
1	1.1537E-05	3.8476E-09	1.0968E-05
2	6.8928E-06	2.9444E-09	8.7388E-06
3	7.4987E-06	2.4851E-09	7.6281E-06
4	6.7084E-06	2.1752E-09	6.8926E-06
5	5.9758E-06	1.8619E-09	6.1502E-06
6	5.1912E-06	1.5447E-09	5.3843E-06
7	4.3063E-06	1.2224E-09	4.5745E-06
8	3.6366E-06	9.8024E-10	3.9221E-06
9	3.1323E-06	8.2834E-10	3.4489E-06
10	2.6044E-06	6.7180E-10	2.9236E-06
11	2.0244E-06	5.0740E-10	2.3055E-06
12	1.4773E-06	3.6810E-10	1.7345E-06
13	1.0535E-06	2.6573E-10	1.2956E-06
14	6.9157E-07	1.8411E-10	8.9139E-07
15	3.9776E-07	1.1204E-10	5.9067E-07
16	1.6781E-07	8.1972E-11	3.2054E-07
17	1.8263E-07	2.4305E-10	3.5487E-07

***** DATA OUT OF RANGE FOR 1.0000E-02 MEV
 18 1.0343E-06 1.4995E-09 1.5263E-06

AMPA DRIVER: SMUG COMPLETE

-----ACCUMULATED CPU TIME-- 204.224 SEC.

AMPA DRIVER NEXT MODULE TO BE EXECUTED IS 3 3 1 4 12 15 5

***THE CENTRAL MEMORY REQUESTED IS NOW 95232

LAPHNGAS

TEST RUN

16 ARRAY 4 ENTRIES READ

UT

LAPHNGAS

INTEGER PARAMETERS (16 AND 24 ARRAYS)

MCK	NUMBER OF NUCLIDES	1
NEL	NO. NEUT FINE GPS.	100
NGS	NO. GAMMA GPS.	16
IK	NON RES WT. FUNCTION 1/2/3/4/5/6 - 1.0/(1/E)/(1/E-FISS)/EXACT (1/E)/ (1/E.SIG-T)/ARBITRARY/	4
LCSM	NO. INTERPOLATION REGIONS	0
MCSM	NO. PTS. IN ARR. WT. FCTN.	0
I7M	0/1 CAL SGRPXS/CAL SGRPXS	0
MS	0/1 NO EFF/MAXWELLIAN THERMAL DIS	1
MM	NO. REACTION TYPES	1
IWU	1/2/3 MIDPOINT/YIELD FCT/E(BAR) INPUT	1
IOU	0/1 PRINT (Y OR SIG)/DO NOT PRINT	-9
IAM	0/1 NO EFFECT/PUNCH SGRP DATA	0
ICA	0/1 NO EFFECT/DETAIL CK.	0
NNRUGP	0/N NO EFFECT/COLLAPSE TO N BROAD GPS.	0

A STANDARD 100 NEUTRON GROUP STRUCTURE HAS BEEN INSERTED FOR YOU AND WILL BE USED UNLESS YOU OVERRIDE IT
 A STANDARD 16 GAMMA GROUP STRUCTURE HAS BEEN INSERTED FOR YOU AND WILL BE USED UNLESS YOU OVERRIDE IT

UT

MEAN TEMPERATURE OF MAXWELLIAN DISTRIBUTION (DEG K) 2.93600E+02

UPPER ENERGY FOR THERMAL (N.G) CORRECTION (EV) 1.26390E-01

NOV 1/V FACTOR 1.00000E+00

THE PHOTON PRODUCTION MATRIX, MATERIAL 4134 REACTION TYPE 1 P 0 COMPONENT

G GP	N GP 1	N GP 2	N GP 3	N GP 4	N GP 5	N GP 6	N GP 7	N GP 8
1	0.	0.	0.	0.	0.	0.	0.	0.
2	4.29065E-03	3.98260E-03	3.39580E-03	2.15392E-03	1.97326E-04	0.	0.	0.
3	5.15385E-02	4.83566E-02	4.74845E-02	5.05361E-02	3.55795E-02	2.30467E-02	8.00821E-03	0.
4	1.70445E-01	1.67127E-01	1.65572E-01	1.38168E-01	1.61444E-01	1.84700E-01	1.29493E-01	5.04124E-02
5	0.	0.	0.	0.	0.	0.	0.	0.
6	4.45106E-02	9.88738E-03	1.33047E-04	0.	0.	0.	0.	0.
7	1.04382E-01	1.15057E-01	1.39353E-01	1.57279E-01	1.09024E-01	6.83095E-02	1.86322E-02	5.62775E-03
8	4.52905E-02	4.20384E-02	3.58445E-02	2.27360E-02	2.08288E-03	0.	0.	0.
9	4.20401E-03	9.80110E-04	2.53489E-05	7.45705E-09	7.83938E-09	8.24132E-09	8.66387E-09	9.10808E-09
10	1.00115E-02	9.29269E-03	7.92353E-03	5.02583E-03	4.60428E-04	0.	0.	0.
11	6.41834E-09	6.74742E-09	7.09337E-09	7.45705E-09	7.83938E-09	8.24132E-09	8.66387E-09	9.10808E-09
12	4.16263E-04	4.39695E-04	4.94569E-04	5.81874E-04	2.04142E-04	1.94948E-04	4.62576E-05	1.07247E-05
13	8.44868E-02	9.86386E-02	1.86707E-01	8.51025E-02	8.87463E-02	1.30909E-01	1.67664E-01	1.21997E-01
14	2.03947E-03	1.50090E-03	2.04278E-03	6.14053E-05	0.	0.	0.	0.
15	3.69472E-02	3.10123E-02	3.97350E-02	1.91667E-02	5.97368E-03	5.95978E-03	1.35460E-03	3.57133E-04
16	8.48360E-03	6.11615E-03	8.50377E-03	4.33689E-04	0.	0.	0.	0.
17	0.	0.	0.	0.	0.	0.	0.	0.
18	0.	0.	0.	0.	0.	0.	0.	0.
G GP	N GP 9	N GP 10	N GP 11	N GP 12	N GP 13	N GP 14	N GP 15	N GP 16
1	0.	0.	0.	0.	0.	0.	0.	0.
G GP 2 THRU G GP 3 SAME AS ABOVE								
4	1.21526E-03	0.	0.	0.	0.	0.	0.	0.
5	0.	0.	0.	0.	0.	0.	0.	0.
6	0.	0.	0.	0.	0.	0.	0.	0.
7	6.04068E-04	4.37402E-05	1.80912E-09	1.90187E-09	1.99939E-09	2.10190E-09	2.20967E-09	2.32298E-09
8	0.	0.	0.	0.	0.	0.	0.	0.
9	9.57506E-09	1.00660E-08	1.05821E-08	1.11247E-08	1.16950E-08	1.22947E-08	1.29251E-08	1.35878E-08
10	0.	0.	0.	0.	0.	0.	0.	0.
11	9.57506E-09	1.00660E-08	1.05821E-08	1.11247E-08	1.16950E-08	1.22947E-08	1.29251E-08	1.35878E-08
12	8.32169E-07	1.17869E-08	1.23912E-08	1.30265E-08	1.36944E-08	1.43965E-08	1.51348E-08	1.59108E-08
13	4.01144E-03	0.	0.	0.	0.	0.	0.	0.
14	0.	0.	0.	0.	0.	0.	0.	0.
15	2.75653E-05	0.	0.	0.	0.	0.	0.	0.
16	0.	0.	0.	0.	0.	0.	0.	0.
G GP 17 THRU G GP 18 SAME AS ABOVE								

G GP	N GP 17	N GP 18	N GP 19	N GP 20	N GP 21	N GP 22	N GP 23	N GP 24
1	0.	0.	0.	0.	0.	0.	0.	0.
G GP 2 THRU G GP 6 SAME AS ABOVE								
7	2.44222E-09	2.55736E-09	2.69891E-09	2.83731E-09	2.98276E-09	3.13575E-09	3.29702E-09	3.46556E-09
8	0.	0.	0.	0.	0.	0.	0.	0.
9	1.42853E-08	1.50173E-08	1.57868E-08	1.65963E-08	1.74471E-08	1.83420E-08	1.92853E-08	2.02711E-08
10	0.	0.	0.	0.	0.	0.	0.	0.
11	1.42853E-08	1.50173E-08	1.57868E-08	1.65963E-08	1.74471E-08	1.83420E-08	1.92853E-08	2.02711E-08
12	1.67275E-08	1.75846E-08	1.84857E-08	1.94336E-08	2.04298E-08	2.14778E-08	2.25823E-08	2.37367E-08
13	0.	0.	0.	0.	0.	0.	0.	0.
G GP 14 THRU G GP 18 SAME AS ABOVE								
G GP	N GP 25	N GP 26	N GP 27	N GP 28	N GP 29	N GP 30	N GP 31	N GP 32
1	0.	0.	0.	0.	0.	0.	0.	0.
G GP 2 THRU G GP 6 SAME AS ABOVE								
7	3.44316E-09	3.82996E-09	4.02633E-09	4.23277E-09	4.44980E-09	4.67795E-09	4.91782E-09	5.16994E-09
8	0.	0.	0.	0.	0.	0.	0.	0.
9	2.13100E-08	2.24026E-08	2.35513E-08	2.47585E-08	2.60283E-08	2.73628E-08	2.87659E-08	3.02406E-08
10	0.	0.	0.	0.	0.	0.	0.	0.
11	2.13100E-08	2.24026E-08	2.35513E-08	2.47585E-08	2.60283E-08	2.73628E-08	2.87659E-08	3.02406E-08
12	2.49532E-08	2.52320E-08	2.75776E-08	2.89915E-08	3.04781E-08	3.20409E-08	3.36837E-08	3.54105E-08
13	0.	0.	0.	0.	0.	0.	0.	0.
G GP 14 THRU G GP 18 SAME AS ABOVE								

THE PHOTON PRODUCTION MATRIX, MATERIAL 4134 REACTION TYPE 22 P 0 COMPONENT
 THE PHOTON PRODUCTION MATRIX, MATERIAL 4134 REACTION TYPE 22 P 1 COMPONENT
 THE PHOTON PRODUCTION MATRIX, MATERIAL 4134 REACTION TYPE 22 P 2 COMPONENT
 THE PHOTON PRODUCTION MATRIX, MATERIAL 4134 REACTION TYPE 22 P 3 COMPONENT
 THE PHOTON PRODUCTION MATRIX, MATERIAL 4134 REACTION TYPE 22 P 4 COMPONENT
 THE PHOTON PRODUCTION MATRIX, MATERIAL 4134 REACTION TYPE 22 P 5 COMPONENT
 THE PHOTON PRODUCTION MATRIX, MATERIAL 4134 REACTION TYPE 103 P 0 COMPONENT
 THE PHOTON PRODUCTION MATRIX, MATERIAL 4134 REACTION TYPE 103 P 1 COMPONENT
 THE PHOTON PRODUCTION MATRIX, MATERIAL 4134 REACTION TYPE 103 P 2 COMPONENT
 THE PHOTON PRODUCTION MATRIX, MATERIAL 4134 REACTION TYPE 103 P 3 COMPONENT
 THE PHOTON PRODUCTION MATRIX, MATERIAL 4134 REACTION TYPE 103 P 4 COMPONENT
 THE PHOTON PRODUCTION MATRIX, MATERIAL 4134 REACTION TYPE 103 P 5 COMPONENT
 THE PHOTON PRODUCTION MATRIX, MATERIAL 4134 REACTION TYPE 107 P 0 COMPONENT
 THE PHOTON PRODUCTION MATRIX, MATERIAL 4134 REACTION TYPE 107 P 1 COMPONENT
 THE PHOTON PRODUCTION MATRIX, MATERIAL 4134 REACTION TYPE 107 P 2 COMPONENT
 THE PHOTON PRODUCTION MATRIX, MATERIAL 4134 REACTION TYPE 107 P 3 COMPONENT
 THE PHOTON PRODUCTION MATRIX, MATERIAL 4134 REACTION TYPE 107 P 4 COMPONENT
 THE PHOTON PRODUCTION MATRIX, MATERIAL 4134 REACTION TYPE 107 P 5 COMPONENT

THE FOLLOWING SGR DATA ON IAMPX
 MT TYPE,NO. ENTRIES,PN,1/0 SGRPX/SGRYIELDS

1	102	408	5	1
2	4	70	5	1
3	22	3	5	1
4	103	15	5	1
5	107	51	5	1

MATERIAL 4134 REQUIRED 68 SECONDS

PERCENT OF THE ABOVE TIME SPENT IN THE VARIOUS SUBROUTINES
 SUBROUTINE PERCENT

LAPH	82.353
ALAN	42.647
PR15	30.882
MATT	39.706
TRC2	0.000
XSEC	26.471
MATRIX	8.824
MUSH	10.294

LAPH CALLS ALAN AND MATT. ALAN CALLS MUSH AND PR15. MATT CALLS TRC2, XSEC, AND MATRIX.

MAXIMUM LIMIT REQUIRED 50474 ---- LIMIT ALLOCATED 51000

PHOTON TIME - 68 SECONDS

TAPE ID	18	NUMBER OF NUCLIDES	1
NUMBER OF NEUTRON GROUPS	100	NUMBER OF GAMMA GROUPS	18
FIRST T-ERMAL GROUP	4		

TABLE OF CONTENTS

TEST RUN

ID 4134

AMPA DRIVER: LAP-OR COMPLETE

-----ACCUMULATED CPU TIME-- 273.725 SEC.

AMPA DRIVER NEXT MODULE TO BE EXECUTED IS 4 4 1 5 12 19 5

***THE CENTRAL MEMORY REQUESTED IS NOW 41984

1\$ ARRAY 2 ENTRIES READ

0T

CHOX

COUPLED NEUTRON AND GAMMA-RAY CROSS-SECTION SETS WILL BE CREATED ON LOGICAL UNIT 1

NUMBER OF COUPLED SETS 1
MOUNT PREVIOUSLY MADE LIBRARY NO

2\$ ARRAY 1 ENTRIES READ

3\$ ARRAY 1 ENTRIES READ

4\$ ARRAY 1 ENTRIES READ

5\$ ARRAY 1 ENTRIES READ

0T

TABLE OF CONTENTS

SET NO.	IDENTIFICATION				NUCLIDE TITLE					
OXYGEN	DNA 4134									
	4134	0	0	10	24	0	0	0	0	0
	A	X	0	0	0	0	0	0	0	0
	U	0	0	0	0	0	4134	0	0	0
	U	30								
	3	4	3	1	0	1	1	1	1	1
TEST RUN										
	4134	0	0	0	0	0	0	0	5	0
	U	0	0	0	0	0	0	0	0	0
	U	0	0	0	0	0	0	0	0	4134
	U	32								

TAPE ID
 NUMBER OF NEUTRON GROUPS
 FIRST THERMAL GROUP

19
 100
 100

NUMBER OF NUCLIDES
 NUMBER OF GAMMA GROUPS

1
 18

TABLE OF CONTENTS

OXYGEN DNA 4134

ID

4134

AMPX DRIVER CHOX COMPLETE

-----ACCUMULATED CPU TIME-- 274.295 SEC.

AMPX DRIVER NEXT MODULE TO BE EXECUTED IS 5 5 1 6 12 21 5

***THE CENTRAL MEMORY REQUESTED IS NOW 68608

18 ARRAY 12 ENTRIES READ

OT

MSCM	NUMBER OF EXTRA CROSS SECTIONS	0
MMT	NUMBER OF NUCLIDES FROM MASTER LIBRARY	1
MXT	NUMBER OF NUCLIDES FROM X-SECT LIBRARY (LOG 2)	0
MAT	NUMBER OF NUCLIDES FROM X-SECT LIBRARY (LOG 3)	0
MCR	ANISN/DOT/MORSE OUTPUT TRIGGER	0
MAX	TOTAL CROSS SECTION POSITION	0
MS	WITHIN-GROUP SCATTERING CROSS SECTION POSITION	0
TRES	NUMBER OF RESONANCE CALCULATIONS	0
TUM	TABLE LENGTH FOR CROSS SECTIONS	0
IFM	IS AN OLD ANISN LIBRARY MOUNTED ^ (0/1 NO/YES)	0
IPP	OUTPUT OPTION TRIGGER	0
IFG	PRINT CONTROL - ANISN OUTPUT	0

NITAWL

THE STORAGE ALLOCATED FOR THIS CASE IS 28000 WORDS

28 ARRAY 1 ENTRIES READ

OT

GENERAL INFORMATION CONCERNING CROSS SECTION LIBRARY

TAPE IDENTIFICATION NUMBER	19
NUMBER OF NUCLIDES ON TAPE	1
NUMBER OF NEUTRON ENERGY GROUPS	100
FIRST THERMAL NEUTRON ENERGY GROUP	100
NUMBER OF GAMMA ENERGY GROUPS	18
XSDRN TAPE	19

NUCLIDES FROM XSDRN TAPE
1 OXYGEN DNA 4134

4134

OXYGEN DNA 4134

4134

-----ACCUMULATED CPU TIME-- 244.122 SEC.

THIS ADORN WORKING TAPE WAS CREATED
E OF THE PARENT CASE IS AS FOLLOWS

THE TITL

TAPE ID	19	NUMBER OF WHOLIDES	1
NUMBER OF NEUTRON GROUPS	170	NUMBER OF GAMMA GROUPS	18
FIRST THERMAL GROUP	100		
	TABLE OF CONTENTS		
OXYGEN DNA 4_34		ID	4134
ANPA DRIVER: NITAWL COMPLETE			
-----ACCUMULATED CPU TIME-- 264.532 SEC.			
ANPA DRIVER NEXT MODULE TO BE EXECUTED IS	6	5	1 7 12 23 5
***THE CENTRAL MEMORY REQUESTED IS NOW	51440		

THIS IS A 14 MEV SOURCE IN OXYGEN

1\$ ARRAY 15 ENTRIES READ

3\$ ARRAY 12 ENTRIES READ

4\$ ARRAY 9 ENTRIES READ

0T

XSDRNPM

THE FOLLOWING DIRECT ACCESS SPACE IS REQUIRED
 LOGICAL UNIT 8 HAS 119 BLOCKS OF LENGTH 715 WORDS
 LOGICAL UNIT 9 HAS 60 BLOCKS OF LENGTH 880 WORDS
 LOGICAL UNIT 10 HAS 472 BLOCKS OF LENGTH 100 WORDS

GENERAL PROBLEM DESCRIPTION DATA BLOCK

GENERAL PROBLEM DATA

IGF	1/2/3 = PLANE/CYLINDER/SPHERE	3	ISN	QUADRATURE ORDER	4
I7M	NUMBER OF ZONES	1	ISCT	ORDER OF SCATTERING	5
IM	NUMBER OF SPACIAL INTERVALS	20	IEVT	0/1/2/3/4/5/6=Q/K/ALPHA/C/7/4/H	0
IHL	0/1/2/3 = VACUUM/REFL/PER/WHITE	1	IIM	INNER ITERATION MAXIMUM	25
IHR	RIGHT BOUNDARY CONDITION	0	ICM	OUTER ITERATION MAXIMUM	1
MXM	NUMBER OF MIXTURES	1	ICLC	-1/0/N=FLAT RES/SN/OPT	0
MS	MIXING TABLE LENGTH	1	ITH	0/1 = FORWARD/ADJOINT	0
IGM	NUMBER OF ENERGY GROUPS	119	IFLU	0/1/2/3/4=L-S/L/S/W/L-W	0
NNG	NUMBER OF NEUTRON GROUPS	100	IPRT	-2/-1/0/N=MIXTURE XSEC PRINT	-1
NGU	NUMBER OF GAMMA GROUPS	18	ID1	0/1/2/3=NO/PRT NO/PCH N/BOTH	0
IFLG	NUMBER OF FIRST THERMAL GROUP	100	IPBT	-1/0/1=NONE/FINE/ALL HAL. PRT	0

SPECIAL OPTIONS

IFG	0/1 = NONE/WEIGHTING CALCULATION	1	IPN	DUMMY PARAMETER	0
IOG	VOLUME/IC SOURCES (0/N=NO/YES)	1	IDFM	0/1 = NONE/DENSITY FACTORS 34*	0
IPG	BOUNDARY SOURCES (0/N=NO/YES)	0	IAZ	0/N = NONE/N ACTIVITIES BY ZONE	0
IFN	0/1/2 = INPUT 33*/34*/USE LAST	0	IAI	0/1=NONE/ACTIVITIES BY INTERVAL	0
ITMX	MAXIMUM TIME (MINUTES)	0	IFCT	0/1=NO/YES UPSCATTER SCALING	0
IDT1	0/1/2/3=NO/XSECT/SRCE/FLUX--OUT	0	IPVT	0/1/2=NO/K/ALPHA PARAMETRIC SRCE	0

WEIGHTING DATA (IFG=1)

ICW	-1/0/1=CELL/ZONE/REGION WEIGHT	0	HTF	TOTAL XSECT PSN IN BWD SP TABLES	3
IGM	NUMBER OF BROAD GROUPS	10	NUSF	PSN G-G OR FILE NUMBER	4
ITP	0/10/20/30/40 0/C/E/AC/A	0	NUSF	TABLE LENGTH OR MAX ORDER	13
IPP	-2/-1/0/N=WGTD XSECT PRINT	-1	NUSM	EXTRA 1-U X-SECT POSITIONS	0
IAP	-1/N ANISN XSECT PRINT	-1			

FLOATING POINT PARAMETERS

EV	EIGENVALUE GUESS	0.	PV	IPVT=1/2--K/ALPHA	0.
EVM	EIGENVALUE MODIFIER	0.	EPS	OVERALL CONVERGENCE	1.00000E-04
BF	BUCKLING FACTOR=1.420892	1.42089E+00	PTC	POINT CONVERGENCE	1.00000E-04
DY	CYL/PLA HT FOR BUCKLING	0.	ANF	NORMALIZATION FACTOR	1.00000E+00
DZ	PLANE DEPTH FOR BUCKLING	0.	EQL	EV CHANGE EPS FOR SEARCH	1.00000E-03
VSC	VOID STREAMING CORRECTION	0.	ANPM	NFW PARAM MOD FOR SEARCH	7.50000E-01

DATA BLOCK 2 (MIXING TABLE, ETC.)

THIS CASE WILL REQUIRE 11766 LOCATIONS FOR MIXING
 THIS CASE HAS BEEN ALLOCATED 28500 LOCATIONS

13\$ ARRAY 1 ENTRIES READ

14\$ ARRAY 1 ENTRIES READ

THIS IS A 14 MEV SOURCE IN OXYGEN

OXYGEN DVA 4134

ZONE WEIGHTED CROSS SECTIONS FOR ASDRN MATERIAL

1+134

XSEC ID	1	2	4	27	101	102	103	104
GRP.								
1	1.05280E-00	9.02565E-01	4.90374E-01	1.79564E-01	1.79864E-01	7.51564E-09	4.34218E-02	1.45061E-02
2	1.57417E-00	1.01494E+00	3.79204E-01	1.80020E-01	1.80020E-01	7.90098E-09	3.11665E-02	1.29047E-02
3	1.07924E-00	1.12920E+00	3.30507E-01	2.13540E-01	2.13540E-01	8.30607E-09	4.20430E-02	3.79335E-03
4	1.35589E+00	9.32658E-01	2.35799E-01	1.87435E-01	1.87435E-01	8.73194E-09	1.51193E-03	2.77556E-05
5	1.23321E+00	8.43454E-01	2.41391E-01	1.48363E-01	1.48363E-01	9.17944E-09	0.	0.
6	1.26713E+00	8.06030E-01	2.73100E-01	1.07998E-01	1.07998E-01	9.65030E-09	0.	0.
7	1.18894E+00	9.02494E-01	2.21298E-01	6.47468E-02	6.47468E-02	1.01451E-08	0.	0.
8	1.14750E+00	9.89590E-01	1.11396E-01	9.65170E-02	9.65170E-02	1.06552E-08	0.	0.
9	1.06170E+00	1.83729E+00	3.54386E-04	2.40539E-02	2.40539E-02	1.87435E-08	0.	0.

XSEC ID	107	1099	1000	1001
GRP.				
1	1.21936E-01	2.96910E-04	4.87492E-01	1.00040E+03
2	1.35948E-01	2.59473E-05	5.70531E-01	9.99077E+02
3	1.67703E-01	1.08405E-05	1.18419E+00	1.00131E+03
4	1.05896E-01	4.40796E-06	1.03448E+00	1.00256E+03
5	1.48363E-01	1.71302E-06	9.67005E-01	1.00185E+03
6	1.07998E-01	7.42549E-07	1.07232E+00	1.00174E+03
7	6.47468E-02	1.43513E-06	9.86861E-01	1.00083E+03
8	9.65170E-02	8.49394E-06	1.06378E+00	1.00074E+03
9	2.40539E-02	1.04771E-04	1.40958E+00	1.00070E+03

XSEC ID	602	516	504	527	501	1500	1501
GRP.							
1	4.25324E-02	3.74606E-02	1.77436E+00	1.39419E+00	1.85436E+00	1.09513E+00	1.09513E+00

-----ACCUMULATED CPU TIME-- 327.227 SEC.

THIS IS A 14 MEV SOURCE IN OXYGEN
CELL AVERAGED FLUXES

ZONE	GRP. 1	GRP. 2	GRP. 3	GRP. 4	GRP. 5	GRP. 6	GRP. 7	GRP. 8
1	2.90910E-04	2.59973E-05	1.08905E-05	4.40795E-06	1.71902E-06	7.92649E-07	1.43513E-06	8.49394E-06
2	2.90910E-04	2.59973E-05	1.08905E-05	4.40795E-06	1.71902E-06	7.92649E-07	1.43513E-06	8.49394E-06

ZONE	GRP. 9	GRP. 10
1	1.04771E-04	1.35158E-04
2	1.04771E-04	1.35158E-04

FLUX DISADVANTAGE FACTORS (ZONE AVERAGE/CELL AVERAGE-FLUX)

ZONE	GRP. 1	GRP. 2	GRP. 3	GRP. 4	GRP. 5	GRP. 6	GRP. 7	GRP. 8
1	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00
2	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00

ZONE	GRP. 9	GRP. 10
1	1.00000E+00	1.00000E+00
2	1.00000E+00	1.00000E+00

ZONE VOLUME VOL. FRACTIONS

1	6.54498E+04	1.00000E+00
2	6.54498E+04	1.00000E+00

-----ACCUMULATED CPU TIME-- 327.269 SEC.

AMPA DRIVER: XSDHMPM COMPLETE

-----ACCUMULATED CPU TIME-- 327.271 SEC.

AMPA DRIVER NEXT MODULE TO BE EXECUTED IS 5 7 1 8 12 32 5

***THE CENTRAL MEMORY REQUESTED IS NOW 68608

05 ARRAY 9 ENTRIES READ

15 ARRAY 12 ENTRIES READ

01

NITAWL

MNOM	NUMBER OF EXTRA CROSS SECTIONS	0
MMI	NUMBER OF NUCLIDES FROM MASTER LIBRARY	1
MAI	NUMBER OF NUCLIDES FROM X-SECT LIBRARY (LOG 2)	0
MAT	NUMBER OF NUCLIDES FROM X-SECT LIBRARY (LOG 3)	0
MCH	ANISN/DOE/MORSE OUTPUT TRIGGER	2
MAA	TOTAL CROSS SECTION POSITION	3
MS	WITHIN-GROUP SCATTERING CROSS SECTION POSITION	4
IRFS	NUMBER OF RESONANCE CALCULATIONS	0
IRM	TABLE LENGTH FOR CROSS SECTIONS	103
IRM	IS AN OLD ANISN LIBRARY MOUNTED ^ (0/1 NO/YES)	0
IPP	OUTPUT OPTION TRIGGER	0
IRU	PRINT CONTROL - ANISN OUTPUT	0

THE STORAGE ALLOCATED FOR THIS CASE IS 28000 WORDS

25 ARRAY 1 ENTRIES READ

01

GENERAL INFORMATION CONCERNING CROSS SECTION LIBRARY

TAPE IDENTIFICATION NUMBER	1
NUMBER OF NUCLIDES ON TAPE	1
NUMBER OF NEUTRON ENERGY GROUPS	100
FIRST THERMAL NEUTRON ENERGY GROUP	100
NUMBER OF GAMMA ENERGY GROUPS	0
XSDRN TAPE	1

THIS
IS
WHAT
FIRST
ALACS RUN

NUCLIDES FROM XSDRN TAPE

1 OXYGEN DNA 4134

OXYGEN DNA 4134

4134

4134

THIS ADDON WORKING TAPE WAS CREATED
E OF THE PARENT CASE IS AS FOLLOWS

THE TITLE

TAPE ID	1	NUMBER OF NUCLIDES	1
NUMBER OF NEUTRON GROUPS	100	NUMBER OF GAMMA GROUPS	0
FIRST THERMAL GROUP	100		

TABLE OF CONTENTS

OXYGEN	DATA 4134		
		10	4134

AMPA DRIVER: NITAWL COMPLETE

-----ACCUMULATED CPU TIME-- 334.521 SEC.

AMPA DRIVER NEXT MODULE TO BE EXECUTED IS 10 8 1 9 12 35 5

***THE CENTRAL MEMORY REQUESTED IS NOW 43520

ANISN COLLAPSER

COMMAND

	FINE	BROAD
NUMBER OF GROUPS	100	10
TOTAL X-SECT POSITION	3	3
INGROUP X-SECT POSITION	4	4
X-SECT TABLE LENGTH	103	5

THIS JOB REQUIRES 10591 LOCATIONS OF 18500 ALLOCATED FOR THE ANISN COLLAPSER

4* APPAY 100 ENTRIES READ

5\$ APPAY 100 ENTRIES READ

OT

GROUP	BROAD GROUP NUMBER	FINE GROUP FLUX
1	1	1.000000E+00
2	2	1.000000E+00
3	3	1.000000E+00
4	4	1.000000E+00
5	5	1.000000E+00
6	6	1.000000E+00
7	7	1.000000E+00
8	8	1.000000E+00
9	9	1.000000E+00
10	10	1.000000E+00
11	10	1.000000E+00
12	10	1.000000E+00
13	10	1.000000E+00
14	10	1.000000E+00
15	10	1.000000E+00
16	10	1.000000E+00
17	10	1.000000E+00
18	10	1.000000E+00
19	10	1.000000E+00
20	10	1.000000E+00
21	10	1.000000E+00
22	10	1.000000E+00
23	10	1.000000E+00
24	10	1.000000E+00
25	10	1.000000E+00
26	10	1.000000E+00
27	10	1.000000E+00
28	10	1.000000E+00
29	10	1.000000E+00
30	10	1.000000E+00
31	10	1.000000E+00
32	10	1.000000E+00
33	10	1.000000E+00
34	10	1.000000E+00
35	10	1.000000E+00
36	10	1.000000E+00
37	10	1.000000E+00
38	10	1.000000E+00
39	10	1.000000E+00
40	10	1.000000E+00
41	10	1.000000E+00
42	10	1.000000E+00
43	10	1.000000E+00
44	10	1.000000E+00
45	10	1.000000E+00
46	10	1.000000E+00
47	10	1.000000E+00
48	10	1.000000E+00

ABROAD GROUP LIBRARY CONTENTS

10 0 0 1 OXYGEN DNA 4134

PSN.	GRP. 1	GRP. 2	GRP. 3	GRP. 4	GRP. 5	GRP. 6	GRP. 7	GRP. 8
1	1.79064E-01	1.80020E-01	2.13540E-01	1.87435E-01	1.48363E-01	1.07998E-01	6.47468E-02	9.65170E-02
2	0.	0.	0.	0.	0.	0.	0.	0.
3	1.65280E+00	1.57417E+00	1.67925E+00	1.35589E+00	1.23321E+00	1.26713E+00	1.18894E+00	1.19750E+00
4	6.60065E-01	6.10923E-01	5.85292E-01	4.25224E-01	3.57405E-01	3.06318E-01	3.09196E-01	3.01478E-01
5	0.	2.42819E-01	2.91295E-01	3.15707E-01	2.68202E-01	2.74088E-01	3.19055E-01	3.10316E-01
6	0.	0.	6.19250E-02	9.18495E-02	1.89344E-01	2.09285E-01	1.88269E-01	2.16506E-01
7	0.	0.	0.	1.17572E-02	2.08751E-02	3.87777E-02	2.99457E-02	2.36922E-02
8	0.	0.	0.	0.	0.	0.	8.74126E-03	6.39270E-02

PSN.	GRP. 9	GRP. 10
1	8.21764E-02	3.28882E-03
2	0.	0.
3	9.62636E-01	3.54443E+00
4	2.83065E-01	3.58233E+00
5	3.54396E-01	5.96194E-01
6	2.73995E-01	4.45112E-01
7	4.41518E-02	2.30684E-01
8	9.15948E-02	1.79211E+00

10 0 0 2 OXYGEN DNA 4134

PSN.	GRP. 1	GRP. 2	GRP. 3	GRP. 4	GRP. 5	GRP. 6	GRP. 7	GRP. 8
1	0.	0.	0.	0.	0.	0.	0.	0.
PSN.	2 THRU	PSN.	3 SAME AS ABOVE					
4	1.80307E+00	1.64325E+00	1.56188E+00	1.13954E+00	9.42101E-01	8.09238E-01	8.07809E-01	7.74451E-01
5	0.	2.94351E-01	3.18537E-01	3.02545E-01	1.88649E-01	1.67305E-01	1.81161E-01	1.73347E-01
6	0.	0.	-7.04727E-02	-1.20568E-01	-2.75398E-01	-2.82384E-01	-2.47374E-01	-2.90524E-01
7	0.	0.	0.	-3.10189E-02	-5.43096E-02	-1.03849E-01	-8.15782E-02	-6.34227E-02
8	0.	0.	0.	0.	0.	0.	0.	0.

PSN.	GRP. 9	GRP. 10
1	0.	0.
PSN.	2 THRU	PSN. 3 SAME AS ABOVE
4	7.44180E-01	5.14272E-01
5	1.25433E-01	-3.09810E-01
6	-3.50738E-01	-4.99709E-01
7	-1.15456E-01	-2.41864E-02
8	0.	0.

10 0 0 3 OXYGEN DNA 4134

PSN.	GRP. 1	GRP. 2	GRP. 3	GRP. 4	GRP. 5	GRP. 6	GRP. 7	GRP. 8
1	0.	0.	0.	0.	0.	0.	0.	0.
PSN.	2 THRU	PSN.	3 SAME AS ABOVE					
4	2.40988E+00	2.23464E+00	2.09962E+00	1.53596E+00	1.22226E+00	1.06070E+00	1.03553E+00	9.50810E-01
5	0.	-9.93400E-02	-2.09341E-01	-2.82876E-01	-2.69481E-01	-3.17957E-01	-4.64436E-01	-4.25488E-01
6	0.	0.	-3.73994E-02	-2.43519E-02	-3.92167E-03	-6.96732E-02	-7.55902E-02	-6.40777E-02
7	0.	0.	0.	3.95515E-02	6.69301E-02	1.37268E-01	1.12114E-01	8.38361E-02
8	0.	0.	0.	0.	0.	0.	0.	0.

PSN. GRP. 9 GRP. 10
 1 0. 0.
 PSN. 2 THRU PSN. 3 SAME AS ABOVE
 4 9.50488E-01 7.24817E-01
 5 -4.89618E-01 -3.44973E-01
 6 -1.40721E-01 -1.94416E-03
 7 1.44056E-01 2.95804E-02
 8 0. 0.
 10 0 0 4 OXYGEN DNA 4134

PSN. GRP. 1 GRP. 2 GRP. 3 GRP. 4 GRP. 5 GRP. 6 GRP. 7 GRP. 8
 1 0. 0. 0. 0. 0. 0. 0. 0.
 PSN. 2 THRU PSN. 3 SAME AS ABOVE
 4 2.65377E+00 2.39010E+00 2.23213E+00 1.51415E+00 1.20107E+00 1.07335E+00 1.01426E+00 8.54668E-01
 5 0. -1.51884E-01 -2.59544E-01 -2.37967E-01 -3.75818E-02 -3.99192E-02 -1.64934E-01 -1.00726E-01
 6 0. 0. 4.11725E-02 6.52777E-02 1.37346E-01 2.09898E-01 1.91325E-01 2.05585E-01
 7 0. 0. 0. -3.57306E-02 -5.63237E-02 -1.34044E-01 -1.17696E-01 -8.21300E-02
 8 0. 0. 0. 0. 0. 0. 0. 0.

PSN. GRP. 9 GRP. 10
 1 0. 0.
 PSN. 2 THRU PSN. 3 SAME AS ABOVE
 4 8.90189E-01 2.09775E-01
 5 7.48439E-02 3.20375E-01
 6 3.27354E-01 3.03082E-01
 7 -1.24519E-01 -2.59300E-02
 8 0. 0.
 7 7 7 7

AMPA DRIVER+ COMMAND COMPLETE

AMPA DRIVER NEXT MODULE TO BE EXECUTED IS 9 9 1 10 12 39 5

***THE CENTRAL MEMORY REQUESTED IS NOW 43520

AN AMPX WORKING INTERFACE WILL BE CREATED ON LOGICAL UNIT 4
 FROM THE ANISN LIBRARY ON LOGICAL UNIT 24
 NUMBER OF NEUTRON GRPS 10
 FIRST THERMAL NEUTRON GRP 10
 NUMBER OF GAMMA GRPS 0
 SIGMA TOTAL PSN 3
 INGROUP PSN 4
 TABLE LENGTH 8

LAVA

THE INPUT ANISN LIBRARY IS IN THE
 BINARY FORMAT

SFT	ANISN ID	SCATT ORDER	AMPX ID
1	1	3	816

THIS IS A WORKING LIBRARY FORMED FROM AN ANISY LIBRARY

TAPE ID	12345	NUMBER OF NUCLIDES	1
NUMBER OF NEUTRON GROUPS	10	NUMBER OF GAMMA GROUPS	0
FIRST THERMAL GROUP	10		
	TABLE OF CONTENTS		
OXYGEN DNA 4134		ID	916
AMPA DRIVER: LAVA	COMPLETE		
AMPA DRIVER NEXT MODULE TO BE EXECUTED IS	11 10 1 11 12 42 5		
***THE CENTRAL MEMORY REQUESTED IS NOW	43520		

MALOC5

07/23/77 23.15.22.

MALOC5

1\$ ARRAY 6 ENTRIES READ

2\$ ARRAY 2 ENTRIES READ

UT

4\$ ARRAY 100 ENTRIES READ

5\$ ARRAY 100 ENTRIES READ

UT

OXYGEN 4134

4134

REACTION CROSS SECTIONS FOR OXYGEN DNA 4134

IDENTIFICATION

4134

GROUP	TOTAL	ELASTIC	INELASTIC	Absorption	CAPTURE	(N,GAMMA)	(N,P)	(N,D)
1	1.65249E+00	9.82565E-01	4.93062E-01	1.79854E-01	1.79864E-01	7.51564E-09	4.34218E-02	1.45061E-02
2	1.57413E+00	1.01494E+00	3.73167E-01	1.80020E-01	1.80020E-01	7.90098E-09	3.11665E-02	1.29047E-02
3	1.67929E+00	1.12920E+00	3.35548E-01	2.13540E-01	2.13540E-01	8.30607E-09	4.20430E-02	3.79335E-03
4	1.35590E+00	9.32658E-01	2.35802E-01	1.87435E-01	1.87435E-01	8.73194E-09	1.51193E-03	2.77556E-05
5	1.23321E+00	8.43654E-01	2.41389E-01	1.48353E-01	1.48363E-01	9.17964E-09	0.	0.
6	1.26713E+00	8.86030E-01	2.73104E-01	1.07998E-01	1.07998E-01	9.65030E-09	0.	0.
7	1.18894E+00	9.02894E-01	2.21296E-01	6.47458E-02	6.47468E-02	1.01451E-08	0.	0.
8	1.08007E+00	9.33116E-01	5.73054E-02	8.95457E-02	8.95467E-02	1.09387E-08	0.	0.
9	1.37276E+00	1.33966E+00	0.	3.30928E-02	3.30928E-02	1.17869E-08	0.	0.
10	3.56856E+00	3.56560E+00	0.	2.95766E-03	2.95766E-03	5.50449E-06	0.	0.

PO ELASTIC

(MT= 2)--OXYGEN DNA 4134

IDENTIFIER

4134

	GRP. 1	GRP. 2	GRP. 3	GRP. 4	GRP. 5	GRP. 6	GRP. 7	GRP. 8
1	1001001	1002002	1003003	1004004	2005005	3006006	4007007	5008008
2	6.50065E-01	6.10923E-01	5.85292E-01	4.25224E-01	3.57405E-01	3.06318E-01	3.09196E-01	4.69769E-01
3		2.42819E-01	2.91295E-01	3.15787E-01	2.68202E-01	2.74088E-01	3.19055E-01	5.84311E-01
4			6.19250E-02	9.18496E-02	1.89344E-01	2.09285E-01	1.88269E-01	2.60658E-01
5				1.17572E-02	2.08751E-02	3.87777E-02	2.99457E-02	2.36922E-02
	GRP. 9	GRP. 10						
1	7009009	8010010						
2	5.19029E-01	3.56560E+00						
3	2.37972E-01	8.20633E-01						
4	9.30024E-03	1.75375E-01						

THIS
IS

WALTS
FIPSI

XLACS RUN

TAPE II

NUMBER OF NEUTRON GROUPS

FIRST THERMAL GROUP

1

10

10

NUMBER OF NUCLIDES

NUMBER OF GAMMA GROUPS

1

0

TABLE OF CONTENTS

OXYGEN DNA 4134

ID

4134

AMPA DRIVER+ MALOCS COMPLETE

AMPA DRIVER NEXT MODULE TO BE EXECUTED IS

8

11

1

12

14

46

5

***THE CENTRAL MEMORY REQUESTED IS NOW

36864

CHECKING TOLERANCE= 1.00000E-03 PER CENT

AMPA NUCLIDE 4134 OXYGEN DNA 4134

HAS THE FOLLOWING DATA

0 RESOLVED RESONANCES
10 TEMP IND 1-D NEUT PROCESSES
0 TEMP DEP 1-D NEUT PROCESSES
2 2-D GAMMA PROCESSES
0 FISSION YIELDS

0 UNRESOLVED RESONANCE POINTS
24 2-D NEUT PROCESSES
5 1-D GAMMA PROCESSES
5 2-D NEUT-TO-GAMMA PROCESSES
0 ENDF MAT OF FAST NEUT DATA
4134 ENDF MAT OF THERMAL NEUT DATA
4134 ENDF MAT OF YIELD DATA
0 ENDF MAT OF GAMMA DATA

70 RECORDS FOR NUCLIDE

THIS NUCLIDE HAS THE FOLLOWING 1-D NEUTRON PROCESSES

1. 2. 4. 27. 101. 102. 103. 104. 107. 1099.

2-D NEUT PROCESSES

	MT	LENGTH	ORDER	TEMP
1	2	444	3	0
2	51	108	0	0
3	52	108	0	0
4	53	103	0	0
5	54	100	0	0
6	55	90	0	0
7	56	87	0	0
8	57	85	0	0
9	58	83	0	0
10	59	76	0	0
11	60	76	0	0
12	61	76	0	0
13	62	74	0	0
14	63	74	0	0
15	64	71	0	0
16	65	71	0	0
17	66	67	0	0
18	67	63	0	0
19	68	61	0	0
20	69	56	0	0
21	70	54	0	0
22	71	50	0	0
23	72	42	0	0
24	73	30	0	0

2-D NEUTRON TO GAMMA TRANSFERS

	MT	LENGTH	ORDER	TYPE
1	102	408	5	1
2	4	70	5	1
3	22	3	5	1
4	103	15	5	1
5	107	51	5	1

NEUTRON GROUP	ESTIMATED BINDING ENERGY (EV)	CAPTURE CROSS SECTION
1	4.349989E+06	7.515535E-09
2	4.349990E+06	7.900975E-09
3	4.349987E+06	8.306074E-09
4	4.349986E+06	8.731941E-09
5	4.349982E+06	9.179544E-09
6	4.349979E+06	9.650301E-09
7	4.349980E+06	1.014509E-08
8	4.349978E+06	1.066525E-08
9	4.349979E+06	1.121207E-08
10	4.349979E+06	1.178694E-08
11	4.349979E+06	1.239127E-08
12	4.349979E+06	1.302660E-08
79	4.353063E+06	3.395179E-05
80	4.354442E+06	3.847248E-05
81	4.360307E+06	4.359511E-05
82	4.365587E+06	4.939982E-05
83	4.360410E+06	5.597742E-05
84	4.356089E+06	6.343084E-05
85	4.366979E+06	7.187568E-05
86	4.366979E+06	8.144709E-05
87	4.352027E+06	9.229181E-05
88	4.353595E+06	1.045805E-05
89	4.354451E+06	1.185054E-05
90	4.355198E+06	1.342845E-05
91	4.357416E+06	1.521645E-05
92	4.355405E+06	1.724253E-05
93	4.362525E+06	1.953838E-05
94	4.366979E+06	2.213992E-05
95	4.366979E+06	2.508786E-05
96	4.352723E+06	2.842532E-05
97	4.352359E+06	3.221358E-05
98	4.354134E+06	3.650281E-05
99	4.354520E+06	4.136318E-05
100	4.413375E+06	1.426132E-04

THIS NUCLIDE HAS THE FOLLOWING U-D GAMMA PROCESSES

602. 516. 504. 527. 501.

DEVIATION= 1.151427E-05 EXCEEDS TOLERANCE FOR TOTAL CHECK AVERAGE VALUE= 7.760475E-01 SUMMED VALUE= 7.760564E-01	GROUP	6
DEVIATION= 1.402556E-05 EXCEEDS TOLERANCE FOR TOTAL CHECK AVERAGE VALUE= 8.819571E-01 SUMMED VALUE= 8.819795E-01	GROUP	7
DEVIATION= 1.702134E-05 EXCEEDS TOLERANCE FOR TOTAL CHECK AVERAGE VALUE= 9.983241E-01 SUMMED VALUE= 9.983411E-01	GROUP	8
DEVIATION= 2.047739E-05 EXCEEDS TOLERANCE FOR TOTAL CHECK AVERAGE VALUE= 1.111250E+00 SUMMED VALUE= 1.111273E+00	GROUP	9
DEVIATION= 2.705261E-05 EXCEEDS TOLERANCE FOR TOTAL CHECK AVERAGE VALUE= 1.271209E+00 SUMMED VALUE= 1.271243E+00	GROUP	10
DEVIATION= 4.156421E-05 EXCEEDS TOLERANCE FOR TOTAL CHECK AVERAGE VALUE= 1.517235E+00 SUMMED VALUE= 1.517298E+00	GROUP	11
DEVIATION= 7.934413E-05 EXCEEDS TOLERANCE FOR TOTAL CHECK AVERAGE VALUE= 1.832031E+00 SUMMED VALUE= 1.832177E+00	GROUP	12
DEVIATION= 1.978576E-04 EXCEEDS TOLERANCE FOR TOTAL CHECK AVERAGE VALUE= 2.188218E+00 SUMMED VALUE= 2.188651E+00	GROUP	13
DEVIATION= 5.562191E-04 EXCEEDS TOLERANCE FOR TOTAL CHECK AVERAGE VALUE= 2.605422E+00 SUMMED VALUE= 2.605872E+00	GROUP	14
DEVIATION= 2.501171E-03 EXCEEDS TOLERANCE FOR TOTAL CHECK AVERAGE VALUE= 3.147079E+00 SUMMED VALUE= 3.154970E+00	GROUP	15
DEVIATION= 2.626479E-02 EXCEEDS TOLERANCE FOR TOTAL CHECK AVERAGE VALUE= 3.915479E+00 SUMMED VALUE= 4.021092E+00	GROUP	16
DEVIATION= 2.304861E-01 EXCEEDS TOLERANCE FOR TOTAL CHECK AVERAGE VALUE= 4.562398E+00 SUMMED VALUE= 5.928935E+00	GROUP	17
DEVIATION= 5.538216E-01 EXCEEDS TOLERANCE FOR TOTAL CHECK AVERAGE VALUE= 4.907489E+00 SUMMED VALUE= 3.357192E+01	GROUP	18

U-D GAMMA PROCESSES

	MT	LENGTH	ORDER	
1	504	145	5	0
2	516	12	6	0

NUCLIDE 4134 HAS BEEN CHECKED

APPA DRIVER+ RAND COMPLETE

APPA DRIVER NEXT MODULE TO BE EXECUTED IS 8 12 1 13 14 47 5

***THE CENTRAL MEMORY REQUESTED IS NOW 36864

CHECKING TOLERANCE= 1.00000E-03 PER CENT

AMPA NUCLIDE 4134 OXYGEN GNA 4134
HAS THE FOLLOWING DATA

0 RESOLVED RESONANCES
10 TEMP IND 1-D NEUT PROCESSES
0 TEMP DEP 1-D NEUT PROCESSES
0 2-D GAMMA PROCESSES
0 FISSION YIELDS

0 UNRESOLVED RESONANCE POINTS
24 2-D NEUT PROCESSES
0 1-D GAMMA PROCESSES
0 2-D NEUT-TO-GAMMA PROCESSES
0 ENDF MAT OF FAST NEUT DATA
0 ENDF MAT OF THERMAL NEUT DATA
0 ENDF MAT OF YIELD DATA
0 ENDF MAT OF GAMMA DATA

10 RECORDS FOR NUCLIDE

THIS NUCLIDE HAS THE FOLLOWING U-D NEUTRON PROCESSES

1. 2. 4. 27. 101. 102. 103. 104. 107. 1099.

2-D NEUT PROCESSES

	MT	LENGTH	ORDER	TEMP
1	2	444	3	0
2	51	108	0	0
3	52	108	0	0
4	53	103	0	0
5	54	100	0	0
6	55	90	0	0
7	56	87	0	0
8	57	85	0	0
9	58	83	0	0
10	59	76	0	0
11	60	76	0	0
12	61	76	0	0
13	62	74	0	0
14	63	74	0	0
15	64	71	0	0
16	65	71	0	0
17	66	67	0	0
18	67	63	0	0
19	68	61	0	0
20	69	56	0	0
21	70	54	0	0
22	71	50	0	0
23	72	42	0	0
24	73	30	0	0

NUCLIDE 4134 HAS BEEN CHECKED

AMPA DRIVER: MADE COMPLETE

AMPA COMPLETE

-----ACCUMULATED CPU TIME-- 334.051 SEC.

```

02/23/77 SCOPE 3.3 - SCM VER326 42 01/11/77
22.39.11.WHVRU0Z
22.39.11.WHV,T0700,CM275000,MT1,EC400.
22.39.11.VANDEVENDER BOX 620 ORG 2642
22.39.11.ACCOUNT,S410481460,G66,A00020H2,PI,D5231
22.39.11.NUNC.
22.39.11.ACCT=00020H2 5231 410681466600 1)
22.39.11.*****R F M O T E J O R*****
22.39.11.REQUEST,TAPE11,HI. VSN=15528
22.50.07. (62 ASSIGNED)
22.50.07.REWIND,TAPE11.
22.50.07.ATTACH,DRIVER,WALTER-LGO.
22.50.07.FILE ATTACHED AS CYCLE 01
22.50.07.ATTACH,A,XLACS-LGO.
22.50.08.FILE ATTACHED AS CYCLE 01
22.50.08.ATTACH,R,SMUG-LGO.
22.50.08.FILE ATTACHED AS CYCLE 01
22.50.08.ATTACH,C,LAPH-LGO.
22.50.08.FILE ATTACHED AS CYCLE 01
22.50.09.ATTACH,D,CHUX-LGO.
22.50.09.FILE ATTACHED AS CYCLE 01
22.50.09.ATTACH,F,NITAWL-LGO.
22.50.09.FILE ATTACHED AS CYCLE 01
22.50.09.ATTACH,F,XSDRVPM-LGO.
22.50.09.FILE ATTACHED AS CYCLE 01
22.50.09.ATTACH,G,RADE-LGO.
22.50.10.FILE ATTACHED AS CYCLE 01
22.50.10.ATTACH,H,LAVA-LGO.
22.50.10.FILE ATTACHED AS CYCLE 01
22.50.10.ATTACH,I,COMAND-LGO.
22.50.10.FILE ATTACHED AS CYCLE 01
22.50.10.ATTACH,J,MALOCs-LGO.
22.50.11.FILE ATTACHED AS CYCLE 01
22.50.11.LOAD,DRIVER.
22.50.16.LOAD,A.
22.51.03.LOAD,B.
22.51.05.LOAD,C.
22.51.15.LOAD,D.
22.51.16.LOAD,E.
22.51.20.LOAD,F.
22.51.33.LOAD,G.
22.51.35.LOAD,H.
22.51.37.LOAD,I.
22.51.38.LOAD,J.
22.51.40.EXECUTE,SAMPX,LC=200000.
22.51.42.OVERLAY LOAD SAMPX
22.51.44.FIELD LGTH 240000 00000022 00000033
22.59.58.FIELD LGTH 200000 00000210 00000224
23.02.53.FIELD LGTH 272000 00000314 00000356
23.09.57.FIELD LGTH 122000 00000421 00000551
23.11.15.FIELD LGTH 206000 00000422 00000567
23.12.07.FIELD LGTH 170000 00000434 00000574
23.13.39.FIELD LGTH 206000 00000507 00000605
23.15.32.FIELD LGTH 125000 00000516 00000627
23.16.12.FIELD LGTH 125000 00000520 00000636
23.16.21.FIELD LGTH 125000 00000520 00000645
23.16.37.FIELD LGTH 110000 00000521 00000650
23.16.54.FIELD LGTH 110000 00000522 00000657
23.17.11.STOP
23.17.12.CP 339.054 SEC.
23.17.12.PP 439.130 SEC.
23.17.12.IP 38.288 SEC.
23.17.12.PU 17742
23.17.12.PU .610
23.17.12.CUST 40.412 DLRS

```

Sample Problem #2 (Two Parts)

(a) Problem Description

Part I. (1) Generate multigroup data (123 group) for U^{235} from ENDF data using XLACS.

(2) Perform resonance calculations for U^{235} using NITAWL.

Part II. (1) Generate multigroup data for oxygen from ENDF/B data. (XLACS)

(2) Combine O^{16} and U^{235} data to form one library (NITAWL.)

(3) Perform 1D S_N calculation to generate flux spectrum and collapse 123 group structure to 9 group. (XSDRNPM)

(4) Convert ANISN binary format to DTF/TWOTRAN. (AID)

(b) Sample Input: See Figures III-2 and III-3

(c) Sample Output.

```

0
3** 126103 300 2 0.25 0.0 0 4.46E-03 1 16.0 50 1 32 1.0
2** 126103
1** 0 1 0 0 0 0 0 1 0 0 -1 0 T
0** 23 2 3 4 18 19 9 15 20
=NITAWL
11** F0 E T
73** 300.0 T
71** 50.0 1.0 5.0 5.0 0 0 T
70** 126103 1261 1 0 0 2 1261 1 11
URANIUM 235 300K SIGP-3000
3** 3 3R1 2R0 T
2** 300 2R5000 200 3R0 2 1 0 0 0 T
1** 300 1 123 30 2
30 THERMAL GROUPS
93 FAST GROUPS
REACTOR SPECTRUM WEIGHTING
123 GROUP
XLACS--- ENDF XSEC LIBRARY
=XLACS
0
EXIT.
CATALOG, TAPE4, URANIUM-235, CN=AMP, CY=1,
EXECUTE, SAMPX, LC=50000.
LOAD, TAPEC.
LOAD, TAPEA.
LOAD, TAPEB.
MAP OFF.
ATTACH, TAPEC, NITAWL-LGO.
ATTACH, TAPEA, XLACS-LGO.
ATTACH, TAPEB, WALTER-LGO.
REQUEST, TAPE11, H1, VSN=17835
REQUEST, TAPE4, *PF.
ACCOUNT, S521504530, D5424, G3702, R0422120, RT, KUNC.
SAMP, T1800, CH245000, MT1, EC400. P S PLOKARD AREA 5A

```

Figure III-2. Sample Input for Problem #2 - Part 1

```

255 127603 126103
155 0 1 1 0 32 0 2R0 -1 0 T
055 23 2 3 4 18 19 9 15 20
=NITAWL
1155 F0 E T
73** 300.0 T
7055 127603 1270 1 1 1 2 0 1 1 1
OXYGEN 300K GAS KERNEL
355 4R1 2R0 T
755 300 2R5000 200 300 2 1 0 0 0 T
155 300 1 123 30 2
30 THERMAL GROUPS
93 FAST GROUPS
REACTOR SPECTRUM WEIGHTING
123 GROUP
XLACS--- ENDF XSEC LIBRARY
=XLACS
0
EXIT.
EXECUTE,SAMPX,LC=50000.
LOAD,TAPEE.
LOAD,TAPE0.
LOAD,TAPEC.
LOAD,TAPEA.
LOAD,TAPEB.
LOAD,TAPEF.
MAP OFF.
ATTACH,TAPE0,AID-LGO.
ATTACH,TAPEE,XSURNPM-LGO.
ATTACH,TAPEC,NITAWL-LGO.
ATTACH,TAPEF,XLACS-LGO.
ATTACH,TAPEB,WALTER-LGO.
ATTACH,TAPE11,TAPE220SG.
ATTACH,TAPE2,URANIUM-235.
ACCOUNT,5521504530,05424,G3702,A0422120,RT,KUNC.
OXYG,T0500,CH246000,MT1,EC400.
P S PICKARD AREA 5A

```

Figure III-3. Sample Input for Problem #2 - Part 2


```

0
0 3 OXYGEN-1
-RTD
51$$ 24R1 12R2 23R3 17R4 16R5 18R6 8R7 6R8 7R9 TT
40$$ F1
39$$ 1
36$$ 10R1
35$$ 910.0 0.25
34$$ F1.0 T
15$$ 0.0446 0.00446 T
14$$ 127603 126103
13$$ 2R1
12$$ 18
5$$ 0.001 0.001 1.0 0.0 0.0 1.420892 100. 0.0 0.0 0.0 0.001 0.75 T
4$$ 1 9 41 -2 4 5 13 0 1
3$$ 1 0 0 1 3 72
2$$ -2 0 -1 E
1$$ 2 1 10 1 1 1 2 4 1 1 10 10 32
SAMPLE PROBLEM UO2 (20 E/0) REGION WEIGHTED CROSS SECTIONS 300K 9 GROUP
-XSDRNPH

```

Figure III-3. (cont'd)

TOP OF AMPA	1	
MCK,JCK	1	0
MCK,JCK	0	1
XI ACS---	ENDF	XSEC LIBRARY
		1
MCK,JCK	0	1
123 GROUP		
		1
MCK,JCK	0	1
REACTOR SPECTRUM WEIGHTING		
		1
MCK,JCK	0	1
43 FAST GROUPS		
		1
MCK,JCK	0	1
30 THERMAL GROUPS		
		1
MCK,JCK	0	1
155 300 1 123 30 2		
		1
MCK,JCK	0	1
255 300 285000 200 300 2 11 0 0 0 T		
		1
MCK,JCK	0	1
355 3 301 200 T		
		1
MCK,JCK	0	1
UPANIUM 235 300K SIGP-3000		
		1
MCK,JCK	0	1
705 126105 1261 1 0 0 2 1261 1 11		
		1
MCK,JCK	0	1
715 50.0 1.0 5.0 5.0 0 0 T		
		1
MCK,JCK	0	1
735 300.0 T		
		1
MCK,JCK	0	1
1155 F0 F 1		
		1
MCK,JCK	5	1
MCK,JCK	0	5
051 23 2 3 4 18 19 9 15 20		
		5
MCK,JCK	0	5
155 0 1 0 0 0 0 0 1 0 0 -1 0 1		
		5
MCK,JCK	0	5
255 126105		
		5
MCK,JCK	0	5
TOP OF AMPA	1	
MCK,JCK	1	0
MCK,JCK	0	1
XLACS---	ENDF	XSEC LIBRARY
		1

DRIVER

Listing of Input

AN XSDRN TAPE WILL BE WRITTEN WITH THE SUSPICIOUS TITLE

XLACS--- ENDF XSEC LIBRARY

123 GROUP

REACTOR SPECTRUM WEIGHTING

43 FAST GROUPS

30 THERMAL GROUPS

XLACS

XSDRN TAPE IDENTIFICATION	300	TRANSFER INTEGRATION MESH-SRCE	0
NUMBER OF NUCLIDES	1	TRANSFER INTEGRATION MESH-SINK	0
NUMBER OF ENERGY GROUPS	123	ENDF TAPE IDENTIFICATION	0
NUMBER OF THERMAL GROUPS	30	ENDF TAPE MODE (FAST DATA)	2
WEIGHTING OPTION	2	PEAK TEMPERATURE (MAXWELLIAN)	300

OUTPUT LISTING OPTIONS

RESONANCE DATA	3
1-DIMENSIONAL ARRAYS	1
ELASTIC SCATTERING	1
THERMAL SCATTERING	1
INELASTIC SCATTERING	0
N2P TRANSFERS	0

AN XSDRN MASTER LIBRARY TAPE WILL BE CREATED ON LOGICAL UNIT 23

- * ITS IDENTIFICATION NUMBER IS 300
- * 1 NUCLIDES HAVE BEEN PROCESSED
- * 123 ENERGY GROUPS * 94 1ST THERMAL GRP

PERTINENT INFORMATION CONCERNING THIS TAPE IS

```

*****
*
*   XLACS---      ENDF   XSEC LIBRARY
*   123 GROUP
*   REACTOR SPECTRUM WEIGHTING
*   93 FAST GROUPS
*   30 THERMAL GROUPS
*
*****

```

TABLE OF CONTENTS

NUCLIDE TITLE

IDENTIFICATION NUMBER

1. URANIUM 235 300K SIGP-3000

126103

REACTION CROSS SECTIONS FOR URANIUM 235 300K SIGP-3000

IDENTIFICATION

126103

GROUP	TOTAL	ELASTIC	INELASTIC	(N,2N)	(N,3N)	SUM FISSION	ABSORPTION	CAPTURE
1	5.85163E+00	3.14655E+00	2.23088E-01	2.84616E-01	3.47776E-02	2.15519E+00	2.15760E+00	2.40744E-03
2	5.76578E+00	3.21295E+00	2.07132E-01	4.16203E-01	7.99573E-03	1.91876E+00	1.92150E+00	2.74316E-03
3	5.73441E+00	3.35692E+00	1.84532E-01	4.55854E-01	8.36658E-07	1.73388E+00	1.73711E+00	3.22084E-03
4	5.77903E+00	3.40516E+00	1.75472E-01	4.50218E-01	0.	1.74400E+00	1.74818E+00	4.17927E-03
5	5.89372E+00	3.47695E+00	1.86194E-01	4.35914E-01	0.	1.78897E+00	1.79466E+00	5.68948E-03
6	6.07032E+00	3.62700E+00	2.37685E-01	4.03320E-01	0.	1.79457E+00	1.80232E+00	7.74936E-03
7	6.31351E+00	3.86776E+00	3.62636E-01	3.50615E-01	0.	1.72241E+00	1.73249E+00	1.00831E-02
8	6.61513E+00	4.08876E+00	6.83811E-01	2.77602E-01	0.	1.55265E+00	1.56496E+00	1.23033E-02
9	6.93776E+00	4.29840E+00	1.15693E+00	1.67137E-01	0.	1.30032E+00	1.31529E+00	1.49625E-02
10	7.25015E+00	4.45461E+00	1.63696E+00	5.16023E-02	0.	1.09102E+00	1.10697E+00	1.59522E-02
11	7.51957E+00	4.62568E+00	1.74347E+00	1.60394E-03	0.	1.08052E+00	1.09882E+00	1.83037E-02
12	7.73908E+00	4.78250E+00	1.82813E+00	0.	0.	1.10754E+00	1.12845E+00	2.09066E-02
13	7.88050E+00	4.89972E+00	1.82422E+00	0.	0.	1.13296E+00	1.15655E+00	2.35879E-02
14	7.93861E+00	4.93710E+00	1.81596E+00	0.	0.	1.15919E+00	1.18555E+00	2.63570E-02
15	7.92344E+00	4.89894E+00	1.81069E+00	0.	0.	1.18441E+00	1.21381E+00	2.94054E-02
16	7.85721E+00	4.79980E+00	1.80942E+00	0.	0.	1.21484E+00	1.24799E+00	3.31444E-02
17	7.75475E+00	4.66037E+00	1.79298E+00	0.	0.	1.24451E+00	1.28139E+00	3.68816E-02
18	7.61661E+00	4.54624E+00	1.76098E+00	0.	0.	1.26844E+00	1.30939E+00	4.09533E-02
19	7.45429E+00	4.38008E+00	1.75000E+00	0.	0.	1.27856E+00	1.32421E+00	4.56515E-02
20	7.27776E+00	4.19400E+00	1.75049E+00	0.	0.	1.27788E+00	1.32827E+00	5.03865E-02
21	7.10063E+00	4.04827E+00	1.72540E+00	0.	0.	1.27123E+00	1.32696E+00	5.57302E-02
22	6.95233E+00	3.95433E+00	1.67131E+00	0.	0.	1.26447E+00	1.32670E+00	6.22281E-02
23	6.83157E+00	3.88590E+00	1.62108E+00	0.	0.	1.25480E+00	1.32458E+00	6.97825E-02
24	6.75498E+00	3.86116E+00	1.56427E+00	0.	0.	1.25017E+00	1.32955E+00	7.93855E-02
25	6.71813E+00	3.87114E+00	1.50235E+00	0.	0.	1.25482E+00	1.34465E+00	8.98330E-02
26	6.72891E+00	3.92710E+00	1.44588E+00	0.	0.	1.25492E+00	1.35593E+00	1.01013E-01
27	6.79178E+00	4.04405E+00	1.39517E+00	0.	0.	1.24020E+00	1.35256E+00	1.12359E-01
28	6.90271E+00	4.23085E+00	1.35011E+00	0.	0.	1.20166E+00	1.32175E+00	1.20088E-01
29	7.05225E+00	4.43016E+00	1.33809E+00	0.	0.	1.15815E+00	1.28400E+00	1.25854E-01
30	7.22317E+00	4.62915E+00	1.33049E+00	0.	0.	1.13160E+00	1.26353E+00	1.31931E-01
31	7.41798E+00	4.84489E+00	1.29955E+00	0.	0.	1.13374E+00	1.27354E+00	1.39797E-01
32	7.63811E+00	5.12291E+00	1.22021E+00	0.	0.	1.14512E+00	1.29499E+00	1.49862E-01
33	7.88412E+00	5.43933E+00	1.13049E+00	0.	0.	1.15417E+00	1.31430E+00	1.60134E-01
34	8.13970E+00	5.69759E+00	1.10693E+00	0.	0.	1.16462E+00	1.33517E+00	1.70550E-01
35	8.34999E+00	5.91338E+00	1.07150E+00	0.	0.	1.18314E+00	1.36510E+00	1.81965E-01
36	8.57718E+00	6.17303E+00	1.00521E+00	0.	0.	1.20522E+00	1.39894E+00	1.93716E-01
37	8.78953E+00	6.43353E+00	9.35236E-01	0.	0.	1.21774E+00	1.42076E+00	2.03023E-01
38	9.00837E+00	6.68356E+00	8.85976E-01	0.	0.	1.22671E+00	1.43883E+00	2.12123E-01
39	9.22844E+00	6.91431E+00	8.36904E-01	0.	0.	1.25006E+00	1.47723E+00	2.27170E-01
40	9.44027E+00	7.11164E+00	7.90394E-01	0.	0.	1.28881E+00	1.53824E+00	2.49437E-01
41	9.66177E+00	7.34604E+00	7.44328E-01	0.	0.	1.30317E+00	1.57140E+00	2.68228E-01
42	9.88085E+00	7.60523E+00	6.81570E-01	0.	0.	1.31295E+00	1.59405E+00	2.81100E-01
43	1.00971E+01	7.82914E+00	6.46467E-01	0.	0.	1.32944E+00	1.62153E+00	2.92089E-01
44	1.03192E+01	8.03474E+00	6.11254E-01	0.	0.	1.36545E+00	1.67325E+00	3.07800E-01
45	1.05341E+01	8.23952E+00	5.63836E-01	0.	0.	1.40468E+00	1.73075E+00	3.26072E-01
46	1.07535E+01	8.44401E+00	5.20604E-01	0.	0.	1.44283E+00	1.78892E+00	3.46090E-01
47	1.09668E+01	8.64187E+00	4.83329E-01	0.	0.	1.47543E+00	1.84157E+00	3.66144E-01
48	1.11839E+01	8.83669E+00	4.51505E-01	0.	0.	1.50894E+00	1.89575E+00	3.86801E-01
49	1.14050E+01	9.03751E+00	4.22782E-01	0.	0.	1.53825E+00	1.94466E+00	4.06414E-01
50	1.17733E+01	9.41165E+00	3.42428E-01	0.	0.	1.58279E+00	2.01921E+00	4.36421E-01

REACTION CROSS SECTIONS FOR URANIUM 235 300K SIGP-3000

IDENTIFICATION

126103

GROUP	TOTAL	ELASTIC	INELASTIC	(N,2N)	(N,3N)	SUM FISSION	ABSORPTION	CAPTURE
51	1.23005E+01	9.91737E+00	1.65024E-01	0.	0.	1.71302E+00	2.21807E+00	5.05047E-01
52	1.27911E+01	1.02874E+01	8.37701E-02	0.	0.	1.84337E+00	2.41998E+00	5.76612E-01
53	1.32181E+01	1.07248E+01	3.69137E-02	0.	0.	1.84508E+00	2.45637E+00	6.11297E-01
54	1.36027E+01	1.09249E+01	2.49944E-02	0.	0.	1.96412E+00	2.65272E+00	6.88600E-01
55	1.39102E+01	1.10176E+01	1.63457E-02	0.	0.	2.11080E+00	2.87629E+00	7.65496E-01
56	1.43498E+01	1.12331E+01	9.60220E-03	0.	0.	2.25953E+00	3.10706E+00	8.47532E-01
57	1.46476E+01	1.13412E+01	4.35626E-03	0.	0.	2.39355E+00	3.30209E+00	9.08546E-01
58	1.51873E+01	1.14937E+01	5.90656E-04	0.	0.	2.68447E+00	3.69301E+00	1.00854E+00
59	1.58010E+01	1.16295E+01	0.	0.	0.	2.96493E+00	4.17149E+00	1.20656E+00
60	1.62740E+01	1.17534E+01	0.	0.	0.	3.15413E+00	4.52062E+00	1.36649E+00
61	1.70267E+01	1.18556E+01	0.	0.	0.	3.72063E+00	5.17110E+00	1.45047E+00
62	1.71693E+01	1.17310E+01	0.	0.	0.	4.09768E+00	5.43826E+00	1.34059E+00
63	1.81250E+01	1.17950E+01	0.	0.	0.	4.80495E+00	6.32997E+00	1.52502E+00
64	1.87225E+01	1.18532E+01	0.	0.	0.	5.17022E+00	6.86936E+00	1.69914E+00
65	1.95370E+01	1.18801E+01	0.	0.	0.	5.62076E+00	7.65691E+00	2.03615E+00
66	2.13570E+01	1.20524E+01	0.	0.	0.	6.86187E+00	9.30461E+00	2.44274E+00
67	2.20543E+01	1.20074E+01	0.	0.	0.	7.41813E+00	1.00468E+01	2.62871E+00
68	2.47032E+01	1.22649E+01	0.	0.	0.	8.47102E+00	1.24383E+01	3.96727E+00
69	2.50171E+01	1.22051E+01	0.	0.	0.	8.65198E+00	1.28120E+01	4.16003E+00
70	2.83828E+01	1.21979E+01	0.	0.	0.	1.20497E+01	1.61849E+01	4.13523E+00
71	3.08271E+01	1.21086E+01	0.	0.	0.	1.45881E+01	1.87184E+01	4.13029E+00
72	2.91098E+01	1.20116E+01	0.	0.	0.	1.26976E+01	1.70981E+01	4.40049E+00
73	3.12365E+01	1.21141E+01	0.	0.	0.	1.35261E+01	1.91224E+01	5.59633E+00
74	3.96602E+01	1.24547E+01	0.	0.	0.	2.00215E+01	2.72054E+01	7.18389E+00
75	3.66001E+01	1.22014E+01	0.	0.	0.	1.64902E+01	2.43987E+01	7.90845E+00
76	3.74208E+01	1.20401E+01	0.	0.	0.	1.76131E+01	2.53807E+01	7.76757E+00
77	3.90911E+01	1.20756E+01	0.	0.	0.	1.80702E+01	2.70155E+01	8.94533E+00
78	3.63018E+01	1.20101E+01	0.	0.	0.	1.60153E+01	2.42917E+01	8.27642E+00
79	1.32003E+01	1.23906E+01	0.	0.	0.	7.63838E-01	8.09628E-01	4.57904E-02
80	1.40063E+01	1.30958E+01	0.	0.	0.	7.38615E-01	9.09493E-01	1.70878E-01
81	1.28183E+01	1.20069E+01	0.	0.	0.	7.24021E-01	8.11492E-01	8.74711E-02
82	1.43943E+01	1.32122E+01	0.	0.	0.	8.18078E-01	1.18211E+00	3.64028E-01
83	1.21653E+01	1.17097E+01	0.	0.	0.	4.17825E-01	4.55633E-01	3.78076E-02
84	1.49436E+01	1.36929E+01	0.	0.	0.	1.18582E+00	1.25073E+00	6.49075E-02
85	1.22446E+01	1.09144E+01	0.	0.	0.	4.29052E-01	1.33423E+00	9.05178E-01
86	1.56688E+01	1.23876E+01	0.	0.	0.	2.23857E+00	3.28121E+00	1.04263E+00
87	1.64143E+01	1.19270E+01	0.	0.	0.	3.80380E+00	4.48728E+00	6.83479E-01
88	1.01432E+01	1.05085E+01	0.	0.	0.	-1.44719E+00	-3.65337E-01	1.08185E+00
89	1.32724E+01	1.06513E+01	0.	0.	0.	1.96187E+00	2.62110E+00	6.59230E-01
90	1.30414E+01	1.09252E+01	0.	0.	0.	1.31651E+00	2.11524E+00	7.98735E-01
91	1.73329E+01	1.13580E+01	0.	0.	0.	4.80253E+00	5.97483E+00	1.17230E+00
92	2.05642E+01	1.15752E+01	0.	0.	0.	7.20538E+00	8.98804E+00	1.78265E+00
93	2.48113E+01	1.19944E+01	0.	0.	0.	1.08615E+01	1.28169E+01	1.95547E+00
94	2.94792E+01	1.21689E+01	0.	0.	0.	1.38431E+01	1.73103E+01	3.46718E+00
95	3.05646E+01	1.21691E+01	0.	0.	0.	1.49362E+01	1.83955E+01	3.45930E+00
96	3.26847E+01	1.21694E+01	0.	0.	0.	1.63988E+01	2.05153E+01	4.11653E+00
97	3.80098E+01	1.21696E+01	0.	0.	0.	1.95901E+01	2.58401E+01	6.25009E+00
98	9.36904E+01	1.21701E+01	0.	0.	0.	6.13747E+01	8.15203E+01	2.01456E+01
99	1.19549E+02	1.21705E+01	0.	0.	0.	8.98037E+01	1.07418E+02	1.76144E+01
100	7.54684E+01	1.21710E+01	0.	0.	0.	5.66394E+01	6.32974E+01	6.65800E+00

REACTION CROSS SECTIONS FOR URANIUM 235 300K SIGP-3000

IDENTIFICATION

126103

GROUP	TOTAL	ELASTIC	INELASTIC	(N,ZN)	(N,3N)	SUM FISSION	ABSORPTION	CAPTURE
101	7.38817E+01	1.21716E+01	0.	0.	0.	5.59816E+01	6.17101E+01	5.72852E+00
102	7.75003E+01	1.21724E+01	0.	0.	0.	5.95794E+01	6.53280E+01	5.74856E+00
103	8.74472E+01	1.21732E+01	0.	0.	0.	6.82791E+01	7.52740E+01	6.99484E+00
104	1.06232E+02	1.21743E+01	0.	0.	0.	8.41236E+01	9.40572E+01	9.93361E+00
105	1.51345E+02	1.21755E+01	0.	0.	0.	1.19855E+02	1.39210E+02	1.93549E+01
106	2.22903E+02	1.21764E+01	0.	0.	0.	1.72225E+02	2.10726E+02	3.85016E+01
107	2.51836E+02	1.21772E+01	0.	0.	0.	1.92657E+02	2.39659E+02	4.70019E+01
108	2.34292E+02	1.21781E+01	0.	0.	0.	1.79701E+02	2.22114E+02	4.24128E+01
109	2.30530E+02	1.21788E+01	0.	0.	0.	1.79592E+02	2.18351E+02	3.87594E+01
110	2.36187E+02	1.21794E+01	0.	0.	0.	1.85963E+02	2.24007E+02	3.80439E+01
111	2.48178E+02	1.21800E+01	0.	0.	0.	1.97643E+02	2.35998E+02	3.83552E+01
112	2.67042E+02	1.21809E+01	0.	0.	0.	2.15101E+02	2.54861E+02	3.97596E+01
113	2.94757E+02	1.21821E+01	0.	0.	0.	2.40006E+02	2.82575E+02	4.25693E+01
114	3.32154E+02	1.21844E+01	0.	0.	0.	2.73033E+02	3.19969E+02	4.69358E+01
115	3.68516E+02	1.21872E+01	0.	0.	0.	3.04697E+02	3.56329E+02	5.16319E+01
116	4.02602E+02	1.21901E+01	0.	0.	0.	3.34223E+02	3.90412E+02	5.61893E+01
117	4.45656E+02	1.21945E+01	0.	0.	0.	3.71416E+02	4.33461E+02	6.20451E+01
118	5.02444E+02	1.22012E+01	0.	0.	0.	4.20339E+02	4.90243E+02	6.99039E+01
119	5.81542E+02	1.22122E+01	0.	0.	0.	4.88238E+02	5.69330E+02	8.10923E+01
120	7.03519E+02	1.22330E+01	0.	0.	0.	5.92336E+02	6.91286E+02	9.89497E+01
121	8.51589E+02	1.22621E+01	0.	0.	0.	7.18193E+02	8.39326E+02	1.21134E+02
122	1.01847E+03	1.23024E+01	0.	0.	0.	8.59632E+02	1.00616E+03	1.46531E+02
123	1.32727E+03	1.23876E+01	0.	0.	0.	1.12187E+03	1.31488E+03	1.93014E+02

XLACS--- ENDF XSEC LIBRARY

124 GROUP

REACTOR SPECTRUM WEIGHTING

43 FAST GROUPS

30 THERMAL GROUPS

TAPE TO

300

NUMBER OF NUCLIDES

1

NUMBER OF NEUTRON GROUPS

123

NUMBER OF GAMMA GROUPS

0

FIRST THERMAL GROUP

TABLE OF CONTENTS

URANIUM 235 300K SIGP-3000

ID 126103

-----ACCUMULATED CPU TIME-- 1344.768 SEC.

116 ARRAY 6 ENTRIES READ

UT

GENERAL INFORMATION CONCERNING UPDATE OPTION

NFWID	IDENTIFICATION OF NEW AMPX LIBRARY	0
ITRCUP	UPDATE TRIGGER 0/1/2 NO/ADD 21 TO 23/COPY 21	0
IFUIT	PRODUCE EDITS OF CROSS-SECTIONS	0
IPLOT	PLOT CROSS-SECTIONS	0
IPART	UPDATE PARTIAL CROSS-SECTIONS	0
IOLD	IS AN OLD AMPX LIBRARY MOUNTED (0/1 NO/YES)	0

 YOU HAVE COME TO THE END OF A PERILOUS FLIGHT THROUGH THAT MAGNIFICENT
 PROGRAM.....X L A C S.....I TRUST IT HAS BEEN A MOVING PERFORMANCE
 SEE YOU ON THE NEXT TIME THROUGH

-----ACCUMULATED CPU TIME-- 1344.825 SEC.

AMPX DRIVER XLACS COMPLETE

-----ACCUMULATED CPU TIME-- 1344.827 SEC.

AMPX DRIVER NEXT MODULE TO BE EXECUTED 5 2 1 3 2 13 5

***THE CENTRAL MEMORY REQUESTED IS NOW 75000

0% ARRAY 9 ENTRIES READ

1% ARRAY 12 ENTRIES READ

UT

MSCM	NUMBER OF EXTRA CROSS SECTIONS	0
MMT	NUMBER OF NUCLIDES FROM MASTER LIBRARY	1
MWT	NUMBER OF NUCLIDES FROM X-SECT LIBRARY (LOG 2)	0
MAT	NUMBER OF NUCLIDES FROM X-SECT LIBRARY (LOG 3)	0
MCR	ANJSN/DOT/MORSE OUTPUT TRIGGER	0
MAX	TOTAL CROSS SECTION POSITION	0
MS	WITHIN-GROUP SCATTERING CROSS SECTION POSITION	0
TRES	NUMBER OF RESONANCE CALCULATIONS	1
TUM	TABLE LENGTH FOR CROSS SECTIONS	0
TPM	IS AN OLD ANISN LIBRARY MOUNTED ^ (0/1 NO/YES)	0
TTP	OUTPUT OPTION TRIGGER	-1
TPG	PRINT CONTROL - ANISN OUTPUT	0

NITAWL

THE STORAGE ALLOCATED FOR THIS CASE IS 28000 WORDS

2% ARRAY 1 ENTRIES READ

3% ARRAY 15 ENTRIES READ

UT

GENERAL INFORMATION CONCERNING CROSS SECTION LIBRARY

TAPE IDENTIFICATION NUMBER	300
NUMBER OF NUCLIDES ON TAPE	1
NUMBER OF NEUTRON ENERGY GROUPS	123
FIRST THERMAL NEUTRON ENERGY GROUP	94
NUMBER OF GAMMA ENERGY GROUPS	0
XSDRN TAPE	300
XLACS---	ENDF XSEC LIBRARY
	123 GROUP
	REACTOR SPECTRUM WEIGHTING
	93 FAST GROUPS
	30 THERMAL GROUPS

NUCLIDES FROM XSDRN TAPE

1 URANIUM 235 300K SIGP-3000

126103

URANIUM 235 300K SIGP-3000

126103

RESONANCE DATA FOR THIS NUCLIDE

MASS NUMBER (A)	= 233.025	TEMPERATURE (KELVIN)	= 300.000
POTENTIAL SCATTER SIGMA	= 11.500	LUMPED NUCLEAR DENSITY	= .4460000E-02
SPIN FACTOR (G)	= 18015.690	LUMP DIMENSION (A-BAR)	= .2500000E+00
SIGMA-M(EFFECTIVE)	= 0.	DANCOFF CORRECTION (C)	= 0.

THE ABSORBER WILL BE TREATED BY THE NORDHEIM INTEGRAL METHOD.

MASS OF MODERATOR-1	= 16.000	SIGMA(PER ABSORBER ATOM)	= .5000000E+02
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MODERATOR-1 WILL BE TREATED BY THE NORDHEIM INTEGRAL METHOD.

THIS RESONANCE MATERIAL WILL BE TREATED AS A 2-DIMENSIONAL OBJECT.

VOLUME FRACTION OF LUMP IN CELL USED TO ACCOUNT FOR SPATIAL SELF SHIELDING=1.00000

GROUP	RES ABS	RES FISS
73	5.238172E+00	3.277961E+00
79	5.033094E+01	2.148974E+01
80	7.018826E+01	4.892956E+01
81	4.666026E+01	3.088637E+01
82	7.253111E+01	4.485878E+01
83	6.061426E+01	4.206589E+01
84	7.439055E+01	4.452094E+01
85	4.598483E+01	3.081513E+01
86	7.801453E+01	3.280909E+01
87	4.735680E+01	7.188291E+01
88	2.894344E+01	1.416531E+01
89	5.347453E+01	2.331906E+01
90	2.043268E+01	3.700590E+00
91	3.897969E+01	2.579581E+01
92	3.130803E+00	6.540463E+00
93	1.448272E+01	3.599298E+00

EXCESS RESONANCE INTEGRALS

	RESOLVED	UNRESOLVED	TOTAL
ABSORPTION	.18174E+03	0.	.18174E+03
FISSION	.10932E+03	0.	.109 2E+03

-----ACCOMULATED CPU TIME-- 1404.884 SEC.

-----ACCOMULATED CPU TIME-- 1407.335 SEC.

THIS ASDPN WORKING TAPE WAS CREATED
E OF THE PARENT CASE IS AS FOLLOWS

THE TITL

TAPE ID
NUMBER OF NEUTRON GROUPS
FIRST THERMAL GROUP

300
123
94

NUMBER OF NUCLIDES
NUMBER OF GAMMA GROUPS

1
0

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URANIUM 235 300K SIGP-3000

ID 126103

AMPA DRIVER, NITAWL COMPLETE

-----ACCUMULATED CPU TIME-- 1407.968 SEC.

AMPA COMPLETE

-----ACCUMULATED CPU TIME-- 1407.970 SEC.

02/23/77 SCOPE 3.3 - SCM VER326 42 01/11/77
 21.26.50.SAMBUOY
 21.26.50.SAMP.T1800.CM245000.MT1.EC400.
 21.26.50. P S PICKARD AREA 5A
 21.26.50.ACCOUNT.S521504538.05424.G3702.40422120.
 21.26.50.P1.KUNC.
 21.26.50.ACT(0422120 5424 5215045383702 T)
 21.26.50.*****R E M O T E J O R*****
 21.26.50.REQUEST.TAPE4.*PF.
 21.26.50.REQUEST.TAPE11.HI. VSN=1783
 21.26.50.5
 21.32.22. (67 ASSIGNED)
 21.32.22.ATTACH.TAPEB.WALTER-LGO.
 21.32.23.FILE ATTACHED AS CYCLE 01
 21.32.23.ATTACH.TAPEA.XLACS-LGO.
 21.32.23.FILE ATTACHED AS CYCLE 01
 21.32.23.ATTACH.TAPEC.VITAWL-LGO.
 21.32.23.FILE ATTACHED AS CYCLE 01
 21.32.23.MAP OFF.
 21.32.23.LOAD.TAPEB.
 21.32.28.LOAD.TAPEA.
 21.32.45.LOAD.TAPEC.
 21.32.49.EXECUTE.SAMPX.LC=50000.
 21.32.52.OVERLAY LOAD SAMPX
 21.32.53.FIELD LGTH 240000 00000011 00000013
 21.39.39.ROLLOUT COMPLETED. (FL 240000)
 21.52.16.PULLIN COMPLETED.
 22.20.20.ROLLOUT COMPLETED. (FL 240000)
 22.30.07.PULLIN COMPLETED.
 22.32.50.FIELD LGTH 206000 00002505 00000146
 22.35.18.STOP
 22.35.18.CATALOG.TAPE4.URANIUM-235.CN=***,CY=1.
 22.35.18.FILE CATALOGED AS CYCLE 01.
 22.35.18.URANIUM-235
 22.35.18.USER 521504538.CL. UNC
 22.35.19.CP 1407.977 SEC.
 22.35.19.PP 111.547 SEC.
 22.35.19.JU 20.842 SEC.
 22.35.19.WU 10624
 22.35.19.PD 1.285
 22.35.19.COST 168.178 DLRS

75

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MCK+JCK      0      5
SAMPLE PROBLEM 002 (20 E/O) REGION WEIGHTED CROSS SECTIONS 300K 9 GROUP      6

MCK+JCK      0      6
199 2 1 10 1 1 1 2 4 1 1 10 10 32      6

MCK+JCK      0      6
299 -2 0 -1 F      6

MCK+JCK      0      6
399 1 0 0 1 3 7Z      6

MCK+JCK      0      6
499 1 0 41 -2 4 5 13 0 1      6

MCK+JCK      0      6
599 0.001 0.001 1.0 0.0 0.0 1.420892 100. 0.0 0.0 0.0 0.001 0.75 T      6

MCK+JCK      0      6
1299 18      6

MCK+JCK      0      6
1399 291      6

MCK+JCK      0      6
1499 1274.03 126103      6

MCK+JCK      0      6
1599 0.0440 0.00446 T      6

MCK+JCK      0      6
3499 F1.0 1      6

MCK+JCK      0      6
3599 910.0 0.25      6

MCK+JCK      0      6
3699 1081      6

MCK+JCK      0      6
3999 1      6

MCK+JCK      0      6
4099 F1      6

MCK+JCK      0      6
5199 2481 1242 2393 1724 1085 1086 887 688 789 TT      6

MCK+JCK      12      6

MCK+JCK      0      12
0 3 OXYGEN-1      12

AMPA DRIVEN NEXT MODULE TO BE EXECUTED IS      1      1      1      2      4      1      5

***THE CENTRAL MEMORY REQUESTED IS NOW      M1920

15 ARRAY      5 ENTRIES READ

25 ARRAY      12 ENTRIES READ

OT

A STANDARD 123 NEUTRON GROUP STRUCTURE HAS BEEN INSERTED FOR YOU AND WILL BE USED UNLESS YOU
OVERRIDE IT

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XLACS--- ENDF XSEC LIBRARY

123 GROUP

REACTOR SPECTRUM WEIGHTING

93 FAST GROUPS

70 THERMAL GROUPS

TAPE ID

300

NUMBER OF NUCLIDES

1

NUMBER OF NEUTRON GROUPS

123

NUMBER OF GAMMA GROUPS

0

FIRST THERMAL GROUP

94

TABLE OF CONTENTS

OXYGEN 300K GAS KERNAL

ID 127503

-----ACCUMULATED CPU TIME-- 288.612 SEC.

115 ARRAY 6 ENTRIES READ

XLACS

OT

GENERAL INFORMATION CONCERNING UPDATE OPTION

NEWID	IDENTIFICATION OF NEW AMPX LIBRARY	0
ITRGRP	UPDATE TRIGGER 0/1/2 NO/ADD 21 TO 23/COPY 21	0
IEDIT	PRODUCE EDITS OF CROSS-SECTIONS	0
IPLOT	PLOT CROSS-SECTIONS	0
IPART	UPDATE PARTIAL CROSS-SECTIONS	0
IOLD	IS AN OLD AMPX LIBRARY MOUNTED (0/1 NO/YES)	0

YOU HAVE COME TO THE END OF A PERILOUS FLIGHT THROUGH THAT MAGNIFICENT
PROGRAM....X L A C S.....I TRUST IT HAS BEEN A MOVING PERFORMANCE
SEE YOU ON THE NEXT TIME THROUGH

-----ACCUMULATED CPU TIME-- 288.724 SEC.

AMPX DRIVER XLACS COMPLETE

-----ACCUMULATED CPU TIME-- 288.726 SEC.

AMPX DRIVER NEXT MODULE TO BE EXECUTED IS 5 2 1 3 4 12 5

***THE CENTRAL MEMORY REQUESTED IS NOW 68608

05 ARRAY 9 ENTRIES READ

15 ARRAY 12 ENTRIES READ

0T

MSCM	NUMBER OF EXTRA CROSS SECTIONS	0
MMT	NUMBER OF NUCLIDES FROM MASTER LIBRARY	1
MAT	NUMBER OF NUCLIDES FROM X-SECT LIBRARY (LOG 2)	1
MAT	NUMBER OF NUCLIDES FROM X-SECT LIBRARY (LOG 3)	0
MOR	ANISN/DOT/MORSE OUTPUT TRIGGER	0
MAX	TOTAL CROSS SECTION POSITION	0
MS	WITHIN-GROUP SCATTERING CROSS SECTION POSITION	0
MRES	NUMBER OF RESONANCE CALCULATIONS	0
LM	TABLE LENGTH FOR CROSS SECTIONS	0
IPM	IS AN OLD ANISN LIBRARY MOUNTED ^ (0/1 NO/YES)	0
IPP	OUTPUT OPTION TRIGGER	-1
IFG	PRINT CONTROL - ANISN OUTPUT	0

NITAWL

THE STORAGE ALLOCATED FOR THIS CASE IS 28000 WORDS

25 ARRAY 2 ENTRIES READ

0T

GENERAL INFORMATION CONCERNING CROSS SECTION LIBRARY

TAPE IDENTIFICATION NUMBER	300
NUMBER OF NUCLIDES ON TAPE	1
NUMBER OF NEUTRON ENERGY GROUPS	123
FIRST THERMAL NEUTRON ENERGY GROUP	94
NUMBER OF GAMMA ENERGY GROUPS	0
XSDRN TAPE	300
XLACS---	END OF XSEC LIBRARY
	123 GROUP
	REACTOR SPECTRUM WEIGHTING
	93 FAST GROUPS
	30 THERMAL GROUPS

WORK TAPE 300

THIS XSDRN WORKING TAPE WAS CREATED
F OF THE PARENT CASE IS AS FOLLOWS

THE TITLE

NUCLIDES FROM XSDRN TAPE
1 OXYGEN 300K GAS KERNAL
NUCLIDES FROM WORK TAPE
2 URANIUM 235 300K SIGP-300C

127603

125103

OXYGEN 300K GAS KERNAL

127603

-----ACCUMULATED CPU TIME-- 293.219 SEC.

THIS ASDRM WORKING TAPE WAS CREATED
E OF THE PARENT CASE IS AS FOLLOWS

THE TITL

TAPE ID
NUMBER OF NEUTRON GROUPS
FIRST THERMAL GROUP

600
123
94

NUMBER OF NUCLIDES
NUMBER OF GAMMA GROUPS

2
0

TABLE OF CONTENTS

OXYGEN 300K GAS KERNAL
URANIUM 235 300K SIGR-3000

10 127503
10 126103

AMPX DRIVER: NITAWL: COMPLETE

-----ACCUMULATED CPU TIME-- 294.084 SEC.

AMPX DRIVER NEXT MODULE TO BE EXECUTED IS 6 3 1 4 4 16 5

***THE CENTRAL MEMORY REQUESTED IS NOW 61440

SAMPLE PROBLEM 002 (20 E/O) REGION WEIGHTED CROSS SECTIONS 300K 9 GR

15 ARRAY 15 ENTRIES READ
 25 ARRAY 10 ENTRIES READ
 35 ARRAY 12 ENTRIES READ
 45 ARRAY 9 ENTRIES READ
 55 ARRAY 12 ENTRIES READ
 01

XSDRNPM

THE FOLLOWING DIRECT ACCESS SPACE IS REQUIRED
 LOGICAL UNIT 8 HAS 153 BLOCKS OF LENGTH 253 WORDS
 LOGICAL UNIT 9 HAS 22 BLOCKS OF LENGTH 880 WORDS
 LOGICAL UNIT 10 HAS 369 BLOCKS OF LENGTH 10 WORDS

GENERAL PROBLEM DESCRIPTION DATA BLOCK

GENERAL PROBLEM DATA

IGE 1/2/3 = PLANE/CYLINDER/SPHERE	2	ISN QUADRATURE ORDER	4
I/M NUMBER OF ZONES	1	ISCT ORDER OF SCATTERING	1
IM NUMBER OF SPACIAL INTERVALS	10	IEVT 0/1/2/3/4/5/6=0/K/ALPHA/C/Z/R/H	1
IRL 0/1/2/3 = VACUUM/REFL/PER/WHITE	1	IIM INNER ITERATION MAXIMUM	10
IRF RIGHT BOUNDARY CONDITION	1	ICM OUTER ITERATION MAXIMUM	10
MXX NUMBER OF MIXTURES	1	ICLC -1/0/N=FLAT RES/SN/OPT	0
MS MIXING TABLE LENGTH	2	ITH 0/1 = FORWARD/ADJOINT	0
IGN NUMBER OF ENERGY GROUPS	123	IFLU 0/1/2/3/4=L-S/L/S/W/L-W	0
NNG NUMBER OF NEUTRON GROUPS	123	IPRT -2/-1/0/N=MIXTURE XSEC PRINT	-2
NGG NUMBER OF GAMMA GROUPS	0	ID1 0/1/2/3=NO/PRT MD/PCN N/BOTH	0
IFTG NUMBER OF FIRST THERMAL GROUP	24	IPBT -1/0/1=NONE/FINE/ALL BAL. PRT	-1

SPECIAL OPTIONS

IFB 0/1 = NONE/WEIGHTING CALCULATION	0	IPN DUMMY PARAMETER	0
IQM VOLUMETRIC SOURCES (0/N=NO/YES)	0	IDFM 0/1 = NONE/DENSITY FACTORS 38*	0
IPM BOUNDARY SOURCES (0/N=NO/YES)	0	IAZ 0/N = NONE/N ACTIVITIES BY ZONE	0
IFN 0/1/2 = INHIT 33*/34*/USE LAST	0	IAI 0/1=NONE/ACTIVITIES BY INTERVAL	0
ITMA MAXIMUM TIME (MINUTES)	3	IFCT 0/1=NO/YES UPSCATTER SCALING	0
IDT1 0/1/2/3=NO/XSECT/SRCE/FLUX--OUT	0	IPVT 0/1/2=NO/K/ALPHA PARAMETRIC SRCH	0

WEIGHTING DATA (IFTG=1)

ICGN -1/0/1=CELL/ZONE/REGION WEIGHT	1	HTF TOTAL XSECT PSN IN BRO GP TABLES	4
IGMF NUMBER OF BROAD GROUPS	4	QUSF PSN 0-6 OR FILE NUMBER	5
ITP 0/10/20/30/40 0/C/E/ALFA	41	QUSF TABLE LENGTH OR MAX ORDER	13
IPP -2/-1/0/N=NOTED XSECT PRINT	-2	MSCM EXTRA 1-D X-SECT POSITIONS	1
IAP -1/N=NISN XSECT PRINT	0		

FLOATING POINT PARAMETERS

EV	EIGENVALUE GUESS	0.	PV	IPVT=1/2--K/ALPHA	0.
EVM	EIGENVALUE MODIFIER	0.	EPS	OVERALL CONVERGENCE	1.00000E-03
BF	BUCKLING FACTOR=1.420892	1.42089E+00	PTC	POINT CONVERGENCE	1.00000E-03
DY	CYL/PLA HT FOR BUCKLING	1.00000E+02	XNF	NORMALIZATION FACTOR	1.00000E+00
DZ	PLANE DEPTH FOR BUCKLING	0.	EOL	EV CHANGE EPS FOR SEARCH	1.00000E-03
VSC	VOID STREAMING CORRECTION	0.	XNPM	NEW PARAM MOD FOR SEARCH	7.50000E-01

DATA BLOCK 2 (MIXING TABLE, ETC.)
 THIS CASE WILL REQUIRE 17377 LOCATIONS FOR MIXING
 THIS CASE HAS BEEN ALLOCATED 28500 LOCATIONS

SAMPLE PROBLEM U02 (20 E/O) REGION WEIGHTED CROSS SECTIONS 300K 9 GR						EXTRA
NUCLIDES REQUESTED	CITATION IDENTIFICATION	MIXTURE	MIXING TABLE COMPONENT	ATOM DENSITY		XSECT IDS
1 0	0	1	127603	4.46000E-02		18
2 0	0	1	126103	4.46000E-03		

-----ACCUMULATED CPU TIME-- 298.708 SEC.

16513 LOCATIONS WILL BE USED

34* ARRAY 10 ENTRIES READ

0T

35* ARRAY 11 ENTRIES READ

36* ARRAY 10 ENTRIES READ

39* ARRAY 1 ENTRIES READ

40* ARRAY 1 ENTRIES READ

51* ARRAY 123 ENTRIES READ

0T

AN ANISN LIBRARY WILL BE MADE ON TAPE 20
FOR 9 NEUTRON GROUPS AND 0 GAMMA GROUPS

ITL= 4
IHS= 5 WHICH ALLOWS 8 DOWNSCATTERS
ITL= 13 0 UPSCATTERS

1 EXTRA CROSS SECTIONS ARE INCLUDED ABOVE THE NORMAL 3 (ABS,NU-SIGF,SIGT) WHICH ARE---
POSITION ENDF/B MT-NUMBER
1 18

THE LIBRARY CONTENTS ARE

NOG ITL ICT ID TITLE
9 13 0 1 P0 DATA FOR OXYGEN 300K GAS KERNEL

XSDRN ID 127603

PSN.	GRP. 1	GRP. 2	GRP. 3	GRP. 4	GRP. 5	GRP. 6	GRP. 7	GRP. 8
1	0.	0.	0.	0.	0.	0.	0.	0.
2	1.06635E-02	3.34817E-08	1.0E091E-07	4.38040E-07	3.40698E-06	2.27753E-05	4.48844E-05	8.77187E-05
3	0.	0.	0.	0.	0.	0.	0.	0.
4	1.60779E+00	4.04995E+00	3.64841E+00	3.73776E+00	3.74792E+00	3.74938E+00	3.75748E+00	3.78042E+00
5	1.35925E+00	3.64880E+00	3.60849E+00	3.73768E+00	3.73159E+00	3.65779E+00	3.65347E+00	3.60514E+00
6	0.	2.37404E-01	4.01157E-01	3.99252E-02	8.54719E-05	1.63248E-02	9.15663E-02	1.03818E-01
7	0.	0.	2.71607E-04	0.	0.	0.	0.	9.30095E-14
8	0.	0.	0.	0.	0.	0.	0.	0.

PSN. 9 THRU PSN. 13 SAME AS ABOVE

PSN. GRP. 9

1	0.
2	1.70008E-04
3	0.
4	3.49324E+00
5	3.87307E+00
6	1.75191E-01
7	1.50140E-04
8	2.54998E-24
9	0.

PSN. 10 THRU PSN. 13 SAME AS ABOVE

9 13 0 2 P1 DATA FOR OXYGEN 300K GAS KERNEL

XSDRN ID 127603

THE LIBRARY CONTENTS ARE

NOG	ITL	ICT	ID	TITLE
9	13	0	3	PO DATA FOR URANIUM 235 300X SIGP-3000

XSDRN ID 126103

PSN.	GRP. 1	GRP. 2	GRP. 3	GRP. 4	GRP. 5	GRP. 6	GRP. 7	GRP. 8
1	1.24821E+00	1.17537E+00	1.67534E+00	4.41883E+00	2.13167E+01	2.32975E+01	1.13179E+02	2.47868E+02
2	1.29465E+00	1.31557E+00	2.16250E+00	6.05410E+00	3.22327E+01	2.82217E+01	1.32744E+02	2.92020E+02
3	3.44782E+00	2.95876E+00	4.07667E+00	1.06908E+01	5.15611E+01	5.63523E+01	2.73754E+02	5.99592E+02
4	7.35201E+00	7.46336E+00	1.17357E+01	1.78802E+01	4.43297E+01	4.03297E+01	1.44919E+02	3.04203E+02
5	5.05571E+00	5.68174E+00	9.56259E+00	1.18261E+01	1.20934E+01	1.21080E+01	1.21578E+01	1.21511E+01
6	0.	7.58781E-01	4.65873E-01	1.06189E-02	1.43476E-05	3.62951E-03	8.77541E-06	1.73871E-02
7	0.	0.	2.51399E-01	1.83615E-04	1.44109E-07	0.	0.	0.
8	0.	0.	0.	2.72037E-04	4.52385E-09	2.78447E-11	0.	0.
9	0.	0.	0.	0.	5.64270E-09	1.40227E-12	2.59005E-12	0.
10	0.	0.	0.	0.	0.	1.75241E-11	1.05948E-13	0.
11	0.	0.	0.	0.	0.	0.	1.32402E-12	5.87266E-15
12	0.	0.	0.	0.	0.	0.	0.	7.33901E-14
13	0.	0.	0.	0.	0.	0.	0.	0.

PSN.	GRP. 9
1	5.77969E+02
2	6.75207E+02
3	1.39762E+03
4	6.87445E+02
5	1.22376E+01
6	3.20129E-02
7	1.32214E-33
8	0.

PSN. 9 THRU PSN. 11 SAME AS ABOVE

12	9.54308E-16
13	1.19259E-14

THE LIBRARY CONTENTS ARE

NOG	ITL	ICT	ID	TITLE
9	13	0	1	OXYGEN 300K GAS KERNAL
9	13	0	2	OXYGEN 300K GAS KERNAL
9	13	0	3	URANIUM 235 300K SIGP-3000
7	1	7	7	

-----ACCUMULATED CPU TIME-- 327.108 SEC.

AMPA DRIVER: XSDRNPM COMPLETE

-----ACCUMULATED CPU TIME-- 327.110 SEC.

AMPA DRIVER NEXT MODULE TO BE EXECUTED IS 12 4 1 5 4 32 3

***THE CENTRAL MEMORY REQUESTED IS NOW 61440

ISOTOPE FROM AMPX TAPE

OXYGEN 300K GAS KERNAL

OXYGEN 300K GAS KERNAL

URANIUM 235 300K SIGP-3000

ISOTOPE ADDED TO NEW DTF LIBRARY

1	9	13	OXYGEN 300K GAS K P0 OXYGEN-1
2	9	13	OXYGEN 300K GAS K P1 OXYGEN-1
3	9	13	URANIUM 235 300K S P0 OXYGEN-1

AMPA DRIVER: AID COMPLETE

AMPA COMPLETE

-----ACCUMULATED CPU TIME-- 327.174 SEC.

02/23/77 SCOPE 3.3 - SCM VER326 42 01/11/77

23.17.13.OAYBUIF
 23.17.13.OAYG.T0500,CM246000,MT1,EC400.
 23.17.13. P S PICKARD AREA 5A
 23.17.13.ACCOUNT,5521504538,05424,63702,40422120.
 23.17.13.RI,KUNC.
 23.17.13.ACI(0422120 5424 5215045383702 1)
 23.17.13.*****P F M O T E J O R*****
 23.17.13.ATTACH,TAPE2,URANIUM-235.
 23.17.13.FILE ATTACHED AS CYCLE 01
 23.17.14.ATTACH,TAPE11,TAPE22996.
 23.17.14.FILE ATTACHED AS CYCLE 01
 23.17.14.ATTACH,TAPFB,WALTER-LGO.
 23.17.14.FILE ATTACHED AS CYCLE 01
 23.17.14.ATTACH,TAPFA,XLACS-LGO.
 23.17.15.FILE ATTACHED AS CYCLE 01
 23.17.15.ATTACH,TAPEC,NITAWL-LGO.
 23.17.15.FILE ATTACHED AS CYCLE 01
 23.17.15.ATTACH,TAPEE,XSDRNP-M-LGO.
 23.17.15.FILE ATTACHED AS CYCLE 01
 23.17.15.ATTACH,TAPED,AIU-LGO.
 23.17.16.FILE ATTACHED AS CYCLE 01
 23.17.16.MAP OFF.
 23.17.16.LOAD,TAPEB.
 23.17.20.LOAD,TAPEA.
 23.17.37.LOAD,TAPEC.
 23.17.41.LOAD,TAPED.
 23.17.42.WARNING BLANK COMMON GREATER THAN PREVIO
 23.17.42.US DECL.
 23.17.42.LOAD,TAPEE.
 23.17.52.EXECUTE,SAMPX,LC=50000.
 23.17.54.OVERLAY LOAD SAMPX
 23.17.55.FIELD LGTH 240000 00000013 00000021
 23.29.19.FIELD LGTH 206000 00000440 00000115
 23.30.36.FIELD LGTH 170000 00000446 00000127
 23.31.54.FIELD LGTH 170000 00000507 00000141
 23.31.57.STOP
 23.31.58.CP 327.176 SEC.
 23.31.58.PP 100.538 SEC.
 23.31.58.TU 25.346 SEC.
 23.31.58.RV 11108
 23.31.58.RU .395
 23.31.58.CUST 52.431 DLKS

References

1. N. M. Greene, J. L. Lucius, L. M. Petrie, W. E. Ford, III, J. E. White, R. Q. Wright, AMPX, A Modular Code System for Generating Coupled Neutron-Gamma Libraries from ENDFIB, ORNL/TM-3706 (March 1976).
2. Fortran Extended Reference Manual, Publication No. 60176600, Control Data Corp.
3. Update Reference Manual, Publication No. 60342500, Control Data Corp.

APPENDIX A

Data Bases

Section 1 - List of ENDF/B Isotopes with
Tape ID Numbers

Section 2 - List of ENDF/B Isotopes by
Tape ID Numbers

Section 3 - List of Isotopes Available
from Old XSDRN Data Compilation

ENDF/B NEUTRON CROSS SECTION DATA

Material	ENDF/B Identification	Tape Numbers
H ¹	1269	2648-S/17867
H ¹ - in H ₂ O Thermal	1002	17066
H ¹ - in ZrH Thermal	1097	18834
H ¹ - in Polyethylene	1114	18852
Li ⁶	1271	2468-S/17867
Be ⁹	1289	2468-S/17869
Be ¹⁰	1373	2408-S/17869
Be ⁹ in BeO	1099	18944
C ¹²	1274	22896-S/18977
C ¹² - in Graphite	1065	18852
N ¹⁴	1275	22896-S/18977
O ¹⁶	1276	22896-S/18977
Na ²³	1156	1778-S/18822
Mg ²⁴	1280	4727-S/17943
Al ²⁷	1193	4727-S/17943
Si ²⁸	1194	4727-S/17943
Ca ⁴⁰	1195	1778-S/18822
Cr ⁵²	1191	5602-S/16850
Mn ⁵⁵	1197	1778-S/18822
Fe ⁵⁶	1192	5602-S/16850
Ni ⁵⁹	1190	5602-S/16850
Cu ⁶³	1295	2468-S
Nb ⁷³	1189	1778-S/18822
Mo ⁹⁶	1287	1778-S/18822
Cd ¹¹²	1281	1778-S/18822
Pb ²⁰⁷	1388	22090-S/18977
Pa ²³³	1297	14432-S/17835
U ²³⁵	1261	14432-S/17835
U ²³⁶	1161	-----
U ²³⁸	1262	1778-S/18822
Np ²³⁷	1263	-----
Pu ²³⁸	1050	-----
Pu ²³⁹	1264	14432-S/17835
Pu ²⁴⁰	1265	14432-S/17835
Pu ²⁴¹	1266	14432-S/17835
Pu ²⁴²	1161	-----
Am ²⁴¹	1056	-----
Am ²⁴³	1057	-----
Cm ²⁴⁴	1162	-----

ENDF/B Tape Contents

ENDF/B Tape 1778-S-HI-4 files
Copy 18822-HI-1 file

Material

Na²³ - 1156
file mark
Ca⁴⁰ - 1195
file mark
Nb⁹³ - 1193
Cd¹¹² - 1281
file mark
Mn⁵⁵ - 1197
U²³⁸ - 1262
Mo⁹⁶ - 1287

ENDF/B Tape 2648-S-HI-2 files
Copy 17867-HI-1 file

H¹ - 1269
Li⁶ - 1271
B¹⁰ - 1273
Be⁹ - 1289
file mark
Cu⁶³ - 1295

ENDF/B Tape 4727-S-HI-1 file
Copy 17943-HI-1 file

Al²⁷ - 1193
Si²⁸ - 1194
Mg²⁴ - 1280

ENDF/B Tape 5602-S-HI-1 file
Copy 16850-HI-1 file

Ni⁵⁹ - 1190
Cr⁵² - 1191
Fe⁵⁶ - 1192

ENDF/B Tape 14432-S-HI-1 file
Copy 17835-HI-1 file

U²³⁵ - 1261
Pu²³⁹ - 1264
Pu²⁴⁰ - 1265
Pu²⁴¹ - 1266
Pa²³³ - 1297

ENDF/B Tape 22896-S-HI-1 file
Copy 18977-HI-1 file

C¹² - 1274
N¹⁴ - 1275
O¹⁶ - 1276
Pb²⁰⁷ - 1288

ENDF/B Tape
Copy

U²³⁵ - 1261
U²³⁶ - 1161
U²³⁸ - 1262
Np²³⁷ - 1263
Pu²³⁸ - 1050
Pu²³⁹ - 1264
Pu²⁴⁰ - 1265
Pu²⁴¹ - 1266
Pu²⁴² - 1161
Am²⁴¹ - 1056
Am²⁴³ - 1057
Cm²⁴⁴ - 1162

902320	THORIUM-232-R	TEMP. = 1165.0
902325	THORIUM-232-R	TEMP. = 900.00
902326	THORIUM-232-R	TEMP. = 800.0
902327	THORIUM-232-R	TEMP. = 850.00
902328	THORIUM-232-R	TEMP. = 950.00
902329	THORIUM-232-R	TEMP. = 1000.0
912310	PROTACTINIUM-231	TEMP. = 1165.0
912315	PROTACTINIUM-231	TEMP. = 900.0
912330	PROTACTINIUM-233	TEMP. = 1165.0
912335	PROTACTINIUM-233	TEMP. = 900.0
912339	PROTACTINIUM-233	TEMP. = 1000.0
922320	URANIUM-232	
922330	URANIUM-233	TEMP. = 1165.0
922335	URANIUM-233	TEMP. = 900.0
922336	URANIUM-233	TEMP. = 800.0
922337	URANIUM-233	TEMP. = 850.0
922338	URANIUM-233	TEMP. = 950.0
922339	URANIUM-233	TEMP. = 1000.0
922340	URANIUM-234-R	TEMP. = 1165.0
922345	URANIUM-234-R	TEMP. = 900.0
922349	URANIUM-234	TEMP. = 1000.0
922350	URANIUM-235	TEMP. = 1165.0
922351	URANIUM-235	TEMP. = 294.6
922355	URANIUM-235	TEMP. = 900.0
922359	URANIUM-235	TEMP. = 1000.0
922360	URANIUM-235	TEMP. = 1165.0
922365	URANIUM-236-R	TEMP. = 900.0
922369	URANIUM-236	TEMP. = 1000.0
922380	URANIUM-238-R	TEMP. = 1165.0
922381	URANIUM-238R	TEMP. = 294.6
922385	URANIUM-238-R	TEMP. = 900.0
932370	NEPTUNIUM-237	TEMP. = 1165.0
932375	NEPTUNIUM-237	TEMP. = 900.0
932390	NEPTUNIUM-239	TEMP. = 1165.0
932395	NEPTUNIUM-239	TEMP. = 900.0
942380	PLUTONIUM-238	TEMP. = 1165.0
942385	PLUTONIUM-238	TEMP. = 900.0
942390	PLUTONIUM-239	TEMP. = 1165.0
942395	PLUTONIUM-239	TEMP. = 900.0
942400	PLUTONIUM-240-R	TEMP. = 1165.0
942405	PLUTONIUM-240-R	TEMP. = 900.0
942410	PLUTONIUM-241	TEMP. = 1165.0
942415	PLUTONIUM-241	TEMP. = 900.0
942420	PLUTONIUM-242-R	TEMP. = 1165.0
942425	PLUTONIUM-242-R	TEMP. = 900.0
942392	PLUTONIUM-239	TEMP. = 293
942393	PLUTONIUM-239R	TEMP. = 293
942402	PLUTONIUM-240	TEMP. = 293
942403	PLUTONIUM-240R	TEMP. = 293
942412	PLUTONIUM-241	TEMP. = 293
942422	PLUTONIUM-242	TEMP. = 293
942423	PLUTONIUM-242R	TEMP. = 293
10000	HYDROGEN IN WATER	TEMP. = 344.60
10001	HYDROGEN--THERMOS	TEMP. = 294.6
180201	HYDROGEN IN WATER	TEMP. = 609.00
10020	DEUTERIUM IN D20	TEMP. = 344.69
10021	DEUTERIUM IN D20	TEMP. = 361.39
		TEMP. = 293.6

List of
Isotopes
Available in
OLD XSDRN
FORMAT
(Tape 12276)

30065	LITHIUM-6	TEMP. = 900.000
30066	LITHIUM-6	TEMP. = 800.000
30069	LITHIUM-6	TEMP. = 1000.00
30070	LITHIUM-7	TEMP. = 293.6
30075	LITHIUM-7	TEMP. = 900.0
30076	LITHIUM-7	TEMP. = 800.0
30077	LITHIUM-7	TEMP. = 850.0
30078	LITHIUM-7	TEMP. = 950.0
30079	LITHIUM-7	TEMP. = 1000.0
40000	BERYLLIUM NATURAL	TEMP. = 293.6
40005	BERYLLIUM NATURAL	TEMP. = 900.0
40006	BERYLLIUM NATURAL	TEMP. = 800.0
40007	BERYLLIUM NATURAL	TEMP. = 850.0
40008	BERYLLIUM NATURAL	TEMP. = 950.0
40009	BERYLLIUM NATURAL	TEMP. = 1000.0
50000	BORON	
50100	BORON-10	
60000	CARBON	TEMP. = 675.02
60001	CARBON	TEMP. = 627.13
60002	CARBON	TEMP. = 589.26
60005	CARBON	TEMP. = 900.0
60006	CARBON	TEMP. = 800.0
60007	CARBON	TEMP. = 850.0
60008	CARBON	TEMP. = 950.0
60009	CARBON	TEMP. = 1000
60015	CARBON	TEMP. = 900.0
60016	CARBON	TEMP. = 800.0
60017	CARBON	TEMP. = 850.0
60018	CARBON	TEMP. = 950.0
60019	CARBON	TEMP. = 1000
70003	NITROGEN	TEMP. = 294.6
80000	OXYGEN	TEMP. = 1165.0
80001	OXYGEN	TEMP. = 344.69
80002	OXYGEN	TEMP. = 361.39
80003	OXYGEN	TEMP. = 293.6
80004	OXYGEN	TEMP. = 294.6
80005	OXYGEN	TEMP. = 900.0
90000	FLUORINE	TEMP. = 293.6
90005	FLUORINE	TEMP. = 900.0
90006	FLUORINE	TEMP. = 800.0
90007	FLUORINE	TEMP. = 850.0
90008	FLUORINE	TEMP. = 950.0
90009	FLUORINE	TEMP. = 1000
110000	SODIUM	TEMP. = 293.6
110005	SODIUM	TEMP. = 900.0
120005	MAGNESIUM	TEMP. = 900.0
130000	ALUMINUM	TEMP. = 627.13
130005	ALUMINUM	TEMP. = 900.0
140005	SILICON	TEMP. = 900.0
160005	SULFUR	TEMP. = 900.0
190005	POTASSIUM	TEMP. = 900.0
240000	CHROMIUM	TEMP. = 627.13
240003	CHROMIUM	TEMP. = 294.6
240005	CHROMIUM	TEMP. = 900.0
250005	MANGANESE	TEMP. = 900.0
260000	IRON	TEMP. = 627.13
260001	IRON	TEMP. = 294.6
260005	IRON	TEMP. = 900.0
280000	NICKEL	TEMP. = 627.13
280003	NICKEL	TEMP. = 294.6

280005	NICKEL	TEMP. = 900.0
290001	COPPER	TEMP. = 294.6
290005	COPPER	TEMP. = 900.0
360820	KRYPTON-82	
360830	KRYPTON-83	
400000	ZIRCONIUM	TEMP. = 627.13
400005	ZIRCONIUM	TEMP. = 900.0
410000	NIOBIUM	TEMP. = 627.13
410005	NIOBIUM	TEMP. = 900.0
420000	MOLYBDENUM	TEMP. = 627.13
420005	MOLYBDENUM	TEMP. = 900.0
420950	MOLYBDENUM	
430990	TECHNETIUM-99	
441000	RUTHENIUM-100	
441010	RUTHENIUM-101	
441020	RUTHENIUM-102	
441060	RUTHENIUM-106	
450000	RHODIUM	
451050	RHODIUM-105	
461050	PALLADIUM-105	
461060	PALLADIUM-106	
461070	PALLADIUM-107	
461080	PALLADIUM-108	
471090	SILVER-109	
481130	CADMIUM-113	
481131	CADMIUM-113	TEMP. = 294.6
491150	INDIUM-115	
500000	TIN	TEMP. = 626.54
500005	TIN	TEMP. = 900.0
531290	IODINE-129	
531310	IODINE-131	
541310	XENON-131	
541330	XENON-133	
541350	XENON-135	
541360	XENON-136	
550000	CESIUM	
551340	CESIUM-134	
5511350	CESIUM-135	
571300	LANTHANUM-139	
590000	PRASEODYMIUM	
591430	PRASEODYMIUM-143	
601430	NEODYMIUM-143	
601440	NEODYMIUM-144	
601450	NEODYMIUM-145	
601460	NEODYMIUM-146	
601480	NEODYMIUM-148	
611481	PROMETHIUM-148	
611470	PROMETHIUM-147	
611480	PROMETHIUM-148	
621470	SAMARIUM-147	
621480	SAMARIUM-148	
621490	SAMARIUM-149	
621500	SAMARIUM-150	
621510	SAMARIUM-151	
621520	SAMARIUM-152	
621540	SAMARIUM-154	
631530	EUROPIUM-153	
631540	EUROPIUM-154	
631550	EUROPIUM-155	
641550	GADOLINIUM-155	

641570	GADOLINIUM-157	
751875	RHENIUM-187	TEMP. = 900.0
740000	TUNGSTEN	TEMP. = 293.6
740005	TUNGSTEN	TEMP. = 900.0
791971	GOLD-197	TEMP. = 294.6
4000000	Slowly-Saturating fiss prod	
820000	LEAD	TEMP. = 293.6
820005	LEAD	TEMP. = 900.0
111111	I/V NUCLIDE	
222222	I/V NUCLIDE	
333333	I/V NUCLIDE	
3000000	Non-Saturating fiss prod	

APPENDIX B

Supplemental Programs

Section 1 - AID - SLA Routine to Convert
ANISN Binary Format Data Into
DTF Library Format

Section 2 - JUANITA - ORNL Routine to
Convert Old XSDRN Format Data
to AMPX Master Interface

Section 1 AID - ANISN INTO DTF CONVERTER

A routine has been written to convert the output of XSDRNPM in an ANISN binary format to a format compatible with DTF/TWOTRAN codes in current use at SLA. This routine is part of the AMPX system and is accessed in the same manner as all other AMPX modules. The code functions are in two modes: (1) creation of a new DTF format library from ANISN data, and (2) adding new DTF format data to an existing DTF library. The converter requires two tape or disk files in mode (1) and three tape or disk files in mode (2). The file assignments are:

Tape 30 - Existing DTF format library.

Tape 20 - ANISN format library to be converted to DTF format.

Tape 19 - New DTF library created by AID routine.

Input Instructions (1 card)

Col 1-5-MODE- (I5)	= 0-New library creation. = 1-Add data converted to an existing library.
Col 6-10-NAD- (I5)	= Number of isotopes from ANISN binary library to be converted to DTF format.
Col 21-28-(Title) (10X, 2A4, 2X)	= An eight-character identifier for the DTF library.
Col 31-80-IDZ (10I5)	= ID of the ANISN isotope. (Isotope ID entered here, suppresses the 2 ℓ + 1 factor conversion for that isotope.)

The output file (Tape 30) is generally cataloged as a permanent file for subsequent use with DTF/TWOTRAN. The conversion to a DTF format involves the Legendre 2 ℓ + 1 factor, which is included in the ANISN format but is not included in the DTF format. AID checks title information to perform this correction. It is possible to have two isotopes with the same title record since these records are generated in XLACS and several different resonance calculations can be performed using the XLACS output for this isotope. The 2 ℓ + 1 correction can be suppressed by entering the effected isotopes in the IDZ array. Although this situation will occur only infrequently, it allows several sets of resonance calculations for the same isotopes to be used in a given cross-section set.

Section 2 JUANITA - Old XSDRN Data Converter

JUANITA is a program used to convert master cross-section libraries from BCD-to-Binary or Binary-to-BCD. This version of JUANITA has only been used to convert the 123 group XSDRN BCD library described above as Tape 12276. This library is written in packed BCD format, and JUANITA is used to unpack the tape and then write selected nuclides onto logical unit 1 in unpacked binary format. This unpacked library is then used as input into module CONVERT to convert to an AMPX interface library. Figure B-1 shows a sample data deck for executing JUANITA and CONVERT. Note that JUANITA is not a module in the AMPX system, but rather is included as a separate program in the AMPX-UPDATE file that must be compiled separately.

JUANITA generally requires the following I/O devices to be made available:

Logical Number	Purpose
1	Output Binary Library
2	Scratch
3	Packed BCD Tape
5	Card Input
6	Standard Output

The following input data are required:

Card 1 - Format (I12)

ICTL - For BCD-to-Binary: A positive integer whose value is the number of nuclides to be converted + 1.

Card 2 - Format (I12)

(ID (I), I = 1, ICTL-1) - The XSDRN identification numbers of the nuclides to be converted.

Although JUANITA can be used to make a BCD library from a binary library, it has not been used for that purpose at SLA. The module AIM, not currently in the system, is for that express purpose.

```

----- 6/7/8/9 MULT. PUNCH IN COLUMN NO. 1 -----
922351 922381 260001
4
*COMPILE, JUANITA
6
CATALOG, TAPE1, JUANITA*HENKEN, CY-1, CN-AMP.
LGO.
COLLECT, LGO, FTNLIB.
FTN(I=COMPILE).
UPDATE(P=MASTER).
ATTACH, MASTER, AMPX-UPDATE.
REWIND, TAPE1, TAPE3.
REQUEST, TAPE1, *PF.
REQUEST, TAPE3, HY.S. VSN=SLA-20
ADV, T1000, CM125000, HT1. VANDEVENDER AREA SA ORH 5231

```

Figure B-1. Sample Input for Conversion of OLD XSDRN Data Format

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