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DASA-1800-V

DEPARTMENT OF DEFENSE LAND FALLOUT PREDICTION SYSTEM

Volume V
PARTICLE ACTIVITY

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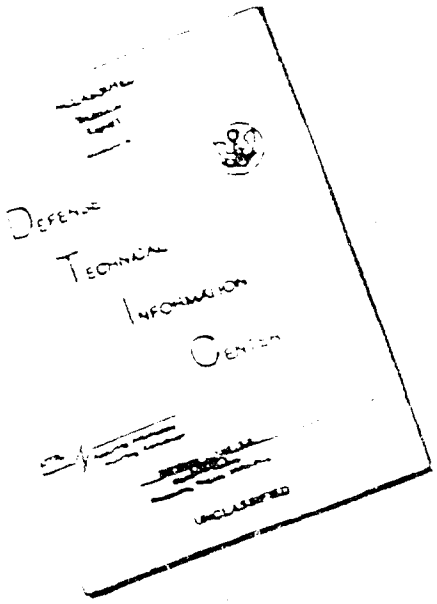

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NDL-TR-102

DEPARTMENT OF DEFENSE
LAND FALLOUT PREDICTION SYSTEM

Volume V - Particle Activity

Robert C. Tompkins

February 1968

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ABSTRACT

This volume of the DELFIC (Defense Land Fallout Interpretive Code) documentation describes the Particle Activity Module. This module computes the distribution of fission-product and induced activities as a function of fallout particle size. Fractionation is accounted for by a modified radial-distribution model. Radioactive decay is computed from the Bateman equation.

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DEPARTMENT OF DEFENSE
LAND FALLOUT PREDICTION SYSTEM

1. INTRODUCTION

The Particle Activity Module (PAM) assigns radioactivity to the fallout particles. Three sources of radioactivity are considered in DELFIC, (1) fission products, (2) products of the n,γ reaction on ^{238}U in the device, and (3) neutron-induced activity in the soil swept up by the fireball. The fallout radioactivity for a particular detonation is assumed to be a function only of particle size and of time after detonation.

The distribution of activity with particle size is generated by a modified version of Freiling's radial-distribution model (References 1 and 2). Consequently, the PAM takes into account radiochemical fractionation and can output the activity of individual mass chains.

The PAM computes the decay of each individual nuclide from the time of detonation to the time requested by the user by means of the Bateman equation. Thereby DELFIC circumvents the problem of selecting an exponent for the power-law approximation to the decay of mixed fission products, and can convert the activities to exposure rates or exposures on the basis of the decay schemes of the nuclides.

The computer program was written in FORTRAN IV for the IBM 7090/94. Its use on a computer having words of fewer than 36 bits will require drastic and intricate modifications.

2. PHYSICAL AND MATHEMATICAL MODELS

The following outline of the approach taken in the PAM will be confined to the computation of exposure rate. The extension to accumulated exposure should be self-evident.

The user requests (cf. Vol VI, Output Processor) the exposure rate at a specified time after detonation. The PAM computes by means of a fractionation model the distribution of the contributing nuclides with particle size. The decay of each activity from detonation to the requested time

is rigorously computed. Each activity is multiplied by a unique conversion factor (exposure-rate-multiplier, ERM) to obtain exposure rate. The ERM's were computed from the gamma energy spectra of the corresponding nuclides.

The normalization factor (K-factor, magic number) used in many fallout models does not appear in DELFIC. However, normalization factors can be readily derived from DELFIC output as described in Section 4.2.

2.1 Nuclide Abundances.

2.1.1 Fission Products. The fission products can be grouped into a number of decay chains:

$$N_1 \rightarrow N_2 \rightarrow N_3 \rightarrow \cdots \rightarrow N_n \quad .$$

One or more members (including, of course, N_1) may be produced directly by the fission event, and each member except N_n decays as $e^{-\lambda_1 t}$, while each member except N_1 grows by $e^{\lambda_{i-1} t}$. The complete growth and decay history for each member of a chain is represented by the Bateman equation (Reference 3):

$$N_n(t) = \sum_{i=1}^{n} \sum_{k=1}^{n} {}_nC_{ki} \, N_i^o \, e^{-\lambda_k t} \quad , \qquad (2.1)$$

where

$N_n(t)$ = atoms of the nth member of the chain at time t,

N_i^o = atoms of the ith number of the chain ($i \leq n$) at time 0,

and λ_k = disintegration constant of the kth member of the chain ($k \leq n$).

$${}_nC_{ki} = \left(\prod_{j=i}^{n-1} \lambda_j \right) \Bigg/ \left(\prod_{\substack{j=i \\ j \neq k}}^{n} \left(\lambda_j - \lambda_k \right) \right) \quad . \qquad (2.2)$$

The activity in disintegrations per second is given by

$$A_n(t) = \lambda_n N_n(t) \quad . \qquad (2.3)$$

The number of disintegrations that occur between times t_1 and t_2 is given by

$$D_n(t_1, t_2) = \lambda_n \sum_{i=1}^{n} \sum_{k=1}^{n} {}_nC_{ki} N_i^o \left(e^{-\lambda_k t_1} - e^{-\lambda_k t_2}\right) \Big/ \lambda_k \ , \qquad (2.4)$$

which is obtained by integration of Equations 2.1 and 2.3. The Bateman equation develops a singularity whenever $\lambda_k = \lambda_{k-1}$. This difficulty is circumvented in DELFIC by slightly incrementing one member of such a pair.

2.1.2 Induced Activity in Soil. The model for the contribution of induced activity in the cloudborne soil was developed by Jones (Reference 4). Three basic assumptions are made:

(1) All neutrons entering the soil are thermalized and then captured.

(2) Only those neutrons need be considered that are seen by the apparent crater.

(3) All significant soil components are refractory in the fractionation scheme.

A detailed description is given in Reference 4. A data deck is currently available only for Nevada Test Site soil.

2.1.3 Induced Activity in Device Materials. The PAM currently accounts for induced activity in only one device component, ^{238}U. Neutron capture by ^{238}U produces ^{239}U, which decays to ^{239}Np and then ^{239}Pu. The following equations are used:

1. Activity of ^{239}U, dis s^{-1}.

$$A_1 = \lambda_1 N_1^o e^{-\lambda_1 t} \quad , \qquad (2.5)$$

where

N_1^o = number of neutron captures,

λ_1 = disintegration constant of ^{239}U, s^{-1},

and t = time, s.

2. Activity of ^{239}Np, dis s^{-1},

$$A_2 = \frac{\lambda_1 \lambda_2 N_1^o}{\lambda_2 - \lambda_1} \left(e^{\lambda_1 t} - e^{-\lambda_2 t} \right) \quad , \qquad (2.6)$$

where

λ_2 = disintegration constant of ^{239}Np, s^{-1}.

3. Disintegrations of ^{239}U occurring between t_1 and t_2,

$$\Delta A_1 \Big|_{t_1}^{t_2} = N_1^o \left(e^{-\lambda_1 t_1} - e^{-\lambda_1 t_2} \right) \quad . \qquad (2.7)$$

4. Disintegrations of ^{239}Np occurring between t_1 and t_2,

$$\Delta A_2 \Big|_{t_1}^{t_2} = \frac{N_1^o}{\lambda_2 - \lambda_1} \left[\lambda_2 \left(e^{-\lambda_1 t_1} - e^{-\lambda_1 t_2} \right) - \lambda_1 \left(e^{-\lambda_2 t_1} - e^{-\lambda_2 t_2} \right) \right] . \qquad (2.8)$$

5. Disintegrations of ^{239}U from t_1 to infinity,

$$\Delta A_1 \Big|_{t_1}^{\infty} = N_1^o \, e^{-\lambda_1 t_1} \quad . \qquad (2.9)$$

6. Disintegrations of ^{239}Np from t_1 to infinity,

$$\Delta A_2 \Big|_{t_1}^{\infty} = \frac{N_1^o}{\lambda_2 - \lambda_1} \left(\lambda_2 e^{-\lambda_1 t_1} - \lambda_1 e^{-\lambda_2 t_1} \right) \quad . \qquad (2.10)$$

This mass chain is considered completely refractory in the fractionation scheme.

2.2 Activity Versus Particle Size.

The radial-distribution model of Freiling (Reference 1) categorizes a nuclide as volatile if its boiling point is less than the solidification temperature of the soil particles. The nuclide is refractory if its boiling point is greater than the solidification temperature. Freiling then assumes that a volatile nuclide will condense on the particle surfaces, whereas a refractory nuclide will condense uniformly throughout the particle. A fission-product mass chain, whose composition changes with time, can then be characterized by the fraction of its membership that represents refractory nuclides at the time the cloud cools to the soil-solidification temperature. This Freiling ratio is referred to as F_R. Freiling has postulated, on an empirical basis, that the specific activity of fallout particles is proportional to the (b_i-1) power of the particle size, where b_i is $\sqrt{F_R}$ for mass chain i.

Freiling (Reference 2) has treated the relationship of the model to the log-normal distribution of particle sizes. In DELFIC, however, it was desirable to generalize the model for arbitrary particle-size distributions in tabular form. The approach can be formulated as follows:

Let

d_k = geometric mean diameter of kth particle-size class,

N_k = number of particles in class k,

F_T = total number of equivalent fissions in all size classes,

Y_i = fission yield of ith mass chain,

and r = index for perfectly refactory mass chain.

The equivalent fissions of mass chain i in size class k is

$$F_i\left(d_k\right) = F_T\, Y_i\, f_i\left(d_k\right) \quad , \tag{2.11}$$

where

$$f_i\left(d_k\right) = N_k\, d_k^{b_i + 2} \Big/ \sum_{k=1}^{n} N_k\, d_k^{b_i + 2} \tag{2.12}$$

For the perfectly refractory chain ($b_i = 1$), Equation 2.11 takes the form

$$F_r\left(d_k\right) = F_T\, Y_r\, f_M\left(d_k\right) \quad , \tag{2.13}$$

where

$$f_M\left(d_k\right) = N_k\, d_k^3 \Big/ \sum_{k=1}^{n} N_k\, d_k^3 \quad , \tag{2.14}$$

i.e., the mass fraction in the kth size class.

The fractionation ratio is given by

$$\left(r_{i,r}\right)_k = \frac{Y_i}{Y_r} \cdot \frac{f_i\left(d_k\right)}{f_M\left(d_k\right)} \quad , \qquad (2.15)$$

or

$$\left(r_{i,r}\right)_k = \frac{Y_i}{Y_r} \cdot \frac{d_k^{b_i - 1} \sum_{k=1}^{n} N_k\, d_k^3}{\sum_{k=1}^{n} N_k\, d_k^{b_i + 2}} \quad . \qquad (2.16)$$

To obtain an algorithm that takes advantage of the fact that particle size distribution consists of a table of $f_M\left(d_k\right)$ versus d_k, we note that

$$\sum_{k=1}^{n} N_k\, d_k^{b_i + 2} \Big/ \sum_{k=1}^{n} N_k\, d_k^3 = \sum_{k=1}^{n} \left(f_M\left(d_k\right) d_k^{b_i} - 1\right). \qquad (2.17)$$

Taking

$$E_i = 1 \Big/ \sum_{k=1}^{n} \left(f_M\left(d_k\right) \cdot d_k^{b_i} - 1\right) \quad , \qquad (2.18)$$

we can rewrite Equation 2.16

$$\left(r_{i,r}\right)_k = \frac{Y_i}{Y_r}\, d_k^{b_i - 1}\, E_i \quad . \qquad (2.19)$$

It follows from Equations 2.11, 2.15, and 2.19 that

$$F_i \left(d_k\right) = F_T Y_i E_i d_k^{b_i - 1} f_M \left(d_k\right) . \qquad (2.20)$$

In this form of the radial distribution model, the specific activity for any mass chain that is not perfectly refractory decreases monotonically with increasing particle size. Observations of fallout, on the other hand, provide strong evidence that the specific activity tends to level off at about 100 to 200 μ. To account for this effect, the model was modified in the following manner:

The approach assumes a two-component system. One component obeys the radial distribution model. The other has a constant specific activity over the particle size distribution.

Let

R_i = fraction of fissions in ith mass chain that obeys radial distribution, and

S_i = fraction of fissions in ith mass chain that appears with constant specific activity.

Then Equation 2.20 is replaced by

$$F_i \left(d_k\right) = F_T Y_i \left(R_i E_i d_k^{b_i - 1} + S_i\right) f_M \left(d_k\right) . \qquad (2.21)$$

Figure 2.1, an idealized plot from fallout observations, shows the two components.

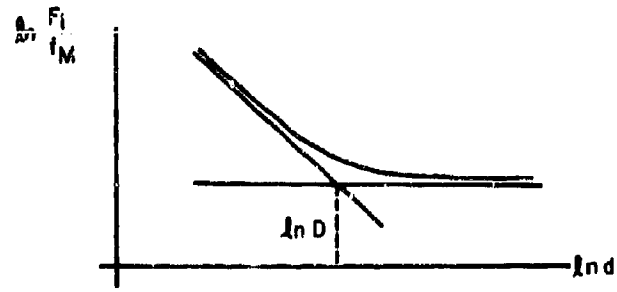


Figure 2.1 Relationship of equivalent fissions to particle size.

The crossing point sets the criterion

$$R_i E_i D^{b_i - 1} = S_i \quad , \tag{2.22}$$

since

$$R_i + S_i = 1 \quad , \tag{2.23}$$

$$R_i \left(1 + E_i D^{b_i - 1}\right) = 1 \quad , \tag{2.24}$$

then

$$R_i = \frac{1}{1 + E_i D^{b_i - 1}} \quad , \tag{2.25}$$

and

$$S_i = \frac{E_i D^{b_i} - 1}{1 + E_i D^{b_i} - 1} \quad . \qquad (2.26)$$

Finally

$$F_i\left(d_k\right) = \frac{F_T Y_i E_i}{1 + E_i D^{b_i} - 1} \left(d_k^{b_i} - 1 + D^{b_i} - 1\right) f_M\left(d_k\right) . \quad (2.27)$$

On the basis of fallout observations, D has been taken as 100 μ.

3. COMPUTER PROGRAM DESCRIPTION

The Particle-Activity Module consists of 14 subroutines organized as shown in Figure 3.1. The activity-versus-particle-size tables generated by the PAM are requested by the Output Processor for specific times. There may be any number of such requests. Consequently, the PAM has been divided into two phases. Phase I reads the input data and preprocesses them to the extent that requested time does not influence the computation. Phase I is exercised only once for a particular detonation. Phase II is exercised as often as required to prepare the tables of activity versus particle size for requested times.

Phase I consists of

PAM1	XPRM
SETUP	INDCD1
YIELD	FRATIØ

Phase II consists of

PAM2	INDCD2
GXPSR	MCHDEP
URAN	

BATMAN is required in both Phase I and Phase II. TIMSEC and UNPACK are small utility routines. Table 3.1 shows the blocks of labeled COMMON.

The individual subroutines are described more fully in the following sections.

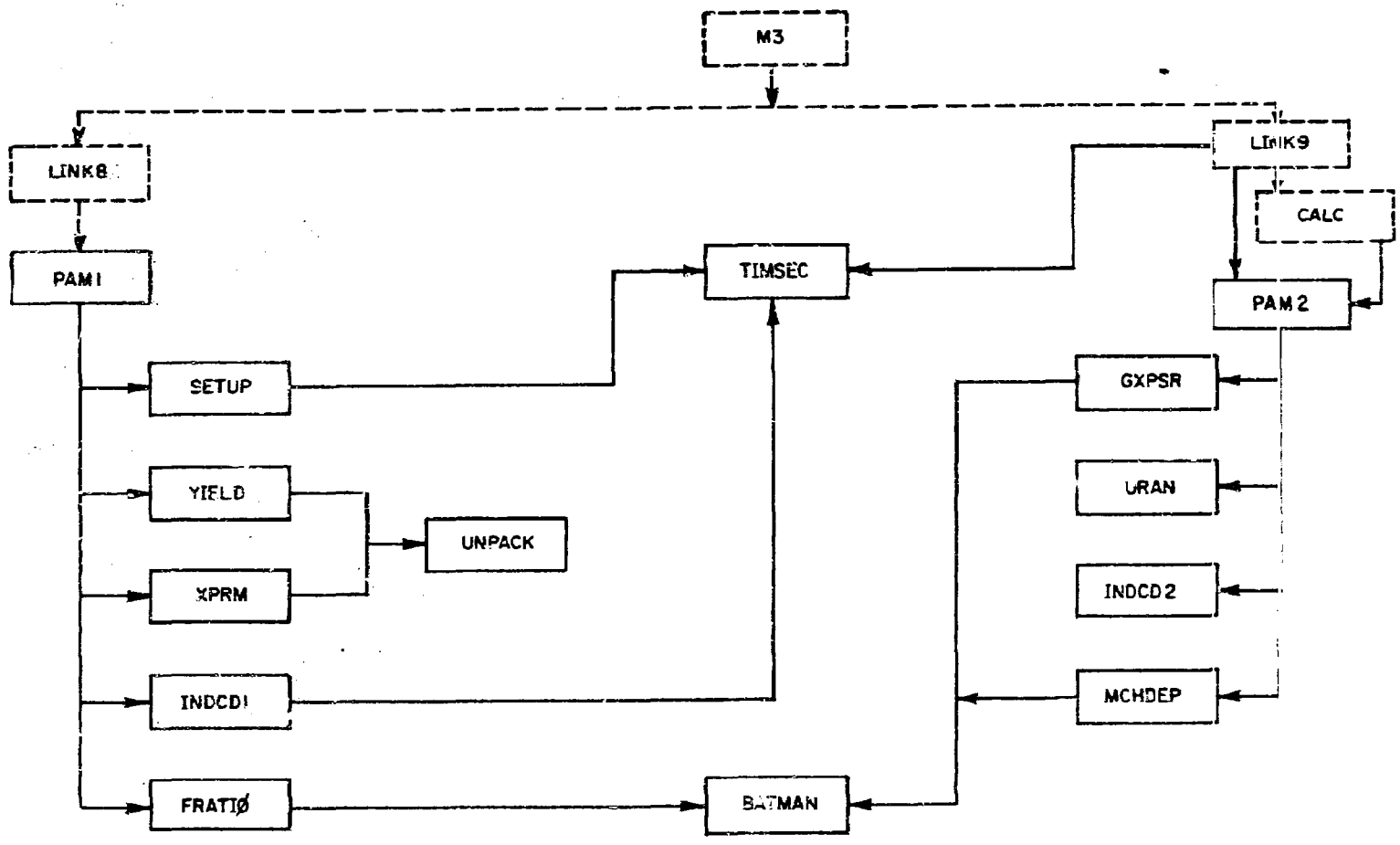


Figure 3.1 Organizational chart of particle-activity module.

TABLE 3.1

CØMMØN BLØCKS

Total Storage 12041_8, 5153_{10}

/FISHIN/1155_8,621_{10}

ABEGN(700)
ABUNDØ(700)
BRANCH(130)
CAPFIS
DCØN(700)
IBRA
INUC
MAXNUC
MULT(11)
NUCLID(700)

/DECAY/6_8,6_{10}

TENTER
JD
KDØS
TENTER
TEXIT
TIME

/OUTPUT/316_8,206_{10}

FISNUM
FP(200)
FW
ITAB
JGØ
MASCHN
SIGMAS

/UTILITY/616_8,398_{10}

KØUT
NPRNT(15)

/INDUCE/616_8,398_{10}

ALBFØM
FAC(7,18)
FØGRNY(7,18)
ISØ(18)
IMAX
XLAM(7,18)

/FRYLING/1047_8,551_{10}

BSUBK(90)
ERM(185)
JRM(185)
KRM
ECF(90)

/SET3/7251_8,3753_{10} (PAM uses only FMASS and PSIZE)

BZ
BZ2
BZZ
BZ22
DELTAX
DGX
DGY
DIFCØN
DIFADJ
FMAS(500)
FMASS(200)
IC(18)
ICØN
ICTR
IH
IØT(18)
IP
IPØUT
ITT(18)
IV
JC(18)
JIN
JØUT
JPØUT
KTR(500)
KTAPE
LAST
MAPRUN
MARRAY
MIN
MXREQ
MYDUMY
NA
NBZX
NBZX2
NBZY
NCL
NE
NF
NIJ
NMAP
NMAX
NØX
NP(21)
NREQ
NS
NTAPES
NTAPET
NTASK
NXMAP
NYMAP
YMIN
PS(500)
PSIZE(200)
PACT(200)
RØPART
T(500)
T1
T2
TLIMIT
X(500)
XF
XØ
XMAX
XMIN
XNMAP
X1
X2
X3
X4
Y(500)
YF
YO
YMAX

3.1 Executive Control.

3.1.1 Subroutine PAM1 (HOB, SIDTMP, TMSD, TW, ISIN, ISOUT, IPOUT, SIGMA).

Inputs:

Argument list	Input tape
HOB	CAPFIS
IPØUT	EMITN
ISIN	FISSID
ISØUT	IFTAPE(10)
SIGMA	NPRNT(15)
SIDTMP	PAMID(12)
TMSD	
TW	

Storage requirement (exclusive of CØMMØN)

1550_8, 872_{10}

Calling program: LINK8, Sequence 312

Subroutines called: SETUP, YIELD, XPRM, INDCD1, FRATIØ

Flowchart: Figure 3.2

Subroutine PAM1, the executive program for Phase I, reads control parameters and input data specific to the run. It also sets file assignments for the invariant data and manages the restart feature. Finally, it calls the worker subroutines of Phase I.

The PAM uses five mnemonics for I/Ø files. KØUT is the system output tape. ISIN is the system input tape. IPAM is the PAM restart tape. The invariant data set (transition cards, fission-yield tables, and exposure-rate multipliers) is read from INTP; the quasi-invariant data set (soil composition) is read from KRD. KØUT is identified with ISØUT, the mnemonic used in the Output Processor. IPAM is identified with IPØUT, the binary output tape from the Transport Module (cf. Vol IV). INTP and KRD are initially identified with ISIN.

PAM1 first reads a run identifier, PAMID(12), and two control arrays, IFTAPE(10) for file manipulation and NPRNT(15) for printout options. If IFTAPE(4) = T, the program branches to read restart data from IPAM, print the title page, and return to LINK8. Otherwise PAM1 reads CAPFIS, EMITN, and FISSID: prints the title page; checks IFTAPE(1) for the correct assignment of INTP; checks IFTAPE(2) for the assignment of KRD.

The worker subroutines are then called sequentially. If EMITN has been set ≤0.0 to suppress the induced activity calculation, IMAX is set to 0 as a flag for Phase II. If IFTAPE(3) = T, restart information is written on IPAM (binary) before the return to LINK8.

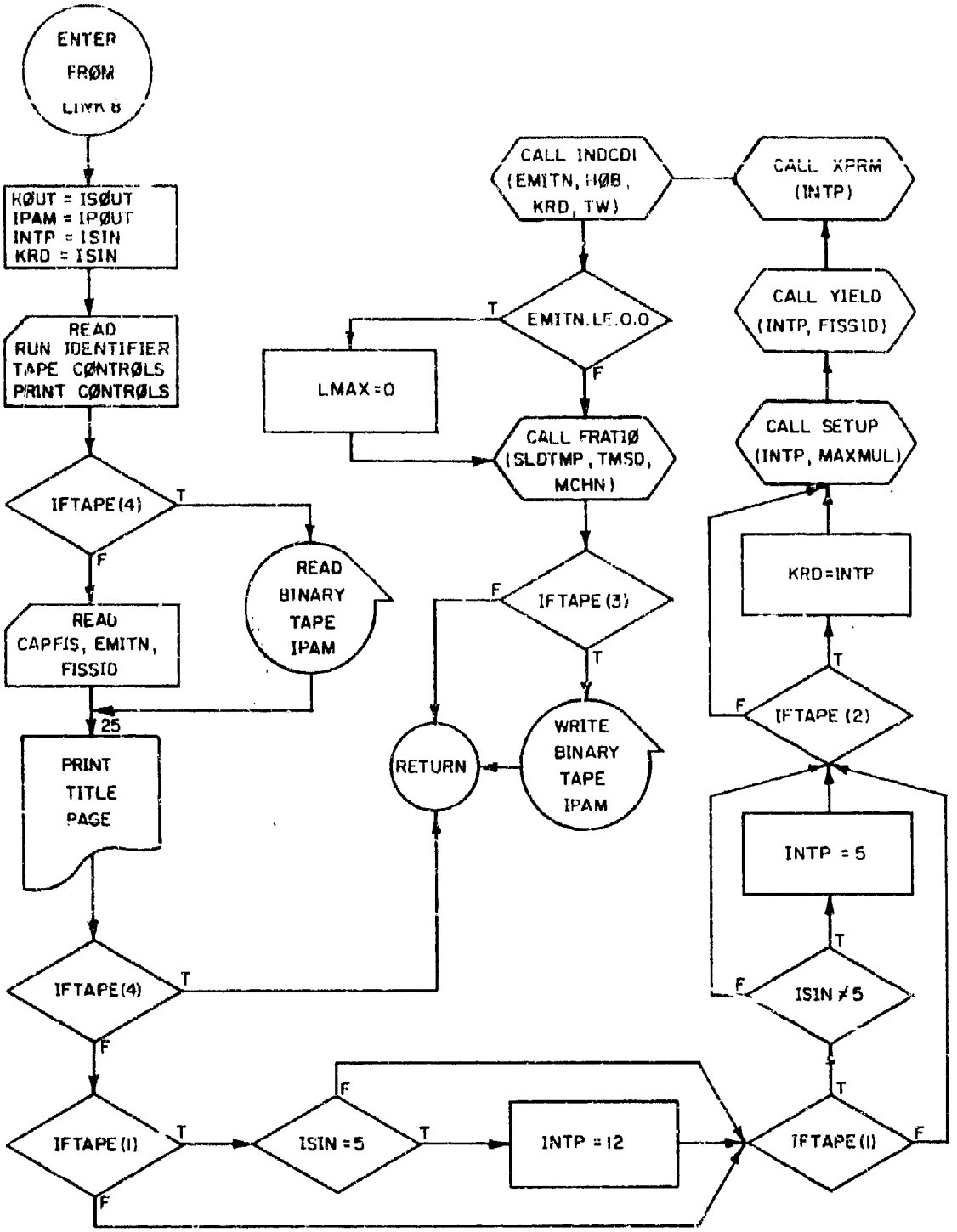


Figure 3.2 Detailed flowchart for Subroutine PAM1.

3.1.2 Subroutine PAM2.

Input:

CØMMØN/ØUTPUT/	CØMMØN/UTILITY/	CØMMØN/FISHIN/	CØMMØN/INDUCE/
FP(200)	KØUT	CAPFIS	LMAX
ITAB	NPRNT(15)		
JGO			

Output:

CØMMØN/ØUTPUT/

FP(200)

Storage requirement (exclusive of CØMMØN): 153_8, 107_{10}

Calling programs: LINK9, Sequence 189

CALC, Sequence 89

Subroutines called: GXPSR, URAN, INDCD2, MCHDEP

Flowchart: Figure 3.3

This subroutine is the executive program for PAM Phase II. The user should note that provision has been made for an additional output option, JGØ = 3, to compute induced activity only. This option is not implemented in the present Output Processor. PAM2 initializes the FP array so that the worker subroutines can accumulate the contributions from different kinds of activity.

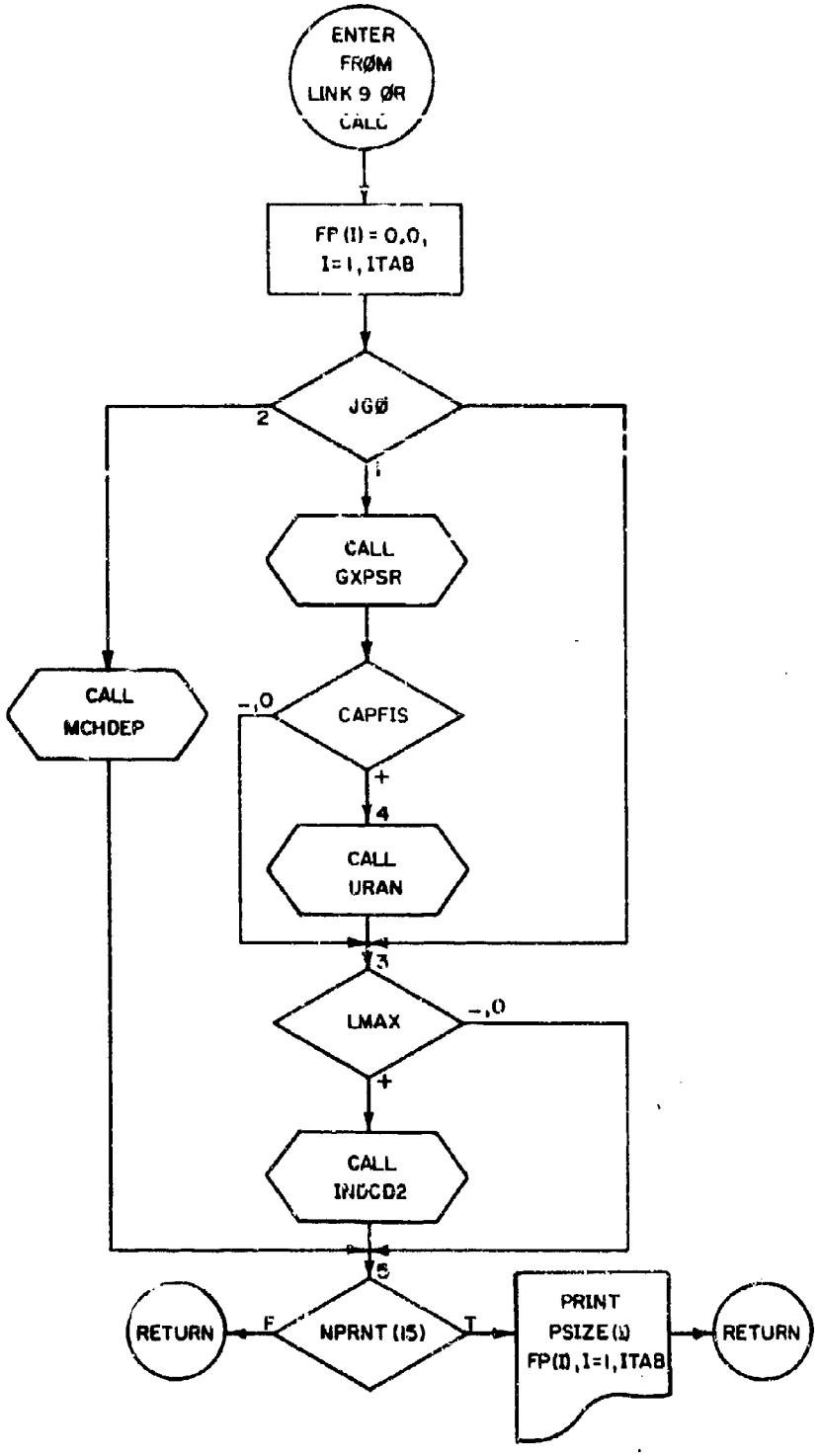


Figure 3.3 Detailed flowchart for Subroutine PAM2.

3.2 Fission Product Abundances.

3.2.1 Approach. Computation with the Bateman equation requires the following inputs:

1. Subchain lists
2. Disintegration constants
3. Branching ratios
4. Fission yields

Overall program efficiency dictated a compromise between rapid access to this information and conservation of core storage. The approach taken was based upon the principles of the packed word and the stacked array, with maximum preprocessing during Phase I of the PAM.

Figure 3.4 shows a typical example of branching in a mass chain (mass 115). The numbers in the circles are atomic numbers, numbers along the arrows are branching ratios, and the asterisks represent isomeric states.

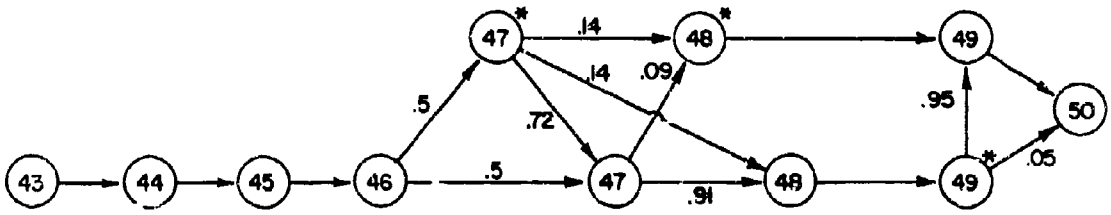
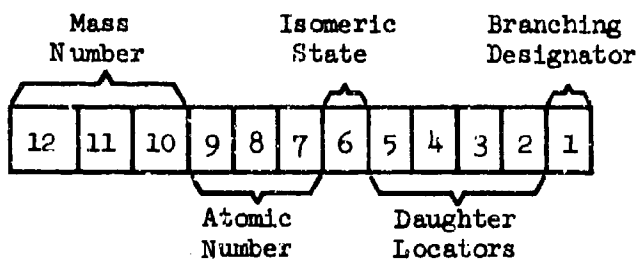


Figure 3.4 Example of complex mass chain (mass 115).

Each of the nine possible paths from 43 to 50 constitutes a subchain. PAM Phase I catalogs the subchains, branching ratios, and disintegration constants. The master table of fission products is the array NUCLID(700). Each entry contains in packed form the identification of the nuclide, a pointer to its daughter (similar to self-relative addressing in an assembly program), and a counter for scanning the branching ratio table, BRANCH(130), which is stacked. The disintegration constants are listed in the simple array DCØN(700), parallel to NUCLID.

A word in NUCLID is subdivided into 12 bytes of 3 bits each; i.e., a byte represents one octal digit. These may be numbered so:



The mass number is placed in bytes 10-12, the atomic number in 7-9, and the isomeric state indicator in byte 6. A fission product may have branching decay to at most 3 daughters. Each of bytes 3-5 references one of the daughters by the appropriate increment to the array index. (If the array is properly ordered, this increment cannot exceed 7.) At most one of these increments can be negative, whereupon byte 2 contains the appropriate byte number. The array BRANCH is stacked so that it contains entries only where there is more than one daughter. When NUCLID and BRANCH are scanned together, byte 1 provides (indirectly) the information for indexing BRANCH. Specifically, the index is incremented by 4-n, where n is the contents of byte 1. The beginning of each subchain is flagged with a minus sign.

Precautions must be taken to prevent redundancy on members of a subchain having more than one arrow entering or leaving (see Figure 3.4). Two steps are taken. Each fission yield [array YIELD(700) parallel to NUCLID] is divided in Phase I by the number of entering arrows. During the decoding process in Phase II, the leaving arrows are accounted for by

accumulating the branching ratios from right to left in each subchain.

The packed words in array NUCLID require a minimum of 36 bits. However, the program operates separately on two groups of 21 and 15 bits, respectively. Consequently, the program can be run on a machine having a word length as short as 21 bits by splitting NUCLID into two parallel arrays and suitably modifying the program. Adjustments may be necessary elsewhere in the program to release the additional 700 words of core memory required.

3.2.2 Subroutine SETUP (INTP, MAXMUL).

Inputs:

Argument list	Input tape	CØMMØN/UTILITY
INTP	BRAT	KØUT
	DATNØ	NPRNT(15)
	DISØM	
	DMASS	
	HLIFE	
	IXEP	
	IUNIT	
	PATNØ	
	PISØM	
	PMASS	

Outputs:

Argument list	CØMMØN/FISHIN/
MAXMUL	BRANCH(130)
	DCØN(700)
	IBRA
	INUC
	MAXNUC
	MULT(11)
	NUCLID(700)

Storage requirement (exclusive of CØMMØN): 1352_{10}, 2510_8

Calling program: Subroutine PAM1, statement 50

Subroutines called: TIMSEC (DEIFIC function)

DUMP (System subroutine)

Flowchart: Figures 3.5a through 3.5h

This subroutine reads data on the nuclear transitions of the fission products and edits them into the arrays BRANCH, DCØN, and NUCLID described in Section 3.2.1. The sequence of input records is inconsequential.

The program begins with a series of initializations. Noteworthy among these is the array MULT(11), which is set up so that MULT(I) = 8**I.

Statement 10 is the return point for successive reading of transition cards. Before each card is read a check is made to ensure that the dimensions of the principal arrays will not be exceeded. After each card is read, the contents are checked for validity. Bad cards are printed out and rejected. PMASS = 0 signals the end of the transition deck and causes a transfer to Statement 200 for a second pass through the stored data.

At Statement 14 the half-life is converted to a disintegration constant in s^{-1}. Then a note is made if the transition involves branching. The parent and daughter are compared to ascertain the type of transition, which is coded into KTYP.

At Statement 22 PMASS and PATNO are packed into bytes 2-6 of NAMPAR. The next block of coding determines what position the new nuclide should occupy in the master table of fission products, NUCLID(700). The first nuclide is immediately shunted to the general scheme for adding an entry to the bottom of the table.

NUCLID is to be ordered by (1) increasing mass number, (2) increasing atomic number, (3) decreasing isomer number. In the first sort loop (110) NAMPAR is compared with the most significant bytes of each entry in NUCLID. If a point is found where the new nuclide should be inserted, a transfer is made out of the loop to Statement 121 or 131. Normal exit from the loop (to Statement 111) indicates that the new nuclide is to be added at the bottom of the table.

At Statement 111 the contents of NAMPAR are transferred to bytes 7-12 of the next cell of NUCLID; PISØM and KTYP are stored in bytes 6 and 5, respectively; the branching designator (byte 1) is initialized at 4; and the sign bit is set negative. The disintegration constant is compiled into the parallel table, DCON(200). If there is no branching, control is immediately returned to Statement 10 to read another card. If there is branching, there is first a detour to Statement 112.

At Statement 112, BRAT is compiled into the stacked array BRANCH(130). The branching designator (byte 1 of NUCLID) is decremented by 1. This branching designator is used to maintain correspondence between NUCLID and BRANCH, which are not parallel. During passes through NUCLID there appear statements of the general form,

KBR = KBR + 4 - MOD (NUC,MULT(1)),

to effect this bookkeeping.

If the new nuclide is found on the basis of mass number and atomic number alone to fall between two entries in NUCLID, control is transferred from loop 110 immediately to Statement 131. NUCLID and DCON are opened for the insertion in a straightforward manner, and the cell of NUCLID is packed as at Statement 112. Again the paths diverge on the existence of branching. In the event of branching it may be necessary to make an insertion in BRANCH.

If the new nuclide has the same mass number and atomic number as an old entry, the transfer from loop 110 is to Statement 121 for a closer look. Isomeric states are now compared in the neighborhood of the exit point from loop 110. If an identical entry is not found, the point of insertion is determined and control is transferred to Statement 131. If an identical entry exists, the new nuclide is not really new but represents another branch in the decay scheme. Transfer is then to Statement 141. Note: The five statements following 121 comprise the most intricate coding in this subroutine.

At Statement 141, checks are made for duplication and for agreement of the disintegration constants. If all is well, the new KTYP is inserted in the highest order available byte, the branching designator is decremented, and BRAT is compiled into BRANCH.

After all the cards have been read, further processing begins at Statement 200. Except for initialization, this segment of the program consists of loop 250 through the nuclide table, now properly ordered. For each entry we examine each decay branch (if any) in turn. The disintegration constants of each parent-daughter pair are compared. If they are equal, one of them is incremented by 10^{-15} to avoid a singularity in the Bateman equation. The type of decay is decoded from KTYP,

and the packed name of the daughter is computed. A search is then made in NUCLID for the daughter. When a daughter is found, its sign is set positive. (Thus at the end a negative value of NUCLID indicates the beginning of a subchain). KTYP is replaced in its byte by the absolute value of the difference between the parent and daughter indices. If this difference is negative, the byte number is inserted as the value of byte 2.

The following restrictions are placed upon the data set input to this program:

1. There must be no more than three decay branches.

2. In a properly ordered table the absolute difference between parent and daughter indices must not exceed 7.

3. There must be no more than one branch per nuclide yielding a daughter lying above the parent in the table.

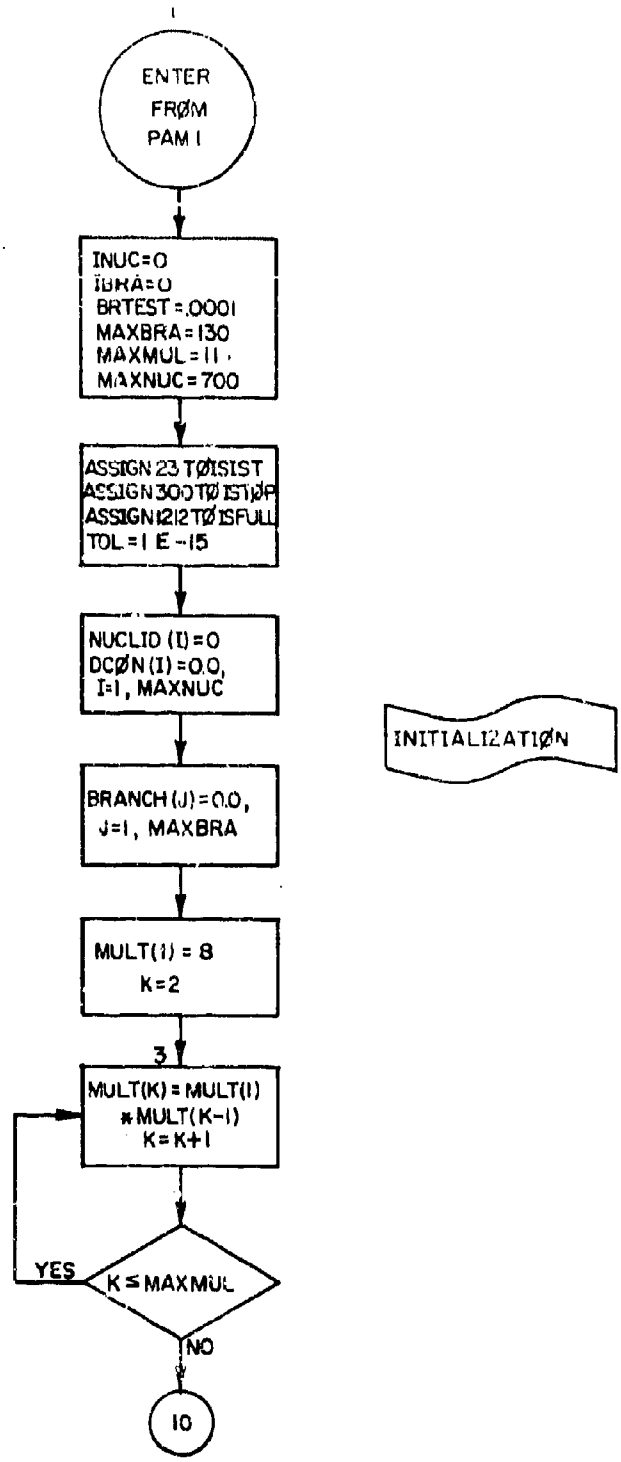


Figure 3.5a Detailed flowchart for Subroutine SETUP.

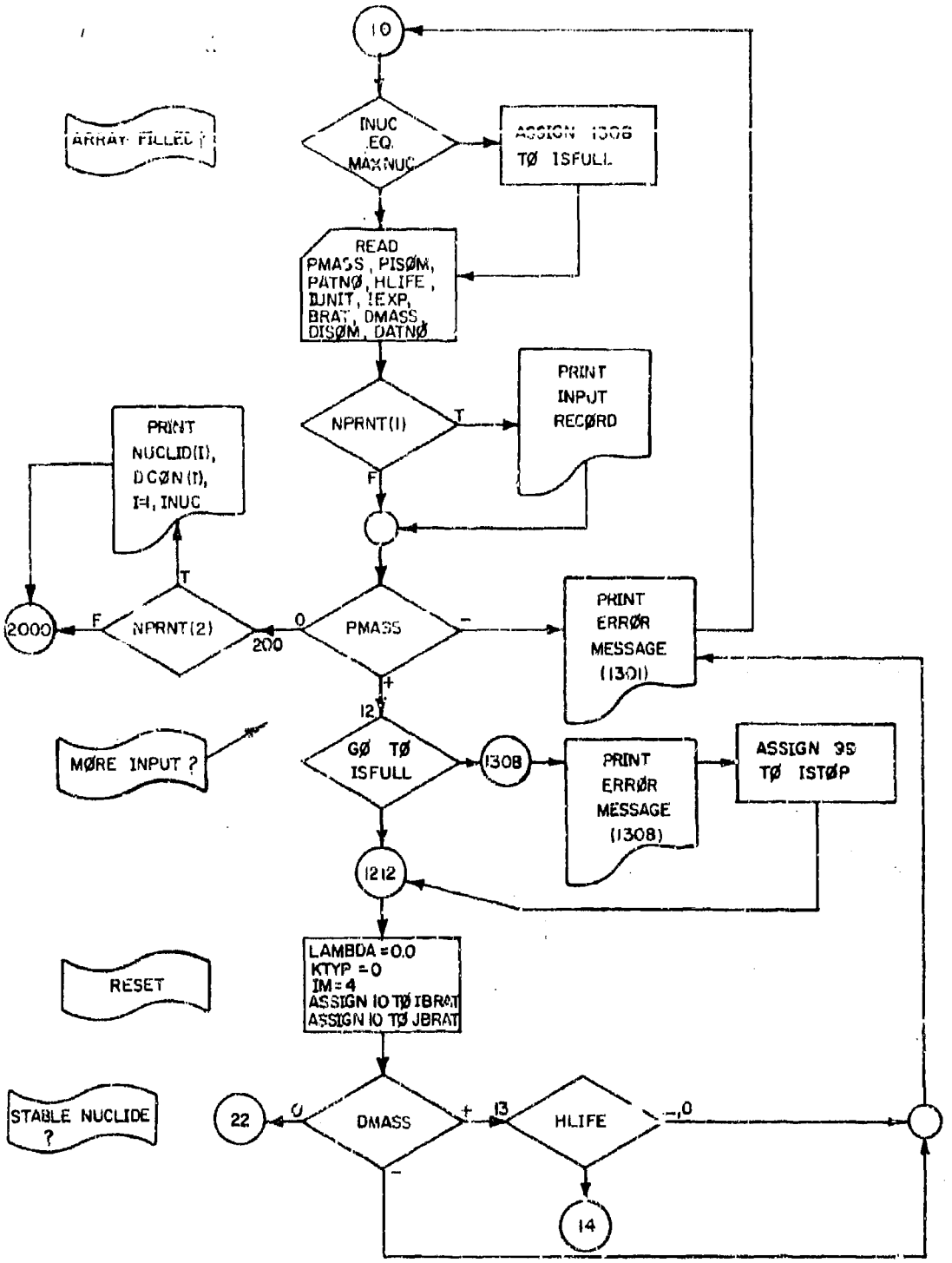


Figure 3.5b Detailed flowchart for Subroutine SETUP.

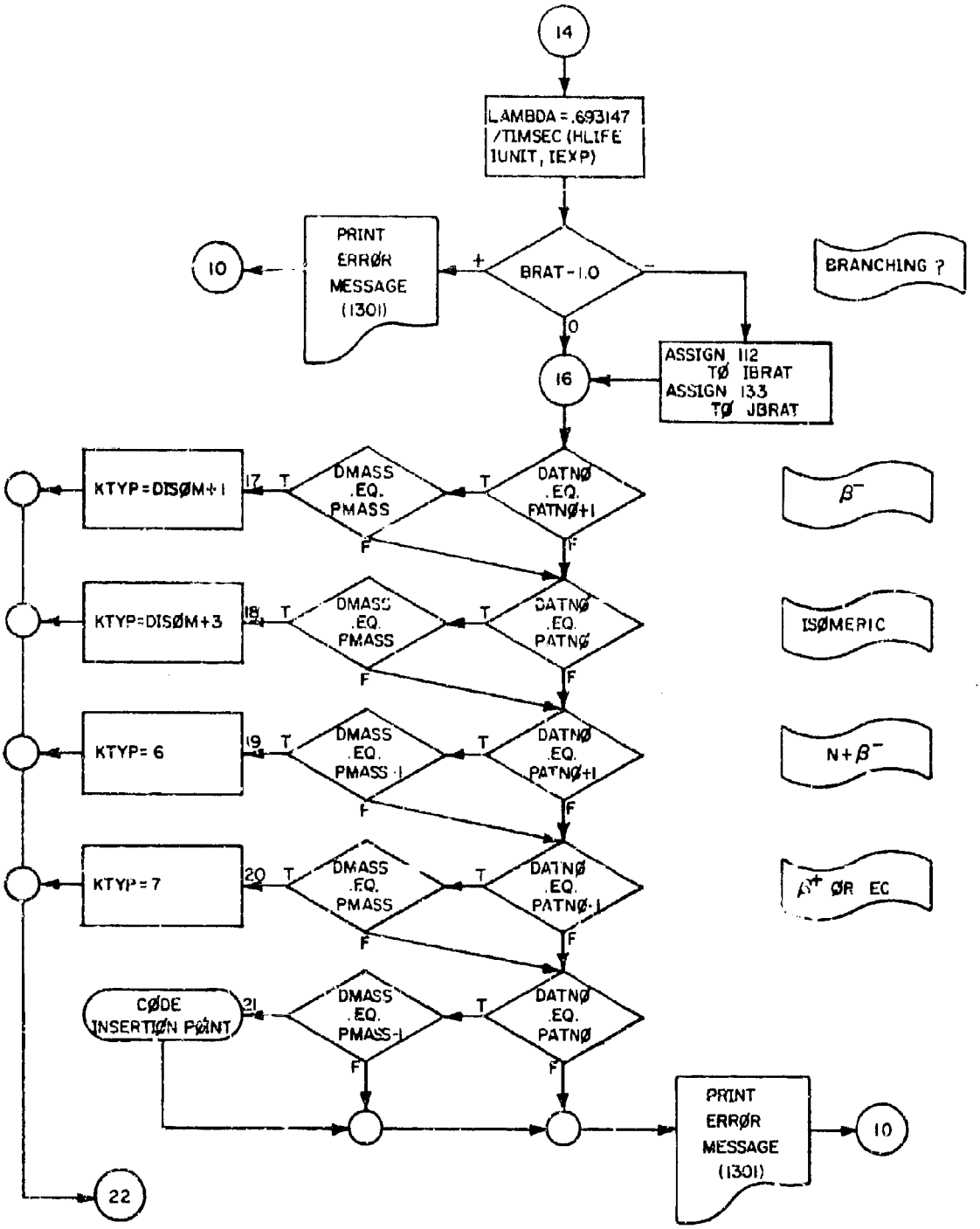


Figure 3.5c Detailed flowchart for Subroutine SETUP.

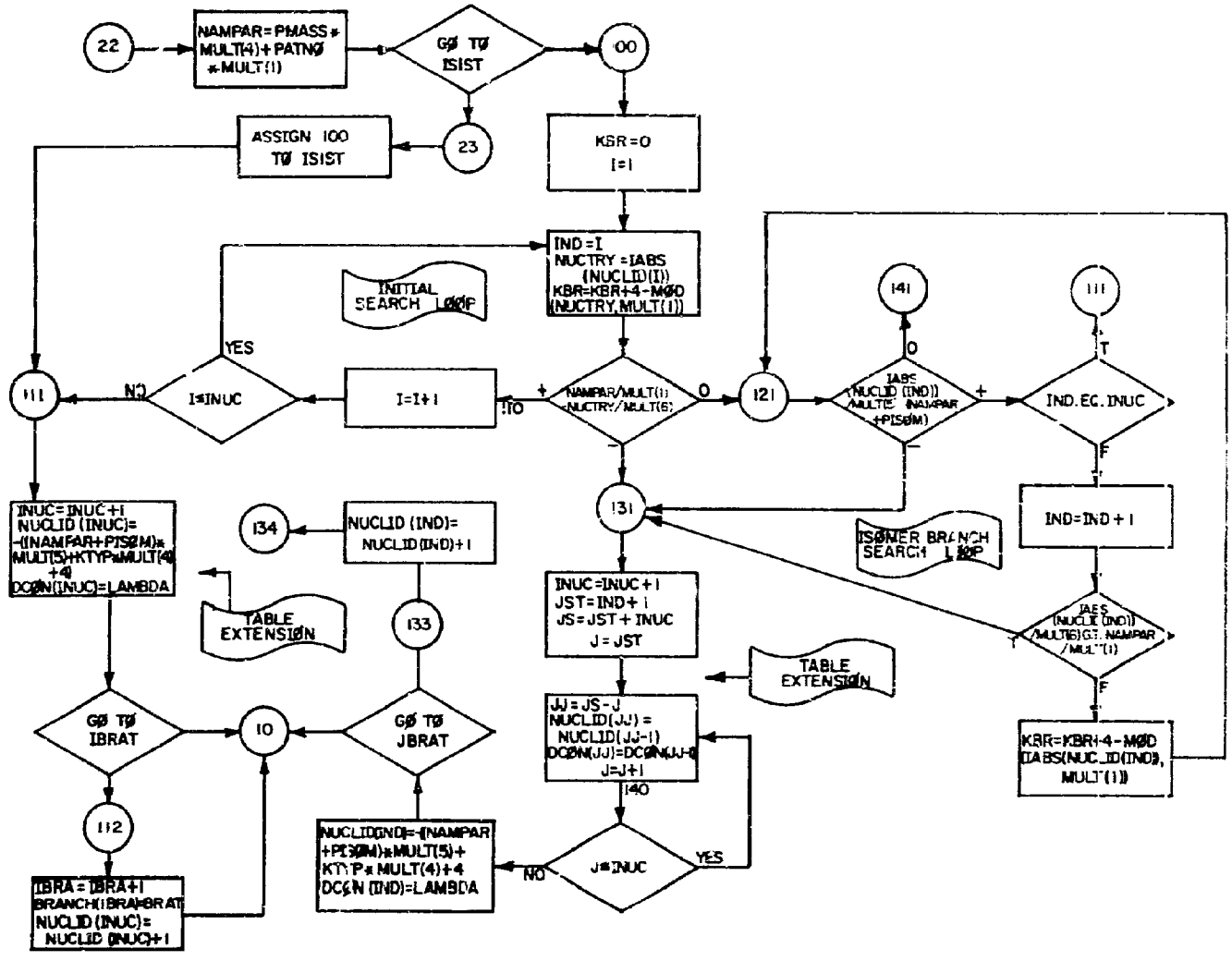


Figure 3.5d Detailed flowchart for Subroutine SETUP.

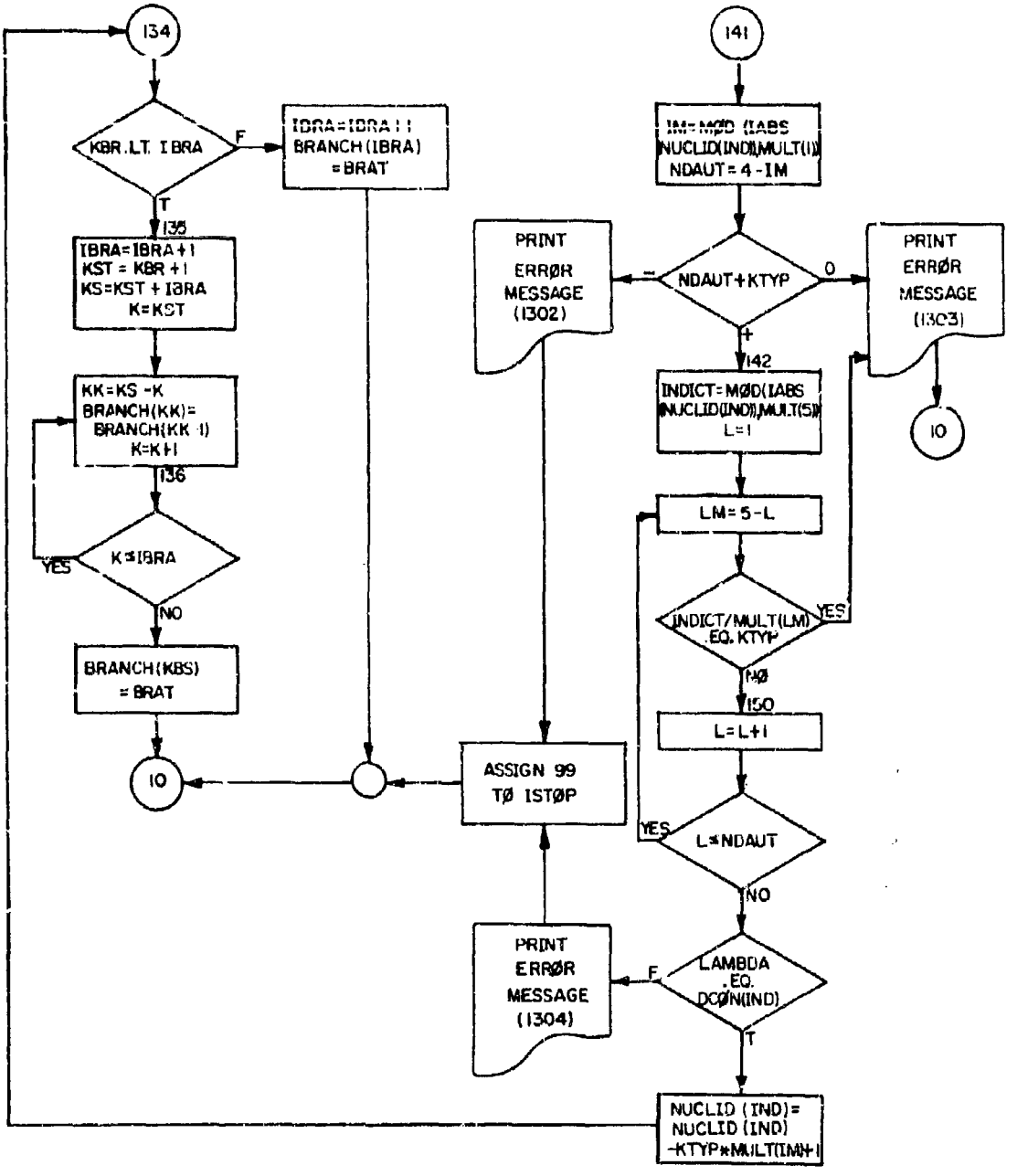


Figure 3.5e Detailed flowchart for Subroutine SETUP.

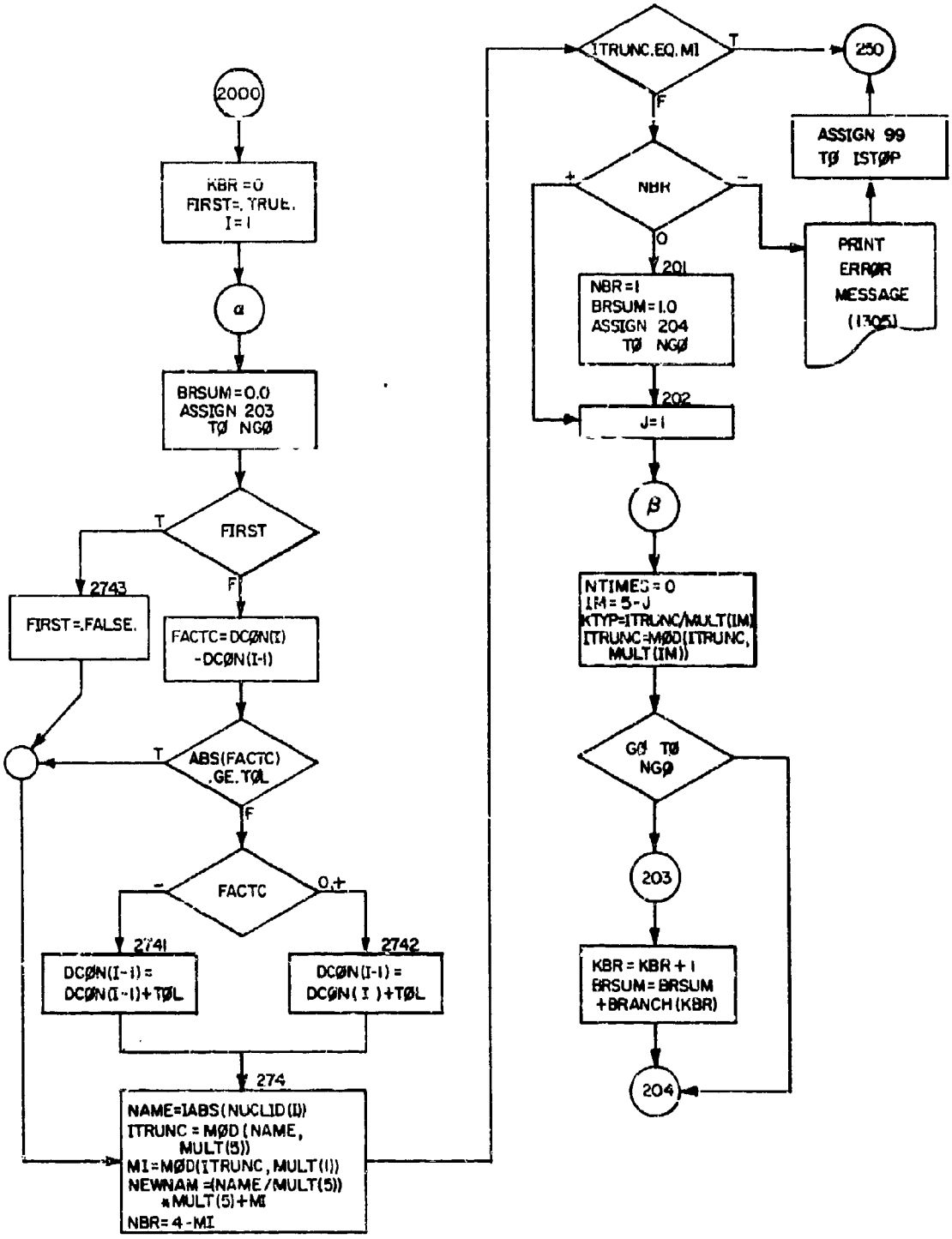


Figure 3.5f Detailed flowchart for Subroutine SETUP.

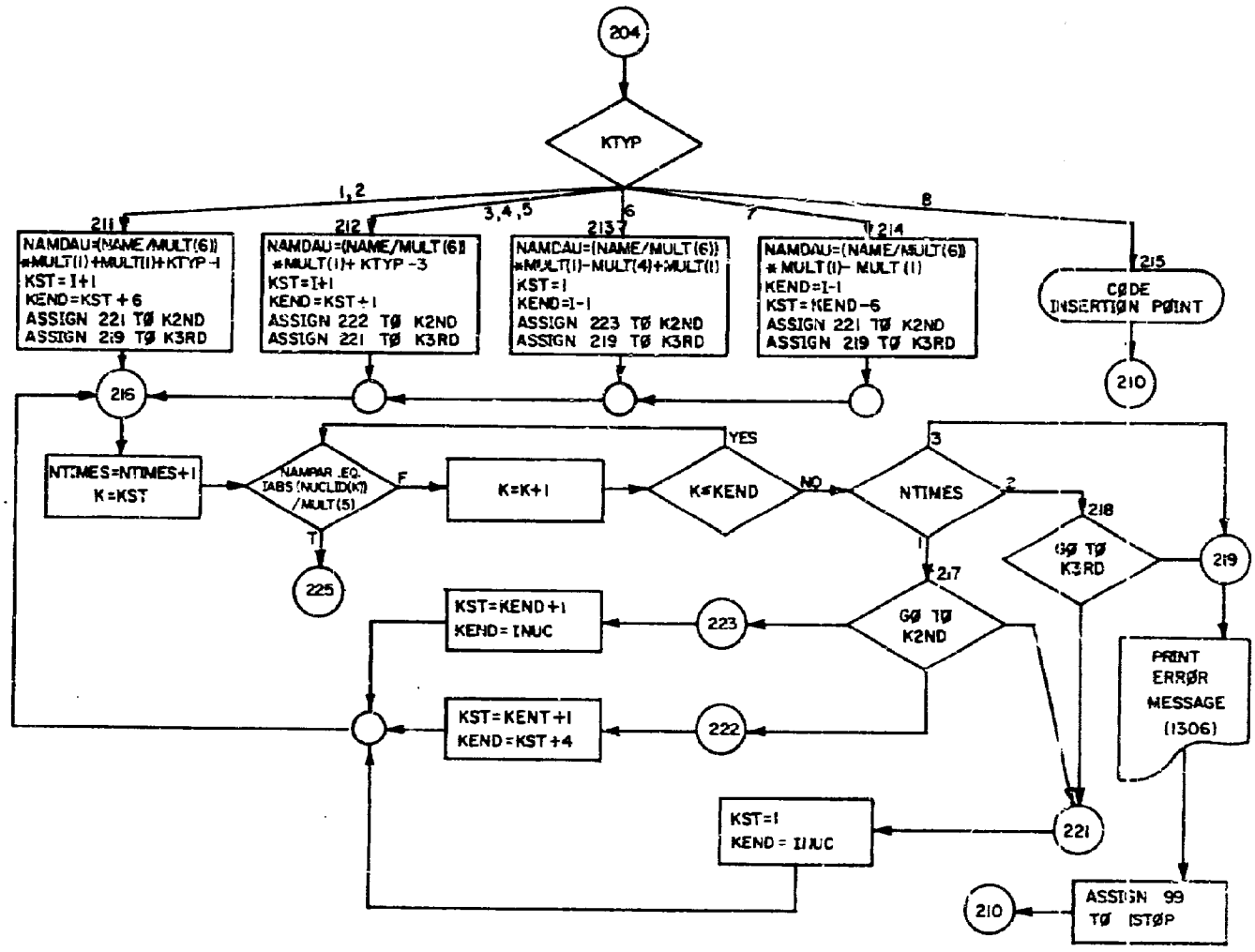


Figure 3.5g Detailed flowchart for Subroutine SETUP.

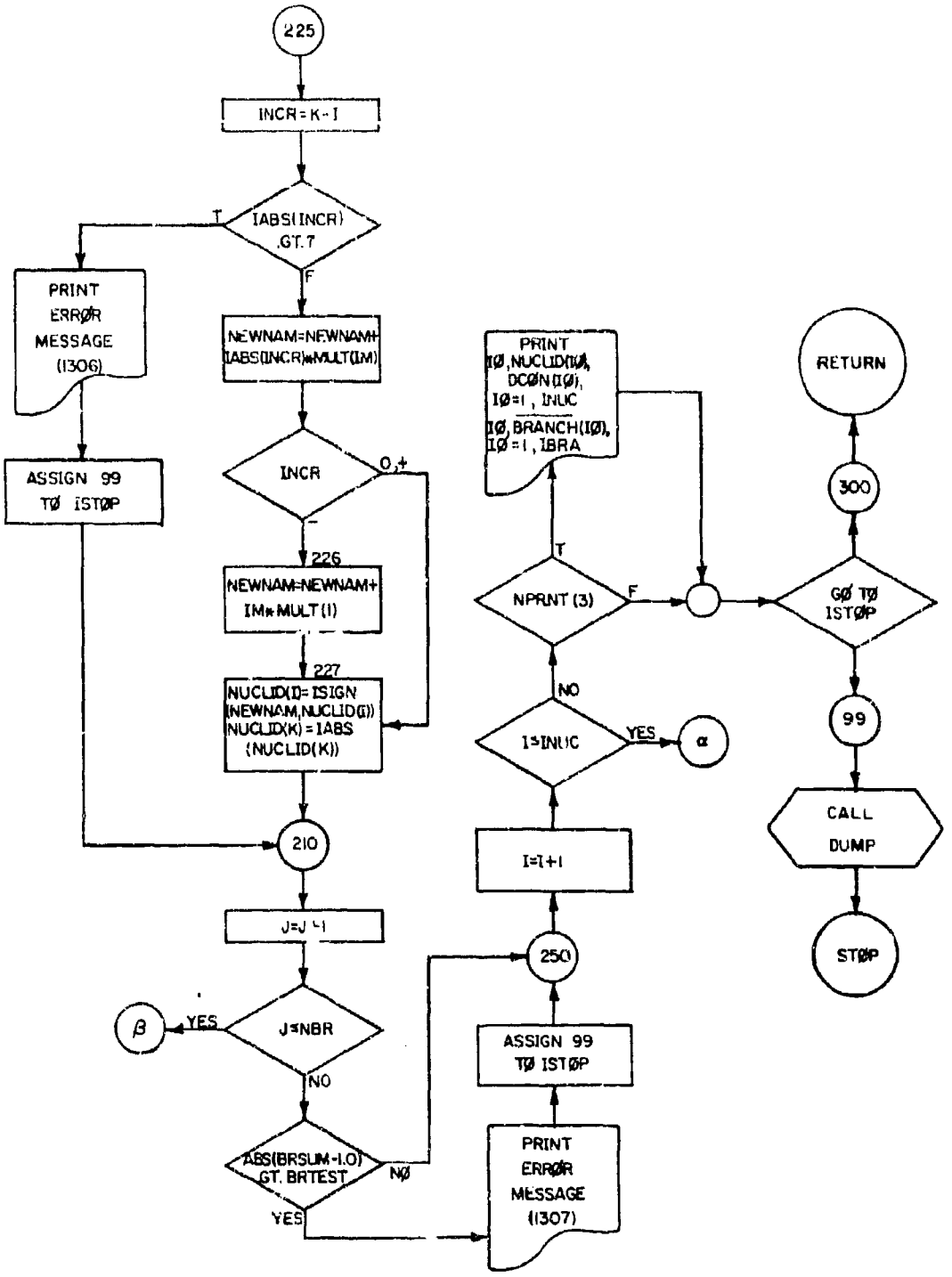


Figure 3.5h Detailed flowchart for Subroutine SETUP.

3.2.3 Subroutine YIELD (INTP, FISSID).

Input:

Argument list	CØMMØN/FISHIN/	CØMMØN/UTILITY/	Input tape
FISSID	INUC	KØUT	FISTYP
INTP	MULT(11)	NPRNT(15)	FYLDIN
	NUCLID(700)		NAT
			NMAS
			NSTAT

Output:

CØMMØN/FISHIN/

ABEGN(700)

Storage requirement (exclusive of CØMMØN): 1300_8, 704_{10}

Calling program: PAM1., Sequence 127

Flowcharts: Figure 3.6a through 3.6e

This subroutine reads the requested table of fission yields and stores it in the array ABEGN, parallel to NUCLID. The entries in ABEGN are then adjusted to prevent redundancy in decay calculations for nuclides that are members of more than one subchain.

There are three sets of input cards (or card images on tape) for this subroutine. Each set consists of a header card containing a list of fission types (FISTYP(6)), a series of data cards containing nuclide identifiers and the fission yields (FYLDIN, atoms/10^4 fissions) in columns ordered in accordance with the header card, and a blank termination card. The entire deck is terminated by an additional blank card.

The program searches the deck for the header card containing the fission type requested (FISSID). It then sets the reading FØRMAT for the correct card column and reads the data cards. For any entry in NUCLID for which no card appears, the yield is set to zero.

After ABEGN has been compiled, the subchains are examined by a simplified version of the procedure used in BATMAN. Each entry in ABEGN is divided by the number of arrows (of Figure 3.4) entering the corresponding subchain member.

If any user has an application for the PAM requiring an unmodified fission-yield table, alternate versions of SETUP, YIELD, and BATMAN are available in which the redundancy problem is handled in a different, but less efficient, manner.

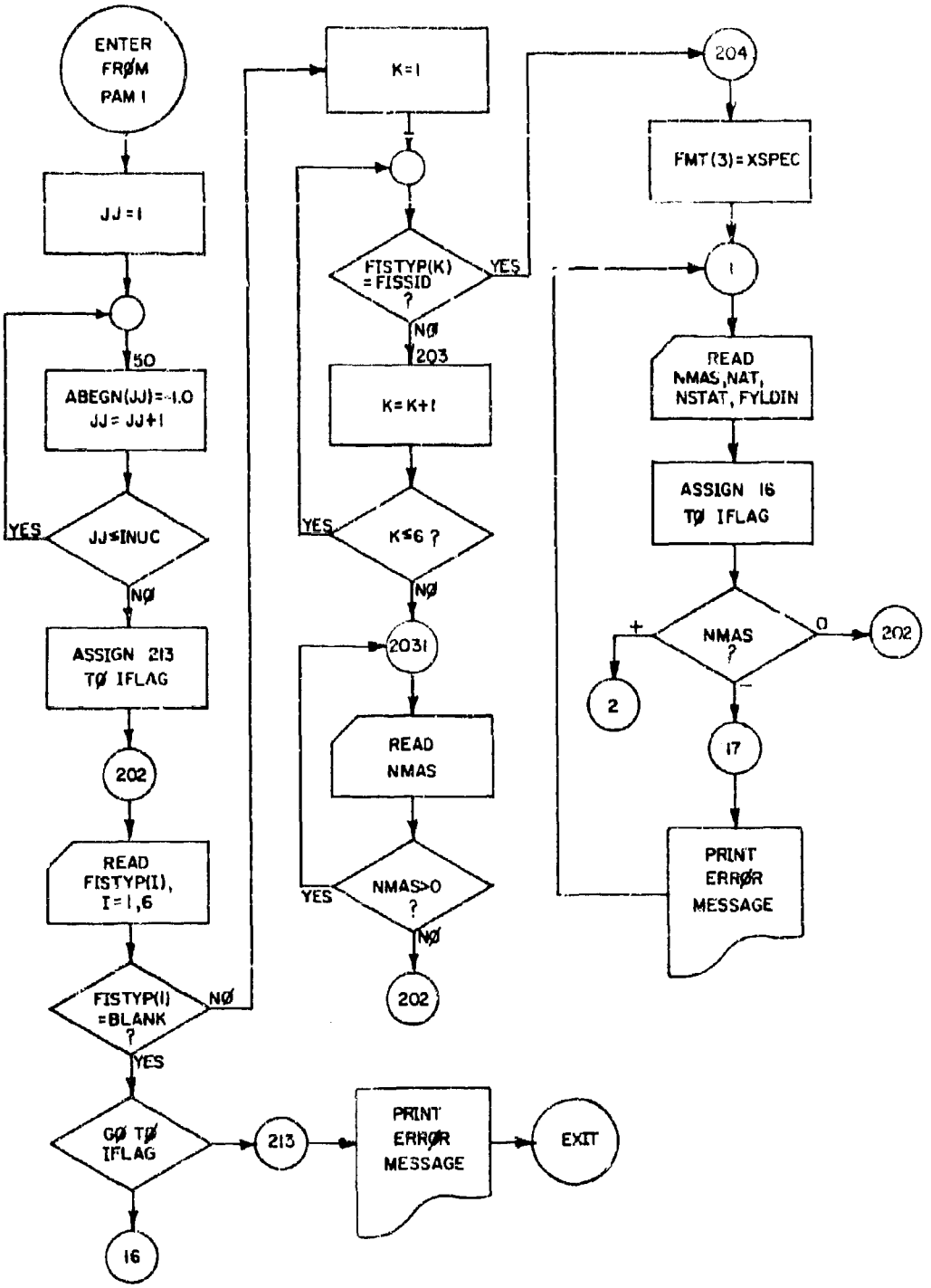


Figure 3.6a Detailed flowchart for Subroutine YIELD.

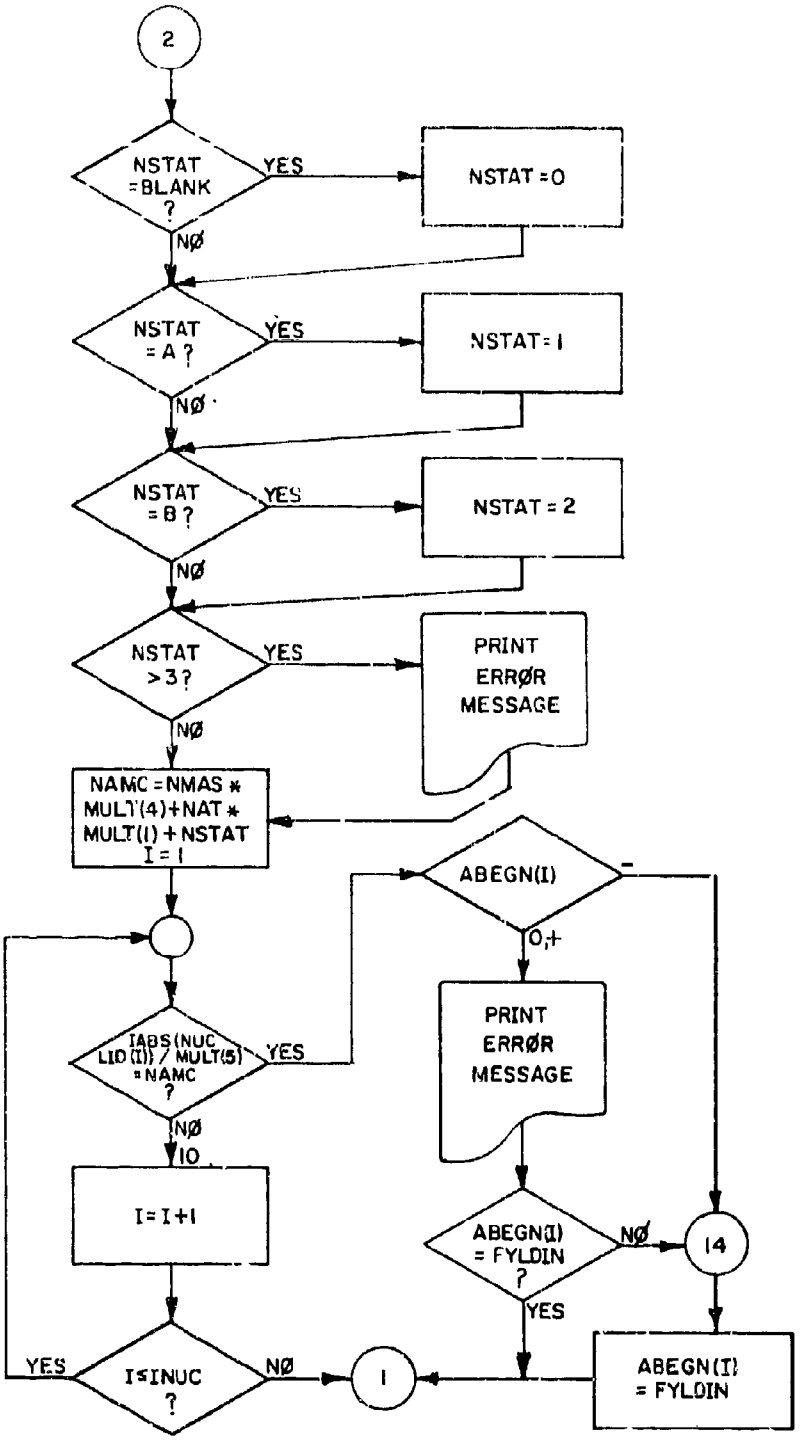


Figure 3.6b Detailed flowchart for Subroutine YIELD.

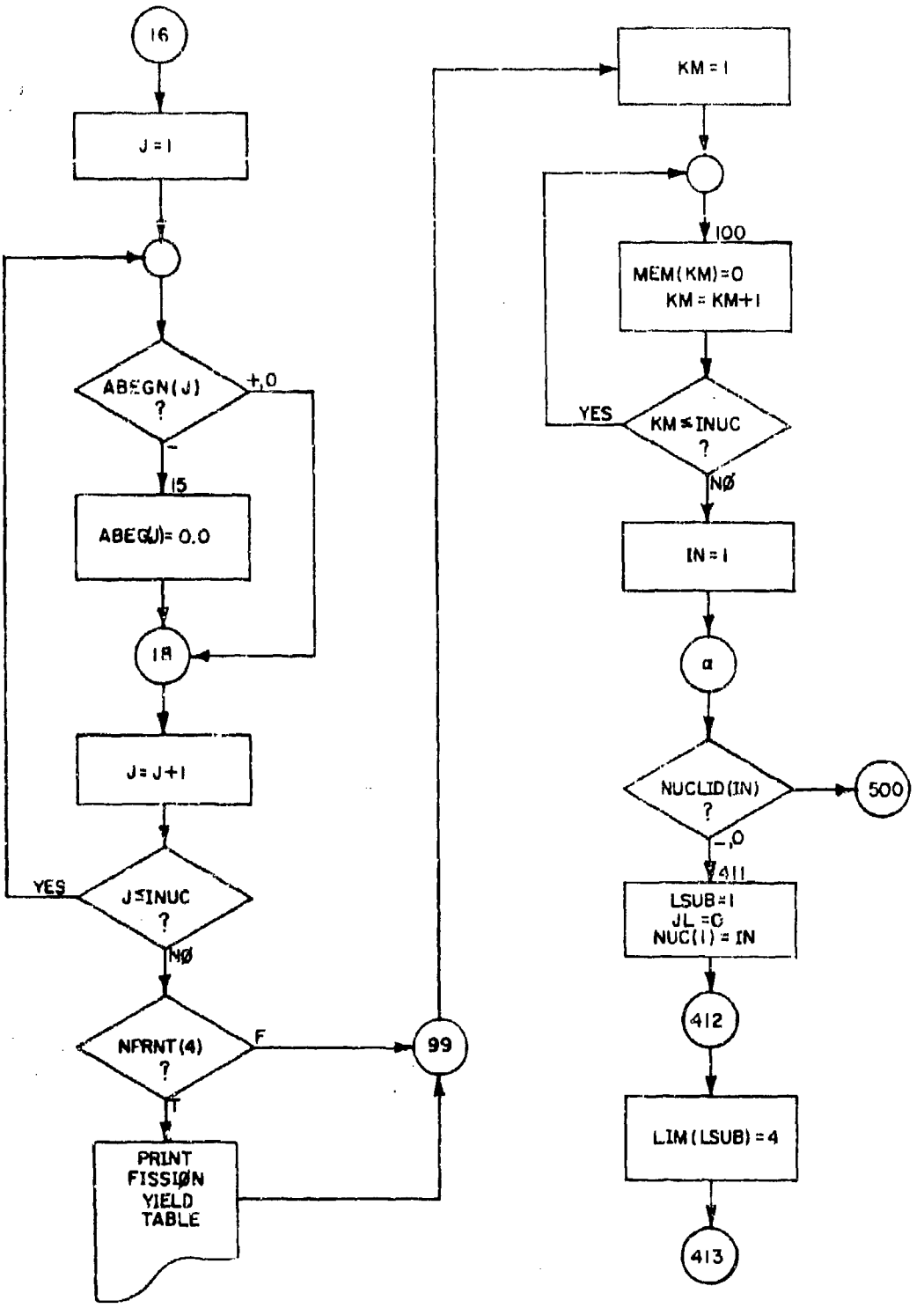


Figure 3.6c Detailed flowchart for Subroutine YIELD.

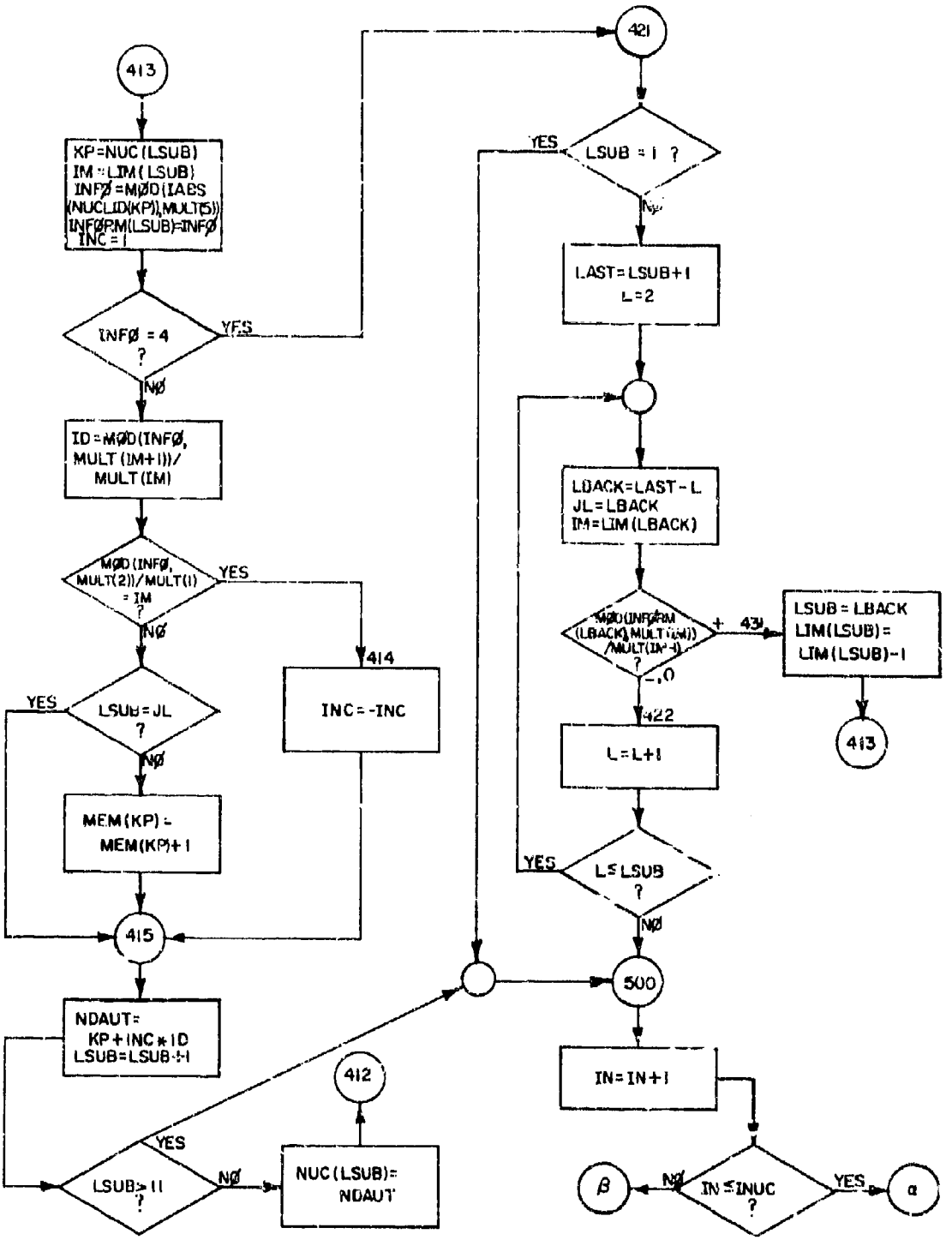


Figure 3.6d Detailed flowchart for Subroutine YIELD.

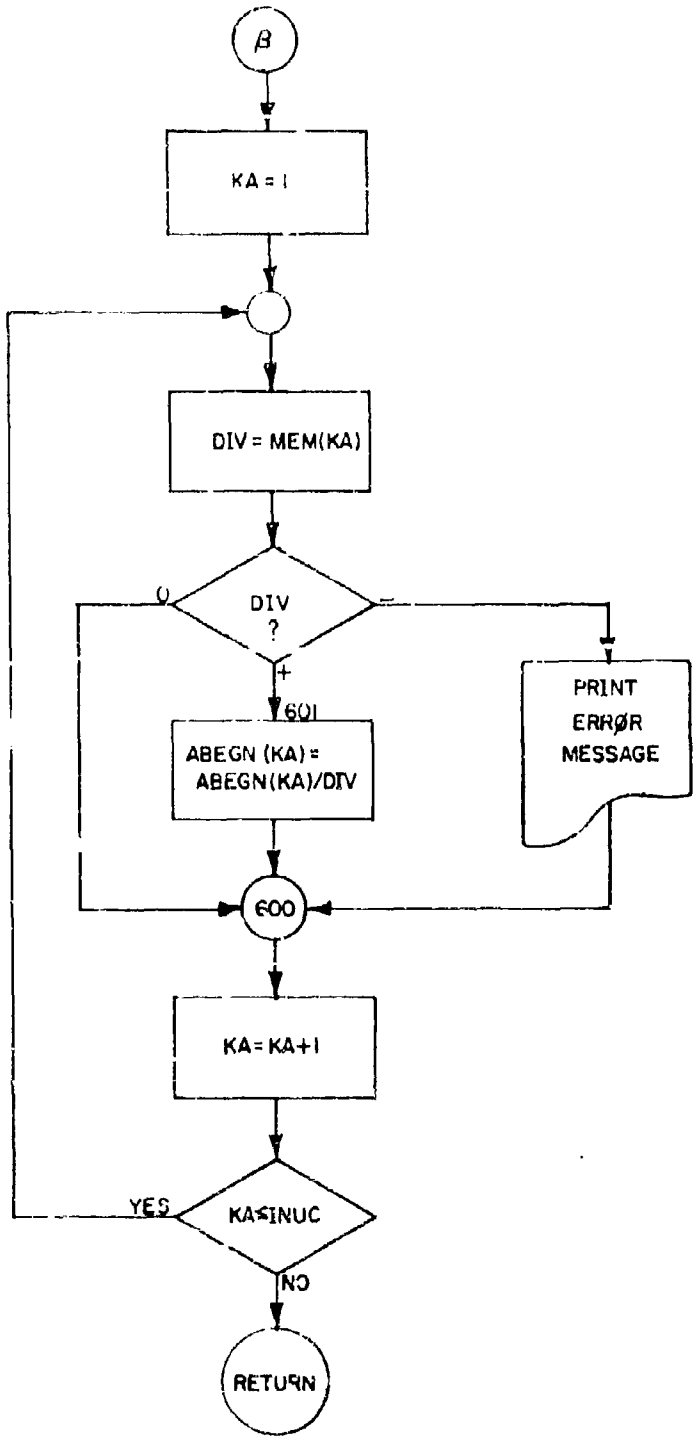


Figure 3.6a Detailed flowchart for Subroutine YIELD.

3.2.4 Subroutine BATMAN.

Input:

CØMMØN/UTILITY	CØMMØN/FISHIN/	CØMMØN/DECAY/
KOUT	ABEGN(700)	IGØ
NPRNT(15)	BRANCH(130)	KDØS
	DCØN(700)	TENTER
	IBRA	TEXIT
	INUC	TIME
	MAXNUC	
	MULT(11)	
	NUCLID(700)	

Output:

CØMMØN/FISHIN/

ABUNDØ(700)

Storage requirements (exclusive of CØMMØN): 1217_8, 655_{10}

Calling programs: FRATIØ, Sequence 67

GXPSR, Sequence 62

MCHDEP, Sequence 76

Flowcharts: Figures 3.7a through 3.7c

This subroutine evaluates the Bateman equation for each fission product. A choice of four outputs is controlled by three input parameters as follows:

	IGØ	JD	KDØS
Atoms/10^4 fissions at TIME	F	T	F
Dis s^{-1}/10^4 fissions at TIME	T	T	F
Dis/10^4 fissions from TENTER to TEXIT	T	F	T
Dis/10^4 fissions from TENTER to infinity	T	F	F

After initialization the program enters the main loop, which scans the NUCLID array. The sign of each entry is examined. If it is positive, the index, IBR, for the BRANCH array is adjusted and the scan continues. A negative sign initiates subchain processing at Statement 11. Subchain members are indexed by LSUB, cross-referenced to the index of NUCLID by the array NUC.

Each decay path (cf Figure 3.7) starting from this entry in NUCLID is considered in turn. The branching points constitute a hierarchy in which the one farthest to the right varies most rapidly and the one farthest to the left least rapidly.

The Bateman equation is evaluated from each member of each subchain. The output is stored in the array ABUNDØ, parallel to NUCLID. For details of the logic, the user should examine the extensive comments in the FORTRAN listing.

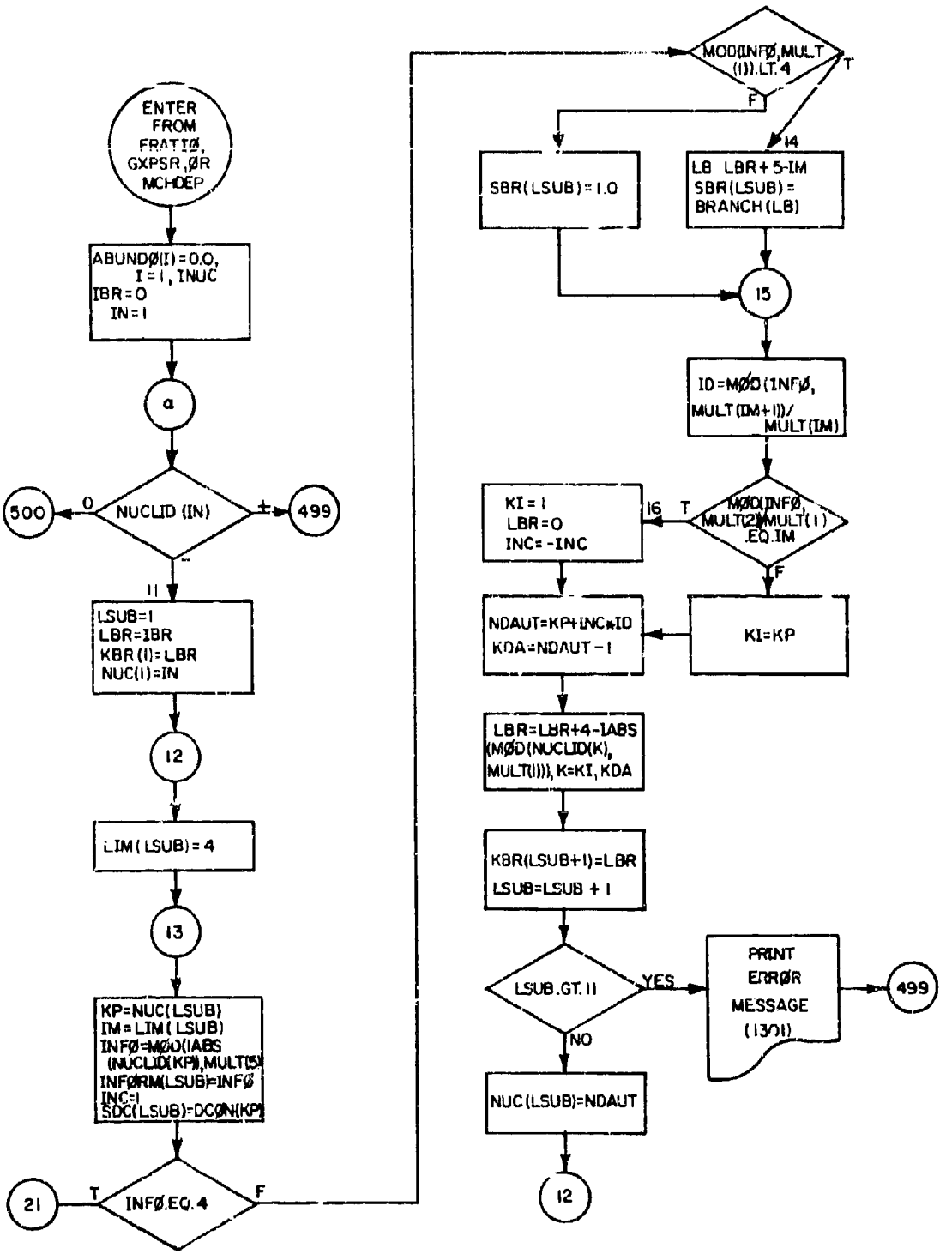


Figure 3.7a Detailed flowchart for Subroutine BATMAN.

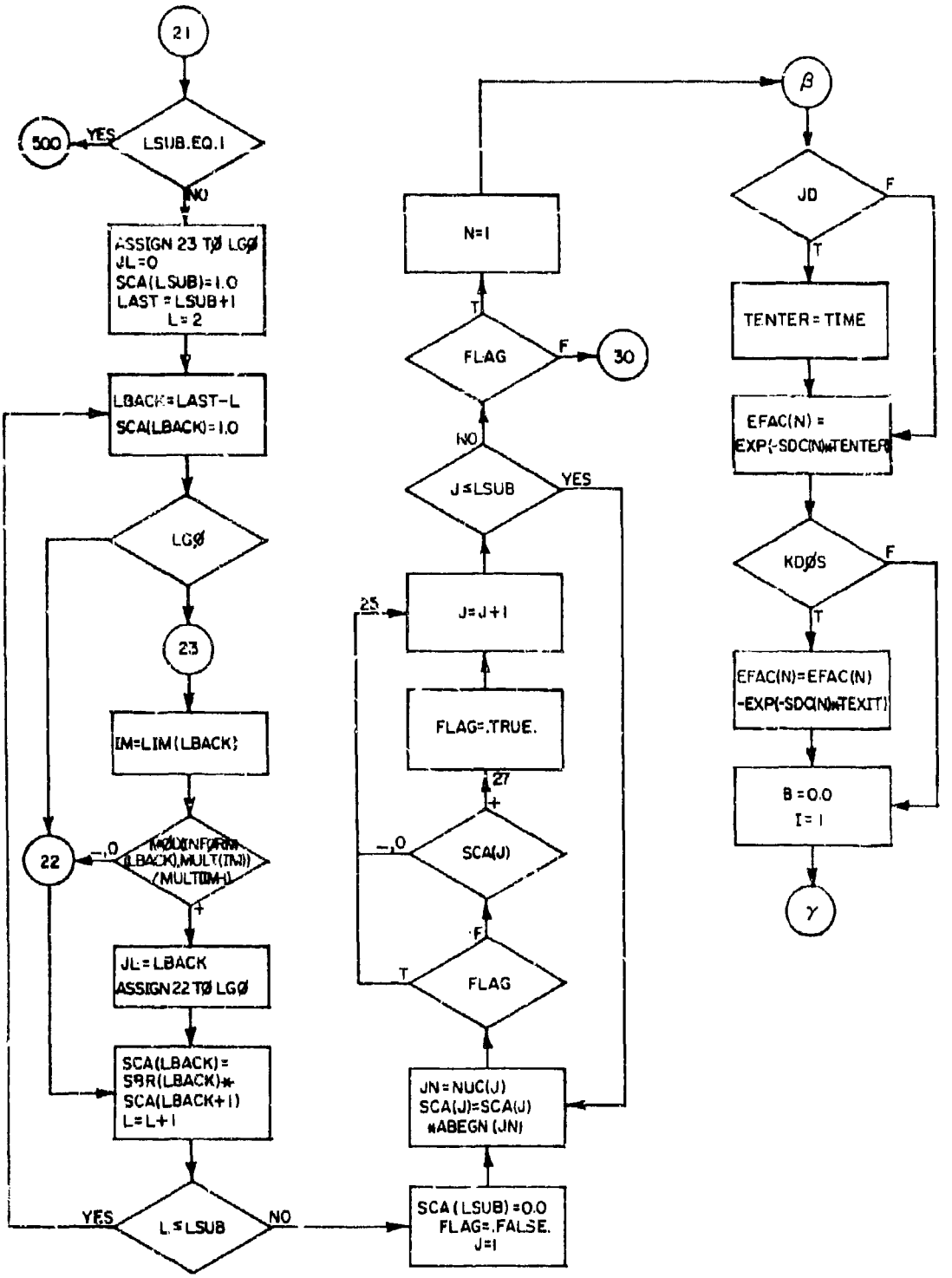


Figure 3.7b Detailed flowchart for Subroutine BATMAN.

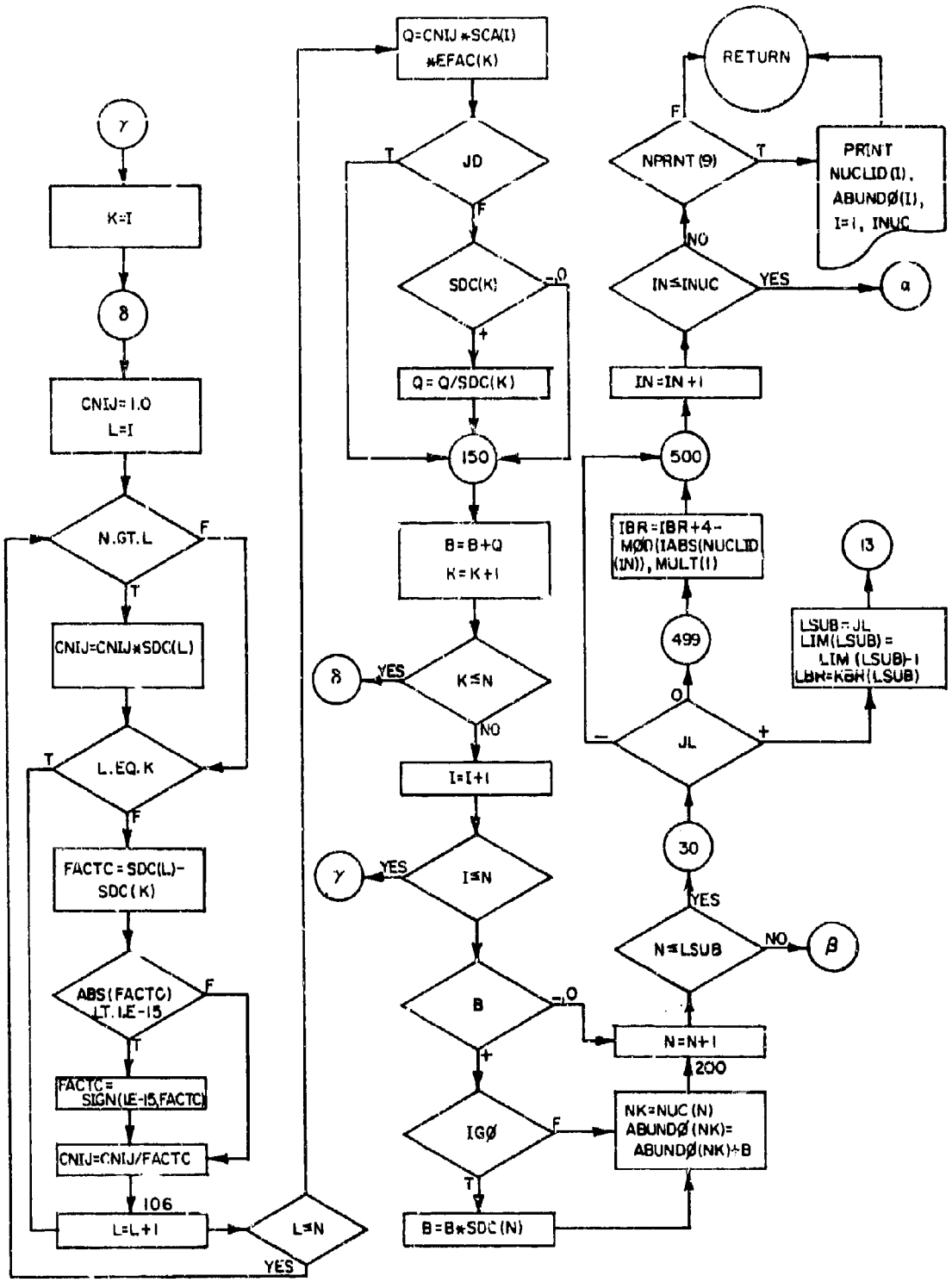


Figure 3.7c Detailed flowchart for Subroutine BATMAN.

3.3 Fractionation.

3.3.1 Subroutine FRATIØ (SLDTMP, TMSD, MCHN).

Input:

Argument list	CØMMØN/SET3/	CØMMØN/ØUTPUT/
SLDTMP	FMASS(200)	ITAB
TMSD	PSIZE(200)	

CØMMØN/FISHIN/	CØMMØN/UTILITY/
ABUNDØ(700)	KØUT
INUC	NPRNT(15)
MULT(11)	
NUCLID(700)	

Output:

Argument list	CØMMØN/FRYLING/	CØMMØN/DECAY/
MCHN	BSUBK(90)	IGØ
	ECF(90)	JD
		KDØS
		TIME

Storage requirement (exclusive of CØMMØN): 1035_8, 541_{10}

Calling program: PAM1, Sequence 134

Subroutine called: BATMAN

Flowcharts: Figures 3.8a and 3.8b

This subroutine computes the parameters for the radial distribution model. It first calls BATMAN to compute the atomic abundance of each fission product at the time (TMSD) when the cloud cooled to the condensation temperature of the soil. The boiling point (BØIL(40)) of each fission product is compared with the solidification temperature (SLDTMP) of the soil. Then the refractory fraction (FR(90)) of each mass chain is computed.

FRATIØ then computes BSUBK(90) (b_i-1 in Section 2.2) and ECF(90) (E_i in Section 2.2).

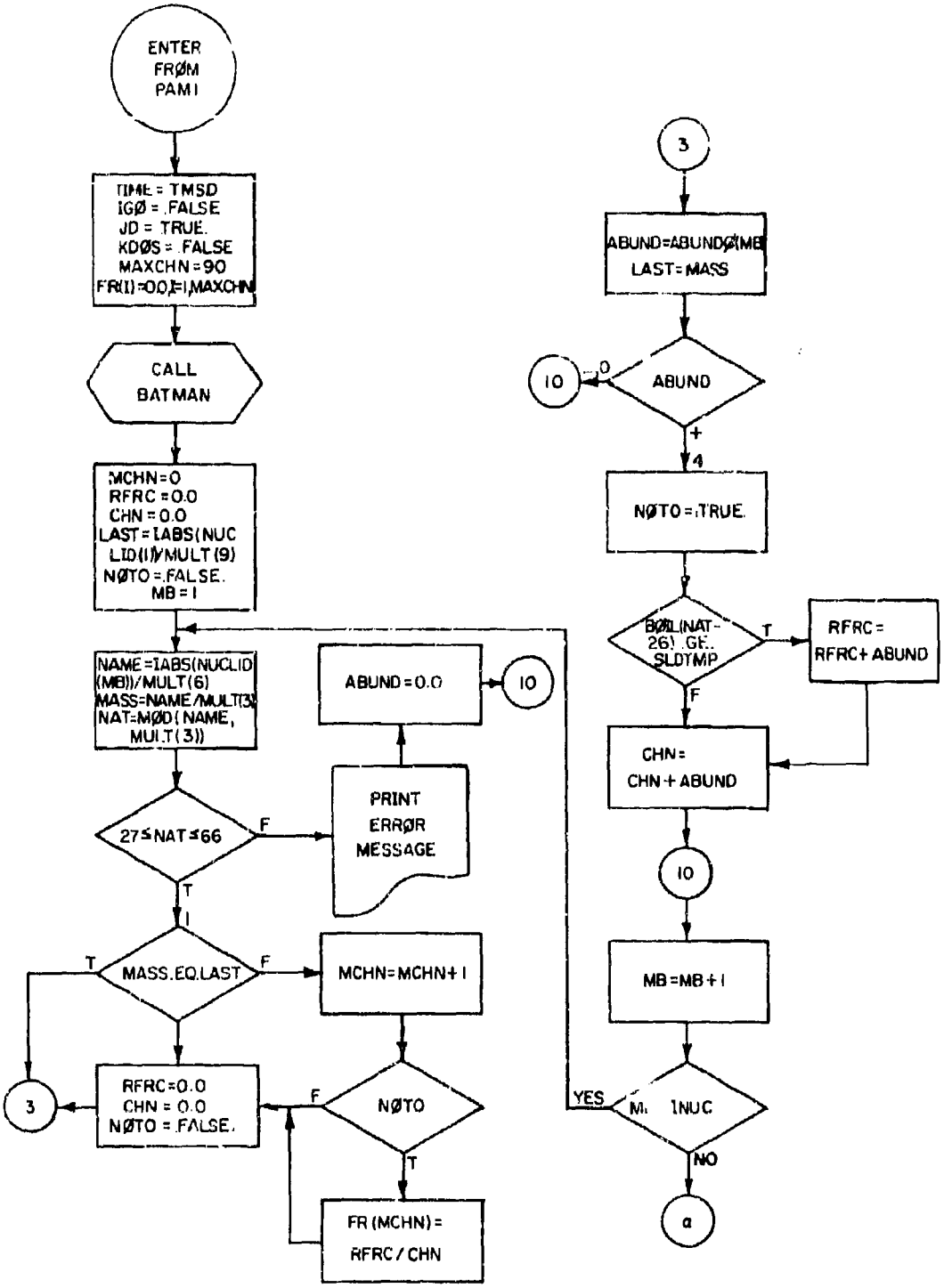


Figure 3.8a Detailed flowchart for Subroutine FRATIO.

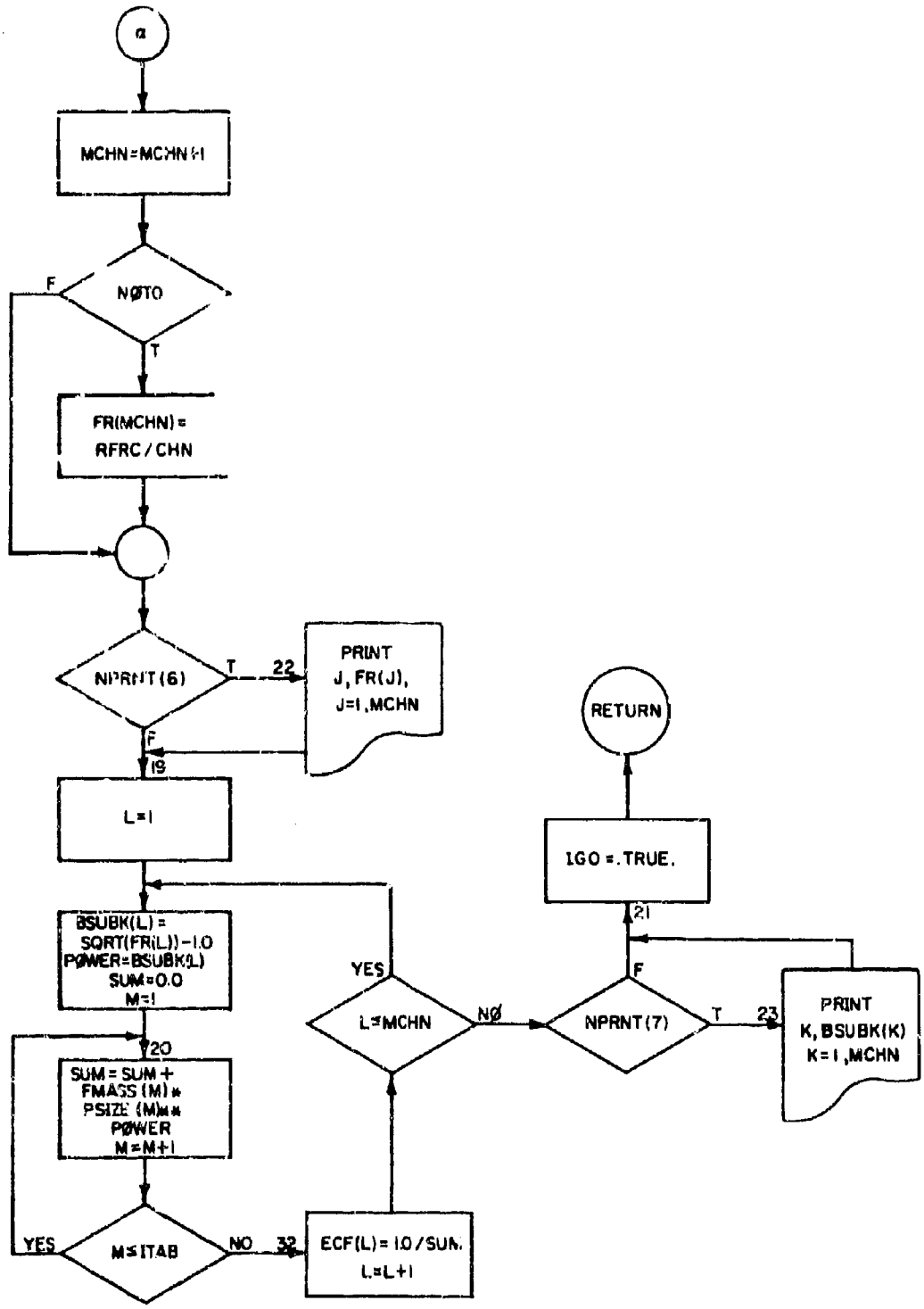


Figure 3.8b Detailed flowchart for Subroutine FRATIO.

3.3.2 Subroutine GXPSR.

Input:

CØMMØN/FISHIN/	CØMMØN/FRYLING/	CØMMØN/UTILITY
ABUNDØ(700)	BSUBK(90) ECF(90) ERM(185) JRM(185) KRM	KØUT NPRNT(15)

CØMMØN/ØUTPUT	CØMMØN/SETS3/
FISNUM ITAB	FMASS(200) PSIZE(200)

Output:

CØMMØN/ØUTPUT/

FP(200)

Storage requirement (exclusive of CØMMØN): 501_8, 321_{10}

Calling program: PAM2, Sequence 72

Subroutine called: BATMAN

Flowchart: Figure 3.9

This subroutine computes the distribution of total fission-product activity with particle size. It first calls BATMAN to obtain the activity of each fission product. The activity, ABUNDØ, is then multiplied by the appropriate exposure-rate multiplier, ERM, and summed over each mass chain.

Finally, Equation 2.27 is evaluated and the result is multiplied by XRT. The mnemonics are related to the symbols of Section 2.2 as follows:

BNEX, BSUBK(IC)	$b_i - 1$
CRISS	$D^{b_i - 1}$

CRØSS	D
ECF(LC)	E_i
FISNUM	F_t
FMASS(LD)	$f_m(d_k)$
PSIZE(LD)	d_k
RADIAL	$n_i E_i$
STRAIT	S_i

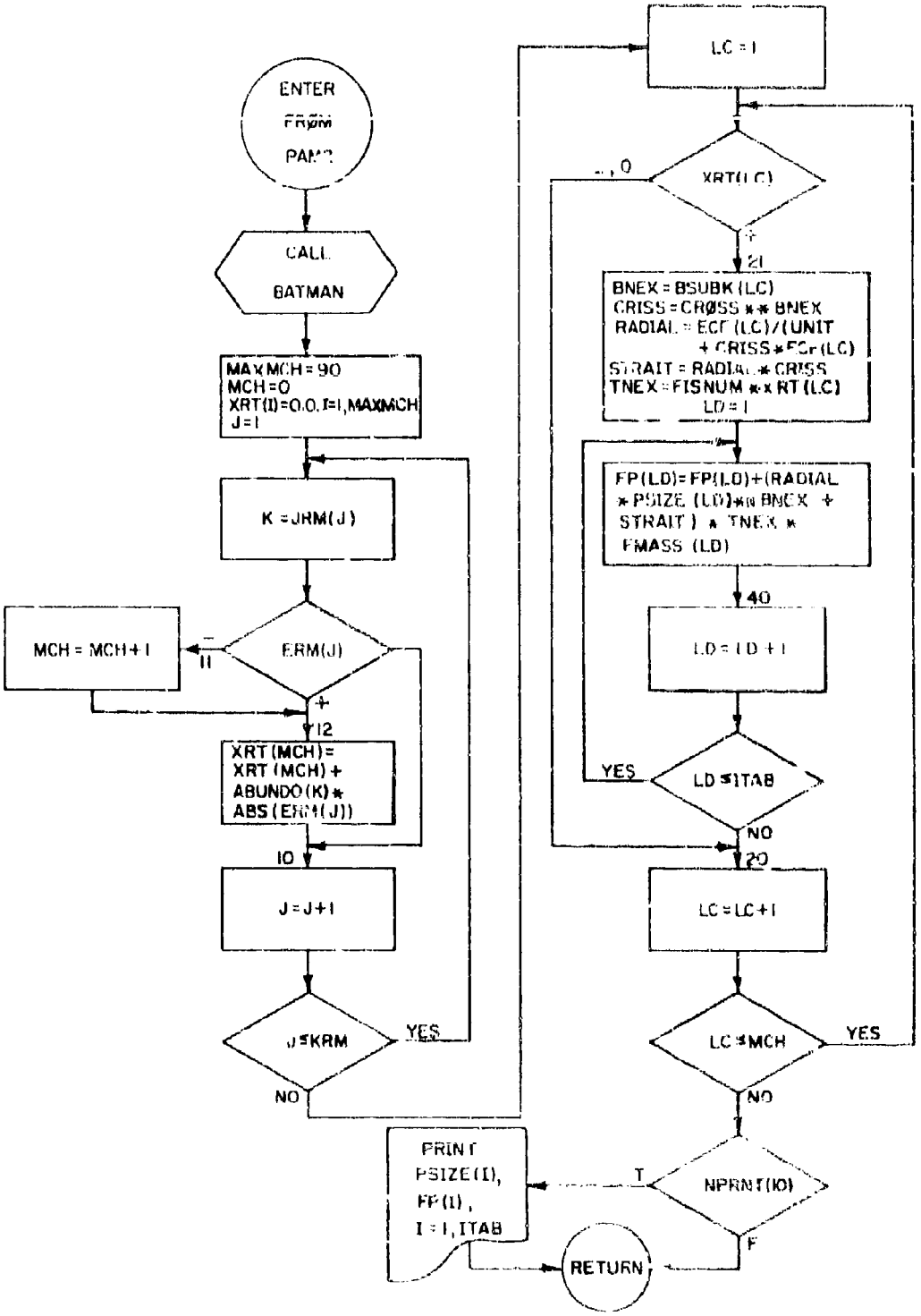


Figure 3.9 Detailed flowchart for Subroutine GXFBR.

3.3.3 Subroutine MCHDEP.

Input:

CØMMØN/FISHIN/	CØMMØN/UTILITY/	CØMMØN/ØUTPUT/
ABUNDØ(700)	KØUT	FISNUM
INUC	NPRNT(15)	ITAB
MULT(11)		MASCHN
NUCLID(700)		

CØMMØN/FRYLING/	CØMMØN/DECAY/	CØMMØN/SET3/
BSUBK(90)	TIME	FMASS(200)
ECF(90)		PSIZE(200)

Output:

CØMMØN/ØUTPUT

FP(200)

Storage requirement (exclusive of CØMMØN): 362_8, 242_{10}

Calling program: PAM2, Sequence 81

Subroutine called: BATMAN

Flowchart: Figure 3.10

This subroutine computes the distribution of a single, user-selected mass chain with particle size. Equation 2.27 is computed in a manner similar to that of GXPSR.

Two options are available.

1. TIME = 0.0

In this case the FP array is equivalent to $F_i(d_k)$ of Section 2.2 for a single value of i. No decay calculation is required.

2. TIME > 0.0

In this case the FP array represents activity in curies. The disintegration rate is obtained by calling BATMAN, is converted to curies per fission, and is multiplied by $F_i(d_k)$.

Provision has been made for addition of a third option with TIME < 0.0.

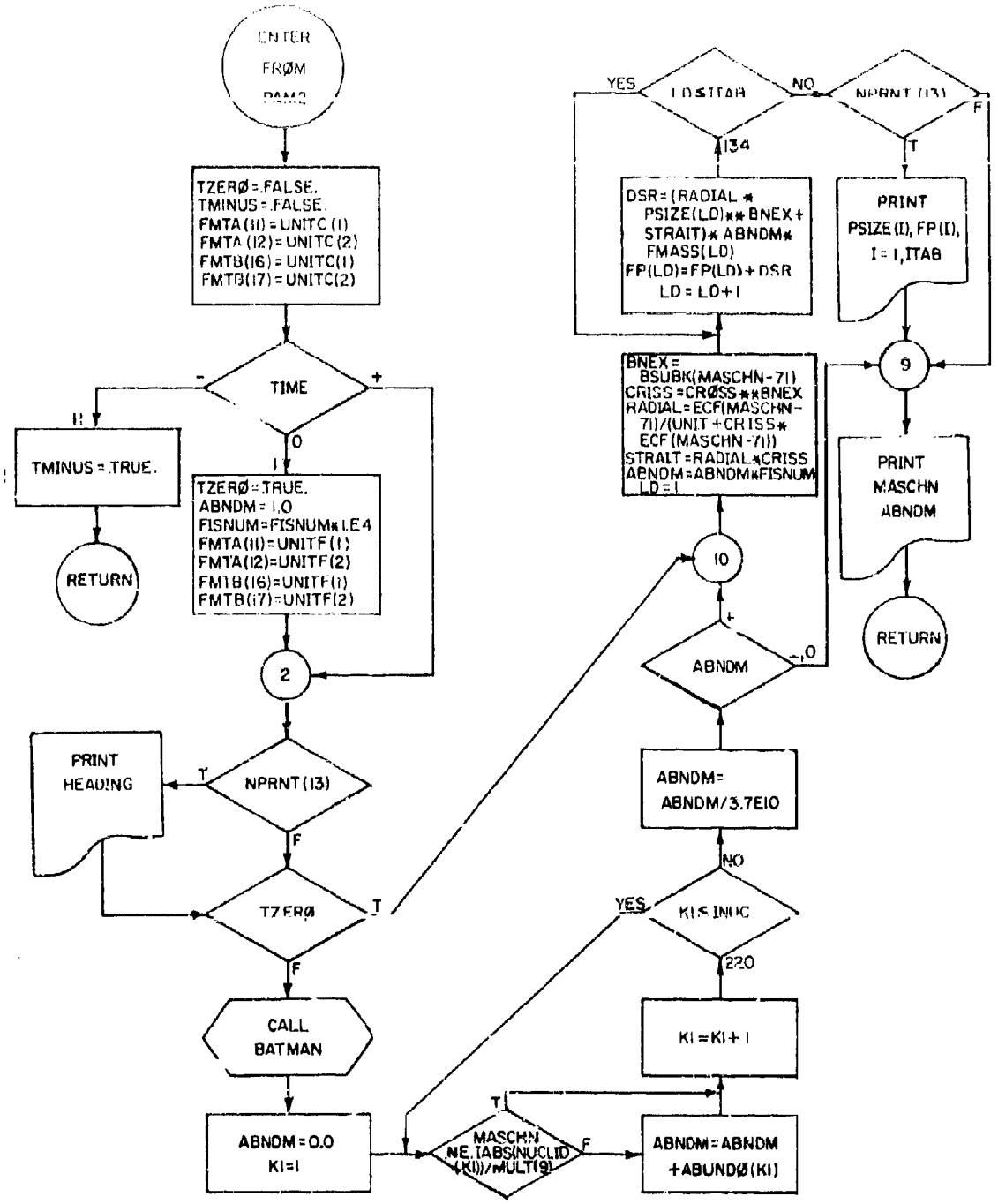


Figure 3.10 Detailed flowchart for Subroutine MCHDEP.

3.3.4 Subroutine XERM (INTP).

Input:

Argument list	CØMMØN/FISHIN/	CØMMØN/UTILITY/	Input tape
INTP	INUC MULT(11) NUCLID(700)	KOUT NPRNT(15)	NAT NMAS NSTAT XRM

Output:

CØMMØN/FRYLING/

ERM(185)
JRM(185)
KRM

Storage requirement (exclusive of CØMMØN): 1152_8, 618_{10}

Calling program: PAM1, Sequence 129

Subroutine called: UNPACK

Flowcharts: Figures 3.11a through 3.11c

This subroutine reads a table of exposure-rate multipliers (XRM, R/hr 3 feet above an infinite, plane source emitting 1 dis s^{-1} cm^{-2}) and orders it by mass number. Fission products for which no card appears are assigned zero multipliers. The multipliers are entered in array ERM(185), cross-indexed to NUCLID by the array JRM(185). The first entry in ERM for each mass chain is flagged with a minus sign.

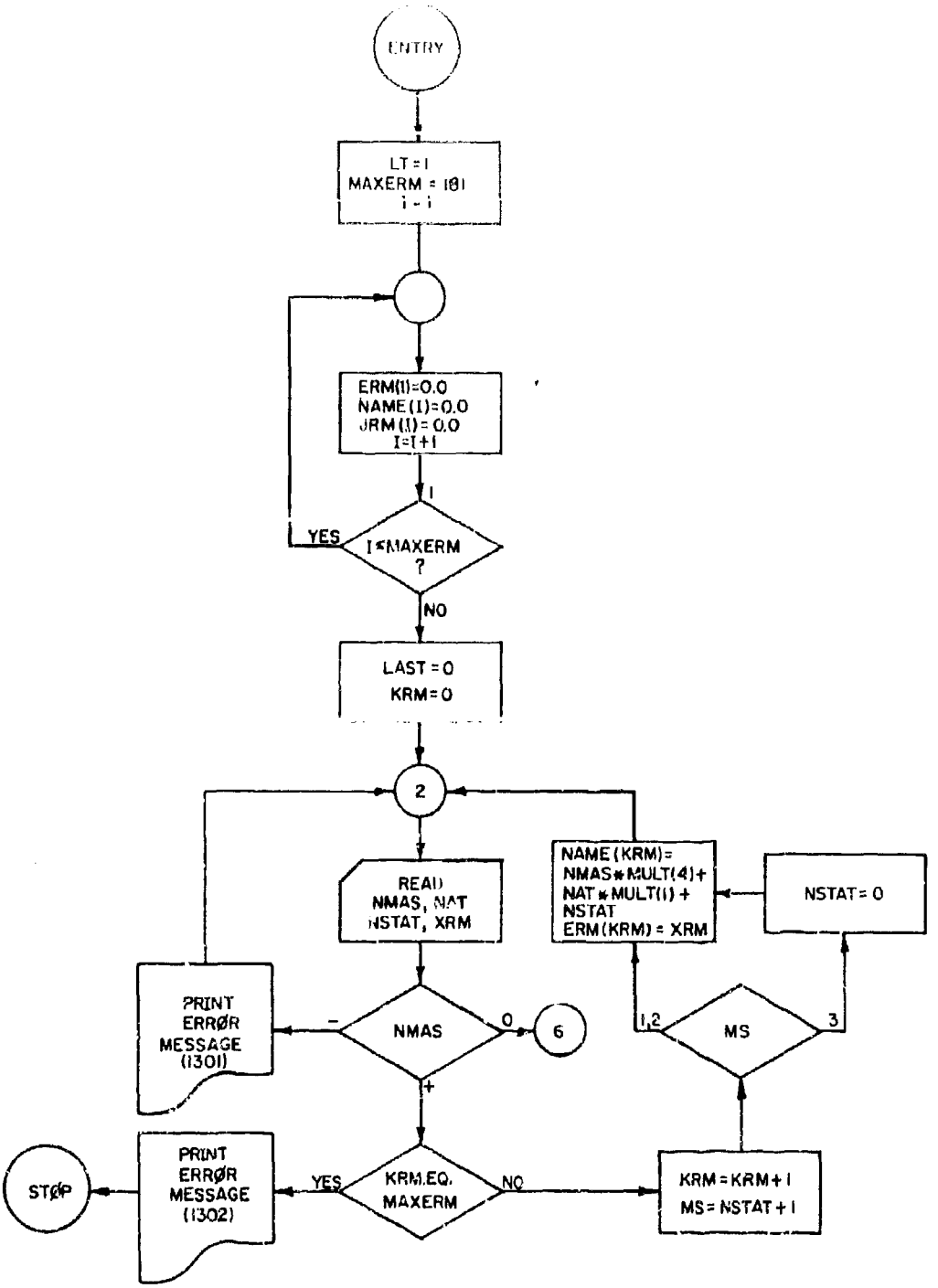


Figure 3.11a Detailed flowchart for Subroutine XPRM.

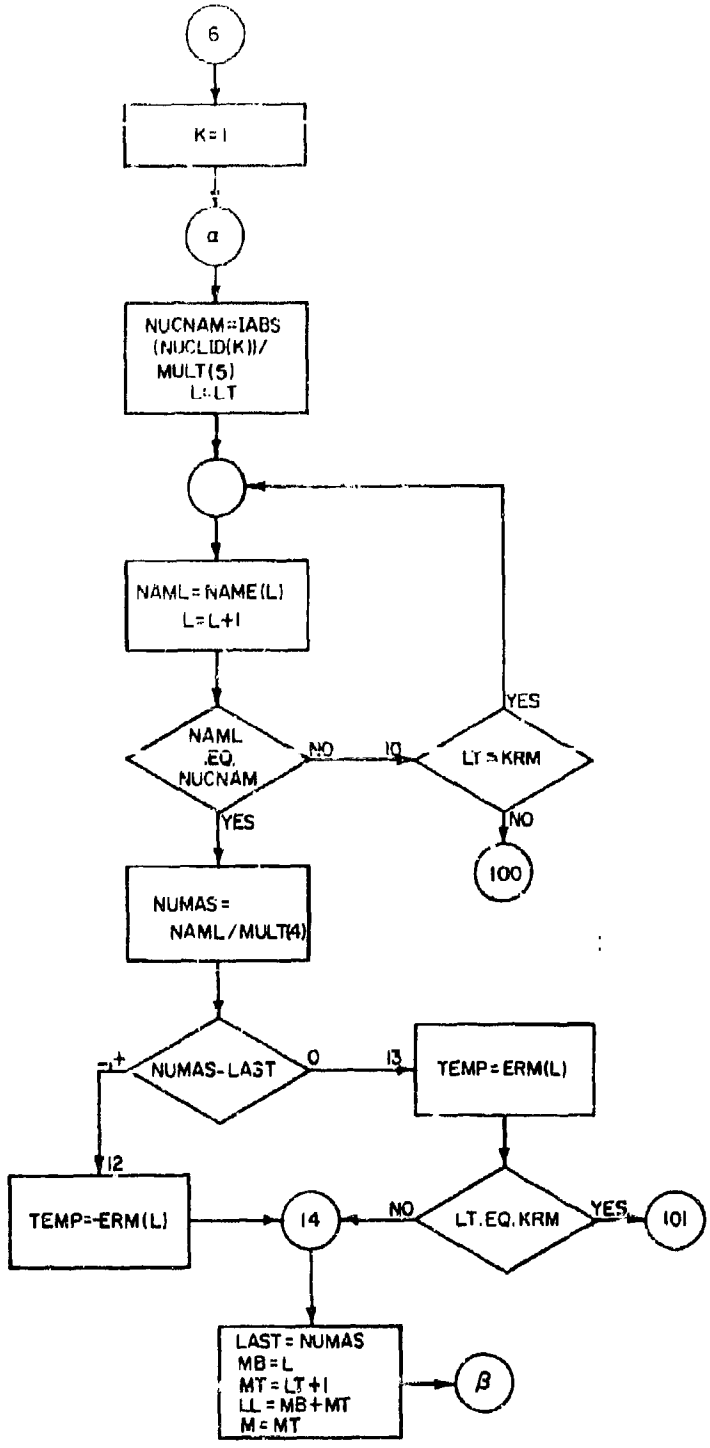


Figure 3.11b Detailed flowchart for Subroutine XIRM.

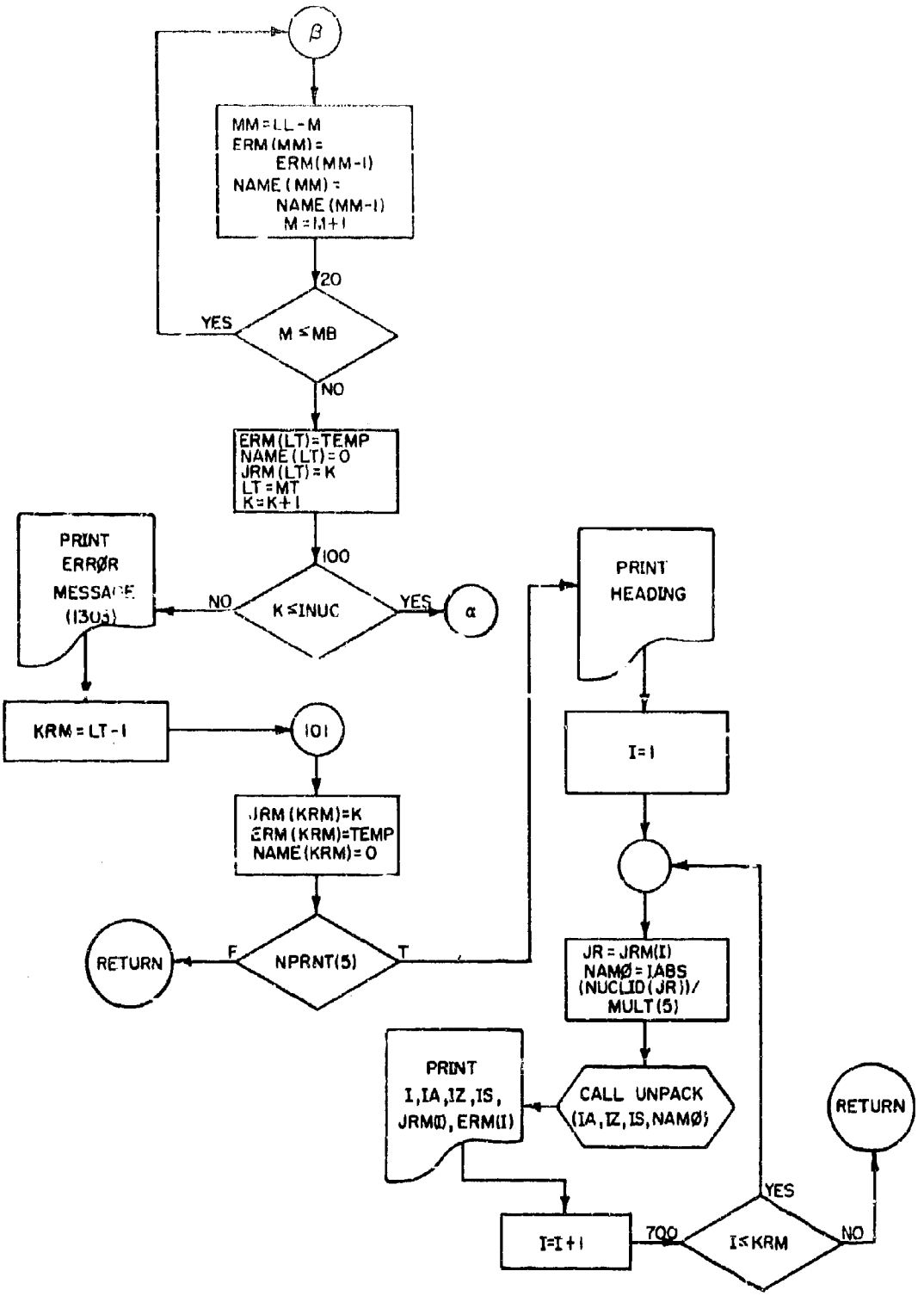


Figure 3.11c Detailed flowchart for Subroutine XPRM.

3.4 Induced Activities.

3.4.1 Subroutine INDCD1 (EMITN, HOB, KRD, TW).

Input:

Argument list	CØMMØN/UTILITY/	Input Tape
EMITN	KOUT	FAI(7,18)
HOB	NHRNT(15)	FM(18)
KRD		FØG(5,7,18)
TW		HL(7,18)
		ISØ(18)
		KEV(7,18)
		LH(7,18)
		IMAX
		NA(7,18)
		NE(18)
		RNY(5,7,18)
		SIGI(7,18)
		SIGISC(7,18)

Output:

CØMMØN/INDUCE/

ALBFØM
FAC(7,18)
FØGRNY(7,18)
ISØ(18)
IMAX
XIAM(7,18)

Storage requirement (exclusive of CØMMØN): 6145_8, 3173_{10}

Calling program: PAM1, Sequence 131

Subroutine called: TIMSEC

Flowcharts: Figures 3.12a through 3.12c

This subroutine and INDCD2 are a modification of the program described by Jones (Reference 4). The principal modification was elimination of the separate pass through the program for weapon casing. The program was split into time-dependent and

time-independent phases for greater efficiency. A new variable, ALBFØM = ALB*FØM, was introduced to facilitate communication with INDCD2.

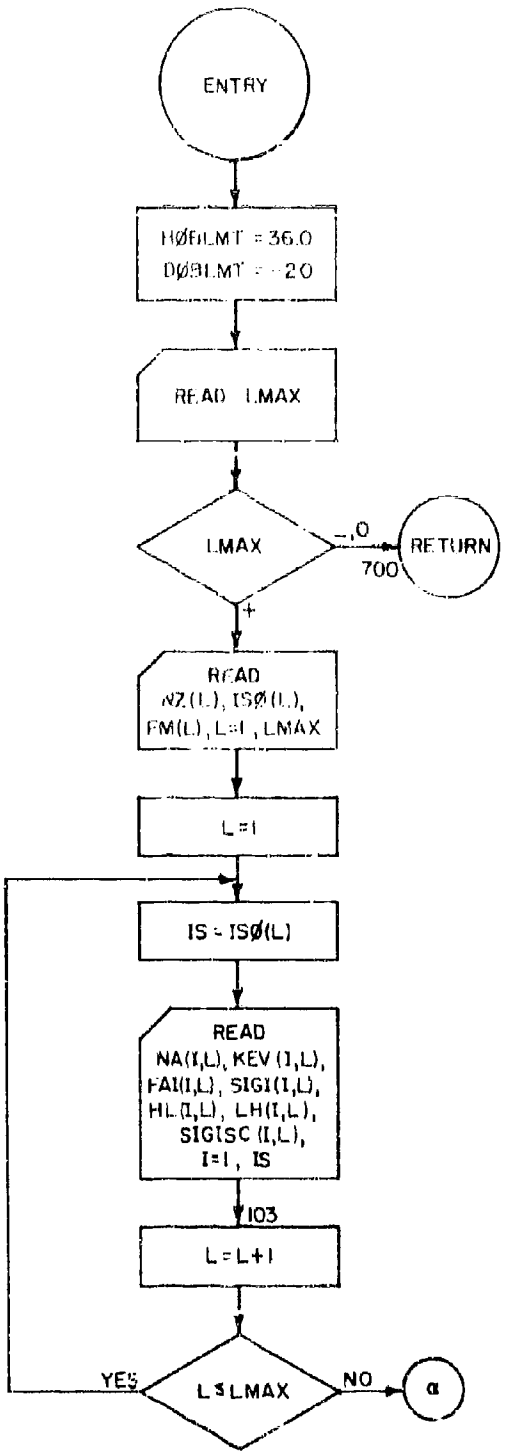


Figure 3.12a Detailed flowchart for Subroutine INDCD1.

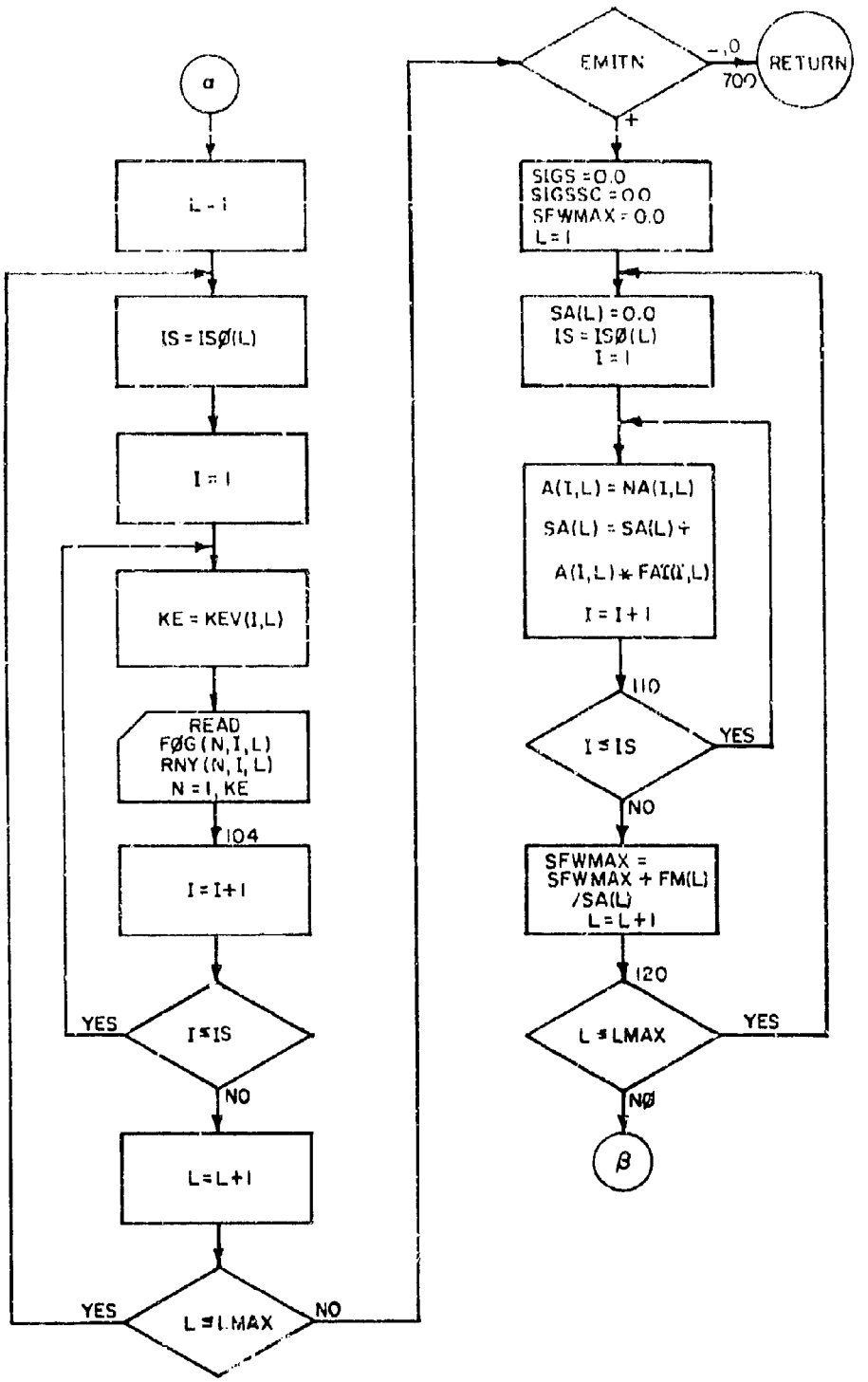


Figure 3.12b Detailed flowchart for Subroutine INDCD1.

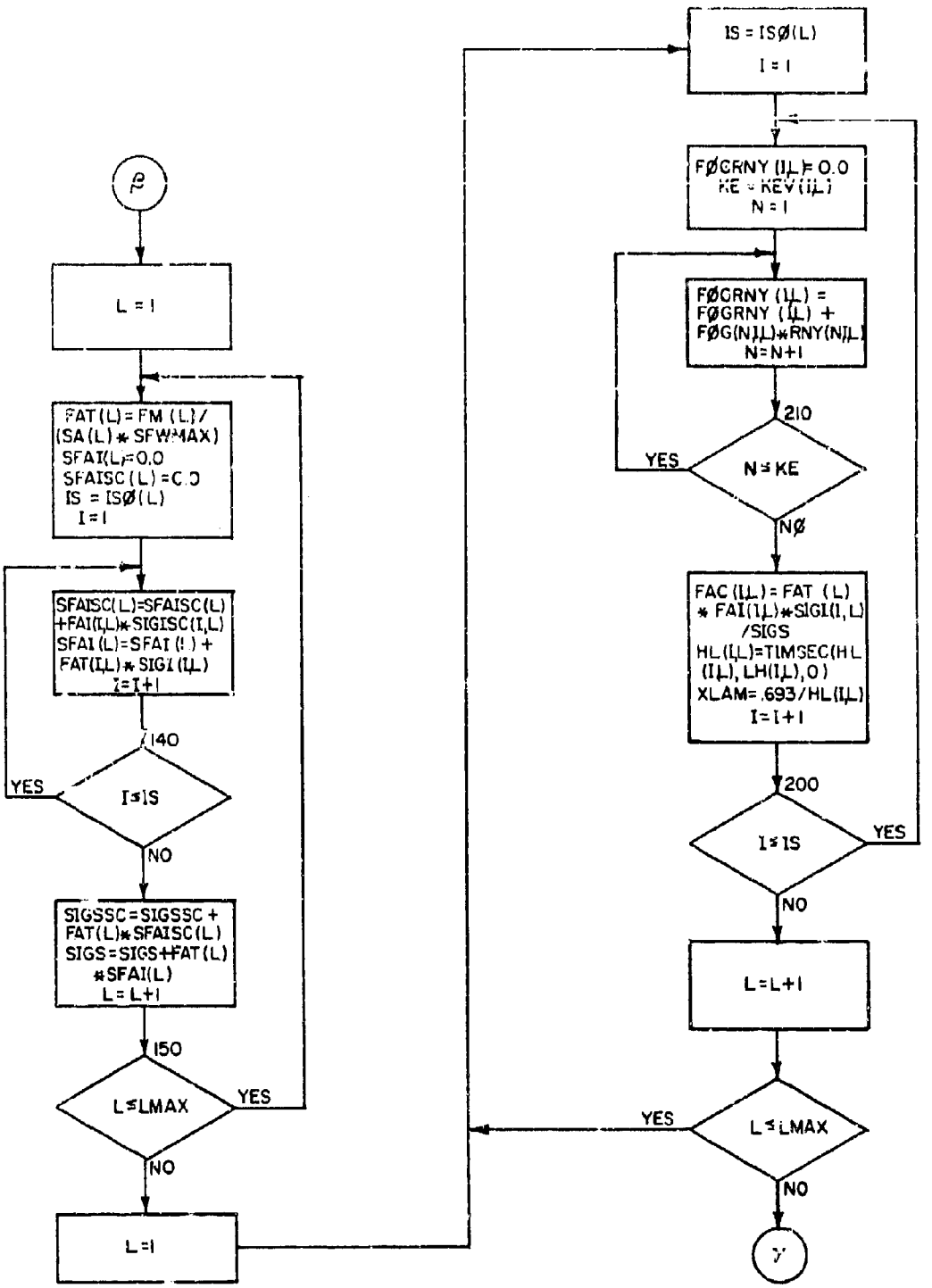


Figure 3.12c Detailed flowchart for Subroutine INDCD1.

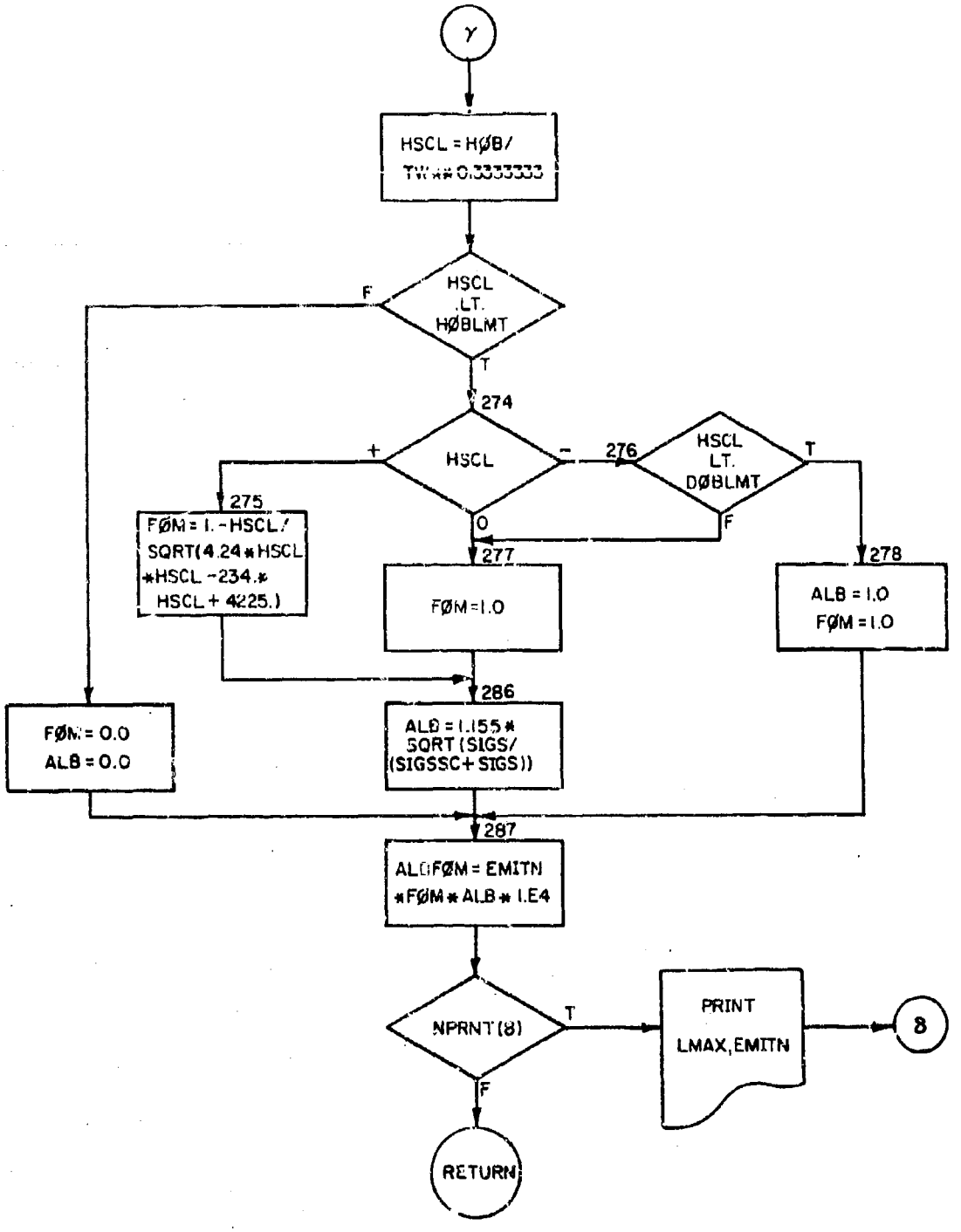


Figure 3.12d Detailed flowchart for Subroutine INDCD1.

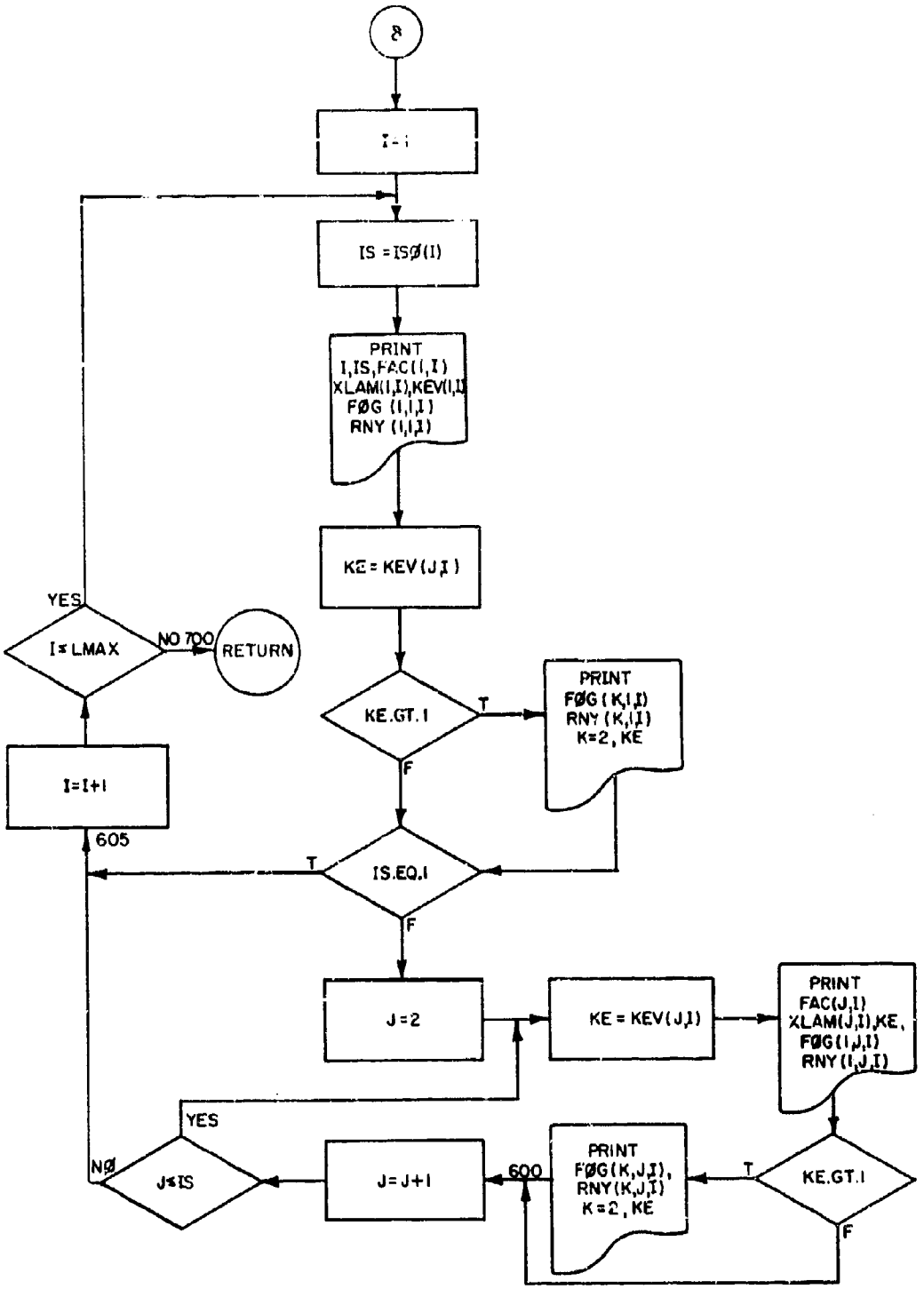


Figure 3.12e Detailed flowchart for Subroutine INDCD1.

3.4.2 Subroutine INDCD2.

Input:

CØMMØN/INDUCE/	CØMMØN/UTILITY/	CØMMØN/ØUTPUT/
ALBRØM	KØUT	FISNUM
FAC(7,18)	NPRNT(15)	ITAB
FØGRNY(7,18)		
ISØ(18)		
IMAX		
XLAM(7,18)		

CØMMØN/DECAY/	CØMMØN/SET3/
JD	FMASS(200)
KDØS	
TENTER	
TEXIT	
TIME	

Output:

CØMMØN/ØUTPUT/

FP(200)

Storage requirement (exclusive of CØMMØN): 262_8, 178_{10}

Calling program: PAM2, Sequence 76

Flowchart: Figure 3.13

See Subroutine INDCD1 for discussion.

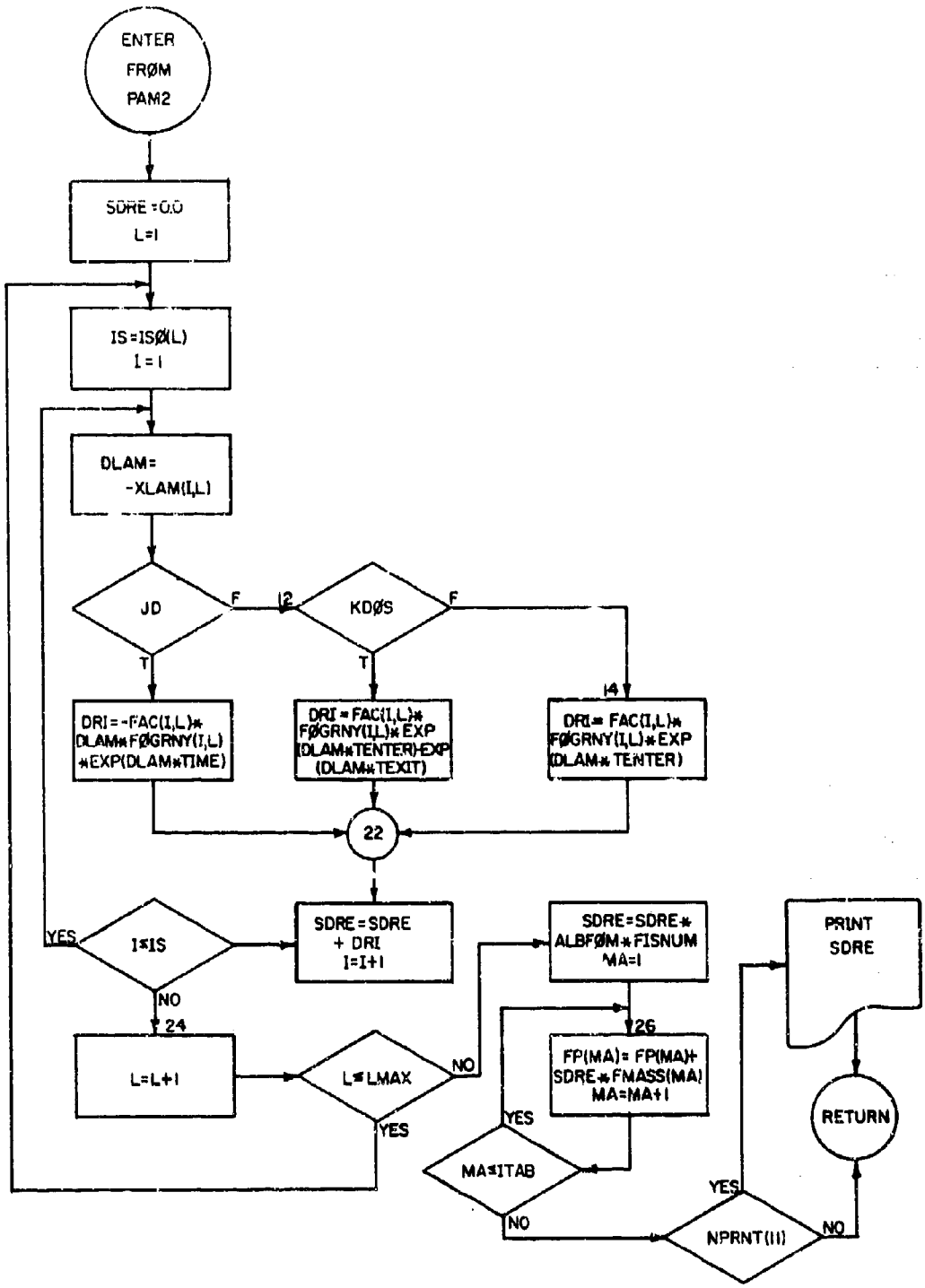


Figure 3.13 Detailed flowchart for Subroutine INDCD2.

3.4.3 Subroutine URAN.

Input:

CØMMØN/UTILITY/	CØMMØN/ØUTPUT/	CØMMØN/DECAY/	CØMMØN/SET3/
KØUT	FISNUM	JD	FMASS(200)
NPRNT(15)	ITAB	KDØS	
		TENTER	
		TEXIT	
		TIME	

Output:

CØMMØN/ØUTPUT/

FP(200)

Storage requirement (exclusive of CØMMØN): 357_8, 239_{10}

Calling program: PAM2, Sequence 74

Flowchart: Figure 3.14

This subroutine computes the activity of ^{239}U and ^{239}Np produced by capture of neutrons by ^{238}U in the device. It evaluates the equations for decay of a parent-daughter pair in a straightforward manner.

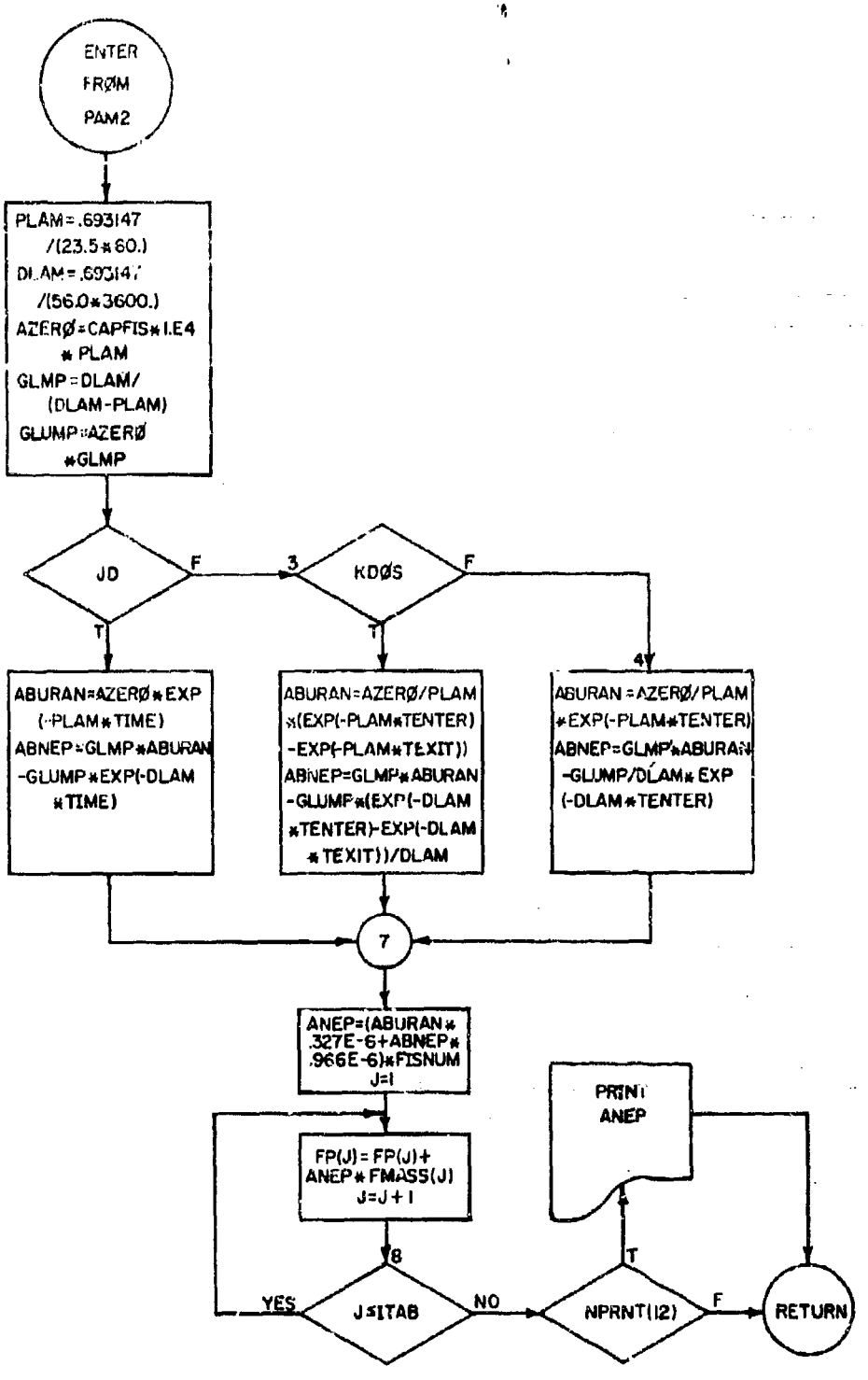


Figure 3.14 Detailed flowchart for Subroutine URAN.

3.5 Utility Programs.

3.5.1 Function TIMSEC (TIME, IUNIT, IEXP).

Input is the argument list

Storage requirement: 113_8, 75_{10}

Calling programs:

SETJP, Sequence 170
INDCD1, Sequence 125
LINK9, Sequence 170, 171

This function converts time in various units to seconds. The input is

$TIME \times 10^{IEXP}$ in units coded

in IUNIT as follows:

1	seconds
2	minutes
3	hours
4	days
5	years

3.5.2 Subroutine UNPACK (IA, IZ, IS, NAME).

Input:

NAME

Output:

IA
IS
IZ

Storage requirement: 67_8, 55_{10}

Calling programs:

YIELD, Sequence 98
XPRM, Sequence 90

4. USER INFORMATION

4.1 Input.

The PAM normally obtains data from three sources: (1) the other modules of DELFIC via argument list and CØMMØN, (2) input cards, (3) magnetic tape (optionally replaced by cards). The first source comprises the following variables:

FISNUM	Number of fissions/10^8
FMASS(200)	Mass fraction in size class
FW	Fission yield, kt
HOB	Height of burst, ft
IPØUT	Logical tape number
ISIN	Logical tape number
ISØUT	Logical tape number
ITAB	Number of particle-size classes
JD	Control parameter
JGØ	Control parameter
KDØS	Control parameter
MASCHN	User-requested mass chain
PSIZE(200)	Midpoint of size class, μ
SIGMA	Not used
SIGMAS	Not used
SLDTMP	Melting point of soil, °K
TENTER	User-requested time, s
TEXIT	User-requested time, s
TIME	User-requested time, s
TMSD	Time of soil condensation, s
TW	Total yield, kt

The input to PAM from sources 2 and 3 can be categorized into three classes (1) specific (to the computer run), (2) invariant, (3) quasi-invariant. The specific data are always on cards. Classes 2 and 3 are normally on magnetic tape, but either one or both can be on cards. The invariant data are the fission-product-tables, the exposure-rate multipliers, and the fission-yield tables. The soil composition is classified as quasi-invariant because only one set (Nevada Test Site) now exists. However, additional soil types may become available in the future.

Figure 4.1 shows the flow of input cards to the PAM. The squares represent card decks described on the pages following. The invariant and quasi-invariant data are described in the Appendix.

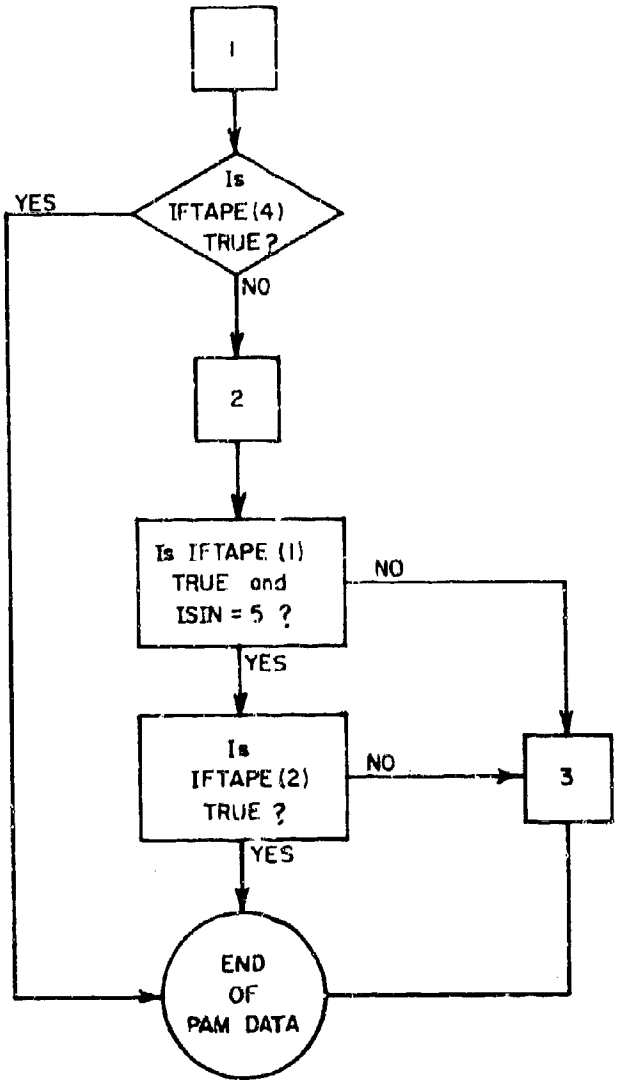


Figure 4.1 Input flowchart.

1

Card Sequence	Mnemonic	Format
1	PAMID(J), J=1,12	12A6
2	IFTAPE(J), J=1,10	10L1
3	NPRNT(J), J=1,15	15L1

PAMID(J) : Arbitrary 72 character particle activity module identifier.

IFTAPE(J) : File control parameters.

IFTAPE(1) : If FALSE, INTP = ISIN.

If TRUE and ISIN = 5, INTP = 12.

If TRUE and ISIN $\neq$ 5, INTP = 5.

IFTAPE(2) : If FALSE, KRD = ISIN

If TRUE, KRD = INTP

IFTAPE(3) : If TRUE, write PAM restart information as a trailer on the grounded particles file (logical 9). Be sure 9 has ring in.

IFTAPE(4) : If TRUE, the PAM expects restart information on logical 9.

NPRNT(J) : Printout Control Parameters. See Table 4.1

Deck 1 is read by subroutine PAM1.

2

Card Sequence	Mnemonic	Format
1	CAPFIS, EMITN	2F10.3
2	FISSID	A6

CAPFIS : Capture-to-fission ratio.

EMITN : Number of neutrons emitted per fission.

FISSID : Type of fission (See DASA-1800-V).

Deck 2 is read by subroutine PAM1.

3

Card Sequence	Mnemonic	Format

This option allows the invariant PAM data (on distributed Reel B) to be read into the program on cards. For a detailed description of the data deck required for this option see the Appendix.

4.2 Output.

The primary output of the PAM is the array FP(200), communicated to the Output Processor by CØMMØN/ØUTPUT/. The units of FP may be any of four, depending upon user option.

1. $R.m^{2}.h^{-1}$
2. $R.m^{2}$
3. Ci
4. equivalent fissions.

In the Output Processor (Subroutine CAIC), FP is multiplied by the mass fraction per unit area (m^{-2}) at each grid point. The so-called normalization factor, K, ($R.mi^{2}.kt^{-1}.h^{-1}$) can be obtained from

$$K = 3.861 \times 10^{-7} \frac{(FP).n_s}{W_f} \quad ,$$

where

n_s = number of particle-size classes,

W_f = fission yield in kilotons,

and FP is obtained from option 1 above.

Printed output is controlled by the array NPRNT. The effect of setting each entry .TRUE. is shown in Table 4.1

TABLE 4.1

PAM Printout Control

Index of Array NPRNT	Subroutine Involved	Printout Resulting from TRUE Value
1	SETUP	Transition Cards (Warning-Produces some 700 pages)
2	SETUP	Intermediate Form of Nuclide Table (Octal)
3	SETUP	Final Form of Nuclide Table (Octal)
4	YIELD	Fission Yield Table
5	XPRM	Exposure Rate Multipliers
6	FRATIC	Refractory Fractions (FR)
7	FRATIC	Square Root of FR (BSUBK)
8	INDCD1	Information Stored for Use by INDCD2
9	BATMAN	Nuclide Abundances (Warning - This option combined with JD = FALSE will bury you in paper)
10	GXPSR	Fission Product Activity vs Part Size (Warning - See 9)
11	INDCD2	Induced Activity (Soil) vs Part Size (Warning - See 9)
12	URAN	Induced Activity (Mass 239) vs Part Size (Warning - See 9)
13	MCHDEP	Selected Mass Chain Activity vs Part Size
14		SPARE
15	PAM2	Total Activity vs Part Size (Warning - See 9)

5. FORTRAN LISTINGS

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```
$IBFTC BAT1     LIST,BECK,M94/2                                         BAT1   0
      SUBROUTINE BATMAN                                                 BAT1   1
C     VERSION 1                                                         BAT1   2
C     R C TOMPKINS -- US ARMY NUCLEAR DEFENSE LABS                      BAT1   3
C     AUGUST 1966                                                       BAT1   4
C   THIS VERSION REPLACES SUBROUTINES INGEN, BATMAN, DECAY, AND DOSE OF BAT1   5
C   THE INITIAL VERSION OF DELF$C                                       BAT1   6
C                                                                       BAT1   7
C                                                                       BAT1   8
C   THE FUNCTION OF THIS SUBROUTINE IS TO COMPUTE RADIOACTIVE DECAY     BAT1   9
C   CHAINS BY MEANS OF THE BATEMAN EQUATION                             BAT1  10
CALLED BY FRATIO, GXPSR, AND MCHDEP                                     BAT1  11
C                                                                       BAT1  12
C  * * * * * * * * * * GLOSSARY * * * * * * * * * * * * * * * * * * * * BAT1  13
C   ABEGN(700)     INITIAL FISSION PRODUCT ABUNDANCES IN ATOMS/10000    BAT1  14
C                  FISSIONS (PARALLEL TO NUCLID)                        BAT1  15
C   ABUNDO(700)    FISSION PRODUCT ABUNDANCES PER 10000 FISSIONS        BAT1  16
C                  ATOMS AT TMSD IN FRATIO                              BAT1  17
C                  DISINTEGRATIONS/SEC AT TIME (UD=1)                   BAT1  18
C                  DISINTEGRATIONS FROM TENTER TO TEXIT                 BAT1  19
C                  OR INFINITY (UD=2)                                   BAT1  20
C   B(15)          CONTRIBUTION OF ONE SUBCHAIN TO ABUNDO               BAT1  21
C   CNIJ(680)      BATEMAN COEFF$CIENTS FOR ONE SUBCHAIN                BAT1  22
C   IBR            COUNTER TO KEEP PLACE IN BRANCHING RATIO TABLE WHILE BAT1  23
C                  SCANNING NUCLIDE TABLE                               BAT1  24
C   IFIGO          ASSIGNED GOTO PARAMETER CORRESPONDING TO IGO         BAT1  25
C   IFJD           ASSIGNED GOTO PARAMETER CORRESPONDING TO JD          BAT1  26
C   IGO            (LOGICAL) TRUE GIVES ACTIVITY,                       BAT1  27
C                  FALSE GIVES ATOMIC ABUNDANCES                        BAT1  28
C   INFORM(11)     TABLE OF DAUGHTER RETRIEVAL INFORMATION FOR EACH     BAT1  29
C                  MEMBER OF A SUBCHAIN, OBTAINED BY TRUNCATING NUCLID  BAT1  30
C                  FROM THE LEFT                                        BAT1  31
C   JD             (LOGICAL) TRUE COMPUTES EXPOSURE RATE,               BAT1  32
C                  FALSE COMPUTES DOSE                                  BAT1  33
C   KDOS           (LOGICAL) TRUE COMPUTES DOSE FROM TENTER TO TEXIT,   BAT1  34
C                  FALSE COMPUTES DOSE FROM TENTER TO INFINITY          BAT1  35
C   KFJD           SEE IFJD                                             BAT1  36
C   LIM(11)        SUBCHAIN TABLE OF INDICES FOR MULT TO FIND CURRENT   BAT1  37
C                  BRANCHING PATH                                       BAT1  38
C   LSUB           COUNTER FOR SUBCHAIN MEMBERS                         BAT1  39
C   NUC(11)        CROSS REFERENCE OF SUBCHAIN MEMBERS TO INDEX IN NUCLIDBAT1  40
C   SBR(11)        SUBCHAIN BRANCHING RATIOS                            BAT1  41
C   SCA(15)        FISSION YIELDS OF SUBCHAIN MEMBERS                   BAT1  42
C   SDC(15)        DISINTEGRATION CONSTANTS OF SUBCHAIN MEMBERS         BAT1  43
C   TENTER         ENTRY TIME (SEC) FOR DOSE CALCULATION WITH JD = FALSE BAT1  44
C   TEXIT          EXIT TIME (SEC) FOR DOSE CALCULATION                 BAT1  45
C                  WITH JD = FALSE, KDOS = TRUE                         BAT1  46
C   TIME           TIME (SEC) AT WHICH EXPOSURE RATE OR MASS CHAIN      BAT1  47
C                  DEPOSITE IS CALCULATED WITH JD = TRUE                BAT1  48
C                                                                       BAT1  49
```


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```
C
      COMMON/OUTPUT/
     1     FISNUM        ,FP     (200) ,FH            ,ITAB        ,JGO
     2    ,MASCHN        ,SIGMAS
      COMMON/UTILTY/
     1     KOUT          ,NPRNT (15)
C
      COMMON/INDUCE/
     1     ALBFOM        ,FAC    (7,18),FOGRNY(7,18),ISO    (18)
     2    ,LMAX          ,XLAM   (7,18)
C
      COMMON/FISHIN/
     1     ABEGN (700) ,ABUNDO(700) ,BRANCH(130) ,CAPFIS
     2    ,DCON  (700) ,IBRA        ,INUC        ,MAXNUC
     3    ,MULT  (11)  ,NUCLID(700)
C
      COMMON/DECAY/
     1     IGO           ,JD           ,KDOS        ,TENTER
     2    ,TEXIT         ,TIME
C
      COMMON/FRYLNG/
     1     BSUBK (90)   ,ERM    (185) ,JRM    (185) ,KRM     ,ECF(90)
C
      COMMON/SET 3/DUMMY(3753)
C
      DIMENSION  EFAC  (11)  ,KBR    (11)
     1           ,INFORM(11) ,LIM    (11)  ,NUC    (11)  ,SBR    (11)
     2           ,SCA   (11) ,SDC    (11)
C
      LOGICAL JD,KDOS,IGO,FLAG,NPRNT
C
CC  SET INITIAL VALUES
      DO 1 I = 1,INUC
    1 ABUNDO(I) = 0.0
      IBR = 0
C
CC  BEGIN MAIN LOOP THROUGH THE NUCLIDE TABLE
C
   10 DO 500 IN = 1,INUC
C   FIND THE NEXT NUCLIDE THAT BEGINS A SUBCHAIN
      IF (NUCLID(IN))11,500,499
C
C   SET PARAMETERS FOR BEGINNING OF A SUBCHAIN
C         MEMBERSHIP COUNTER
   11 LSUB = 1
C         BRANCHING RATIO COUNTER
      LBR = IBR
      KBR(1) = LBR
C         STARTING INDEX
```

```
      NUC(1) = IN                                                       BAT1  99
   12 LIM(LSUB) = 4                                                     BAT1 100
C   PROCESS A SUBCHAIN MEMBER                                           BAT1 101
   13 KP = NUC(LSUB)                                                    BAT1 102
      IM = LIM(LSUB)                                                    BAT1 103
      INFO = MOD(IABS(NUCLID(KP)),MULT(5))                              BAT1 104
      INFORM(LSUB) = INFO                                               BAT1 105
      INC = 1                                                           BAT1 106
C   SET UP SUBCHAIN DISINTEGRATION CONSTANTS                            BAT1 107
      SDC(LSUB) = DCON(KP)                                              BAT1 108
CHECK FOR END OF SUBCHAIN                                               BAT1 109
      IF (INFO.EQ.4) GO TO 21                                           BAT1 110
CHECK FOR BRANCHING                                                     BAT1 111
      IF (MOD(INFO,MULT(1)).LT.4) GO TO 14                              BAT1 112
      SBR(LSUB) = 1.0                                                   BAT1 113
      GO TO 15                                                          BAT1 114
C   SET UP SUBCHAIN BRANCHING RATIOS                                    BAT1 115
   14 LB = LBR + 5 - IM                                                 BAT1 116
      SBR(LSUB) = BRANCH(LB)                                            BAT1 117
C   EXTRACT THE DAUGHTER INCREMENT                                      BAT1 118
   15 ID = MOD(INFO,MULT(IM+1))/MULT(IM)                                BAT1 119
C   SEE IF THIS INCREMENT SHOULD BE NEGATIVE                            BAT1 120
      IF (MOD(INFO,MULT(2))/MULT(1).EQ.IM)GO TO 16                      BAT1 121
C   SET PARAMETER TO LOOK AHEAD FOR BRANCHING RATIO OF DAUGHTER         BAT1 122
      KI = KP                                                           BAT1 123
      GO TO 17                                                          BAT1 124
C   SET PARAMETER TO LOOK BEHIND FOR BRANCHING RATIO OF DAUGHTER        BAT1 125
   16 KI = 1                                                            BAT1 126
      LBR = 0                                                           BAT1 127
      INC = -INC                                                        BAT1 128
COMPUTE DAUGHTER INDEX                                                  BAT1 129
   17 NDAUT = KP + INC*ID                                               BAT1 130
      KDA = NDAUT - 1                                                   BAT1 131
C   STEP THROUGH THE NUCLIDE TABLE TO ESTABLISH THE CORRECT INDEX FOR   BAT1 132
C   THE BRANCHING RATIO OF THE DAUGHTER                                 BAT1 133
      DO  20 K = KI,KDA                                                 BAT1 134
   20 LBR = LBR + 4 - IABS(MOD(NUCLID(K),MULT(1)))                      BAT1 135
      KBR(LSUB+1) = LBR                                                 BAT1 136
C                                                                       BAT1 137
C   ACCEPT THE DAUGHTER FOR MEMBERSHIP IN THE SUBCHAIN AND RECYCLE      BAT1 138
      LSUB = LSUB + 1                                                   BAT1 139
      IF (LSUB.GT.11) GO TO 1301                                        BAT1 140
      NUC(LSUB) = NDAUT                                                 BAT1 141
      GO TO 12                                                          BAT1 142
C                                                                       BAT1 143
CC  A SUBCHAIN HAS NOW BEEN SET UP AND CAN BE STUDIED IN TOTO           BAT1 144
C   ELIMINATE  UNI-MEMBERED SUBCHAIN                                    BAT1 145
   21 IF (LSUB.EQ.1) GO TO 500                                          BAT1 146
C   RUN BACK THROUGH THE SUBCHAIN TO ACCUMULATE BRANCHING RATIOS        BAT1 147
      ASSIGN 23 TO LGO                                                  BAT1 148
      JL = 0                                                            BAT1 149
      SCA(LSUB) = 1.0                                                   BAT1 150
      LAST = LSUB + 1                                                   BAT1 151
      DO 22 L = 2,LSUB                                                  BAT1 152
      LBACK = LAST - L                                                  BAT1 153
      SCA(LBACK) = 1.0                                                  BAT1 154
      GO TO LGO,(22,23)                                                 BAT1 155
C   FIND THE LAST BRANCH IN THE SUBCHAIN                                BAT1 156
   23 IM = LIM(LBACK)                                                   BAT1 157
      IF (MOD(INFORM(LBACK),MULT(IM))/MULT(IM-1))22,22,24               BAT1 158
```

```
   24 JL = LBACK                                                        BAT1 159
      ASSIGN 22 TO LBO                                                  BAT1 160
   22 SCA(LBACK) = SBR(LBACK)*SCA(LBACK+1)                              BAT1 161
      SCA(LSUB) = 0.0                                                   BAT1 162
CORRECT FISSION YIELDS FOR BRANCHING                                    BAT1 163
      FLAG = .FALSE.                                                    BAT1 164
      DO 25 J = 1,LSUB                                                  BAT1 165
      JN = NUC(J)                                                       BAT1 166
      SCA(J) = SCA(J)*BEGN(JN)                                          BAT1 167
      IF (FLAG) GO TO 25                                                BAT1 168
C   MAKE A NOTE IF AT LEAST ONE VALUE OF SCA IS NONTRIVIAL              BAT1 169
      IF (SCA(J))25,25,27                                               BAT1 170
   27 FLAG = .TRUE.                                                     BAT1 171
   25 CONTINUE                                                          BAT1 172
C                                                                       BAT1 173
C   OMIT COMPUTATIONS FOR TRIVIAL SUBCHAIN                              BAT1 174
      IF (.NOT.FLAG) GO TO 30                                           BAT1 175
C                                                                       BAT1 176
CC  THE CENTRAL COMPUTATIONS BEGIN AT THIS POINT                        BAT1 177
C                                                                       BAT1 178
      DO 200 N = 1,LSUB                                                 BAT1 179
COMPUTE EXPONENTIALS BEFORE ENTERING INNER  LOOPS                       BAT1 180
      IF (JD) TENTER = TIME                                             BAT1 181
      EFAC(N) = EXP(-SDC(N)*TENTER)                                     BAT1 182
      IF (KDOS) EFAC(N) = EFAC(N) - EXP(-SDC(N)*TEXIT)                  BAT1 183
      B = 0.0                                                           BAT1 184
C                                                                       BAT1 185
      DO 150 I = 1,N                                                    BAT1 186
      DO 150 K = I,N                                                    BAT1 187
C                                                                       BAT1 188
COMPUTE BATEMAN COEFFICIENTS                                            BAT1 189
      CNIJ = 1.0                                                        BAT1 190
      DO 106 L = I,N                                                    BAT1 191
      IF (N.GT.L) CNIJ = CNIJ*SDC(L)                                    BAT1 192
      IF (L.EQ.K) GO TO 106                                             BAT1 193
      FACTC = SDC(L) - SDC(K)                                           BAT1 194
      IF (ABS(FACTC).LT.1.E-15) FACTC = SIGN(1.E-15,FACTC)              BAT1 195
      CNIJ = CNIJ/FACTC                                                 BAT1 196
  106 CONTINUE                                                          BAT1 197
COMPUTE BATEMAN EQUATION, BRANCH TO 109 FOR INTEGRATED FORM             BAT1 198
C                                                                       BAT1 199
      Q = CNIJ*SCA(I)*EFAC(K)                                           BAT1 200
      IF (JD) GO TO 150                                                 BAT1 201
C   PREVENT DIVIDE CHECK ERROR                                          BAT1 202
      IF (SDC(K))150,150,110                                            BAT1 203
  110 Q = Q/SDC(K)                                                      BAT1 204
  150 B = B + Q                                                         BAT1 205
C   STORE RESULTS IN ABUNDANCE TABLE                                    BAT1 206
      IF (B)200,200,151                                                 BAT1 207
  151 IF (IGO) B = B*SDC(N)                                             BAT1 208
      NK = NUC(N)                                                       BAT1 209
      ABUNDO(NK) = ABUNDO(NK) + B                                       BAT1 210
  200 CONTINUE                                                          BAT1 211
C                                                                       BAT1 212
C   SET UP A NEW SUBCHAIN STARTING FROM DEEPEST UNEXPLORED BRANCH       BAT1 213
   30 IF (JL)500,499,31                                                 BAT1 214
   31 LSUB = JL                                                         BAT1 215
      LIM(LSUB) = LIM(LSUB) - 1                                         BAT1 216
      LBR = KBR(LSUB)                                                   BAT1 217
      GO TO 13                                                          BAT1 21
```

```
C                                                                       BAT1 219
C                                                                       BAT1 220
 1301        WRITE (KOUT,1351) NUCLID(IN)                               BAT1 221
C                                                                       BAT1 222
C   STEP UP BRANCH COUNTER IN MAIN LOOP                                 BAT1 223
  499 IBR = IBR + 4 - MOD(IABS(NUCLID(IN)),MULT(1))                     BAT1 224
  500 CONTINUE                                                          BAT1 225
      IF (NPRNT(9)) WRITE (KOUT,1000) (NUCLID(I),ABUNDO(I),I=1,INUC)    BAT1 226
      RETURN                                                            BAT1 227
 1000 FORMAT (17H1OUTPUT OF BATMAN//8X6HNUCLID11X6HABUNDO/              BAT1 228
     1    (5X012,5X1PE12.4))                                            BAT1 229
 1351 FORMAT (25H0SUBCHAIN BEGINNING WITH 012,8H TOO BIG)               BAT1 230
      END                                                               BAT1 231
$IBFTC TIMSEX  LIST,DECK,M94/2                                          TIMS   0
C    FTIMSEC - 3/66 - TOMPKINS                                          TIMS   1
C                                                                       TIMS   2
      FUNCTION TIMSEC (TIME,IUNIT,IEXP)                                 TIMS   3
C                                                                       TIMS   4
      GO TO (1,2,3,4,5),IUNIT                                           TIMS   5
C                                                                       TIMS   6
    1 SCALE = 1.0                                                       TIMS   7
      GO TO 6                                                           TIMS   8
    2 SCALE = 60.0                                                      TIMS   9
      GO TO 6                                                           TIMS  10
    3 SCALE = 3.6E3                                                     TIMS  11
      GO TO 6                                                           TIMS  12
    4 SCALE = 8.64E4                                                    TIMS  13
      GO TO 6                                                           TIMS  14
    5 SCALE = 8.64E4*365.25                                             TIMS  15
C                                                                       TIMS  16
    6 TIMSEC = TIME*SCALE*10.**IEXP                                     TIMS  17
      RETURN                                                            TIMS  18
      END                                                               TIMS  19
$IBFTC UNPAX   LIST,DECK,M94/2                                          UNPA   0
C     SRUNPACK - 3/66 - MEREDITH                                        UNPA   1
C                                                                       UNPA   2
      SUBROUTINE UNPACK                                                 UNPA   3
     1    (IA,IZ,IS,NAME)                                               UNPA   4
C                                                                       UNPA   5
      JX = 8                                                            UNPA   6
      JY = 4096                                                         UNPA   7
C                                                                       UNPA   8
      IA = NAME/JY                                                      UNPA   9
      IZ = (NAME - IA*JY)/JX                                            UNPA  10
      IS =  MOD (NAME,JX)                                               UNPA  11
C                                                                       UNPA  12
   10 RETURN                                                            UNPA  13
      END                                                               UNPA  14
                                                                        UNPA  13
```

```
$IBFTC PAM1ST  LIST,DECK,H94/2                                          PAM1   0
      SUBROUTINE PAM1                                                   PAM1   1
     1    (MOD    ,SLDTMP ,TMSD   ,TW                                  PAM1   2
     2    ,ISIN   ,ISOUT  ,IPOUT  ,SIGMA )                             PAM1   3
C                                                                       PAM1   4
C     R C TOMPKINS -- US ARMY NUCLEAR DEFENSE LABS                      PAM1   5
C     OCTOBER 1966                                                      PAM1   6
C                                                                       PAM1   7
C   EXECUTIVE PROGRAM FOR TIME-INDEPENDENT PART OF PARTICLE-ACTIVITY    PAM1   8
C   MODULE                                                              PAM1   9
CALLED BY LINK8                                                         PAM1  10
CALLS SETUP7 YIELD, XPRM, INDCD1, AND FRATIO                            PAM1  11
C                                                                       PAM1  12
C  * * * * * * * * * * * * * GLOSSARY * * * * * * * *                   PAM1  13
C                                                                       PAM1  14
C   CAPFIS          CAPTURE-TO-FISSION RATIO                            PAM1  15
C   EMITN           NUMBER OF NEUTRONS EMITTED PER FISSION              PAM1  16
C   FISSID          SIX CHARACTER IDENTIFIER OF FISSION TYPE            PAM1  17
C   IFTAPE(10)      LOGICAL ARRAY TO CONTROL FILE MANIPULATION          PAM1  18
C                   (1) TRUE - SET INTP NOT EQUAL TO ISIN               PAM1  19
C                       FALSE - SET INTP = ISIN                         PAM1  20
C                   (2) TRUE - SET KRD = INTP                           PAM1  21
C                       FALSE - SET KRD = ISIN                          PAM1  22
C                   (3) TRUE - WRITE FILE IPAM                          PAM1  23
C                   (4) TRUE - READ FILE IPAM INTO MEMORY AND RETURN    PAM1  24
C                   (5-10) SPARES                                       PAM1  25
C   IPAM            BINARY FILE OF PAM1 OUTPUT FOR RESTARTS             PAM1  26
C   ISIN            INPUT FILE (BCD) USED BY OTHER DELFIC MODULES       PAM1  27
C   KOUT            BCD FILE OF PAM OUTPUT FOR PERIPHERAL PRINTING      PAM1  28
C   KRD             INPUT FILE (BCD) CONTAINING SOIL PARAMETERS         PAM1  29
C   NPRNT(20)       LOGICAL ARRAY TO CONTROL WRITING OF KOUT, TRUE = WRITEPAM1  30
C                   (1)  SETUP - TRANSITION CARDS (WARNING - PRODUCES SOMEPAM1  31
C                            700 PAGES)                                 PAM1  32
C                   (2)  SETUP - INTERMEDIATE FORM OF NUCLIDE TABLE (OCTALPAM1  33
C                   (3)  SETUP - FINAL FORM OF NUCLIDE TABLE (OCTAL)    PAM1  34
C                   (4)  YIELD - FISSION YIELD TABLE                    PAM1  35
C                   (5)  XPRM - EXPOSURE RATE MULTIPLIERS               PAM1  36
C                   (6)  FRATIO - REFRACTORY FRACTIONS (FR)             PAM1  37
C                   (7)  FRATIO - SQUARE ROOT OF FR (BSUBK)             PAM1  38
C                   (8)  INDCD1 - INFORMATION STORED FOR USE BY INDCD2  PAM1  39
C                   (9)  BATMAN - NUCLIDE ABUNDANCES (WARNING - THIS    PAM1  40
C                        OPTION COMBINED WITH JD = FALSE WILL BURY YOU  PAM1  41
C                        IN PAPER!                                      PAM1  42
C                   (10) GXPSR - FISSION PRODUCT ACTIVITY VS PART SIZE  PAM1  43
C                        (WARNING - SEE (9))                            PAM1  44
C                   (11) INDCD2 - INDUCED ACTIVITY (SOIL) VS PART SIZE  PAM1  45
C                        (WARNING - SEE (9))                            PAM1  46
C                   (12) URAN - INDUCED ACTIVITY (   S 239) VS PART SIZE PAM1  47
C                        (WARNING - SEE (9))                            PAM1  48
C                   (13) MCHDEP - SELECTED MA   CHAIN ACTIVIY VS PART SIZEPAM1  49
C                   (14) SPARE                                          PAM1  50
C                   (15) PAM2 - TOTAL ACTIVITY VS PART SIZE (WARNING-SEE 9PAM1  51
C                   (16-20) SPARES                                      PAM1  52
C   PAMID(12)       RUN IDENTIFICATION FOR PARTICLE-ACTIVITY MODULE     PAM1  53
```

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C  * *  *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *        PAM1  54
C                                                                            PAM1  55
      COMMON/FISHIN/                                                         PAM1  56
     1    ABEGN (700) ,ABUNDO(700) ,BRANCH(130) ,CAPFIS                      PAM1  57
     2   ,DCON  (700) ,IBRA        ,INUC        ,MAXNUC                      PAM1  58
     3   ,MULT  (11)  ,NUCLID(700)                                           PAM1  59
      COMMON/INDUCE/                                                         PAM1  60
     1    ALBFOM       ,FAC    (7,18),FOGRNY(7,18),ISO    (18)               PAM1  61
     2   ,LMAX         ,XLAM   (7,18)                                        PAM1  62
      COMMON/UTILTY/                                                         PAM1  63
     1    KOUT         ,NPRNT (15)                                           PAM1  64
      COMMON/FRYLNG/                                                         PAM1  65
     1    BSUBK (90)   ,ERM    (185) ,JRM    (185) ,KRM     ,ECF(90)         PAM1  66
      COMMON/OUTPUT/                                                         PAM1  67
     1    FISNUM       ,FP     (200) ,FW            ,ITAB        ,JGO        PAM1  68
     2   ,MASCHN       ,SIGMAS                                               PAM1  69
      DIMENSION                                                              PAM1  70
     1    PAMID (12)                                                        PAM1  71
      LOGICAL                                                                PAM1  72
     1    NPRNT        ,IFTAPE(10)                                           PAM1  73
C                                                                            PAM1  74
C*************************************************************************PAM1  75
C                                                                            PAM1  76
    1 FORMAT (12A6/10L1/20L1)                                                PAM1  77
    2 FORMAT (2F10.3/A6)                                                     PAM1  78
    3 FORMAT (1H1///51X19H* * * * * * * * * *//12X101HT H E   D E P A R PAM1  79
     1T M E N T   O F   D E F E N S E   F A L L O U T   P R E D I C T I PAM1  80
     20 N   S Y S T E M//51X19H* * * * * * * * * *////48X24HPARTICLE ACTPAM1  81
     3IVITY MODULE///55X11HPREPARED BY/43X34HUS ARMY NUCLEAR DEFENSE LABPAM1  82
     4ORATORY/47X26HEDGEWOOD ARSENAL, MARYLAND////24X12A6)               PAM1  83
    4 FORMAT (////48X23HCONTROL VARIABLE ARRAYS//48X9HIFTAPE(I)/30X10L5/PAM1  84
     1//48X8HNPRNT(I)/20X15L5)                                           PAM1  85
    5 FORMAT (////40X31HCAPTURE - TO - FISSION RATIO IS,F10.3)           PAM1  86
    6 FORMAT (//35X41HNUMBER OF NEUTRONS EMITTED PER FISSION IS,F10.3)  PAM1  87
    7 FORMAT (//47X19HTYPE OF FISSION IS A6)                             PAM1  88
    8 FORMAT (//23X55HTHE CLOUD REACHED THE SOIL CONDENSATION TEMPERATURPAM1  89
     1E OF F7.1,4H AT F8.2,5H SEC.)                                      PAM1  90
    9 FORMAT (//42X14HTOTAL YIELD IS,1PE12.4,10H KILOTONS.)              PAM1  91
   10 FORMAT (//41X16HFISSION YIELD IS,1PE12.4,10H KILOTONS.)            PAM1  92
   11 FORMAT (//32X9HTHERE ARE,I4,36H PARTICLE CLASSES WITH SIGMA OF,    PAM1  93
     1    F7.4,1H.)                                                       PAM1  94
   12 FORMAT (//41X22HTHE HEIGHT OF BURST IS,F9.3,6H FEET.)              PAM1  95
C                                                                            PAM1  96
C*************************************************************************PAM1  97
C*************************************************************************PAM1  98
C                                                                            PAM1  99
      KOUT = ISOUT                                                           PAM1 100
      IPAM = IPOUT                                                           PAM1 101
      INTP = ISIN                                                            PAM1 102
      KRD = ISIN                                                             PAM1 103
      READ (ISIN,1)                                                          PAM1 104
     1    (PAMID(I),I=1,12),(IFTAPE(J),J=1,10),(NPRNT(K),K=1,15)            PAM1 105
      IF(IFTAPE(4)) GO TO 150                                                PAM1 106
      READ (ISIN,2)                                                          PAM1 107
     1    CAPFIS,EMITN,FISSID                                               PAM1 108
   25 WRITE (KOUT,3)                                                         PAM1 109
     1    (PAMID(I),I=1,12)                                                 PAM1 110
      WRITE (KOUT,4)                                                         PAM1 111
     1    (IFTAPE(J),J=1,10),(NPRNT(K),K=1,15)                              PAM1 112
      WRITE (KOUT, 9) TW                                                     PAM1 113
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      WRITE (KOUT,10) FW                                                PAM1 114
      WRITE (KOUT,7) FISSID                                             PAM1 115
      WRITE (KOUT,12) HOB                                               PAM1 116
      WRITE (KOUT,5) CAPFIS                                             PAM1 117
      WRITE (KOUT,6) EMITN                                              PAM1 118
      WRITE (KOUT,8) SLDTMP,TMSD                                        PAM1 119
      WRITE (KOUT,11) ITAB,SIGMA                                        PAM1 120
      IF(IFTAPE(4)) RETURN                                              PAM1 121
      IF(IFTAPE(1).AND. ISIN.EQ.5)INTP=12                               PAM1 122
      IF(IFTAPE(1).AND. ISIN.NE.5)INTP=5                                PAM1 123
      IF(IFTAPE(2)) KRD=INTP                                            PAM1 124
   50 CALL SETUP                                                        PAM1 125
     1     (INTP    ,MAXMUL)                                           PAM1 126
      CALL YIELD                                                        PAM1 127
     1     (INTP,FISSID)                                                PAM1 128
      CALL XPRM                                                         PAM1 129
     1     (INTP)                                                       PAM1 130
      CALL INDCD1                                                       PAM1 131
     1     (EMITN  ,HOB     ,KRD     ,TW      )                        PAM1 132
      IF (EMITN.LE.0.0) LMAX=0                                          PAM1 133
      CALL FRATIO                                                       PAM1 134
     1     (SLDTMP ,TMSD    ,MCHN    )                                 PAM1 135
      IF (IFTAPE(3)) GO TO 100                                          PAM1 136
      REWIND IPAM                                                       PAM1 137
      RETURN                                                            PAM1 138
  100 WRITE (IPAM)                                                      PAM1 139
     1      CAPFIS,ALBFOM,LMAX,EMITN,FISSID                             PAM1 140
      WRITE (IPAM)                                                      PAM1 141
     1     INUC,IBRA,MAXMUL,KRM,MCHN                                    PAM1 142
      WRITE (IPAM)                                                      PAM1 143
     1     (MULT(I),I=1,MAXMUL)                                         PAM1 144
      WRITE (IPAM)                                                      PAM1 145
     1     (NUCLID(J),DCON(J),ABEGN(J),J=1,INUC)                        PAM1 146
      WRITE (IPAM)                                                      PAM1 147
     1     (BRANCH(K),K=1,IBRA)                                         PAM1 148
      WRITE (IPAM)                                                      PAM1 149
     1     (ERM(L),JRM(L),L=1,KRM)                                      PAM1 150
      WRITE (IPAM)                                                      PAM1 151
     1     (BSUBK(M),ECF(M),M=1,MCHN)                                   PAM1 152
      WRITE (IPAM)                                                      PAM1 153
     1    ((FAC(I,J),FOGRNY(I,J),XLAM(I,J),I=1,7),ISO(J),J=1,18)        PAM1 154
      ENDFILE IPAM                                                      PAM1 155
      REWIND IPAM                                                       PAM1 156
      RETURN                                                            PAM1 157
  150 READ (IPAM)                                                       PAM1 158
     1      CAPFIS,ALBFOM,LMAX,EMITN,FISSID                             PAM1 159
      READ (IPAM)                                                       PAM1 160
     1     INUC,IBRA,MAXMUL,KRM,MCHN                                    PAM1 161
      READ (IPAM)                                                       PAM1 162
     1     (MULT(I),I=1,MAXMUL)                                         PAM1 163
      READ (IPAM)                                                       PAM1 164
     1     (NUCLID(J),DCON(J),ABEGN(J),J=1,INUC)                        PAM1 165
      READ (IPAM)                                                       PAM1 166
     1     (BRANCH(K),K=1,IBRA)                                         PAM1 167
      READ (IPAM)                                                       PAM1 168
     1     (ERM(L),JRM(L),L=1,KRM)                                      PAM1 169
      READ (IPAM)                                                       PAM1 170
     1     (BSUBK(M),ECF(M),M=1,MCHN)                                   PAM1 171
      READ (IPAM)                                                       PAM1 172
     1    ((FAC(I,J),FOGRNY(I,J),XLAM(I,J),I=1,7),ISO(J),J=1,18)        PAM1 173
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      REWIND IPAM                                                       PAM1 174
      GO TO 25                                                          PAM1 175
      END                                                               PAM1 176
$IBFTC SUP1     LIST,DECK,M94/2                                         SUP1   0
      SUBROUTINE SETUP                                                  SUP1   1
     1    (INTP,MAXMUL)                                                 SUP1   2
C     VERSION 1                                                         SUP1   3
C                                                                       SUP1   4
C     R C TOMPKINS -- US ARMY NUCLEAR DEFENSE LABS                      SUP1   5
C                                                                       SUP1   6
CALLED BY PAM1                                                          SUP1   7
C                                                                       SUP1   8
C  * * * * * * * * * GLOSSARY * * * * * * * * * * * * *                 SUP1   9
C                                                                       SUP1  10
C   BRANCH(150)    TABLE OF BRANCHING RATIOS THAT LIE BETWEEN 0 AND 1,  SUP1  11
C                  I.E., REPRESENT NONTRIVIAL BRANCHES.  IT IS ORDERED  SUP1  12
C                  PRIMARILY BY INCREASING VALUES OF NUCLID AND SECON-  SUP1  13
C                  DARILY BY DAUGHTER POSITION WITHIN NUCLID.           SUP1  14
C   BRAT           TEMPORARY STORAGE FOR BRANCHING RATIO READ FROM INPUT SUP1  15
C                  RECORD                                               SUP1  16
C   BRSUM          SUM OF BRANCHING RATIOS FOR A SINGLE PARENT          SUP1  17
C   BRTEST         TOLERANCE FOR COMPARISON OF BRSUM WITH UNITY         SUP1  18
C   DATNO          (INTEGER) TEMPORARY STORAGE FOR ATOMIC NUMBER OF     SUP1  19
C                  DAUGHTER READ FROM INPUT RECORD                      SUP1  20
C   DCON(700)      TABLE OF DISINTEGATION CONSTANTS PARALLEL TO NUCLID, SUP1  21
C                  SET TO ZERO FOR STABLE NUCLIDES.  (SEC**-1)          SUP1  22
C   DISOM          (INTEGER) TEMPORARY STORAGE FOR ISOMERIC STATE OF    SUP1  23
C                  DAUGHTER READ FROM INPUT RECORD.  0 FOR GROUND STATE, SUP1  24
C                  1 AND 2 FOR EXCITED STATES.                          SUP1  25
C   DMASS          (INTEGER) TEMPORARY STORAGE FOR MASS NUMBER OF       SUP1  26
C                  DAUGHTER READ FROM INPUT RECORD                      SUP1  27
C   HLIFE          FRACTIONAL PART OF HALF-LIFE READ FROM INPUT RECORD  SUP1  28
C   IBRA           NUMBER OF ENTRIES IN ARRAY BRANCH                    SUP1  29
C   IBRAT          ASSIGNED GOTO PARAMETER FOR EXISTENCE OF BRANCHING ON SUP1  30
C                  RECORD BEING PROCESSED                               SUP1  31
C   IEXP           CHARACTERISTIC OF HALF-LIFE READ FROM INPUT RECORD   SUP1  32
C   IM             WORD POSITION INDICATOR FOR LOCATING DAUGHTERS IN    SUP1  33
C                  PACKED WORD, USED AS INDEX OF ARRAY MULT.            SUP1  34
C   IND            INDEX OF INSERTION POINT IN ARRAY NUCLID FOR NEW ENTRYSUP1  35
C   INPUT          NAMELIST NAME FOR PRINTOUT OF INPUT RECORD           SUP1  36
C   INTP           INPUT FILE NUMBER, NORMALLY CORRESPONDS TO SYSIN1    SUP1  37
C   INUC           NUMBER OF ENTRIES IN ARRAYS NUCLID AND DCON          SUP1  38
C   IUNIT          UNIT OF HALF-LIFE READ FROM INPUT RECORD             SUP1  39
C                    1 - SECONDS                                        SUP1  40
C                    2 - MINUTES                                        SUP1  41
C                    3 - HOURS                                          SUP1  42
C                    4 - DAYS                                           SUP1  43
C                    5 - YEARS                                          SUP1  44
C   IS1ST          ASSIGNED GOTO PARAMETER FOR SPECIAL HANDLING OF FIRST SUP1  45
C                  INPUT RECORD                                         SUP1  46
C   ISTOP          ASSIGNED GOTO PARAMETER TO SIGNAL A DISABLING ERROR  SUP1  47
C                  FOR PANIC EXIT AFTER PROCESSING                      SUP1  48
C   ITRUNC         TEMPORARY STORAGE FOR RIGHT-MOST 5 OCTAL POSITIONS OF SUP1  49
C                  NUCLID                                               SUP1  50
C   JBRAT          ASSIGNED GOTO PARAMETER SIMILAR TO IBRAT             SUP1  51
C   K2ND           ASSIGNED GOTO PARAMETER FOR ACTION TO BE TAKEN IF    SUP1  52
C                  FIRST SEARCH FOR DAUGHTER FAILS                      SUP1  53
C   K3RD           ASSIGNED GOTO PARAMETER FOR ACTION TO BE TAKEN IF    SUP1  54
C                  SECOND SEARCH FOR DAUGHTER FAILS                     SUP1  55
C   KBR            COUNTER FOR ARRAY BRANCH DURING SCANS OF ARRAY NUCLID SUP1  56
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C     KEND          DO-TERMINATOR FOR DAUGHTER SEARCH                      SUP1  57
C     KOUT          OUTPUT FILE NUMBER, NORMALLY CORRESPONDS TO SYSOU1     SUP1  58
C     KST           DO-INITIATOR FOR DAUGHTER SEARCH                       SUP1  59
C     KTYP          INDICATOR FOR TYPE OF NUCLEAR TRANSITION ON CURRENT    SUP1  60
C                   INPUT RECORD                                           SUP1  61
C     LAMBDA        (REAL) TEMPORARY STORAGE FOR DISINTEGRATION CONSTANT   SUP1  62
C                   OF CURRENT INPUT PARENT.  (SEC**-1)                    SUP1  63
C     MAXBRA        DIMENSION OF ARRAY BRANCH                              SUP1  64
C     MAXMUL        DIMENSION OF ARRAY MULT. MUST NOT EXCEED 11 ON IBM7094SUP1  65
C     MAXNUC        DIMENSION OF ARRAYS NUCLID AND DCON                    SUP1  66
C     MAXPNT        DIMENSION OF ARRAY NPRNT                               SUP1  67
C     MULT(11)      MULTIPLIERS FOR ACCESS TO OCTAL POSITIONS OF WORD,     SUP1  68
C                   MULT(I) = 8**I                                         SUP1  69
C     NAMDAU        PACKED NAME OF DAUGHTER NUCLIDE                        SUP1  70
C     NAMPAR        PACKED NAME OF PARENT NUCLIDE                          SUP1  71
C     NPRNT(20)     LOGICAL ARRAY TO CONTROL PRODUCTION OF OUTPUT RECORDS  SUP1  72
C     NTIMES        COUNTER FOR ITERATIONS OF DAUGHTER SEARCH              SUP1  73
C     NUCLID(700)   MASTER TABLE OF NUCLIDES.  THE LEFT-MOST 7 OCTAL POSI-SUP1  74
C                   TIONS CONTAIN THE MASS NUMBER AND ATOMIC NUMBER IN     SUP1  75
C                   ASCENDING ORDER AND THE ISOMER NUMBER IN DESCENDING    SUP1  76
C                   ORDER.  THE 5 RIGHT-MOST POSITIONS CONTAIN DAUGHTER    SUP1  77
C                   IDENTIFICATION.  THE DIGIT POSITION CONTAINS THE IN-   SUP1  78
C                   DEX REQUIRED ON MULT TO ACCESS THE LEFT-MOST VACANT    SUP1  79
C                   POSITION.  INITIALLY THE MULT(2) TO MULT(8) POSITIONS SUP1  80
C                   ARE OCCUPIED BY KTYP VALUES.  FINALLY THEY CONTAIN THESUP1  81
C                   INCREMENTS OF THE NUCLID INDEX REQUIRED TO FIND THE    SUP1  82
C                   DAUGHTERS.  IF ONE OF THESE IS A DECREMENT, ITS POSI-  SUP1  83
C                   TION IS TAGGED IN POSITION MULT(1).  INITIALLY ALL     SUP1  84
C                   ENTRIES ARE SET NEGATIVE, BUT AT THE END A MINUS SIGN  SUP1  85
C                   DESIGNATES THE BEGINNING OF A SUBCHAIN.                SUP1  86
C     PATNO         (INTEGER) TEMPORARY STORAGE FOR THE ATOMIC NUMBER OF   SUP1  87
C                   PARENT READ FROM INPUT RECORD                          SUP1  88
C     PISOM         (INTEGER) TEMPORARY STORAGE OF ISOMERIC STATE OF       SUP1  89
C                   PARENT READ FROM INPUT RECORD.  SEE DISOM.             SUP1  90
C     PMASS         (INTEGER) TEMPORARY STORAGE FOR THE MASS NUMBER OF     SUP1  91
C                   PARENT READ FROM INPUT RECORD                          SUP1  92
C                                                                          SUP1  93
C  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  SUP1  94
C                                                                          SUP1  95
      COMMON/FISHIN/                                                       SUP1  96
     1    ABEGN (700) ,ABUNDO(700) ,BRANCH(130) ,CAPFIS                    SUP1  97
     2   ,DCON  (700) ,IBRA        ,INUC         ,MAXNUC                   SUP1  98
     3   ,MULT  (11)  ,NUCLID(700)                                         SUP1  99
C                                                                          SUP1 100
      COMMON/UTILTY/                                                       SUP1 101
     1    KOUT         ,NPRNT (15)                                         SUP1 102
C                                                                          SUP1 103
      INTEGER DATNO,DISOM,DMASS,PATNO,PISOM,PMASS                          SUP1 104
      LOGICAL NPRNT,FIRST                                                  SUP1 105
      REAL LAMBDA                                                          SUP1 106
C                                                                          SUP1 107
      NAMELIST /INPUT/                                                     SUP1 108
     1    PMASS,PATNO,PISOM,HLIFE,IEXP,IUNIT,DMASS,DATNO,DISOM,BRAT        SUP1 109
C                                                                          SUP1 110
 1001 FORMAT (29H1INTERMEDIATE OUTPUT OF SETUP//)                          SUP1 111
 1002 FORMAT (6X4HINUC7X6HNUCLID11X4HDCON/)                                SUP1 112
 1003 FORMAT (6XI3,5XO12,5X1PE18.3)                                        SUP1 113
 1004 FORMAT (22H1FINAL OUTPUT OF SETUP//)                                 SUP1 114
 1005 FORMAT (///6X4HIBRA5X6HBRANCH/)                                      SUP1 115
 1006 FORMAT (6XI3,5XF8.5)                                                 SUP1 116
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C                                                                       SUP1 117
CC  INITIALIZE VARIABLES                                                SUP1 118
C                   NUCLIDE COUNTER                                     SUP1 119
      INUC = 0                                                          SUP1 120
C                   BRANCHING RATIO COUNTER                             SUP1 121
      IBRA = 0                                                          SUP1 122
C                   TOLERANCE ON SUM OF BRANCHING RATIOS                SUP1 123
      BRTEST = 0.0001                                                   SUP1 124
      ASSIGN 23  TO ISIST                                               SUP1 125
      ASSIGN 300 TO ISTOP                                               SUP1 126
      ASSIGN 1212 TO ISFULL                                             SUP1 127
      MAXBRA = 130                                                      SUP1 128
      MAXMUL = 11                                                       SUP1 129
      MAXNUC = 700                                                      SUP1 130
      TOL = 1.E-15                                                      SUP1 131
C                                                                       SUP1 132
C                                                                       SUP1 133
CC  INITIALIZE ARRAYS                                                   SUP1 134
      DO 1 I = 1,MAXNUC                                                 SUP1 135
      NUCLID(I) = 0                                                     SUP1 136
    1 DCON(I) = 0.0                                                     SUP1 137
      DO 2 J = 1,MAXBRA                                                 SUP1 138
    2 BRANCH(J) = 0.0                                                   SUP1 139
C   SET UP WORD-POSITION MULTIPLIERS                                    SUP1 140
      MULT(1) = 8                                                       SUP1 141
      DO 3 K=2,MAXMUL                                                   SUP1 142
    3 MULT(K) = MULT(1)*MULT(K-1)                                       SUP1 143
C                                                                       SUP1 144
C   READ AN INPUT RECORD AFTER CHECK OF AVAILABLE SPACE                 SUP1 145
C                                                                       SUP1 146
   10 IF (INUC.EQ.MAXNUC) ASSIGN 1308 TO ISFULL                         SUP1 147
      READ (INTP,11)                                                    SUP1 148
     1     PMASS,PISOM,PATNO,HLIFE,IUNIT,IEXP,BRAT,DMASS,DISOM,DATNO    SUP1 149
   11 FORMAT                                                            SUP1 150
     1     (10X3I3,8XF9.4,1X2I3,3XF7.5,7X3I3)                           SUP1 151
C                                                                       SUP1 152
      IF (NPRNT(1)) WRITE (KOUT,INPUT)                                  SUP1 153
CHECK FOR END-OF-FILE SENTINEL                                          SUP1 154
      IF (PMASS)1301,200,12                                             SUP1 155
   12 GO TO ISFULL,(1212,1308)                                          SUP1 156
C                                                                       SUP1 157
C   RESET PARAMETERS FOR NEW RECORD                                     SUP1 158
C                                                                       SUP1 159
 1212 LAMBDA = 0.0                                                      SUP1 160
      KTYP = 0                                                          SUP1 161
      ASSIGN 10 TO IBRAT                                                SUP1 162
      ASSIGN 10 TO JBRAT                                                SUP1 163
      IM = 4                                                            SUP1 164
CHECK FOR EXISTENCE OF DAUGHTER                                         SUP1 165
      IF (DMASS)1301,22,13                                              SUP1 166
C                                                                       SUP1 167
CHECK THE HALF-LIFE                                                     SUP1 168
   13 IF (HLIFE)1301,1301,14                                            SUP1 169
   14 LAMBDA = 0.693147/TIMSEC(HLIFE,IUNIT,IEXP)                        SUP1 170
CHECK THE BRANCHING RATIO AND MARK THE EXISTENCE OF A BRANCH            SUP1 171
      IF (BRAT-1.0)15,16,1301                                           SUP1 172
C                                                                       SUP1 173
   15 ASSIGN 112 TO IBRAT                                               SUP1 174
      ASSIGN 133 TO JBRAT                                               SUP1 175
CC  DETERMINE THE TYPE OF TRANSITION                                    SUP1 176
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C
C          BETA EMISSION
   16 IF (DATNO.EQ.(PATNO+1).AND.DMASS.EQ.PMASS) GO TO 17
C          ISOMERIC TRANSITION
      IF (DATNO.EQ.PATNO.AND.DMASS.EQ.PMASS) GO TO 18
C          NEUTRON PLUS BETA EMISSION
      IF (DATNO.EQ.(PATNO+1).AND.DMASS.EQ.(PMASS-1)) GO TO 19
C          POSITRON EMISSION OR ELECTRON CAPTURE
      IF (DATNO.EQ.(PATNO-1).AND.DMASS.EQ.PMASS) GO TO 20
C          NEUTRON EMISSION
      IF (DATNO.EQ.PATNO.AND.DMASS.EQ.(PMASS-1)) GO TO 21
C   ERROR TRACE FOR ILLEGAL TRANSITION
      GO TO 1301
C
C   INDICATE THE TYPE OF TRANSITION
   17 KTYP = DISOM + 1
      GO TO 22
   18 KTYP = DISOM + 3
      GO TO 22
   19 KTYP = 6
      GO TO 22
   20 KTYP = 7
      GO TO 22
C
C  * * * * * * * * * CODE INSERTION POINTS * * * * * * * *
   21 GO TO 1301
C  * * * * * * * * * * * * * * * * * * * * * * * * * *
C
C   PACK THE PARENT NAME INTO THE 7 LOWEST OCTAL POSITIONS OF NAMPAR
   22 NAMPAR = PMASS*MULT(4) + PATNO*MULT(1)
C   IF THIS IS THE FIRST RECORD GO DIRECTLY TO 111 AFTER CHECKING IT OFF
      GO TO IS1ST,(23,100)
   23 ASSIGN 100 TO IS1ST
      GO TO 111
C
C   FIND OUT WHERE THE NEW ENTRY BELONGS IN THE NUCLIDE TABLE WHILE
C   KEEPING TRACK OF LOCATION IN THE BRANCHING RATIO TABLE
  100 KBR = 0
      DO 110 I = 1,INUC
      INO = I
      NUCTRY = IABS(NUCLID(I))
C   INCREMENT THE INDEX OF BRANCH IF REQUIRED
      KBR = KBR + 4 - MOD(NUCTRY,MULT(1))
      IF(NAMPAR/MULT(1)-NUCTRY/MULT(6))131,121,110
  110 CONTINUE
C
C   THE NEW ENTRY BELONGS NEXT IN SEQUENCE.  INCREMENT THE NUCLIDE
COUNTER AND PUT NAME IN HIGH ORDER POSITIONS OF NEW WORD.
  111 INUC = INUC + 1
      NUCLID(INUC) = -((NAMPAR * PISOM)*MULT(5) + KTYP*MULT(4) + 4)
      DCON(INUC) = LAMBDA
      GO TO IBRAY,(10,112)
C
C   ADD NEW BRANCHING RATIO
  112 IBRA = IBRA + 1
      BRANCH(IBRA) = BRAT
C   DECREMENT THE BRANCH INDICATOR
      NUCLID(INUC) = NUCLID(INUC) + 1
      GO TO 10
C
```

```
C   THE NEW ENTRY IS EQUAL TO OR ISOMERIC WITH AN OLD ONE.  ISOMERS MUSTSUP1 237
C   BE ORDERED IN D*E*S*C*E*N*D*I*N*G SEQUENCE                          SUP1 238
  121 IF (IABS(NUCLID(IND))/MULT(5) - (NAMPAR + PISOM))131,141,122      SUP1 239
C   IF THIS IS THE END OF THE TABLE WE MUST STOP HERE AND GO TO 111     SUP1 240
 122  IF (IND.EQ.INUC) GO TO 111                                        SUP1 241
      IND = IND + 1                                                     SUP1 242
      IF ((IABS(NUCLID(IND))/MULT(6).GT.NAMPAR/MULT(1)) GO TO 131       SUP1 243
      KBR = KBR + 4 - MOD((IABS(NUCLID(IND)),MULT(1))                   SUP1 244
      GO TO 121                                                         SUP1 245
C                                                                       SUP1 246
C   THE NEW ENTRY MUST BE I*N*S*E*R*T*E*D ABOVE IND.  MOVE THE          SUP1 247
C   SUCCEEDING ENTRIES DOWN TO MAKE ROOM.                               SUP1 248
  131 INUC = INUC + 1                                                   SUP1 249
      JST = IND + 1                                                     SUP1 250
      JS = JST + INUC                                                   SUP1 251
      DO 140 J = JST,INUC                                               SUP1 252
      JJ = JS - J                                                       SUP1 253
      NUCLID(JJ) = NUCLID(JJ-1)                                         SUP1 254
  140 DCON(JJ) = DCON(JJ-1)                                             SUP1 255
C                                                                       SUP1 256
C   NOW INSERT THE NEW ENTRY                                            SUP1 257
  132 NUCLID(IND) = -((NAMPAR + PISOM)*MULT(5) + KTYP*MULT(4) + 4)      SUP1 258
      DCON(IND) = LAMBDA                                                SUP1 259
      GO TO JBRAT,(10,133)                                              SUP1 260
C                                                                       SUP1 261
C   DECREMENT THE BRANCH INDICATOR                                      SUP1 262
  133 NUCLID(IND) = NUCLID(IND) + 1                                     SUP1 263
CHECK POSITION IN BRANCHING RATIO TABLE, AND GO TO 134 IF INSERTION IS  SUP1 264
C   REQUIRED.                                                           SUP1 265
  134 IF (KBR.LT.IBRA) GO TO 135                                        SUP1 266
C   OTHERWISE EXTEND THE TABLE.                                         SUP1 267
      IBRA = IBRA + 1                                                   SUP1 268
      BRANCH(IBRA) = BRAT                                               SUP1 269
      GO TO 10                                                          SUP1 270
C                                                                       SUP1 271
  135 IBRA = IBRA + 1                                                   SUP1 272
C   MAKE ROOM IN THE TABLE.                                             SUP1 273
      KST = KBR + 1                                                     SUP1 274
      KS = KST + IBRA                                                   SUP1 275
      DO 136 K = KST,IBRA                                               SUP1 276
      KK = KS - K                                                       SUP1 277
  136 BRANCH(KK) = BRANCH(KK-1)                                         SUP1 278
      BRANCH(KBR) = BRAT                                                SUP1 279
      GO TO 10                                                          SUP1 280
C                                                                       SUP1 281
C   THE NEW ENTRY REPRESENTS ANOTHER BRANCH OF AN OLD ENTRY.            SUP1 282
C   SET POSITION INDICATOR.                                             SUP1 283
  141 IM = MOD((IABS(NUCLID(IND)),MULT(1))                              SUP1 284
      NDAUT = 4 - IM                                                    SUP1 285
CHECK FOR DUPLICATION                                                   SUP1 286
      IF (NDAUT + KTYP)1302,1303,142                                    SUP1 287
  142 INDICT = MOD((IABS(NUCLID(IND)),MULT(5))                          SUP1 288
      DO 150 L = 1,NDAUT                                                SUP1 289
      LM = 5 - L                                                        SUP1 290
      IF (INDICT/MULT(LM).EQ.KTYP) GO TO 1303                           SUP1 291
  150 CONTINUE                                                          SUP1 292
C                                                                       SUP1 293
CHECK AGREEMENT OF DISINTEGRATION CONSTANTS                             SUP1 294
      IF (LAMBDA.NE.DCON(IND)) GO TO 1304                               SUP1 295
C   ENTER THE NEW TRANSITION AND DECREMENT THE POSITION COUNTER.        SUP1 296
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      NUCLID(IND) = NUCLID(IND) - KTYP*MULT(IM) + 1                     SUP1 297
C   GO BACK TO STORE THE BRANCHING RATIO                                SUP1 298
      GO TO 134                                                         SUP1 299
C                                                                       SUP1 300
C                                                                       SUP1 301
CC  NOW THAT ALL THE INPUT RECORDS HAVE BEEN READ, IT IS TIME TO SET UP SUP1 302
CC  THE RELATIONS BETWEEN THE PARENT AND DAUGHTER INDICES.              SUP1 303
C                                                                       SUP1 304
C                                                                       SUP1 305
C   WRITE INTERMEDIATE OUTPUT IF REQUESTED                              SUP1 306
  200 IF(.NOT.NPRNT(2)) GO TO 2000                                      SUP1 307
      WRITE (KOUT,1001)                                                 SUP1 308
      WRITE (KOUT,1002)                                                 SUP1 309
      WRITE (KOUT,1003) (IO,NUCLID(IO),DCON(IO),IO=1,INUC)              SUP1 310
 2000 KBR = 0                                                           SUP1 311
      FIRST = .TRUE.                                                    SUP1 312
C   BEGIN THE MAIN LOOP THROUGH THE NUCLIDE TABLE.                      SUP1 313
      DO 250 I = 1,INUC                                                 SUP1 314
      BRSUM = 0.0                                                       SUP1 315
      ASSIGN 203 TO NGO                                                 SUP1 316
C   UNPACK THE NUCLIDE WORD                                             SUP1 317
C   ENSURE THAT SUCCESSIVE DISINTEGRATION CONSTANTS ARE NOT EQUAL       SUP1 318
      IF (FIRST) GO TO 2743                                             SUP1 319
      FACTC = DCON(I) - DCON(I-1)                                       SUP1 320
      IF (ABS(FACTC).GE.TOL) GO TO 274                                  SUP1 321
      IF (FACTC) 2741,2742,2742                                         SUP1 322
 2741 DCON(I-1) = DCON(I-1) + TOL                                       SUP1 323
      GO TO 274                                                         SUP1 324
 2742 DCON(I) = DCON(I) + TOL                                           SUP1 325
      GO TO 274                                                         SUP1 326
 2743 FIRST = .FALSE.                                                   SUP1 327
  274 NAME = IABS(NUCLID(I))                                            SUP1 328
      ITRUNC = MOD(NAME,MULT(5))                                        SUP1 329
      MI = MOD(ITRUNC,MULT(1))                                          SUP1 330
      NEWNAM = (NAME/MULT(5))*MULT(5) + MI                              SUP1 331
      NBR = 4 - MI                                                      SUP1 332
CHECK FOR EXISTENCE OF DAUGHTERS                                        SUP1 333
      IF(ITRUNC.EQ.MI)GO TO 250                                         SUP1 334
      IF (NBR)1305,201,202                                              SUP1 335
  201 NBR = 1                                                           SUP1 336
      BRSUM = 1.0                                                       SUP1 337
      ASSIGN 204 TO NGO                                                 SUP1 338
C                                                                       SUP1 339
CONSIDER EACH BRANCH IN TURN                                            SUP1 340
  202 DO 210 J = 1,NBR                                                  SUP1 341
      NTIMES = 0                                                        SUP1 342
      IM = 5 -J                                                         SUP1 343
      KTYP = ITRUNC/MULT(IM)                                            SUP1 344
      ITRUNC = MOD(ITRUNC,MULT(IM))                                     SUP1 345
      GO TO NGO,(203,204)                                               SUP1 346
  203 KBR = KBR + 1                                                     SUP1 347
C   SUM THE BRANCHING RATIOS FOR CHECKING                               SUP1 348
      BRSUM = BRSUM + BRANCH(KBR)                                       SUP1 349
C   BRANCH ON THE TRANSITION MODE TO SYNTHESIZE THE DAUGHTER NAME       SUP1 350
  204 GO TO (211,211,212,212,212,213,214,215),KTYP                      SUP1 351
C                                                                       SUP1 352
C   BETA EMISSION                                                       SUP1 353
  211 NAMDAU = (NAME/MULT(6))*MULT(1) + MULT(1) + KTYP - 1              SUP1 354
C   SET DO PARAMETERS FOR SEARCH IN NEXT 7 ENTRIES                      SUP1 355
      KST = I + 1                                                       SUP1 356
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      KEND = KST + 6                                                    SUP1 357
C   SET MODE FOR FURTHER SEARCHES                                       SUP1 358
      ASSIGN 221 TO K2ND                                                SUP1 359
      ASSIGN 219 TO K3RD                                                SUP1 360
      GO TO 216                                                         SUP1 361
C                                                                       SUP1 362
C   ISOMERIC TRANSITION                                                 SUP1 363
  212 NAMDAU = (NAME/MULT(6))*MULT(1) + KTYP - 3                        SUP1 364
C   SET DO PARAMETERS FOR SEARCH IN NEXT 2 ENTRIES                      SUP1 365
      KST = I + 1                                                       SUP1 366
      KEND = KST +1                                                     SUP1 367
C   SET MODE FOR FURTHER SEARCHES                                       SUP1 368
      ASSIGN 222 TO K2ND                                                SUP1 369
      ASSIGN 221 TO K3RD                                                SUP1 370
      GO TO 216                                                         SUP1 371
C                                                                       SUP1 372
C   NEUTRON PLUS BETA EMISSION                                          SUP1 373
  213 NAMDAU = (NAME/MULT(6))*MULT(1) - MULT(4) + MULT(1)               SUP1 374
C   SET DO PARAMETERS FOR SEARCH IN PRECEDING ENTRIES                   SUP1 375
      KST = 1                                                           SUP1 376
      KEND = I -1                                                       SUP1 377
C   SET MODE FOR FURTHER SEARCHES                                       SUP1 378
      ASSIGN 223 TO K2ND                                                SUP1 379
      ASSIGN 219 TO K3RD                                                SUP1 380
      GO TO 216                                                         SUP1 381
C                                                                       SUP1 382
C   POSITRON EMISSION OR ELECTRON CAPTURE                               SUP1 383
  214 NAMDAU = (NAME/MULT(6))*MULT(1) - MULT(1)                         SUP1 384
C   SET DO PARAMETERS FOR SEARCH IN PREVIOUS SEVEN ENTRIES              SUP1 385
      KEND = I - 1                                                      SUP1 386
      KST = KEND - 6                                                    SUP1 387
C   SET MODE FOR FURTHER SEARCHES                                       SUP1 388
      ASSIGN 221 TO K2ND                                                SUP1 389
      ASSIGN 219 TO K3RD                                                SUP1 390
      GO TO 216                                                         SUP1 391
C                                                                       SUP1 392
C  *  *  *  *  *  *  *  *  CODE INSERTION POINTS  *  *  *  *  *  *  *  *SUP1 393
  215 GO TO 210                                                         SUP1 394
C  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  SUP1 395
C                                                                       SUP1 396
C   SEARCH FOR THE DAUGHTER IN THE NUCLIDE TABLE                        SUP1 397
  216 NTIMES = NTIMES + 1                                               SUP1 398
      DO 220 K = KST,KEND                                               SUP1 399
      IF (NAMDAU.EQ.(ABS(NUCLID(K))/MULT(5))) GO TO 225                 SUP1 400
  220 CONTINUE                                                          SUP1 401
C                                                                       SUP1 402
C             SEARCH FAILED, TRY LONGER SEARCH IF POSSIBLE              SUP1 403
                GO TO (217,218,219),NTIMES                              SUP1 404
C                                                                       SUP1 405
  217           GO TO K2ND,(221,222,223)                                SUP1 406
  221           KST = 1                                                 SUP1 407
                KEND = INUC                                             SUP1 408
                GO TO 216                                               SUP1 409
C                                                                       SUP1 410
  222           KST = KEND + 1                                          SUP1 411
                KEND = KST + 4                                          SUP1 412
                GO TO 216                                               SUP1 413
C                                                                       SUP1 414
  223           KST = KEND + 1                                          SUP1 415
                KEND = INUC                                             SUP1 416
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                GO TO 216                                                SUP1 417
C                                                                        SUP1 418
  218           GO TO K3RD,(219,221)                                     SUP1 419
C             DAUGHTER IS MISSING                                        SUP1 420
  219           GO TO 1306                                               SUP1 421
C                                                                        SUP1 422
COMPUTE INCREMENT OR DECREMENT OF PARENT INDEX TO FIND DAUGHTER, AND     SUP1 423
C   MAKE SURE IT DOES NOT EXCEED 7                                       SUP1 424
  225 INCR = K - I                                                       SUP1 425
      IF (IABS(INCR).GT.7) GO TO 1306                                    SUP1 426
C   REVISE THE NUCLIDE NAME                                              SUP1 427
      NEWNAM = NEWNAM + IABS(INCR)*MULT(IM)                              SUP1 428
C   MARK THE POSITION IF IT BE A DECREMENT.                              SUP1 429
      IF (INCR)226,227,227                                               SUP1 430
  226 NEWNAM = NEWNAM + IK*MULT(1)                                       SUP1 431
  227 NUCLID(I) = ISIGN(NEWNAM,NUCLID(I))                                SUP1 432
C   MARK THE DAUGHTER AS N*O*T THE BEGINNING OF A SUBCHAIN.              SUP1 433
      NUCLID(K) = IABS(NUCLID(K))                                        SUP1 434
  210  CONTINUE                                                          SUP1 435
C                                                                        SUP1 436
CHECK WHETHER BRANCHING RATIOS ADD UP TO 1.                              SUP1 437
      IF (ABS(BRSUM-1.0).GT.BRTEST) GO TO 1307                           SUP1 438
C                                                                        SUP1 439
  250 CONTINUE                                                           SUP1 440
C                                                                        SUP1 441
      IF (.NOT.NPRNT(3)) GO TO 2500                                      SUP1 442
      WRITE (KOUT,1004)                                                  SUP1 443
      WRITE (KOUT,1002)                                                  SUP1 444
      WRITE (KOUT,1003) (IO,NUCNID(IO),DCON(IO),IO=1,INUC)               SUP1 445
      WRITE (KOUT,1005)                                                  SUP1 446
      WRITE (KOUT,1006) (IO,BRANCH(IO),IO=1,IBRA)                        SUP1 447
 2500 GO TO ISTOP,(99,300)                                               SUP1 448
  300 RETURN                                                             SUP1 449
C                                                                        SUP1 450
C  * * * * * * * * ERROR FORMATS * * * * * * * * * *                     SUP1 451
C                                                                        SUP1 452
 1351 FORMAT (37H0FAULTY INPUT RECORD HAS BEEN OMITTED//)                SUP1 453
 1352 FORMAT (22H0KTYP + NDAUT NEGATIVE//)                               SUP1 454
 1353 FORMAT (40H0DUPLICATE INPUT RECORD HAS BEEN OMITTED//)             SUP1 455
 1354 FORMAT  (7H0DCON, 1PE10.3,13H FOR NUCLID, O12,27H INCONSISTENT WITSUP1 456
     1H LAMBDA, 1PE10.3//)                                               SUP1 457
 1355 FORMAT (21H0TOO MANY DAUGHTERS, O12)                               SUP1 458
 1356 FORMAT (11H0DAUGHTER, G7.20H NOT FOUND OR INCR EXCEEDS 7)          SUP1 459
 1357 FORMAT (23H0BRANCHING RATIOS FOR, O12,20H, DO NOT ADD UP TO 1)     SUP1 460
 1358 FORMAT (40H0DIMENSIONS OF NUCLID HAVE BEEN EXCEEDED)               SUP1 461
C                                                                        SUP1 462
C  * * * * * * * * ERROR TRACES * * * * * * * * * *                      SUP1 463
C                                                                        SUP1 464
 1301 WRITE (KOUT,1351)                                                  SUP1 465
 1310 WRITE (KOUT,INPUT)                                                 SUP1 466
      GO TO 10                                                           SUP1 467
C                                                                        SUP1 468
 1302 WRITE (KOUT,1352)                                                  SUP1 469
      ASSIGN 99 TO ISTOP                                                 SUP1 470
      GO TO 1310                                                         SUP1 471
C                                                                        SUP1 472
 1303 WRITE (KOUT,1353)                                                  SUP1 473
      GO TO 1310                                                         SUP1 474
C                                                                        SUP1 475
 1304 WRITE (KOUT,1354) DCON(IND),NUCLID(IND),LAMBDA                     SUP1 476
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      ASSIGN  99   TO ISTOP                                          SUP1 477
      GO TO 1310                                                     SUP1 478
C                                                                    SUP1 479
 1305 WRITE (KOUT,1355) NUCLID(I)                                    SUP1 480
      ASSIGN 99 TO ISTOP                                             SUP1 481
      GO TO 250                                                      SUP1 482
C                                                                    SUP1 483
 1306 WRITE (KOUT,1356) NAMDAU                                       SUP1 484
      ASSIGN 99 TO ISTOP                                             SUP1 485
      GO TO 210                                                      SUP1 486
C                                                                    SUP1 487
 1307 WRITE (KOUT,1357) NUCLID(I)                                    SUP1 488
      ASSIGN 99 TO ISTOP                                             SUP1 489
      GO TO 250                                                      SUP1 490
C                                                                    SUP1 491
 1308 WRITE (KOUT,1358)                                              SUP1 492
      ASSIGN 99 TO ISTOP                                             SUP1 493
      GO TO 1212                                                     SUP1 494
C                                                                    SUP1 495
   99 CALL DUMP                                                      SUP1 496
      STOP                                                           SUP1 497
C                                                                    SUP1 498
      END                                                            SUP1 499
$IBFTC YLD1    LIST,DECK,M94/2                                       YLD1   0
      SUBROUTINE YIELD                                               YLD1   1
     1    (INTP,FISSID)                                              YLD1   2
C     VERSION 1                                                      YLD1   3
C     R C TOMPKINS -- US ARMY NUCLEAR DEFENSE LABS                   YLD1   4
C     14 SEPTEMBER 1966                                              YLD1   5
C                                                                    YLD1   6
CALLED BY PAM1                                                       YLD1   7
C                                                                    YLD1   8
C  * * * * * * * * * * GLOSSARY * * * * * * * * * * * * * * * * * *  YLD1   9
C                                                                    YLD1  10
C   ABEGN(700)     INITIAL FISSION PRODUCT ABUNDANCES IN ATOMS/10000 YLD1  11
C                  FISSIONS (PARALLEL TO NPARNT)                     YLD1  12
C   FISSID         TYPE OF FISSION REQUESTED BY USER                 YLD1  13
C   FISTYP(6)      TYPES OF FISSION CORRESPONDING TO DATA FIELDS ON  YLD1  14
C                  FISSION YIELD CARDS                               YLD1  15
C   FYLDIN         FISSION YIELD ON INPUT CARD (YIELD)               YLD1  16
C   NSTAT          ISOMER NUMBER ON                                  YLD1  17
C                  FISSION YIELD CARD (YIELD), CF. LISOM             YLD1  18
C                  ERM CARD (XPRM) -                                 YLD1  19
C                      GROUND STATE 0 OR 2                           YLD1  20
C                      EXCITED STATE 1                               YLD1  21
C                                                                    YLD1  22
C  * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *   YLD1  23
C                                                                    YLD1  24
      COMMON/FISHIN/                                                 YLD1  25
     1    ABEGN (700) ,ABUNDO(700) ,BRANCH(130) ,CAPFIS              YLD1  26
     2   ,DCON  (700) ,IBRA        ,INUC        ,MAXNUC              YLD1  27
     3   ,MULT  (11)  ,NUCLID(700)                                   YLD1  28
      COMMON/UTILTY/                                                 YLD1  29
     1    KOUT        ,NPRNT (15)                                    YLD1  30
C                                                                    YLD1  31
      DIMENSION FMT(4),XSPEC(6),FISTYP(6)                            YLD1  32
      DIMENSION INFORM(11),LIM(11),MEM(700),NUC(11)                  YLD1  33
      EQUIVALENCE (MEM,ABUNDO)                                       YLD1  34
C                                                                    YLD1  35
      INTEGER A,B,BLANK,FISSID,FISTYP                                YLD1  36
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      LOGICAL NPRNT                                                     YLD1  37
C                                                                       YLD1  38
      DATA FMT(1),FMT(2),FMT(4)/6H(I5,I4,6H,A1,  ,6HE10.0)/,            YLD1  39
     1    (XSPEC(I),I=1,6)/6H       ,6H10X    ,6H20X    ,6H30X    ,    YLD1  40
     2    6H40X    ,6H50X    /                                          YLD1  41
      DATA BLANK,A,B/1H ,1HA,1HB/                                       YLD1  42
C                                                                       YLD1  43
      DO 50 JJ=1,INUC                                                   YLD1  44
   50 ABEGN(JJ) = -1.0                                                  YLD1  45
      ASSIGN 213 TO IFLAG                                               YLD1  46
C     FIND THE RIGHT DATA                                               YLD1  47
  202 READ (INTP,101) (FISTYP(I),I=1,6)                                 YLD1  48
C     GO AHEAD IF WE FOUND IT, ELSE STOP                                YLD1  49
      IF (FISTYP(1).EQ.BLANK) GO TO IFLAG,(213,16)                      YLD1  50
      DO 203 K=1,6                                                      YLD1  51
      IF (FISTYP(K).EQ.FISSID) GO TO 204                                YLD1  52
  203 CONTINUE                                                          YLD1  53
C                                                                       YLD1  54
 2031 READ (INTP,103) NMAS                                              YLD1  55
      IF (NMAS)202,202,2031                                             YLD1  56
  204 FMT(3) = XSPEC(K)                                                 YLD1  57
    1 READ (INTP,FMT) NMAS,NAT,NSTAT,FYLDIN                             YLD1  58
C     MAKE A NOTE THAT WE FOUND IT                                      YLD1  59
      ASSIGN 16 TO IFLAG                                                YLD1  60
      IF(NMAS)17,202,2                                                  YLD1  61
  213 WRITE (KOUT,1304) FISSID                                          YLD1  62
      STOP                                                              YLD1  63
COMPATIBILIZE THE ISOMERIC STATE INDICATORS                             YLD1  64
    2 IF (NSTAT.EQ.BLANK) NSTAT=0                                       YLD1  65
      IF (NSTAT.EQ.A) NSTAT=1                                           YLD1  66
      IF (NSTAT.EQ.B) NSTAT=2                                           YLD1  67
      IF (NSTAT.GT.3) WRITE (KOUT,1305) NMAS,NAT,NSTAT,FYLDIN           YLD1  68
      NAMC = NMAS*MULT(4) + NAT*MULT(1) + NSTAT                         YLD1  69
C                                                                       YLD1  70
      DO 10 I=1,INUC                                                    YLD1  71
   10 IF (IABS(NUCLID(I))/MULT(5).EQ.NAMC) GO TO 12                     YLD1  72
      GO TO 1                                                           YLD1  73
CHECK CONTENTS OF ABEGN                                                 YLD1  74
   12 IF (ABEGN(I))14,13,13                                             YLD1  75
COMPILE FYLDIN INTO ARRAY                                               YLD1  76
   14 ABEGN(I) = FYLDIN                                                 YLD1  77
      GO TO 1                                                           YLD1  78
C                                                                       YLD1  79
   13 WRITE (KOUT,1301)                                                 YLD1  80
     1       NUCLID(I),ABEGN(I)                                         YLD1  81
      IF(ABEGN(I)-FYLDIN)14,1,14                                        YLD1  82
   17 WRITE (KOUT,1302)                                                 YLD1  83
      BACKSPACE INTP                                                    YLD1  84
      READ (INTP,1303)                                                  YLD1  85
      WRITE (INTP,1303)                                                 YLD1  86
      GO TO 1                                                           YLD1  87
CHECK FOR COMPLETENESS                                                  YLD1  88
   16 DO 18 J=1,INUC                                                    YLD1  89
      IF(ABEGN(J))15,18,18                                              YLD1  90
   15 CONTINUE                                                          YLD1  91
      ABEGN(J) = 0.0                                                    YLD1  92
   18 CONTINUE                                                          YLD1  93
      IF (.NOT.NPRNT(4)) GO TO 99                                       YLD1  94
      WRITE (KOUT,1001) FISSID                                          YLD1  95
      DO 1000 IO = 1,INUC                                               YLD1  96
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      NAME = IABS(NUCLID(IO))/MULT(5)                                   YLD1  97
      CALL UNPACK (NMAS,NAT,NSTAT,NAME)                                 YLD1  98
 1000 WRITE (KOUT,1002) NMAS,NAT,NSTAT,ABEGN(IO)                        YLD1  99
CODING TO PREVENT DUPLICATION OF FISSION YIELDS FOR NUCLIDES THAT ARE   YLD1 100
C   MEMBERS OF MORE THAN ONE SUBCHAIN                                   YLD1 101
   99 DO 100 KM =1,INUC                                                 YLD1 102
  100 MEM(KM) = 0                                                       YLD1 103
      DO 500 IN = 1,INUC                                                YLD1 104
C   FIND THE NEXT NUCLIDE THAT BEGINS A SUBCHAIN                        YLD1 105
      IF (NUCLID(IN))411,411,500                                        YLD1 106
C                                                                       YLD1 107
C   SET PARAMETERS FOR BEGINNING OF A SUBCHAIN                          YLD1 108
C         MEMBERSHIP COUNTER                                            YLD1 109
  411 LSUB = 1                                                          YLD1 110
      JL = 0                                                            YLD1 111
C         STARTING INDEX                                                YLD1 112
      NUC(1) = IN                                                       YLD1 113
  412 LIM(LSUB) = 4                                                     YLD1 114
C   PROCESS A SUBCHAIN MEMBER                                           YLD1 115
  413 KP = NUC(LSUB)                                                    YLD1 116
      IM = LIM(LSUB)                                                    YLD1 117
      INFO = MOD(IABS(NUCLID(KP)),MULT(5))                              YLD1 118
      INFORM(LSUB) = INFO                                               YLD1 119
      INC = 1                                                           YLD1 120
CHECK FOR END OF SUBCHAIN                                               YLD1 121
      IF (INFO.EQ.4) GO TO 421                                          YLD1 122
C   EXTRACT THE DAUGHTER INCREMENT                                      YLD1 123
      ID = MOD(INFO,MULT(IM+1))/MULT(IM)                                YLD1 124
C   SEE IF THIS INCREMENT SHOULD BE NEGATIVE                            YLD1 125
      IF (MOD(INFO,MULT(2))/MULT(1).EQ.IM) GO TO 414                    YLD1 126
      IF (LSUB.EQ.JL) GO TO 415                                         YLD1 127
C   RECORD THE MEMBERSHIP OF NUCLID(KP) IN THIS SUBCHAIN                YLD1 128
      MEM(KP) = MEM(KP) +1                                              YLD1 129
      GO TO 415                                                         YLD1 130
  414 INC = -INC                                                        YLD1 131
COMPUTE DAUGHTER INDEX                                                  YLD1 132
  415 NDAUT = KP + INC*ID                                               YLD1 133
C   ACCEPT THE DAUGHTER FOR MEMBERSHIP AND RECYCLE                      YLD1 134
      LSUB = LSUB + 1                                                   YLD1 135
      IF (LSUB.GT.11) GO TO 500                                         YLD1 136
      NUC(LSUB) = NDAUT                                                 YLD1 137
      GO TO 412                                                         YLD1 138
C                                                                       YLD1 139
  421 IF (LSUB.EQ.1) GO TO 500                                          YLD1 140
C   FIND THE LAST BRANCH IN THE SUBCHAIN                                YLD1 141
      LAST = LSUB + 1                                                   YLD1 142
      DO 422 L = 2,LSUB                                                 YLD1 143
      LBACK = LAST - L                                                  YLD1 144
      JL = LBACK                                                        YLD1 145
      IM = LIM(LBACK)                                                   YLD1 146
      IF (MOD(INFORM(LBACK),MULT(IM))/MULT(IM-1))422,422,431            YLD1 147
  422 CONTINUE                                                          YLD1 148
      GO TO 500                                                         YLD1 149
C                                                                       YLD1 150
C   SET UP A NEW SUBCHAIN STARTING FROM THE DEEPEST UNEXPLORED BRANCH   YLD1 151
  431 LSUB = LBACK                                                      YLD1 152
      LIM(LSUB) = LIM(LSUB) -1                                          YLD1 153
      GO TO 413                                                         YLD1 154
  500 CONTINUE                                                          YLD1 155
C                                                                       YLD1 156
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```
      DO 600 KA =1,INUC                                                 YLD1 157
      DIV = MEM(KA)                                                     YLD1 158
      IF (DIV) 613,600,601                                              YLD1 159
  601 ABEGN(KA) = ABEGN(KA)/DIV                                         YLD1 160
      GO TO 600                                                         YLD1 161
  613 WRITE (6,6130) KA                                                 YLD1 162
 6130 FORMAT (15H0MINUS MEM FOR I3)                                     YLD1 163
  600 CONTINUE                                                          YLD1 164
      RETURN                                                            YLD1 165
C                                                                       YLD1 166
  101 FORMAT(6A6)                                                       YLD1 167
  103 FORMAT(I5)                                                        YLD1 168
 1001 FORMAT (20H1FISSION YIELDS FOR A6//5X4HMA$S5X6HCHARGE5X6HISOMER5X2YLD1 169
     15HYIELD PER 10,000 FISSIONS/)                                     YLD1 170
 1002 FORMAT (5XI3,7XI3,9XI1,14X1PE12.4)                                YLD1 171
 1301 FORMAT (9H0NUCLIDE O12,11H WITH YIELD1PE12.4,14H IS DUPLICATED)   YLD1 172
 1302 FORMAT (24H0CARD WITH NEGATIVE MASS)                              YLD1 173
 1303 FORMAT(80H                                                        YLD1 174
     1                                                                  YLD1 175
 1304 FORMAT (32H0NO FISSION YIELD AVAILABLE FOR A6)                    YLD1 176
 1305 FORMAT (9H0BAD CARD/5X2I3,A3,5X1PE12.4)                           YLD1 177
      END                                                               YLD1 178
$IBFTC XPRMX   LIST,DECK,M94/2                                          XPRM   0
      SUBROUTINE XPRM                                                   XPRM   1
     1    (INTP)                                                        XPRM   2
C                                                                       XPRM   3
C     R C TOMPKINS - US ARMY NUCLEAR DEFENSE LABS                       XPRM   4
C     NOVEMBER 1966                                                     XPRM   5
CALLED BY PAM1                                                          XPRM   6
C                                                                       XPRM   7
C  * * * * * * * * * * GLOSSARY * * * * * * * * * * * * * *             XPRM   8
C                                                                       XPRM   9
C   ERM(181)        EXPOSURE RATE MULTIPLIERS FOR GAMMA-EMITTING FISSION XPRM  10
C                   PRODUCTS (CF. XPRM AND GXPSR)                       XPRM  11
C   JRM(181)        CROSS REFERENCE TO INDICES OF NPARNT (XPRM AND GXPSR) XPRM  12
C                   PARALLEL TO ERM                                     XPRM  13
C   KRM             NUMBER OF FISSION PRODUCTS CONTRIBUTING TO GAMMA DOSE XPRM  14
C                   (XPRM AND GXPSR)                                    XPRM  15
C   NSTAT           ISOMER NUMBER ON                                    XPRM  16
C                   FISSION YIELD CARD (YIELD), CF. LISOM               XPRM  17
C                   ERM CARD (XPRM) -                                   XPRM  18
C                       GROUND STATE 0 OR 2                             XPRM  19
C                       EXCITED STATE 1                                 XPRM  20
C   XRM             EXPOSURE RATE MULTIPLIER ON EBM CARD (XPRM)         XPRM  21
C                                                                       XPRM  22
C  * * * * * * * * * * * * * * * * * * * * * * * * * *                  XPRM  23
C                                                                       XPRM  24
      COMMON/FRYLNG/                                                    XPRM  25
     1    BSUBK (90)  ,ERM   (185) ,JRM   (185) ,KRM    ,ECF(90)        XPRM  26
      COMMON/FISHIN/                                                    XPRM  27
     1    ABEGN (700) ,ABUNDO(780) ,BRANCH(130) ,CAPFIS                 XPRM  28
     2   ,DCON  (700) ,IBRA        ,INUC        ,MAXNUC                 XPRM  29
     3   ,MULT  (11)  ,NUCLID(700)                                      XPRM  30
      COMMON/UTILTY/                                                    XPRM  31
     1    KOUT        ,NPRNT (15)                                       XPRM  32
      DIMENSION NAME(181)                                               XPRM  33
      LOGICAL JD,IGO,KDOS,NPRNT                                         XPRM  34
C                                                                       XPRM  35
 1001 FORMAT (2X2I3,I2,E8.3)                                            XPRM  36
 1002 FORMAT                                                            XPRM  37
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     1     (15H1OUTPUT OF XPRM//5X5HINDEX5X2HIA5X2HIZ5X2HIS5X3HJRM9X3HERMXPRM  38
     2     //)                                                          XPRM  39
  702 FORMAT                                                            XPRM  40
     1     (6X,I3,5X,I3,5X,I2,6X,I1,5X,I3,5X1PE10.3)                   XPRM  41
 1311 FORMAT (22HONEGATIVE MASS IN XPRM)                                XPRM  42
 1312 FORMAT (19HOTOO MANY ERM CARDS)                                   XPRM  43
 1313 FORMAT (55HOTHE FOLLOWING ERM CARDS HAVE NO COUNTERPARTS IN NUCLIDXPRM  44
     1)                                                                 XPRM  45
 1323 FORMAT (5X07,5XE6.3)                                              XPRM  46
C                                                                       XPRM  47
C    INITIALIZE VARIABLES                                               XPRM  48
      LT = 1                                                            XPRM  49
      MAXERM = 181                                                      XPRM  50
      DO 1 I = 1,MAXERM                                                 XPRM  51
      ERM(I) = 0.0                                                      XPRM  52
      NAME(I) = 0.0                                                     XPRM  53
    1 JRM(I) = 0                                                        XPRM  54
      LAST = 0                                                          XPRM  55
      KRM = 0                                                           XPRM  56
C                                                                       XPRM  57
C                                                                       XPRM  58
C                                                                       XPRM  59
C   READ A CARD                                                         XPRM  60
    2 READ (INTP,1001)                                                  XPRM  61
     1     NMAS,NAT,NSTAT,XRM                                           XPRM  62
CHECK FOR END-OF-FILE SENTINEL                                          XPRM  63
      IF (NMAS)1301,6,3                                                 XPRM  64
    3 IF(KRM.EQ.MAXERM) GO TO 1302                                      XPRM  65
      KRM = KRM + 1                                                     XPRM  66
COMPATIBILIZE THE ISOMERIC STATE INDICATORS                             XPRM  67
      MS = NSTAT + 1                                                    XPRM  68
      GO TO (5,5,4),MS                                                  XPRM  69
C                                                                       XPRM  70
    4 NSTAT = 0                                                         XPRM  71
C   PACK THE NUCLIDE NAME                                               XPRM  72
    5 NAME(KRM) = NMAS*MULT(4) + NAT*MULT(1) + NSTAT                    XPRM  73
      ERM(KRM) = XRM                                                    XPRM  74
C                                                                       XPRM  75
      GO TO 2                                                           XPRM  76
C   MATCH THE NAMES                                                     XPRM  77
    6 DO 100 K = 1,INUC                                                 XPRM  78
      NUCNAM = IABS(NUCLID(K))/MULT(5)                                  XPRM  79
      DO 10 L = LT,KRM                                                  XPRM  80
      NAML = NAME(L)                                                    XPRM  81
    7 IF (NAML.EQ.NUCNAM) GO TO 11                                      XPRM  82
   10 CONTINUE                                                          XPRM  83
      GO TO 100                                                         XPRM  84
C                                                                       XPRM  85
   11 NUMAS = NAML/MULT(4)                                              XPRM  86
CHECK FOR BEGINNING OF MASS CHAIN                                       XPRM  87
      IF (NUMAS - LAST)12,13,12                                         XPRM  88
   12 TEMP = -ERM(L)                                                    XPRM  89
      GO TO 14                                                          XPRM  90
   13 TEMP = ERM(L)                                                     XPRM  91
      IF (LT.EQ.KRM) GO TO 101                                          XPRM  92
   14 LAST = NUMAS                                                      XPRM  93
C   ORDER THE ARRAYS                                                    XPRM  94
      MB = L                                                            XPRM  95
      MT = LT + 1                                                       XPRM  96
      LL = MB + MT                                                      XPRM  97
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C                                                                       XPRM  98
      DO 20 M = MT,HB                                                   XPRM  99
      MM = LL - M                                                       XPRM 100
      ERM(MM) = ERM(MM-1)                                               XPRM 101
   20 NAME(MM) = NAME(MM-1)                                             XPRM 102
C                                                                       XPRM 103
      ERM(LT) = TEMP                                                    XPRM 104
      NAME(LT) = 0                                                      XPRM 105
      JRM(LT) = K                                                       XPRM 106
      LT = MT                                                           XPRM 107
C                                                                       XPRM 108
  100 CONTINUE                                                          XPRM 109
C   ERROR TRACE ON NORMAL EXIT                                          XPRM 110
      GO TO 1303                                                        XPRM 111
C   PROCESS THE LAST ENTRY                                              XPRM 112
  101 JRM(KRM) = K                                                      XPRM 113
      ERM(KRM) = TEMP                                                   XPRM 114
      NAME(KRM) = 0                                                     XPRM 115
C   OUTPUT RESULTS ON REQUEST                                           XPRM 116
      IF (.NOT.NPRNT(5)) RETURN                                         XPRM 117
      WRITE (KOUT,1002)                                                 XPRM 118
      DO 700 I=1,KRM                                                    XPRM 119
      JR = JRM(I)                                                       XPRM 120
      NAMO = IABS(NUCLID(JR))/MULT(5)                                   XPRM 121
      CALL UNPACK(IA,IZ,IS,NAMO)                                        XPRM 122
  700 WRITE (KOUT,702)                                                  XPRM 123
     1    I,IA,IZ,IS,JRM(I),ERM(I)                                      XPRM 124
      RETURN                                                            XPRM 125
C * * * * * * ERROR TRACES * * * * * * *                                 XPRM 126
 1301 WRITE (KOUT,1311)                                                 XPRM 127
      WRITE (KOUT,1001) NMAS,NAT,NSTAT,XRM                              XPRM 128
      GO TO 2                                                           XPRM 129
 1302 WRITE (KOUT,1312)                                                 XPRM 130
      STOP 1302                                                         XPRM 131
 1303 WRITE (KOUT,1313)                                                 XPRM 132
      WRITE (KOUT,1323) (NAME(L),ERM(L),L=LT,KRM)                       XPRM 133
      KRM = LT - 1                                                      XPRM 134
      GO TO 101                                                         XPRM 135
      END                                                               XPRM 136
$IBFTC INDX    LIST,DECK,M94/2                                          INDX   0
      SUBROUTINE INDCD1                                                 INDX   1
     1    (EMITN , HOB   , KRD   , TW    )                              INDX   2
CALLED BY PAM1                                                          INDX   3
C     INDCD IS MODIFIED VERION OF JONES-HOFFMAN INDUCED                 INDX   4
C     COMPUTER PROGRAM, USNRDL DR-                                      INDX   5
C                                                                       INDX   6
C     NOVEMBER 1966                                                     INDX   7
C                                                                       INDX   8
C  * * * * * * * * * * GLOSSARY * * * * * * * * * * * * *               INDX   9
C                                                                       INDX  10
C   ALB            NEUTRON ALBEDO OF SOIL                               INDX  11
C   FAC(7,18)      NUMBER OF ATOMS OF ISOTOPE I OF ELEMENT J ACTIVATED  INDX  12
C                  PER NEUTRON (CF. INDCD1 AND INDCD2)                  INDX  13
C   FAI(7,18)      ATOMS OF ISOTOPE I OF J PER ATOM OF J                INDX  14
C   FAT(18)        ATOMS OF ELEMENT I PER ATOM OF SOIL                  INDX  15
C   FM(18)         MASS FRACTION OF ELEMENTS IN SOIL                    INDX  16
C                  (CF. CASSIDY/JONES FW)                               INDX  17
C   FOG(5,7,18)    PHOTONS PER DISINTEGRATION OF ENERGY I OF ISOTOPE J OFINDX  18
C                  ELEMENT K (INDCD1 AND INDCD2)                        INDX  19
C   FOM            FRACTIONS OF NEUTRONS SEEN BY APPARENT CRATER        INDX  20
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C   HL(7,18)        HALF LIFE OF CAPTURE PRODUCT OF ISOTOPE I OF ELEMENT JINDX  21
C   HOB             HEIGHT OF BURST IN FEET                                INDX  22
C   HSCL            SCALED HEIGHT OF BURST (W**1/3 IN INDCD2)              INDX  23
C   ISO(18)         NUMBER OF ISOTOPES OF EACH ELEMENT OCCURRING IN NATUREINDX  24
C   KEV(7,18)       NUMBER OF PHOTON ENERGIES EMITTED BY CAPTURE PRODUCT  INDX  25
C                   OF I OF J                                              INDX  26
C   LH(7,18)        UNITS OF HL,CR, IUNIT                                  INDX  27
C   NA(7,18)        MASS NUMBER OF ISOTOPE I OF ELEMENT J                  INDX  28
C   NZ(18)          ATOMIC NUMBERS OF SOIL ELEMENTS                        INDX  29
C   RNY(5,7,18)     EXPOSURE RATE MULTIPLIERS FOR PHOTON ENERGIES PARALLELINDX  30
C                   TO FOG                                                 INDX  31
C   SIGI(7,18)      THERMAL NEUTRON ABSORPTION CROSS SECTION OF ISOTOPE I INDX  32
C                   OF ELEMENT J (BARNS)                                   INDX  33
C   SIGISC(7,18)    THERMAL NEUTRON SCATTERING CROSS SECTION OF ISOTOPE I INDX  34
C                   OF ELEMENT J (BARNS)                                   INDX  35
C   SIGS            THERMAL NEUTRON ABSORPTION CROSS SECTION OF SOIL       INDX  36
C                   (BARNS)                                                INDX  37
C   SIGSSC          THERMAL NEUTRON SCATTERING CROSS SECTION OF SOIL       INDX  38
C                   (BARNS)                                                INDX  39
C   XLAM(7,18)      DISINTEGRATION CONSTANT OF CAPTURE PRODUCT OF ISOTOPE INDX  40
C                   I OF ELEMENT J                                         INDX  41
C                                                                          INDX  42
C  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  INDX  43
C                                                                          INDX  44
      COMMON/INDUCE/                                                       INDX  45
     1    ALBFOM        ,FAC    (7,18),FOGRNY(7,18),ISO    (18)            INDX  46
     2   ,LMAX          ,XLAM   (7,18)                                     INDX  47
C                                                                          INDX  48
      COMMON/UTILTY/                                                       INDX  49
     1    KOUT          ,NPRNT  (15)                                       INDX  50
C                                                                          INDX  51
      DIMENSION                                                            INDX  52
     1  A (7, 18),     FAI (7, 18), FAT(18),  FM(18),    FOG(5,7,18),      INDX  53
     2HL(7,18),  NZ(18),          LH (7, 18), NA (7, 18), RNY(5,7,18),    INDX  54
     3KEV(7,18),                                                          INDX  55
     4 SA (18), SFAI (18), SFAISC (18), SIGI (7, 18), SIGISC (7, 18)      INDX  56
C                                                                          INDX  57
      LOGICAL NPRNT                                                        INDX  58
C                                                                          INDX  59
   10 FORMAT(I2,8X,F10.0)                                                  INDX  60
   14 FORMAT (I2,I5,E13.3)                                                 INDX  61
  016 FORMAT (                                                             INDX  62
     1  I3, I2, F9.5, F15.5, E18.3, I3, F15.5)                             INDX  63
   18 FORMAT (F10.0,E10.0)                                                 INDX  64
  601 FORMAT                                                               INDX  65
     1    (17H1OUTPUT OF INDCD1/22H0NUMBER OF ELEMENTS = I2/42H0NUMBER OINDX  66
     2F NEUTRONS EMITTED PER FISSION = F5.2/                               INDX  67
     4    / 9H0   INDEX5X3HISO18X3HFAC12X4HXLAM9X3HKEV9X3HFOG12X3HRNY/)   INDX  68
  602 FORMAT                                                               INDX  69
     1    (//6XI2,8XI1,6X1PE12.3,5XE10.3,6XI1,6X0PF10.5,5X1PE10.3)        INDX  70
  603 FORMAT                                                               INDX  71
     1    (63X0PF10.5,5X1PE10.3)                                          INDX  72
  604 FORMAT                                                               INDX  73
     1    (1H022X1PE12.3,5XE10.3,6XI1,6X0PF10.5,5X1PE10.3)                INDX  74
C                                          ELEMENTS OF CASING ARE          INDX  75
C                                          IGNORED IN THIS COMPUTATIONS    INDX  76
C                                                                          INDX  77
      HOBLMT = 36.0                                                        INDX  78
      DOBLMT = -2.0                                                        INDX  79
  100 READ            (KRD, 10)                                            INDX  80
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     1  LMAX                                                              INDX  81
      IF(LMAX)700,700,102                                                 INDX  82
  102 READ        (KRD, 14)                                               INDX  83
     1  (NZ(L), ISO(L), FM(L), L=1, LMAX)                                 INDX  84
      DO 103 L = 1, LMAX                                                  INDX  85
      IS = ISO(L)                                                         INDX  86
  103 READ                                (KRD, 16)                       INDX  87
     1  (NA(I,L), KEV(I,L), FAI(I,L), SIGI(I,L), HL(I,L), LH(I,L),        INDX  88
     2  SIGISC (I, L), I = 1, IS)                                         INDX  89
      DO 104 L = 1, LMAX                                                  INDX  90
      IS = ISO(L)                                                         INDX  91
      DO 104 I = 1, IS                                                    INDX  92
      KE = KEV(I,L)                                                       INDX  93
  104 READ            (KRD, 18)                                           INDX  94
     1  (FOG(N,I,L), RNY(N,I,L), N=1, KE)                                 INDX  95
      IF(EMITN)700,700,105                                                INDX  96
 105  SIGS= 0.                                                            INDX  97
      SIGSSC= 0.0                                                         INDX  98
      SFWMAX=0.                                                           INDX  99
      DO 120 L=1, LMAX                                                    INDX 100
      SA(L)=0.                                                            INDX 101
      IS=ISO(L)                                                           INDX 102
      DO 110 I=1, IS                                                      INDX 103
      A(I,L)=NA(I,L)                                                      INDX 104
  110 SA(L)= SA(L)+A(I,L)*FAI(I,L)                                        INDX 105
  120 SFWMAX=SFWMAX+FM(L)/SA(L)                                           INDX 106
      DO 150 L=1, LMAX                                                    INDX 107
      FAT(L) = FM(L)/(SA(L)*SFWMAX)                                       INDX 108
      SFAI(L)=0.                                                          INDX 109
      SFAISC(L)=0.0                                                       INDX 1 0
      IS=ISO(L)                                                           INDX 111
      DO 140 I=1, IS                                                      INDX 112
      SFAISC(L) = SFAISC (L)+FAI(I,L)* SIGISC(I,L)                        INDX 113
  140 SFAI(L) = SFAI(L)+FAI(I,L)*SIGI(I,L)                                INDX 114
      SIGSSC=SIGSSC+FAT(L)*SFAISC(L)                                      INDX 115
  150 SIGS=SIGS+FAT(L)*SFAI(L)                                            INDX 116
  152 DO 200 L=1, LMAX                                                    INDX 117
      IS=ISO(L)                                                           INDX 118
      DO 200 I=1, IS                                                      INDX 119
      FOGRNY(I,L) = 0.                                                    INDX 120
      KE = KEV(I,L)                                                       INDX 121
      DO 210 N = 1, KE                                                    INDX 122
  210 FOGRNY(I,L) = FOGRNY(I,L) + FOG(N,I,L)*RNY(N,I,L)                   INDX 123
      FAC(I,L)=FAT(L)*FAI(I,L)*SIGI(I,L)/SIGS                             INDX 124
      HL(I,L)=TIMSEC(HL(I,L),LH(I,L),0)                                   INDX 125
  200 XLAM(I,L)=.693/HL(I,L)                                              INDX 126
C     REDUCTION OF SOIL EXP. RATE IS NOW MADE AC                          INDX 127
C     THE SOLID ANGLE FRACTION OF THE FIREBALL TOUCHING THE GROUND AT     INDX 128
C     THE TIME OF HYDRODYNAMIC SEPARATION, AND THE FRACTION OF            INDX 129
C     NEUTRONS THAT REMAIN IN THE SOIL AFTER ALBEDO.                      INDX 130
      HSCL=HOB/TW**0.33333333                                             INDX 131
  272 IF (HSCL.LT.HOBLMT) GO TO 274                                       INDX 132
  273 FOM=0.0                                                             INDX 133
      ALB=0.0                                                             INDX 134
      GO TO 287                                                           INDX 135
  274 IF(HSCL)276,277,275                                                 INDX 136
  275 FOM=1.-HSCL/SQRT(4.24*HSCL*HSCL-234.*HSCL+4225.)                    INDX 137
      GO TO 286                                                           INDX 138
  276 IF (HSCL.LT.DOBLMT) GO TO 278                                       INDX 139
  277 FOM=1.0                                                             INDX 140
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      GO TO 286                                                         INDX 141
  278 ALB=1.0                                                           INDX 142
      FOM=1.0                                                           INDX 143
      GO TO 287                                                         INDX 144
  286 ALB=1.155*SQRT(SIGS/(SIGSSC+SIGS))                                INDX 145
  287 ALBFOM = EMITN*FOM*ALB*1.E4                                       INDX 146
      IF (.NOT.NPRNT(8)) RETURN                                         INDX 147
    6 WRITE (KOUT,601)                                                  INDX 148
     1    LMAX,EMITN                                                    INDX 149
C                                                                       INDX 150
      DO 605 I=1,LMAX                                                   INDX 151
      IS = ISO(I)                                                       INDX 152
      WRITE (KOUT,602)                                                  INDX 153
     1    I,IS,FAC(1,I),XLAM(1,I),KEV(1,I),FOG(1,1,I),RNY(1,1,I)        INDX 154
      KE=KEV(1,I)                                                       INDX 155
      IF(KE.GT.1)                                                       INDX 156
     1WRITE (KOUT,603)                                                  INDX 157
     1    (FOG(K,1,I),RNY(K,1,I),K=2,KE)                                INDX 158
      IF(IS.EQ.1) GO TO 605                                             INDX 159
C                                                                       INDX 160
      DO 600 J=2,IS                                                     INDX 161
      KE = KEV(J,I)                                                     INDX 162
      WRITE (KOUT,604)                                                  INDX 163
     1    FAC(J,I),XLAM(J,I),KE,FOG(1,J,I),RNY(1,J,I)                   INDX 164
      IF(KE.GT.1)                                                       INDX 165
     1WRITE (KOUT,603)                                                  INDX 166
     1    (FOG(K,J,I),RNY(K,J,I),K=2,KE)                                INDX 167
  600 CONTINUE                                                          INDX 168
  605 CONTINUE                                                          INDX 169
  700 RETURN                                                            INDX 170
      END                                                               INDX 171
$IBFTC FRTAB   LIST,DECK,G04/2                                          FRTA   0
      SUBROUTINE FRATB                                                  FRTA   1
     1    (SLDYMP,TMSD,MCHN)                                            FRTA   2
C                                                                       FRTA   3
C     R C TOMPKINS -- US ARMY NUCLEAR DEFENSE LABS                      FRTA   4
C     SEPTEMBER 1966                                                    FRTA   5
C                                                                       FRTA   6
      COMMON  /SET3/                                                    FRTA   7
     1    BZ            ,BZ2          ,BZZ          ,BZ22                FRTA   8
     2   ,DELTAX        ,DGX          ,DGY          ,DIFCON              FRTA   9
     3   ,DIFADJ        ,FMAS(500)    ,FMASS(200)   ,IC(18)              FRTA  10
     4   ,ICON          ,ICTR         ,IH           ,IOT(18)             FRTA  11
     5   ,IP            ,IPOUT        ,ITT(18)      ,IV                  FRTA  12
     6   ,JC(18)        ,JIN          ,JOUT         ,JPOUT               FRTA  13
     7   ,KTR(500)      ,KTAPE        ,LAST         ,MAPRUN              FRTA  14
     8   ,MARRAY        ,MIN          ,MXREQ                             FRTA  15
     9   ,N             ,NA           ,NBZX         ,NBZX2               FRTA  16
     1   ,NBZY          ,NCL          ,NE           ,NF                  FRTA  17
     2   ,NIJ           ,NMAP         ,NMAX         ,NOX                 FRTA  18
     3   ,NP(21)        ,NREQ         ,NS           ,NTAPES              FRTA  19
     4   ,NTAPET        ,NTASK        ,NXMAP        ,NYMAP               FRTA  20
     5   ,YMIN          ,PS(500)      ,PSIZE(200)   ,PACT(200)           FRTA  21
     6   ,ROPART                      ,T(500)       ,T1                  FRTA  22
     7   ,T2            ,TLIMIT       ,X(500)       ,XF                  FRTA  23
     8   ,X0            ,XMAX         ,XMIN         ,XNMAP               FRTA  24
     9   ,X1            ,X2           ,X3           ,X4                  FRTA  25
     1   ,Y(500)        ,YF           ,YO           ,YMAX                FRTA  26
      COMMON/OUTPUT/                                                    FRTA  27
     1    FISNUM      ,FP     (200) ,FW           ,ITAB       ,JGO      FRTA  28
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```
     2   ,MASCHN       ,SIGMAS                                          FRTA  29
      COMMON/FISHIN/                                                    FRTA  30
     1    ABEGN (700) ,ABUNDO(700) ,BRANCH(130) ,CAPFIS                 FRTA  31
     2   ,DCON  (700) ,IBRA        ,INUC        ,MAXNUC                 FRTA  32
     3   ,MULT  (11)  ,NUCLID(700)                                      FRTA  33
C                                                                       FRTA  34
      COMMON/UTILTY/                                                    FRTA  35
     1    KOUT        ,NPRNT (15)                                       FRTA  36
C                                                                       FRTA  37
      COMMON/FRYLNG/                                                    FRTA  38
     1    BSUBK (90)  ,ERM   (185) ,JRM   (185) ,KRM    ,ECF(90)        FRTA  39
C                                                                       FRTA  40
      COMMON/DECAY/                                                     FRTA  41
     1    IGO         ,JD          ,KDOS        ,TENTER                 FRTA  42
     2   ,TEXIT       ,TIME                                            FRTA  43
C                                                                       FRTA  44
C                                                                       FRTA  45
      DIMENSION FR(90)                                                  FRTA  46
      DIMENSION BOIL(40)                                                FRTA  47
C                                                                       FRTA  48
      EQUIVALENCE (FR,BSUBK)                                            FRTA  49
C                                                                       FRTA  50
      LOGICAL NPRNT,IGO,JD,NOTO,KDOS                                    FRTA  51
C                                                                       FRTA  52
      DATA BOIL/2*3173.0,2907.0,3000.0,2976.0,1764.0,1010.0,1026.0,331.8FRTA  53
     1,120.1,1656.0,3497.0,4695.0,4808.0,3300.0,1351.0,583.0,4505.0,4149FRTA  54
     2.0,3436.0,2451.0,1832.0,2123.0,2247.0,1832.0,1534.0,457.4,165.9,15FRTA  55
     355.0,3003.0,4608.0,4367.0,4252.0,4464.0,4348.0,5*4300.0/          FRTA  56
C                                                                       FRTA  57
C                                                                       FRTA  58
      TIME = THSD                                                       FRTA  59
      IGO = .FALSE.                                                     FRTA  60
      JD = .TRUE.                                                       FRTA  61
      KDOS = .FALSE.                                                    FRTA  62
      MAXCHN = 90                                                       FRTA  63
      DO 30 I = 1,MAXCHN                                                FRTA  64
   30 FR(I) = 0.0                                                       FRTA  65
C                                                                       FRTA  66
      CALL BATMAN                                                       FRTA  67
C                                                                       FRTA  68
      MCHN = 0                                                          FRTA  69
      RFRC = 0.0                                                        FRTA  70
      CHN = 0.0                                                         FRTA  71
      LAST = IABS(NUCLID(1))/MULT(9)                                    FRTA  72
      NOTO = .FALSE.                                                    FRTA  73
C                                                                       FRTA  74
      DO 10 MB = 1,INUC                                                 FRTA  75
      NAME = IABS(NUCLID(MB))/MULT(6)                                   FRTA  76
      MASS = NAME/MULT(3)                                               FRTA  77
      NAT = MOD(NAME,MULT(3))                                           FRTA  78
      IF (NAT.GE.27.AND.NAT.LE.66) GO TO 1                              FRTA  79
      WRITE (KOUT,513) NAT,MASS                                         FRTA  80
      ABUND = 0.0                                                       FRTA  81
      GO TO 10                                                          FRTA  82
    1 IF (MASS.EQ.LAST)GO TO 3                                          FRTA  83
      MCHN = MCHN + 1                                                   FRTA  84
      IF (NOTO) FR(MCHN) = RFRC/CHN                                     FRTA  85
      RFRC = 0.0                                                        FRTA  86
      CHN = 0.0                                                         FRTA  87
      NOTO = .FALSE.                                                    FRTA  88
```

```
    3 ABUND = ABUNDO(MB)                                                FRTA  89
      LAST = MASS                                                       FRTA  90
      IF (ABUND)10,10,4                                                 FRTA  91
    4 NOTO = .TRUE.                                                     FRTA  92
      IF (BOIL(NAT-26).GE.SLDTMB) RFRC = RFRC + ABUND                   FRTA  93
      CHN = CHN + ABUND                                                 FRTA  94
   10 CONTINUE                                                          FRTA  95
      MCHN = MCHN + 1                                                   FRTA  96
      IF (NOTO) FR(MCHN) = RFRC/CHN                                     FRTA  97
C                                                                       FRTA  98
      IF (NPRNT(6)) GO TO 22                                            FRTA  99
   19 DO 32 L = 1,MCHN                                                  FRTA 100
      BSUBK(L) = SQRT(FR(L)) * 1.0                                      FRTA 101
      POWER = BSUBK(L)                                                  FRTA 102
      SUM = 0.0                                                         FRTA 103
      DO 20 M = 1,ITAB                                                  FRTA 104
   20 SUM = SUM + FMASS(M)*PSIZE(M)**POWER                              FRTA 105
   32 ECF(L) = 1.0/SUM                                                  FRTA 106
      IF (NPRNT(7)) GO TO 23                                            FRTA 107
   21 IGO = .TRUE.                                                      FRTA 108
      RETURN                                                            FRTA 109
   22 WRITE (KOUT,501)                                                  FRTA 110
      WRITE (KOUT,502) (J,FR(J),J=1,MCHN)                               FRTA 111
      GO TO 19                                                          FRTA 112
   23 WRITE (KOUT,503)                                                  FRTA 113
      WRITE (KOUT,502) (K,BSUBK(K),K=1,MCHN)                            FRTA 114
      GO TO 21                                                          FRTA 115
  501 FORMAT                                                            FRTA 116
     1    (17H1OUTPUT OF FRATIO//6X4HMCHN 10X2HFR//)                    FRTA 117
  502 FORMAT                                                            FRTA 118
     1    (7XI2,6X1PE12.4)                                              FRTA 119
  503 FORMAT(///6X4HMCHN9X5HBSUBK//)                                    FRTA 120
  513 FORMAT (44H0BOILING POINT IS NOT AVAILABLE FOR ELEMENT I3,        FRTA 121
     1  6H(MASS I3,1H))                                                 FRTA 122
      END                                                               FRTA 123
     1  6H(MASS I3,1H))                                                 FRTA 122

$IBFTC PAM2ND  LIST,DECK,M94/2                                          PAM2   0
      SUBROUTINE PAM2                                                   PAM2   1
C                                                                       PAM2   2
C     R C TOMPKINS -- US ARMY NUCLEAR DEFENSE LABS                      PAM2   3
C     OCTOBER 1966                                                      PAM2   4
C   EXECUTIVE PROGRAM FOR THE TIME-DEPENDENT PART OF THE PARTICLE       PAM2   5
C   ACTIVITY MODULE                                                     PAM2   6
CALLED BY LINK9 AND BY CALC                                             PAM2   7
C                                                                       PAM2   8
C  * * * * * * * * * * GLOSSARY * * * * * * * * * * * * * * * * * *     PAM2   9
C                                                                       PAM2  10
C   FP(200)        ACTIVITY DENSITY IN EACH PARTICLE SIZE FRACTION      PAM2  11
C   ITAB           NUMBER OF PARTICLE SIZE CLASSES                      PAM2  12
C   MASCHN         MASS NUMBER REQUESTED FOR OUTPUT WITH JUO = 2        PAM2  13
C   SV(200)        FRACTION OF TOTAL SURFACE IN EACH PARTICLE SIZE CLASS PAM2  14
C                  DIVIDED BY FRACTION OF TOTAL VOLUME                  PAM2  15
C                                                                       PAM2  16
C  * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *     PAM2  17
C                                                                       PAM2  18
      COMMON/FISHIN/                                                    PAM2  19
     1    ABEGN (700) ,ABUNDO(700) ,BRANCH(136) ,CAPFIS                 PAM2  20
     2   ,DCON  (700) ,IBRA        ,INUC        ,MAXNUC                 PAM2  21
     3   ,MULT  (11)  ,NUCLID(700)                                      PAM2  22
C                                                                       PAM2  23
      COMMON/INDUCE/                                                    PAM2  24
```

```
     1    ALBFOM        ,FAC    [7,18],FOGRNY[7,18],ISO    [18]
     2   ,LMAX          ,XLAM   [7,18]
C
      COMMON/UTILTY/
     1    KOUT          ,NPRNT  [15]
C
      COMMON/OUTPUT/
     1    FISNUM        ,FP     [200] ,FW            ,ITAB        ,JGO
     2   ,MASCHN        ,SIGMAS
C
      COMMON/DECAY/
     1    IGO           ,JD             ,KDOS        ,TENTER
     2   ,TEXIT         ,TIME
C
      COMMON  /SET3/
     1    BZ                ,BZ2              ,BZZ              ,BZZ2
     2   ,DELTAX            ,DGX              ,DGY              ,DIFCON
     3   ,DIFADJ            ,FMAS[500]        ,FMASS[200]       ,IC[18]
     4   ,ICON              ,ICTR             ,IH               ,IOT[18]
     5   ,IP                ,IPOUT            ,ITT[18]          ,IV
     6   ,JC[18]            ,JIN              ,JOUT             ,JPOUT
     7   ,KTR[500]          ,KTAPE            ,LAST             ,MAPRUN
     8   ,MARRAY            ,MIN              ,MXREQ
     ~   ,MYDUMY            ,NA               ,NBZX             ,NBZX2
     1   ,NBZY              ,NCL              ,NE               ,NF
     2   ,NIJ               ,NMAP             ,NMAX             ,NOX
     3   ,NP[21]            ,NREQ             ,NS               ,NTAPES
     4   ,NTAPET            ,NTASK            ,NXMAP            ,NYMAP
     5   ,YMIN              ,PS[500]          ,PSIZE[200]       ,PACT[200]
     6   ,RCPART                              ,T[500]           ,T1
     7   ,T2                ,TLIMIT           ,X[500]           ,XF
     8   ,XO                ,XMAX             ,XMIN             ,XNMAP
     9   ,X1                ,X2               ,X3               ,X4
     1    Y[500]            ,YF               ,YO               ,YMAX
C
      LOGIC.  JD,IG^,KDOS,NPRNT
C
  100 FORMAT
     1    [17H1TOTAL PAM OUTPUT/9X5HPSIZE22X2HFP]
  101 FORMAT
     1    [5]    12.4,14XE12.4]
C
      DO 101 = 1,ITAB
   10 FP[I] = 0.0
C
      GO TO [1,2,3],JGO
C
    1 CALL GXPSR
      IF [CAPFIS]3,3,4
    4 CALL URAN
    3 IF [LMAX]5,5,6
    6 CALL INDCD2
    5 IF[.NOT.NPRNT[15]] RETURN
      WRITE [KOUT,100]
      WRITE [KOUT,101] [PSIZE[I],FP[I],I=1,ITAB]
      RETURN
    2 CALL MCHDEP
      GO TO 5
      END
      GO TO 5
```

```
$IBFTC GXTS    LIST,DECK,M94/2                                          GXTS   0
      SUBROUTINE GXPSR                                                  GXTS   1
C                                                                       GXTS   2
C     CASSIDY - NRDL / TOMPKINS - NDL                                   GXTS   3
C                                                                       GXTS   4
C     NOVEMBER 1966                                                     GXTS   5
CALLED BY PAM2                                                          GXTS   6
      COMMON/FISHIN/                                                    GXTS   7
     1    ABEGN [700] ,ABUNDO[700] ,BRANCH[150] ,CAPFIS                 GXTS   8
     2   ,DOON  [700] ,IBRA        ,INUC        ,MAXNUC                 GXTS   9
     3   ,MULT  [11]  ,NUCLID[700]                                      GXTS  10
C                                                                       GXTS  11
      COMMON/FRYLNG/                                                    GXTS  12
     1    BSUBK [90]  ,ERM   [185] ,JRM   [185] ,KRM    ,ECF[90]        GXTS  13
C                                                                       GXTS  14
      COMMON/UTILTY/                                                    GXTS  15
     1    KOUT        ,NPRNT [15]                                       GXTS  16
C                                                                       GXTS  17
      COMMON/OUTPUT/                                                    GXTS  18
     1    FISNUM      ,FP    [280] ,FW          ,ITAB       ,JGO        GXTS  19
     2   ,MASCHN      ,SIGMAS                                           GXTS  20
C                                                                       GXTS  21
      COMMON/DECAY/                                                     GXTS  22
     1    IGO         ,JD          ,KDOS        ,TENTER                 GXTS  23
     2   ,TEXIT       ,TIME                                             GXTS  24
C                                                                       GXTS  25
      COMMON  /SET3/                                                    GXTS  26
     1    BZ            ,BZ2          ,BZZ          ,BZ22               GXTS  27
     2   ,DELTAX        ,DGX          ,DGY          ,DIFCON             GXTS  28
     3   ,DIFADJ        ,FMAS[500]    ,FMASS[200]   ,IC[18]             GXTS  29
     4   ,ICON          ,ICTR         ,IH           ,IOT[18]            GXTS  30
     5   ,IP            ,IPOUT        ,ITT[18]      ,IV                 GXTS  31
     6   ,JC[18]        ,JIN          ,JOUT         ,JPOUT              GXTS  32
     7   ,KTR[500]      ,KTAPE        ,LAST         ,MAPRUN             GXTS  33
     8   ,MARRAY        ,MIN          ,MXREQ                            GXTS  34
     9   ,MYDUMY        ,NA           ,NBZX         ,NBZX2              GXTS  35
     1   ,NBZY          ,NCL          ,NE           ,NF                 GXTS  36
     2   ,NIJ           ,NMAP         ,NMAX         ,NOX                GXTS  37
     3   ,NP[21]        ,NREQ         ,NS           ,NTAPES             GXTS  38
     4   ,NTAPET        ,NTASK        ,NXMAP        ,NYMAP              GXTS  39
     5   ,YMIN          ,PS[500]      ,PSIZE[200]   ,PACT[200]          GXTS  40
     6   ,ROPART                      ,T[500]       ,T1                 GXTS  41
     7   ,T2            ,TLIMIT       ,X[500]       ,XF                 GXTS  42
     8   ,XO            ,XMAX         ,XMIN         ,XNMAP              GXTS  43
     9   ,X1            ,X2           ,X3           ,X4                 GXTS  44
     1   ,Y[500]        ,YF           ,YO           ,YMAX               GXTS  45
C                                                                       GXTS  46
      DIMENSION XRT[90]                                                 GXTS  47
C                                                                       GXTS  48
      LOGICAL JD,IGO,KDOS,NPRNT                                         GXTS  49
      DATA CROSS,UNIT/100.0,1.0/                                        GXTS  50
C                                                                       GXTS  51
  901 FORMAT                                                            GXTS  52
     1    [16H1OUTPUT OF GXPSR/5X13HPARTICLE SIZE7X24HFISSION PROCUCT ACGXTS  53
     2TIVITY]                                                           GXTS  54
  902 FORMAT                                                            GXTS  55
     1    [8X7HMICRONS16X11H(R*H**2)/HP//]                              GXTS  56
  903 FORMAT                                                            GXTS  57
     1    [5X1PE12.4,14XE12.4]                                          GXTS  58
  912 FORMAT                                                            GXTS  59
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     1     (8X7HMICRONS18X6HR*M**2//)                                    GXTS  60
C                                                                        GXTS  61
      CALL BATMAN                                                        GXTS  62
      MAXMCH = 90                                                        GXTS  63
      MCH = 0                                                            GXTS  64
      DO 1 I = 1,MAXMCH                                                  GXTS  65
    1 XRT(I) = 0.0                                                       GXTS  66
C                                                                        GXTS  67
      DO 10 J = 1,KRM                                                    GXTS  68
      K = JRM(J)                                                         GXTS  69
      IF (ERM(J))11,10,12                                                GXTS  70
   11 MCH = MCH + 1                                                      GXTS  71
COMPUTE MASS CHAIN NORMALIZATION FACTOR                                  GXTS  72
C                                                                        GXTS  73
   12 XRT(MCH) = XRT(MCH) + ABUNDO(K)*ABS(ERM(J))                        GXTS  74
C                                                                        GXTS  75
   10 CONTINUE                                                           GXTS  76
C                                                                        GXTS  77
      DO 20 LC = 1,MCH                                                   GXTS  78
      IF (XRT(LC))20,20,21                                               GXTS  79
   21 BNEX = BSUBK(LC)                                                   GXTS  80
      CRISS = CROSS**BNEX                                                GXTS  81
      RADIAL = ECF(LC)/(UNIT + CRISS*ECF(LC))                            GXTS  82
      STRAIT = RADIAL*CRISS                                              GXTS  83
      TNEX = FISNUM*XRT(LC)                                              GXTS  84
      DO 40 LD = 1,ITAB                                                  GXTS  85
   40 FP(LD) = FP(LD) + (RADIAL*PSIZE(LD)**BNEX + STRAIT)*TNEX*FMASS(LD)GXTS  86
   20 CONTINUE                                                           GXTS  87
C                                                                        GXTS  88
C                                                                        GXTS  89
      IF (.NOT.NPRNT(10)) RETURN                                         GXTS  90
C                                                                        GXTS  91
      WRITE (KOUT,901)                                                   GXTS  92
      IF (JD) GO TO 101                                                  GXTS  93
      WRITE (KOUT,912)                                                   GXTS  94
      GO TO 102                                                          GXTS  95
  101 WRITE (KOUT,902)                                                   GXTS  96
  102 CONTINUE                                                           GXTS  97
      DO 103 I=1,ITAB                                                    GXTS  98
      WRITE (KOUT,903) FSIZE(I),FP(I)                                    GXTS  99
  103 CONTINUE                                                           GXTS 100
C                                                                        GXTS 101
      RETURN                                                             GXTS 102
      END                                                                GXTS 103
$IBFTC URANX   LIST,DECK,M94/2                                           URAN   0
      SUBROUTINE URAN                                                    URAN   1
C                                                                        URAN   2
C     R C TOMPKINS - US ARMY NUCLEAR DEFENSE LABS                        URAN   3
C     MAY 1966                                                           URAN   4
CALLED BY PAM2                                                           URAN   5
C                                                                        URAN   6
C   DLAM          DISINTEGRATION CONSTANT OF NP239                       URAN   7
C   PLAM          DISINTEGRATION CONSTANT OF U239                        URAN   8
C                                                                        URAN   9
      COMMON/FISHIN/                                                     URAN  10
     1    ABEGN (700) ,ABUNDO(780) ,BRANCH(130) ,CAPFIS                  URAN  11
     2   ,DCON  (700) ,IBRA        ,INUC        ,MAXNUC                 URAN  12
     3   ,MULT  (11)  ,NUCLID(780)                                       URAN  13
C                                                                        URAN  14
      COMMON/UTILTY/                                                     URAN  15
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     1    KOUT          ,NPRNT (15)                                          URAN  16
      COMMON/OUTPUT/                                                        URAN  17
     1    FISNUM        ,FP     (200) ,FW            ,ITAB        ,JGO      URAN  18
     2   ,MASCHN        ,SIGMAS                                             URAN  19
      COMMON/DECAY/                                                         URAN  20
     1    IGO           ,JD           ,KDOS          ,TENTER                URAN  21
     2   ,TEXIT         ,TIME                                               URAN  22
C                                                                           URAN  23
      COMMON  /SET3/                                                        URAN  24
     1    BZ                ,BZ2              ,BZZ              ,BZ22        URAN  25
     2   ,DELTAX            ,DGX              ,DGY              ,DIFCON      URAN  26
     3   ,DIFADJ            ,FMAS(500)        ,FMASS(200)       ,IC(18)      URAN  27
     4   ,ICON              ,ICTR             ,IH               ,IOT(18)     URAN  28
     5   ,IP                ,IPOUT            ,ITT(18)          ,IV          URAN  29
     6   ,JC(18)            ,JIN              ,JOUT             ,JPOUT       URAN  30
     7   ,KTR(500)          ,KTAPE            ,LAST             ,MAPRUN      URAN  31
     8   ,MARRAY            ,MIN              ,MXREQ                         URAN  32
     9   ,MYDUMY            ,NA               ,NBZX             ,NBZX2       URAN  33
     1   ,NBZY              ,NCL              ,NE               ,NF          URAN  34
     2   ,NIJ               ,NMAP             ,NMAX             ,NOX         URAN  35
     3   ,NP(21)            ,NREQ             ,NS               ,NTAPES      URAN  36
     4   ,NTAPET            ,NTASK            ,NXMAP            ,NYMAP       URAN  37
     5   ,YMIN              ,PS(500)          ,PSIZE(200)       ,PACT(200)   URAN  38
     6   ,ROPART                              ,T(500)           ,T1          URAN  39
     7   ,T2                ,TLIMIT           ,X(500)           ,XF          URAN  40
     8   ,X0                ,XMAX             ,XMIN             ,XNMAP       URAN  41
     9   ,X1                ,X2               ,X3               ,X4          URAN  42
     1   ,Y(500)            ,YF               ,Y0               ,YMAX        URAN  43
CCCCC                                                                       URAN  44
      LOGICAL JD,IGO,KDOS,NPRNT                                             URAN  45
C                                                                           URAN  46
COMPUTE U239 DISINTEGRATION CONSTANT                                        URAN  47
      PLAM = 0.693147/(23.5*60.0)                                           URAN  48
COMPUTE NP239 DISINTEGRATION CONSTANT                                       URAN  49
      DLAM = 0.693147/(56.0*3600.0)                                         URAN  50
C                                                                           URAN  51
    2 AZERO = CAPFIS*1.E4*PLAM                                              URAN  52
      GLMP = DLAM/(DLAM - PLAM)                                             URAN  53
      GLUMP = AZERO*GLMP                                                    URAN  54
C                                                                           URAN  55
      IF (.NOT.JD) GO TO 3                                                  URAN  56
      ABURAN = AZERO*EXP (-PLAM*TIME)                                       URAN  57
      ABNEP = GLMP*ABURAN - GLUMP*EXP (-DLAM*TIME)                          URAN  58
      GO TO 7                                                               URAN  59
C                                                                           URAN  60
    3 IF (.NOT.KDOS) GO TO 4                                                URAN  61
      ABURAN = AZERO/PLAM*(EXP (-PLAM*TENTER) - EXP (-PLAM*TEXIT))          URAN  62
      ABNEP = GLMP*ABURAN -                                                 URAN  63
     1GLUMP*(EXP (-DLAM*TENTER) - EXP (-DLAM*TEXIT))/DLAM                   URAN  64
      GO TO 7                                                               URAN  65
C                                                                           URAN  66
    4 ABURAN = AZERO/PLAM*EXP (-PLAM*TENTER)                                URAN  67
      ABNEP = GLMP*ABURAN - GLUMP/DLAM*EXP (-DLAM*TENTER)                   URAN  68
C                                                                           URAN  69
    7 ANEP = (ABURAN*.327E-6 + ABNEP*.966E-6)*FISNUM                        URAN  70
      DO 8 J=1,ITAB                                                         URAN  71
    8 FP(J) = FP(J) + ANEP*FMASS(J)                                         URAN  72
C                                                                           URAN  73
      IF (NPRNT(12)) WRITE (KOUT,100) ANEP                                  URAN  74
  100 FORMAT                                                                URAN  75
```

```
     1     (15H1OUTPUT OF URAN/5X21HMASS 239 CONTRIBUTES 1PE12.4,        URAN  76
     2     23H TO EACH PARTICLE SIZE.)                                   URAN  77
      RETURN                                                             URAN  78
      END                                                                URAN  79
$IBFTC INDY    LIST,DECK,M94/2                                          INDY   0
      SUBROUTINE INDCD2                                                  INDY   1
C                                                                        INDY   2
C     NOVEMBER 1966                                                      INDY   3
      COMMON/INDUCE/                                                     INDY   4
     1     ALBFOM       ,FAC    (7,18),FOGRNY(7,18),ISO    (18)         INDY   5
     2    ,LMAX         ,XLAM   (7,18)                                   INDY   6
C                                                                        INDY   7
      COMMON/UTILTY/                                                     INDY   8
     1     KOUT         ,NPRNT (15)                                      INDY   9
C                                                                        INDY  10
      COMMON/OUTPUT/                                                     INDY  11
     1     FISNUM       ,FP     (200) ,FW            ,ITAB        ,JGO   INDY  12
     2    ,MASCHN       ,SIGMAS                                          INDY  13
C                                                                        INDY  14
      COMMON/DECAY/                                                      INDY  15
     1     IGO          ,JD            ,KDOS         ,TENTER            INDY  16
     2    ,TEXIT        ,TIME                                            INDY  17
C                                                                        INDY  18
      COMMON  /SET3/                                                     INDY  19
     1     BZ             ,BZ2            ,BZZ            ,BZ22          INDY  20
     2    ,DELTAX         ,DGX            ,DGY            ,DIFCON        INDY  21
     3    ,DIFADJ         ,FMAS(500)      ,FMASS(200)     ,IC(18)        INDY  22
     4    ,ICON           ,ICTR           ,IH             ,IOT(18)       INDY  23
     5    ,IP             ,IPOUY          ,ITT(18)        ,IV            INDY  24
     6    ,JC(18)         ,JIN            ,JOUT           ,JPOUT         INDY  25
     7    ,K(500)         ,KTAPE          ,LAST           ,MAPRUN        INDY  26
     8    ,MARRAY         ,MIN            ,MXREQ                         INDY  27
     9    ,MYDUMY         ,NA             ,NBZX           ,NBZX2         INDY  28
     1    ,NBZY           ,NCL            ,NE             ,NF            INDY  29
     2    ,NIJ            ,NMAP           ,NMAX           ,NOX           INDY  30
     3    ,NP(21)         ,NREQ           ,NS             ,NTAPES        INDY  31
     4    ,NTAPET         ,NTASK          ,NXMAP          ,NYMAP         INDY  32
     5    ,YMIN           ,PS(500)        ,PSIZE(200)     ,PACT(200)     INDY  33
     6    ,ROPART                         ,T(500)         ,T1            INDY  34
     7    ,T2             ,TLIMIT         ,X(500)         ,XF            INDY  35
     8    ,XO             ,XMAX           ,XMIN           ,XNMAP         INDY  36
     9    ,X1             ,X2             ,X3             ,X4            INDY  37
     1    ,Y(500)         ,YF             ,YO             ,YMAX          INDY  38
C                                                                        INDY  39
      LOGICAL JD,IGO,KDOS,NPRNT                                          INDY  40
C                                                                        INDY  41
 1000 FORMAT                                                             INDY  42
     1     (17H1OUTPUT OF INDCD2/5X53HINDUCED ACTIVITY IN THE TRANSPORTEDINDY  43
     2 SOIL CONTRIBUTES 1PE12.4,23H TO EACH PARTICLE SIZE.)              INDY  44
C                                                                        INDY  45
      SDRE = 0.0                                                         INDY  46
C                                                                        INDY  47
      DO 24 L = 1,LMAX                                                   INDY  48
      IS = ISO(L)                                                        INDY  49
C                                                                        INDY  50
      DO 22 I = 1,IS                                                     INDY  51
      DLAM = -XLAM(I,L)                                                  INDY  52
      IF (.NOT.JD) GO TO 12                                              INDY  53
      DRI = -FAC(I,L)*DLAM*FOGRNY(I,L)*EXP(DLAM*TIME)                    INDY  54
      GO TO 22                                                           INDY  55
```

```
C                                                                       INDY  56
   12 IF (.NOT.KDOS) GO TO 14                                           INDY  57
      DRI = FAC(I,L)*FOGRNY(I,L)*(EXP(DLAM*TENTER) - EXP(DLAM*TEXIT))   INDY  58
      GO TO 22                                                          INDY  59
C                                                                       INDY  60
   14 DRI = FAC(I,L)*FOGRNY(I,L)*EXP(DLAM*TENTER)                       INDY  61
C                                                                       INDY  62
   22 SDRE = SDRE + DRI                                                 INDY  63
   24 CONTINUE                                                          INDY  64
C                                                                       INDY  65
C                                                                       INDY  66
      SDRE = SDRE*ALBFOM*FISNUM                                         INDY  67
C                                                                       INDY  68
      DO 26 MA = 1,ITAB                                                 INDY  69
   26 FP(MA) = FP(MA) + SDRE*FMASS(MA)                                  INDY  70
C                                                                       INDY  71
      IF (NPRNT(11)) WRITE (KOUT,1000) SDRE                             INDY  72
      RETURN                                                            INDY  73
      END                                                               INDY  74
      RETURN                                                            INDY  73
$IBFTC MCTS    LIST,DECK,M94/2                                          MCTS   0
      SUBROUTINE MCHBEP                                                 MCTS   1
C                                                                       MCTS   2
C        R C TOMPKINS - US ARMY NUCLEAR DEFENSE LABS                    MCTS   3
C      NOVEMBER 1966                                                    MCTS   4
CALLED BY PAM2                                                          MCTS   5
C                                                                       MCTS   6
      COMMON/FISHIN/                                                    MCTS   7
     1    ABEGN (700) ,ABUNDO(700) ,BRANCH(130) ,CAPFIS                 MCTS   8
     2   ,DCON  (700) ,IBRA        ,INUC        ,MAXNUC                 MCTS   9
     3   ,MULT  (11)  ,NUCLID(700)                                      MCTS  10
      COMMON/UTILTY/                                                    MCTS  11
     1    KOUT        ,NPRNT (15)                                       MCTS  12
      COMMON/OUTPUT/                                                    MCTS  13
     1    FISNUM      ,FP    (200) ,FW          ,ITAB       ,JGO        MCTS  14
     2   ,MASCHN      ,SIGMAS                                           MCTS  15
      COMMON/FRYLNG/                                                    MCTS  16
     1    BSUBK (90)  ,ERM   (185) ,JRM   (185) ,XRM    ,ECF(90)        MCTS  17
      COMMON/DECAY/                                                     MCTS  18
     1    IQO         ,JD          ,KDOS        ,TENTER                 MCTS  19
     2   ,TEXIT       ,TIME                                             MCTS  20
      COMMON  /SET3/                                                    MCTS  21
     1    BZ            ,BZ2          ,BZZ          ,BZ22                MCTS  22
     2   ,DELTAX        ,DGX          ,DGY          ,DIFCON              MCTS  23
     3   ,DIFADJ        ,FMAS(500)    ,FMASS(200)   ,IC(18)              MCTS  24
     4   ,ICON          ,ICTR         ,IM           ,IOT(18)             MCTS  25
     5   ,IP            ,IPOUT        ,ITT(18)      ,IV                  MCTS  26
     6   ,JC(18)        ,JIN          ,JOUT         ,JPOUT               MCTS  27
     7   ,KTR(500)      ,KTAPE        ,LAST         ,MAPRUN              MCTS  28
     8   ,MARRAY        ,MIN          ,MXREQ                             MCTS  29
     9   ,MYDUMY        ,NA           ,NBZX         ,NBZX2               MCTS  30
     1   ,NBZY          ,NCL          ,NE           ,NF                  MCTS  31
     2   ,NIJ           ,NMAP         ,NMAX         ,NOX                 MCTS  32
     3   ,NP(21)        ,NREQ         ,NS           ,NTAPES              MCTS  33
     4   ,NTAPET        ,NTASK        ,NXMAP        ,NYMAP               MCTS  34
     5   ,YMIN          ,PS(500)      ,PSIZE(200)   ,PACT(200)           MCTS  35
     6   ,ROPART                      ,T(500)       ,T1                  MCTS  36
     7   ,T2            ,TLIMIT       ,X(500)       ,XF                  MCTS  37
     8   ,X0            ,XMAX         ,XMIN         ,XNMAP               MCTS  38
     9   ,X1            ,X2           ,X3           ,X4                  MCTS  39
```

```
     1    ,Y(500)          ,YF              ,YO              ,YMAX
C
      DIMENSION FMTA(12),FMTB(18),UNITC(2),UNITF(2)
C
      LOGICAL NPRNT,TZERO,TMINUS
C
      DATA (FMTA(I),I=1,10)/6H(/14X3,6H1H TOT,6HAL ABU,6HNDANCE,6H OF MA
     1,6HSS CHA,6HIN I3,,6H4H WAS,6H1PE12.,6H4,  9H/
     2,(FMTB(I),I=1,15)/6H(17H10,6HUTPUT ,6HOF MCH,6HDEP///,6H5X13HP
     3,6HARTICL,6HE SIZE,6H6X22HA,6HCTIVIT,6HY OF M,6HASS CH,6HAINI4/
     4,6H8X7HMI,6HCRONS1,6H8X  9H/
     5,(UNITC(I),I=1,2)/6H CURIE,6HS  /) /
     6,(UNITF(I),I=1,2)/6H FISSI,6HONS/) /
      DATA CROSS,UNIT/100.0,1.0/
C
  903 FORMAT
     1    (5X1PE12.4,14XE12.4)
C
      TZERO = .FALSE.
      TMINUS = .FALSE.
      FMTA(11) = UNITC(1)
      FMTA(12) = UNITC(2)
      FMTB(16) = UNITC(1)
      FMTB(17) = UNITC(2)
      IF (TIME)11,1,2
    1 TZERO = .TRUE.
COMPUTE EQUIVALENT FISSIONS
      ABNDM = 1.0
      FISNUM = FISNUM*1.E4
      FMTA(11) = UNITF(1)
      FMTA(12) = UNITF(2)
      FMTB(16) = UNITF(1)
      FMTB(17) = UNITF(2)
    2 IF (NPRNT(13)) WRITE (KOUT,FMTB) MASCHN
      IF (TZERO) GO TO 10
COMPUTE ACTIVITY IN CURIES
      CALL BATMAN
      ABNDM = 0.0
      DO 220 K1=1,INUC
      IF(MASCHN.NE.IABS(NUCLID(K1))/MULT(9)) GO TO 220
C     SUM THE ACTIVITIES IN ONE MASS CHAIN AND CONVERT TO CURIES
      ABNDM = ABNDM + ABUNDO(K1)
  220 CONTINUE
      ABNDM = ABNDM/3.7E10
C
      IF (ABNDM)9,9,10
C     THE REST IS AN ABRIDGEMENT OF GXPSR
   10 BNEX = BSUBK(MASCHN-71)
      CRISS = CROSS**BNEX
      RADIAL = ECF(MASCHN-71)/(UNIT + CRISS*ECF(MASCHN-71))
      STRAIT = RADIAL*CRISS
      ABNDM = ABNDM*FISNUM
      DO 134 LD = 1,ITAB
      DSR = (RADIAL*PSIZE(LD)**BNEX + STRAIT)*ABNDM*FMASS(LD)
  134 FP(LD) =  FP(LD) + DSR
      IF (.NOT.NPRNT(13)) GO TO 9
      WRITE (KOUT,903)
     1    (PSIZE(I),FP(I),I=1,ITAB)
    9 WRITE (KOUT,FMTA) MASCHN,ABNDM
      RETURN
```

```
C  * * * * * * * CODE INSERTION POINT * * * * * * * *        MCTS 100
C                                                            MCTS 101
   11 TMINUS = .TRUE.                                        MCTS 102
      RETURN                                                 MCTS 103
C                                                            MCTS 104
C  * * * * * * * * * * * * * * * * * * * * * * * * *         MCTS 105
      END                                                    MCTS 106
```

6. SAMPLE TEST PROBLEM AND PRINTOUT

PRECEDING
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* * * * * * * * * * *

THE DEPARTMENT OF DEFENSE FALLOUT PREDICTION SYSTEM

* * * * * * * * * * *

PARTICLE ACTIVITY MODULE

PREPARED BY
US ARMY NUCLEAR DEFENSE LABORATORY
EDGEWOOD ARSENAL, MARYLAND

PARTICLE ACTIVITY MODULE 26 JUN 67

CONTROL VARIABLE ARRAYS

IFTAPE(I)

T T F F F F F F F F

NPRNT(I)

F T T T T T F T T T T T T F T

TOTAL YIELD IS 2.0000E 00 KILOTONS.

FISSION YIELD IS 1.0000E 00 KILOTONS.

TYPE OF FISSION IS P239HE

THE HEIGHT OF BURST IS 10.000 FEET.

CAPTURE - TO - FISSION RATIO IS 0.000

NUMBER OF NEUTRONS EMITTED PER FISSION IS 1.400

THE CLOUD REACHED THE SOIL CONDENSATION TEMPERATURE OF 2200.0 AT 3.86 SEC.

THERE ARE 10 PARTICLE CLASSES WITH SIGMA OF 1.3863.

PRECEDING PAGE BLANK

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INTERMEDIATE OUTPUT OF SETUP

INUC	NUCLID	DCON
1	510033010004	6.931E 01
2	510034010004	1.980E-01
3	510035010004	6.931E-02
4	510036010004	4.141E-06
5	510037010004	1.366E-05
6	510040000004	0.000E-39
7	511033010004	6.931E 01
8	511034010004	3.466E-01
9	511035010004	9.902E-02
10	511036010004	5.776E-03
11	511037020004	4.011E-05
12	511040130004	1.308E 00
13	511040000004	0.000E-39
14	512033010004	6.931E 01
15	512034010004	4.621E-01
16	512035010004	1.733E-01
17	512036010004	2.567E-03
18	512037010004	1.481E-03
19	512040000004	0.000E-39
20	513033010004	6.931E 01
21	513034010004	6.931E 01
22	513035010004	2.773E-01
23	513036010004	7.296E-02
24	513037020004	5.776E-03
25	513040130004	1.415E-02
26	513040010004	1.409E-04
27	513041000004	0.000E-39
28	514034010004	6.931E 01
29	514035010004	3.466E-01
30	514036010004	8.664E-02
31	514037010004	2.310E-02
32	514040000004	0.000E-39
33	514041010004	7.266E-06
34	514042000004	0.000E-39
35	515034010004	6.931E 01
36	515035010004	4.621E-01
37	515036010004	1.980E-01
38	515037021002	4.621E-02
39	515040131002	1.284E-02
40	515040010004	1.704E-05
41	515041010004	4.975E-06
42	515042000004	0.000E-39
43	516034010004	6.931E 01
44	516035010004	6.931E 01
45	516036010004	2.773E-01
46	516037010004	8.664E-02
47	516040021002	9.169E-05
48	516041130004	1.925E-03
49	516041010004	1.269E-04
50	516042000004	0.000E-39
51	517035010004	6.931E 01
52	517036010004	4.621E-01
53	517037010004	1.540E-01
54	517040010004	2.773E-02
55	517041020004	1.284E-03
56	517042130004	2.970E-03
57	517042010004	3.661E-13

58	517043000004	0.000E-39
59	520035010004	6.931E 01
60	520036010004	4.621E-01
61	520037010004	2.310E-01
62	520040010004	2.773E-02
63	520041010004	1.925E-02
64	520042000004	0.000E-39
65	521035010004	6.931E 01
66	521036010004	6.931E 01
67	521037010004	3.466E-01
68	521040010004	9.902E-02
69	521041021002	2.100E-02
70	521042130004	2.027E-04
71	521042010004	6.418E-04
72	521043000004	0.000E-39
73	522036010004	6.931E 01
74	522037010004	4.621E-01
75	522040010004	1.386E-01
76	522041010004	3.851E-02
77	522042000004	0.000E-39
78	522043010004	5.363E-06
79	522044000004	0.000E-39
80	523036010004	6.931E 01
81	523037010004	6.931E 01
82	523040010004	3.466E-01
83	523041021002	9.902E-02
84	523042131002	1.005E-02
85	523042010004	4.621E-04
86	523043020004	8.023E-05
87	523044130004	1.013E-04
88	523044000004	0.000E-39
89	524037010004	6.931E 01
90	524040010004	4.621E-01
91	524041010004	1.733E-01
92	524042010004	3.851E-03
93	524043010004	3.610E-04
94	524044000004	0.000E-39
95	525037010004	6.931E 01
96	525040010004	6.931E-01
97	525041010004	1.612E 00
98	525042010004	1.777E-02
99	525043020004	3.851E-03
100	525044131002	4.376E-05
101	525044010004	2.072E-09
102	525045000004	0.000E-39
103	526040010004	6.931E 01
104	526041010004	3.466E-01
105	526042010004	4.332E-02
106	526043010004	1.155E-02
107	526044000004	0.000E-39
108	526045130004	1.111E-02
109	526045010004	4.313E-07
110	526046000004	0.000E-39
111	527040010004	6.931E 01
112	527041010004	4.621E-01
113	527042010004	4.332E-02
114	527043061002	1.272E-02
115	527044010004	1.481E-04
116	527045010004	5.108E-19
117	527046000004	0.000E-39

118	530040010004	6.931E 01
119	530041010004	6.931E 01
120	530042010004	2.773E-01
121	530043061002	4.252E-02
122	530044010004	6.876E-05
123	530045010004	6.418E-04
124	530046000004	0.000E-39
125	531041010004	6.931E 01
126	531042010004	5.466E-01
127	531043061002	1.575E-01
128	531044010004	3.610E-03
129	531045010004	7.502E-04
130	531046010004	1.589E-07
131	531047130004	4.332E-02
132	531047000004	0.000E-39
133	532041010004	6.931E 01
134	532042010004	6.931E 01
135	532043061002	4.332E-01
136	532044010004	2.100E-02
137	532045010004	4.279E-03
138	532046010004	7.844E-10
139	532047010004	2.994E-06
140	532050000004	0.000E-39
141	533042010004	6.931E 01
142	533043010004	3.466E-01
143	533044010004	6.931E-02
144	533045010004	9.627E-03
145	533046021002	1.985E-05
146	533047130004	2.310E-04
147	533047010004	1.383E-07
148	533050000004	0.000E-39
149	534042010004	6.931E 01
150	534043010004	4.621E-01
151	534044010004	2.310E-01
152	534045010004	1.308E-01
153	534046010004	7.131E-05
154	534047010004	5.348E-05
155	534050000004	0.000E-39
156	535042010004	6.931E 01
157	535043010004	6.931E 01
158	535044010004	3.466E-01
159	535045010004	1.238E-01
160	535046010004	1.444E-03
161	535047010004	1.925E-05
162	535050021002	2.312E-14
163	535051130004	5.936E-09
164	535051000004	0.000E-39
165	536043010004	6.931E 01
166	536044010004	4.951E-01
167	536045010004	2.310E-01
168	536046010004	8.887E-03
169	536047010004	5.776E-04
170	536050000004	0.000E-39
171	537043010004	6.931E 01
172	537044010004	6.931E 01
173	537045010004	3.466E-01
174	537046010004	1.733E-02
175	537047010004	1.155E-03
176	537050021002	1.234E-07
177	537051130004	2.139E-06

178	537051010004	2.292E-07
179	537052000004	0.000E-39
180	540043010004	6.931E 01
181	540044010004	6.931E 01
182	540045010004	6.931E-01
183	540046010004	2.773E-01
184	540047010004	5.023E-03
185	540050000004	0.000E-39
186	540051010004	8.371E-06
187	540052000004	0.000E-39
188	541044010004	6.931E 01
189	541045010004	6.931E 01
190	541046010004	4.621E-01
191	541047010004	1.386E-01
192	541050021002	1.133E-05
193	541051130004	1.155E-02
194	541051010004	1.583E-04
195	541052000004	0.000E-39
196	542044010004	6.931E 01
197	542045010004	6.931E 01
198	542046010004	6.931E-01
199	542047010004	2.773E-01
200	542050010004	1.155E-02
201	542051110004	2.265E-04
202	542051010004	5.776E-03
203	542052000004	0.000E-39
204	543045010004	6.931E 01
205	543046010004	6.931E-01
206	543047010004	4.621E-01
207	543050010004	4.332E-01
208	543051010004	5.023E-03
209	543052021002	2.895E-06
210	543053130004	3.209E-05
211	543053010004	1.046E-13
212	543054000004	0.000E-39
213	544046010004	6.931E 01
214	544047010004	4.621E-01
215	544050010004	1.980E-01
216	544051010004	3.851E-03
217	544052000004	0.000E-39
218	544053010004	4.332E-02
219	544054000004	0.000E-39
220	545046010004	6.931E 01
221	545047010004	6.931E-01
222	545050010004	2.773E-01
223	545051010004	1.155E-02
224	545052010004	7.913E-04
225	545053010004	8.252E-04
226	545054000004	0.000E-39
227	546046010004	6.931E 01
228	546047010004	6.931E 01
229	546050010004	3.466E-01
230	546051010004	9.902E-02
231	546052021002	1.005E-03
232	546053110004	2.567E-03
233	546053010004	1.386E-01
234	546054000004	0.000E-39
235	547047010004	6.931E 01
236	547050010004	4.621E-01
237	547051010004	1.733E-01

238	547052010004	2.773E-02
239	547053010004	9.627E-03
240	547054021002	2.021E-07
241	547055130004	2.027E-04
242	547055000004	0.000E-39
243	550047010004	6.931E 01
244	550050010004	6.931E 01
245	550051010004	2.310E-01
246	550052010004	4.621E-03
247	550053010004	6.418E-04
248	550054000004	0.000E-39
249	550055130004	2.626E-03
250	550055010004	1.650E-02
251	550056000004	0.000E-39
252	551047010004	6.931E 01
253	551050010004	6.931E 01
254	551051010004	3.466E-01
255	551052010004	5.778E-03
256	551053010004	1.284E-03
257	551054021002	4.376E-05
258	551055130004	1.824E-02
259	551055010004	5.348E-06
260	551056000004	0.000E-39
261	552047010004	6.931E 01
262	552050010004	6.931E 01
263	552051010004	4.621E-01
264	552052010004	1.733E-01
265	552053010004	7.702E-02
266	552054010004	2.156E-08
267	552055110004	9.752E-05
268	552055010004	2.310E-02
269	552056000004	0.000E-39
270	553050010004	6.931E 01
271	553051010004	6.931E-01
272	553052010004	2.773E-01
273	553053010004	1.155E-02
274	553054021002	2.511E-03
275	553055130004	1.540E-02
276	553055010004	5.251E-04
277	553056010004	3.138E-15
278	553057000004	0.000E-39
279	554050010004	6.931E 01
280	554051010004	6.931E 01
281	554052010004	3.466E-01
282	554053010004	1.155E-02
283	554054010004	2.687E-03
284	554055010004	3.851E-02
285	554056000004	0.000E-39
286	555050010004	6.931E 01
287	555051010004	6.931E 01
288	555052010004	4.621E-01
289	555053010004	2.773E-01
290	555054021002	4.332E-02
291	555055130004	1.386E-02
292	555055021002	2.310E-02
293	555056130004	2.458E-03
294	555056020004	1.375E-05
295	555057130004	1.77[illegible]E-02
296	555057000004	0.000E-39
297	556051010004	6.931E 01

298	556052010004	6.931E-01
299	556053010004	3.466E-01
300	556054010004	6.931E-02
301	556055010004	1.386E-01
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303	557051010004	6.931E-01
304	557052010004	6.931E-01
305	557053010004	4.621E-01
306	557054010004	1.733E-01
307	557055021002	5.776E-02
308	557056132002	3.501E-05
309	557056021002	5.023E-04
310	557057130004	9.367E-03
311	557057010004	1.056E-06
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313	560052010004	6.931E-01
314	560053010004	4.621E-01
315	560054010004	2.310E-01
316	560055010004	9.902E-02
317	560056010004	9.169E-06
318	560057010004	6.017E-05
319	560060000004	0.000E-39
320	561052010004	6.931E-01
321	561053010004	6.931E-01
322	561054010004	3.466E-01
323	561055010004	1.733E-01
324	561056020004	8.252E-03
325	561057131002	9.627E-03
326	561057010004	3.633E-05
327	561060000004	0.000E-39
328	562052010004	6.931E-01
329	562053010004	6.931E-01
330	562054010004	4.621E-01
331	562055010004	2.310E-01
332	562056010004	4.814E-03
333	562057010004	1.386E-01
334	562060000004	0.000E-39
335	563053010004	6.931E-01
336	563054010004	6.931E-01
337	563055010004	2.773E-01
338	563056021002	1.540E-02
339	563057132101	3.466E-02
340	563057021002	5.501E-04
341	563060110004	1.866E-07
342	563060020004	3.633E-06
343	563061131002	4.269E-05
344	563061010004	3.661E-23
345	563062000004	0.000E-39
346	564053010004	6.931E-01
347	564054010004	6.931E-01
348	564055010004	3.466E-01
349	564056010004	6.931E-02
350	564057010004	4.621E-03
351	564060000004	0.000E-39
352	565053010004	6.931E-01
353	565054010004	6.931E-01
354	565055010004	4.621E-01
355	565056010004	1.386E-01
356	565057021002	1.050E-02
357	565060132101	6.418E-05

358	565060020004	2.310E-0[illegible]
359	565061132101	9.627E-05
360	565061010004	2.567E-04
361	565062110004	5.730E-07
362	565062000004	0.000E-39
363	566054010004	6.931E 01
364	566055010004	4.621E-01
365	566056010004	1.540E-01
366	566057010004	2.773E-02
367	566060010004	2.310E-04
368	566061110004	2.567E-03
369	566061010004	1.386E-01
370	566062000004	0.000E-39
371	567054010004	6.931E 01
372	567055010004	4.621E-01
373	567056010004	2.310E-01
374	567057021002	4.077E-02
375	567060120004	4.279E-03
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377	567061132101	6.418E-04
378	567061020004	5.776E-03
379	567062130004	3.275E-08
380	567062000004	0.000E-39
381	570055010004	6.931E 01
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383	570057010004	1.155E-01
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386	570062000004	0.000E-39
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388	571056010004	4.621E-01
389	571057010004	1.733E-01
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392	571061010004	2.310E-02
393	571062110004	8.786E-10
394	571062010004	7.131E-06
395	571063000004	0.000E-39
396	572056010004	4.621E-01
397	572057010004	2.310E-01
398	572060010004	1.733E-02
399	572061010004	1.540E-02
400	572062000004	0.000E-39
401	572063130004	2.[illegible]34E-03
402	572063071002	2.865E-06
403	572064000004	0.000E-39
404	573056010004	6.931E 01
405	573057010004	2.773E-01
406	573060021002	7.702E-02
407	573061110004	1.925E-02
408	573061010004	6.931E-02
409	573062110004	6.418E-08
410	573062010004	2.818E-04
411	573063000004	0.000E-39
412	574056010004	6.931E 01
413	574057010004	3.466E-01
414	574060010004	6.931E-02
415	574061010004	3.466E-02
416	574062000004	0.000E-39
417	574063210004	5.501E-04

418	574063110004	8.887E-03
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420	574064000004	0.000E-39
421	575057010004	3.466E-01
422	575060010004	1.386E-01
423	575061021002	4.621E-02
424	575062110004	1.191E-03
425	575062010004	8.535E-07
426	575063021002	8.135E-09
427	575064130004	1.383E-07
428	575064000004	0.000E-39
429	576057010004	6.931E 01
430	576060010004	2.310E-01
431	576061010004	9.902E-02
432	576062020004	1.098E-13
433	576063131002	6.080E-04
434	576063010004	6.418E-07
435	576064000004	0.000E-39
436	577057010004	6.931E 01
437	577060010004	4.621E-01
438	577061021002	2.310E-01
439	577062110004	2.751E-03
440	577062010004	8.557E-05
441	577063021002	2.061E-06
442	577064131002	7.641E-08
443	577064010004	2.070E-05
444	577065000004	0.000E-39
445	600060010004	6.931E-01
446	600061010004	3.466E-01
447	600062021002	2.027E-04
448	600063110004	1.050E-03
449	600063010004	2.239E-05
450	600064000004	0.000E-39
451	600065071002	4.621E-04
452	600066000004	0.000E-39
453	601060010004	6.931E 01
454	601061010004	4.621E-01
455	601062010004	1.070E-04
456	601063021002	4.186E-05
457	601064131002	1.957E-07
458	601064010004	1.605E-04
459	601065010004	1.373E-15
460	601066130004	1.003E-06
461	601066000004	0.000E-39
462	602060010004	6.931E 01
463	602061010004	4.621E-01
464	602062021002	4.443E-03
465	602063110004	1.925E-03
466	602063010004	3.122E-04
467	602064000004	0.000E-39
468	602065010004	1.540E-05
469	602066000004	0.000E-39
470	603060010004	6.931E 01
471	603061010004	6.931E-01
472	603062010004	1.050E-02
473	603063021002	5.955E-04
474	603064131002	6.418E-06
475	603064010004	4.814E-04
476	603065021002	9.966E-07
477	603066130004	6.685E-07

478	604064000004	0.000E-39
479	604065010004	6.931E-01
480	604066010004	6.931E 01
481	604062010004	1.386E-02
482	604063010004	3.691E-03
483	604064010004	2.468E-04
484	604065010004	8.371E-05
485	604066000004	0.000E-39
486	605061010004	6.931E 01
487	605062010004	1.777E-02
488	605063021002	4.376E-03
489	605064131002	2.310E-04
490	605064010004	9.242E-04
491	605065021002	9.257E-06
492	605066130004	3.488E-06
493	605066010004	1.522E-06
494	605067000004	0.000E-39
495	606061010004	6.931E 01
496	606062010004	6.931E 01
497	606063010004	4.621E-01
498	606064010004	2.731E-04
499	606065010004	2.[illegible]80E-04
500	606066000004	0.[illegible]00E-39
501	606067130004	[illegible]39E-05
502	606067010004	9.984E-09
503	606070000004	0.000E-39
504	607062010004	6.931E 01
505	607063010004	3.648E-01
506	607064010004	8.252E-03
507	607065021002	2.874E-05
508	607066130004	7.551E-04
509	607066010004	2.093E-05
510	607067010004	1.098E-14
511	607070000004	0.000E-39
512	610063010004	2.310E-01
513	610064010004	1.155E-01
514	610065010004	8.351E-03
515	610066000004	0.000E-39
516	610067010004	6.171E-07
517	610070000004	0.000E-39
518	611063010004	6.931E 01
519	611064010004	2.310E-01
520	611065061002	2.841E-02
521	611066010004	2.962E-03
522	611067021002	7.522E-10
523	611070130004	4.443E-03
524	611070000004	0.000E-39
525	612063010004	6.931E 01
526	612064010004	3.466E-01
527	612065061002	1.100E-01
528	612066010004	8.252E-04
529	612067010004	3.588E-04
530	612070000004	0.000E-39
531	612071010004	1.997E-19
532	612072000004	0.000E-39
533	613064010004	6.931E 01
534	613065061002	3.466E-01
535	613066010004	1.691E-02
536	613067010004	1.216E-03
537	613070010004	1.359E-04

538	613073000004	0.000E-39
539	614064010004	6.931E 01
540	614065010004	4.621E-01
541	614066010004	4.332E-02
542	614067010004	1.050E-02
543	614070010004	6.268E-07
544	614071010004	4.790E-06
545	614072000004	0.000E-39
546	615065010004	6.931E 01
547	615066010004	4.077E-01
548	615067010004	2.773E-02
549	615070010004	6.418E-04
550	615071010004	5.067E-05
551	615072010004	2.431E-07
552	615073000004	0.000E-39
553	616065010004	6.931E 01
554	616066010004	4.621E-01
555	616067010004	8.004E-02
556	616070010004	1.155E-03
557	616071010004	1.375E-04
558	616072000004	0.000E-39
559	617065010004	6.931E 01
560	617066010004	6.931E-01
561	617067010004	3.466E-01
562	617070010004	5.332E-02
563	617071010004	6.418E-04
564	617072010004	5.835E-06
565	617073010004	5.813E-07
566	617074000004	0.000E-39
567	620066010004	6.931E 01
568	620067010004	4.621E-01
569	620070010004	1.980E-01
570	620071010004	4.621E-02
571	620072010004	2.815E-08
572	620073010004	6.078E-04
573	620074000004	0.000E-39
574	621066010004	6.931E 01
575	621067010004	6.931E-01
576	621070010004	3.466E-01
577	621071010004	7.702E-02
578	621072010004	3.851E-03
579	621073010004	3.220E-05
580	621074000004	0.000E-39
581	622066010004	6.931E 01
582	622067010004	6.931E 01
583	622070010004	4.621E-01
584	622071010004	1.733E-01
585	622072010004	8.311E-04
586	622073010004	4.735E-04
587	622074000004	0.000E-39
588	623067010004	6.931E 01
589	623070010004	6.931E-01
590	623071010004	3.466E-01
591	623072010004	9.627E-03
592	623073010004	9.627E-04
593	623074010004	7.228E-07
594	623075010004	8.448E-09
595	623076000004	0.000E-39
596	624067010004	6.931E 01
597	624070010004	6.931E-01

598	624071010004	3.466E-01
599	624072010004	1.732E-02
600	624073010004	5.924E-03
601	624074000004	0.000E-39
602	624075010004	1.484E-06
603	624076000004	0.000E-39
604	625070010004	6.931E-01
605	625071010004	4.621E-01
606	625072010004	1.980E-01
607	625073010004	2.310E-02
608	625074010004	9.627E-05
609	625075010004	3.626E-06
610	625076000004	0.000E-39
611	626070010004	6.931E-01
612	626071010004	4.621E-01
613	626072010004	2.773E-01
614	626073010004	4.621E-02
615	626074000004	0.000E-39
616	626075010004	7.131E-05
617	626076000004	0.000E-39
618	627071010004	6.931E-01
619	627072010004	3.466E-01
620	627073010004	9.902E-02
621	627074010004	8.886E-04
622	627075010004	6.780E-06
623	627076010004	2.746E-10
624	627077000004	0.000E-39
625	630071010004	6.931E-01
626	630072010004	4.621E-01
627	630073010004	1.386E-01
628	630074010004	3.851E-03
629	630075010004	1.925E-03
630	630076000004	0.000E-39
631	630077171002	2.070E-05
632	630077071002	1.690E-09
633	630100000004	0.000E-39
634	631071010004	6.931E-01
635	631072010004	4.621E-01
636	631073010004	2.310E-01
637	631074010004	3.851E-02
638	631075010004	2.100E-03
639	631076010004	4.097E-06
640	631077000004	0.000E-39
641	632072010004	6.931E-01
642	632073010004	3.466E-01
643	632074010004	5.776E-02
644	632075010004	4.621E-03
645	632076000004	0.000E-39
646	632077010004	1.373E-09
647	632100000004	0.000E-39
648	633072010004	6.931E-01
649	633073010004	3.466E-01
650	633074010004	1.386E-01
651	633075010004	1.155E-02
652	633076010004	4.814E-04
653	633077010004	1.292E-08
654	633100000004	0.000E-39
655	634073010004	4.621E-01
656	634074010004	1.540E-01
657	634075010004	2.773E-02

658	634076010004	1.925E-05
659	634077010004	5.209E-07
660	634100000004	0.000E-39
661	635073010004	6.931E 01
662	635074010004	2.310E-01
663	635075010004	5.332E-02
664	635076010004	2.[illegible].0E-02
665	635077010004	1.284E-05
666	635100000004	0.000E-39
667	636073010004	6.931E 01
668	636074010004	3.466E-01
669	636075010004	1.155E-01
670	636076010004	7.702E-04
671	636077010004	1.925E-04
672	636100000004	0.000E-39
673	637074010004	4.621E-01
674	637075010004	1.980E-01
675	637076010004	4.951E-02
676	637077010004	5.776E-04
677	637100010004	1.070E-05
678	637101000004	0.000E-39
679	640074010004	6.931E 01
680	640075010004	2.773E-01
681	640076010004	4.621E-02
682	640077010004	4.621E-03
683	640100000004	0.000E-39
684	640101010004	1.099E-07
685	640102000004	0.000E-39
686	641074010004	6.931E 01
687	641075010004	3.466E-01
688	641076010004	1.733E-01
689	641077010004	3.151E-02
690	641100010004	3.122E-03
691	641101010004	1.163E-06
692	641102000004	0.000E-39

FINAL OUTPUT OF SETUP

INDX	NUCLID	DCON
1	510033010004	6.931E 01
2	110034010004	1.980E-01
3	110035010004	6.931E-02
4	110036010004	4.141E-06
5	110037010004	1.366E-05
6	110040000004	0.000E-39
7	511033010004	6.931E 01
8	111034010004	3.466E-01
9	111035010004	9.902E-02
10	111036010004	5.776E-03
11	111037010004	4.011E-05
12	111040110004	1.308E 00
13	111040000004	0.000E-39
14	512033010004	6.931E 01
15	112034010004	4.621E-01
16	112035010004	1.733E-01
17	112036010004	2.567E-03
18	112037010004	1.481E-03
19	112040000004	0.000E-39
20	513033010004	6.931E 01
21	113034010004	6.931E 01
22	113035010004	2.773E-01
23	113036010004	7.296E-02
24	113037010004	5.776E-03
25	113040110004	1.415E-02
26	113040010004	1.409E-04
27	113041000004	0.000E-39
28	514034010004	6.931E 01
29	114035010004	3.466E-01
30	114036010004	8.664E-02
31	114037010004	2.310E-02
32	114040000004	0.000E-39
33	514041010004	7.266E-06
34	114042000004	0.000E-39
35	515034010004	6.931E 01
36	115035010004	4.621E-01
37	115036010004	1.980E-01
38	115037012002	4.621E-02
39	115040112002	1.284E-02
40	115040010004	1.704E-05
41	115041010004	4.975E-06
42	115042000004	0.000E-39
43	516034010004	6.931E 01
44	116035010004	6.931E 01
45	116036010004	2.773E-01
46	116037010004	8.664E-02
47	116040012002	9.169E-05
48	116041110004	1.925E-03
49	116041010004	1.269E-04
50	116042000004	0.000E-39
51	517034010004	6.931E 01
52	117036010004	4.621E-01
53	117037010004	1.540E-01
54	117040010004	2.773E-02
55	117041010004	1.284E-03
56	117042110004	2.970E-03
57	117042010004	3.661E-13

58	117042000004	0.000E-39
59	520035010004	6.931E 01
60	120036010004	4.621E-01
61	120037010004	2.310E-01
62	120040010004	2.773E-02
63	120041010004	1.925E-02
64	120042000004	0.000E-39
65	521035010004	6.931E 01
66	121036010004	6.931E 01
67	121037010004	3.466E-01
68	121040010004	9.902E-02
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584	222071010004	1.733E-01
585	222072010004	8.311E-04
586	222073010004	4.735E-04
587	222074000004	0.000E-39
588	623067010004	6.931E 01
589	223070010004	6.931E-01
590	223071010004	3.466E-01
591	223072010004	9.627E-03
592	223073010004	9.627E-04
593	223074010004	7.228E-07
594	223075010004	8.448E-09
595	223076000004	0.000E-39
596	624067010004	6.931E 01
597	224070010004	6.931E-01

598	224071010004	3.466E-01
599	224072010004	1.733E-02
600	224073010004	5.924E-03
601	224074000004	0.000E-39
602	624075010004	1.486E-06
603	224076000004	0.000E-39
604	625070010004	6.931E 01
605	225071010004	4.621E-01
606	225072010004	1.980E-01
607	225073010004	2.310E-02
608	225074010004	9.627E-05
609	225075010004	3.626E-06
610	225076000004	0.000E-39
611	626070010004	6.931E 01
612	226071010004	4.621E-01
613	226072010004	2.773E-01
614	226073010004	4.621E-02
615	226074000004	0.000E-39
616	626075010004	7.131E-05
617	226076000004	0.000E-39
618	627071010004	6.931E-01
619	227072010004	3.466E-01
620	227073010004	9.902E-02
621	227074010004	8.986E-04
622	227075010004	6.780E-06
623	227076010004	2.746E-10
624	227077000004	0.000E-39
625	630071010004	6.931E 01
626	230072010004	4.621E-01
627	230073010004	1.386E-01
628	230074010004	3.851E-03
629	230075010004	1.925E-03
630	230076000004	0.000E-39
631	630077112042	2.070E-05
632	630077021042	1.690E-09
633	230100000004	0.000E-39
634	631071010004	6.931E 01
635	231072010004	4.621E-01
636	231073010004	2.310E-01
637	231074010004	3.851E-02
638	231075010004	2.100E-03
639	231076010004	4.097E-06
640	231077000004	0.000E-39
[illegible]	632072010004	6.931E-01
[illegible]	232073010004	3.466E-01
643	232074010004	5.776E-02
644	232075010004	4.621E-03
645	232076000004	0.000E-39
646	632077010004	1.373E-09
647	232100000004	0.000E-39
648	633072010004	6.931E 01
649	233073010004	3.466E-01
650	233074010004	1.386E-01
651	233075010004	1.155E-02
652	233076010004	4.814E-04
653	233077010004	1.292E-08
654	233100000004	0.000E-39
655	634073010004	4.621E-01
656	234074010004	1.540E-01
657	234075010004	2.773E-02

658	234076010004	1.925E-05
659	234077010004	5.209E-07
660	234100000004	0.000E-39
661	635073010004	6.931E 01
662	235074010004	2.310E-01
663	235075010004	5.332E-02
664	235076010004	2.310E-02
665	235077010004	1.284E-05
666	235100000004	0.000E-39
667	636073010004	6.931E 01
668	236074010004	3.466E-01
669	236075010004	1.155E-01
670	236076010004	7.702E-04
671	236077010004	1.925E-04
672	236100000004	0.000E-39
673	637074010004	4.621E-01
674	237075010004	1.980E-01
675	237076010004	4.951E-02
676	237077010004	5.776E-04
677	237100010004	1.070E-05
678	237101000004	0.000E-39
679	640074010004	6.931E 01
680	240075010004	2.773E-01
681	240076010004	4.621E-02
682	240077010004	4.621E-03
683	240100000004	0.000E-39
684	640101010004	1.099E-07
685	240102000004	0.000E-39
686	641074010004	6.931E 01
687	241075010004	3.466E-01
688	241076010004	1.733E-01
689	241077010004	3.151E-02
690	241100010004	3.122E-03
691	241101010004	1.163E-06
692	241102000004	0.000E-39

IBRA	BRANCH
1	0.60000
2	0.40000
3	0.36000
4	0.64000
5	0.50000
6	0.50000
7	0.06000
8	0.94000
9	0.44000
10	0.56000
11	0.10000
12	0.90000
13	0.19000
14	0.81000
15	0.03000
16	0.97000
17	0.07000
18	0.93000
19	0.11800
20	0.88200
21	0.15000

22	0.85000
23	0.60000
24	0.40000
25	0.25000
26	0.75000
27	0.02000
28	0.98000
29	0.96000
30	0.04000
31	0.87000
32	0.13000
33	0.50000
34	0.50000
35	0.99500
36	0.00500
37	0.20600
38	0.79400
39	0.50000
40	0.50000
41	0.50000
42	0.50000
43	0.50000
44	0.50000
45	0.01000
46	0.99000
47	0.68000
48	0.32000
49	0.50000
50	0.50000
51	0.90000
52	0.10000
53	0.50000
54	0.50000
55	0.72000
56	0.14000
57	0.14000
58	0.09000
59	0.91000
60	0.95000
61	0.05000
62	0.50000
63	0.50000
64	0.60000
65	0.10000
66	0.30000
67	0.21900
68	0.78000
69	0.00100
70	0.50000
71	0.50000
72	0.05000
73	0.50000
74	0.45000
75	0.50000
76	0.50000
77	0.03000
78	0.97000
79	0.50000
80	0.50000
81	0.50000

82	0.50000
83	0.21500
84	0.78500
85	0.99000
86	0.01000
87	0.50000
88	0.50000
89	0.22000
90	0.78000
91	0.98000
92	0.02000
93	0.97000
94	0.03000
95	0.06500
96	0.93500
97	0.17300
98	0.82700
99	0.68000
100	0.32000
101	0.90000
102	0.10000
103	0.15000
104	0.85000
105	0.20000
106	0.80000
107	0.00800
108	0.99200
109	0.72000
110	0.28000
111	0.13000
112	0.87000
113	0.02400
114	0.97600
115	0.30000
116	0.70000
117	0.04000
118	0.96000
119	0.92000
120	0.08000
121	0.03000
122	0.97000
123	0.04000
124	0.96000
125	0.75000
126	0.25000
127	0.73000
128	0.27000

FISSION YIELDS FOR P239HE

MASS	CHARGE	ISOMER	YIELD PER 10,000 FISSIONS
72	27	0	-0.0000E-39
72	28	0	-0.0000E-39
72	29	0	-0.0000E-39
72	30	0	-0.0000E-39
72	31	0	-0.0000E-39
72	32	0	0.0000E-39
73	27	0	-0.0000E-39
73	28	0	-0.0000E-39
73	29	0	-0.0000E-39
73	30	0	-0.0000E-39
73	31	0	-0.0000E-39
73	32	1	-0.0000E-39
73	32	0	-0.0000E-39
74	27	0	-0.0000E-39
74	28	0	-0.0000E-39
74	29	0	-0.0000E-39
74	30	0	-0.0000E-39
74	31	0	-0.0000E-39
74	32	0	-0.0000E-39
75	27	0	-0.0000E-39
75	28	0	-0.0000E-39
75	29	0	-0.0000E-39
75	30	0	-0.0000E-39
75	31	0	-0.0000E-39
75	32	1	-0.0000E-39
75	32	0	-0.0000E-39
75	33	0	0.0000E-39
76	28	0	-0.0000E-39
76	29	0	-0.0000E-39
76	30	0	-0.0000E-39
76	31	0	-0.0000E-39
76	32	0	-0.0000E-39
76	33	0	-0.0000E-39
76	34	0	0.0000E-39
77	28	0	-0.0000E-39
77	29	0	-0.0000E-39
77	30	0	-0.0000E-39
77	31	0	-0.0000E-39
77	32	1	-0.0000E-39
77	32	0	-0.0000E-39
77	33	0	-0.0000E-39
77	34	0	0.0000E-39
78	28	0	-0.0000E-39
78	29	0	-0.0000E-39
78	30	0	-0.0000E-39
78	31	0	-0.0000E-39
78	32	0	-0.0000E-39
78	33	1	-0.0000E-39
78	33	0	-0.0000E-39
78	34	0	0.0000E-39
79	29	0	-0.0000E-39
79	30	0	-0.0000E-39
79	31	0	-0.0000E-39
79	32	0	-0.0000E-39
79	33	0	-0.0000E-39
79	34	1	-0.0000E-39
79	34	0	-0.0000E-39

79	35	0	0.0000E-39
80	29	0	-0.0000E-39
80	30	0	6.2000E-01
80	31	0	1.8400E 00
80	32	0	4.7800E 00
80	33	0	3.2100E 00
80	34	0	5.2500E-01
81	29	0	-0.0000E-39
81	30	0	-0.0000E-39
81	31	0	1.2900E 00
81	32	0	5.9200E 00
81	33	0	6.7200E 00
81	34	1	9.9620E-01
81	34	0	9.9620E-01
81	35	0	2.0700E-02
82	30	0	-0.0000E-39
82	31	0	5.4900E-01
82	32	0	5.3100E 00
82	33	0	1.0600E 01
82	34	0	5.3100E 00
82	35	0	5.4900E-01
82	36	0	0.0000E-39
83	30	0	-0.0000E-39
83	31	0	-0.0000E-39
83	32	0	3.5090E 00
83	33	0	1.3200E 01
83	34	1	4.5883E 00
83	34	0	7.8126E 00
83	35	0	2.8300E 00
83	36	1	-0.0000E-39
83	36	0	-0.0000E-39
84	31	0	-0.0000E-39
84	32	0	1.6800E-01
84	33	0	1.2600E 01
84	34	0	2.1400E 01
84	35	0	9.4400E 00
84	36	0	5.6200E-01
85	31	0	-0.0000E-39
85	32	0	1.1900E-02
85	33	0	8.6200E 00
85	34	0	2.7900E 01
85	35	0	2.3000E 01
85	36	1	3.0647E 00
85	36	0	3.0647E 00
85	37	0	-0.0000E-39
86	32	0	-0.0000E-39
86	33	0	5.9400E 00
86	34	0	3.1100E 01
86	35	0	4.0200E 01
86	36	0	1.3400E 01
86	37	1	1.3010E-01
86	37	0	1.3010E-01
86	38	0	0.0000E-39
87	32	0	-0.0000E-39
87	33	0	1.5800E 00
87	34	0	2.6700E 01
87	35	0	6.0500E 01
87	36	0	3.5500E 01
87	37	0	4.750 E 00
87	38	0	0.0000E-39

88	32	0	-0.0000E-39
88	33	0	-0.0000E-39
88	34	0	1.6800E 01
88	35	0	6.7200E 01
88	36	0	6.7200E 01
88	37	0	1.6800E 01
88	38	0	-0.0000E-39
89	33	0	-0.0000E-39
89	34	0	7.6600E 00
89	35	0	5.7300E 01
89	36	0	9.7500E 01
89	37	0	4.3000E 01
89	38	0	2.5600E 00
89	39	1	-0.0000E-39
89	39	0	-0.0000E-39
90	33	0	-0.0000E-39
90	34	0	1.0600E 00
90	35	0	4.1500E 01
90	36	0	1.1600E 02
90	37	0	8.3600E 01
90	38	0	1.4800E 01
90	39	0	0.0000E-39
90	40	0	0.0000E-39
91	34	0	-0.0000E-39
91	35	0	2.2500E 01
91	36	0	1.0900E 02
91	37	0	1.3519E 02
91	38	0	4.1100E 01
91	39	1	2.9840E-01
91	39	0	2.9840E-01
91	40	0	0.0000E-39
92	34	0	-0.0000E-39
92	35	0	6.4100E 00
92	36	0	8.0600E 01
92	37	0	1.7000E 02
92	38	0	9.2200E 01
92	39	0	1.1200E 01
92	40	0	0.0000E-39
93	34	0	-0.0000E-39
93	35	0	5.4500E-01
93	36	0	5.1200E 01
93	37	0	1.7700E 02
93	38	0	1.5500E 02
93	39	0	5.3900E 01
93	40	0	-0.0000E-39
93	41	1	-0.0000E-39
93	41	0	-0.0000E-39
94	35	0	-0.0000E-39
94	36	0	2.3500E 01
94	37	0	1.4300E 02
94	38	0	2.1300E 02
94	39	0	8.2200E 01
94	40	0	2.7700E 00
95	35	0	-0.0000E-39
95	36	0	2.9500E 00
95	37	0	8.7400E 01
95	38	0	2.2700E 02
95	39	0	1.5200E 02
95	40	0	2.5000E 01
95	41	1	-0.0000E-39

95	41	0	-0.0000E-39
95	42	0	0.0000E-39
96	35	0	-0.0000E-39
96	36	0	4.3400E 01
96	37	0	1.9900E 02
96	38	0	2.2600E 02
96	39	0	6.5500E 01
96	40	0	6.9800E-01
96	41	0	-0.0000E-39
96	42	0	0.0000E-39
97	36	0	-0.0000E-39
97	37	0	-0.0000E-39
97	38	0	1.7000E 01
97	39	0	1.4100E 02
97	40	0	2.5900E 02
97	41	1	6.2513E 01
97	41	0	6.2513E 01
97	42	0	9.7300E 00
98	36	0	-0.0000E-39
98	37	0	-0.0000E-39
98	38	0	5.4800E 01
98	39	0	2.1900E 02
98	40	0	2.1900E 02
98	41	1	2.7851E 01
98	41	0	2.7851E 01
98	42	0	-0.0000E-39
99	37	0	-0.0000E-39
99	38	0	6.7500E 00
99	39	0	1.1400E 02
99	40	0	2.5700E 02
99	41	0	1.5100E 02
99	42	0	2.0200E 01
99	43	1	-0.0000E-39
99	43	0	-0.0000E-39
99	44	0	0.0000E-39
100	38	0	-0.0000E-39
100	39	0	4.0000E 01
100	40	0	1.9400E 02
100	41	0	2.3600E 02
100	42	0	7.2900E 01
100	43	0	1.0500E 00
100	44	0	0.0000E-39
101	38	0	-0.0000E-39
101	39	0	3.1200E 00
101	40	0	9.2600E 01
101	41	0	2.4100E 02
101	42	0	1.6100E 02
101	43	0	2.6500E 01
101	44	0	0.0000E-39
102	38	0	-0.0000E-39
102	39	0	-0.0000E-39
102	40	0	4.5400E 01
102	41	0	1.9600E 02
102	42	0	2.1100E 02
102	43	1	2.8512E 01
102	43	0	2.8512E 01
102	44	0	-0.0000E-39
103	39	0	-0.0000E-39
103	40	0	2.0600E 01
103	41	0	1.3900E 02

103	42	0	2.2000E 02
103	43	0	9.0900E 01
103	44	0	4.0700E 00
103	45	1	-0.0000E-39
103	45	0	-0.0000E-39
104	39	0	-0.0000E-39
104	40	0	1.2200E 00
104	41	0	6.4400E 01
104	42	0	1.9200E 02
104	43	0	1.4900E 02
104	44	0	2.8500E 01
104	45	1	-0.0000E-39
104	45	0	-0.0000E-39
104	46	0	0.0000E-39
105	39	0	-0.0000E-39
105	40	0	5.1700E-01
105	41	0	4.8500E 01
105	42	0	1.6700E 02
105	43	0	1.4700E 02
105	44	0	3.2200E 01
105	45	1	-0.0000E-39
105	45	0	-0.0000E-39
105	46	0	0.0000E-39
106	39	0	-0.0000E-39
106	40	0	-0.0000E-39
106	41	0	3.4800E 01
106	42	0	1.3800E 02
106	43	0	1.3800E 02
106	44	0	3.4800E 01
106	45	1	-0.0000E-39
106	45	0	-0.0000E-39
106	46	0	0.0000E-39
107	40	0	-0.0000E-39
107	41	0	2.3600E 01
107	42	0	1.0800E 02
107	43	0	1.2200E 02
107	44	0	3.5600E 01
107	45	1	-0.0000E-39
107	45	0	-0.0000E-39
107	46	0	0.0000E-39
107	47	0	0.0000E-39
108	40	0	-0.0000E-39
108	41	0	3.7900E 00
108	42	0	4.7800E 01
108	43	0	1.0100E 02
108	44	0	5.4600E 01
108	45	0	6.6400E 00
108	46	0	0.0000E-39
109	40	0	-0.0000E-39
109	41	0	2.0600E-01
109	42	0	1.9300E 01
109	43	0	6.6300E 01
109	44	0	5.8400E 01
109	45	1	6.5054E 00
109	45	0	6.5054E 00
109	46	1	-0.0000E-39
109	46	0	-0.0000E-39
109	47	1	-0.0000E-39
109	47	0	-0.0000E-39
110	41	0	-0.0000E-39

110	42	0	8.1200E 00
110	43	0	4.2700E 01
110	44	0	6.3900E 01
110	45	0	2.4500E 01
110	46	0	8.2600E-01
111	41	0	-0.0000E-39
111	42	0	7.5000E-01
111	43	0	2.2300E 01
111	44	0	5.7800E 01
111	45	0	3.8800E 01
111	46	1	3.2324E 00
111	46	0	3.2324E 00
111	47	1	-0.0000E-39
111	47	0	-0.0000E-39
111	48	0	0.0000E-39
112	42	0	-0.0000E-39
112	43	0	9.6900E 00
112	44	0	4.4300E 01
112	45	0	5.0200E 01
112	46	0	1.4600E 01
112	47	0	1.5500E-01
112	48	0	0.0000E-39
113	42	0	-0.0000E-39
113	43	0	2.8000E 00
113	44	0	2.7000E 01
113	45	0	4.8100E 01
113	46	0	2.7000E 01
113	47	1	1.4231E 00
113	47	0	1.4231E 00
113	48	0	0.0000E-39
114	42	0	-0.0000E-39
114	43	0	1.5200E-01
114	44	0	1.3300E 01
114	45	0	4.5600E 01
114	46	0	4.0200E 01
114	47	0	8.8000E 00
114	48	0	-0.0000E-39
115	43	0	-0.0000E-39
115	44	0	5.3000E 00
115	45	0	3.2300E 01
115	46	0	4.8200E 01
115	47	1	9.4532E 00
115	47	0	9.4532E 00
115	48	1	3.1770E-01
115	48	0	3.1770E-01
115	49	1	-0.0000E-39
115	49	0	-0.0000E-39
115	50	0	0.0000E-39
116	43	0	-0.0000E-39
116	44	0	6.2000E-01
116	45	0	1.8400E 01
116	46	0	4.7800E 01
116	47	0	3.2000E 01
116	48	0	5.2500E 00
117	43	0	-0.0000E-39
117	44	0	-0.0000E-39
117	45	0	9.1800E 00
117	46	0	3.9700E 01
117	47	0	4.2800E 01
117	48	1	5.7431E 00

117	48	0	5.7431E 00
117	49	1	-0.0000E-39
117	49	0	-0.0000E-39
117	50	1	-0.0000E-39
117	50	0	-0.0000E-39
118	44	0	-0.0000E-39
118	45	0	3.1400E 00
118	46	0	2.5800E 01
118	47	0	4.7600E 01
118	48	0	2.2600E 01
118	49	1	9.1480E-01
118	49	0	9.1480E-01
118	50	0	0.0000E-39
119	44	0	-0.0000E-39
119	45	0	1.9000E-01
119	46	0	1.3300E 01
119	47	0	4.2900E 01
119	48	1	1.7991E 01
119	48	0	1.7991E 01
119	49	1	4.2082E 00
119	49	0	4.2082E 00
119	50	1	-0.0000E-39
119	50	0	-0.0000E-39
120	45	0	-0.0000E-39
120	46	0	5.7900E 00
120	47	0	3.2800E 01
120	48	0	4.5800E 01
120	49	0	1.6300E 01
120	50	0	-0.0000E-39
121	45	0	-0.0000E-39
121	46	0	8.7600E-01
121	47	0	1.9500E 01
121	48	0	4.7300E 01
121	49	1	1.5145E 01
121	49	0	1.5145E 01
121	50	1	2.2464E 00
121	50	0	2.2464E 00
121	51	0	0.0000E-39
122	46	0	-0.0000E-39
122	47	0	7.7200E 00
122	48	0	3.7500E 01
122	49	0	4.5400E 01
122	50	0	1.4100E 01
122	51	1	1.0220E-01
122	51	0	1.0220E-01
122	52	0	0.0000E-39
123	46	0	-0.0000E-39
123	47	0	3.4000E 00
123	48	0	2.7900E 01
123	49	1	2.6123E 01
123	49	0	2.6123E 01
123	50	1	1.2401E 01
123	50	0	1.2401E 01
123	51	0	1.9400E 00
124	46	0	-0.0000E-39
124	47	0	2.2200E-01
124	48	0	1.5500E 01
124	49	0	5.0200E 01
124	50	0	4.1400E 01
124	51	2	2.8902E 00

124	51	1	2.8902E 00
124	51	0	2.8902E 00
124	52	0	-0.0000E-39
125	47	0	-0.0000E-39
125	48	0	7.0000E-01
125	49	0	4.1300E 01
125	50	1	2.9173E 01
125	50	0	2.9173E 01
125	51	0	2.0400E 01
125	52	1	5.9470E-01
125	52	0	5.9470E-01
126	47	0	-0.0000E-39
126	48	0	1.0900E 00
126	49	0	2.4600E 01
126	50	0	5.9400E 01
126	51	1	1.9059E 01
126	51	0	1.9059E 01
126	52	0	5.5500E 00
127	47	0	-0.0000E-39
127	48	0	-0.0000E-39
127	49	0	1.4200E 01
127	50	1	0.0000E-39
127	50	0	6.1600E 01
127	51	0	6.6500E 01
127	52	1	8.9449E 00
127	52	0	8.9449E 00
127	53	0	-0.0000E-39
128	48	0	-0.0000E-39
128	49	0	1.2900E 01
128	50	0	6.7300E 01
128	51	1	4.4267E 01
128	51	0	4.4267E 01
128	52	0	2.9100E 01
128	53	0	5.5500E-01
128	54	0	0.0000E-39
129	48	0	-0.0000E-39
129	49	0	1.0500E 01
129	50	0	7.0700E 01
129	51	0	1.1200E 02
129	52	1	2.3531E 01
129	52	0	2.3531E 01
129	53	0	2.0700E 00
129	54	1	-0.0000E-39
129	54	0	-0.0000E-39
130	48	0	-0.0000E-39
130	49	0	1.0900E 01
130	50	0	8.0900E 01
130	51	1	0.0000E-39
130	51	0	1.3800E 02
130	52	0	6.0800E 01
130	53	0	3.6200E 00
130	54	0	0.0000E-39
131	48	0	-0.0000E-39
131	49	0	2.0700E 00
131	50	0	6.1300E 01
131	51	0	1.6000E 02
131	52	1	5.4381E 01
131	52	0	5.4381E 01
131	53	0	1.7600E 01
131	54	1	-0.0000E-39

131	54	0	-0.0000E-39
132	48	0	-0.0000E-39
132	49	0	-0.0000E-39
132	50	0	3.2900E 01
132	51	0	1.5100E 02
132	52	0	1.7100E 02
132	53	0	4.9600E 01
132	54	0	5.2900E-01
133	49	0	-0.0000E-39
133	50	0	1.4800E 01
133	51	0	1.2200E 02
133	52	1	1.1435E 02
133	52	0	1.1435E 02
133	53	0	1.0600E 02
133	54	1	4.2946E 00
133	54	0	4.2946E 00
133	55	0	0.0000E-39
134	49	0	-0.0000E-39
134	50	0	-0.0000E-39
134	51	0	4.7400E 01
134	52	0	2.0500E 02
134	53	0	2.2100E 02
134	54	0	5.8600E 01
134	55	1	-0.0000E-39
134	55	0	-0.0000E-39
134	56	0	0.0000E-39
135	50	0	-0.0000E-39
135	51	0	4.7900E 00
135	52	0	1.0700E 02
135	53	0	2.5900E 02
135	54	1	8.2842E 01
135	54	0	8.2842E 01
135	55	0	2.4200E 01
135	56	0	0.0000E-39
136	51	0	-0.0000E-39
136	52	0	3.1500E 01
136	53	0	1.7800E 02
136	54	0	2.4900E 02
136	55	0	8.8200E 01
136	56	0	2.2700E 00
137	51	0	-0.0000E-39
137	52	0	6.6900E 00
137	53	0	1.1300E 02
137	54	0	2.5500E 02
137	55	0	1.5000E 02
137	56	1	1.0165E 01
137	56	0	1.0165E 01
138	51	0	-0.0000E-39
138	52	0	-0.0000E-39
138	53	0	5.2500E 01
138	54	0	2.0700E 02
138	55	0	2.0700E 02
138	56	0	5.2500E 01
138	57	0	-0.0000E-39
138	58	0	0.0000E-39
139	52	0	-0.0000E-39
139	53	0	1.8100E 01
139	54	0	1.3600E 02
139	55	0	2.3200E 02
139	56	0	1.0200E 02

139	57	0	6.0200E 00
140	52	0	-0.0000E-39
140	53	0	1.9800E 00
140	54	0	7.7400E 01
140	55	0	2.1700E 02
140	56	0	1.5700E 02
140	57	0	2.7600E 01
140	58	0	0.0000E-39
141	53	0	-0.0000E-39
141	54	0	3.2800E 01
141	55	0	1.5900E 02
141	56	0	1.9300E 02
141	57	0	5.9800E 01
141	58	0	8.5300E-01
141	59	0	0.0000E-39
142	53	0	-0.0000E-39
142	54	0	7.4800E 00
142	55	0	9.4100E 01
142	56	0	1.9800E 02
142	57	0	1.0700E 02
142	58	0	1.3100E 01
143	53	0	-0.0000E-39
143	54	0	5.1400E-01
143	55	0	4.8200E 01
143	56	0	1.6600E 02
143	57	0	1.4600E 02
143	58	0	3.2100E 01
143	59	0	-0.0000E-39
143	60	0	0.0000E-39
144	54	0	-0.0000E-39
144	55	0	1.8600E 01
144	56	0	1.1300E 02
144	57	0	1.7000E 02
144	58	0	6.5100E 01
144	59	0	2.2000E 00
144	60	0	0.0000E-39
145	54	0	-0.0000E-39
145	55	0	1.8900E 00
145	56	0	5.5300E 01
145	57	0	1.4400E 02
145	58	0	9.6300E 01
145	59	0	1.5800E 01
145	60	0	0.0000E-39
146	54	0	-0.0000E-39
146	55	0	-0.0000E-39
146	56	0	2.3800E 01
146	57	0	1.0300E 02
146	58	0	1.0900E 02
146	59	0	2.9400E 01
146	60	0	-0.0000E-39
147	55	0	-0.0000E-39
147	56	0	6.8100E 00
147	57	0	5.6000E 01
147	58	0	1.0300E 02
147	59	0	4.9000E 01
147	60	0	3.8900E 00
147	61	0	0.0000E-39
147	62	0	0.0000E-39
148	55	0	-0.0000E-39
148	56	0	3.3900E-01

148	57	0	2.3800E 01
148	58	0	7.6700E 01
148	59	0	6.3200E 01
148	60	0	1.3000E 01
148	61	0	-0.0000E-39
148	62	0	0.0000E-39
149	56	0	-0.0000E-39
149	57	0	6.6200E 00
149	58	0	4.0300E 01
149	59	0	6.0200E 01
149	60	0	2.3200E 01
149	61	0	7.8000E-01
149	62	0	0.0000E-39
150	56	0	-0.0000E-39
150	57	0	3.8600E-01
150	58	0	1.5100E 01
150	59	0	4.2400E 01
150	60	0	3.0400E 01
150	61	0	5.3700E 00
150	62	0	0.0000E-39
151	57	0	-0.0000E-39
151	58	0	-0.0000E-39
151	59	0	-0.0000E-39
151	60	0	-0.0000E-39
151	61	0	-0.0000E-39
151	62	0	-0.0000E-39
151	63	0	0.0000E-39
152	57	0	-0.0000E-39
152	58	0	-0.0000E-39
152	59	0	-0.0000E-39
152	60	0	-0.0000E-39
152	61	0	-0.0000E-39
152	62	0	-0.0000E-39
152	63	1	-0.0000E-39
152	63	0	-0.0000E-39
152	64	0	0.0000E-39
153	57	0	-0.0000E-39
153	58	0	-0.0000E-39
153	59	0	-0.0000E-39
153	60	0	-0.0000E-39
153	61	0	-0.0000E-39
153	62	0	-0.0000E-39
153	63	0	0.0000E-39
154	58	0	-0.0000E-39
154	59	0	-0.0000E-39
154	60	0	-0.0000E-39
154	61	0	-0.0000E-39
154	62	0	-0.0000E-39
154	63	0	-0.0000E-39
154	64	0	0.0000E-39
155	58	0	-0.0000E-39
155	59	0	-0.0000E-39
155	60	0	-0.0000E-39
155	61	0	-0.0000E-39
155	62	0	-0.0000E-39
155	63	0	-0.0000E-39
155	64	0	0.0000E-39
156	59	0	-0.0000E-39
156	60	0	-0.0000E-39
156	61	0	-0.0000E-39

156	62	0	-0.0000E-39
156	63	0	-0.0000E-39
156	64	0	-0.0000E-39
157	59	0	-0.0000E-39
157	60	0	-0.0000E-39
157	61	0	-0.0000E-39
157	62	0	-0.0000E-39
157	63	0	-0.0000E-39
157	64	0	-0.0000E-39
158	59	0	-0.0000E-39
158	60	0	-0.0000E-39
158	61	0	-0.0000E-39
158	62	0	-0.0000E-39
158	63	0	-0.0000E-39
158	64	0	-0.0000E-39
159	60	0	-0.0000E-39
159	61	0	-0.0000E-39
159	62	0	-0.0000E-39
159	63	0	-0.0000E-39
159	64	0	-0.0000E-39
159	65	0	-0.0000E-39
160	60	0	-0.0000E-39
160	61	0	-0.0000E-39
160	62	0	-0.0000E-39
160	63	0	-0.0000E-39
160	64	0	-0.0000E-39
160	65	0	-0.0000E-39
160	66	0	0.0000E-39
161	60	0	-0.0000E-39
161	61	0	-0.0000E-39
161	62	0	-0.0000E-39
161	63	0	-0.0000E-39
161	64	0	-0.0000E-39
161	65	0	-0.0000E-39
161	66	0	0.0000E-39

OUTPUT OF XPRM

INDEX	IA	IZ	IS	JRM	ERM
1	72	30	0	4	-8.400E-07
2	72	31	0	5	1.170E-05
3	73	31	0	11	-1.890E-06
4	73	32	1	12	7.790E-08
5	74	30	0	17	-3.650E-06
6	74	31	0	18	1.800E-05
7	75	32	1	25	-3.030E-07
8	75	32	0	26	1.990E-07
9	76	33	0	33	-2.100E-06
10	77	32	1	39	-4.040E-07
11	77	32	0	40	5.740E-06
12	77	33	0	41	5.730E-08
13	78	32	0	47	-2.430E-06
14	78	33	1	48	2.710E-06
15	78	33	0	49	4.280E-06
16	79	34	1	56	-1.040E-07
17	81	34	1	70	-1.150E-07
18	82	35	0	78	-1.430E-05
19	83	34	1	84	-6.660E-07
20	83	34	0	85	1.490E-05
21	83	35	0	86	2.770E-07
22	83	36	1	87	2.320E-07
23	84	35	0	93	-9.170E-06
24	85	36	1	100	-9.090E-07
25	85	36	0	101	2.770E-08
26	86	37	1	108	-2.990E-06
27	86	37	0	109	4.750E-07
28	87	36	0	115	-4.100E-06
29	88	36	0	122	-7.680E-06
30	88	37	0	123	3.120E-06
31	89	36	0	128	-1.690E-05
32	89	37	0	129	1.100E-05
33	90	36	0	136	-8.990E-06
34	91	38	0	145	-4.180E-06
35	91	39	1	146	2.820E-06
36	91	39	0	147	1.730E-08
37	92	38	0	153	-5.880E-06
38	92	39	0	154	1.220E-06
39	93	38	0	160	-1.140E-05
40	93	39	0	161	4.880E-07
41	93	41	1	163	1.660E-07
42	94	39	0	169	-3.480E-06
43	95	40	0	176	-3.780E-06
44	95	41	1	177	1.330E-06
45	95	41	0	178	3.910E-06
46	96	41	0	186	-1.150E-05
47	97	40	0	192	-2.380E-07
48	97	41	1	193	3.820E-06
49	97	41	0	194	3.500E-06
50	99	42	0	209	-6.580E-07
51	99	43	1	210	7.450E-07
52	100	43	0	218	-6.070E-06
53	101	42	0	224	-7.920E-06
54	101	43	0	225	1.930E-06
55	102	43	1	232	-5.350E-06
56	103	44	0	240	-2.610E-06

57	103	45	1	241	1.220E-07
58	104	45	1	249	-2.150E-07
59	104	45	0	250	3.000E-06
60	105	44	0	257	-3.880E-06
61	105	45	1	258	4.170E-07
62	105	45	0	259	1.730E-07
63	106	45	1	267	-8.680E-06
64	106	45	0	268	1.480E-06
65	107	44	0	274	-1.220E-06
66	107	45	0	276	1.740E-06
67	108	44	0	283	-2.650E-07
68	108	45	0	284	2.360E-06
69	109	45	1	291	-6.370E-07
70	109	46	1	293	6.910E-07
71	109	46	0	294	1.690E-07
72	109	47	1	295	8.050E-08
73	111	46	1	308	-3.400E-07
74	111	46	0	309	8.900E-07
75	111	47	1	310	3.770E-07
76	111	47	0	311	1.310E-07
77	112	46	0	317	-1.250E-07
78	112	47	0	318	3.240E-06
79	115	48	1	341	-1.770E-07
80	115	48	0	342	1.040E-06
81	115	49	1	343	1.020E-06
82	116	47	0	350	-4.430E-06
83	117	48	1	357	-7.080E-06
84	117	49	1	359	5.250E-07
85	117	49	0	360	3.850E-06
86	117	50	1	361	1.220E-06
87	118	49	0	369	-1.160E-06
88	119	49	1	377	-2.690E-07
89	119	49	0	378	4.070E-06
90	119	50	1	379	1.470E-07
91	120	48	0	384	-2.710E-06
92	121	49	0	392	-4.690E-06
93	122	51	1	401	-4.840E-07
94	122	51	0	402	2.020E-06
95	123	49	0	408	-5.350E-06
96	123	50	1	409	1.050E-07
97	123	50	0	410	8.320E-07
98	124	51	0	419	-8.960E-06
99	125	50	1	424	-1.960E-06
100	125	50	0	425	3.980E-07
101	125	51	0	426	2.540E-06
102	125	52	1	427	3.270E-07
103	126	51	0	434	-9.390E-06
104	127	50	0	440	-2.710E-06
105	127	51	0	441	2.630E-06
106	127	52	1	442	5.140E-07
107	127	52	0	443	2.340E-08
108	128	50	0	447	-2.390E-06
109	128	51	1	448	9.280E-06
110	128	53	0	451	4.900E-07
111	129	51	0	456	-5.400E-06
112	129	52	1	457	1.830E-07
113	129	52	0	458	1.230E-06
114	129	54	1	460	4.300E-07
115	130	53	0	468	-7.840E-06
116	131	51	0	473	-3.180E-06

117	131	52	1	474	9.300E-06
118	131	52	0	475	2.130E-06
119	131	53	0	476	2.210E-06
120	131	54	1	477	1.980E-07
121	132	52	0	483	-1.440E-06
122	132	53	0	484	1.120E-05
123	133	52	1	489	-1.120E-05
124	133	52	0	490	7.840E-06
125	133	53	0	491	3.140E-06
126	133	54	1	492	3.840E-07
127	133	54	0	493	3.060E-07
128	134	52	0	498	-6.840E-06
129	134	53	0	499	1.220E-05
130	134	55	1	501	7.540E-07
131	134	55	0	502	8.130E-06
132	135	53	0	507	-1.560E-05
133	135	54	1	508	2.390E-06
134	135	54	0	509	1.490E-06
135	136	53	0	514	-1.210E-05
136	136	55	0	516	1.170E-05
137	137	56	1	523	-3.180E-06
138	138	54	0	528	-4.410E-06
139	138	55	0	529	9.790E-06
140	139	54	0	535	-1.460E-06
141	139	55	0	536	1.100E-06
142	139	56	0	537	2.550E-07
143	140	55	0	542	-3.230E-06
144	140	56	0	543	1.160E-06
145	140	57	0	544	1.140E-05
146	141	56	0	549	-3.650E-06
147	141	57	0	550	1.270E-07
148	141	58	0	551	4.670E-07
149	142	56	0	556	-4.950E-06
150	142	57	0	557	6.010E-06
151	143	57	0	563	-5.740E-06
152	143	58	0	564	3.500E-06
153	144	58	0	571	-1.230E-07
154	144	59	0	572	1.400E-07
155	145	58	0	578	-3.650E-06
156	145	59	0	579	4.090E-06
157	146	58	0	585	-1.500E-06
158	146	59	0	586	6.530E-06
159	147	60	0	593	-9.600E-07
160	148	61	0	602	-5.280E-06
161	149	60	0	608	-1.220E-06
162	149	61	0	609	2.800E-08
163	150	61	0	616	-8.080E-06
164	151	60	0	621	-5.600E-06
165	151	61	0	622	1.290E-06
166	152	61	0	629	-3.400E-06
167	152	63	1	631	1.920E-06
168	152	63	0	632	5.800E-06
169	153	61	0	638	-8.040E-07
170	153	62	0	639	1.860E-07
171	154	63	0	646	-6.010E-06
172	155	62	0	652	-7.260E-07
173	155	63	0	653	2.890E-07
174	156	63	0	659	-3.020E-06
175	157	63	0	665	-3.380E-06
176	158	62	0	670	-2.710E-06

177	158	63	0	671	6.300E-06
178	159	64	0	677	-3.950E-07
179	160	65	0	684	-2.020E-06
180	161	64	0	690	-2.030E-06
181	161	65	0	691	2.430E-07

OUTPUT OF INDCE1

NUMBER OF ELEMENTS = 18

NUMBER OF NEUTRONS EMITTED PER FISSION = 1.40

INDEX	ISC	FAC	XLAM	KEV	FOG	RNY
1	4	1.002E-02	7.419E-09	1	0.00000	0.000E-39
		1.469E-01	7.461E-35	1	0.00000	0.000E-39
		3.250E-03	6.930E-31	1	0.00000	0.000E-39
		2.155E-04	1.744E-07	3	0.43000 0.03000 0.57000	6.100E-06 5.770E-06 5.380E-06
2	7	0.000E-39	3.487E-08	1	0.00000	0.000E-39
		0.000E-39	6.930E-31	1	0.00000	0.000E-39
		0.000E-39	6.930E-31	1	0.00000	0.000E-39
		0.000E-39	6.930E-31	1	0.00000	0.000E-39
		0.000E-39	6.930E-31	1	0.00000	0.000E-39
		0.000E-39	1.069E-05	1	0.00000	0.000E-39
		0.000E-39	3.208E-03	1	0.00000	0.000E-39
3	3	4.829E-02	6.930E-31	1	0.00000	0.000E-39
		8.615E-03	6.930E-31	1	0.00000	0.000E-39
		2.225E-03	7.347E-05	1	0.00700	6.040E-06
4	3	8.997E-02	1.689E-17	1	0.11000	6.700E-06
		6.150E-04	6.930E-31	1	0.00000	0.000E-39
		3.324E-03	1.552E-05	1	0.18000	6.950E-06
5	1	2.714E-03	5.022E-03	1	1.00000	7.750E-06
6	1	7.495E-03	1.283E-05	2	1.00000 1.00000	1.070E-05 6.400E-06
7	5	2.899E-04	6.930E-31	1	0.00000	0.000E-39
		7.541E-04	6.930E-31	1	0.00000	0.000E-39

		3.604E-02	6.930E-31	1	0.00000	0.000E-39
		6.379E-04	6.930E-31	1	0.00000	0.000E-39
		4.556E-05	1.991E-03	3	0.04200 0.01300 0.94500	4.680E-06 3.230E-06 1.750E-06
8	2	5.779E-01	6.930E-31	1	0.00000	0.000E-39
		1.498E-07	1.771E-09	1	0.00000	0.000E-39
9	4	1.167E-02	6.930E-31	1	0.00000	0.000E-39
		1.540E-02	6.930E-31	1	0.00000	0.000E-39
		8.676E-04	5.277E-08	1	0.00000	0.000E-39
		1.191E-04	1.359E-03	3	0.00600 0.01000 0.89000	1.576E-05 1.410E-05 1.168E-05
10	2	1.970E-02	7.130E-14	1	0.00000	0.000E-39
		8.120E-05	3.080E-04	2	0.47000 0.31000	8.920E-06 7.140E-06
11	7	0.000E-39	2.005E-08	1	0.00000	0.000E-39
		0.000E-39	6.930E-31	1	0.00000	0.000E-39
		0.000E-39	6.930E-31	1	0.00000	0.000E-39
		0.000E-39	6.930E-31	1	0.00000	0.000E-39
		0.000E-39	6.930E-31	1	0.00000	0.000E-39
		0.000E-39	4.096E-06	1	0.00000	0.000E-39
		0.000E-39	4.813E-04	1	0.00000	0.000E-39
12	1	8.026E-03	7.461E-05	5	0.00500 0.01800 0.19500 0.28200 0.97700	1.134E-05 1.040E-05 8.840E-06 7.850E-06 4.550E-06
13	3	1.347E-03	1.283E-34	1	0.00000	0.000E-39
		1.560E-03	6.930E-31	1	0.00000	0.000E-39
		1.911E-04	1.216E-03	2	0.30000 0.70000	5.050E-06 4.330E-06

14	2	0.000E-39	6.930E-31	1	0.00000	0.000E-39
		0.000E-39	2.310E-01	2	0.02600 0.01300	1.513E-05 1.200E-05
15	2	0.000E-39	6.930E-31	1	0.00000	0.000E-39
		0.000E-39	3.072E-03	1	1.00000	6.620E-06
16	4	1.869E-04	2.885E-07	1	0.09000	1.750E-06
		1.709E-04	6.930E-31	1	0.00000	0.000E-39
		4.384E-04	6.930E-31	1	0.00000	0.000E-39
		2.306E-06	3.208E-05	1	0.00000	0.000E-39
17	1	4.801E-04	5.609E-07	1	0.00000	0.000E-39
18	1	4.539E-04	6.930E-31	1	-0.00000	-0.000E-39

OUTPUT OF BATMAN

NUCLID	ABUNDO
510033010004	0.0000E-39
110034010004	0.0000E-39
110035010004	0.0000E-39
110036010004	0.0000E-39
110037010004	0.0000E-39
110040000004	0.0000E-39
511033010004	0.0000E-39
111034010004	0.0000E-39
111035010004	0.0000E-39
111036010004	0.0000E-39
111037010004	0.0000E-39
111040110004	0.0000E-39
111040000004	0.0000E-39
512033010004	0.0000E-39
112034010004	0.0000E-39
112035010004	0.0000E-39
112036010004	0.0000E-39
112037010004	0.0000E-39
112040000004	0.0000E-39
513033010004	0.0000E-39
113034010004	0.0000E-39
113035010004	0.0000E-39
113036010004	0.0000E-39
113037010004	0.0000E-39
113040110004	0.0000E-39
113040010004	0.0000E-39
113041000004	0.0000E-39
514034010004	0.0000E-39
114035010004	0.0000E-39
114036010004	0.0000E-39
114037010004	0.0000E-39
114040000004	0.0000E-39
514041010004	0.0000E-39
114042000004	0.0000E-39
515034010004	0.0000E-39
115035010004	0.0000E-39
115036010004	0.0000E-39
115037012002	0.0000E-39
115040112002	0.0000E-39
115040010004	0.0000E-39
115041010004	0.0000E-39
115042000004	0.0000E-39
516034010004	0.0000E-39
116035010004	0.0000E-39
116036010004	0.0000E-39
116037010004	0.0000E-39
116040012002	0.0000E-39
116041110004	0.0000E-39
116041010004	0.0000E-39
116042000004	0.0000E-39
517035010004	0.0000E-39
117036010004	0.0000E-39
117037010004	0.0000E-39
117040010004	0.0000E-39
117041010004	0.0000E-39
117042110004	0.0000E-39
117042010004	0.0000E-39

117043000004	0.0000E-39
520035010004	0.0000E-39
120036010004	1.0416E-01
120037010004	1.0541E 00
120040010004	5.5232E 00
120041010004	3.5188E 00
120042000004	2.4971E-01
521035010004	0.0000E-39
121036010004	0.0000E-39
121037010004	3.3851E-01
121040010004	4.7978E 00
121041012002	8.1857E 00
121042110004	1.0319E 00
121042010004	1.5654E 00
121043000004	3.1509E-03
522036010004	0.0000E-39
122037010004	9.2231E-02
122040010004	3.4370E 00
122041010004	1.1289E 01
122042000004	1.6407E 00
522043010004	5.4899E-01
122044000004	1.1370E-05
523036010004	0.0000E-39
123037010004	0.0000E-39
123040010004	9.1843E-01
123041012002	1.1064E 01
123042112002	6.4484E 00
123042010004	1.0459E 01
123043010004	3.0394E 00
123044110004	9.0626E-04
123044000004	1.1474E-06
524037010004	0.0000E-39
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124041010004	6.5470E 00
124042010004	2.7226E 01
124043010004	9.7931E 00
124044000004	1.3393E-02
525037010004	0.0000E-39
125040010004	8.1941E-04
125041010004	1.7703E-02
125042010004	3.4181E 01
125043010004	2.4976E 01
125044112002	3.4205E 00
125044010004	3.0648E 00
125045000004	4.4549E-04
526040010004	0.0000E-39
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126042010004	3.0272E 01
126043010004	4.3540E 01
126044000004	1.9585E 00
526045110004	1.2464E-01
126045010004	1.3556E-01
126046000004	2.2724E-07
527040010004	0.0000E-39
127041010004	2.6544E-01
127042010004	2.3770E 01
127043071042	6.1741E 01
127044010004	3.9174E 01
127045010004	4.7713E 00
127046000004	9.5367E-07

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130042010004	5.7609E 00
130043061042	6.7062E 01
130044010004	8.0856E 01
130045010004	1.6778E 01
130046000004	4.1600E-02
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131043051042	3.5152E 01
131044010004	1.2562E 02
131045010004	4.4452E 01
131046020004	2.6865E 00
531047110004	0.0000E-39
131047000004	1.0639E-05
532041010004	0.0000E-39
132042010004	0.0000E-39
132043071042	7.9945E 00
132044010004	1.3488E 02
132045010004	9.2644E 01
132046010004	1.6254E 01
132047010004	4.6915E-08
132050000004	8.9407E-06
533042010004	0.0000E-39
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133044010004	9.7553E 01
133045010004	1.5778E 02
133046012002	4.6553E 01
133047110004	3.0014E-01
133047010004	3.0001E-01
133050000004	1.3046E-05
534042010004	0.0000E-39
134043010004	1.0769E 00
134044010004	3.6137E 01
134045010004	1.4042E 02
134046010004	1.7154E 02
134047010004	1.1234E 01
134050000004	2.3264E-03
535042010004	0.0000E-39
135043010004	0.0000E-39
135044010004	1.3579E 01
135045010004	1.3856E 02
135046010004	2.3052E 02
135047010004	3.4981E 01
135050012002	2.5692E-03
135051110004	1.1369E-11
135051000004	5.1260E-06
536043010004	0.0000E-39
136044010004	3.4756E 00
136045010004	7.0155E 01
136046010004	2.9693E 02
136047010004	9.0949E 01
136050000004	1.9252E-01
537043010004	0.0000E-39
137044010004	0.0000E-39
137045010004	2.3712E 01
137046010004	2.7630E 02
137047010004	1.6862E 02
137050012002	2.5714E 01
137051110004	2.4214E-07

137051010004	1.1683E-05
137052000004	2.6561E-05
540043010004	0.0000E-39
140044010004	0.0000E-39
140045010004	1.6721E 01
140046010004	1.8826E 02
140047010004	3.2500E 02
140050000004	3.9119E 00
540051010004	0.0000E-39
140052000004	0.0000E-39
541044010004	0.0000E-39
141045010004	0.0000E-39
141046010004	2.8560E 00
141047010004	9.2709E 01
141050012002	3.2142E 02
141051110004	5.9798E 01
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542044010004	0.0000E-39
142045010004	0.0000E-39
142046010004	3.7734E 00
142047010004	1.0013E 02
142050020004	3.7513E 02
542051120004	2.7827E 01
142051010004	4.0863E 01
142052000004	7.7807E-01
543045010004	0.0000E-39
143046010004	4.6479E-01
143047010004	2.1159E 01
143050010004	8.6545E 01
143051010004	4.1463E 02
143052012002	2.6154E 01
143053110004	2.2095E-04
143053010004	5.4389E-05
143054000004	1.7732E-05
544046010004	0.0000E-39
144047010004	6.7199E 00
144050010004	1.1115E 02
144051010004	3.4771E 02
144052000004	4.4204E 00
544053010004	8.8830E-01
144054000004	1.6170E-01
545046010004	0.0000E-39
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145050010004	3.3179E 01
145051010004	2.9122E 02
145052010004	1.7260E 02
145053010004	2.6924E 01
145054000004	8.5071E-02
546046010004	0.0000E-39
146047010004	0.0000E-39
146050010004	1.1913E 01
146051010004	1.6043E 02
146052012002	2.7911E 02
146053120004	2.8706E 01
146053010004	1.7070E 01
146054000004	1.2202E 01
547047010004	0.0000E-39
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147051010004	8.2551E 01

147052010004	2.6713E 02
147053010004	1.1357E 02
147054012002	7.8563E 00
147055110004	4.5594E-06
147055000004	2.4044E-05
550047010004	0.0000E-39
150050010004	0.0000E-39
150051010004	2.6898E 01
150052010004	2.2693E 02
150053010004	1.5241E 02
150054000004	3.7326E-01
550055110004	0.0000E-39
150055010004	0.0000E-39
150056000004	0.0000E-39
551047010004	0.0000E-39
151050010004	0.0000E-39
151051010004	1.2863E 01
151052010004	1.9899E 02
151053010004	1.5043E 02
151054012002	3.2931E 01
151055110004	1.0943E-03
151055010004	4.4107E-03
151056000004	1.5616E-05
552047010004	0.0000E-39
152050010004	0.0000E-39
152051010004	5.8463E 00
152052010004	8.9860E 01
152053010004	1.6849E 02
152054020004	8.1408E 01
552055120004	0.0000E-39
152055010004	4.6803E-06
152056000004	1.6212E-05
553050010004	0.0000E-39
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153052010004	4.7814E 01
153053010004	1.9679E 02
153054012002	4.2591E 01
153055110004	1.8287E-01
153055010004	1.9333E-01
153056010004	1.9574E-04
153057000004	2.3842E-06
554050010004	0.0000E-39
154051010004	0.0000E-39
154052010004	1.3543E 01
154053010004	1.3363E 02
154054010004	5.9430E 01
154055010 04	6.2718E 00
154056000004	9.5837E-01
555050010004	0.0000E-39
155051010004	0.0000E-39
155052010004	3.2772E 00
155053010004	3.1265E 01
155054012002	9.6125E 01
155055110004	1.2772E 01
155055012002	1.2933E 01
155056110004	4.2093E-01
155056010004	4.2446E-01
155057110004	9.7619E-06
155057000004	8.4043E-06
556051010004	0.0000E-39

156052010004	5.5913E-01
156053010004	1.4348E 01
156054010004	7.9662E 01
156055010004	3.0097E 01
156056000004	1.4564E 01
557051010004	0.0000E-39
157052010004	0.0000E-39
157053010004	3.8732E 00
157054010004	4.2305E 01
157055012002	6.1937E 01
157056112002	3.3473E 00
157056012002	1.4635E 01
157057110004	8.2725E-03
157057010004	8.3635E-03
157060000004	5.4985E-06
560052010004	0.0000E-39
160053010004	1.6279E 00
160054010004	2.2845E 01
160055010004	5.8272E 01
160056010004	3.6044E 01
160057010004	1.5585E-01
160060000004	4.1123E-05
561052010004	0.0000E-39
161053010004	0.0000E-39
161054010004	7.8235E 00
161055010004	3.9530E 01
161056010004	5.6202E 01
161057112002	2.6937E 00
161057010004	1.4893E 00
161060000004	7.5807E-03
562052010004	0.0000E-39
162053010004	0.0000E-39
162054010004	2.2601E 00
162055010004	2.5198E 01
162056010004	7.0734E 01
162057010004	5.9938E 00
162060000004	3.8667E 00
563053010004	0.0000E-39
163054010004	3.6495E-01
163055010004	1.3497E 01
163056012002	6.8365E 01
163057112301	9.9477E 00
163057012002	1.2147E 01
163060130004	5.0062E-01
163060010004	5.1933E-01
163061112002	5.7707E-06
163061010004	3.8529E-06
163062000004	1.0825E-06
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164054010004	0.0000E-39
164055010004	4.9918E 00
164056010004	4.8533E 01
164057010004	4.4612E 01
164060000004	6.8354E-01
565053010004	0.0000E-39
165054010004	0.0000E-39
165055010004	1.5422E 00
165056010004	2.8724E 01
165057012002	5.9321E 01
165060112301	6.7880E 00

165060010004	6.7849E 00
165061132C1	5.7157E-03
165061020004	4.6385E-04
165062110004	4.6566E-09
165062000004	7.8356E-06
566054010004	0.0000E-39
166055010004	5.2751E-01
166056010004	1.6044E 01
166057010004	5.4449E 01
166060020004	2.8097E 01
566061120004	9.0578E-01
166061010004	5.5333E-01
166062000004	3.9305E-01
567054010004	0.0000E-39
167055010004	3.1920E-02
167056010004	5.5433E 00
167057012002	4.3893E 01
167060120004	2.1129E 01
167060010004	2.1360E 01
167061112301	4.6127E 00
167061010004	4.1159E 00
167062110004	9.8258E-02
167062000004	4.9143E-03
570055010004	0.0000E-39
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170057010004	2.4280E 01
170060010004	5.8396E 01
170061010004	1.5641E 01
170062000004	8.5427E-01
571055010004	0.0000E-39
171056010004	1.4717E-01
171057010004	1.0472E 01
171060012002	4.4639E 01
171061130004	2.1093E 01
171061020004	1.9791E 01
571062120004	2.2464E 00
171062010004	4.0713E 00
171063000004	8.8662E-05
572056010004	0.0000E-39
172057010004	3.1642E 00
172060010004	3.9459E 01
172061010004	4.5301E 01
172062000004	2.6959E 00
572063110004	1.0111E-01
172063021042	1.0329E-01
172064000004	1.1059E-06
573056010004	0.0000E-39
173057010004	1.1659E 00
173060012002	2.2607E 01
173061130004	2.7874E 01
173061020004	2.3277E 01
573062120004	1.2401E 01
173062010004	2.1005E 01
173063000004	1.8231E-02
574056010004	0.0000E-39
174057010004	5.8255E-02
174060010004	1.2001E 01
174061010004	4.7333E 01
174062000004	6.5304E 00
574063230004	2.8841E 00

574063120004	2.7927E 00
574063010004	2.8902E 00
174064000004	1.0360E-01
575057010004	0.0000E-39
175060010004	4.0991E-01
175061012002	3.4816E 01
175062120004	3.2418E 01
175062010004	3.2559E 01
175063012002	2.0542E 01
175064110004	5.9470E-01
175064000004	4.8502E-06
576057010004	0.0000E-39
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176061010004	1.7305E 01
176062010004	6.7338E 01
176063112002	1.9014E 01
176063010004	1.9103E 01
176064000004	4.9737E-04
577057010004	0.0000E-39
177060010004	0.0000E-39
177061012002	5.8202E 00
177062120004	4.1645E 00
177062010004	6.5769E 01
177063012002	6.6546E 01
177064112002	8.9450E 00
177064010004	8.9446E 00
177065000004	7.2003E-04
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200061010004	3.3851E 00
200062012002	7.6758E 01
200063120004	4.4143E 01
200063010004	4.4265E 01
200064000004	1.8310E-01
600065011042	5.5401E-01
200066000004	9.2483E-04
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201062010004	7.9405E 01
201063012002	1.1201E 02
201064112002	2.3534E 01
201064010004	2.3532E 01
201065020004	2.0846E 00
601066110004	0.0000E-39
201066000004	1.8477E-04
602060010004	0.0000E-39
202061010004	1.8312E 00
202062012002	8.8424E 01
202063120004	1.3225E 00
202063010004	1.3798E 02
202064000004	1.7117E-01
602065010004	3.6198E 00
202066000004	2.1523E-04
603060010004	0.0000E-39
203061010004	1.4254E-01
203062010004	6.0738E 01
203063012002	1.6212E 02
203064112002	5.4435E 01
203064010004	5.4595E 01
203065012002	1.7702E 01
203066110004	5.3453E-07

203066000004	7.7062E-05
604060010004	0.0000E-39
204061010004	0.0000E-39
204062010004	3.1186E 01
204063010004	1.5057E 02
204064010004	1.7315E 02
204065010004	4.9586E 01
204066000004	1.6037E-02
605061010004	0.0000E-39
205062010004	1.3819E 01
205063012002	1.2093E 02
205064112002	1.1573E 02
205064010004	1.1453E 02
205065012002	1.0649E 02
205066110004	4.2946E 00
205066010004	4.2983E 00
205067000004	4.3690E-05
606061010004	0.0000E-39
206062010004	0.0000E-39
206063010004	7.9631E 00
206064010004	2.4419E 02
206065010004	2.2106E 02
206066000004	1.8597E-01
606067110004	0.0000E-39
206067010004	0.0000E-39
206070000004	0.0000E-39
607062010004	0.0000E-39
207063010004	1.1715E 00
207064010004	1.0719E 02
207065012002	2.5240E 02
20706611000	8.2610E 01
207066010004	8.3097E 01
207067010004	2.4207E 01
207070000004	4.7684E-06
610063010004	0.0000E-39
210064010004	2.0167E 01
210065010004	1.8349E 02
210066000004	6.3198E 00
610067010004	8.8200E 01
210070000004	2.0981E-04
611063010004	0.0000E-39
211064010004	2.7421E 00
211065051042	1.0497E 02
211066010004	2.6407E 02
211067012002	1.5297E 02
211070110004	9.9918E 00
211070000004	1.7288E-01
612063010004	0.0000E-39
212064010004	0.0000E-39
212065061042	3.4333E 01
212066010004	2.2447E 02
212067010004	2.0740E 02
212070000004	2.8697E-01
612071010004	0.0000E-39
212072000004	0.0000E-39
613064010004	0.0000E-39
213065061042	4.7496E 00
213066010004	1.3973E 02
213067010004	2.3998E 02
213070010004	1.0305E 02

213071000004	5.3800E-02
614064010004	0.0000E-39
214065010004	3.3264E-01
214066010004	6.6962E 01
214067010004	2.2022E 02
214070010004	1.6587E 02
214071010004	2.7600E 01
214072000004	5.2547E-04
615065010004	0.0000E-39
215066010004	6.7970E 00
215067010004	1.6719E 02
215070010004	2.1021E 02
215071010004	6.0288E 01
215072010004	8.6475E-01
215073000004	1.5579E-05
616065010004	0.0000E-39
216066010004	1.2566E 00
216067010004	7.2392E 01
216070010004	2.2499E 02
216071010004	1.0789E 02
216072000004	5.7042E-02
617065010004	0.0000E-39
217066010004	3.5393E-02
217067010004	1.2847E 01
217070010004	1.6679E 02
217071010004	1.8063E 02
217072010004	3.2504E 01
217073010004	7.2289E-04
217074000004	1.8597E-05
620066010004	0.0000E-39
220067010004	3.1248E 00
220070010004	6.2296E 01
220071010004	2.0231E 02
220072010004	9.8974E 01
220073010004	2.1943E 00
220074000004	5.6762E-03
621066010004	0.0000E-39
221067010004	1.3014E-01
221070010004	1.5243E 01
221071010004	1.4203E 02
221072010004	1.3835E 02
221073010004	1.7544E 01
221074000004	2.0752E-03
622066010004	0.0000E-39
222067010004	0.0000E-39
222070010004	3.9983E 00
222071010004	6.5872E 01
222072010004	1.6548E 02
222073010004	2.9793E 01
222074000004	5.4068E-02
623067010004	0.0000E-39
223070010004	4.6892E-01
223071010004	1.7331E 01
223072010004	1.4327E 02
223073010004	5.3550E 01
223074010004	4.0801E 00
223075010004	1.3262E-05
223076000004	6.2883E-06
624067010004	0.0000E-39
224070010004	2.3343E-02

224071010004	6.3765E 00
224072010004	8.8774E 01
224073010004	6.7374E 01
224074000004	1.4918E 00
624075010004	0.0000E-39
224076000004	0.0000E-39
625070010004	0.0000E-39
225071010004	1.1121E 00
225072010004	2.2210E 01
225073010004	7.7540E 01
225074010004	2.9448E 01
225075010004	7.8972E-01
225076000004	1.5207E-05
626070010004	0.0000E-39
226071010004	6.4847E-02
226072010004	5.3468E 00
226073010004	4.4560E 01
226074000004	7.9139E 00
626075010004	5.3685E 00
226076000004	1.4781E-03
627071010004	0.0000E-39
227072010004	0.0000E-39
227073010004	0.0000E-39
227074010004	0.0000E-39
227075010004	0.0000E-39
227076010004	0.0000E-39
227077000004	0.0000E-39
630071010004	0.0000E-39
230072010004	0.0000E-39
230073010004	0.0000E-39
230074010004	0.0000E-39
230075010004	0.0000E-39
230076000004	0.0000E-39
630077112042	0.0000E-39
630077021042	0.0000E-39
230100000004	0.0000E-39
631071010004	0.0000E-39
231072010004	0.0000E-39
231073010004	0.0000E-39
231074010004	0.0000E-39
231075010004	0.0000E-39
231076010004	0.0000E-39
231077000004	0.0000E-39
632072010004	0.0000E-39
232073010004	0.0000E-39
232074010004	0.0000E-39
232075010004	0.0000E-39
232076000004	0.0000E-39
632077010004	0.0000E-39
232100000004	0.0000E-39
633072010004	0.0000E-39
233073010004	0.0000E-39
233074010004	0.0000E-39
233075010004	0.0000E-39
233076010004	0.0000E-39
233077010004	0.0000E-39
233100000004	0.0000E-39
634073010004	0.0000E-39
234074010004	0.0000E-39
234075010004	0.0000E-39

234076010004	0.0000E-39
234077010004	0.0000E-39
234100000004	0.0000E-39
635073010004	0.0000E-39
235074010004	0.0000E-39
235075010004	0.0000E-39
235076010004	0.0000E-39
235077010004	0.0000E-39
235100000004	0.0000E-39
636073010004	0.0000E-39
236074010004	0.0000E-39
236075010004	0.0000E-39
236076010004	0.0000E-39
236077010004	0.0000E-39
236100000004	0.0000E-39
637074010004	0.0000E-39
237075010004	0.0000E-39
237076010004	0.0000E-39
237077010004	0.0000E-39
237100010004	0.0000E-39
237101000004	0.0000E-39
640074010004	0.0000E-39
240075010004	0.0000E-39
240076010004	0.0000E-39
240077010004	0.0000E-39
240100000004	0.0000E-39
640101010004	0.0000E-39
240102000004	0.0000E-39
641074010004	0.0000E-39
241075010004	0.0000E-39
241076010004	0.0000E-39
241077010004	0.0000E-39
241100010004	0.0000E-39
241101010004	0.0000E-39
241102000004	0.0000E-39

OUTPUT OF FRATIO

MCHN	FR
1	0.0000E-39
2	0.0000E-39
3	0.0000E-39
4	0.0000E-39
5	0.0000E-39
6	0.0000E-39
7	0.0000E-39
8	0.0000E-39
9	1.1084E-01
10	2.1260E-02
11	5.4228E-03
12	0.0000E-39
13	0.0000E-39
14	0.0000E-39
15	2.9288E-09
16	7.3517E-09
17	2.4399E-04
18	1.2798E-02
19	6.4557E-02
20	1.5290E-01
21	5.0714E-01
22	6.3572E-01
23	8.4052E-01
24	9.5203E-01
25	9.6868E-01
26	9.9993E-01
27	9.9858E-01
28	9.5236E-01
29	9.8873E-01
30	6.1939E-01
31	3.6226E-01
32	1.9780E-01
33	6.7067E-02
34	1.1589E-01
35	2.5247E-01
36	1.5419E-01
37	3.1174E-01
38	7.8029E-01
39	8.9292E-01
40	9.6929E-01
41	9.8631E-01
42	9.9993E-01
43	9.6421E-01
44	9.9032E-01
45	9.2308E-01
46	8.6838E-01
47	7.0727E-01
48	4.9183E-01
49	2.6471E-01
50	1.6530E-01
51	6.4522E-02
52	3.1908E-01
53	8.8328E-02
54	5.3550E-01
55	5.4654E-01
56	4.3656E-01

57	4.5341E-01
58	3.2767E-01
59	3.7212E-01
60	1.7367E-01
61	7.7097E-02
62	2.8783E-02
63	0.0000E-39
64	8.5047E-09
65	7.0363E-07
66	1.9002E-02
67	6.1517E-04
68	2.1147E-01
69	4.0224E-01
70	6.0942E-01
71	8.1886E-01
72	9.6720E-01
73	9.9153E-01
74	9.9958E-01
75	1.0000E 00
76	1.0000E 00
77	1.0000E 00
78	1.0000E 00
79	1.0000E 00
80	0.0000E-39
81	0.0000E-39
82	0.0000E-39
83	0.0000E-39
84	0.0000E-39
85	0.0000E-39
86	0.0000E-39
87	0.0000E-39
88	0.0000E-39
89	0.0000E-39
90	0.0000E-39

ENTERING LINK 9

OUTPUT OF BATMAN

NUCLID	ABUNDD
510033010004	0.0000E-39
110034010004	0.0000E-39
110035010004	0.0000E-39
110036010004	0.0000E-39
110037010004	0.0000E-39
110040000004	0.0000E-39
511033010004	0.0000E-39
111034010004	0.0000E-39
111035010004	0.0000E-39
111036010004	0.0000E-39
111037010004	0.0000E-39
111040110004	0.0000E-39
111040000004	0.0000E-39
512033010004	0.0000E-39
112034010004	0.0000E-39
112035010004	0.0000E-39
112036010004	0.0000E-39
112037010004	0.0000E-39
112040000004	0.0000E-39
513033010004	0.0000E-39
113034010004	0.0000E-39
113035010004	0.0000E-39
113036010004	0.0000E-39
113037010004	0.0000E-39
113040110004	0.0000E-39
113040010004	0.0000E-39
113041000004	0.0000E-39
514034010004	0.0000E-39
114035010004	0.0000E-39
114036010004	0.0000E-39
114037010004	0.0000E-39
114040000004	0.0000E-39
514041010004	0.0000E-39
114042000004	0.0000E-39
515034010004	0.0000E-39
115[illegible]3010004	0.0000E-39
115[illegible]6010004	0.0000E-39
115037012002	0.0000E-39
115040112002	0.0000E-39
115040010004	0.0000E-39
115041010004	0.0000E-39
115042000004	0.0000E-39
516034010004	0.0000E-39
116035010004	0.0000E-39
116036010004	0.0000E-39
116037010004	0.0000E-39
116040012002	0.0000E-39
116041110004	0.0000E-39
116041010004	0.0000E-39
116042000004	0.0000E-39
517035010004	0.0000E-39
117036010004	0.0000E-39
117037010004	0.0000E-39
117040010004	0.0000E-39
117041010004	0.0000E-39
117042110004	0.0000E-39
117042010004	0.0000E-39

117043000004	0.0000E-39
520035010004	0.0000E-39
120036010004	0.0000E-39
120037010004	0.0000E-39
120040010004	0.0000E-39
120041010004	4.2123E-31
120042000004	0.0000E-39
521035010004	0.0000E-39
121036010004	0.0000E-39
121037010004	0.0000E-39
121040010004	0.0000E-39
121041012002	4.8548E-34
121042110004	1.7989E-04
121042010004	1.1347E-03
121043000004	0.0000E-39
522036010004	0.0000E-39
122037010004	0.0000E-39
122040010004	0.0000E-39
122041010004	0.0000E-39
122042000004	0.0000E-39
522043010004	2.8881E-06
122044000004	0.0000E-39
523036010004	0.0000E-39
123037010004	0.0000E-39
123040010004	0.0000E-39
123041012002	0.0000E-39
123042112002	2.5343E-17
123042010004	1.6167E-03
123043010004	1.8181E-03
123044110004	4.9726E-04
123044000004	0.0000E-39
524037010004	0.0000E-39
124040010004	0.0000E-39
124041010004	0.0000E-39
124042010004	1.2655E-07
124043010004	4.6428E-03
124044000004	0.0000E-39
525037010004	0.0000E-39
125040010004	0.0000E-39
125041010004	0.0000E-39
125042010004	1.0622E-28
125043010004	2.5583E-07
125044112002	2.3689E-03
125044010004	9.6815E-09
125045000004	0.0000E-39
526040010004	0.0000E-39
126041010004	0.0000E-39
126042010004	0.0000E-39
126043010004	9.1173E-19
126044000004	0.0000E-39
526045110004	6.2059E-21
126045010004	1.1206E-07
126046000004	0.0000E-39
527040010004	0.0000E-39
127041010004	0.0000E-39
127042010004	0.0000E-39
127043071042	1.6690E-20
127044010004	1.1178E-02
127045010004	5.6806E-14
127046000004	0.0000E-39

530040010004	0.0000E-39
130041010004	0.0000E-39
130042010004	0.0000E-39
130043061042	0.0000E-39
130044010004	8.2202E-03
130045010004	9.0978E-03
130046000004	0.0000E-39
531041010004	0.0000E-39
131042010004	0.0000E-39
131043051042	0.0000E-39
131044010004	1.3319E-06
131045010004	1.2437E-02
131046020004	3.0198E-05
531047110004	0.0000E-39
131047000004	0.0000E-39
532041010004	0.0000E-39
132042010004	0.0000E-39
132043071042	0.0000E-39
132044010004	4.6802E-33
132045010004	2.4062E-07
132046010004	1.9656E-07
132047010004	1.9624E-09
132050000004	0.0000E-39
533042010004	0.0000E-39
133043010004	0.0000E-39
133044010004	0.0000E-39
133045010004	2.4681E-15
133046012002	5.6991E-03
133047110004	1.9854E-03
133047010004	1.7536E-06
133050000004	0.0000E-39
534042010004	0.0000E-39
134043010004	0.0000E-39
134044010004	0.0000E-39
134045010004	0.0000E-39
134046010004	1.9274E-02
134047010004	4.3193E-03
134050000004	0.0000E-39
535042010004	0.0000E-39
135043010004	0.0000E-39
135044010004	0.0000E-39
135045010004	0.0000E-39
135046010004	3.0846E-03
135047010004	7.5550E-03
135050012002	5.3460E-13
135051110004	1.3093E-18
135051000004	0.0000E-39
536043010004	0.0000E-39
136044010004	0.0000E-39
136045010004	0.0000E-39
136046010004	4.3885E-14
136047010004	3.5275E-02
136050000004	0.0000E-39
537043010004	0.0000E-39
137044010004	0.0000E-39
137045010004	0.0000E-39
137046010004	4.5089E-27
137047010004	8.8871E-03
137050012002	6.0044E-05
137051110004	7.1655E-09

137051010004	3.7729E-08
137052000004	0.0000E-39
540043010004	0.0000E-39
140044010004	0.0000E-39
140045010004	0.0000E-39
140046010004	0.0000E-39
140047010004	3.8359E-08
140050000004	0.000[illegible]-39
540051010004	0.0000E[illegible]
140052000004	0.0000E-39
541044010004	0.0000E-39
141045010004	0.0000E-39
141046010004	0.0000E-39
141047010004	0.0000E-39
141050012002	4.5344E-03
141051110004	4.3573E-03
141051010004	1.3241E-02
141052000004	0.0000E-39
542044010004	0.0000E-39
142045010004	0.0000E-39
142046010004	0.0000E-39
142047010004	0.0000E-39
142050020004	5.0670E-18
542051120004	2.7912E-03
142051010004	5.5197E-09
142052000004	0.0000E-39
543045010004	0.0000E-39
143046010004	0.0000E-39
143047010004	0.0000E-39
143050010004	0.0000E-39
143051010004	3.7670E-08
143052012002	1.5738E-03
143053110004	1.4243E-04
143053010004	9.9214E-14
143054000004	0.0000E-39
544046010004	0.0000E-39
144047010004	0.0000E-39
144050010004	0.0000E-39
144051010004	1.7443E-06
144052000004	0.0000E-39
544053010004	0.0000E-39
144054000004	0.0000E-39
545046010004	0.0000E-39
145047010004	0.0000E-39
145050010004	0.0000E-39
145051010004	3.4163E-18
145052010004	2.3962E-02
145053010004	6.6989E-03
145054000004	0.0000E-39
546046010004	0.0000E-39
146047010004	0.0000E-39
146050010004	0.0000E-39
146051010004	0.0000E-39
146052012002	1.2286E-02
146053120004	1.0062E-02
146053010004	6.1877E-03
146054000004	0.0000E-39
547047010004	0.0000E-39
147050010004	0.0000E-39
147051010004	0.0000E-39

147052010004	0.0000E-39
147053010004	5.8786E-15
147054012002	9.5833E-05
147055110004	4.8124E-05
147055000004	0.0000E-39
550047010004	0.0000E-39
150050010004	0.0000E-39
150051010004	0.0000E-39
150052010004	7.1326E-08
150053010004	2.8551E-02
150054000004	0.0000E-39
550055110004	0.0000E-39
150055010004	0.0000E-39
150056000004	0.0000E-39
551047010004	0.0000E-39
151050010004	0.0000E-39
151051010004	0.0000E-39
151052010004	1.1665E-09
151053010004	5.3694E-03
151054012002	1.5127E-02
151055110004	3.1208E-03
151055010004	2.3963E-04
151056000004	0.0000E-39
552047010004	0.0000E-39
152050010004	0.0000E-39
152051010004	0.0000E-39
152052010004	0.0000E-39
152053010004	0.0000E-39
152054020004	7.5903E-06
552055120004	0.0000E-39
152055010004	7.5903E-06
152056000004	0.0000E-39
553050010004	0.0000E-39
153051010004	0.0000E-39
153052010004	0.0000E-39
153053010004	2.6027E-18
153054012002	1.0747E-04
153055110004	6.4204E-05
153055010004	3.0737E-02
153056010004	7.2363E-13
153057000004	0.0000E-39
554050010004	0.0000E-39
154051010004	0.0000E-39
154052010004	0.0000E-39
154053010004	1.5468E-18
154054010004	4.3008E-05
154055010004	4.6233E-05
154056000004	0.0000E-39
555050010004	0.0000E-39
155051010004	0.0000E-39
155052010004	0.0000E-39
155053010004	0.0000E-39
155054012002	0.0000E-39
155055110004	3.4169E-22
155055012002	8.5373E-22
155056110004	3.6487E-05
155056010004	2.0662E-03
155057110004	2.0678E-03
155057000004	0.0000E-39
556051010004	0.0000E-39

156052010004	0.0000E-39
156053010004	0.0000E-39
156054010004	0.0000E-39
155055010004	0.0000E-39
156056000004	0.0000E-39
157051010004	0.0000E-39
157052010004	0.0000E-39
157053010004	0.0000E-39
157054010004	0.0000E-39
157055012002	0.0000E-39
157056112002	1.3671E-04
157056012002	1.0209E-02
157057110004	5.4349E-03
157057010004	1.0668E-04
157060000004	0.0000E-39
560052010004	0.0000E-39
160053010004	0.0000E-39
160054010004	0.0000E-39
160055010004	0.0000E-39
160056010004	1.0539E-03
160057010004	2.1548E-04
160060000004	0.0000E-39
561052010004	0.0000E-39
161053010004	0.0000E-39
161054010004	0.0000E-39
161055010004	0.0000E-39
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161057010004	3.1210E-03
161060000004	0.0000E-39
562052010004	0.0000E-39
162053010004	0.0000E-39
162054010004	0.0000E-39
162055010004	0.0000E-39
162056010004	1.4439E-08
162057010004	1.4959E-08
162060000004	0.0000E-39
563053010004	0.0000E-39
163054010004	0.0000E-39
163055010004	0.0000E-39
163056012002	1.1230E-24
163057112301	1.0107E-24
163057012002	7.0970E-03
163060130004	2.7206E-06
163060010004	2.8034E-04
163061112002	2.7464E-05
163061010004	4.5280E-17
163062000004	0.0000E-39
564053010004	0.0000E-39
164054010004	0.0000E-39
164055010004	0.0000E-39
164056010004	0.0000E-39
164057010004	2.8609E-08
164060000004	0.0000E-39
565053010004	0.0000E-39
165054010004	0.0000E-39
165055010004	0.0000E-39
165056010004	0.0000E-39
165057012002	3.8315E-17
165060112301	2.6426E-03

165060010004	6.2691E-03
165061123201	2.5466E-03
165061020004	7.3875E-04
165062110004	3.0250E-09
165062000004	0.0000E-39
566054010004	0.0000E-39
166055010004	0.0000E-39
166056010004	0.0000E-39
166057010004	0.0000E-39
166060020004	1.0040E-02
566061120004	2.2754E-07
166061010004	1.0057E-02
166062000004	0.0000E-39
567054010004	0.0000E-39
167055010004	0.0000E-39
167056010004	0.0000E-39
167057012002	0.0000E-39
167060120004	4.3406E-08
167060010004	7.1885E-04
167061112301	9.2509E-03
167061010004	5.1467E-04
167062110004	1.6039E-06
167062000004	0.0000E-39
570055010004	0.0000E-39
170056010004	0.0000E-39
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170060010004	2.5491E-03
170061010004	2.7393E-03
170062000004	0.0000E-39
571055010004	0.0000E-39
171056010004	0.0000E-39
171057010004	0.0000E-39
171060012002	0.0000E-39
171061130004	2.8428E-07
171061020004	1.1871E-36
571062120004	1.9736E-09
171062010004	6.9733E-04
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172057010004	0.0000E-39
172060010004	6.4176E-28
172061010004	5.8221E-24
172062000004	0.0000E-39
572063110004	1.2643E-08
172063021042	5.7992E-07
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573056010004	0.0000E-39
173057010004	0.0000E-39
173060012002	0.0000E-39
173061130004	7.1630E-31
173061020004	0.0000E-39
573062120004	7.9571E-07
173062010004	9.8968E-03
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574056010004	0.0000E-39
174057010004	0.0000E-39
174060010004	0.0000E-39
174061010004	0.0000E-39
174062000004	0.0000E-39
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574063120004	3.2807E-16
574063010004	3.8626E-07
174064000004	0.0000E-39
575057010004	0.0000E-39
175060010004	0.0000E-39
175061012002	0.0000E-39
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175062010004	4.2689E-05
175063012002	5.6967E-07
175064110004	8.2269E-08
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176060010004	0.0000E-39
176061010004	0.0000E-39
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176063112002	1.2984E-03
176063010004	2.2940E-05
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177061012002	0.0000E-39
177062120004	9.8959E-07
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177063012002	1.8801E-04
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201062010004	5.9099E-03
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201064112002	5.1982E-06
201064010004	3.9047E-03
201065020004	2.1791E-14
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201066000004	0.0000E-39
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202061010004	0.0000E-39
202062012002	4.6153E-08
202063120004	2.7425E-04
202063010004	1.5004E-02
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202066000004	0.0000E-39
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203061010004	0.0000E-39
203062010004	2.5326E-17
203063012002	1.5857E-02
203064112002	5.2759E-04
203064010004	3.3375E-02
203065012002	1.7078E-04
203066110004	1.8200E-09

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204064010004	8.6862E-04
204065010004	3.2906E-03
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205063012002	8.9258E-08
205064112002	2.1973E-02
205064010004	8.8780E-03
205065012002	3.3122E-03
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210065010004	1.5534E-13
210066000004	0.0000E-39
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211070110004	3.6596E-07
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212067010004	5.7132E-02
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212072000004	0.0000E-39
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213067010004	6.0654E-03
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214066010004	0.0000E-39
214067010004	1.2856E-16
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214071010004	1.3470E-04
214072000004	0.0000E-39
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215067010004	0.0000E-39
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215071010004	1.8055E-02
215072010004	1.2270E-05
215073000004	0.0000E-39
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216066010004	0.0000E-39
216067010004	0.0000E-39
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216071010004	3.6757E-02
216072000004	0.0000E-39
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217072010004	2.0510E-03
217073010004	3.0385E-06
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221071010004	0.0000E-39
221072010004	1.1339E-06
221073010004	9.0577E-03
221074000004	0.0000E-39
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222070010004	0.0000E-39
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222073010004	3.6733E-02
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623067010004	0.0000E-39
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223071010004	0.0000E-39
223072010004	1.4340E-15
223073010004	7.0229E-03
223074010004	1.5250E-04
223075010004	3.3812E-09
223076000004	0.0000E-39
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224071010004	0.0000E-39
224072010004	1.4295E-27
224073010004	7.0270E-10
224074000004	0.0000E-39
624075010004	0.0000E-39
224076000004	0.0000E-39
625070010004	0.0000E-39
225071010004	0.0000E-39
225072010004	0.0000E-39
225073010004	1.9766E-36
225074010004	8.9035E-03
225075010004	1.3905E-04
225076000004	0.0000E-39
626070010004	0.0000E-39
226071010004	0.0000E-39
226072010004	0.0000E-39
226073010004	0.0000E-39
226074000004	0.0000E-39
626075010004	2.9624E-04
226076000004	0.0000E-39
627071010004	0.0000E-39
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231074010004	0.0000E-39
231075010004	0.0000E-39
231076010004	0.0000E-39
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232074010004	0.0000E-39
232075010004	0.0000E-39
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233074010004	0.0000E-39
233075010004	0.0000E-39
233076010004	0.0000E-39
233077010004	0.0000E-39
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234075010004	0.0000E-39

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236074010004	0.0000E-39
236075010004	0.0000E-39
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237076010004	0.0000E-39
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237100010004	0.0000E-39
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641074010004	0.0000E-39
241075010004	0.0000E-39
241076010004	0.0000E-39
241077010004	0.0000E-39
241100010004	0.0000E-39
241101010004	0.0000E-39
241102000004	0.0000E-39

OUTPUT OF GXPSR

PARTICLE SIZE MICRONS	FISSION PRODUCT ACTIVITY (R*M**2)/HR
7.7965E 03	2.6227E 08
4.3473E 03	3.1974E 08
2.5825E 02	3.4085E 08
1.7168E 02	3.6162E 08
1.1940E 02	3.8434E 08
8.4075E 01	4.1113E 08
5.8469E 01	4.4532E 08
3.8870E 01	4.9397E 08
2.2965E 01	5.7853E 08
1.2875E 00	2.4852E 09

```
OUTPUT OF INDCC2
    INDUCED ACTIVITY IN THE TRANSPORTED SOIL CONTRIBUTES   1.6528E 07 TO EACH PARTICLE SIZE.
```

TOTAL PAM OUTPUT

PSIZE	FP
7.7965E 03	2.6392E 08
4.3673E 02	3.2141E 08
2.5825E 02	3.3250E 08
1.7168E 02	3.6327E 08
1.1940E 02	3.8599E 08
8.4075E 01	4.1278E 08
5.8469E 01	4.4698E 08
3.8870E 01	4.9563E 08
2.2985E 01	5.8018E 08
1.2875E 00	2.4869E 09

OUTPUT OF MCHDEP

PARTICLE SIZE MICRONS	ACTIVITY OF MASS CHAIN 89 FISSIONS
7.1965E 03	2.1632E 21
4.3073E 02	2.6919E 21
2.5825E 02	3.0321E 21
1.7168E 02	3.4307E 21
1.1940E 02	3.9293E 21
8.4075E 01	4.5898E 21
5.8469E 01	5.5290E 21
3.8870E 01	7.0169E 21
2.2985E 01	9.9243E 21
1.2875E 00	1.0269E 23

TOTAL ABUNDANCE OF MASS CHAIN 89 WAS 1.4500E 23 FISSIONS

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2. Freiling, E. C., Fractionation III. Estimation of Degree of Fractionation and Radionuclide Partition for Nuclear Debris, USNRDL-TR-680, US Naval Radiological Defense Laboratory, San Francisco, California (1963).

3. Bateman, Proc Camb Phil Soc, 15, 423 (1910).

4. Jones, T. H., A Prediction System for the Neutron-Induced Activity Contribution to Fallout Exposure Rates, USNRDL-TR-1056, US Naval Radiological Defense Laboratory, San Francisco, California (1966).

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APPENDIX

DETAILS OF PAM DATA TAPE

The data cards for this tape were obtained from Messrs. S. H. Cassidy and G. R. Crocker of the US Naval Radiological Defense Laboratory.

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TABLE A.1

Transition Cards

Cards Sequence	Mnemonic	Format
1	PMASS,PISOM,PATNO,HLIFE,IUNIT,IEXP, BRAT,DMASS,DISOM,DATNØ	(10X, 3I3, 8X, F9.4, IX, 2I3, 3X, F7.5, 7X, 3I3)
2	Same as Card 1	
.	.	
.	.	
.	.	
Terminator	Blank	

Mnemonics explained in Glossary of Subroutine SETUP.

Deck is read by SETUP.

TABLE A.2

Fission Yield Cards

	Card Sequence	Mnemonic	Format
First Set	1	FISTYP(I) = I=1,6	12A6
	2	NMAS,NAT,NSTAT,FYLDIN(I),I = 1,6	(I5,I4,A1,6E10.0)
	3	Same as Card 3	
	.	.	
	.	.	
	Set Terminator	Blank	
	Second Set	Same sequence as first set	
	Third Set	Same sequence as first set	
	.	.	
	.	.	
	.	.	
	.	.	
	Deck Terminator	Blank	

Mnemonics explained in Glossary of Subroutine YIELD.

Deck is read by YIELD.

TABLE A.3

Exposure - Rate Multipliers

Card Sequence	Mnemonic	Format
1	NMAS,NAT,NSTAT,XRM	(2X2I3,I2,E8.3)
2	Same as Card 1	
.	.	
.	.	
.	.	
Terminator	Blank	

Mnemonics explained in Glossary of Subroutine XPRM.

Deck is read by XPRM.

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LISTING OF

PAM DATA TAPE

PRECEDING
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72	0	27	1.0000	1	-2	1.00000	72	0	28	TRAN	1
72	0	28	3.5000	1	0	1.00000	72	0	29	TRAN	2
72	0	29	10.0000	1	0	1.00000	72	0	30	TRAN	3
72	0	30	46.5000	3	0	1.00000	72	0	31	TRAN	4
72	0	31	14.1000	3	0	1.00000	72	0	32	TRAN	5
72	0	32								TRAN	6
73	0	27	1.0000	1	-2	1.00000	73	0	28	TRAN	7
73	0	28	2.0000	1	0	1.00000	73	0	29	TRAN	8
73	0	29	7.0000	1	0	1.00000	73	0	30	TRAN	9
73	0	30	2.0000	2	0	1.00000	73	0	31	TRAN	10
73	0	31	4.8000	3	0	1.00000	73	1	32	TRAN	11
73	1	32	0.5300	1	0	1.00000	73	0	32	TRAN	12
73	0	32								TRAN	13
74	0	27	1.0000	1	-2	1.00000	74	0	28	TRAN	14
74	0	28	1.5000	1	0	1.00000	74	0	29	TRAN	15
74	0	29	4.0000	1	0	1.00000	74	0	30	TRAN	16
74	0	30	4.5000	2	0	1.00000	74	0	31	TRAN	17
74	0	31	7.8000	2	0	1.00000	74	0	32	TRAN	18
74	0	32								TRAN	19
75	0	27	1.0000	1	-2	1.00000	75	0	28	TRAN	20
75	0	28	1.0000	1	-2	1.00000	75	0	29	TRAN	21
75	0	29	2.5000	1	0	1.00000	75	0	30	TRAN	22
75	0	30	9.5000	1	0	1.00000	75	0	31	TRAN	23
75	0	31	2.0000	2	0	1.00000	75	1	32	TRAN	24
75	1	32	49.0000	1	0	1.00000	75	0	32	TRAN	25
75	0	32	82.0000	2	0	1.00000	75	0	33	TRAN	26
75	0	33								TRAN	27
76	0	28	1.0000	1	-2	1.00000	76	0	29	TRAN	28
76	0	29	2.0000	1	0	1.00000	76	0	30	TRAN	29
76	0	30	8.0000	1	0	1.00000	76	0	31	TRAN	30
76	0	31	30.0000	1	0	1.00000	76	0	32	TRAN	31
76	0	32								TRAN	32
76	0	33	26.5000	3	0	1.00000	76	0	34	TRAN	33
76	0	34								TRAN	34
77	0	28	1.0000	1	-2	1.00000	77	0	29	TRAN	35
77	0	29	1.5000	1	0	1.00000	77	0	30	TRAN	36
77	0	30	3.5000	1	0	1.00000	77	0	31	TRAN	37
77	0	31	15.0000	1	0	0.60000	77	1	32	TRAN	38
77	0	31	15.0000	1	0	0.40000	77	0	32	TRAN	39
77	1	32	54.0000	1	0	0.36000	77	0	32	TRAN	40
77	1	32	54.0000	1	0	0.64000	77	0	33	TRAN	41
77	0	32	11.3300	3	0	1.00000	77	0	33	TRAN	42
77	0	33	38.7000	3	0	1.00000	77	0	34	TRAN	43
77	0	34								TRAN	44
78	0	28	1.0000	1	-2	1.00000	78	0	29	TRAN	45
78	0	29	1.0000	1	-2	1.00000	78	0	30	TRAN	46
78	0	30	2.5000	1	0	1.00000	78	0	31	TRAN	47
78	0	31	8.0000	1	0	1.00000	78	0	32	TRAN	48
78	0	32	2.1000	3	0	0.50000	78	1	33	TRAN	49
78	0	32	2.1000	3	0	0.50000	78	0	33	TRAN	50
78	1	33	6.0000	2	0	1.00000	78	0	33	TRAN	51
78	0	33	91.0000	2	0	1.00000	78	0	34	TRAN	52
78	0	34								TRAN	53
79	0	29	1.0000	1	-2	1.00000	79	0	30	TRAN	54
79	0	30	1.5000	1	0	1.00000	79	0	31	TRAN	55
79	0	31	4.5000	1	0	1.00000	79	0	32	TRAN	56
79	0	32	25.0000	1	0	1.00000	79	0	33	TRAN	57
79	0	33	9.0000	2	0	1.00000	79	1	34	TRAN	58
79	1	34	3.8900	2	0	1.00000	79	0	34	TRAN	59
79	0	34	6.0000	5	4	1.00000	79	0	35	TRAN	60

79	0	35								TRAN	61
80	0	29	1.0000	1	-2	1.00000	80	0	30	TRAN	62
80	0	30	1.5000	1	0	1.00000	80	0	31	TRAN	63
80	0	31	3.0000	1	0	1.00000	80	0	32	TRAN	64
80	0	32	25.0000	1	0	1.00000	80	0	33	TRAN	65
80	0	33	36.0000	1	0	1.00000	80	0	34	TRAN	66
80	0	34								TRAN	67
81	0	29	1.0000	1	-2	1.00000	81	0	30	TRAN	68
81	0	30	1.0000	1	-2	1.00000	81	0	31	TRAN	69
81	0	35								TRAN	70
81	0	31	2.0000	1	0	1.00000	81	0	32	TRAN	71
81	0	32	7.0000	1	0	1.00000	81	0	33	TRAN	72
81	0	33	33.0000	1	0	0.06000	81	1	34	TRAN	73
81	0	33	33.0000	1	0	0.94000	81	0	34	TRAN	74
81	1	34	57.0000	2	0	1.00000	81	0	34	TRAN	75
81	0	34	18.0000	2	0	1.00000	81	0	35	TRAN	76
82	0	30	1.0000	1	-2	1.00000	82	0	31	TRAN	77
82	0	31	1.5000	1	0	1.00000	82	0	32	TRAN	78
82	0	32	5.0000	1	0	1.00000	82	0	33	TRAN	79
82	0	33	18.0000	1	0	1.00000	82	0	34	TRAN	80
82	0	34								TRAN	81
82	0	35	35.9000	3	0	1.00000	82	0	36	TRAN	82
82	0	36								TRAN	83
83	0	30	1.0000	1	-2	1.00000	83	0	31	TRAN	84
83	0	31	1.0000	1	-2	1.00000	83	0	32	TRAN	85
83	0	32	2.0000	1	0	1.00000	83	0	33	TRAN	86
83	0	33	7.0000	1	0	0.44000	83	1	34	TRAN	87
83	0	33	7.0000	1	0	0.56000	83	0	34	TRAN	88
83	1	34	69.0000	1	0	0.10000	83	0	34	TRAN	89
83	1	34	69.0000	1	0	0.90000	83	0	35	TRAN	90
83	0	34	25.0000	2	0	1.00000	83	0	35	TRAN	91
83	0	35	2.4000	3	0	1.00000	83	1	36	TRAN	92
83	1	36	114.0000	2	0	1.00000	83	0	36	TRAN	93
83	0	36								TRAN	94
84	0	31	1.0000	1	-2	1.00000	84	0	32	TRAN	95
84	0	32	1.5000	1	0	1.00000	84	0	33	TRAN	96
84	0	33	4.0000	1	0	1.00000	84	0	34	TRAN	97
84	0	34	3.0000	2	0	1.00000	84	0	35	TRAN	98
84	0	35	32.0000	2	0	1.00000	84	0	36	TRAN	99
84	0	36								TRAN	100
85	0	31	1.0000	1	-2	1.00000	85	0	32	TRAN	101
85	0	32	1.0000	1	0	1.00000	85	0	33	TRAN	102
85	0	33	0.4300	1	0	1.00000	85	0	34	TRAN	103
85	0	34	39.0000	1	0	1.00000	85	0	35	TRAN	104
85	0	35	3.0000	2	0	1.00000	85	1	36	TRAN	105
85	1	36	4.4000	3	0	0.19000	85	0	36	TRAN	106
85	1	36	4.4000	3	0	0.81000	85	0	37	TRAN	107
85	0	36	10.6000	5	0	1.00000	85	0	37	TRAN	108
85	0	37								TRAN	109
86	0	32	1.0000	1	-2	1.00000	86	0	33	TRAN	110
86	0	33	2.0000	1	0	1.00000	86	0	34	TRAN	111
86	0	34	16.0000	1	0	1.00000	86	0	35	TRAN	112
86	0	35	1.0000	2	0	1.00000	86	0	36	TRAN	113
86	0	36								TRAN	114
86	1	37	1.0400	2	0	1.00000	86	0	37	TRAN	115
86	0	37	18.6000	4	0	1.00000	86	0	38	TRAN	116
86	0	38								TRAN	117
87	0	32	1.0000	1	-2	1.00000	87	0	33	TRAN	118
87	0	33	1.5000	1	0	1.00000	87	0	34	TRAN	119
87	0	34	16.0000	1	0	1.00000	87	0	35	TRAN	120

87	0	35	54.5000	1	0	0.03000	86	0	36	TRAN	121
87	0	35	54.5000	1	0	0.97000	87	0	36	TRAN	122
87	0	36	78.0000	2	0	1.00000	87	0	37	TRAN	123
87	0	37	4.3000	5	10	1.00000	87	0	38	TRAN	124
87	0	38								TRAN	125
88	0	32	1.0000	1	-2	1.00000	88	0	33	TRAN	126
88	0	33	1.0000	1	-2	1.00000	88	0	34	TRAN	127
88	0	34	2.5000	1	0	1.00000	88	0	35	TRAN	128
88	0	35	16.3000	1	0	0.07000	87	0	36	TRAN	129
88	0	35	16.3000	1	0	0.93000	88	0	36	TRAN	130
88	0	36	2.8000	3	0	1.00000	88	0	37	TRAN	131
88	0	37	18.0000	2	0	1.00000	88	0	38	TRAN	132
88	0	38								TRAN	133
89	0	33	1.0000	1	-2	1.00000	89	0	34	TRAN	134
89	0	34	2.0000	1	0	1.00000	89	0	35	TRAN	135
89	0	35	4.4000	1	0	0.11600	88	0	36	TRAN	136
89	0	35	4.4000	1	0	0.88200	89	0	36	TRAN	137
89	0	36	3.2000	2	0	1.00000	89	0	37	TRAN	138
89	0	37	15.4000	2	0	1.00000	89	0	38	TRAN	139
89	0	38	50.5000	4	0	1.00000	89	0	39	TRAN	140
89	1	39	16.0000	1	0	1.00000	89	0	39	TRAN	141
89	0	39								TRAN	142
90	0	33	1.0000	1	-2	1.00000	90	0	34	TRAN	143
90	0	34	1.0000	1	-2	1.00000	90	0	35	TRAN	144
90	0	35	1.6000	1	0	0.15000	89	0	36	TRAN	145
90	0	35	1.6000	1	0	0.85000	90	0	36	TRAN	146
90	0	36	33.0000	1	0	1.00000	90	0	37	TRAN	147
90	0	37	2.7000	2	0	1.00000	90	0	38	TRAN	148
90	0	38	28.0000	5	0	1.00000	90	0	39	TRAN	149
90	0	39	64.3000	3	0	1.00000	90	0	40	TRAN	150
90	0	40								TRAN	151
91	0	34	1.0000	1	-2	1.00000	91	0	35	TRAN	152
91	0	35	2.0000	1	0	1.00000	91	0	36	TRAN	153
91	0	36	10.0000	1	0	1.00000	91	0	37	TRAN	154
91	0	37	72.0000	1	0	1.00000	91	0	38	TRAN	155
91	0	38	9.7000	3	0	0.60000	91	1	39	TRAN	156
91	0	38	9.7000	3	0	0.40000	91	0	39	TRAN	157
91	1	39	50.0000	2	0	1.00000	91	0	39	TRAN	158
91	0	39	58.0000	4	0	1.00000	91	0	40	TRAN	159
91	0	40								TRAN	160
92	0	34	1.0000	1	-2	1.00000	92	0	35	TRAN	161
92	0	35	1.5000	1	0	1.00000	92	0	36	TRAN	162
92	0	36	3.0000	1	0	1.00000	92	0	37	TRAN	163
92	0	37	5.3000	1	0	1.00000	92	0	38	TRAN	164
92	0	38	2.7000	3	0	1.00000	92	0	39	TRAN	165
92	0	39	3.6000	3	0	1.00000	92	0	40	TRAN	166
92	0	40								TRAN	167
93	0	34	1.0000	1	-2	1.00000	93	0	35	TRAN	168
93	0	35	1.0000	1	-2	1.00000	93	0	36	TRAN	169
93	0	36	2.0000	1	0	1.00000	93	0	37	TRAN	170
93	0	37	5.6000	1	0	1.00000	93	0	38	TRAN	171
93	0	38	8.0000	2	0	1.00000	93	0	39	TRAN	172
93	0	39	10.0000	3	0	1.00000	93	0	40	TRAN	173
93	0	40	9.5000	5	5	0.25000	93	1	41	TRAN	174
93	0	40	9.5000	5	5	0.75000	93	0	41	TRAN	175
93	1	41	3.7000	5	0	1.00000	93	0	41	TRAN	176
93	0	41								TRAN	177
94	0	35	1.0000	1	-2	1.00000	94	0	36	TRAN	178
94	0	36	1.4000	1	0	1.00000	94	0	37	TRAN	179
94	0	37	3.0000	1	0	1.00000	94	0	38	TRAN	180

94	0	38	1.3000	2	0	1.00000	94	0	39	TRAN 181
94	0	39	20.0000	2	0	1.00000	94	0	40	TRAN 182
94	0	40								TRAN 183
95	0	35	1.0000	1	-2	1.00000	95	0	36	TRAN 184
95	0	36	1.0000	1	-2	1.00000	95	0	37	TRAN 185
95	0	37	2.0000	1	0	1.00000	95	0	38	TRAN 186
95	0	38	40.0000	1	0	1.00000	95	0	39	TRAN 187
95	0	39	10.0000	2	0	1.00000	95	0	40	TRAN 188
95	0	40	65.0000	4	0	0.02000	95	1	41	TRAN 189
95	0	40	65.0000	4	0	0.98000	95	0	41	TRAN 190
95	1	41	90.0000	3	0	1.00000	95	0	41	TRAN 191
95	0	41	35.0000	4	0	1.00000	95	0	42	TRAN 192
95	0	42								TRAN 193
96	0	35	1.0000	1	-2	1.00000	96	0	36	TRAN 194
96	0	36	1.0000	1	-2	1.00000	96	0	37	TRAN 195
96	0	37	1.0000	1	0	1.00000	96	0	38	TRAN 196
96	0	38	2.5000	1	0	1.00000	96	0	39	TRAN 197
96	0	39	2.3000	2	0	1.00000	96	0	40	TRAN 198
96	0	40								TRAN 199
96	0	41	23.0000	3	0	1.00000	96	0	42	TRAN 200
96	0	42								TRAN 201
97	0	36	1.0000	1	-2	1.00000	97	0	37	TRAN 202
97	0	37	1.0000	1	-2	1.00000	97	0	38	TRAN 203
97	0	38	1.5000	1	0	1.00000	97	0	39	TRAN 204
97	0	39	5.0000	1	0	1.00000	97	0	40	TRAN 205
97	0	40	17.0000	3	0	0.96000	97	1	41	TRAN 206
97	0	40	17.0000	3	0	0.04000	97	0	41	TRAN 207
97	1	41	1.0000	2	0	1.00000	97	0	41	TRAN 208
97	0	41	73.0000	2	0	1.00000	97	0	42	TRAN 209
97	0	42								TRAN 210
98	0	36	1.0000	1	-2	1.00000	98	0	37	TRAN 211
98	0	37	1.0000	1	-2	1.00000	98	0	38	TRAN 212
98	0	38	1.0000	1	0	1.00000	98	0	39	TRAN 213
98	0	39	2.5000	1	0	1.00000	98	0	40	TRAN 214
98	0	40	60.0000	1	0	1.00000	98	0	41	TRAN 215
98	1	41	51.0000	2	0	1.00000	98	0	42	TRAN 216
98	0	41	2.0000	2	0	1.00000	98	0	42	TRAN 217
98	0	42								TRAN 218
99	0	37	1.0000	1	-2	1.00000	99	0	38	TRAN 219
99	0	38	1.0000	1	0	1.00000	99	0	39	TRAN 220
99	0	39	1.5000	1	0	1.00000	99	0	40	TRAN 221
99	0	40	1.6000	1	0	1.00000	99	0	41	TRAN 222
99	0	41	2.3000	2	0	1.00000	99	0	42	TRAN 223
99	0	42	66.5000	3	0	0.87000	99	1	43	TRAN 224
99	0	42	66.5000	3	0	0.13000	99	0	43	TRAN 225
99	1	43	6.0000	3	0	1.00000	99	0	43	TRAN 226
99	0	43	2.1000	5	5	1.00000	99	0	44	TRAN 227
99	0	44								TRAN 228
100	0	38	1.0000	1	-2	1.00000	100	0	39	TRAN 229
100	0	39	1.5000	1	0	1.00000	100	0	40	TRAN 230
100	0	40	3.5000	1	0	1.00000	100	0	41	TRAN 231
100	0	41	3.0000	2	0	1.00000	100	0	42	TRAN 232
100	0	42								TRAN 233
100	0	43	16.0000	1	0	1.00000	100	0	44	TRAN 234
100	0	44								TRAN 235
101	0	38	1.0000	1	-2	1.00000	101	0	39	TRAN 236
101	0	39	1.0000	1	0	1.00000	101	0	40	TRAN 237
101	0	40	2.5000	1	0	1.00000	101	0	41	TRAN 238
101	0	41	1.0000	2	0	1.00000	101	0	42	TRAN 239
101	0	42	14.6000	2	0	1.00000	101	0	43	TRAN 240

101	0	43	14.0000	2	0	1.00000	101	0	44	TRAN 241
101	0	44								TRAN 242
102	0	38	1.0000	1	-2	1.00000	102	0	39	TRAN 243
102	0	39	1.0000	1	-2	1.00000	102	0	40	TRAN 244
102	0	40	2.0000	1	0	1.00000	102	0	41	TRAN 245
102	0	41	7.0000	1	0	1.00000	102	0	42	TRAN 246
102	0	42	11.5000	2	0	0.50000	102	1	43	TRAN 247
102	0	42	11.5000	2	0	0.50000	102	0	43	TRAN 248
102	1	43	4.5000	2	0	1.00000	102	0	44	TRAN 249
102	0	43	5.0000	1	0	1.00000	102	0	44	TRAN 250
102	0	44								TRAN 251
103	0	39	1.0000	1	-2	1.00000	103	0	40	TRAN 252
103	0	40	1.5000	1	0	1.00000	103	0	41	TRAN 253
103	0	41	4.0000	1	0	1.00000	103	0	42	TRAN 254
103	0	42	25.0000	1	0	1.00000	103	0	43	TRAN 255
103	0	43	1.2000	2	0	1.00000	103	0	44	TRAN 256
103	0	44	39.7000	4	0	0.99500	103	1	45	TRAN 257
103	0	44	39.7000	4	0	0.00500	103	0	45	TRAN 258
103	1	45	57.0000	2	0	1.00000	103	0	45	TRAN 259
103	0	45								TRAN 260
104	0	39	1.0000	1	-2	1.00000	104	0	40	TRAN 261
104	0	40	1.0000	1	-2	1.00000	104	0	41	TRAN 262
104	0	41	3.0000	1	0	1.00000	104	0	42	TRAN 263
104	0	42	2.5000	2	0	1.00000	104	0	43	TRAN 264
104	0	43	18.0000	2	0	1.00000	104	0	44	TRAN 265
104	0	44								TRAN 266
104	1	45	4.4000	2	0	1.00000	104	0	45	TRAN 267
104	0	45	42.0000	1	0	1.00000	104	0	46	TRAN 268
104	0	46								TRAN 269
105	0	39	1.0000	1	-2	1.00000	105	0	40	TRAN 270
105	0	40	1.0000	1	-2	1.00000	105	0	41	TRAN 271
105	0	41	2.0000	1	0	1.00000	105	0	42	TRAN 272
105	0	42	2.0000	2	0	1.00000	105	0	43	TRAN 273
105	0	43	9.0000	2	0	1.00000	105	0	44	TRAN 274
105	0	44	4.4000	3	0	0.20600	105	1	45	TRAN 275
105	0	44	4.4000	3	0	0.79400	105	0	45	TRAN 276
105	1	45	38.0000	1	0	1.00000	105	0	45	TRAN 277
105	0	45	36.0000	3	0	1.00000	105	0	46	TRAN 278
105	0	46								TRAN 279
106	0	39	1.0000	1	-2	1.00000	106	0	40	TRAN 280
106	0	40	1.0000	1	-2	1.00000	106	0	41	TRAN 281
106	0	41	1.5000	1	0	1.00000	106	0	42	TRAN 282
106	0	42	4.0000	1	0	1.00000	106	0	43	TRAN 283
106	0	43	9.0000	1	0	1.00000	106	0	44	TRAN 284
106	0	44	1.0000	5	0	1.00000	106	0	45	TRAN 285
106	1	45	2.2000	3	0	1.00000	106	0	46	TRAN 286
106	0	45	30.0000	1	0	1.00000	106	0	46	TRAN 287
106	0	46								TRAN 288
107	0	40	1.0000	1	-2	1.00000	107	0	41	TRAN 289
107	0	41	1.0000	1	0	1.00000	107	0	42	TRAN 290
107	0	42	2.5000	1	0	1.00000	107	0	43	TRAN 291
107	0	43	1.0000	2	0	1.00000	107	0	44	TRAN 292
107	0	44	4.6000	2	0	0.50000	107	1	45	TRAN 293
107	0	44	4.6000	2	0	0.50000	107	0	45	TRAN 294
107	1	45	45.0000	1	0	1.00000	107	0	45	TRAN 295
107	0	45	22.0000	2	0	.00000	107	0	46	TRAN 296
107	0	46	7.0000	5	6	1.00000	107	0	47	TRAN 297
107	0	47								TRAN 298
108	0	40	1.0000	1	-2	1.00000	108	0	41	TRAN 299
108	0	41	1.0000	1	-2	1.00000	108	0	42	TRAN 300

108	0	42	2.0000	1	0	1.00000	108	0	43	TRAN	301
108	0	43	1.0000	2	0	1.00000	108	0	44	TRAN	302
108	0	44	4.3000	2	0	1.00000	108	0	45	TRAN	303
108	0	45	18.0000	1	0	1.00000	108	0	46	TRAN	304
108	0	46								TRAN	305
109	0	40	1.0000	1	-2	1.00000	109	0	41	TRAN	306
109	0	41	1.0000	1	-2	1.00000	109	0	42	TRAN	307
109	0	42	1.5000	1	0	1.00000	109	0	43	TRAN	308
109	0	43	2.5000	1	0	1.00000	109	0	44	TRAN	309
109	0	44	16.0000	1	0	0.50000	109	1	45	TRAN	310
109	0	44	16.0000	1	0	0.50000	109	0	45	TRAN	311
109	1	45	50.0000	1	0	1.00000	109	0	45	TRAN	312
109	0	45	30.0000	1	0	0.50000	109	1	46	TRAN	313
109	0	45	30.0000	1	0	0.50000	109	0	46	TRAN	314
109	1	46	4.7000	2	0	1.00000	109	0	46	TRAN	315
109	0	46	14.0000	3	0	1.00000	109	1	47	TRAN	316
109	1	47	39.0000	1	0	1.00000	109	0	47	TRAN	317
109	0	47								TRAN	318
110	0	41	1.0000	1	-2	1.00000	110	0	42	TRAN	319
110	0	42	1.0000	1	0	1.00000	110	0	43	TRAN	320
110	0	43	2.0000	1	0	1.00000	110	0	44	TRAN	321
110	0	44	10.0000	1	0	1.00000	110	0	45	TRAN	322
110	0	45	5.0000	1	0	1.00000	110	0	46	TRAN	323
110	0	46								TRAN	324
111	0	41	1.0000	1	-2	1.00000	111	0	42	TRAN	325
111	0	42	1.0000	1	-2	1.00000	111	0	43	TRAN	326
112	0	42	1.0000	1	-2	1.00000	112	0	43	TRAN	327
111	0	43	1.5000	1	0	1.00000	111	0	44	TRAN	328
111	0	44	4.0000	1	0	1.00000	111	0	45	TRAN	329
111	0	45	12.0000	1	0	0.01000	111	1	46	TRAN	330
111	0	45	12.0000	1	0	0.99000	111	0	46	TRAN	331
111	1	46	5.5000	3	0	0.68000	111	0	46	TRAN	332
111	1	46	5.5000	3	0	0.32000	111	1	47	TRAN	333
111	0	46	23.0000	2	0	0.50000	111	1	47	TRAN	334
111	0	46	23.0000	2	0	0.50000	111	0	47	TRAN	335
111	1	47	74.0000	1	0	1.00000	111	0	47	TRAN	336
111	0	47	7.6000	4	0	1.00000	111	0	48	TRAN	337
111	0	48								TRAN	338
112	0	43	1.5000	1	0	1.00000	112	0	44	TRAN	339
112	0	44	3.0000	1	0	1.00000	112	0	45	TRAN	340
112	0	45	7.0000	1	0	1.00000	112	0	46	TRAN	341
112	0	46	21.0000	3	0	1.00000	112	0	47	TRAN	342
112	0	47	3.2000	3	0	1.00000	112	0	48	TRAN	343
112	0	48								TRAN	344
113	0	42	1.0000	1	-2	1.00000	113	0	43	TRAN	345
113	0	43	1.0000	1	-2	1.00000	113	0	44	TRAN	346
113	0	44	2.0000	1	0	1.00000	113	0	45	TRAN	347
113	0	45	4.0000	1	0	1.00000	113	0	46	TRAN	348
113	0	46	1.4000	2	0	1.00000	113	1	47	TRAN	349
113	1	47	1.2000	2	0	0.90000	113	0	47	TRAN	350
113	1	47	1.2000	2	0	0.10000	113	0	48	TRAN	351
113	0	47	5.3000	3	0	1.00000	113	0	48	TRAN	352
113	0	48								TRAN	353
114	0	42	1.0000	1	-2	1.00000	114	0	43	TRAN	354
114	0	43	1.0000	1	-2	1.00000	114	0	44	TRAN	355
114	0	44	1.5000	1	0	1.00000	114	0	45	TRAN	356
114	0	45	3.0000	1	0	1.00000	114	0	46	TRAN	357
114	0	46	2.4000	2	0	1.00000	114	0	47	TRAN	358
114	0	47	5.0000	1	0	1.00000	114	0	48	TRAN	359
114	0	48								TRAN	360

115	0	43	1.0000	1	-2	1.00000	115	0	44	TRAN	361
115	0	44	1.0000	1	0	1.00000	115	0	45	TRAN	362
115	0	45	2.5000	1	0	1.00000	115	0	46	TRAN	363
115	0	46	45.0000	1	0	0.50000	115	1	47	TRAN	364
115	0	46	45.0000	1	0	0.50000	115	0	47	TRAN	365
115	1	47	20.0000	1	0	0.72000	115	0	47	TRAN	366
115	1	47	20.0000	1	0	0.14000	115	1	48	TRAN	367
115	1	47	20.0000	1	0	0.14000	115	0	48	TRAN	368
115	0	47	21.0000	2	0	0.09000	115	1	48	TRAN	369
115	0	47	21.0000	2	0	0.91000	115	0	48	TRAN	370
115	1	48	43.0000	4	0	1.00000	115	0	49	TRAN	371
115	0	48	53.0000	3	0	1.00000	115	1	49	TRAN	372
115	1	49	4.5100	3	0	0.95000	115	0	49	TRAN	373
115	1	49	4.5100	3	0	0.05000	115	0	50	TRAN	374
115	0	49	6.0000	5	14	1.00000	115	0	50	TRAN	375
115	0	50								TRAN	376
116	0	43	1.0000	1	-2	1.00000	116	0	44	TRAN	377
116	0	44	1.0000	1	-2	1.00000	116	0	45	TRAN	378
116	0	45	2.0000	1	0	1.00000	116	0	46	TRAN	379
116	0	46	10.0000	1	0	1.00000	116	0	47	TRAN	380
116	0	47	2.5000	2	0	1.00000	116	0	48	TRAN	381
116	0	48								TRAN	382
117	0	43	1.0000	1	-2	1.00000	117	0	44	TRAN	383
117	0	44	1.0000	1	-2	1.00000	117	0	45	TRAN	384
117	0	45	1.5000	1	0	1.00000	117	0	46	TRAN	385
117	0	46	5.0000	1	0	1.00000	117	0	47	TRAN	386
117	0	47	1.1000	2	0	0.50000	117	1	48	TRAN	387
117	0	47	1.1000	2	0	0.50000	117	0	48	TRAN	388
117	1	48	3.0000	3	0	0.60000	117	0	48	TRAN	389
117	1	48	3.0000	3	0	0.10000	117	1	49	TRAN	390
117	1	48	3.0000	3	0	0.30000	117	0	49	TRAN	391
117	0	48	50.0000	2	0	1.00000	117	1	49	TRAN	392
117	1	49	2.0000	3	0	0.21900	117	0	49	TRAN	393
117	1	49	2.0000	3	0	0.78000	117	0	50	TRAN	394
117	1	49	2.0000	3	0	0.00100	117	1	50	TRAN	395
117	0	49	45.0000	2	0	1.00000	117	0	50	TRAN	396
117	1	50	14.0000	4	0	1.00000	117	0	50	TRAN	397
117	0	50								TRAN	398
118	0	44	1.0000	1	-2	1.00000	118	0	45	TRAN	399
118	0	45	1.5000	1	0	1.00000	118	0	46	TRAN	400
118	0	46	4.5000	1	0	1.00000	118	0	47	TRAN	401
118	0	47	25.0000	1	0	1.00000	118	0	48	TRAN	402
118	0	48	50.0000	2	0	1.00000	118	0	49	TRAN	403
118	1	49	4.5000	2	0	1.00000	118	0	50	TRAN	404
118	0	49	5.0000	1	0	1.00000	118	0	50	TRAN	405
118	0	50								TRAN	406
119	0	44	1.0000	1	-2	1.00000	119	0	45	TRAN	407
119	0	45	1.5000	1	0	1.00000	119	0	46	TRAN	408
119	0	46	3.0000	1	0	1.00000	119	0	47	TRAN	409
119	0	47	17.0000	1	0	0.50000	119	1	48	TRAN	410
119	0	47	17.0000	1	0	0.50000	119	0	48	TRAN	411
119	1	48	2.7000	2	0	1.00000	119	1	49	TRAN	412
119	0	48	9.5000	2	0	1.00000	119	1	49	TRAN	413
119	1	49	18.0000	2	0	0.05000	119	0	49	TRAN	414
119	1	49	18.0000	2	0	0.50000	119	1	50	TRAN	415
119	1	49	18.0000	2	0	0.45000	119	0	50	TRAN	416
119	0	49	2.0000	2	0	1.00000	119	1	50	TRAN	417
119	1	50	245.0000	4	0	1.00000	119	0	50	TRAN	418
119	0	50								TRAN	419
120	0	45	1.0000	1	-2	1.00000	120	0	46	TRAN	420

120	0	46	2.0000	1	0	1.00000	120	0 47	TRAN 421
120	0	47	6.0000	1	0	1.00000	120	0 48	TRAN 422
120	0	48	12.0000	2	0	1.00000	120	0 49	TRAN 423
120	0	49	50.0000	1	0	1.00000	120	0 50	TRAN 424
120	0	50							TRAN 425
121	0	45	1.0000	1	-2	1.00000	121	0 46	TRAN 426
121	0	46	1.5000	1	0	1.00000	121	0 47	TRAN 427
121	0	47	4.0000	1	0	1.00000	121	0 48	TRAN 428
121	0	48	10.0000	1	0	0.50000	121	1 49	TRAN 429
121	0	48	10.0000	1	0	0.50000	121	0 49	TRAN 430
121	1	49	3.1000	2	0	1.00000	121	0 50	TRAN 431
121	0	49	30.0000	1	0	1.00000	121	0 50	TRAN 432
121	1	50	25.0000	5	0	1.00000	121	0 51	TRAN 433
121	0	50	27.0000	3	0	1.00000	121	0 51	TRAN 434
121	0	51							TRAN 435
122	0	46	1.5000	1	0	1.00000	122	0 47	TRAN 436
122	0	47	3.0000	1	0	1.00000	122	0 48	TRAN 437
122	0	48	40.0000	1	0	1.00000	122	0 49	TRAN 438
122	0	49	45.0000	1	0	1.00000	122	0 50	TRAN 439
122	0	50							TRAN 440
122	0	51	2.8000	4	0	0.03000	122	0 50	TRAN 441
122	1	51	4.1500	2	0	1.00000	122	0 51	TRAN 442
122	0	51	2.8000	4	0	0.97000	122	0 52	TRAN 443
122	0	52							TRAN 444
123	0	46	1.0000	1	-2	1.00000	123	0 47	TRAN 445
123	0	47	2.5000	1	0	1.00000	123	0 48	TRAN 446
123	0	48	9.0000	1	0	0.50000	123	1 49	TRAN 447
123	0	48	9.0000	1	0	0.50000	123	0 49	TRAN 448
123	1	49	36.0000	1	0	1.00000	123	0 50	TRAN 449
123	0	49	10.0000	1	0	1.00000	123	0 50	TRAN 450
123	1	50	125.0000	4	0	1.00000	123	0 51	TRAN 451
123	0	50	41.0000	2	0	1.00000	123	0 51	TRAN 452
123	0	51							TRAN 453
124	0	46	1.0000	1	-2	1.00000	124	0 47	TRAN 454
124	0	47	2.0000	1	0	1.00000	124	0 48	TRAN 455
124	0	48	10.0000	1	0	1.00000	124	0 49	TRAN 456
124	0	49	20.0000	1	0	1.00000	124	0 50	TRAN 457
124	0	50							TRAN 458
124	2	51	21.0000	2	0	1.00000	124	0 52	TRAN 459
124	1	51	1.3000	2	0	1.00000	124	0 52	TRAN 460
124	0	51	60.0000	4	0	1.00000	124	0 52	TRAN 461
124	0	52							TRAN 462
125	0	47	2.0000	1	0	1.00000	125	0 48	TRAN 463
125	0	48	5.0000	1	0	1.00000	125	0 49	TRAN 464
125	0	49	15.0000	1	0	0.50000	125	1 50	TRAN 465
125	0	49	15.0000	1	0	0.50000	125	0 50	TRAN 466
125	1	50	9.7000	2	0	1.00000	125	0 51	TRAN 467
125	0	50	9.4000	4	0	1.00000	125	0 51	TRAN 468
125	0	51	2.7000	5	0	0.21500	125	1 52	TRAN 469
125	0	51	2.7000	5	0	0.78500	125	0 52	TRAN 470
125	1	52	58.0000	4	0	1.00000	125	0 52	TRAN 471
125	0	52							TRAN 472
126	0	47	1.0000	1	-2	1.00000	126	0 48	TRAN 473
126	0	48	3.0000	1	0	1.00000	126	0 49	TRAN 474
126	0	49	7.0000	1	0	1.00000	126	0 50	TRAN 475
126	0	50	2.0000	5	5	1.00000	126	1 51	TRAN 476
126	1	51	19.0000	2	0	0.99000	126	0 51	TRAN 477
126	1	51	19.0000	2	0	0.01000	126	0 52	TRAN 478
126	0	51	12.5000	4	0	1.00000	126	0 52	TRAN 479
127	0	47	1.0000	1	-2	1.00000	127	0 48	TRAN 480

127	0	48	1.5000	1	0	1.00000	127	0	49	TRAN 481
127	0	49	3.0000	1	0	0.50000	127	1	50	TRAN 482
127	0	49	3.0000	1	0	0.50000	127	0	50	TRAN 483
126	0	52								TRAN 484
127	1	50	4.2000	2	0	1.00000	127	0	51	TRAN 485
127	0	50	2.2500	3	0	1.00000	127	0	51	TRAN 486
127	0	51	93.4000	3	0	0.22000	127	1	52	TRAN 487
127	0	51	93.4000	3	0	0.78000	127	0	52	TRAN 488
127	1	52	105.0000	4	0	0.98000	127	0	52	TRAN 489
127	1	52	105.0000	4	0	0.02000	127	0	53	TRAN 490
127	0	52	9.3000	3	0	1.00000	127	0	53	TRAN 491
127	0	53								TRAN 492
128	0	48	1.0000	1	0	1.00000	128	0	49	TRAN 493
128	0	49	2.0000	1	0	1.00000	128	0	50	TRAN 494
128	0	50	57.0000	2	0	0.97000	128	1	51	TRAN 495
128	0	50	57.0000	2	0	0.03000	128	0	51	TRAN 496
128	1	51	11.0000	2	0	1.00000	128	0	52	TRAN 497
128	0	51	8.6000	3	0	1.00000	128	0	52	TRAN 498
128	0	52								TRAN 499
128	0	53	25.0000	2	0	0.06500	128	0	52	TRAN 500
128	0	53	25.0000	2	0	0.93500	128	0	54	TRAN 501
128	0	54								TRAN 502
129	0	48	1.0000	1	-2	1.00000	129	0	49	TRAN 503
129	0	49	1.5000	1	0	1.00000	129	0	50	TRAN 504
129	0	50	1.8000	3	0	1.00000	129	0	51	TRAN 505
129	0	51	4.6000	3	0	0.17300	129	1	52	TRAN 506
129	0	51	4.6000	3	0	0.82700	129	0	52	TRAN 507
129	1	52	41.0000	4	0	0.68000	129	0	52	TRAN 508
129	0	52	72.0000	2	0	1.00000	129	0	53	TRAN 509
129	1	52	41.0000	4	0	0.32000	129	0	53	TRAN 510
129	0	53	1.6000	5	7	1.00000	129	0	54	TRAN 511
129	1	54	8.0000	4	0	1.00000	129	0	54	TRAN 512
129	0	54								TRAN 513
130	0	48	1.0000	1	-2	1.00000	130	0	49	TRAN 514
130	0	49	1.5000	1	0	1.00000	130	0	50	TRAN 515
130	0	50	2.6000	2	0	0.90000	130	1	51	TRAN 516
130	0	50	2.6000	2	0	0.10000	130	0	51	TRAN 517
130	1	51	6.0000	2	0	1.00000	130	0	52	TRAN 518
130	0	51	37.0000	2	0	1.00000	130	0	52	TRAN 519
130	0	52								TRAN 520
130	0	53	12.5000	3	0	1.00000	130	0	54	TRAN 521
130	0	54								TRAN 522
131	0	48	1.0000	1	-2	1.00000	131	0	49	TRAN 523
131	0	49	1.0000	1	0	1.00000	131	0	50	TRAN 524
131	0	50	66.0000	1	0	1.00000	131	0	51	TRAN 525
131	0	51	19.4000	2	0	0.15000	131	1	52	TRAN 526
131	0	51	19.4000	2	0	0.85000	131	0	52	TRAN 527
131	1	52	30.0000	3	0	0.20000	131	0	52	TRAN 528
131	1	52	30.0000	3	0	0.80000	131	0	53	TRAN 529
131	0	52	24.0000	2	0	1.00000	131	0	53	TRAN 530
131	0	53	8.0500	4	0	0.00800	131	1	54	TRAN 531
131	0	53	8.0500	4	0	0.99200	131	0	54	TRAN 532
131	1	54	12.0000	4	0	1.00000	131	0	54	TRAN 533
131	0	54								TRAN 534
132	0	48	1.0000	1	-2	1.00000	132	0	49	TRAN 535
132	0	49	1.0000	1	-2	1.00000	132	0	50	TRAN 536
132	0	50	50.0000	1	0	1.00000	132	0	51	TRAN 537
132	0	51	3.1300	2	0	1.00000	132	0	52	TRAN 538
132	0	52	78.0000	3	0	1.00000	132	0	53	TRAN 539
132	0	53	2.3000	3	0	1.00000	132	0	54	TRAN 540

132	0	54							TRAN 541
133	0	49	1.0000	1	-2	1.00000	133	0 50	TRAN 542
133	0	50	39.0000	1	0	1.00000	133	0 51	TRAN 543
133	0	51	2.6400	2	0	0.72000	133	1 52	TRAN 544
133	0	51	2.6400	2	0	0.28000	133	0 52	TRAN 545
133	1	52	50.0000	2	0	0.13000	133	0 52	TRAN 546
133	1	52	50.0000	2	0	0.87000	133	0 53	TRAN 547
133	0	52	12.5000	2	0	1.00000	133	0 53	TRAN 548
133	0	53	20.8000	3	0	0.02400	133	1 54	TRAN 549
133	0	53	20.8000	3	0	0.97600	133	0 54	TRAN 550
133	1	54	2.3000	4	0	1.00000	133	0 54	TRAN 551
133	0	54	5.2700	4	0	1.00000	133	0 55	TRAN 552
133	0	55							TRAN 553
134	0	49	1.0000	1	-2	1.00000	134	0 50	TRAN 554
134	0	50	1.0000	1	-2	1.00000	134	0 51	TRAN 555
134	0	51	1.5000	1	0	1.00000	134	0 52	TRAN 556
134	0	52	42.0000	2	0	1.00000	134	0 53	TRAN 557
134	0	53	53.0000	2	0	1.00000	134	0 54	TRAN 558
134	0	54							TRAN 559
134	1	55	2.9000	3	0	1.00000	134	0 55	TRAN 560
134	0	55	2.2000	5	0	1.00000	134	0 56	TRAN 561
134	0	56							TRAN 562
135	0	50	1.0000	1	-2	1.00000	135	0 51	TRAN 563
135	0	51	1.9000	1	0	1.00000	135	0 52	TRAN 564
135	0	52	1.4000	2	0	1.00000	135	0 53	TRAN 565
135	0	53	6.7000	3	0	0.30000	135	1 54	TRAN 566
135	0	53	6.7000	3	0	0.70000	135	0 54	TRAN 567
135	1	54	15.3000	2	0	1.00000	135	0 54	TRAN 568
135	0	54	9.2000	3	0	1.00000	135	0 55	TRAN 569
135	0	55	2.0000	5	6	1.00000	135	0 56	TRAN 570
135	0	56							TRAN 571
136	0	51	3.0000	1	0	1.00000	136	0 52	TRAN 572
136	0	52	6.0000	1	0	1.00000	136	0 53	TRAN 573
136	0	53	83.0000	1	0	1.00000	136	0 54	TRAN 574
136	0	54							TRAN 575
136	0	55	13.0000	4	0	1.00000	136	0 56	TRAN 576
136	0	56							TRAN 577
137	0	51	1.0000	1	-2	1.00000	137	0 52	TRAN 578
137	0	52	3.0000	1	0	1.00000	137	0 53	TRAN 579
137	0	53	24.4000	1	0	0.04000	136	0 54	TRAN 580
137	0	53	24.4000	1	0	0.96000	137	0 54	TRAN 581
137	0	54	3.9000	2	0	1.00000	137	0 55	TRAN 582
137	0	55	29.2000	5	0	0.92000	137	1 56	TRAN 583
137	0	55	29.2000	5	0	0.08000	137	0 56	TRAN 584
137	1	56	2.6000	2	0	1.00000	137	0 56	TRAN 585
137	0	56							TRAN 586
138	0	51	1.0000	1	-2	1.00000	138	0 52	TRAN 587
138	0	52	2.0000	1	0	1.00000	138	0 53	TRAN 588
138	0	53	6.3000	1	0	0.03000	137	0 54	TRAN 589
138	0	53	6.3000	1	0	0.97000	138	0 54	TRAN 590
138	0	54	14.0000	2	0	1.00000	138	0 55	TRAN 591
138	0	55	32.2000	2	0	1.00000	138	0 56	TRAN 592
138	0	56							TRAN 593
138	0	57	1.1000	5	11	1.00000	138	0 58	TRAN 594
138	0	58							TRAN 595
139	0	52	1.0000	1	-2	1.00000	139	0 53	TRAN 596
139	0	53	2.0000	1	0	0.04000	138	0 54	TRAN 597
139	0	53	2.0000	1	0	0.96000	139	0 54	TRAN 598
139	0	54	41.0000	1	0	1.00000	139	0 55	TRAN 599
139	0	55	9.5000	2	0	1.00000	139	0 56	TRAN 600

139	0	56	85.0000	2	0	1.00000	139	0	57	TRAN	601
139	0	57								TRAN	602
140	0	52	1.0000	1	-2	1.00000	140	0	53	TRAN	603
140	0	53	1.5000	1	0	1.00000	140	0	54	TRAN	604
140	0	54	16.0000	1	0	1.00000	140	0	55	TRAN	605
140	0	55	66.0000	1	0	1.00000	140	0	56	TRAN	606
140	0	56	12.0000	4	0	1.00000	140	0	57	TRAN	607
140	0	57	40.2000	3	0	1.00000	140	0	58	TRAN	608
140	0	58								TRAN	609
141	0	53	1.0000	1	-2	1.00000	141	0	54	TRAN	610
141	0	54	1.7000	1	0	1.00000	141	0	55	TRAN	611
141	0	55	25.0000	1	0	1.00000	141	0	56	TRAN	612
141	0	56	18.0000	2	0	1.00000	141	0	57	TRAN	613
141	0	57	3.8000	3	0	1.00000	141	0	58	TRAN	614
141	0	58	33.0000	4	0	1.00000	141	0	59	TRAN	615
141	0	59								TRAN	616
142	0	53	1.0000	1	-2	1.00000	142	0	54	TRAN	617
142	0	54	1.5000	1	0	1.00000	142	0	55	TRAN	618
142	0	55	8.0000	1	0	1.00000	142	0	56	TRAN	619
142	0	56	10.0000	2	0	1.00000	142	0	57	TRAN	620
142	0	57	1.4000	3	0	1.00000	142	0	58	TRAN	621
142	0	58								TRAN	622
143	0	53	1.0000	1	-2	1.00000	143	0	54	TRAN	623
143	0	54	1.0000	1	0	1.00000	143	0	55	TRAN	624
143	0	55	2.0000	1	0	1.00000	143	0	56	TRAN	625
143	0	56	13.0000	1	0	1.00000	143	0	57	TRAN	626
143	0	57	18.0000	2	0	1.00000	143	0	58	TRAN	627
143	0	58	33.0000	3	0	1.00000	143	0	59	TRAN	628
143	0	59	13.8000	4	0	1.00000	143	0	60	TRAN	629
143	0	60								TRAN	630
144	0	54	1.0000	1	-2	1.00000	144	0	55	TRAN	631
144	0	55	1.5000	1	0	1.00000	144	0	56	TRAN	632
144	0	56	3.5000	1	0	1.00000	144	0	57	TRAN	633
144	0	57	15.0000	1	0	1.00000	144	0	58	TRAN	634
144	0	58	285.0000	4	0	1.00000	144	0	59	TRAN	635
144	0	59	17.3000	2	0	1.00000	144	0	60	TRAN	636
144	0	60								TRAN	637
145	0	54	1.0000	1	-2	1.00000	145	0	55	TRAN	638
145	0	55	1.0000	1	0	1.00000	145	0	56	TRAN	639
145	0	56	2.0000	1	0	1.00000	145	0	57	TRAN	640
145	0	57	9.0000	1	0	1.00000	145	0	58	TRAN	641
145	0	58	3.0000	2	0	1.00000	145	0	59	TRAN	642
145	0	59	5.9800	3	0	1.00000	145	0	60	TRAN	643
145	0	60								TRAN	644
146	0	54	1.0000	1	-2	1.00000	146	0	55	TRAN	645
146	0	55	1.0000	1	-2	1.00000	146	0	56	TRAN	646
146	0	56	1.5000	1	0	1.00000	146	0	57	TRAN	647
146	0	57	4.0000	1	0	1.00000	146	0	58	TRAN	648
146	0	58	13.9000	2	0	1.00000	146	0	59	TRAN	649
146	0	59	24.4000	2	0	1.00000	146	0	60	TRAN	650
146	0	60								TRAN	651
147	0	55	1.0000	1	-2	1.00000	147	0	56	TRAN	652
147	0	56	1.0000	1	0	1.00000	147	0	57	TRAN	653
147	0	57	2.0000	1	0	1.00000	147	0	58	TRAN	654
147	0	58	1.2000	2	0	1.00000	147	0	59	TRAN	655
147	0	59	12.0000	2	0	1.00000	147	0	60	TRAN	656
147	0	60	11.1000	4	0	1.00000	147	0	61	TRAN	657
147	0	61	2.6000	5	0	1.00000	147	0	62	TRAN	658
147	0	62								TRAN	659
148	0	55	1.0000	1	-2	1.00000	148	0	56	TRAN	660

148	0	56	1.0000	1	0	1.00000	148	0	57	TRAN	661
148	0	57	2.0000	1	0	1.00000	148	0	58	TRAN	662
148	0	58	40.0000	1	0	1.00000	148	0	59	TRAN	663
148	0	59	1.9500	2	0	1.00000	148	0	60	TRAN	664
148	0	60								TRAN	665
148	0	61	5.4000	4	0	1.00000	148	0	62	TRAN	666
148	0	62								TRAN	667
149	0	56	1.0000	1	-2	1.00000	149	0	57	TRAN	668
149	0	57	1.5000	1	0	1.00000	149	0	58	TRAN	669
149	0	58	3.5000	1	0	1.00000	149	0	59	TRAN	670
149	0	59	30.0000	1	0	1.00000	149	0	60	TRAN	671
149	0	60	2.0000	3	0	1.00000	149	0	61	TRAN	672
149	0	61	53.1000	3	0	1.00000	149	0	62	TRAN	673
149	0	62								TRAN	674
150	0	56	1.0000	1	-2	1.00000	150	0	57	TRAN	675
150	0	57	1.5000	1	0	1.00000	150	0	58	TRAN	676
150	0	58	2.5000	1	0	1.00000	150	0	59	TRAN	677
150	0	59	15.0000	1	0	1.00000	150	0	60	TRAN	678
150	0	60								TRAN	679
150	0	61	2.7000	3	0	1.00000	150	0	62	TRAN	680
150	0	62								TRAN	681
151	0	57	1.0000	1	0	1.00000	151	0	58	TRAN	682
151	0	58	2.0000	1	0	1.00000	151	0	59	TRAN	683
151	0	59	7.0000	1	0	1.00000	151	0	60	TRAN	684
151	0	60	13.0000	2	0	1.00000	151	0	61	TRAN	685
151	0	61	28.4000	3	0	1.00000	151	0	62	TRAN	686
151	0	62	80.0000	5	0	1.00000	151	0	63	TRAN	687
151	0	63								TRAN	688
152	0	57	1.0000	1	-2	1.00000	152	0	58	TRAN	689
152	0	58	1.5000	1	0	1.00000	152	0	59	TRAN	690
152	0	59	5.0000	1	0	1.00000	152	0	60	TRAN	691
152	0	60	3.0000	2	0	1.00000	152	0	61	TRAN	692
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152	0	62								TRAN	694
152	1	63	9.3000	3	0	0.25000	152	0	62	TRAN	695
152	0	63	13.0000	5	0	0.73000	152	0	62	TRAN	696
152	1	63	9.3000	3	0	0.75000	152	0	64	TRAN	697
152	0	63	13.0000	5	0	0.27000	152	0	64	TRAN	698
152	0	64								TRAN	699
153	0	57	1.0000	1	-2	1.00000	153	0	58	TRAN	700
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153	0	59	3.0000	1	0	1.00000	153	0	60	TRAN	702
153	0	60	10.0000	1	0	1.00000	153	0	61	TRAN	703
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153	0	62	47.0000	3	0	1.00000	153	0	63	TRAN	705
153	0	63								TRAN	706
154	0	58	1.0000	1	0	1.00000	154	0	59	TRAN	707
154	0	59	2.0000	1	0	1.00000	154	0	60	TRAN	708
154	0	60	12.0000	1	0	1.00000	154	0	61	TRAN	709
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154	0	62								TRAN	711
154	0	63	16.0000	5	0	1.00000	154	0	64	TRAN	712
154	0	64								TRAN	713
155	0	58	1.0000	1	-2	1.00000	155	0	59	TRAN	714
155	0	59	2.0000	1	0	1.00000	155	0	60	TRAN	715
155	0	60	5.0000	1	0	1.00000	155	0	61	TRAN	716
155	0	61	60.0000	1	0	1.00000	155	0	62	TRAN	717
155	0	62	24.0000	2	0	1.00000	155	0	63	TRAN	718
155	0	63	1.7000	5	0	1.00000	155	0	64	TRAN	719
155	0	64								TRAN	720

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156  0 64                                                   TRAN 726
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157  0 64                                                   TRAN 732
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159  0 65                                                   TRAN 744
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160  0 64                                                   TRAN 749
160  0 65         73.0000   4  0   1.00000      160  0 66   TRAN 750
160  0 66                                                   TRAN 751
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161  0 66                                                   TRAN 758
                                                            TRAN 759
U235THU235HEU233THU233HEP239THP239HE                        FY     1
 110  46          - .230   - 1.38    -2.298    -          - .826    - 1FY    2
  72  27 1:       -4       - 1.      -4        - 5.       -4        - 1FY    3
  72  28 4:       -4       - 1.9     -3        - 3.4      -3        - 1FY    4
  72  29 6:       -4       - 4.6     -3        - 5.5      -3        - 1FY    5
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  72  31 5:       -5       - 4.0     -4        - 2.       -4        - 1FY    7
  73  27 1:       -4       -         -         - 1.       -4        - 1FY    8
  73  28 2:3      -3       - 3.37    -3        - 4.1      -3        - 1FY    9
  73  29 5:2      -3       - 1.32    -2        - 1.14     -2        - 1FY   10
  73  30 2:9      -3       - 1.32    -2        - 8.5      -3        - 1FY   11
  73  31 4:0      -4       - 3.37    -3        - 1.4      -3        - 1FY   12
 073 032A          -        -         -         -          -         - 1FY   13
 073 032           -        -         -         -          -         - 1FY   14
  74  27           -        -         -         -          -         - 1FY   15
  74  26 3:9      -3.147   - 4.04    -3        - 5.1      -3        - 1FY   16
  74  29 1:42     -2.877   - 2.63    -2        - 2.32     -2        - 1FY   17
  74  30 1:32     -21.26   - 4.17    -2        - 2.65     -2        - 1FY   18
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  74  32          - 6.7    -38.09    -4        - 1.0      -4        - 1FY   20
  75  27           -        -         -         -          -         - 1FY   21
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76	29	6:02	-2.577	- 5.01	-2	- 3.79	-2	- 1FY	29
76	30	.16	- 2.47	- .244	-	- .131	-	- 1FY	30
76	31	.110	- 2.62	- .294	-	- .115	-	- 1FY	31
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76	33		-	- 1.21	-3	-	-	- 1FY	33
77	28		-	-	-	-	-	- 1FY	34
77	29	6:75	-2.300	- 5.15	-2	- 3.02	-2	- 1FY	35
77	30	.308	- 2.33	- .498	-	- .171	-	- 1FY	36
77	31	.348	- 4.15	- .987	-	- .237	-	- 1FY	37
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77	33	1:1	-3.115	- 5.15	-2	- 2.16	-3	- 1FY	40
78	28		-	-	-	-	-	- 1FY	41
78	29	5:15	-23.28	-26.3	-3	- 1.01	-2	- 1FY	42
78	30	.485	- 1.72	- .588	-	- .227	-	- 1FY	43
78	31	.953	- 5.15	- 2.03	-	- .545	-	- 1FY	44
78	32	.473	- 3.93	- 1.79	-	- .347	-	- 1FY	45
078	033A	.0233	- .3678	- .1957	-	- .0255	-	- 1FY	46
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79	29		-	-	-	-	-	- 1FY	48
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79	31	2:39	- 6.04	- 3.39	-	- .987	-	- 1FY	50
79	32	2:02	- 7.68	- 5.05	-	- .987	-	- 1FY	51
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80	29		-	-	-	-	-	- 1FY	55
80	30	.569	- .355	- .302	- 1.00	- .179	- .620	- 1FY	56
80	31	3:11	- 4.44	- 4.52	- 16.9	- 1.33	- 1.84	- 1FY	57
80	32	4:21	- 9.45	- 10.9	- 38.2	- 2.27	- 4.78	- 1FY	58
80	33	1:49	- 5.12	- 6.90	- 22.4	- 1.00	- 3.21	- 1FY	59
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81	32	6:61	- 10.9	- 17.0	- 31.6	- 4.35	- 5.92	- 1FY	64
81	33	3:90	- 10.1	- 18.3	- 50.1	- 3.12	- 6.72	- 1FY	65
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81	35		-	-	- .926	-	- 2.07	-2 1FY	68
82	30	1:01	-2	-	-	-	-	- 1FY	69
82	31	3:90	- 1.70	- 2.30	- .397	- 1.09	- .549	- 1FY	70
82	32	11.0	- 11.6	- 18.9	- 20.8	- 5.67	- 5.31	- 1FY	71
82	33	7:89	- 18.6	- 34.9	- 62.4	- 7.34	- 10.6	- 1FY	72
82	34	1:39	- 7.73	- 16.5	- 48.2	- 2.45	- 5.31	- 1FY	73
82	35		- .364	- 1.31	- 9.21	- 4.68	-2.549	- 1FY	74
83	30		-	-	-	-	-	- 1FY	75
83	31	4:43	- .339	- .152	-	- .261	-	- 1FY	76
83	32	20.2	- 17.5	- 16.3	- 11.5	- 5.59	- 3.50	- 1FY	77
83	33	22.9	- 51.4	- 49.1	- 59.8	- 13.5	- 13.2	- 1FY	78
083	34A	2:8650	- 16.3770	- 28.3532	- 34.0742	- 3.1407	- 4.5883	- 1FY	79
083	034	3.7977	- 21.7090	- 26.9799	- 45.1682	- 5.3477	- 7.8126	- 1FY	80
83	35	7:13	-27.37	- 9.48	- 25.8	- 1.27	- 2.83	- 1FY	81

083	36A		-	-	- .2519	-	-	-	[illegible]		82
083	36		-	-	- .2519	-	-	-	1FY		83
84	31	2:48	-	-	-	-	-	-	1FY		84
84	32	24.0	- 9.91	- 9.79	- 1.86	- 4.17	- .168	-	1FY		85
84	33	47.5	- 53.6	- 59.7	- 41.7	- 18.1	- 12.6	-	1FY		86
84	34	24.0	- 70.4	- 89.0	- 101.	- 19.5	- 21.4	-	1FY		87
84	35	2:48	- 24.0	- 54.3	- 63.7	- 5.16	- 9.44	-	1FY		88
84	36		- .496	- 1.15	- 9.44	-	- .562	-	1FY		89
85	31		-	-	-	-	-	-	1FY		90
85	32	5:69	- 1.48	- 1.03	-	- 1.34	- 1.19	-2	1FY		91
85	33	38.3	- 38.2	- 40.2	- 21.1	- 13.0	- 8.62	-	1FY		92
85	34	60.9	- 97.5	- 113.	- 96.6	- 25.6	- 27.9	-	1FY		93
85	35	25.0	- 63.6	- 81.1	- 110.	- 13.0	- 23.0	-	1FY		94
085	36A	.5552	- 4.9299	- 7.1550	- 16.3297	- .6668	- 3.0647	-	1FY		95
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85	37		-	-	- .340	-	-	-	1FY		97
86	32	.852	-	-	-	- .215	-	-	1FY		98
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86	34	91.3	- 96.8	- 117.	- 80.2	- 33.7	- 31.1	-	1FY		100
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086	37A		-	- .3132	- 4.2437	-	- .1301	-	1FY		103
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87	32		-	-	-	-	-	-	1FY		105
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87	35	107.	- 150.	- 213.	- 170.	- 42.8	- 60.5	-	1FY		108
87	36	32.8	- 70.1	- 116.	- 140.	- 18.9	- 35.5	-	1FY		109
87	37	.428	- 5.62	- 14.1	- 28.8	- 1.12	- 4.75	-	1FY		110
88	32		-	-	-	-	-	-	1FY		111
88	33	7:89	- .748	-	-	- .840	-	-	1FY		112
88	34	82.6	- 50.5	- 59.2	- 24.7	- 25.0	- 16.8	-	1FY		113
88	35	170.	- 160.	- 223.	- 140.	- 64.7	- 67.2	-	1FY		114
88	36	86.9	- 132.	- 207.	- 194.	- 43.4	- 67.2	-	1FY		115
88	37	9:33	- 27.7	- 47.9	- 69.3	- 7.12	- 16.8	-	1FY		116
88	38		-	-	- 1.78	-	-	-	1FY		117
89	33	.621	-	-	-	-	-	-	1FY		118
89	34	57.3	- 28.2	- 29.5	- 4.00	- 15.3	- 7.66	-	1FY		119
89	35	200.	- 153.	- 180.	- 89.4	- 66.3	- 57.3	-	1FY		120
89	36	175.	- 199.	- 269.	- 217.	- 71.5	- 97.5	-	1FY		121
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89	38		- 1.37	- 3.49	- 20.2	-	- 2.56	-	1FY		123
089	39A		-	-	-	-	-	-	1FY		124
089	39		-	-	-	-	-	-	1FY		125
90	33		-	-	-	-	-	-	1FY		126
90	34	30.2	- 5.64	- 3.81	-	- 6.99	- 1.06	-	1FY		127
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90	37	98.6	- 122.	- 198.	- 196.	- 50.3	- 83.6	-	1FY		130
90	38		- 16.4	- 32.4	- 49.0	- 3.99	- 14.8	-	1FY		131
91	34	4:52	-	-	-	- .792	-	-	1FY		132
91	35	110.	- 50.3	- 52.4	- 18.8	- 41.6	- 22.5	-	1FY		133
91	36	270.	- 197.	- 239.	- 140.	- 125.	- 109.	-	1FY		134
091	37	172.0688	- 188.4969	- 272.1905	- 244.6890	- 104.4880	- 135.1901	-	1FY		135
91	38	25.8	- 47.3	- 78.9	- 106.	- 18.4	- 41.1	-	1FY		136
091	39A		-	- .4208	- 3.2148	-	- .2984	-	1FY		137
091	39		-	- .4208	- 3.2148	-	- .2984	-	1FY		138
92	34		-	-	-	-	-	-	1FY		139
92	35	53.9	- 20.3	- 28.7	- 1.49	- 20.3	- 6.41	-	1FY		140
92	36	231.	- 142.	- 170.	- 78.0	- 106.	- 80.6	-	1FY		141

92	37	246.	- 238.	- 313.	- 233.	- 137.	- 170.	-	1FY	142
92	38	65.9	- 99.7	- 149.	- 181.	- 46.0	- 92.2	-	1FY	143
92	39	.605	- 5.09	- 11.8	- 34.5	- .875	- 11.2	-	1FY	144
93	34		-	-	-	-	-	-	1FY	145
93	35	20.0	- 1.93	- 1.34	-	- 4.88	- .545	-	1FY	146
93	36	168.	- 79.7	- 93.2	- 35.0	- 82.1	- 51.2	-	1FY	147
93	37	304.	- 228.	- 302.	- 183.	- 187.	- 177.	-	1FY	148
93	38	141.	- 165.	- 249.	- 237.	- 109.	- 155.	-	1FY	149
93	39	10.3	- 29.4	- 51.2	- 79.0	- 14.6	- 33.9	-	1FY	150
93	40		-	- 1.56	- 1.50	-	-	-	1FY	151
093	041A		-	-	-	-	-	-	1FY	152
093	041		-	-	-	-	-	-	1FY	153
94	35	1:42	-	-	-	-	-	-	1FY	154
94	36	88.4	- 37.1	- 38.4	- 9.40	- 45.0	- 23.5	-	1FY	155
94	37	279.	- 181.	- 217.	- 119.	- 179.	- 143.	-	1FY	156
94	38	225.	- 210.	- 302.	- 250.	- 179.	- 213.	-	1FY	157
94	39	44.5	- 68.1	- 103.	- 135.	- 45.0	- 82.2	-	1FY	158
94	40		- .969	- 2.76	- 16.4	-	- 2.77	-	1FY	159
95	35		-	-	-	-	-	-	1FY	160
95	36	40.2	- 10.5	- 5.24	-	- 21.7	- 2.95	-	1FY	161
95	37	212.	- 115.	- 117.	- 57.3	- 147.	- 87.4	-	1FY	162
95	38	277.	- 236.	- 284.	- 216.	- 232.	- 227.	-	1FY	163
95	39	94.4	- 125.	- 179.	- 201.	- 96.8	- 152.	-	1FY	164
95	40	1:89	- 1.0	- 26.5	- 46.4	- 4.30	- 25.	-	1FY	165
095	041A		-	-	-	-	-	-	1FY	166
095	041		-	-	-	-	-	-	1FY	167
96	35		-	-	-	-	-	-	1FY	168
96	36	7:58	- .598	-	-	- 2.13	- 43.4	-	1FY	169
96	37	130.	- 61.3	- 54.0	- 21.8	- 83.0	- 199.	-	1FY	170
96	38	294.	- 212.	- 223.	- 147.	- 234.	- 226.	-	1FY	171
96	39	171.	- 193.	- 223.	- 233.	- 169.	- 65.5	-	1FY	172
96	40	22.7	- 43.1	- 56.0	- 96.3	- 29.6	- .698	-	1FY	173
96	41		-	-	- 4.30	-	-	-	1FY	174
97	36		-	-	-	-	-	-	1FY	175
97	37		-	-	-	-	-	-	1FY	176
97	38	61.3	- 28.5	- 19.7	- 2.85	- 41.2	- 17.0	-	1FY	177
97	39	246.	- 174.	- 148.	- 84.6	- 201.	- 141.	-	1FY	178
97	40	241.	- 254.	- 252.	- 220.	- 243.	- 259.	-	1FY	179
097	041A	29.7619	- 48.2359	- 55.5389	- 75.2496	- 37.3669	- 62.5127	-	1FY	180
097	041	29.7619	- 48.2359	- 55.5389	- 75.2496	- 37.3669	- 62.5127	-	1FY	181
97	42		- 3.31	- 6.59	- 24.2	- 1.07	- 9.73	-	1FY	182
98	36		-	-	-	-	-	-	1FY	183
98	37	10.2	- .925	-	-	- 3.49	-	-	1FY	184
98	38	131.	- 64.9	- 56.9	- 22.3	- 103.	- 54.8	-	1FY	185
98	39	274.	- 215.	- 214.	- 136.	- 268.	- 219.	-	1FY	186
98	40	146.	- 177.	- 198.	- 202.	- 180.	- 219.	-	1FY	187
098	041A	8:6035	- 17.8347	- 22.9661	- 39.8260	- 14.7279	- 27.8512	-	1FY	188
098	041	8:6035	- 17.8347	- 22.9661	- 39.8260	- 14.7279	- 27.8512	-	1FY	189
98	42		-	-	- 2.63	-	-	-	1FY	190
99	37		-	-	-	-	-	-	1FY	191
99	38	49.5	- 18.2	- 11.9	- .782	- 35.1	- 6.75	-	1FY	192
99	39	229.	- 149.	- 115.	- 54.8	- 199.	- 114.	-	1FY	193
99	40	259.	- 243.	- 227.	- 177.	- 277.	- 257.	-	1FY	194
99	41	58.1	- 108.	- 115.	- 147.	- 98.4	- 151.	-	1FY	195
99	42	.805	- 7.52	- 11.9	- 30.1	- 2.52	- 20.2	-	1FY	196
099	043A		-	-	-	-	-	-	1FY	197
099	043		-	-	-	-	-	-	1FY	198
100	38	4:95	-	-	-	- 2.00	-	-	1FY	199
100	39	119.	- 49.4	- 35.9	- 13.6	- 105.	- 40.0	-	1FY	200
100	40	292.	- 192.	- 164.	- 102.	- 314.	- 194.	-	1FY	201

100	41	186.	- 188.	- 186.	- 151.	- 242.	- 236.	-	1FY	202
100	42	28.0	- 44.1	- 54.2	- 76.3	- 46.5	- 72.9	-	1FY	203
100	43		-	- .577	- 4.55	-	- 1.05	-	1FY	204
101	38		-	-	-	-	-	-	1FY	205
101	39	31.9	- 7.92	- 22.1	-	- 21.8	- 3.12	-	1FY	206
101	40	170.	- 93.5	- 51.8	- 35.7	- 162.	- 92.6	-	1FY	207
101	41	223.	- 196.	- 125.	- 135.	- 277.	- 241.	-	1FY	208
101	42	76.0	- 104.	- 80.0	- 125.	- 122.	- 161.	-	1FY	209
101	43	1:57	- 13.0	- 11.7	- 28.8	- 7.27	- 26.5	-	1FY	210
102	38		-	-	-	-	-	-	1FY	211
102	39	5:51	- 5.16	-	-	- 2.48	-	-	1FY	212
102	40	87.1	- 47.3	- 22.0	- 11.4	- 96.5	- 45.4	-	1FY	213
102	41	194.	- 164.	- 87.7	- 69.5	- 272.	- 196.	-	1FY	214
102	42	111.	- 144.	- 87.7	- 104.	- 194.	- 211.	-	1FY	215
102	043A	7:0528	- 15.1281	- 11.0077	- 20.4249	- 17.1162	- 28.5119	-	1FY	216
102	043	7:0528	- 15.1281	- 11.0077	- 20.4249	- 17.1162	- 28.5119	-	1FY	217
102	44		-	-	- 1.35	-	-	-	1FY	218
103	39	.510	-	-	-	-	-	-	1FY	219
103	40	39.0	- 24.1	- 9.03	- 2.03	- 56.3	- 20.6	-	1FY	220
103	41	128.	- 120.	- 55.1	- 34.1	- 225.	- 139.	-	1FY	221
103	42	108.	- 154.	- 82.2	- 77.4	- 225.	- 220.	-	1FY	222
103	43	22.2	- 51.2	- 31.6	- 45.4	- 56.3	- 90.9	-	1FY	223
103	44		- .883	- 1.06	- 6.07	-	- 4.07	-	1FY	224
103	045A		-	-	-	-	-	-	1FY	225
103	045		-	-	-	-	-	-	1FY	226
104	39		-	-	-	-	-	-	1FY	227
104	40	8:07	- 1.99	- .382	- 11.3	- 14.5	- 1.22	-	1FY	228
104	41	53.1	- 47.5	- 14.9	- 51.7	- 141.	- 64.4	-	1FY	229
104	42	83.4	- 117.	- 42.0	- 58.7	- 280.	- 192.	-	1FY	230
104	43	34.0	- 73.7	- 30.2	- 17.1	- 141.	- 149.	-	1FY	231
104	44	1:40	- 11.2	- 5.32	- .182	- 14.5	- 28.5	-	1FY	232
104	045A		-	-	-	-	-	-	1FY	233
104	045		-	-	-	-	-	-	1FY	234
105	39		-	-	-	-	-	-	1FY	235
105	40	2:92	- .649	- .142	-	- 6.40	- .517	-	1FY	236
105	41	23.8	- 27.0	- 7.47	- 9.26	- 108.	- 48.5	-	1FY	237
105	42	43.1	- 76.9	- 22.3	- 45.1	- 244.	- 167.	-	1FY	238
105	43	19.8	- 55.6	- 17.3	- 54.5	- 143.	- 147.	-	1FY	239
105	44	.776	- 9.91	- 3.31	- 16.8	- 19.2	- 32.2	-	1FY	240
105	045A		-	-	- .1234	-	-	-	1FY	241
105	045		-	-	- .1234	-	-	-	1FY	242
106	39		-	-	-	-	-	-	1FY	243
106	40	.749	- .285	-	-	- 2.72	-	-	1FY	244
106	41	8:87	- 21.0	- 2.63	- 5.91	- 80.6	- 34.8	-	1FY	245
106	42	18.6	- 68.2	- 9.92	- 36.0	- 210.	- 138.	-	1FY	246
106	43	9.85	- 57.1	- 9.20	- 53.7	- 140.	- 138.	-	1FY	247
106	44	1.14	- 11.4	- 2.13	- 20.3	- 23.1	- 34.8	-	1FY	248
106	045A		-	-	- .3568	-	-	-	1FY	249
106	045		-	-	- .3568	-	-	-	1FY	250
107	40	.173	-	-	-	- .971	-	-	1FY	251
107	41	3:71	- 15.7	- 1.54	- 3.94	- 51.0	- 23.6	-	1FY	252
107	42	8:87	- 59.8	- 6.71	- 29.4	- 153.	- 108.	-	1FY	253
107	43	5:51	- 56.2	- 7.23	- 50.1	- 118.	- 122.	-	1FY	254
107	44	.806	- 13.3	- 1.92	- 22.1	- 22.6	- 35.6	-	1FY	255
107	045A		-	-	- .6757	-	-	-	1FY	256
107	045		-	-	- .6757	-	-	-	1FY	257
108	40		-	-	-	-	-	-	1FY	258
108	41	.635	- 6.08	- .259	- .424	- 16.9	- 3.79	-	1FY	259
108	42	2.74	- 40.8	- 2.12	- 16.6	- 87.9	- 47.8	-	1FY	260
100	43	2:86	- 65.0	- 3.92	- 46.6	- 113.	- 101.	-	1FY	261

108	44 .746	- 26.9	- 1.85	- 33.5	- 38.0	- 54.6	-	1FY	262
108	45	- 1.20	- .145	- 5.90	- .724	- 6.64	-	1FY	263
109	40	-	-	-	-	-	-	1FY	264
109	41 9.82	-2.540	- 8.3	-3	- 1.71	- .205	-	1FY	265
109	42 .785	- 21.1	- .584	- 7.15	- 28.6	- 19.3	-	1FY	266
109	43 1.42	- 59.3	- 1.89	- 34.7	- 65.3	- 66.3	-	1FY	267
109	44 .658	- 47.5	- 1.56	- 42.2	- 38.3	- 58.4	-	1FY	268
109	045A.0227	- 3.6298	- .1601	- 6.6547	- 2.5475	- 6.5054	-	1FY	269
109	045 .0227	- 3.6298	- .1601	- 6.6547	- 2.5475	- 6.5054	-	1FY	270
109	046A	-	-	- .0952	-	-	-	1FY	271
109	046	-	-	- .0952	-	-	-	1FY	272
109	047A	-	-	-	-	-	-	1FY	273
109	047	-	-	-	-	-	-	1FY	274
110	41 4.0	-3	-	-	-	-	-	1FY	275
110	42 .247	- 9.69	- .191	- .170	- 7.51	- 8.12	-	1FY	276
110	43 .778	- 44.3	- 1.09	- 21.4	- 30.0	- 42.7	-	1FY	277
110	44 .624	- 53.6	- 1.52	- 45.1	- 30.0	- 63.9	-	1FY	278
110	45 .124	- 16.8	- .538	- 24.5	- 7.51	- 24.5	-	1FY	279
111	41	-	-	-	-	-	-	1FY	280
111	42 .114	- 2.29	- 2.05	-2	- .851	- .750	-	1FY	281
111	43 .609	- 27.1	- .458	- 10.3	- 6.36	- 22.3	-	1FY	282
111	44 .805	- 56.8	- 1.10	- 39.2	- 10.8	- 57.8	-	1FY	283
111	45 .275	- 30.2	- .699	- 36.4	- 4.78	- 38.8	-	1FY	284
111	046A.0028	- 1.7497	- .0516	- 4.3051	- .1418	- 3.2324	-	1FY	285
111	046 .0028	- 1.7497	- .0516	- 4.3051	- .1418	- 3.2324	-	1FY	286
111	047A	-	-	-	-	-	-	1FY	287
111	047	-	-	-	-	-	-	1FY	288
112	42 1.11	-2 .1130	-	-	- 3.90	-2	-	1FY	289
112	43 .202	- 12.547	- .142	- 3.97	- .204	- 9.69	-	1FY	290
112	44 .469	- 46.430	- .816	- 26.0	- 6.12	- 44.3	-	1FY	291
112	45 .280	- 42.974	- .665	- 42.4	- 4.73	- 50.2	-	1FY	292
112	46 3.83	-2 9.936	- .176	- 17.5	- .902	- 14.6	-	1FY	293
112	47	-	-	- .784	-	- .155	-	1FY	294
113	42	-	-	-	-	-	-	1FY	295
113	43 .156	- .528	- 4.82	-2.371	- .889	- 2.80	-	1FY	296
113	44 .633	- 34.5	- .397	- 14.5	- 4.32	- 27.0	-	1FY	297
113	45 .649	- 52.8	- .731	- 40.7	- 5.23	- 48.1	-	1FY	298
113	46 .166	- 21.3	- .346	- 29.3	- 1.62	- 27.0	-	1FY	299
113	047A	- .4109	- .8138	- 2.6414	- .0116	- 1.4231	-	1FY	300
113	047	- .4109	- .8138	- 2.6414	- .0116	- 1.4231	-	1FY	301
114	42	-	-	-	-	-	-	1FY	302
114	43 4.75	-2.544	- 2.94	-3	- 9.79	-2.152	-	1FY	303
114	44 .371	- 18.3	- .205	- 6.59	- 1.24	- 13.3	-	1FY	304
114	45 .646	- 48.9	- .863	- 32.0	- 2.60	- 45.6	-	1FY	305
114	46 .290	- 34.3	- .547	- 38.8	- 1.41	- 40.2	-	1FY	306
114	47 1.86	-25.98	- .113	- 12.0	- .172	- 8.80	-	1FY	307
114	48	-	-	- .172	-	-	-	1FY	308
115	43 3.0	-3	-	-	-	-	-	1FY	309
115	44 .163	- 8.37	- .138	- .159	- .452	- 5.30	-	1FY	310
115	45 .487	- 39.1977	- .718	- 20.0	- 1.70	- 32.3	-	1FY	311
115	46 .375	- 45.1412	- .929	- 42.2	- 1.58	- 48.2	-	1FY	312
115	047A.0353	- 6.3513	- .1551	- 11.7738	- .1821	- 9.4532	-	1FY	313
115	047 .0353	- 6.3513	- .1551	- 11.7738	- .1821	- 9.4532	-	1FY	314
115	048A	- .0728	- .8030	- 1.4231	-	- .3177	-	1FY	315
115	048	- .0728	- .8030	- 1.4231	-	- .3177	-	1FY	316
115	049A	-	-	-	-	-	-	1FY	317
115	049	-	-	-	-	-	-	1FY	318
116	43	-	-	-	-	-	-	1FY	319
116	44 .117	- 2.49	- 1.87	-2	- .162	- .620	-	1FY	320
116	45 .617	- 24.9	- .313	- 9.85	- 1.10	- 18.4	-	1FY	321

116	46 .801	- 50.8	- .709	- 37.2	- 1.74	- 47.8	-	1FY	322
116	47 .267	- 26.0	- .417	- 34.5	- .719	- 32.0	-	1FY	323
116	48 4:98	-22.82	- 3.22	-27.99	- 3.22	-25.25	-	1FY	324
117	43	-	-	-	-	-	-	1FY	325
117	44 1:50	=2.133	-	-	- 1.49	-2	-	1FY	326
117	45 .232	- 12.8	- .150	- 3.89	- .579	- 9.18	-	1FY	327
117	46 .518	- 44.8	- .600	- 26.2	- 1.63	- 39.7	-	1FY	328
117	47 .296	= 39.4	- .400	- 41.5	- 1.17	- 42.8	-	1FY	329
117	048A.0194	- 4.7173	- .0751	- 8.8047	- .1025	- 5.7431	-	1FY	330
117	048 .0194	- 4.7173	- .0751	- 8.8047	- .1025	- 5.7431	-	1FY	331
117	049A	-	-	- .3932	-	-	-	1FY	332
117	049	-	-	- .3932	-	-	-	1FY	333
117	050A	-	-	-	-	-	-	1FY	334
117	050	-	-	-	-	-	-	1FY	335
118	44	-	-	-	-	-	-	1FY	336
118	45 .143	- 5.42	- 6.00	-2.376	- .261	- 3.14	-	1FY	337
118	46 .574	- 33.3	- .418	- 14.6	- 1.27	- 25.8	-	1FY	338
118	47 .567	- 49.6	- .713	- 41.3	- 1.53	- 47.6	-	1FY	339
118	48 .139	- 19.2	- .314	- 29.6	- .476	- 22.6	-	1FY	340
118	049A	- .3272	- .0095	- 2.6722	- .0034	- .9148	-	1FY	341
118	049	- .3272	- .0095	- 2.6722	- .0034	- .9148	-	1FY	342
119	44	-	-	-	-	-	-	1FY	343
119	45 5:4	-2.646	- 4.4	-37.54	- 6.41	-2.190	-	1FY	344
119	46 .395	- 19.3	- .232	- 34.5	- .807	- 13.3	-	1FY	345
119	47 .667	- 50.0	- .694	- 39.1	- 1.70	- 42.9	-	1FY	346
119	048A.1431	- 16.1914	- .2687	- 5.7845	- .4593	- 17.9915	-	1FY	347
119	048 .1431	- 16.1914	- .2687	- 5.7845	- .4593	- 17.9915	-	1FY	348
119	049A.0075	- 2.6583	- .0516	- .0620	- .0558	- 4.2082	-	1FY	349
119	049 .0075	- 2.6583	- .0516	- .0620	- .0558	- 4.2082	-	1FY	350
119	050A	-	-	-	-	-	-	1FY	351
119	050	-	-	-	-	-	-	1FY	352
120	45 6:5	-3	-	-	-	-	-	1FY	353
120	46 .213	- 9.14	- .106	- 2.37	- .413	- 5.79	-	1FY	354
120	47 .625	- 42.3	- .554	- 23.0	- 1.56	- 32.8	-	1FY	355
120	48 .476	- 47.6	- .717	- 45.6	- 1.44	- 45.8	-	1FY	356
120	49 8:8	-213.8	- .239	- 23.0	- .334	- 16.3	-	1FY	357
120	50	- .150	- 4.6	-32.37	-	-	-	1FY	358
121	45	-	-	-	-	-	-	1FY	359
121	46 9:51	-23.02	- 2.22	-2.131	- .190	- .876	-	1FY	360
121	47 .487	- 29.2	- .373	- 12.2	- 1.28	- 19.5	-	1FY	361
121	48 .618	- 58.6	- .842	- 42.3	- 2.02	- 47.3	-	1FY	362
121	049A.1011	- 14.1131	- .2487	- 19.0428	- .4160	- 15.1454	-	1FY	363
121	049 .1011	- 14.1131	- .2487	- 19.0428	- .4160	- 15.1454	-	1FY	364
121	050A.0002	- 1.4597	- .0332	- 4.1669	- .0186	- 2.2464	-	1FY	365
121	050 .0032	- 1.4597	- .0332	- 4.1669	- .0186	- 2.2464	-	1FY	366
122	46 1:	-2	-	-	- 9.1	-3	-	1FY	367
122	47 .274	- 12.3	- 8.40	-23.90	- .639	- 7.72	-	1FY	368
122	48 .696	- 49.7	- .382	- 29.2	- 2.06	- 37.5	-	1FY	369
122	49 .456	- 49.7	- .434	- 49.7	- 1.71	- 45.4	-	1FY	370
122	50 7:09	-212.3	- 1.26	- 21.9	- .350	- 14.1	-	1FY	371
122	051A	-	- .0007	- .6655	-	- .1022	-	1FY	372
122	051	-	- .0007	- .6655	-	- .1022	-	1FY	373
123	46	-	-	-	-	-	-	1FY	374
123	47 .174	- 6.44	- .127	- .679	- .415	- 3.40	-	1FY	375
123	48 .657	- 39.1	- .898	- 20.1	- 2.02	- 27.9	-	1FY	376
123	049A.3157	- 28.0329	- .7656	- 26.7725	- 1.2191	- 26.1232	-	1FY	377
123	049 .3157	- 28.0329	- .7656	- 26.7725	- 1.2191	- 26.1232	-	1FY	378
123	50A.0761	- 10.5365	- .3413	- 17.9678	- .3767	- 12.4009	-	1FY	379
123	50 .0761	- 10.5365	- .3413	- 17.9678	- .3767	- 12.4009	-	1FY	380
123	51	- .676	- 3.94	-25.75	- 1.07	-21.94	-	1FY	381

124	46	-	-	-	-	-	-	1FY	382
124	47 7:10	-2.814	- 1.6	-2	- .125	- .222	- 15.5	1FY	383
124	48 .520	- 23.4	- .812	- 10.1	- 1.57	- 50.2	- 41.4	1FY	384
124	49 .826	- 59.1	- 2.43	- 46.1	- 3.31	- 2.8902	- 1FY	1FY	385
124	50 .346	- 39.4	- 1.88	- 52.4	- 1.80	- 41.4	- 1FY	1FY	386
124	050A.0057	- 2.0332	- .1198	- 5.1873	- .0723	- 2.8902	- 1FY	1FY	387
124	051A.0057	- 2.0332	- .1198	- 5.1873	- .0723	- 2.8902	- 1FY	1FY	388
124	051 .0057	- 2.0332	- .1198	- 5.1873	- .0723	- 2.8902	- 1FY	1FY	389
124	52	-	-	- .182	-	-	- 1FY	1FY	390
125	47 6:8	-2	-	-	-	-	- 1FY	1FY	391
125	48 .329	- 11.2	- .974	- 3.25	- 1.05	- .70	- 1FY	1FY	392
125	49 .937	- 50.4	- 5.09	- 31.5	- 3.95	- 41.3	- 1FY	1FY	393
125	050A.3497	- 27.2596	- 3.2973	- 31.9939	- 1.8211	- 29.1726	- 1FY	1FY	394
125	050 .3497	- 27.2596	- 3.2973	- 31.9939	- 1.8211	- 29.1726	- 1FY	1FY	395
125	51 .128	- 16.0	- 2.20	- 31.5	- .847	- 20.4	- 1FY	1FY	396
125	052A	- .0822	- .8210	- 1.6637	-	- .5947	- 1FY	1FY	397
125	052	- .0822	- .8210	- 1.6637	-	- .5947	- 1FY	1FY	398
126	47	-	-	-	-	-	- 1FY	1FY	399
126	48 .226	- 5.05	- .395	- .203	- .827	- 1.09	- 1FY	1FY	400
126	49 1:13	- 44.8	- 6.66	- 19.0	- 5.05	- 24.6	- 1FY	1FY	401
126	50 1:39	- 87.9	- 15.1	- 65.5	- 7.53	- 59.4	- 1FY	1FY	402
126	051A.2196	- 21.2180	- 4.4331	- 29.4856	- 1.4430	- 19.0588	- 1FY	1FY	403
126	051 .2196	- 21.2180	- 4.4331	- 29.4856	- 1.4430	- 19.0588	- 1FY	1FY	404
126	52 6:7	-34.30	- 1.19	- 12.6	- 9.75	-25.55	- 1FY	1FY	405
127	47	-	-	-	-	-	- 1FY	1FY	406
127	48 .130	- .323	-	-	- .229	-	- 1FY	1FY	407
127	49 1.78	- 28.3	- 5.88	- 9.33	- 6.81	- 14.2	- 1FY	1FY	408
127	50 8:76	- 97.1	- 23.5	- 56.9	- 17.7	- 61.6	- 1FY	1FY	409
127	51 2:07	- 84.5	- 23.5	- 34.9	- 11.9	- 66.5	- 1FY	1FY	410
127	052A.1301	- 8.6999	- 2.9421	- 16.7392	- .9703	- 8.9449	- 1FY	1FY	411
127	052 .1301	- 8.6999	- 2.9421	- 16.7392	- .9703	- 8.9449	- 1FY	1FY	412
127	53	-	-	- 1.11	-	-	- 1FY	1FY	413
128	48 .190	-	-	-	- .111	-	- 1FY	1FY	414
128	49 6:41	- 25.9	- 6.99	- 6.42	- 10.4	- 12.9	- 1FY	1FY	415
128	50 17.2	- 109.	- 33.9	- 52.8	- 35.9	- 67.3	- 1FY	1FY	416
128	051A5:8524	- 55.5824	- 28.6145	- 49.6545	- 15.7230	- 44.2672	- 1FY	1FY	417
128	051 5:8524	- 55.5824	- 28.6145	- 49.6545	- 15.7230	- 44.2672	- 1FY	1FY	418
128	52 1:97	- 30.1	- 12.7	- 46.1	- 6.93	- 29.1	- 1FY	1FY	419
128	53	-	- .282	- 3.66	-	- .555	- 1FY	1FY	420
129	48 .113	-	-	-	-	-	- 1FY	1FY	421
129	49 11.0	- 21.3	- 8.59	- 2.81	- 15.1	- 10.5	- 1FY	1FY	422
129	50 33.8	- 111.	- 52.3	- 47.2	- 65.5	- 70.7	- 1FY	1FY	423
129	51 29.1	- 144.	- 78.0	- 107.	- 70.6	- 112.	- 1FY	1FY	424
129	052A3:0963	- 23.2963	- 15.0105	- 32.1986	- 9.3044	- 23.5312	- 1FY	1FY	425
129	052 3:0963	- 23.2963	- 15.0105	- 32.1986	- 9.3044	- 23.5312	- 1FY	1FY	426
129	53	- .917	- 1.01	- 8.44	-	- 2.07	- 1FY	1FY	427
129	054A	-	-	-	-	-	- 1FY	1FY	428
129	054	-	-	-	-	-	- 1FY	1FY	429
130	48	-	-	-	-	-	- 1FY	1FY	430
130	49 18.3	- 15.8	- 6.84	- .816	- 17.7	- 10.9	- 1FY	1FY	431
130	50 77.0	- 107.	- 56.2	- 42.8	- 92.6	- 80.9	- 1FY	1FY	432
130	51 81.2	- 173.	- 104.	- 128.	- 119.	- 138.	- 1FY	1FY	433
130	52 21.7	- 71.2	- 49.2	- 99.1	- 40.0	- 60.0	- 1FY	1FY	434
130	53 .562	- 3.38	- 3.90	- 18.9	- .762	- 3.32	- 1FY	1FY	435
131	48	-	-	-	-	-	- 1FY	1FY	436
131	49 17.7	- 7.60	- 2.91	- 37.5	- 13.9	- 2.07	- 1FY	1FY	437
131	50 97.4	- 95.8	- 64.9	- 142.	- 104.	- 61.3	- 1FY	1FY	438
131	51 131.	- 203.	- 157.	- 132.	- 177.	- 160.	- 1FY	1FY	439
131	052A23.0092	- 53.1658	- 49.5847	- 15.5618	- 38.8396	- 54.3810	- 1FY	1FY	440
131	052 23.0092	- 53.1658	- 49.5847	- 15.5618	- 38.8396	- 54.3810	- 1FY	1FY	441

131	53	.945	-	13.1	-	14.7	-		-	4.65	-	17.6	-	1FY	442
131	054A		-		-		-		-		-		-	1FY	443
131	054		-		-		-		-		-		-	1FY	444
132	48		-		-		-		-		-		-	1FY	445
132	49	4.86	-	.557	-		-		-	2.16	-		-	1FY	446
132	50	88.3	-	58.2	-	41.3	-	17.4	-	84.1	-	32.9	-	1FY	447
132	51	206.	-	208.	-	179.	-	117.	-	237.	-	151.	-	1FY	448
132	52	122.	-	191.	-	193.	-	186.	-	170.	-	171.	-	1FY	449
132	53	16.7	-	43.0	-	50.1	-	76.9	-	30.0	-	49.6	-	1FY	450
132	54		-		-		-	3.44	-		-	.529	-	1FY	451
133	49		-		-		-		-		-		-	1FY	452
133	50	66.4	-	27.2	-	21.2	-	1.92	-	50.5	-	14.8	-	1FY	453
133	51	266.	-	168.	-	159.	-	74.7	-	246.	-	122.	-	1FY	454
133	052A	130.5522	-	120.8313	-	135.0946	-	107.4994	-	148.2735	-	114.3525	-	1FY	455
133	052	130.5522	-	120.8313	-	135.0946	-	107.4994	-	148.2735	-	114.3525	-	1FY	456
133	53	64.4	-	96.7	-	118.	-	151.	-	92.1	-	106.	-	1FY	457
133	054A		-	1.5950	-	4.9935	-	13.6678	-	.6518	-	4.2946	-	1FY	458
133	054		-	1.5950	-	4.9935	-	13.6678	-	.6518	-	4.2946	-	1FY	459
134	49		-		-		-		-		-		-	1FY	460
134	50	10.5	-	.744	-		-		-	3.07	-		-	1FY	461
134	51	170.	-	70.2	-	59.5	-	22.6	-	121.	-	47.4	-	1FY	462
134	52	378.	-	247.	-	238.	-	152.	-	339.	-	205.	-	1FY	463
134	53	217.	-	224.	-	238.	-	241.	-	242.	-	221.	-	1FY	464
134	54	27.5	-	48.7	-	59.5	-	99.9	-	42.8	-	58.6	-	1FY	465
134	055A		-		-		-	2.2831	-		-		-	1FY	466
134	055		-		-		-	2.2831	-		-		-	1FY	467
135	50		-		-		-		-		-		-	1FY	468
135	51	43.7	-	13.7	-	7.41	-		-	30.8	-	4.79	-	1FY	469
135	52	225.	-	135.	-	125.	-	59.9	-	208.	-	107.	-	1FY	470
135	53	285.	-	270.	-	282.	-	227.	-	331.	-	259.	-	1FY	471
135	054A	46.5186	-	66.2156	-	83.5585	-	107.4994	-	67.6684	-	82.8421	-	1FY	472
135	054	46.5186	-	66.2156	-	83.5585	-	107.4994	-	67.6684	-	82.8421	-	1FY	473
135	55		-	15.0	-	22.1	-	48.6	-	6.10	-	24.2	-	1FY	474
136	51	2.27	-		-		-		-	.867	-		-	1FY	475
136	52	102.	-	43.3	-	43.3	-	13.5	-	81.3	-	31.5	-	1FY	476
136	53	288.	-	198.	-	226.	-	130.	-	279.	-	178.	-	1FY	477
136	54	211.	-	217.	-	294.	-	259.	-	246.	-	249.	-	1FY	478
136	55	37.7	-	60.9	-	98.0	-	130.	-	54.0	-	88.2	-	1FY	479
136	56		-	.581	-	1.87	-	13.5	-		-	2.27	-	1FY	480
137	51		-		-		-		-		-		-	1FY	481
137	52	46.0	-	15.2	-	11.6	-	.693	-	33.5	-	6.69	-	1FY	482
137	53	220.	-	128.	-	147.	-	65.1	-	204.	-	113.	-	1FY	483
137	54	266.	-	240.	-	309.	-	224.	-	304.	-	255.	-	1FY	484
137	55	81.5	-	116.	-	108.	-	197.	-	117.	-	150.	-	1FY	485
137	056A	.5853	-	3.1996	-	18.2072	-	22.1142	-	1.9604	-	10.1647	-	1FY	486
137	056	.5853	-	3.1996	-	18.2072	-	22.1142	-	1.9604	-	10.1647	-	1FY	487
138	51		-		-		-		-		-		-	1FY	488
138	52	12.7	-	1.64	-		-		-	3.76	-		-	1FY	489
138	53	133.	-	68.7	-	70.1	-	29.7	-	112.	-	52.5	-	1FY	490
138	54	275.	-	215.	-	205.	-	167.	-	290.	-	207.	-	1FY	491
138	55	140.	-	179.	-	245.	-	234.	-	194.	-	207.	-	1FY	492
138	56	12.7	-	36.1	-	56.8	-	83.2	-	31.9	-	52.5	-	1FY	493
138	57		-		-		-	2.13	-		-		-	1FY	494
139	52	.757	-		-		-		-		-		-	1FY	495
139	53	77.7	-	30.3	-	27.9	-	4.18	-	52.3	-	18.1	-	1FY	496
139	54	275.	-	167.	-	188.	-	93.0	-	226.	-	136.	-	1FY	497
139	55	244.	-	223.	-	380.	-	226.	-	244.	-	232.	-	1FY	498
139	56	54.7	-	78.4	-	124.	-	143.	-	64.7	-	102.	-	1FY	499
139	57		-	1.70	-	3.52	-	21.1	-		-	6.02	-	1FY	500
140	52		-		-		-		-		-		-	1FY	501

140	53	28.6	- 5.45	- 3.86	-	- 17.5	- 1.98	-	1FY	502
140	54	202.	- 93.0	- 114.	- 41.5	- 144.	- 77.4	-	1FY	503
140	55	296.	- 216.	- 298.	- 180.	- 265.	- 217.	-	1FY	504
140	56	112.	- 125.	- 199.	- 194.	- 126.	- 157.	-	1FY	505
140	57	3°71	- 17.4	- 32.7	- 51.5	- 9.98	- 27.6	-	1FY	506
141	53	4°45	-	-	-	- 1.02	-	-	1FY	507
141	54	116.	- 45.0	- 53.9	- 16.3	- 71.4	- 32.8	-	1FY	508
141	55	296.	- 179.	- 249.	- 122.	- 231.	- 159.	-	1FY	509
141	56	193.	- 178.	- 279.	- 207.	- 191.	- 193.	-	1FY	510
141	57	34.1	- 43.2	- 81.1	- 91.6	- 39.1	- 59.8	-	1FY	511
141	58		-	- .864	- 5.45	-	- .853	-	1FY	512
142	53		-	-	-	-	-	-	1FY	513
142	54	53.6	- 16.0	- 16.8	- 1.18	- 32.8	- 7.48	-	1FY	514
142	55	232.	- 116.	- 163.	- 61.9	- 171.	- 94.1	-	1FY	515
142	56	249.	- 195.	- 323.	- 185.	- 221.	- 198.	-	1FY	516
142	57	67.0	- 83.0	- 163.	- 143.	- 74.1	- 107.	-	1FY	517
142	58		- 4.63	- 16.8	- 27.4	- 1.41	- 13.1	-	1FY	518
143	53		-	-	-	-	-	-	1FY	519
143	54	19.0	- 1.48	- 1.14	-	- 5.6	- .514	-	1FY	520
143	55	151.	- 61.8	- 88.2	- 25.6	- 94.1	- 48.2	-	1FY	521
143	56	277.	- 177.	- 259.	- 134.	- 214.	- 166.	-	1FY	522
143	57	143.	- 127.	- 215.	- 173.	- 126.	- 146.	-	1FY	523
143	58	12.5	- 22.7	- 43.9	- 57.8	- 16.8	- 32.1	-	1FY	524
143	59		-	-	- 1.11	-	-	-	1FY	525
144	54	1°25	-	-	-	-	-	-	1FY	526
144	55	77.6	- 24.1	- 26.3	- 6.43	- 39.2	- 18.6	-	1FY	527
144	56	244.	- 118.	- 149.	- 80.9	- 156.	- 113.	-	1FY	528
144	57	196.	- 143.	- 207.	- 171.	- 156.	- 170.	-	1FY	529
144	58	38.5	- 44.0	- 73.8	- 92.5	- 39.2	- 65.1	-	1FY	530
144	59		- .632	- 1.89	- 11.2	-	- 2.20	-	1FY	531
145	53		-	-	-	-	-	-	1FY	532
145	54		-	-	-	-	-	-	1FY	533
145	55	25.6	- 6.50	- 2.98	-	- 13.5	- 1.89	-	1FY	534
145	56	134.	- 68.9	- 66.6	- 34.3	- 90.9	- 55.3	-	1FY	535
145	57	175.	- 142.	- 161.	- 129.	- 144.	- 144.	-	1FY	536
145	58	59.5	- 74.0	- 101.	- 119.	- 59.6	- 96.3	-	1FY	537
145	59	1°11	- 8.46	- 15.1	- 27.6	- 2.66	- 15.8	-	1FY	538
146	54		-	-	-	-	-	-	1FY	539
146	55	3°40	- .309	-	-	- 1.08	-	-	1FY	540
146	56	64.8	- 29.1	- 25.9	- 11.0	- 42.0	- 23.8	-	1FY	541
146	57	145.	- 111.	- 104.	- 74.5	- 118.	- 103.	-	1FY	542
146	58	83.7	- 91.1	- 184.	- 118.	- 84.8	- 109.	-	1FY	543
146	59	11.2	- 20.2	- 25.9	- 48.9	- 14.9	- 29.4	-	1FY	544
146	60		-	-	- 2.18	-	-	-	1FY	545
147	55		-	-	-	-	-	-	1FY	546
147	56	26.0	- 10.5	- 7.14	- 1.21	- 14.95	- 6.81	-	1FY	547
147	57	96.3	- 63.7	- 53.4	- 35.8	- 72.715	- 56.0	-	1FY	548
147	58	92.7	- 92.4	- 98.9	- 93.2	- 88.107	- 103.	-	1FY	549
147	59	22.1	- 35.2	- 48.1	- 62.5	- 27.334	- 49.0	-	1FY	550
147	60		- 1.13	- 2.39	- 10.2	- 3.892	- 3.89	-	1FY	551
148	55		-	-	-	-	-	-	1FY	552
148	56	7°04	- .883	- .374	-	- 4.20	- .339	-	1FY	553
148	57	49.3	- 24.9	- 19.6	- 13.2	- 40.6	- 23.8	-	1FY	554
148	58	79.9	- 64.8	- 58.8	- 60.3	- 80.4	- 76.7	-	1FY	555
148	59	33.2	- 42.8	- 45.5	- 68.4	- 40.6	- 63.2	-	1FY	556
148	60	1°56	- 6.69	- 8.68	- 19.8	- 4.20	- 13.0	-	1FY	557
148	61		-	-	- .212	-	-	-	1FY	558
149	53	.286	-	-	-	-	-	-	1FY	559
149	57	16.3	- 4.31	- 4.31	- 2.28	- 14.5	- 6.62	-	1FY	560
149	58	50.0	- 20.4	- 24.4	- 28.6	- 54.8	- 40.3	-	1FY	561

149	59	38.3	- 24.1	- 34.1	- 60.4	- 50.9	- 60.2	- 1FY	562
149	60	7:54	- 7.09	- 12.2	- 32.8	- 11.8	- 23.2	- 1FY	563
149	61		- 9.05	-2.311	- 3.98	-	- .780	- 1FY	564
150	56		-	-	-	-	-	- 1FY	565
150	57	.835	- .386	- .326	- 9.55	- 5.05	- .386	- 1FY	566
150	58	13.5	- 6.24	- 9.68	- 38.2	- 30.8	- 15.1	- 1FY	567
150	59	30.2	- 13.9	- 25.2	- 38.2	- 46.0	- 42.4	- 1FY	568
150	60	17.0	- 7.85	- 16.9	- 9.55	- 17.7	- 30.4	- 1FY	569
150	61	2:12	- .979	- 2.76	-	- .596	- 5.37	- 1FY	570
151	57	.236	-	-	-	- .154	-	- 1FY	571
151	58	7:55	- 1.97	- 2.45	-	- 10.7	-	- 1FY	572
151	59	20.3	- 3.21	- 11.9	-	- 34.7	-	- 1FY	573
151	60	13.8	- 8.41	- 14.4	-	- 28.7	-	- 1FY	574
151	61	2:32	- 2.21	- 4.46	-	- 5.90	-	- 1FY	575
151	62		-	- 3.67	-2	-	-	- 1FY	576
152	57		-	-	-	-	-	- 1FY	577
152	58	1:98	- .408	- .267	-	- 3.11	-	- 1FY	578
152	59	9:48	- 3.77	- 4.49	-	- 19.0	-	- 1FY	579
152	60	12.1	- 7.38	- 10.2	-	- 28.3	-	- 1FY	580
152	61	3:83	- 3.69	- 5.98	-	- 10.9	-	- 1FY	581
152	62	5:92	-2.361	- .799	-	- .367	-	- 1FY	582
152	063A		-	-	-	-	-	- 1FY	583
152	063		-	-	-	-	-	- 1FY	584
153	57		-	-	-	-	-	- 1FY	585
153	58	.224	- 9.35	-2	-	- .161	-	- 1FY	586
153	59	3:61	- 1.41	- 1.29	-	- 4.23	-	- 1FY	587
153	60	8:05	- 5.03	- 5.14	-	- 17.7	-	- 1FY	588
153	61	4:63	- 4.49	- 5.14	-	- 12.7	-	- 1FY	589
153	62	.603	- .980	- 1.29	-	- 2.24	-	- 1FY	590
154	58		-	-	-	-	-	- 1FY	591
154	59	.824	- .480	- .163	-	- 2.14	-	- 1FY	592
154	60	3:10	- 2.92	- 1.22	-	- 10.4	-	- 1FY	593
154	61	2:99	- 4.23	- 2.07	-	- 12.6	-	- 1FY	594
154	62	.716	- 1.62	- .915	-	- 3.90	-	- 1FY	595
154	63		- 5.08	-25.44	-2	- 5.57	-2	- 1FY	596
155	58		-	-	-	-	-	- 1FY	597
155	59	.145	- 6.00	-21.11	-2	- .571	-	- 1FY	598
155	60	.960	- 1.40	- .439	-	- 5.52	-	- 1FY	599
155	61	1:51	- 3.44	- 1.24	-	- 10.9	-	- 1FY	600
155	62	.619	- 2.17	- .886	-	- 5.52	-	- 1FY	601
155	63	2:49	-2.329	- .150	-	- .571	-	- 1FY	602
156	59	8:2	-3	-	-	- 1.44	-2	- 1FY	603
156	60	.241	- .506	- 8.1	-2	- 1.35	-	- 1FY	604
156	61	.646	- 2.14	- .395	-	- 4.66	-	- 1FY	605
156	62	.440	- 2.26	- .477	-	- 4.11	-	- 1FY	606
156	63	7:38	-2.600	- .147	-	- .899	-	- 1FY	607
156	64		-	- 2.1	-3	-	-	- 1FY	608
157	59		-	-	-	-	-	- 1FY	609
157	60	6:47	-2.159	- 1.16	-2	- .437	-	- 1FY	610
157	61	.291	- 1.19	- .112	-	- 2.47	-	- 1FY	611
157	62	.324	- 2.07	- .223	-	- 3.44	-	- 1FY	612
157	63	9:2	-2.903	- .112	-	- 1.22	-	- 1FY	613
157	64	9:	-45.37	-21.16	-2	- 3.14	-2	- 1FY	614
158	59		-	-	-	-	-	- 1FY	615
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158	61	5:08	-2.467	- 2.2	-2	- .879	-	- 1FY	617
158	62	9:54	-21.39	- 7.59	-2	- 1.99	-	- 1FY	618
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102	41	223.	- 231.	- 192.	- 238.	- 296.	-	-	2FY	873
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103	39	7.91	- .496	-	- 33.0	-	-	-	2FY	878
103	40	99.3	- 37.9	- 9.50	- 201.	- 62.7	-	-	2FY	879
103	41	210.	- 124.	- 58.	- 300.	- 250.	-	-	2FY	880
103	42	114.	- 105.	- 86.5	- 122.	- 250.	-	-	2FY	881
103	43	13.9	- 21.6	- 33.3	- 3.30	- 62.7	-	-	2FY	882
103	44		-	- 1.12	-	-	-	-	2FY	883
103	045A		-	-	-	-	-	-	2FY	884
103	045		-	-	-	-	-	-	2FY	885
104	39		-	-	- 3.06	-	-	-	2FY	886
104	40	39.1	- 7.53	- .496	- 113.	- 14.2	-	-	2FY	887
104	41	156.	- 49.6	- 19.4	- 279.	- 138.	-	-	2FY	888
104	42	156.	- 77.9	- 54.5	- 187.	- 273.	-	-	2FY	889
104	43	39.1	- 31.7	- 39.1	- 30.6	- 138.	-	-	2FY	890
104	44		- 1.31	- 6.90	-	- 14.2	-	-	2FY	891
104	045A		-	-	-	-	-	-	2FY	892
104	045		-	-	-	-	-	-	2FY	893
105	39		-	-	- .810	-	-	-	2FY	894
105	40	27.7	- 4.34	- .165	- 72.9	- 6.36	-	-	2FY	895
105	41	126.	- 29.2	- 8.67	- 227.	- 107.	-	-	2FY	896
105	42	144.	- 46.4	- 26.0	- 196.	- 242.	-	-	2FY	897
105	43	41.7	- 19.2	- 28.1	- 44.0	- 142.	-	-	2FY	898
105	44	.445	- .857	- 3.84	-	- 19.1	-	-	2FY	899
105	045A		-	-	-	-	-	-	2FY	900
105	045		-	-	-	-	-	-	2FY	901
106	39		-	-	- .406	-	-	-	2FY	902
106	40	16.3	- .247	-	- 38.4	- 2.72	-	-	2FY	903
106	41	85.1	- 9.66	- 3.96	- 113.	- 80.7	-	-	2FY	904
106	42	110.	- 27.2	- 14.9	- 97.7	- 210.	-	-	2FY	905
106	43	36.7	- 19.5	- 13.9	- 220.	- 141.	-	-	2FY	906
106	44	.701	- 3.44	- 3.20	-	- 23.1	-	-	2FY	907
106	045A		-	-	-	-	-	-	2FY	908
106	045		-	-	-	-	-	-	2FY	909
107	40	8.68	- .331	-	- 10.9	- 1.09	-	-	2FY	910
107	41	52.9	- 5.64	- 2.49	- 48.2	- 57.3	-	-	2FY	911
107	42	79.0	- 17.0	- 16.9	- 55.9	- 172.	-	-	2FY	912
107	43	30.4	- 10.5	- 11.6	- 17.9	- 133.	-	-	2FY	913
107	44	10.2	- 1.54	- 3.08	- .199	- 25.4	-	-	2FY	914
107	045A		-	-	-	-	-	-	2FY	915
107	045		-	-	-	-	-	-	2FY	916
108	40	.821	-	-	- 1.23	-	-	-	2FY	917
108	41	24.4	- 2.25	- .620	- 15.9	- 20.1	-	-	2FY	918
108	42	43.3	- 9.39	- 5.10	- 30.5	- 105.	-	-	2FY	919
108	43	42.5	- 9.80	- 9.40	- 15.9	- 136.	-	-	2FY	920
108	44	6.96	- 2.56	- 4.46	- 1.23	- 45.4	-	-	2FY	921

108	45	-	- .354	-	- .864	-	-	2FY	922
109	40	-	-	- 4.80	-2	-	-	2FY	923
109	41 9:61	- .477	- 2.85	-24.32	- 2.46	-	-	2FY	924
109	42 43.9	- 3.81	- 2.00	- 13.5	- 41.3	-	-	2FY	925
109	43 49.9	- 6.89	- 6.45	- 11.6	- 93.8	-	-	2FY	926
109	44 14.4	- 3.20	- 5.33	- 2.60	- 55.1	-	-	2FY	927
109	045A.0773	- .1119	- .5600	-	- 3.7359	-	-	2FY	928
109	045 .0773	- .1119	- .5600	-	- 3.7359	-	-	2FY	929
109	046A	-	-	-	-	-	-	2FY	930
109	046	-	-	-	-	-	-	2FY	931
109	047A	-	-	-	-	-	-	2FY	932
109	047	-	-	-	-	-	-	2FY	933
110	41 2:52	- 2.40	-2	- .724	-	-	-	2FY	934
110	42 24.3	- 1.50	- .627	- 4.42	- 7.51	-	-	2FY	935
110	43 48.3	- 4.72	- 3.55	- 6.60	- 30.0	-	-	2FY	936
110	44 24.3	- 3.80	- 4.95	- 2.68	- 30.0	-	-	2FY	937
110	45 2:52	- .754	- 1.76	- 7.24	-27.51	-	-	2FY	938
110	46	-	- 4.51	-2	-	-	-	2FY	939
111	41 .126	-	-	- 3.8	-2	-	-	2FY	940
111	42 11.9	- .445	- 6.80	-21.41	- 1.18	-	-	2FY	941
111	43 40.5	- 2.39	- 1.52	- 3.46	- 8.79	-	-	2FY	942
111	44 35.7	- 3.16	- 3.68	- 2.32	- 15.0	-	-	2FY	943
111	45 7:82	- 1.08	- 2.32	- .380	- 6.63	-	-	2FY	944
111	046A	- .0110	- .1752	-	- .2005	-	-	2FY	945
111	046	- .0110	- .1752	-	- .2005	-	-	2FY	946
111	047A	-	-	-	-	-	-	2FY	947
111	047	-	-	-	-	-	-	2FY	948
112	42 3:48	- 4.54	-2	- .375	- 3.93	-2	-	2FY	949
112	43 21.2	- .825	- .623	- 1.67	- 2.07	-	-	2FY	950
112	44 31.7	- 1.93	- 2.70	- 1.93	- 6.20	-	-	2FY	951
112	45 12.2	- 1.15	- 2.91	- .621	- 4.78	-	-	2FY	952
112	46 .411	- .157	- .770	- 6.9	-3.913	-	-	2FY	953
112	47	-	-	-	-	-	-	2FY	954
113	42 .506	-	-	- .210	-	-	-	2FY	955
113	43 15.0	- .384	- .198	- 1.28	- .744	-	-	2FY	956
113	44 39.0	- 1.56	- 1.63	- 1.91	- 3.61	-	-	2FY	957
113	45 26.2	- 1.60	- 3.01	- .777	- 4.37	-	-	2FY	958
113	46 4:29	- .408	- 1.43	- .921	- 1.35	-	-	2FY	959
113	047A	-	- .0579	-	- .0098	-	-	2FY	960
113	047	-	- .0579	-	- .0098	-	-	2FY	961
114	42	-	-	- 1.97	-2	-	-	2FY	962
114	43 5:70	- .134	- .116	- .730	- .142	-	-	2FY	963
114	44 26.1	- 1.04	- .811	- 1.79	- 1.79	-	-	2FY	964
114	45 29.5	- 1.81	- 2.62	- 1.20	- 3.77	-	-	2FY	965
114	46 8:57	- .811	- 2.17	- .197	- 2.05	-	-	2FY	966
114	47 9:14	-25.22	-2.445	-	- .249	-	-	2FY	967
114	48	-	-	-	-	-	-	2FY	968
115	43 1:75	- 1.03	-2	- .302	-	-	-	2FY	969
115	44 17.0	- .559	- .452	- 1.34	- .738	-	-	2FY	970
115	45 33.6	- 1.67	- 2.37	- 1.55	- 2.78	-	-	2FY	971
115	46 17.0	- 1.28	- 3.06	- .509	- 2.58	-	-	2FY	972
115	047A.8779	- .1236	- .0520	- .0027	- .3031	-	-	2FY	973
115	047 .8779	- .1236	- .0520	- .0027	- .3031	-	-	2FY	974
115	048A	-	- .0100	-	-	-	-	2FY	975
115	048	-	- .0100	-	-	-	-	2FY	976
115	049A	-	-	-	-	-	-	2FY	977
115	049	-	-	-	-	-	-	2FY	978
116	43 9:03	-2	-	- 7.14	-2	-	-	2FY	979
116	44 6:47	- .240	- 7.32	-2.875	- .282	-	-	2FY	980
116	45 29.1	- 1.26	- 1.23	- 1.68	- 1.90	-	-	2FY	981

116	46 25.7	- 1.65	- 2.79	- .875	- 3.01	-	-	2FY	982
116	47 5.62	- .552	- 1.64	- 7.14	-21.25	-	-	2FY	983
116	48	- 1.02	-2.219	-	- 5.57	-2	-	2FY	984
117	43	-	-	- .52	-2	-	-	2FY	985
117	44 3.90	- 5.1	-3	- .473	- 2.58	-2	-	2FY	986
117	45 22.1	- .791	- .694	- 1.47	- 1.01	-	-	2FY	987
117	46 30.1	- 1.76	- 2.41	- 1.27	- 2.84	-	-	2FY	988
117	47 11.0	- 1.01	- 2.41	- .285	- 2.04	-	-	2FY	989
117	048A.1405	- .0671	- .3075	-	- .1828	-	-	2FY	990
117	048 .1405	- .0671	- .3075	-	- .1828	-	-	2FY	991
117	049A	-	-	-	-	-	-	2FY	992
117	049	-	-	-	-	-	-	2FY	993
117	050A	-	-	-	-	-	-	2FY	994
117	050	-	-	-	-	-	-	2FY	995
118	44 .578	-	-	- .173	-	-	-	2FY	996
118	45 12.9	- .375	- .226	- 1.06	- .461	-	-	2FY	997
118	46 31.3	- 1.50	- 1.69	- 1.58	- 2.24	-	-	2FY	998
118	47 19.8	- 1.48	- 2.88	- .642	- 2.72	-	-	2FY	999
118	48 2.93	- .364	- 1.27	- 1.73	-2.840	-	-	2FY	1000
118	049A	-	- .8385	-	- .0061	-	-	2FY	1001
118	049	-	- .8385	-	- .0061	-	-	2FY	1002
119	44	-	-	- 1.74	-2	-	-	2FY	1003
119	45 6.08	- .145	- 1.85	-2.645	- .111	-	-	2FY	1004
119	46 26.3	- 1.05	- .970	- 1.58	- 1.41	-	-	2FY	1005
119	47 28.4	- 1.78	- 2.90	- 1.07	- 2.96	-	-	2FY	1006
119	048A3.7725	- .3879	- 1.1404	- .0842	- .8122	-	-	2FY	1007
119	048 3.7725	- .3879	- 1.1404	- .0842	- .8122	-	-	2FY	1008
119	049A	- .0204	- .2184	-	- .0990	-	-	2FY	1009
119	049	- .0204	- .2184	-	- .0990	-	-	2FY	1010
119	050A	-	-	-	-	-	-	2FY	1011
119	050	-	-	-	-	-	-	2FY	1012
120	45 2.20	- 1.79	-2	- .285	-	-	-	2FY	1013
120	46 18.2	- .585	- .494	- 1.27	- .694	-	-	2FY	1014
120	47 33.5	- 1.72	- 2.58	- 1.47	- 2.62	-	-	2FY	1015
120	48 15.9	- 1.31	- 2.34	- .473	- 2.42	-	-	2FY	1016
120	49 1.26	- .242	- 1.12	- 5.2	-3.562	-	-	2FY	1017
120	50	-	- 2.13	-2	-	-	-	2FY	1018
121	45 .142	-	-	-	-	-	-	2FY	1019
121	46 10.0	- .271	- .134	- 7.24	-2.279	-	-	2FY	1020
121	47 32.2	- 1.38	- 2.26	- .887	- 1.88	-	-	2FY	1021
121	48 26.6	- 1.76	- 5.12	- 1.70	- 2.98	-	-	2FY	1022
121	049A2.7441	- .2918	- 1.5274	- .4293	- .6244	-	-	2FY	1023
121	049 2.7441	- .2918	- 1.5274	- .4293	- .6244	-	-	2FY	1024
121	050A	- .0050	- .2047	- .0351	- .0315	-	-	2FY	1025
121	050	- .0050	- .2047	- .0351	- .0315	-	-	2FY	1026
122	46 3.42	- 4.06	-2	- .310	- 1.2	-3	-	2FY	1027
122	47 23.1	- 1.11	- 1.13	- 1.38	- .901	-	-	2FY	1028
122	48 36.6	- 2.82	- 5.18	- 1.60	- 2.90	-	-	2FY	1029
122	49 15.2	- 1.85	- 5.88	- .513	- 2.40	-	-	2FY	1030
122	50 .677	- .289	- 1.71	- 5.7	-3.493	-	-	2FY	1031
122	051A	-	- .0093	-	-	-	-	2FY	1032
122	051	-	- .0093	-	-	-	-	2FY	1033
123	46 .738	-	-	- .202	-	-	-	2FY	1034
123	47 16.5	- 1.00	- .694	- 1.23	- .588	-	-	2FY	1035
123	48 39.9	- 3.78	- 5.19	- 1.83	- 2.86	-	-	2FY	1036
123	049A12.6417	- 1.8505	- 4.5006	- .3611	- 1.7563	-	-	2FY	1037
123	049 12.6417	- 1.8505	- 4.5006	- .3611	- 1.7563	-	-	2FY	1038
123	050A1.8762	- .4443	- 1.9856	- .0001	- .5431	-	-	2FY	1039
123	050 1.8762	- .4443	- 1.9856	- .0001	- .5431	-	-	2FY	1040
123	51	-	- .232	-	- 1.53	-2	-	2FY	1041

124	46	-	-	- 2.20	-2	-	-	2FY	1042
124	47 8:50	- .516	- 7.28	-2.814	- 1.75	-2	-	2FY	1043
124	48 36.8	- 3.74	- 3.82	- 2.00	- 2.21	-	-	2FY	1044
124	49 39.7	- 6.00	- 11.4	- 1.34	- 4.65	-	-	2FY	1045
124	50 10.6	- 2.52	- 8.84	- .220	- 2.52	-	-	2FY	1046
124	051B	- .420	- .5736	-	- .1039	-	-	2FY	1047
124	051A	- .420	- .5736	-	- .1039	-	-	2FY	1048
124	051	- .420	- .5736	-	- .1039	-	-	2FY	1049
124	52	-	-	-	-	-	-	2FY	1050
125	47 3:39	- 6.64	-2	- .399	-	-	-	2FY	1051
125	48 28.0	- 3.22	- 2.28	- 1.77	- .154	-	-	2FY	1052
125	49 51.4	- 9.22	- 11.9	- 2.06	- 5.81	-	-	2FY	1053
125	050A12.1903	- 3.4823	- 7.8404	- .3204	- 2.7359	-	-	2FY	1054
125	050 12.1903	- 3.4823	- 7.8404	- .3204	- 2.7359	-	-	2FY	1055
125	51 1:94	- 1.25	- 5.15	- 7.4	-21.25	-	-	2FY	1056
125	052A	-	- .0499	-	-	-	-	2FY	1057
125	052	-	- .0499	-	-	-	-	2FY	1058
126	47 .247	-	-	- .118	-	-	-	2FY	1059
126	48 17.3	- 2.39	- .561	- 1.45	- .914	-	-	2FY	1060
126	49 55.8	- 11.9	- 9.43	- 2.77	- 5.58	-	-	2FY	1061
126	50 46.1	- 14.9	- 21.4	- 1.45	- 8.30	-	-	2FY	1062
126	051A4:7557	- 2.3588	- 6.4149	- .0571	- 1.6243	-	-	2FY	1063
126	051 4:7557	- 2.3588	- 6.4149	- .0571	- 1.6243	-	-	2FY	1064
126	52	- 7.16	-21.68	-	- .108	-	-	2FY	1065
127	47	-	-	- 1.8	-2	-	-	2FY	1066
127	48 9:75	- .750	-	- 1.62	- .205	-	-	2FY	1067
127	49 55.2	- 10.2	- 6.14	- 5.04	- 6.10	-	-	2FY	1068
127	50 77.0	- 22.0	- 24.5	- 4.34	- 15.8	-	-	2FY	1069
127	51 27.3	- 12.0	- 24.5	- .978	- 10.6	-	-	2FY	1070
127	052A.3517	- .7626	- 3.1260	-	- .8832	-	-	2FY	1071
127	052 .3517	- .7626	- 3.1260	-	- .8832	-	-	2FY	1072
127	53	-	-	-	-	-	-	2FY	1073
128	48 8:38	- 1.80	-	- 3.01	- .216	-	-	2FY	1074
128	49 62.8	- 16.7	- 6.35	- 13.4	- 20.2	-	-	2FY	1075
128	50 107.	- 33.0	- 30.9	- 15.5	- 69.7	-	-	2FY	1076
128	051A23.6280	- 8.4897	- 19.0409	- 2.4198	- 31.1660	-	-	2FY	1077
128	051 23.6280	- 8.4897	- 19.0409	- 2.4198	- 31.1660	-	-	2FY	1078
128	52 2:80	- 1.80	- 11.6	- 5.55	-213.4	-	-	2FY	1079
128	53	-	- .165	-	-	-	-	2FY	1080
129	48 5:16	- .239	-	- 4.55	-	-	-	2FY	1081
129	49 68.0	- 16.7	- 6.85	- 27.8	- 26.2	-	-	2FY	1082
129	50 136.	- 54.1	- 41.8	- 41.3	- 113.3	-	-	2FY	1083
129	51 74.3	- 44.7	- 62.3	- 16.9	- 122.	-	-	2FY	1084
129	052A4:5350	- 4.6617	- 12.2187	- .2202	- 16.4459	-	-	2FY	1085
129	052 4:5350	- 4.6617	- 12.2187	- .2202	- 16.4459	-	-	2FY	1086
129	53	-	- .808	-	-	-	-	2FY	1087
129	054A	-	-	-	-	-	-	2FY	1088
129	054	-	-	-	-	-	-	2FY	1089
130	48 2:22	-	-	- 3.78	-	-	-	2FY	1090
130	49 66.1	- 13.7	- 8.28	- 46.3	- 24.8	-	-	2FY	1091
130	50 172.	- 71.8	- 68.1	- 88.8	- 130.	-	-	2FY	1092
130	51 115.	- 92.9	- 126.	- 46.3	- 168.	-	-	2FY	1093
130	52 18.9	- 31.1	- 59.5	- 3.78	- 56.2	-	-	2FY	1094
130	53	- .591	- 4.73	-	- 1.07	-	-	2FY	1095
131	48 .628	-	-	- 1.48	-	-	-	2FY	1096
131	49 58.8	- 21.7	- 3.28	- 54.8	- 16.6	-	-	2FY	1097
131	50 203.	- 120.	- 73.3	- 135.	- 124.	-	-	2FY	1098
131	51 179.	- 161.	- 77.6	- 114.	- 211.	-	-	2FY	1099
131	052A19.6148	- 28.7225	- 61.0936	- 7.1626	- 47.2058	-	-	2FY	1100
131	052 19.6148	- 28.7225	- 61.0936	- 7.1626	- 47.2058	-	-	2FY	1101

131	53	- 1.16	- 16.6	-	- 5.53	-	-	2FY	1102
131	054A	-	-	-	-	-	-	2FY	1103
131	054	-	-	-	-	-	-	2FY	1104
132	48	-	-	- .705	-	-	-	2FY	1105
132	49 23.7	- 5.50	-	- 63.4	- 2.11	-	-	2FY	1106
132	50 144.	- 100.	- 17.4	- 197.	- 82.4	-	-	2FY	1107
132	51 216.	- 233.	- 117.	- 170.	- 232.	-	-	2FY	1108
132	52 83.0	- 138.	- 186.	- 38.3	- 166.	-	-	2FY	1109
132	53 2:79	- 19.1	- 76.9	-	- 29.4	-	-	2FY	1110
132	54	-	- 3.44	-	-	-	-	2FY	1111
133	49 5:66	-	-	- 27.5	-	-	-	2FY	1112
133	50 126.	- 55.1	- 1.92	- 168.	- 41.5	-	-	2FY	1113
133	51 307.	- 220.	- 74.7	- 250.	- 202.	-	-	2FY	1114
133	052A96.8195	- 109.8063	- 106.9138	- 49.3636	- 124.3592	-	-	2FY	1115
133	052 96.8195	- 109.8063	- 106.9138	- 49.3636	- 124.3592	-	-	2FY	1116
133	53 28.6	- 53.4	- 151.	- 2.75	- 75.7	-	-	2FY	1117
133	054A	-	- 13.5933	-	- .5482	-	-	2FY	1118
133	054	-	- 13.5933	-	- .5482	-	-	2FY	1119
134	49	-	-	- .990	-	-	-	2FY	1120
134	50 33.1	- 7.01	-	- 89.1	- 2.52	-	-	2FY	1121
134	51 189.	- 123.	- 22.6	- 277.	- 98.7	-	-	2FY	1122
134	52 263.	- 274.	- 152.	- 239.	- 277.	-	-	2FY	1123
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145	56	122.	- 136.	- 159.	- 183.	- 80.1	-	-	2FY	1195
145	57	107.	- 177.	- 100.	- 95.5	- 127.	-	-	2FY	1196
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156 63 0.302E-05                                                    ERM  174
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159 62 0.271E-05                                                    ERM  176
158 63 0.630E-05                                                    ERM  177
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0.	0. -6	P

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13. ABSTRACT

This volume of the DELFIC (Defense Land Fallout Interpretive Code) documentation describes the Particle Activity Module. This module computes the distribution of fission-product and induced activities as a function of fallout particle size. Fractionation is accounted for by a modified radial-distribution model. Radioactive decay is computed from the Bateman equation.

DD FORM 1 NOV 65 1473 REPLACES DD FORM 1473, 1 JAN 64, WHICH IS OBSOLETE FOR ARMY USE.

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14. KEY WORDS	LINK A ROLE	LINK A WT	LINK B ROLE	LINK B WT	LINK C ROLE	LINK C WT
Fallout						
Fractionation						
DELFIC						
PAM						