BNL-8381

ENDF

Evaluated Nuclear Data File

Description and Specifications

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Preface

A series of formats and specifications such as contained in this report are constantly revised and updated as errors are found and new material is added. Indeed, the reader will find that several sections have yet to be prepared. To facilitate the updating, this report has been prepared in a loose leaf form and the pages have been numbered within major sections. When other sections have been completed, they will be distributed and can easily be inserted or replace obsolete sections.

Acknowledgments

The work reported in this document is a collection of the suggestions and ideas of many people who participated in a series of three meetings held to develop an Evaluated Nuclear Data File (ENDF). The names and affiliations of these people are listed below.

Three people deserve particular mention: Jack Chernick of BNL for his support and encouragement; Paul Michael of BNL for the many lunch hours spent discussing the ENDF; and Ken Parker of Aldermaston for his help in assigning reaction classifications. The Aldermaston/Winfrith data file developed by Dr. Parker served as a model for the ENDF reported here and many features have been incorporated without alteration.

The author would like to thank the Reactor Mathematics and Computation Division of the American Nuclear Society for their cooperation, support, and sponsorship of the first two discussion meetings.

Finally, the author would not be involved with the ENDF were it not for a stimulating evening at the Colony Restaurant in Washington, D. C. with Al Henry of Westinghouse and George Joanou of General Atomic. The discussion that evening led to requesting the RMC division to sponsor the meetings.

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1. Introduction

This report is a description of a punched card/magnetic tape system for storing and distributing evaluated nuclear data. In the next few sections of this introduction we will describe some of the background of this work, define evaluated data, discuss the general design philosophy, and finally discuss the development of the system.

1.1 Review of the Discussion Meetings

Historically, the preparation of nuclear data (cross sections, etc.) for use in reactor calculations has been done by the individual laboratory stressing its own needs for materials, cross section types, and energy ranges. Each laboratory has developed its own methods for the storage and retrieval of this data. There is a need for a common link, an Evaluated Nuclear Data File (ENDF), between these existing systems. The Reactor Mathematics and Computation (RMC) division of the American Nuclear Society has sponsored two meetings to discuss this common link.

On July 19, 1963, a group of eighteen representatives from fifteen U.S. laboratories met in New York City to review existing cross section libraries and discuss means for interchanging these libraries. A subcommittee was appointed and met at Hanford on September 18-20, 1963 to examine library formats in more detail. The conclusions of these discussions were:

1. A need exists for a standard format for evaluated nuclear data.

2. The format should be as flexible as possible so that existing libraries can be translated into the standard format.
3. The format should be as flexible as possible so that future needs can be easily incorporated.
4. A center should be established and charged with the development and maintenance of the ENDF, and the collection and distribution of data.

Following these meetings a preliminary report containing detailed formats for the ENDF was prepared and sent to about 20 laboratories for review and comment. A group of 22 people were invited to attend a final meeting at BNL on May 4-5, 1964 to discuss changes in the preliminary formats and settle on a final version.

1.2 Definition of Evaluated Data

Much of the discussion concerning nuclear data and its role in reactor calculation is summarized in the flow diagram of Figure 1. The results of measurement and calculation of cross section are presently being collected at the BNL Sigma Center and are being stored on punched cards and magnetic tape. This raw data is then available to groups for evaluation. The evaluated data is sent to an ENDF center. From here it can be sent to individual laboratories and used to make up individual master libraries, special purpose libraries, and finally used in reactor codes. Note that the ENDF does not replace existing master libraries but forms a common link between them.

The distinction between raw and evaluated data is somewhat tenuous. A set of experimental points is raw data. If

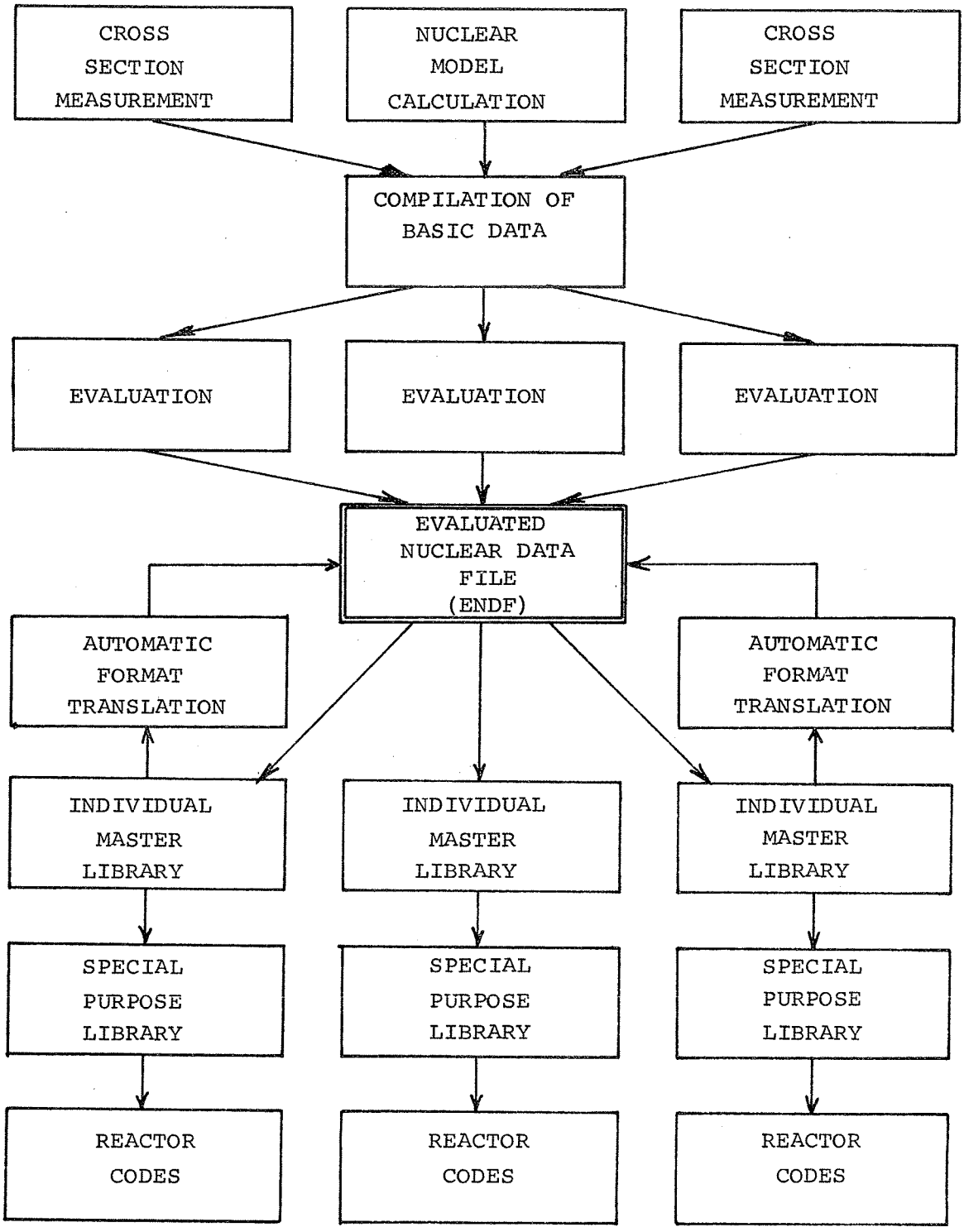

CROSS SECTION MEASUREMENT
NUCLEAR MODEL CALCULATION
CROSS SECTION MEASUREMENT
COMPILATION OF BASIC DATA
EVALUATION
EVALUATION
EVALUATION
EVALUATED NUCLEAR DATA FILE (ENDF)
AUTOMATIC FORMAT TRANSLATION
AUTOMATIC FORMAT TRANSLATION
INDIVIDUAL MASTER LIBRARY
INDIVIDUAL MASTER LIBRARY
INDIVIDUAL MASTER LIBRARY
SPECIAL PURPOSE LIBRARY
SPECIAL PURPOSE LIBRARY
SPECIAL PURPOSE LIBRARY
REACTOR CODES
REACTOR CODES
REACTOR CODES

Figure 1

someone draws a smooth curve through the points and reports a set of points from the smooth curve and a rule for interpolation, this is evaluated data. For the purposes of the ENDF, we adopt a methematical definition: Evaluated data is a complete description of a function within a given domain. For example, for a given range of incident neutron energies, the data must be given such that a cross section can be calculated at every interior point in the range. This can be accomplished by giving a set of discrete values plus an interpolation formula, or by giving the coefficients of a built-in analytical expression. Thus, we visualize the data as a mathematical function, $y(x_1, x_2, x_3...)$, where y can be a cross section, a probability, etc., and the x_1, x_2, x_3 are the variables incident energy, final energy, angle, etc. These variables have been ordered in such a way that, in a tabulation, x_1 is the most rapidly moving variable, x_2 is the next rapidly moving, and so on.

1.3 Design Philosophy

If the ENDF is to serve as a common link between libraries, it must be highly flexible and be able to accept nearly all existing data with a minimum of rearrangement. If this goal can be met, then translation from tape to tape of an existing library to the ENDF will be practical.

Flexibility is also essential if the ENDF is to easily accomodate future data. At present most data is in the form of $\sigma(E)$ and $\sigma(E,\mu)$. More complex reactions such as $\sigma(E^1 \rightarrow E,\mu)$ and multiparticle correlation functions are now being measured and computed by nuclear model calculations. The ENDF must be able to handle these multidimensional functions. The quantity

of data required to tabulate a multidimensional function could easily become so vast that it would be impractical to include it in the ENDF. There is hope, however, that much of this data can be fit with analytic forms. Thus the ENDF should be able to handle analytic as well as tabulated data.

The smallest unit of data which will be distributed is called a Data Record. The Data Record should contain sufficient Hollerith information to identify the data. The Data Record should also contain numerical data equ ivalent to the Hollerith information. Dictionaries are then required which have the advantage that they are easily extended to meet future needs.

To meet the above requirements, the ENDF formats will not be simple and this will be the main objection to the ENDF. Two steps will be taken to minimize difficulties caused by the complexity of the formats. First, a set of retrieval subroutines will be written which will decode the formats. They will be written in Fortran II and should be useable by most installations. The need for each installation to write their own retrieval system can be largely eliminated. A second step is to use a simplified sub-set of the formats. The sub-set (Version B) could be obtained by automatic translation from the complete formats (Version A).

2. General Description of the ENDF

A brief description of the ENDF will be given in the following pages. Detailed formats are given in Section 4.

The unit of data which we consider is called a Data Record and is defined as the data for a given

1. Isotope,
2. Reaction,
3. Range of incident energy, and
4. Evaluation.

Thus, the fission cross section of U^{235} between 0 and 10 ev obtained from the smooth curve in BNL 325 could be contained in a Data Record. All data included in the ENDF must be in the form of Data Records.

From a mathematical point of view, a Data Record contains a function $y(x_1,x_2,x_3 \ldots)$. For example, $\sigma(E)$, $S(\alpha,\beta)$, $\sigma(E,\mu)$, $\sigma(E'\rightarrow E,\mu)$, $P(E'\rightarrow E)$, etc. Thus, y may be a cross section, a probability, the thermal scattering law, or even $\sqrt{E}$ times a cross section. The variables x_1,x_2, ... are associated with the variables E,E',μ,α,β,T, etc. The order in which these variables are listed is important, for in a tabulation, x_1, is the most rapidly moving variable, x_2 the next most rapidly moving, and so on. As an example, consider the elastic angular distribution, $\sigma(E,\mu)$. Associate y with σ, x_1 with E, and x_2 with μ. This implies that the data is arranged as follows.

$\sigma(E_1, \mu_1)$, $\sigma(E_2, \mu_1)$, $\sigma(E_3, \mu_1)$, ... $\sigma(E_n, \mu_1)$

$\sigma(E_1, \mu_2)$, $\sigma(E_2, \mu_2)$, $\sigma(E_3, \mu_2)$, ... $\sigma(E_n, \mu_2)$

....

$$\sigma(E_n, \mu_m)\ ,\ \sigma(E_2, \mu_m)\ ,\ \sigma(E_3, \mu_m)\ ,\ \ldots\ \sigma(E_m, \mu_m)$$

If we had written $\sigma(\mu, E)$, the arrangement would be

$$\sigma(E_1, \mu_1)\ ,\ \sigma(E_1, \mu_2)\ ,\ \sigma(E_1, \mu_3)\ ,\ \ldots\ \sigma(E_1, \mu_m)$$

$$\sigma(E_2, \mu_1)\ ,\ \sigma(E_2, \mu_2)\ ,\ \sigma(E_2, \mu_3)\ ,\ \ldots\ \sigma(E_2, \mu_m)$$

$$\ldots\ldots$$

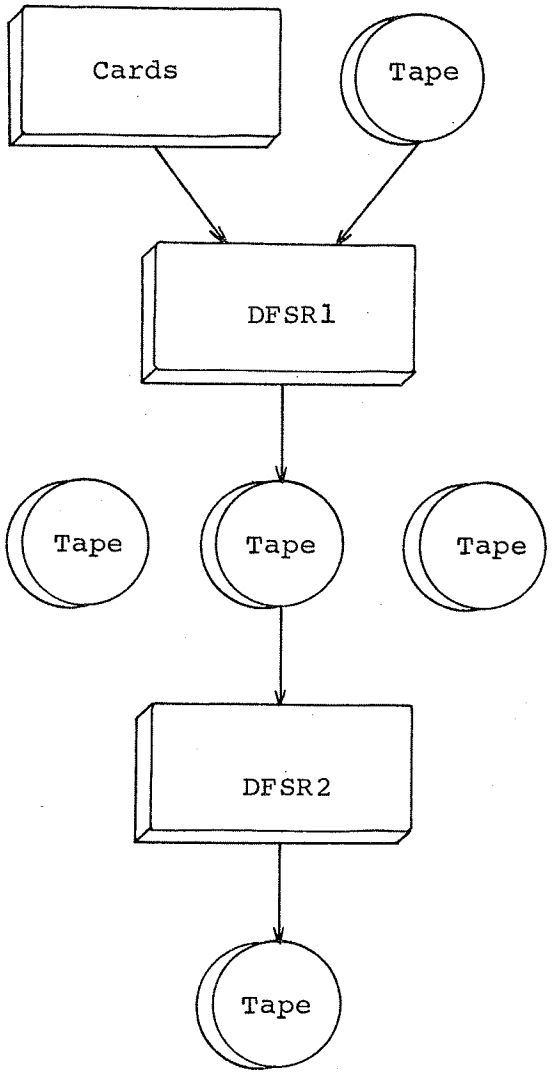
$$\sigma(E_n, \mu_1)\ ,\ \sigma(E_n, \mu_2)\ ,\ \sigma(E_n, \mu_3)\ ,\ \ldots\ \sigma(E_n, \mu_m)$$

2.1 Stroage and Transmission of Data Records

A Data Record exists physically as a deck of punched IBM cards. An ENDF Center will be established at BNL where the Data Records will be received and stored on magnetic tape. A schematic of this process and the distribution of data to individual installations is shown in Figure 2. A similar process at the individual installation is shown in Figure 3.

When a Data Record is received at the ENDF Center, a permanent identification number is assigned. This identification is in the form of an alphabetic character and a four digit number. The first Data Record received will be assigned the number A0001, the second A0002, etc. Periodically the ENDF Center will send out a Newsletter which will list the identification numbers on the Master Library Tape and a brief description of the contents of each Data Record. Data can be obtained from the ENDF Center by sending a list of the desired identification numbers and a magnetic tape.

ENDF Center Operation



Data Records on tape or cards from evaluator.
Order: random
Format: BCD card images

Program to put Data Records on Master Library tapes.

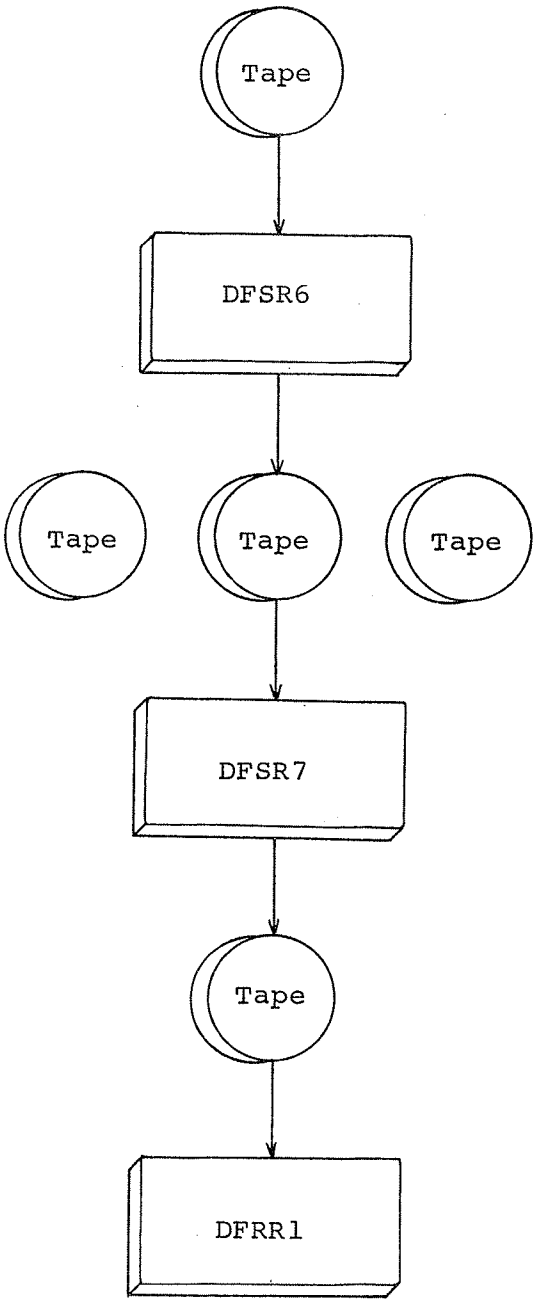
Master Library tapes.
Order: as received
Format: Packed card images

Program to read selected Data Records from Master Library tapes and write them on requestors tapes.

Requestors tape.
Order: Same as Master Library tape.
Format: Packed or unpacked card images.

Figure 2

Individual Installation Operation



Requestors tape from ENDF Center.
Order: Same as Master Library tape
Format: Packed or unpacked card images

Program to write packed or unpacked Data Records on Library tapes.

Installation Library tapes.
Order: Arbitrary
Format: Packed card images

Program to read selected Data Records from Library tapes and old Working Tape, order them, and write them on a new Working Tape.

Working Tape.
Order: Increasing Z, A, reaction type, and data type
Format: Card images

Retrieval Program to read Data Records into memory, unscramble formats, process data, form averages, etc.

Figure 3

Individual installations will probably maintain library tapes similar in format to those at the ENDF Center but with fewer Data Records. Selected records can be taken from these library tapes, ordered, and placed on a working tape. The working tape can also be made up directly from Data Records on cards. The working tape is then used as input data to the retrieved programs which will compute the cross sections (or averages) needed in later reactor calculations.

2.2 Organization of a Data Record

A Data Record is defined by giving the following information:

1. The isotope or material, i.e., U^{235}
2. The general reaction type, i.e., elastic scattering
3. Specific information concerning what data is given for this reaction and the secondary particles involved, i.e., angular distribution for the secondary neutron
4. The range of incident particle energies, i.e., 1-10 Mev.
5. The source of the evaluated data, i.e., reference to a report describing the data and evaluation procedures.

A separate Data Record must be used when any of this information changes. This information is given on a set of cards called Heading Cards.

The data for a reaction can be given as a set of parameters (i.e., resonance parameters) or as a data tabulation. We consider the data to describe a function of the form

$$y_s(x_1,x_2, \ldots.) = y_{s1}(x_1,x_2, \ldots.) \quad , \quad E_1 \leq E < E_2$$

$$= y_{s2}(x_1, x_2, \ldots) \quad , E_2 \leq E < E_3$$

etc.

For example, consider the (n,2n) reaction. There are two secondary particles; S=1 might refer to the first neutron, and S=2 might refer to the second neutron. The data for either neutron may be further subdivided by energy ranges having limits of E_1, E_2, E_3, etc. The function $y_{sn}(x_1, x_2 \ldots)$ is contained in a Data Block. The structure of a Data Record is shown in Figure 4. The control cards SEC and ENR will be described more fully in later sections.

2.3 The Heading Cards

The first few cards of each Data Record are called the Heading Cards. There may be between 4 and 15 of these cards.

The first Heading Card gives a full description of the Data Record in Hollerith. These cards are easily read, and a listing of the first Heading Cards of all Data Records on a library tape would provide complete documentation of the tape. Some examples are shown in Figure 5. The first Heading Card is divided into six major areas.

1. Isotope or material identification. (Cols. 1-5)
2. Physical description of the reaction. (Cols. 7-25)
   Example: (N,INELAS) 1,N AECR
   The symbol INELAS is the reaction type and denotes inelastic scattering. Other types such as elastic (ELAST), fission (FISS) are listed in Dictionary 3. The first character inside the parenthesis is the incident particle type (N meaning neutron in this case). Other particle types are given in Dictionary 2. The integer following the parenthesis is the final state number, in this case

Structure of a Data Record

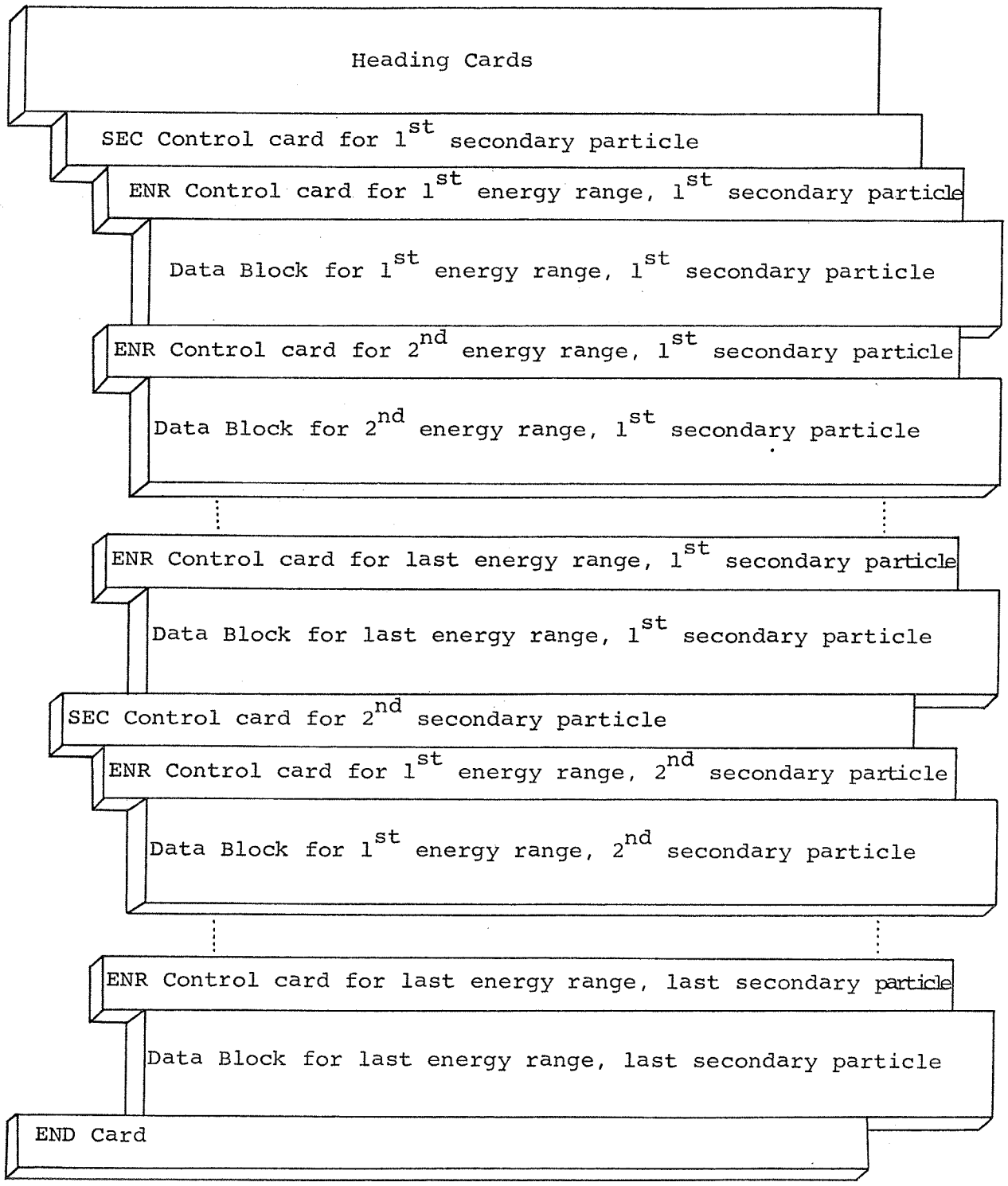


Figure 4

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 U238 (N,TOTAL )   ,  CROS C(EI       )BN BNL2015 10/62 1.000+2 2.000+6 EVA0267001
 U235 (N,ELAST )   ,N CROS C(EI       )BN BNL2020 11/62 1.000+0 1.500+6 EVA0268001
 U235 (N,ELAST )   ,N ANGD C(EI,CL    )BN ANL1056  9/61 1.000-2 1.500+0MEVA03     1
PU239 (N,NONEL )   ,N CROS C(EI       )BN BNL3066  4/63 2.000-2 1.500+0MEVA0597001
 U238 (N,INELAS) 2,N CROS C(EI       )MB BNL3086  4/63 0.100-0 1.000+1MEVA0599001
 U238 (N,INELAS)99,N ENED C(EI,EF    )BN BNL3087  5/63 0.100-0 1.000+0MEVA06     1
 U238 (N,INELAS)99,N AECR C(EI,EF,CL)BN BNL3088  5/63 0.100-0 1.000+1MEVA0601001
BE  9 (N,PAIR  )   ,N ENED C(EI,EF    )BN  GA6034 10/63 1.000-1 1.000+1MEVA06 4001
 U235 (N,FISS  )   ,  CROS C(EI       )BN HAN4201  7/62 1.000-1 1.000+1MEVA0603001
 U235 (N,NF    )   ,N CROS C(EI       )BN ANL5036  6/62 1.000-1 1.000+1MEVA06 5001
 U235 (N,2NF   )   ,N CROS C(EI       )BN BNL2012 12/63 1.000-1 1.000+1MEVA0606001
 U235 (N,FISS  )   ,N ENED P(EF       )   LAS5930  7/61 1.000-1 1.000+1MEVA06 7001
 U238 (N,3NA   )   ,N CROS C(EI       )BN LIV8061  8/62 1.000-1 1.000+1MEVA0608001
```

Figure 5

indicating the nucleus is left in the 1^{st} excited state. The next character denotes the secondary particle, in this case a neutron. The term AECR describes the type of data given (in this case angle-energy correlation). Other types such as angular distribution (ANGD), energy distribution (ENED), cross section (CRØS) are given in Dictionary 5.

3. Mathematical description of the data. (Cols. 7-39)
   Example: C(CL,EF,EI)MB
   The symbol C(CL,EF,EI) defines the mathematical function $y(x_1,x_2,x_3)$ and is read $\sigma(\mu_L, E_f, E_i)$. Thus x_1 is defined to be μ_L (CL means cos θ, lab system), x_2 is E_f (EF means final energy), x_3 is E_i (EI means initial energy). A list of the various forms x is given in Dictionay 6. The symbol C is interpreted as σ. Other forms are given in Dictionary 4. The final symbol MB gives the units of σ (milli barns in this case). Other units are given in Dictionary 7.
4. Source of evaluated data. (Cols. 41-53)
   Example: BNL 8412 10/63
   The first three characters define the laboratory where the data was evaluated (see Dictionary 9). The following four digit number is to be assigned by the evaluator. The last characters are the date (month/year) of the evaluation.
5. Range of incident energy. (Cols. 55-72)
   Example: 1.000-6 1.000+2MEV
   The range illustrated here is 10^{-6} to 100 Mev. Other codes

for energy units are given in Dictionary 8.

6. Final reference and sequence numbers. (Cols. 73-80)
   Example: A2693 001
   The first five characters is the identification number assigned by the ENDF Center. When the deck is originally prepared, column 73 should be left blank, and 74-77 should contain the same number as in item 4. above (i.e., 8412).

The next three Heading cards are all numeric and contain the following information:

1. Number of cards in the Data Record.
2. Number of different secondary particle distributions given.
3. A code describing the format for punching data cards.
4. The number of comment cards used ($\leq$ 10).
5. The numerical equivalents (via the dictionaries) of all Hollerith fields on the first Heading card.
6. Atomic weight (C^{12} scale).
7. Reaction Q value.
8. Temperature.
9. Scale factor for all data in record.

The fifth Heading card is optional. If the evaluator wishes to punch his data cards in a format not given in Dictionary 16, the format is given on the fifth Heading card.

The remaining Heading cards (up to 10 of them) are comment cards and should contain a complete description of the evaluation, references, evaluators names, etc. Every effort should be made to make the information on these cards as complete as possible.

2.4 Control Cards

Two types of control cards were illustrated in Figure 4. These were the SEC (secondary particle) and ENR (energy range) control cards. There are also two other major control cards, the PDC (partial distribution) and END (end) control cards.

If more than one secondary particle distribution is given, the data for each secondary particle distribution must be preceeded by a SEC card. The information given on this card is:

1. The number of this secondary particle distribution.
2. The total number of secondary particle distributions given.

If the energy range given in the Heading card is to be subdivided, and data given for each subrange, an ENR card must head the data for each range. The information given on this card is:

1. The number of this energy range.
2. Total number of energy ranges given for this particle.
3. Upper and lower energy limits of this range.

If a distribution is to be represented as the sume of partial distributions, a PDC card must head the data for each distribution. The information given on this card is:

1. The number of this partial distribution.
2. Total number of partial distributions given for this particle in this energy range.
3. The probability for this partial distribution.

The last card in a Data Record must be an END card. When processed by the ENDF Center, the END card will contain a form of "checksum" of the Data Record to insure the future integrity of the deck.

Each of the control cards (except the END card) may be followed by up to 10 comment cards which can be used to further describe the secondary particle, energy range, or partial distribution.

A second class of control cards are the Data Control Cards (DCC) which are used in a Data Block. These cards are described in the following section.

2.5 Data Blocks

There are a variety of different Data Block types.

1. One dimensional tabulated function
2. Two " " "
3. Three " " "
4. Four " " "
5. Five " " "
6. One dimensional analytic function
7. Two " " "
8. Three " " "
9. Discrete (delta) function
10. Reduced variable
11. Resolved resonance parameters
12. Unresolved " "
13. Isotope production data

Each Data Block is headed by a Data Control Card (DCC). The information given (where appropriate) on a DCC is:

1. The symbol DCC and the Data Block type number.
2. Description of how data is arranged in the block.
3. Interpolation code (Dictionary 17).
4. Number of constants.
5. Length of data block.

6. Value of next higher order variable.

In certain cases the tabulated values of a function do not give a complete description of the function. For example, a common way to write the thermal scattering law is:

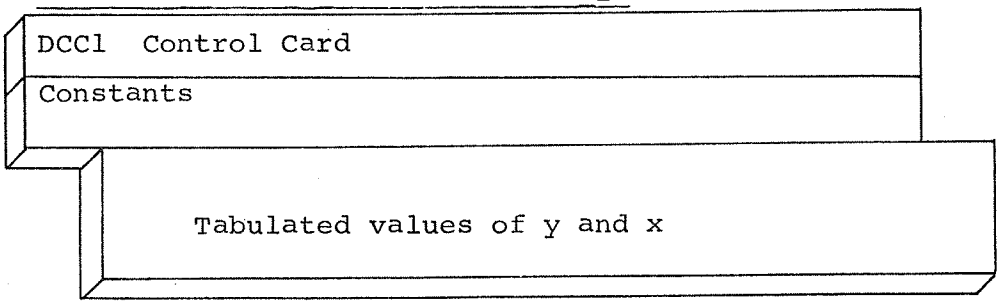
$$S(\alpha,\beta) = S^*(\alpha,\beta) + e^{-\lambda\alpha}\,\delta(\beta)$$

The $S^*(\alpha,\beta)$ is tabulated and λ is given on a Constants card. These Constants cards will be more important when analytic functions are discussed.

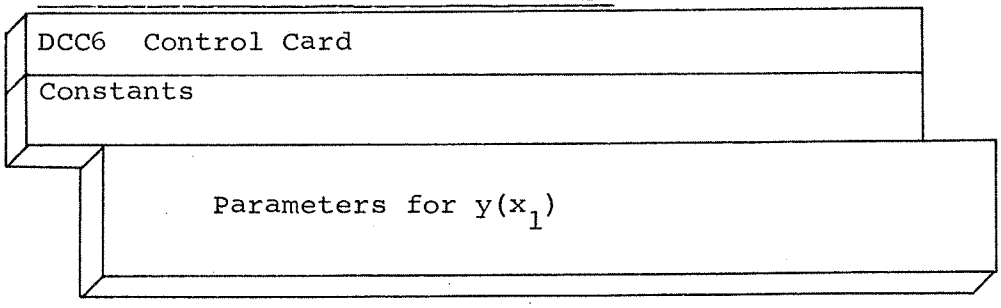
2.5.1 Data Blocks for tabulated functions

The notation $y(x_1,x_2,x_3, \ldots.)$ implies that x_1 is the fastest moving variable, x_2 is the next most rapidly moving variable, etc. Thus a two dimensional function $y(x_1,x_2)$ is a set of one dimensional functions $y(x_1)$, each at a different value of x_2. In the same way, an n dimensional function is a set of n-1 dimensional functions. In Figure 6 the Data Block for a one dimensional tabulated function is shown. The first card is a DCC 1 (DCC type 1) and the remaining cards have the tabulated values of y and x_1. A wide variety of ordering of this data is allowed. The Data Block for a tabulated two dimensional function $y(x_1,x_2)$ is shown in Figure 7 and is simply a DCC 2 card followed by Data Blocks for one dimensional tabulated functions each at successive values of x_2. It is obvious how higher order functions are built up. Note that in Figure 8a a three dimensional function $y(x_1,x_2,x_3)$ is shown. The tabulated aspect of the data refers only to the variable x_3. The $y(x_1,x_2)$ at a given x_3 may be analytic in x_2 and x_1.

a. Data Block for tabulated $y(x_1)$



b. Data Block for analytic $y(x_1)$



c. Data Block for analytic $y(x_1 , x_2)$

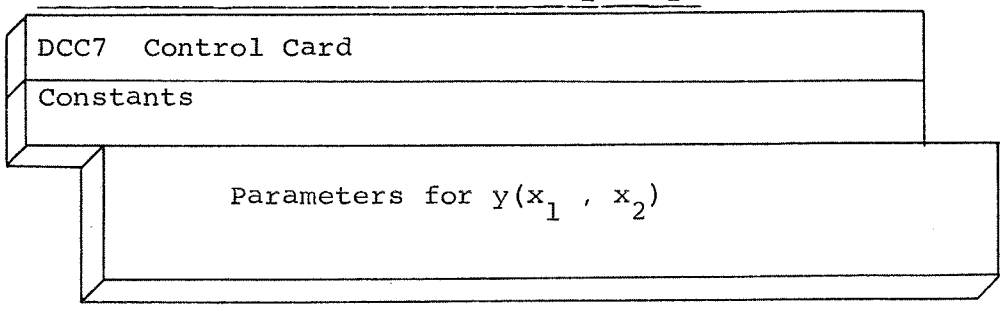


Figure 6

2.5.2 Data Blocks for Analytical Functions

If $y(x_1)$ is an analytic function, for example, a Legendre expansion

$$y(x_1) = \sum_{n=0}^{N} A_n P_n(x_1)$$

the required data is N, A_o, A_1, ...A_N. This data is divided into constants (c_n) and parameters (p_n). In this case the constant is $c_1 = N$ and the parameters are $p_1 = A_o$, $p_2 = A_1$ .... . The distinction between constants and parameters is that parameters may be a function of lower order variables and constants cannot. For example

$$y(x_1, x_2) = \sum_{n=0}^{N} A_n(x_1) P_n(x_2)$$

The Data Block for an analytic $y(x_1)$ is illustrated in Figure 6b. The c_n and p_n are on separate sets of cards and if the p_n are functions of lower order variables (as in Figure 8b) a separate Data Block is used for each p_n.

To illustrate the various permutations that may be of interest, consider the elastic scattering cross section $\sigma(\mu, E)$.

1. $\sigma(\mu,E) = \sum_{n=0}^{N} A_n(E) P_n(\mu)$, $A_n(E)$ tabular

Identify $x_1 = \mu$, $x_2 = E$. Figure 7 is appropriate.

The data order is:

$A_o(E_1)$, $A_1(E_1)$, $A_2(E_1)$ ...

$A_o(E_2)$, $A_1(E_2)$, ...

.....

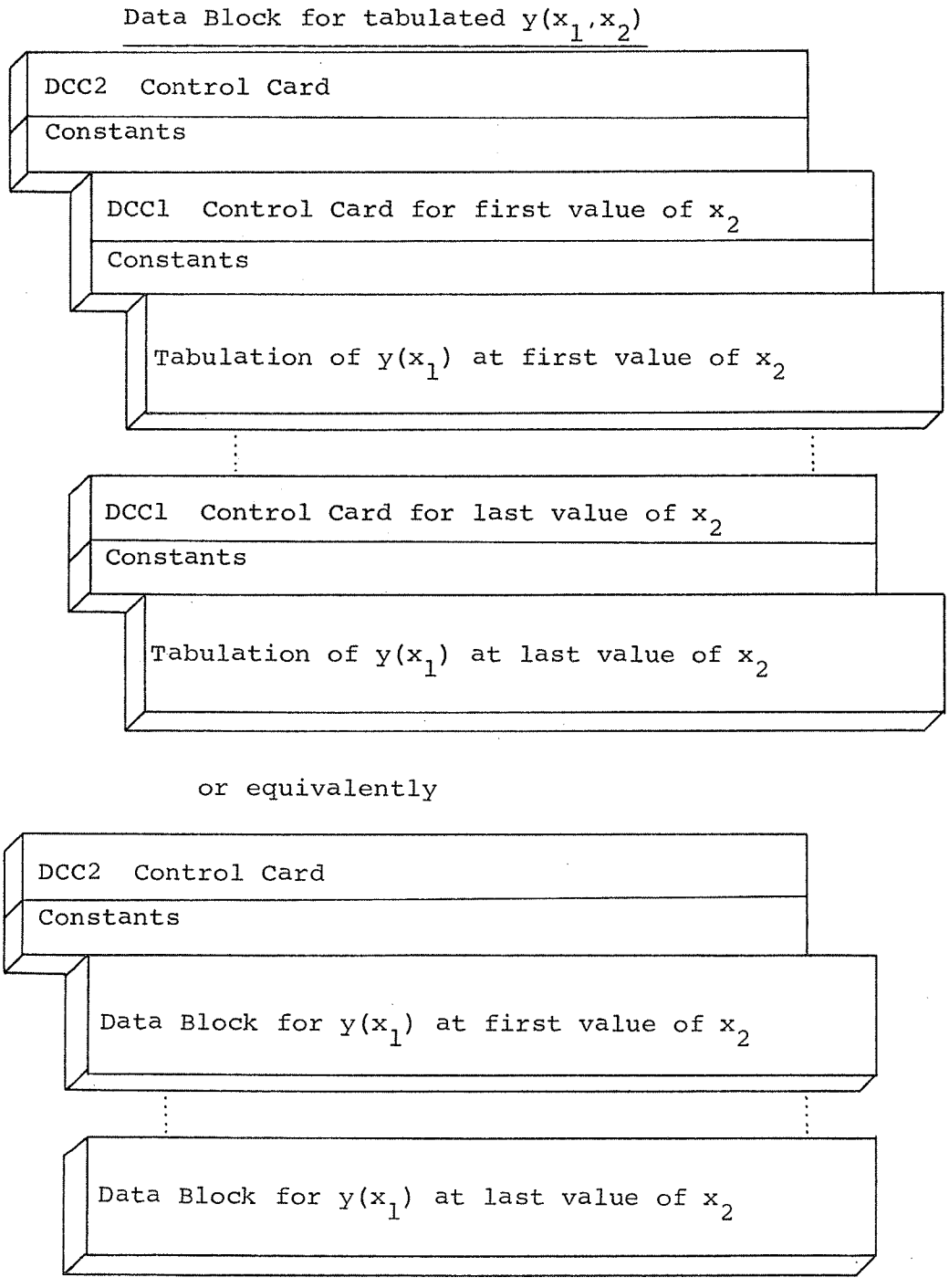
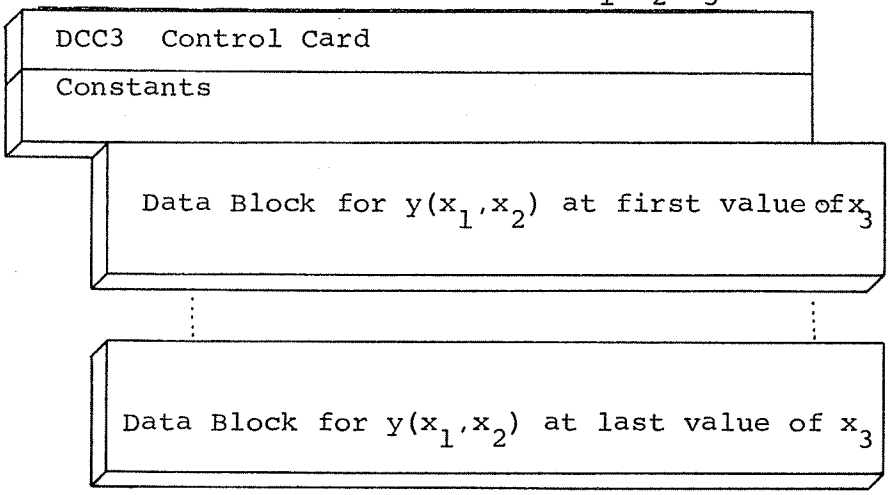

Data Block for tabulated $y(x_1, x_2)$
DCC2 Control Card
Constants
DCC1 Control Card for first value of x_2
Constants
Tabulation of $y(x_1)$ at first value of x_2
DCC1 Control Card for last value of x_2
Constants
Tabulation of $y(x_1)$ at last value of x_2
or equivalently
DCC2 Control Card
Constants
Data Block for $y(x_1)$ at first value of x_2
Data Block for $y(x_1)$ at last value of x_2

Figure 7

a. Data Block for tabulated $y(x_1,x_2,x_3)$



b. Data Block for $y(x_1,x_2)$ analytic with respect to x_2

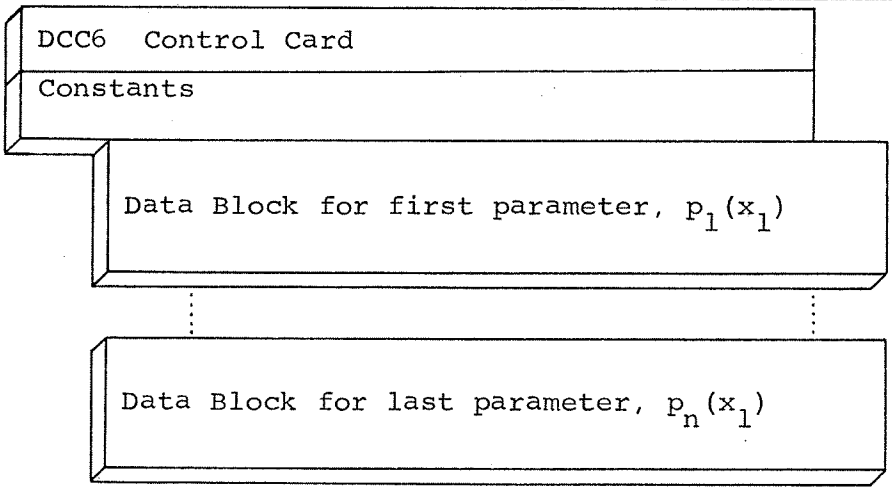


Figure 8

2. $\sigma(E, \mu) = \sum_{n=0}^{N} A_n(E)\ P_n(\mu)$, $A_n(E)$ tabular

Identify $x_1 = E$, $x_2 = \mu$. Figure 8b is appropriate.
The data order is:

$A_o(E_1)$, $A_o(E_2)$, $A_o(E_3)$ ...

$A_1(E_1')$, $A_1(E_2')$, $A_1(E_3')$ ...

.....

In this case it is not necessary that $E_1 = E_1'$, $E_2 = E_2'$, etc.
The following one dimensional analytic forms are available:

1. Power series
2. Two forms of a Legendre expansion
3. Rational approximation (ratio of two power series)
4. Two types of fission spectra
5. Single B-W formula with interference and a polynomial correction term
6.
7.
8.
9.

The following two dimensional analytic forms are available:

1. Double series expansion
2.
3.
4.
5.

2.5.3 Data Blocks for other nuclear data

Three other types of nuclear data can be specified by DCC's; resolved resonance parameters, unresolved resonance parameters, and

isotope production data.

The following formulas for resolved resonances are included:

1. Breit-Wigner formula for a single isolated level involving $\ell = 0$ neutrons.
2. Breit-Wigner formula for $\ell = 0$ neutrons and many levels when elastic scattering and radiative capture are the only important processes.
3. The Reich-Moore formula
4. The Vogt formula
5. Multilevel formula for neutrons of all ℓ in the case when only elastic scattering need be considered
6. Breit-Wigner formula for a single isolated level involving neutrons of any ℓ
7. The Adler formula
8.
9.

The isotope production data contains the following information:

1. Isotopes produced by first and second decay of this isotope
2. Isotopes produced by various nuclear reactions and the isotopes produced by first and second decay of these products
3. Fission product yields
4. Decay constants

2.5.4 Partial Distributions

The function contained in a Data Block may be represented as the sum of partial distributions. A PDC card must preceed each Data Block representing a partial distribution. An example is shown in Figure 9.

Data Block for tabulated $y(x_1, x_2)$

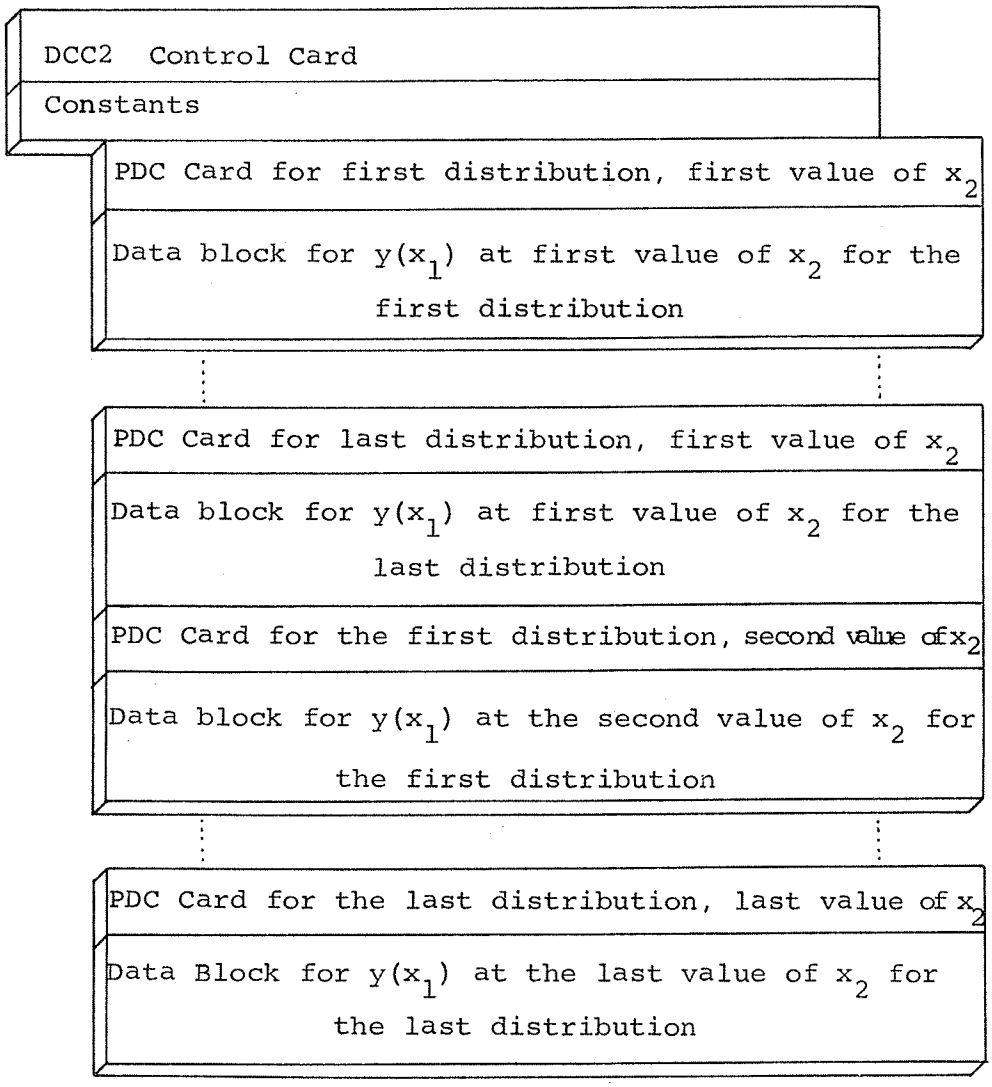


Figure 9

2.6 Versions of the ENDF

The ENDF cards will usually be prepared according to the detailed specifications given in Section 4. These cards will be called Version A and will contain considerable Hollerith information, and be quite general in format and units. The writing of an effective retrieval system for the data is greatly simplified if the data were more standardized. Thus it is envisioned that Version A decks will be converted automatically to another version, Version B. This conversion will be done by the ENDF center. The specifications for Version B are by no means complete, but the following are the anticipated alterations.

1. All Hollerith information will have an equivalent numeric representation. Appropriate fields have been provided for on Version A cards but they may be left blank originally.
2. Energy units will be electron volts and cross section units will be barns and brans/steradian.
3. All comment cards will be deleted except for those in the Heading Cards.
4. Data cards shall have a fixed format.
5. The data for a one dimensional tabulated function shall be put in the form of E_1, σ_1, E_2, σ_2, etc., that is, in energy-cross section pairs.

2.7 Error Detection

Considerable care must be taken to insure that the data is free from errors and that errors are not introduced during the various manipulations and distribution of the data records. Binary records on tape will always have a logical checksum associated with them. This checksum combined with the usual redundancy checking should be sufficient. A similar technique

will be used for BCD information on cards or tape. The last card in a Data Record will have the symbol END punched in the first three columns. The remainder of the card will contain a character count (Modulo 8) of the entire Data Record.

The problem of insuring that the original data is free from errors is quite difficult. Various methods have been used for other libraries and it is anticipated that the more successful of these will be applied to the ENDF.

3. ENDF Computer Programs

Two classes of computer programs are needed for the ENDF. The first class will consist of programs to manipulate, print, edit, copy, and correct complete Data Records. The programs are called Service Routines and are designated by the symbol DFSR (Data File Service Routine). The second class of programs will take a Data Record, unscramble it, and compute desired values or averages of the data. The programs are called the Retrieval Routines and are designated by the symbol DFRR (Data File Retrieval Routine).

3.1 Service Routines

The Service Routines are concerned mainly with Data Records as complete units and rarely are concerned with the details within a Data Record. They are used to move Data Records from cards to tapes, tapes to tapes, and tapes to cards. In all of the manipulation, the Data Record is in the form of card images.

The following routines are needed (also refer to Figures 2 and 3 in Section 2).

DFSR1 - Takes Data Records from cards or input tape and puts them on a Master Library tape in the form of packed card images. Various checking and sequencing operations are also done.

DFSR2 - Reads selected Data Records from the Master Library tape and puts them on a requestors tape in the form of packed or unpacked card images.

DFSR3 - Makes corrections on the Master Library tape. These corrections may be individual cards or complete Data Records.

DFSR4 - Print/punch/copy selected portions of the Master Library tape.

DFSR5 - Prints a list describing what Data Records are on the Master Library tape. This list is ordered by isotope, reaction type, and type of data given.

DFSR6 - Takes Data Records received at an individual installation from the ENDF center and creates a Library tape for the installation.

DFSR7 - Select Data Records from the installation Library, order them by isotope, reaction type, and data type and place them on a working tape which will be input to the Retrieval Routines.

The first five programs are intended for the ENDF center and are written largely in Fortran II. The last two programs are used at individual installations and are written entirely in Fortran II.

3.2 Retrieval Routines

The Retrieval Routines will be written entirely in Fortran II and will be in the form of subroutines. Users will then write a control program using the Retrieval Routines which will prepare the data in the form they want. The specifications for the Retrieval Routines have not been completed but the following description should provide a rough indication of how they can be used.

The users program calls the retrieval subroutine and provides a list of arguments. These arguments will be:

1. A description of what Data Records are to be used. For example, the sequence 0.001, A0256, 10.0, A0392, 1000., A0256, 1.0E+7 might indicate that in the range of incident energies from 0.001 ev to 10 ev, Data Record A0256 is to be used, from 10 to 1000 ev Data Record A0392 is to be used. An alternate description might be "use what is on the working tape in the order that exists there".
2. A description of what information is desired. The request might be for:
   a. the data as it stands
   b. values of the function at given values of the arguments
   c. averages of the data given a weighting function
3. Input data to the retrieval subroutine. When required, this would be values of the arguments (for 2b above), or energy ranges and weights (for 2c above).
4. information telling the retrieval subroutine where and in what order to store the data.

The user will generally not need to know the details in the Data Records. If his request is for $\sigma_{elastic}(E)$ at various values of E, and the Data Record contains $\sigma_{elastic}(E,\mu)$, the angular integration will be done automatically.

The Retrieval Routines will be developed in various stages. The first stage will handle only the simplest types of data such as tabulated $\sigma(E)$ and $\sigma(E,\mu)$. This first stage should be completed by the spring of 1965 and be available in the summer of 1965. A complete retrieval program will be completed by mid-1966.

4. Detailed Card Formats

The following section gives the detailed card formats for the ENDF. Before that, a few general remarks are necessary.

A variety of formats are available for punching data cards. Built-in formats are given in Dictionary 16, but the user may supply his own format. Once this format is specified it must be used for all data cards in the Data Record except for Heading and Control card which have a fixed format. Where practical the A/W format (NCDF = 1) should be used. If the user supplies his own format, it should consist entirely of fixed or floating point fields (not integers). Integers when used should be punched as floating point numbers.

The notation [ ] means "a deck of cards". Suppose the data were given as $[a_1, a_2, a_3, a_4]$, $[b_1, b_2, b_3]$. If the format selected provided for 4 or more words/card, the data would be punched

card 1 a_1 a_2 a_3 a_4

card 2 b_1 b_2 b_3

If the format required 3 words/card, the data would be punched

card 1 a_1 a_2 a_3

card 2 a_4

card 3 b_1 b_2 b_3

The field numbers in many of the following pages contain an *. These fields are numerical equivalents (via the dictionaries) of the Hollerith fields. The fields marked with an * may be left blank. When the decks are converted to Version B, they will be automatically filled in.

It is advisable to sequence number the decks in columns 78-80. The numbering should start with 000. The maximum number of cards allowed in a Data Record is 1000. If more cards are required the data should be broken up into two or more Data Records. The deck should also be labeled in columns 73-77. The use of an alphabetic character in column 73 should be avoided. A convenient number to use as a label is the number given in Field 14 of the First Heading Card.

The units used for cross sections and energy are arbitrary but once selected must be uniform throughout the Data Record. Wherever possible, the units of barns and ev should be used. Atomic weights are based on the physical scale in which $C^{12} = 12.000000$. On this scale the neutron mass is 1.008665. Avogadro's number is 0.602295×10^{24}, but 0.6023×10^{24} is adequate for most work.

Confusion often arises about the value of a function outside of the given range. The ranges of incident energy are completely specified on the Heading Cards and Energy Range Cards, but no ranges are given for other variables such as final energy. The data given should reflect the fact that a distribution is zero by including the zeros in the data, and not limiting the data to the non-zero range and assuming it to be zero outside the range.

4.1 Heading Cards

The leading cards of a Data Record are the Heading Cards. The information given in these cards is:

1. Complete Hollerith description of the material, physical description of the reaction, mathematical description of the data, and brief description of the source of the data.
2. The numerical equivalents (from the dictionaries) of the above items.
3. The punched card format for the Data Record.
4. Further information about the source of data and the evaluation, applicable references, etc. This information is contained on Comment Cards and every effort should be made to include as complete a documentation of the data as possible.

First Heading Card

FIELD	DESCRIPTION	SYMBOL	FORMAT	COLUMNS
1	Chemical symbol (2 characters, Dictionary 1)	CHEMS	A2	1-2
2	Mass number (Integer ≤ 999)	MASSN	I3	3-5
	b(		2X	6-7
3	Incident particle type (1 character, Dictionary 2)	PART	A1	8
	,		1X	9
4	Reaction type (6 characters, Dictionary 3)	REAC	A6	10-15
	)		1X	16
5	Final state description (Integer ≤ 99, Dictionary 15)	NFS	I2	17-18
	,		1X	19
6	Secondary particle type (1 character, Dictionary 2)	SECP	A1	20
	b		1X	21
7	Type of data given (4 characters, Dictionary 4)	DTYP	A4	22-25
	b		1X	26
8	Form of the function y (1 character, Dictionary 5)	YFØRM	A1	27
	(		1X	28
9	Form of the variable x_1 (2 characters, Dictionary 6)	FX(1)	A2	29-30
	If more than 3 variables are needed, put the symbol xx here			
	and put entire list on the First Heading Card Extension.			

Form 1507

First Heading Card (Cont'd.)

FIELD	DESCRIPTION	SYMBOL	FORMAT	COLUMNS
	,		1X	31
10	Form of the variable x_2 (2 characters, Dictionary 6)	FX(2)	A2	32-33
	,		1X	34
11	Form of the variable x_3 (2 characters, Dictionary 6)	FX(3)	A2	35-36
	)		1X	37
12	Cross section units (2 characters, Dictionary 7)	CSUN	A2	38-39
	b		1X	40
13	Installation code (3 characters, Dictionary 9)	EVAL	A3	41-43
14	Identification number assigned by evaluator (Integer ≤ 9999)	IDEV	I4	44-47
	b		1X	48
15	Month data was prepared (Integer ≤ 12)	NEMØ	I2	49-50
	/		1X	51
16	Year (last 2 digits) data was prepared (Integer ≤ 99)	NEYR	I2	52-53
	b		1X	54
17	Lowest energy, x.xxx+y, where x.xxx is an unsigned four	ELØW	E7.3	55-61
	digit number, and +y is a signed one digit exponent			
	b		1X	62

Form 1507

First Heading Card (Cont'd.)

FIELD	DESCRIPTION	SYMBOL	FORMAT	COLUMNS
18	Highest energy (same form as field 17)	EHIGH	E7.3	63-69
19	Energy units (3 characters, Dictionary 8)	ENUN	A3	70-72

Form 1507

First Heading Card (Extension) If there are more than 3 variables, put the symbol xx in field 9 of First Heading Card and write entire list on this card. Otherwise, omit this card.

FIELD	DESCRIPTION	SYMBOL	FORMAT	COLUMNS
1	Form of the function y (1 character, Dictionary 5)	YFØRM	A1	1
	(		1X	2
2	Form of the variable x_1 (2 characters, Dictionary 6)	FX(1)	A2	3-4
	,		1X	5
3	Form of the variable x_2 (2 characters, Dictionary 6)	FX(2)	A2	6-7
	,		1X	8
4	Form of the variable x_3 (2 characters, Dictionary 6)	FX(3)	A2	9-10
	,		1X	11
5	Form of the variable x_4 (2 characters, Dictionary 6)	FX(4)	A2	12-13
	,		1X	14
6	Form of the variable x_5 (2 characters, Dictionary 6)	FX(5)	A2	15-16
	)		1X	17

Form 1507

Second Heading Card This card contains information about the length of the Data Record, number of secondaries, and numerical equivalents of fields on the First Heading Card.

FIELD	DESCRIPTION	SYMBOL	FORMAT	COLUMNS
1	Number of cards in Data Record	NCIDR	I5	1-5
2	Number of secondary particle distributions given	NSECX	I5	7-11
3*	Value of NATØM corresponding to CHEMS from Dictionary 1	NATØM	I5	13-17
4*	Value of MASSN	MASSNX	I5	19-23
5*	Value of NPART corresponding to PART from Dictionary 2	NIPT	I5	25-29
6*	Value of NREAC corresponding to REAC from Dictionary 3	NREAC	I5	31-35
7*	Value of NFX	NFSX	I5	37-41
8*	Value of NPART corresponding to SECP from Dictionary 2	NSPT	I5	43-47
9*	Value of NDTYP corresponding to DTYP from Dictionary 4	NDTYP	I5	49-53
10*	Value of NYFØR corresponding to YFØRM from Dictionary 5	NYFØR	I5	55-59
11*	Value of NCSUN corresponding to CSUN from Dictionary 7	NCSUN	I5	61-65
12*	Value of NENUN corresponding to ENUN from Dictionary 8	NENUN	I5	67-71

Form 1507

Third Heading Card This card contains information about card formats, comment cards, and the remaining numerical equivalents of fields on the First Heading Card

FIELD	DESCRIPTION	SYMBOL	FORMAT	COLUMNS
1	Punched card format code (Integer ≤ 99, Dictionary 16)	NCDF	I5	1-5
	If the number 0 is used here, a Format Card must be used			
	following the Fourth Heading Card			
2	Number of comment cards following the Fourth Heading Card	NCCRD	I5	7-11
	(or Format Card if used). (Integer ≤ 10)			
3*	Value of NXFØR corresponding to FX(1) from Dictionary 6	NFX(1)	I5	13-17
4*	Value of NXFØR corresponding to FX(2) from Dictionary 6	NFX(2)	I5	19-23
5*	Value of NXFØR corresponding to FX(3) from Dictionary 6	NFX(3)	I5	25-29
6*	Value of NXFØR corresponding to FX(4) from Dictionary 6	NFX(4)	I5	31-35
7*	Value of NXFØR corresponding to FX(5) from Dictionary 6	NFX(5)	I5	37-41
8*	Value of NEVAL corresponding to EVAL from Dictionary 9	NEVAL	I5	43-47
9*	Value of IDEV	IDEVX	I5	49-53
10*	Value of NEMØ	NEMØX	I5	55-59
11*	Value of NEYR	NEYRX	I5	61-65
12*			I5	67-71

Form 1507

Fourth Heading Card This card contains floating point data for the entire record.

FIELD	DESCRIPTION	SYMBOL	FORMAT	COLUMNS
1	Atomic Weight (C^{12} scale)	ATWGT	E11.0	1-11
2	Reaction Q value (if appropriate)	QVAL	E11.0	13-23
3	Temperature (^{o}k) (if appropriate)	TEMPK	E11.0	25-35
4	Scale factor for all data in record.	SCALE	E11.0	37-47
5*	Lowest energy (repeat of field 17, First Heading Card)	ELØWX	E11.0	49-59
6*	Highest energy (repeat of field 18, First Heading Card)	EHIGHX	E11.0	61-71

Form 1507

Format Card If the number 0 was used in Field 1 of the Third Heading Card, the punched card format must be given here. Otherwise, omit this card.

FIELD	DESCRIPTION	SYMBOL	FORMAT	COLUMNS
1	A standard Fortran format statement is written here starting	FMT(I)	12A6	1-72
	with (and ending with). This format will be used to read	I=1,12		
	all data cards in the record except Heading Cards and Control			
	Cards.			

Form 1507

Comment Cards Up to 10 Comment Cards may be used following the Format Card (if used) or the Fourth Heading Card if a Format Card is not used.

FIELD	DESCRIPTION	SYMBOL	FORMAT	COLUMNS
1	Any descriptive remarks.	CCRD	12A6	1-72
	The information on these cards should include:			
	1. The evaluators name and installation			
	2. Date of evaluation			
	3. References to pertinent documents			
	4. Brief description of the evaluation procedure and the data used.			

Form 1507

4.2 Secondary Particles

If more than one secondary particle is specified in the field NSECX of the Second Heading Card, a SEC control card must head the data for each secondary particle. If only one particle is specified, the SEC card is omitted. All secondary particles must be of the same type as specified on the First Heading Card. If distributions are given for more than one type of secondary, a separate Data Record must be used for each particle type. Fields 3 and 4 of the SEC card are to be read, for example, as the 1st of 3 secondary particles, or 2nd of 2 secondary particles.

The SEC card may be followed by a ENR, PDC, or DCC card.

Secondary Particle Control Card

FIELD	DESCRIPTION	SYMBOL	FORMAT	COLUMNS
1	SEC (left adjusted)	HCCT	A5	1-5
2*	100	NCCT	I5	7-11
3	Number of this secondary particle	NSEC	I5	13-17
4	Total number of secondary particles given	NSECX	I5	19-23
5			I5	25-29
6			I5	31-35
7			I5	37-41
8	Number of comment cards (≤10) following this card	NCCD	I5	43-47
9			E11.0	49-59
10			E11.0	61-71

Form 1507

4.3 Energy Range

It is often convenient to divide the data into various energy ranges so as to use a different model or representation in each range. If this is done an ENR card must head the data for each energy range. The ENR Card is omitted if only one range is used.

Fields 3 and 4 of the ENR Card are to be read, for example, as the 1st of 3 energy ranges, or 2nd of 2 energy ranges. Fields 9 and 10 give the limits of the energy range and the upper limit of the n^{th} range should not exceed the lower limit of the $n+1^{st}$ range. If the ranges do not completely cover the range given on the Heading Card, the data is assumed to be zero in those ranges not covered by ENR Cards.

The ENR Card may be followed by a PDC or DCC Card.

Energy Range Control Card

FIELD	DESCRIPTION	SYMBOL	FORMAT	COLUMNS
1	ENR (left adjusted)	HCCT	A5	1-5
2*	200	NCCT	I5	7-11
3	Number of this energy range	NENR	I5	13-17
4	Total number of energy ranges used	NENRX	I5	19-23
5			I5	25-29
6			I5	31-35
7			I5	37-41
8	Number of comment cards (≤10) following this card	NCCD	I5	43-47
9	Lower limit of energy range	ESRL	E11.0	49-59
10	Upper limit of energy range	ESRH	E11.0	61-71

Form 1507

4.4 Partial Distributions

It is often convenient to split a function into particl distributions. This splitting is accomplished with a PDC control card. A PDC card must head the data for each partial distribution given. The PDC card may preceed any DCC card, but may not preceed an ENR or SEC card, nor may it immediately follow a DCC card. The PDC cards may not be nested, that is, a PDC card may not be used in a data block which is itself a partial distribution.

Fields 3 and 4 are to be read, for example, as the 1st of 3 partial distributions, or 2nd of 2 partial distributions.

The PDC card must be followed by a DCC card.

Partial Distribution Control Card

FIELD	DESCRIPTION	SYMBOL	FORMAT	COLUMNS
1	PDC (left adjusted)	HCCT	A5	1-5
2*	300	NCCT	I5	7-11
3	Number of this partial distribution	NPD	I5	13-17
4	Total number of partial distributions given	NPDX	I5	19-23
5			I5	25-29
6			I5	31-35
7			I5	37-41
8	Number of comment cards (≤10) following this card	NCCD	I5	43-47
9	Probability for this partial distribution	PPDST	E11.0	49-59
10			E11.0	61-71

Form 1507

4.5 END Card

An END card must be the last card of the Data Record. Field 3 is a character count (a form of check sum) for the entire Data Record and should be left blank when the deck is prepared. Field 3 will be filled in when the deck is placed on a Master Library tape.

End Control Card

FIELD	DESCRIPTION	SYMBOL	FORMAT	COLUMNS
1	END (left adjusted)	HCCT	A5	1-5
2*	500	NCCT	I5	7-11
3*	Data Record character count (modulo 8)			13-60

Form 1507

4.6 Data Control Cards

4.6.1 One Dimensional Tabulated Function

The DCC1 card controls the data for a one dimensional tabulated function, $y(x_1)$. The tabulated values plus an interpolation method completely specifies the function. In some special cases a number of constants may also be required.

The data can be arranged on the cards in many ways according to the test NDBA. These arrangements are listed on the following pages.

If this tabulation is part of a higher dimensional function, $y(x_1,x_2)$, at a given value of x_2, this value must also be given on the DCC1 card.

The DCC1 card is followed by the Comment Cards (if any), the Constants (if any), and then the tabulation of $y(x_1)$.

Data Control Card 1 One dimensional tabulated functions

FIELD	DESCRIPTION	SYMBOL	FORMAT	COLUMNS
1	DCC1 (left adjusted)	HCCT	A5	1-5
2*	401	NCCT	I5	7-11
3	Arrangement of data (see next page)	NDBA	I5	13-17
4	Interpolation code for $y(x_1)$ (Dictionary 17)	INTER	I5	19-23
5	Number of constants	NCØN	I5	25-29
6	Number of values of x_1 at which y is given	LDB	I5	31-35
7			I5	37-41
8	Number of comment cards (≤10) following this card	NCCD	I5	43-47
9	Value of the next higher order variable, x_2	VHX	E11.0	49-59
10			E11.0	61-71

Form 1507

Data arrangement for DCC 1.

The data is in the form $y_i = y(Z_i)$, i = 1, N, where Z denotes x_1. Various arrangements are allowed and depend on the value of NDBA.

NDBA = 1 $\left[Z_1 , y_1 , Z_2 , \cdots Z_N , y_N \right]$

= 2 $\left[Z_1 , Z_2 , \cdots Z_N , y_1 , y_2 \cdots y_N \right]$

= 3 $\left[Z_1 , Z_2 , \cdots Z_N \right] \left[y_1 , y_2 , \cdots , y_N \right]$

= 4 $\left[y_1 , y_2 , y_3 , \cdots y_N \right]$, the Z values are assumed to be the same as in the preceding data block.

= 5 $\left[Z_1 , \Delta Z, y_1 , y_2 , y_3 \cdots y_N \right]$, the Z points are equally spaced at intervals of ΔZ starting at Z_1.

= 6 $\left[Z_1 , \Delta Z \right] , \left[y_1 , y_2 , y_3 \cdots y_N \right]$

The notation [ ] means a deck of cards.

4.6.2 Two Dimensional Tabulated Function

The DCC2 controls data for a two dimensional function $y(x_1,x_2)$ which is tabulated with respect to x_2. The functional form of $y(x_1)$ at a given x_2 may be either tabulated or analytical. An interpolation code must be given to indicate how y varies between successive values of x_2 for a given x_1. In some cases constants may also be required.

If $y(x_1, x_2)$ is part of a higher dimensional function, $y(x_1, x_2, x_3)$, then the value of x_3 must be given on the DCC2 card.

The DCC2 card is followed by the Comment Cards (if any), the Constants (if any) and then by a DCC1, DCC6, DCC9, or PDC card.

Data Control Card 2 Two dimensional tabulated functions

FIELD	DESCRIPTION	SYMBOL	FORMAT	COLUMNS
1	DCC2 (left adjusted)	HCCT	A5	1-5
2*	402	NCCT	I5	7-11
3			I5	13-17
4	Interpolation code for $y(x_2)$ (Dictionary 17)	INTER	I5	19-23
5	Number of constants	NCØN	I5	25-29
6	Number of values of x_2 at which y is given	LDB	I5	31-35
7			I5	37-41
8	Number of comment cards (≤10) following this card	NCCD	I5	43-47
9	Value of the next higher order variable, x_3	VHX	E11.0	49-59
10			E11.0	61-71

Form 1507

4.6.3. Three Dimensional Tabulated Function

The DCC3 card controls data for a three dimensional function $y(x_1, x_2, x_3)$ which is tabulated with respect to x_3. The function form of $y(x_1, x_2)$ at a given x_3 may be either tabulated or analytical. An interpolation code must be given to indicate how y varies between successive values of x_3 for a given x_1 and x_2. In some cases constants may also be required.

If $y(x_1, x_2, x_3)$ is part of a higher dimensional function, $y(x_1, x_2, x_3, x_4)$, then the value of x_4 must be given on the DCC3 card.

The DCC3 card is followed by the Comment Cards (if any), the constants (if any), and then by a DCC2, DCC6, DCC7, DCC9, DCC10, or PDC card.

Data Control Card 3 Three dimensional tabulated functions

FIELD	DESCRIPTION	SYMBOL	FORMAT	COLUMNS
1	DCC3 (left adjusted)	HCCT	A5	1-5
2*	403	NCCT	I5	7-11
3			I5	13-17
4	Interpolation code for y (x_3) (Dictionary 17)	INTER	I5	19-23
5	Number of constants	NCØN	I5	25-29
6	Number of values of x_3 at which y is given	LDB	I5	31-35
7			I5	37-41
8	Number of comment cards (≤10) following this card	NCCD	I5	43-47
9	Value of the next higher order variable, x_4	VHX	E11.0	49-59
10			E11.0	61-71

Form 1507

4.6.4. Four Dimensional Tabulated Function

The DCC4 card controls data for a four dimensional function $y(x_1, x_2, x_3, x_4)$ which is tabulated with respect to x_4. The functional form of $y(x_1, x_2, x_3)$ at a given x_4 may be either tabulated or analytical. An interpolation code must be given to indicate how y varies between successive values of x_4 for a given x_1, x_2, and x_3. In some cases constants may also be required.

If $y(x_1, x_2, x_3, x_4)$ is part of a higher dimensional function, $y(x_1, x_2, x_3, x_4, x_5)$, then the value of x_5 must be given on the DCC4 card.

The DCC4 card is followed by the Comment Cards (if any). the constants (if any), and then by a DCC3, DCC6, DCC7, DCC8, DCC9, DCC10, or PDC card.

Data Control Card 4 Four dimensional tabulated functions

FIELD	DESCRIPTION	SYMBOL	FORMAT	COLUMNS
1	DCC4 (left adjusted)	HCCT	A5	1-5
2*	404	NCCT	I5	7-11
3			I5	13-17
4	Interpolation code for y (x_4) (Dictionary 17)	INTER	I5	19-23
5	Number of constants	NCØN	I5	25-29
6	Number of values of x_4 at which y is given	LDB	I5	31-35
7			I5	37-41
8	Number of comment cards (≤10) following this card	NCCD	I5	43-47
9	Value of the next higher order variable, x_5	VHX	E11.0	49-59
10			E11.0	61-71

Form 1507

4.6.5. Five Dimensional Tabulated Function

The DCC5 card controls data for a five dimensional function $y(x_1, x_2, x_3, x_4, x_5)$ which is tabulated with respect to x_5. An interpolation code must be given to indicate how y varies between successive values of x_5 for given x_1, x_2, x_3, x_4. In some cases constants may also be required.

The DCC5 card is followed by the Comment Cards (if any), the constants (if any), and then by a DCC4, DCC6, DCC7, DCC8, DCC10, or PDC card.

Data Control Card 5 Five dimensional tabulated functions

FIELD	DESCRIPTION	SYMBOL	FORMAT	COLUMNS
1	DCC5 (left adjusted)	HCCT	A5	1-5
2*	405	NCCT	I5	7-11
3			I5	13-17
4	Interpolation code for y (x_5) (Dictionary 17)	INTER	I5	19-23
5	Number of constants	NCØN	I5	25-29
6	Number of values of x_5 at which y is given	LDB	I5	31-35
7			I5	37-41
8	Number of comment cards (≤10) following this card	NCCD	I5	43-47
9			E11.0	49-59
10			E11.0	61-71

Form 1507

4.6.6. One Dimensional Analytic Function

The DCC6 card controls data for a one dimensional analytic function y(z). Various analytic forms are allowed. The data is divided into constants and parameters. The parameters may depend on lower order variables while the constants may not. As an example, consider the elastic angular distribution, $\sigma(E,\mu)$, represented by

$$\sigma(E,\mu) = \frac{1}{4\pi} \sum_{\ell=0}^{7} \frac{2\ell+1}{2} A_\ell(E) P_\ell(\mu)$$

The appropriate form is NAFT = 2 (see following pages). The constants are L = 7, k = 1, and $B_o = 4\pi$. The parameters are the $A_\ell(E)$ which depend on one lower order variable, E; hence NVR = 1. The DCC6 card is followed by the comment cards (if any), the constants L, k, B_o, and then 8 decks (one for each $A_\ell(E)$), each starting with a DCC1 card (if $A_\ell(E)$ is tabulated) or a DCC6 card (if $A_\ell(E)$ is analytic).

If the function were given as:

$$\sigma(\mu,E) = \frac{1}{4\pi} \sum_{\ell=0}^{L} \frac{2\ell+1}{2} A_\ell(E) P_\ell(\mu)$$

then we might start with a DCC2 card (tabulated with respect to E) followed by as many decks as E values, each deck having a DCC6 card with the appropriate E in Field 9, comment cards (if any), constants L, k, B_o, and the parameter cards with A_ℓ at the specified E. Note here L can vary with E.

Data Control Card 6 One dimensional analytic functions

FIELD	DESCRIPTION	SYMBOL	FORMAT	COLUMNS
1	DCC6 (left adjusted)	HCCT	A5	1-5
2*	406	NCCT	I5	7-11
3	Type of analytic function (see next page)	NAFT	I5	13-17
4			I5	19-23
5	Number of constants	NCØN	I5	25-29
6	Number of parameters	LDB	I5	31-35
7	Number of lower order variables left to be considered	NVR	I5	37-41
8	Number of comment cards (≤10) following this card	NCCD	I5	43-47
9	Value of next higher order variable	VHX	E11.0	49-59
10			E11.0	61-71

Form 1507

Types of one-dimensional analytic functions [ ] denotes a deck of cards

NAFT = 1 Polynomial, $y(Z) = \sum_{\ell=0}^{L} A_\ell Z^\ell$,

constants [L] , parameters [A_o, A_1, A_2, ... A_L]

NAFT = 2 Legendre Series, $y(Z) = \frac{1}{B_o} \sum_{\ell=0}^{L} \left(\frac{2\ell+1}{2}\right)^k A_\ell P_\ell(Z)$,

constants [L, k, B_o] , parameters [A_o, A_1, A_2, ... A_L]

NAFT = 3 Legendre Series, $y(Z) = \frac{B_1}{B_o} \left[1 + \sum_{\ell=1}^{L} \left(\frac{2\ell+1}{2}\right)^k A_\ell P_\ell(Z) \right]$,

constants [L,k,B_o] , parameters [B_1, A_1, A_2, ... A_L]

NAFT = 4 Rational Approximation, $y(Z) = \sum_{\ell=0}^{L} A_\ell Z^\ell \Big/ \sum_{i=0}^{I} B_i Z^i$

constants [L,I] , Parameters [A_o, A_1, ... A_L, B_o, B_1 ... B_I]

NAFT = 5 Fission Spectrum $y(Z) = A_o e^{-Z/A_1} \text{ Sinh } \sqrt{A_2 Z}$

no constants, parameters $\left[A_o , A_1 , A_2 \right]$

NAFT = 6 Single Level, $y(Z) = \dfrac{\alpha + \beta (Z-E_o)}{(Z-E_o)^2 + \frac{\Gamma^2}{4}} + \sum_{\ell=0}^{L} B_\ell Z^\ell$

constants = $\left[L \right]$, parameters = $\left[\alpha, \beta, \Gamma, E_o, B_o, B_1, \ldots B_L \right]$

NAFT = 7 Improved Fission Spectrum, $y(Z) = \alpha \left(\dfrac{Z}{\tau^2} \right) e^{-Z/\tau} + (1-\alpha) \sqrt{\dfrac{4Z}{\pi\beta^3}} e^{-Z/\beta}$

no constants, parameters $\left[\alpha, \beta, \tau \right]$

4.6.7. Two Dimensional Analytic Function

The DCC7 card controls data for a two dimensional analytic function $y(z_1, z_2)$. Various analytic forms are allowed. The data is divided into constants and parameters. The parameters may depend on lower order variables while the constants may not. As an example consider the elastic angular distribution, $\sigma(\mu,E)$, represented by

$$\sigma(\mu,E) = \sum_{\ell=0}^{6} \sum_{m=0}^{10} A_{\ell m} \mu^{\ell} E^{m}$$

The appropriate form is NAFT = 1 (see following pages). The constants are L = 6, M = 10. The parameters are the $A_{\ell m}$ and since they depend on no lower order variable, NVR = 0. The DCC7 card is followed by the comment cards (if any), the constants L and M, and the parameters $A_{\ell m}$.

If a higher order variable is also present, $\sigma(\mu, E, E^1)$, the appropriate value of E^1 is put in Field 9 of the DCC7 card. If a lower order variable is present, $\sigma(E^1, \mu, E)$, then NVR = 1, and the $A_{\ell m}$ are functions of E^1. Each of the parameters $A_{\ell m}$ is given by a deck starting with a DCC1 or DCC6 card.

Data Control Card 7 Two dimensional analytic functions

FIELD	DESCRIPTION	SYMBOL	FORMAT	COLUMNS
1	DCC7 (left adjusted)	HCCT	A5	1-5
2*	507	NCCT	I5	7-11
3	Type of analytic function (see next page)	NAFT	I5	13-17
4			I5	19-23
5	Number of constants	NCØN	I5	25-29
6	Number of parameters	LDB	I5	31-35
7	Number of lower order variables left to be considered	NVR	I5	37-41
8	Number of comment cards (≤10) following this card	NCCD	I5	43-47
9	Value of next higher order variable	VHX	E11.0	49-59
10			E11.0	61-71

Form 1507

Types of two-dimensional analytic functions [ ] denotes a deck of cards

NAFT = 1 Power Series, $y(Z_1,Z_2) = \sum_{\ell=0}^{L} \sum_{m=0}^{M} A_{\ell m} Z_1^{\ell} Z_2^{m}$

constants = [L,M] , parameters = [$A_{00},A_{10},A_{20},\ldots A_{M0},A_{01},A_{11},\ldots A_{LM}$]

4.6.8. Three Dimensional Analytic Function

The DCC8 card controls data for three dimensional analytic functions, should the need for them ever arise.

4.6.9. Discrete Functions

It is often convenient to express energy distributions as discrete functions. For example, the inelastic cross section $\sigma(\mu, E, E^1)$ might be represented as

$$\sigma(\mu, E, E^1) = \sum_{\ell=1}^{L} \sigma_\ell(\mu, E)\ \delta\ [E^1 - B_\ell(E-A_\ell)]$$

where A_ℓ is the energy of the level, B_ℓ is the "reduction factor", and L is the number of levels. The DCC9 card is followed by comment cards (if any), the constants, and L decks for the $\sigma_\ell(\mu, E)$, each deck starting with a DCC2, DCC6, DCC7, DCC8, DCC9, or DCC10 card. Each deck contains the A_ℓ and B_ℓ as constants.

Data Control Card 9 Discrete functions

FIELD	DESCRIPTION	SYMBOL	FORMAT	COLUMNS
1	DCC9 (left adjusted)	HCCT	A5	1-5
2*	409	NCCT	I5	7-11
3	Type of formula used (see next page)	NTDF	I5	13-17
4			I5	19-23
5	Number of constants	NCØN	I5	25-29
6	Number of discrete levels, L	NLEV	I5	31-35
7	Number of lower order variables left to be considered, N-1	NVR	I5	37-41
8	Number of comment cards (≤10) following this card	NCCD	I5	43-47
9			E11.0	49-59
10			E11.0	61-71

Form 1507

Types of Discrete Functions

NTDF = 1 $y(x_1, x_2, \ldots x_N) = \sum_{\ell=1}^{L} y_\ell(x_1, x_2, \ldots x_{N-1})\ \delta\ (x_N - A_\ell)$

constants = $\left[A_1, A_2 \ldots A_L\right]$, parameters = $\left[y_1, y_2, \ldots y_L\right]$

NTDF = 2 $y(x_1, x_2, \ldots x_N) = \sum_{\ell=1}^{L} y_\ell(x_1, x_2, \ldots x_{N-1})\ \delta\ (x_N - B_\ell(x_{N-1} - A_\ell))$

constants = $\left[A_1, B_1, A_2, \ldots B_L\right]$, parameters = $\left[y_1, y_2, \ldots y_L\right]$

Note: The constants should follow the control card defining the y_ℓ. For example, if N=1, the deck structure is

$\left[\text{DCC9}\right]\left[A_1, A_2 \ldots A_L\right]\ \left[y_1, y_2, \ldots y_L\right]$

If N=2, and $y_\ell(x_1)$ is tabulated, the deck structure is

$\left[\text{DCC9}\right]\ \left[\text{DCC1}\right]\left[A_1\right]\ \left[y_1(x_1)\right]\left[\text{DCC1}\right]\left[A_2\right]\left[y_2(x_1)\right] \ldots \left[\text{DCC1}\right]\left[A_L\right]\left[y_L(x_1)\right]$

If N=3, and $y_\ell(x_1, x_2)$ is tabulated, the deck structure is

$\left[\text{DCC9}\right]\left[\text{DCC2}\right]\left[A_1\right]\left[\text{DCC1}\right]\left[y_1(x_1) \text{ at } 1^{\underline{st}}\ x_2\right]\left[\text{DCC1}\right]\left[y_1(x_1) \text{ at } 2^{\underline{nd}}\ x_2\right] \ldots \left[\text{DCC2}\right]\left[A_2\right]$ etc.

4.6.10. Reduction of Variables

It is often convenient to eliminate the dependence or change the form of a variable in certain energy ranges. Thus suppose the energy distribution $P(E, E^1)$ were given in various energy ranges (E is the initial energy). In one range the full function might be tabulated. In another range the function might be independent of E, $P(E, E^1) = P(E^1)$. In still another range the dependence might be on $(E^1/E)^q$.

$$P(E, E^1) = P((E^1/E)^q) \quad \text{or perhaps} \quad P(E,(E^1/E)^q)$$

The DCC10 card is designed to control these options. The DCC10 cards if followed by comment cards (if any), constants (if any), and then an appropriate Data Block to describe the remaining function.

Data Control Card 10 Reduced variables

FIELD	DESCRIPTION	SYMBOL	FORMAT	COLUMNS
1	DCC10	HCCT	A5	1-5
2*	410	NCCT	I5	7-11
3	Type of reduced variable (see next page)	NTCV	I5	13-17
4			I5	19-23
5	Number of constants given	NCØN	I5	25-29
6			I5	31-35
7	Number of lower order variables left to be considered	NVR	I5	37-41
8	Number of comment cards to follow	NCCD	I5	43-47
9	Value of next higher order variable	VHX	E11.0	49-59
10			E11.0	61-71

Form 1507

Reduced Variable Types

NVR = 1	$y(x_1, x_2) \rightarrow y(u)$	NTCV = 1	$u = x_1$
NVR = 2	$y(x_1, x_2) \rightarrow y(x_1, u)$	NTCV = 2	$u = x_2$
		NTCV = 3	$u = (x_2/x_1)^q$ q = constant

Final forms of $y(x_1, x_2)$

NTCV \ NVR	1	2
1	$y(x_1)$	-
2	$y(x_2)$	$y(x_1, x_2)$
3	$y[(x_2/x_1)^q]$	$y[x_1, (x_2/x_1)^q]$

4.6.11. Resolved Resonance Parameters

The data order for resolved resonance parameters and the types of resonance formulas used are identical to those in the Aldermaston/Winfrith Data File. It is recommended that the punched card format also conform to the A/W system (NCDF = 1, six numbers/card).

Two changes from the A/W system were made. The first is that in the ENDF all energies used in resonance formulas must be in ev. The second change is the addition of the Adler-type resonance formula.

Data Control Card 11 Resolved Resonance Parameters

FIELD	DESCRIPTION	SYMBOL	FORMAT	COLUMNS
1	DCC11	HCCT	A5	1-5
2*	411	NCCT	I5	7-11
3	Type of resonance formula used (see next page)	NTRF	I5	13-17
4			I5	19-23
5			I5	25-29
6	Number of resonances	NRES	I5	31-35
7			I5	37-41
8	Number of comment cards (≤10) following this card	NCCD	I5	43-47
9	Nuclear Spin, I	SPINI	E11.0	49-59
10			E11.0	61-71

Form 1507

NTRF = 1 Single level Breit-Wigner formula, ℓ=0 neutrons, isolated resonances

The cross sections are defined by the equations

$$\sigma_{nn}(E) = \pi\lambda\bar{\lambda}\sum_r g_{J_r}\frac{\Gamma_{rn}^2 + 4a\Gamma_{rn}(E-E_r)}{(E-E_r)^2 + \Gamma_r^2/4} + b_n\sqrt{\frac{\epsilon_n}{E}} + 4\pi a^2$$

$$\sigma_{nx}(E) = \pi\lambda\bar{\lambda}^2\sum_r g_{J_r}\frac{\Gamma_{rn}\Gamma_{rn}}{(E-E_r)^2 + \Gamma_r^2/4} + b_x\sqrt{\frac{\epsilon_x}{E}}$$

where x refers to α, f, etc., and $\Gamma_r = \sum_x \Gamma_{rx}$. The required input is:

E_ℓ - Lower limit of range of validity of cross sections calculated from these parameters

E_h - Upper " " " " " " " " " " " " "

a - Scattering length in units of 10^{-12} cm.

T_1 - A test indicating the energy variation of Γ_n, Γ_γ

$T_1 = 1$ $\Gamma_n(E) = \Gamma_n^\circ$ E, Γ_γ constant, Γ_f constant

NTRF = 1 (Cont'd)

T_2 - A test indicating the partial widths specified and their order

$T_2 = 1$ Γ_n, Γ_γ

$T_2 = 2$ Γ_n, Γ_γ, Γ_f

$T_2 = 3$ Γ_n

b_x - Value of additional 1/v component of x cross section at energy ϵ_x (barns)

ϵ_x - Energy at which b_x is evaluated (ev)

E_r - The resonance energy (ev)

J_r - The angular momentum of the compound nucleus

Γ_r - The total width evaluated at E_r (ev)

Γ_{rx} - The partial width evaluated at E_r (ev)

The order of data on the cards is:

T_2=1 $[E_\ell, E_h, a, T_1, T_2]$ $[\epsilon_n, b_n, \epsilon_\gamma, b_\gamma]$ $[E_1, J_1, \Gamma_1, \Gamma_{1n}, \Gamma_{1\gamma}]$
$[E_2, J_2, \Gamma_2, \Gamma_{2n}, \Gamma_{2\gamma}]$ $[E_3, J_3, \Gamma_3, \Gamma_{3n}, \Gamma_{3\gamma}]$ etc.

T_2=2 $[E_\ell, E_h, a, T_1, T_2]$ $[\epsilon_n, b_n, \epsilon_\gamma, b_\gamma, \epsilon_f, b_f]$ $[E_1, J_1, \Gamma_1, \Gamma_{1n}, \Gamma_{1\gamma}, \Gamma_{1f}]$
$[E_2, J_a, \Gamma_2, \Gamma_{2n}, \Gamma_{2\gamma}, \Gamma_{2f}]$ etc.

T_2=3 $[E_\ell, E_h, a, T_1, T_2]$ $[\epsilon_n, b_n]$ $[E_1, J_1, \Gamma_1, \Gamma_{1n}]$ $[E_2, J_2, \Gamma_2, \Gamma_{2n}]$ etc.

NTRF = 2 Single level Breit-Wigner Formula for ℓ=0 neutrons and many levels for elastic scattering and radiative capture

The cross sections are defined by the equations

$$\sigma_{nn}(E) = \pi\lambda\!\!\!^{-2}\left\{ \sum_r g_{J_r} \frac{\Gamma_{rn}^2 - 2\Gamma_{rn}\Gamma_r a^2/\lambda\!\!\!^{-2} + 4(a/\lambda\!\!\!^{-})\Gamma_{rn}(E-E_r)}{(E-E_r)^2 + \Gamma_r^2/4} \right.$$

$$\left. + \sum_r \sum_{s\neq r} g_{J_r} \frac{2\Gamma_{rn}\Gamma_{sn}[\frac{1}{4}\Gamma_r\Gamma_s + (E-E_r)(E-E_s)]}{[(E-E_r)^2 + \Gamma_r^2/4][(E-E_s)^2 + \Gamma_s^2/4]} \right\} + b_n \frac{\epsilon_n}{E} + 4\pi a^2$$

$$\sigma_{n\gamma}(E) = \pi\lambda\!\!\!^{-2} \sum_r g_{J_r} \frac{\Gamma_{rn}\Gamma_{r\gamma}}{(E-E_r)^2 + \Gamma_r^2/4} + b_\gamma \frac{\epsilon_\gamma}{E}$$

The order of data on the cards is the same as for NTRF = 1 with T_2 = 1

NTRF = 3 The Reich-Moore Formula - A multilevel formula with few fission channels for ℓ=0 neutrons

The theory is given by Reich and Moore (Phys. Rev., 111, 929 (1958)) and has been applied to U^{233} (Phys. Rev., 118, 718 (1960)), U^{235} (Phys. Rev., 112, 191 (1958)) and Pu^{241} (IDO-16679 (1961)). The following quantities are needed for each resonance (numbered by λ).

E_λ - Channel energy (ev)

J_λ - Spin of compound nucleus

$2\beta_{\lambda 2}^2$, $2\beta_{\lambda 2}^2$

S_{12} = Sign of $\beta_{\lambda 1}\beta_{\lambda 2}$

S_{13} = Sign of $\beta_{\lambda 1}\beta_{\lambda 3}$

Γ_λ - Total width (ev)

$\Gamma_{\lambda n}$ - Neutron width (ev)

$\Gamma_{\lambda\gamma}$ - Radiation width (ev)

$\Gamma_{\lambda f}$ - Fission width (ev)

T_1 - Test indicating the energy variation of $\Gamma_{\lambda n}$, $\Gamma_{\lambda\gamma}$, $\Gamma_{\lambda f}$ with energy
$T_1 = 1$ implies $\Gamma_{\lambda n} = \Gamma_{\lambda n}^{\circ}\sqrt{E}$; $\Gamma_{\lambda\gamma}$, $\beta_{\lambda 2}$, $\beta_{\lambda 3}$ are independent of energy

E_ℓ - Lower limit of range of validity of cross sections calculated from these parameters

E_h - Upper " " " " " " " " " " " " "

a - Scattering length in units of 10^{-12} cm

b_x - Value of additional 1/v component of x cross section at energy ϵ_x (barns)

ϵ_x - Energy at which b_x is evaluated (ev)

c - The number of fission channels

NTRF = 3 (Cont'd)

The order of data on cards is:

$[E_\ell, E_h, a, T_1, c]$ $[\epsilon_n, b_n, \epsilon_\gamma, b_\gamma, \epsilon_f, b_f]$ $[E_1, J_1, \Gamma_1, \Gamma_{1n}, \Gamma_{1\gamma}, \Gamma_{1f}]$

$[2\beta_{12}^2, S_{12}, 2\beta_{13}^2, S_{12}]$ $[E_2, J_2, \Gamma_2, \Gamma_{2n}, \Gamma_{2\gamma}, \Gamma_{2f}]$ $[2\beta_{22}^2, S_{12}, 2\beta_{23}^2, S_{13}]$ etc.

NTRF = 4 The Vogt many channel, few level formula for ℓ=0 neutrons

The theory is given by Vogt (Phys. Rev., 112, 203 (1958). The required input is similar to the Reich-Moore formula (NTRF = 3) except that the β_λ are replaced by a vector $g_{\lambda f}$ of length C, where C is the number of fission channels. The units of $g_{\lambda f}$ are $(ev)^{\frac{1}{2}}$.

The order of data on cards is:

$[E_\ell, E_h, a, T_1, C]$ $[\epsilon_n, b_n, \epsilon_\gamma, b_\gamma, \epsilon_f, b_f]$ $[E_1, J_1, \Gamma_1, \Gamma_{1n}, \Gamma_{1\gamma}, \Gamma_{1f}]$

$[g_{1f1}, g_{1f2}, g_{1f3}, \ldots g_{1fc}]$ $[E_2, J_2, \Gamma_2, \Gamma_{2n}, \Gamma_{2\gamma}, \Gamma_{2f}]$ $[g_{2f1}, g_{2f2}, \ldots g_{2fc}]$ etc.

NTRF = 5 The multilevel formula with pure scattering as used by Hibdon

Specifications not yet completed.

NTRF = 6 Breit-Wigner formula for a single isolated level involving neutrons of any ℓ

Specifications not yet completed.

NTRF = 7 The Adler Formula

The cross section is given by the formula (Trans. Am. Nuc. Soc., Vol. 7, No. 1, pg. 86 (1964)

$$\sigma_{nx} = 4\pi a^2 + \frac{c}{\sqrt{E}} \sum_{j=1}^{NR+NN} (G_j \psi_j + H_j X_j) + \frac{1}{\sqrt{E}} \sum_{k=k_1}^{k_2} b_k E^k$$

$G_j = \alpha_j \cos 2a/\lambda + \beta_j \sin 2a/\lambda$

$H_j = \beta_j \cos 2a/\lambda - \beta_j \sin 2a/\lambda$

NR = Number of levels in the energy band analyzed

NN = Number of external neighboring levels

The required input data is:

E_ℓ - Lower limit of range of validity of cross sections calculated from these parameters (ev)

E_h - Upper " " " " " " " " " " " " " "

a - Scattering length in units of 10^{-12} cm

T_1 - Test indicating the type of cross section, x

T_1 = 1 Total
= 2 Fission
= 3 Capture
= 4 Scattering

NTRF = 7 (Cont'd)

NB - Number of energy bands considered

For each energy band i the required data is:

E_1^i - Lower energy limit of band (ev)

E_2^i - Upper " " " " "

NL^i - Number of levels in band

k_1^i - Lowest power of E in polynomial correction term

k_2^i - Highest " " " " " " "

b_k^i - Coefficients in the polynomial correction term

μ_j^n - Parameter describing the energy of level j

υ_j^i - " " " halfwidth of level j

α_j^i - Parameter used in the G and H functions

β_j^i - " " " " " " " "

The order of data on cards is:

$[E_\ell, E_h, a, T_1, NB]\ [E_1^1, E_2^1, NL^1, k_1^1, k_2^1][b_{k_1}^1, \ldots b_{k_2}^1][\mu_1^1, \upsilon_1^1, \alpha_1^1, \beta_1^1][\mu_2^1, \upsilon_2^1, \alpha_2^1, \beta_2^1]$

$\ldots.[\mu_{NL}^1, \upsilon_{NL}^1, \alpha_{NL}^1, \beta_{NL}^1][E_1^2, E_2^2, NL^2, k_1^2, k_2^2][b_k^2, \ldots b_{k_2}^2][\mu_1^2, \upsilon_1^2, \ldots]$ etc.

4.6.12. Unresolved Resonance Parameters

Although little work has been done in this area, it seems clear that the approximations to the full R-matrix theory used for resolved resonances will apply to the unresolved region. Hence the formulas and card formats given for the resolved resonances can be used here if we replace the resonance energy by the mean spacing (D) and consider only one level. Detailed formats are then similar to those in Section 4.6.11. All energies used must be in ev.

Data Control Card 12 Unresolved Resonance Parameters

FIELD	DESCRIPTION	SYMBOL	FORMAT	COLUMNS
1	DCC12	HCCT	A5	1-5
2*	412	NCCT	I5	7-11
3	Type of formula used (see next page)	NTRF	I5	13-17
4			I5	19-23
5			I5	25-29
6			I5	31-35
7			I5	37-41
8	Number of comment cards (≤10) following this card	NCCD	I5	43-47
9	Nuclear spin, I	SPIN I	E11.0	49-59
10			E11.0	61-71

Form 1507

NTRF = 1 Single level Breit-Wigner formula, ℓ = 0 neutrons, isolated resonances

Same card format as NTRF = 1, Section 4.6.11, except that only one set of parameters is given and the resonance energy is replaced by the mean spacing, D.

4.6.13. Radioactive Decay and Fission Product Yield Data

If (Z,A) represents the nuclide specified on the Heading Cards, then we consider the sequence

$$(Z,A) \xrightarrow{\text{reaction}} (Z_1,A_1) \xrightarrow{\lambda_1 \text{ decay}} (Z_2,A_2) \xrightarrow{\lambda_2 \text{ decay}} (Z_3,A_3)$$

where the reaction might be (n,α),(n,2n) or no reaction in which cas $(Z_1,A_1) = (Z_1A)$. Data for the above sequence is given on Radioactive Decay Cards.

The (Z,A) designation and the fractional yield of fission products is given of the Fission Product Yield cards.

The DCC13 card is followed by comment cards (if any), Radioactive Decay cards (if any), and the Version Product Yield cards (if any).

Data Control Card 13 Radioactive decay and fission product yield data

FIELD	DESCRIPTION	SYMBOL	FORMAT	COLUMNS
1	DCC13	HCCT	A5	1-5
2*	513	NCCT	I5	7-11
3			I5	13-17
4			I5	19-23
5	Number of Radioactive Decay Data cards	NRDD	I5	25-29
6	Number of fission product yields given	NFPY	I5	31-35
7			I5	37-41
8	Number of comment cards (<10) following this card	NCCD	I5	43-47
9			E11.0	49-59
10			E11.0	61-71

Form 1507

Radioactive Decay Card

FIELD	DESCRIPTION	SYMBOL	FORMAT	COLUMNS
1	Reaction type (Integer NREAC from Dictionary 3) (note 2)	RTYP	E11.0	1-11
2	Identification number of isotope produced by this reaction (note 1)	ZA1	E11.0	13-23
3	Decay constant ($days^{-1}$) of the isotope ZA1	DC1	E11.0	25-35
4	Identification number of isotope produced by the decay of ZA1	ZA2	E11.0	37-47
5	Decay constant ($days^{-1}$) of the isotope ZA2	DC2	E11.0	49-59
6	Identification number of isotope produced by the decay of ZA2	ZA3	E11.0	61-71
	Note 1: The identification number of a nuclide is given by			
	1000 Z + A. For example,			
	Hydrogen - 1001			
	U^{238} - 92238			
	Note 2: RTYP = 0 implies spontaneous decay of the original			
	isotope. If used, this card should be first and			
	the remaining RTYP should be in increasing order.			

Form 1507

Fission Product Yield Card

FIELD	DESCRIPTION	SYMBOL	FORMAT	COLUMNS
1	Identification number of first fission product (note 1)	FP(1)	E11.0	1-11
2	Fictional yield of first fission product	YLD(1)	E11.0	13-23
3	Identification number of second fission product (note 1)	FP(2)	E11.0	25-35
4	Fractional yield of second fission product	YLD(2)	E11.0	37-47
5	Identification number of third fission product (note 1)	FP(3)	E11.0	49-59
6	Fractional yield of third fission product	YLD(3)	E11.0	61-71
	Note 1: The identification number of a nuclide is given by			
	1000 Z + A. For example,			
	Hydrogen - 1001			
	U^{238} - 92238			
	Note 2: Repeat the above pattern on successive cards until			
	all fission products have been listed.			

Form 1537

4.7 Thermal Scattering Law

The scattering law is written in the form $S(\alpha,\beta) + e^{-\lambda\alpha}\delta(\beta)$, where $S(\alpha,\beta)$ is a tabulated function. The formats follow those in the A/W library. The mathematical description on the first heading card should read S(AL,BT) or S(AL,BT,T) if the temperature dependence is considered. The following constant are also required.

- σ_f - The free atom cross section (barns).
- ϵ - The value of E/kT above which the static nucleus model of elastic scattering is adequate.
- A - The effective value of the ratio mass of "molecule" to mass of neutron to be used.
- E_m - The upper energy limit for constant σ_f. Above this energy σ_{el} must be used in conjunction with the monatomic gas law.
- λ - The parameter in the δ - function contribution to $S(\alpha,\beta)$. If there is no contribution from this term, set λ to zero.

These constants are placed on the constants cards following the DCC2 card. The deck structure is given on the following pages.

Temperature Independent $S(\alpha,\beta)$

[Heading cards]

[DCC2 card with the number of β values]

[σ_f, ε, A, E_m, λ]

[DCC1 card with the first value of β]

[values of α]

[values of S]

[DCC1 card with second value of β]

[values of α]

[values of S]

.
.
.
.
.

[END card]

Temperature Dependent S(α,β)

[Heading cards]

[DCC3 card to control temperature dependence]

[deck on preceding page starting with DCC2 card for 1st temperature]

[" " " " " " " " " 2nd "]

.

.

.

.

[END card]

5. Dictionaries

The dictionaries referred to in the preceding sections are given on the following pages.

5.1 Dictionary 1 - Chemical Symbols

The following 2 character chemical symbols may be used in field 1 (Cols. 1-2) of the first Heading Card. Single characters may be either left or right adjusted in the field. When deck is converted to Version B the corresponding number NATØM will be put in field 3 (Cols. 13-17) of the second Heading Card.

NATØM	CHEMS	NATØM	CHEMS	NATØM	CHEMS	NATØM	CHEMS
1	H	26	FE	51	SB	76	ØS
2	HE	27	CØ	52	TE	77	IR
3	LI	28	NI	53	I	78	PI
4	BE	29	CU	54	XE	79	AU
5	B	30	ZN	55	CS	80	HG
6	C	31	GA	56	BA	81	TL
7	N	32	GE	57	LA	82	PB
8	Ø	33	AS	58	CE	83	BI
9	F	34	SE	59	PR	84	PØ
10	NE	35	BR	60	ND	85	AT
11	NA	36	KR	61	IL	86	RN
12	MG	37	RB	62	SM	87	FR
13	AL	38	SR	63	EU	88	RA
14	SI	39	Y	64	GD	89	AC
15	P	40	ZR	65	TB	90	TH
16	S	41	CB	66	DY	91	PA
17	CL	42	MØ	67	HØ	92	U
18	A	43	MA	68	ER	93	NP
19	K	44	RU	69	TM	94	PU
20	CA	45	RH	70	YB	95	AM
21	SC	46	PD	71	LU	96	CM
22	TI	47	AG	72	HF	0	blank
23	V	48	CD	73	TA		
24	CR	49	IN	74	W		
25	MN	50	SN	75	RE		

5.2 Dictionary 2 - Particle Types

The following one character particle types are to be used in fields 3 (Col. 8) and 6 (Col. 0) of the first Heading Card. When the deck is converted to Version B the corresponding number NPART will be put in fields 5 (Cols. 25-29) and 8 (Cols. 43-47) of the second Heading Card.

NPART	PART	Description
0		Irrelevant
1	N	Neutron
2	G	Gamma
3	P	Proton
4	A	Alpha
5	E	Electron
6	D	Deuteron
7	T	Triton
8	H	Helium 3
9	F	Fission fragment
10	U	Special particle (see note 1)
11	V	" " " " "
12	W	" " " " "
13	X	" " " " "
14	Y	" " " " "
15	Z	" " " " "

Note 1. If these particles are used, they should be defined on the Comment Cards.

5.3 Dictionary 3 - Reaction Types

The following reaction types are to be used in field 4 (cols. 10-15) of the first Heading Card. If the symbol is less than 6 characters, the symbol may be either left or right adjusted in the field. When the deck is converted to Version B, the corresponding number NREAC will be put in field 6 (cols. 31-35) of the second Heading Card. Note that the number NREAC is equivalent to the PCN in the Aldermaston/Winfrith format. The descriptions of the reactions are illustrated for neutron induced reactions.

NREAC	REAC	Description
1	TØTAL	Total
2	ELAST	Elastic
3	NØNEL	Non-elastic
4	INELAS	Inelastic
5-15		not used
16	PAIR	Pair production
17	TRIPLE	Triplet production
18	FISS	Fission = (n,f) + (n,f'f)+...
19	F	(n,f)
20	NF	(n,f'f)
21	2NF	(n,2nf)
22	NA	(n,n')α
23	N3A	(n,n')3α
24	2NA	(n,2n)α
25	3NA	(n,3n)α
26		not used
27	ABSØRP	absorption (fission + capture)
28	NP	(n,n')p

Dictionary 3 (Cont'd.)

NREAC	REAC	Description
29-100		to be assigned
101	PARABS	Parasitic absorption
102	G	(n,γ)
103	P	(n,p)
104	D	(n,d)
105	T	(n,t)
106	H	(n,He^3)
107	A	(n,α)
108	2A	$(n,2\alpha)$
109-		to be assigned

5.4 Dictionary 4 - Type of Data

The following 4 character data type descriptions are to be used in field 7 (Cols. 22-25) of the first Heading Card. When the deck is converted to Version B, the corresponding NDTYP will be put in field 9 (Cols. 49-53) of the second Heading Card. Symbols with less than 4 characters may be either right or left adjusted in the field.

NDTYP	DTYP	Description	G.C.N. (Note 1)
0		Irrelevant	
1	CRØS	Cross section	1 or 8
2	ANGD	Angular distributor	2 or 9
3	ENED	Energy distributor	3 or 10
4	AECR	Angle-energy correlation	-
5	CØRR	Multi-dimensional correlation	-
6	RERP	Resolved resonance parameters	5
7	UNRP	Unresolved resonance parameters	6
8	TSCL	Thermal scattering law	7
9	BURN	Burnup data	
10	NU	ν Neutrons/fission	
11	ETA	N Neutrons/capture	
12	ALPH	α (Capture/fission)-1	
13	ØPAL	1 + α (Capture/fission)	
14	NBAR	$\bar{N}$ Neutrons/collision	

Note 1. This is the General Classification Number used in the Aldermaston/Winfrith Nuclear Data File.

5.5 Dictionary 5 - Form of y

The following symbols describing the function y are to be used in field 8 (Col. 27) of the first Heading Card. When the deck is converted to Version B, the corresponding symbol NYFØR will be put in field 10 (Cols. 55-59) of the second Heading Card.

NYFØR	YFØRM	Description
0		Irrelevant
1	C	$y = \sigma$, The Desired Cross Section
2	P	y = P, A Probability Distribution
3	S	y = S, The Scattering Law
4	V	$y = \sqrt{E_i}\ \sigma$
5		
6		
7		
8		
9		
10		
11		

5.6 Dictionary 6 - Form of x

The following symbols describing the variables x are to be used in fields 9 (Cols. 29-30), 10 (Cols. 32-33), and 11 (Cols. 35-36) of the first Heading Card. When the deck is converted to Version B, the corresponding number NXFØR will be put in fields 3-5 of the third Heading Card.

NXFØR	XFØRM	
0		Irrelevant
1	EI	Initial Energy, E_i
2	EF	Final Energy, E_f
3	DE	Energy Loss, E_i-E_f
4	UI	Initial Lethargy, U_i
5	UF	Final Lethargy, U_f
6	DU	Lethargy Gain, U_f-U_i
7	AL	Angle (Lab), θ (Degrees)
8	AC	Angle (COM), Ψ (Degrees)
9	CL	Cos θ (Lab)
10	CC	Cos Ψ (CØM)
11	T	Temperature (^{o}K)
12	AL	Scattering Law α
13	BT	Scattering Law β

Dictionary 6 (Cont'd.)

NXFØR	XFØRM	Description
41	A1	Angle 1, Multidimensional Correlation
42	A2	" 2, " "
43	A3	" 3, " "
44	A4	" 4, " "
45	A5	" 5, " "
46	C1	Cosine 1 " "
47	C2	" 2 " "
48	C3	" 3 " "
49	C4	" 4 " "
50	C5	" 5 " "
51	E1	Energy 1 " "
52	E2	" 2 " "
53	E3	" 3 " "
54	E4	" 4 " "
55	E5	" 5 " "

99	XX	See note 1.

Note 1. The special symbol XX in field 9 of the first Heading Card indicates more than 3 variables are used and a Heading Card Extension is required.

5.7 Dictionary 7 - Cross Section Units

The following symbols for cross section units are to be used in field 12 (Cols. 38-39) of the first Heading Card. When the deck is converted to Version B, this dictionary will be eliminated. The data will be scaled so that the units are barns and the symbol BN will be put in field 12.

NCSUN	CSUN	Description
0		Irrelevant
1	BN	Barns
1	B	Barns
2	MB	Millibarns

5.8 Dictionary 8 - Energy Units

The following symbols for energy units are to be used in field 19 (Cols. 70-72) of the first Heading Card. When the deck is converted to Version B, this dictionary will be eliminated. The data will be scaled so that energies are in electron volts and the symbol EV will be put in field 19. Symbols with less than 3 characters may be either right or left adjusted in the field.

NENUN	ENUN	Description
0		Irrelevant
1	MV	Milli-Electron Volts
2	EV	Electron Volts
3	KEV	Thousand Electron Volts
4	MEV	Million Electron Volts
5	K	Degrees Kelvin
6	A	Angstroms

5.9 Dictionary 9 - Installation Codes

The following 3 letter codes should be used to denote the installation where the data was evaluated.

NEVAL	EVAL	Installation
1	ALD	AWRE, Aldermaston, England
2	ANL	Argonne National Lab., Lemont, Illinois
3	ARK	U. of Arkansas, Fayetteville
4	AUS	Austria
5	AUL	Australia
6	BAR	Bartol Research Foundation, Swarthmore, Pennsylvania
7	BAS	U. of Basel, Switzerland
8	BAT	Battelle Memorial Inst., Columbus, Ohio
9	BEL	Bell Telephone Labs., Murray Hill, New Jersey
10	BET	Westinghouse, Bettis Atomic Power Division, Pittsburgh, Pennsylvania
11	BKB	B. Kidrich, Belgrade, Yugoslavia
12	BNL	Brookhaven National Lab., Upton, New York
13	BOM	Bombay, India
14	BOS	Bose Inst., Calcutta, India
15	BRK	U. of California, Berkeley
16	BRN	Brown U., Providence, Rhode Island
17	BUL	Bulgaria
18	BW	Babcock & Wilcox Co., Lynchburg, Virginia
19	BZL	Brazil
20	CAN	Australian U., Canberra
21	CAL	California Institute of Tech., Pasadena, California
22	CAR	Carnegie Institute of Tech., Pittsburgh, Pennsylvania
23	CAT	U. of Catania, Italy

Dictionary 9 (Cont'd.)

NEVAL	EVAL	Installation
24	CCP	U. S. S. R.
25	CER	CERN, Geneva, Switzerland
26	CHI	U. of Chicago, Illinois
27	CHL	Chile
28	CIS	C. I. S. E., Milan, Italy
29	CLC	Calcutta, India
30	CND	Canada
31	COL	Columbia U., New York City, New York
32	CON	Convair, San Diego, California
33	CRC	Chalk River, Ontario, Canada
34	CSE	Case Institute of Tech., Cleveland, Ohio
35	CTL	Chatillon, Fontenay-aux-Roses, France
36	DEN	Denmark
37	DKE	Duke U., Durham, North Carolina
38	ENG	England
39	ETH	ETH, Zurich, Switzerland
40	FAR	Fontenay-aux-Roses, Seine, France
41	FR	France
42	GA	General Atomic, San Diego, California
43	GEL	Geel, Belgium
44	GER	Germany
45	GEV	GE-Vallecitos Atomic Lab., San Jose, California
46	GLS	U. of Glascow, Scotland
47	GRN	Groningen, The Netherlands
48	HAN	Hanford Atomic Products, Richland, Virginia
49	HAR	AERE, Harwell, England
50	HAV	Harvard U., Massachusetts
51	IND	India

Dictionary 9 (Cont'd.)

NEVAL	EVAL	Installation
52	IOW	Iowa State U., Iowa City, Iowa
53	IP	Inst. of Physics, U. S. S. R.
54	ISL	Israel
55	ISP	Euratom, Ispra, Italy
56	ITY	Italy
57	JAE	Japan Atomic Energy Research Inst.
58	JAP	Japan
59	JEN	JENER, Norway
60	JHU	Johns Hopkins U., Baltimore, Maryland
61	JIN	Joint Inst. for Nuclear Research, Georgian S. S. R. (Dubna)
62	KAP	Knolls Atomic Power Lab., Schenectady, New York
63	KON	Konan U., Japan
64	KRL	Karlsruke, West Germany
65	KTO	U. of Kyoto, Japan
66	KTY	U. of Kentucky, Lexington, Kentucky
67	LAS	Los Alamos Scientific Lab., New Mexico
68	LEB	Lebedev Inst., U. S. S. R.
69	LOK	Lockheed Aircraft, Sunnyvale, California
70	LOV	U. of Louvain, Belgium
71	LRL	Lawrence Radiation Lab., Livermore, California
72	LVP	U. of Liverpool, England
73	MAR	Marquette U., Milwaukee, Wisconsin
74	MCG	McGill U., Montreal, Canada
75	MCM	McMaster U., Ontario, Canada
76	MEX	Mexico
77	MIT	MIT, Cambridge, Massachusetts
78	MND	Mound Lab., Miamisburg, Ohio
79	MOL	Mol, Belgium

Dictionary 9 (Cont'd.)

NEVAL	EVAL	Installation
80	MON	U. of Montreal, Canada
81	MTR	Phillips Petroleum Co. - MTR., Idaho Falls, Idaho
82	MUN	Munich, Germany
83	NAA	NAA, Atomics International, Kanooga Park, California
84	NBS	National Bureau of Standards, Washington, D. C.
85	NED	Netherlands
86	NEV	U. of Neuchatel, Switzerland
87	NOR	Norway
88	NOT	U. of Notre Dame, South Bend, Indiana
89	NRD	U. S. Naval Research Defense Lab., San Franciso, California
90	NRL	U. S. Naval Research Lab., Washington, D. C.
91	NWU	Northwestern U., Evanston, Illinois
92	NZL	New Zealand
93	ORL	Oak Ridge National Lab., Tennessee
94	OXF	U. of Oxford, England
95	PAR	Paris
96	POL	Poland
97	PSV	Penn State U., University Park, Pennsylvania
98	RBZ	Inst. <<R. Boskovic>>, Zagreb, Yugoslavia
99	RIC	Rice Inst., Houston, Texas
100	RIS	Riso, Roskilde, Denmark
101	ROS	Rosendorf bei Dresden, Germany
102	RPI	Rensselaer Polytechnic Inst., Troy, New York
103	RUM	Rumania
104	SAC	Saclay, Paris, France
105	SAH	Saha Inst., Calcutta, India

Dictionary 9 (Cont'd.)

NEVAL	EVAL	Installation
106	SOC	Socony Mobil Oil Co., Dallas, Texas
107	SR	Savannah River Lab., Aiken, South Carolina
108	STF	Stanford U., Menlo Park, California
109	SWD	Sweden
110	SWT	Switzerland
111	TAT	Tata Inst., Bombay, India
112	TEX	U. of Texas, Austin
113	TNC	Texas Nuclear Corp., Austin, Texas
114	TUK	Turkey
115	UKR	Ukraine
116	UMT	U. of Montana, Helena, Montana
117	UNC	United Nuclear Corp., White Plains, New York
118	UPA	U. of Pennsylvania, Philadelphia, Pennsylvania
119	UVA	U. of Virginia, Charlottesville, Virginia
120	WAD	Wright Air Development Center, Ohio
121	WAP	Westinghouse Atomic Power Dept., Pittsburgh, Pennsylvania
122	WIN	AEEW, Winfrith, England
123	WIS	U. of Wisconsin, Madison, Wisconsin
124	WUR	Wurenlingen, Switzerland
125	YAL	Yale U., New Haven, Connecticut
126	ZAG	U. of Zagreb, Yugoslavia
127	ZUR	Zurich, Switzerland
128	A/W	Aldermaston/Winfrith

5.10 Dictionary 10 - Control Card Types

The following control card types are used

HCCT (cols. 1-5, Left adjusted)	NCCT (Note 1) (cols. 9-11)	Description
SEC	100	Secondary particle
ENR	200	Energy range
PDC	300	Partial distribution
DCC 1	401	Tabulated function (1D)
DCC 2	402	" " (2D)
DCC 3	403	" " (3D)
DCC 4	404	" " (4D)
DCC 5	405	" " (5D)
DCC 6	406	Analytic function (1D)
DCC 7	407	" " (2D)
DCC 8	408	" " (3D)
DCC 9	409	Discrete function
DCC 10	410	Reduced variables
DCC 11	411	Resolved resonances
DCC 12	412	Unresolved resonances
DCC 13	413	Radioactive decay and fission yield
END	500	End card

5.11 Dictionary 11 - Allowed Characters

The following characters may be used.

NCHT	CHAR	NCHT	CHAR
1	0	31	Not used
2	1	32	Not used
3	2	33	-
4	3	34	J
5	4	35	K
6	5	36	L
7	6	37	M
8	7	38	N
9	8	39	O
10	9	40	P
11	Not used	41	Q
12	=	42	R
13	-	43	Not used
14	Not used	44	$
15	Not used	45	*
16	Not used	46	Not used
17	+	47	Not used
18	A	48	Not used
19	B	49	Blank
20	C	50	/
21	D	51	S
22	E	52	T
23	F	53	U
24	G	54	V
25	H	55	W
26	I	56	X
27	Not used	57	Y
28	.	58	Z
29	)	59	Not used
30	Not used	60	,
		61	(

5.15 Dictionary 15 - Final State Numbers

The following final state numbers are to be used in field 5 (Cols. 17-18) of the first Heading Card. When the deck is converted to Version B, the number NFS will be put in field 7 (Cols. 37-41) of the second Heading Card.

NFS	Description
0	Ground state
1	1^{st} excited state
2	2^{nd} excited state
---	-----
20	20^{th} excited state
---	-----
98	A range of final states
99	All final states

5.16 Dictionary 16 - Data Card Formats

Card formats for data, constants, and parameters must be specified by giving a value to NCDF (Field 1) on the third Heading Card. The following formats are built in, but NCDF = 1 (the Aldermaston/Winfrith format) is recommended.

NCDF	Description
0	User supplies his own format (see note below)
1	(6(E11.0, 1x)) Aldermaston/Winfrith format
2	(7E10.0)
3	(8E9.0)
4	(9E8.3)
5	(10F7.4)
6	(12F6.3)

Note: If NCDF = 0 is used, a Format card must follow the fourth Heading Card.

5.17 Dictionary 17 - Interpolation Codes

The following values of NTERP are to be used in field 4 (Cols. 19-23) of a DCC 1-5 type control card to indicate the type of interpolation to be used between tabulated values.

NTERP	Description
0	Irrelevant
1	Piece-Wise Constant
2	y Linear in x
3	y Linear in ln x
4	lny Linear in x
5	lny Linear in ln x

Appendix A - Material Identification System

Materials are identified by two numbers, Z (2 digits), and A (3 digits). If the material is a single isotope, then Z is its atomic number, and A is its mass number. If the material is a natural mixture of isotopes of the same Z, then A is set to zero. If the material is a mixture of isotopes with different Z, set Z to zero and give the appropriate A number from the lists given on the following pages. Assignment of numbers in these lists is arbitrary but should conform to the following divisions.

1 - 99	Hypothetical materials
100 - 199	Liquid moderators and coolants
200 - 299	Solid moderators
300 - 399	Metal alloys, cladding, and structural materials
400 - 499	Lumped poisons
500 - 599	
600 - 699	
700 - 799	
800 - 899	
900 - 999	

Liquid Moderators and Coolants

A	Description
100	Water, H_2O
101	Heavy Water, D_2O
102	Biphenyl, $C_{12}H_{10}$
103	Sodium Hydroxide, NaOH
104	Santowax R, $C_{18}H_{14}$
105	Dowtherm A
106	Benzene
107	
108	
109	

Hypothetical Materials

A	Description
001	Pure $1/\sigma$ absorber, σa (2200 m/s) = 1.0
002	Pure Scatterer, σs = 1.0
003	
004	
005	

Solid Moderators

A	Description
200	Beryllea, BeO
201	Beryllium Carbide, Be_2C
202	Beryllium Flouride, BeF_2
203	Zirconium Hydride, ZrH_2
204	Polystyrene, $(CH)_n$
205	Polyethylene, $(CH_2)_n$
206	
207	
208	
209	

Metal Alloys, Cladding, and Structural Materials

A	Description
300	
301	Zircalloy 1
302	Zircalloy 2
303	
304	304 Type Stainless Steel
305	
306	
307	
308	
309	

Lumped Poisons

A	Description
400	U^{233} Fission products
401	U^{235} " "
402	Pu^{239} " "
403	Pu^{241} " "
404	
405	
406	
407	
408	
409	

Appendix B - Sample Data Records

```
TI     (N,TOTAL )  ,  CROS C(EI        )BN BNL0008  4/64 2.000-3 3.000-1EV
    0      0
    0      1
 0.0           0.0           0.0           1.0
(12F6.3)
                  TAKEN FROM PRELIMINARY BNL 325 1964
DCC1     401      1      6      0     20
  .002 27.     .003 22.     .004 19.7    .005 18.     .006 16.8    .007 16.
  .008 15.2    .009 14.6    .01  14.     .02  11.3    .03  10.     .04  9.2
  .05   8.7    .06   8.1    .07   7.85   .08   7.5    .09   7.3    .1     7.1
  .2    6.2    .3    5.9
END


 U235 (N,ABSORP)  ,  CROS V(EI        )BN ID00002  4/64 0.000+0 0.500+0EV
    0      0
    2      1
 0.0           0.0           0.0           1.0
FLUHARTY ET AL, PREPRINT
ENR      200      1      2                                0.0           0.1
DCC6     406      1      0      1      3      0
 2.0
115.27     -329.09     986.74
ENR      200      2      2                                0.1           0.5
DCC6     406      6      0      1      7      0
 2.0
0.335      1.410      0.148      0.283      108.14     -188.93     162.23
END


 U238 (N,ELAST )  ,N ANGD C(CC,EI    )BN BNL0001  4/64 0.100+0 2.000+0MEV
    0      1
    0      1
238.046468    0.0           0.0           1.0
(12F6.3)
OPTICAL MODEL CALCULATION BY MOORE AND AUERBACH, BNL 818, AUG 1963
DCC2     402      0      3      0     20
DCC1     401      5      3      0     21                    0.1
 1.000-0.100 1.230 1.181 1.135 1.092 1.052 1.014 0.978 0.945 0.914 0.886
 0.860 0.836 0.814 0.794 0.777 0.761 0.747 0.736 0.726 0.718 0.712  .
DCC1     401      5      3      0     21                    0.2
 1.000-0.100 1.269 1.175 1.090 1.013 0.943 0.879 0.822 0.771 0.725 0.685
 0.650 0.619 0.593 0.570 0.552 0.537 0.525 0.516 0.510 0.508 0.507  .
DCC1     401      5      3      0     21                    0.3
 1.000-0.100 1.329 1.184 1.057 0.946 0.849 0.766 0.695 0.634 0.583 0.541
 0.506 0.477 0.455 0.437 0.424 0.415 0.409 0.406 0.406 0.408 0.412  .
DCC1     401      5      3      0     21                    0.4
 1.000-0.100 1.396 1.195 1.025 0.882 0.763 0.666 0.586 0.522 0.472 0.433
 0.404 0.382 0.367 0.356 0.349 0.345 0.343 0.342 0.343 0.344 0.347  .
DCC1     401      5      3      0     21                    0.5
 1.000-0.100 1.471 1.210 0.996 0.822 0.684 0.576 0.493 0.431 0.386 0.355
 0.332 0.321 0.313 0.309 0.307 0.305 0.302 0.299 0.296 0.291 0.287  .
DCC1     401      5      3      0     21                    0.6
 1.000-0.100 1.560 1.231 0.970 0.766 0.611 0.496 0.414 0.357 0.321 0.299
 0.289 0.285 0.284 0.285 0.285 0.283 0.277 0.268 0.256 0.243 0.230  .
DCC1     401      5      3      0     21                    0.7
```

Appendix B - (Cont'd)

```
 1.000-0.100 1.655 1.252 0.942 0.710 0.540 0.420 0.341 0.293 0.267 0.257
 0.257 0.262 0.268 0.272 0.272 0.266 0.255 0.237 0.216 0.193 0.171  .
DCC1     401       5       3       0      21                   0.8
 1.000-0.100 1.768 1.284 0.922 0.659 0.475 0.353 0.279 0.240 0.225 0.227
 0.237 0.250 0.261 0.268 0.266 0.256 0.238 0.212 0.181 0.149 0.123  .
DCC1     401       5       3       0      21                   0.9
 1.000-0.100 1.902 1.327 0.909 0.615 0.418 0.295 0.227 0.198 0.195 0.208
 0.227 0.247 0.262 0.269 0.265 0.250 0.224 0.190 0.152 0.116 0.089  .
DCC1     401       5       3       0      21                   1.0
 1.000-0.100 2.057 1.380 0.900 0.574 0.365 0.242 0.182 0.163 0.172 0.195
 0.222 0.247 0.264 0.270 0.262 0.242 0.210 0.170 0.127 0.090 0.069  .
DCC1     401       5       3       0      21                   1.1
 1.000-0.100 2.236 1.441 0.895 0.537 0.317 0.196 0.144 0.137 0.156 0.188
 0.221 0.249 0.267 0.270 0.258 0.233 0.195 0.151 0.106 0.072 0.060  .
DCC1     401       5       3       0      21                   1.2
 1.000-0.100 2.435 1.513 0.896 0.505 0.274 0.157 0.114 0.118 0.147 0.186
 0.224 0.252 0.268 0.267 0.251 0.221 0.180 0.134 0.091 0.062 0.064  .
DCC1     401       5       3       0      21                   1.3
 1.000-0.100 2.655 1.593 0.901 0.476 0.237 0.124 0.092 0.106 0.144 0.188
 0.227 0.255 0.267 0.262 0.241 0.206 0.163 0.118 0.079 0.060 0.076  .
DCC1     401       5       3       0      21                   1.4
 1.000-0.100 2.893 1.680 0.910 0.451 0.204 0.097 0.075 0.100 0.145 0.193
 0.232 0.256 0.263 0.253 0.227 0.190 0.146 0.103 0.072 0.063 0.095  .
DCC1     401       5       3       0      21                   1.5
 1.000-0.100 3.145 1.772 0.920 0.428 0.176 0.076 0.065 0.099 0.150 0.199
 0.236 0.256 0.257 0.241 0.210 0.171 0.129 0.090 0.066 0.069 0.115  .
DCC1     401       5       3       0      21                   1.6
 1.000-0.100 3.406 1.866 0.932 0.408 0.152 0.059 0.059 0.102 0.157 0.207
 0.240 0.254 0.248 0.226 0.192 0.152 0.111 0.079 0.063 0.077 0.135  .
DCC1     401       5       3       0      21                   1.7
 1.000-0.100 3.672 1.961 0.944 0.390 0.131 0.047 0.057 0.108 0.167 0.215
 0.243 0.250 0.238 0.210 0.173 0.132 0.095 0.068 0.061 0.085 0.153  .
DCC1     401       5       3       0      21                   1.8
 1.000-0.100 3.938 2.054 0.957 0.375 0.113 0.038 0.058 0.115 0.176 0.222
 0.246 0.246 0.227 0.194 0.154 0.113 0.080 0.059 0.060 0.092 0.166  .
DCC1     401       5       3       0      21                   1.9
 1.000-0.100 4.201 2.144 0.969 0.361 0.098 0.031 0.060 0.124 0.186 0.229
 0.247 0.240 0.215 0.177 0.135 0.096 0.066 0.052 0.060 0.098 0.175  .
DCC1     401       5       3       0      21                   2.0
 1.000-0.100 4.457 2.231 0.981 0.348 0.086 0.027 0.065 0.133 0.196 0.235
 0.247 0.234 0.202 0.161 0.118 0.080 0.054 0.046 0.060 0.102 0.180  .
END
```

**********0106**********

ENDF

Evaluated Nuclear Data File Service Routines*

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Evelyn Gottesfeld

Brookhaven National Laboratory

January 1, 1965

*Work performed under the auspices of the United States Atomic Energy Commission

Contents

1. Introduction

This report gives a brief description of the operation of the ENDF Center at BNL and a detailed description of the computer programs developed to maintain the center. These programs are designated by the symbol DFSR (Data File Service Routine).

2. Operation of the ENDF Center

The ENDF Center will receive and distribute Data Records in the form described in the ENDF Specifications. A series of computer programs have been written which will handle the receiving and distributing of data and provide necessary bookkeeping.

The Center will operate in the following way. Data in the form of complete Data Records will be sent to the Center and will be added to the library tapes by the program DFSR1. This program will also produce listings and punched cards for later use. Some of these cards will be collected and printed as a Newsletter which will be sent to all interested parties about four times a year. Upon receipt of the Newsletter, a user may request data by submitting a tape and a letter indicating the desired data. The data is taken from the library tapes by DFSR2 and placed on the users tape to be returned to him. If errors in the data are found, the program DFSR3 can be used to correct the library tapes. A program DFSR4 is also available to print/punch/copy selected Data Records from the library tapes.

When DFSR1 puts a Data Record on the library tape, it automatically assigns it an identification number consisting of one alphabetic character and four numerical digits. For example, A0258. This is the permanent identification number of the Data Record and must be used in all references to the Data Record. Should the record be subsequently deleted from the library, an entry is still retained on the library giving the identification number and date deleted. The Data Records are numbered on the first

library tape by A0001, A0002, etc. If the last record on the first library tape is A0864, then the first number on the second library is A0865.

The order of Data Records on the Library Tapes is the order received. To facilitate finding desired Data Records, a program DFSR5 was written which prints a one-line message for each Data Record. These lines are ordered first by isotope, then by reaction type, and finally by data type. This list will also be included in the Newsletter.

All correspondence should be addressed to:

ENDF Data Center
c/o The Sigma Center
Brookhaven National Laboratory
Upton, L.I., New York 11973

3. Description of the Library Tapes

Data Records are stored on magnetic tapes (Library tapes) in the form of packed card images. Specifically, if KX is the number of cards in the Data Record, the input tape INP is read with the statements

```
READ INPUT INP, 10, ((R(I,K),I=1,14), K=1,KX)
10   FØRMAT(12A6,A5,A3)
```

The library tape LIB is written with the statement

```
WRITE TAPE LIB,KX,(RL(I),I=1,14), ((R(I,K),I=1,14),K=1,KX)
```

The image RL is called the Lead Card and contains the identification of the Data Record, the number of cards in the Data Record, the date the Data Record was added, and the date the Data Record was last corrected.

The capacity of such a tape (556 bpi) is about 1.2×10^5 cards and since about three pairs of (E,σ) occur on each card, the tape has a capacity of 3.6×10^5 data points. Provision has been made for four library tapes for a total of 1.4×10^6 data points. The Aldermaston/Winfrith Data File received by BNL contains 38 elements, 25,000 cards, and 551 Data Records. This represents about 20% of the capacity of one tape and 5% of four tapes. The average Data Record is 50 cards so that a tape will hold about 2400 Data Records. Thus, four tapes should be adequate for the next few years.

4. Procedure for Submitting Data

Data submitted to the Data Center must be in the form of complete Data Records. Two methods may be used to send the data, but the second (magnetic tape) is preferred.

1. BCD punched IBM cards
2. BCD punched IBM card images on IBM magnetic tape. Each card image should be one record. No extra cards or tape marks between Data Records. An end-of-file mark at the end of the tape. Be sure to mark density on the tape.

In both cases the Data Records may or may not be sequence numbered. If the First Heading Card contains blanks in columns 78-80, the deck is assumed not to be numbered and the DFSR1 program will provide sequence numbers. If the First Heading Card contains non-blanks in columns 78-80, the deck is assumed to be numbered starting with 000 and the deck will be checked. The DFSR1 program will reject the Data Record if a sequencing error is found.

In a similar manner, columns 13-60 of the END card should be blank if the character count has not been made.

5. Procedures for Requesting Data

Data Records may be requested from the Data Center by sending an IBM magnetic tape (clearly marked with the desired density) and a letter containing the identification numbers (from the Newsletters) of the desired Data Records. It would be helpful if the requestor could send cards 5 and 6 for the input to DFSR2 leaving NUST blank. Requests for "all data for U^{235}" etc., will not be processed. The identification numbers must be used. A typical request might read

A0101 0 A0105 0 A0110-A0117 0 A0120

which is interpreted as meaning that Data Records A0101, A0105, A0110 through A0117, and A0120 are wanted. The records will be written by DFSR2 on the requestors tape as either packed or unpacked card images of the Data Records. No special marks occur between Records and an EØF ends the tape. The tape and a processing message will be returned to the requestor.

An alternate method of requesting data is to request a copy of a portion (or all) of the library tape(s). The form here is packed BCD card images plus information as to when record was added to the library and when corrected. The request here must be of the form A0110-A0117 meaning Data Records A0110 through A0117 are wanted. Only one such request can be put on the requestors tape.

6. Description, Flow Diagrams, and Listings of the Programs

6.1 Non-Standard Functions

The Service Routines were written largely in Fortran II and are intended for use by the BNL center or a few other centers. It became readily apparent that some jobs could not be done in Fortran II and that FAP routines or non-standard features of the BNL Monitor system must be used. This section gives a brief description of the non-standard functions on the BNL Monitor System.

The routine NEXEM is used to sense tape errors and EØF in a Fortran II program. The statement

```
CALL NEXEM1 (I1,I2,I3,....)
```

used near the beginning of a program tells the Monitor that conditions I1, I2, I3, ... are to be tested by the Fortran II program and execution is not to be terminated by the Monitor. The values of the integers that are used are:

10 - redundancy reading tape
11 - end of file reading tape
13 - redundancy writing tape
15 - end of tape during writing

Thus, one of the first statements in DFSR1 is:

```
CALL NEXEM1 (10,11,13,15)
```

Later in the program, following a WRITE TAPE statement, the following statement is used:

```
IF(NEXEM2(11)) b, b, a
```

where control passes to b if no error of type 11 occurred, and to a if an error of type 11 occurred.

The ability to unpack data words and compare bits is essential in BCD data processing. The ENDF programs, using the BNL extended version of the standard FBM FORTRAN system, contain functions enabling them to shift a word left or right the desired number of bits and to logically compare two words for equality.

In the following descriptions the arguments A_i represent operands, the arguments N the bit shift counts. The N and A_i's may be constants, variables, or expressions; if expressions, these are evaluated by the system before the instruction sequences are generated.

Regarding the shift functions, programmers should note that a FORTRAN arithmetic statement generates a STØ, while a Boolean statement generates a SLW, hence a logical left shift must be a Boolean statement whose shift length is either a floating point name or an octal number. A fixed point name may be equivalenced to a floating point variable or, as an alternative, used in the statement

```
Y = ABSF(N)
```

where y then replaces N as an argument.

A. Logical Compare - a boolean "exclusive or"

Function: BERAF (A_1, A_2)

```
CAL  A1
ERA  A2
```

Example: IF(BERAF(A_1,A_2)) m1, m2, m1

Note: Equality exists at m2.

B. Logical left shift

Function: SHIFTLF(N,A)

```
CAL  A
ALS  N
```

Example: B SR = SHIFTLF (14000000,R)

Notes: R is shifted left 12 bit places (2 BCD characters) and stored in SR. R in memory is untouched. Since the statement is Boolean, a SLW is generated, thus preserving the hi-order position of R. Foating point names are used throughout the statement and the shift count N is an octal number in the decrement position.

C. Logical right shift

Function: SHIFTRF(N,A)

```
CAL  A
ARS  N
```

Example: Y(I) = SHIFTRF(6,R)

Name: DFSR1

Purpose: To create a library tape from Data Record card images.

Language: FORTRAN II

Input: The program deck consisting of:

1. The binary deck DFSR1
2. A * Data Card
3. The 5 Input Cards (see detail listing following this writeup)
4. An EØF card

Tapes: A. Input

1. One to five INPT tapes of BCD Data Record

B. Output

1. Library tapes NLIBA and NLIBB
2. Output Print tapes NØUTA and NØUTB
3. Output Punch tapes NPUNA and NPUNB
4. Error print output tape NØUTE
5. Error punch output tape NPUNE

Method:

Data Records are read and processed one at a time. Each file is defined by its END card, which is a card punched with END in col. 1-3.
A Data Record may be up to 1000 cards in length, including the END card. It may or may not be sequenced (col. 78-80) and may or may not already have check sums present in the END card. Sequencing, when present, is from 0-999.

Each Data Record is assigned an identification number one higher than the preceding record on the library tape unless the Input Data field HOLID indicates that a new library tape is to be started.

A Lead Card is developed, containing the number at cards in the Data Record (KX), the new ID number, and the date. The Lead Card will precede the Data Record on the library tape.

Each card in the Data Record is sequence checked. If the sequence field is blank, sequence numbers are inserted. An out-of-sequence condition causes the erroneous Data Record to be printed on the output error tape NØUTE in the format dictated by error print indicator IØUTE, and to be written for punching on tape NPUNE according to IPUNE. A detailed listing of these indicators is present in the PRINT AND PUNCH Service Routine writeups.

The entire Data Record (exclusive of the END card) is scanned from column 1-72, and a character count (modulo 8) of each legitimate character is kept. This is the logical checksum of the record and is kept in words 2-9 of the END card. The logical checksum is recomputed for each tape pass and compared with the original sum to insure the integrity of the data. DFSR1 accepts the Data Record with or without this sum. If the character count is not present, it is inserted, and then becomes a permanent part of the record. If the sum is present, the new count is compared with the original, and a discrepancy causes error printing and punching as heretofore described. The presence of an illegal character will also cause the Data Record to be printed on the output error tape instead of the library tape.

After checking, the data record is printed on output tapes NØUTA and NØUTB, and written for punching on tapes NPUNA and NPUNB, unless the tape numbers indicate otherwise (see note in detail listing of Input Data).

The Lead Card and Data Record are then written in packed BCD onto the library tape. An end-of-tape condition on the library tape causes backspacing to the last Data Record and termination of the tape. A message is printed indicating the first and last records on the full tape, and the current Data Record begins a new tape. Processing continues until the end of the last input tape is reached.

Service Routines:

1. RDIN - Read a Data Record (BCD)
2. RDLIB - Read a library tape record (packed BCD)
3. WRLIB - Write a record on the library tape (packed BCD)
4. PRDR - Print selected portions of the Data Record on tape NØUT
5. PUNDR - Write selected portion of a Data Record on a punch tape
6. SEQ - Check sequence number of a Data Record and change the ID number
7. AID - Increase the sequence number
8. NTCD - Determine the number of Heading cards in the Data Record
9. HIC - Hollerith to integer conversion
10. IHC - Integer to Hollerith conversion
11. DRCCK - Calculate and compare character occurence sums

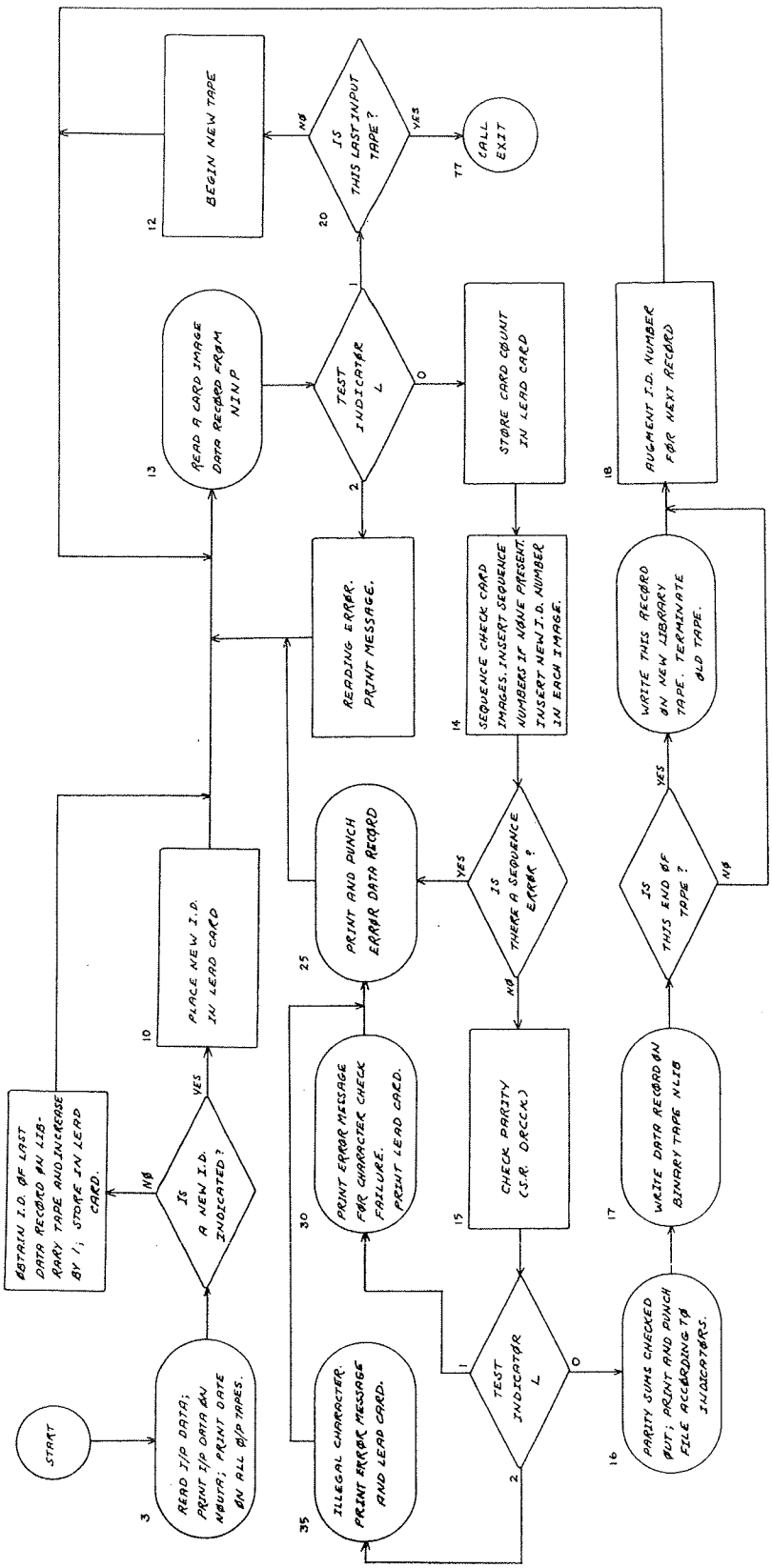
INPUT DATA TO MAKE UP THE LIBRARY TAPE

CARD	COLUMNS	FORMAT	SYMBOL	DESCRIPTION
1	1-6	A6	DATEA	The date in the form
	7-12	A6	DATEB	NOV (1) 30, (1) 1964
	13-14	2x	-	
	15-19	A5	HØLID	Hollerith identification. If this field is blank, the identification will be picked up from the last Data Record on the library. If it is not blank, a new library tape will be started, beginning with this ID.
2	1-10			The characters LIBRARY
	11-15	I5	NLIBA	1st library tape number
	16-20	I5	NLIBB	2nd library tape number
3	1-10			The characters PRINT
	11-15	I5	NØUTA	1st print output tape number
	16-20	I5	IØUTA	Printing mode for NØUTA - described in PRINT Routine writeup as IPRN
	21-25	I5	NØUTB	2nd print output tape number
	26-30	I5	IØUTB	Printing mode for NØUTB
	31-35	I5	NØUTE	Error print output tape number
	36-40	I5	IØUTE	Printing mode for NØUTE
4	1-10			The characters PUNCH
	11-15	I5	NPUNA	1st output punch tape number
	16-20	I5	IPUNA	Punching mode for NPUNA
	21-25	I5	NPUNB	2nd output punch tape number
	26-30	I5	IPUNB	Punching mode for NPUNB
	31-35	I5	NPUNE	Error output punch tape number
	36-40	I5	IPUNE	Punching mode for NPUNE

CARD	COLUMNS	FORMAT	SYMBOL	DESCRIPTION
5	1-10			The characters INPUT
	11-15	I5	NINX	Number of input tapes
	16-20	I5	INPT(1)	1st input tape number
	21-25	I5	INPT(2)	2nd " " "
	26-30	I5	INPT(3)	3rd " " "
	31-35	I5	INPT(4)	4th " " "
	36-40	I5	INPT(5)	5th " " "

Note: For output tapes, blank, zero tape numbers cause suppression of printing or punching on those tapes.

DFSR1 - CREATE LIBRARY TAPE FROM CARD IMAGES



```
*      *ENDF* SERVICE ROUTINE
*      FORTRAN
*      LABEL
CDFSR1 CREATE LIBRARY TAPE FROM DATA RECORD CARD IMAGES
       DIMENSION R(14,1000),RL(14),INPT(5),NOTAP(6)
       COMMONR,RL,KX
       EQUIVALENCE(NOTAP,NOUTA),(NOTAP(2),NOUTB),(NOTAP(3),NOUTE),(NOTAP(
      14),NPUNA),(NOTAP(5),NPUNB),(NOTAP(6),NPUNE)
       CALLNEXEM1(10,11,13,15)
CINPUT DATA ON TAPE 5
       NINP=5
       RITNINP,2000,DATEA,DATEB,HOLID,NLIBA,NLIBB,NOUTA,
      1IOUTA,NOUTB,IOUTB,NOUTE,IOUTE,NPUNA,IPUNA,
      2NPUNB,IPUNB,NPUNE,IPUNE,NINX,(INPT(JIN),JIN=1,NINX)
 2000 FORMAT(2A6,2XA5/10X2I5/10X6I5/10X6I5/10X6I5)
       RL(3)=DATEA
       RL(4)=DATEB
B      RL(5)=606060606060
B      RL(6)=606060606060
       IF(NOUTA)4,4,3
CPRINT INPUT DATA ON NOUTA
     3 WOTNOUTA,3000,DATEA,DATEB,HOLID,NLIBA,NLIBB,NOUTA,
       1IOUTA,NOUTB,IOUTB,NOUTE,IOUTE,NPUNA,IPUNA,NPUNB,IPUNB,
       2NPUNE,IPUNE,NINX,(INPT(JIN),JIN=1,NINX)
 3000 FORMAT(1H 2A6,2XA5/10H LIBRARY  2I5/10H PRINT    6I5/10H PUNCH
      16I5/10H INPUT    6I5)
CPRINT DATE ON ALL OUTPUT TAPES
     4 DO6I=1,6
       NT=NOTAP(I)
       IF(NT)6,6,5
     5 WOTNT,4000,DATEA,DATEB
 4000 FORMAT(1H 2A6,12X)
     6 CONTINUE
B      BT=606060606060
B      IF(HOLID*(-BT))10,7,10
CGET ID FROM LAST DATA RECORD ON LIBRARY TAPE-READ TO EOF + BSP
     7 CALLRDLIB(NLIBA,L,NOUTA)
C TEST EOF
       IF(L-1)7,9,7
CINCREASE ID NO. BY ONE
     9 CALLAID(RL(1))
       GOTO11
    10 RL(1)=HOLID
    11 NLIB=NLIBA
CJIN IS CURRENT INPUT TAPE NO.
       JIN=1
    12 NINP=INPT(JIN)
CREAD A CARD IMAGE DATA RECORD
    13 CALLRDIN(NINP,L,NOUTA)
       IF(L-1)14,20,13
C CHECK SEQUENCE NOS.
    14 CALLSEQ(L,NOUTA)
       IF(L)25,15,25
CPARITY SCAN
    15 CALLDRCCK(L)
       IF(L-1)16,30,35
```

```
CSUMS CHECK OUT, PRINT + PUNCH
   16 CALLPUNCH(IPUNA,NPUNA)
      CALLPUNCH(IPUNB,NPUNB)
      CALLPRINT(IOUTA,NOUTA)
      CALLPRINT(IOUTB,NOUTB)
CWRITE RECORD ON LIBRARY TAPE
   17 CALLWRLIB(NLIB,L,NOUTA)
      IF(L)40,18,40
   18 CALLAID(RL(1))
CREAD THE NEXT DATA RECORD
      GOTO13
C ERROR ROUTINES-------------------------------------------------------
C EOF ON INPT TAPE-ANY MORE TAPES TO BE READ
   20 JIN=JIN+1
      IF(JIN-NINX)12,12,75
C PRINT P PUNCH ERROR FILE
   25 CALLPRINT(IOUTE,NOUTE)
      CALLPUNCH(IPUNE,NPUNE)
      GOTO13
CPARITY SUMS DO NOT MATCH, L=1
   30 IF(NOUTA)25,25,32
   31 FORMAT(29H  CHARACTER CHECK FAILURE IN A6)
   32 WOTNOUTA,31,RL(1)
      GOTO25
CILLEGAL CHARACTER IN FILE
   35 IF(NOUTA)25,25,37
   36 FORMAT(23H  ILLEGAL CHARACTER IN A6)
   37 WOTNOUTA,36,RL(1)
      GOTO25
CEND OF TAPE ONO/P LIBRARY TAPE, STEP UP
   40 NLIB=NLIBB
      GOTO17
   75 DO77JIN=1,NINX
      INPT1=INPT(JIN)
      REWINDINPT1
   77 UNLOADINPT1
      ENDFILENLIB
      REWINDNLIB
      UNLOADNLIB
      CALLEXIT
      END
```

Name: DFSR2

Purpose: To copy selected records from the library tape onto a requestor tape, and to prepare a list of the requests for distribution.

Language: FORTRAN II

Input: A. The program deck consisting of:

1. The binary deck DFSR2
2. A * Data Card
3. Six or more Input Data Cards
   (See detail listing following this writeup)
4. An EØF card

B. Tapes

1. Input
   a. One to four library tapes NLIBA-NLIBD
   b. Scratch tape NSCR

Output: A. One to four O/P requestor's tapes NUST

B. Listing tape NØUT, containing, for each requestor, the Lead and first Heading Card of each selected Data Record. This list shows both processed and non-processable records.

Method: DFSR2 is a library search and tabulation program. It prepares output tapes and listings for up to four users, each of whom may request up to 2000 Data Records.

A record identification (RID) list is set up for each user, and the library tapes are read and checked against this list. As each request is located, it is written out in packed or unpacked form (as per NPCK) on the designated user's tape. The Lead Card and first Heading Card of the request is also written on the scratch tape

for organization into the appropriate distribution list.

Each user's list contains two sections, REQUESTS PRØCESSED and REQUESTS NØT PRØCESSED. One output tape is prepared for each requestor, hence any requests occurring after an 0/P end-of-file condition will not be processed but will be identified in an ØUTPUT TAPE FULL message on NØUT and also in the REQUESTS NØT PRØCESSED section of the listing. Records which cannot be found on the library tape will appear in the NØT PRØCESSED section.

Service Routines:

1. AID
2. RDLIB
3. WRLIB
4. HIC
5. IHC

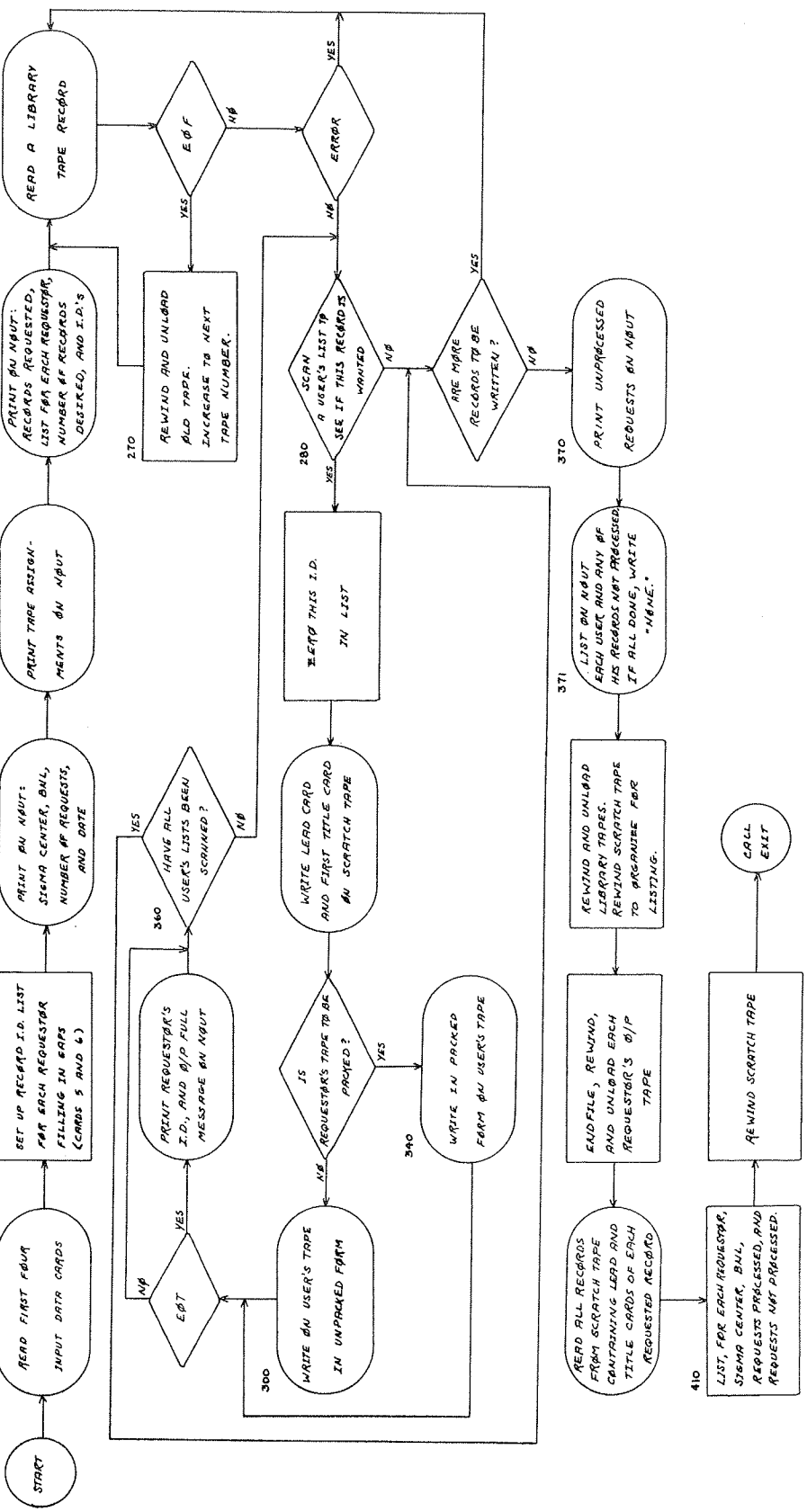
Input data to copy selected records from the library tape onto a requestor tape.

Card	Cols.	Format	Symbol	Description
1.	1-6	A6	DATEA	The date in the form
	7-12	A6	DATEB	JAN (1) 21, (1) 1964
	13-15	I3	NUSX	Number of output tapes (requestor's tapes) mounted ≤ 4
2.	1-10	10X	-----	The characters LIBRARY
	11-15	I5	NLIBA	1st library tape number
	16-20	I5	NLIBB	2nd " " "
	21-25	I5	NLIBC	3rd " " "
	26-30	I5	NLIBD	4th " " "
3.	1-10	10X	-----	The characters PRINT
	11-15	I5	NØUT	Output tape number (printing)
4.	1-10	10X	-----	The characters SCRATCH
	11-15	I5	NSCR	Scratch tape number
5.	1-48	8A6	HUID(K) K=1,8	Hollerith description of requestor. Name, installation, etc.
	51-55	I5	JUSX	Number of data record indentifications given on the following cards (type 6)
	56-60	I5	NUST	Requestors output tape number
	61-65	I5	NPCK	=0, output unpacked on tape NUST =1, output packed on tape NUST
6.	1-5	A5	A(1)	Ident of first data record desired
	6	A1	B(1)	See note 1 below
	7-11	A5	A(2)	Ident of second data record desired
	12	A1	B(2)	See note 1 below
	etc.			
	72	A1	B(12)	

Notes:

1. The fields in cols 5, 10, 15, etc. in card 6 are normally blank. If they are not blank, they are to be read as "through". For example, card 6 might be:
   A0101 (1) A0105 (1) A0110 - A0117 (1) A0120
   which is interpreted as meaning that data records A0101, A0105, A0110 through A0117, and A0120 are wanted. The total number of records requested by a single user must be no more than 2000.
2. Repeat card types 5-6 for each requestor.

DFSR2 - COPY TO REQUESTOR'S TAPE



```
*       *ENDF* SERVICE ROUTINE
*       FORTRAN
*       LABEL
CDF0R2COPY RECORDS FROM LIBRARY TO REQUESTORS TAPES
        DIMENSIONRL(14),R(14,1000),NLIST(4),HOID(8,4),JOSX(4),NOUT(4),
       1NPCK(4),A(2000),B(2000),RID(2000,4),E(18)
        COMMON R,RL,KX,A,B,RID
B       BLANK=8H      
        IMAX=2000
        NIN=5
        CALL NEXEM1(10,11,13,15)
C======READ INPUT DATA==========================================
  100 READINPUTTAPENIN,110,DATEA,DATEB,NOSX,(NLIST(N),N=1,4),NOUT,NSCR
  110 FORMAT(2A6,I5/10XI5,3I5/10XI5/10XI5)
        NRECX=0
        REWINDNSCR
C======SET UP RECORD ID LIST FOR EACH REQUESTOR==================
        DO200N=1,NOSX
        READINPUTTAPENIN,120,(HOID(K,N),K=1,8),JOSX(N),NOST(N),NPCK(N)
  120 FORMAT(8A6,2XI5,2I5)
        JX=JOSX(N)
        READINPUTTAPENIN,130,(A(J),B(J),J=1,JX)
  130 FORMAT(12(A5,A1))
        I=1
        DO160J=1,JX
        RID(I,N)=A(J)
        I=I+1
B       IF(SERAF(B(J),BLANK))140,170,140
C       FILL OUT LIST
  140 C=A(J)
  150 CALLAID(C)
B       IF(SERAF(C,A(J+1)))160,170,160
  160 RID(I,N)=C
        I=I+1
        IF(I-IMAX)150,150,190
  170 IF(I-IMAX)180,180,190
  180 CONTINUE
  190 JOSX(N)=I-1
  200 NRECX=NRECX+JOSX(N)
C======PRINT INPUT DATA==========================================
        WRITEOUTPUTTAPENOUT,210,NOSX,DATEA,DATEB
  210 FORMAT(22H1THE SIGMA CENTER, BNL//I3,38H REQUESTS FROM THE *ENDF*
      1PROCESSED ON1XA6,A6)
        WRITEOUTPUTTAPENOUT,220,(NLIST(N),N=1,4),NOUT,NSCR
  220 FORMAT(17H0TAPE ASSIGNMENTS/8H LIBRARYI7,3I5/7H OUTPUTI8/8H SCRATC
      1H17)
        WRITEOUTPUTTAPENOUT,230
  230 FORMAT(37H0THE FOLLOWING RECORDS WERE REQUESTED)
        DO250N=1,NOSX
        JX=JOSX(N)
        WRITEOUTPUTTAPENOUT,240,(HOID(K,N),K=1,8),JX,(RID(J,N),J=1,JX)
  240 FORMAT(1H0A6,7A6,11H  REQUESTEDI5,8H RECORDS/(5XA6,1P6A6))
  250 CONTINUE
        ILT=1
        NSC=0
        NLIB=NLIST(1)
```

```
C======READ RECORD FROM LIBRARY=================================================
  260 CALLRDLIB(NLIB,L,NOUT)
      IF(L-1)280,270,260
C     LIBRARY TAPE FINISHED, USE NEXT TAPE
  270 ILT=ILT+1
      REWINDNLIB
      UNLOADNLIB
      NLIB=NLIBT(ILT)
      IF(NLIB)370,370,260
C======TEST TO SEE IF THIS RECORD IS WANTED
  280 DO360N=1,NUSX
      JX=JUSX(N)
      DO360J=1,JX
      IF(BERAF(RID(J,N),RL(1)))360,290,360
C======RECORD IS WANTED, WRITE IT ON REQUESTORS TAPE
  290 NPUN=NUST(N)
      IF(NPUN)360,360,295
  295 NRECX=NRECX-1
      RID(J,N)=0.0
      WRITETAPENSCR,N,(RL(K),K=1,6),(R(L,I),L=1,12)
      NSC=NSC+1
C     IS REQUESTORS TAPE TO BE PACKED OR UNPACKED
      IF(NPCK(N))300,300,340
  300 WRITEOUTPUTTAPENPUN,310,((R(L,K),L=1,14),K=1,KX)
  310 FORMAT(12A6,A5,A3)
      IF(NEXLM2(15))330,360,330
  340 CALLWRLIB(NPUN,L,NOUT)
      IF(L)360,360,350
C     REQUESTORS TAPE IS FULL
  350 NUST(N)=-NUST(N)
      WRITEOUTPUTTAPENOUT,355,(HOID(L,N),L=1,8)
  355 FORMAT(1H0A6,7A6,21H  OUTPUT TAPE IS FULL)
  360 CONTINUE
C======DETERMINE IF ANY RECORDS HAVE NOT BEEN PROCESSED=================
      IF(NRECX)370,370,260
C     NO MORE RECORDS ON LIBRARIES
  370 WRITEOUTPUTTAPENOUT,470
      DO377N=1,NUSX
      JX=JUSX(N)
      I=0
      DO372J=1,JX
      IF(RID(J,N))371,372,371
  371 I=I+1
      RID(I,N)=RID(J,N)
  372 CONTINUE
      JUSX(N)=I
      IF(I)375,373,375
  373 WRITEOUTPUTTAPENOUT,374,(HOID(L,N),L=1,8)
  374 FORMAT(1H0A6,7A6/7X4HNONE)
      GOTO377
  375 WRITEOUTPUTTAPENOUT,376,(HOID(L,N),L=1,8),(RID(J,N),J=1,I)
  376 FORMAT(1H0A6,7A6/(5XA6,19A6))
  377 CONTINUE
```

```
C======END FILE, REWIND, AND UNLOAD TAPES=============================
  390 REWINDNLIB
      UNLOADNLIB
      REWINDNSCR
      DO400N=1,NUSX
      NPUN=XABSF(NUST(N))
      ENDFILENPUN
      REWINDNPUN
      UNLOADNPUN
  400 CONTINUE
C======REORGANIGE OUTPUT AND PRINT LISTS TO BE SENT TO REQUESTOR=======
      DO520N=1,NUSX
      WRITEOUTPUTTAPENOUT,420,(HUID(K,N),K=1,8),DATEA,DATES
  420 FORMAT(22H1THE SIGMA CENTER, BNL//21H *ENDF* REQUEST FROM A6,7A6,4
     1H ON A6,A6)
      WRITEOUTPUTTAPENOUT,430
  430 FORMAT(19HOREQUESTS PROCESSED)
      I=1
      DO460J=1,NSC
      READTAPENSCR,NUT,(E(K),K=1,18)
      IF(N-NUT)460,440,460
  440 WRITEOUTPUTTAPENOUT,450,I,(E(K),K=1,18)
  450 FORMAT(I4,1H A5,A6,7H CARDS A6,A6,1H A6,A6,1H A6,11A6)
      I=I+1
  460 CONTINUE
      REWIND NSCR
      WRITEOUTPUTTAPENOUT,470
  470 FORMAT(23HOREQUESTS NOT PROCESSED)
      I=JUSX(N)
      IF(I)480,480,500
  480 WRITEOUTPUTTAPENOUT,490
  490 FORMAT(11H        NONE)
      GOTO520
  500 WRITEOUTPUTTAPENOUT,510,(RID(J,N),J=1,I)
  510 FORMAT(3XA6,19A6)
  520 CONTINUE
C======TERMINATE RUN===================================================
      REWINDNSCR
      CALLEXIT
      END
```

Name: DFSR3

Purpose: To create an updated library tape.

Language: FORTRAN II

Input: A. The program deck consisting of:

1. The binary deck DFSR3
2. A * Data Card
3. Five or more Input Data Cards
   (see detail listing following this writeup)
4. An EØF card

Tapes: A. Input

1. The library tape to be updated (NLIBA)
2. Tape NCT (used only when replacing a record on the library tape with a record on tape NCT)

B. Output

1. New library tape NLIBB
2. Print tape NØUT
3. Punch tape NPUN

Method: The library tape NLIBA is modified by the deletion, replacement, or correction of as many Data Records as desired. Insertions are made within an existing record (to insert complete records see DFSR1).

Processing requests are handled by ID number and must be in the same order as the records on the library tape. Each record is requested only once and all alterations to that record must be executed at that time.

DFSR3 reads a request card (the 5 card in the detail writeup) specifying the record to be corrected (RID) and the operation code (NCT), which has three values.

1. NCT < 0

The entire record is deleted and is replaced by a three card record containing the message RECØRD DELETED ØN (DATE) and blanks. The Lead card is retained, and a deletion message is written on tape NØUT. After writing the token record on NLIBB the program returns to read another 5 card, if any.

2. NCT > 0

The designated record is completely omitted from the new library tape and a new record from tape NCT is written in its place. A replacement message appears on tape NØUT and the program returns to read another 5 card, if any.

3. NCT = 0

The record is to be corrected.
Cards 6 & 7 must appear whenever NCT = 0.
The 6 card specifies the type of correction, i.e. CHANGE, DELETE, or INSERT, and the 7 cards are the correction cards. As many 7 cards as needed may be used with each 6 card, and groups of 6 and 7 cards are repeated for multiple changes within the record. A blank card must follow the last 7 card of the final change to each record so that the program may write the record on the library tape and return to process the next record (read another 5 card).

The sequence number in CHANGE and DELETE cards indicates which card is to be changed, while INSERT correction cards are inserted <u>following</u> the card whose sequence number appears on the first INSERT card. If insertions are to be made in other places in the record, another INSERT card is used.

Records are resequenced and the character check sums are recomputed; error conditions cause the appropriate message to be printed on NØUT and the job to be terminated as an ERRØR STØP. Since record processing is controlled by the number of records to be corrected (NCØR) end-of-file conditions also cause ERRØR STØP.

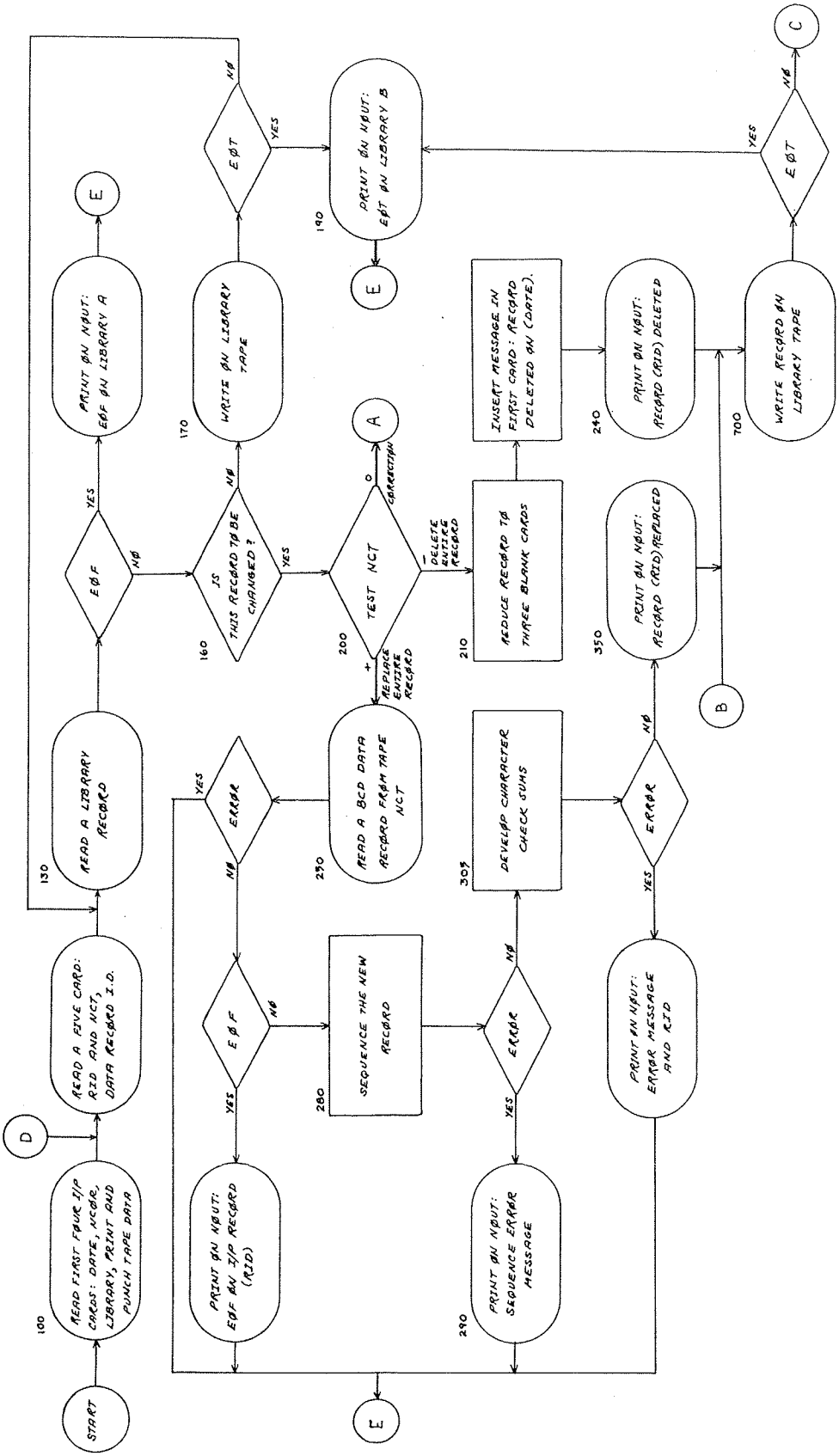
<u>Service Routines</u>:

1. RDLIB
2. WRLIB
3. RDIN
4. IHC
5. HIC
6. SEQ
7. DRCCK
8. PUNDR
9. PRDR
10. NTCD

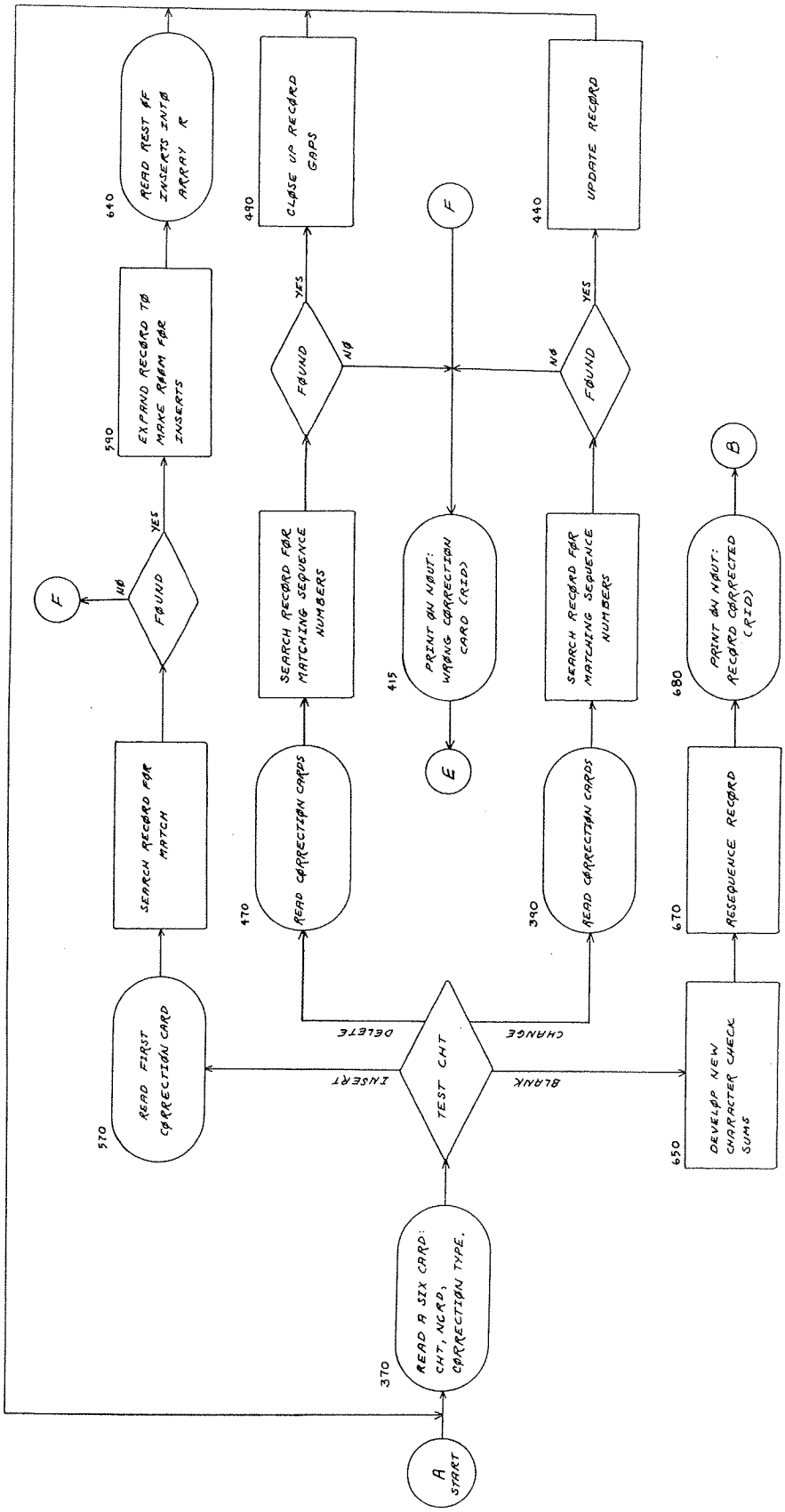
Input data to correct library tape

Card	Cols.	Format	Symbol	Description
1.	1-6	A6	DATEA	The date in the form
	7-12	A6	DATEB	JAN ① 21, ① 1964
	13-15	I3	NCØR	Number of records to be corrected
2.	1-10	10X	-----	The characters LIBRARY
	11-15	I5	NLIBA	Library tape number to be corrected
	16-20	I5	NLIBB	New Library tape number
3.	1-10	10X	-----	The characters PRINT
	11-15	I5	NØUT	Main print tape number
4.	1-10	10X	-----	The characters PUNCH
	11-15	I5	NPUN	Punch tape number
	16-20	I5	IPUN	Test for type of punched output
5.	1-5	A5	RID	Identification of record to be corrected
	6-11	I6	NCT	< 0 delete entire record = 0 correct record > 0 replace record with record on tape NCT
6.	1-6	A6	CHT	Type of correction. This must be either CHANGE, DELETE, or INSERT. Any other symbol signals the end of the corrections for this Data Record.
	7-10	I4	NCRD	The number of correction cards that follow.
7.	1-72	12A6		The correction card
	72-77	A5		ignored.
	78-80	A4		The sequence number

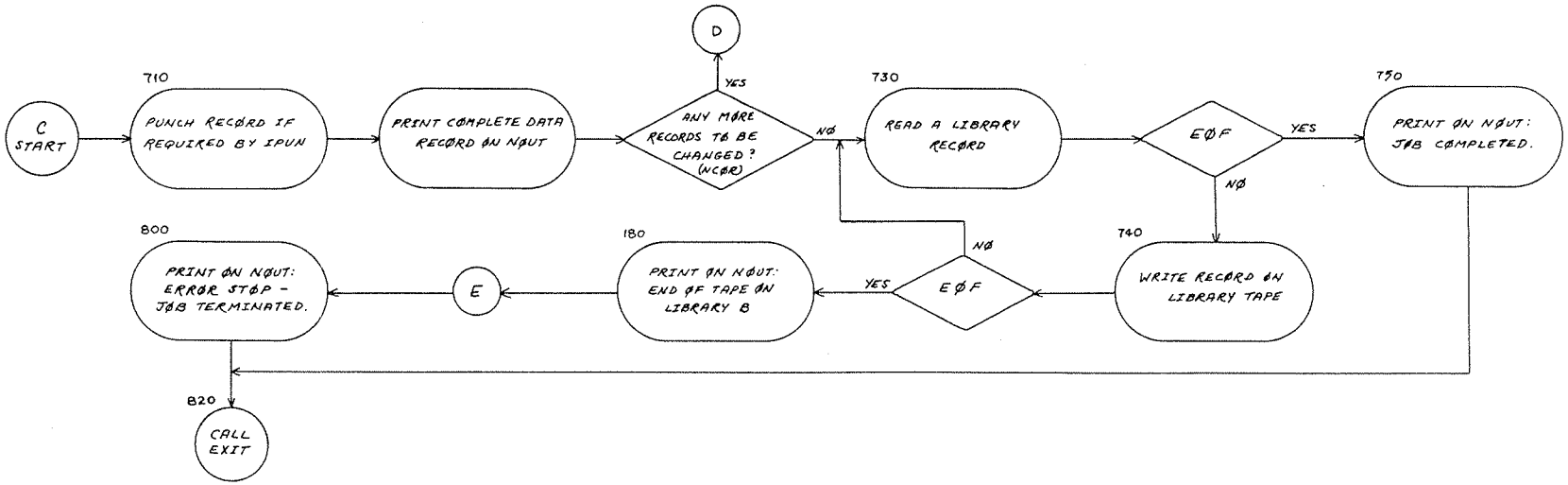
DFSR3 - UPDATE LIBRARY TAPE



DFSR3 (CONT.)


A
START
370
READ A SIX CARD: CHT, NCRD, CORRECTION TYPE.
TEST CHT
INSERT
DELETE
CHANGE
BLANK
570
READ FIRST CORRECTION CARD
SEARCH RECORD FOR MATCH
FOUND
YES
NO
F
590
EXPAND RECORD TO MAKE ROOM FOR INSERTS
640
READ REST OF INSERTS INTO ARRAY R
470
READ CORRECTION CARDS
SEARCH RECORD FOR MATCHING SEQUENCE NUMBERS
FOUND
YES
NO
F
490
CLOSE UP RECORD GAPS
415
PRINT ON MOUT: WRONG CORRECTION CARD (RID)
E
390
READ CORRECTION CARDS
SEARCH RECORD FOR MATCHING SEQUENCE NUMBERS
FOUND
YES
NO
440
UPDATE RECORD
650
DEVELOP NEW CHARACTER CHECK SUMS
670
RESEQUENCE RECORD
680
PRINT ON MOUT: RECORD CORRECTED (RID)
B

DFSR3 (CØNT.)


C
START
710
PUNCH RECØRD IF REQUIRED BY IPUN
PRINT COMPLETE DATA RECØRD ØN NØUT
D
YES
ANY MØRE RECORDS TØ BE CHANGED? (NCØR)
NØ
730
READ A LIBRARY RECØRD
EØF
YES
NØ
750
PRINT ØN NØUT: JØB CØMPLETED.
740
WRITE RECØRD ØN LIBRARY TAPE
NØ
YES
EØF
180
PRINT ØN NØUT: END ØF TAPE ØN LIBRARY B
E
800
PRINT ØN NØUT: ERRØR STØP - JØB TERMINATED.
820
CALL EXIT

```
*      *ENDF* SERVICE ROUTINE
*      FORTRAN
*      LABEL
CDFSR3  CORRECT AND MAKE UP NEW LIBRARY TAPE
       DIMENSIONR(14,1000),RL(14),A(14)
       COMMONR,RL,KX
B      BLANK=606060606060
B      CHANGE=233021452725
B      DELETE=242543256325
B      SERT=314562255163
       NIN=5
       CALL NEXEM1(10,11,13,15)
  100 READINPUTTAPENIN,110,DATEA,DATEB,NCOR,NLIBA,NLIBB,NOUT,NOUTB,NPUN,
     1IPUN
  110 FORMAT(2A6,I3/10XI5,I5/10XI5,I5/10XI5,I5)
C======START LOOP ON RECORDS TO BE CORRECTED============================
       DO720NC=1,NCOR
       READINPUTTAPENIN,120,RID,NCT
  120 FORMAT(A5,I6)
  130 CALL RDLIB(NLIBA,L,NOUT)
       KX=KX
       IF(L-1)160,140,160
  140 WRITEOUTPUTTAPENOUT,150
  150 FORMAT(17H0EOF ON LIBRARY A)
       GOTO800
B 160 IF(BERAF(RL(1),RID))170,200,170
  170 CALL WRLIB(NLIBB,L,0)
       IF(L)130,130,180
  180 WRITEOUTPUTTAPENOUT,190
  190 FORMAT(17H0EOT ON LIBRARY B)
       GOTO800
  200 IF(NCT)210,370,250
C======DELETE ENTIRE RECORD=============================================
B 210 R(1,1)=512523465124
B      R(2,1)=602425432563
B      R(3,1)=252460464560
       R(4,1)=DATEA
       R(5,1)=DATEB
C      THE MESSAGE WRITTEN ABOVE IS   RECORD DELETED ON (DATE)
       DO220I=6,12
  220 R(I,1)=BLANK
       DO230I=1,12
       R(I,2)=BLANK
  230 R(I,3)=BLANK
       R(1,3)=R(1,KX)
       KX=3
       WRITEOUTPUTTAPENOUT,240,RID
  240 FORMAT(7H0RECORDA6,8H DELETED)
       GOTO700
C======REPLACE ENTIRE RECORD============================================
  250 CALL RDIN(NCT,L,NOUT)
       IF(L-1)280,260,800
  260 WRITEOUTPUTTAPENOUT,270,RID
  270 FORMAT(25H0EOF ON INPUT TAPE RECORDA6)
       GOTO800
  280 CALL IHC(RL(2),KX)
       CALL SEQ(L,NOUT)
       IF(L)305,305,290
  290 WRITEOUTPUTTAPENOUT,300,RID
  300 FORMAT(22H0SEQ NO. CHECK, RECORDA6)
```

```
      GOTO800
  305 CALL DRCCK(L)
      IF(L-1)350,330,310
  310 WRITEOUTPUTTAPENOUT,320,RID
  320 FORMAT(24HOILLEGAL CHAR. IN RECORDA6)
      GOTO800
  330 WRITEOUTPUTTAPENOUT,340,RID
  340 FORMAT(28HOCHAR. CHECK FAILURE, RECORDA6)
      GOTO800
  350 WRITEOUTPUTTAPENOUT,360,RID
  360 FORMAT(7HORECORDA5,9H REPLACED)
      GOTO700
C======CORRECT EXISTING RECORD=========================================
  370 READINPUTTAPENIN,380,CHT,NCRD
  380 FORMAT(A6,I4)
B     IF(BERAF(CHT,CHANGE))460,390,460
C======CARDS ARE TO BE CHANGED
  390 DO450N=1,NCRD
      READINPUTTAPENIN,400,(A(I),I=1,14)
  400 FORMAT(12A6,A5,A3)
      DO410K=1,KX
      KK=K
B     IF(BERAF(R(14,K),A(14)))410,430,410
  410 CONTINUE
      GOTO415
  430 DO440I=1,14
  440 R(I,KK)=A(I)
  450 CONTINUE
      GOTO370
B 460 IF(BERAF(CHT,DELETE))560,470,560
C======CARDS ARE TO BE DELETED
  470 DO510N=1,NCRD
      READINPUTTAPENIN,400,(A(I),I=1,14)
      DO480K=1,KX
      KK=K
B     IF(BERAF(R(14,K),A(14)))480,490,480
  480 CONTINUE
      GOTO415
  490 DO500I=1,14
  500 R(I,KK)=0.0
  510 CONTINUE
C     CLOSE UP RECORD
      KXP=KX-1
      KXX=KX
      DO550K=1,KX
  520 IF(R(14,K))545,530,545
  530 KXX=KXX-1
      DO540L=K,KXX
      DO540I=1,14
  540 R(I,L)=R(I,L+1)
      GOTO520
  545 IF(K-KXX)555,555,550
  550 CONTINUE
  555 KX=KXX
```

```
      GOTO370
B 560 IF(BERAF(CHT,SERT))650,570,650
C======CARDS ARE TO BE INSERTED
  570 READINPUTTAPENIN,400,(A(I),I=1,14)
      DO580K=1,KX
      KK=K
B     IF(BERAF(R(14,K),A(14)))580,590,580
  580 CONTINUE
      GOTO415
  590 KX=KX+NCRD
C     EXPAND RECORD
      KB=KX
      KA=KB-NCRD
  600 DO610I=1,14
  610 R(I,KB)=R(I,KA)
      KB=KB-1
      KA=KA-1
      IF(KA-KK)620,620,600
C     INSERT CARDS
  620 DO630I=1,14
  630 R(I,KK+1)=A(I)
      NCRD=NCRD-1
      KK=KK+2
      KKA=KK+NCRD-1
      IF(NCRD)370,370,640
  640 READINPUTTAPENIN,400,((R(I,K),I=1,14),K=KK,KKA)
      GOTO370
C======CORRECTIONS COMPLETE, SEQUENCE NO. AND CHAR. CHECK
  650 R(14,1)=BLANK
      DO660K=2,9
  660 R(K,KX)=BLANK
      CALL DRCCK(L)
      IF(L-1)670,330,310
  670 CALL IHC(RL(2),KX)
      CALL SEQ(L,NOUT)
      WRITEOUTPUTTAPENOUT,680,RID
  680 FORMAT(7HORECORDA6,10H CORRECTED)
C======ADD DATE AND WRITE ON NEW LIBRARY
  700 RL(5)=DATEA
      RL(6)=DATEB
      CALL WRLIB(NLIBB,L,0)
      IF(L)710,710,180
  710 CALL PUNCH(IPUN,NPUN)
      CALLPRINT(3,NOUTB)
  720 CONTINUE
C======END OF RECORDS LOOP, COMPLETE NEW LIBRARY======================
  730 CALL RDLIB(NLIBA,L,NOUT)
      IF(L-1)740,750,740
  740 CALL WRLIB(NLIBB,L,0)
      IF(L)730,730,180
  750 WRITEOUTPUTTAPENOUT,760
  760 FORMAT(14HOJOB COMPLETED)
      GOTO820
C======ERROR EXITS=====================================================
  415 WRITEOUTPUTTAPENOUT,420,(A(I),I=1,14)
  420 FORMAT(26HOWRONG CORRECTION CARD LOC/2H  A6,11A6,A5,A3)
```

```
  800 WRITEOUTPUTTAPENOUT,810
  810 FORMAT(27HOERROR STOP, JOB TERMINATED)
C======TERMINATION==============================================================
  820 ENDFILENLIBB
      REWINDNLIBB
      UNLOADNLIBB
      REWINDNLIBA
      UNLOADNLIBA
      CALL EXIT
      END
```

Name: DFSR4

Purpose: To copy/print/punch the library tape

Language: FORTRAN II

Input: A. The program deck consisting of:

1. The binary deck DFSR4
2. A * Data Card
3. The 5 Input Cards (see detail listing following this writeup)
4. An EØF card

Tapes: A. Input

1. One to four library tapes to be copied.

B. Output

1. One to four copy tapes
2. Print tape NØUTA
3. Punch tape NPUN

Method: DFSR4 copies each specified tape and will print/punch a selected bloc of Data Records at the option of the user. A single bloc of any size may be selected.

After reading a Data Record from the library tape the program checks to see if a copy tape is present. If so, the record is copied. Printing and punching then take place if indicated, and the next record is brought in. Loop processing continues in this manner until an EØF on the I/P library tape is reached, at which point the COPY as well as the LIBRARY tape is terminated. The program then steps to the next set of library and copy tapes to keep a parallel relationship between them.

Since processing hinges upon the presence of a positive tape number the user selects his options by indicating the appropriate tapes. Zero or blank tape numbers cause bypassing. DFSR4 may be used as a listing/punching program without copying.

Messages:

TAPE (NCØPY) IS TØØ SHØRT

Service Routines:

RDLIB

WRLIB

PRINT

PUNCH

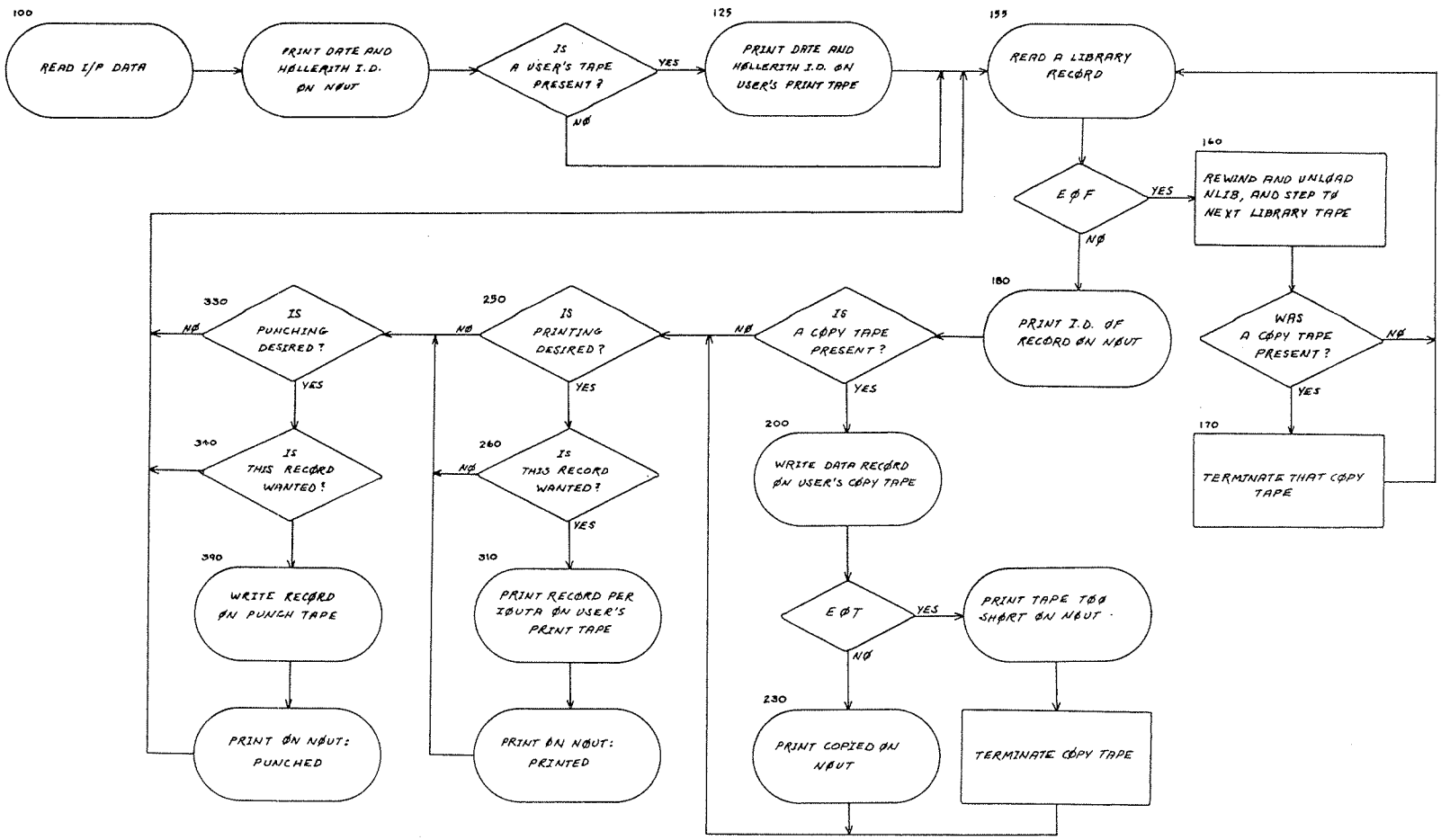
NTCRD

HIC

Input data to copy/print/ punch library tape

Card	Cols.	Format	Symbol	Description
1.	1-6	A6	DATEA	The date in the form
	7-12	A6	DATEB	JAN@21,@1964
	13-72	10A6	HØL	Hollerith remarks
2.	1-10	10X	-----	The characters LIBRARY
	11-15	I5	NLIBT(1)	1st library tape number
	16-20	I5	NLIBT(2)	2nd " " "
	21-25	I5	NLIBT(3)	3rd " " "
	26-30	I5	NLIBT(4)	4th " " "
3.	1-10	10X	-----	The characters PRINT
	11-15	I5	NØUTA	Print tape number
	16-20	I5	IØUTA	Test for printing (see subroutine PRINT)
	22-26	A5	PRIDA	First record to be printed
	28-32	A5	PRIDB	Last record to be printed
4.	1-10	10X	-----	The characters PUNCH
	11-15	I5	NPUN	Punch tape number
	16-20	I5	IPUN	Test for punching (see subroutine PUNCH)
	22-26	A5	PUIDA	First record to be punched
	28-32	A5	PUIDB	Last record to be punched
5.	1-10	10X	-----	The characters CØPY@TAPE
	11-15	I5	NCPYT(1)	1st copy tape number
	16-20	I5	NCPYT(2)	2nd " " "
	21-25	I5	NCPYT(3)	3rd " " "
	26-30	I5	NCPYT(4)	4th " " "

DFSR4 - CØPY/PRINT/PUNCH LIBRARY TAPE



```
*      *ENDF* SERVICE ROUTINE
*      FORTRAN
*      LABEL
CDFSR4  COPY/PRINT/PUNCH LIBRARY TAPES
       DIMENSIONR(14,1000),RL(14),NLIBT(4),NCPYT(4),HOL(10)
       COMMON R,RL,KX
       EQUIVALENCE(PRIDA,IPA),(RL,KLC),(PRIDB,IPB),(PUIDA,IPUA),
      1(PUIDB,IPUB)
       NIN=5
       NOUT=6
       CALL NEXEM1(10,11,13,15)
C======READ INPUT=============================================================
  100 READINPUTTAPENIN,110,DATEA,DATEB,HOL,(NLIBT(I),I=1,4),NOUTA,IOUTA,
     1PRIDA,PRIDB,NPUN,IPUN,PUIDA,PUIDB,(NCPYT(I),I=1,4)
  110 FORMAT(12A6/10XI5,3I5/10XI5,I5,1XA5,1XA5/10XI5,I5,1XA5,1XA5/10XI5,
     13I5)
       WRITEOUTPUTTAPENOUT,120,DATEA,DATEB,HOL
  120 FORMAT(30H1*ENDF* COPY/PRINT/PUNCH JOB  A6,11A6//)
C======INITIALIZE=============================================================
       LPRN=0
       LPUN=0
       ILT=1
       IF(NOUTA)130,130,125
  125 WRITEOUTPUTTAPENOUTA,120,DATEA,DATEB,HOL
C======SET UP LIBRARY AND COPY TAPES==========================================
  130 NLIB=NLIBT(ILT)
       NCPY=NCPYT(ILT)
       IF(NLIB)420,420,140
  140 WRITEOUTPUTTAPENOUT,150,ILT
  150 FORMAT(8HOLIBRARYI3)
C======READ RECORD FROM LIBRARY===============================================
  155 CALL RDLIB(NLIB,L,NOUT)
       IF(L-1)180,160,180
  160 ILT=ILT+1
       REWINDNLIB
       UNLOADNLIB
       IF(NCPY)130,130,170
  170 ENDFILENCPY
       REWINDNCPY
       UNLOADNCPY
       GOTO130
  180 WRITEOUTPUTTAPENOUT,190,RL(1)
  190 FORMAT(3XA5)
C======COPY RECORD============================================================
       IF(NCPY)250,250,200
  200 CALL WRLIB(NCPY,L,0)
       IF(L)230,230,210
  210 WRITEOUTPUTTAPENOUT,220,NCPY
  220 FORMAT(9X,9HCOPY TAPEI3,13H IS TOO SHORT)
       ENDFILENCPY
       REWINDNCPY
       UNLOADNCPY
       NCPY=0
       GOTO250
  230 WRITEOUTPUTTAPENOUT,240
  240 FORMAT(15H+         COPIED)
```

```
C======PRINT RECORD=============================================================
  250 IF(NOUTA)330,300,260
  260 IF(LPRN)270,270,290
  270 IF(IPA-KLC)330,280,330
  280 LPRN=1
      GOTO310
  290 IF(IPB-KLC)330,300,310
  300 LPRN=0
  310 CALL PRINT(IOUTA,NOUTA)
      WRITEOUTPUTTAPENOUT,320
  320 FORMAT(24H+                    PRINTED)
C======PUNCH RECORD=============================================================
  330 IF(NPUN)410,410,340
  340 IF(LPUN)350,350,370
  350 IF(IPUA-KLC)410,360,410
  360 LPUN=1
      GOTO390
  370 IF(IPUB-KLC)155,380,390
  380 LPUN=0
  390 CALL PUNCH(IPUN,NPUN)
      WRITEOUTPUTTAPENOUT,400
  400 FORMAT(33H+                                PUNCHED)
C======READ NEXT RECORD=========================================================
  410 GOTO155
C======JOB FINISHED=============================================================
  420 WRITEOUTPUTTAPENOUT,430
  430 FORMAT(13H0JOB FINISHED)
      CALL EXIT
      END
```

**********0512**********

Name: DFSR5

Purpose: To provide a list of the data records on the library in order of increasing:

1. Atomic number (NATØM in Dictionary 1)
2. Atomic weight (MASSN)
3. Reaction type (NREAC in Dictionary 3)
4. Type of data (NDTYP in Dictionary 4)

Input: The program deck consisting of:

1. The binary deck DFSR5
2. a * DATA card
3. The Dictionary input (see subroutine DICT)
4. The 2 input cards (see detail listing following this writeup)

Tapes: A. Input

1. One to four library tapes, NLIBT(N)
2. Systems input NIN=5 (Preset in DFSR5)

B. Output

1. Systems print output NØUT=6 (Preset in DFSR5)

C. Other

1. Scratch NSCT=2 (Preset in DFSR5)

Method:

Each Data Record from the library is read into memory and the first Heading Card is written on the scratch tape. The scratch tape is rewound and read back into memory. As each of the first Heading Cards is read, the numbers NATØM, MASSN, NREAC, NDTYD, and the record identification number (RECID) are stored. The list is then sorted first on increasing NATØM, next on increasing MASSN, next on increasing NREAC, and finally on increasing NDTYD, and a line is printed for each record. This line gives the chemical symbol, mass number, reaction type, data type, and record identification.

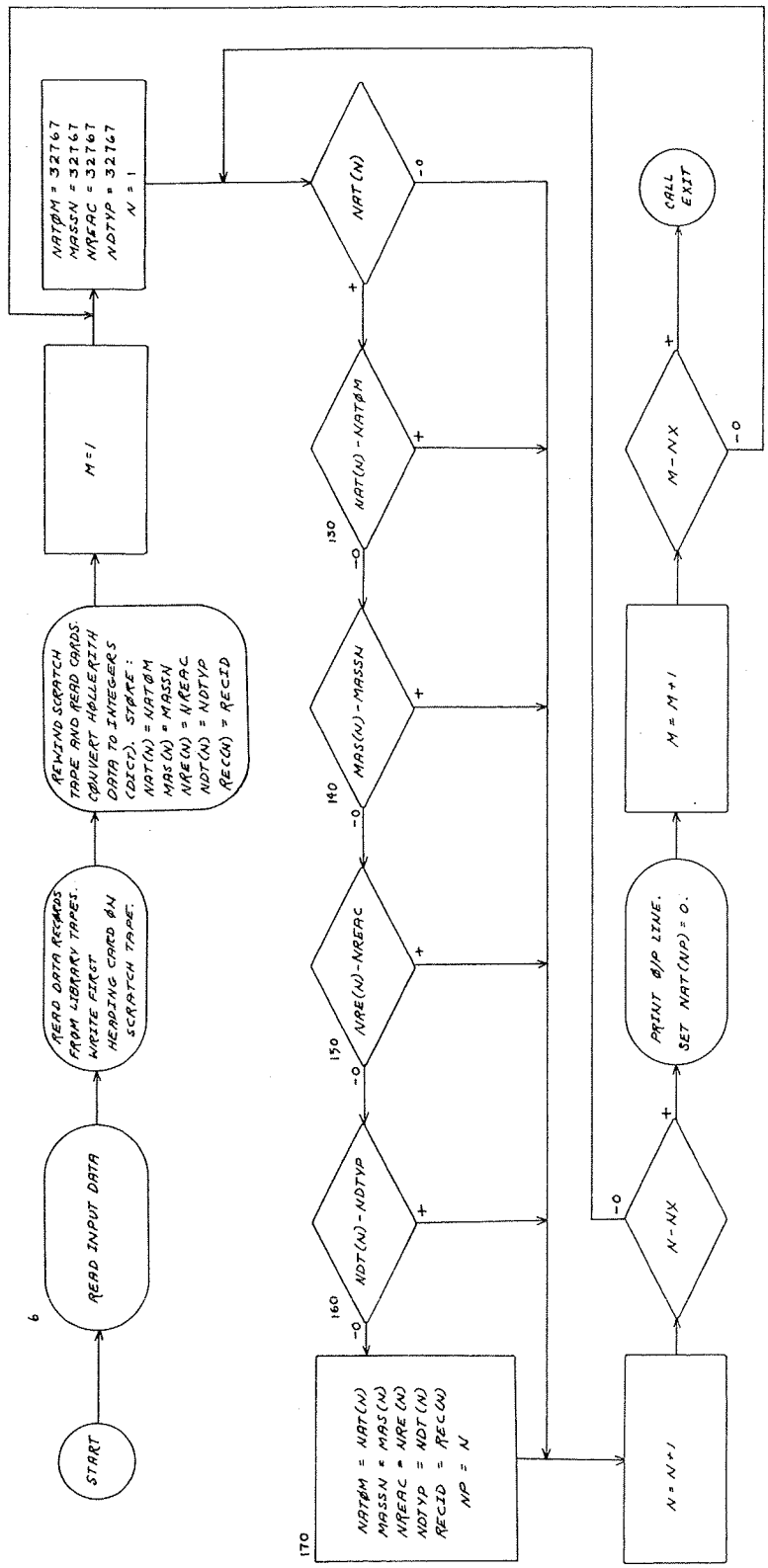
Subroutines: DICT - the dictionary subroutine.

Restrictions: The total number of Data Records on the library must not exceed 5000.

Input Data for DFSR5

Card	Columns	Format	Symbol	Description
1	1-6	A6	DATEA	Date in the form
	7-12	A6	DATEB	Jan 1, 1964
	13-72	10A6	HØL	Remarks
2	1-10	10X	-	The characters LIBRARY
	11-15	I5	NLIBT(1)	1st Library tape number
	16-20	I5	NLIBT(2)	2nd " " "
	21-25	I5	NLIBT(3)	3rd " " "
	26-30	I5	NLIBT(4)	4th " " "

DFSR5 - PRINT LIBRARY CROSS REFERENCE



```
*========ENDF SERVICE ROUTINE 5=========================================
CDFSR5    SORT HEADING CARDS AND PRINT
      DIMENSION RL(14),R(14,1800),NAT(5000),MAS(5000),NRE(5000),
     1NDT(5000),REC(5000),HOL(10),NLIBT(4)
      COMMON NIN,NOUT,R
      EQUIVALENCE (NIN,NIN),(NOUT,NOUT)
      EQUIVALENCE (NAT,R(1)),(MAS,R(5001)),(NRE,R(10001)),
     1(NDT,R(15001)),(REC,R(20001))
   10 NIN=5
      NOUT=6
      NSCT=2
      READINPUTTAPENIN,20,DATEA,DATEB,HOL
   20 FORMAT(12A6)
      READINPUTTAPENIN,30,(NLIBT(N),N=1,4)
   30 FORMAT(10X4I5)
      CALL DICT(X,X,X,0,X)
      CALL NEXEM1(11)
      REWIND NSCT
      NX=1
      DO 90 NL=1,4
      LIB=NLIBT(NL)
      IF(LIB)90,90,40
   40 REWIND LIB
   50 READTAPELIB,KX,(RL(N),N=1,14),(R(N,1),N=1,14)
      IF(NEXEM2(11))60,60,80
   60 NX=NX+1
      WRITEOUTPUTTAPENSCT,70,(R(N,1),N=1,14)
   70 FORMAT(12A6,2A4)
      GOTO50
   80 REWIND LIB
   90 CONTINUE
      END FILE NSCT
      REWIND NSCT
      DO 110 N=1,NX
      READINPUTTAPENSCT,100,CHEMS,MASSN,REAC,DTYP,RECID
  100 FORMAT(A2,I3,4XA6,6XA4,47XA4)
      CALL DICT(CHEMS,NAT(N),1,1,IF)
      CALL DICT(REAC,NRE(N),3,1,IF)
      CALL DICT(DTYP,NDT(N),4,1,IF)
      MAS(N)=MASSN
  110 REC(N)=RECID
      REWIND NSCT
      WRITEOUTPUTTAPENOUT,120,DATEA,DATEB,NX,HOL
  120 FORMAT(18H1ENDF LIBRARY SORT,3XA6,A6,I6,8H RECORDS/10A6/1H )
      DO 200 M=1,NX
      NATOM=32767
      MASSN=32767
      NREAC=32767
      NDTYP=32767
      DO 180 N=1,NX
      IF(NAT(N))180,180,130
  130 IF(NAT(N)-NATOM)140,140,180
  140 IF(MAS(N)-MASSN)150,150,180
  150 IF(NRE(N)-NREAC)160,160,180
  160 IF(NDT(N)-NDTYP)170,170,180



  170 NATOM=NAT(N)
      MASSN=MAS(N)
      NREAC=NRE(N)
      NDTYP=NDT(N)
      RECID=REC(N)
      NP=N
  180 CONTINUE
      CALL DICT(CHEMS,NATOM,1,2,IF)
      CALL DICT(REAC,NREAC,3,2,IF)
      CALL DICT(DTYP,NDTYP,4,2,IF)
      WRITEOUTPUTTAPENOUT,190,CHEMS,MASSN,REAC,DTYP,RECID
  190 FORMAT(6XA2,I4,3XA6,3XA4,3XA4)
      NAT(NP)=0
  200 CONTINUE
      CALL EXIT
      END
```

Name: RDIN(NINP, L, NØUT)

Purpose: To read the card images of the Data Record on tape NINP and store them in the array R, and determine the number of cards in the Data Record.

Language: FORTRAN II

Arguments:

R(N,K)	-	The Data Record in core storage (CØMMØN) $1 \leq N \leq 14$, $1 \leq K \leq KX$
KX	-	The number of cards in the Data Record (CØMMØN)
NINP	-	The input tape number
L	-	If L=1, an EØF was encountered. If L=2, reading error occurred.
NØUT	-	Print output tape number.

Method: Card images (unpacked) are read successively from tape NINP under the Format (12A6,A5, A3).

The Kth card is stored in R(N,K), N=1,14.

Examine R(1,K) to see if the word is ENDbbb.

If it is, then this is the last card of the Data Record and KX=K.

Use subroutine IHC to change KX to Hollerith and store in RL(2). Set L=0 and return to main program.

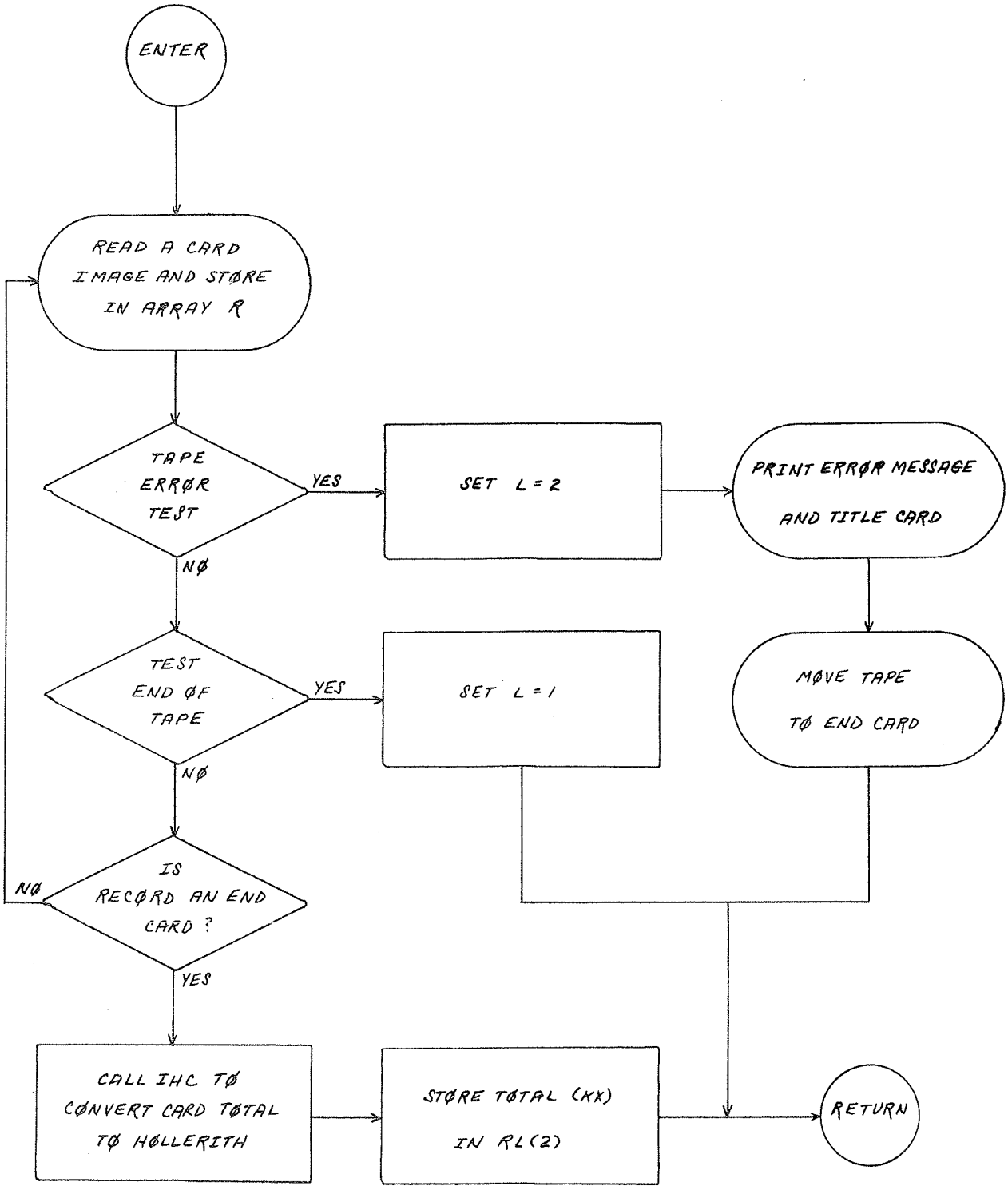
If an end of file mark is encountered, set L=1, and return to main program.

If a tape reading error occurs, print a message on tape NØUT giving the input tape number, the card number where the error occurred, and the contents of the first card. Set L=2. Continue reading cards until the END card is encountered. Return to main program.

Message:

READ ERROR TAPE NO. (NINP), CARD NO. (SEQ.NO), TITLE (ENTIRE HEADING CARD PRINTED)

RDIN - READ BCD INPUT TAPE



```
*       *ENDF* SERVICE ROUTINE
*       FORTRAN
*       LABEL
        SUBROUTINERDIN(NINP,L,NOUT)
CRDIN READ A DATA RECORD(IN CARD IMAGE FORM)
        DIMENSIONR(14,1000),RL(14)
        COMMONR,RL,KX
      1 K=0
        L=0
CCONSTANT FOR END CARD COL. 1-6
B       TEST=254524606060
 1000 FORMAT(12A6,A5,A3)
      2 K=K+1
     21 RITNINP,1000,(R(N,K),N=1,14)
        LTEMP=NEXEM2(10)
CTEST FOR REDUNDANT I/P AND EOF
        IF(LTEMP)100,3,100
      3 LTEMP=NEXEM2(11)
        IF(LTEMP)200,4,200
CTEST END CARD
B     4 IF(TEST*(-R(1,K)))2,6,2
      6 KX=K
        CALLIHC(A,KX)
        RL(2)=A
        L=0
        GOTO201
  100 L=2
CREADING ERROR, KEEP PASSING TAPE TO END CARD.
  101 IF(NOUT)103,103,102
  102 WOTNOUT,2000,NINP,R(14,K),(R(N,1),N=1,14)
 2000 FORMAT(25H I/P READ ERROR TAPE NO. I5,10H CARD NO. A4,9H HEADING 1
     12A6,A5,A3)
  103 LTEMP=NEXEM2(11)
        IF(LTEMP)200,104,200
  104 IF(BERAF(TEST,R(1,K)))105,201,105
  105 RIT NINP,1000,(R(N,K),N=1,14)
        LTEMP=NEXEM2(10)
        IF(LTEMP)101,103,101
CEND OF FILE INPUT TAPE
  200 L=1
  201 RETURN
        END
```

Name: RDLIB(NLIB, L, NØUT)

Purpose: To read a Data Record from the library tape.

Language: FORTRAN II

Arguments:

R(N,K) - The Data Record in core storage (CØMMØN)
$1 \leq N \leq 14$, $1 \leq K \leq KX$

RL(N) - The Lead Card in core storage (CØMMØN)

KX - The number of cards in the Data Record (CØMMØN)

NLIB - The library tape number

L - End of File indicator normally = 0. If L = 1, an EØF was encountered. If L = 2, a reading error occurred.

NØUT - Print output tape number

Method: Read a Data Record from the library tape with the instruction:

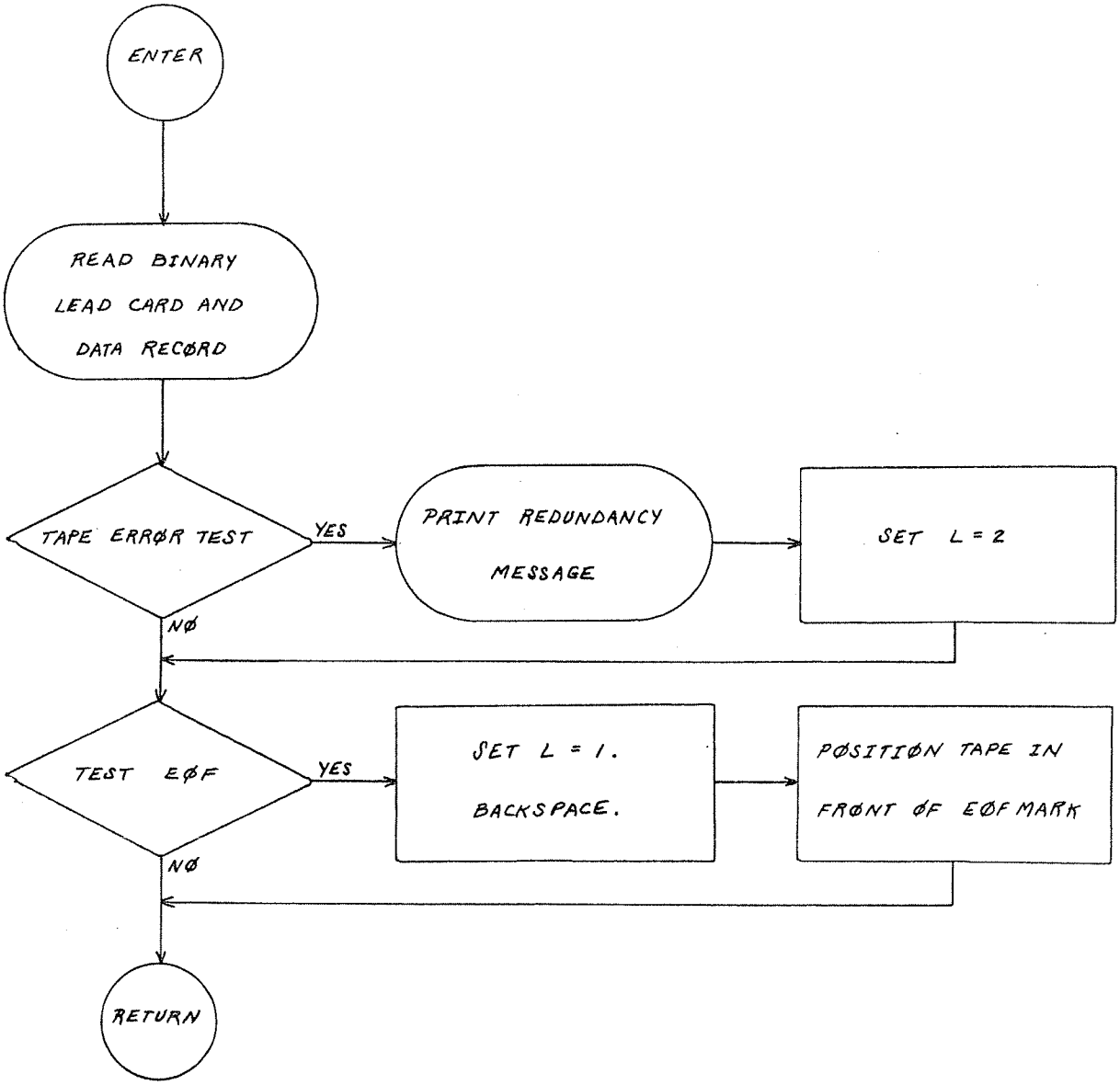
READ TAPE NLIB, (KX, (RL(N), N=1,14),((R(N,K), N=1,14),K=1,KX))

If no EØF occurs, or no reading error, set L=0 and return. If an EØF occurs, set L=1 and position tape in front of EØF mark. If a reading error occurs, print a message on tape NØUT indicating the tape number and the Data Record identification RL(1). Set L=2 and return.

Error Message:

READ ERROR LIBRARY TAPE (NLIB), DATA RECORD (ID NØ)

RDLIB - READ A BINARY DATA FILE FROM LIBRARY TAPE



```
*      *ENDF* SERVICE ROUTINE
*      FORTRAN
*      LABEL
CRDLIB READ A BINARY DATA FILE FROM LIBRARY TAPE
       SUBROUTINERDLIB(NLIB,L,NOUT)
       DIMENSIONR(14,1000),RL(14)
       COMMONR,RL,KX
       L=0
       READTAPENLIB,(KX,(RL(N),N=1,14),((R(N,K),N=1,14),K=1,KX))
       LTEMP=NEXEM2(10)
C TEST REDUNDANT I/P
       IF(LTEMP)100,5,100
C TEST I/P EOF
     5 LTEMP=NEXEM2(11)
       IF(LTEMP)200,7,200
     7 RETURN
   100 IF(NOUT)103,103,101
CPRINT REDUNDANCY MSG
   101 WOTNOUT,102,NLIB,RL(1)
   102 FORMAT(25H READ ERROR LIBRARY TAPE I5,14H DATA RECORD A5)
   103 L=2
       GOTO5
C EOF INPUT TAPE
   200 L=1
       BACKSPACENLIB
       GOTO7
       END
```

Name: WRLIB(NLIB,L,NØUT)

Purpose: To write the Lead card and the Data Record on the Library tape.

Language: FORTRAN II

Arguments:

R(N,K)	-	The data Record in core storage (CØMMØN) $1 \leq N \leq 14$, $1 \leq K \leq KX$
RL(N)	-	The Lead Card in core storage (CØMMØN)
KX	-	The number of cards in the Data Record (CØMMØN)
NLIB	-	The library tape number
L	-	End of tape indicator normally = 0. If L=1, the end of tape mark was encountered
NØUT	-	Print output tape number

Method: Write the Lead card and the Data Record on the library tape with the instruction:

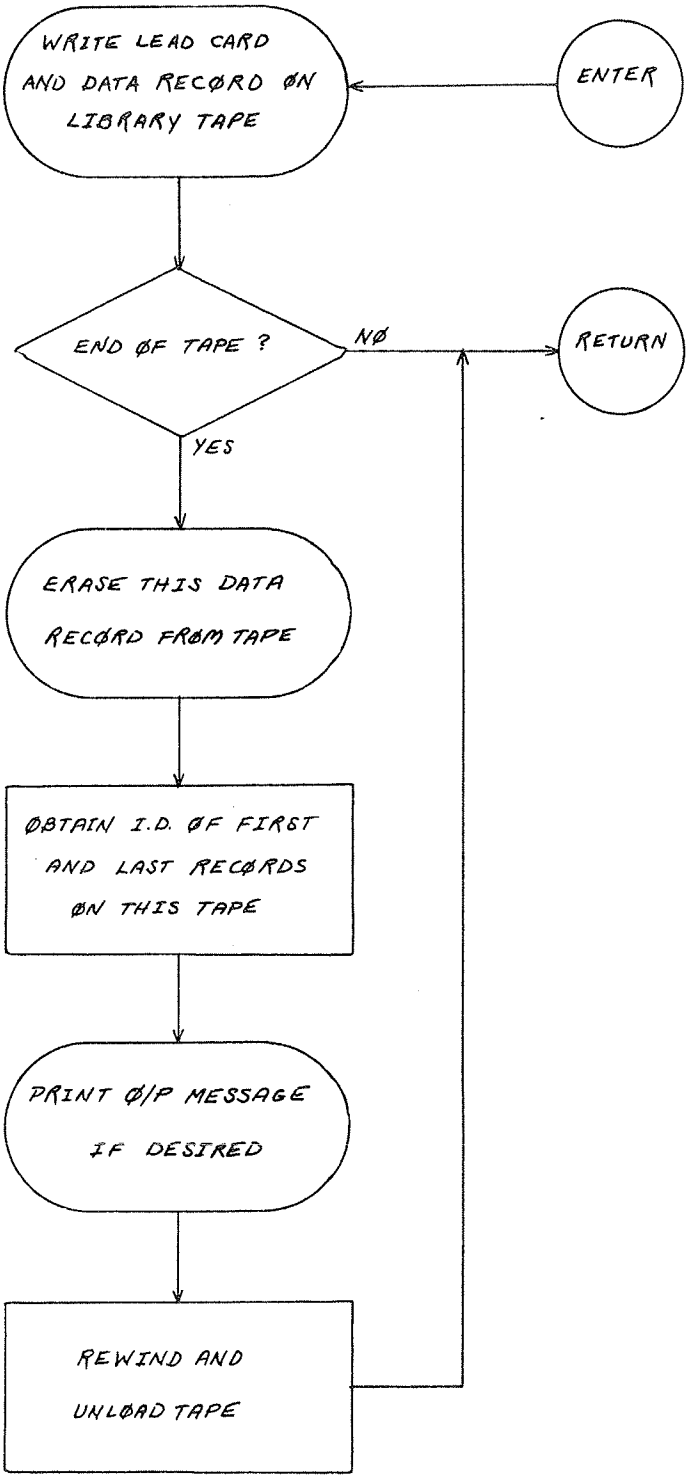
```
WRITE TAPE NLIB, (KX,(RL(N), N=1,14),((R(N,K),N=1,14),K=1,KX))
```

If an end of tape mark is encountered, backspace to the beginning of the last record previously written on the tape. Read the second word of the record into location B (this will be the identification number of the last complete Data Record on this tape). Write an EØF mark and rewind. Read the second word of the first data record on tape into location A (this will be the identification number of the first Data Record). Rewind and unload the tape. Print a message on tape NØUT indicating that the tape is full and that the first and last Data Records are A and B.

Message:

TAPE(NLIB) FULL, FIRST RECORD IS (A), LAST RECORD IS (B)

WRLIB - WRITE A RECØRD ØN BINARY LIBRARY TAPE



```
*      *ENDF* SERVICE ROUTINE
*      FORTRAN
*      LABEL
CWRLIB WRITE A RECORD ON BINARY LIBRARY TAPE
       SUBROUTINEWRLIB(NLIB,L,NOUT)
       DIMENSIONR(14,1000),RL(14)
       COMMONR,RL,KX
       WRITETAPENLIB,(KX,(RL(N),N=1,14),((R(N,K),N=1,14),K=1,KX))
       L=NEXEM2(15)
CTEST FOR END OF TAPE
       IF(L)200,3,200
     3 RETURN
CEND OF TAPE REACHED
   200 BACKSPACENLIB
       IF(NOUT)210,210,201
COBTAIN ID OF FIRST AND LAST RECORDS AND PRINT MSG
   201 BACKSPACENLIB
   202 READTAPENLIB,Z,B
       ENDFILENLIB
       REWINDNLIB
       READTAPENLIB,Z,A
   204 REWINDNLIB
       WOTNOUT,1000,NLIB,A,B
  1000 FORMAT(6H TAPE I5,23H FULL  FIRST RECORD IS A5,16H LAST RECORD IS
      1A5)
   205 UNLOADNLIB
CRETURN TO CHANGE TAPE NO + START NEW TAPE
       GOTO3
CNOUT =0, DO NOT PRINT MSG
   210 ENDFILENLIB
       REWINDNLIB
       GOTO205
       END
```

Name: PRDR(IPRN,NØUT)

Purpose: To print selected portions of the Data Record on tape NØUT.

Language: FORTRAN II

Arguments:

R(N,K) - The Data Record in core storage (CØMMØN)
$1 \leq N \leq 14$, $1 \leq K \leq KX$

RL(N) - The Lead card in core storage (CØMMØN)
$1 \leq N \leq 14$

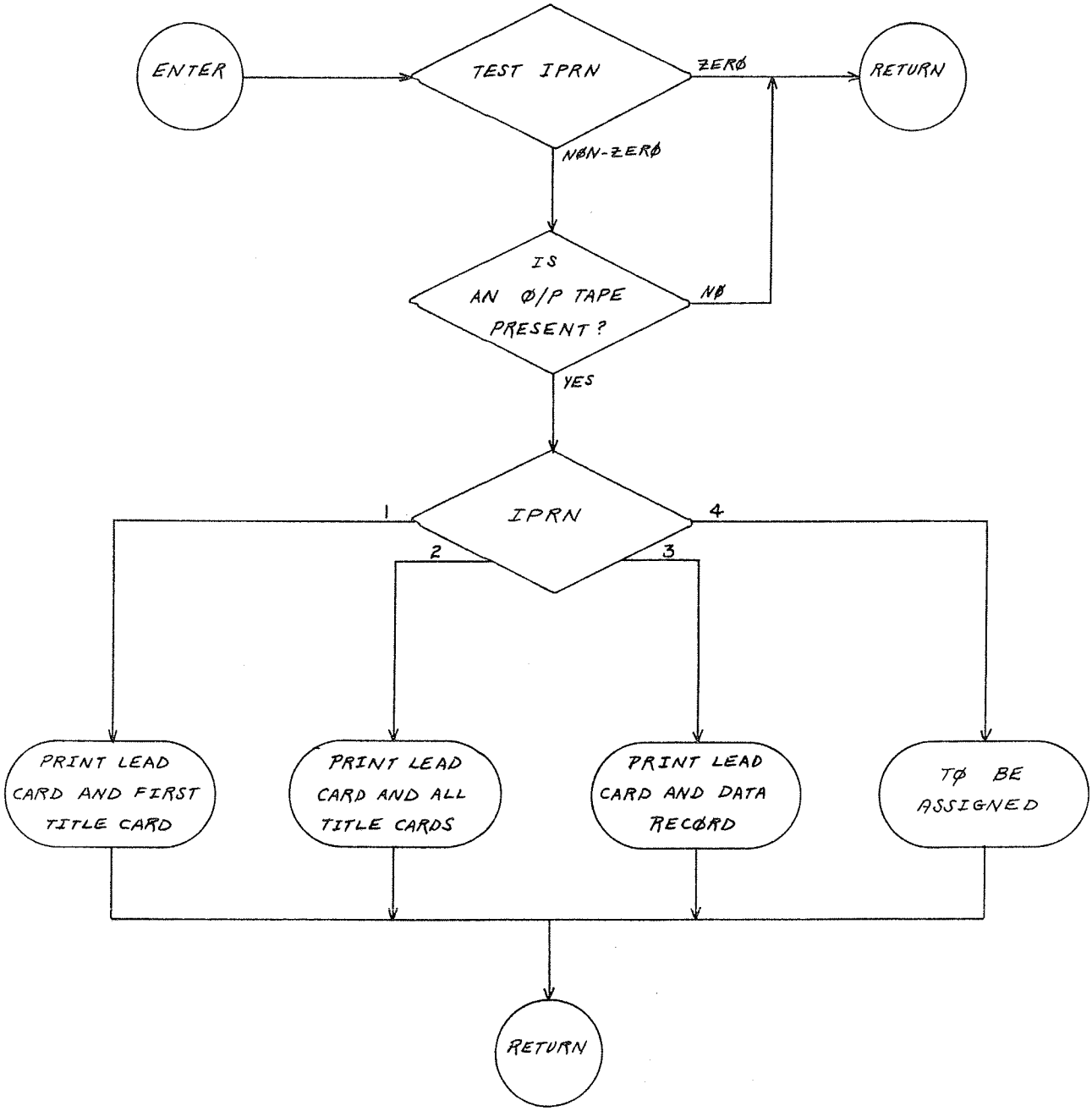
KX - The number of cards in the Data Record (CØMMØN)

IPRN - Print test
=0 no printing
=1 Print Lead card and first heading card.
=2 " " " " all heading cards.
=3 " " " " complete Data Record.
=4
=5
=6

NØUT - Output tape number

Note: The subroutine NTCD(LX), is used to determine the number of Heading Cards, LX.

PRDR - PRINT SELECTED PØRTIØNS ØF THE DATA RECØRD



```
*      *ENDF* SERVICE ROUTINE
*      FORTRAN
*      LABEL
CPRDR PRINT SELECTED PORTIONS OF THE DATA RECORD ON TAPE NOUT
      SUBROUTINEPRINT(IPRN,NOUT)
      DIMENSIONR(14,1000),RL(14)
      COMMONR,RL,KX
CDECODE IPRN, IF 0, RETURN, IF NOUT=0,RETURN
      IF(IPRN)1,12,1
    1 IF(NOUT)12,12,2
    2 GOTO(10,20,30,40,50,60),IPRN
C PRINT LEAD CARD AND FIRST HEADING CARD
   10 WOTNOUT,11,(RL(N),N=1,6),(R(N,1),N=1,12)
   11 FORMAT(1H A5,A6,8H CARDS  A6,A6,2XA6,A6,2XA6,11A6)
   12 RETURN
C PRINT LEAD CARD AND ALL HEADING CARDS
   20 CALLNTCD(LX)
      WOTNOUT,21,(RL(N),N=1,6),((R(N,L),N=1,12),L=1;LX)
   21 FORMAT(1H0A5,A6,8H CARDS  A6,A6,2XA6,A6,2XA6,11A6/(47XA6,11A6))
      GOTO12
CPRINT LEAD CARD AND COMPLETE DATA RECORD
   30 WOTNOUT,31,(RL(N),N=1,6),((R(N,L),N=1,14),L=1,KX)
   31 FORMAT(1H1A5,A6,8H CARDS  A6,A6,2XA6,A6//(6XA6,11A6,2XA5,A3))
      GOTO12
CTO BE FILLED IN
   40 GOTO12
CTO BE FILLED IN
   50 GOTO12
CTO BE FILLED IN
   60 GOTO12
      END
```

Name: PUNDR(IPUN,NPUN)

Purpose: To write selected portions of the Data Record on tape NPUN in a form suitable for punching.

Language: FORTRAN II

Arguments:

R(N,K) - The Data Record in core storage (CØMMØN)
$1 \leq N \leq 14$, $1 \leq K \leq KX$

RL(N) - The Lead card in core storage (CØMMØN)
$1 \leq N \leq 14$

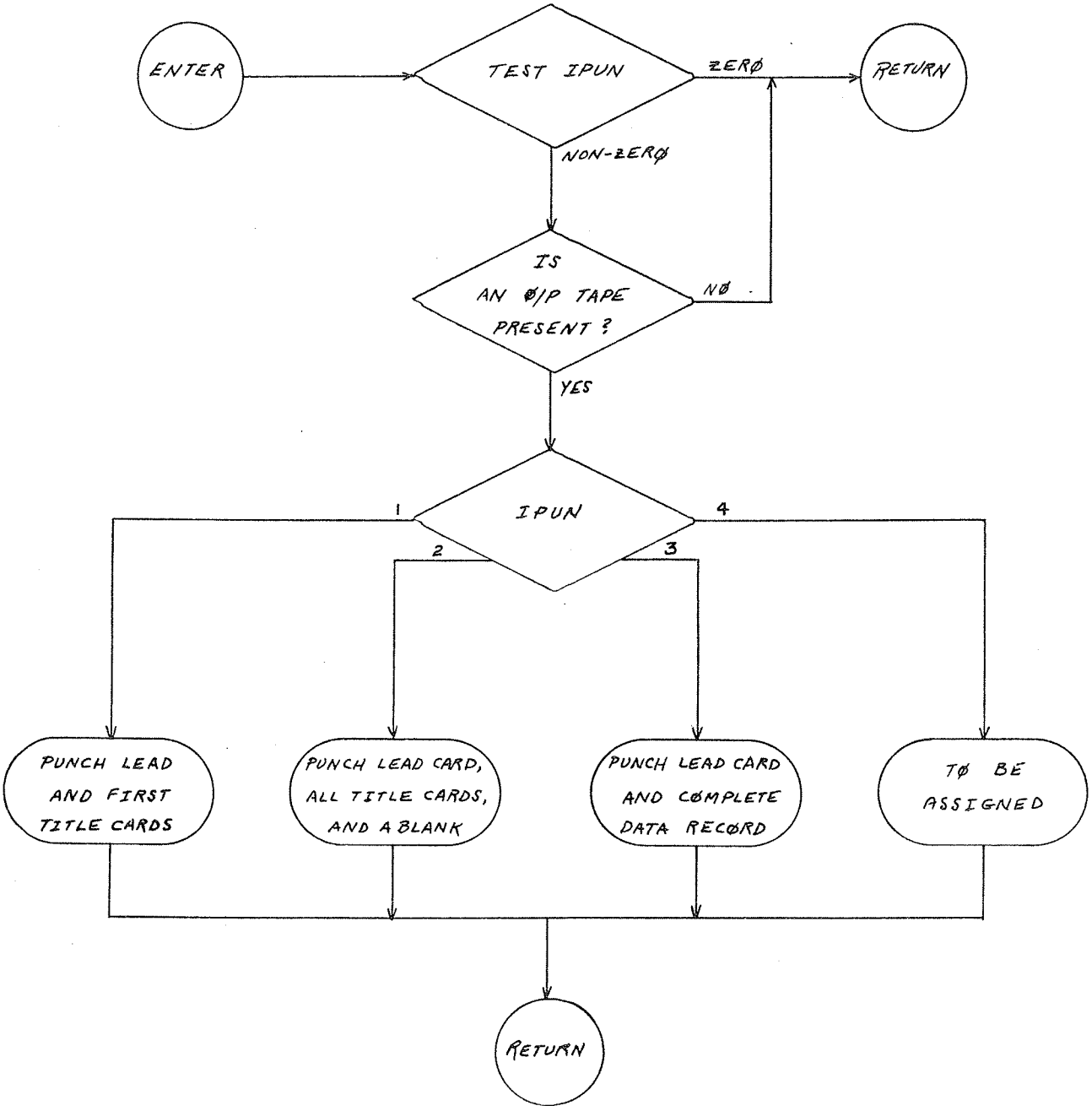
KX - The number of cards in the Data Record (CØMMØN)

IPUN - Punch test
=0 no printing
=1 Punch Lead card and first heading card.
=2 " " " , all heading cards, and a blank.
=3 " " " and complete Data Record.
=4
=5
=6

NPUN - Punch tape number

Note: The subroutine NTCD(LX) is used to determine the number of Heading cards, LX.

PUNDR - PUNCH SELECTED PORTIONS OF A DATA RECORD ON A PUNCH TAPE



```
*      *ENDF* SERVICE ROUTINE
*      FORTRAN
*      LABEL
CPUNDR WRITE SELECTED PORTIONS OF A DATA RECORD ON A PUNCH TAPE
       SUBROUTINEPUNCH(IPUN,NPUN)
       DIMENSIONR(14,1000),RL(14)
       COMMONR,RL,KX
CDECODE IPUN,IF ZERO, RETURN, SAME FOR NPUN
       IF(IPUN)1,12,1
     1 IF(NPUN)2,12,2
     2 GOTO(10,20,30,40,50,60),IPUN
C LEAD CARD AND FIRST HEADING CARD
    10 WOTNPUN,11,(RL(N),N=1,6),(R(N,1),N=1,14)
    11 FORMAT(1H A5,A6,8H CARDS  A6,A6,2XA6,A6/12A6,A5,A3)
    12 RETURN
C LEAD CARD, ALL HEADING CARDS, AND A BLANK
    20 CALLNTCD(LX)
       WOTNPUN,21,(RL(N),N=1,6),((R(N,K),N=1,14),K=1,LX)
    21 FORMAT(1H A5,A6,8H CARDS  A6,A6,2XA6,A6/(12A6,A5,A3))
       WOTNPUN,22
    22 FORMAT(1H )
       GOTO12
CLEAD CARD AND COMPLETE DATA RECORD
    30 WOTNPUN,31,(RL(N),N=1,6),((R(N,K),N=1,14),K=1,KX)
    31 FORMAT(1H A5,A6,8H CARDS  A6,A6,2XA6,A6/(12A6,A5,A3))
       GOTO12
CTO BE FILLED IN
    40 GOTO12
CTO BE FILLED IN
    50 GOTO12
CTO BE FILLED IN
    60 GOTO12
       END
```

Name: SEQ(L,NØUT)

Purpose: To check the sequence number of the Data Record and change the identification number.

Language: FORTRAN II

Arguments:

R(N,K) - The Data Record in core storage. (CØMMØN)
$1 \leq N \leq 14$, $1 \leq K \leq KX$

RL(N) - The Lead Card in core storage. (CØMMØN)
$1 \leq N \leq 14$

KX - The number of cards in the Data Record. (CØMMØN)

L - Error indicator normally = 0. If sequence numbers don't check, L=1.

NØUT - Print output tape number.

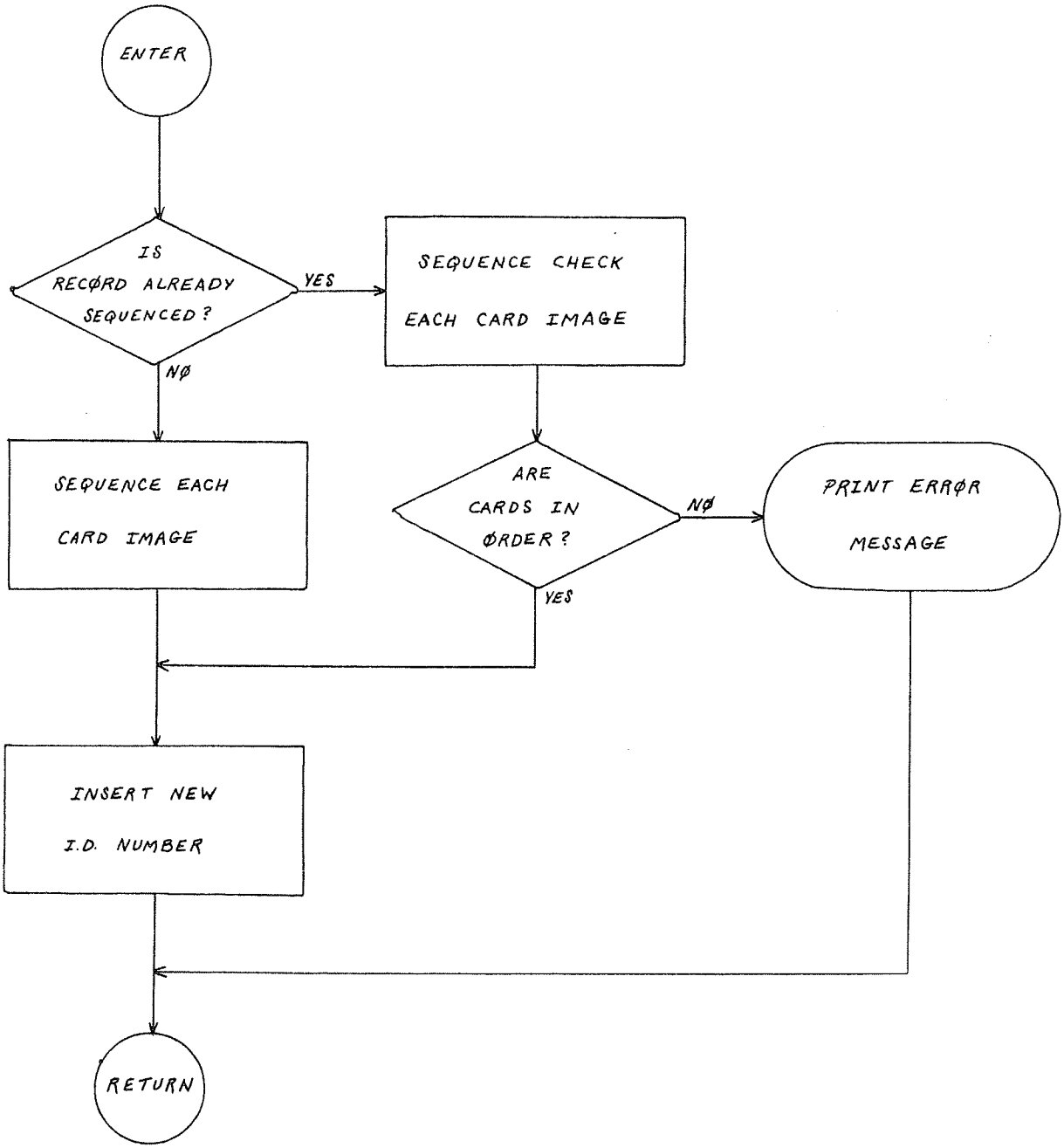
Method:

1. Take the identification number in RL(1) and put it in R(13,K), K=1,KX.
2. Test the first sequence number, R(14,1). If it is not blank, the deck has been sequence numbered. Check the sequence numbers on all the cards by comparing R(14,K) with K using subroutine HIC. If they all check, set L=0 and return. Otherwise set L=1, print an error message on NØUT, and return.
3. If R(14,1) is blank, sequence number the card images using subroutine IHC. Set L=0 and return.

Messages:

FOLLOWING DATA RECORD OUT OF SEQUENCE
This message is followed by a print-out of the error file.

SEQ - CHECK SEQUENCE NUMBER ØF DATA RECØRD AND CHANGE THE I.D. NUMBER



```
*      *ENDF* SERVICE ROUTINE
*      FORTRAN
*      LABEL
CSEQ   CHECK SEQUENCE NO OF DATA RECORD AND CHANGE THE ID NO.
       SUBROUTINESEQ(L,NOUT)
       DIMENSIONR(14,1000),RL(14)
       COMMONR,RL,KX
B      TEST2=606060606060
CTEST FOR PRIOR SEQUENCING
B      IF(BERAF(TEST2,R(14,1)))50,7,50
C  INSERT SEQ NOS., LEFT ADJUSTED, TRAILING BLANKS
     7 DO8K=1,KX
       CALLIHC(A,K-1)
B      A=SHIFT1F(22000000,A)
B      A=A+606060
     8 R(14,K)=A
     9 L=0
CINSERT NEW IDENTIFICATION NUMBER
     5 DO6K=1,KX
     6 R(13,K)=RL(1)
    10 RETURN
C  SEQUENCE CHECK, RIGHT ADJUSTED, CONVERTED NOS.
    50 DO51K=1,KX
B      Y=SHIFT2F(22000000,R(14,K))
       CALLHIC(Y,I)
       IF(I-K)75,51,75
    51 CONTINUE
CENTIRE DATA RECORD IN SEQ
       GOTO9
    75 L=1
       IF(NOUT)10,10,76
    76 WOTNOUT,2
     2 FORMAT(38H FOLLOWING DATA RECORD OUT OF SEQUENCE)
       WOTNOUT,3,(R(N,1),N=1,14)
     3 FORMAT(1H 12A6,A5,A3)
       GOTO10
       END
```

Name: AID(B)

Purpose: To increase the identification number by one.

Language: FORTRAN II

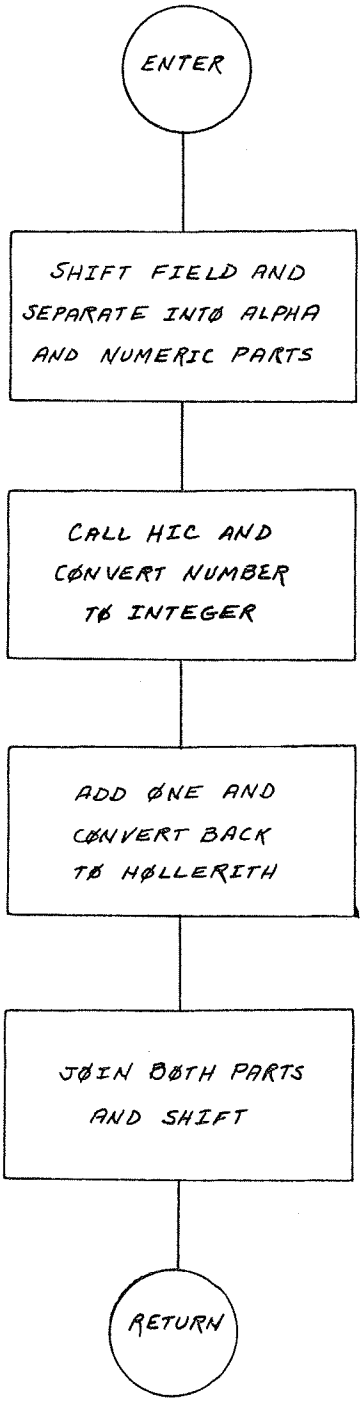
Arguments:

B - The identification number (5 Hollerith characters), a blank followed by a letter and four numbers

Method:

Since only the numbers are operated upon, separate B in half. Convert the right half, containing the four Hollerith numbers, into an integer, using subroutine HIC. Add one to the integer and convert it back to Hollerith, using IHC. Bring the two halves together again and return.

AID - INCREASE THE SEQUENCE NUMBER



```
*      *ENDF* SERVICE ROUTINE
*      FORTRAN
*      LABEL
C INCREASE THE IDENTIFICATION NUMBER
       SUBROUTINEAID(B)
CB OCCUPIES LEFTMOST 5 POSITIONS OF WORD.
C RIGHT ADJUST FIELD ONE DIGIT.
B      B=SHIFT2F(6000000,B)
C  SEPARATE B INTO BL(A ZERO AND A HOLLERITH) AND BR(4DIGITS)
B      BR=B*77777777
B      BL=B*777700000000
CCONVERT BR INTO AN INTEGER AND ADD 1
       CALLHIC(BR,I)
       I=I+1
CCONVERT BACK TO HOLLERITH
       CALLIHC(BR,I)
C  REMOVE BLANKS FROM LEFT END OF BR AND ADD BL
B      BR=BR*77777777
B      B=BL+BR
C LEFT ADJUST WORD
B      B=SHIFT1F(6000000,B)
C RESTORE BLANK AT RIGHT
B      B=B+60
       RETURN
       END
```

Name: NTCD(LX)

Purpose: To determine the number of heading cards in the Data Record.

Language: FORTRAN II

Arguments: R(N,K) - The Data Record in core storage (CØMMØN)

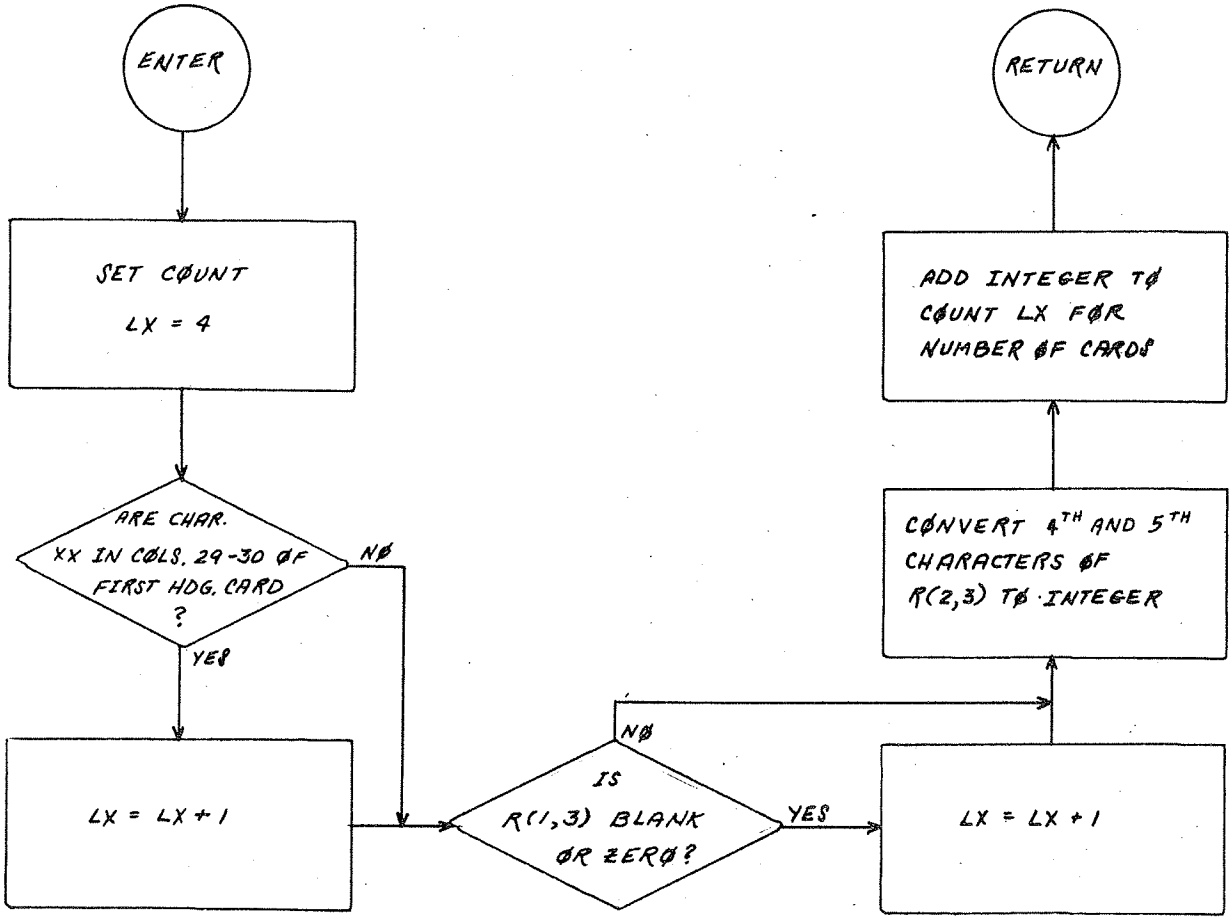
LX - The number of heading cards

Method:

1. Set LX = 4
2. Isolate columns 29 and 30 of first heading card. If they contain XX, then the first extension card is present and LX = LX + 1.
3. Test NCDF (format card) in card 3 for 0 (col. 1-5) If present LX = LX + 1.
4. Obtain NCCRD (no. of comment cards) from col. 7-11 of card 3. Convert it to an integer, I, using subroutine HIC and add to LX to establish the total number of heading cards.

Notes: R is shifted right 6 bit places (one BCD character) and stored, via a STØ instruction in Y(I). It is not necessary to use a Boolean Statement since a ARS generates zeroes at the hi-order end of the word.

NTCD - NUMBER ØF TITLE CARDS IN THE DATA RECØRD



```
*      *ENDF* SERVICE ROUTINE
*      FORTRAN
*      LABEL
CNTCRDNO. OF HEADING CARDS IN THE DATA RECORD
       SUBROUTINE NTCD(LX)
       DIMENSIONR(14,1000)
       COMMONR
       LX=4
CTEST COL.29+30 OF CARD 1 FOR XX(EXTENSION CARD)
B      TEST=6767
B      Y=R(5,1)*7777
B      IF(BERAF(TEST,Y))7,5,7
     5 LX=LX+1
C TEST NCDF(COL.1-5) IN CARD 3 FOR ZERO OR BLANK(CARD FORMAT)
     7 IF(R(1,3))8,9,10
B    8 TEST=606060606060
       IF(BERAF(R(1,3),TEST))10,9,10
     9 LX=LX+1
C ADD NCCRD TO LX(COL.10+11,NO. OF COMMENT CARDS)
B   10 Y=SHIFT2F(6000000,R(2,3))*7777
       CALLHIC(Y,N)
       LX=LX+N
       RETURN
       END
```

Name: HIC(A,I)

Purpose: To convert the Hollerith representation of an integer to a binary representation.

Language: FAP

Arguments:

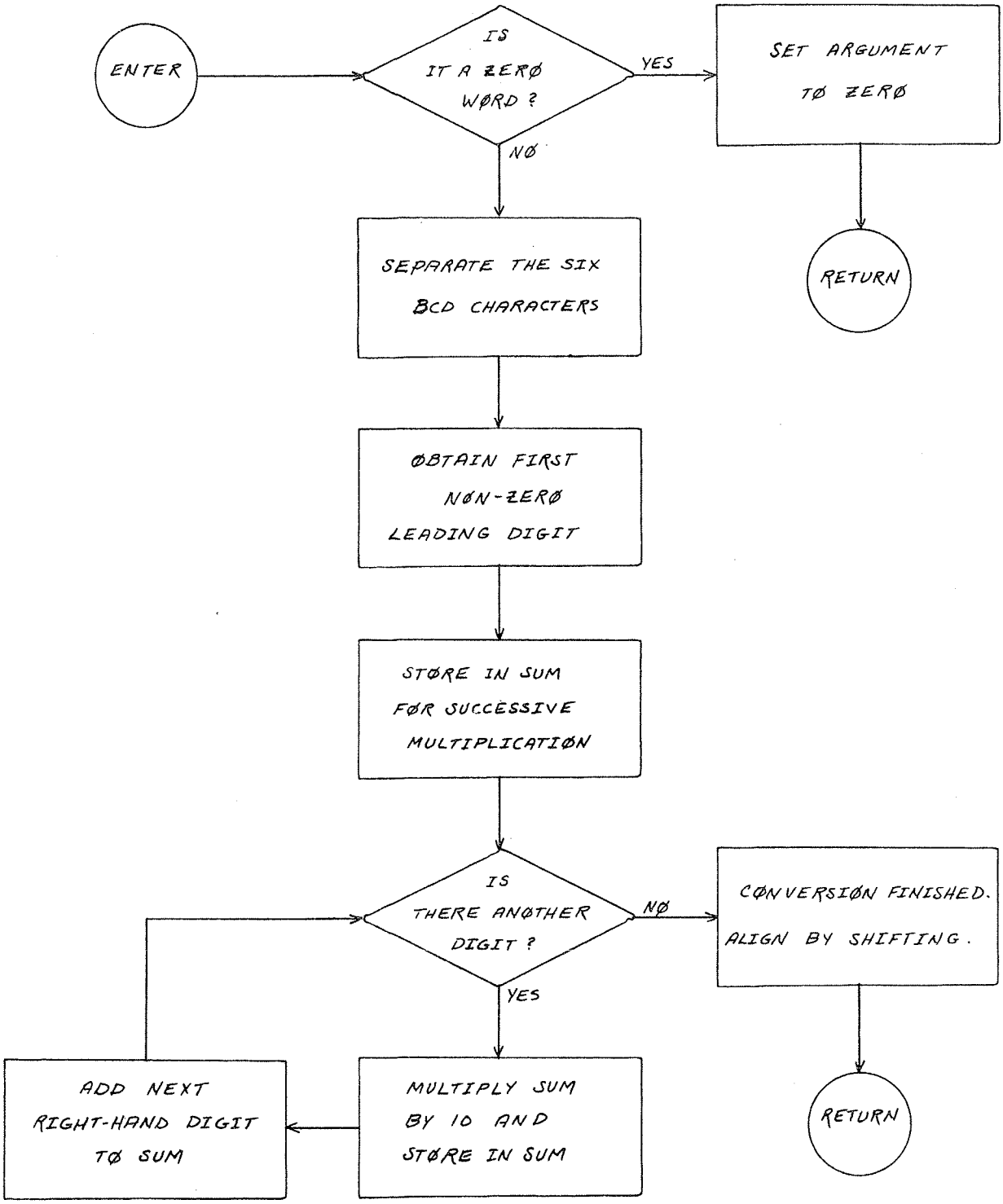
A - A word containing 6 Hollerith characters each of which is an integer 0-9 or a blank.

I - The binary representation of A in the decrement.

Method: Isolate the six characters in A. Call them N_1, N_2 ... N_6. Convert blanks to zeros. Since the Hollerith representation for an integer is just the integer itself, I is obtained from

$$I = N_1 + 10N_2 + 100N_3 + 1000N_4 + 10000N_5 + 100000N_6$$

HIC - HØLLERITH TØ INTEGER CØNVERSIØN



```
*       FAP
*HIC            HOLLERITH TO INTEGER CONVERSION
        COUNT   30
        ENTRY   HIC
*       NUMBER IS RIGHT ADJUSTED,LEADING ZEROES  OR BLANKS
 HIC    SXA     LP3,2
        CAL*    1,4
        TZE     DN+1            TEST ZERO WORD
        XCA
        AXT     6,2
 LP     ZAC
        LGL     6                       SEPARATE 1 BCD CH
        TZE     *+4                      LEADING ZEROES
        CAS     =060                   TEST LEADING BLANKS
        TRA     *+2          INCORRECT CH-PROCESS AS SUCH
        ZAC                           CONVERT TO ZERO
        STO     AR,2
        TIX     LP,2,1                  CONTINUE
* WORD UNPACKED , BEGIN CONVERSION
        AXT     6,2
    TB  CLA     AR,2        TEST FOR LEADING ZERO
        TZE     DN
   LP1  TNX     ADJST,2,1      SIX WORD TEST
        XCA
        MPY     =10
        STQ     TEMP1
        CLA     AR,2                NODO NEXT
        ADD     TEMP1
        TRA     LP1
 ADJST  ALS     18     SHIFT INTO DECREMENT
        STO*    2,4
 LP3    AXT     0,2
        TRA     3,4                     RETURN
    DN  TIX     TB,2,1
        STZ*    2,4                     WORD ALL BLANK
        TRA     LP3
 TEMP1
    AR  BES     6
        END
```

Name: IHC(A,I)

Purpose: To convert an integer to its Hollerith representation.

Language: FAP

Arguments:

A - A word containing 6 Hollerith characters each of which is an integer 0-9 or a blank.

I - A binary integer in the decrement field ≤ 9999

Method: Determine the numbers N_1, N_2, N_3, N_4 by the following procedure. The notation $\lfloor\ \rfloor$ means "the integral part of".

$$N_4 = \lfloor I/1000 \rfloor$$

$$N = N - 1000\ N_4$$

$$N_3 = \lfloor N/100 \rfloor$$

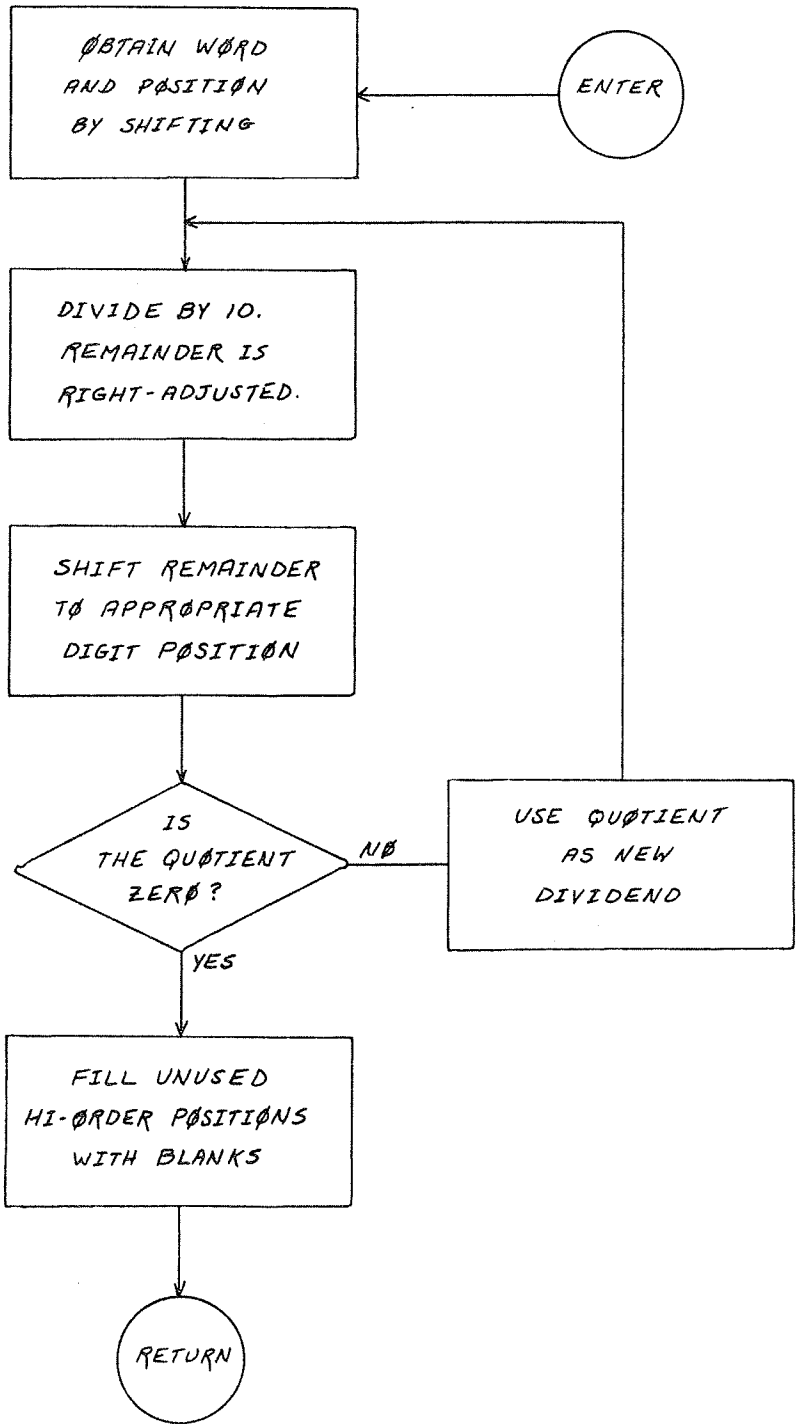
$$N = N - 100\ N_3$$

$$N_2 = \lfloor N/10 \rfloor$$

$$N_1 = N - 10\ N_2$$

Pack the Hollerith equivalent of N_1, N_2, N_3, N_4 into A so that the 6 characters in A are ($bbN_4N_5N_2N_1$).

IHC - INTEGER TØ HØLLERITH CØNVERSIØN



```
*      *ENDF* SERVICE ROUTINE
*      LABEL
*       FAP
*IHC            INTEGER TO HOLLERITH CONVERSION
        COUNT   20
        ENTRY   IHC
*       DEVELOPS 4 DIGITS, RIGHT ADJUSTED,2 LEADING BLANKS
 IHC    SXA     REST,2                  SAVE IR 2
        AXT     0,2
        LDQ*    2,4
        RQL     18                      POSITION I
        STZ     TEMP1
 LOOP   ZAC
        DVP     =10
        ALS     0,2
        ORS     TEMP1
        XCA
        TXI     *+1,2,-6
        TZE     FILL                    TEST FOR 0 QUOTIENT
        XCA
        TRA     LOOP
  FILL  CAL     MASK
        ORA     TEMP1
        SLW*    1,4         STORE HOLLERITH WORD
 REST   AXT     0,2                     RESTORE IR 2
        TOV     3,4                     TURN OFF AC OVERFLOW
        TRA     3,4                     RETURN
 TEMP1  PZE
 MASK   OCT     606000000000
        END
```

Name: DRCCK(L)

Purpose: To compute the frequency (modulo 8) of occurrence of each character type in the Data Record (card columns 1-72) and compare with the frequency given on the last card (the END card) of the Data Record.

Language: FAP

Arguments:

R(N,K) - The Data Record in core storage (COMMON)
$1 \leq N \leq 14$, $1 \leq K \leq KX$

KX - Number of cards in the Data Record (COMMON)

L - An error indicator normally =0. If the card check fails, L=1. If an illegal character occurs, L=2.

Method:

1. Each word of the array R(N,K), $1 \leq N \leq 12$, $1 \leq K \leq KX-1$, contains 6 Hollerith characters for a total of 72(KX-1) characters. For each of these characters, determine the type of character and augment a counter (modulo 8) for that type character. Thus there will be a sum (modulo 8) of the A's, B's, C's, etc. for a total of 48 character types. If an illegal character is found, set L=2 and return.

2. Convert each sum (an integer ≤ 7) into its Hollerith equivalent and pack the 47 sums into 8 words. The order is given in the table on the next page.

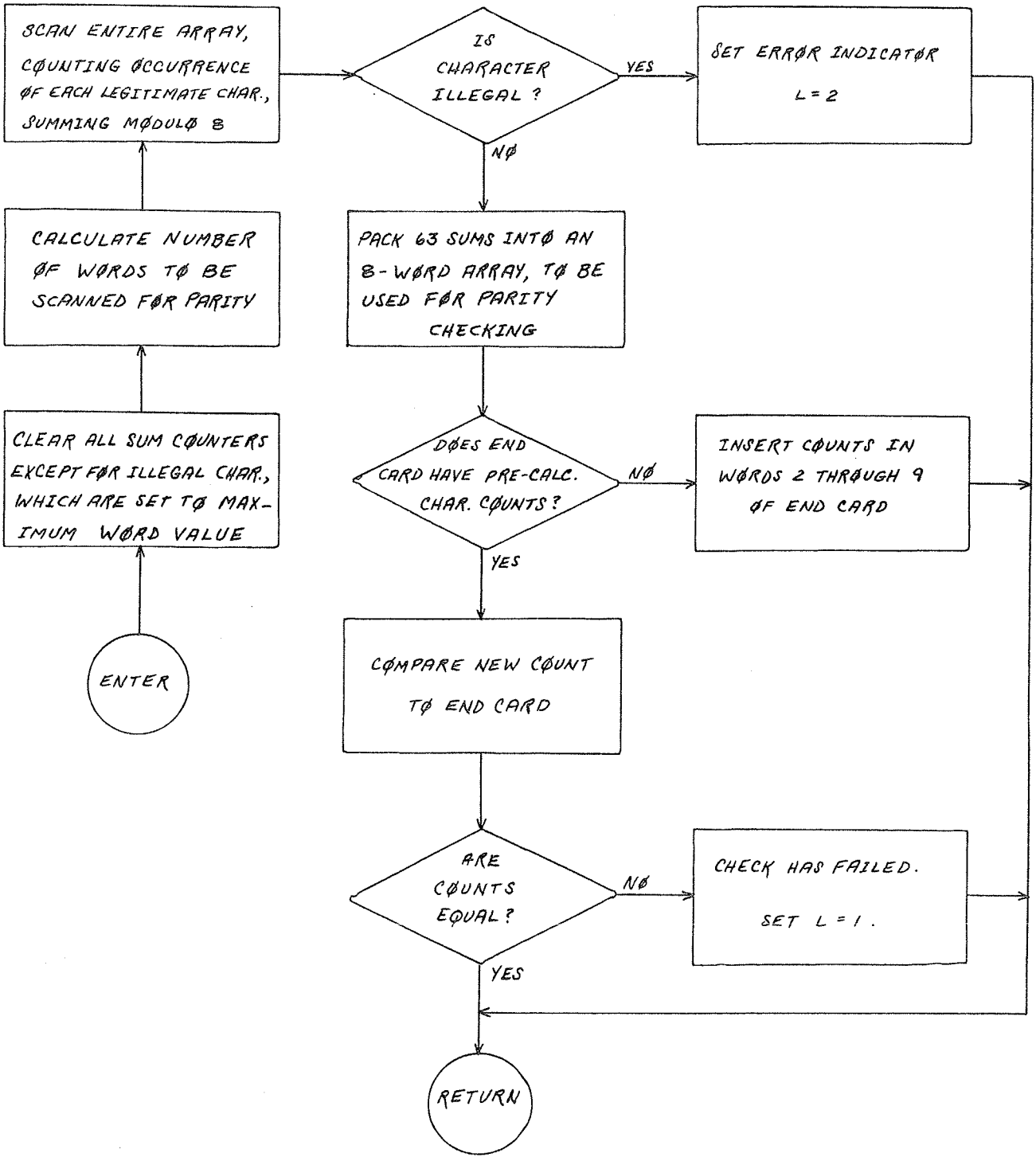
3. Test the 8 words R(N,KX), N=2,3, ... 9 to see if they are blanks. If they are blank, replace them with the 8 words computed in step 2. Set L=0 and return to main program.

4. If they are not blank, compare them with the 8 words computed in step 2. If they are identical, set L=0 and return to main program.

5. If they are not identical, set L=1 and return to the main program.

Notes: The array R is a Fortran II array and is stored backward in core storage. The integers KX and L are in the decrement field.

DRCCK - CALCULATE AND COMPARE CHARACTER OCCURRENCE SUMS



```
*      *ENDF* SERVICE ROUTINE
*       LABEL
*       FAP
*DRCCK CALCULATE AND COMPARE CHARACTER OCCURENCE SUMS
        COUNT   160
        ENTRY   DRCCK
     R  COMMON  14*1000
    RL  COMMON  14
    KX  COMMON  1
 DRCCK  SXA     REST1,1
        SXA     REST2,2
        SXA     REST4,4
 CLEAR  AXT     61,2                    ZERO SUM COUNTERS
        CLA     SUM,2                   EXCEPT FOR ILLEG. CHAR
        TMI     *+2                     WHICH ARE ALL SEVENS
        STZ     SUM,2
        TIX     CLEAR+1,2,1
        CLA     KX
        ARS     18
        SUB     =1                      KX-1, NO OF CARDS TO SCAN
        XCA                             MOVE INTO FOR MPY
        MPY     =14                     14 WDS PER CARD
        XCA                             PRODUCT IN AC
        PAX     ,1                      IR1=NO OF WORDS IN RECORD
        ADD     =9
        STA     ENDC                    WORD 9 OF END CARD
        TXI     *+1,1,-2                BEGIN AT WORD 12 OF LAST DATA CARD
 LOOP1  AXT     13,2                    DO 12 WDS PER CARD
 LOOP2  TNX     BUMP,2,1                MORE IN R, ARE 12 WORDS DONE
        AXT     6,4                     NO,PACK 6 CHAR INTO EACH WD
        LDQ     R+1,1
        SXA     TEMP2,2                 SAVE 12 WORD COUNT
 LOOP3  ZAC
        LGL     6                       ISOLATE CHAR
        PAX     ,2                      USE IT AS FACTOR
        CLA     SUM-1,2
        TMI     ILLEG
        ADD     =1
        ANA     =07                       REDUCE MODULO 8
        STO     SUM-1,2
        TIX     LOOP3,4,1               ARE 6 CHAR DONE
        LXA     TEMP2,2                 YES, RESTORE 12 WORD COUNT
        TIX     LOOP2,1,1               YES, IS ARRAY DONE
*               OBTAIN SUM WORD, REDUCE MODULO 8, AND
* PACK  SUMS INTO 8 WORD ARRAY SUM8 FROM 63 TO 1
        AXT     61,1                  SCAN 61 COUNTERS
        AXT     8,4
        AXT     6,2
 LOOP4  CLA     SUM,1
        TMI     TESTW                   TEST LEGITIMAVY
        LGR     6                          PACK IN MQ
        TNX     FIN,1,1                    ANY MORE WORDS IN SUM
        TIX     LOOP4,2,1             IS WORD FULLU PACKED
        STQ     SUM8,4
        TXI     LOOP4-1,4,-1                STEP TO NEXT WORD
 TESTW  TXI     LOOP4,1,-1
```

```
   FIN  STQ     SUM8,4              ARRAY FULLY PACKED
        LXA     ENDC,4
        CLA     R+8,4
        SUB     BLANK
        TZE     INE
*               COMPARE DEVELOPED SUMS TO END CARD
*               SUMS.
        AXT     8,2                 8 WDS TO BE COMPARED.
        LXA     ENDC,4              IR3=WORD 9 OF END CARD
 COMPS  CAL     SUM8,2
        LAS     R+1,4               COMPARE SUMS TO END CARD
        TRA     NG                  NOT EQUAL
        TXI     *+2,4,-1            EQUAL, ADJUST END CARD
        TRA     NG                  NOT EQUAL
        TIX     COMPS,2,1           ARE 8 WDS DONE
 SETL   ZAC                         L=0
 REST4  AXT     0,4
        STO*    1,4                 L
 REST1  AXT     0,1                 RESTORE INDEX REGISTERS
 REST2  AXT     0,2
        TRA     2,4                 RETURN TO MAIN PROGRAM
 BUMP   TXI     LOOP1,1,-2          SKIP WORDS 13,14
 NG     CLA     =O1000000           SUMS DO NOT MATCH, SET L=1
        TRA     SETL+1
 ILLEG  CLA     =O2000000           ILLEGAL CHAR IN CARD
        TRA     SETL+1
* PLACE SUMS IN END CARD,FROM WD 9 TO WD2 AND LEAVE
 INE    AXT     8,2
 LOOP5  CAL     SUM8,2
        SLW     R+1,4          END CARD
        TXI     *+1,4,-1
        TIX     LOOP5,2,1           ARE 8 WORDS DONE
        TRA     SETL                YES
 TEMP2  PZE                         TEMPORARY STORAGE IR 2
 ENDC   PZE                         POSITION OF WORD 9 OF END CARD
 BLANK  OCT     606060606060
* CHARACTER FREQUENCY COUNTERS
 SUM8   BES     8                   PACKED SUM WORDS
        PZE
        OCT     777777777777                ILLEG CHAR          77
        OCT     777777777777                ILLEG CHAR          76
        OCT     777777777777                ILLEG CHAR          75
        PZE                                 (                   74
        PZE                                 ,                   73
        OCT     777777777777                ILLEG               72
        PZE                                 Z                   71
        PZE                                 Y                   70
        PZE                                 X                   67
        PZE                                 W                   66
        PZE                                 V                   65
        PZE                                 U                   64
        PZE                                 T                   63
        PZE                                 S                   62
        PZE                                 /                   61
        PZE                                 BLANK               60
        OCT     777777777777                ILLEG               57
```

```
      OCT     777777777777              ILLEG                   56
      OCT     777777777777              ILLEG                   55
      PZE                               *                       54
      PZE                               $                       53
      OCT     777777777777              ILLEG                   52
      PZE                               R                       51
      PZE                               Q                       50
      PZE                               P                       47
      PZE                               O                       46
      PZE                               N                       45
      PZE                               M                       44
      PZE                               L                       43
      PZE                               K                       42
      PZE                               J                       41
      PZE                               -                       40
      OCT     777777777777              ILLEG                   37
      OCT     777777777777              ILLEG                   36
      OCT     777777777777              ILLEG                   35
      PZE                               )                       34
      PZE                               .                       33
      OCT     777777777777              ILLEG                   32
      PZE                               I                       31
      PZE                               H                       30
      PZE                               G                       27
      PZE                               F                       26
      PZE                               E                       25
      PZE                               D                       24
      PZE                               C                       23
      PZE                               B                       22
      PZE                               A                       21
      PZE                               +                       20
      OCT     777777777777              ILLEG                   17
      OCT     777777777777              ILLEG                   16
      OCT     777777777777              ILLEG                   15
      PZE                               ,                       14
      PZE                               =                       13
      OCT     777777777777              ILLEG                   12
      PZE                               9                       11
      PZE                               8
      PZE                               7
      PZE                               6
      PZE                               5
      PZE                               4
      PZE                               3
      PZE                               2
      PZE                               1
      PZE                               0
SUM   PZE
      END
```

**********0321**********

Name: DICT(A,N,ND,M,IF)

Purpose: To provide access to dictionaries 1-10 defined in the ENDF specifications.

Language: FORTRAN II

Arguments: A - A 6 character Hollerith word
N - An integer
ND- The dictionary number
M = -1, Load and print dictionaries
= 0, Load dictionaries
= 1, Given A, find N in dictionary ND
= 2, Given A, find A in dictionary ND
IF= 0, normal return
= 1, Entry not found in dictionary.

Method: Each item in the dictionary is compared with A (or N) until a match is found.

Error Messages:

1. ERRØR, DICTxx Øut øf Ørder (dictionary numbers must be in increasing order)
2. ERRØR, DICTxx TøØ Løng (150 entries maximum)
The above errors lead to a CALL EXIT statement. xx is the dictionary number.
3. ENTRY (yyyyyy) NØT IN DICTIØNARY xx
where yyyyyy is either A or N. Program returns with IF=1.

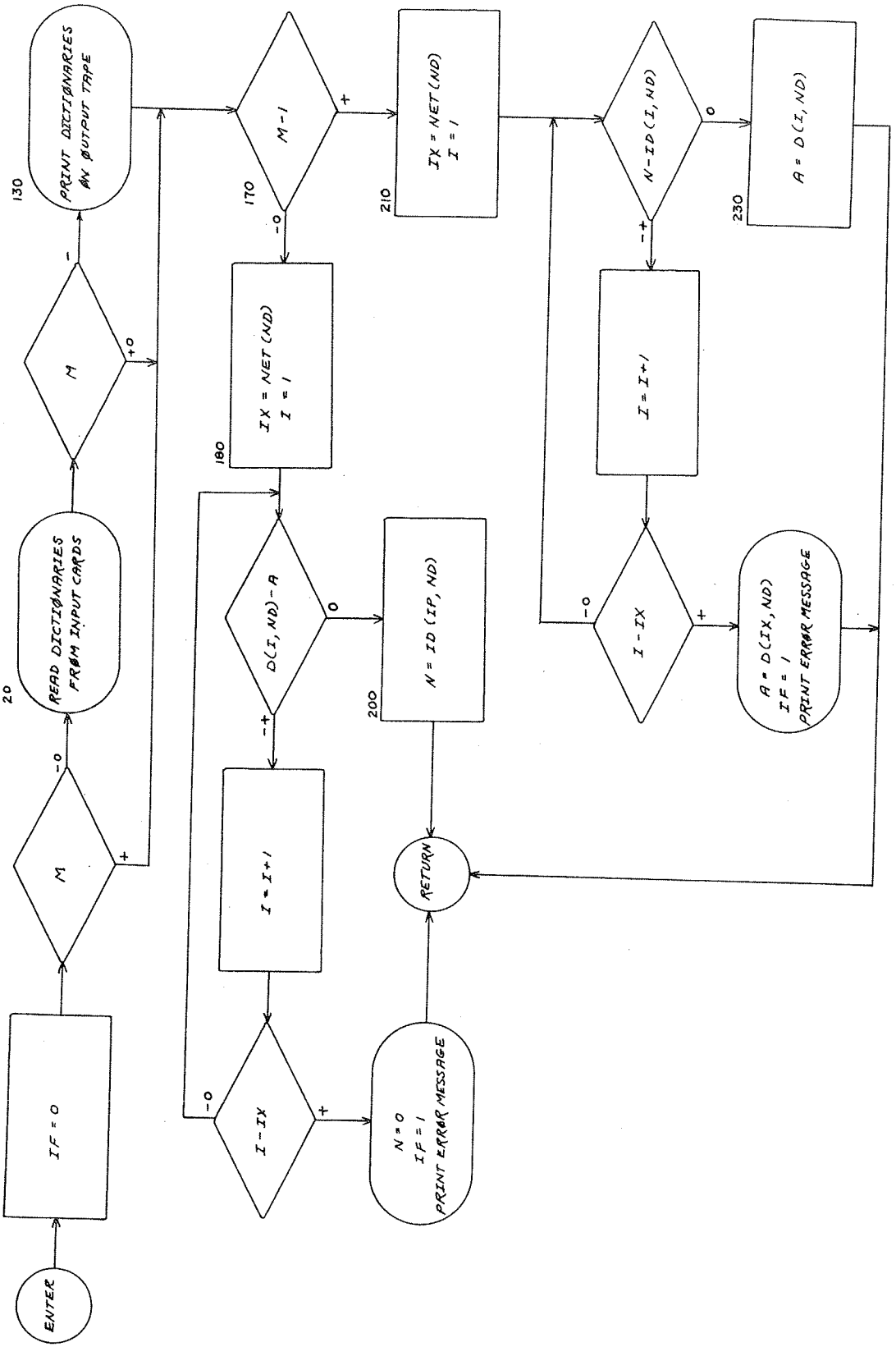
Input Data for DICT

Card	Columns	Format	Symbol	Description
1	1-3	I3	NDx	Number of dictionaries $\leq$10
2	1-11	11x	-	The characters DICTIØN-ARY(1)
	12-13	I2	ND	The dictionary number (note 2)
	16-18	I3	NET(ND)	Number of entries in dictionary ND $\leq$150
3	-	8(I3,A6)	(ID(I,ND), D(I,ND), I=1, NET)	The numerical (ID) and Hollerith (D) entries of the dictionary.

Note 1. Use as many cards of type 3 as required to complete dictionary. Start each new dictionary with a card type 2.

Note 2. The dictionary numbers must be in increasing order starting with 1.

DICT - DICTIONARY SUBROUTINE



```
=========A/N TO ENDF CONVERSION=========================================
CDICT     ENDF DICTIONARIES
      SUBROUTINE DICT(A,N,ND,M,IF)
C     M=-1, LOAD DICTIONARIES AND PRINT
C     M=0, LOAD DICTIONARIES
C     M=1, GIVEN A, FIND N
C     M=2, GIVEN N, FIND A
C     ND=DICTIONARY NO.
C     IF=0, NORMAL      IF=1, ENTRY NOT IN DICTIONARY
      COMMON NTIN,NTOUT
      DIMENSION D(150,10),NET(10),ID(150,10)
   10 IF=0
      IF(M)20,20,170
   20 READINPUTTAPENTIN,30,NDX
   30 FORMAT(I3)
      DO 120 ND=1,NDX
      READINPUTTAPENTIN,40,NDP,NET(ND)
   40 FORMAT(11X12,2X13)
      IF(ND-NDP)50,70,50
   50 WRITEOUTPUTTAPENTOUT,60,NDP
   60 FORMAT(12H0ERROR, DICTI3,13H OUT OF ORDER)
      CALL EXIT
   70 IF(NET(ND)-150)100,100,80
   80 WRITEOUTPUTTAPENTOUT,90,ND
   90 FORMAT(12H0ERROR, DICTI3,9H TOO LONG)
      CALL EXIT
  100 IX=NET(ND)
      READINPUTTAPENTIN,110,(ID(I,ND),D(I,ND),I=1,IX)
  110 FORMAT(8(I3,A6))
  120 CONTINUE
      IF(M)130,240,240
  130 WRITEOUTPUTTAPENTOUT,140
  140 FORMAT(24H1LISTING OF DICTIONARIES)
      DO 150 ND=1,NDX
      IX=NET(ND)
  150 WRITEOUTPUTTAPENTOUT,160,ND,IX,(ID(I,ND),D(I,ND),I=1,IX)
  160 FORMAT(11H0DICTIONARYI3,I5,8H ENTRIES/(8(I5,1XA6)))
      GOTO240
  170 IF(M-1)180,180,210
  180 IX=NET(ND)
      DO 190 I=1,IX
      IP=I
      IF(BERAF(D(I,ND),A))190,200,190
  190 CONTINUE
      IF=1
      WRITEOUTPUTTAPENTOUT,195,A,ND
  195 FORMAT(8H0ENTRY (A6,19H) NOT IN DICTIONARYI3)
      N=0
      GOTO240
  200 N=ID(IP,ND)
      GOTO240
  210 IX=NET(ND)
      DO 220 I=1,IX
      IP=I
      IF(N-ID(I,ND))220,230,220
  220 CONTINUE
      IF=1
      WRITEOUTPUTTAPENTOUT,225,N,ND
  225 FORMAT(8H0ENTRY (I6,19H) NOT IN DICTIONARYI3)
      A=D(IX,ND)
      GOTO240
```

```
230  A=D(IP,ND)
240  RETURN
     END
```

```
*      DATA
  10
DICTIONARY  1,  112 ENTRIES
   1M         1 M         2ME         3LI         4BE         5B          5 B         6C
   6 C        7N          7 N         8O          8 O         9F          9 F         10NE
  11NA        12MG        13AL        14SI        15P         15 P        16S         16 S
  17CL        18A         18 A        19K         19 K        20CA        21SC        22TI
  23V         23 V        24CR        25MN        26FE        27CO        28NI        29CU
  30ZN        31GA        32GE        33AS        34SE        35BR        36KR        37RB
  38SR        39Y         39 Y        40ZR        41CB        42MO        43MA        44RU
  45RH        46PD        47AG        48CD        49IN        50SN        51SB        52TE
  53I         54 I        54XE        55CS        56BA        57LA        58CE        59PR
  60ND        61IL        62SM        63EU        64GD        65TB        66DY        67HO
  68ER        69TM        70YB        71LU        72HF        73TA        74W         74 W
  75RE        76OS        77IR        78PI        79AU        80HG        81TL        82PB
  83BI        84PO        85AT        86RN        87FR        88RA        89AC        90TH
  91PA        92U         92 U        93NP        94PU        95AM        96CM        0
DICTIONARY  2,   17 ENTRIES
   0          1N          2G          3P          4A          5E          6D          7T
   8H         9F          10U         11V         12W         13X         14Y         15Z
   0
DICTIONARY  3,   37 ENTRIES
   1TOTAL     1 TOTAL     2ELAST      2 ELAST     3NONEL      3 NONEL     4UNELAS 16PAIR
  16  PAIR   17TRIPLE    18FISS      18  FISS    19F         19      F   20NF        20      NF
  212NF      21    2NF   22NA        22     NA   23N3A       23    N3A   242NA       24     2NA
  25ONA      25    3NA   27ABSORP    28NP        28      NP101PARABS102G         102       G
103P        103       P104D       104       D105T       105       T106H         106       H
107A        107       A1082A      108     2A  0
DICTIONARY  4,   18 ENTRIES
   0          1CROS       2ANGD       3ENED       4AECR       5CORR       6RERP       7UNRP
   8TSCL      9BURN       10NU        10  NU      11ETA       11 ETA      12ALPH      13OPAL
  14NBAR      0
DICTIONARY  5,    6 ENTRIES
   0          1C          2P          3S          4V          0
DICTIONARY  6,   32 ENTRIES
   0          1EI         2EF         3DE         4UI         5UF         6DU         7AL
   8AC        9CL         10CC        11T         11 T        12AL        13BT        41A1
  42A2        43A3        44A4        45A5        46C1        47C2        48C3        49C4
  50C3        51E1        52E2        53E3        54E4        55E5        99XX        0
DICTIONARY  7,    6 ENTRIES
   0          1BN         1B          1 B         2MB         0
DICTIONARY  8,   12 ENTRIES
   0          1MV         1 MV        2EV         2 EV        3KEV        4MEV        5K
   5  K       6A          6  A        0
DICTIONARY  9,  134 ENTRIES
   1ALD       2ANL        3ARK        4AUS        5AUL        6BAR        7BAS        8BAT
   9BEL       10BET       11BKB       12BNL       13BOM       14BOS       15BRK       16BRN
  17BUL       18BW        18 BW       19BZL       20CAN       21CAL       22CAR       23CAT
  24CCP       25CER       26CHI       27CHL       28CIS       29CLC       30CND       31COL
  32CON       33CRC       34CSE       35CTL       36DEN       37DKE       38ENG       39ETH
  40FAR       41FR        41 FR       42GA        42 GA       43GEL       44GER       45GEV
  46GLS       47GRN       48HAN       49HAR       50HAV       51IND       52IOW       53IP
  53 IP       54ISL       55ISP       56ITY       57JAL       58JAP       59JEN       60JNC
  61JIN       62KAP       63KON       64KRL       65KTO       66KTY       67LAS       68LEA
  69LOK       70LOV       71LRL       72LVP       73MAR       74MCG       75MCM       76MEX
  77MIT       78MND       79MOL       80MON       81NTR       82NON       83NAA       84NBS
  85NED       86NEV       87NOR       88NOT       89NRD       90NRL       91NWO       92NZL
  93ORL       94OXF       95PAR       96POL       97PSV       98RDZ       99RIC       100RIO
  101ROS      102RPI      103RUM      104SAC      105SAH      106SOC      107SR       108 SR
  108STF      109SWD      110SWT      111TAT      112TEX      113TNC      114TOK      115UKR
  116UMT      117UNC      118UPA      119UVA      120WAD      121WAP      122WIN      123WIS
```

```
124WUR   125YAL   126ZAG   127ZUR   128A/W     0
DICTIONARY 10,  18 ENTRIES
100SEC   200ENR   300PDC   401DCC1  402DCC2  403DCC3  404DCC4  405DCC5
406DCC6  407DCC7  408DCC8  409DCC9  410DCC10 411DCC11 412DCC12 413DCC13
500END     0
```

**********0130**********

CONVERSION OF THE ALDERMASTON/WINFRITH DATA of JULY 1, 1964 TO THE ENDF FORMAT

Henry C. Honeck

February 1, 1965

Preface

This report is a very brief description of the conversion of the Aldermaston/Winfrith Data to the ENDF format. A more detailed report, including complete description of the computer code used, will be prepared and distributed later.

The BNL Sigma Center received a magnetic tape containing data on 38 elements from the Aldermaston/Winfrith (A/W) Data File. The tape was sent by Dr. K. Parker of Aldermaston, was dated July 1, 1964, and contained BCD card images for 23,964 cards punched in the A/W format (EANDC Compilation Study Group, ECSG P11). A list of the elements, energy ranges, evaluation dates, and references is given in Table I.

A Fortran II program was written to convert this data to the ENDF format. The conversion was entirely tape-to-tape and required about 30 minutes of 7094 time. The effort involved in writing, debugging, and running this conversion program was one man-month plus about four hours of 7094 time.

A summary of the data received is given in Table II. The numbers in the Table are interpreted as follows:

1 - Cross section (GCN = 1) data only.

2 - Cross section (GCN = 1) and angular distribution (GCN = 2) data.

3 - Cross section (GCN = 1), angular distribution (GCN = 2), and energy distribution (GCN = 3) data.

4 - Cross section (GCN = 1), angular distribution (GCN = 2), energy distribution (GCN = 3), and ν (GCN = 4) data.

No data was given for GCN $>$ 4, that is, there were no resonance parameters, thermal scattering laws, or photon data on

the tape. Thus, the conversion program was written to treat only GCN = 1,2,3, or 4. The other GCN numbers will be included later, and the program will be documented and distributed.

Several alterations and assumptions were made in the conversion. These and some comments are listed below.

1. All energies were converted to electron volts (ev). This includes the Q values.
2. If a cross section had a temperature dependence, the dependence was assumed to be linear with T.
3. If an angular distribution (GCN = 2) is given both rangewise and pointwise within an energy range, the data must be converted by hand. Fortunately, the situation did not occur.
4. Law 7 for neutron secondary energies was not included in the program nor did it occur in the data.
5. The only extensive rearrangement of data occurred for GCN = 2 and 3. The A/W data is arranged in the order
   a) all laws or partial distributions for one neutron for one energy range;
   b) all neutrons for one energy range;
   c) all energy ranges.

The ENDF format has b) and c) interchanged.

Table 1

Material	NIN	Energy Range	Evaluation Date	References
H	10	0.0033 ev - 15 Mev	Spring 1963	4
D	11	0.001 ev - 15 Mev	Spring 1963	4
T	109	0.025 ev - 15 Mev	November 1957	7
He-4	31	0.001 ev - 15 Mev	Spring 1963	4
Be-9	8	0.001 ev - 15 Mev	Spring 1963	4,6
B	15	0.001 ev - 15 Mev	Spring 1963	4,7
B-10	13	0.001 ev - 15 Mev	Spring 1963	4,7
C	6	0.0001 ev - 15 Mev	Spring 1963	4,8
N	14	0.0001 ev - 15 Mev	Spring 1963	4,7
O	37	0.001 ev - 15 Mev	January 1964	1
F-19	23	0.0001 ev - 15 Mev	Spring 1963	4,7
Na-23	182	0.01 ev - 15 Mev	June 1963	3
Al-27	35	0.0006 ev - 15 Mev	January 1964	1
Si	25	0.0004 ev - 15 Mev	Spring 1963	4,7
Cl	141	0.025 ev - 15 Mev	February 1959	7
Ca	138	0.025 ev - 15 Mev	October 1958	7
Cr	17	0.0001 ev - 15 Mev	Spring 1963	4,7
Fe	36	0.01 ev - 15 Mev	January 1964	18
Ni	19	0.0001 ev - 15 Mev	Spring 1963	4,7
Cu	186	0.025 ev - 14.6 Mev	January 1964	
Zr	179	0.025 ev - 17 Mev	May 1963	5
Cd	24	0.0001 ev - 15 Mev	Spring 1963	4,7
Xe-135	4	0.01 ev - 1 Kev	Spring 1962	2
Au-197	137	1 Kev - 15 Mev	December 1962	
Pb	26	0.0001 ev - 15 Mev	Spring 1963	4,7
Th-232	22	0.0001 ev - 15 Mev	Spring 1963	4,7
U-233	122	0.025 ev - 15 Mev	Spring 1959	7
U-234	174	1 Kev - 15 Mev	August 1962	12
U-235	2	0.005 ev - 15 Mev	Spring 1963	4,10
U-236	173	1 Kev - 15 Mev	August 1962	11
U-238	5	0.001 ev - 15 Mev	Spring 1963	4,9
Np-237	130	100 Kev - 15 Mev	1959	
Pu-239	184	0.001 ev - 15 Mev	January 1964	17
Pu-240	29	0.001 ev - 15 Mev	Spring 1963	4,7
Pu-241	129	0.025 ev - 15 Mev	Spring 1959	7
H_2O	27	0.0006 ev - 0.5 ev	Spring 1963	4
D_2O	28	0.0005 ev - 9 ev	Spring 1963	4
BeO	7	0.001 ev - 1 Kev	Spring 1963	4

References to Table 1

No.	Report No.	Materials	Date	Authors
1	AEEW M445	O,Al	July 1964	D.C. King
2	AEEW R116	Xe-135	June 1962	H.M. Sumner
3	AEEW R254	Na-23	April 1963	T.P. Moorhead
4	AEEW R351	Many	Feb. 1964	E.P. Barrington, A.L. Pope, and J.S. Story
5	AHSB(S)R62	Zr	1963	P.J. Hemmings
6	AWRE O-27/60	Be-9	Sept. 1960	K. Parker
7	AWRE O-28/60	Many	March 1961	B.R.S. Buckingham, K. Parker, and E.D. Pendlebury
8	AWRE O-71/60	C	Aug. 1961	K. Parker
9	AWRE O-79/63	U-238	Jan. 1964	K. Parker
10	AWRE O-82/63	U-235	Dec. 1963	K. Parker
11	AWRE O-30/64	U-236	July 1964	K. Parker
12	AWRE O-37/64	U-234	July 1964	K. Parker
13	AWRE O-60/64	Li-6	July 1964	E.D. Pendlebury
14	AWRE O-61/64	Li-7	July 1964	E.D. Pendlebury
15	AWRE O-77/64	Ti	Oct. 1964	S.M. Miller, K. Parker
16	AWRE O-78/64	He-3	Aug. 1964	R. Batchelor, K. Parker
17	AWRE O-79/64	Pu-239	To be published	A.C. Douglas
18	AEEW report	Fe	To be published	A.C. Douglas

NIN	ISOTOPE	TOTAL	ELASTIC	NON-ELASTIC	INELASTIC SCATTERING											CONTINUUM	(n,2n)	(n,3n)	FISSION	(n,f)	(n,n'f)	(n,2nf)	(n,n')α	(n,n')3α	(n,2n)α	(n,3n)α	(n,2n)iso.	PAR. ABS.	(n,γ)	(n,p)	(n,d)	(n,t)	(n,He3)	(n,α)	(n,2α)
					TOTAL	1ST	2ND	3RD	4TH	5TH	6TH	7TH	8TH	9TH	10TH																				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	101	102	103	104	105	106	107	108
2	U235	1	2	1		3	3	3	3	3	3					3	3	3	4										1						
5	U238	1	2	1		3	3	3	3	3	3					3	3	3	4										1						
7	BEO	1	2	1																									1						
8	BE9	1	2	1																					3				1			1		1	
10	H	1	2																										1						
11	D	1	2	1													3												1						
22	TH232	1	2	1												3	3	3	4										1						
27	H2O	1	2	1																									1						
28	D2O	1	2	1																									1						
29	PU240	1	2	1												3	3	3	4										1						
31	HE4	1	2																																
109	T	1	2	1													3	3																	
122	U233	1	2	1												3	3	3	4										1						
173	U236	1	2	1		2	2	2	2	2	2					3	3	3	4										1						
174	U234	1	2	1		2	2	2	2	2	2					3	3	3	4										1						
184	PU239	1	2	1		2	2	2	2	2	2	2				3	3	3	4										1						
129	PU241	1	2	1												3	3	3	4										1						
130	NP237																		1																
4	XE135	1	2																										1						
6	C	1	2	1												3								3					1	1				1	
13	B10	1	2	1												3												1							
14	N	1	2	1												3	3												1	1	1	1		1	1
15	B	1	2	1												3												1							
17	CR	1	2	1												3													1	1				1	
19	NI	1	2	1												3	3												1	1				1	
23	F19	1	2	1												3	3											1							
24	CD	1	2	1												3	3											1							
25	SI	1	2	1												3													1	1				1	
26	PB	1	2	1												3													1						
35	AL27	1	2			2	2	2	2	2	2	2	2	2		3	3												1	1				1	
36	FE	1	2			2	2	2	2	2	2	2				3	3												1	1				1	
37	O	1	2			2	2	2	2							3												1		1	1		1	
137	AU197																1										1		1						
138	CA	1	2	1												3													1	1				1	
141	CL	1	2	1												3	3												1	1				1	
179	ZR	1	2	1												3	3											1							
182	NA23	1	2	1		2	2	2	2	2	2	2				3	3												1	1				1	
186	CU	1	2	1												3	3												1	1					

Vol. 1, No. 1 ENDF Newsletter March 1, 1965

The Sigma Center Brookhaven National Laboratory Upton, N. Y.

This is the first ENDF Newsletter from the ENDF Center at BNL. Newsletters will be sent out periodically to describe new evaluated data received and placed on the ENDF for distribution. There are three parts to the Newsletter. The first will be a few sentences describing the new data and references. The second part is a computer listing of several cards from each Data Record received. The first line gives the Data Record Identification Number by which it will always be referred, the number of cards, and the date included on the ENDF. The second line is the First Heading Card on the Data Record. Remaining lines are the comment cards in the Data Record.

The third part of the report is a cross reference for all data on the ENDF. One line is printed for each Data Record. The order is first by isotope, next by reactor type, and finally by the type of data given.

If you wish any data described in this Newsletter, fill out one of the enclosed request forms and send it along with an IBM magnetic tape to the ENDF Center. Please refer to data by the Data Record Identification Number.

ENDF Request Form

To: ENDF Center
The Sigma Center
Brookhaven National Laboratory
Upton, L. I., New York

From: _____

_____

_____

_____

Data Records Requested: (Limit 2000)

_____

_____

_____

_____

Note: Use only the Data Record Identification Number. A typical list is: A0394, A2560-A2573, A0194, etc.

Output Mode (check one):

_____ BCD Cards (not recommended)

_____ BCD Tape, card images

_____ BCD Tape, packed card images (1 Data Record/ tape record)

_____ Binary Tape copy of ENDF Library Tape

Magnetic tape sent with this request:

Labeled: _____

_____

Density: _____200 bpi _____556 bpi _____800 bpi

```
A0001----- 228 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 235 (N,TØTAL ) 0,  CRØS C(EI,  ,  )BN A/W0001  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 1   PCN=  1
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0002----- 228 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 235 (N,ELAST ) 0,N CRØS C(EI,  ,  )BN A/W0002  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 1   PCN=  2
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0003----- 191 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 235 (N,ELAST ) 0,N ANGD P(CC,EI,  )   A/W0003  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 2   PCN=  2
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0004----- 228 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 235 (N,NØNEL ) 0,  CRØS C(EI,  ,  )BN A/W0004  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 1   PCN=  3
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0005-----  17 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 235 (N,INELAS) 1,N CRØS C(EI,  ,  )BN A/W0005  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 1   PCN=  5
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0006-----  10 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 235 (N,INELAS) 1,N ANGD P(CC,EI,  )   A/W0006  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 2   PCN=  5
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0007-----  10 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 235 (N,INELAS) 1,N ENED P(EI,EF,  )   A/W0007  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 3   PCN=  5
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0008-----  20 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 235 (N,INELAS) 2,N CRØS C(EI,  ,  )BN A/W0008  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 1   PCN=  6
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0009-----  10 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 235 (N,INELAS) 2,N ANGD P(CC,EI,  )   A/W0009  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 2   PCN=  6
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0010-----  10 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 235 (N,INELAS) 2,N ENED P(EI,EF,  )   A/W0010  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 3   PCN=  6
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0011-----  18 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 235 (N,INELAS) 3,N CRØS C(EI,  ,  )BN A/W0011  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 1   PCN=  7
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0012-----  10 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 235 (N,INELAS) 3,N ANGD P(CC,EI,  )   A/W0012  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 2   PCN=  7
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER
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A0013-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     U 235 (N,INELAS) 3,N ENED P(EI,EF,  )   A/W0013  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 3   PCN=  7
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0014-----  17 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     U 235 (N,INELAS) 4,N CRØS C(EI,  ,  )BN A/W0014  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 1   PCN=  8
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0015-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     U 235 (N,INELAS) 4,N ANGD P(CC,EI,  )   A/W0015  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 2   PCN=  8
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0016-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     U 235 (N,INELAS) 4,N ENED P(EI,EF,  )   A/W0016  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 3   PCN=  8
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0017-----  17 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     U 235 (N,INELAS) 5,N CRØS C(EI,  ,  )BN A/W0017  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 1   PCN=  9
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0018-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     U 235 (N,INELAS) 5,N ANGD P(CC,EI,  )   A/W0018  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 2   PCN=  9
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0019-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     U 235 (N,INELAS) 5,N ENED P(EI,EF,  )   A/W0019  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 3   PCN=  9
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0020-----  16 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     U 235 (N,INELAS) 6,N CRØS C(EI,  ,  )BN A/W0020  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 1   PCN= 10
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0021-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     U 235 (N,INELAS) 6,N ANGD P(CC,EI,  )   A/W0021  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 2   PCN= 10
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0022-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     U 235 (N,INELAS) 6,N ENED P(EI,EF,  )   A/W0022  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 3   PCN= 10
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0023-----  28 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     U 235 (N,INELAS)98,N CRØS C(EI,  ,  )BN A/W0023  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 1   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0024-----  26 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     U 235 (N,INELAS)98,N ANGD P(CL,EI,  )   A/W0024  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 2   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0025----- 129 CARDS, ADDED MAR 1, 1965 ----------------------------------------
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     U 235 (N,INELAS)98,N ENED P(EI,EF,  )   A/W0025  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 3   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0026-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 235 (N,PAIR  ) 0,N CRØS C(EI,  ,  )BN A/W0026  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 1   PCN= 16
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0027-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 235 (N,PAIR  ) 0,N ANGD P(CL,EI,  )   A/W0027  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 2   PCN= 16
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0028----- 245 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 235 (N,PAIR  ) 0,N ENED P(EI,EF,  )   A/W0028  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 3   PCN= 16
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0029-----  11 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 235 (N,TRIPLE) 0,N CRØS C(EI,  ,  )BN A/W0029  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 1   PCN= 17
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0030-----  19 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 235 (N,TRIPLE) 0,N ANGD P(CL,EI,  )   A/W0030  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 2   PCN= 17
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0031----- 100 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 235 (N,TRIPLE) 0,N ENED P(EI,EF,  )   A/W0031  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 3   PCN= 17
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0032----- 228 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 235 (N,FISS  ) 0,N CRØS C(EI,  ,  )BN A/W0032  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 1   PCN= 18
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0033-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 235 (N,FISS  ) 0,N ANGD P(CL,EI,  )   A/W0033  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 2   PCN= 18
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0034-----  36 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 235 (N,FISS  ) 0,N ENED P(EI,EF,  )   A/W0034  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 3   PCN= 18
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0035-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 235 (N,FISS  ) 0,N NU    (EI,  ,  )   A/W0035  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 4   PCN= 18
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0036----- 228 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 235 (N,G     ) 0,  CRØS C(EI,  ,  )BN A/W0036  0/63 0.500-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  2   GCN= 1   PCN=102
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-82/63, 12/63, K.PARKER

A0037----- 651 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 238 (N,TØTAL ) 0,  CRØS C(EI,  ,  )BN A/W0037  0/63 0.100-2 1.500+7EV
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     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=  5   GCN= 1   PCN=  1
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-79/63,  1/64, K.PARKER

A0038----- 651 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 238 (N,ELAST ) 0,N CRØS C(EI,  ,  )BN A/W0038  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=  5   GCN= 1   PCN=  2
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-79/63,  1/64, K.PARKER

A0039----- 191 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 238 (N,ELAST ) 0,N ANGD P(CC,EI,  )    A/W0039  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=  5   GCN= 2   PCN=  2
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-79/63,  1/64, K.PARKER

A0040----- 651 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 238 (N,NØNEL ) 0,  CRØS C(EI,  ,  )BN A/W0040  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=  5   GCN= 1   PCN=  3
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-79/63,  1/64, K.PARKER

A0041-----  50 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 238 (N,INELAS) 1,N CRØS C(EI,  ,  )BN A/W0041  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=  5   GCN= 1   PCN=  5
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-79/63,  1/64, K.PARKER

A0042-----  10 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 238 (N,INELAS) 1,N ANGD P(CC,EI,  )    A/W0042  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=  5   GCN= 2   PCN=  5
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-79/63,  1/64, K.PARKER

A0043-----  10 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 238 (N,INELAS) 1,N ENED P(EI,EF,  )    A/W0043  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=  5   GCN= 3   PCN=  5
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-79/63,  1/64, K.PARKER

A0044-----  46 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 238 (N,INELAS) 2,N CRØS C(EI,  ,  )BN A/W0044  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=  5   GCN= 1   PCN=  6
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-79/63,  1/64, K.PARKER

A0045-----  10 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 238 (N,INELAS) 2,N ANGD P(CC,EI,  )    A/W0045  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=  5   GCN= 2   PCN=  6
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-79/63,  1/64, K.PARKER

A0046-----  10 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 238 (N,INELAS) 2,N ENED P(EI,EF,  )    A/W0046  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=  5   GCN= 3   PCN=  6
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-79/63,  1/64, K.PARKER

A0047-----  42 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 238 (N,INELAS) 3,N CRØS C(EI,  ,  )BN A/W0047  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=  5   GCN= 1   PCN=  7
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-79/63,  1/64, K.PARKER

A0048-----  10 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 238 (N,INELAS) 3,N ANGD P(CC,EI,  )    A/W0048  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=  5   GCN= 2   PCN=  7
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-79/63,  1/64, K.PARKER

A0049-----  10 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 238 (N,INELAS) 3,N ENED P(EI,EF,  )    A/W0049  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=  5   GCN= 3   PCN=  7
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     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-79/63,  1/64, K.PARKER

A0050-----  36 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 238 (N,INELAS) 4,N CRØS C(EI,  ,  )BN A/W0050  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=  5   GCN= 1   PCN=  8
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-79/63,  1/64, K.PARKER

A0051-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 238 (N,INELAS) 4,N ANGD P(CC,EI,  )   A/W0051  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=  5   GCN= 2   PCN=  8
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-79/63,  1/64, K.PARKER

A0052-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 238 (N,INELAS) 4,N ENED P(EI,EF,  )   A/W0052  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=  5   GCN= 3   PCN=  8
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-79/63,  1/64, K.PARKER

A0053-----  23 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 238 (N,INELAS) 5,N CRØS C(EI,  ,  )BN A/W0053  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=  5   GCN= 1   PCN=  9
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-79/63,  1/64, K.PARKER

A0054-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 238 (N,INELAS) 5,N ANGD P(CC,EI,  )   A/W0054  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=  5   GCN= 2   PCN=  9
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-79/63,  1/64, K.PARKER

A0055-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 238 (N,INELAS) 5,N ENED P(EI,EF,  )   A/W0055  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=  5   GCN= 3   PCN=  9
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-79/63,  1/64, K.PARKER

A0056-----  22 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 238 (N,INELAS) 6,N CRØS C(EI,  ,  )BN A/W0056  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=  5   GCN= 1   PCN= 10
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-79/63,  1/64, K.PARKER

A0057-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 238 (N,INELAS) 6,N ANGD P(CC,EI,  )   A/W0057  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=  5   GCN= 2   PCN= 10
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-79/63,  1/64, K.PARKER

A0058-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 238 (N,INELAS) 6,N ENED P(EI,EF,  )   A/W0058  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=  5   GCN= 3   PCN= 10
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-79/63,  1/64, K.PARKER

A0059-----  32 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 238 (N,INELAS)98,N CRØS C(EI,  ,  )BN A/W0059  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=  5   GCN= 1   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-79/63,  1/64, K.PARKER

A0060-----  26 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 238 (N,INELAS)98,N ANGD P(CL,EI,  )   A/W0060  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=  5   GCN= 2   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-79/63,  1/64, K.PARKER

A0061----- 134 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 238 (N,INELAS)98,N ENED P(EI,EF,  )   A/W0061  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=  5   GCN= 3   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-79/63,  1/64, K.PARKER
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A0062-----  18 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 238 (N,PAIR  ) 0,N CRØS C(EI,  ,  )BN A/W0062  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  5   GCN= 1   PCN= 16
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-79/63,  1/64, K.PARKER

A0063-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 238 (N,PAIR  ) 0,N ANGD P(CL,EI,  )   A/W0063  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  5   GCN= 2   PCN= 16
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-79/63,  1/64, K.PARKER

A0064----- 245 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 238 (N,PAIR  ) 0,N ENED P(EI,EF,  )   A/W0064  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  5   GCN= 3   PCN= 16
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-79/63,  1/64, K.PARKER

A0065-----  12 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 238 (N,TRIPLE) 0,N CRØS C(EI,  ,  )BN A/W0065  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  5   GCN= 1   PCN= 17
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-79/63,  1/64, K.PARKER

A0066-----  19 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 238 (N,TRIPLE) 0,N ANGD P(CL,EI,  )   A/W0066  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  5   GCN= 2   PCN= 17
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-79/63,  1/64, K.PARKER

A0067----- 100 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 238 (N,TRIPLE) 0,N ENED P(EI,EF,  )   A/W0067  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  5   GCN= 3   PCN= 17
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-79/63,  1/64, K.PARKER

A0068-----  52 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 238 (N,FISS  ) 0,N CRØS C(EI,  ,  )BN A/W0068  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  5   GCN= 1   PCN= 18
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-79/63,  1/64, K.PARKER

A0069-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 238 (N,FISS  ) 0,N ANGD P(CL,EI,  )   A/W0069  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  5   GCN= 2   PCN= 18
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-79/63,  1/64, K.PARKER

A0070-----  36 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 238 (N,FISS  ) 0,N ENED P(EI,EF,  )   A/W0070  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  5   GCN= 3   PCN= 18
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-79/63,  1/64, K.PARKER

A0071-----  14 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 238 (N,FISS  ) 0,N NU    (EI,  ,  )   A/W0071  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  5   GCN= 4   PCN= 18
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-79/63,  1/64, K.PARKER

A0072----- 651 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 238 (N,G     ) 0,  CRØS C(EI,  ,  )BN A/W0072  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  5   GCN= 1   PCN=102
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-79/63,  1/64, K.PARKER

A0073-----  23 CARDS, ADDED MAR 1, 1965 ----------------------------------
       200 (N,TØTAL ) 0,  CRØS C(EI,  ,  )BN A/W0073  0/63 0.100-2 0.000+2EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  7   GCN= 1   PCN=  1
     AEEW R351, 2/64, BARRINGTØN ETAL
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A0074-----  23 CARDS, ADDED MAR 1, 1965 ----------------------------------------
      200 (N,ELAST ) 0,N CRØS C(EI,  ,  )BN A/W0074  0/63 0.100-2 0.000+2EV
    ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  7   GCN= 1   PCN=  2
    AEEW R351, 2/64, BARRINGTØN ETAL

A0075-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------------
      200 (N,ELAST ) 0,N ANGD P(CC,EI,  )   A/W0075  0/63 0.100-2 0.000+2EV
    ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  7   GCN= 2   PCN=  2
    AEEW R351, 2/64, BARRINGTØN ETAL

A0076-----  23 CARDS, ADDED MAR 1, 1965 ----------------------------------------
      200 (N,NØNEL ) 0,  CRØS C(EI,  ,  )BN A/W0076  0/63 0.100-2 0.000+2EV
    ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  7   GCN= 1   PCN=  3
    AEEW R351, 2/64, BARRINGTØN ETAL

A0077-----  23 CARDS, ADDED MAR 1, 1965 ----------------------------------------
      200 (N,G     ) 0,  CRØS C(EI,  ,  )BN A/W0077  0/63 0.100-2 0.000+2EV
    ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  7   GCN= 1   PCN=102
    AEEW R351, 2/64, BARRINGTØN ETAL

A0078-----  48 CARDS, ADDED MAR 1, 1965 ----------------------------------------
    BE  9 (N,TØTAL ) 0,  CRØS C(EI,  ,  )BN A/W0078  0/63 0.100-2 1.500+7EV
    ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  8   GCN= 1   PCN=  1
    AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-27/60,  9/60, K.PARKER

A0079-----  48 CARDS, ADDED MAR 1, 1965 ----------------------------------------
    BE  9 (N,ELAST ) 0,N CRØS C(EI,  ,  )BN A/W0079  0/63 0.100-2 1.500+7EV
    ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  8   GCN= 1   PCN=  2
    AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-27/60,  9/60, K.PARKER

A0080----- 131 CARDS, ADDED MAR 1, 1965 ----------------------------------------
    BE  9 (N,ELAST ) 0,N ANGD P(CC,EI,  )   A/W0080  0/63 0.100-2 1.500+7EV
    ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  8   GCN= 2   PCN=  2
    AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-27/60,  9/60, K.PARKER

A0081-----  48 CARDS, ADDED MAR 1, 1965 ----------------------------------------
    BE  9 (N,NØNEL ) 0,  CRØS C(EI,  ,  )BN A/W0081  0/63 0.100-2 1.500+7EV
    ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  8   GCN= 1   PCN=  3
    AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-27/60,  9/60, K.PARKER

A0082-----  23 CARDS, ADDED MAR 1, 1965 ----------------------------------------
    BE  9 (N,2NA   ) 0,N CRØS C(EI,  ,  )BN A/W0082  0/63 0.100-2 1.500+7EV
    ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  8   GCN= 1   PCN= 24
    AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-27/60,  9/60, K.PARKER

A0083-----  35 CARDS, ADDED MAR 1, 1965 ----------------------------------------
    BE  9 (N,2NA   ) 0,N ANGD P(CL,EI,  )   A/W0083  0/63 0.100-2 1.500+7EV
    ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  8   GCN= 2   PCN= 24
    AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-27/60,  9/60, K.PARKER

A0084-----  51 CARDS, ADDED MAR 1, 1965 ----------------------------------------
    BE  9 (N,2NA   ) 0,N ENED P(EI,EF,  )   A/W0084  0/63 0.100-2 1.500+7EV
    ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  8   GCN= 3   PCN= 24
    AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-27/60,  9/60, K.PARKER

A0085-----  19 CARDS, ADDED MAR 1, 1965 ----------------------------------------
    BE  9 (N,G     ) 0,  CRØS C(EI,  ,  )BN A/W0085  0/63 0.100-2 1.500+7EV
    ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  8   GCN= 1   PCN=102
    AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-27/60,  9/60, K.PARKER

A0086-----  11 CARDS, ADDED MAR 1, 1965 ----------------------------------------
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     BE  9 (N,T     ) 0,  CRØS C(EI,  ,  )BN A/W0086  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  8   GCN= 1   PCN=105
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-27/60,  9/60, K.PARKER

A0087-----  26 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     BE  9 (N,A     ) 0,  CRØS C(EI,  ,  )BN A/W0087  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  8   GCN= 1   PCN=107
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-27/60,  9/60, K.PARKER

A0088-----  31 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     H   1 (N,TØTAL ) 0,  CRØS C(EI,  ,  )BN A/W0088  0/63 0.330-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 10   GCN= 1   PCN=  1
     AEEW R351, 2/64, BARRINGTØN ETAL

A0089-----  31 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     H   1 (N,ELAST ) 0,N CRØS C(EI,  ,  )BN A/W0089  0/63 0.330-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 10   GCN= 1   PCN=  2
     AEEW R351, 2/64, BARRINGTØN ETAL

A0090-----  12 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     H   1 (N,ELAST ) 0,N ANGD P(CC,EI,  )   A/W0090  0/63 0.330-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 10   GCN= 2   PCN=  2
     AEEW R351, 2/64, BARRINGTØN ETAL

A0091-----  22 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     H   1 (N,G     ) 0,  CRØS C(EI,  ,  )BN A/W0091  0/63 0.330-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 10   GCN= 1   PCN=102
     AEEW R351, 2/64, BARRINGTØN ETAL

A0092-----  23 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     H   2 (N,TØTAL ) 0,  CRØS C(EI,  ,  )BN A/W0092  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 11   GCN= 1   PCN=  1
     AEEW R351, 2/64, BARRINGTØN ETAL

A0093-----  23 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     H   2 (N,ELAST ) 0,N CRØS C(EI,  ,  )BN A/W0093  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 11   GCN= 1   PCN=  2
     AEEW R351, 2/64, BARRINGTØN ETAL

A0094-----  50 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     H   2 (N,ELAST ) 0,N ANGD P(CC,EI,  )   A/W0094  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 11   GCN= 2   PCN=  2
     AEEW R351, 2/64, BARRINGTØN ETAL

A0095-----  23 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     H   2 (N,NØNEL ) 0,  CRØS C(EI,  ,  )BN A/W0095  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 11   GCN= 1   PCN=  3
     AEEW R351, 2/64, BARRINGTØN ETAL

A0096-----  18 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     H   2 (N,PAIR  ) 0,N CRØS C(EI,  ,  )BN A/W0096  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 11   GCN= 1   PCN= 16
     AEEW R351, 2/64, BARRINGTØN ETAL

A0097-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     H   2 (N,PAIR  ) 0,N ANGD P(CL,EI,  )   A/W0097  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 11   GCN= 2   PCN= 16
     AEEW R351, 2/64, BARRINGTØN ETAL

A0098-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     H   2 (N,PAIR  ) 0,N ENED P(EI,EF,  )   A/W0098  0/63 0.100-2 1.500+7EV
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     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 11   GCN= 3   PCN= 16
     AEEW R351, 2/64, BARRINGTØN ETAL

A0099-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     H   2 (N,G     ) 0,  CRØS C(EI,  ,  )BN A/W0099  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 11   GCN= 1   PCN=102
     AEEW R351, 2/64, BARRINGTØN ETAL

A0100-----  86 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     TH232 (N,TØTAL ) 0,  CRØS C(EI,  ,  )BN A/W0100  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 22   GCN= 1   PCN=  1
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-27/60,  9/60, K.PARKER

A0101-----  86 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     TH232 (N,ELAST ) 0,N CRØS C(EI,  ,  )BN A/W0101  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 22   GCN= 1   PCN=  2
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-27/60,  9/60, K.PARKER

A0102----- 209 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     TH232 (N,ELAST ) 0,N ANGD P(CC,EI,  )   A/W0102  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 22   GCN= 2   PCN=  2
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-27/60,  9/60, K.PARKER

A0103-----  86 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     TH232 (N,NØNEL ) 0,  CRØS C(EI,  ,  )BN A/W0103  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 22   GCN= 1   PCN=  3
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-27/60,  9/60, K.PARKER

A0104-----  32 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     TH232 (N,INELAS)98,N CRØS C(EI,  ,  )BN A/W0104  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 22   GCN= 1   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-27/60,  9/60, K.PARKER

A0105-----  14 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     TH232 (N,INELAS)98,N ANGD P(CL,EI,  )   A/W0105  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 22   GCN= 2   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-27/60,  9/60, K.PARKER

A0106----- 128 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     TH232 (N,INELAS)98,N ENED P(EI,EF,  )   A/W0106  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 22   GCN= 3   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-27/60,  9/60, K.PARKER

A0107-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     TH232 (N,PAIR  ) 0,N CRØS C(EI,  ,  )BN A/W0107  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 22   GCN= 1   PCN= 16
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-27/60,  9/60, K.PARKER

A0108-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     TH232 (N,PAIR  ) 0,N ANGD P(CL,EI,  )   A/W0108  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 22   GCN= 2   PCN= 16
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-27/60,  9/60, K.PARKER

A0109-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     TH232 (N,PAIR  ) 0,N ENED P(EI,EF,  )   A/W0109  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 22   GCN= 3   PCN= 16
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-27/60,  9/60, K.PARKER

A0110-----  11 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     TH232 (N,TRIPLE) 0,N CRØS C(EI,  ,  )BN A/W0110  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 22   GCN= 1   PCN= 17
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     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-27/60,  9/60, K.PARKER

A0111-----  19 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     TH232 (N,TRIPLE) 0,N ANGD P(CL,EI,  )   A/W0111  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 22   GCN= 2   PCN= 17
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-27/60,  9/60, K.PARKER

A0112-----  19 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     TH232 (N,TRIPLE) 0,N ENED P(EI,EF,  )   A/W0112  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 22   GCN= 3   PCN= 17
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-27/60,  9/60, K.PARKER

A0113-----  26 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     TH232 (N,FISS  ) 0,N CRØS C(EI,  ,  )BN A/W0113  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 22   GCN= 1   PCN= 18
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-27/60,  9/60, K.PARKER

A0114-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     TH232 (N,FISS  ) 0,N ANGD P(CL,EI,  )   A/W0114  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 22   GCN= 2   PCN= 18
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-27/60,  9/60, K.PARKER

A0115-----  36 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     TH232 (N,FISS  ) 0,N ENED P(EI,EF,  )   A/W0115  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 22   GCN= 3   PCN= 18
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-27/60,  9/60, K.PARKER

A0116-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     TH232 (N,FISS  ) 0,N NU    (EI,  ,  )   A/W0116  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 22   GCN= 4   PCN= 18
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-27/60,  9/60, K.PARKER

A0117-----  86 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     TH232 (N,G     ) 0,  CRØS C(EI,  ,  )BN A/W0117  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 22   GCN= 1   PCN=102
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-27/60,  9/60, K.PARKER

A0118-----  14 CARDS, ADDED MAR 1, 1965 ----------------------------------------
       100 (N,TØTAL ) 0,  CRØS C(EI,  ,  )BN A/W0118  0/63 0.600-3 0.500+0EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 27   GCN= 1   PCN=  1
     AEEW R351, 2/64, BARRINGTØN ETAL

A0119-----  14 CARDS, ADDED MAR 1, 1965 ----------------------------------------
       100 (N,ELAST ) 0,N CRØS C(EI,  ,  )BN A/W0119  0/63 0.600-3 0.500+0EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 27   GCN= 1   PCN=  2
     AEEW R351, 2/64, BARRINGTØN ETAL

A0120-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------------
       100 (N,ELAST ) 0,N ANGD P(CC,EI,  )   A/W0120  0/63 0.600-3 0.500+0EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 27   GCN= 2   PCN=  2
     AEEW R351, 2/64, BARRINGTØN ETAL

A0121-----  14 CARDS, ADDED MAR 1, 1965 ----------------------------------------
       100 (N,NØNEL ) 0,  CRØS C(EI,  ,  )BN A/W0121  0/63 0.600-3 0.500+0EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 27   GCN= 1   PCN=  3
     AEEW R351, 2/64, BARRINGTØN ETAL

A0122-----  14 CARDS, ADDED MAR 1, 1965 ----------------------------------------
       100 (N,G     ) 0,  CRØS C(EI,  ,  )BN A/W0122  0/63 0.600-3 0.500+0EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 27   GCN= 1   PCN=102
     AEEW R351, 2/64, BARRINGTØN ETAL
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A0123-----  30 CARDS, ADDED MAR 1, 1965 ----------------------------------------
      101 (N,TØTAL ) 0,  CRØS C(EI,  ,  )BN A/W0123  0/63 0.500-3 9.000+0EV
    ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 28   GCN= 1   PCN=  1
    AEEW R351, 2/64, BARRINGTØN ETAL

AC124-----  30 CARDS, ADDED MAR 1, 1965 ----------------------------------------
      101 (N,ELAST ) 0,N CRØS C(EI,  ,  )BN A/W0124  0/63 0.500-3 9.000+0EV
    ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 28   GCN= 1   PCN=  2
    AEEW R351, 2/64, BARRINGTØN ETAL

A0125-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------------
      101 (N,ELAST ) 0,N ANGD P(CC,EI,  )   A/W0125  0/63 0.500-3 9.000+0EV
    ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 28   GCN= 2   PCN=  2
    AEEW R351, 2/64, BARRINGTØN ETAL

A0126-----  30 CARDS, ADDED MAR 1, 1965 ----------------------------------------
      101 (N,NØNEL ) 0,  CRØS C(EI,  ,  )BN A/W0126  0/63 0.500-3 9.000+0EV
    ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 28   GCN= 1   PCN=  3
    AEEW R351, 2/64, BARRINGTØN ETAL

A0127-----  30 CARDS, ADDED MAR 1, 1965 ----------------------------------------
      101 (N,G     ) 0,  CRØS C(EI,  ,  )BN A/W0127  0/63 0.500-3 9.000+0EV
    ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 28   GCN= 1   PCN=102
    AEEW R351, 2/64, BARRINGTØN ETAL

A0128-----  63 CARDS, ADDED MAR 1, 1965 ----------------------------------------
    PU240 (N,TØTAL ) 0,  CRØS C(EI,  ,  )BN A/W0128  0/63 0.100-2 1.500+7EV
    ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 29   GCN= 1   PCN=  1
    AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0129-----  63 CARDS, ADDED MAR 1, 1965 ----------------------------------------
    PU240 (N,ELAST ) 0,N CRØS C(EI,  ,  )BN A/W0129  0/63 0.100-2 1.500+7EV
    ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 29   GCN= 1   PCN=  2
    AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0130----- 209 CARDS, ADDED MAR 1, 1965 ----------------------------------------
    PU240 (N,ELAST ) 0,N ANGD P(CC,EI,  )   A/W0130  0/63 0.100-2 1.500+7EV
    ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 29   GCN= 2   PCN=  2
    AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0131-----  63 CARDS, ADDED MAR 1, 1965 ----------------------------------------
    PU240 (N,NØNEL ) 0,  CRØS C(EI,  ,  )BN A/W0131  0/63 0.100-2 1.500+7EV
    ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 29   GCN= 1   PCN=  3
    AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0132-----  29 CARDS, ADDED MAR 1, 1965 ----------------------------------------
    PU240 (N,INELAS)98,N CRØS C(EI,  ,  )BN A/W0132  0/63 0.100-2 1.500+7EV
    ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 29   GCN= 1   PCN= 15
    AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0133-----  14 CARDS, ADDED MAR 1, 1965 ----------------------------------------
    PU240 (N,INELAS)98,N ANGD P(CL,EI,  )   A/W0133  0/63 0.100-2 1.500+7EV
    ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 29   GCN= 2   PCN= 15
    AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0134----- 128 CARDS, ADDED MAR 1, 1965 ----------------------------------------
    PU240 (N,INELAS)98,N ENED P(EI,EF,  )   A/W0134  0/63 0.100-2 1.500+7EV
    ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 29   GCN= 3   PCN= 15
    AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL
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A0135-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU240 (N,PAIR  ) O,N CRØS C(EI,  ,  )BN A/W0135  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 29   GCN= 1   PCN= 16
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0136-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU240 (N,PAIR  ) O,N ANGD P(CL,EI,  )   A/W0136  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 29   GCN= 2   PCN= 16
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0137-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU240 (N,PAIR  ) O,N ENED P(EI,EF,  )   A/W0137  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 29   GCN= 3   PCN= 16
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0138-----  11 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU240 (N,TRIPLE) O,N CRØS C(EI,  ,  )BN A/W0138  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 29   GCN= 1   PCN= 17
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0139-----  19 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU240 (N,TRIPLE) O,N ANGD P(CL,EI,  )   A/W0139  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 29   GCN= 2   PCN= 17
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0140-----  19 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU240 (N,TRIPLE) O,N ENED P(EI,EF,  )   A/W0140  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 29   GCN= 3   PCN= 17
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0141-----  63 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU240 (N,FISS  ) O,N CRØS C(EI,  ,  )BN A/W0141  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 29   GCN= 1   PCN= 18
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0142-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU240 (N,FISS  ) O,N ANGD P(CL,EI,  )   A/W0142  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 29   GCN= 2   PCN= 18
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0143-----  36 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU240 (N,FISS  ) O,N ENED P(EI,EF,  )   A/W0143  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 29   GCN= 3   PCN= 18
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0144-----  12 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU240 (N,FISS  ) O,N NU    (EI,  ,  )   A/W0144  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 29   GCN= 4   PCN= 18
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0145-----  59 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU240 (N,G     ) O,  CRØS C(EI,  ,  )BN A/W0145  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 29   GCN= 1   PCN=102
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0146-----  21 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     HE  4 (N,TØTAL ) O,  CRØS C(EI,  ,  )BN A/W0146  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 31   GCN= 1   PCN=  1
     AEEW R351, 2/64, BARRINGTØN ETAL

A0147-----  21 CARDS, ADDED MAR 1, 1965 ----------------------------------------
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     HE  4 (N,ELAST ) 0,N CRØS C(EI,  ,  )BN A/W0147  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 31   GCN= 1   PCN=  2
     AEEW R351, 2/64, BARRINGTØN ETAL

A0148-----  50 CARDS, ADDED MAR 1, 1965 ----------------------------------
     HE  4 (N,ELAST ) 0,N ANGD P(CC,EI,  )   A/W0148  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 31   GCN= 2   PCN=  2
     AEEW R351, 2/64, BARRINGTØN ETAL

A0149-----  20 CARDS, ADDED MAR 1, 1965 ----------------------------------
     H   3 (N,TØTAL ) 0,  CRØS C(EI,  ,  )BN A/W0149 11/57 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=109   GCN= 1   PCN=  1
     AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0150-----  20 CARDS, ADDED MAR 1, 1965 ----------------------------------
     H   3 (N,ELAST ) 0,N CRØS C(EI,  ,  )BN A/W0150 11/57 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=109   GCN= 1   PCN=  2
     AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0151-----  50 CARDS, ADDED MAR 1, 1965 ----------------------------------
     H   3 (N,ELAST ) 0,N ANGD P(CC,EI,  )   A/W0151 11/57 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=109   GCN= 2   PCN=  2
     AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0152-----  13 CARDS, ADDED MAR 1, 1965 ----------------------------------
     H   3 (N,NØNEL ) 0,  CRØS C(EI,  ,  )BN A/W0152 11/57 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=109   GCN= 1   PCN=  3
     AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0153-----  13 CARDS, ADDED MAR 1, 1965 ----------------------------------
     H   3 (N,PAIR  ) 0,N CRØS C(EI,  ,  )BN A/W0153 11/57 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=109   GCN= 1   PCN= 16
     AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0154-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------
     H   3 (N,PAIR  ) 0,N ANGD P(CL,EI,  )   A/W0154 11/57 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=109   GCN= 2   PCN= 16
     AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0155-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------
     H   3 (N,PAIR  ) 0,N ENED P(EI,EF,  )   A/W0155 11/57 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=109   GCN= 3   PCN= 16
     AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0156-----  11 CARDS, ADDED MAR 1, 1965 ----------------------------------
     H   3 (N,TRIPLE) 0,N CRØS C(EI,  ,  )BN A/W0156 11/57 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=109   GCN= 1   PCN= 17
     AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0157-----  19 CARDS, ADDED MAR 1, 1965 ----------------------------------
     H   3 (N,TRIPLE) 0,N ANGD P(CL,EI,  )   A/W0157 11/57 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=109   GCN= 2   PCN= 17
     AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0158-----  19 CARDS, ADDED MAR 1, 1965 ----------------------------------
     H   3 (N,TRIPLE) 0,N ENED P(EI,EF,  )   A/W0158 11/57 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=109   GCN= 3   PCN= 17
     AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0159-----  95 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 233 (N,TØTAL ) 0,  CRØS C(EI,  ,  )BN A/W0159  0/63 0.250-1 1.500+7EV
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     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=122   GCN= 1   PCN=  1
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0160-----  95 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     U 233 (N,ELAST ) 0,N CRØS C(EI,  ,  )BN A/W0160  0/63 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=122   GCN= 1   PCN=  2
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0161----- 207 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     U 233 (N,ELAST ) 0,N ANGD P(CC,EI,  )   A/W0161  0/63 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=122   GCN= 2   PCN=  2
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0162-----  95 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     U 233 (N,NØNEL ) 0,  CRØS C(EI,  ,  )BN A/W0162  0/63 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=122   GCN= 1   PCN=  3
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0163-----  28 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     U 233 (N,INELAS)98,N CRØS C(EI,  ,  )BN A/W0163  0/63 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=122   GCN= 1   PCN= 15
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0164-----  14 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     U 233 (N,INELAS)98,N ANGD P(CL,EI,  )   A/W0164  0/63 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=122   GCN= 2   PCN= 15
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0165----- 116 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     U 233 (N,INELAS)98,N ENED P(EI,EF,  )   A/W0165  0/63 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=122   GCN= 3   PCN= 15
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0166-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     U 233 (N,PAIR  ) 0,N CRØS C(EI,  ,  )BN A/W0166  0/63 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=122   GCN= 1   PCN= 16
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0167-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     U 233 (N,PAIR  ) 0,N ANGD P(CL,EI,  )   A/W0167  0/63 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=122   GCN= 2   PCN= 16
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0168-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     U 233 (N,PAIR  ) 0,N ENED P(EI,EF,  )   A/W0168  0/63 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=122   GCN= 3   PCN= 16
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0169-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     U 233 (N,TRIPLE) 0,N CRØS C(EI,  ,  )BN A/W0169  0/63 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=122   GCN= 1   PCN= 17
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0170-----  19 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     U 233 (N,TRIPLE) 0,N ANGD P(CL,EI,  )   A/W0170  0/63 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=122   GCN= 2   PCN= 17
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0171-----  19 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     U 233 (N,TRIPLE) 0,N ENED P(EI,EF,  )   A/W0171  0/63 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=122   GCN= 3   PCN= 17
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      AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0172-----  95 CARDS, ADDED MAR 1, 1965 ----------------------------------
      U 233 (N,FISS  ) 0,N CRØS C(EI,  ,  )BN A/W0172  0/63 0.250-1 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=122   GCN= 1   PCN= 18
      AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0173-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
      U 233 (N,FISS  ) 0,N ANGD P(CL,EI,  )   A/W0173  0/63 0.250-1 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=122   GCN= 2   PCN= 18
      AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0174-----  36 CARDS, ADDED MAR 1, 1965 ----------------------------------
      U 233 (N,FISS  ) 0,N ENED P(EI,EF,  )   A/W0174  0/63 0.250-1 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=122   GCN= 3   PCN= 18
      AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0175-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------
      U 233 (N,FISS  ) 0,N NU    (EI,  ,  )   A/W0175  0/63 0.250-1 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=122   GCN= 4   PCN= 18
      AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0176-----  95 CARDS, ADDED MAR 1, 1965 ----------------------------------
      U 233 (N,G     ) 0,  CRØS C(EI,  ,  )BN A/W0176  0/63 0.250-1 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=122   GCN= 1   PCN=102
      AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0177-----  52 CARDS, ADDED MAR 1, 1965 ----------------------------------
      U 236 (N,TØTAL ) 0,  CRØS C(EI,  ,  )BN A/W0177  8/62 0.000+2 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=173   GCN= 1   PCN=  1
      AWRE 0-30/64, 7/64, K.PARKER

A0178-----  52 CARDS, ADDED MAR 1, 1965 ----------------------------------
      U 236 (N,ELAST ) 0,N CRØS C(EI,  ,  )BN A/W0178  8/62 0.000+2 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=173   GCN= 1   PCN=  2
      AWRE 0-30/64, 7/64, K.PARKER

A0179----- 189 CARDS, ADDED MAR 1, 1965 ----------------------------------
      U 236 (N,ELAST ) 0,N ANGD P(CC,EI,  )   A/W0179  8/62 0.000+2 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=173   GCN= 2   PCN=  2
      AWRE 0-30/64, 7/64, K.PARKER

A0180-----  52 CARDS, ADDED MAR 1, 1965 ----------------------------------
      U 236 (N,NØNEL ) 0,  CRØS C(EI,  ,  )BN A/W0180  8/62 0.000+2 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=173   GCN= 1   PCN=  3
      AWRE 0-30/64, 7/64, K.PARKER

A0181-----  30 CARDS, ADDED MAR 1, 1965 ----------------------------------
      U 236 (N,INELAS) 1,N CRØS C(EI,  ,  )BN A/W0181  8/62 0.000+2 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=173   GCN= 1   PCN=  5
      AWRE 0-30/64, 7/64, K.PARKER

A0182-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
      U 236 (N,INELAS) 1,N ANGD P(CC,EI,  )   A/W0182  8/62 0.000+2 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=173   GCN= 2   PCN=  5
      AWRE 0-30/64, 7/64, K.PARKER

A0183-----  24 CARDS, ADDED MAR 1, 1965 ----------------------------------
      U 236 (N,INELAS) 2,N CRØS C(EI,  ,  )BN A/W0183  8/62 0.000+2 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=173   GCN= 1   PCN=  6
      AWRE 0-30/64, 7/64, K.PARKER
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A0184-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 236 (N,INELAS) 2,N ANGD P(CC,EI,  )   A/W0184  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=173   GCN= 2   PCN=  6
     AWRE 0-30/64, 7/64, K.PARKER

A0185-----  22 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 236 (N,INELAS) 3,N CRØS C(EI,  ,  )BN A/W0185  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=173   GCN= 1   PCN=  7
     AWRE 0-30/64, 7/64, K.PARKER

A0186-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 236 (N,INELAS) 3,N ANGD P(CC,EI,  )   A/W0186  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=173   GCN= 2   PCN=  7
     AWRE 0-30/64, 7/64, K.PARKER

A0187-----  19 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 236 (N,INELAS) 4,N CRØS C(EI,  ,  )BN A/W0187  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=173   GCN= 1   PCN=  8
     AWRE 0-30/64, 7/64, K.PARKER

A0188-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 236 (N,INELAS) 4,N ANGD P(CC,EI,  )   A/W0188  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=173   GCN= 2   PCN=  8
     AWRE 0-30/64, 7/64, K.PARKER

A0189-----  16 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 236 (N,INELAS) 5,N CRØS C(EI,  ,  )BN A/W0189  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=173   GCN= 1   PCN=  9
     AWRE 0-30/64, 7/64, K.PARKER

A0190-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 236 (N,INELAS) 5,N ANGD P(CC,EI,  )   A/W0190  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=173   GCN= 2   PCN=  9
     AWRE 0-30/64, 7/64, K.PARKER

A0191-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 236 (N,INELAS) 6,N CRØS C(EI,  ,  )BN A/W0191  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=173   GCN= 1   PCN= 10
     AWRE 0-30/64, 7/64, K.PARKER

A0192-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 236 (N,INELAS) 6,N ANGD P(CC,EI,  )   A/W0192  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=173   GCN= 2   PCN= 10
     AWRE 0-30/64, 7/64, K.PARKER

A0193-----  27 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 236 (N,INELAS)98,N CRØS C(EI,  ,  )BN A/W0193  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=173   GCN= 1   PCN= 15
     AWRE 0-30/64, 7/64, K.PARKER

A0194-----  28 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 236 (N,INELAS)98,N ANGD P(CL,EI,  )   A/W0194  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=173   GCN= 2   PCN= 15
     AWRE 0-30/64, 7/64, K.PARKER

A0195----- 134 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 236 (N,INELAS)98,N ENED P(EI,EF,  )   A/W0195  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=173   GCN= 3   PCN= 15
     AWRE 0-30/64, 7/64, K.PARKER
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A0196-----  16 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 236 (N,PAIR  ) 0,N CRØS C(EI,  ,  )BN A/W0196  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=173   GCN= 1   PCN= 16
     AWRE 0-30/64, 7/64, K.PARKER

A0197-----  15 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 236 (N,PAIR  ) 0,N ANGD P(CL,EI,  )   A/W0197  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=173   GCN= 2   PCN= 16
     AWRE 0-30/64, 7/64, K.PARKER

A0198----- 245 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 236 (N,PAIR  ) 0,N ENED P(EI,EF,  )   A/W0198  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=173   GCN= 3   PCN= 16
     AWRE 0-30/64, 7/64, K.PARKER

A0199-----  11 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 236 (N,TRIPLE) 0,N CRØS C(EI,  ,  )BN A/W0199  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=173   GCN= 1   PCN= 17
     AWRE 0-30/64, 7/64, K.PARKER

A0200-----  19 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 236 (N,TRIPLE) 0,N ANGD P(CL,EI,  )   A/W0200  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=173   GCN= 2   PCN= 17
     AWRE 0-30/64, 7/64, K.PARKER

A0201----- 100 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 236 (N,TRIPLE) 0,N ENED P(EI,EF,  )   A/W0201  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=173   GCN= 3   PCN= 17
     AWRE 0-30/64, 7/64, K.PARKER

A0202-----  34 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 236 (N,FISS  ) 0,N CRØS C(EI,  ,  )BN A/W0202  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=173   GCN= 1   PCN= 18
     AWRE 0-30/64, 7/64, K.PARKER

A0203-----  10 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 236 (N,FISS  ) 0,N ANGD P(CL,EI,  )   A/W0203  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=173   GCN= 2   PCN= 18
     AWRE 0-30/64, 7/64, K.PARKER

A0204-----  36 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 236 (N,FISS  ) 0,N ENED P(EI,EF,  )   A/W0204  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=173   GCN= 3   PCN= 18
     AWRE 0-30/64, 7/64, K.PARKER

A0205-----  11 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 236 (N,FISS  ) 0,N NU    (EI,  ,  )   A/W0205  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=173   GCN= 4   PCN= 18
     AWRE 0-30/64, 7/64, K.PARKER

A0206-----  52 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 236 (N,G     ) 0,  CRØS C(EI,  ,  )BN A/W0206  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=173   GCN= 1   PCN=102
     AWRE 0-30/64, 7/64, K.PARKER

A0207-----  59 CARDS, ADDED MAR 1, 1965 ------------------------------------
     U 234 (N,TØTAL ) 0,  CRØS C(EI,  ,  )BN A/W0207  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=174   GCN= 1   PCN=  1
     AWRE 0-37/64, 7/64, K.PARKER

A0208-----  59 CARDS, ADDED MAR 1, 1965 ------------------------------------
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     U 234 (N,ELAST ) 0,N CRØS C(EI,  ,  )BN A/W0208  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=174   GCN= 1   PCN=  2
     AWRE 0-37/64, 7/64, K.PARKER

A0209----- 189 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 234 (N,ELAST ) 0,N ANGD P(CC,EI,  )   A/W0209  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=174   GCN= 2   PCN=  2
     AWRE 0-37/64, 7/64, K.PARKER

A0210-----  59 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 234 (N,NØNEL ) 0,  CRØS C(EI,  ,  )BN A/W0210  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=174   GCN= 1   PCN=  3
     AWRE 0-37/64, 7/64, K.PARKER

A0211-----  36 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 234 (N,INELAS) 1,N CRØS C(EI,  ,  )BN A/W0211  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=174   GCN= 1   PCN=  5
     AWRE 0-37/64, 7/64, K.PARKER

A0212-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 234 (N,INELAS) 1,N ANGD P(CC,EI,  )   A/W0212  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=174   GCN= 2   PCN=  5
     AWRE 0-37/64, 7/64, K.PARKER

A0213-----  30 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 234 (N,INELAS) 2,N CRØS C(EI,  ,  )BN A/W0213  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=174   GCN= 1   PCN=  6
     AWRE 0-37/64, 7/64, K.PARKER

A0214-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 234 (N,INELAS) 2,N ANGD P(CC,EI,  )   A/W0214  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=174   GCN= 2   PCN=  6
     AWRE 0-37/64, 7/64, K.PARKER

A0215-----  27 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 234 (N,INELAS) 3,N CRØS C(EI,  ,  )BN A/W0215  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=174   GCN= 1   PCN=  7
     AWRE 0-37/64, 7/64, K.PARKER

A0216-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 234 (N,INELAS) 3,N ANGD P(CC,EI,  )   A/W0216  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=174   GCN= 2   PCN=  7
     AWRE 0-37/64, 7/64, K.PARKER

A0217-----  20 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 234 (N,INELAS) 4,N CRØS C(EI,  ,  )BN A/W0217  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=174   GCN= 1   PCN=  8
     AWRE 0-37/64, 7/64, K.PARKER

A0218-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 234 (N,INELAS) 4,N ANGD P(CC,EI,  )   A/W0218  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=174   GCN= 2   PCN=  8
     AWRE 0-37/64, 7/64, K.PARKER

A0219-----  18 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 234 (N,INELAS) 5,N CRØS C(EI,  ,  )BN A/W0219  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=174   GCN= 1   PCN=  9
     AWRE 0-37/64, 7/64, K.PARKER

A0220-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 234 (N,INELAS) 5,N ANGD P(CC,EI,  )   A/W0220  8/62 0.000+2 1.500+7EV
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     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=174   GCN= 2   PCN=  9
     AWRE 0-37/64, 7/64, K.PARKER

A0221-----  17 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 234 (N,INELAS) 6,N CRØS C(EI,   ,  )BN A/W0221  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=174   GCN= 1   PCN= 10
     AWRE 0-37/64, 7/64, K.PARKER

A0222-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 234 (N,INELAS) 6,N ANGD P(CC,EI,  )   A/W0222  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=174   GCN= 2   PCN= 10
     AWRE 0-37/64, 7/64, K.PARKER

A0223-----  30 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 234 (N,INELAS)98,N CRØS C(EI,   ,  )BN A/W0223  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=174   GCN= 1   PCN= 15
     AWRE 0-37/64, 7/64, K.PARKER

A0224-----  28 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 234 (N,INELAS)98,N ANGD P(CL,EI,  )   A/W0224  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=174   GCN= 2   PCN= 15
     AWRE 0-37/64, 7/64, K.PARKER

A0225----- 134 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 234 (N,INELAS)98,N ENED P(EI,EF,  )   A/W0225  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=174   GCN= 3   PCN= 15
     AWRE 0-37/64, 7/64, K.PARKER

A0226-----  17 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 234 (N,PAIR  ) 0,N CRØS C(EI,   ,  )BN A/W0226  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=174   GCN= 1   PCN= 16
     AWRE 0-37/64, 7/64, K.PARKER

A0227-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 234 (N,PAIR  ) 0,N ANGD P(CL,EI,  )   A/W0227  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=174   GCN= 2   PCN= 16
     AWRE 0-37/64, 7/64, K.PARKER

A0228----- 245 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 234 (N,PAIR  ) 0,N ENED P(EI,EF,  )   A/W0228  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=174   GCN= 3   PCN= 16
     AWRE 0-37/64, 7/64, K.PARKER

A0229-----  12 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 234 (N,TRIPLE) 0,N CRØS C(EI,   ,  )BN A/W0229  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=174   GCN= 1   PCN= 17
     AWRE 0-37/64, 7/64, K.PARKER

A0230-----  19 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 234 (N,TRIPLE) 0,N ANGD P(CL,EI,  )   A/W0230  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=174   GCN= 2   PCN= 17
     AWRE 0-37/64, 7/64, K.PARKER

A0231----- 100 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 234 (N,TRIPLE) 0,N ENED P(EI,EF,  )   A/W0231  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=174   GCN= 3   PCN= 17
     AWRE 0-37/64, 7/64, K.PARKER

A0232-----  52 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 234 (N,FISS  ) 0,N CRØS C(EI,   ,  )BN A/W0232  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=174   GCN= 1   PCN= 18
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     AWRE 0-37/64, 7/64, K.PARKER

A0233-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 234 (N,FISS  ) 0,N ANGD P(CL,EI,  )   A/W0233  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=174   GCN= 2   PCN= 18
     AWRE 0-37/64, 7/64, K.PARKER

A0234-----  36 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 234 (N,FISS  ) 0,N ENED P(EI,EF,  )   A/W0234  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=174   GCN= 3   PCN= 18
     AWRE 0-37/64, 7/64, K.PARKER

A0235-----  13 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 234 (N,FISS  ) 0,N NU    (EI,  ,  )   A/W0235  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=174   GCN= 4   PCN= 18
     AWRE 0-37/64, 7/64, K.PARKER

A0236-----  59 CARDS, ADDED MAR 1, 1965 ----------------------------------
     U 234 (N,G     ) 0,  CRØS C(EI,  ,  )BN A/W0236  8/62 0.000+2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=174   GCN= 1   PCN=102
     AWRE 0-37/64, 7/64, K.PARKER

A0237----- 292 CARDS, ADDED MAR 1, 1965 ----------------------------------
     PU239 (N,TØTAL ) 0,  CRØS C(EI,  ,  )BN A/W0237  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=184   GCN= 1   PCN=  1
     AWRE 0-79/64, T/ BE PUBLISHED, A.C.DØUGLAS

A0238----- 292 CARDS, ADDED MAR 1, 1965 ----------------------------------
     PU239 (N,ELAST ) 0,N CRØS C(EI,  ,  )BN A/W0238  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=184   GCN= 1   PCN=  2
     AWRE 0-79/64, T/ BE PUBLISHED, A.C.DØUGLAS

A0239----- 191 CARDS, ADDED MAR 1, 1965 ----------------------------------
     PU239 (N,ELAST ) 0,N ANGD P(CC,EI,  )   A/W0239  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=184   GCN= 2   PCN=  2
     AWRE 0-79/64, T/ BE PUBLISHED, A.C.DØUGLAS

A0240----- 292 CARDS, ADDED MAR 1, 1965 ----------------------------------
     PU239 (N,NØNEL ) 0,  CRØS C(EI,  ,  )BN A/W0240  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=184   GCN= 1   PCN=  3
     AWRE 0-79/64, T/ BE PUBLISHED, A.C.DØUGLAS

A0241-----  32 CARDS, ADDED MAR 1, 1965 ----------------------------------
     PU239 (N,INELAS) 1,N CRØS C(EI,  ,  )BN A/W0241  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=184   GCN= 1   PCN=  5
     AWRE 0-79/64, T/ BE PUBLISHED, A.C.DØUGLAS

A0242-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     PU239 (N,INELAS) 1,N ANGD P(CC,EI,  )   A/W0242  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=184   GCN= 2   PCN=  5
     AWRE 0-79/64, T/ BE PUBLISHED, A.C.DØUGLAS

A0243-----  22 CARDS, ADDED MAR 1, 1965 ----------------------------------
     PU239 (N,INELAS) 2,N CRØS C(EI,  ,  )BN A/W0243  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=184   GCN= 1   PCN=  6
     AWRE 0-79/64, T/ BE PUBLISHED, A.C.DØUGLAS

A0244-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     PU239 (N,INELAS) 2,N ANGD P(CC,EI,  )   A/W0244  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=184   GCN= 2   PCN=  6
     AWRE 0-79/64, T/ BE PUBLISHED, A.C.DØUGLAS
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A0245-----  21 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU239 (N,INELAS) 3,N CRØS C(EI,  ,  )BN A/W0245  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=184   GCN= 1   PCN=  7
     AWRE O-79/64, T/ BE PUBLISHED, A.C.DØUGLAS

A0246-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU239 (N,INELAS) 3,N ANGD P(CC,EI,  )   A/W0246  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=184   GCN= 2   PCN=  7
     AWRE O-79/64, T/ BE PUBLISHED, A.C.DØUGLAS

A0247-----  20 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU239 (N,INELAS) 4,N CRØS C(EI,  ,  )BN A/W0247  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=184   GCN= 1   PCN=  8
     AWRE O-79/64, T/ BE PUBLISHED, A.C.DØUGLAS

A0248-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU239 (N,INELAS) 4,N ANGD P(CC,EI,  )   A/W0248  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=184   GCN= 2   PCN=  8
     AWRE O-79/64, T/ BE PUBLISHED, A.C.DØUGLAS

A0249-----  19 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU239 (N,INELAS) 5,N CRØS C(EI,  ,  )BN A/W0249  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=184   GCN= 1   PCN=  9
     AWRE O-79/64, T/ BE PUBLISHED, A.C.DØUGLAS

A0250-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU239 (N,INELAS) 5,N ANGD P(CC,EI,  )   A/W0250  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=184   GCN= 2   PCN=  9
     AWRE O-79/64, T/ BE PUBLISHED, A.C.DØUGLAS

A0251-----  17 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU239 (N,INELAS) 6,N CRØS C(EI,  ,  )BN A/W0251  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=184   GCN= 1   PCN= 10
     AWRE O-79/64, T/ BE PUBLISHED, A.C.DØUGLAS

A0252-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU239 (N,INELAS) 6,N ANGD P(CC,EI,  )   A/W0252  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=184   GCN= 2   PCN= 10
     AWRE O-79/64, T/ BE PUBLISHED, A.C.DØUGLAS

A0253-----  16 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU239 (N,INELAS) 7,N CRØS C(EI,  ,  )BN A/W0253  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=184   GCN= 1   PCN= 11
     AWRE O-79/64, T/ BE PUBLISHED, A.C.DØUGLAS

A0254-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU239 (N,INELAS) 7,N ANGD P(CC,EI,  )   A/W0254  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=184   GCN= 2   PCN= 11
     AWRE O-79/64, T/ BE PUBLISHED, A.C.DØUGLAS

A0255-----  28 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU239 (N,INELAS)98,N CRØS C(EI,  ,  )BN A/W0255  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=184   GCN= 1   PCN= 15
     AWRE O-79/64, T/ BE PUBLISHED, A.C.DØUGLAS

A0256-----  26 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU239 (N,INELAS)98,N ANGD P(CL,EI,  )   A/W0256  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=184   GCN= 2   PCN= 15
     AWRE O-79/64, T/ BE PUBLISHED, A.C.DØUGLAS
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A0257-----  51 CARDS, ADDED MAR 1, 1965 ------------------------------------
     PU239 (N,INELAS)98,N ENED P(EI,EF,  )   A/W0257  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=184   GCN= 3   PCN= 15
     AWRE 0-79/64, T/ BE PUBLISHED, A.C.DØUGLAS

A0258-----  17 CARDS, ADDED MAR 1, 1965 ------------------------------------
     PU239 (N,PAIR  ) 0,N CRØS C(EI,  ,  )BN A/W0258  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=184   GCN= 1   PCN= 16
     AWRE 0-79/64, T/ BE PUBLISHED, A.C.DØUGLAS

A0259-----  15 CARDS, ADDED MAR 1, 1965 ------------------------------------
     PU239 (N,PAIR  ) 0,N ANGD P(CL,EI,  )   A/W0259  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=184   GCN= 2   PCN= 16
     AWRE 0-79/64, T/ BE PUBLISHED, A.C.DØUGLAS

A0260-----  90 CARDS, ADDED MAR 1, 1965 ------------------------------------
     PU239 (N,PAIR  ) 0,N ENED P(EI,EF,  )   A/W0260  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=184   GCN= 3   PCN= 16
     AWRE 0-79/64, T/ BE PUBLISHED, A.C.DØUGLAS

A0261-----  11 CARDS, ADDED MAR 1, 1965 ------------------------------------
     PU239 (N,TRIPLE) 0,N CRØS C(EI,  ,  )BN A/W0261  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=184   GCN= 1   PCN= 17
     AWRE 0-79/64, T/ BE PUBLISHED, A.C.DØUGLAS

A0262-----  19 CARDS, ADDED MAR 1, 1965 ------------------------------------
     PU239 (N,TRIPLE) 0,N ANGD P(CL,EI,  )   A/W0262  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=184   GCN= 2   PCN= 17
     AWRE 0-79/64, T/ BE PUBLISHED, A.C.DØUGLAS

A0263-----  19 CARDS, ADDED MAR 1, 1965 ------------------------------------
     PU239 (N,TRIPLE) 0,N ENED P(EI,EF,  )   A/W0263  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=184   GCN= 3   PCN= 17
     AWRE 0-79/64, T/ BE PUBLISHED, A.C.DØUGLAS

A0264----- 292 CARDS, ADDED MAR 1, 1965 ------------------------------------
     PU239 (N,FISS  ) 0,N CRØS C(EI,  ,  )BN A/W0264  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=184   GCN= 1   PCN= 18
     AWRE 0-79/64, T/ BE PUBLISHED, A.C.DØUGLAS

A0265-----  10 CARDS, ADDED MAR 1, 1965 ------------------------------------
     PU239 (N,FISS  ) 0,N ANGD P(CL,EI,  )   A/W0265  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=184   GCN= 2   PCN= 18
     AWRE 0-79/64, T/ BE PUBLISHED, A.C.DØUGLAS

A0266-----  94 CARDS, ADDED MAR 1, 1965 ------------------------------------
     PU239 (N,FISS  ) 0,N ENED P(EI,EF,  )   A/W0266  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=184   GCN= 3   PCN= 18
     AWRE 0-79/64, T/ BE PUBLISHED, A.C.DØUGLAS

A0267-----  15 CARDS, ADDED MAR 1, 1965 ------------------------------------
     PU239 (N,FISS  ) 0,N NU    (EI,  ,  )   A/W0267  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=184   GCN= 4   PCN= 18
     AWRE 0-79/64, T/ BE PUBLISHED, A.C.DØUGLAS

A0268----- 292 CARDS, ADDED MAR 1, 1965 ------------------------------------
     PU239 (N,G     ) 0,  CRØS C(EI,  ,  )BN A/W0268  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=184   GCN= 1   PCN=102
     AWRE 0-79/64, T/ BE PUBLISHED, A.C.DØUGLAS

A0269-----  71 CARDS, ADDED MAR 1, 1965 ------------------------------------
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     PU241 (N,TØTAL ) 0,  CRØS C(EI,  ,  )BN A/W0269  0/59 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=129   GCN= 1   PCN=  1
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0270-----  71 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU241 (N,ELAST ) 0,N CRØS C(EI,  ,  )BN A/W0270  0/59 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=129   GCN= 1   PCN=  2
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0271----- 207 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU241 (N,ELAST ) 0,N ANGD P(CC,EI,  )   A/W0271  0/59 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=129   GCN= 2   PCN=  2
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0272-----  71 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU241 (N,NØNEL ) 0,  CRØS C(EI,  ,  )BN A/W0272  0/59 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=129   GCN= 1   PCN=  3
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0273-----  29 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU241 (N,INELAS)98,N CRØS C(EI,  ,  )BN A/W0273  0/59 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=129   GCN= 1   PCN= 15
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0274-----  14 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU241 (N,INELAS)98,N ANGD P(CL,EI,  )   A/W0274  0/59 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=129   GCN= 2   PCN= 15
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0275----- 116 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU241 (N,INELAS)98,N ENED P(EI,EF,  )   A/W0275  0/59 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=129   GCN= 3   PCN= 15
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0276-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU241 (N,PAIR  ) 0,N CRØS C(EI,  ,  )BN A/W0276  0/59 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=129   GCN= 1   PCN= 16
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0277-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU241 (N,PAIR  ) 0,N ANGD P(CL,EI,  )   A/W0277  0/59 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=129   GCN= 2   PCN= 16
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0278-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU241 (N,PAIR  ) 0,N ENED P(EI,EF,  )   A/W0278  0/59 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=129   GCN= 3   PCN= 16
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0279-----  11 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU241 (N,TRIPLE) 0,N CRØS C(EI,  ,  )BN A/W0279  0/59 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=129   GCN= 1   PCN= 17
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0280-----  19 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU241 (N,TRIPLE) 0,N ANGD P(CL,EI,  )   A/W0280  0/59 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=129   GCN= 2   PCN= 17
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0281-----  19 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PU241 (N,TRIPLE) 0,N ENED P(EI,EF,  )   A/W0281  0/59 0.250-1 1.500+7EV
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     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=129   GCN= 3   PCN= 17
     AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0282-----  71 CARDS, ADDED MAR 1, 1965 ----------------------------------
     PU241 (N,FISS  ) O,N CRØS C(EI,  ,  )BN A/W0282  0/59 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=129   GCN= 1   PCN= 18
     AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0283-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     PU241 (N,FISS  ) O,N ANGD P(CL,EI,  )   A/W0283  0/59 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=129   GCN= 2   PCN= 18
     AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0284-----  36 CARDS, ADDED MAR 1, 1965 ----------------------------------
     PU241 (N,FISS  ) O,N ENED P(EI,EF,  )   A/W0284  0/59 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=129   GCN= 3   PCN= 18
     AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0285-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------
     PU241 (N,FISS  ) O,N NU    (EI,  ,  )   A/W0285  0/59 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=129   GCN= 4   PCN= 18
     AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0286-----  68 CARDS, ADDED MAR 1, 1965 ----------------------------------
     PU241 (N,G     ) O,  CRØS C(EI,  ,  )BN A/W0286  0/59 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=129   GCN= 1   PCN=102
     AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0287-----  17 CARDS, ADDED MAR 1, 1965 ----------------------------------
     NP237 (N,FISS  ) O,N CRØS C(EI,  ,  )BN A/W0287  0/59 0.000+4 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=130   GCN= 1   PCN= 18
     UNPUBLISHED

A0288-----  26 CARDS, ADDED MAR 1, 1965 ----------------------------------
     XE135 (N,TØTAL ) O,  CRØS C(EI,  ,  )BN A/W0288  0/62 0.100-1 0.000+2EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  4   GCN= 1   PCN=  1
     AEEW R116, 6/62, H.M.SUMNER

A0289-----  26 CARDS, ADDED MAR 1, 1965 ----------------------------------
     XE135 (N,ELAST ) O,N CRØS C(EI,  ,  )BN A/W0289  0/62 0.100-1 0.000+2EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  4   GCN= 1   PCN=  2
     AEEW R116, 6/62, H.M.SUMNER

A0290-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     XE135 (N,ELAST ) O,N ANGD P(CC,EI,  )   A/W0290  0/62 0.100-1 0.000+2EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  4   GCN= 2   PCN=  2
     AEEW R116, 6/62, H.M.SUMNER

A0291-----  26 CARDS, ADDED MAR 1, 1965 ----------------------------------
     XE135 (N,G     ) O,  CRØS C(EI,  ,  )BN A/W0291  0/62 0.100-1 0.000+2EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  4   GCN= 1   PCN=102
     AEEW R116, 6/62, H.M.SUMNER

A0292-----  81 CARDS, ADDED MAR 1, 1965 ----------------------------------
     C   O (N,TØTAL ) O,  CRØS C(EI,  ,  )BN A/W0292  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  6   GCN= 1   PCN=  1
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE O-71/60, 8/61, K. PARKER

A0293-----  81 CARDS, ADDED MAR 1, 1965 ----------------------------------
     C   O (N,ELAST ) O,N CRØS C(EI,  ,  )BN A/W0293  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  6   GCN= 1   PCN=  2
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     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-71/60, 8/61, K. PARKER

A0294----- 164 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     C   0 (N,ELAST ) 0,N ANGD P(CC,EI,  )   A/W0294  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  6   GCN= 2   PCN=  2
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-71/60, 8/61, K. PARKER

A0295-----  81 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     C   0 (N,NØNEL ) 0,  CRØS C(EI,  ,  )BN A/W0295  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  6   GCN= 1   PCN=  3
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-71/60, 8/61, K. PARKER

A0296-----  47 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     C   0 (N,INELAS)98,N CRØS C(EI,  ,  )BN A/W0296  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  6   GCN= 1   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-71/60, 8/61, K. PARKER

A0297-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     C   0 (N,INELAS)98,N ANGD P(CL,EI,  )   A/W0297  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  6   GCN= 2   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-71/60, 8/61, K. PARKER

A0298-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     C   0 (N,INELAS)98,N ENED P(EI,EF,  )   A/W0298  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  6   GCN= 3   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-71/60, 8/61, K. PARKER

A0299-----  31 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     C   0 (N,N3A   ) 0,N CRØS C(EI,  ,  )BN A/W0299  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  6   GCN= 1   PCN= 23
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-71/60, 8/61, K. PARKER

A0300-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     C   0 (N,N3A   ) 0,N ANGD P(CL,EI,  )   A/W0300  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  6   GCN= 2   PCN= 23
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-71/60, 8/61, K. PARKER

A0301-----  57 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     C   0 (N,N3A   ) 0,N ENED P(EI,EF,  )   A/W0301  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  6   GCN= 3   PCN= 23
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-71/60, 8/61, K. PARKER

A0302-----  18 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     C   0 (N,G     ) 0,  CRØS C(EI,  ,  )BN A/W0302  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  6   GCN= 1   PCN=102
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-71/60, 8/61, K. PARKER

A0303-----  12 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     C   0 (N,P     ) 0,  CRØS C(EI,  ,  )BN A/W0303  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  6   GCN= 1   PCN=103
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-71/60, 8/61, K. PARKER

A0304-----  37 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     C   0 (N,A     ) 0,  CRØS C(EI,  ,  )BN A/W0304  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=  6   GCN= 1   PCN=107
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-71/60, 8/61, K. PARKER

A0305-----  46 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     B  10 (N,TØTAL ) 0,  CRØS C(EI,  ,  )BN A/W0305  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 13   GCN= 1   PCN=  1
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-28/60, 3/61, BUCKINGHAM ETAL
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A0306-----  46 CARDS, ADDED MAR 1, 1965 ------------------------------------
     B  10 (N,ELAST ) 0,N CRØS C(EI,  ,  )BN A/W0306  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 13   GCN= 1   PCN=  2
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0307-----  34 CARDS, ADDED MAR 1, 1965 ------------------------------------
     B  10 (N,ELAST ) 0,N ANGD P(CC,EI,  )   A/W0307  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 13   GCN= 2   PCN=  2
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0308-----  46 CARDS, ADDED MAR 1, 1965 ------------------------------------
     B  10 (N,NØNEL ) 0,  CRØS C(EI,  ,  )BN A/W0308  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 13   GCN= 1   PCN=  3
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0309-----  22 CARDS, ADDED MAR 1, 1965 ------------------------------------
     B  10 (N,INELAS)98,N CRØS C(EI,  ,  )BN A/W0309  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 13   GCN= 1   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0310-----  10 CARDS, ADDED MAR 1, 1965 ------------------------------------
     B  10 (N,INELAS)98,N ANGD P(CL,EI,  )   A/W0310  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 13   GCN= 2   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0311-----  19 CARDS, ADDED MAR 1, 1965 ------------------------------------
     B  10 (N,INELAS)98,N ENED P(EI,EF,  )   A/W0311  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 13   GCN= 3   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0312-----  46 CARDS, ADDED MAR 1, 1965 ------------------------------------
     B  10 (N,PARABS) 0,  CRØS C(EI,  ,  )BN A/W0312  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 13   GCN= 1   PCN=101
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0313-----  65 CARDS, ADDED MAR 1, 1965 ------------------------------------
     N   0 (N,TØTAL ) 0,  CRØS C(EI,  ,  )BN A/W0313  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 14   GCN= 1   PCN=  1
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0314-----  65 CARDS, ADDED MAR 1, 1965 ------------------------------------
     N   0 (N,ELAST ) 0,N CRØS C(EI,  ,  )BN A/W0314  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 14   GCN= 1   PCN=  2
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0315-----  45 CARDS, ADDED MAR 1, 1965 ------------------------------------
     N   0 (N,ELAST ) 0,N ANGD P(CC,EI,  )   A/W0315  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 14   GCN= 2   PCN=  2
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0316-----  65 CARDS, ADDED MAR 1, 1965 ------------------------------------
     N   0 (N,NØNEL ) 0,  CRØS C(EI,  ,  )BN A/W0316  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 14   GCN= 1   PCN=  3
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0317-----  24 CARDS, ADDED MAR 1, 1965 ------------------------------------
     N   0 (N,INELAS)98,N CRØS C(EI,  ,  )BN A/W0317  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 14   GCN= 1   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL
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A0318-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     N   0 (N,INELAS)98,N ANGD P(CL,EI,  )   A/W0318  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 14   GCN= 2   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0319-----  33 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     N   0 (N,INELAS)98,N ENED P(EI,EF,  )   A/W0319  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 14   GCN= 3   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0320-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     N   0 (N,PAIR  ) 0,N CRØS C(EI,  ,  )BN A/W0320  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 14   GCN= 1   PCN= 16
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0321-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     N   0 (N,PAIR  ) 0,N ANGD P(CL,EI,  )   A/W0321  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 14   GCN= 2   PCN= 16
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0322-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     N   0 (N,PAIR  ) 0,N ENED P(EI,EF,  )   A/W0322  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 14   GCN= 3   PCN= 16
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0323-----  24 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     N   0 (N,G     ) 0,  CRØS C(EI,  ,  )BN A/W0323  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 14   GCN= 1   PCN=102
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0324-----  65 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     N   0 (N,P     ) 0,  CRØS C(EI,  ,  )BN A/W0324  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 14   GCN= 1   PCN=103
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0325-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     N   0 (N,D     ) 0,  CRØS C(EI,  ,  )BN A/W0325  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 14   GCN= 1   PCN=104
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0326-----  17 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     N   0 (N,T     ) 0,  CRØS C(EI,  ,  )BN A/W0326  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 14   GCN= 1   PCN=105
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0327-----  45 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     N   0 (N,A     ) 0,  CRØS C(EI,  ,  )BN A/W0327  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 14   GCN= 1   PCN=107
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0328-----  12 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     N   0 (N,2A    ) 0,  CRØS C(EI,  ,  )BN A/W0328  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 14   GCN= 1   PCN=108
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0329-----  52 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     B   0 (N,TØTAL ) 0,  CRØS C(EI,  ,  )BN A/W0329  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 15   GCN= 1   PCN=  1
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0330-----  52 CARDS, ADDED MAR 1, 1965 ----------------------------------------
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     B   O (N,ELAST ) O,N CRØS C(EI,  ,  )BN A/W0330  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 15   GCN= 1   PCN=  2
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0331-----  42 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     B   O (N,ELAST ) O,N ANGD P(CC,EI,  )   A/W0331  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 15   GCN= 2   PCN=  2
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0332-----  52 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     B   O (N,NØNEL ) O,  CRØS C(EI,  ,  )BN A/W0332  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 15   GCN= 1   PCN=  3
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0333-----  30 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     B   O (N,INELAS)98,N CRØS C(EI,  ,  )BN A/W0333  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 15   GCN= 1   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0334-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     B   O (N,INELAS)98,N ANGD P(CL,EI,  )   A/W0334  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 15   GCN= 2   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0335-----  23 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     B   O (N,INELAS)98,N ENED P(EI,EF,  )   A/W0335  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 15   GCN= 3   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0336-----  52 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     B   O (N,PARABS) O,  CRØS C(EI,  ,  )BN A/W0336  0/63 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 15   GCN= 1   PCN=101
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0337-----  88 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     CR  O (N,TØTAL ) O,  CRØS C(EI,  ,  )BN A/W0337  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 17   GCN= 1   PCN=  1
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0338-----  88 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     CR  O (N,ELAST ) O,N CRØS C(EI,  ,  )BN A/W0338  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 17   GCN= 1   PCN=  2
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0339-----  45 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     CR  O (N,ELAST ) O,N ANGD P(CC,EI,  )   A/W0339  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 17   GCN= 2   PCN=  2
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0340-----  88 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     CR  O (N,NØNEL ) O,  CRØS C(EI,  ,  )BN A/W0340  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 17   GCN= 1   PCN=  3
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0341-----  21 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     CR  O (N,INELAS)98,N CRØS C(EI,  ,  )BN A/W0341  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 17   GCN= 1   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0342-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     CR  O (N,INELAS)98,N ANGD P(CL,EI,  )   A/W0342  0/63 0.100-3 1.500+7EV
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     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 17   GCN= 2   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0343-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     CR  0 (N,INELAS)98,N ENED P(EI,EF,  )   A/W0343  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 17   GCN= 3   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0344-----  88 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     CR  0 (N,G     ) 0,  CRØS C(EI,  ,  )BN A/W0344  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 17   GCN= 1   PCN=102
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0345-----  13 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     CR  0 (N,P     ) 0,  CRØS C(EI,  ,  )BN A/W0345  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 17   GCN= 1   PCN=103
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0346-----  13 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     CR  0 (N,A     ) 0,  CRØS C(EI,  ,  )BN A/W0346  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 17   GCN= 1   PCN=107
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0347-----  78 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     NI  0 (N,TØTAL ) 0,  CRØS C(EI,  ,  )BN A/W0347  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 19   GCN= 1   PCN=  1
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0348-----  78 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     NI  0 (N,ELAST ) 0,N CRØS C(EI,  ,  )BN A/W0348  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 19   GCN= 1   PCN=  2
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0349-----  44 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     NI  0 (N,ELAST ) 0,N ANGD P(CC,EI,  )   A/W0349  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 19   GCN= 2   PCN=  2
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0350-----  78 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     NI  0 (N,NØNEL ) 0,  CRØS C(EI,  ,  )BN A/W0350  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 19   GCN= 1   PCN=  3
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0351-----  17 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     NI  0 (N,INELAS)98,N CRØS C(EI,  ,  )BN A/W0351  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 19   GCN= 1   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0352-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     NI  0 (N,INELAS)98,N ANGD P(CL,EI,  )   A/W0352  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 19   GCN= 2   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0353-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     NI  0 (N,INELAS)98,N ENED P(EI,EF,  )   A/W0353  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 19   GCN= 3   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0354-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     NI  0 (N,PAIR  ) 0,N CRØS C(EI,  ,  )BN A/W0354  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 19   GCN= 1   PCN= 16
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     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0355-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     NI  0 (N,PAIR  ) 0,N ANGD P(CL,EI,  )    A/W0355  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 19   GCN= 2   PCN= 16
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0356-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     NI  0 (N,PAIR  ) 0,N ENED P(EI,EF,  )    A/W0356  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 19   GCN= 3   PCN= 16
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0357-----  78 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     NI  0 (N,G     ) 0,  CRØS C(EI,  ,  )BN A/W0357  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 19   GCN= 1   PCN=102
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0358-----  14 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     NI  0 (N,P     ) 0,  CRØS C(EI,  ,  )BN A/W0358  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 19   GCN= 1   PCN=103
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0359-----  13 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     NI  0 (N,A     ) 0,  CRØS C(EI,  ,  )BN A/W0359  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 19   GCN= 1   PCN=107
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0360-----  49 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     F  19 (N,TØTAL ) 0,  CRØS C(EI,  ,  )BN A/W0360  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 23   GCN= 1   PCN=  1
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0361-----  49 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     F  19 (N,ELAST ) 0,N CRØS C(EI,  ,  )BN A/W0361  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 23   GCN= 1   PCN=  2
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0362-----  44 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     F  19 (N,ELAST ) 0,N ANGD P(CC,EI,  )    A/W0362  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 23   GCN= 2   PCN=  2
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0363-----  49 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     F  19 (N,NØNEL ) 0,  CRØS C(EI,  ,  )BN A/W0363  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 23   GCN= 1   PCN=  3
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0364-----  31 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     F  19 (N,INELAS)98,N CRØS C(EI,  ,  )BN A/W0364  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 23   GCN= 1   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0365-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     F  19 (N,INELAS)98,N ANGD P(CL,EI,  )    A/W0365  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 23   GCN= 2   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0366-----  50 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     F  19 (N,INELAS)98,N ENED P(EI,EF,  )    A/W0366  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 23   GCN= 3   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL
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A0367-----  11 CARDS, ADDED MAR 1, 1965 ----------------------------------
     F  19 (N,PAIR  ) 0,N CRØS C(EI,  ,  )BN A/W0367  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 23   GCN= 1   PCN= 16
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0368-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------
     F  19 (N,PAIR  ) 0,N ANGD P(CL,EI,  )   A/W0368  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 23   GCN= 2   PCN= 16
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0369-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------
     F  19 (N,PAIR  ) 0,N ENED P(EI,EF,  )   A/W0369  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 23   GCN= 3   PCN= 16
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0370-----  49 CARDS, ADDED MAR 1, 1965 ----------------------------------
     F  19 (N,PARABS) 0,  CRØS C(EI,  ,  )BN A/W0370  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 23   GCN= 1   PCN=101
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0371-----  82 CARDS, ADDED MAR 1, 1965 ----------------------------------
     CD  0 (N,TØTAL ) 0,  CRØS C(EI,  ,  )BN A/W0371  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 24   GCN= 1   PCN=  1
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0372-----  82 CARDS, ADDED MAR 1, 1965 ----------------------------------
     CD  0 (N,ELAST ) 0,N CRØS C(EI,  ,  )BN A/W0372  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 24   GCN= 1   PCN=  2
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0373-----  44 CARDS, ADDED MAR 1, 1965 ----------------------------------
     CD  0 (N,ELAST ) 0,N ANGD P(CC,EI,  )   A/W0373  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 24   GCN= 2   PCN=  2
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0374-----  82 CARDS, ADDED MAR 1, 1965 ----------------------------------
     CD  0 (N,NØNEL ) 0,  CRØS C(EI,  ,  )BN A/W0374  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 24   GCN= 1   PCN=  3
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0375-----  17 CARDS, ADDED MAR 1, 1965 ----------------------------------
     CD  0 (N,INELAS)98,N CRØS C(EI,  ,  )BN A/W0375  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 24   GCN= 1   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0376-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     CD  0 (N,INELAS)98,N ANGD P(CL,EI,  )   A/W0376  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 24   GCN= 2   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0377-----  28 CARDS, ADDED MAR 1, 1965 ----------------------------------
     CD  0 (N,INELAS)98,N ENED P(EI,EF,  )   A/W0377  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 24   GCN= 3   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0378-----  11 CARDS, ADDED MAR 1, 1965 ----------------------------------
     CD  0 (N,PAIR  ) 0,N CRØS C(EI,  ,  )BN A/W0378  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 24   GCN= 1   PCN= 16
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE 0-28/60, 3/61, BUCKINGHAM ETAL
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A0379-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     CD  0 (N,PAIR  ) 0,N ANGD P(CL,EI,  )   A/W0379  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 24   GCN= 2   PCN= 16
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0380-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     CD  0 (N,PAIR  ) 0,N ENED P(EI,EF,  )   A/W0380  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 24   GCN= 3   PCN= 16
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0381-----  82 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     CD  0 (N,PARABS) 0,  CRØS C(EI,  ,  )BN A/W0381  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 24   GCN= 1   PCN=101
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0382-----  69 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     SI  0 (N,TØTAL ) 0,  CRØS C(EI,  ,  )BN A/W0382  0/63 0.400-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 25   GCN= 1   PCN=  1
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0383-----  69 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     SI  0 (N,ELAST ) 0,N CRØS C(EI,  ,  )BN A/W0383  0/63 0.400-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 25   GCN= 1   PCN=  2
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0384-----  45 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     SI  0 (N,ELAST ) 0,N ANGD P(CC,EI,  )   A/W0384  0/63 0.400-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 25   GCN= 2   PCN=  2
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0385-----  69 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     SI  0 (N,NØNEL ) 0,  CRØS C(EI,  ,  )BN A/W0385  0/63 0.400-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 25   GCN= 1   PCN=  3
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0386-----  25 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     SI  0 (N,INELAS)98,N CRØS C(EI,  ,  )BN A/W0386  0/63 0.400-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 25   GCN= 1   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0387-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     SI  0 (N,INELAS)98,N ANGD P(CL,EI,  )   A/W0387  0/63 0.400-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 25   GCN= 2   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0388-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     SI  0 (N,INELAS)98,N ENED P(EI,EF,  )   A/W0388  0/63 0.400-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 25   GCN= 3   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0389-----  30 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     SI  0 (N,G     ) 0,  CRØS C(EI,  ,  )BN A/W0389  0/63 0.400-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 25   GCN= 1   PCN=102
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0390-----  16 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     SI  0 (N,P     ) 0,  CRØS C(EI,  ,  )BN A/W0390  0/63 0.400-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 25   GCN= 1   PCN=103
     AEEW R351, 2/64, BARRINGTØN ETAL,   AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0391-----  16 CARDS, ADDED MAR 1, 1965 ----------------------------------------
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     SI  0 (N,A      ) 0,  CRØS C(EI,  ,  )BN A/W0391  0/63 0.400-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 25   GCN= 1   PCN=107
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0392-----  66 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PB  0 (N,TØTAL ) 0,  CRØS C(EI,  ,  )BN A/W0392  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 26   GCN= 1   PCN=  1
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0393-----  66 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PB  0 (N,ELAST ) 0,N CRØS C(EI,  ,  )BN A/W0393  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 26   GCN= 1   PCN=  2
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0394-----  65 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PB  0 (N,ELAST ) 0,N ANGD P(CC,EI,  )   A/W0394  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 26   GCN= 2   PCN=  2
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0395-----  66 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PB  0 (N,NØNEL ) 0,  CRØS C(EI,  ,  )BN A/W0395  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 26   GCN= 1   PCN=  3
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0396-----  26 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PB  0 (N,INELAS)98,N CRØS C(EI,  ,  )BN A/W0396  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 26   GCN= 1   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0397-----  14 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PB  0 (N,INELAS)98,N ANGD P(CL,EI,  )   A/W0397  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 26   GCN= 2   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0398----- 229 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PB  0 (N,INELAS)98,N ENED P(EI,EF,  )   A/W0398  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 26   GCN= 3   PCN= 15
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0399-----  16 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PB  0 (N,PAIR  ) 0,N CRØS C(EI,  ,  )BN A/W0399  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 26   GCN= 1   PCN= 16
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0400-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PB  0 (N,PAIR  ) 0,N ANGD P(CL,EI,  )   A/W0400  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 26   GCN= 2   PCN= 16
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0401-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PB  0 (N,PAIR  ) 0,N ENED P(EI,EF,  )   A/W0401  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 26   GCN= 3   PCN= 16
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0402-----  66 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     PB  0 (N,G      ) 0,  CRØS C(EI,  ,  )BN A/W0402  0/63 0.100-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN= 26   GCN= 1   PCN=102
     AEEW R351, 2/64, BARRINGTØN ETAL,    AWRE O-28/60, 3/61, BUCKINGHAM ETAL

A0403----- 124 CARDS, ADDED MAR 1, 1965 ----------------------------------------
     AL 27 (N,TØTAL ) 0,  CRØS C(EI,  ,  )BN A/W0403  1/64 0.600-3 1.500+7EV
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      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 35   GCN= 1   PCN=  1
      AEEW M445, 7/64, D.C.KING

A0404----- 124 CARDS, ADDED MAR 1, 1965 ----------------------------------
      AL 27 (N,ELAST ) 0,N CRØS C(EI,  ,  )BN A/W0404  1/64 0.600-3 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 35   GCN= 1   PCN=  2
      AEEW M445, 7/64, D.C.KING

A0405----- 222 CARDS, ADDED MAR 1, 1965 ----------------------------------
      AL 27 (N,ELAST ) 0,N ANGD P(CC,EI,  )   A/W0405  1/64 0.600-3 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 35   GCN= 2   PCN=  2
      AEEW M445, 7/64, D.C.KING

A0406-----  33 CARDS, ADDED MAR 1, 1965 ----------------------------------
      AL 27 (N,INELAS) 1,N CRØS C(EI,  ,  )BN A/W0406  1/64 0.600-3 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 35   GCN= 1   PCN=  5
      AEEW M445, 7/64, D.C.KING

A0407-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
      AL 27 (N,INELAS) 1,N ANGD P(CC,EI,  )   A/W0407  1/64 0.600-3 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 35   GCN= 2   PCN=  5
      AEEW M445, 7/64, D.C.KING

A0408-----  33 CARDS, ADDED MAR 1, 1965 ----------------------------------
      AL 27 (N,INELAS) 2,N CRØS C(EI,  ,  )BN A/W0408  1/64 0.600-3 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 35   GCN= 1   PCN=  6
      AEEW M445, 7/64, D.C.KING

A0409-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
      AL 27 (N,INELAS) 2,N ANGD P(CC,EI,  )   A/W0409  1/64 0.600-3 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 35   GCN= 2   PCN=  6
      AEEW M445, 7/64, D.C.KING

A0410-----  23 CARDS, ADDED MAR 1, 1965 ----------------------------------
      AL 27 (N,INELAS) 3,N CRØS C(EI,  ,  )BN A/W0410  1/64 0.600-3 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 35   GCN= 1   PCN=  7
      AEEW M445, 7/64, D.C.KING

A0411-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
      AL 27 (N,INELAS) 3,N ANGD P(CC,EI,  )   A/W0411  1/64 0.600-3 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 35   GCN= 2   PCN=  7
      AEEW M445, 7/64, D.C.KING

A0412-----  20 CARDS, ADDED MAR 1, 1965 ----------------------------------
      AL 27 (N,INELAS) 4,N CRØS C(EI,  ,  )BN A/W0412  1/64 0.600-3 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 35   GCN= 1   PCN=  8
      AEEW M445, 7/64, D.C.KING

A0413-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
      AL 27 (N,INELAS) 4,N ANGD P(CC,EI,  )   A/W0413  1/64 0.600-3 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 35   GCN= 2   PCN=  8
      AEEW M445, 7/64, D.C.KING

A0414-----  19 CARDS, ADDED MAR 1, 1965 ----------------------------------
      AL 27 (N,INELAS) 5,N CRØS C(EI,  ,  )BN A/W0414  1/64 0.600-3 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 35   GCN= 1   PCN=  9
      AEEW M445, 7/64, D.C.KING

A0415-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
      AL 27 (N,INELAS) 5,N ANGD P(CC,EI,  )   A/W0415  1/64 0.600-3 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 35   GCN= 2   PCN=  9
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     AEEW M445, 7/64, D.C.KING

A0416-----  19 CARDS, ADDED MAR 1, 1965 ----------------------------------
     AL 27 (N,INELAS) 6,N CRØS C(EI,  ,  )BN A/W0416  1/64 0.600-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 35   GCN= 1   PCN= 10
     AEEW M445, 7/64, D.C.KING

A0417-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     AL 27 (N,INELAS) 6,N ANGD P(CC,EI,  )   A/W0417  1/64 0.600-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 35   GCN= 2   PCN= 10
     AEEW M445, 7/64, D.C.KING

A0418-----  12 CARDS, ADDED MAR 1, 1965 ----------------------------------
     AL 27 (N,INELAS) 7,N CRØS C(EI,  ,  )BN A/W0418  1/64 0.600-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 35   GCN= 1   PCN= 11
     AEEW M445, 7/64, D.C.KING

A0419-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     AL 27 (N,INELAS) 7,N ANGD P(CC,EI,  )   A/W0419  1/64 0.600-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 35   GCN= 2   PCN= 11
     AEEW M445, 7/64, D.C.KING

A0420-----  12 CARDS, ADDED MAR 1, 1965 ----------------------------------
     AL 27 (N,INELAS) 8,N CRØS C(EI,  ,  )BN A/W0420  1/64 0.600-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 35   GCN= 1   PCN= 12
     AEEW M445, 7/64, D.C.KING

A0421-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     AL 27 (N,INELAS) 8,N ANGD P(CC,EI,  )   A/W0421  1/64 0.600-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 35   GCN= 2   PCN= 12
     AEEW M445, 7/64, D.C.KING

A0422-----  11 CARDS, ADDED MAR 1, 1965 ----------------------------------
     AL 27 (N,INELAS) 9,N CRØS C(EI,  ,  )BN A/W0422  1/64 0.600-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 35   GCN= 1   PCN= 13
     AEEW M445, 7/64, D.C.KING

A0423-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     AL 27 (N,INELAS) 9,N ANGD P(CC,EI,  )   A/W0423  1/64 0.600-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 35   GCN= 2   PCN= 13
     AEEW M445, 7/64, D.C.KING

A0424-----  36 CARDS, ADDED MAR 1, 1965 ----------------------------------
     AL 27 (N,INELAS)98,N CRØS C(EI,  ,  )BN A/W0424  1/64 0.600-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 35   GCN= 1   PCN= 15
     AEEW M445, 7/64, D.C.KING

A0425-----  14 CARDS, ADDED MAR 1, 1965 ----------------------------------
     AL 27 (N,INELAS)98,N ANGD P(CL,EI,  )   A/W0425  1/64 0.600-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 35   GCN= 2   PCN= 15
     AEEW M445, 7/64, D.C.KING

A0426-----  64 CARDS, ADDED MAR 1, 1965 ----------------------------------
     AL 27 (N,INELAS)98,N ENED P(EI,EF,  )   A/W0426  1/64 0.600-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 35   GCN= 3   PCN= 15
     AEEW M445, 7/64, D.C.KING

A0427-----   9 CARDS, ADDED MAR 1, 1965 ----------------------------------
     AL 27 (N,PAIR  ) 0,N CRØS C(EI,  ,  )BN A/W0427  1/64 0.600-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 35   GCN= 1   PCN= 16
     AEEW M445, 7/64, D.C.KING
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A0428----- 15 CARDS, ADDED MAR 1, 1965 ------------------------------------
     AL 27 (N,PAIR  ) 0,N ANGD P(CL,EI,  )   A/W0428  1/64 0.600-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 35   GCN= 2   PCN= 16
     AEEW M445, 7/64, D.C.KING

A0429----- 15 CARDS, ADDED MAR 1, 1965 ------------------------------------
     AL 27 (N,PAIR  ) 0,N ENED P(EI,EF,  )   A/W0429  1/64 0.600-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 35   GCN= 3   PCN= 16
     AEEW M445, 7/64, D.C.KING

A0430----- 124 CARDS, ADDED MAR 1, 1965 -----------------------------------
     AL 27 (N,G     ) 0,  CRØS C(EI,  ,  )BN A/W0430  1/64 0.600-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 35   GCN= 1   PCN=102
     AEEW M445, 7/64, D.C.KING

A0431----- 48 CARDS, ADDED MAR 1, 1965 ------------------------------------
     AL 27 (N,P     ) 0,  CRØS C(EI,  ,  )BN A/W0431  1/64 0.600-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 35   GCN= 1   PCN=103
     AEEW M445, 7/64, D.C.KING

A0432----- 28 CARDS, ADDED MAR 1, 1965 ------------------------------------
     AL 27 (N,A     ) 0,  CRØS C(EI,  ,  )BN A/W0432  1/64 0.600-3 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 35   GCN= 1   PCN=107
     AEEW M445, 7/64, D.C.KING

A0433----- 269 CARDS, ADDED MAR 1, 1965 -----------------------------------
     FE  0 (N,TØTAL ) 0,  CRØS C(EI,  ,  )BN A/W0433  1/64 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 36   GCN= 1   PCN=  1
     AEEW REPØRT TØ BE PUBLISHED

A0434----- 269 CARDS, ADDED MAR 1, 1965 -----------------------------------
     FE  0 (N,ELAST ) 0,N CRØS C(EI,  ,  )BN A/W0434  1/64 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 36   GCN= 1   PCN=  2
     AEEW REPØRT TØ BE PUBLISHED

A0435----- 134 CARDS, ADDED MAR 1, 1965 -----------------------------------
     FE  0 (N,ELAST ) 0,N ANGD P(CC,EI,  )   A/W0435  1/64 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 36   GCN= 2   PCN=  2
     AEEW REPØRT TØ BE PUBLISHED

A0436----- 100 CARDS, ADDED MAR 1, 1965 -----------------------------------
     FE  0 (N,INELAS) 1,N CRØS C(EI,  ,  )BN A/W0436  1/64 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 36   GCN= 1   PCN=  5
     AEEW REPØRT TØ BE PUBLISHED

A0437-----  10 CARDS, ADDED MAR 1, 1965 -----------------------------------
     FE  0 (N,INELAS) 1,N ANGD P(CC,EI,  )   A/W0437  1/64 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 36   GCN= 2   PCN=  5
     AEEW REPØRT TØ BE PUBLISHED

A0438-----  50 CARDS, ADDED MAR 1, 1965 -----------------------------------
     FE  0 (N,INELAS) 2,N CRØS C(EI,  ,  )BN A/W0438  1/64 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 36   GCN= 1   PCN=  6
     AEEW REPØRT TØ BE PUBLISHED

A0439-----  10 CARDS, ADDED MAR 1, 1965 -----------------------------------
     FE  0 (N,INELAS) 2,N ANGD P(CC,EI,  )   A/W0439  1/64 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 36   GCN= 2   PCN=  6
     AEEW REPØRT TØ BE PUBLISHED
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A0440-----  26 CARDS, ADDED MAR 1, 1965 ------------------------------------
     FE  0 (N,INELAS) 3,N CRØS C(EI,  ,  )BN A/W0440  1/64 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 36   GCN= 1   PCN=  7
     AEEW REPØRT TØ BE PUBLISHED

A0441-----  10 CARDS, ADDED MAR 1, 1965 ------------------------------------
     FE  0 (N,INELAS) 3,N ANGD P(CC,EI,  )   A/W0441  1/64 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 36   GCN= 2   PCN=  7
     AEEW REPØRT TØ BE PUBLISHED

A0442-----  22 CARDS, ADDED MAR 1, 1965 ------------------------------------
     FE  0 (N,INELAS) 4,N CRØS C(EI,  ,  )BN A/W0442  1/64 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 36   GCN= 1   PCN=  8
     AEEW REPØRT TØ BE PUBLISHED

A0443-----  10 CARDS, ADDED MAR 1, 1965 ------------------------------------
     FE  0 (N,INELAS) 4,N ANGD P(CC,EI,  )   A/W0443  1/64 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 36   GCN= 2   PCN=  8
     AEEW REPØRT TØ BE PUBLISHED

A0444-----  17 CARDS, ADDED MAR 1, 1965 ------------------------------------
     FE  0 (N,INELAS) 5,N CRØS C(EI,  ,  )BN A/W0444  1/64 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 36   GCN= 1   PCN=  9
     AEEW REPØRT TØ BE PUBLISHED

A0445-----  10 CARDS, ADDED MAR 1, 1965 ------------------------------------
     FE  0 (N,INELAS) 5,N ANGD P(CC,EI,  )   A/W0445  1/64 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 36   GCN= 2   PCN=  9
     AEEW REPØRT TØ BE PUBLISHED

A0446-----  12 CARDS, ADDED MAR 1, 1965 ------------------------------------
     FE  0 (N,INELAS) 6,N CRØS C(EI,  ,  )BN A/W0446  1/64 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 36   GCN= 1   PCN= 10
     AEEW REPØRT TØ BE PUBLISHED

A0447-----  10 CARDS, ADDED MAR 1, 1965 ------------------------------------
     FE  0 (N,INELAS) 6,N ANGD P(CC,EI,  )   A/W0447  1/64 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 36   GCN= 2   PCN= 10
     AEEW REPØRT TØ BE PUBLISHED

A0448-----  10 CARDS, ADDED MAR 1, 1965 ------------------------------------
     FE  0 (N,INELAS) 7,N CRØS C(EI,  ,  )BN A/W0448  1/64 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 36   GCN= 1   PCN= 11
     AEEW REPØRT TØ BE PUBLISHED

A0449-----  10 CARDS, ADDED MAR 1, 1965 ------------------------------------
     FE  0 (N,INELAS) 7,N ANGD P(CC,EI,  )   A/W0449  1/64 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 36   GCN= 2   PCN= 11
     AEEW REPØRT TØ BE PUBLISHED

A0450-----  23 CARDS, ADDED MAR 1, 1965 ------------------------------------
     FE  0 (N,INELAS)98,N CRØS C(EI,  ,  )BN A/W0450  1/64 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 36   GCN= 1   PCN= 15
     AEEW REPØRT TØ BE PUBLISHED

A0451-----  10 CARDS, ADDED MAR 1, 1965 ------------------------------------
     FE  0 (N,INELAS)98,N ANGD P(CL,EI,  )   A/W0451  1/64 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 36   GCN= 2   PCN= 15
     AEEW REPØRT TØ BE PUBLISHED

A0452-----  15 CARDS, ADDED MAR 1, 1965 ------------------------------------
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     FE  0 (N,INELAS)98,N ENED P(EI,EF,  )   A/W0452  1/64 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 36   GCN= 3   PCN= 15
     AEEW REPØRT TØ BE PUBLISHED

A0453-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     FE  0 (N,PAIR  ) 0,N CRØS C(EI,  ,  )BN A/W0453  1/64 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 36   GCN= 1   PCN= 16
     AEEW REPØRT TØ BE PUBLISHED

A0454-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------
     FE  0 (N,PAIR  ) 0,N ANGD P(CL,EI,  )   A/W0454  1/64 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 36   GCN= 2   PCN= 16
     AEEW REPØRT TØ BE PUBLISHED

A0455-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------
     FE  0 (N,PAIR  ) 0,N ENED P(EI,EF,  )   A/W0455  1/64 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 36   GCN= 3   PCN= 16
     AEEW REPØRT TØ BE PUBLISHED

A0456----- 269 CARDS, ADDED MAR 1, 1965 ----------------------------------
     FE  0 (N,G     ) 0,  CRØS C(EI,  ,  )BN A/W0456  1/64 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 36   GCN= 1   PCN=102
     AEEW REPØRT TØ BE PUBLISHED

A0457-----  20 CARDS, ADDED MAR 1, 1965 ----------------------------------
     FE  0 (N,P     ) 0,  CRØS C(EI,  ,  )BN A/W0457  1/64 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 36   GCN= 1   PCN=103
     AEEW REPØRT TØ BE PUBLISHED

A0458-----  11 CARDS, ADDED MAR 1, 1965 ----------------------------------
     FE  0 (N,A     ) 0,  CRØS C(EI,  ,  )BN A/W0458  1/64 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 36   GCN= 1   PCN=107
     AEEW REPØRT TØ BE PUBLISHED

A0459----- 150 CARDS, ADDED MAR 1, 1965 ----------------------------------
     Ø   0 (N,TØTAL ) 0,  CRØS C(EI,  ,  )BN A/W0459  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 37   GCN= 1   PCN=  1
     AEEW M445, 7/64, D.C.KING

A0460----- 150 CARDS, ADDED MAR 1, 1965 ----------------------------------
     Ø   0 (N,ELAST ) 0,N CRØS C(EI,  ,  )BN A/W0460  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 37   GCN= 1   PCN=  2
     AEEW M445, 7/64, D.C.KING

A0461-----1006 CARDS, ADDED MAR 1, 1965 ----------------------------------
     Ø   0 (N,ELAST ) 0,N ANGD P(CC,EI,  )   A/W0461  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 37   GCN= 2   PCN=  2
     AEEW M445, 7/64, D.C.KING

A0462-----  35 CARDS, ADDED MAR 1, 1965 ----------------------------------
     Ø   0 (N,INELAS) 1,N CRØS C(EI,  ,  )BN A/W0462  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 37   GCN= 1   PCN=  5
     AEEW M445, 7/64, D.C.KING

A0463-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     Ø   0 (N,INELAS) 1,N ANGD P(CC,EI,  )   A/W0463  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 37   GCN= 2   PCN=  5
     AEEW M445, 7/64, D.C.KING

A0464-----  36 CARDS, ADDED MAR 1, 1965 ----------------------------------
     Ø   0 (N,INELAS) 2,N CRØS C(EI,  ,  )BN A/W0464  1/64 0.100-2 1.500+7EV
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     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 37   GCN= 1   PCN=  6
     AEEW M445, 7/64, D.C.KING

A0465-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     Ø   0 (N,INELAS) 2,N ANGD P(CC,EI,  )   A/W0465  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 37   GCN= 2   PCN=  6
     AEEW M445, 7/64, D.C.KING

A0466-----  26 CARDS, ADDED MAR 1, 1965 ----------------------------------
     Ø   0 (N,INELAS) 3,N CRØS C(EI,  ,  )BN A/W0466  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 37   GCN= 1   PCN=  7
     AEEW M445, 7/64, D.C.KING

A0467-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     Ø   0 (N,INELAS) 3,N ANGD P(CC,EI,  )   A/W0467  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 37   GCN= 2   PCN=  7
     AEEW M445, 7/64, D.C.KING

A0468-----  23 CARDS, ADDED MAR 1, 1965 ----------------------------------
     Ø   0 (N,INELAS) 4,N CRØS C(EI,  ,  )BN A/W0468  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 37   GCN= 1   PCN=  8
     AEEW M445, 7/64, D.C.KING

A0469-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     Ø   0 (N,INELAS) 4,N ANGD P(CC,EI,  )   A/W0469  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 37   GCN= 2   PCN=  8
     AEEW M445, 7/64, D.C.KING

A0470-----  12 CARDS, ADDED MAR 1, 1965 ----------------------------------
     Ø   0 (N,INELAS)98,N CRØS C(EI,  ,  )BN A/W0470  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 37   GCN= 1   PCN= 15
     AEEW M445, 7/64, D.C.KING

A0471-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     Ø   0 (N,INELAS)98,N ANGD P(CL,EI,  )   A/W0471  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 37   GCN= 2   PCN= 15
     AEEW M445, 7/64, D.C.KING

A0472-----  32 CARDS, ADDED MAR 1, 1965 ----------------------------------
     Ø   0 (N,INELAS)98,N ENED P(EI,EF,  )   A/W0472  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 37   GCN= 3   PCN= 15
     AEEW M445, 7/64, D.C.KING

A0473-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     Ø   0 (N,PARABS) 0,  CRØS C(EI,  ,  )BN A/W0473  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 37   GCN= 1   PCN=101
     AEEW M445, 7/64, D.C.KING

A0474-----  12 CARDS, ADDED MAR 1, 1965 ----------------------------------
     Ø   0 (N,P     ) 0,  CRØS C(EI,  ,  )BN A/W0474  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 37   GCN= 1   PCN=103
     AEEW M445, 7/64, D.C.KING

A0475-----  11 CARDS, ADDED MAR 1, 1965 ----------------------------------
     Ø   0 (N,D     ) 0,  CRØS C(EI,  ,  )BN A/W0475  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 37   GCN= 1   PCN=104
     AEEW M445, 7/64, D.C.KING

A0476-----  85 CARDS, ADDED MAR 1, 1965 ----------------------------------
     Ø   0 (N,A     ) 0,  CRØS C(EI,  ,  )BN A/W0476  1/64 0.100-2 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN= 37   GCN= 1   PCN=107
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AEEW M445, 7/64, D.C.KING

A0477----- 18 CARDS, ADDED MAR 1, 1965 ----------
AU197 (N,PAIR) 0,N CRØS C(EI, ,)BN A/W0477 12/62 0.000+2 1.500+7EV
ALDERMASTØN/WINFRITH DATA FILE, 7/1/64 NIN=137 GCN= 1 PCN= 16
NØ REFERENCE GIVEN

A0478----- 17 CARDS, ADDED MAR 1, 1965 ----------
AU197 (N,PAIR) 1,N CRØS C(EI, ,)BN A/W0478 12/62 0.000+2 1.500+7EV
ALDERMASTØN/WINFRITH DATA FILE, 7/1/64 NIN=137 GCN= 1 PCN= 26
NØ REFERENCE GIVEN

A0479----- 32 CARDS, ADDED MAR 1, 1965 ----------
AU197 (N,G) 0, CRØS C(EI, ,)BN A/W0479 12/62 0.000+2 1.500+7EV
ALDERMASTØN/WINFRITH DATA FILE, 7/1/64 NIN=137 GCN= 1 PCN=102
NØ REFERENCE GIVEN

A0480----- 58 CARDS, ADDED MAR 1, 1965 ----------
CA 0 (N,TØTAL) 0, CRØS C(EI, ,)BN A/W0480 10/58 0.250-1 1.500+7EV
ALDERMASTØN/WINFRITH DATA FILE, 7/1/64 NIN=138 GCN= 1 PCN= 1
AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0481----- 58 CARDS, ADDED MAR 1, 1965 ----------
CA 0 (N,ELAST) 0,N CRØS C(EI, ,)BN A/W0481 10/58 0.250-1 1.500+7EV
ALDERMASTØN/WINFRITH DATA FILE, 7/1/64 NIN=138 GCN= 1 PCN= 2
AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0482----- 43 CARDS, ADDED MAR 1, 1965 ----------
CA 0 (N,ELAST) 0,N ANGD P(CC,EI,) A/W0482 10/58 0.250-1 1.500+7EV
ALDERMASTØN/WINFRITH DATA FILE, 7/1/64 NIN=138 GCN= 2 PCN= 2
AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0483----- 58 CARDS, ADDED MAR 1, 1965 ----------
CA 0 (N,NØNEL) 0, CRØS C(EI, ,)BN A/W0483 10/58 0.250-1 1.500+7EV
ALDERMASTØN/WINFRITH DATA FILE, 7/1/64 NIN=138 GCN= 1 PCN= 3
AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0484----- 14 CARDS, ADDED MAR 1, 1965 ----------
CA 0 (N,INELAS)98,N CRØS C(EI, ,)BN A/W0484 10/58 0.250-1 1.500+7EV
ALDERMASTØN/WINFRITH DATA FILE, 7/1/64 NIN=138 GCN= 1 PCN= 15
AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0485----- 10 CARDS, ADDED MAR 1, 1965 ----------
CA 0 (N,INELAS)98,N ANGD P(CL,EI,) A/W0485 10/58 0.250-1 1.500+7EV
ALDERMASTØN/WINFRITH DATA FILE, 7/1/64 NIN=138 GCN= 2 PCN= 15
AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0486----- 19 CARDS, ADDED MAR 1, 1965 ----------
CA 0 (N,INELAS)98,N ENED P(EI,EF,) A/W0486 10/58 0.250-1 1.500+7EV
ALDERMASTØN/WINFRITH DATA FILE, 7/1/64 NIN=138 GCN= 3 PCN= 15
AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0487----- 27 CARDS, ADDED MAR 1, 1965 ----------
CA 0 (N,G) 0, CRØS C(EI, ,)BN A/W0487 10/58 0.250-1 1.500+7EV
ALDERMASTØN/WINFRITH DATA FILE, 7/1/64 NIN=138 GCN= 1 PCN=102
AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0488----- 19 CARDS, ADDED MAR 1, 1965 ----------
CA 0 (N,P) 0, CRØS C(EI, ,)BN A/W0488 10/58 0.250-1 1.500+7EV
ALDERMASTØN/WINFRITH DATA FILE, 7/1/64 NIN=138 GCN= 1 PCN=103
AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

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A0489-----  13 CARDS, ADDED MAR 1, 1965 ------------------------------------
     CA  0 (N,A      ) 0,  CRØS C(EI,  ,  )BN A/W0489 10/58 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=138   GCN= 1   PCN=107
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0490-----  71 CARDS, ADDED MAR 1, 1965 ------------------------------------
     CL  0 (N,TØTAL ) 0,  CRØS C(EI,  ,  )BN A/W0490  2/59 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=141   GCN= 1   PCN=  1
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0491-----  71 CARDS, ADDED MAR 1, 1965 ------------------------------------
     CL  0 (N,ELAST ) 0,N CRØS C(EI,  ,  )BN A/W0491  2/59 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=141   GCN= 1   PCN=  2
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0492-----  43 CARDS, ADDED MAR 1, 1965 ------------------------------------
     CL  0 (N,ELAST ) 0,N ANGD P(CC,EI,  )   A/W0492  2/59 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=141   GCN= 2   PCN=  2
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0493-----  71 CARDS, ADDED MAR 1, 1965 ------------------------------------
     CL  0 (N,NØNEL ) 0,  CRØS C(EI,  ,  )BN A/W0493  2/59 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=141   GCN= 1   PCN=  3
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0494-----  17 CARDS, ADDED MAR 1, 1965 ------------------------------------
     CL  0 (N,INELAS)98,N CRØS C(EI,  ,  )BN A/W0494  2/59 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=141   GCN= 1   PCN= 15
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0495-----  10 CARDS, ADDED MAR 1, 1965 ------------------------------------
     CL  0 (N,INELAS)98,N ANGD P(CL,EI,  )   A/W0495  2/59 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=141   GCN= 2   PCN= 15
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0496-----  24 CARDS, ADDED MAR 1, 1965 ------------------------------------
     CL  0 (N,INELAS)98,N ENED P(EI,EF,  )   A/W0496  2/59 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=141   GCN= 3   PCN= 15
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0497-----  11 CARDS, ADDED MAR 1, 1965 ------------------------------------
     CL  0 (N,PAIR  ) 0,N CRØS C(EI,  ,  )BN A/W0497  2/59 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=141   GCN= 1   PCN= 16
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0498-----  15 CARDS, ADDED MAR 1, 1965 ------------------------------------
     CL  0 (N,PAIR  ) 0,N ANGD P(CL,EI,  )   A/W0498  2/59 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=141   GCN= 2   PCN= 16
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0499-----  15 CARDS, ADDED MAR 1, 1965 ------------------------------------
     CL  0 (N,PAIR  ) 0,N ENED P(EI,EF,  )   A/W0499  2/59 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=141   GCN= 3   PCN= 16
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0500-----  60 CARDS, ADDED MAR 1, 1965 ------------------------------------
     CL  0 (N,G      ) 0,  CRØS C(EI,  ,  )BN A/W0500  2/59 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=141   GCN= 1   PCN=102
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL
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A0501-----  71 CARDS, ADDED MAR 1, 1965 ------------------------------------
     CL  0 (N,P      ) 0,  CRØS C(EI,  ,  )BN A/W0501  2/59 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=141   GCN= 1   PCN=103
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0502-----  16 CARDS, ADDED MAR 1, 1965 ------------------------------------
     CL  0 (N,A      ) 0,  CRØS C(EI,  ,  )BN A/W0502  2/59 0.250-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=141   GCN= 1   PCN=107
     AWRE 0-28/60, 3/61, BUCKINGHAM ETAL

A0503-----  48 CARDS, ADDED MAR 1, 1965 ------------------------------------
     ZR  0 (N,TØTAL ) 0,  CRØS C(EI,  ,  )BN A/W0503  5/63 0.250-1 1.700+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=179   GCN= 1   PCN=  1
     AHSB(S)R(62), 1963, P.J.HEMMINGS

A0504-----  48 CARDS, ADDED MAR 1, 1965 ------------------------------------
     ZR  0 (N,ELAST ) 0,N CRØS C(EI,  ,  )BN A/W0504  5/63 0.250-1 1.700+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=179   GCN= 1   PCN=  2
     AHSB(S)R(62), 1963, P.J.HEMMINGS

A0505-----  50 CARDS, ADDED MAR 1, 1965 ------------------------------------
     ZR  0 (N,ELAST ) 0,N ANGD P(CC,EI,  )   A/W0505  5/63 0.250-1 1.700+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=179   GCN= 2   PCN=  2
     AHSB(S)R(62), 1963, P.J.HEMMINGS

A0506-----  48 CARDS, ADDED MAR 1, 1965 ------------------------------------
     ZR  0 (N,NØNEL ) 0,  CRØS C(EI,  ,  )BN A/W0506  5/63 0.250-1 1.700+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=179   GCN= 1   PCN=  3
     AHSB(S)R(62), 1963, P.J.HEMMINGS

A0507-----  21 CARDS, ADDED MAR 1, 1965 ------------------------------------
     ZR  0 (N,INELAS)98,N CRØS C(EI,  ,  )BN A/W0507  5/63 0.250-1 1.700+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=179   GCN= 1   PCN= 15
     AHSB(S)R(62), 1963, P.J.HEMMINGS

A0508-----  10 CARDS, ADDED MAR 1, 1965 ------------------------------------
     ZR  0 (N,INELAS)98,N ANGD P(CL,EI,  )   A/W0508  5/63 0.250-1 1.700+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=179   GCN= 2   PCN= 15
     AHSB(S)R(62), 1963, P.J.HEMMINGS

A0509-----  62 CARDS, ADDED MAR 1, 1965 ------------------------------------
     ZR  0 (N,INELAS)98,N ENED P(EI,EF,  )   A/W0509  5/63 0.250-1 1.700+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=179   GCN= 3   PCN= 15
     AHSB(S)R(62), 1963, P.J.HEMMINGS

A0510-----  13 CARDS, ADDED MAR 1, 1965 ------------------------------------
     ZR  0 (N,PAIR  ) 0,N CRØS C(EI,  ,  )BN A/W0510  5/63 0.250-1 1.700+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=179   GCN= 1   PCN= 16
     AHSB(S)R(62), 1963, P.J.HEMMINGS

A0511-----  15 CARDS, ADDED MAR 1, 1965 ------------------------------------
     ZR  0 (N,PAIR  ) 0,N ANGD P(CL,EI,  )   A/W0511  5/63 0.250-1 1.700+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=179   GCN= 2   PCN= 16
     AHSB(S)R(62), 1963, P.J.HEMMINGS

A0512-----  15 CARDS, ADDED MAR 1, 1965 ------------------------------------
     ZR  0 (N,PAIR  ) 0,N ENED P(EI,EF,  )   A/W0512  5/63 0.250-1 1.700+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=179   GCN= 3   PCN= 16
     AHSB(S)R(62), 1963, P.J.HEMMINGS

A0513-----  48 CARDS, ADDED MAR 1, 1965 ------------------------------------
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      ZR  0 (N,PARABS) 0,  CRØS C(EI,  ,  )BN A/W0513  5/63 0.250-1 1.700+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=179   GCN= 1   PCN=101
      AHSB(S)R(62), 1963, P.J.HEMMINGS

A0514----- 234 CARDS, ADDED MAR 1, 1965 ------------------------------------
      NA 23 (N,TØTAL ) 0,  CRØS C(EI,  ,  )BN A/W0514  6/63 0.100-1 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=182   GCN= 1   PCN=  1
      AEEW R254, 4/63, T.P.MØØRHEAD         ALSØ SØME UNPUBLISHED

A0515----- 234 CARDS, ADDED MAR 1, 1965 ------------------------------------
      NA 23 (N,ELAST ) 0,N CRØS C(EI,  ,  )BN A/W0515  6/63 0.100-1 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=182   GCN= 1   PCN=  2
      AEEW R254, 4/63, T.P.MØØRHEAD         ALSØ SØME UNPUBLISHED

A0516----- 149 CARDS, ADDED MAR 1, 1965 ------------------------------------
      NA 23 (N,ELAST ) 0,N ANGD P(CC,EI,  )   A/W0516  6/63 0.100-1 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=182   GCN= 2   PCN=  2
      AEEW R254, 4/63, T.P.MØØRHEAD         ALSØ SØME UNPUBLISHED

A0517----- 234 CARDS, ADDED MAR 1, 1965 ------------------------------------
      NA 23 (N,NØNEL ) 0,  CRØS C(EI,  ,  )BN A/W0517  6/63 0.100-1 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=182   GCN= 1   PCN=  3
      AEEW R254, 4/63, T.P.MØØRHEAD         ALSØ SØME UNPUBLISHED

A0518----- 128 CARDS, ADDED MAR 1, 1965 ------------------------------------
      NA 23 (N,INELAS) 1,N CRØS C(EI,  ,  )BN A/W0518  6/63 0.100-1 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=182   GCN= 1   PCN=  5
      AEEW R254, 4/63, T.P.MØØRHEAD         ALSØ SØME UNPUBLISHED

A0519-----  10 CARDS, ADDED MAR 1, 1965 ------------------------------------
      NA 23 (N,INELAS) 1,N ANGD P(CC,EI,  )   A/W0519  6/63 0.100-1 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=182   GCN= 2   PCN=  5
      AEEW R254, 4/63, T.P.MØØRHEAD         ALSØ SØME UNPUBLISHED

A0520-----  70 CARDS, ADDED MAR 1, 1965 ------------------------------------
      NA 23 (N,INELAS) 2,N CRØS C(EI,  ,  )BN A/W0520  6/63 0.100-1 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=182   GCN= 1   PCN=  6
      AEEW R254, 4/63, T.P.MØØRHEAD         ALSØ SØME UNPUBLISHED

A0521-----  10 CARDS, ADDED MAR 1, 1965 ------------------------------------
      NA 23 (N,INELAS) 2,N ANGD P(CC,EI,  )   A/W0521  6/63 0.100-1 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=182   GCN= 2   PCN=  6
      AEEW R254, 4/63, T.P.MØØRHEAD         ALSØ SØME UNPUBLISHED

A0522-----  59 CARDS, ADDED MAR 1, 1965 ------------------------------------
      NA 23 (N,INELAS) 3,N CRØS C(EI,  ,  )BN A/W0522  6/63 0.100-1 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=182   GCN= 1   PCN=  7
      AEEW R254, 4/63, T.P.MØØRHEAD         ALSØ SØME UNPUBLISHED

A0523-----  10 CARDS, ADDED MAR 1, 1965 ------------------------------------
      NA 23 (N,INELAS) 3,N ANGD P(CC,EI,  )   A/W0523  6/63 0.100-1 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=182   GCN= 2   PCN=  7
      AEEW R254, 4/63, T.P.MØØRHEAD         ALSØ SØME UNPUBLISHED

A0524-----  49 CARDS, ADDED MAR 1, 1965 ------------------------------------
      NA 23 (N,INELAS) 4,N CRØS C(EI,  ,  )BN A/W0524  6/63 0.100-1 1.500+7EV
      ALDERMASTØN/WINFRITH DATA FILE, 7/1/64     NIN=182   GCN= 1   PCN=  8
      AEEW R254, 4/63, T.P.MØØRHEAD         ALSØ SØME UNPUBLISHED

A0525-----  10 CARDS, ADDED MAR 1, 1965 ------------------------------------
      NA 23 (N,INELAS) 4,N ANGD P(CC,EI,  )   A/W0525  6/63 0.100-1 1.500+7EV
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     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=182   GCN= 2   PCN=  8
     AEEW R254, 4/63, T.P.MØØRHEAD        ALSØ SØME UNPUBLISHED

A0526-----  48 CARDS, ADDED MAR 1, 1965 ----------------------------------
     NA 23 (N,INELAS) 5,N CRØS C(EI,  ,  )BN A/W0526  6/63 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=182   GCN= 1   PCN=  9
     AEEW R254, 4/63, T.P.MØØRHEAD        ALSØ SØME UNPUBLISHED

A0527-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     NA 23 (N,INELAS) 5,N ANGD P(CC,EI,  )   A/W0527  6/63 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=182   GCN= 2   PCN=  9
     AEEW R254, 4/63, T.P.MØØRHEAD        ALSØ SØME UNPUBLISHED

A0528-----  40 CARDS, ADDED MAR 1, 1965 ----------------------------------
     NA 23 (N,INELAS) 6,N CRØS C(EI,  ,  )BN A/W0528  6/63 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=182   GCN= 1   PCN= 10
     AEEW R254, 4/63, T.P.MØØRHEAD        ALSØ SØME UNPUBLISHED

A0529-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     NA 23 (N,INELAS) 6,N ANGD P(CC,EI,  )   A/W0529  6/63 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=182   GCN= 2   PCN= 10
     AEEW R254, 4/63, T.P.MØØRHEAD        ALSØ SØME UNPUBLISHED

A0530-----  14 CARDS, ADDED MAR 1, 1965 ----------------------------------
     NA 23 (N,INELAS) 7,N CRØS C(EI,  ,  )BN A/W0530  6/63 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=182   GCN= 1   PCN= 11
     AEEW R254, 4/63, T.P.MØØRHEAD        ALSØ SØME UNPUBLISHED

A0531-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     NA 23 (N,INELAS) 7,N ANGD P(CC,EI,  )   A/W0531  6/63 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=182   GCN= 2   PCN= 11
     AEEW R254, 4/63, T.P.MØØRHEAD        ALSØ SØME UNPUBLISHED

A0532-----  36 CARDS, ADDED MAR 1, 1965 ----------------------------------
     NA 23 (N,INELAS)98,N CRØS C(EI,  ,  )BN A/W0532  6/63 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=182   GCN= 1   PCN= 15
     AEEW R254, 4/63, T.P.MØØRHEAD        ALSØ SØME UNPUBLISHED

A0533-----  13 CARDS, ADDED MAR 1, 1965 ----------------------------------
     NA 23 (N,INELAS)98,N ANGD P(CL,EI,  )   A/W0533  6/63 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=182   GCN= 2   PCN= 15
     AEEW R254, 4/63, T.P.MØØRHEAD        ALSØ SØME UNPUBLISHED

A0534-----  38 CARDS, ADDED MAR 1, 1965 ----------------------------------
     NA 23 (N,INELAS)98,N ENED P(EI,EF,  )   A/W0534  6/63 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=182   GCN= 3   PCN= 15
     AEEW R254, 4/63, T.P.MØØRHEAD        ALSØ SØME UNPUBLISHED

A0535-----  10 CARDS, ADDED MAR 1, 1965 ----------------------------------
     NA 23 (N,PAIR  ) 0,N CRØS C(EI,  ,  )BN A/W0535  6/63 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=182   GCN= 1   PCN= 16
     AEEW R254, 4/63, T.P.MØØRHEAD        ALSØ SØME UNPUBLISHED

A0536-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------
     NA 23 (N,PAIR  ) 0,N ANGD P(CL,EI,  )   A/W0536  6/63 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=182   GCN= 2   PCN= 16
     AEEW R254, 4/63, T.P.MØØRHEAD        ALSØ SØME UNPUBLISHED

A0537-----  15 CARDS, ADDED MAR 1, 1965 ----------------------------------
     NA 23 (N,PAIR  ) 0,N ENED P(EI,EF,  )   A/W0537  6/63 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=182   GCN= 3   PCN= 16
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     AEEW R254, 4/63, T.P.MØØRHEAD        ALSØ SØME UNPUBLISHED

A0538----- 234 CARDS, ADDED MAR 1, 1965 ------------------------------------
     NA 23 (N,G     ) 0,  CRØS C(EI,  ,  )BN A/W0538  6/63 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=182   GCN= 1   PCN=102
     AEEW R254, 4/63, T.P.MØØRHEAD        ALSØ SØME UNPUBLISHED

A0539-----  36 CARDS, ADDED MAR 1, 1965 ------------------------------------
     NA 23 (N,P     ) 0,  CRØS C(EI,  ,  )BN A/W0539  6/63 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=182   GCN= 1   PCN=103
     AEEW R254, 4/63, T.P.MØØRHEAD        ALSØ SØME UNPUBLISHED

A0540-----  29 CARDS, ADDED MAR 1, 1965 ------------------------------------
     NA 23 (N,A     ) 0,  CRØS C(EI,  ,  )BN A/W0540  6/63 0.100-1 1.500+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=182   GCN= 1   PCN=107
     AEEW R254, 4/63, T.P.MØØRHEAD        ALSØ SØME UNPUBLISHED

A0541-----  35 CARDS, ADDED MAR 1, 1965 ------------------------------------
     CU  0 (N,TØTAL ) 0,  CRØS C(EI,  ,  )BN A/W0541  1/64 0.250-1 1.460+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=186   GCN= 1   PCN=  1
     UNPUBLISHED

A0542-----  35 CARDS, ADDED MAR 1, 1965 ------------------------------------
     CU  0 (N,ELAST ) 0,N CRØS C(EI,  ,  )BN A/W0542  1/64 0.250-1 1.460+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=186   GCN= 1   PCN=  2
     UNPUBLISHED

A0543-----  43 CARDS, ADDED MAR 1, 1965 ------------------------------------
     CU  0 (N,ELAST ) 0,N ANGD P(CC,EI,  )   A/W0543  1/64 0.250-1 1.460+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=186   GCN= 2   PCN=  2
     UNPUBLISHED

A0544-----  35 CARDS, ADDED MAR 1, 1965 ------------------------------------
     CU  0 (N,NØNEL ) 0,  CRØS C(EI,  ,  )BN A/W0544  1/64 0.250-1 1.460+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=186   GCN= 1   PCN=  3
     UNPUBLISHED

A0545-----  13 CARDS, ADDED MAR 1, 1965 ------------------------------------
     CU  0 (N,INELAS)98,N CRØS C(EI,  ,  )BN A/W0545  1/64 0.250-1 1.460+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=186   GCN= 1   PCN= 15
     UNPUBLISHED

A0546-----  10 CARDS, ADDED MAR 1, 1965 ------------------------------------
     CU  0 (N,INELAS)98,N ANGD P(CL,EI,  )   A/W0546  1/64 0.250-1 1.460+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=186   GCN= 2   PCN= 15
     UNPUBLISHED

A0547-----  32 CARDS, ADDED MAR 1, 1965 ------------------------------------
     CU  0 (N,INELAS)98,N ENED P(EI,EF,  )   A/W0547  1/64 0.250-1 1.460+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=186   GCN= 3   PCN= 15
     UNPUBLISHED

A0548-----  10 CARDS, ADDED MAR 1, 1965 ------------------------------------
     CU  0 (N,PAIR  ) 0,N CRØS C(EI,  ,  )BN A/W0548  1/64 0.250-1 1.460+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=186   GCN= 1   PCN= 16
     UNPUBLISHED

A0549-----  15 CARDS, ADDED MAR 1, 1965 ------------------------------------
     CU  0 (N,PAIR  ) 0,N ANGD P(CL,EI,  )   A/W0549  1/64 0.250-1 1.460+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=186   GCN= 2   PCN= 16
     UNPUBLISHED
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A0550-----  67 CARDS, ADDED MAR 1, 1965 ------------------------------------
     CU  0 (N,PAIR  ) 0,N ENED P(EI,EF,  )   A/W0550  1/64 0.250-1 1.460+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=186   GCN= 3   PCN= 16
     UNPUBLISHED

A0551-----  35 CARDS, ADDED MAR 1, 1965 ------------------------------------
     CU  0 (N,G     ) 0,  CRØS C(EI,  ,  )BN A/W0551  1/64 0.250-1 1.460+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=186   GCN= 1   PCN=102
     UNPUBLISHED

A0552-----  12 CARDS, ADDED MAR 1, 1965 ------------------------------------
     CU  0 (N,P     ) 0,  CRØS C(EI,  ,  )BN A/W0552  1/64 0.250-1 1.460+7EV
     ALDERMASTØN/WINFRITH DATA FILE, 7/1/64    NIN=186   GCN= 1   PCN=103
     UNPUBLISHED
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	100	(N,TOTAL)	CROS	A0118
	100	(N,ELAST)	CROS	A0119
	100	(N,ELAST)	ANGD	A0120
	100	(N,NONEL)	CROS	A0121
	100	(N,G)	CROS	A0122
	101	(N,TOTAL)	CROS	A0123
	101	(N,ELAST)	CROS	A0124
	101	(N,ELAST)	ANGD	A0125
	101	(N,NONEL)	CROS	A0126
	101	(N,G)	CROS	A0127
	200	(N,TOTAL)	CROS	A0073
	200	(N,ELAST)	CROS	A0074
	200	(N,ELAST)	ANGD	A0075
	200	(N,NONEL)	CROS	A0076
	200	(N,G)	CROS	A0077
H	1	(N,TOTAL)	CROS	A0088
H	1	(N,ELAST)	CROS	A0089
H	1	(N,ELAST)	ANGD	A0090
H	1	(N,G)	CROS	A0091
H	2	(N,TOTAL)	CROS	A0092
H	2	(N,ELAST)	CROS	A0093
H	2	(N,ELAST)	ANGD	A0094
H	2	(N,NONEL)	CROS	A0095
H	2	(N,PAIR)	CROS	A0096
H	2	(N,PAIR)	ANGD	A0097
H	2	(N,PAIR)	ENED	A0098
H	2	(N,G)	CROS	A0099
H	3	(N,TOTAL)	CROS	A0149
H	3	(N,ELAST)	CROS	A0150
H	3	(N,ELAST)	ANGD	A0151
H	3	(N,NONEL)	CROS	A0152
H	3	(N,PAIR)	CROS	A0153
H	3	(N,PAIR)	ANGD	A0154
H	3	(N,PAIR)	ENED	A0155
H	3	(N,TRIPLE)	CROS	A0156
H	3	(N,TRIPLE)	ANGD	A0157
H	3	(N,TRIPLE)	ENED	A0158
HE	4	(N,TOTAL)	CROS	A0146
HE	4	(N,ELAST)	CROS	A0147
HE	4	(N,ELAST)	ANGD	A0148
BE	9	(N,TOTAL)	CROS	A0078
BE	9	(N,ELAST)	CROS	A0079
BE	9	(N,ELAST)	ANGD	A0080
BE	9	(N,NONEL)	CROS	A0081
BE	9	(N,2NA)	CROS	A0082
BE	9	(N,2NA)	ANGD	A0083
BE	9	(N,2NA)	ENED	A0084
BE	9	(N,G)	CROS	A0085
BE	9	(N,T)	CROS	A0086
BE	9	(N,A)	CROS	A0087
B	0	(N,TOTAL)	CROS	A0329
B	0	(N,ELAST)	CROS	A0330
B	0	(N,ELAST)	ANGD	A0331
B	0	(N,NONEL)	CROS	A0332
B	0	(N,INELAS)	CROS	A0333
B	0	(N,INELAS)	ANGD	A0334
B	0	(N,INELAS)	ENED	A0335
B	0	(N,PARABS)	CROS	A0336
B	10	(N,TOTAL)	CROS	A0305

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B   10 (N,ELAST  ) CROS  A0306
B   10 (N,ELAST  ) ANGD  A0307
B   10 (N,NONEL  ) CROS  A0308
B   10 (N,INELAS) CROS  A0309
B   10 (N,INELAS) ANGD  A0310
B   10 (N,INELAS) ENED  A0311
B   10 (N,PARABS) CROS  A0312
C    0 (N,TOTAL  ) CROS  A0292
C    0 (N,ELAST  ) CROS  A0293
C    0 (N,ELAST  ) ANGD  A0294
C    0 (N,NONEL  ) CROS  A0295
C    0 (N,INELAS) CROS  A0296
C    0 (N,INELAS) ANGD  A0297
C    0 (N,INELAS) ENED  A0298
C    0 (N,N3A    ) CROS  A0299
C    0 (N,N3A    ) ANGD  A0300
C    0 (N,N3A    ) ENED  A0301
C    0 (N,G      ) CROS  A0302
C    0 (N,P      ) CROS  A0303
C    0 (N,A      ) CROS  A0304
N    0 (N,TOTAL  ) CROS  A0313
N    0 (N,ELAST  ) CROS  A0314
N    0 (N,ELAST  ) ANGD  A0315
N    0 (N,NONEL  ) CROS  A0316
N    0 (N,INELAS) CROS  A0317
N    0 (N,INELAS) ANGD  A0318
N    0 (N,INELAS) ENED  A0319
N    0 (N,PAIR   ) CROS  A0320
N    0 (N,PAIR   ) ANGD  A0321
N    0 (N,PAIR   ) ENED  A0322
N    0 (N,G      ) CROS  A0323
N    0 (N,P      ) CROS  A0324
N    0 (N,D      ) CROS  A0325
N    0 (N,T      ) CROS  A0326
N    0 (N,A      ) CROS  A0327
N    0 (N,2A     ) CROS  A0328
O    0 (N,TOTAL  ) CROS  A0459
O    0 (N,ELAST  ) CROS  A0460
O    0 (N,ELAST  ) ANGD  A0461
O    0 (N,INELAS) CROS  A0462
O    0 (N,INELAS) ANGD  A0463
O    0 (N,INELAS) CROS  A0464
O    0 (N,INELAS) ANGD  A0465
O    0 (N,INELAS) CROS  A0466
O    0 (N,INELAS) ANGD  A0467
O    0 (N,INELAS) CROS  A0468
O    0 (N,INELAS) ANGD  A0469
O    0 (N,INELAS) CROS  A0470
O    0 (N,INELAS) ANGD  A0471
O    0 (N,INELAS) ENED  A0472
O    0 (N,PARABS) CROS  A0473
O    0 (N,P      ) CROS  A0474
O    0 (N,D      ) CROS  A0475
O    0 (N,A      ) CROS  A0476
F   19 (N,TOTAL  ) CROS  A0360
F   19 (N,ELAST  ) CROS  A0361
F   19 (N,ELAST  ) ANGD  A0362
F   19 (N,NONEL  ) CROS  A0363
F   19 (N,INELAS) CROS  A0364
F   19 (N,INELAS) ANGD  A0365
F   19 (N,INELAS) ENED  A0366
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F   19 (N,PAIR  ) CROS  A0367
F   19 (N,PAIR  ) ANGD  A0368
F   19 (N,PAIR  ) ENED  A0369
F   19 (N,PARABS) CROS  A0370
NA  23 (N,TOTAL ) CROS  A0514
NA  23 (N,ELAST ) CROS  A0515
NA  23 (N,ELAST ) ANGD  A0516
NA  23 (N,NONEL ) CROS  A0517
NA  23 (N,INELAS) CROS  A0518
NA  23 (N,INELAS) ANGD  A0519
NA  23 (N,INELAS) CROS  A0520
NA  23 (N,INELAS) ANGD  A0521
NA  23 (N,INELAS) CROS  A0522
NA  23 (N,INELAS) ANGD  A0523
NA  23 (N,INELAS) CROS  A0524
NA  23 (N,INELAS) ANGD  A0525
NA  23 (N,INELAS) CROS  A0526
NA  23 (N,INELAS) ANGD  A0527
NA  23 (N,INELAS) CROS  A0528
NA  23 (N,INELAS) ANGD  A0529
NA  23 (N,INELAS) CROS  A0530
NA  23 (N,INELAS) ANGD  A0531
NA  23 (N,INELAS) CROS  A0532
NA  23 (N,INELAS) ANGD  A0533
NA  23 (N,INELAS) ENED  A0534
NA  23 (N,PAIR  ) CROS  A0535
NA  23 (N,PAIR  ) ANGD  A0536
NA  23 (N,PAIR  ) ENED  A0537
NA  23 (N,G     ) CROS  A0538
NA  23 (N,P     ) CROS  A0539
NA  23 (N,A     ) CROS  A0540
AL  27 (N,TOTAL ) CROS  A0403
AL  27 (N,ELAST ) CROS  A0404
AL  27 (N,ELAST ) ANGD  A0405
AL  27 (N,INELAS) CROS  A0406
AL  27 (N,INELAS) ANGD  A0407
AL  27 (N,INELAS) CROS  A0408
AL  27 (N,INELAS) ANGD  A0409
AL  27 (N,INELAS) CROS  A0410
AL  27 (N,INELAS) ANGD  A0411
AL  27 (N,INELAS) CROS  A0412
AL  27 (N,INELAS) ANGD  A0413
AL  27 (N,INELAS) CROS  A0414
AL  27 (N,INELAS) ANGD  A0415
AL  27 (N,INELAS) CROS  A0416
AL  27 (N,INELAS) ANGD  A0417
AL  27 (N,INELAS) CROS  A0418
AL  27 (N,INELAS) ANGD  A0419
AL  27 (N,INELAS) CROS  A0420
AL  27 (N,INELAS) ANGD  A0421
AL  27 (N,INELAS) CROS  A0422
AL  27 (N,INELAS) ANGD  A0423
AL  27 (N,INELAS) CROS  A0424
AL  27 (N,INELAS) ANGD  A0425
AL  27 (N,INELAS) ENED  A0426
AL  27 (N,PAIR  ) CROS  A0427
AL  27 (N,PAIR  ) ANGD  A0428
AL  27 (N,PAIR  ) ENED  A0429
AL  27 (N,G     ) CROS  A0430
AL  27 (N,P     ) CROS  A0431
AL  27 (N,A     ) CROS  A0432
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SI   0 (N,TOTAL  ) CROS  A0382
SI   0 (N,ELAST  ) CROS  A0383
SI   0 (N,ELAST  ) ANGD  A0384
SI   0 (N,NONEL  ) CROS  A0385
SI   0 (N,INELAS) CROS  A0386
SI   0 (N,INELAS) ANGD  A0387
SI   0 (N,INELAS) ENED  A0388
SI   0 (N,G      ) CROS  A0389
SI   0 (N,P      ) CROS  A0390
CL   0 (N,TOTAL  ) CROS  A0490
CL   0 (N,ELAST  ) CROS  A0491
CL   0 (N,ELAST  ) ANGD  A0492
CL   0 (N,NONEL  ) CROS  A0493
CL   0 (N,INELAS) CROS  A0494
CL   0 (N,INELAS) ANGD  A0495
CL   0 (N,INELAS) ENED  A0496
CL   0 (N,PAIR   ) CROS  A0497
CL   0 (N,PAIR   ) ANGD  A0498
CL   0 (N,PAIR   ) ENED  A0499
CL   0 (N,G      ) CROS  A0500
CL   0 (N,P      ) CROS  A0501
CL   0 (N,A      ) CROS  A0502
CA   0 (N,TOTAL  ) CROS  A0480
CA   0 (N,ELAST  ) CROS  A0481
CA   0 (N,ELAST  ) ANGD  A0482
CA   0 (N,NONEL  ) CROS  A0483
CA   0 (N,INELAS) CROS  A0484
CA   0 (N,INELAS) ANGD  A0485
CA   0 (N,INELAS) ENED  A0486
CA   0 (N,G      ) CROS  A0487
CA   0 (N,P      ) CROS  A0488
CA   0 (N,A      ) CROS  A0489
CR   0 (N,TOTAL  ) CROS  A0337
CR   0 (N,ELAST  ) CROS  A0338
CR   0 (N,ELAST  ) ANGD  A0339
CR   0 (N,NONEL  ) CROS  A0340
CR   0 (N,INELAS) CROS  A0341
CR   0 (N,INELAS) ANGD  A0342
CR   0 (N,INELAS) ENED  A0343
CR   0 (N,G      ) CROS  A0344
CR   0 (N,P      ) CROS  A0345
CR   0 (N,A      ) CROS  A0346
FE   0 (N,TOTAL  ) CROS  A0433
FE   0 (N,ELAST  ) CROS  A0434
FE   0 (N,ELAST  ) ANGD  A0425
FE   0 (N,INELAS) CROS  A0436
FE   0 (N,INELAS) ANGD  A0437
FE   0 (N,INELAS) CROS  A0438
FE   0 (N,INELAS) ANGD  A0439
FE   0 (N,INELAS) CROS  A0440
FE   0 (N,INELAS) ANGD  A0441
FE   0 (N,INELAS) CROS  A0442
FE   0 (N,INELAS) ANGD  A0443
FE   0 (N,INELAS) CROS  A0444
FE   0 (N,INELAS) ANGD  A0445
FE   0 (N,INELAS) CROS  A0446
FE   0 (N,INELAS) ANGD  A0447
FE   0 (N,INELAS) CROS  A0448
FE   0 (N,INELAS) ANGD  A0449
FE   0 (N,INELAS) CROS  A0450
FE   0 (N,INELAS) ANGD  A0451
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FE    4 (N,INELAS) ENED   A0452
FE    4 (N,PAIR  ) CROS   A0453
FE    4 (N,PAIR  ) ANGD   A0454
FE    4 (N,PAIR  ) ENED   A0455
FE    4 (N,G     ) CROS   A0456
FE    4 (N,P     ) CROS   A0457
FE    4 (N,A     ) CROS   A0458
NI    6 (N,TOTAL ) CROS   A0347
NI    6 (N,ELAST ) CROS   A0348
NI    6 (N,ELAST ) ANGD   A0349
NI    6 (N,NONEL ) CROS   A0350
NI    6 (N,INELAS) CROS   A0351
NI    6 (N,INELAS) ANGD   A0352
NI    6 (N,INELAS) ENED   A0353
NI    6 (N,PAIR  ) CROS   A0354
NI    6 (N,PAIR  ) ANGD   A0355
NI    6 (N,PAIR  ) ENED   A0356
NI    6 (N,G     ) CROS   A0357
NI    6 (N,P     ) CROS   A0358
NI    6 (N,A     ) CROS   A0359
CU    6 (N,TOTAL ) CROS   A0541
CU    6 (N,ELAST ) CROS   A0542
CU    6 (N,ELAST ) ANGD   A0543
CU    6 (N,NONEL ) CROS   A0544
CU    6 (N,INELAS) CROS   A0545
CU    6 (N,INELAS) ANGD   A0546
CU    6 (N,INELAS) ENED   A0547
CU    6 (N,PAIR  ) CROS   A0548
CU    6 (N,PAIR  ) ANGD   A0549
CU    6 (N,PAIR  ) ENED   A0550
CU    6 (N,G     ) CROS   A0551
CU    6 (N,P     ) CROS   A0552
ZR    6 (N,TOTAL ) CROS   A0503
ZR    6 (N,ELAST ) CROS   A0504
ZR    6 (N,ELAST ) ANGD   A0505
ZR    6 (N,NONEL ) CROS   A0506
ZR    6 (N,INELAS) CROS   A0507
ZR    6 (N,INELAS) ANGD   A0508
ZR    6 (N,INELAS) ENED   A0509
ZR    6 (N,PAIR  ) CROS   A0510
ZR    6 (N,PAIR  ) ANGD   A0511
ZR    6 (N,PAIR  ) ENED   A0512
ZR    6 (N,PARADS) CROS   A0513
CD    6 (N,TOTAL ) CROS   A0371
CD    6 (N,ELAST ) CROS   A0372
CD    6 (N,ELAST ) ANGD   A0373
CD    6 (N,NONEL ) CROS   A0374
CD    6 (N,INELAS) CROS   A0375
CD    6 (N,INELAS) ANGD   A0376
CD    6 (N,INELAS) ENED   A0377
CD    6 (N,PAIR  ) CROS   A0378
CD    6 (N,PAIR  ) ANGD   A0379
CD    6 (N,PAIR  ) ENED   A0380
CD    6 (N,PARADS) CROS   A0381
XE135 (N,TOTAL ) CROS   A0389
XE135 (N,ELAST ) CROS   A0390
XE135 (N,ELAST ) ANGD   A0391
XE135 (N,G     ) CROS   A0392
AU197 (N,PAIR  ) CROS   A0477
AU197 (N,PAIR  ) ANGD   A0478
AU197 (N,G     ) CROS   A0479
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PB    C (N,TOTAL  ) CROS  A0392
PB    C (N,ELAST  ) CROS  A0393
PB    C (N,ELAST  ) ANGD  A0394
PB    C (N,NONEL  ) CROS  A0395
PB    C (N,INELAS) CROS  A0396
PB    C (N,INELAS) ANGD  A0397
PB    C (N,INELAS) ENED  A0398
PB    C (N,PAIR   ) CROS  A0399
PB    C (N,PAIR   ) ANGD  A0400
PB    C (N,PAIR   ) ENED  A0401
PB    C (N,G      ) CROS  A0402
TH232 (N,TOTAL  ) CROS  A0100
TH232 (N,ELAST  ) CROS  A0101
TH232 (N,ELAST  ) ANGD  A0102
TH232 (N,NONEL  ) CROS  A0103
TH232 (N,INELAS) CROS  A0104
TH232 (N,INELAS) ANGD  A0105
TH232 (N,INELAS) ENED  A0106
TH232 (N,PAIR   ) CROS  A0107
TH232 (N,PAIR   ) ANGD  A0108
TH232 (N,PAIR   ) ENED  A0109
TH232 (N,TRIPLE) CROS  A0110
TH232 (N,TRIPLE) ANGD  A0111
TH232 (N,TRIPLE) ENED  A0112
TH232 (N,FISS   ) CROS  A0113
TH232 (N,FISS   ) ANGD  A0114
TH232 (N,FISS   ) ENED  A0115
TH232 (N,FISS   ) NU    A0116
TH232 (N,G      ) CROS  A0117
U 233 (N,TOTAL  ) CROS  A0159
U 233 (N,ELAST  ) CROS  A0160
U 233 (N,ELAST  ) ANGD  A0161
U 233 (N,NONEL  ) CROS  A0162
U 233 (N,INELAS) CROS  A0163
U 233 (N,INELAS) ANGD  A0164
U 233 (N,INELAS) ENED  A0165
U 233 (N,PAIR   ) CROS  A0166
U 233 (N,PAIR   ) ANGD  A0167
U 233 (N,PAIR   ) ENED  A0168
U 233 (N,TRIPLE) CROS  A0169
U 233 (N,TRIPLE) ANGD  A0170
U 233 (N,TRIPLE) ENED  A0171
U 233 (N,FISS   ) CROS  A0172
U 233 (N,FISS   ) ANGD  A0173
U 233 (N,FISS   ) ENED  A0174
U 233 (N,FISS   ) NU    A0175
U 233 (N,G      ) CROS  A0176
U 234 (N,TOTAL  ) CROS  A0207
U 234 (N,ELAST  ) CROS  A0208
U 234 (N,ELAST  ) ANGD  A0209
U 234 (N,NONEL  ) CROS  A0210
U 234 (N,INELAS) CROS  A0211
U 234 (N,INELAS) ANGD  A0212
U 234 (N,INELAS) CROS  A0213
U 234 (N,INELAS) ANGD  A0214
U 234 (N,INELAS) CROS  A0215
U 234 (N,INELAS) ANGD  A0216
U 234 (N,INELAS) CROS  A0217
U 234 (N,INELAS) ANGD  A0218
U 234 (N,INELAS) CROS  A0219
U 234 (N,INELAS) ANGD  A0220
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U 234 (N,INELAS) CROS  A0221
U 234 (N,INELAS) ANGD  A0222
U 234 (N,INELAS) CROS  A0223
U 234 (N,INELAS) ANGD  A0224
U 234 (N,INELAS) ENED  A0225
U 234 (N,PAIR  ) CROS  A0226
U 234 (N,PAIR  ) ANGD  A0227
U 234 (N,PAIR  ) ENED  A0228
U 234 (N,TRIPLE) CROS  A0229
U 234 (N,TRIPLE) ANGD  A0230
U 234 (N,TRIPLE) ENED  A0231
U 234 (N,FISS  ) CROS  A0232
U 234 (N,FISS  ) ANGD  A0233
U 234 (N,FISS  ) ENED  A0234
U 234 (N,FISS  ) NU    A0235
U 234 (N,G     ) CROS  A0236
U 235 (N,TOTAL ) CROS  A0001
U 235 (N,ELAST ) CROS  A0002
U 235 (N,ELAST ) ANGD  A0003
U 235 (N,NONEL ) CROS  A0004
U 235 (N,INELAS) CROS  A0005
U 235 (N,INELAS) ANGD  A0006
U 235 (N,INELAS) ENED  A0007
U 235 (N,INELAS) CROS  A0008
U 235 (N,INELAS) ANGD  A0009
U 235 (N,INELAS) ENED  A0010
U 235 (N,INELAS) CROS  A0011
U 235 (N,INELAS) ANGD  A0012
U 235 (N,INELAS) ENED  A0013
U 235 (N,INELAS) CROS  A0014
U 235 (N,INELAS) ANGD  A0015
U 235 (N,INELAS) ENED  A0016
U 235 (N,INELAS) CROS  A0017
U 235 (N,INELAS) ANGD  A0018
U 235 (N,INELAS) ENED  A0019
U 235 (N,INELAS) CROS  A0020
U 235 (N,INELAS) ANGD  A0021
U 235 (N,INELAS) ENED  A0022
U 235 (N,INELAS) CROS  A0023
U 235 (N,INELAS) ANGD  A0024
U 235 (N,INELAS) ENED  A0025
U 235 (N,PAIR  ) CROS  A0026
U 235 (N,PAIR  ) ANGD  A0027
U 235 (N,PAIR  ) ENED  A0028
U 235 (N,TRIPLE) CROS  A0029
U 235 (N,TRIPLE) ANGD  A0030
U 235 (N,TRIPLE) ENED  A0031
U 235 (N,FISS  ) CROS  A0032
U 235 (N,FISS  ) ANGD  A0033
U 235 (N,FISS  ) ENED  A0034
U 235 (N,FISS  ) NU    A0035
U 235 (N,G     ) CROS  A0036
U 236 (N,TOTAL ) CROS  A0177
U 236 (N,ELAST ) CROS  A0178
U 236 (N,ELAST ) ANGD  A0179
U 236 (N,NONEL ) CROS  A0180
U 236 (N,INELAS) CROS  A0181
U 236 (N,INELAS) ANGD  A0182
U 236 (N,INELAS) CROS  A0183
U 236 (N,INELAS) ANGD  A0184
U 236 (N,INELAS) CROS  A0185
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U 236 (N,INELAS) ANGD A0186
U 236 (N,INELAS) CROS A0187
U 236 (N,INELAS) ANGD A0188
U 236 (N,INELAS) CROS A0189
U 236 (N,INELAS) ANGD A0190
U 236 (N,INELAS) CROS A0191
U 236 (N,INELAS) ANGD A0192
U 236 (N,INELAS) CROS A0193
U 236 (N,INELAS) ANGD A0194
U 236 (N,INELAS) ENED A0195
U 236 (N,PAIR) CROS A0196
U 236 (N,PAIR) ANGD A0197
U 236 (N,PAIR) ENED A0198
U 236 (N,TRIPLE) CROS A0199
U 236 (N,TRIPLE) ANGD A0200
U 236 (N,TRIPLE) ENED A0201
U 236 (N,FISS) CROS A0202
U 236 (N,FISS) ANGD A0203
U 236 (N,FISS) ENED A0204
U 236 (N,FISS) NU A0205
U 236 (N,G) CROS A0206
U 238 (N,TOTAL) CROS A0037
U 238 (N,ELAST) CROS A0038
U 238 (N,ELAST) ANGD A0039
U 238 (N,KONEL) CROS A0040
U 238 (N,INELAS) CROS A0041
U 238 (N,INELAS) ANGD A0042
U 238 (N,INELAS) ENED A0043
U 238 (N,INELAS) CROS A0044
U 238 (N,INELAS) ANGD A0045
U 238 (N,INELAS) ENED A0046
U 238 (N,INELAS) CROS A0047
U 238 (N,INELAS) ANGD A0048
U 238 (N,INELAS) ENED A0049
U 238 (N,INELAS) CROS A0050
U 238 (N,INELAS) ANGD A0051
U 238 (N,INELAS) ENED A0052
U 238 (N,INELAS) CROS A0053
U 238 (N,INELAS) ANGD A0054
U 238 (N,INELAS) ENED A0055
U 238 (N,INELAS) CROS A0056
U 238 (N,INELAS) ANGD A0057
U 238 (N,INELAS) ENED A0058
U 238 (N,INELAS) CROS A0059
U 238 (N,INELAS) ANGD A0060
U 238 (N,INELAS) ENED A0061
U 238 (N,PAIR) CROS A0062
U 238 (N,PAIR) ANGD A0063
U 238 (N,PAIR) ENED A0064
U 238 (N,TRIPLE) CROS A0065
U 238 (N,TRIPLE) ANGD A0066
U 238 (N,TRIPLE) ENED A0067
U 238 (N,FISS) CROS A0068
U 238 (N,FISS) ANGD A0069
U 238 (N,FISS) ENED A0070
U 238 (N,FISS) NU A0071
U 238 (N,G) CROS A0072
NP237 (N,FISS) CROS A0267
PU239 (N,TOTAL) CROS A0237
PU239 (N,ELAST) CROS A0238
PU239 (N,ELAST) ANGD A0239

PU239 (N,NONEL) CROS A0240
PU239 (N,INELAS) CROS A0241
PU239 (N,INELAS) ANGD A0242
PU239 (N,INELAS) CROS A0243
PU239 (N,INELAS) ANGD A0244
PU239 (N,INELAS) CROS A0245
PU239 (N,INELAS) ANGD A0246
PU239 (N,INELAS) CROS A0247
PU239 (N,INELAS) ANGD A0248
PU239 (N,INELAS) CROS A0249
PU239 (N,INELAS) ANGD A0250
PU239 (N,INELAS) CROS A0251
PU239 (N,INELAS) ANGD A0252
PU239 (N,INELAS) CROS A0253
PU239 (N,INELAS) ANGD A0254
PU239 (N,INELAS) CROS A0255
PU239 (N,INELAS) ANGD A0256
PU239 (N,INELAS) ENED A0257
PU239 (N,PAIR) CROS A0258
PU239 (N,PAIR) ANGD A0259
PU239 (N,PAIR) ENED A0260
PU239 (N,TRIPLE) CROS A0261
PU239 (N,TRIPLE) ANGD A0262
PU239 (N,TRIPLE) ENED A0263
PU239 (N,FISS) CROS A0264
PU239 (N,FISS) ANGD A0265
PU239 (N,FISS) ENED A0266
PU239 (N,FISS) NU A0267
PU239 (N,G) CROS A0268
PU240 (N,TOTAL) CROS A0128
PU240 (N,ELAST) CROS A0129
PU240 (N,ELAST) ANGD A0130
PU240 (N,NONEL) CROS A0131
PU240 (N,INELAS) CROS A0132
PU240 (N,INELAS) ANGD A0133
PU240 (N,INELAS) ENED A0134
PU240 (N,PAIR) CROS A0135
PU240 (N,PAIR) ANGD A0136
PU240 (N,PAIR) ENED A0137
PU240 (N,TRIPLE) CROS A0138
PU240 (N,TRIPLE) ANGD A0139
PU240 (N,TRIPLE) ENED A0140
PU240 (N,FISS) CROS A0141
PU240 (N,FISS) ANGD A0142
PU240 (N,FISS) ENED A0143
PU240 (N,FISS) NU A0144
PU240 (N,G) CROS A0145
PU241 (N,TOTAL) CROS A0269
PU241 (N,ELAST) CROS A0270
PU241 (N,ELAST) ANGD A0271
PU241 (N,NONEL) CROS A0272
PU241 (N,INELAS) CROS A0273
PU241 (N,INELAS) ANGD A0274
PU241 (N,INELAS) ENED A0275
PU241 (N,PAIR) CROS A0276
PU241 (N,PAIR) ANGD A0277
PU241 (N,PAIR) ENED A0278
PU241 (N,TRIPLE) CROS A0279
PU241 (N,TRIPLE) ANGD A0280
PU241 (N,TRIPLE) ENED A0281
PU241 (N,FISS) CROS A0282

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PU241 (N,FISS  ) ANGD   A0283
PU241 (N,FISS  ) ENED   A0284
PU241 (N,FISS  ) NU     A0285
PU241 (N,G     ) CROS   A0286
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**********0533**********