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NEUTRON SPECTRUM MEASUREMENTS FOR RADIATION PROTECTION PURPOSES

D. R. Slaughter, D. W. Rueppel and D. A. Fuess

February 21, 1978

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NEUTRON SPECTRUM MEASUREMENTS FOR RADIATION PROTECTION PURPOSES

ABSTRACT

At LLL we have measured the energy spectra of low-intensity neutron sources used for calibrating personnel neutron dose-rate meters and dosimeters, and for characterizing the neutron fields to which personnel are exposed. This report describes several detector-analyzer systems that will measure in the energy range 50 keV to 20 MeV at intensities from 10^{-1} to 10^5 n/cm²-s. The systems include NE213 and stilbene organic scintillators as well as H₂, ³He, and CH₄ proportional counters. Also described are pulse-height analysis and pulse-shape discrimination systems. An unfolding code, NUTSPEC, reduces the pulse-height data to an absolute differential neutron flux $\phi(E)$ for the above detectors. The code uses

a derivative unfolding method for the scintillation detectors, and for the proportional counters it calculates a response matrix and uses an iterative unfolding method to determine $\phi(E)$. The unfolded flux distribution combined with published conversion factors produces differential neutron dose-equivalent and kerma rates. Spectral segments obtained with different detectors from several measurements merge into a single differential flux spectrum over the range 50 keV to 20 MeV, together with the corresponding differential kerma and neutron dose-equivalent distributions. Also reported are spectrum measurements near ²⁵²Cf and ²³⁸PuBe sources with various moderators.

INTRODUCTION

Biological tissue is damaged by neutrons when secondary charged particles are produced by interactions in hydrogen or carbon nuclei, or when gamma rays are produced following the capture of a neutron. The extent and nature of the effect is strongly influenced by the tissue type and the

linear energy transfer (LET) of the secondary charged particles produced. To infer the biological effect of a neutron exposure, it is necessary to determine the energy spectrum and intensity of a neutron field as well as the type and geometrical distribution of the tissue. It is reasonable

to make general assumptions about the tissue type and geometry for estimation of the effects due to personnel exposures, but the energy spectrum of the neutrons is highly dependent on the source type, shielding, and the environment around the source.

Several approaches may be used to estimate the biological effect of a particular neutron field on tissue exposed to it. The first is to devise a dosimeter or dose-rate-meter whose signal in a neutron field is proportional to the effect that field will have in tissue. Using general assumptions regarding charged particle production at various depths in many organs, the ICRP has proposed a guideline for the neutron dose-energy response for the whole body.¹ Several devices have been developed whose output due to neutron exposures approximates the prescribed dose-energy response. However, none of these devices follows the ICRP dose-energy response accurately at all neutron energies.

A second approach involves the direct measurement of the LET spectra produced by secondary charged particles which result from neutron interactions in a tissue-like medium. This work is currently being pursued at LLL and elsewhere, but will not be discussed here.

A third method of inferring biological effect due to a neutron

field is the direct measurement of neutron energy spectra and intensities, followed by calculation of the energy deposition in tissue or by application of an appropriate dose-response relationship as in Ref. 1. The work reported here is directed toward the last method. The Hazards Control Department at LLL has constructed a calibration facility including a low-scatter cell.² There are several neutron sources available to simulate neutron fields of health physics interest, including ²³⁸PuBe and ²⁵²Cf with H₂O, D₂O, CH₂ and aluminum moderators up to 25 cm thick. A neutron generator is also available which produces 2.5- or 14-MeV neutrons. This facility is designed for calibrating neutron and gamma-ray monitoring instruments and dosimeters. Since most neutron monitoring devices have a response which only approximates the guideline dose response in tissue, it may be necessary to determine the neutron energy spectrum at the time of exposure.

Similarly, an Intrinsic Radiation Facility has been constructed at LLL to measure the dose rate and spectra of radiation intrinsically emitted by nuclear weapons and their component parts. As a result of measurements made there, it is possible to forecast the radiation exposure to military personnel during handling and storage of these weapons and the

effect of changes in weapon design, shielding, storage configuration, or proximity of living quarters.

We have measured neutron spectra in both of the facilities described above. These data are being used to assess shielding effects and the response of monitoring instruments, and also for comparing neutron transport calculations and experimental measurements. The measurements serve both to confirm the calculations and to determine the effects of complex geometries not easily simulated in a calculation. Some neutron energy spectrum measurements have been made in the field, and more are anticipated. These measurements are

of interest as a means of verifying shielding calculations and to calibrate the response of various dosimeters used in work areas. One field measurement has already been reported³ using a modified version of the laboratory spectrometer. A transportable system with high neutron sensitivity is now under construction.

The following sections describe the equipment used for laboratory and field measurements, and some of the important considerations in choosing appropriate detectors. The important neutron interactions in each detector are briefly discussed, and finally the data reduction methods used to obtain neutron spectra are described and their success is evaluated.

EQUIPMENT

Neutron spectra in the field or in the facilities described earlier vary greatly in intensity and energy distribution. The intensities of interest range from 0.1 to 10^5 n/cm²s, and the energies range from thermal (0.025 eV) to 20 MeV. Energy resolution must be at least as good as that in the transport calculations for purposes of verification, and should be better if resonances or anti-resonances in shielding materials are important. These requirements are difficult to meet and, as yet, there

is no single detector system which covers the full energy and intensity range of interest.

A number of established methods are used to measure spectra in various regions of the above energy range including:

- Nuclear emulsions
- Threshold detectors using activation foils
- Moderated thermal or threshold detectors
- Time of flight
- Proton recoil spectrometers

- ^3He gas proportional counters
- ^3He or ^6Li semiconductor sandwich detectors.

While several of these methods are used to complement one another at LLL,⁴ only the proton recoil and ^3He gas proportional counter methods will be discussed below. The latter methods are restricted to a fairly narrow useful energy range, but offer the advantages of high sensitivity and good energy resolution.

The system to be described consists of several neutron detectors of different sensitivity and energy range. In combination, they may be used to measure spectra in the range 10 keV to 20 MeV over the whole intensity range described. There are several NE213 liquid scintillation detectors and a variety of ^3He , CH_4 , and H_2 , proportional counters. Spectral segments obtained with these detectors are merged into a mosaic displaying a continuous neutron energy spectrum. Spectra in the range 1-10 keV are not measured routinely since our calculations indicate a small contribution to the dose-equivalent in this range for the fields of interest.

Table 1 contains a list of detectors in the present inventory, and it gives some performance parameters. Generally, the scintillation detectors are used to measure the high-energy portion of a spectrum

and the proportional counters the low-energy part. The scintillation detectors have much higher sensitivity in a given volume than the proportional counters, and may be operated at higher count rates. Thus, they are capable of useful measurements over a much wider range of intensities.

However, only the proportional counters have been found useful at neutron energies below 0.5 MeV. Since the physics principles, mode of operation, and data reduction for the scintillation detectors is fundamentally different from those of proportional counters in this application, the following discussions will consider scintillation and proportional counter measurements separately.

ORGANIC SCINTILLATION DETECTORS - NE213 AND STILBENE

Organic scintillators have been used for many years to measure fast neutron energy spectra, and there are several good reviews of this technique⁵⁻⁷ and many reported measurements.⁸⁻¹⁸ Materials used are generally pure hydrocarbons with maximum possible hydrogen content. Neutrons interact primarily by elastic scattering to produce recoil protons and carbon nuclei. The latter produce a very small scintillation output because: (1) the recoil energy is at most 28% of the neutron energy, and (2) the light output of these scintillators decreases rapidly

Table 1. Detectors used for neutron spectrum measurements.

Detector No.	Scintillators	Energy (MeV)	Energy resolution (%)	Useful neutron intensity (n/cm ² -s)
101	5.08 × 11.4 cm diam NE213	0.5 - 20	7	0.1 - 10 ³
103	7.6 × 3.8 cm diam NE213	0.5 - 20	7	0.5 - 10 ⁴
105	5.08 × 5.08 cm diam NE213	0.5 - 20	7	0.5 - 10 ⁴
104	2.5 × 2.5 cm diam NE213	0.5 - 20	7	5 - 10 ⁵
102	1.3 × 1.3 cm diam NE213	0.5 - 20	7	50 - 10 ⁶
401	1.0 × 1.3 cm diam Stilbene	0.5 - 20	7	50 - 10 ⁶
<u>Proportional counters</u>				
201	20 × 3.8 cm diam 3 atm H ₂	0.01 - 0.8	5	30 - 3000
204	46 × 5.1 cm diam 1 atm H ₂	0.02 - 1.0	5	5 - 500
206	91 × 15.2 cm diam 0.5 atm H ₂	0.02 - 1.0		1 - 100
208	91 × 15.2 cm diam 1 atm H ₂	0.05 - 1.5	5	0.5 - 50
207	91 × 15.2 cm diam 1 atm H ₂ + 1 atm Kr	0.1 - 2.0		0.5 - 50
604	91 × 15.2 cm diam 1 atm CH ₄			0.2 - 25
602	91 × 5.1 cm diam 2 atm CH ₄ + 4 atm Kr	0.5 - 10		0.5 - 50
301	46 × 5.1 cm diam 4 atm ³ He + 3 atm Ar	0.2 - 3.0	6	5 - 500
303	46 × 4.1 cm diam 4 atm ³ He + 3 atm Kr	0.2 - 3.0	6	5 - 500
302	15 × 2.5 cm diam 3 atm ³ He	0.1 - 1.0	4	50 - 5000

as the specific ionization of the charged particle increases, resulting in very small scintillation output due to recoil carbon nuclei.

There are two important difficulties in using these detectors.

First, organic scintillators are sensitive to gamma rays. Photons in the energy range 100 keV-10 MeV interact in the scintillator primarily by Compton scattering. Compton electrons are produced which cause

fluorescence and contribute to the output pulse-height spectrum. Figure 1 shows the light output from NE213 liquid as a function of charged particle energy. Two features are important:

1. Compton electrons at about 1 MeV produce as much light as a recoil proton at 3 MeV. Thus a significant portion of the pulse-height spectrum may be obscured by gamma-ray interactions.
2. The fluorescent output of organic scintillators is dependent not only on the energy deposited by charged particles, but on the specific ionization of those particles. Higher specific ionization results in reduced fluorescence. Thus, light output due to recoil protons is not linear with energy. To analyze recoil protons over the energy range 0.5-20 MeV (dynamic energy range 40:1), pulse height must be analyzed over a dynamic range 300:1.¹⁹ This imposes stringent requirements on the electronics used for pulse-height analysis.

Fortunately, some organic scintillators such as NE213 and Stilbene fluoresce via several de-excitation modes with time constants ranging from a few nanoseconds to a few hun-

dred nanoseconds.²⁰ The relative amplitude for each mode depends on the specific ionization of the charged particle, and thus the shape of the light pulse in time depends on whether the charged particle was an electron or a proton. Pulse-shape discrimination (PSD) is used to distinguish gamma ray and neutron interactions in the scintillator.

The scintillation output is viewed by an RCA 8575 photomultiplier tube whose base is connected as shown in Fig. 2. Several features of this base are important. The linear signal obtained from the 10th dynode is used for pulse-height analysis. Signals obtained nearer the anode were found to be not linear with energy for large-amplitude signals. In addition, the signal at the 10th dynode is linear only as long as the photomultiplier tube is operated at reasonably low gain; i.e., up to about 1600-1700 volts on the anode. Finally, the importance of the high-capacitance bypass capacitors on the last dynodes cannot be over emphasized since the large nonlinear signal at the anode is readily coupled to the 10th dynode through the voltage divider resistors if the dynodes are not adequately bypassed to ground.

Figure 3 shows a block diagram of the pulse processing electronics used. Two functions are carried out

Fig. 1. Light output in NE213 and Stilbene. L_e is the light output due to electrons, L_p the light output due to protons, L_α the light output due to alpha particles, and L_c the light output due to recoil carbon nuclei. Data are taken from Refs. 7 and 19.

Fig. 2. Circuit diagram of PM tube base.

Fig. 3. Block diagram of scintillation spectrometer system.

simultaneously. A signal derived from the anode of the PM tube is analyzed for shape, and a gate signal is generated if the risetime is consistent with that of a neutron event. Another signal derived from the 10th dynode of the RCA 3575 PM tube is amplified and used for pulse-height analysis.

The performance of the system shown is limited at low energies by its ability to distinguish neutron and gamma-ray interactions. At present the useful energy range is 0.5-20 MeV since the pulse-shape discrimination begins to fail for pulses less than about 0.003 of full scale. Similarly, the maximum neutron intensity in which a given detector may be used is limited to approximately 10^5 counts/s above which the PSD system begins to fail. It should also be noted that this count rate limit includes both gamma and neutron interactions so that a high gamma-ray background further reduces the maximum acceptable neutron intensity.

Data acquisition with these detectors requires: (1) establishing suitable pulse-shape discrimination to reject gamma-ray interactions and $^{12}\text{C}(n,\alpha)$ reactions; (2) establishing an energy scale for the detector linear signal; and (3) collection of a pulse-height spectrum from the linear signal available at the 10th

dynode. The energy scale is determined by pulse-height analysis of a gamma-ray spectrum due to ^{22}Na or other simple gamma-ray source. Gamma rays interact in the scintillator to produce a distribution of Compton scattered electrons. The relationship between the light output due to protons and electrons at the same energy is well known,¹⁹ and has been shown in Fig. 1. Recoil proton energies may be determined from the pulse-height distribution due to Compton scattered electrons as follows: The most energetic Compton scattered electrons due to the 1.275-MeV gamma ray emitted by ^{22}Na have energy 1.062 MeV. The 0.511-MeV annihilation photons produce Compton electrons up to 0.341 MeV. These two end-point energies occur as sharp edges in the ^{22}Na pulse-height spectrum shown in Fig. 4. Since the light output produced by energetic electrons is essentially linear with energy as shown in Fig. 1, the fluorescence output, or light unit, is defined in terms of an equivalent electron energy deposition and its value is based on the data of Ref. 19.

One light unit $\equiv$ the light output due to the deposition of 1.19 MeV by an electron.

Thus, any simple gamma-ray source may be used to establish the energy scale

Fig. 4. Pulse-height spectrum due to ^{22}Na gamma rays in NE213. Location of electron edges at 0.341 and 1.062 MeV are shown.

for the pulse-height distribution in light units. Then the relationship displayed in Fig. 1 is used to infer recoil proton energy corresponding to any given pulse height.

GAS PROPORTIONAL COUNTERS — CH_4
AND H_2

Hydrogen and methane proportional counters have been used by many to measure neutron spectra in the energy

range of interest here.²¹⁻³⁹ Good reviews of this technique are given in Refs. 26, 38 and 39. Proton recoils are produced in a hydrogenous gas proportional counter, and these are pulse-height analyzed to infer the neutron spectrum using an unfolding technique described in a later section. The electronics configuration used for this analysis is shown in Fig. 5.

There are a few important limitations on the performance of these detectors. First, the density of hydrogen is a great deal lower than in scintillators for practical gas pressures, and so the neutron sensitivity is much lower (see Table 1) even for very large proportional counters. Second, the charge collection time in a proportional counter is very long, i.e., on the order of 2-10 μ s.⁴⁰ A proportional counter cannot be operated at a high count

rate ($> 10^3$ c/s) and preserve good pulse-height resolution. As a result, the dynamic range is useful neutron intensity is narrow compared to the scintillator. Third, the pulse-height resolution is sensitive to the charge-collection efficiency and diameter of the anode wire in a proportional counter. Attempts to increase detector sensitivity by increasing the gas pressure in the detector generally result in:

(1) Reduced charge collection efficiency due to increased partial pressures of impurities in the gas and increased charge trapping in the primary gas; and (2) a requirement to reduce the anode wire diameter to maintain sufficient gas multiplication at practical anode voltages. Tolerances on the uniformity of anode wire diameter for very thin wires become critical since small variations in diameter cause large variations in

Fig. 5. Block diagram of proportional counter spectrometer system.

gas multiplication and poor resolution.

Finally, the useful energy range of a proportional counter is determined by the stopping power of the gas fill and detector size. At the upper bound, useful spectrum measurements cannot be made when the energy of a recoil proton is so large that its range in the gas exceeds the detector dimensions. At low energies, the pulse-height spectrum is distorted by photoelectron events in the detector walls and gas. Typically, the range of a photoelectron in the gas is long compared to detector dimensions so that energy deposition depends only on stopping power of the gas, its density, and the detector dimensions.

Increasing the gas dimensions or pressure, or introduction of a high-Z stopping gas will extend the useful energy range to more energetic neutrons by allowing analysis of more energetic protons, but this is done at the expense of greater energy deposition by photoelectrons generated in the detector wall. As a result, interference due to gamma-ray interactions obscures a greater portion of the low-energy spectrum.

It is possible to reduce gamma-ray interference by rejecting long risetime events (Refs. 26, 28-30, 32, 35-36, 39-43). However, this technique has not been incorporated into the present system. The additional

complexity associated with this technique does not appear to be warranted in the neutron fields investigated thus far.

We have made some effort to optimize detector dimensions and gas fill for measurements in the energy range 1 keV to 3 MeV. Several proportional counter envelopes have been constructed with an active length of 91 cm and inner diameter of 5.1 and 15.2 cm. Each has a spring-tensioned 0.051-mm-diameter anode wire and a fill tube to allow replacement of the gas. A gas handling system has been constructed (see Fig. 6) which supplies up to 6 atm of H_2 , CH_4 , Ar, Kr, or 3He with less than a few ppm water vapor or oxygen. The importance of removing electro-negative

Fig. 6. Gas handling system used to refill gas proportional counters.

or polar impurities has been discussed before.^{33,44} The arrangement of gas filters and supplies is shown in Fig. 7.

The proper gas fill and detector geometry for a particular measurement is chosen on the basis of the desired sensitivity, energy range, and resolution. Energy resolution is determined by the uniformity of the multiplication process and efficiency of charge collection. Since charge collection efficiency depends on the relative concentration of charge-trapping species and on the number of charge mean-free-paths between anode and cathode, this requirement dictates the lowest possible gas pressure. On the other hand, high sensitivity and good performance at

high energies require higher gas pressures. The rationale used to balance these competing requirements is as follows: Assuming a fixed number of charge mean-free-paths from anode to cathode, the sensitivity of a cylindrical detector is directly proportional to the product of its length and diameter while that of a spherical detector varies as the diameter is squared. This is seen as follows: Note that

$$\lambda \sim \frac{1}{\text{pressure}} . \quad (1)$$

For a cylinder of diameter $2R$ and M mean-free-paths over the anode-cathode distance R ,

$$R = M\lambda \sim \frac{M}{P} , \quad (2)$$

Fig. 7. Schematic of gas handling system used to refill gas proportional counters.

and since

$$\text{sensitivity} \sim PV, \quad (3)$$

then

$$S \sim \frac{M}{R} \pi R^2 L \quad (4)$$

$$\sim MRL. \quad (5)$$

For a spherical detector of diameter $2R$,

$$\text{sensitivity} \sim PV, \quad (6)$$

$$\sim \frac{M}{R} \frac{4}{3} \pi R^3, \quad (7)$$

$$\sim MR^2. \quad (8)$$

It must be noted that the pressure is reduced inversely as the radius in the above calculations. Figure 8 shows a plot of detector sensitivity versus detector radius where it is assumed that the number of mean-free-paths between anode and cathode (represented by the product of pressure and radius) is fixed. Inspection of the figure shows that proportional counters to be used in environmental neutron fields of $1 \text{ n/cm}^2 \text{ s}$ or less must have diameters on the order of 15 cm or larger if the product $P \times R$ is limited to 10 atm-cm. Another important consideration is the fact that a cylindrical proportional counter with $L > 2R$ has greater volume than a spherical detector of the same diameter, and is more

Fig. 8. Proportional counter sensitivity assuming pressure $\times$ radius = 10 atm-cm.

sensitive. However, the spherical detector has an isotropic response while the cylinder does not.

For a given gas fill and detector diameter, the useful energy range is bound at the top by the range of a recoil proton in the gas. When the range is on the order of the detector diameter, the response function becomes complex and the data reduction is difficult. Figure 9 shows proton range for several gasses plotted against energy. The plot is based on the data of Northcliffe⁴⁵ and Parker.⁴⁶ We have observed, as

Fig. 9. Proton range in various gas mixtures as a function of energy.

others have²⁵ that resolution begins to worsen appreciably when the anode-cathode distance exceeds 10-20 atm-cm. Consequently, it is clear from the figure that detectors filled primarily with hydrogen are limited to measurement of low-energy spectra, i.e., below about 1 MeV. Proportional counters for use in the range 1-5 MeV generally include either Kr, CH₄, or both as a stopping gas.

Calibration of the pulse height-energy scale is accomplished by either of two mechanisms. The counter gas fill may contain small amounts of N₂ or ³He which interact with thermal

neutrons according to ¹⁴N(n,p)¹⁴C or ³He(n,p)T. The first reaction produces charged particles depositing about 606 keV, and the second 764 keV. These reactions will produce a peak in the pulse-height spectrum whose location establishes the recoil proton energy scale. Alternatively, the detector gas multiplication may be determined as a function of anode voltage. Then deposition of a known amount of charge on the anode wire by a test pulser will produce a peak in the pulse-height spectrum whose location, together with the detector gas multiplication factor, is used to establish the energy scale. Curves of gas multiplication versus anode voltage have been determined for several detectors. The data were obtained by locating the edge of the proton recoil distribution produced by a monoenergetic neutron source and comparing the pulse height to that produced when a known charge was placed on the anode wire. Figure 10 shows gas multiplication curves for several detectors.

GAS PROPORTIONAL COUNTERS - ³He

³He gas proportional counters are used in a fashion similar to that of CH₄ and H₂ detectors. Good reviews of their characteristics may be found in Refs. 47 and 48. There are two principle neutron interactions of interest: (1) ³He(n,p) which has a

Fig. 10. Gas multiplication factor versus anode voltage for several gas proportional counters.

$Q = +0.764$ MeV, and (2) elastic scattering. As a result of the positive Q for the (n,p) reaction, these pulse-height spectra exhibit a 0.764-MeV bias. Neutrons deposit $E = E_n + 0.764$ MeV. There is no bias for the elastic scattering reaction in which the maximum energy deposition is 75% of the neutron energy. As a result, elastic scattering reactions interfere with the pulse-height spectrum due to (n,p) reactions only at neutron energies greater than $\frac{0.764}{0.75} = 1.02$ MeV. Above that energy, the ^3He recoil distribution complicates the unfolding process, as will be described later.

Little interference due to gamma rays occurs in these detectors because of the 0.764-MeV bias mentioned earlier, and energy scale calibration is accomplished simply by locating the always prominent peak due to thermal neutron capture.

The principle characteristics which limit the use of these detectors are:

- The low-energy performance is limited since a portion of the pulse-height spectrum produced by very low-energy neutrons is obscured by the rather broad peak produced by thermal neutrons. For a resolution of 5%, the thermal peak is $0.05 \times 764 = 38$ keV wide, and thus obscures

the lowest 50 keV or so of the neutron spectrum.

- The (n,p) cross section for thermal neutrons is about 5900 barns while that for fast neutrons is on the order of 1 barn. Thus, a small intensity of thermal neutrons may dominate the detector count rate and cause distortion of the pulse-height spectrum due to pulse pile-up.
- At energies above 1.02 MeV, the recoil distribution due to elastic scattering overlaps and interferes with the (n,p) pulse-height distribution. Analysis of recoil events may be suppressed by pulse-shape discrimination,^{49,50} however, this is accomplished at considerable expense in sensitivity, and the resulting lower efficiency is extremely sensitive to small changes in the pulse-shape discriminator.
- The (n,p) cross section falls rapidly above 1 MeV and is exceeded by elastic scattering at about 80 keV.⁵¹
- The upper bound on the useful energy range is limited primarily by the same proton range-versus-detector dimension considerations as were encountered in hydrogenous proportional counters.

DATA REDUCTION TO OBTAIN DIFFERENTIAL NEUTRON SPECTRUM, $\phi(E)$

Three detector types have been described previously. In each case, a pulse-height spectrum is obtained and is related to the neutron spectrum through the pulse-height energy scale and the detector response function. A computer program called NUTSPEC⁵² has been developed which unfolds the detector response functions from the pulse-height spectrum in order to obtain the neutron spectrum. The essential features of the code have been described before,⁵³⁻⁵⁴ but will be briefly summarized here. In the following sections each detector type will be discussed first with regard to the detector response to monoenergetic neutrons, and then with regard to the unfolding strategy used to infer the neutron energy spectrum, $\phi(E)$.

ORGANIC SCINTILLATORS — NE213 AND STILBENE

The principle neutron interaction of interest in the organic scintillator is elastic scattering. This is illustrated schematically in Fig. 11. It is readily shown⁵⁵ that a neutron at energy E_0 , scattering elastically from a nucleus initially at rest,

Fig. 11. Neutron-proton elastic scattering.

will transfer energy ΔE to the target nucleus given by

$$\Delta E = E_0 \left(\frac{2A}{(A+1)^2} \right) (1 - \cos\theta) \quad (9)$$

where $A = \frac{\text{mass of target}}{\text{mass of neutron}}$,

θ = scattering angle measured in the laboratory coordinate system.

In the case where the target is the nucleus of a hydrogen atom in an organic scintillator, $A \approx 1$ and the energy transfer for (n,p) scattering is

$$\Delta E = \frac{1}{2} E_0 (1 - \cos\theta) \quad (10)$$

For neutron energies up to about 10 MeV, (n,p) elastic scattering is spherically symmetric⁵⁵ in the center-of-mass coordinate system. A simple geometric argument shows that the probability distribution of $P(\cos\theta)$ is constant in this case, i.e.,

$$P(\cos\theta) = \text{const} \quad (11)$$

so that the probability distribution of recoil proton energies is constant up to the maximum proton energy,

$E_p = E_0$, from Eq. (10).

$$P(E_0) = \begin{cases} \frac{1}{E_0} & 0 \leq E_p \leq E_0 \\ 0 & E_p > E_0 \end{cases} \quad (12)$$

This distribution is drawn in Fig. 12.

The value of the constant is known since the area of the distribution must be unity. Thus, monoenergetic neutrons at energy E_0 will produce a

Fig. 12. Probability distribution of recoil proton energies due to elastic scattering by neutron at energy E .

recoil proton distribution in which recoil proton energies are equally probable in the range $0 < E_p \leq E_0$. Generalizing this result to the case where there is a continuous spectrum of source neutrons whose intensity is given by $\phi(E_0)$, the recoil proton distribution is obtained by integrating the neutron scattering rate over all source energies which could produce a recoil proton at energy E :

$$P(E) = n_H VT \int_E^\infty \sigma_{np}(E_0) \frac{\phi(E_0) dE_0}{E_0} \quad (13)$$

where V = detector volume (cm^3),
 T = duration of exposure (s),
 n_H = density of target protons (H atoms/ cm^3),
 σ_{np} = n-p elastic scattering cross section (cm^2),

and the recoil proton distribution function $1/E_0$ has been included. Differentiation of Eq. (13) gives

$$\frac{dP(E)}{dE} = \frac{-VTn_H}{E} \sigma_{np}(E) \phi(E) \quad (14)$$

Then solving for $\phi(E)$,

$$\phi(E) = \frac{-E}{VTn_H \sigma_{np}(E)} \frac{dP(E)}{dE} \quad (15)$$

The neutron spectrum is related directly to the first derivative of the proton recoil distribution, $P(E)$. Parameters V and T are determined at the time of measurement while n_H

depends on whether Stilbene or NE213 is selected for the detector. The (n,p) scattering cross section is given by Gammel⁵⁶ as

$$\sigma_{np}(E) = 1.236E + (-1.86 + .09415E + .091199E^2)/E^2 + 1.206E + (-3.22) + .131E^2 \quad (16)$$

where E = neutron energy in MeV,
 σ_{np} = differential scattering cross section in barns.

The factor $\frac{dP(E)}{dE}$ is obtained from the experimental data. A proton energy scale is established as described earlier.

Referring back to Fig. 1, recall that scintillation output due to recoil protons is significantly reduced by their high LET, and is much smaller than that due to electrons of the same energy. The reduction in scintillation output is most severe for low-energy protons so that light output for protons is highly nonlinear. Verbinski¹⁹ has studied the response of NE213, and Swartz and Owen⁷ have tabulated proton scintillation yield in Stilbene. These data were plotted in Fig. 1 and show the scintillation output for electrons as well as alpha particles and recoil carbon nuclei for comparison. To simplify the light-versus-energy

relation for computational purposes, these data have been fitted with B-spline interpolation functions subject to the constraints that the functional form be continuous and its first and second derivatives are continuous. The functions $L_p(E)$ which satisfy these constraints and fit the data over the whole energy range within $\pm 2\%$ are given in Table 2A. The function takes on different parameter values in each of several energy ranges separated by "knots." Each parameter set yields a function which joins smoothly with the function in the adjacent energy regions. Evaluation of $L_p(E)$ at any proton energy yields the scintillation output in light units "L.U." as defined earlier. Functions used to obtain the inverse, i.e., $E(L_p)$, are given in Table 2B.

A detection system with amplification factor g (channels/light unit) and bias X_0 (channel location corresponding to zero scintillation output) will yield a pulse-height spectrum where the relationship between channel number X and proton energy E is

$$X(E) = X_0 + g L_p(E) \quad (17)$$

where X_0 and g are determined by a ²²Na or other gamma-ray calibration as described earlier.

Table 2A. Piecewise polynomial representation of scintillator light output due to protons.

$$L_p(E) = a_0 + a_1 (E-E_0) + \frac{a_2}{2!} (E-E_0)^2 + \frac{a_3}{3!} (E-E_0)^3 \text{ for } E \geq E_0$$

	E_0 (MeV)	$E_{\max}$	a_0	a_1	a_2	a_3
NE213						
	0.100	1.09	6.7729×10^{-3}	6.4924×10^{-2}	2.4964×10^{-1}	-9.9712×10^{-2}
	1.092	3.17	1.7787×10^{-1}	2.6356×10^{-1}	1.5070×10^{-1}	-6.1466×10^{-2}
	3.170	40.0	9.5905×10^{-1}	4.4402×10^{-1}	2.2969×10^{-2}	-1.0129×10^{-3}
Stilbene						
	0.200	1.146	9.3996×10^{-3}	9.4224×10^{-2}	2.1801×10^{-1}	-1.1671×10^{-1}
	1.146	2.59	1.7967×10^{-1}	2.4826×10^{-1}	1.0757×10^{-1}	-2.5032×10^{-2}
	2.592	4.52	6.3824×10^{-1}	3.7759×10^{-1}	7.1395×10^{-2}	-1.6803×10^{-2}
	4.519	15.0	1.4784×10^0	4.8397×10^{-1}	3.5014×10^{-2}	-3.5576×10^{-3}

To obtain $\frac{dP(E)}{dE}$, we note first that

$$P(E) = P(X) \frac{dX}{dE}, \quad (18)$$

then

$$\frac{dP(E)}{dE} = \frac{dP(X)}{dX} \left(\frac{dX}{dE} \right)^2 + P(X) \frac{d^2 X}{dE^2}. \quad (19)$$

Substitution of $X(E)$ from Eq. (17) gives

$$\frac{dP(E)}{dE} = \frac{dP(X)}{dX} \left(k \frac{dL_p(E)}{dE} \right)^2 + P(X) k \frac{d^2 L_p(E)}{dE^2}. \quad (20)$$

The neutron spectrum $\phi(E)$ is obtained from Eqs. (15) and (20):

$$\phi(E) = \frac{1}{n_H} \frac{dL_p(E)}{dE} \left[\frac{dP(X)}{dX} \left(\frac{dL_p(E)}{dE} \right)^2 + P(X) \frac{d^2 L_p(E)}{dE^2} \right] \quad (21)$$

where $P(X)$ = pulse-height spectrum of recoil protons (counts/channel),

$\frac{dP(X)}{dX}$ = slope of the pulse-height spectrum,

$L_p(E)$ = light output given by the piecewise polynomials in Table 2A.

Two important problems remain before a reliable estimate of $\phi(E)$ may be obtained. First, a suitable means must be found to obtain the slope of the pulse-height distribution without amplifying the statistical noise present or distorting the

Table 2B. Piecewise polynomial representation of proton energy for given scintillation light output.

$$E(L_p) = a_0 + a_1 (L_p - L_0) + \frac{a_2}{2!} (L_p - L_0)^2 + \frac{a_3}{3!} (L_p - L_0)^3 + \frac{a_4}{4!} (L_p - L_0)^4 \text{ for } L_p \geq L_0$$

L_0 (Light Units)	$L_{\max}$	a_0	a_1	a_2	a_3	a_4
NE213						
0.006710	0.300	1.0238×10^{-1}	1.2433×10^1	-1.6697×10^2	1.9023×10^3	-9.7458×10^3
0.3004	0.950	1.5637×10^0	4.2897×10^0	-2.8616×10^1	1.8903×10^2	-4.9693×10^2
0.9460	1.92	3.2500×10^0	2.9227×10^0	-1.0137×10^1	4.3826×10^1	-7.3901×10^1
1.9148	3.70	5.2524×10^0	2.4704×10^0	-2.3466×10^0	4.1566×10^0	-3.2480×10^0
3.6894	24.8	8.4722×10^0	1.8257×10^0	-3.5913×10^{-2}	1.3413×10^{-2}	-1.0787×10^{-3}
Stilbene						
0.009400	0.104	2.0000×10^{-1}	9.4015×10^0	-8.5642×10^1	7.7967×10^2	---
0.1043	0.320	8.1770×10^{-1}	4.7348×10^0	-1.1634×10^1	4.4121×10^1	---
0.3129	1.0	1.6294×10^0	3.3173×10^0	-2.4322×10^0	2.6991×10^0	---
1.0430	2.82	3.5783×10^0	2.2609×10^0	-4.6155×10^{-1}	1.9055×10^{-1}	---
2.816	10.0	7.0383×10^0	1.7421×10^0	-1.2367×10^{-1}	2.4282×10^{-2}	---

data. Second, pulse-height spectra must be compensated for distortions due to: (1) recoil protons which do not deposit all of their energy in the sensitive volume of the detector; (2) neutrons which scatter more than once in the detector, producing two or more recoil proton events which are not resolved in time by the detection system; and (3) secondary reactions such as inelastic scattering or (n, α) reactions in carbon.

A suitable digital filter has been designed⁵³ which finds the slope of the pulse-height data. If a parabola is least-squares fitted to $2N+1$ data points, its slope at the midpoint may be obtained by a simple digital filter. The digital filter computes the slope of the pulse-height parabola as follows:

$$\left(\frac{dP}{dX}\right)_k = \sum_{i=1}^N W_i (P_{k+i} - P_{k-i}) \quad (22)$$

where $P_{(k+i)}$ = counts in the $(k+i)$ th bin of the pulse-height distribution.

$$W_i = C_N \quad (23)$$

$$C_N = \frac{1}{2 \sum_{k=1}^N k^2} \quad (24)$$

are the weight functions.

Expanding the width, N , of this filter has the effect of smoothing out statistical noise, but does so at

the expense of resolution loss in the data. One must be cautious since Johnson⁵⁷ has found that sharp edges in the data will produce peaks in the unfolded spectrum whose centroids are shifted toward higher energies.

Some distortions in the pulse-height data may be partially compensated. Loss of proton counts due to multiple scattering of one neutron in a thick detector may be treated by calculating the self attenuation of the detector.⁷ The detector efficiency is effectively reduced by the factor f ,

$$f(aL) = \frac{1 - e^{-aL}}{aL} \quad (25)$$

where L = detector thickness (cm),

$$a = n_H \sigma_H + n_C \sigma_C \quad (26)$$

and

n_H, n_C = atom densities of hydrogen and carbon,

σ_H, σ_C = total cross sections of hydrogen and carbon.

In the work reported here, the carbon cross section is obtained by linear interpolation of the data given in Table 3.

Generally, multiple scattering produces two or more coincident proton events whose scintillation output is summed by the detection system. Thus a distortion occurs, tending to increase the apparent rate of more

Table 3. C(n,n) elastic scattering cross section.

E	σ (barns)	E	σ (barns)
0.0	4.85	6.2	1.1
0.5	3.4	6.3	2.7
1.0	2.7	6.5	1.0
2.7	1.6	7.15	0.75
2.95	3.1	7.7	2.3
3.03	1.0	8.4	1.1
3.5	2.5	10.0	1.2
4.15	1.8	11.0	1.4
4.25	2.1	20.0	1.6
5.32	1.1	40.0	1.1

energetic protons. Countering this effect is the loss of energetic protons which escape the detector active volume before depositing all of their energy. A semi-empirical formula due to Broek and Anderson⁵⁸ has been used with considerable success in those cases where the multiple scatter and escape corrections are not large.

The correction is given below:

$$S(E) = 1 - 0.78 \frac{R_{\max} L}{L} + 0.090 \frac{R_{\max} L}{V} - 0.077 \frac{R_{\max} R}{V} - 0.068 E \quad (27)$$

where

- $R_{\max}$ = range of protons (cm),
- L = detector thickness,
- R = detector radius,
- V = detector volume,

and the range is obtained using the empirical formula⁵⁹

$$\text{Range} = \frac{0.00178}{\rho} (E - 0.119)^{1.815} \quad (28)$$

where ρ = density (g/cm³).

Incorporating these corrections into the expression for $\phi(E)$, Eq. (21), gives:

$$\phi(E) = \frac{1}{\sigma_p n_{\text{sp}}(E)} f(E) S(E) \left[P \frac{dP(E)}{dE} \left(\frac{dL}{dE} \right)^2 + P(E) \left(\frac{d^2 L}{dE^2} \right) \right] \quad (29)$$

This expression is evaluated by the code NUTSPEC when reducing NE213 or Stilbene pulse-height data. All cross-section data are maintained in a parameter library internal to the code. Detector dimensions, elemental composition and density are also maintained within the parameter library and are filed under the appropriate ID number for a particular detector. Reference 52 contains an operating manual for the code.

Generally, it is necessary to divide the energy range 0.5-20 MeV into two segments to maintain an approximately uniform resolution. This is because the bin width or energy width per pulse-height channel varies by nearly a decade over the 0.5- to 20-MeV range due to the highly nonlinear relation between proton energy and scintillation output.

UNCERTAINTY ESTIMATION - SCINTILLATORS

Three sources of uncertainty are considered in the estimation of $\delta\phi(E)$, the uncertainty in spectral intensity. They are: (1) energy calibration errors, (2) statistical errors in pulse-height intensity, and (3) statistical errors in determination of the slope of the pulse-height distribution. These errors are assumed to be independent and are added in quadrature. Then

$$\sigma_{\phi(E)} = \sqrt{(\sigma_{\phi(E)}^2)^2 + (\sigma_{\phi(E)}^2)^2 + (\sigma_{\phi(E)}^2)^2 + (\sigma_{\phi(E)}^2)^2} \quad (30)$$

where

$$\frac{\delta\phi}{\delta E} \approx \frac{\phi(E)}{E}, \quad (31)$$

$$\frac{\delta\phi}{\delta P} = \frac{-E}{n_H TV \sigma_{np}} \frac{g}{fS} \left(\frac{d^2 L_P(E)}{dE^2} \right)^2, \quad (32)$$

$$\frac{\delta\phi}{\delta P^2} = \frac{-E}{n_H TV \sigma_{np}} \frac{g^2}{fS} \left(\frac{dL_P(E)}{dE} \right)^2, \quad (33)$$

and assuming Poisson statistics,

$$(\delta P(X))^2 = P(X), \quad (34)$$

$$(\delta P^2(X_k))^2 = \sum_{i=1}^N w_i^2 (P_{k+1} + P_{k-1}), \quad (35)$$

δE = estimated calibration uncertainty.

The analysis described above has been used to obtain neutron spectra from pulse-height data in a variety of detector systems and a variety of neutron fields. Three phenomena are not included in the foregoing calculation: (1) anisotropy in the n-p scattering, (2) inelastic reactions in carbon, and (3) elastic scattering in carbon.

Anisotropy in the n-p scattering cross section causes less than 10% variation in the differential cross section at 14 and 22.5 MeV.⁵⁹ This has been neglected in the analysis above, although an empirical expression due to Gammel⁵⁶ could be incorporated. Neutrons which scatter inelastically in carbon are neglected here, and caution must be exercised in the interpretation of reduced spectra. Similarly, (n, α) and (n,p) reactions are neglected since their cross sections are less than one-tenth that due to (n,p) scattering at energies up to 20 MeV and have energy thresholds at 6.2 and 13.6

MeV. Nevertheless, caution must be exercised in the interpretation of reduced neutron spectra where the predominant intensity consists of neutrons above 10 MeV. These reactions and their thresholds are listed in Table 4.

A crude attempt is made to remove the effects of neutrons scattered elastically in carbon. Figure 1 shows that the scintillation output due to a recoil ^{12}C nucleus is negligible. However, in a thick detector a neutron which loses up to 28% of its energy scattering elastically in carbon may then produce a proton recoil before leaving the detector. The reduced data then show a continuous distribution of

Table 4. Neutron reactions in ^{12}C .

Reaction	Neutron energy threshold (MeV)
$(n, n'\gamma)$	4.8
(n, α)	6.2
$(n, ^9\text{Be})$	6.2
$(n, n\alpha)$	8.0
(n, p)	13.6
(n, d)	14.8

neutrons ranging in energy from E_0 to $0.72 E_0$ where E_0 is the source energy. This is seen clearly in Fig. 13 where detectors of various thicknesses have been exposed to 2.5- and 14-MeV neutrons and the data have been reduced. Note that the relative intensity of the scattered neutrons increases as the ratio of detector thickness to neutron mean-free-path increases.

In the approach used here, the neutron energy distribution obtained from Eq. (29) is taken as a first approximation to that which would exist in the absence of carbon elastic scattering. Partial compensation for the spectral distortion due to undetected elastic scattering in carbon is accomplished by calculating the energy spectrum of carbon-scattered neutrons and subtracting that from the solution to Eq. (29). This is carried out as follows:

$$\phi(E) = \phi_0(E) - \phi_c(E) \quad (36)$$

where

ϕ_0 = solution to Eq. (29),

ϕ_c = spectral intensity of neutrons elastically scattered by ^{12}C nuclei in the detector.

Fig. 13. Unfolded neutron spectra obtained with several different NE213 detectors exposed to 2.5- and 14-MeV neutrons. (a) 401 at 2.5 MeV, ($R = 0.75$ cm, $L = 1.0$ cm); (b) 102 at 2.5 MeV, ($R = 0.65$ cm, $L = 1.3$ cm); (c) 104 at 2.5 MeV, ($R = 1.27$ cm, $L = 2.54$ cm); (d) 103 at 2.5 MeV, ($R = 1.9$ cm, $L = 7.6$ cm); (e) 105 at 2.5 MeV, ($R = 2.54$ cm, $L = 5.08$ cm); and (f) 101 at 2.5 MeV, ($R = 5.7$ cm, $L = 5.1$ cm).

Fig. 13. Continued. (g) 401 at 14 MeV, (h) 102 at 14 MeV, (i) 104 at 14 MeV, (j) 103 at 14 MeV, (k) 105 at 14 MeV, and (l) 101 at 14 MeV.

An estimate of $\phi_c(E)$ is made by calculating the scattering rate due to the best current estimate of the neutron spectrum, ϕ_0 , i.e.,

$$\phi_c(E) = \int_E^{E'} n_c \sigma_c(E') \left[\frac{1 - \alpha_c(E')}{1 - \alpha_c(E)} \right] K_c(E', E) \phi_0(E') dE' \quad (37)$$

where $\alpha = \left(\frac{A-1}{A+1} \right)^2$,

n_c, σ_c = ^{12}C atom density and elastic scattering cross section,

$\Sigma_T = n_c \sigma_c + n_H \sigma_H$ = total cross section,

$K_c(E', D) dE$ = probability that a neutron scattering elastically in ^{12}C at energy E' will have final energy E such that $E < E' + dE$.

The probability distribution K_c is

obtained from the angular distribution of elastically scattered neutrons in the laboratory and the kinematics given in Eq. (9),

$$K_c(E', E) = \begin{cases} 0 & \text{for } E < \alpha_c E' \\ \frac{P(\cos\theta)}{(1-\alpha_c)E'} & \text{for } \alpha_c E' < E < E' \\ 0 & \text{for } E > E' \end{cases} \quad (38)$$

where $P(\cos\theta)$ = angular distribution in the laboratory and

$$\theta = \cos^{-1} \left[1 - \frac{(A+1)^2}{2A} \left(1 - \frac{E}{E'} \right) \right] \quad (40)$$

The angular distribution, $P(\cos\theta)$ was represented in the form of Legendre polynomials obtained from the LLL ENDF/B neutron cross-section library (1973) due to Howerton.⁶⁰

Figure 14 shows neutron spectra which have been compensated using

Fig. 14. Unfolded neutron spectrum showing the effect of compensation for ^{12}C (n,n) elastic scattering; (a) without compensation, (b) with compensation.

Eqs. (36) and (37). It is clear from the figures that subtraction of neutron intensity due to single scattering in carbon results in incomplete compensation. A complete removal of the effects of detector size can only be obtained by a response function unfolding method. However, the simple derivative unfolding method has been used satisfactorily to reduce data taken near various monoenergetic sources. Results shown in Figs. 13 and 14 are typical. In addition, the integral of these spectra is in good agreement with the total intensity indicated by a calibrated long counter.⁶¹

GAS PROPORTIONAL COUNTERS - CH₄ AND H₂

Reduction of proportional counter pulse-height data is substantially more complex than was the case with organic scintillators. Like the scintillator, the H₂ and CH₄ gas proportional counters are proton recoil devices. However, at normal gas pressures of a few atmospheres, the range of recoil protons is comparable with the detector dimensions at energies of only about 1 MeV. As a result, many recoil protons deposit significant amounts of energy outside the detector sensitive volume, and the pulse-height distribution is distorted.

Several approaches have been used in the past to obtain neutron spectra from proportional counter pulse-height spectra. Some have used derivative unfolding methods^{26,35} with appropriate corrections to the pulse-height data before differentiation, while others use a response matrix unfolding approach.^{24,28,39,62,63} The work described below employs a combination of these two techniques to reduce pulse-height spectra as efficiently as possible.

The data reduction problem for gas proportional counters is defined as follows:

$$P(X) = n_H(T) \left[\int_{E_{\min}}^{E_{\max}} \underbrace{P_{1,n}(X, E) \cdot U(E)}_{F_{1,n}(E)} + n_H(T) \int_{E_{\min}}^{E_{\max}} \underbrace{P_{2,n}(X, E) \cdot U(E)}_{F_{2,n}(E)} \right] dE \quad (41)$$

where

$P(X)$ = experimental-pulse height distribution,

X = energy deposited within detector-sensitive volume (MeV),

n_H = hydrogen atom density within sensitive volume (cm⁻³),

V = sensitive volume (cm³),

T = duration of exposure (s),

$E_{\max}$ = an energy at which the proton range is a low multiple of the detector radius,

σ = n,p elastic scattering cross section (cm²),

ϕ_{low} = neutron spectrum at energies below E_{max} , which is to be determined,

ϕ_{hi} = neutron spectrum at energies above E_{max} , which has already been determined independently,

$R(E, X)dX$ = probability that a neutron scattering in hydrogen at energy E will produce a recoil proton which deposits its energy ϵ within the sensitive volume such that $x < \epsilon < x + dx$.

Reduction of pulse-height data is carried out in the following sequence:

1. Calculate the detector response matrix, R_{hi} , for interactions at energies above E_{max} .
2. Evaluate the second term in Eq. (41); i.e., the high-energy pulse-height response:

$$P_{\text{hi}}(X) = n_H VT \int_{E_{\text{max}}}^{\infty} R_{\text{hi}}(E, X) \sigma(E) \phi_{\text{hi}}(E) dE. \quad (42)$$

3. Subtract the high-energy response from the experimental pulse-height data to obtain the low-energy residual:

$$P_{\text{low}}(X) = P(X) - P_{\text{hi}}(X). \quad (43)$$

4. Calculate the detector response matrix, R_{low} , for interactions at energies below E_{max} .

5. Make an initial estimate of the neutron spectrum, $\phi_{\text{low}}(E)$, using a derivative unfolding method based on Eq. (15).

6. Unfold the low-energy neutron spectrum, $\phi_{\text{low}}(E)$, from the residual:

$$P_{\text{low}}(X) = n_H VT \int_X^{E_{\text{max}}} R_{\text{low}}(E, X) \phi_{\text{low}}(E) dE. \quad (44)$$

using an iterative unfolding procedure to be described below. Details of these calculations are described in the following sections.

High-Energy Response

The pulse-height response of several hydrogen proportional counters to energetic neutrons has been determined empirically. It is assumed here that recoil protons yield a pulse whose amplitude is proportional to the energy deposited within the detector sensitive volume. Figures 15(a) and 15(b) show pulse-height spectra obtained when a hydrogen proportional counter (3atm H_2 , $R = 1.9\text{cm}$, $L = 20\text{cm}$) was irradiated with 2.5- and 14-MeV neutrons. A response of the form

$$R_{\text{hi}}(E, X) = a_0(E) e^{-(a_1(E)X + a_2(E)X^2 + a_3(E)X^3)} \quad (45)$$

where

X = energy deposited within sensitive volume (MeV), and

E = neutron source energy.

fits the data reasonably well.

Fig. 15. Pulse-height distribution, measured with hydrogen proportional counters, due to 14-MeV neutrons (a) and (b); and 2.5-MeV neutrons (c) and (d).

Clearly, the parameters a_0 , a_1 , a_2 and a_3 are functions of the detector construction, the source energy, and the angular distribution of the neutrons incident on the detector. Table 5 contains parameter values at 2.5 and 14 MeV for two detectors irradiated by a point source which illuminated the detector normal to its axis. Unfortunately, the energy dependence of the parameters is not well established by only two data points. Nevertheless, in the absence of measured or calculated responses

at other energies, spectra have been unfolded where the parameters were obtained by linear interpolation between the 2.5- and 14-MeV data points. This procedure could readily lead to serious errors in the estimation of the pulse-height response to neutrons at energies intermediate between 2.5 and 14 MeV. However, this approach has been used in a variety of measurements with two different proportional counters to remove events from the pulse-height spectra due to energetic neutrons. The

Table 5. Proportional counter response to high-energy neutrons.

$$R_{hi}(E, X) = \frac{a_0(E) e^{a_1(E)x + a_2(E)x^2 + a_3(E)x^3}}{\int_0^\infty e^{a_1x + a_2x^2 + a_3x^3} dx}$$

Detector No. 201		Detector No. 208	
(3 atm H ₂ , R = 1.9 cm, L = 25 cm)		(1 atm H ₂ , R = 7.6 cm, L = 91 cm)	
2.5 MeV (radial)	14 MeV (radial)	2.5 MeV (radial)	14 MeV (radial)
a ₀	1.0	1.0	1.0
a ₁	-6.48	-3.75	-6.35
a ₂	7.55	1.502	4.63
a ₃	-5.11	-1.585	-2.034

unfolded results obtained in these measurements are not in good agreement with calculated spectra in every case. However, the estimation of $P_{hi}(X)$ generally merges with the experimental pulse-height spectrum at its high-energy end. The measured and calculated pulse-height intensities at E_{max} agree within a factor of 2 in every case, and generally fall within $\pm 25\%$.

Since the shape of the pulse-height spectra at 2.5 and 14 MeV are very similar, it is assumed here that the relative pulse-height distribution is estimated with greater accuracy than the absolute pulse-height distribution. Consequently, a test is made during the unfolding

process to compare the calculated pulse-height intensity at E_{max} to the measured intensity. The calculated pulse-height distribution, $P_{hi}(X)$, is then renormalized by the ratio of these intensities so that $P_{hi}(X)$ merges with $P(X)$ at the high end in every case. Figure 16 shows a typical pulse-height spectrum together with $P_{hi}(X)$ after renormalization.

Low-Energy Response

A low-energy neutron spectrum, $\phi_{low}(E)$, is obtained by an iterative matrix unfolding method following removal of the pulse-height response to energetic neutrons, as described

Fig. 16. Experimental pulse-height spectrum in hydrogen proportional counter due to $^{238}\text{PuBe}$ source and calculated response to neutrons above E_{max} .

before. The unfolding problem has been reduced to

$$R_{\text{low}}(E, X) = \frac{1}{E}. \quad (47)$$

$$P_{\text{low}}(X) = n_H V \int_X^{E_{\text{max}}} R_{\text{low}}(E, X) \varepsilon(E) \varepsilon_{\text{low}}(E) dE \quad (46)$$

where

$R_{\text{low}}(E, X) dx$ = probability that a recoil proton produced by neutron of energy E will deposit energy ε ($x \leq \varepsilon \leq x+dx$) within the detector sensitive volume.

In an ideal, wall-less detector the response function would be simple; i.e.,

However, there are several important distortions to this simple response function. They are:

- Recoil protons which leave the sensitive volume with significant energy.
- Recoil protons which deposit significant amounts of energy before entering the sensitive volume, such as in end regions of the detector.
- Recoil protons suffering both 1 and 2 above.

- Events depositing energy in a region of the detector where the gas amplification is low or the charge collection is poor; i.e., the pulse-height spectrum may not be identical to the ionization spectrum.

All of the detectors used in this work are long cylinders; i.e., $\frac{L}{R} > 10$. Consequently, the gas amplification and charge collection are reasonably uniform, and the "end volumes" are very small compared to the sensitive volume. In all of the discussions which follow, the ionization distribution and the pulse-height distribution will be considered identical. Only recoil protons which deposit significant amounts of energy in the walls are considered in calculating the detector response function. The analytical functions due to Snidow and Warren⁶⁴ are used to calculate the detector response, distorted by "wall events." A "gaussian" filter is then used to smooth the response. Detector pulse-height response functions are calculated at up to 64 neutron energies. Each energy deposition spectrum constitutes one column of the detector response matrix. Figure 17 shows a typical pulse-height spectrum extending to about 1 MeV and Fig. 18 shows the response matrix calculated to unfold the data. The elements of the response

Fig. 17. Pulse-height distribution due to hydrogen proportional counter (201) exposed to $^{238}\text{PuBe}$ neutron source. Full scale corresponds to 1 MeV deposition.

matrix R_{ji} are defined by (48) below:

$$P_j = \sum_{i=1}^M n_H V T R'_{ji} \Delta X_j \sigma_i \phi_i \Delta E_i \quad (48)$$

where

P_j = number of events counted in bin j of the pulse-height spectrum, $P_{\text{low}}(X)$,

M = number of columns in R' ,

n_H = number of hydrogen atoms in detector sensitive volume (cm^{-3}),

V = detector volume (cm^3),

T = duration of measurement (sec),

ΔX_j = energy width of pulse-height bin j (MeV),

σ_i = n,p elastic scattering cross section at energy E_i (cm^2),

Fig. 18. (a) Proton ionization response matrix, D , for hydrogen proportional counter 201. (b) Ionization response produced by neutrons in a hydrogen proportional counter.

ϕ_i = neutron differential intensity at output bin i
($\text{n/cm}^2\text{-sec-MeV}$),

ΔE_i = energy width of output bin i (MeV),

and $R'_{ji} \Delta X_j$ = probability that a recoil proton produced by a neutron with energy E_i will deposit energy ϵ within detector sensitive volume such that $X_{j-1} < \epsilon < X_j$.

The detector response matrix, R' , may be factored further into an ideal response matrix and a distortion matrix where the pulse-height distribution due to monoenergetic recoil protons is calculated. As mentioned earlier in Eq. (12), the ideal response to monoenergetic neutrons at

energy E in the absence of wall events is:

$$R'_{ji} = \begin{cases} \frac{1}{E_i} & \text{for } X_j \leq E_i \\ 0 & \text{for } X_j > E_i \end{cases} \quad (49)$$

The matrix R'_{ji} then contains the distribution of recoil protons due to monoenergetic neutrons. Define the distortion matrix, D , to be the matrix containing the pulse-height distributions due monoenergetic protons.

If $D_{ji} \Delta X_j$ = probability that a recoil proton of energy E_i will deposit energy ϵ in the detector sensitive volume such that $X_{j-1} < \epsilon < X_j$,

then

$$R'_{ji} = \frac{1}{E_i} \sum_{k=j}^i D_{jk} . \quad (50)$$

Clearly, the ideal response is obtained in the special case where the distortion matrix, D , is just the unit matrix. Generally, the detector response to monoenergetic protons, D , is not a unit matrix at energies of interest here, and it is calculated according to the analytical relations given by Snidow and Warren. For the purposes of that calculation, the ratio of recoil proton range to the detector length and diameter are calculated. The proton range is approximated by polynomials fitted to the range-versus-energy data contained in Ref. 45. Table 6 contains the polynomial coefficients which are used.

Unfolding

Following removal of events from the pulse-height spectrum due to neutrons at energies above $E_{\max}$ and the calculation of the low-energy response matrix R' defined above, the low-energy neutron spectrum is unfolded from Eq. (47) according to the algorithm described below. For ease of calculation, a detector response matrix $\underline{R}$ is defined as follows:

$$\begin{aligned} R_{ji} &= n_H TV \Delta X_j \Delta E_i \sigma_i R'_{ji} \\ &= \frac{n_H VT \Delta X_j \sigma_i \Delta E_i}{E_i} \sum_{k=j}^i D_{jk} . \end{aligned} \quad (51)$$

Then, from Eq. (47), the unfolding problem is that of finding the solution vector $\underline{\phi}$ to the matrix equation,

$$\underline{P} = \underline{R} \underline{\phi} , \quad (52)$$

Table 6. Proton range in gasses.

$R(E) = a_0 + a_1 E + a_2 E^2 + a_3 E^3$ <p>where E = proton energy (MeV) R = range (mg/cm²)</p>				
Gas	a_0	a_1	a_2	a_3
Hydrogen	0.0947	-0.0325	0.602	-0.00691
Helium	0.179	0.586	1.25	-0.0128
Methane				
Argon	-2.79×10^{-5}	3.09	1.83	-0.0256
Krypton	-0.0197	5.16	2.24	-0.0312

given the response matrix $\underline{R}$ and input vector $\underline{P}$. In principal, this problem has a unique solution which may be obtained by the inversion of the response matrix; i.e.,

$$\underline{\phi} = (\underline{R})^{-1} \underline{P} . \quad (53)$$

However, $\underline{R}$ normally contains minor systematic errors and is frequently ill conditioned.⁶⁵ In addition, $\underline{P}$ contains stochastic noise and systematic errors due to the removal of $P_{hi}(X)$. The result is frequently nonphysical and noisy solution vectors, $\underline{\phi}$.^{65,66}

It is claimed, a priori, that the solution vector $\underline{\phi}$ cannot have any negative components; i.e., neutron intensities are non-negative. The approach taken here is to start with a reasonably good first estimate of the low-energy neutron spectrum, and to refine that estimate iteratively until a convergence criterion is satisfied. A first estimate of the low-energy neutron spectrum is obtained using a derivative unfolding method,

$$\phi_0(E) = \frac{-E}{n_H TVG(E)} \frac{dP_{low}(X)}{dX} , \quad (54)$$

where $\frac{dP_{low}(X)}{dX}$ is obtained using a parabolic digital filter described earlier.

A trial pulse-height spectrum corresponding to the first estimate spectrum is then calculated using the response matrix $\underline{R}$ as follows:

$$P_0 = \underline{R} \underline{\phi}_0 . \quad (55)$$

Figure 19 shows a typical calculated pulse-height spectrum P_0 , compared to the experimental data, P_{low} .

A convergence parameter χ^2 is then calculated to determine the adequacy of the current estimate, $\underline{\phi}_0$,

$$\chi^2 = \frac{1}{M} \sum_{i=1}^M \frac{(P_{low}(X_i) - (P_0)_i)^2}{P_{low}(X_i)} . \quad (56)$$

The next estimate of $\underline{\phi}$ is obtained by a multiplicative procedure,

$$(\phi_1)_j = \left[\frac{P_{low}(X_j)}{(P_0)_j} \right] (\phi_0)_j , \quad (57)$$

Fig. 19. Experimental pulse-height spectrum compared to that calculated by refolding initial estimate of neutron spectrum.

followed by calculation of P_1 and its corresponding convergence parameter, x_1^2 . If the value of x_n^2 is less than the value which meets the convergence criteria, then the iterative procedure is stopped and P_N is reported as the solution vector. In the event x_n^2 fails to decrease on four successive iterations, the unfolding is stopped and the most recent P_N is reported with an error indication.

The procedure described above has been used before⁶⁷⁻⁷⁰ to unfold gamma-ray energy distributions. One of its principle advantages is that, since P_i and R_i are non-negative, the solution vector P_N will also be non-negative as long as the initial estimate P_0 is. Secondly, with a suitable initial estimate, the procedure converges very rapidly.

Starting with an initial estimate which gave the P_0 shown in Fig. 19, the unfolding procedure produced a x^2 of 2.3 in only seven iterations. The final P_N is shown in Fig. 20 superimposed on the experimental data.

Error Estimates

Estimates of the uncertainty in spectral intensity are not easily obtained when an iterative procedure such as that above is used. No error matrix is available as in the case of a least-squares fitting procedure or a true response matrix inversion.

Fig. 20. (a) Refolded pulse-height spectrum calculated from estimated spectrum $\phi(E)$ compared to experimental pulse-height spectrum. (b) Unfolded neutron spectrum obtained with a hydrogen proportional counter exposed to $^{238}\text{PuBe}$ neutron source.

No serious effort is made here to estimate the true uncertainty, but some assessment of its lower bound may be made on the basis of the residuals between $P_{\text{low}}(X)$ and P_N .

The output vector, ϕ_N , is accompanied by a convergence vector $\delta\phi_N$ defined by

$$(\delta\phi_N)_j = \frac{P_{low}(X_j) - (P_N)_j}{P_{low}(X_j)} \times \frac{(\phi_N)_j}{1} \quad (58)$$

This vector is not intended to reflect uncertainties in the response matrix, R , or stochastic errors in the pulse-height data, but instead provides some measure of the agreement between P_{low} and P_N over the spectrum.

Tests of the Method

Several measurements have been made where hydrogenous proportional counters have been exposed to nearly monoenergetic neutrons produced by the ${}^7\text{Li}(p,n)$ reaction. Source energy dispersion was about 12 keV. Data at various energies between 23 keV and 1.0 MeV were obtained and unfolded according to the procedure above. The pulse-height data and unfolded spectra are shown in Fig. 21. It was not necessary to remove events due to energetic neutrons from these data. Spectra obtained near energetic sources will be discussed later where the subtraction of $P_{hi}(X)$ is important. All of the spectra shown in Fig. 21 show good energy resolution (except at 23 keV where the

12-keV source dispersion is important) and are relatively free of spurious oscillations. Integration of each spectrum indicates an intensity in good agreement with that measured by a calibrated long counter.⁶¹

GAS PROPORTIONAL COUNTERS — ${}^3\text{He}$

Conceptually, pulse-height data obtained using ${}^3\text{He}$ proportional counters is unfolded in exactly the same way as using the hydrogenous proportional counters; i.e., by calculating the response matrix, making an initial estimate of the neutron spectrum, ϕ_0 , and solving Eq. (52). However, the similarity ends there. The principle reaction of interest is the ${}^3\text{He}(n,p)\text{T}$ reaction with $Q = 0.764$ MeV. An initial estimate of the neutron flux is made assuming there are no other competing reactions and that all proton and triton energy is deposited within the detector sensitive volume. Then,

$$\phi_0(E) = \frac{P(E + 0.764)}{n_{\text{He}} VT \sigma_{np}(E)} \quad (59)$$

where

$P(E)$ = pulse-height distribution (counts/MeV) at energy deposition E ,
 $\sigma_{np}(E)$ = ${}^3\text{He}(n,p)$ reaction cross section.

Fig. 21. Response to monoenergetic neutrons in the energy range 0.025-1.0 MeV. Plots show pulse-height spectra and corresponding unfolded neutron spectra at neutron energies: 25 keV - (a) pulse-height data, (b) unfolded spectrum; 54 keV - (c) pulse-height data, (d) unfolded spectrum; 100 keV - (e) pulse-height data, (f) unfolded spectrum.

Fig. 21. Continued. 250 keV - (g) pulse-height data, (h) unfolded spectrum; 567 keV - (i) pulse-height data, (j) unfolded spectrum.

Unfolding the actual neutron spectrum is complicated by several distortions:

- Many (n,p) reactions produce protons or tritons which deposit some of their energy outside the detector active volume.
- Elastic scattering in ^3He by neutrons at energies above 1.02 MeV produce recoils which interfere with the low-energy

portion of the pulse-height spectrum.

- $^3\text{He}(n,d)$ reactions whose threshold is 4.36 MeV.
- $^3\text{He}(n,pn)$ reactions whose threshold is 7.37 MeV.

An excellent review of these interferences and some of the efforts to deal with them is given by Batchelor and Morrison⁴⁸ and by Bair.⁴⁷

Response Matrix

The calculation of the response matrix to be described here is simpler than some of those used previously;^{47,48,71,72} and seems to be adequate in most cases. Basically, the pulse-height response to mono-energetic neutrons is decomposed into three components. These are illustrated on the pulse-height spectrum shown in Fig. 22. The three components are:

1. Peak due to $^3\text{He}(n,p)$ where charged particles deposit all of their energy in the sensitive volume.
2. Recoil distribution due to $^3\text{He}(n,n')$ elastic scattering.
3. Continuum due to charged particles which deposit significant energy outside the sensitive volume.

The three individual components are calculated, added together, then

Fig. 22. Pulse-height distribution in ^3He detector due to 2.3-MeV neutrons.

smoothed with a gaussian filter to provide a pulse-height response function at each neutron energy; i.e., for each column of the response matrix. Each of the three components has been empirically parameterized⁷³ using experimental pulse-height spectra obtained near monoenergetic sources. The sources were produced by $^7\text{Li}(p,n)$ and $\text{T}(p,n)$ reactions on a van de Graaf accelerator, and were monitored using a calibrated long counter.⁶¹ Parametric descriptions of each component are given below:

$$R(E,x) = R_{\text{peak}}(E,x) + R_{\text{rec}}(E,x) + R_{\text{cont}}(E,x) \quad (60)$$

A peak corresponding to full energy deposition in the sensitive volume by a $^3\text{He}(n,p)$ reaction is represented by a delta function at the proper energy,

$$R_{\text{peak}}(E,x)dx = n_H VT \sigma_{np}(E) \epsilon(E) dx \quad (61)$$

where

n_H = atom density of ^3He (cm^{-3}),

σ_{np} = $^3\text{He}(n,p)$ differential cross section (cm^2),

ϵ = the probability that an (n,p) reaction at energy E will result in full energy deposition within the sensitive volume of the detector.

The efficiency function, ϵ , for two ^3He proportional counters has been measured, and the data are shown in Fig. 23. For each detector, a function of the form

$$\epsilon(E) = \epsilon_0 e^{-\epsilon_1(E+Q) - \epsilon_2(E+Q)^2} \quad (62)$$

has been fitted to the data. The fits are shown for comparison.

Fig. 23. ^3He (n,p) reaction peak efficiency.

The energy distribution of recoil ^3He nuclei produced by elastic scattering is determined by the scattered neutron angular distribution. Although an adequate description of that distribution exists,^{71,72} an empirical method is used here where the recoil distribution is represented by two straight lines, as shown in Fig. 24. The parameters H_H and H_L determine the slope of the distribution over the top portion. Parameters C_L and C_H determine the rate of fall to zero, and are also used to compensate for the fact that a ^3He recoil produces less collected charge in the counter than does an (n,p) reaction depositing the same energy. The recoil response function then takes the form,

$$R_{\text{rec}}(E, X) dx = n_H VT \sigma_s(E) S(E, x) dx \quad (63)$$

where n_H = atom density of ^3He (cm^{-3})
 σ_s = $^3\text{He}(n, n)$ elastic scattering cross section (cm^2)

Fig. 24. Simple representation of ^3He (n,n) recoil distribution.

and

$$S(E, x) = \begin{cases} H_H - \left(\frac{x}{C_L}\right) (H_H - H_L) & \text{for } x \leq C_L \\ H_L \left(\frac{C_H - x}{C_H - C_L}\right) & \text{for } C_L \leq x \leq C_H \end{cases} \quad (64)$$

The parameters are given as a function of neutron energy by

$$C_H = C_0 (1 - \alpha) E, \quad (65)$$

$$\frac{C_L}{C_H} = C_1 + C_2 E + C_3 E^2, \quad (66)$$

$$\frac{H_H}{H_L} = h_1 + h_2 E, \quad (67)$$

$$H_L = \frac{h_0}{\frac{1}{2} C_H \left(1 + \frac{H_H}{H_L} \frac{C_L}{C_H}\right)}. \quad (68)$$

Table 7 gives the parameter values used for two ^3He gas proportional counters. Note that the constant h_0 is the area of the recoil distribution due to a single scattering event.

The continuum distribution obtained in many pulse-height spectra due to monoenergetic neutrons is observed to be nearly exponential up to the point where the continuum joins the gaussian peak at its low-energy side. Figure 25 shows the form of the response assumed here for the continuum due to (n,p) events which deposit significant energy outside the detector active volume. For $X \leq C_L$,

Table 7. ^3He response function parameters.

Parameter	Detector No. 301	Detector No. 303
	(4 atm ^3He , 3 atm Ar) (R = 2.5 cm, L = 46 cm)	(4 atm ^3He , 3 atm Kr) (R = 2.5 cm, L = 46 cm)
ϵ_0	0.95	0.93
ϵ_1	0.356	0.203
ϵ_2	0.0448	0.072
c_0	0.91	0.95
c_1	0.6	0.75
c_2	0.159	0.02
c_3	-0.0212	0
h_0	0.3	0.3
h_1	0.2	0.3
h_2	0	0
δ_1	-0.357	-0.357
δ_2	-0.774	-0.774
δ_3	0.04	0.04
δ_4	-0.015	-0.010
δ_5	0	-0.002
δ_6	0	0
δ_7	0	0
δ_8	0	0
δ_9	0	0
δ_{10}	-1.43	-1.43
δ_{11}	-0.613	-0.613
δ_{12}	0	0
δ_{13}	-0.05	-0.05
δ_{14}	0.0075	0.0075
δ_{15}	0	0

Fig. 25. Simple representation of ^3He pulse-height distribution before smoothing, showing: (a) delta function representation of (n,p) reaction peak; (b) continuum due to incomplete charge collection; and (c) continuum plus ^3He (n,n) recoil distribution.

$$R_{\text{cont}}(E, x) dx = n_H V T \sigma_{np} dx e^{r_1 + r_2(x-C_1) + r_3(x-C_1)^2} \quad (69)$$

where

$$r_1 = \delta_1 + \delta_2 E + \delta_3 E^2 \quad (70)$$

$$r_2 = \delta_4 + \delta_5 E + \delta_6 E^2 \quad (71)$$

$$r_3 = \delta_7 + \delta_8 E + \delta_9 E^2 \quad (72)$$

Parameter values for $\delta_1 - \delta_9$ are also included in Table 7. For energy depositions $x \geq C_1$, the continuum is assumed to fall toward zero with greater slope, so that for $x > C_1$,

$$R_{\text{cont}}(E, x) dx = n_H V T \sigma_{np} dx e^{r_4 + r_5 x} \quad (73)$$

where

$$r_4 = \delta_{10} + \delta_{11} E + \delta_{12} E^2 \quad (74)$$

$$r_5 = \delta_{13} + \delta_{14} E + \delta_{15} E^2 \quad (75)$$

Full-width at half-maximum (FWHM) of the gaussian reaction peak has been measured as a function of energy for two detectors. The data are plotted in Fig. 26. A straight line passing through these data is used to infer the resolution width of the detector response as a function of neutron energy. A gaussian filter of the same width is used to smooth the response function calculated from the three components described above. A smoothed pulse-height response function is calculated for each column of the detector response matrix. Figure 27 displays a response matrix calculated for neutrons up to 2.3 MeV.

Unfolding

An initial estimate of the neutron spectrum is made from Eq. (59). Following this and the calculation of the response matrix, a neutron spectrum is unfolded from the pulse-height data using the same procedure as for hydrogenous proportional counters.

Fig. 26. ^3He detector pulse-height resolution versus neutron energy.

Fig. 27. Response matrix for ^3He proportional counter.

Tests of the Method

A variety of pulse-height spectra have been obtained near neutron sources using $^7\text{Li}(p,n)$ and $\text{T}(p,n)$ reactions. These have been unfolded as described above. Figure 28 shows some typical experimental data and the corresponding neutron spectra. It is clear that most of the interferences described earlier have been properly accommodated by the response matrix in spite of several simplifications. However, at neutron energies of 2 MeV and greater, the recoil distribution is not properly represented by the response matrix, and there remains a small peak in the low-energy spectrum due to the systematic errors in the response matrix.

RESULTS

DISPLAY FORMAT

Neutron spectral data are obtained from experimental pulse-height data using organic scintillators, hydrogenuous gas proportional counters, and ^3He gas proportional counters.

Each detector is useful in a rather narrow portion of the energy range of interest. Spectral segments are obtained using the LLL unfolding code NUTSPEC.⁵² The spectral output from NUTSPEC appears in both graphic and tabulated form. The tabular output

Fig. 28. ^3He proportional counter exposed to monoenergetic neutrons:
 (a) pulse-height spectrum, 268-keV source; (b) unfolded energy spectrum,
 268-keV source; (c) pulse-height spectrum, 567-keV source; (d) unfolded
 energy spectrum, 567-keV source; (e) pulse-height spectrum, 1.2-MeV source;
 and (f) unfolded energy spectrum, 1.2-MeV source.

Fig. 28. Continued. (g) pulse-height spectrum, 2.03-MeV source, (h) unfolded energy spectrum, 2.03-MeV source, and (i) refold pulse-height spectrum compared to experimental data, 2.03-MeV source.

gives spectral intensity, $\phi(E)$, (neutrons/cm²-s-MeV) as well as the uncertainty, $\delta\phi(E)$. In addition, the spectral intensity is multiplied by a neutron dose-equivalent conversion factor⁷⁴ at energy E to obtain the neutron differential dose-equivalent rate, $D(E)$, (mR/hr-MeV) and by a suitable conversion factor⁷⁵ to obtain differential neutron kerma rate, $K(E)$, (erg/g-s-MeV). Finally,

integrals of ϕ , D , and K are given as functions of energy; i.e.,

$$I_{\phi}(E) = \int_E^{\infty} \phi(E') dE'. \quad (76)$$

Graphical data are also given showing the experimental pulse-height data, the refolded pulse-height spectrum compared to the experimental data, the unfolded neutron spectrum $\phi(E)$,

and differential dose-equivalent rate $D(E)$. Spectral segments obtained using several detectors are merged together into a mosaic using an LLL code called RESULTS.⁵²

LABORATORY MEASUREMENTS

A series of measurements has recently been completed in the LLL low-scatter facility.^{2,4} Neutron spectra at 1 and 2 m from sources of ^{252}Cf and $^{238}\text{PuBe}$ were made following the procedures described earlier. Each source was exposed bare, and enclosed by various spherical moderators of H_2O , CH_2 , D_2O , or Al . The results of these measurements are tabulated in Appendix A and plotted in Figs. 29-32.

Differential neutron energy spectra are given in Figs. 29 and 30 for ^{252}Cf and $^{238}\text{PuBe}$ sources, respectively. The integral of these spectra, from Eq. (76), are plotted in Figs. 31 and 32. These measurements may be used to assess the limits on the present methods of spectral determination. All of the spectra exhibit a depression or gap in the 0.5 to 0.8-MeV region which is an instrumental effect. It is caused by the absence of overlap between the useful energy ranges of the H_2 proportional counter and the NE213 detectors. The proportional counter used in these measurements is a low-pressure (1 atm) detector

where wall events predominate above about 0.7 MeV. Scintillation measurements were limited by the very high count rates where PSD was effective only for recoil protons at energies greater than about 0.8-0.9 MeV.

Aside from the gap in these measurements, the measured spectra for unmoderated ^{252}Cf and $^{238}\text{PuBe}$ sources are in good agreement with the work of others.^{76,77} Fission temperature inferred from a Maxwellian fit to the bare ^{252}Cf data in the range 2-10 MeV yields a temperature of 1.40 MeV which is in good agreement with Guenther, *et al.*⁷⁸ who measured 1.42 MeV.

FIELD MEASUREMENTS

Only one measurement has been made outside the laboratory to date.⁷⁹ It was carried out using two large detectors and with the laboratory pulse-processing electronics system. A neutron spectrum was measured over a period of about 16 hours in a neutron field whose total intensity was about $5 \text{ n/cm}^2\text{-s}$ (which produced a dose-equivalent rate of about 0.5 mR/hr). The experience gained from that measurement indicates that spectral data may be obtained at neutron intensities as low as $0.1 \text{ n/cm}^2\text{-s}$ with some sacrifice in statistical accuracy if it is possible to accumulate data over

Fig. 29. Neutron spectra measured 2 m from a ^{252}Cf source. All data are normalized to 1-n/s source intensity. (a) Bare, (b) 25-cm H_2O moderation, (c) 5-cm D_2O , (d) 10-cm D_2O , (e) 15-cm D_2O , and (f) 25-cm D_2O .

Fig. 29. Continued. (g) 20-cm aluminum, (h) 2-cm polyethylene, (i) 5-cm polyethylene, and (j) 10-cm polyethylene.

24-48 hours. Data with good statistics may be obtained during this time period at intensities of $1 \text{ n/cm}^2\text{-s}$.

Spectrometer temperature stability and cosmic-ray background limit the measurement of neutron spectra at low intensities. Stability is important since system drift due to temperature or other variations limit the period

during which good data may be accumulated. Interference due to energetic cosmic-ray protons also become important as neutron intensities decrease. At the present time, a field spectrometer is being built which will monitor a built-in γ ray source to stabilize the system for measurements using organic scintillators.

Fig. 30. Dose-equivalent spectrum at $R=2\text{m}$ for ^{252}Cf integrated from threshold energy E to infinity. Data normalized to 1-n/s source. (a) Bare, (b) 25-cm H_2O moderation, (c) 5-cm D_2O , (d) 10-cm D_2O , (e) 15-cm D_2O , and (f) 25-cm D_2O .

Fig. 30. Continued. (g) 20-cm aluminum, (h) 2-cm polyethylene, (i) 5-cm polyethylene, and (j) 10-cm polyethylene.

CONCLUSIONS

Spectrometer systems for both laboratory and field measurements have been constructed and evaluated. Simple unfolding methods have been investigated and found to be efficient, and quite adequate for dosimetry, shielding, and verification

of theoretical calculations. Hydrogen gas proportional counters have been used routinely for low-energy measurements, while NE213 liquid scintillation detectors have been used for measurements above 1 MeV. These systems have been found

Fig. 31. Neutron spectra measured at R=1M from a $^{238}\text{PuBe}$ neutron source. All data are normalized to 1-n/s source strength. (a) Bare, (b) 25-cm H_2O moderation, (c) 5-cm D_2O , (d) 10-cm D_2O , (e) 15-cm D_2O , and (f) 25-cm D_2O .

Fig. 31. Continued. (g) 20-cm aluminum, (h) 2-cm polyethylene, (i) 5-cm polyethylene, and (j) 10-cm polyethylene.

adequate for the intensity range 10^{-1} to 10^6 $\text{n/cm}^2\text{-s}$ and an energy range nominally 0.05 to 20 MeV.

The most significant problem remaining is that of closing the spectral gap due to the failure of the proportional counter and scintillator responses to overlap. In principle, the ^3He proportional counters should bridge this gap readily. Response functions for several such detectors have been

determined in the range 0.2-4 MeV. However, the large count rate due to thermal neutrons in the fields of interest have caused serious distortions in the response functions due to pulse pile-up in the detector and processing system. As a result, an echo of the thermal peak appears in the pulse-height spectra. Unfolded results have been unreliable in many cases of interest. These detectors may yet prove useful if an

Fig. 32. Dose-equivalent spectra at $R=1\text{M}$ for $^{238}\text{PuBe}$ source, integrated from threshold energy E to infinity. Data normalized to 1-n/s source. (a) Bare, (b) 25-cm H_2O moderation, (c) 5-cm D_2O , (d) 10-cm D_2O , (e) 15-cm D_2O , and (f) 25-cm D_2O .

Fig. 32. Continued. (g) 20-cm aluminum, (h) 2-cm polyethylene, (i) 5-cm polyethylene, and (j) 10-cm polyethylene.

effective thermal neutron shield may be designed for them.

Alternatively, the useful energy range of hydrogen and methane gas proportional counters may be extended to higher energies by introducing a stopping gas or increasing the fill pressure. This work is now in progress. As yet, electronegative impurities introduced during the fill

process limit the performance of high stopping power detectors.

Measurements made thus far have provided enough information about the neutron spectra of interest that shielding and dosimetric conclusions may be drawn. The gap in the measured spectra, although it often occurs in a region of high intensity, is narrow and an estimate of the spectral shape

may be based on transport calculations without introducing large errors. Thus, the methods described here may be implemented to provide a simple and efficient means of neutron spectroscopic measurements. Imple-

mentation on a mini-computer or micro-computer is straightforward, and the quality and completeness of the result has been found adequate for the purposes described in the Introduction.

REFERENCES

1. *Data for Protection Against Ionizing Radiation from External Sources*, ICRP Publication 21 (Pergamon Press, Oxford, 1971).
2. J. V. Boggs, *Neutron Scattering in the Hazards Control Low-Scatter Cell*, Hazards Control Progress Report No. 34, UCRL-50007-69-2 (1969).
3. D. R. Slaughter and D. W. Rueppel, *Environmental Neutron Spectrum Outside the LLL High Intensity 14-MeV Neutron Facility*, Lawrence Livermore Laboratory, Rept. UCRL-78946 (1977).
4. R. V. Griffith, D. R. Slaughter, H. W. Patterson, J. L. Beach, E. G. Frank, D. W. Rueppel and J. C. Fisher, "Multi-Technique Characterization of Neutron Fields from Moderated ^{252}Cf and $^{238}\text{PuBe}$ Sources," IAEA Symp. National and International Standardization of Radiation Dosimetry, Atlanta, Georgia, December 5-9, 1977 (Preprint UCRL-79483).
5. J. Cerny, *Nuclear Spectroscopy and Reactions, Part B* (Academic Press, New York, 1974).
6. H. Schraube, W. Eckl, K. Kolbe and G. Burger, "The Spectrometry of Neutrons with Different Methods," First Symp. Neutron Dosimetry in Biology and Medicine, Neuherberg/Munchen May 15-19, 1972, EUR-4896 d-f-e.
7. C. D. Swartz and G. E. Owen, "Recoil Detection in Scintillators," *Fast Neutron Physics, Part I* (Interscience Publishers, London, 1960).
8. M. J. Coolbaugh, "Fast Neutron Spectroscopy in Aqueous Media Using an NE213 Proton Recoil Neutron Spectrometer System," Nuclear Engineering Dept., University of Kansas, C00-2049-7 (1971).
9. D. W. Jones and M. E. Toms, "A Neutron Spectrometer Using Organic Scintillators," Naval Research Laboratory, Washington, D.C., NRL-7324 (1971).
10. Yu A. Kazanski, A. A. Van'Kov and E. I. Inyutin, *Atomic Energy Rev.* 13, ISS 4, 807 (1975).

11. W. R. Young, "Neutron Spectra from an Organic Scintillator," University of Calif., UCRL-16149 (1965).
12. M. E. Toms, *Nucl. Instr. Meth.* 92, 61 (1971).
13. R. S. Reynolds, *Trans. Amer. Nucl. Soc.* 19, 419 (1974).
14. R. H. Johnson, B. W. Wehring, J. J. Dorning, "NE-213 Neutron Spectrometry for Measurements to 15 MeV," *Nuclear Cross Sections and Technology*, Vol. I, Proceedings of Conference, National Bureau of Standards, Wash. D.C., March 3-7, 1975.
15. *Time-Dependent Fast Neutron and Secondary Gamma Ray Spectrum Measurements in Concrete*, Gulf General Atomic, San Diego, Calif. DASA-2401-1 (1969).
16. W. Eckl, *Determination of Transfer Matrix of a Scintillation Spectrometer for Neutrons and Deconvolution of Neutron Spectra*, PhD Thesis, Technische Universitat Munchen, Germany (1974).
17. J. L. Butragueno Casada, *Neutron Spectroscopy with Organic Scintillators*, Junta de Energia Nuclear, Madrid, Spain, JEN-249 (1972).
18. J. S. Liu and B. G. Oltman, *Liquid Scintillator Analysis of Neutron Spectra*, Radiological Physics Div. Annual Report July 1969 - June 1970, Argonne National Laboratory, ANL-7760, Part I (1970).
19. V. V. Verbinski, W. R. Burrus, T. A. Love, W. Zobel, N. W. Hill and R. Textor, *Nucl. Instr. Meth.* 65, 8 (1968).
20. F. T. Kuchnir and F. J. Lynch, *IEEE Trans. Nucl. Sci.* NS-15, No. 3, 107 (1968).
21. V. V. Badyayev, Yu A. Yegorov, V. A. Kulagin and Yu. V. Pankratyev, *Voprosy Fiziki Zashchity Reaktorov* No. 6, 152-158 (1974).
22. E. F. Bennett, *A Study of the 1/E Slowing Down Neutron Spectrum Using 4 π Recoil Proportional Counters*, Argonne National Laboratory, ANL-6897 (1964).
23. P. W. Benjamin, C. D. Kemshall and J. Redfearn, *Nucl. Instr. Meth.* 59, 77 (1968).
24. P. W. Benjamin, C. D. Kemshall and A. Brickstock, *The Analysis of Recoil Proton Spectra*, UKAEA, AWRE Re. No. O-9/68 (1968).
25. E. F. Bennett and T. J. Yule, *Nucl. Instr. Meth.* 93, 393 (1972).
26. E. F. Bennett, *Nucl. Sci. Eng.* 27, 16-27 (1967).
27. E. F. Bennett, *Nucl. Sci. Eng.* 27, 28-33 (1967).
28. G. M. Borgonovi and G. E. Bromley, *Proton Recoil Data Analyses at Gulf Radiation Technology*, Gulf-RT-10487 (1971).
29. A. M. Broomfield and M. D. Carter, *Proton Recoil Techniques in Zebra*, UKAEA, AEEW-M905 (1969).

30. A. Capgras, C. Ronteix and M. Sueur, "Spectrometrie de Neutrons et Etalonnage de Sources," First Symp. Neutron Dosimetry in Biology and Medicine, Neuherberg/Munchen, May 15-19, 1972, EUR-4896-d-f-e (1972).
31. G. Fieg, *J. Nucl. Energy* 26, 585 (1972).
32. T. Ichimori, M. Obu, K. Shirakata, *Measuring Fast Neutron Spectra with a Recoil Proton Proportional Counter*, Japan Atomic Energy Research Institute, KURRI-TR-89, 80-86 (1975). Also *Nucl. Instr. Meth.* 127, 571 (1975).
33. D. Albert, H. Koepernik and W. Vogel, *Kernergie* 16, ISS 9, 287 (1973).
34. C. D. Kemshall, *Use of Spherical Proportional Counters for Neutron Measurements*, UKAEA Weapons Group, Aldermaston, AWRE-0-31-73 (1973).
35. C. D. Livengood, C. K. Paulson and H. E. Hungerford, *Nucl. Sci. Eng.* 52, 254-266 (1973).
36. J. E. Powerll and J. W. Mathews, *A Proton Recoil Spectrometer for Neutron Spectrum Measurements in the Sandia Pulsed Reactor-II Facility*, Sandia Laboratories, SC-RR-71 0453 (1971).
37. H. Werle and H. Bluhm, *J. Nucl. Energy* 26, 165 (1971).
38. H. Werle, *Nucl. Instr. Meth.* 99, 295 (1972).
39. V. V. Verbinski and R. Giovanninni, *Nucl. Instr. Meth.* 114, 205 (1973).
40. A. I. M. Ritchie and A. Rose, *Nucl. Instr. Meth.* 127, 237 (1975).
41. E. Mathieson and T. J. Harris, *Nucl. Instr. Meth.* 88, 181 (1970).
42. G. R. Ricker and J. J. Gomes, *Rev. Sci. Instr.* 40, 227 (1968).
43. L. F. Bennett and T. J. Yule, *Techniques and Analyses of Fast Reactor Neutron Spectroscopy with Proton Recoil Proportional Counters*, Argonne National Laboratory, ANL-7763 (1971).
44. B. B. Rossi and H. H. Staub, *Ionization Chambers and Counters* (McGraw-Hill, New York, 1949).
45. L. C. Northcliffe and R. F. Schilling, "Range and Stopping Power Tables for Heavy Ions," *Nuclear Data Tables A7*, 233-463 (1970).
46. J. B. Parker, P. H. White and R. J. Webster, *Nucl. Instr. Meth.* 25, 61 (1963).
47. W. A. Bair, *An Improved Helium-3 Neutron Spectrometer*, Lawrence Berkeley Laboratory, UCRL-96595 (1966).
48. R. Batchelor and G. C. Morrison, "Helium-3 Neutron Spectrometers," *Fast Neutron Physics, Part I*, J. B. Marion, J. L. Fowler, Eds. (Interscience, New York, 1960).

49. A. E. Evans and L. V. East, *Evaluation of a Gridded ^3He Spectrometer Tube for Safeguards and Other Analysis Applications*, Los Alamos Scientific Laboratory, LA-5291-PR (1973).
50. J. Cutler, Y. Dagan and S. Shalev, *Trans. Amer. Nucl. Soc.* 14, 417 (1971).
51. D. I. Garber and R. R. Kinsey, *Neutron Cross Sections Volume II*, BNL-325, Third Ed, Vol II (1976).
52. D. R. Slaughter, *NUTSPEC: A Program for Unfolding Neutron Spectral Data Obtained with Scintillation Detectors and Gas Proportional Counters*, Lawrence Livermore Laboratory, UCID-17713 (1978).
53. D. R. Slaughter, "A Simple Method to Unfold NE213 and Stilbene Neutron Spectral Data," *Radiation Energy Spectra Unfolding*, Oak Ridge National Laboratory, ORNL-RSIC-40 (1976).
54. D. R. Slaughter, "NUTSPEC, A Code for Unfolding Neutron Pulse-Height Data," *Hazards Control Progress Report No. 51*, Lawrence Livermore Laboratory, UCRL-50007-75-2 (1976).
55. A. M. Weinberg and E. P. Wigner, *The Physical Theory of Neutron Chain Reactors* (University of Chicago Press, Chicago, 1958), pp. 279-284.
56. J. L. Gammel, "The n-p Total and Differential Cross Sections in the Energy Range 0-40 MeV," *Fast Neutron Physics Part II*, J. B. Marion and J. L. Fowler, Eds. (Interscience, New York, 1963), page 2209.
57. R. H. Johnson, "Improvements in Differentiation Unfolding of Radiation Spectra," *Radiation Energy Spectra Unfolding*, Oak Ridge National Laboratory, ORNL/RSIC-40 (1976).
58. H. W. Broek and C. E. Anderson, *Rev. Sci. Instr.* 31, 1063 (1960).
59. D. I. Garber, L. G. Stromberg, M. D. Goldberg, D. E. Cullen and V. M. May, *Angular Distributions in Neutron Induced Reactions, Volume I, Z-1 to 20*, Brookhaven National Laboratory, BNL-400, Third Ed. (1970).
60. R. J. Howerton, W. J. Cahill, K. L. Hill, D. W. Thompson and S. T. Perkins, Lawrence Livermore Laboratory, UCRL-50400.
61. D. R. Slaughter and D. W. Rueppel, *Nucl. Instr. Meth.* 145, 315 (1977).
62. W. R. Burrus and V. V. Verbinski, *Nucl. Instr. Meth.* 67, 181 (1969).
63. H. Werle, *Spectrum Measurements of Radioactive Neutron Sources in the 10 keV-10 MeV Energy Region with Proton Recoil Proportional Counters*, Karlsruhe Nuclear Research Center, INR-4170-25 (1970) (Transl. ORNL-TR-2415).
64. N. L. Snidow and H. D. Warren, *Nucl. Instr. Meth.* 51, 109 (1966).

65. B. W. Rust, "Mathematical Foundations Underlying the Burrus Techniques of Spectra Unfolding," *Radiation Spectra Unfolding*, ORNL/RSIC-40 (1976).
66. W. R. Burrus, "FERD and FERDO Type Unfolding Codes," *Radiation Spectra Unfolding*, Oak Ridge National Laboratory, ORNL/RSIC-40 (1976).
67. N. E. Scofield, "A Technique for Unfolding Gamma-Ray Scintillation Spectrometer Pulse-Height Distributions," U.S. Naval Radiological Defense Laboratory, USNRDL-TR-447 (1960).
68. C. V. Smith and N. E. Scofield, *A Computer Program for Unfolding Pulse-Height Distributions*, U.S. Naval Radiological Defense Laboratory, USNRDL-TR-829 (1965).
69. W. J. O'Connell, *A Computer Program for Unfolding Detector Response Effects from a Continuous Gamma Ray Spectrum*, Lawrence Livermore Laboratory, UCID-30079 (1973).
70. J. F. Mollenauer, *A Computer Analysis of a Complex Sodium Iodide Gamma Spectra*, Lawrence Livermore Laboratory, UCRL-9748 (1961).
71. W. K. Brown, *Nucl. Instr. Meth.* 26, 1 (1964).
72. H. T. Wang, *Inversion Matrix for a ^3He Fast Neutron Spectrometer*, Lawrence Berkeley Laboratory, UCRL-10770 (1963).
73. D. R. Slaughter, "A Parameterized Pulse-Height Response Matrix for a ^3He Proportional Counter," *Hazards Control Progress Report No. 52*, Lawrence Livermore Laboratory, UCRL-50007-76-1 (1976).
74. *Radiation Protection*, ICRP Publication 21, Pergamon Press, 1971.
75. *Protection Against Neutron Radiation*, National Council on Radiation Protection, NCRP Report No. 38, 1971.
76. W. Meyer, *Trans. Amer. Nucl. Soc.* 19, 480 (1974).
77. A. Kumar and P. S. Nagarajan, *Nucl. Instr. Meth.* 140, 175 (1977).
78. P. Guenther, D. Havel, R. Sjoblom and A. Smith, *A Remark on the Prompt Fission Neutron Spectrum of ^{252}Cf* , Argonne National Laboratory, ANL/NDM-19 (1976).
79. D. R. Slaughter and D. W. Rueppel, "Environmental Neutron Spectrum Outside the LLL High Intensity 14 MeV Neutron Facility," Health Physics Society 22nd Annual Meeting, Atlanta, Georgia, July 3-8, 1977 (Also UCRL-78946).

APPENDIX A — TABULAR RESULTS FOR NEUTRON SPECTRUM MEASUREMENTS NEAR VARIOUS MODERATOR-SOURCE CONFIGURATIONS

Data are given in two forms for each configuration. First, spectral results are given where absolute intensities are normalized to a source strength of 1 n/s. Second, these tabular results are integrated over the 30 energy groups used by MORSE-L to give 30 group results. The first table for each configuration includes the absolute differential intensity ($\text{n/cm}^2\text{s-MeV}$) and its uncertainty (one-sigma). The table also includes differential neutron dose-equivalent rate (mR/hr-MeV) and differential Kerma rate (erg/g-s-MeV). Finally, the table shows the integrals $\int_E^\infty \phi(E')dE'$ and $\int_E^\infty D(E')dE'$. The second table for each configuration gives, for each group:

- The differential flux $\phi(E)$, averaged over the group.
- The group flux, i.e., $\phi(E)$ integrated over the group.
- The differential flux per unit lethargy $\phi(U) = E \phi(E)$, averaged over each group.

CF-252 BARE AT R=2M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING
 10/18/77U 09:13.04

10:26:57U 10/18/77
 09:13.04

ENERGY (MEV)	PHI (NEUT/CM2-SEC-MEV)	DEL-PHI	DOSE (MR/HR-MEV)	KERMA (ERG/GM-SEC-MEV)	INTEGRAL (NEUT/CM2-SEC)	INT-DOSE (MR/HR)	FILE-ID
1.799E-01	1.386E-06	6.931E-08	3.689E-08	1.079E-13	3.260E-06	3.595E-07	7060C09S
1.941E-01	1.490E-06	3.549E-08	4.143E-08	1.477E-13	3.240E-06	3.590E-07	7060C09S
2.083E-01	1.598E-06	3.763E-08	4.645E-08	1.327E-13	3.218E-06	3.584E-07	7060C09S
2.225E-01	1.709E-06	3.998E-08	5.186E-08	1.464E-13	3.194E-06	3.577E-07	7060C09S
2.367E-01	1.815E-06	4.265E-08	5.753E-08	1.605E-13	3.169E-06	3.569E-07	7060C09S
2.509E-01	1.907E-06	4.503E-08	6.318E-08	1.742E-13	3.143E-06	3.550E-07	7060C09S
2.651E-01	1.983E-06	4.631E-08	6.861E-08	1.869E-13	3.115E-06	3.531E-07	7060C09S
2.793E-01	2.074E-06	4.697E-08	7.385E-08	2.087E-13	3.087E-06	3.515E-07	7060C09S
2.935E-01	2.170E-06	4.738E-08	7.892E-08	2.084E-13	3.058E-06	3.500E-07	7060C09S
3.077E-01	2.266E-06	4.745E-08	8.270E-08	2.175E-13	3.028E-06	3.482E-07	7060C09S
3.219E-01	2.362E-06	4.725E-08	8.688E-08	2.258E-13	2.998E-06	3.457E-07	7060C09S
3.361E-01	2.458E-06	4.690E-08	9.099E-08	2.337E-13	2.968E-06	3.429E-07	7060C09S
3.503E-01	2.554E-06	4.653E-08	9.510E-08	2.413E-13	2.938E-06	3.401E-07	7060C09S
3.645E-01	2.650E-06	4.618E-08	9.932E-08	2.491E-13	2.908E-06	3.372E-07	7060C09S
3.787E-01	2.746E-06	4.581E-08	1.037E-07	2.571E-13	2.878E-06	3.345E-07	7060C09S
3.929E-01	2.842E-06	4.545E-08	1.084E-07	2.655E-13	2.848E-06	3.317E-07	7060C09S
4.072E-01	2.938E-06	4.518E-08	1.135E-07	2.747E-13	2.818E-06	3.290E-07	7060C09S
4.214E-01	3.034E-06	4.503E-08	1.189E-07	2.845E-13	2.788E-06	3.262E-07	7060C09S
4.356E-01	3.130E-06	4.501E-08	1.248E-07	2.952E-13	2.759E-06	3.234E-07	7060C09S
4.498E-01	3.226E-06	4.508E-08	1.318E-07	3.067E-13	2.727E-06	3.207E-07	7060C09S
4.640E-01	3.322E-06	4.517E-08	1.381E-07	3.186E-13	2.697E-06	3.180E-07	7060C09S
4.782E-01	3.418E-06	4.525E-08	1.451E-07	3.311E-13	2.666E-06	3.153E-07	7060C09S
4.924E-01	3.514E-06	4.525E-08	1.523E-07	3.435E-13	2.635E-06	3.126E-07	7060C09S
5.066E-01	3.610E-06	4.512E-08	1.573E-07	3.521E-13	2.604E-06	3.099E-07	7060C09S
5.208E-01	3.706E-06	4.500E-08	1.627E-07	3.598E-13	2.573E-06	3.072E-07	7060C09S
5.350E-01	3.802E-06	4.448E-08	1.699E-07	3.582E-13	2.542E-06	3.045E-07	7060C09S
5.492E-01	3.898E-06	4.387E-08	1.717E-07	3.569E-13	2.511E-06	3.018E-07	7060C09S
5.634E-01	3.994E-06	4.296E-08	1.616E-07	3.577E-13	2.481E-06	2.991E-07	7060C09S
5.776E-01	4.090E-06	4.181E-08	1.607E-07	3.548E-13	2.451E-06	2.964E-07	7060C09S
5.918E-01	4.186E-06	4.048E-08	1.551E-07	3.501E-13	2.422E-06	2.937E-07	7060C09S
6.060E-01	4.282E-06	3.902E-08	1.566E-07	3.442E-13	2.393E-06	2.910E-07	7060C09S
6.202E-01	4.378E-06	3.753E-08	1.541E-07	3.375E-13	2.366E-06	2.883E-07	7060C09S
6.344E-01	4.474E-06	3.608E-08	1.512E-07	3.300E-13	2.339E-06	2.856E-07	7060C09S
6.486E-01	4.570E-06	3.470E-08	1.478E-07	3.219E-13	2.313E-06	2.829E-07	7060C09S
6.628E-01	4.666E-06	3.323E-08	1.441E-07	3.129E-13	2.288E-06	2.802E-07	7060C09S
6.770E-01	4.762E-06	3.185E-08	1.395E-07	3.039E-13	2.265E-06	2.775E-07	7060C09S
6.912E-01	4.858E-06	3.099E-08	1.351E-07	2.941E-13	2.242E-06	2.748E-07	7060C09S
7.054E-01	4.954E-06	2.925E-08	1.296E-07	2.842E-13	2.220E-06	2.721E-07	7060C09S
7.196E-01	5.050E-06	2.838E-08	1.235E-07	2.743E-13	2.200E-06	2.694E-07	7060C09S
7.338E-01	5.146E-06	2.744E-08	1.167E-07	2.650E-13	2.181E-06	2.667E-07	7060C09S
7.480E-01	5.242E-06	2.644E-08	1.095E-07	2.558E-13	2.163E-06	2.640E-07	7060C09S
7.622E-01	5.338E-06	2.540E-08	1.018E-07	2.468E-13	2.147E-06	2.613E-07	7060C09S
7.764E-01	5.434E-06	2.436E-08	9.345E-08	2.379E-13	2.131E-06	2.586E-07	7120C01LS
7.906E-01	5.530E-06	2.332E-08	8.495E-08	2.289E-13	2.116E-06	2.559E-07	7120C01LS
8.048E-01	5.626E-06	2.228E-08	7.627E-08	2.199E-13	2.101E-06	2.532E-07	7120C01LS
8.190E-01	5.722E-06	2.124E-08	6.759E-08	2.110E-13	2.086E-06	2.505E-07	7120C01LS
8.332E-01	5.818E-06	2.020E-08	5.891E-08	2.021E-13	2.071E-06	2.478E-07	7120C01LS
8.474E-01	5.914E-06	1.916E-08	5.023E-08	1.932E-13	2.056E-06	2.451E-07	7120C01LS
8.616E-01	6.010E-06	1.812E-08	4.155E-08	1.843E-13	2.041E-06	2.424E-07	7120C01LS
8.758E-01	6.106E-06	1.708E-08	3.287E-08	1.754E-13	2.026E-06	2.397E-07	7120C01LS
8.900E-01	6.202E-06	1.604E-08	2.419E-08	1.665E-13	2.011E-06	2.370E-07	7120C01LS
9.042E-01	6.298E-06	1.500E-08	1.551E-08	1.576E-13	2.000E-06	2.343E-07	7120C01LS
9.184E-01	6.394E-06	1.396E-08	6.686E-08	1.487E-13	1.985E-06	2.316E-07	7120C01LS
9.326E-01	6.490E-06	1.292E-08	3.348E-08	1.398E-13	1.970E-06	2.289E-07	7120C01LS
9.468E-01	6.586E-06	1.188E-08	1.489E-08	1.309E-13	1.955E-06	2.262E-07	7120C01LS
9.610E-01	6.682E-06	1.084E-08	5.734E-08	1.220E-13	1.940E-06	2.235E-07	7120C01LS
9.752E-01	6.778E-06	9.80E-09	3.363E-08	1.131E-13	1.925E-06	2.208E-07	7120C01LS
9.894E-01	6.874E-06	8.76E-09	1.493E-08	1.042E-13	1.910E-06	2.181E-07	7120C01LS
1.000E-00	6.970E-06	7.72E-09	6.66E-09	9.53E-14	1.895E-06	2.154E-07	7120C01LS
1.102E-00	7.066E-06	6.68E-09	2.493E-09	8.64E-14	1.880E-06	2.127E-07	7120C01LS
1.133E-00	7.162E-06	5.64E-09	1.363E-09	7.75E-14	1.865E-06	2.100E-07	7120C01LS

1.162E+00	7.898E-07	5.212E-08	9.615E-08	1.932E-13	1.853E-06	2.595E-07	7120C01LS
1.187E+00	8.346E-07	5.099E-08	1.021E-07	2.048E-13	1.833E-06	2.570E-07	7120C01LS
1.218E+00	8.534E-07	4.955E-08	1.050E-07	2.102E-13	1.807E-06	2.536E-07	7120C01LS
1.248E+00	8.956E-07	4.799E-08	1.108E-07	2.213E-13	1.781E-06	2.506E-07	7120C01LS
1.278E+00	8.606E-07	4.664E-08	1.071E-07	2.134E-13	1.754E-06	2.473E-07	7120C01LS
1.308E+00	8.774E-07	4.547E-08	1.099E-07	2.184E-13	1.728E-06	2.441E-07	7120C01LS
1.337E+00	8.638E-07	4.529E-08	1.097E-07	1.157E-13	1.703E-06	2.409E-07	7120C01LS
1.366E+00	8.405E-07	4.511E-08	1.064E-07	1.106E-13	1.678E-06	2.378E-07	7120C01LS
1.395E+00	8.249E-07	4.434E-08	1.050E-07	2.074E-13	1.654E-06	2.347E-07	7120C01LS
1.423E+00	8.437E-07	4.561E-08	1.080E-07	1.128E-13	1.631E-06	2.317E-07	7120C01LS
1.451E+00	8.619E-07	4.646E-08	1.109E-07	2.181E-13	1.607E-06	2.287E-07	7120C01LS
1.479E+00	8.489E-07	4.613E-08	1.098E-07	1.166E-13	1.583E-06	2.256E-07	7120C01LS
1.515E+00	8.097E-07	4.787E-08	1.153E-07	2.257E-13	1.559E-06	2.225E-07	7120C01LS
1.541E+00	8.275E-07	4.356E-08	1.083E-07	2.117E-13	1.529E-06	2.195E-07	7120C01LS
1.568E+00	8.009E-07	4.285E-08	1.054E-07	2.055E-13	1.507E-06	2.157E-07	7120C01LS
1.594E+00	7.950E-07	4.256E-08	1.052E-07	2.046E-13	1.487E-06	2.130E-07	7120C01LS
1.628E+00	7.704E-07	4.145E-08	1.026E-07	1.991E-13	1.460E-06	2.095E-07	7120C01LS
1.654E+00	7.710E-07	4.148E-08	1.032E-07	1.999E-13	1.440E-06	2.068E-07	7120C01LS
1.685E+00	8.009E-07	4.290E-08	1.076E-07	2.084E-13	1.418E-06	2.035E-07	7120C01LS
1.712E+00	8.27E-07	4.133E-08	1.059E-07	2.043E-13	1.394E-06	2.006E-07	7120C01LS
1.746E+00	7.768E-07	4.095E-08	1.061E-07	2.041E-13	1.368E-06	1.970E-07	7120C01LS
1.770E+00	7.840E-07	4.115E-08	1.073E-07	2.060E-13	1.349E-06	1.945E-07	7120C01LS
1.803E+00	7.846E-07	4.125E-08	1.080E-07	2.070E-13	1.329E-06	1.909E-07	7120C01LS
1.828E+00	7.632E-07	4.009E-08	1.056E-07	2.019E-13	1.304E-06	1.882E-07	7120C01LS
1.860E+00	7.155E-07	4.783E-08	9.974E-08	1.903E-13	1.280E-06	1.850E-07	7120C01LS
1.894E+00	7.178E-07	4.705E-08	1.004E-07	1.912E-13	1.263E-06	1.826E-07	7120C01LS
1.915E+00	6.918E-07	4.566E-08	9.733E-08	1.849E-13	1.241E-06	1.795E-07	7120C01LS
1.947E+00	6.951E-07	4.585E-08	9.839E-08	1.865E-13	1.219E-06	1.764E-07	7120C01LS
1.970E+00	6.905E-07	4.555E-08	9.818E-08	1.858E-13	1.203E-06	1.741E-07	7120C01LS
1.001E+00	6.931E-07	4.575E-08	9.912E-08	1.872E-13	1.181E-06	1.710E-07	7120C01LS
1.032E+00	6.808E-07	4.505E-08	9.738E-08	1.846E-13	1.160E-06	1.680E-07	7120C01LS
1.063E+00	6.782E-07	4.402E-08	9.704E-08	1.846E-13	1.139E-06	1.650E-07	7120C01LS
1.093E+00	6.568E-07	4.296E-08	9.400E-08	1.795E-13	1.119E-06	1.621E-07	7120C01LS
1.115E+00	6.325E-07	4.186E-08	9.054E-08	1.734E-13	1.105E-06	1.601E-07	7120C01LS
1.115E+00	7.256E-07	4.187E-08	1.039E-07	1.989E-13	1.105E-06	1.601E-07	7120C01LS
1.145E+00	6.302E-07	4.122E-08	9.024E-08	1.734E-13	1.085E-06	1.572E-07	7120C01LS
1.175E+00	6.172E-07	4.048E-08	8.840E-08	1.705E-13	1.066E-06	1.548E-07	7120C01LS
1.205E+00	5.962E-07	3.902E-08	8.414E-08	1.653E-13	1.046E-06	1.519E-07	7120C01LS
1.234E+00	5.838E-07	3.928E-08	8.366E-08	1.625E-13	1.031E-06	1.494E-07	7120C01LS
1.263E+00	5.881E-07	3.873E-08	8.431E-08	1.644E-13	1.014E-06	1.470E-07	7120C01LS
1.274E+00	6.522E-07	3.957E-08	9.351E-08	1.825E-13	1.007E-06	1.460E-07	7120C01LS
1.292E+00	7.26E-07	3.903E-08	8.210E-08	1.608E-13	9.957E-07	1.444E-07	7120C01LS
1.321E+00	6.88E-07	3.947E-08	8.444E-08	1.658E-13	9.788E-07	1.420E-07	7120C01LS
1.349E+00	6.894E-07	3.874E-08	8.456E-08	1.666E-13	9.623E-07	1.397E-07	7120C01LS
1.378E+00	6.941E-07	3.822E-08	8.525E-08	1.685E-13	9.455E-07	1.372E-07	7120C01LS
1.406E+00	6.775E-07	3.688E-08	8.269E-08	1.644E-13	9.286E-07	1.348E-07	7120C01LS
1.434E+00	6.18E-07	3.562E-08	8.065E-08	1.606E-13	9.128E-07	1.326E-07	7120C01LS
1.453E+00	6.103E-07	4.313E-08	9.764E-08	1.749E-13	9.027E-07	1.310E-07	7120C01LS
1.469E+00	6.307E-07	3.831E-08	7.68E-08	1.532E-13	8.925E-07	1.292E-07	7120C01LS
1.496E+00	6.169E-07	3.575E-08	7.426E-08	1.489E-13	8.783E-07	1.276E-07	7120C01LS
1.524E+00	6.676E-07	3.318E-08	8.164E-08	1.663E-13	8.089E-07	1.176E-07	7120C01LS
1.550E+00	6.240E-07	3.035E-08	7.547E-08	1.567E-13	7.238E-07	1.054E-07	7120C01LS
1.588E+00	6.398E-07	3.525E-08	8.260E-08	1.333E-13	6.242E-07	9.102E-08	7120C01LS
1.145E+00	6.656E-07	3.341E-08	1.159E-08	1.159E-13	5.761E-07	8.191E-08	7120C01LS
1.353E+00	5.152E-07	1.875E-08	1.018E-08	1.018E-13	4.899E-07	7.125E-08	7120C01LS
2.869E-07	1.695E-08	1.695E-08	4.159E-08	9.438E-14	4.429E-07	6.481E-08	7120C01LS
2.718E+00	4.458E-07	1.438E-08	3.573E-08	8.313E-14	3.873E-07	5.463E-08	7120C01LS
3.872E+00	2.169E-07	1.277E-08	3.155E-08	7.484E-14	3.516E-07	5.155E-08	7120C01LS
4.064E+00	1.881E-07	1.114E-08	2.741E-08	6.555E-14	3.128E-07	4.589E-08	7120C01LS
4.208E+00	1.736E-07	1.055E-08	2.534E-08	6.260E-14	2.867E-07	4.209E-08	7120C01LS

4.418E+00	1.553E-07	9.294E-09	2.271E-08	5.756E-14	2.522E-07	3.704E-08	7120C01HS
4.565E+00	1.450E-07	8.684E-09	2.123E-08	5.478E-14	2.301E-07	3.382E-08	7120C01HS
4.758E+00	1.210E-07	7.470E-09	1.773E-08	4.890E-14	2.041E-07	3.085E-08	7120C01HS
4.950E+00	1.148E-07	7.068E-09	1.689E-08	4.567E-14	1.818E-07	2.763E-08	7120C01HS
5.093E+00	1.020E-07	6.369E-09	1.500E-08	4.090E-14	1.663E-07	2.445E-08	7120C01HS
5.282E+00	8.969E-08	5.726E-09	1.318E-08	3.612E-14	1.482E-07	2.179E-08	7120C01HS
5.458E+00	8.100E-08	5.265E-09	1.191E-08	3.275E-14	1.331E-07	1.958E-08	7120C01HS
5.651E+00	7.360E-08	4.670E-09	1.082E-08	2.989E-14	1.182E-07	1.738E-08	7120C01HS
5.792E+00	6.847E-08	4.413E-09	1.007E-08	2.790E-14	1.082E-07	1.591E-08	7120C01HS
5.957E+00	5.808E-08	3.914E-09	8.539E-09	2.377E-14	9.714E-08	1.428E-08	7120C01HS
6.150E+00	4.928E-08	3.492E-09	7.244E-09	2.026E-14	8.678E-08	1.276E-08	7120C01HS
6.341E+00	4.712E-08	3.405E-09	6.926E-09	1.948E-14	7.805E-08	1.148E-08	7120C01HS
6.521E+00	4.167E-08	3.055E-09	6.125E-09	1.727E-14	7.006E-08	1.030E-08	7120C01HS
6.700E+00	4.184E-08	3.040E-09	6.151E-09	1.742E-14	6.259E-08	9.206E-09	7120C01HS
6.877E+00	3.517E-08	2.730E-09	5.170E-09	1.470E-14	5.577E-08	8.204E-09	7120C01HS
7.054E+00	2.909E-08	2.462E-09	4.775E-09	1.221E-14	5.009E-08	7.368E-09	7120C01HS
7.229E+00	2.676E-08	2.376E-09	3.933E-09	1.128E-14	4.520E-08	6.650E-09	7120C01HS
7.403E+00	2.568E-08	2.124E-09	3.804E-09	1.058E-14	4.062E-08	5.977E-09	7120C01HS
7.576E+00	2.315E-08	2.016E-09	3.403E-09	9.839E-15	3.638E-08	5.353E-09	7120C01HS
7.748E+00	2.224E-08	1.981E-09	3.269E-09	9.491E-15	3.248E-08	4.779E-09	7120C01HS
7.919E+00	1.787E-08	1.784E-09	2.627E-09	7.658E-15	2.905E-08	4.275E-09	7120C01HS
8.131E+00	1.504E-08	1.641E-09	2.210E-09	6.475E-15	2.556E-08	3.762E-09	7120C01HS
8.300E+00	1.251E-08	1.525E-09	1.838E-09	5.407E-15	2.323E-08	3.420E-09	7120C01HS
8.458E+00	1.527E-08	1.573E-09	2.245E-09	6.627E-15	2.104E-08	3.098E-09	7120C01HS
8.633E+00	1.325E-08	1.469E-09	1.948E-09	5.775E-15	1.854E-08	2.731E-09	7120C01HS
8.791E+00	1.110E-08	1.417E-09	1.631E-09	4.854E-15	1.662E-08	2.448E-09	7120C01HS
9.008E+00	8.369E-09	1.293E-09	1.229E-09	3.775E-15	1.453E-08	2.141E-09	7120C01HS
9.171E+00	9.644E-09	1.136E-09	1.418E-09	4.256E-15	1.304E-08	1.922E-09	7120C01HS
9.334E+00	9.501E-09	1.120E-09	1.397E-09	4.209E-15	1.148E-08	1.693E-09	7120C01HS
9.538E+00	6.393E-09	1.007E-09	9.397E-10	2.846E-15	9.858E-09	1.455E-09	7120C01HS
9.699E+00	5.332E-09	9.741E-10	7.838E-10	2.383E-15	8.914E-09	1.316E-09	7120C01HS
9.860E+00	4.816E-09	9.054E-10	7.082E-10	1.613E-15	8.097E-09	1.199E-09	7120C01HS
1.008E+01	4.409E-09	7.116E-10	6.983E-10	1.438E-15	7.075E-09	1.045E-09	7120C01HS
1.022E+01	4.738E-09	8.655E-10	6.137E-10	2.137E-15	6.263E-09	9.259E-10	7120C01HS
1.042E+01	4.702E-09	8.281E-10	6.925E-10	2.125E-15	5.319E-09	7.869E-10	7120C01HS
1.058E+01	3.039E-09	8.138E-10	4.795E-10	1.376E-15	4.700E-09	6.957E-10	7120C01HS
1.077E+01	2.517E-09	6.678E-10	3.713E-10	1.142E-15	4.172E-09	6.179E-10	7120C01HS
1.093E+01	1.882E-09	6.446E-10	2.779E-10	8.553E-16	3.620E-09	5.589E-10	7120C01HS
1.112E+01	1.51E-09	6.152E-10	2.559E-10	1.435E-15	3.442E-09	4.953E-10	7120C01HS
1.128E+01	3.178E-09	6.305E-10	4.700E-10	1.450E-15	2.836E-09	4.205E-10	7120C01HS
1.147E+01	2.353E-09	5.943E-10	3.483E-10	1.076E-15	2.310E-09	3.427E-10	7120C01HS
1.163E+01	1.999E-09	5.489E-10	2.961E-10	9.151E-16	1.962E-09	2.912E-10	7120C01HS
1.182E+01	1.266E-09	5.128E-10	1.877E-10	8.808E-16	1.652E-09	2.452E-10	7120C01HS
1.201E+01	1.341E-09	1.323E-09	1.991E-10	6.166E-16	1.404E-09	2.085E-10	7120C01HS
1.216E+01	1.738E-08	1.025E-08	2.581E-09	8.001E-15	0.	0.	7120C01HS

1 CF-252 BARE AT R=2M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING
 COMPILATION DATE OF THIS CODE VERSION

10:26:57U 10/18/77
 10/18/77U 09.13.04

30 GROUP OUTPUT

GROUP#	ENERGY UP-BOUND-MEV	DIFFERENTIAL FLUX N/CM2-SEC-MEV	INTEGRAL FLUX N/CM2-SEC	FLUX PER UNIT LETHARGY N/CM2-SEC
30	1.000000E-07	0.	0.	0.
29	3.180000E-06	0.	0.	0.
28	2.520000E-05	0.	0.	0.
27	2.000000E-04	0.	0.	0.
26	1.590000E-03	0.	0.	0.
25	1.261000E-02	0.	0.	0.
24	1.000000E-01	0.	0.	0.
23	2.236000E-01	1.444315E-06	1.785173E-07	2.336901E-07
22	5.000000E-01	2.077042E-06	5.740945E-07	7.514739E-07
21	9.945000E-01	2.139102E-06	2.023591E-07	1.170731E-06
20	7.071000E-01	1.762964E-06	1.983334E-07	1.147425E-06
19	8.409000E-01	1.072603E-06	1.435143E-07	8.301950E-07
18	1.000000E+00	6.058365E-07	9.638859E-08	5.576422E-07
17	1.257400E+00	7.989679E-07	2.056543E-07	9.017951E-07
16	1.581100E+00	8.504070E-07	2.752767E-07	1.206940E-06
15	1.988200E+00	7.532273E-07	3.066389E-07	1.344247E-06
14	2.500000E+00	6.135516E-07	3.140157E-07	1.376871E-06
13	3.173000E+00	5.191143E-07	2.455411E-07	1.420556E-06
12	3.535500E+00	3.472483E-07	1.953272E-07	1.150033E-06
11	4.204500E+00	2.213392E-07	1.480760E-07	8.565829E-07
10	5.000000E+00	1.397546E-07	1.111748E-07	6.431855E-07
9	6.764800E+00	8.639399E-08	6.607412E-08	4.650070E-07
8	8.648500E+00	5.132255E-08	4.525991E-08	3.185519E-07
7	1.066310E+00	2.994492E-08	3.044203E-08	2.142501E-07
6	8.835200E+00	1.556615E-08	1.824508E-08	1.284075E-07
5	1.018600E+01	7.189890E-09	9.712103E-09	6.838017E-08
4	1.174500E+01	2.994805E-09	4.668902E-09	3.283954E-08
3	1.354100E+01	1.510173E-08	2.712270E-08	1.909311E-07
2	1.561200E+01	0.	0.	0.
1	1.800000E+01	0.	0.	0.

1 CF-252 25 CM H2O AT R=2M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING
COMPIATION DATE OF THIS CODE VERSION

10/18/77U 10:28:36U 10/18/77
09.13.04

ENERGY (MEV)	PHI (NEUT/CM2-SEC-MEV)	DEL-PHI	DOSE (MR/HR-MEV)	KERMA (ERG/GM-SEC-MEV)	INTEGRAL (NEUT/CM2-SEC)	INT-DOSE (MR/HR)	FILE-ID
1.657E-01	4.596E-08	2.298E-09	1.171E-09	3.463E-15	1.280E-07	1.581E-08	7060C11S
1.752E-01	4.449E-08	1.038E-09	1.167E-09	3.425E-15	1.275E-07	1.579E-08	7060C11S
1.846E-01	4.309E-08	1.023E-09	1.162E-09	3.387E-15	1.270E-07	1.577E-08	7060C11S
1.941E-01	4.181E-08	1.008E-09	1.221E-09	3.350E-15	1.265E-07	1.575E-08	7060C11S
2.036E-01	4.053E-08	1.010E-09	1.269E-09	3.313E-15	1.260E-07	1.573E-08	7060C11S
2.130E-01	4.511E-08	1.031E-09	1.329E-09	3.276E-15	1.255E-07	1.571E-08	7060C11S
2.225E-01	4.608E-08	1.063E-09	1.398E-09	3.240E-15	1.250E-07	1.569E-08	7060C11S
2.320E-01	4.702E-08	1.092E-09	1.469E-09	3.204E-15	1.245E-07	1.567E-08	7060C11S
2.415E-01	4.777E-08	1.095E-09	1.537E-09	3.168E-15	1.240E-07	1.565E-08	7060C11S
2.509E-01	4.852E-08	1.099E-09	1.599E-09	3.132E-15	1.235E-07	1.563E-08	7060C11S
2.604E-01	4.950E-08	1.091E-09	1.654E-09	3.096E-15	1.230E-07	1.561E-08	7060C11S
2.699E-01	4.851E-08	1.080E-09	1.704E-09	3.060E-15	1.225E-07	1.559E-08	7060C11S
2.793E-01	4.837E-08	1.059E-09	1.749E-09	3.024E-15	1.220E-07	1.557E-08	7060C11S
2.888E-01	4.810E-08	1.056E-09	1.791E-09	2.988E-15	1.215E-07	1.555E-08	7060C11S
2.983E-01	4.775E-08	1.041E-09	1.830E-09	2.952E-15	1.210E-07	1.553E-08	7060C11S
3.077E-01	4.733E-08	1.023E-09	1.868E-09	2.916E-15	1.205E-07	1.551E-08	7060C11S
3.172E-01	4.686E-08	1.005E-09	1.904E-09	2.880E-15	1.200E-07	1.549E-08	7060C11S
3.267E-01	4.635E-08	9.865E-10	1.940E-09	2.844E-15	1.195E-07	1.547E-08	7060C11S
3.361E-01	4.588E-08	9.696E-10	1.976E-09	2.808E-15	1.190E-07	1.545E-08	7060C11S
3.456E-01	4.540E-08	9.534E-10	2.014E-09	2.772E-15	1.185E-07	1.543E-08	7060C11S
3.551E-01	4.494E-08	9.372E-10	2.053E-09	2.736E-15	1.180E-07	1.541E-08	7060C11S
3.645E-01	4.451E-08	9.229E-10	2.093E-09	2.699E-15	1.175E-07	1.539E-08	7060C11S
3.740E-01	4.411E-08	9.092E-10	2.136E-09	2.663E-15	1.170E-07	1.537E-08	7060C11S
3.835E-01	4.374E-08	8.963E-10	2.180E-09	2.627E-15	1.165E-07	1.535E-08	7060C11S
3.930E-01	4.339E-08	8.839E-10	2.227E-09	2.591E-15	1.160E-07	1.533E-08	7060C11S
4.024E-01	4.305E-08	8.723E-10	2.275E-09	2.555E-15	1.155E-07	1.531E-08	7060C11S
4.119E-01	4.274E-08	8.606E-10	2.326E-09	2.519E-15	1.150E-07	1.529E-08	7060C11S
4.214E-01	4.244E-08	8.502E-10	2.378E-09	2.483E-15	1.145E-07	1.527E-08	7060C11S
4.308E-01	4.216E-08	8.398E-10	2.432E-09	2.447E-15	1.140E-07	1.525E-08	7060C11S
4.403E-01	4.187E-08	8.301E-10	2.487E-09	2.411E-15	1.135E-07	1.523E-08	7060C11S
4.498E-01	4.158E-08	8.203E-10	2.543E-09	2.375E-15	1.130E-07	1.521E-08	7060C11S
4.592E-01	4.127E-08	8.106E-10	2.599E-09	2.339E-15	1.125E-07	1.519E-08	7060C11S
4.687E-01	4.095E-08	8.002E-10	2.656E-09	2.303E-15	1.120E-07	1.517E-08	7060C11S
4.782E-01	4.059E-08	7.895E-10	2.710E-09	2.267E-15	1.115E-07	1.515E-08	7060C11S
4.876E-01	4.021E-08	7.769E-10	2.763E-09	2.231E-15	1.110E-07	1.513E-08	7060C11S
4.971E-01	3.982E-08	7.645E-10	2.818E-09	2.195E-15	1.105E-07	1.511E-08	7060C11S
5.066E-01	3.940E-08	7.528E-10	2.872E-09	2.159E-15	1.100E-07	1.509E-08	7060C11S
5.160E-01	3.897E-08	7.405E-10	2.928E-09	2.123E-15	1.095E-07	1.507E-08	7060C11S
5.255E-01	3.852E-08	7.289E-10	2.982E-09	2.087E-15	1.090E-07	1.505E-08	7060C11S
5.350E-01	3.806E-08	7.165E-10	3.037E-09	2.051E-15	1.085E-07	1.503E-08	7060C11S
5.445E-01	3.757E-08	7.048E-10	3.090E-09	2.015E-15	1.080E-07	1.501E-08	7060C11S
5.539E-01	3.704E-08	6.925E-10	3.142E-09	1.979E-15	1.075E-07	1.499E-08	7060C11S
5.634E-01	3.649E-08	6.799E-10	3.197E-09	1.943E-15	1.070E-07	1.497E-08	7060C11S
5.729E-01	3.599E-08	6.675E-10	3.252E-09	1.907E-15	1.065E-07	1.495E-08	7060C11S
5.823E-01	3.545E-08	6.550E-10	3.307E-09	1.871E-15	1.060E-07	1.493E-08	7060C11S
5.918E-01	3.489E-08	6.430E-10	3.362E-09	1.835E-15	1.055E-07	1.491E-08	7060C11S
6.013E-01	3.390E-08	6.171E-10	3.480E-09	1.799E-15	1.050E-07	1.489E-08	7060C11S
6.107E-01	3.218E-08	6.014E-10	3.648E-09	1.763E-15	1.045E-07	1.487E-08	7060C11S
6.202E-01	3.246E-08	5.853E-10	3.815E-09	1.727E-15	1.040E-07	1.485E-08	7060C11S
6.297E-01	3.174E-08	5.690E-10	3.982E-09	1.691E-15	1.035E-07	1.483E-08	7060C11S
6.391E-01	3.105E-08	5.809E-10	4.150E-09	1.655E-15	1.030E-07	1.481E-08	7060C11S

6.486E-01	3.041E-08	5.958E-10	2.521E-09	5.439E-15	1.077E-07	1.474E-08	7060C11S
6.581E-01	982E-08	6.138E-10	4.46E-09	5.424E-15	1.075E-07	1.472E-08	7060C11S
6.675E-01	928E-08	6.378E-10	4.74E-09	5.367E-15	1.072E-07	1.470E-08	7060C11S
6.770E-01	877E-08	6.678E-10	4.54E-09	5.314E-15	1.069E-07	1.467E-08	7060C11S
6.865E-01	826E-08	7.133E-10	4.33E-09	5.259E-15	1.066E-07	1.465E-08	7060C11S
6.960E-01	769E-08	7.697E-10	4.07E-09	5.193E-15	1.064E-07	1.462E-08	7060C11S
7.054E-01	712E-08	8.112E-10	3.80E-09	5.125E-15	1.061E-07	1.461E-08	7060C11S
7.149E-01	653E-08	8.702E-09	3.91E-09	4.942E-15	1.009E-07	1.410E-08	7130C05LS
9.540E-01	608E-08	1.838E-09	3.938E-09	6.029E-15	1.000E-07	1.400E-08	7130C05LS
9.782E-01	820E-08	1.974E-09	3.255E-09	6.649E-15	9.937E-08	1.393E-08	7130C05LS
1.014E+00	760E-08	1.961E-09	3.289E-09	6.882E-15	9.837E-08	1.381E-08	7130C05LS
1.071E+00	938E-08	2.020E-09	3.295E-09	7.009E-15	9.771E-08	1.379E-08	7130C05LS
1.093E+00	762E-08	2.017E-09	3.318E-09	6.762E-15	9.674E-08	1.362E-08	7130C05LS
1.124E+00	543E-08	1.966E-09	3.074E-09	6.702E-15	9.613E-08	1.354E-08	7130C05LS
1.156E+00	871E-08	1.38E-09	3.490E-09	6.194E-15	9.531E-08	1.344E-08	7130C05LS
1.190E+00	930E-08	1.22E-09	3.565E-09	7.017E-15	9.444E-08	1.334E-08	7130C05LS
1.212E+00	150E-08	2.40E-09	3.872E-09	7.192E-15	9.346E-08	1.322E-08	7130C03LS
1.243E+00	3.590E-08	4.60E-09	4.438E-09	7.782E-15	9.279E-08	1.314E-08	7130C05LS
1.274E+00	3.341E-08	3.73E-09	4.156E-09	8.865E-15	9.174E-08	1.301E-08	7130C05LS
1.304E+00	3.447E-08	4.32E-09	4.133E-09	8.282E-15	9.067E-08	1.288E-08	7130C05LS
1.334E+00	4.38E-08	4.51E-09	4.326E-09	8.576E-15	8.965E-08	1.275E-08	7130C05LS
1.363E+00	3.49E-08	4.22E-09	4.236E-09	8.583E-15	8.862E-08	1.262E-08	7130C05LS
1.393E+00	3.31E-08	3.39E-09	4.239E-09	8.367E-15	8.763E-08	1.249E-08	7130C05LS
1.421E+00	3.470E-08	4.28E-09	4.439E-09	8.374E-15	8.663E-08	1.237E-08	7130C05LS
1.450E+00	3.33E-08	3.71E-09	4.291E-09	8.750E-15	8.568E-08	1.225E-08	7130C05LS
1.487E+00	3.330E-08	3.95E-09	4.315E-09	8.440E-15	8.469E-08	1.212E-08	7130C05LS
1.515E+00	3.340E-08	4.07E-09	4.352E-09	8.464E-15	8.346E-08	1.196E-08	7130C05LS
1.542E+00	3.19E-08	3.53E-09	4.185E-09	8.518E-15	8.253E-08	1.184E-08	7130C05LS
1.569E+00	3.05E-08	2.47E-09	4.08E-09	8.175E-15	8.164E-08	1.172E-08	7130C05LS
1.604E+00	3.193E-08	2.97E-09	4.232E-09	8.70E-15	8.079E-08	1.161E-08	7130C05LS
1.630E+00	3.281E-08	3.52E-09	4.369E-09	8.228E-15	7.969E-08	1.147E-08	7130C05LS
1.665E+00	3.280E-08	3.58E-09	4.398E-09	8.480E-15	7.885E-08	1.135E-08	7130C05LS
1.688E+00	3.23E-08	3.86E-09	4.478E-09	8.513E-15	7.770E-08	1.120E-08	7130C05LS
1.715E+00	3.33E-08	4.06E-09	4.513E-09	8.653E-15	7.694E-08	1.110E-08	7130C05LS
1.750E+00	3.98E-08	4.73E-09	4.958E-09	8.703E-15	7.604E-08	1.098E-08	7130C05LS
1.783E+00	3.294E-08	3.20E-09	4.518E-09	8.383E-15	7.490E-08	1.082E-08	7130C05LS
1.808E+00	3.324E-08	3.44E-09	4.580E-09	8.707E-15	7.383E-08	1.068E-08	7130C05LS
1.841E+00	3.194E-08	2.69E-09	4.430E-09	8.773E-15	7.300E-08	1.056E-08	7130C05LS
1.866E+00	1.53E-08	2.81E-09	4.394E-09	8.463E-15	7.193E-08	1.041E-08	7130C05LS
1.895E+00	3.81E-08	1.25E-09	4.13E-09	8.379E-15	7.113E-08	1.030E-08	7130C05LS
1.930E+00	3.974E-08	1.39E-09	4.196E-09	7.873E-15	7.016E-08	1.017E-08	7130C05LS
1.952E+00	6.66E-08	1.01E-09	4.071E-09	9.83E-15	6.93E-08	1.003E-08	7130C05LS
1.986E+00	8.54E-08	1.00E-09	4.070E-09	7.709E-15	6.827E-08	9.901E-09	7130C05LS
2.017E+00	7.79E-08	0.79E-09	3.975E-09	7.692E-15	6.759E-08	9.803E-09	7130C05LS
2.049E+00	0.06E-08	1.86E-09	4.300E-09	7.520E-15	6.671E-08	9.678E-09	7130C05LS
2.079E+00	7.95E-08	0.08E-09	4.27E-09	8.167E-15	6.579E-08	9.546E-09	7130C05LS
2.079E+00	3.5E-08	0.59E-09	4.27E-09	8.058E-15	6.489E-08	9.418E-09	7130C05LS
2.110E+00	8.56E-08	0.54E-09	4.08E-09	9.32E-15	6.395E-08	9.283E-09	7130C05LS
2.141E+00	8.32E-08	0.81E-09	4.055E-09	8.222E-15	6.307E-08	9.157E-09	7130C05LS
2.163E+00	8.67E-08	0.34E-09	4.105E-09	7.790E-15	6.245E-08	9.067E-09	7130C05LS
2.193E+00	7.49E-08	1.974E-09	3.938E-09	7.613E-15	6.160E-08	8.947E-09	7130C05LS
2.201E+00	1.64E-08	0.64E-09	4.53E-09	6.770E-15	6.137E-08	8.913E-09	7130C05LS
2.229E+00	7.43E-08	0.6E-09	4.931E-09	6.67E-15	6.072E-08	8.820E-09	7130C05LS
2.253E+00	9.15E-08	1.00E-09	4.178E-09	6.135E-15	5.957E-08	8.698E-09	7130C05LS
2.283E+00	9.08E-08	0.58E-09	4.189E-09	6.147E-15	5.899E-08	8.573E-09	7130C05LS
2.312E+00	9.50E-08	0.26E-09	4.230E-09	6.296E-15	5.815E-08	8.451E-09	7130C05LS
2.348E+00	8.44E-08	0.20E-09	4.080E-09	6.037E-15	5.710E-08	8.302E-09	7130C05LS
2.377E+00	8.78E-08	0.37E-09	4.130E-09	6.185E-15	5.627E-08	8.183E-09	7130C05LS
2.406E+00	6.69E-08	0.62E-09	4.075E-09	6.085E-15	5.544E-08	8.065E-09	7130C05LS

2.424E+00	3.063E-08	2.093E-09	4.397E-09	8.741E-15	5.491E-08	7.987E-09	7130C05HS
2.435E+00	2.864E-08	1.957E-09	4.112E-09	8.186E-15	5.459E-08	7.941E-09	7130C05LS
2.463E+00	2.934E-08	1.896E-09	4.214E-09	8.418E-15	5.377E-08	7.824E-09	7130C05LS
2.481E+00	2.951E-08	1.822E-09	4.239E-09	8.497E-15	5.295E-08	7.706E-09	7130C05LS
2.601E+00	3.028E-08	1.775E-09	4.353E-09	8.844E-15	4.966E-08	7.233E-09	7130C05HS
2.708E+00	3.054E-08	1.625E-09	3.905E-09	8.244E-15	4.506E-08	6.571E-09	7130C05HS
2.920E+00	2.514E-08	1.467E-09	3.625E-09	7.656E-15	4.084E-08	5.962E-09	7130C05HS
3.132E+00	1.893E-08	1.116E-09	2.736E-09	5.929E-15	3.616E-08	5.288E-09	7130C05HS
3.291E+00	1.632E-08	9.865E-10	2.361E-09	5.217E-15	3.336E-08	4.883E-09	7130C05HS
3.503E+00	1.328E-08	8.190E-10	1.925E-09	4.365E-15	3.023E-08	4.428E-09	7130C05HS
3.652E+00	1.170E-08	7.145E-10	1.625E-09	3.823E-15	2.823E-08	4.139E-09	7130C05HS
3.872E+00	1.010E-08	6.299E-10	1.470E-09	3.487E-15	2.594E-08	3.805E-09	7130C05HS
4.019E+00	9.404E-09	5.903E-10	1.370E-09	3.308E-15	2.450E-08	3.597E-09	7130C05HS
4.215E+00	9.164E-09	5.766E-10	1.337E-09	3.307E-15	2.268E-08	3.331E-09	7130C05HS
4.379E+00	9.105E-09	5.720E-10	1.331E-09	3.358E-15	2.118E-08	3.113E-09	7130C05HS
4.577E+00	8.437E-09	5.343E-10	1.235E-09	3.193E-15	1.945E-08	2.858E-09	7130C05HS
4.774E+00	7.814E-09	5.076E-10	1.145E-09	3.034E-15	1.785E-08	2.624E-09	7130C05HS
4.921E+00	7.944E-09	5.095E-10	1.167E-09	3.145E-15	1.669E-08	2.454E-09	7130C05HS
5.115E+00	7.691E-09	4.948E-10	1.131E-09	3.085E-15	1.517E-08	2.231E-09	7130C05HS
5.307E+00	7.554E-09	4.836E-10	1.110E-09	3.044E-15	1.371E-08	2.016E-09	7130C05HS
5.488E+00	6.698E-09	4.404E-10	9.846E-10	2.710E-15	1.242E-08	1.826E-09	7130C05HS
5.635E+00	5.955E-09	3.875E-10	8.754E-10	2.418E-15	1.149E-08	1.690E-09	7130C05HS
5.823E+00	5.507E-09	3.640E-10	8.096E-10	2.246E-15	1.040E-08	1.529E-09	7130C05HS
6.003E+00	4.956E-09	3.382E-10	7.289E-10	2.031E-15	9.468E-09	1.393E-09	7130C05HS
6.200E+00	4.428E-09	3.115E-10	6.509E-10	1.822E-15	8.544E-09	1.257E-09	7130C05HS
6.384E+00	3.943E-09	2.906E-10	5.797E-10	1.630E-15	7.774E-09	1.143E-09	7130C05HS
6.567E+00	3.601E-09	2.702E-10	5.294E-10	1.495E-15	7.083E-09	1.042E-09	7130C05HS
6.749E+00	3.521E-09	2.638E-10	5.176E-10	1.468E-15	6.435E-09	9.467E-10	7130C05HS
6.929E+00	3.403E-09	2.562E-10	5.002E-10	1.424E-15	5.812E-09	8.551E-10	7130C05HS
7.109E+00	2.975E-09	2.399E-10	4.373E-10	1.251E-15	5.238E-09	7.707E-10	7130C05HS
7.287E+00	2.338E-09	2.167E-10	3.436E-10	9.868E-16	4.765E-09	7.012E-10	7130C05HS
7.464E+00	2.304E-09	1.942E-10	3.387E-10	9.767E-16	4.354E-09	6.408E-10	7130C05HS
7.639E+00	2.529E-09	2.026E-10	3.718E-10	1.077E-15	3.932E-09	5.786E-10	7130C05HS
7.814E+00	2.244E-09	1.902E-10	3.299E-10	9.592E-16	3.514E-09	5.172E-10	7130C05HS
7.988E+00	1.765E-09	1.701E-10	2.595E-10	7.576E-16	3.165E-09	4.660E-10	7130C05HS
8.203E+00	1.468E-09	1.551E-10	2.183E-10	6.185E-16	2.818E-09	4.149E-10	7130C05HS
8.361E+00	1.558E-09	1.550E-10	2.291E-10	6.747E-16	2.579E-09	3.798E-10	7130C05HS
8.539E+00	1.426E-09	1.493E-10	2.096E-10	6.199E-16	2.313E-09	3.408E-10	7130C05HS
8.710E+00	1.324E-09	1.430E-10	1.946E-10	5.779E-16	2.078E-09	3.062E-10	7130C05HS
8.925E+00	1.023E-09	1.334E-10	1.504E-10	4.488E-16	1.826E-09	2.691E-10	7130C05HS
9.092E+00	9.462E-10	1.303E-10	1.391E-10	4.169E-16	1.662E-09	2.449E-10	7130C05HS
9.259E+00	8.983E-10	1.107E-10	1.320E-10	3.972E-16	1.503E-09	2.193E-10	7130C05HS
9.467E+00	9.067E-10	1.066E-10	1.333E-10	4.029E-16	1.320E-09	1.947E-10	7130C05HS
9.632E+00	7.963E-10	1.035E-10	1.171E-10	3.553E-16	1.179E-09	1.741E-10	7130C05HS
9.795E+00	7.249E-10	1.010E-10	1.066E-10	3.247E-16	1.055E-09	1.557E-10	7130C05HS
1.000E+01	5.261E-10	9.359E-11	7.733E-11	2.367E-16	9.270E-10	1.370E-10	7130C05HS
1.016E+01	5.302E-10	9.203E-11	7.799E-11	2.390E-16	9.955E-10	1.245E-10	7130C05HS
1.037E+01	4.546E-10	8.885E-11	6.697E-11	2.281E-16	7.391E-10	1.093E-10	7130C05HS
1.053E+01	4.951E-10	8.859E-11	7.311E-11	2.245E-16	6.630E-10	9.811E-11	7130C05HS
1.073E+01	4.517E-10	8.450E-11	6.663E-11	2.048E-16	5.683E-10	8.414E-11	7130C05HS
1.089E+01	4.121E-10	7.295E-11	6.082E-11	1.872E-16	4.992E-10	7.394E-11	7130C05HS
1.106E+01	4.576E-10	7.081E-11	6.761E-11	2.083E-16	4.166E-10	6.174E-11	7130C05HS
1.124E+01	4.168E-10	6.581E-11	6.115E-11	1.893E-16	3.466E-10	5.141E-11	7130C05HS
1.144E+01	2.919E-10	6.342E-11	4.319E-11	1.333E-16	2.758E-10	4.093E-11	7130C05HS
1.163E+01	1.738E-10	6.084E-11	2.574E-11	7.957E-17	2.316E-10	3.438E-11	7130C05HS
1.179E+01	1.068E-10	5.687E-11	1.583E-11	4.896E-17	2.091E-10	3.105E-11	7130C05HS
1.198E+01	1.975E-10	5.371E-11	2.930E-11	9.074E-17	1.802E-10	2.677E-11	7130C05HS
1.218E+01	3.748E-10	1.401E-11	5.566E-11	1.726E-16	1.230E-10	1.827E-11	7130C05HS
1.233E+01	1.265E-09	9.099E-10	1.880E-10	5.834E-16	0.	0.	7130C05HS

1
CF-252 25 CM H2O AT R=2M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING
COMPIATION DATE OF THIS CODE VERSION

10:28:36U 10/18/77
10/18/77U 09.13.04

30 GROUP OUTPUT

GROUP#	ENERGY UP-BOUND-MEV	DIFFERENTIAL FLUX N/CM2-SEC-MEV	INTEGRAL FLUX N/CM2-SEC	FLUX PER UNIT LETHARGY N/CM2-SEC
30	4.000000E-07	0.	0.	0.
29	3.180000E-06	0.	0.	0.
28	2.520000E-05	0.	0.	0.
27	2.000000E-04	0.	0.	0.
26	1.590000E-03	0.	0.	0.
25	1.261000E-02	0.	0.	0.
24	1.000000E-01	0.	0.	0.
23	2.235000E-01	4.535209E-08	5.605519E-09	7.337969E-09
22	5.000000E-01	4.465368E-08	1.234228E-08	1.615570E-08
21	5.946000E-01	3.726252E-08	3.526927E-09	2.040479E-08
20	7.071000E-01	3.046967E-08	3.427638E-09	1.983118E-08
19	8.409000E-01	0.	0.	0.
18	1.000000E+00	2.454223E-08	3.904666E-09	2.258989E-08
17	1.257400E+00	2.922125E-08	7.521551E-09	3.296203E-08
16	1.581100E+00	3.342344E-08	1.081917E-08	4.743621E-08
15	1.968200E+00	3.166617E-08	1.289130E-08	5.651303E-08
14	2.400000E+00	2.899476E-08	1.483952E-08	6.506714E-08
13	2.973000E+00	2.778004E-08	1.313996E-08	7.602008E-08
12	3.535500E+00	1.732578E-08	9.745752E-09	5.638242E-08
11	4.204500E+00	1.049425E-08	7.020651E-09	4.061273E-08
10	5.000000E+00	8.439318E-09	6.713477E-09	3.883985E-08
9	5.764800E+00	6.968494E-09	5.329505E-09	3.750722E-08
8	6.465000E+00	4.465524E-09	3.937253E-09	2.771148E-08
7	7.663100E+00	2.879514E-09	2.927314E-09	2.060235E-08
6	8.835200E+00	1.661591E-09	1.947550E-09	1.370671E-08
5	1.018600E+01	8.103622E-10	1.094637E-09	7.707031E-09
4	1.174500E+01	3.941908E-10	6.145435E-10	4.322499E-09
3	1.354100E+01	1.014119E-09	1.821357E-09	1.262150E-08
2	1.561200E+01	0.	0.	0.
1	1.800000E+01	0.	0.	0.

1 CF-252 5 CM D20 AT R=2M (FCR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING 10:30:18U 10/18/77
 COMPILATION DATE OF THIS CODE VERSION 10/18/77U 09.13.04

ENERGY (MEV)	PHI (NEUT/CM2-SEC-MEV)	DEL-PHI	DOSE (MR/HR-MEV)	KERMA (ERG/GM-SEC-MEV)	INTEGRAL (NEUT/CM2-SEC)	INT-DOSE (MR/HR)	FILE-ID
1.562E-01	2.057E-06	1.029E-07	5.087E-08	1.517E-13	2.010E-06	2.107E-07	7070C085
1.704E-01	1.958E-06	4.595E-08	5.087E-08	1.499E-13	1.981E-06	1.03E-07	7070C085
1.846E-01	1.935E-06	4.407E-08	5.223E-08	1.521E-13	1.953E-06	.092E-07	7070C085
1.988E-01	1.919E-06	4.418E-08	5.413E-08	1.558E-13	1.926E-06	.085E-07	7070C085
2.130E-01	1.919E-06	4.564E-08	5.656E-08	1.609E-13	1.899E-06	.077E-07	7070C085
2.273E-01	1.913E-06	4.550E-08	5.891E-08	1.656E-13	1.871E-06	.069E-07	7070C085
2.415E-01	1.887E-06	4.419E-08	6.073E-08	1.687E-13	1.844E-06	.060E-07	7070C085
2.557E-01	1.841E-06	4.225E-08	6.190E-08	1.699E-13	1.818E-06	.052E-07	7070C085
2.699E-01	1.779E-06	4.046E-08	6.248E-08	1.695E-13	1.792E-06	.043E-07	7070C085
2.841E-01	1.708E-06	3.852E-08	6.265E-08	1.680E-13	1.767E-06	.034E-07	7070C085
2.983E-01	1.634E-06	3.643E-08	6.262E-08	1.660E-13	1.744E-06	.025E-07	7070C085
3.125E-01	1.558E-06	3.442E-08	6.249E-08	1.637E-13	1.721E-06	.016E-07	7070C085
3.267E-01	1.489E-06	3.257E-08	6.232E-08	1.613E-13	1.699E-06	.007E-07	7070C085
3.409E-01	1.423E-06	3.091E-08	6.228E-08	1.593E-13	1.679E-06	1.998E-07	7070C085
3.551E-01	1.366E-06	2.943E-08	6.240E-08	1.577E-13	1.659E-06	1.990E-07	7070C085
3.693E-01	1.315E-06	2.813E-08	6.274E-08	1.567E-13	1.640E-06	1.981E-07	7070C085
3.835E-01	1.271E-06	2.701E-08	6.338E-08	1.565E-13	1.621E-06	1.972E-07	7070C085
3.977E-01	1.234E-06	2.605E-08	6.429E-08	1.569E-13	1.604E-06	1.963E-07	7070C085
4.119E-01	1.205E-06	2.525E-08	6.558E-08	1.581E-13	1.586E-06	1.953E-07	7070C085
4.261E-01	1.183E-06	2.463E-08	6.726E-08	1.603E-13	1.569E-06	1.944E-07	7070C085
4.403E-01	1.168E-06	2.419E-08	6.935E-08	1.633E-13	1.553E-06	1.934E-07	7070C085
4.545E-01	1.156E-06	2.389E-08	7.185E-08	1.672E-13	1.536E-06	1.924E-07	7070C085
4.687E-01	1.153E-06	2.368E-08	7.477E-08	1.720E-13	1.520E-06	1.914E-07	7070C085
4.829E-01	1.151E-06	2.356E-08	7.798E-08	1.773E-13	1.503E-06	1.903E-07	7070C085
4.971E-01	1.152E-06	2.349E-08	8.152E-08	1.833E-13	1.487E-06	1.892E-07	7070C085
5.113E-01	1.154E-06	2.342E-08	8.319E-08	1.860E-13	1.471E-06	1.887E-07	7070C085
5.255E-01	1.151E-06	2.331E-08	8.434E-08	1.881E-13	1.454E-06	1.868E-07	7070C085
5.397E-01	1.147E-06	2.314E-08	8.521E-08	1.895E-13	1.438E-06	1.856E-07	7070C085
5.539E-01	1.138E-06	2.288E-08	8.580E-08	1.903E-13	1.422E-06	1.844E-07	7070C085
5.681E-01	1.124E-06	2.250E-08	8.594E-08	1.901E-13	1.406E-06	1.832E-07	7070C085
5.823E-01	1.103E-06	2.198E-08	8.552E-08	1.886E-13	1.390E-06	1.820E-07	7070C085
5.965E-01	1.074E-06	2.131E-08	8.450E-08	1.870E-13	1.374E-06	1.807E-07	7070C085
6.107E-01	1.038E-06	2.05E-08	8.281E-08	1.816E-13	1.359E-06	1.796E-07	7070C085
6.249E-01	9.943E-07	1.951E-08	8.048E-08	1.760E-13	1.345E-06	1.784E-07	7070C085
6.391E-01	9.443E-07	1.837E-08	7.754E-08	1.691E-13	1.331E-06	1.773E-07	7070C085
6.533E-01	8.891E-07	1.716E-08	7.406E-08	1.611E-13	1.318E-06	1.762E-07	7070C085
6.675E-01	8.307E-07	1.591E-08	7.019E-08	1.523E-13	1.306E-06	1.752E-07	7070C085
6.816E-01	7.937E-07	1.507E-08	6.597E-08	1.427E-13	1.295E-06	1.742E-07	7070C085
6.960E-01	7.081E-07	1.495E-08	6.156E-08	1.328E-13	1.284E-06	1.733E-07	7070C085
7.102E-01	6.472E-07	1.431E-08	5.708E-08	1.228E-13	1.274E-06	1.725E-07	7070C085
7.244E-01	5.875E-07	1.310E-08	5.255E-08	1.128E-13	1.266E-06	1.717E-07	7070C085
7.386E-01	5.303E-07	1.142E-08	4.812E-08	1.030E-13	1.258E-06	1.710E-07	7070C085
7.528E-01	4.762E-07	1.071E-08	4.384E-08	9.353E-14	1.251E-06	1.703E-07	7070C085
7.670E-01	4.258E-07	1.029E-08	3.976E-08	8.460E-14	1.244E-06	1.697E-07	7070C085
9.035E-01	4.299E-07	4.875E-08	4.604E-08	9.541E-14	1.186E-06	1.639E-07	7120C04LS
9.286E-01	2.980E-07	4.777E-08	3.272E-08	6.749E-14	1.177E-06	1.629E-07	7120C04LS
9.532E-01	3.871E-07	5.176E-08	4.358E-08	8.944E-14	1.168E-06	1.619E-07	7120C04LS
9.894E-01	4.952E-07	5.742E-08	5.781E-08	1.178E-13	1.152E-06	1.601E-07	7120C04LS
1.013E+00	4.925E-07	5.295E-08	5.826E-08	1.184E-13	1.147E-06	1.587E-07	7120C04LS
1.048E+00	4.558E-07	6.105E-08	6.428E-08	1.203E-13	1.142E-06	1.568E-07	7120C04LS
1.070E+00	4.446E-07	6.297E-08	5.317E-08	1.076E-13	1.114E-06	1.556E-07	7120C04LS

1.104E+00	4.083E-07	6.503E-08	4.915E-08	9.920E-14	1.100E-06	1.538E-07	7120C04LS
1.124E+00	3.169E-07	7.509E-08	3.854E-08	7.767E-14	1.092E-06	1.530E-07	7120C04LS
1.156E+00	4.641E-07	7.107E-08	8.643E-08	1.134E-13	1.080E-06	1.514E-07	7120C04LS
1.190E+00	3.357E-07	7.282E-08	4.849E-08	9.712E-14	1.055E-06	1.497E-07	7120C04LS
1.215E+00	5.056E-07	5.933E-08	4.237E-08	1.248E-13	1.051E-06	1.479E-07	7120C04LS
1.253E+00	4.691E-07	5.339E-08	6.811E-08	1.160E-13	1.036E-06	1.460E-07	7120C04LS
1.273E+00	5.125E-07	5.579E-08	6.373E-08	1.270E-13	1.026E-06	1.448E-07	7120C04LS
1.303E+00	4.458E-07	5.547E-08	5.576E-08	1.109E-13	1.011E-06	1.430E-07	7120C04LS
1.333E+00	4.240E-07	6.40E-08	6.334E-08	1.058E-13	9.984E-07	1.414E-07	7120C04LS
1.363E+00	4.01E-07	1.10E-08	8.34E-08	9.839E-07	9.839E-07	1.395E-07	7120C04LS
1.392E+00	3.767E-07	6.678E-08	6.537E-08	1.258E-13	9.839E-07	1.376E-07	7120C04LS
1.421E+00	4.202E-07	6.08E-08	5.376E-08	1.060E-13	9.555E-07	1.359E-07	7120C04LS
1.449E+00	3.523E-07	6.088E-08	4.531E-08	8.914E-14	9.447E-07	1.345E-07	7120C04LS
1.466E+00	6.049E-07	8.899E-08	7.837E-08	1.537E-13	9.270E-07	1.323E-07	7120C04LS
1.514E+00	4.281E-07	6.613E-08	5.576E-08	1.092E-13	9.125E-07	1.304E-07	7120C04LS
1.541E+00	4.721E-07	6.613E-08	4.871E-08	9.517E-14	9.017E-07	1.290E-07	7120C04LS
1.568E+00	4.263E-07	7.107E-08	5.927E-08	8.896E-07	8.896E-07	1.274E-07	7120C04LS
1.595E+00	4.255E-07	7.022E-08	5.629E-08	1.095E-13	8.767E-07	1.257E-07	7120C04LS
1.630E+00	4.822E-07	5.439E-08	6.422E-08	1.246E-13	8.608E-07	1.236E-07	7120C04LS
1.656E+00	4.745E-07	5.04E-08	6.351E-08	1.230E-13	8.484E-07	1.219E-07	7120C04LS
1.681E+00	3.969E-07	3.85E-08	5.339E-08	1.032E-13	8.375E-07	1.204E-07	7120C04LS
1.715E+00	4.480E-07	6.06E-08	6.055E-08	1.70E-13	8.232E-07	1.185E-07	7120C04LS
1.741E+00	3.824E-07	5.03E-08	5.03E-08	1.001E-13	8.124E-07	1.170E-07	7120C04LS
1.774E+00	4.162E-07	7.68E-08	7.26E-08	1.100E-13	7.991E-07	1.152E-07	7120C04LS
1.799E+00	5.041E-07	6.048E-08	6.935E-08	1.329E-13	7.876E-07	1.137E-07	7120C04LS
1.832E+00	3.950E-07	8.775E-08	4.470E-08	1.046E-13	7.728E-07	1.116E-07	7120C04LS
1.857E+00	4.483E-07	6.065E-08	6.236E-08	1.190E-13	7.622E-07	1.101E-07	7120C04LS
1.890E+00	4.522E-07	3.179E-08	6.331E-08	1.205E-13	7.474E-07	1.081E-07	7120C04LS
1.922E+00	3.484E-07	6.051E-08	4.922E-08	9.348E-14	7.346E-07	1.063E-07	7120C04LS
1.946E+00	3.612E-07	7.85E-08	5.111E-08	9.690E-14	7.260E-07	1.051E-07	7120C04LS
1.978E+00	3.507E-07	4.840E-08	4.994E-08	9.445E-14	7.146E-07	1.034E-07	7120C04LS
1.009E+00	3.917E-07	0.01E-08	6.02E-08	1.059E-13	7.031E-07	1.018E-07	7120C04LS
1.040E+00	4.29E-07	1.76E-08	6.150E-08	1.167E-13	6.904E-07	9.999E-08	7120C04LS
1.064E+00	3.91E-07	1.49E-08	7.11E-08	1.087E-13	6.805E-07	9.856E-08	7120C04LS
1.079E+00	4.07E-07	1.04E-08	6.94E-08	1.745E-13	6.71E-07	9.856E-08	7120C04LS
1.095E+00	2.42E-07	1.97E-08	6.640E-08	8.862E-14	6.688E-07	9.689E-08	7120C04LS
1.125E+00	3.656E-07	3.19E-08	5.235E-08	1.004E-13	6.584E-07	9.541E-08	7120C04LS
1.156E+00	3.960E-07	3.88E-08	6.71E-08	1.091E-13	6.466E-07	9.372E-08	7120C04LS
1.186E+00	4.055E-07	4.52E-08	8.51E-08	1.130E-13	6.345E-07	9.199E-08	7120C04LS
1.216E+00	3.75E-07	2.51E-08	8.93E-08	1.32E-13	6.223E-07	9.124E-08	7120C04LS
1.238E+00	2.993E-07	3.321E-08	4.20E-08	8.338E-14	6.12E-07	8.912E-08	7120C04LS
1.260E+00	3.904E-07	4.442E-08	5.505E-08	1.091E-13	6.069E-07	8.803E-08	7120C04LS
1.268E+00	3.141E-07	4.476E-08	4.502E-08	8.782E-14	6.041E-07	8.763E-08	7120C04LS
1.297E+00	3.405E-07	4.435E-08	4.882E-08	9.557E-14	5.946E-07	8.627E-08	7120C04LS
1.326E+00	4.84E-07	4.348E-08	4.998E-08	9.819E-14	5.846E-07	8.484E-08	7120C04LS
1.355E+00	3.046E-07	4.565E-08	4.370E-08	8.618E-14	5.752E-07	8.346E-08	7120C04LS
1.384E+00	3.7433E-07	4.636E-08	4.926E-08	9.768E-14	5.65E-07	8.213E-08	7120C04LS
1.413E+00	3.394E-07	4.611E-08	4.872E-08	9.674E-14	5.559E-07	8.071E-08	7120C04LS
1.424E+00	3.668E-07	8.19E-08	5.266E-08	1.047E-13	5.520E-07	8.015E-08	7120C04LS
1.449E+00	3.58E-07	8.27E-08	5.153E-08	1.028E-13	5.429E-07	7.885E-08	7120C04LS
1.477E+00	3.13E-07	7.71E-08	4.759E-08	9.522E-14	5.333E-07	7.746E-08	7120C04LS
1.501E+00	4.00E-07	1.16E-08	4.897E-08	9.948E-14	5.18E-07	7.145E-08	7120C04LS
1.560E+00	3.344E-07	1.16E-08	4.818E-08	9.378E-14	5.380E-07	7.103E-08	7120C04LS
1.591E+00	8.63E-07	8.75E-08	4.128E-08	8.718E-14	3.886E-07	5.664E-08	7120C04LS
1.132E+00	1.32E+00	1.590E-08	3.419E-08	7.410E-14	3.329E-07	4.861E-08	7120C04LS
1.291E+00	1.739E-07	1.342E-08	2.516E-08	5.560E-14	3.003E-07	4.389E-08	7120C04LS
1.503E+00	1.737E-07	1.342E-08	3.518E-08	5.710E-14	2.634E-07	3.855E-08	7120C04LS
1.562E+00	1.400E-07	1.202E-08	2.033E-08	4.699E-14	2.385E-07	3.493E-08	7120C04LS
1.572E+00	1.156E-07	1.067E-08	1.682E-08	3.988E-14	2.117E-07	3.103E-08	7120C04LS
1.019E+00	1.022E-07	1.067E-08	1.489E-08	3.596E-14	1.957E-07	2.870E-08	7120C04LS

4.215E+00	1.010E-07	1.069E-08	1.474E-08	3.645E-14	1.757E-07	2.590E-08	7120C04HS
4.429E+00	1.002E-07	1.067E-08	1.465E-08	3.719E-14	1.542E-07	2.269E-08	7120C04HS
4.575E+00	8.619E-08	1.016E-08	1.262E-08	3.262E-14	1.403E-07	2.062E-08	7120C04HS
4.775E+00	7.548E-08	6.808E-09	1.107E-08	2.931E-14	1.244E-07	1.829E-08	7120C04HS
4.970E+00	6.743E-08	6.448E-09	9.910E-09	2.687E-14	1.105E-07	1.624E-08	7120C04HS
5.116E+00	5.195E-08	5.912E-09	7.637E-09	2.084E-14	1.016E-07	1.496E-08	7120C04HS
5.305E+00	4.082E-08	4.597E-09	5.941E-09	1.451E-14	9.094E-08	1.337E-08	7120C04HS
5.489E+00	2.953E-08	3.415E-09	5.811E-09	1.600E-14	8.185E-08	1.204E-08	7120C04HS
5.684E+00	2.610E-08	3.352E-09	5.307E-09	1.468E-14	7.448E-08	1.095E-08	7120C04HS
5.870E+00	4.444E-08	5.535E-09	6.533E-09	1.815E-14	6.699E-08	9.850E-09	7120C04HS
6.062E+00	4.293E-08	5.369E-09	6.311E-09	1.761E-14	5.860E-08	8.617E-09	7120C04HS
6.201E+00	2.751E-08	3.064E-09	4.044E-09	1.132E-14	5.370E-08	7.898E-09	7120C04HS
6.385E+00	3.100E-08	5.203E-09	4.556E-09	1.291E-14	4.832E-08	7.106E-09	7120C04HS
6.566E+00	2.564E-08	3.471E-09	3.769E-09	1.064E-14	4.314E-08	6.345E-09	7120C04HS
6.750E+00	2.066E-08	3.330E-09	3.038E-09	8.614E-15	3.893E-08	5.725E-09	7120C04HS
6.930E+00	2.225E-08	3.282E-09	3.271E-09	9.316E-15	3.506E-08	5.157E-09	7120C04HS
7.110E+00	2.000E-08	3.153E-09	2.939E-09	8.406E-15	3.126E-08	4.598E-09	7120C04HS
7.286E+00	1.892E-08	3.156E-09	2.2781E-09	7.985E-15	2.790E-08	4.089E-09	7120C04HS
7.508E+00	1.372E-08	3.067E-09	2.017E-09	5.822E-15	2.419E-08	3.559E-09	7120C04HS
7.684E+00	1.510E-08	3.049E-09	2.219E-09	6.432E-15	2.167E-08	3.189E-09	7120C04HS
7.859E+00	1.317E-08	2.958E-09	1.936E-09	5.634E-15	1.920E-08	2.825E-09	7120C04HS
8.032E+00	8.950E-09	2.871E-09	1.316E-09	3.845E-15	1.728E-08	2.544E-09	7120C04HS
8.205E+00	1.047E-08	2.735E-09	1.540E-09	4.519E-15	1.560E-08	2.297E-09	7120C04HS
8.383E+00	9.923E-09	2.011E-09	1.459E-09	4.297E-15	1.399E-08	2.060E-09	7120C04HS
8.565E+00	7.082E-09	1.857E-09	1.070E-09	3.169E-15	1.205E-08	1.779E-09	7120C04HS
8.751E+00	7.872E-09	1.876E-09	1.151E-09	3.440E-15	1.082E-08	1.594E-09	7120C04HS
8.926E+00	6.756E-09	1.803E-09	9.931E-10	2.964E-15	9.543E-09	1.406E-09	7120C04HS
9.136E+00	5.534E-09	1.715E-09	8.135E-10	2.440E-15	8.253E-09	1.216E-09	7120C04HS
9.303E+00	5.613E-09	1.736E-09	8.250E-10	2.485E-15	7.322E-09	1.080E-09	7120C04HS
9.468E+00	4.157E-09	1.611E-09	6.111E-10	1.847E-15	6.516E-09	9.611E-10	7120C04HS
9.675E+00	3.950E-09	1.646E-09	5.806E-10	1.764E-15	5.677E-09	8.378E-10	7120C04HS
9.839E+00	1.333E-09	1.536E-09	2.842E-10	9.687E-16	5.195E-09	7.869E-10	7120C04HS
1.004E+01	3.976E-09	1.203E-09	5.845E-10	1.790E-15	4.601E-09	6.796E-10	7120C04HS
1.021E+01	3.769E-09	1.144E-09	5.545E-10	1.700E-15	3.942E-09	5.827E-10	7120C04HS
1.041E+01	3.759E-09	1.133E-09	5.536E-10	1.699E-15	3.190E-09	4.719E-10	7120C04HS
1.057E+01	8.437E-10	1.069E-09	1.244E-10	3.820E-16	2.821E-09	4.177E-10	7120C04HS
1.077E+01	2.781E-09	1.646E-09	4.103E-10	1.262E-15	2.459E-09	1.640E-10	7120C04HS
1.093E+01	1.813E-09	9.936E-10	2.676E-10	8.237E-16	2.091E-09	3.100E-10	7120C04HS
1.113E+01	1.795E-10	9.067E-10	2.653E-11	8.175E-17	1.892E-09	2.806E-10	7120C04HS
1.128E+01	2.279E-09	9.339E-10	3.370E-10	1.039E-15	1.708E-09	2.533E-10	7120C04HS
1.148E+01	9.748E-10	9.008E-10	1.443E-10	4.456E-16	1.383E-09	2.052E-10	7120C04HS
1.168E+01	1.140E-09	7.126E-10	1.689E-10	5.223E-16	1.171E-09	1.739E-10	7120C04HS
1.183E+01	1.813E-09	6.944E-10	2.698E-10	9.371E-16	9.449E-10	1.410E-10	7120C04HS
1.203E+01	4.941E-10	6.600E-10	2.332E-11	6.237E-16	7.188E-10	1.069E-10	7120C04HS
1.222E+01	4.931E-10	9.436E-10	7.324E-11	2.272E-16	6.250E-10	9.289E-11	7120C04HS
1.237E+01	7.840E-09	7.366E-09	1.165E-09	3.617E-15	0.	0.	7120C04HS

1 CF-252 5 CM D20 AT R=2M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING 10:30:18U 10/18/77
 COMPIATION DATE OF THIS CODE VERSION 10/18/77U 09.13.04

30 GROUP OUTPUT

GROUP#	ENERGY UP-BOUND-MEV	DIFFERENTIAL FLUX N/CM2-SEC-MEV	INTEGRAL FLUX N/CM2-SEC	FLUX PER UNIT LETHARGY N/CM2-SEC
30	4.000000E-07	0.	0.	0.
29	3.180000E-06	0.	0.	0.
28	2.520000E-05	0.	0.	0.
27	2.000000E-04	0.	0.	0.
26	1.590000E-03	0.	0.	0.
25	1.261000E-02	0.	0.	0.
24	1.000000E-01	0.	0.	0.
23	2.236000E-01	1.996974E-06	2.468259E-07	3.231103E-07
22	5.000000E-01	1.427906E-06	3.946732E-07	5.166164E-07
21	5.946000E-01	1.133140E-06	1.071951E-07	6.201677E-07
20	7.071000E-01	8.887871E-07	9.998854E-08	5.784671E-07
19	8.409000E-01	4.770486E-07	6.382910E-08	3.692356E-07
18	1.000000E+00	4.124738E-07	6.562458E-08	3.796615E-07
17	1.257400E+00	4.409839E-07	1.135092E-07	4.377385E-07
16	1.581100E+00	4.650801E-07	1.505464E-07	6.600649E-07
15	1.988200E+00	4.225243E-07	1.720097E-07	7.540580E-07
14	2.500000E+00	3.621970E-07	1.853724E-07	8.128062E-07
13	3.273000E+00	3.216463E-07	1.521387E-07	8.801850E-07
12	3.835500E+00	2.054678E-07	1.155756E-07	6.686436E-07
11	4.204500E+00	1.212270E-07	8.110086E-08	4.691485E-07
10	5.000000E+00	8.586713E-08	6.830730E-08	3.951820E-07
9	5.764800E+00	4.849153E-08	3.708637E-08	2.610012E-07
8	6.646500E+00	3.425745E-08	3.020479E-08	2.125897E-07
7	7.663100E+00	1.691386E-08	1.922783E-08	1.353249E-07
6	8.835200E+00	1.005701E-08	1.179954E-08	8.304428E-08
5	1.018600E+01	4.552663E-09	6.149737E-09	4.329856E-08
4	1.174500E+01	1.889530E-09	2.945777E-09	2.071964E-08
3	1.354100E+01	7.071375E-09	1.270019E-08	8.940340E-08
2	1.561200E+01	0.	0.	0.
1	1.800000E+01	0.	0.	0.

TIME AND DATE OF DATA REPORTING
 COMPILATION DATE OF THIS CODE VERSION

10:32:05U 10/18/77
 10/18/77U 09.13.04

ENERGY (MEV)	PHI (NEUT/CM2-SEC-MEV)	DEL-PHI	DOSE (MR/HR-MEV)	KERMA (ERG/GM-SEC-MEV)	INTEGRAL (NEUT/CM2-SEC)	INT-DOSE (MR/HR)	FILE-ID
1.664E-01	1.265E-06	6.326E-08	3.229E-08	9.548E-14	1.077E-06	1.179E-07	7100C02S
1.759E-01	1.166E-06	6.687E-08	3.064E-08	8.989E-14	1.085E-06	1.176E-07	7100C02S
1.854E-01	1.102E-06	6.558E-08	2.983E-08	8.598E-14	1.054E-06	1.172E-07	7100C02S
1.949E-01	1.059E-06	6.401E-08	2.950E-08	8.520E-14	1.044E-06	1.170E-07	7100C02S
2.044E-01	1.030E-06	6.325E-08	2.956E-08	8.469E-14	1.034E-06	1.167E-07	7100C02S
2.139E-01	1.016E-06	6.307E-08	3.002E-08	8.532E-14	1.025E-06	1.164E-07	7100C02S
2.234E-01	1.008E-06	6.425E-08	3.067E-08	8.650E-14	1.015E-06	1.161E-07	7100C02S
2.329E-01	9.995E-07	6.67E-08	3.132E-08	8.763E-14	1.005E-06	1.158E-07	7100C02S
2.424E-01	9.89E-07	6.443E-08	3.181E-08	8.831E-14	9.90E-07	1.155E-07	7100C02S
2.519E-01	9.85E-07	6.305E-08	3.206E-08	8.831E-14	9.867E-07	1.152E-07	7100C02S
2.614E-01	9.938E-07	6.198E-08	3.211E-08	8.774E-14	9.777E-07	1.149E-07	7100C02S
2.709E-01	9.073E-07	6.072E-08	3.196E-08	8.666E-14	9.689E-07	1.146E-07	7100C02S
2.804E-01	8.742E-07	5.927E-08	3.171E-08	8.530E-14	9.604E-07	1.143E-07	7100C02S
2.899E-01	8.398E-07	5.839E-08	3.137E-08	8.372E-14	9.523E-07	1.140E-07	7100C02S
2.994E-01	8.048E-07	5.748E-08	3.096E-08	8.196E-14	9.445E-07	1.137E-07	7100C02S
3.089E-01	7.704E-07	5.657E-08	3.051E-08	8.015E-14	9.370E-07	1.134E-07	7100C02S
3.184E-01	7.373E-07	5.570E-08	3.007E-08	7.837E-14	9.298E-07	1.132E-07	7100C02S
3.280E-01	7.048E-07	5.489E-08	2.961E-08	7.656E-14	9.229E-07	1.129E-07	7100C02S
3.375E-01	6.750E-07	5.418E-08	2.920E-08	7.490E-14	9.164E-07	1.126E-07	7100C02S
3.470E-01	6.474E-07	5.349E-08	2.884E-08	7.339E-14	9.101E-07	1.123E-07	7100C02S
3.565E-01	6.221E-07	5.288E-08	2.853E-08	7.205E-14	9.041E-07	1.120E-07	7100C02S
3.660E-01	5.982E-07	5.232E-08	2.830E-08	7.089E-14	8.983E-07	1.118E-07	7100C02S
3.755E-01	5.755E-07	5.182E-08	2.814E-08	6.993E-14	8.927E-07	1.115E-07	7100C02S
3.850E-01	5.603E-07	5.138E-08	2.806E-08	6.919E-14	8.872E-07	1.112E-07	7100C02S
3.945E-01	5.443E-07	5.093E-08	2.807E-08	6.867E-14	8.820E-07	1.110E-07	7100C02S
4.040E-01	5.305E-07	5.048E-08	2.807E-08	6.828E-14	8.768E-07	1.107E-07	7100C02S
4.135E-01	5.187E-07	5.036E-08	2.837E-08	6.831E-14	8.719E-07	1.104E-07	7100C02S
4.230E-01	5.089E-07	5.011E-08	2.866E-08	6.847E-14	8.670E-07	1.102E-07	7100C02S
4.325E-01	5.009E-07	5.010E-08	2.904E-08	6.884E-14	8.622E-07	1.099E-07	7100C02S
4.420E-01	4.943E-07	5.035E-08	2.951E-08	6.940E-14	8.575E-07	1.096E-07	7100C02S
4.515E-01	4.889E-07	5.066E-08	3.006E-08	7.013E-14	8.528E-07	1.093E-07	7100C02S
4.610E-01	4.843E-07	5.086E-08	3.068E-08	7.098E-14	8.482E-07	1.090E-07	7100C02S
4.705E-01	4.806E-07	5.352E-09	3.133E-08	7.195E-14	8.436E-07	1.087E-07	7100C02S
4.800E-01	4.772E-07	5.242E-09	3.204E-08	7.299E-14	8.391E-07	1.084E-07	7100C02S
4.896E-01	4.741E-07	5.144E-09	3.278E-08	7.410E-14	8.345E-07	1.081E-07	7100C02S
4.991E-01	4.710E-07	5.047E-09	3.353E-08	7.520E-14	8.300E-07	1.078E-07	7100C02S
5.086E-01	4.677E-07	5.050E-09	3.368E-08	7.535E-14	8.256E-07	1.075E-07	7100C02S
5.181E-01	4.640E-07	5.046E-09	3.374E-08	7.549E-14	8.211E-07	1.072E-07	7100C02S
5.276E-01	4.599E-07	5.029E-09	3.376E-08	7.525E-14	8.168E-07	1.069E-07	7100C02S
5.371E-01	4.550E-07	5.099E-09	3.372E-08	7.503E-14	8.124E-07	1.065E-07	7100C02S
5.466E-01	4.494E-07	5.456E-09	3.363E-08	7.468E-14	8.081E-07	1.062E-07	7100C02S
5.561E-01	4.431E-07	6.294E-09	3.347E-08	7.419E-14	8.039E-07	1.059E-07	7100C02S
5.656E-01	4.359E-07	6.119E-09	3.325E-08	7.356E-14	7.997E-07	1.056E-07	7100C02S
5.751E-01	4.282E-07	7.931E-09	3.297E-08	7.282E-14	7.956E-07	1.053E-07	7100C02S
5.846E-01	4.200E-07	7.723E-09	3.265E-08	7.197E-14	7.916E-07	1.050E-07	7100C02S
5.941E-01	4.114E-07	7.515E-09	3.229E-08	7.104E-14	7.876E-07	1.046E-07	7100C02S
6.036E-01	4.028E-07	7.314E-09	3.192E-08	7.010E-14	7.837E-07	1.043E-07	7100C02S
6.131E-01	3.945E-07	7.243E-09	3.155E-08	6.918E-14	7.800E-07	1.040E-07	7100C02S
6.226E-01	3.866E-07	7.334E-09	3.122E-08	6.832E-14	7.762E-07	1.037E-07	7100C02S
6.321E-01	3.797E-07	7.451E-09	3.096E-08	6.762E-14	7.725E-07	1.034E-07	7100C02S
6.416E-01	3.740E-07	7.593E-09	3.078E-08	6.711E-14	7.690E-07	1.032E-07	7100C02S

6.512E-01	3.697E-07	7.762E-09	3.072E-08	6.686E-14	7.655E-07	1.029E-07	7100C02S
6.607E-01	6.70E-07	8.009E-09	3.080E-08	6.689E-14	7.620E-07	1.026E-07	7100C02S
6.702E-01	6.60E-07	8.266E-09	3.101E-08	6.723E-14	7.585E-07	1.023E-07	7100C02S
6.797E-01	6.66E-07	8.522E-09	3.135E-08	6.785E-14	7.550E-07	1.020E-07	7100C02S
6.892E-01	6.84E-07	9.456E-09	3.181E-08	6.871E-14	7.515E-07	1.017E-07	7100C02S
6.987E-01	3.719E-07	1.002E-08	3.242E-08	6.992E-14	7.480E-07	1.014E-07	7100C02S
7.082E-01	3.758E-07	1.069E-08	3.308E-08	7.119E-14	7.444E-07	1.011E-07	7100C02S
7.169E-01	1.653E-07	1.290E-08	1.794E-08	3.709E-14	6.880E-07	9.774E-08	7130C02LS
9.540E-01	1.085E-07	1.340E-08	2.091E-08	4.290E-14	5.815E-07	9.502E-08	7130C02LS
9.782E-01	1.039E-07	1.452E-08	2.354E-08	4.808E-14	6.768E-07	9.446E-08	7130C02LS
1.014E+00	2.072E-07	1.473E-08	2.451E-08	4.980E-14	6.694E-07	9.362E-08	7130C02LS
1.037E+00	2.058E-07	1.492E-08	2.466E-08	4.961E-14	6.646E-07	9.305E-08	7130C02LS
1.071E+00	1.911E-07	1.444E-08	2.266E-08	4.624E-14	6.579E-07	9.225E-08	7130C02LS
1.093E+00	1.922E-07	1.461E-08	3.099E-08	4.664E-14	6.537E-07	9.175E-08	7130C02LS
1.124E+00	1.685E-07	1.097E-08	3.079E-08	4.681E-14	6.507E-07	9.130E-08	7130C02LS
1.156E+00	1.958E-07	1.534E-08	3.378E-08	4.780E-14	6.423E-07	9.037E-08	7130C02LS
1.190E+00	1.158E-07	1.591E-08	6.553E-08	5.320E-14	6.353E-07	8.951E-08	7130C02LS
1.212E+00	2.64E-07	1.649E-08	2.783E-08	5.572E-14	6.304E-07	8.891E-08	7130C02LS
1.243E+00	4.17E-07	1.732E-08	2.988E-08	5.969E-14	6.231E-07	8.802E-08	7130C02LS
1.274E+00	4.47E-07	1.774E-08	3.043E-08	6.065E-14	6.156E-07	8.708E-08	7130C02LS
1.304E+00	4.10E-07	1.768E-08	3.015E-08	5.944E-14	6.083E-07	8.617E-08	7130C02LS
1.334E+00	4.71E-07	1.858E-08	3.110E-08	6.169E-14	6.010E-07	8.526E-08	7130C02LS
1.363E+00	6.65E-07	1.922E-08	3.372E-08	6.675E-14	5.935E-07	8.432E-08	7130C02LS
1.393E+00	5.09E-07	1.767E-08	3.193E-08	6.307E-14	5.858E-07	8.333E-08	7130C02LS
1.421E+00	6.29E-07	1.861E-08	3.364E-08	6.631E-14	5.786E-07	8.241E-08	7130C02LS
1.450E+00	6.23E-07	1.864E-08	3.375E-08	6.639E-14	5.710E-07	8.144E-08	7130C02LS
1.487E+00	6.29E-07	1.885E-08	3.407E-08	6.682E-14	5.612E-07	8.018E-08	7130C02LS
1.515E+00	5.93E-07	1.874E-08	3.379E-08	6.613E-14	5.539E-07	7.923E-08	7130C02LS
1.542E+00	5.64E-07	1.879E-08	3.383E-08	6.610E-14	5.469E-07	7.832E-08	7130C02LS
1.569E+00	4.61E-07	1.770E-08	3.240E-08	6.316E-14	5.401E-07	7.742E-08	7130C02LS
1.604E+00	6.27E-07	1.852E-08	3.481E-08	6.768E-14	5.312E-07	7.625E-08	7130C02LS
1.630E+00	5.30E-07	1.819E-08	3.370E-08	6.541E-14	5.245E-07	7.536E-08	7130C02LS
1.665E+00	4.93E-07	1.609E-08	3.343E-08	6.472E-14	5.157E-07	7.416E-08	7130C02LS
1.698E+00	5.09E-07	1.696E-08	3.334E-08	6.365E-14	5.100E-07	7.325E-08	7130C02LS
1.718E+00	3.51E-07	1.784E-08	3.182E-08	6.137E-14	5.036E-07	7.254E-08	7130C02LS
1.750E+00	3.32E-07	1.696E-08	3.178E-08	6.113E-14	4.954E-07	7.143E-08	7130C02LS
1.783E+00	4.06E-07	1.733E-08	3.300E-08	6.332E-14	4.875E-07	7.036E-08	7130C02LS
1.808E+00	4.19E-07	1.749E-08	3.334E-08	6.385E-14	4.815E-07	6.953E-08	7130C02LS
1.841E+00	4.18E-07	1.754E-08	3.354E-08	6.408E-14	4.735E-07	6.843E-08	7130C02LS
1.866E+00	4.21E-07	1.765E-08	3.375E-08	6.434E-14	4.675E-07	6.758E-08	7130C02LS
1.898E+00	2.88E-07	1.650E-08	3.208E-08	6.103E-14	4.600E-07	6.653E-08	7130C02LS
1.930E+00	3.32E-07	1.672E-08	3.290E-08	6.244E-14	4.526E-07	6.549E-08	7130C02LS
1.962E+00	4.06E-07	1.713E-08	3.415E-08	6.467E-14	4.450E-07	6.442E-08	7130C02LS
1.986E+00	2.97E-07	1.666E-08	3.276E-08	6.191E-14	4.393E-07	6.362E-08	7130C02LS
2.017E+00	2.65E-07	1.658E-08	3.297E-08	6.295E-14	4.323E-07	6.261E-08	7130C02LS
2.049E+00	1.87E-07	1.628E-08	3.129E-08	6.141E-14	4.251E-07	6.183E-08	7130C02LS
2.079E+00	1.71E-07	1.567E-08	3.107E-08	5.922E-14	4.186E-07	6.065E-08	7130C02LS
2.079E+00	4.79E-07	1.555E-08	3.548E-08	6.763E-14	4.186E-07	6.065E-08	7130C02HS
2.110E+00	1.37E-07	1.570E-08	3.058E-08	5.852E-14	4.115E-07	5.963E-08	7130C02LS
2.141E+00	1.51E-07	1.586E-08	3.081E-08	5.917E-14	4.048E-07	5.868E-08	7130C02LS
2.163E+00	1.71E-07	1.611E-08	3.109E-08	5.986E-14	4.001E-07	5.808E-08	7130C02LS
2.193E+00	2.18E-07	1.657E-08	3.141E-08	6.057E-14	3.935E-07	5.708E-08	7130C02LS
2.201E+00	4.37E-07	1.585E-08	3.491E-08	6.755E-14	3.916E-07	5.679E-08	7130C02HS
2.223E+00	2.20E-07	1.544E-08	3.181E-08	6.171E-14	3.865E-07	5.605E-08	7130C02LS
2.253E+00	2.44E-07	1.573E-08	3.217E-08	6.264E-14	3.798E-07	5.509E-08	7130C02LS
2.283E+00	1.43E-07	1.548E-08	3.072E-08	6.005E-14	3.732E-07	5.415E-08	7130C02LS
2.312E+00	1.58E-07	1.568E-08	3.105E-08	6.053E-14	3.675E-07	5.335E-08	7130C02LS
2.348E+00	1.27E-07	1.523E-08	3.051E-08	6.010E-14	3.592E-07	5.214E-08	7130C02LS
2.377E+00	2.13E-07	1.474E-08	3.176E-08	6.278E-14	3.529E-07	5.123E-08	7130C02LS
2.406E+00	2.140E-07	1.510E-08	3.071E-08	6.093E-14	3.466E-07	5.033E-08	7130C02LS

2.424E+00	2.231E-07	1.458E-08	3.203E-08	6.369E-14	3.426E-07	4.976E-08	7130C02HS
4.395E+00	2.022E-07	1.499E-08	2.903E-08	5.779E-14	3.403E-07	4.943E-08	7130C02HS
4.637E+00	2.076E-07	1.449E-08	2.982E-08	5.956E-14	3.345E-07	4.860E-08	7130C02LS
2.491E+00	1.951E-07	1.325E-08	2.802E-08	5.617E-14	3.289E-07	4.779E-08	7130C02LS
2.601E+00	2.111E-07	1.242E-08	3.036E-08	6.167E-14	3.066E-07	4.458E-08	7130C02HS
2.760E+00	1.933E-07	1.141E-08	2.784E-08	7.67E-14	2.744E-07	3.996E-08	7130C02HS
2.920E+00	1.815E-07	1.060E-08	6.617E-08	2.427E-14	2.404E-07	3.564E-08	7130C02HS
3.132E+00	1.395E-07	8.216E-09	2.417E-08	4.372E-14	1.104E-07	3.129E-08	7130C02HS
3.291E+00	1.188E-07	7.165E-09	1.719E-08	3.798E-14	1.899E-07	2.775E-08	7130C02HS
3.503E+00	9.644E-08	5.925E-09	1.398E-08	3.171E-14	1.670E-07	2.445E-08	7130C02HS
3.662E+00	8.599E-08	5.176E-09	1.249E-08	8.87E-14	1.525E-07	2.235E-08	7130C02HS
3.872E+00	7.353E-08	4.514E-09	1.070E-08	5.37E-14	1.358E-07	1.991E-08	7130C02HS
4.019E+00	6.474E-08	4.023E-09	9.431E-09	2.77E-14	1.266E-07	1.843E-08	7130C02HS
4.215E+00	5.689E-08	3.612E-09	8.857E-09	1.90E-14	1.133E-07	1.664E-08	7130C02HS
4.379E+00	5.973E-08	3.731E-09	6.730E-09	2.202E-14	1.035E-07	1.520E-08	7130C02HS
4.577E+00	5.402E-08	3.414E-09	7.911E-09	2.044E-14	9.220E-08	1.355E-08	7130C02HS
4.774E+00	4.773E-08	3.113E-09	7.001E-09	1.853E-14	8.218E-08	1.208E-08	7130C02HS
4.921E+00	4.427E-08	2.98E-09	6.504E-09	1.753E-14	7.542E-08	1.109E-08	7130C02HS
5.15E+00	3.924E-08	2.689E-09	5.76E-09	1.574E-14	6.732E-08	9.898E-09	7130C02HS
5.307E+00	3.428E-08	2.414E-09	5.034E-09	1.380E-14	6.026E-08	8.861E-09	7130C02HS
5.486E+00	3.333E-08	2.349E-09	4.899E-09	1.348E-14	5.415E-08	7.962E-09	7130C02HS
5.635E+00	3.004E-08	2.052E-09	4.415E-09	1.220E-14	4.949E-08	7.277E-09	7130C02HS
5.825E+00	4.451E-08	1.804E-09	3.602E-09	9.985E-15	4.431E-08	6.516E-09	7130C02HS
6.003E+00	1.149E-08	1.658E-09	3.160E-09	8.804E-15	4.021E-08	5.94E-09	7130C02HS
6.200E+00	2.094E-08	1.634E-09	3.078E-09	8.185E-15	3.603E-08	5.300E-09	7130C02HS
6.384E+00	1.990E-08	1.602E-09	2.925E-09	6.223E-15	3.228E-08	4.747E-09	7130C02HS
6.567E+00	1.647E-08	1.423E-09	2.420E-09	6.834E-15	2.895E-08	4.258E-09	7130C02HS
6.749E+00	1.582E-08	1.375E-09	2.326E-09	6.595E-15	2.601E-08	3.826E-09	7130C02HS
6.929E+00	1.430E-08	1.314E-09	2.102E-09	6.985E-15	2.330E-08	3.428E-09	7130C02HS
7.109E+00	1.349E-08	1.27E-09	1.86E-09	2.112E-08	2.07E-08	3.07E-09	7130C02HS
7.287E+00	1.015E-08	1.165E-09	1.492E-09	4.285E-15	1.933E-08	2.844E-09	7130C02HS
7.464E+00	1.121E-08	1.064E-09	1.648E-09	4.751E-15	1.744E-08	2.566E-09	7130C02HS
7.639E+00	1.120E-08	1.068E-09	1.647E-09	4.768E-15	1.548E-08	2.278E-09	7130C02HS
7.814E+00	8.755E-09	9.631E-10	1.287E-09	3.742E-15	1.373E-08	2.021E-09	7130C02HS
7.988E+00	7.463E-09	9.073E-10	1.097E-09	2.03E-15	1.232E-08	1.814E-09	7130C02HS
8.203E+00	6.029E-09	7.34E-10	8.863E-10	5.01E-15	1.087E-08	1.601E-09	7130C02HS
8.361E+00	6.444E-09	7.989E-10	8.002E-10	3.57E-15	9.965E-09	1.467E-09	7130C02HS
8.539E+00	6.382E-09	7.970E-10	9.381E-10	2.775E-15	8.913E-09	1.313E-09	7130C02HS
8.710E+00	5.699E-09	7.710E-10	8.377E-10	2.488E-15	7.880E-09	1.161E-09	7130C02HS
8.925E+00	3.990E-09	7.204E-10	5.865E-10	1.751E-15	6.838E-09	1.008E-09	7130C02HS
9.092E+00	5.542E-09	6.834E-10	5.207E-10	1.560E-15	6.209E-09	9.153E-10	7130C02HS
9.259E+00	2.887E-09	5.761E-10	4.244E-10	1.277E-15	4.672E-09	8.364E-10	7130C02HS
9.457E+00	2.525E-09	5.731E-10	3.712E-10	1.22E-15	5.109E-09	8.536E-10	7130C02HS
9.632E+00	2.246E-09	5.380E-10	3.301E-10	1.002E-15	4.716E-09	6.958E-10	7130C02HS
9.796E+00	2.812E-09	5.450E-10	4.134E-10	1.259E-15	4.301E-09	6.348E-10	7130C02HS
1.000E+01	3.172E-09	5.432E-10	4.663E-10	1.428E-15	3.691E-09	5.451E-10	7130C02HS
1.016E+01	3.897E-09	5.036E-10	4.262E-10	1.306E-15	3.205E-09	4.737E-10	7130C02HS
1.037E+01	2.292E-09	4.369E-10	3.695E-10	1.166E-15	2.632E-09	3.64E-10	7130C02HS
1.053E+01	2.388E-09	4.161E-10	3.79E-10	1.080E-15	2.196E-09	3.310E-10	7130C02HS
1.073E+01	9.579E-10	4.187E-10	1.413E-10	4.344E-16	1.902E-09	2.817E-10	7130C02HS
1.089E+01	9.956E-10	3.686E-10	1.470E-10	4.522E-16	1.746E-09	2.587E-10	7130C02HS
1.108E+01	1.078E-09	3.442E-10	1.593E-10	4.906E-16	1.549E-09	2.296E-10	7130C02HS
1.124E+01	1.094E-09	3.464E-10	1.618E-10	4.989E-16	1.375E-09	2.039E-10	7130C02HS
1.144E+01	9.339E-10	3.296E-10	1.382E-10	4.267E-16	9.17E-10	1.739E-10	7130C02HS
1.163E+01	1.152E-09	3.065E-10	1.708E-10	4.74E-16	7.739E-10	1.44E-10	7130C02HS
1.179E+01	1.085E-09	3.025E-10	1.608E-10	4.976E-16	7.949E-10	1.180E-10	7130C02HS
1.198E+01	8.899E-10	2.688E-10	1.320E-10	4.088E-16	6.073E-10	9.021E-11	7130C02HS
1.218E+01	9.144E-10	5.930E-10	1.358E-10	4.211E-16	6.269E-10	8.343E-11	7130C02HS
1.233E+01	4.777E-09	3.203E-09	7.099E-10	2.203E-15	0.	0.	7130C02HS

1 CF-252 10 CM D20 AT R=2M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING
COMPILATION DATE OF THIS CODE VERSION

10/18/77U 10:32:05U 10/18/77
09.13.04

30 GROUP OUTPUT

GROUP#	ENERGY UP-BOUND-MEV	DIFFERENTIAL FLUX N/CM2-SEC-MEV	INTEGRAL FLUX N/CM2-SEC	FLUX PER UNIT LETHARGY N/CM2-SEC
30	4.000000E-07	0.	0.	0.
29	3.180000E-06	0.	0.	0.
28	2.520000E-05	0.	0.	0.
27	2.000000E-04	0.	0.	0.
26	1.590000E-03	0.	0.	0.
25	1.261000E-02	0.	0.	0.
24	1.000000E-01	0.	0.	0.
23	2.236000E-01	1.181513E-06	1.460350E-07	1.911688E-07
22	5.000000E-01	6.698065E-07	1.851345E-07	2.423360E-07
21	5.946000E-01	4.460223E-07	4.219371E-08	2.441080E-07
20	7.071000E-01	3.782697E-07	4.255534E-08	2.461968E-07
19	8.409000E-01	3.758359E-07	5.028684E-08	2.908970E-07
18	1.000000E+00	1.958752E-07	3.116391E-08	1.802943E-07
17	1.257400E+00	2.045515E-07	5.265156E-08	2.308773E-07
16	1.581100E+00	2.549038E-07	8.251237E-08	3.617723E-07
15	1.988200E+00	2.414347E-07	9.828806E-08	4.306764E-07
14	2.500000E+00	2.182193E-07	1.116847E-07	4.897050E-07
13	2.973000E+00	1.946258E-07	9.205798E-08	5.325934E-07
12	3.535500E+00	1.264788E-07	7.114421E-08	4.115930E-07
11	4.204500E+00	7.469366E-08	4.997006E-08	2.890645E-07
10	5.000000E+00	5.276551E-08	4.197496E-08	2.428401E-07
9	5.764800E+00	3.421128E-08	2.616478E-08	1.841388E-07
8	6.646500E+00	2.062326E-08	1.818353E-08	1.279808E-07
7	7.663100E+00	1.223612E-08	1.243924E-08	8.754697E-08
6	8.835200E+00	6.812311E-09	7.984715E-09	5.619578E-08
5	1.018600E+01	3.033876E-09	4.098160E-09	2.865396E-08
4	1.174500E+01	1.466489E-09	2.286256E-09	1.608078E-08
3	1.354100E+01	3.849428E-09	6.913572E-09	4.866832E-08
2	1.561200E+01	0.	0.	0.
1	1.800000E+01	0.	0.	0.

1 CF-252 15 CM D20 AT R=2M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING 10/18/77U 10:33:21U 10/18/77
 COMPILATION DATE OF THIS CODE VERSION 09.13.04

ENERGY (MEV)	PHI (NEUT/CM2-SEC-MEV)	DEL-PHI	DOSE (MR/HR-MEV)	KERMA (ERG/GM-SEC-MEV)	INTEGRAL (NEUT/CM2-SEC)	INT-DOSE (MR/HR)	FILE-ID
1.562E-01	6.037E-07	3.018E-08	1.493E-09	4.453E-14	5.653E-07	6.265E-08	7070C04S
1.704E-01	5.840E-07	1.378E-08	1.509E-09	4.448E-14	5.569E-07	6.243E-08	7070C04S
1.846E-01	5.735E-07	1.330E-08	1.548E-09	4.510E-14	5.486E-07	6.222E-08	7070C04S
1.988E-01	5.551E-07	1.329E-08	1.594E-09	4.589E-14	5.405E-07	6.195E-08	7070C04S
2.130E-01	5.372E-07	1.588E-08	1.642E-09	4.672E-14	5.326E-07	6.176E-08	7070C04S
2.273E-01	5.447E-07	1.606E-08	1.678E-09	4.716E-14	5.247E-07	6.153E-08	7070C04S
2.415E-01	5.248E-07	1.439E-08	1.689E-09	4.691E-14	5.171E-07	6.129E-08	7070C04S
2.557E-01	4.978E-07	1.433E-08	1.673E-09	4.594E-14	5.098E-07	6.105E-08	7070C04S
2.699E-01	4.664E-07	1.129E-08	1.638E-09	4.445E-14	5.030E-07	6.081E-08	7070C04S
2.841E-01	4.337E-07	9.729E-09	1.591E-09	4.268E-14	4.966E-07	6.058E-08	7070C04S
2.983E-01	4.019E-07	8.385E-09	1.541E-09	4.083E-14	4.907E-07	6.036E-08	7070C04S
3.125E-01	3.721E-07	8.132E-09	1.490E-09	3.903E-14	4.852E-07	6.015E-08	7070C04S
3.267E-01	3.451E-07	7.483E-09	1.444E-09	3.738E-14	4.801E-07	5.994E-08	7070C04S
3.409E-01	3.213E-07	6.925E-09	1.404E-09	3.592E-14	4.754E-07	5.974E-08	7070C04S
3.551E-01	3.004E-07	6.439E-09	1.372E-09	3.468E-14	4.709E-07	5.954E-08	7070C04S
3.693E-01	2.823E-07	6.014E-09	1.347E-09	3.365E-14	4.668E-07	5.935E-08	7070C04S
3.835E-01	2.667E-07	5.637E-09	1.329E-09	3.282E-14	4.629E-07	5.916E-08	7070C04S
3.977E-01	2.533E-07	5.321E-09	1.319E-09	3.219E-14	4.592E-07	5.897E-08	7070C04S
4.119E-01	2.421E-07	5.060E-09	1.317E-09	3.176E-14	4.557E-07	5.878E-08	7070C04S
4.261E-01	2.328E-07	4.838E-09	1.323E-09	3.154E-14	4.523E-07	5.859E-08	7070C04S
4.403E-01	2.254E-07	5.112E-09	1.339E-09	3.153E-14	4.491E-07	5.840E-08	7070C04S
4.545E-01	2.199E-07	5.019E-09	1.364E-09	3.175E-14	4.459E-07	5.821E-08	7070C04S
4.687E-01	2.162E-07	5.019E-09	1.392E-09	3.202E-14	4.428E-07	5.801E-08	7070C04S
4.829E-01	2.142E-07	6.307E-09	1.451E-09	3.257E-14	4.398E-07	5.781E-08	7070C04S
4.971E-01	2.138E-07	6.568E-09	1.513E-09	3.399E-14	4.367E-07	5.760E-08	7070C04S
5.113E-01	2.149E-07	6.776E-09	1.552E-09	3.470E-14	4.337E-07	5.738E-08	7070C04S
5.255E-01	2.172E-07	6.905E-09	1.591E-09	3.547E-14	4.306E-07	5.716E-08	7070C04S
5.397E-01	2.204E-07	7.099E-09	1.638E-09	3.642E-14	4.275E-07	5.693E-08	7070C04S
5.539E-01	2.243E-07	7.035E-09	1.693E-09	3.749E-14	4.243E-07	5.670E-08	7070C04S
5.681E-01	2.286E-07	6.983E-09	1.748E-09	3.865E-14	4.211E-07	5.645E-08	7070C04S
5.823E-01	2.327E-07	6.789E-09	1.804E-09	3.980E-14	4.179E-07	5.620E-08	7070C04S
5.965E-01	2.358E-07	6.495E-09	1.855E-09	4.080E-14	4.145E-07	5.594E-08	7070C04S
6.107E-01	2.371E-07	6.172E-09	1.892E-09	4.150E-14	4.122E-07	5.567E-08	7070C04S
6.249E-01	2.355E-07	6.345E-09	1.906E-09	4.243E-14	4.078E-07	5.540E-08	7070C04S
6.391E-01	2.305E-07	6.850E-09	1.893E-09	4.129E-14	4.045E-07	5.513E-08	7070C04S
6.533E-01	2.216E-07	7.120E-09	1.845E-09	4.014E-14	4.013E-07	5.487E-08	7070C04S
6.675E-01	2.085E-07	7.256E-09	1.761E-09	3.821E-14	3.982E-07	5.461E-08	7070C04S
6.818E-01	1.916E-07	7.236E-09	1.643E-09	3.553E-14	3.954E-07	5.437E-08	7070C04S
6.960E-01	1.717E-07	7.355E-09	1.493E-09	3.221E-14	3.928E-07	5.415E-08	7070C04S
7.102E-01	1.500E-07	6.711E-09	1.323E-09	2.847E-14	3.905E-07	5.395E-08	7070C04S
7.244E-01	1.279E-07	6.150E-09	1.144E-09	2.455E-14	3.885E-07	5.377E-08	7070C04S
7.386E-01	1.070E-07	5.505E-09	9.711E-09	2.078E-14	3.869E-07	5.362E-08	7070C04S
7.528E-01	8.833E-08	4.925E-09	8.130E-09	1.735E-14	3.855E-07	5.349E-08	7070C04S
7.670E-01	7.249E-08	4.450E-09	6.769E-09	1.440E-14	3.844E-07	5.339E-08	7070C04S
7.812E-01	7.185E-08	4.454E-09	6.066E-09	1.293E-14	3.746E-07	5.242E-08	7130C04LS
7.954E-01	7.217E-08	6.561E-09	8.131E-09	1.669E-14	3.722E-07	5.215E-08	7130C04LS
8.096E-01	7.905E-08	7.022E-09	9.126E-09	1.864E-14	3.704E-07	5.194E-08	7130C04LS
8.238E-01	8.859E-08	7.561E-09	1.048E-08	2.130E-14	3.674E-07	5.159E-08	7130C04LS
8.380E-01	8.703E-08	7.710E-09	1.034E-08	2.098E-14	3.654E-07	5.135E-08	7130C04LS
8.522E-01	7.593E-08	7.535E-09	9.083E-09	1.838E-14	3.626E-07	5.102E-08	7130C04LS
8.664E-01	7.158E-08	7.561E-09	8.599E-09	1.737E-14	3.610E-07	5.083E-08	7130C04LS

1.124E+00	7.022E-08	7.820E-09	8.486E-09	1.710E-14	3.588E-07	5.056E-08	7130C04LS
1.156E+00	9.962E-08	9.086E-09	1.211E-08	4.35E-14	3.561E-07	5.023E-08	7130C04LS
1.190E+00	1.110E-07	9.099E-09	1.359E-08	7.25E-14	3.525E-07	4.979E-08	7130C04LS
1.212E+00	1.194E-07	9.566E-09	1.468E-08	9.93E-14	3.500E-07	4.948E-08	7130C04LS
1.243E+00	1.236E-07	9.904E-09	1.529E-08	0.53E-14	3.465E-07	4.902E-08	7130C04LS
1.274E+00	1.156E-07	9.793E-09	1.438E-08	8.6E-14	3.429E-07	4.856E-08	7130C04LS
1.304E+00	1.142E-07	9.684E-09	1.398E-08	3.90E-14	3.390E-07	4.813E-08	7130C04LS
1.334E+00	1.258E-07	1.054E-08	1.583E-08	1.40E-14	3.354E-07	4.768E-08	7130C04LS
1.363E+00	1.269E-07	1.075E-08	1.606E-08	1.80E-14	3.318E-07	4.722E-08	7130C04LS
1.393E+00	1.340E-07	1.047E-08	1.705E-08	3.69E-14	3.279E-07	4.672E-08	7130C04LS
1.421E+00	1.391E-07	1.084E-08	1.779E-08	5.08E-14	3.240E-07	4.623E-08	7130C04LS
1.450E+00	1.415E-07	1.123E-08	1.826E-08	5.80E-14	3.200E-07	4.571E-08	7130C04LS
1.478E+00	1.288E-07	1.065E-08	1.669E-08	2.74E-14	3.160E-07	4.506E-08	7130C04LS
1.515E+00	1.286E-07	1.078E-08	1.675E-08	3.279E-14	3.114E-07	4.460E-08	7130C04LS
1.542E+00	1.151E-07	1.037E-08	1.507E-08	9.44E-14	3.081E-07	4.417E-08	7130C04LS
1.569E+00	1.267E-07	1.029E-08	1.668E-08	2.51E-14	3.048E-07	4.374E-08	7130C04LS
1.604E+00	1.378E-07	1.085E-08	1.826E-08	3.51E-14	3.002E-07	4.313E-08	7130C04LS
1.630E+00	1.413E-07	1.12E-08	1.862E-08	5.62E-14	2.966E-07	4.264E-08	7130C04LS
1.665E+00	1.377E-07	1.106E-08	1.846E-08	5.73E-14	2.917E-07	4.199E-08	7130C04LS
1.686E+00	1.225E-07	1.053E-08	1.649E-08	1.187E-14	2.887E-07	4.159E-08	7130C04LS
1.715E+00	1.067E-07	1.007E-08	1.444E-08	7.86E-14	2.856E-07	4.117E-08	7130C04LS
1.750E+00	1.094E-07	9.618E-09	1.491E-08	8.69E-14	2.818E-07	4.066E-08	7130C04LS
1.783E+00	1.165E-07	9.395E-09	1.599E-08	0.58E-14	2.781E-07	4.015E-08	7130C04LS
1.808E+00	1.185E-07	1.016E-08	1.633E-08	3.128E-14	2.751E-07	3.974E-08	7130C04LS
1.841E+00	1.382E-07	1.105E-08	1.917E-08	3.663E-14	2.709E-07	3.916E-08	7130C04LS
1.866E+00	1.400E-07	1.120E-08	1.951E-08	3.721E-14	2.674E-07	3.868E-08	7130C04LS
1.898E+00	1.382E-07	1.067E-08	1.938E-08	3.688E-14	2.630E-07	3.805E-08	7130C04LS
1.930E+00	1.306E-07	1.040E-08	1.842E-08	4.97E-14	2.587E-07	3.745E-08	7130C04LS
1.962E+00	1.266E-07	1.029E-08	1.797E-08	3.403E-14	2.546E-07	3.687E-08	7130C04LS
1.986E+00	1.199E-07	1.008E-08	1.710E-08	3.23E-14	2.516E-07	3.644E-08	7130C04LS
2.017E+00	1.14E-07	9.845E-09	1.593E-08	3.014E-14	2.480E-07	3.593E-08	7130C04LS
2.049E+00	1.262E-07	1.047E-08	1.806E-08	3.430E-14	2.442E-07	3.539E-08	7130C04LS
2.079E+00	1.261E-07	1.001E-08	1.805E-08	3.440E-14	2.404E-07	3.485E-08	7130C04LS
2.079E+00	1.334E-07	9.560E-09	1.909E-08	3.640E-14	2.404E-07	3.485E-08	7130C04HS
2.110E+00	1.29E-07	9.729E-09	1.616E-08	0.91E-14	2.366E-07	3.430E-08	7130C04LS
2.141E+00	1.164E-07	1.012E-08	1.667E-08	2.02E-14	2.379E-07	3.379E-08	7130C04LS
2.163E+00	1.248E-07	9.858E-09	1.787E-08	4.42E-14	2.304E-07	3.341E-08	7130C04LS
2.193E+00	1.164E-07	9.196E-09	1.668E-08	3.224E-14	2.268E-07	3.289E-08	7130C04LS
2.201E+00	1.312E-07	9.677E-09	1.879E-08	3.636E-14	2.258E-07	3.275E-08	7130C04HS
2.233E+00	1.108E-07	9.878E-09	1.588E-08	3.082E-14	2.231E-07	3.237E-08	7130C04LS
2.253E+00	1.210E-07	1.012E-08	1.735E-08	3.378E-14	2.197E-07	3.187E-08	7130C04LS
2.283E+00	1.247E-07	9.744E-09	1.788E-08	3.48E-14	2.160E-07	3.134E-08	7130C04LS
2.312E+00	1.295E-07	9.527E-09	1.657E-08	3.495E-14	2.123E-07	3.082E-08	7130C04LS
2.348E+00	1.195E-07	9.138E-09	1.715E-08	3.378E-14	2.078E-07	3.017E-08	7130C04LS
2.377E+00	1.225E-07	9.125E-09	1.758E-08	3.476E-14	2.043E-07	2.967E-08	7130C04LS
2.406E+00	1.117E-07	9.300E-09	1.603E-08	3.180E-14	2.009E-07	2.918E-08	7130C04LS
2.424E+00	1.255E-07	9.222E-09	1.802E-08	3.583E-14	1.988E-07	2.887E-08	7130C04HS
2.435E+00	1.109E-07	8.138E-09	1.592E-08	7.0E-14	1.975E-07	2.859E-08	7130C04LS
2.463E+00	1.142E-07	8.702E-09	1.640E-08	3.77E-14	1.949E-07	2.824E-08	7130C04LS
2.491E+00	1.114E-07	7.515E-09	1.601E-08	3.209E-14	1.911E-07	2.778E-08	7130C04LS
2.601E+00	1.238E-07	7.321E-09	1.781E-08	3.617E-14	1.782E-07	2.592E-08	7130C04LS
2.760E+00	1.121E-07	6.678E-09	1.615E-08	3.345E-14	1.594E-07	2.322E-08	7130C04HS
2.902E+00	1.019E-07	6.036E-09	1.469E-08	3.104E-14	1.423E-07	2.075E-08	7130C04HS
3.132E+00	7.80E-08	4.685E-09	1.117E-08	2.421E-14	1.233E-07	1.801E-08	7130C04HS
3.291E+00	7.899E-08	4.259E-09	9.983E-09	2.06E-14	1.117E-07	1.633E-08	7130C04HS
3.503E+00	5.500E-08	3.527E-09	7.975E-09	1.808E-14	9.856E-08	1.443E-08	7130C04HS
3.662E+00	4.642E-08	2.927E-09	6.741E-09	1.558E-14	9.049E-08	1.326E-08	7130C04HS
3.872E+00	3.821E-08	2.526E-09	5.558E-09	1.318E-14	8.161E-08	1.197E-08	7130C04HS
4.019E+00	3.670E-08	2.433E-09	5.347E-09	1.291E-14	7.610E-08	1.117E-08	7130C04HS
4.215E+00	3.307E-08	2.266E-09	4.827E-09	1.194E-14	6.926E-08	1.017E-08	7130C04HS

4.379E+00	3.416E-08	2.305E-09	4.992E-09	1.260E-14	6.375E-08	9.363E-09	7130C04HS
4.577E+00	3.144E-08	1.162E-09	4.604E-09	1.190E-14	5.725E-08	8.413E-09	7130C04HS
4.774E+00	2.834E-08	6.024E-09	4.158E-09	1.101E-14	5.137E-08	7.550E-09	7130C04HS
4.921E+00	2.615E-08	4.083E-09	4.439E-09	1.194E-14	6.918E-09	6.918E-09	7130C04HS
5.115E+00	2.351E-08	1.794E-09	3.471E-09	9.470E-15	4.185E-08	6.153E-09	7130C04HS
5.307E+00	2.062E-08	1.548E-09	3.031E-09	8.307E-15	3.761E-08	5.529E-09	7130C04HS
5.488E+00	1.924E-08	1.580E-09	2.829E-09	7.786E-15	3.400E-08	4.998E-09	7130C04HS
5.535E+00	1.851E-08	1.414E-09	2.721E-09	7.515E-15	3.122E-08	4.590E-09	7130C04HS
5.625E+00	1.560E-08	1.277E-09	2.593E-09	6.363E-15	2.798E-08	4.114E-09	7130C04HS
6.003E+00	1.392E-08	1.219E-09	2.046E-09	5.702E-15	2.536E-08	3.728E-09	7130C04HS
6.200E+00	1.238E-08	1.158E-09	1.819E-09	5.093E-15	2.276E-08	3.347E-09	7130C04HS
6.384E+00	1.157E-08	1.140E-09	1.700E-09	4.779E-15	2.056E-08	3.023E-09	7130C04HS
6.567E+00	1.187E-08	1.108E-09	1.745E-09	4.927E-15	1.842E-08	2.708E-09	7130C04HS
6.749E+00	9.333E-09	1.021E-09	1.372E-09	3.890E-15	1.649E-08	2.424E-09	7130C04HS
6.929E+00	8.534E-09	9.780E-10	1.255E-09	3.572E-15	1.488E-08	2.189E-09	7130C04HS
7.109E+00	7.561E-09	9.300E-10	1.111E-09	3.178E-15	1.343E-08	1.975E-09	7130C04HS
7.287E+00	6.547E-09	9.560E-10	1.256E-09	3.608E-15	1.200E-08	1.764E-09	7130C04HS
7.464E+00	6.951E-09	7.963E-10	1.022E-09	2.946E-15	1.063E-08	1.563E-09	7130C04HS
7.639E+00	6.284E-09	7.794E-10	9.237E-10	2.675E-15	9.469E-09	1.392E-09	7130C04HS
7.814E+00	5.221E-09	7.353E-10	7.675E-10	2.232E-15	8.462E-09	1.244E-09	7130C04HS
7.988E+00	5.350E-09	7.243E-10	7.864E-10	2.296E-15	7.542E-09	1.109E-09	7130C04HS
8.203E+00	4.130E-09	6.756E-10	6.070E-10	1.781E-15	6.523E-09	9.595E-10	7130C04HS
8.351E+00	4.015E-09	6.485E-10	6.903E-10	1.738E-15	6.649E-09	8.649E-10	7130C04HS
8.539E+00	3.571E-09	6.259E-10	5.250E-10	1.553E-15	5.205E-09	7.656E-10	7130C04HS
8.710E+00	3.985E-09	6.173E-10	5.858E-10	1.740E-15	4.559E-09	6.707E-10	7130C04HS
8.925E+00	3.030E-09	5.881E-10	4.454E-10	1.329E-15	3.804E-09	5.598E-10	7130C04HS
9.092E+00	1.791E-09	5.678E-10	6.32E-10	7.887E-16	3.402E-09	5.006E-10	7130C04HS
9.259E+00	1.491E-09	4.599E-10	1.92E-05	6.535E-16	3.128E-09	4.603E-10	7130C04HS
9.457E+00	2.405E-09	4.542E-10	5.35E-10	1.069E-16	2.752E-09	4.008E-10	7130C04HS
9.632E+00	3.191E-09	4.734E-10	4.691E-10	1.424E-15	2.261E-09	3.329E-10	7130C04HS
9.796E+00	2.591E-09	4.547E-10	3.808E-10	1.160E-15	1.767E-09	2.632E-10	7130C04HS
1.000E+01	1.154E-09	4.039E-10	1.696E-10	5.133E-16	1.405E-09	2.071E-10	7130C04HS
1.015E+01	9.378E-10	3.959E-10	2.38E-10	5.227E-16	1.238E-09	1.825E-10	7130C04HS
1.037E+01	1.518E-09	3.711E-10	2.23E-10	5.858E-16	9.797E-10	1.445E-10	7130C04HS
1.053E+01	1.117E-09	3.623E-10	1.646E-10	5.054E-16	7.690E-10	1.135E-10	7130C04HS
1.073E+01	1.257E-09	3.732E-10	1.854E-10	5.701E-16	5.316E-10	7.846E-11	7130C04HS
1.089E+01	8.197E-10	3.183E-10	1.210E-10	3.723E-16	3.654E-10	5.395E-11	7130C04HS
1.108E+01	1.361E-10	6.84E-10	2.011E-11	6.194E-17	2.746E-10	4.055E-11	7130C04HS
1.124E+01	6.042E-10	1.839E-10	9.93E-11	1.755E-16	2.154E-10	3.179E-11	7130C04HS
1.144E+01	6.186E-10	0.25E-10	1.155E-11	8.22E-16	9.310E-11	1.370E-11	7130C04HS
1.163E+01	3.517E-10	9.04E-10	5.209E-11	1.610E-16	9.170E-13	5.667E-14	7130C04HS
1.179E+01	3.522E-10	6.03E-10	5.221E-11	1.815E-16	-5.540E-11	-8.287E-12	7130C04HS
1.198E+01	4.663E-10	7.532E-10	7.215E-11	2.234E-16	-1.351E-10	-2.010E-11	7130C04HS
1.218E+01	1.108E-09	4.83E-10	1.646E-10	1.104E-16	-2.945E-10	-4.378E-11	7130C04HS
1.239E+01	5.036E-09	5.032E-09	7.483E-10	3.22E-15	0.	0.	7130C04HS

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CF-252 15 CM D20 AT R=2M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING 10:33:21U 10/18/77
COMPILATION DATE OF THIS CODE VERSION 10/18/77U 09.13.04

30 GROUP OUTPUT

GROUP#	ENERGY UP-BOUND-MEV	DIFFERENTIAL FLUX N/CM2-SEC-MEV	INTEGRAL FLUX N/CM2-SEC	FLUX PER UNIT LETHARGY N/CM2-SEC
30	4.000000E-07	0.	0.	0.
29	3.190000E-06	0.	0.	0.
28	2.520000E-05	0.	0.	0.
27	2.000000E-04	0.	0.	0.
26	1.590000E-03	0.	0.	0.
25	1.261000E-02	0.	0.	0.
24	1.000000E-01	0.	0.	0.
23	2.235000E-01	5.865264E-07	7.249466E-08	5.489997E-08
22	5.000000E-01	3.278533E-07	9.061866E-08	1.186173E-07
21	5.946000E-01	2.232938E-07	2.112360E-08	1.222087E-07
20	7.071000E-01	2.132019E-07	2.398522E-08	1.387625E-07
19	8.409000E-01	8.760220E-08	1.172117E-08	6.780410E-08
18	1.000000E+00	6.897797E-08	1.065620E-08	6.164987E-08
17	1.257400E+00	9.393105E-08	2.417940E-08	1.060267E-07
16	1.581100E+00	1.272265E-07	4.118321E-08	1.805662E-07
15	1.988200E+00	1.275348E-07	5.191941E-08	2.276050E-07
14	2.500200E+00	1.195748E-07	6.119840E-08	2.68379E-07
13	2.973000E+00	1.121621E-07	5.305269E-08	3.06937E-07
12	3.535500E+00	7.162393E-08	4.028846E-08	2.330822E-07
11	4.204500E+00	4.063622E-08	2.716563E-08	1.572622E-07
10	5.000000E+00	3.120138E-08	2.482070E-08	1.435966E-07
9	5.764800E+00	2.071144E-08	1.584011E-08	1.14773E-07
8	6.646500E+00	1.296518E-08	1.143140E-08	8.045740E-08
7	7.663100E+00	8.065440E-09	8.199327E-09	5.770661E-08
6	8.835200E+00	4.457416E-09	5.224538E-09	3.676990E-08
5	1.018600E+01	2.133664E-09	2.882153E-09	2.029242E-08
4	1.174500E+01	6.029781E-10	1.251843E-09	8.805057E-09
3	1.354100E+01	-4.299761E-09	-7.722371E-09	-5.436188E-08
2	1.561200E+01	0.	0.	0.
1	1.800000E+01	0.	0.	0.

CF-252 25 CM D20 AT R=2M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING 10:59:41U 10/18/77
 COMPILATION DATE OF THIS CODE VERSION 10/18/77U 09.13.04

ENERGY (MEV)	PHI (NEUT/CM ² -SEC-MEV)	DEL-PHI	DOSE (MR/HR-MEV)	KERMA (ERG/GM-SEC-MEV)	INTEGRAL (NEUT/CM ² -SEC)	INT-DOSE (MR/HR)	FILE-ID
1.562E-01	1.711E-07	8.554E-09	4.233E-09	1.263E-14	1.977E-07	2.295E-08	7060C07S
1.704E-01	1.637E-07	8.823E-09	4.232E-09	1.247E-14	1.954E-07	2.289E-08	7060C07S
1.846E-01	1.602E-07	9.692E-09	4.326E-09	1.260E-14	1.931E-07	2.283E-08	7060C07S
1.988E-01	1.577E-07	9.636E-09	4.449E-09	1.281E-14	1.908E-07	2.277E-08	7060C07S
2.130E-01	1.556E-07	4.241E-09	4.592E-09	1.306E-14	1.886E-07	2.270E-08	7060C07S
2.273E-01	1.528E-07	4.268E-09	4.705E-09	1.329E-14	1.864E-07	2.263E-08	7060C07S
2.415E-01	1.478E-07	4.074E-09	4.755E-09	1.321E-14	1.842E-07	2.257E-08	7060C07S
2.557E-01	1.408E-07	3.886E-09	4.732E-09	1.299E-14	1.822E-07	2.250E-08	7060C07S
2.699E-01	1.324E-07	3.573E-09	4.650E-09	1.262E-14	1.802E-07	2.244E-08	7060C07S
2.841E-01	1.235E-07	3.116E-09	4.532E-09	1.215E-14	1.784E-07	2.237E-08	7060C07S
2.983E-01	1.148E-07	2.585E-09	4.394E-09	1.164E-14	1.767E-07	2.231E-08	7060C07S
3.125E-01	1.060E-07	2.324E-09	4.247E-09	1.112E-14	1.752E-07	2.225E-08	7060C07S
3.267E-01	9.800E-08	2.133E-09	4.101E-09	1.061E-14	1.737E-07	2.219E-08	7060C07S
3.409E-01	9.067E-08	1.961E-09	3.964E-09	1.014E-14	1.724E-07	2.213E-08	7060C07S
3.551E-01	8.405E-08	1.804E-09	3.839E-09	9.703E-15	1.711E-07	2.207E-08	7060C07S
3.693E-01	7.820E-08	1.674E-09	3.732E-09	9.322E-15	1.700E-07	2.202E-08	7060C07S
3.835E-01	7.308E-08	1.628E-09	3.643E-09	8.994E-15	1.689E-07	2.197E-08	7060C07S
3.977E-01	6.873E-08	1.563E-09	3.580E-09	8.734E-15	1.679E-07	2.192E-08	7060C07S
4.119E-01	6.509E-08	1.571E-09	3.542E-09	8.541E-15	1.670E-07	2.187E-08	7060C07S
4.261E-01	6.215E-08	1.563E-09	3.533E-09	8.419E-15	1.660E-07	2.182E-08	7060C07S
4.403E-01	5.973E-08	1.565E-09	3.548E-09	8.355E-15	1.652E-07	2.177E-08	7060C07S
4.545E-01	5.779E-08	1.589E-09	3.586E-09	8.349E-15	1.643E-07	2.172E-08	7060C07S
4.687E-01	5.627E-08	1.595E-09	3.648E-09	8.361E-15	1.635E-07	2.166E-08	7060C07S
4.829E-01	5.522E-08	1.722E-09	3.740E-09	8.502E-15	1.627E-07	2.161E-08	7060C07S
4.971E-01	5.466E-08	1.816E-09	3.869E-09	8.692E-15	1.620E-07	2.156E-08	7060C07S
5.113E-01	5.469E-08	1.892E-09	3.950E-09	8.831E-15	1.612E-07	2.150E-08	7060C07S
5.255E-01	5.329E-08	1.934E-09	4.051E-09	9.032E-15	1.604E-07	2.145E-08	7060C07S
5.397E-01	5.152E-08	1.945E-09	4.200E-09	9.339E-15	1.596E-07	2.139E-08	7060C07S
5.539E-01	5.837E-08	1.992E-09	4.400E-09	9.757E-15	1.588E-07	2.133E-08	7060C07S
5.681E-01	6.080E-08	2.151E-09	4.648E-09	1.028E-14	1.580E-07	2.126E-08	7060C07S
5.823E-01	6.364E-08	2.350E-09	4.336E-09	1.089E-14	1.571E-07	2.119E-08	7060C07S
5.965E-01	6.659E-08	2.608E-09	5.238E-09	1.152E-14	1.561E-07	2.112E-08	7060C07S
6.107E-01	6.918E-08	2.902E-09	5.521E-09	1.211E-14	1.552E-07	2.104E-08	7060C07S
6.249E-01	7.081E-08	3.190E-09	5.081E-09	1.254E-14	1.542E-07	2.096E-08	7060C07S
6.391E-01	7.100E-08	4.436E-09	5.830E-09	1.279E-14	1.533E-07	2.088E-08	7060C07S
6.533E-01	6.925E-08	3.632E-09	5.768E-09	1.255E-14	1.522E-07	2.080E-08	7060C07S
6.675E-01	6.542E-08	3.755E-09	5.527E-09	1.199E-14	1.512E-07	2.072E-08	7060C07S
6.818E-01	5.961E-08	3.746E-09	5.109E-09	1.105E-14	1.503E-07	2.064E-08	7060C07S
6.960E-01	5.213E-08	3.574E-09	4.533E-09	9.778E-15	1.495E-07	2.058E-08	7060C07S
7.102E-01	3.707E-08	3.216E-09	3.854E-09	8.292E-15	1.483E-07	2.052E-08	7060C07S
7.244E-01	5.16E-08	2.741E-09	3.145E-09	7.48E-15	1.478E-07	2.047E-08	7060C07S
7.386E-01	2.731E-08	2.225E-09	2.478E-09	5.302E-15	1.479E-07	2.043E-08	7060C07S
7.528E-01	2.066E-08	1.772E-09	1.902E-09	4.059E-15	1.475E-07	2.040E-08	7060C07S
7.670E-01	1.556E-08	1.454E-09	1.453E-09	3.092E-15	1.473E-07	2.037E-08	7060C07S
7.812E-01	4.787E-08	5.399E-09	5.127E-09	1.062E-14	1.429E-07	1.992E-08	7120C05LS
7.954E-01	4.226E-08	3.494E-09	4.644E-09	9.577E-15	1.418E-07	1.980E-08	7120C05LS
8.096E-01	3.268E-08	9.854E-09	3.931E-09	8.406E-15	1.217E-14	1.973E-08	7120C05LS
8.238E-01	4.132E-08	5.978E-09	4.824E-09	9.331E-15	1.389E-07	1.948E-08	7120C05LS
1.013E+00	4.610E-08	6.306E-09	5.454E-09	1.108E-14	1.379E-07	1.935E-08	7120C05LS
1.048E+00	4.349E-08	6.568E-09	5.179E-09	1.050E-14	1.363E-07	1.917E-08	7120C05LS
1.070E+00	3.913E-08	6.724E-09	4.680E-09	9.469E-15	1.354E-07	1.906E-08	7120C05LS

1.104E+00	4.966E-08	7.295E-09	5.978E-09	1.207E-14	1.339E-07	1.888E-08	7120C05LS
1.124E+00	2.112E-08	7.009E-09	2.553E-09	5.145E-15	1.332E-07	1.879E-08	7120C05LS
1.156E+00	3.963E-08	7.671E-09	4.818E-09	9.687E-15	1.322E-07	1.868E-08	7120C05LS
1.190E+00	6.819E-08	8.333E-09	8.877E-09	1.379E-14	1.306E-07	1.848E-08	7120C05LS
1.221E+00	1.088E-08	9.289E-09	5.982E-09	1.197E-14	1.290E-07	1.828E-08	7120C05LS
1.253E+00	4.685E-08	1.544E-09	4.565E-09	9.112E-15	1.275E-07	1.811E-08	7120C05LS
1.273E+00	8.269E-08	6.957E-09	6.552E-09	1.306E-14	1.267E-07	1.800E-08	7120C05LS
1.303E+00	4.434E-08	6.066E-09	5.546E-09	1.103E-14	1.253E-07	1.782E-08	7120C05LS
1.333E+00	8.866E-08	6.134E-09	4.888E-09	9.698E-15	1.240E-07	1.766E-08	7120C05LS
1.363E+00	7.28E-08	6.140E-09	3.451E-09	6.833E-15	1.230E-07	1.753E-08	7120C05LS
1.392E+00	1.039E-08	5.937E-09	2.039E-09	1.068E-14	1.220E-07	1.741E-08	7120C05LS
1.421E+00	4.952E-08	2.336E-09	6.628E-09	1.504E-14	1.205E-07	1.722E-08	7120C05LS
1.449E+00	8.673E-08	4.931E-09	4.981E-09	9.799E-15	1.192E-07	1.704E-08	7120C05LS
1.485E+00	4.450E-08	7.308E-09	5.764E-09	1.131E-14	1.176E-07	1.684E-08	7120C05LS
1.514E+00	4.721E-08	7.541E-09	6.149E-09	1.204E-14	1.163E-07	1.667E-08	7120C05LS
1.541E+00	1.124E-08	7.807E-09	6.708E-09	1.111E-14	1.150E-07	1.650E-08	7120C05LS
1.568E+00	4.063E-08	9.57E-09	5.653E-09	1.299E-14	1.136E-07	1.632E-08	7120C05LS
1.595E+00	4.427E-08	8.203E-09	1.179E-09	1.397E-14	1.122E-07	1.613E-08	7120C05LS
1.630E+00	4.431E-08	5.986E-09	5.902E-09	1.145E-14	1.105E-07	1.590E-08	7120C05LS
1.656E+00	4.690E-08	6.160E-09	6.278E-09	1.216E-14	1.093E-07	1.575E-08	7120C05LS
1.681E+00	4.716E-08	6.271E-09	6.343E-09	1.226E-14	1.081E-07	1.559E-08	7120C05LS
1.715E+00	4.380E-08	6.323E-09	5.930E-09	1.144E-14	1.066E-07	1.538E-08	7120C05LS
1.741E+00	3.418E-08	6.254E-09	5.850E-09	8.907E-15	1.056E-07	1.524E-08	7120C05LS
1.774E+00	3.967E-08	6.516E-09	5.431E-09	1.043E-14	1.043E-07	1.508E-08	7120C05LS
1.799E+00	4.664E-08	6.789E-09	6.417E-09	1.230E-14	1.033E-07	1.493E-08	7120C05LS
1.832E+00	4.943E-08	6.977E-09	6.844E-09	1.308E-14	1.017E-07	1.471E-08	7120C05LS
1.857E+00	4.400E-08	6.977E-09	6.121E-09	1.168E-14	1.005E-07	1.455E-08	7120C05LS
1.890E+00	3.850E-08	7.003E-09	5.390E-09	1.026E-14	9.915E-08	1.436E-08	7120C05LS
1.922E+00	4.263E-08	7.206E-09	6.005E-09	1.140E-14	9.785E-08	1.417E-08	7120C05LS
1.946E+00	4.371E-08	5.724E-09	6.185E-09	1.173E-14	9.682E-08	1.403E-08	7120C05LS
1.978E+00	5.165E-08	6.031E-09	7.363E-09	1.396E-14	9.529E-08	1.381E-08	7120C05LS
2.009E+00	4.139E-08	5.848E-09	5.920E-09	1.119E-14	9.384E-08	1.360E-08	7120C05LS
2.040E+00	3.941E-08	5.880E-09	5.638E-09	1.070E-14	9.259E-08	1.343E-08	7120C05LS
2.064E+00	4.230E-08	6.025E-09	6.053E-09	1.182E-14	9.161E-08	1.329E-08	7120C05LS
2.079E+00	4.076E-08	6.117E-09	6.171E-09	1.21E-14	9.095E-08	1.319E-08	7120C05LS
2.095E+00	4.529E-08	6.279E-09	6.483E-09	1.238E-14	9.024E-08	1.309E-08	7120C05LS
2.125E+00	4.547E-08	6.214E-09	6.510E-09	1.248E-14	8.887E-08	1.289E-08	7120C05LS
2.156E+00	3.899E-08	6.397E-09	5.584E-09	1.075E-14	8.757E-08	1.271E-08	7120C05LS
2.186E+00	4.384E-08	6.659E-09	6.280E-09	1.213E-14	8.632E-08	1.253E-08	7120C05LS
2.216E+00	5.231E-08	6.678E-09	7.495E-09	1.453E-14	8.488E-08	1.232E-08	7120C05LS
2.238E+00	4.19E-08	6.703E-09	7.337E-09	1.425E-14	8.374E-08	1.216E-08	7120C05LS
2.260E+00	4.815E-08	6.329E-09	6.902E-09	1.348E-14	8.206E-08	1.200E-08	7120C05LS
2.268E+00	3.952E-08	5.526E-09	5.665E-09	1.105E-14	8.230E-08	1.195E-08	7120C05LS
2.297E+00	3.922E-08	5.545E-09	5.624E-09	1.101E-14	8.116E-08	1.179E-08	7120C05LS
2.326E+00	4.475E-08	5.547E-09	6.418E-09	1.261E-14	7.994E-08	1.161E-08	7120C05LS
2.355E+00	4.365E-08	5.772E-09	6.263E-09	1.235E-14	7.866E-08	1.143E-08	7120C05LS
2.384E+00	4.268E-08	5.703E-09	1.128E-09	1.212E-14	7.741E-08	1.125E-08	7120C05LS
2.413E+00	4.945E-08	5.822E-09	7.098E-09	1.401E-14	7.607E-08	1.108E-08	7120C05LS
2.424E+00	5.076E-08	7.287E-09	7.287E-09	1.449E-14	7.552E-08	1.096E-08	7120C05LS
2.449E+00	4.564E-08	3.473E-09	6.563E-09	1.307E-14	7.431E-08	1.081E-08	7120C05LS
2.477E+00	3.889E-08	6.633E-09	5.585E-09	1.116E-14	7.313E-08	1.064E-08	7120C05LS
2.501E+00	4.031E-08	2.757E-09	6.772E-09	1.294E-14	6.797E-08	9.895E-09	7120C05LS
2.560E+00	4.084E-08	2.878E-09	5.780E-09	1.218E-14	6.120E-08	8.921E-09	7120C05LS
2.591E+00	3.476E-08	2.279E-09	5.013E-09	1.055E-14	5.519E-08	8.055E-09	7120C05LS
2.613E+00	2.672E-08	1.852E-09	3.861E-09	8.368E-15	4.865E-08	7.110E-09	7120C05LS
2.691E+00	2.473E-08	1.795E-09	3.578E-09	7.907E-15	4.456E-08	6.519E-09	7120C05LS
2.750E+00	1.829E-08	1.550E-09	2.652E-09	6.013E-15	4.000E-08	5.858E-09	7120C05LS
2.822E+00	1.578E-08	1.478E-09	2.566E-09	5.296E-15	3.998E-08	5.485E-09	7120C05LS
2.872E+00	1.567E-08	1.478E-09	2.280E-09	4.988E-15	3.999E-08	4.985E-09	7120C05LS
2.919E+00	1.256E-08	1.389E-09	1.830E-09	4.420E-15	3.191E-08	4.683E-09	7120C05LS

4.215E+00	1.505E-08	1.476E-09	2.196E-09	5.432E-15	2.920E-08	4.289E-09	7120C05HS
4.429E+00	1.165E-09	1.382E-09	1.704E-09	4.324E-15	2.635E-08	3.871E-09	7120C05HS
4.578E+00	1.208E-08	1.403E-09	1.769E-09	4.571E-15	2.458E-08	3.613E-09	7120C05HS
4.775E+00	1.059E-08	9.534E-10	1.553E-09	4.111E-15	2.235E-08	3.285E-09	7120C05HS
4.970E+00	1.218E-08	9.995E-10	1.790E-09	4.854E-15	2.013E-08	2.959E-09	7120C05HS
5.116E+00	1.042E-08	9.333E-10	1.531E-09	4.178E-15	1.848E-08	2.717E-09	7120C05HS
5.308E+00	9.326E-09	8.859E-10	1.371E-09	3.759E-15	1.650E-08	2.439E-09	7120C05HS
5.489E+00	7.003E-09	8.122E-10	1.029E-09	2.834E-15	1.510E-08	2.231E-09	7120C05HS
5.684E+00	7.165E-09	8.164E-10	1.053E-09	2.913E-15	1.372E-08	2.018E-09	7120C05HS
5.870E+00	5.195E-09	7.665E-10	7.636E-10	2.121E-15	1.257E-08	1.849E-09	7120C05HS
6.062E+00	6.244E-09	7.866E-10	9.179E-10	2.561E-15	1.148E-08	1.688E-09	7120C05HS
6.201E+00	6.447E-09	7.866E-10	9.477E-10	2.653E-15	1.059E-08	1.558E-09	7120C05HS
6.385E+00	5.893E-09	7.918E-10	8.663E-10	2.435E-15	9.458E-09	1.391E-09	7120C05HS
6.568E+00	4.058E-09	5.157E-10	5.956E-10	1.684E-15	8.548E-09	1.257E-09	7120C05HS
6.750E+00	3.522E-09	5.014E-10	5.178E-10	1.468E-15	7.858E-09	1.156E-09	7120C05HS
6.930E+00	4.365E-09	5.082E-10	6.416E-10	1.827E-15	7.148E-09	1.052E-09	7120C05HS
7.110E+00	3.962E-09	4.965E-10	5.824E-10	1.666E-15	6.399E-09	9.414E-10	7120C05HS
7.288E+00	3.285E-09	4.750E-10	4.828E-10	1.387E-15	5.754E-09	8.466E-10	7120C05HS
7.509E+00	3.552E-09	4.859E-10	5.221E-10	1.507E-15	4.598E-09	7.356E-10	7120C05HS
7.684E+00	2.552E-09	4.686E-10	3.751E-10	1.087E-15	4.464E-09	6.571E-10	7120C05HS
7.859E+00	2.139E-09	4.481E-10	3.144E-10	9.153E-16	4.054E-09	5.967E-10	7120C05HS
8.032E+00	2.693E-09	4.434E-10	3.959E-10	1.157E-15	3.636E-09	5.353E-10	7120C05HS
8.205E+00	2.109E-09	4.201E-10	3.101E-10	9.099E-16	3.220E-09	4.742E-10	7120C05HS
8.363E+00	9.975E-10	2.902E-10	1.466E-10	4.319E-16	2.975E-09	4.381E-10	7120C05HS
8.585E+00	1.672E-09	2.985E-10	2.458E-10	7.277E-16	2.678E-09	3.946E-10	7120C05HS
8.751E+00	1.378E-09	2.926E-10	2.025E-10	6.020E-16	2.425E-09	3.574E-10	7120C05HS
8.926E+00	9.690E-10	2.839E-10	1.424E-10	4.251E-16	2.220E-09	3.272E-10	7120C05HS
9.136E+00	1.233E-09	2.811E-10	1.813E-10	5.437E-16	1.989E-09	2.932E-10	7120C05HS
9.303E+00	1.237E-09	2.752E-10	1.818E-10	5.476E-16	1.782E-09	2.629E-10	7120C05HS
9.468E+00	1.234E-09	2.621E-10	1.814E-10	5.483E-16	1.579E-09	2.329E-10	7120C05HS
9.675E+00	8.138E-10	2.551E-10	1.196E-10	3.634E-16	1.367E-09	2.018E-10	7120C05HS
9.839E+00	4.363E-10	2.348E-10	6.413E-11	1.956E-16	1.264E-09	1.867E-10	7120C05HS
1.004E+01	8.943E-10	1.931E-10	1.315E-10	4.026E-16	1.130E-09	1.670E-10	7120C05HS
1.021E+01	6.879E-10	1.830E-10	1.012E-10	3.103E-16	9.960E-10	1.473E-10	7120C05HS
1.041E+01	5.273E-10	1.741E-10	7.766E-11	2.383E-16	8.745E-10	1.294E-10	7120C05HS
1.057E+01	6.015E-10	1.674E-10	8.865E-11	2.723E-16	7.842E-10	1.161E-10	7120C05HS
1.077E+01	7.087E-10	1.644E-10	1.046E-10	3.235E-16	6.531E-10	9.674E-11	7120C05HS
1.093E+01	3.830E-10	1.616E-10	5.654E-11	1.740E-16	5.556E-10	8.385E-11	7120C05HS
1.113E+01	3.880E-10	1.519E-10	5.737E-11	1.767E-16	4.887E-10	7.247E-11	7120C05HS
1.128E+01	4.243E-10	1.508E-10	6.275E-11	1.935E-16	4.278E-10	6.346E-11	7120C05HS
1.148E+01	3.930E-10	1.336E-10	5.818E-11	1.796E-16	3.461E-10	5.137E-11	7120C05HS
1.168E+01	3.227E-10	1.084E-10	4.781E-11	1.478E-16	2.745E-10	4.077E-11	7120C05HS
1.189E+01	1.327E-10	1.015E-10	1.969E-11	6.235E-17	2.405E-10	3.571E-11	7120C05HS
1.203E+01	5.082E-11	1.012E-10	5.442E-12	2.336E-17	2.220E-10	3.299E-11	7120C05HS
1.222E+01	2.148E-10	1.479E-10	3.190E-11	9.893E-17	1.967E-10	2.924E-11	7120C05HS
1.237E+01	2.408E-09	1.105E-09	3.580E-10	1.111E-15	0.	0.	7120C05HS

1 CF-252 25 CM D20 AT R=2M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING 10:59:41U 10/18/77
 COMPILATION DATE OF THIS CODE VERSION 10/18/77U 09.13.04

30 GROUP OUTPUT

GROUP#	ENERGY UP-BOUND-MEV	DIFFERENTIAL FLUX N/CM2-SEC-MEV	INTEGRAL FLUX N/CM2-SEC	FLUX PER UNIT LETHARGY N/CM2-SEC
30	4.000000E-07	0.	0.	0.
29	3.180000E-06	0.	0.	0.
28	2.520000E-05	0.	0.	0.
27	2.000000E-04	0.	0.	0.
26	1.590000E-03	0.	0.	0.
25	1.261000E-02	0.	0.	0.
24	1.000000E-01	0.	0.	0.
23	2.236000E-01	1.652188E-07	2.042105E-08	2.673240E-08
22	5.000000E-01	9.087654E-08	2.511828E-08	3.287913E-08
21	5.946000E-01	5.852628E-08	5.536586E-09	3.203143E-08
20	7.071000E-01	6.464211E-08	7.272237E-09	4.207232E-08
19	8.409000E-01	2.642731E-08	3.535974E-09	2.045474E-08
18	1.000000E+00	4.389074E-08	6.983017E-09	4.039923E-08
17	1.257400E+00	4.298237E-08	1.103792E-08	4.840133E-08
16	1.581100E+00	4.477261E-08	1.449290E-08	6.354353E-08
15	1.988200E+00	4.464253E-08	1.817397E-08	7.967129E-08
14	2.500000E+00	4.406345E-08	2.255167E-08	9.886279E-08
13	2.573000E+00	3.985985E-08	1.885371E-08	1.090765E-07
12	3.535500E+00	2.482002E-08	1.396126E-08	8.077054E-08
11	4.204500E+00	1.502083E-08	1.004894E-08	5.813063E-08
10	5.000000E+00	1.206035E-08	9.594008E-09	4.550474E-08
9	5.764800E+00	8.614540E-09	6.588400E-09	3.636690E-08
8	6.646500E+00	5.603430E-09	4.940544E-09	3.477293E-08
7	7.663100E+00	3.658685E-09	3.719419E-09	2.617716E-08
6	8.835200E+00	1.877875E-09	2.201057E-09	1.549087E-08
5	1.018600E+01	9.658778E-10	1.304708E-09	9.186078E-09
4	1.174900E+01	4.853540E-10	7.566669E-10	5.322149E-09
3	1.354100E+01	1.787279E-09	3.209952E-09	2.59656E-08
2	1.561200E+01	0.	0.	0.
1	1.800000E+01	0.	0.	0.

1 CF-252 20 CM ALUMINUM AT R=2M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING
 COMPILATION DATE OF THIS CODE VERSION

10/18/77U 10:58:16U 10/18/77
 09.13.04

ENERGY (MEV)	PHI (NEUT/CM2-SEC-MEV)	DEL-PHI	DOSE (MR/HR-MEV)	KERMA (ERG/GM-SEC-MEV)	INTEGRAL (NEUT/CM2-SEC)	INT-DOSE (MR/HR)	FILE-ID
1.562E-01	2.337E-06	1.168E-07	5.781E-08	1.724E-13	2.383E-06	2.201E-07	7070C06S
1.704E-01	4.12E-06	6.234E-08	1.837E-13	2.349E-06	2.193E-07	7070C06S	
1.846E-01	5.19E-06	6.54E-08	1.976E-13	2.31E-06	1.84E-07	7070C06S	
1.988E-01	6.19E-06	7.369E-08	1.27E-13	2.278E-06	1.174E-07	7070C06S	
2.130E-01	7.28E-06	8.039E-08	2.67E-13	2.240E-06	2.163E-07	7070C06S	
2.273E-01	8.21E-06	8.687E-08	4.42E-13	2.200E-06	2.151E-07	7070C06S	
2.415E-01	8.85E-06	9.284E-08	5.79E-13	2.160E-06	2.138E-07	7070C06S	
2.557E-01	9.17E-06	9.805E-08	6.92E-13	2.119E-06	2.124E-07	7070C06S	
2.699E-01	9.13E-06	9.98E-08	1.02E-07	2.77E-13	1.10E-07	7070C06S	
2.841E-01	8.80E-06	6.55E-08	1.057E-07	8.34E-13	2.036E-06	2.095E-07	7070C06S
2.983E-01	8.23E-06	6.357E-08	1.082E-07	8.67E-13	1.996E-06	2.080E-07	7070C06S
3.125E-01	7.47E-06	6.121E-08	1.100E-07	8.81E-13	1.956E-06	2.065E-07	7070C06S
3.267E-01	6.58E-06	5.870E-08	1.112E-07	8.78E-13	1.918E-06	2.049E-07	7070C06S
3.409E-01	5.62E-06	6.09E-08	1.120E-07	8.64E-13	1.881E-06	2.033E-07	7070C06S
3.551E-01	4.62E-06	3.44E-08	1.124E-07	8.42E-13	1.845E-06	2.017E-07	7070C06S
3.693E-01	3.64E-06	5.081E-08	1.128E-07	8.18E-13	1.811E-06	2.001E-07	7070C06S
3.835E-01	2.69E-06	4.835E-08	1.131E-07	7.93E-13	1.778E-06	1.985E-07	7070C06S
3.977E-01	1.82E-06	4.612E-08	1.136E-07	7.73E-13	1.746E-06	1.969E-07	7070C06S
4.119E-01	1.03E-06	4.418E-08	1.144E-07	7.59E-13	1.718E-06	1.953E-07	7070C06S
4.261E-01	2.03E-06	4.248E-08	1.155E-07	7.53E-13	1.686E-06	1.936E-07	7070C06S
4.403E-01	1.969E-06	4.094E-08	1.170E-07	7.54E-13	1.658E-06	1.920E-07	7070C06S
4.545E-01	1.913E-06	3.953E-08	1.187E-07	7.62E-13	1.630E-06	1.903E-07	7070C06S
4.687E-01	1.863E-06	3.827E-08	1.208E-07	7.77E-13	1.604E-06	1.886E-07	7070C06S
4.829E-01	1.818E-06	3.712E-08	1.231E-07	7.99E-13	1.577E-06	1.869E-07	7070C06S
4.971E-01	1.777E-06	3.611E-08	1.257E-07	8.25E-13	1.552E-06	1.851E-07	7070C06S
5.113E-01	1.739E-06	3.522E-08	1.286E-07	8.56E-13	1.527E-06	1.833E-07	7070C06S
5.255E-01	1.702E-06	3.437E-08	1.247E-07	7.81E-13	1.503E-06	1.816E-07	7070C06S
5.397E-01	1.665E-06	3.348E-08	1.237E-07	7.52E-13	1.479E-06	1.798E-07	7070C06S
5.539E-01	1.626E-06	3.254E-08	1.225E-07	7.17E-13	1.455E-06	1.781E-07	7070C06S
5.681E-01	1.582E-06	3.151E-08	1.210E-07	6.75E-13	1.432E-06	1.763E-07	7070C06S
5.823E-01	1.536E-06	3.039E-08	1.191E-07	6.26E-13	1.410E-06	1.746E-07	7070C06S
5.965E-01	1.485E-06	2.911E-08	1.168E-07	5.69E-13	1.389E-06	1.729E-07	7070C06S
6.107E-01	1.431E-06	2.798E-08	1.142E-07	5.05E-13	1.368E-06	1.713E-07	7070C06S
6.249E-01	1.375E-06	2.671E-08	1.113E-07	4.34E-13	1.348E-06	1.697E-07	7070C06S
6.391E-01	1.317E-06	2.543E-08	1.081E-07	3.58E-13	1.329E-06	1.681E-07	7070C06S
6.533E-01	1.258E-06	2.414E-08	1.048E-07	2.80E-13	1.311E-06	1.666E-07	7070C06S
6.675E-01	1.199E-06	2.287E-08	1.013E-07	1.98E-13	1.293E-06	1.652E-07	7070C06S
6.818E-01	1.141E-06	2.165E-08	9.79E-08	1.27E-13	1.275E-06	1.637E-07	7070C06S
6.960E-01	1.084E-06	2.044E-08	9.42E-08	1.03E-13	1.257E-06	1.624E-07	7070C06S
7.102E-01	1.027E-06	1.927E-08	9.060E-08	9.94E-13	1.246E-06	1.611E-07	7070C06S
7.244E-01	9.716E-07	1.815E-08	8.691E-08	1.865E-13	1.232E-06	1.598E-07	7070C06S
7.386E-01	9.164E-07	1.705E-08	8.316E-08	1.779E-13	1.218E-06	1.586E-07	7070C06S
7.528E-01	8.619E-07	1.597E-08	7.933E-08	1.693E-13	1.206E-06	1.574E-07	7070C06S
7.670E-01	8.080E-07	1.490E-08	7.544E-08	1.605E-13	1.194E-06	1.563E-07	7070C06S
7.812E-01	7.595E-07	1.388E-08	7.158E-08	1.491E-13	1.182E-06	1.551E-07	7130C03LS
7.954E-01	7.124E-07	1.450E-08	6.76E-08	1.355E-13	1.168E-06	1.536E-07	7130C03LS
8.096E-01	6.669E-07	1.356E-08	6.391E-08	1.214E-13	1.151E-06	1.521E-07	7130C03LS
8.238E-01	6.229E-07	1.262E-08	6.029E-08	1.068E-13	1.134E-06	1.506E-07	7130C03LS
8.380E-01	5.802E-07	1.170E-08	5.680E-08	9.163E-13	1.117E-06	1.491E-07	7130C03LS
8.522E-01	5.387E-07	1.079E-08	5.340E-08	7.601E-13	1.100E-06	1.476E-07	7130C03LS
8.664E-01	5.000E-07	9.90E-09	5.000E-08	6.000E-13	1.083E-06	1.461E-07	7130C03LS
8.806E-01	4.641E-07	9.00E-09	4.641E-08	4.400E-13	1.066E-06	1.446E-07	7130C03LS
8.948E-01	4.312E-07	8.10E-09	4.312E-08	2.800E-13	1.049E-06	1.431E-07	7130C03LS
9.090E-01	4.013E-07	7.20E-09	4.013E-08	1.200E-13	1.032E-06	1.416E-07	7130C03LS
9.232E-01	3.744E-07	6.30E-09	3.744E-08	600E-14	1.015E-06	1.401E-07	7130C03LS
9.374E-01	3.505E-07	5.40E-09	3.505E-08	400E-14	9.98E-07	1.386E-07	7130C03LS
9.516E-01	3.286E-07	4.50E-09	3.286E-08	200E-14	9.81E-07	1.371E-07	7130C03LS
9.658E-01	3.087E-07	3.60E-09	3.087E-08	100E-14	9.64E-07	1.356E-07	7130C03LS
9.800E-01	2.908E-07	2.70E-09	2.908E-08	50E-14	9.47E-07	1.341E-07	7130C03LS
9.942E-01	2.749E-07	1.80E-09	2.749E-08	20E-14	9.30E-07	1.326E-07	7130C03LS
1.014E+00	2.610E-07	9.0E-09	2.610E-08	10E-14	9.13E-07	1.311E-07	7130C03LS
1.037E+00	2.491E-07	8.10E-09	2.491E-08	5E-14	8.96E-07	1.296E-07	7130C03LS
1.071E+00	2.392E-07	7.20E-09	2.392E-08	2E-14	8.79E-07	1.281E-07	7130C03LS
1.093E+00	2.313E-07	6.30E-09	2.313E-08	1E-14	8.62E-07	1.266E-07	7130C03LS

1.124E+00	8.125E-07	4.998E-08	9.819E-08	1.979E-13	9.334E-07	1.275E-07	7130C03LS
1.156E+00	8.151E-07	4.979E-08	9.911E-08	1.993E-13	9.073E-07	1.245E-07	7130C03LS
1.190E+00	7.833E-07	4.803E-08	9.587E-08	1.923E-13	8.802E-07	1.212E-07	7130C03LS
1.212E+00	7.814E-07	4.783E-08	9.604E-08	1.923E-13	8.630E-07	1.190E-07	7130C03LS
1.243E+00	7.567E-07	4.625E-08	9.356E-08	1.869E-13	8.391E-07	1.161E-07	7130C03LS
1.274E+00	6.834E-07	4.270E-08	8.500E-08	1.694E-13	8.168E-07	1.133E-07	7130C03LS
1.304E+00	6.64E-07	4.182E-08	8.319E-08	1.653E-13	7.966E-07	1.108E-07	7130C03LS
1.334E+00	6.464E-07	4.069E-08	8.133E-08	1.614E-13	7.766E-07	1.083E-07	7130C03LS
1.363E+00	6.404E-07	4.028E-08	8.102E-08	1.604E-13	7.583E-07	1.060E-07	7130C03LS
1.393E+00	6.516E-07	4.040E-08	8.292E-08	1.638E-13	7.369E-07	1.035E-07	7130C03LS
1.421E+00	6.548E-07	4.067E-08	8.378E-08	1.652E-13	7.206E-07	1.012E-07	7130C03LS
1.450E+00	6.405E-07	3.971E-08	8.241E-08	1.621E-13	7.018E-07	9.879E-08	7130C03LS
1.487E+00	6.095E-07	3.823E-08	7.893E-08	1.545E-13	6.763E-07	9.575E-08	7130C03LS
1.515E+00	6.060E-07	3.769E-08	7.894E-08	1.545E-13	6.609E-07	9.350E-08	7130C03LS
1.542E+00	5.990E-07	3.719E-08	7.844E-08	1.532E-13	6.447E-07	9.138E-08	7130C03LS
1.569E+00	5.883E-07	3.640E-08	7.743E-08	1.510E-13	6.286E-07	8.927E-08	7130C03LS
1.604E+00	5.689E-07	3.518E-08	7.539E-08	1.466E-13	6.084E-07	8.660E-08	7130C03LS
1.630E+00	5.500E-07	3.418E-08	7.325E-08	1.422E-13	5.939E-07	8.467E-08	7130C03LS
1.656E+00	5.350E-07	3.321E-08	7.173E-08	1.389E-13	5.748E-07	8.213E-08	7130C03LS
1.686E+00	5.101E-07	3.181E-08	6.870E-08	1.328E-13	5.628E-07	8.051E-08	7130C03LS
1.715E+00	5.023E-07	3.141E-08	6.800E-08	1.312E-13	5.492E-07	7.867E-08	7130C03LS
1.750E+00	4.845E-07	3.008E-08	6.604E-08	1.270E-13	5.319E-07	7.632E-08	7130C03LS
1.783E+00	4.563E-07	2.852E-08	6.265E-08	1.206E-13	5.164E-07	7.420E-08	7130C03LS
1.808E+00	4.501E-07	2.809E-08	6.204E-08	1.188E-13	5.050E-07	7.263E-08	7130C03LS
1.841E+00	4.282E-07	2.690E-08	5.939E-08	1.135E-13	4.905E-07	7.063E-08	7130C03LS
1.866E+00	4.193E-07	2.634E-08	5.848E-08	1.119E-13	4.799E-07	6.916E-08	7130C03LS
1.896E+00	4.190E-07	2.639E-08	5.875E-08	1.118E-13	4.665E-07	6.728E-08	7130C03LS
1.930E+00	4.245E-07	2.608E-08	5.989E-08	1.137E-13	4.530E-07	6.538E-08	7130C03LS
1.962E+00	4.092E-07	2.519E-08	5.809E-08	1.100E-13	4.397E-07	6.350E-08	7130C03LS
2.017E+00	4.027E-07	2.476E-08	5.743E-08	1.086E-13	4.299E-07	6.211E-08	7130C03LS
2.049E+00	3.899E-07	2.402E-08	5.576E-08	1.053E-13	4.176E-07	6.035E-08	7130C03LS
2.079E+00	3.611E-07	2.244E-08	5.166E-08	1.019E-13	4.056E-07	5.864E-08	7130C03LS
2.079E+00	3.462E-07	2.135E-08	4.955E-08	9.446E-14	3.950E-07	5.712E-08	7130C03LS
2.079E+00	4.013E-07	2.081E-08	5.743E-08	1.095E-13	3.950E-07	5.712E-08	7130C03HS
2.110E+00	3.369E-07	1.989E-08	4.822E-08	9.228E-14	3.836E-07	5.548E-08	7130C03LS
2.141E+00	2.141E-07	1.941E-08	4.602E-08	8.839E-14	3.734E-07	5.402E-08	7130C03LS
2.163E+00	1.639E-07	1.939E-08	4.140E-08	8.589E-14	3.664E-07	5.302E-08	7130C03LS
2.193E+00	9.69E-07	1.776E-08	4.253E-08	8.292E-14	3.573E-07	5.172E-08	7130C03LS
2.201E+00	5.14E-07	1.722E-08	5.034E-08	9.740E-14	3.547E-07	5.134E-08	7130C03HS
2.223E+00	8.45E-07	1.669E-08	4.077E-08	7.910E-14	3.477E-07	5.034E-08	7130C03LS
2.253E+00	7.35E-07	1.648E-08	3.920E-08	7.633E-14	3.393E-07	4.914E-08	7130C03LS
2.283E+00	6.03E-07	1.648E-08	3.775E-08	7.378E-14	3.313E-07	4.799E-08	7130C03LS
2.312E+00	5.64E-07	1.541E-08	3.05E-08	7.297E-14	3.237E-07	4.695E-08	7130C03LS
2.348E+00	4.92E-07	1.466E-08	3.575E-08	7.043E-14	3.146E-07	4.559E-08	7130C03LS
2.377E+00	4.20E-07	1.436E-08	3.473E-08	6.865E-14	3.074E-07	4.457E-08	7130C03LS
2.406E+00	2.62E-07	1.419E-08	3.246E-08	6.440E-14	3.006E-07	4.360E-08	7130C03LS
2.424E+00	5.82E-07	1.414E-08	3.663E-08	7.284E-14	2.963E-07	4.298E-08	7130C03HS
2.435E+00	2.05E-07	2.305E-08	3.307E-08	6.267E-14	2.905E-07	4.260E-08	7130C03LS
2.463E+00	1.64E-07	2.032E-08	3.107E-08	6.206E-14	2.876E-07	4.172E-08	7130C03LS
2.491E+00	1.60E-07	1.488E-08	3.103E-08	6.219E-14	2.815E-07	4.065E-08	7130C03LS
2.501E+00	2.09E-07	1.282E-08	3.177E-08	6.453E-14	2.573E-07	3.740E-08	7130C03HS
2.501E+00	1.891E-07	1.104E-08	2.722E-08	5.039E-14	2.249E-07	3.271E-08	7130C03LS
2.520E+00	2.97E-07	9.709E-08	2.919E-08	5.106E-14	1.964E-07	2.860E-08	7130C03HS
2.512E+00	1.263E-07	7.347E-09	1.825E-08	5.985E-14	1.652E-07	2.410E-08	7130C03HS
2.591E+00	1.094E-07	6.747E-09	1.583E-08	4.99E-14	1.465E-07	2.139E-08	7130C03LS
2.503E+00	9.410E-08	5.550E-09	1.364E-08	3.094E-14	1.249E-07	1.826E-08	7130C03HS
2.662E+00	7.970E-08	4.654E-09	1.157E-08	2.675E-14	1.111E-07	1.626E-08	7130C03LS
2.672E+00	6.71E-08	3.866E-09	9.565E-09	2.668E-14	9.580E-08	1.404E-08	7130C03HS
2.672E+00	4.019E-08	2.911E-09	7.281E-09	2.029E-14	8.672E-08	1.272E-08	7130C03HS
2.615E+00	4.993E-08	2.999E-09	7.286E-09	1.802E-14	7.616E-08	1.118E-08	7130C03HS

4.379E+00	4.732E-08	2.829E-09	6.916E-09	1.74E-14	6.819E-08	1.001E-08	7130C03HS
4.4577E+00	4.071E-08	4.59E-09	5.961E-09	1.5E-14	5.947E-08	6.738E-09	7130C03HS
4.5774E+00	3.672E-08	2.53E-09	3.87E-09	1.42E-14	5.185E-08	7.621E-09	7130C03HS
4.821E+00	3.308E-08	0.44E-09	4.860E-09	1.310E-14	4.677E-08	6.865E-09	7130C03HS
5.115E+00	2.730E-08	7.74E-09	4.014E-09	1.095E-14	4.086E-08	6.007E-09	7130C03HS
5.307E+00	2.364E-08	1.552E-09	3.475E-09	9.523E-15	3.597E-08	5.288E-09	7130C03HS
5.488E+00	2.256E-08	1.486E-09	3.316E-09	9.128E-15	3.179E-08	4.673E-09	7130C03HS
5.635E+00	1.973E-08	1.262E-09	2.900E-09	8.011E-15	2.868E-08	4.216E-09	7130C03HS
5.825E+00	1.610E-08	1.104E-09	2.387E-09	6.567E-15	5.527E-08	3.715E-09	7130C03HS
6.003E+00	1.280E-08	9.547E-10	1.881E-09	5.242E-15	2.70E-08	3.385E-09	7130C03HS
6.200E+00	1.180E-08	9.002E-10	1.734E-09	4.855E-15	2.02E-08	2.982E-09	7130C03HS
6.384E+00	1.220E-08	9.196E-10	1.794E-09	5.042E-15	1.807E-08	2.657E-09	7130C03HS
6.567E+00	1.056E-08	8.294E-10	1.552E-09	4.383E-15	1.559E-08	2.351E-09	7130C03HS
6.749E+00	8.632E-09	7.412E-10	1.269E-09	3.598E-15	1.424E-08	2.094E-09	7130C03HS
6.929E+00	8.476E-09	7.256E-10	1.246E-09	3.48E-15	1.270E-08	1.868E-09	7130C03HS
7.109E+00	6.555E-09	6.529E-10	9.636E-10	2.756E-15	1.135E-08	1.689E-09	7130C03HS
7.287E+00	6.455E-09	6.433E-10	9.489E-10	2.72E-15	1.019E-08	1.499E-09	7130C03HS
7.464E+00	5.407E-09	5.426E-10	7.949E-10	2.292E-15	9.142E-09	1.345E-09	7130C03HS
7.639E+00	5.615E-09	5.554E-10	8.254E-10	2.390E-15	8.178E-09	1.203E-09	7130C03HS
7.814E+00	4.106E-09	4.914E-10	6.036E-10	1.755E-15	7.327E-09	1.078E-09	7130C03HS
7.988E+00	4.115E-09	4.849E-10	6.049E-10	1.766E-15	6.612E-09	9.727E-10	7130C03HS
8.203E+00	3.310E-09	4.514E-10	4.866E-10	1.428E-15	5.814E-09	8.554E-10	7130C03HS
8.361E+00	3.224E-09	4.362E-10	4.740E-10	1.396E-15	5.299E-09	7.795E-10	7130C03HS
8.539E+00	3.168E-09	4.200E-10	4.658E-10	1.378E-15	4.729E-09	6.959E-10	7130C03HS
8.710E+00	2.884E-09	4.122E-10	4.239E-10	1.259E-15	4.211E-09	6.198E-10	7130C03HS
8.925E+00	2.722E-09	3.977E-10	4.001E-10	1.194E-15	3.609E-09	5.312E-10	7130C03HS
9.092E+00	2.022E-09	3.740E-10	2.972E-10	8.905E-16	3.213E-09	4.730E-10	7130C03HS
9.256E+00	1.878E-09	3.213E-10	2.72E-10	8.306E-16	2.887E-09	4.231E-10	7130C03HS
9.467E+00	1.321E-09	2.953E-10	1.942E-10	5.872E-16	2.554E-09	3.762E-10	7130C03HS
9.632E+00	1.694E-09	2.893E-10	2.490E-10	5.57E-16	2.305E-09	3.396E-10	7130C03HS
9.796E+00	1.822E-09	2.893E-10	2.679E-10	8.161E-16	2.017E-09	2.973E-10	7130C03HS
1.000E+01	2.114E-09	2.837E-10	3.108E-10	9.515E-16	1.616E-09	2.382E-10	7130C03HS
1.016E+01	1.735E-09	2.750E-10	2.553E-10	7.823E-16	1.308E-09	1.929E-10	7130C03HS
1.037E+01	1.036E-10	4.38E-10	1.529E-10	4.691E-16	1.016E-09	1.501E-10	7130C03HS
1.073E+01	8.216E-10	2.21E-10	1.17E-10	3.718E-16	8.675E-10	1.282E-10	7130C03HS
1.089E+01	9.936E-10	2.268E-10	1.466E-10	4.30E-16	7.895E-10	1.014E-10	7130C03HS
1.108E+01	1.076E-09	1.922E-10	1.568E-10	4.888E-16	5.204E-10	7.697E-11	7130C03HS
1.124E+01	7.022E-10	1.836E-10	1.037E-10	3.196E-16	3.515E-10	5.202E-11	7130C03HS
1.144E+01	3.350E-10	1.793E-10	4.953E-11	1.527E-16	2.685E-10	3.976E-11	7130C03HS
1.163E+01	1.438E-10	1.622E-10	1.227E-11	6.568E-17	2.206E-10	3.268E-11	7130C03HS
1.179E+01	3.956E-10	1.634E-10	8.59E-11	1.811E-16	1.694E-10	2.509E-11	7130C03HS
1.198E+01	4.855E-10	1.307E-10	6.713E-11	3.079E-16	8.531E-11	1.263E-11	7130C03HS
1.218E+01	4.525E-10	1.621E-10	6.713E-11	3.079E-16	1.993E-11	-2.19E-12	7130C03HS
1.233E+01	-2.264E-11	3.972E-10	-3.362E-12	-1.042E-17	-6.293E-11	-9.351E-12	7130C03HS
	-8.164E-10	2.915E-09	-1.213E-10	-3.765E-16	0.	0.	7130C03HS

1 CF-252 20 CM ALUMINUM AT R=2M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING 10:58:16U 10/18/77
 COMPILE DATE OF THIS CODE VERSION 10/18/77U 09.13.04

30 GROUP OUTPUT

GROUP#	ENERGY UP-BOUND-MEV	DIFFERENTIAL FLUX N/CM2-SEC-MEV	INTEGRAL FLUX N/CM2-SEC	FLUX PER UNIT LETHARGY N/CM2-SEC
30	4.000000E-07	0.	0.	0.
29	3.180000E-06	0.	0.	0.
28	2.520000E-05	0.	0.	0.
27	2.000000E-04	0.	0.	0.
26	1.590000E-03	0.	0.	0.
25	1.261000E-02	0.	0.	0.
24	1.000000E-01	0.	0.	0.
23	2.238000E-01	2.457429E-06	3.037382E-07	3.976120E-07
22	5.000000E-01	2.401761E-06	6.638468E-07	8.689572E-07
21	5.946000E-01	1.639185E-06	1.550669E-07	8.971260E-07
20	7.071000E-01	1.267634E-06	1.426088E-07	8.250393E-07
19	8.409000E-01	8.264275E-07	1.105760E-07	6.396549E-07
18	1.000000E+00	6.519112E-07	1.037191E-07	6.000517E-07
17	1.257400E+00	8.016731E-07	2.063506E-07	9.048484E-07
16	1.581100E+00	6.391530E-07	2.068398E-07	9.071179E-07
15	1.988200E+00	4.729674E-07	1.925450E-07	8.440812E-07
14	2.500000E+00	2.919894E-07	1.494402E-07	6.552535E-07
13	2.973000E+00	1.941466E-07	9.183134E-08	5.312822E-07
12	3.535500E+00	1.171087E-07	6.587365E-08	3.811010E-07
11	4.204500E+00	6.755007E-08	4.519039E-08	2.614188E-07
10	5.000000E+00	4.084838E-08	3.249487E-08	1.879944E-07
9	5.764800E+00	2.342604E-08	1.791524E-08	1.260883E-07
8	6.646500E+00	1.258410E-08	1.109540E-08	7.809253E-08
7	7.663100E+00	7.021295E-09	7.137649E-09	5.023596E-08
6	8.835200E+00	3.573809E-09	4.188862E-09	2.948089E-08
5	1.018600E+01	1.919288E-09	2.592575E-09	1.825358E-08
4	1.174500E+01	7.379159E-10	1.150411E-09	8.091617E-09
3	1.354100E+01	-5.145331E-10	-9.241015E-10	-6.505242E-09
2	1.561200E+01	0.	0.	0.
1	1.800000E+01	0.	0.	0.

1 CF-252 2 CM POLY AT R=2M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING 11:07:36U 10/18/77
 COMPILATION DATE OF THIS CODE VERSION 10/18/77U 09.13.04

ENERGY (MEV)	PHI (NEUT/CM2-SEC-MEV)	DEL-PHI	DOSE (MR/HR-MEV)	KERMA (ERG/GM-SEC-MEV)	INTEGRAL (NEUT/CM2-SEC)	INT-DOSE (MR/HR)	FILE-ID
1.568E-01	1.367E-06	6.840E-08	3.389E-08	1.010E-13	2.412E-06	2.637E-07	7100C06S
1.711E-01	1.375E-06	3.239E-08	3.562E-08	1.049E-13	2.393E-06	2.632E-07	7100C06S
1.854E-01	1.410E-06	2.310E-08	3.817E-08	1.111E-13	2.373E-06	2.627E-07	7100C06S
1.996E-01	1.455E-06	1.44E-08	4.114E-08	1.146E-13	2.352E-06	2.621E-07	7100C06S
2.139E-01	1.508E-06	3.556E-08	4.455E-08	1.186E-13	2.331E-06	2.615E-07	7100C06S
2.281E-01	1.556E-06	3.676E-08	4.803E-08	1.349E-13	2.309E-06	2.609E-07	7100C06S
2.424E-01	1.592E-06	3.718E-08	5.137E-08	1.425E-13	2.287E-06	2.601E-07	7100C06S
2.567E-01	1.615E-06	3.709E-08	5.445E-08	1.494E-13	2.264E-06	2.594E-07	7100C06S
2.709E-01	1.624E-06	3.698E-08	5.723E-08	1.552E-13	2.241E-06	2.586E-07	7100C06S
2.852E-01	1.626E-06	3.696E-08	5.986E-08	1.604E-13	2.218E-06	2.578E-07	7100C06S
2.994E-01	1.621E-06	3.629E-08	6.236E-08	1.651E-13	2.195E-06	2.569E-07	7100C06S
3.137E-01	1.613E-06	3.579E-08	6.483E-08	1.696E-13	2.172E-06	2.560E-07	7100C06S
3.280E-01	1.602E-06	3.528E-08	6.732E-08	1.740E-13	2.149E-06	2.550E-07	7100C06S
3.422E-01	1.590E-06	3.478E-08	6.979E-08	1.783E-13	2.126E-06	2.541E-07	7100C06S
3.565E-01	1.577E-06	3.426E-08	7.234E-08	1.827E-13	2.103E-06	2.530E-07	7100C06S
3.707E-01	1.564E-06	3.372E-08	7.486E-08	1.870E-13	2.081E-06	2.520E-07	7100C06S
3.850E-01	1.551E-06	3.323E-08	7.763E-08	1.916E-13	2.059E-06	2.509E-07	7100C06S
3.992E-01	1.538E-06	3.276E-08	8.048E-08	1.961E-13	2.037E-06	2.498E-07	7100C06S
4.135E-01	1.525E-06	3.229E-08	8.340E-08	2.008E-13	2.015E-06	2.486E-07	7100C06S
4.278E-01	1.511E-06	3.179E-08	8.635E-08	2.055E-13	1.993E-06	2.474E-07	7100C06S
4.420E-01	1.497E-06	3.128E-08	8.940E-08	2.102E-13	1.972E-06	2.462E-07	7100C06S
4.563E-01	1.483E-06	3.078E-08	9.254E-08	2.150E-13	1.951E-06	2.449E-07	7100C06S
4.705E-01	1.469E-06	3.031E-08	9.579E-08	2.200E-13	1.930E-06	2.435E-07	7100C06S
4.848E-01	1.456E-06	2.986E-08	9.918E-08	2.251E-13	1.909E-06	2.421E-07	7100C06S
4.991E-01	1.442E-06	2.943E-08	1.027E-07	2.303E-13	1.883E-06	2.407E-07	7100C06S
5.133E-01	1.428E-06	2.900E-08	1.034E-07	2.310E-13	1.868E-06	2.392E-07	7100C06S
5.276E-01	1.413E-06	2.855E-08	1.037E-07	2.312E-13	1.847E-06	2.377E-07	7100C06S
5.418E-01	1.396E-06	2.805E-08	1.039E-07	2.311E-13	1.827E-06	2.363E-07	7100C06S
5.561E-01	1.377E-06	2.753E-08	1.040E-07	2.306E-13	1.807E-06	2.348E-07	7100C06S
5.704E-01	1.354E-06	2.698E-08	1.037E-07	2.293E-13	1.788E-06	2.333E-07	7100C06S
5.846E-01	1.326E-06	2.636E-08	1.031E-07	2.272E-13	1.769E-06	2.318E-07	7100C06S
5.989E-01	1.292E-06	2.560E-08	1.018E-07	2.239E-13	1.750E-06	2.304E-07	7100C06S
6.131E-01	1.249E-06	2.469E-08	9.994E-08	2.191E-13	1.732E-06	2.289E-07	7100C06S
6.274E-01	1.196E-06	2.355E-08	9.722E-08	2.126E-13	1.715E-06	2.275E-07	7100C06S
6.416E-01	1.139E-06	2.217E-08	9.355E-08	2.048E-13	1.698E-06	2.260E-07	7100C06S
6.559E-01	1.073E-06	2.076E-08	8.959E-08	1.948E-13	1.682E-06	2.246E-07	7100C06S
6.702E-01	1.002E-06	1.922E-08	8.489E-08	1.841E-13	1.667E-06	2.236E-07	7100C06S
6.844E-01	9.287E-07	1.763E-08	7.981E-08	1.726E-13	1.654E-06	2.224E-07	7100C06S
6.987E-01	8.554E-07	1.608E-08	7.457E-08	1.608E-13	1.641E-06	2.213E-07	7100C06S
7.129E-01	7.846E-07	1.458E-08	6.939E-08	1.492E-13	1.629E-06	2.203E-07	7100C06S
7.272E-01	7.191E-07	1.320E-08	6.451E-08	1.383E-13	1.619E-06	2.193E-07	7100C06S
7.415E-01	6.507E-07	1.201E-08	6.013E-08	1.286E-13	1.609E-06	2.183E-07	7100C06S
7.557E-01	6.086E-07	1.176E-08	5.619E-08	1.198E-13	1.600E-06	2.172E-07	7100C06S
7.700E-01	5.640E-07	1.173E-08	5.282E-08	1.123E-13	1.591E-06	2.168E-07	7100C06S
7.843E-01	5.263E-07	4.623E-08	5.636E-08	1.168E-13	1.519E-06	2.096E-07	7120C02LS
7.986E-01	3.460E-07	4.217E-08	3.800E-08	7.836E-14	1.508E-06	2.084E-07	7120C02LS
8.129E-01	4.749E-07	4.749E-08	5.346E-08	1.097E-13	1.497E-06	2.073E-07	7120C02LS
8.272E-01	4.809E-07	5.795E-08	5.615E-08	1.144E-13	1.480E-06	2.053E-07	7120C02LS
8.415E-01	5.499E-07	5.499E-08	7.077E-08	1.438E-13	1.467E-06	2.038E-07	7120C02LS
8.558E-01	6.131E-07	5.766E-08	7.302E-08	1.480E-13	1.446E-06	2.018E-07	7120C02LS
8.701E-01	5.535E-07	5.737E-08	6.620E-08	1.339E-13	1.433E-06	1.997E-07	7120C02LS

1.104E+00	6.776E-07	6.340E-08	8.157E-08	1.646E-13	1.412E-06	1.972E-07	7120C02LS
1.124E+00	5.321E-07	9.976E-08	6.430E-08	1.295E-13	1.400E-06	1.958E-07	7120C02LS
1.156E+00	5.366E-07	6.226E-08	6.549E-08	1.517E-13	1.383E-06	1.937E-07	7120C02LS
1.140E+00	5.117E-07	6.672E-08	7.487E-08	1.501E-13	1.364E-06	1.913E-07	7120C02LS
1.221E+00	5.366E-07	6.657E-08	9.069E-08	1.814E-13	1.343E-06	1.887E-07	7120C02LS
1.253E+00	5.979E-07	5.158E-08	7.406E-08	1.478E-13	1.321E-06	1.861E-07	7120C02LS
1.273E+00	7.243E-07	5.729E-08	9.007E-08	1.795E-13	1.308E-06	1.844E-07	7120C02LS
1.303E+00	6.469E-07	5.524E-08	8.091E-08	1.609E-13	1.288E-06	1.819E-07	7120C02LS
1.333E+00	6.568E-07	5.646E-08	9.052E-08	1.368E-13	1.266E-06	1.794E-07	7120C02LS
1.363E+00	6.834E-07	5.078E-08	9.000E-08	1.386E-13	1.245E-06	1.771E-07	7120C02LS
1.392E+00	6.325E-07	5.754E-08	8.048E-08	1.590E-13	1.233E-06	1.750E-07	7120C02LS
1.421E+00	6.260E-07	5.816E-08	8.009E-08	1.579E-13	1.214E-06	1.726E-07	7120C02LS
1.449E+00	6.568E-07	6.021E-08	8.448E-08	1.662E-13	1.197E-06	1.703E-07	7120C02LS
1.486E+00	6.096E-07	5.971E-08	7.898E-08	1.549E-13	1.173E-06	1.673E-07	7120C02LS
1.514E+00	6.361E-07	6.58E-08	8.286E-08	1.622E-13	1.156E-06	1.650E-07	7120C02LS
1.541E+00	5.964E-07	6.447E-08	9.017E-08	1.781E-13	1.138E-06	1.627E-07	7120C02LS
1.568E+00	5.996E-07	6.203E-08	7.891E-08	1.539E-13	1.120E-06	1.604E-07	7120C02LS
1.595E+00	5.590E-07	6.169E-08	7.395E-08	1.439E-13	1.105E-06	1.583E-07	7120C02LS
1.630E+00	6.079E-07	5.178E-08	8.097E-08	1.571E-13	1.084E-06	1.556E-07	7120C02LS
1.656E+00	5.753E-07	5.113E-08	7.701E-08	1.492E-13	1.069E-06	1.536E-07	7120C02LS
1.681E+00	5.337E-07	5.006E-08	7.178E-08	1.388E-13	1.055E-06	1.517E-07	7120C02LS
1.715E+00	5.269E-07	5.045E-08	7.133E-08	1.376E-13	1.037E-06	1.493E-07	7120C02LS
1.741E+00	5.502E-07	5.186E-08	7.485E-08	1.376E-13	1.023E-06	1.474E-07	7120C02LS
1.774E+00	5.240E-07	5.168E-08	7.175E-08	1.378E-13	1.005E-06	1.449E-07	7120C02LS
1.799E+00	5.883E-07	5.424E-08	8.093E-08	1.551E-13	9.912E-07	1.430E-07	7120C02LS
1.832E+00	6.032E-07	5.543E-08	8.352E-08	1.597E-13	9.715E-07	1.403E-07	7120C02LS
1.857E+00	5.357E-07	5.350E-08	7.453E-08	1.422E-13	9.573E-07	1.383E-07	7120C02LS
1.890E+00	4.967E-07	5.298E-08	6.955E-08	1.324E-13	9.403E-07	1.360E-07	7120C02LS
1.922E+00	4.829E-07	5.315E-08	6.802E-08	1.292E-13	9.245E-07	1.338E-07	7120C02LS
1.946E+00	5.113E-07	4.544E-08	7.236E-08	1.372E-13	9.127E-07	1.321E-07	7120C02LS
1.978E+00	6.170E-07	4.982E-08	8.786E-08	1.662E-13	8.946E-07	1.295E-07	7120C02LS
2.009E+00	5.151E-07	4.625E-08	7.367E-08	1.392E-13	8.771E-07	1.270E-07	7120C02LS
2.040E+00	4.569E-07	4.457E-08	6.536E-08	1.240E-13	8.620E-07	1.249E-07	7120C02LS
2.064E+00	5.301E-07	4.740E-08	7.585E-08	1.443E-13	8.502E-07	1.232E-07	7120C02LS
2.079E+00	5.246E-07	4.675E-08	7.507E-08	1.431E-13	8.423E-07	1.220E-07	7120C02LS
2.095E+00	4.388E-07	4.603E-08	6.437E-08	1.376E-13	8.340E-07	1.208E-07	7120C02LS
2.125E+00	5.306E-07	4.551E-08	7.597E-08	1.356E-13	8.183E-07	1.186E-07	7120C02LS
2.156E+00	4.463E-07	4.420E-08	6.391E-08	1.230E-13	8.034E-07	1.165E-07	7120C02LS
2.166E+00	3.890E-07	4.696E-08	5.572E-08	1.076E-13	7.908E-07	1.147E-07	7120C02LS
2.216E+00	4.660E-07	4.648E-08	6.677E-08	1.294E-13	7.780E-07	1.128E-07	7120C02LS
2.238E+00	4.418E-07	3.985E-08	6.332E-08	1.231E-13	7.680E-07	1.114E-07	7120C02LS
2.260E+00	4.792E-07	4.128E-08	6.868E-08	1.339E-13	7.579E-07	1.100E-07	7120C02LS
2.266E+00	4.357E-07	3.930E-08	6.246E-08	1.218E-13	7.542E-07	1.094E-07	7120C02LS
2.297E+00	4.681E-07	3.914E-08	6.712E-08	1.314E-13	7.411E-07	1.076E-07	7120C02LS
2.326E+00	4.444E-07	4.063E-08	5.800E-08	1.140E-13	7.289E-07	1.057E-07	7120C02LS
2.355E+00	3.932E-07	4.272E-08	5.642E-08	1.112E-13	7.169E-07	1.041E-07	7120C02LS
2.384E+00	4.309E-07	4.004E-08	6.183E-08	1.223E-13	7.050E-07	1.024E-07	7120C02LS
2.413E+00	4.838E-07	3.983E-08	6.944E-08	1.379E-13	6.917E-07	1.005E-07	7120C02LS
2.424E+00	4.650E-07	3.345E-08	5.676E-08	1.050E-13	6.757E-07	9.877E-08	7120C02LS
2.449E+00	4.017E-07	3.085E-08	5.769E-08	1.150E-13	6.707E-07	9.816E-08	7120C02LS
2.477E+00	3.926E-07	3.033E-08	5.639E-08	1.128E-13	6.645E-07	9.656E-08	7120C02LS
2.601E+00	4.056E-07	2.446E-08	5.833E-08	1.185E-13	6.151E-07	8.945E-08	7120C02LS
2.760E+00	3.772E-07	2.296E-08	5.432E-08	1.125E-13	5.528E-07	8.049E-08	7120C02LS
2.919E+00	3.175E-07	1.128E-08	4.012E-08	1.058E-13	4.952E-07	7.219E-08	7120C02LS
3.132E+00	2.779E-07	1.729E-08	4.156E-08	7.203E-14	4.705E-07	6.525E-08	7120C02LS
3.291E+00	2.315E-07	1.521E-08	3.350E-08	7.402E-14	3.881E-07	6.672E-08	7120C02LS
3.503E+00	2.239E-07	1.467E-08	3.246E-08	7.361E-14	3.398E-07	4.973E-08	7120C02LS
3.662E+00	1.784E-07	1.243E-08	2.591E-08	5.989E-14	3.078E-07	4.509E-08	7120C02LS
3.872E+00	1.608E-07	1.160E-08	2.340E-08	5.549E-14	2.722E-07	3.991E-08	7120C02LS
4.019E+00	1.332E-07	1.035E-08	1.941E-08	4.687E-14	2.506E-07	3.677E-08	7120C02LS

4.215E+00	1.367E-07	1.046E-08	1.995E-08	4.933E-14	2.242E-07	3.291E-08	7120C02HS
4.429E+00	1.022E-07	9.138E-09	1.494E-08	4.792E-14	1.986E-07	2.918E-08	7120C02HS
4.578E+00	1.371E-07	9.727E-09	1.669E-08	4.055E-14	1.830E-07	2.689E-08	7120C02HS
4.775E+00	1.050E-07	7.236E-09	1.540E-08	4.055E-14	1.621E-07	2.383E-08	7120C02HS
4.970E+00	7.996E-08	6.090E-09	1.175E-08	3.186E-14	1.441E-07	2.195E-08	7120C02HS
5.116E+00	7.697E-08	5.936E-09	1.131E-08	3.087E-14	1.326E-07	1.950E-08	7120C02HS
5.308E+00	7.094E-08	5.620E-09	1.043E-08	2.858E-14	1.184E-07	1.741E-08	7120C02HS
5.489E+00	6.408E-08	5.289E-09	9.419E-09	2.593E-14	1.062E-07	1.562E-08	7120C02HS
5.684E+00	4.92E-08	4.967E-09	8.074E-09	2.33E-14	9.460E-08	1.391E-08	7120C02HS
5.870E+00	4.991E-08	4.747E-09	7.335E-09	2.038E-14	8.485E-08	1.248E-08	7120C02HS
6.062E+00	4.699E-08	4.594E-09	6.908E-09	1.927E-14	7.554E-08	1.111E-08	7120C02HS
6.201E+00	4.862E-08	4.346E-09	5.676E-09	1.589E-14	6.959E-08	1.024E-08	7120C02HS
6.385E+00	4.042E-08	4.463E-09	5.942E-09	1.670E-14	6.232E-08	9.167E-09	7120C02HS
6.568E+00	3.048E-08	3.000E-09	4.480E-09	1.265E-14	5.584E-08	8.214E-09	7120C02HS
6.750E+00	2.901E-08	2.914E-09	4.265E-09	1.209E-14	5.042E-08	7.418E-09	7120C02HS
6.930E+00	2.717E-08	2.828E-09	4.098E-09	1.167E-14	4.530E-08	6.665E-09	7120C02HS
7.110E+00	2.651E-08	2.739E-09	3.897E-09	1.115E-14	4.041E-08	5.945E-09	7120C02HS
7.288E+00	2.267E-08	2.617E-09	3.332E-09	9.570E-15	3.603E-08	5.302E-09	7120C02HS
7.509E+00	1.674E-08	2.508E-09	2.460E-09	7.103E-15	3.168E-08	4.682E-09	7120C02HS
7.684E+00	1.310E-08	2.450E-09	1.925E-09	5.581E-15	2.907E-08	4.278E-09	7120C02HS
7.859E+00	1.889E-08	2.493E-09	1.775E-09	5.081E-15	2.627E-08	3.867E-09	7120C02HS
8.032E+00	1.718E-08	2.366E-09	2.525E-09	4.7380E-15	2.315E-08	3.408E-09	7120C02HS
8.205E+00	1.025E-08	2.179E-09	1.506E-09	4.421E-15	2.078E-08	3.060E-09	7120C02HS
8.363E+00	1.208E-08	1.631E-09	1.775E-09	5.229E-15	1.901E-08	2.800E-09	7120C02HS
8.585E+00	1.128E-08	1.591E-09	1.658E-09	4.909E-15	1.642E-08	2.419E-09	7120C02HS
8.751E+00	9.670E-09	1.497E-09	1.422E-09	4.225E-15	1.468E-08	2.134E-09	7120C02HS
8.926E+00	8.671E-09	1.481E-09	1.273E-09	3.804E-15	1.308E-08	1.928E-09	7120C02HS
9.136E+00	8.148E-09	1.354E-09	7.565E-10	2.59E-15	1.183E-08	1.715E-09	7120C02HS
9.303E+00	2.98E-09	1.343E-09	6.28E-10	2.03E-15	1.057E-08	1.574E-09	7120C02HS
9.468E+00	4.609E-09	1.332E-09	6.775E-10	2.048E-15	9.770E-09	1.442E-09	7120C02HS
9.675E+00	6.22E-09	1.255E-09	6.265E-10	2.511E-15	8.711E-09	1.286E-09	7120C02HS
9.839E+00	5.329E-09	1.266E-09	5.995E-10	2.927E-15	7.715E-09	1.140E-09	7120C02HS
1.004E+01	4.254E-09	9.251E-10	6.255E-10	1.915E-15	6.631E-09	9.803E-10	7120C02HS
1.021E+01	3.737E-09	8.402E-10	4.028E-10	1.235E-15	6.037E-09	8.929E-10	7120C02HS
1.041E+01	6.75E-09	5.521E-10	3.940E-10	1.039E-15	5.495E-09	8.132E-10	7120C02HS
1.057E+01	1.125E-09	9.131E-10	7.554E-10	2.920E-16	7.213E-09	7.213E-10	7120C02HS
1.077E+01	3.237E-09	8.431E-10	4.775E-10	1.468E-15	4.035E-09	5.980E-10	7120C02HS
1.093E+01	1.891E-09	7.970E-10	2.791E-10	8.591E-16	3.625E-09	5.375E-10	7120C02HS
1.113E+01	1.823E-09	7.548E-10	2.694E-10	8.302E-16	3.254E-09	4.826E-10	7120C02HS
1.129E+01	1.990E-09	7.535E-10	2.643E-10	9.079E-16	2.968E-09	4.403E-10	7120C02HS
1.149E+01	1.49E-09	7.314E-10	2.064E-10	7.375E-16	2.695E-09	3.903E-10	7120C02HS
1.168E+01	1.918E-09	5.689E-10	2.842E-10	8.737E-16	2.298E-09	3.412E-10	7120C02HS
1.183E+01	2.225E-09	5.428E-10	3.299E-10	1.021E-15	1.987E-09	2.951E-10	7120C02HS
1.203E+01	1.963E-09	5.106E-10	2.313E-10	9.026E-16	1.568E-09	2.330E-10	7120C02HS
1.222E+01	6.055E-10	7.133E-10	8.993E-11	7.789E-16	1.324E-09	1.968E-10	7120C02HS
1.237E+01	1.705E-08	5.787E-09	2.534E-09	7.866E-15	0.	0.	7120C02HS

[illegible]

CF-252 5 CM POLY

AT R=2M

(FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING
COMPILATION DATE OF THIS CODE VERSION10/18/77U 11:03:55U 10/18/77
09.13.04

ENERGY (MEV)	PHI (NEUT/CM2-SEC-MEV)	DEL-PHI	DOSE (MR/HR-MEV)	KERMA (ERG/GM-SEC-MEV)	INTEGRAL (NEUT/CM2-SEC)	INT-DOSE (MR/HR)	FILE-ID
1.562E-01	8.872E-07	4.435E-08	2.194E-08	6.545E-14	1.545E-06	1.702E-07	7070C02S
1.704E-01	8.943E-07	4.441E-08	2.311E-08	6.812E-14	1.532E-06	1.698E-07	7070C02S
1.846E-01	9.144E-07	4.123E-08	2.469E-08	7.191E-14	1.519E-06	1.695E-07	7070C02S
1.988E-01	9.391E-07	4.175E-08	2.649E-08	7.625E-14	1.506E-06	1.691E-07	7070C02S
2.130E-01	9.664E-07	4.281E-08	2.848E-08	8.102E-14	1.493E-06	1.688E-07	7070C02S
2.273E-01	9.904E-07	4.342E-08	3.050E-08	8.575E-14	1.479E-06	1.683E-07	7070C02S
2.415E-01	1.016E-06	4.369E-08	3.267E-08	9.092E-14	1.464E-06	1.679E-07	7070C02S
2.557E-01	1.012E-06	4.325E-08	3.401E-08	9.339E-14	1.450E-06	1.674E-07	7070C02S
2.699E-01	1.010E-06	4.299E-08	3.547E-08	9.623E-14	1.436E-06	1.669E-07	7070C02S
2.841E-01	1.002E-06	4.264E-08	3.677E-08	9.860E-14	1.421E-06	1.664E-07	7070C02S
2.983E-01	9.910E-07	4.188E-08	3.799E-08	1.007E-13	1.407E-06	1.659E-07	7070C02S
3.125E-01	9.787E-07	4.169E-08	3.920E-08	1.027E-13	1.393E-06	1.653E-07	7070C02S
3.267E-01	9.651E-07	4.122E-08	4.038E-08	1.045E-13	1.379E-06	1.648E-07	7070C02S
3.409E-01	9.521E-07	4.078E-08	4.162E-08	1.065E-13	1.366E-06	1.642E-07	7070C02S
3.551E-01	9.398E-07	4.036E-08	4.292E-08	1.085E-13	1.352E-06	1.636E-07	7070C02S
3.693E-01	9.287E-07	4.007E-08	4.432E-08	1.107E-13	1.339E-06	1.630E-07	7070C02S
3.835E-01	9.190E-07	4.003E-08	4.581E-08	1.131E-13	1.326E-06	1.623E-07	7070C02S
3.977E-01	9.112E-07	4.003E-08	4.746E-08	1.158E-13	1.313E-06	1.617E-07	7070C02S
4.119E-01	9.047E-07	4.003E-08	4.923E-08	1.187E-13	1.300E-06	1.610E-07	7070C02S
4.261E-01	8.989E-07	4.003E-08	5.110E-08	1.218E-13	1.287E-06	1.603E-07	7070C02S
4.403E-01	8.937E-07	4.003E-08	5.308E-08	1.250E-13	1.275E-06	1.595E-07	7070C02S
4.545E-01	8.891E-07	4.003E-08	5.517E-08	1.284E-13	1.262E-06	1.588E-07	7070C02S
4.687E-01	8.839E-07	4.003E-08	5.731E-08	1.318E-13	1.249E-06	1.580E-07	7070C02S
4.829E-01	8.774E-07	4.003E-08	5.943E-08	1.351E-13	1.237E-06	1.571E-07	7070C02S
4.971E-01	8.690E-07	4.003E-08	6.150E-08	1.381E-13	1.224E-06	1.563E-07	7070C02S
5.113E-01	8.586E-07	4.003E-08	6.360E-08	1.386E-13	1.212E-06	1.554E-07	7070C02S
5.255E-01	8.465E-07	4.003E-08	6.571E-08	1.400E-13	1.200E-06	1.545E-07	7070C02S
5.397E-01	8.281E-07	4.003E-08	6.781E-08	1.368E-13	1.188E-06	1.536E-07	7070C02S
5.539E-01	8.087E-07	4.003E-08	6.995E-08	1.352E-13	1.177E-06	1.528E-07	7070C02S
5.681E-01	7.859E-07	4.003E-08	7.209E-08	1.329E-13	1.165E-06	1.519E-07	7070C02S
5.823E-01	7.613E-07	4.003E-08	7.423E-08	1.302E-13	1.154E-06	1.511E-07	7070C02S
5.965E-01	7.353E-07	4.003E-08	7.637E-08	1.272E-13	1.144E-06	1.502E-07	7070C02S
6.107E-01	7.075E-07	4.003E-08	7.851E-08	1.239E-13	1.133E-06	1.494E-07	7070C02S
6.249E-01	6.795E-07	4.003E-08	8.065E-08	1.203E-13	1.124E-06	1.486E-07	7070C02S
6.391E-01	6.516E-07	4.003E-08	8.279E-08	1.167E-13	1.114E-06	1.479E-07	7070C02S
6.533E-01	6.257E-07	4.003E-08	8.493E-08	1.134E-13	1.105E-06	1.471E-07	7070C02S
6.675E-01	6.012E-07	4.003E-08	8.707E-08	1.102E-13	1.096E-06	1.464E-07	7070C02S
6.817E-01	5.797E-07	4.003E-08	8.921E-08	1.073E-13	1.088E-06	1.457E-07	7070C02S
6.959E-01	5.579E-07	4.003E-08	9.135E-08	1.047E-13	1.080E-06	1.450E-07	7070C02S
7.101E-01	5.385E-07	4.003E-08	9.349E-08	1.022E-13	1.072E-06	1.443E-07	7070C02S
7.244E-01	5.197E-07	4.003E-08	9.563E-08	9.975E-14	1.065E-06	1.436E-07	7070C02S
7.386E-01	5.012E-07	4.003E-08	9.779E-08	9.730E-14	1.057E-06	1.430E-07	7070C02S
7.528E-01	4.822E-07	4.003E-08	9.993E-08	9.471E-14	1.050E-06	1.423E-07	7070C02S
7.670E-01	4.626E-07	4.003E-08	1.017E-08	9.191E-14	1.044E-06	1.417E-07	7070C02S
7.812E-01	4.436E-07	4.003E-08	1.039E-08	8.933E-14	1.038E-06	1.411E-07	7120C03LS
7.954E-01	4.239E-07	4.003E-08	1.058E-08	8.737E-14	1.031E-06	1.404E-07	7120C03LS
8.096E-01	4.022E-07	4.003E-08	1.077E-08	8.542E-14	1.024E-06	1.397E-07	7120C03LS
8.238E-01	3.795E-07	4.003E-08	1.096E-08	8.347E-14	1.017E-06	1.390E-07	7120C03LS
8.380E-01	3.568E-07	4.003E-08	1.115E-08	8.152E-14	1.010E-06	1.383E-07	7120C03LS
8.522E-01	3.341E-07	4.003E-08	1.134E-08	7.957E-14	1.003E-06	1.376E-07	7120C03LS
8.664E-01	3.114E-07	4.003E-08	1.153E-08	7.762E-14	9.991E-07	1.369E-07	7120C03LS
8.806E-01	2.887E-07	4.003E-08	1.172E-08	7.567E-14	9.950E-07	1.362E-07	7120C03LS
8.948E-01	2.660E-07	4.003E-08	1.191E-08	7.372E-14	9.909E-07	1.355E-07	7120C03LS
9.090E-01	2.433E-07	4.003E-08	1.210E-08	7.177E-14	9.868E-07	1.348E-07	7120C03LS
9.232E-01	2.206E-07	4.003E-08	1.229E-08	6.982E-14	9.827E-07	1.341E-07	7120C03LS
9.374E-01	1.979E-07	4.003E-08	1.248E-08	6.787E-14	9.786E-07	1.334E-07	7120C03LS
9.516E-01	1.752E-07	4.003E-08	1.267E-08	6.592E-14	9.745E-07	1.327E-07	7120C03LS
9.658E-01	1.525E-07	4.003E-08	1.286E-08	6.397E-14	9.704E-07	1.320E-07	7120C03LS
9.800E-01	1.298E-07	4.003E-08	1.305E-08	6.202E-14	9.663E-07	1.313E-07	7120C03LS
9.942E-01	1.071E-07	4.003E-08	1.324E-08	6.007E-14	9.622E-07	1.306E-07	7120C03LS
1.016E-00	8.44E-08	4.003E-08	1.343E-08	5.812E-14	9.581E-07	1.299E-07	7120C03LS
1.040E-00	6.17E-08	4.003E-08	1.362E-08	5.617E-14	9.540E-07	1.292E-07	7120C03LS
1.070E-00	3.90E-08	4.003E-08	1.381E-08	5.422E-14	9.499E-07	1.285E-07	7120C03LS

1.104E+00	4.933E-07	5.537E-08	5.938E-08	1.199E-13	9.129E-07	1.275E-07	7120C03LS
1.124E+00	3.644E-07	3.320E-08	4.404E-08	8.875E-14	9.043E-07	1.264E-07	7120C03LS
1.156E+00	4.217E-07	5.675E-08	3.127E-08	1.031E-13	8.917E-07	1.249E-07	7120C03LS
1.190E+00	3.777E-07	5.708E-08	3.011E-08	8.044E-14	8.790E-07	1.239E-07	7120C03LS
1.221E+00	4.908E-07	4.475E-08	6.042E-08	1.209E-13	8.663E-07	1.218E-07	7120C03LS
1.253E+00	3.836E-07	4.205E-08	4.751E-08	9.484E-14	8.523E-07	1.201E-07	7120C03LS
1.273E+00	4.146E-07	4.383E-08	5.156E-08	1.029E-13	8.443E-07	1.191E-07	7120C03LS
1.303E+00	4.146E-07	4.496E-08	5.186E-08	1.031E-13	8.319E-07	1.175E-07	7120C03LS
1.333E+00	4.874E-07	4.829E-08	5.431E-08	1.217E-13	8.182E-07	1.158E-07	7120C03LS
1.363E+00	5.894E-07	4.747E-08	6.004E-08	1.076E-13	8.045E-07	1.141E-07	7120C03LS
1.392E+00	3.747E-07	4.701E-08	4.755E-08	9.419E-14	7.930E-07	1.126E-07	7120C03LS
1.421E+00	3.871E-07	4.836E-08	4.953E-08	9.763E-14	7.819E-07	1.112E-07	7120C03LS
1.449E+00	3.097E-07	4.770E-08	3.984E-08	7.837E-14	7.722E-07	1.099E-07	7120C03LS
1.486E+00	4.718E-07	5.332E-08	6.113E-08	1.199E-13	7.577E-07	1.081E-07	7120C03LS
1.514E+00	4.292E-07	3.17E-08	5.591E-08	1.094E-13	7.451E-07	1.064E-07	7120C03LS
1.541E+00	4.824E-07	2.933E-08	6.044E-08	7.341E-14	7.341E-07	1.050E-07	7120C03LS
1.568E+00	4.911E-07	5.664E-08	6.463E-08	1.260E-13	7.223E-07	1.035E-07	7120C03LS
1.595E+00	3.475E-07	5.404E-08	4.597E-08	8.945E-14	7.110E-07	1.020E-07	7120C03LS
1.630E+00	3.514E-07	4.109E-08	4.680E-08	9.082E-14	6.988E-07	1.003E-07	7120C03LS
1.656E+00	3.747E-07	4.247E-08	5.015E-08	9.714E-14	6.893E-07	9.908E-08	7120C03LS
1.681E+00	3.509E-07	4.240E-08	4.720E-08	9.125E-14	6.803E-07	9.787E-08	7120C03LS
1.715E+00	4.077E-07	4.459E-08	5.319E-08	1.054E-13	6.745E-07	9.613E-08	7120C03LS
1.741E+00	3.561E-07	4.318E-08	5.547E-08	8.547E-14	6.683E-07	9.483E-08	7120C03LS
1.774E+00	2.531E-07	4.222E-08	3.466E-08	6.654E-14	6.483E-07	9.353E-08	7120C03LS
1.799E+00	2.822E-07	4.363E-08	3.862E-08	7.441E-14	6.416E-07	9.261E-08	7120C03LS
1.832E+00	3.926E-07	4.708E-08	5.436E-08	1.039E-13	6.305E-07	9.107E-08	7120C03LS
1.857E+00	4.164E-07	4.818E-08	5.793E-08	1.105E-13	6.204E-07	8.967E-08	7120C03LS
1.890E+00	3.301E-07	4.572E-08	4.621E-08	8.797E-14	6.080E-07	8.795E-08	7120C03LS
1.922E+00	3.318E-07	4.746E-08	4.674E-08	8.876E-14	5.974E-07	8.646E-08	7120C03LS
1.946E+00	3.072E-07	3.735E-08	4.348E-08	8.243E-14	5.898E-07	8.538E-08	7120C03LS
1.978E+00	3.354E-07	3.855E-08	4.776E-08	9.032E-14	5.795E-07	8.392E-08	7120C03LS
1.009E+00	3.640E-07	3.980E-08	5.205E-08	9.838E-14	5.687E-07	8.237E-08	7120C03LS
1.040E+00	3.527E-07	3.993E-08	5.046E-08	9.574E-14	5.575E-07	8.078E-08	7120C03LS
1.064E+00	2.809E-07	3.844E-08	4.013E-08	7.637E-14	5.499E-07	7.970E-08	7120C03LS
1.079E+00	3.995E-07	3.568E-08	4.854E-08	9.272E-14	5.453E-07	7.903E-08	7120C03LS
1.095E+00	3.133E-07	4.139E-08	4.485E-08	8.66E-14	5.401E-07	7.828E-08	7120C03LS
1.125E+00	3.670E-07	4.058E-08	5.254E-08	1.007E-13	5.299E-07	7.682E-08	7120C03LS
1.156E+00	3.215E-07	3.881E-08	4.604E-08	8.860E-14	5.192E-07	7.529E-08	7120C03LS
1.186E+00	2.221E-07	4.069E-08	3.181E-08	6.144E-14	5.110E-07	7.413E-08	7120C03LS
1.216E+00	2.893E-07	4.145E-08	4.145E-08	8.034E-14	5.034E-07	7.303E-08	7120C03LS
1.236E+00	1.92E-07	3.425E-08	4.574E-08	8.891E-14	4.967E-07	7.207E-08	7120C03LS
1.250E+00	3.992E-07	2.44C-08	4.255E-08	8.899E-14	4.899E-07	7.114E-08	7120C03LS
1.266E+00	2.992E-07	3.346E-08	4.289E-08	8.78E-14	4.857E-07	7.076E-08	7120C03LS
1.297E+00	2.956E-07	3.466E-08	4.239E-08	8.298E-14	4.789E-07	6.952E-08	7120C03LS
1.326E+00	2.454E-07	3.422E-08	3.520E-08	8.195E-14	4.711E-07	6.840E-08	7120C03LS
1.355E+00	2.861E-07	3.464E-08	4.105E-08	8.094E-14	4.634E-07	6.729E-08	7120C03LS
1.384E+00	2.584E-07	3.434E-08	3.709E-08	7.338E-14	4.555E-07	6.616E-08	7120C03LS
1.413E+00	2.547E-07	4.44E-08	3.709E-08	7.543E-14	4.479E-07	6.507E-08	7120C03LS
1.424E+00	2.53E-07	3.27E-08	3.952E-08	7.445E-14	4.409E-07	6.454E-08	7120C03LS
1.449E+00	2.382E-07	2.135E-08	3.420E-08	6.821E-14	4.385E-07	6.372E-08	7120C03LS
1.477E+00	2.350E-07	2.085E-08	3.375E-08	6.754E-14	4.319E-07	6.277E-08	7120C03LS
1.601E+00	2.607E-07	1.639E-08	3.749E-08	7.616E-14	4.011E-07	5.835E-08	7120C03HS
1.760E+00	2.487E-07	1.582E-08	3.581E-08	7.418E-14	3.606E-07	5.253E-08	7120C03HS
1.915E+00	2.103E-07	1.399E-08	3.042E-08	6.424E-14	3.241E-07	4.726E-08	7120C03HS
1.132E+00	1.716E-07	1.182E-08	2.479E-08	5.324E-14	2.834E-07	4.128E-08	7120C03HS
3.291E+00	1.539E-07	1.123E-08	2.228E-08	4.922E-14	2.757E-07	3.764E-08	7120C03HS
3.503E+00	1.398E-07	1.066E-08	2.027E-08	4.596E-14	2.63E-07	3.313E-08	7120C03HS
3.662E+00	1.159E-07	9.618E-09	1.683E-08	3.891E-14	2.060E-07	3.018E-08	7120C03HS
3.872E+00	9.157E-08	8.794E-09	1.332E-08	3.160E-14	1.842E-07	2.701E-08	7120C03HS
4.019E+00	9.540E-08	8.878E-09	1.390E-08	3.356E-14	1.705E-07	2.501E-08	7120C03HS

4.215E+00	8.398E-08	8.528E-09	1.226E-08	3.031E-14	1.529E-07	2.245E-08	7120C03HS
4.423E+00	6.957E-08	8.151E-09	1.017E-08	2.582E-14	1.365E-07	2.005E-08	7120C03HS
4.578E+00	7.262E-08	8.223E-09	1.06E-08	2.749E-14	1.259E-07	1.890E-08	7120C03HS
4.775E+00	5.666E-08	8.329E-09	8.3E-09	2.200E-14	1.131E-07	1.653E-08	7120C03HS
4.975E+00	5.709E-08	8.303E-09	8.390E-09	2.275E-14	1.021E-07	1.500E-08	7120C03HS
5.116E+00	5.741E-08	8.256E-09	8.439E-09	2.305E-14	9.369E-08	1.378E-08	7120C03HS
5.308E+00	4.537E-08	4.808E-09	6.670E-09	1.828E-14	8.383E-08	1.233E-08	7120C03HS
5.489E+00	4.474E-08	4.746E-09	6.576E-09	1.810E-14	7.567E-08	1.113E-08	7120C03HS
5.684E+00	3.707E-08	4.518E-09	5.449E-09	1.507E-14	6.770E-08	9.954E-09	7120C03HS
5.870E+00	3.103E-08	4.326E-09	4.561E-09	1.267E-14	1.136E-08	9.023E-09	7120C03HS
6.052E+00	2.972E-08	4.279E-09	4.369E-09	1.219E-14	5.53E-08	8.166E-09	7120C03HS
6.201E+00	3.328E-08	4.320E-09	4.892E-09	1.369E-14	5.115E-08	7.522E-09	7120C03HS
6.385E+00	3.015E-08	4.269E-09	4.431E-09	1.246E-14	4.532E-08	6.664E-09	7120C03HS
6.568E+00	2.003E-08	2.784E-09	2.944E-09	8.313E-15	4.073E-08	5.990E-09	7120C03HS
6.750E+00	2.347E-08	2.826E-09	3.451E-09	9.785E-15	3.677E-08	5.408E-09	7120C03HS
6.930E+00	1.913E-08	2.586E-09	2.812E-09	8.006E-15	3.293E-08	4.844E-09	7120C03HS
7.110E+00	1.853E-08	2.625E-09	2.724E-09	7.789E-15	2.954E-08	4.348E-09	7120C03HS
7.288E+00	1.489E-08	2.524E-09	2.189E-09	6.285E-15	2.657E-08	3.909E-09	7120C03HS
7.509E+00	1.542E-08	2.575E-09	2.267E-09	6.544E-15	2.322E-08	3.416E-09	7120C03HS
7.684E+00	1.493E-08	2.547E-09	2.194E-09	6.360E-15	2.057E-08	3.026E-09	7120C03HS
7.859E+00	1.469E-08	2.479E-09	2.160E-09	6.287E-15	1.797E-08	2.645E-09	7120C03HS
8.032E+00	1.026E-08	2.293E-09	1.508E-09	4.408E-15	1.582E-08	2.328E-09	7120C03HS
8.205E+00	5.857E-09	1.61E-09	6.609E-10	2.525E-15	1.442E-08	2.123E-09	7120C03HS
8.363E+00	7.30E-09	1.618E-09	1.136E-09	3.347E-15	1.335E-08	1.958E-09	7120C03HS
8.585E+00	8.236E-09	1.569E-09	1.211E-09	3.535E-15	1.158E-08	1.705E-09	7120C03HS
8.751E+00	6.977E-09	1.557E-09	1.026E-09	3.049E-15	1.031E-08	1.519E-09	7120C03HS
8.926E+00	3.703E-09	1.487E-09	5.444E-10	1.625E-15	9.379E-09	1.382E-09	7120C03HS
9.136E+00	3.079E-09	1.464E-09	4.526E-10	1.358E-15	8.667E-09	1.277E-09	7120C03HS
9.303E+00	4.38E-09	1.445E-09	9.46E-10	8.50E-15	7.872E-09	1.160E-09	7120C03HS
9.469E+00	7.86E-09	1.469E-09	8.469E-10	2.211E-15	7.063E-09	1.012E-09	7120C03HS
9.675E+00	4.951E-09	1.347E-09	7.278E-10	2.211E-15	6.750E-09	8.482E-10	7120C03HS
9.839E+00	4.459E-09	1.313E-09	6.554E-10	1.999E-15	4.979E-09	7.348E-10	7120C03HS
1.004E+01	3.089E-09	9.488E-10	4.541E-10	1.390E-15	4.220E-09	6.233E-10	7120C03HS
1.021E+01	1.342E-09	8.456E-10	1.975E-10	6.053E-16	3.844E-09	5.679E-10	7120C03HS
1.041E+01	2.005E-09	8.885E-10	2.959E-10	9.081E-16	3.508E-09	5.185E-10	7120C03HS
1.057E+01	3.703E-09	8.800E-10	3.45E-10	1.576E-16	3.051E-09	4.512E-10	7120C03HS
1.077E+01	2.472E-09	8.560E-10	2.200E-10	1.292E-16	2.863E-09	2.150E-10	7120C03HS
1.093E+01	2.472E-09	8.593E-10	2.182E-10	6.715E-16	2.650E-09	3.035E-10	7120C03HS
1.113E+01	2.303E-10	8.190E-10	3.404E-11	1.049E-16	1.860E-09	2.783E-10	7120C03HS
1.128E+01	2.856E-09	8.151E-10	4.224E-10	1.303E-15	1.648E-09	2.441E-10	7120C03HS
1.148E+01	2.488E-09	8.067E-10	3.683E-10	1.137E-15	1.114E-09	1.650E-10	7120C03HS
1.168E+01	1.957E-09	7.72E-10	2.900E-10	8.966E-16	6.891E-10	9.920E-11	7120C03HS
1.183E+01	1.693E-09	7.52E-10	2.510E-10	7.788E-16	3.953E-10	5.862E-11	7120C03HS
1.203E+01	1.163E-09	6.75E-10	1.72E-10	5.347E-16	1.097E-10	1.626E-11	7120C03HS
1.222E+01	1.263E-09	7.970E-10	1.876E-10	5.818E-16	1.208E-10	1.796E-11	7120C03HS
1.237E+01	2.873E-09	5.712E-09	4.270E-10	1.326E-15	0.	0.	7120C03HS

1 CF-252 5 CM POLY AT R=2M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING 11:03:55U 10/18/77
 COMPILE DATE OF THIS CODE VERSION 10/18/77U 09.13.04

30 GROUP OUTPUT

GROUP#	ENERGY UP-BOUND-MEV	DIFFERENTIAL FLUX N/CM2-SEC-MEV	INTEGRAL FLUX N/CM2-SEC	FLUX PER UNIT LETHARGY N/CM2-SEC
30	4.000000E-07	0.	0.	0.
29	3.180000E-06	0.	0.	0.
28	2.520000E-05	0.	0.	0.
27	2.000000E-04	0.	0.	0.
26	1.590000E-03	0.	0.	0.
25	1.261000E-02	0.	0.	0.
24	1.000000E-01	0.	0.	0.
23	2.236000E-01	9.092736E-07	1.123862E-07	1.471205E-07
22	5.000000E-01	9.415519E-07	2.602449E-07	3.406535E-07
21	5.946000E-01	8.126581E-07	7.687746E-08	4.447678E-07
20	7.071000E-01	6.341094E-07	7.133731E-08	4.127101E-07
19	8.409000E-01	4.666322E-07	6.243539E-08	3.611733E-07
18	1.000000E+00	3.503930E-07	5.574753E-08	3.225193E-07
17	1.257400E+00	4.075503E-07	1.049034E-07	4.600016E-07
16	1.581100E+00	4.147599E-07	1.342578E-07	5.986480E-07
15	1.988200E+00	3.447172E-07	1.403344E-07	6.151996E-07
14	2.500000E+00	2.953451E-07	1.496222E-07	6.560517E-07
13	2.973000E+00	2.398137E-07	1.134319E-07	6.562502E-07
12	3.535500E+00	1.619523E-07	9.109817E-08	5.270333E-07
11	4.204500E+00	1.017757E-07	6.808797E-08	3.938721E-07
10	5.000000E+00	6.718715E-08	5.344738E-08	2.092121E-07
9	5.764800E+00	4.645942E-08	3.553217E-08	2.500632E-07
8	6.646500E+00	2.916167E-08	2.571185E-08	1.809671E-07
7	7.663100E+00	1.791966E-08	1.821713E-08	1.282116E-07
6	8.835200E+00	9.458478E-09	1.108628E-08	7.802440E-08
5	1.018600E+01	4.377685E-09	5.913376E-09	4.163441E-08
4	1.174500E+01	2.138021E-09	3.333174E-09	2.344446E-08
3	1.354100E+01	1.658161E-09	2.978057E-09	2.096413E-08
2	1.561200E+01	0.	0.	0.
1	1.800000E+01	0.	0.	0.

1 CF-252 10 CM POLY AT R=2M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING 11:06:08U 10/18/77
 COMPILATION DATE OF THIS CODE VERSION 10/18/77U 09.13.04

ENERGY (MEV)	PHI (NEUT/CM2-SEC-MEV)	DEL-PHI	DOSE (MR/HR-MEV)	KERMA (ERG/GM-SEC-MEV)	INTEGRAL (NEUT/CM2-SEC)	INT-DOSE (MR/HR)	FILE-ID
1.568E-01	3.406E-07	1.703E-08	8.440E-09	2.516E-14	5.945E-07	6.920E-08	7100C04S
1.711E-01	3.315E-07	7.691E-09	8.586E-09	2.529E-14	5.897E-07	6.907E-08	7100C04S
1.854E-01	3.327E-07	7.587E-09	9.008E-09	2.621E-14	5.850E-07	6.895E-08	7100C04S
1.996E-01	3.368E-07	7.769E-09	9.525E-09	2.740E-14	5.802E-07	6.882E-08	7100C04S
2.139E-01	3.431E-07	8.210E-09	1.014E-08	2.882E-14	5.754E-07	6.868E-08	7100C04S
2.281E-01	3.473E-07	8.254E-09	1.072E-08	3.012E-14	5.705E-07	6.853E-08	7100C04S
2.424E-01	3.473E-07	8.125E-09	1.121E-08	3.111E-14	5.658E-07	6.837E-08	7100C04S
2.567E-01	3.429E-07	7.885E-09	1.156E-08	3.172E-14	5.608E-07	6.821E-08	7100C04S
2.709E-01	3.350E-07	7.639E-09	1.180E-08	3.200E-14	5.558E-07	6.804E-08	7100C04S
2.852E-01	3.251E-07	7.360E-09	1.197E-08	3.207E-14	5.510E-07	6.787E-08	7100C04S
2.994E-01	3.141E-07	7.022E-09	1.208E-08	3.198E-14	5.465E-07	6.770E-08	7100C04S
3.137E-01	3.025E-07	6.555E-09	1.217E-08	3.183E-14	5.421E-07	6.753E-08	7100C04S
3.280E-01	2.915E-07	6.378E-09	1.225E-08	3.166E-14	5.378E-07	6.735E-08	7100C04S
3.422E-01	2.811E-07	6.107E-09	1.234E-08	3.152E-14	5.338E-07	6.718E-08	7100C04S
3.565E-01	2.717E-07	5.866E-09	1.246E-08	3.147E-14	5.298E-07	6.700E-08	7100C04S
3.707E-01	2.635E-07	5.647E-09	1.263E-08	3.151E-14	5.260E-07	6.682E-08	7100C04S
3.850E-01	2.565E-07	5.450E-09	1.285E-08	3.167E-14	5.223E-07	6.664E-08	7100C04S
3.992E-01	2.506E-07	5.294E-09	1.312E-08	3.196E-14	5.187E-07	6.646E-08	7100C04S
4.135E-01	2.459E-07	5.172E-09	1.345E-08	3.239E-14	5.152E-07	6.627E-08	7100C04S
4.278E-01	2.421E-07	5.055E-09	1.383E-08	3.292E-14	5.117E-07	6.607E-08	7100C04S
4.420E-01	2.390E-07	4.978E-09	1.427E-08	3.355E-14	5.082E-07	6.587E-08	7100C04S
4.563E-01	2.360E-07	4.906E-09	1.473E-08	3.423E-14	5.049E-07	6.567E-08	7100C04S
4.705E-01	2.330E-07	4.832E-09	1.519E-08	3.488E-14	5.015E-07	6.545E-08	7100C04S
4.848E-01	2.298E-07	4.736E-09	1.564E-08	3.550E-14	4.982E-07	6.523E-08	7100C04S
4.991E-01	2.257E-07	4.623E-09	1.607E-08	3.604E-14	4.950E-07	6.501E-08	7100C04S
5.133E-01	2.214E-07	4.498E-09	1.651E-08	3.650E-14	4.918E-07	6.478E-08	7100C04S
5.275E-01	2.167E-07	4.373E-09	1.691E-08	3.746E-14	4.885E-07	6.455E-08	7100C04S
5.418E-01	2.119E-07	4.241E-09	1.738E-08	3.807E-14	4.856E-07	6.433E-08	7100C04S
5.561E-01	2.074E-07	4.117E-09	1.786E-08	3.872E-14	4.826E-07	6.410E-08	7100C04S
5.704E-01	2.032E-07	4.004E-09	1.837E-08	3.942E-14	4.797E-07	6.388E-08	7100C04S
5.846E-01	1.993E-07	3.910E-09	1.891E-08	4.019E-14	4.768E-07	6.366E-08	7100C04S
5.989E-01	1.953E-07	3.838E-09	1.948E-08	4.103E-14	4.740E-07	6.343E-08	7100C04S
6.131E-01	1.913E-07	3.789E-09	2.008E-08	4.195E-14	4.712E-07	6.322E-08	7100C04S
6.274E-01	1.873E-07	3.703E-09	2.074E-08	4.295E-14	4.685E-07	6.300E-08	7100C04S
6.416E-01	1.833E-07	3.637E-09	2.138E-08	4.395E-14	4.658E-07	6.278E-08	7100C04S
6.559E-01	1.793E-07	3.544E-09	2.222E-08	4.509E-14	4.632E-07	6.256E-08	7100C04S
6.702E-01	1.753E-07	3.446E-09	2.294E-08	4.626E-14	4.605E-07	6.234E-08	7100C04S
6.844E-01	1.713E-07	3.376E-09	2.352E-08	4.748E-14	4.581E-07	6.213E-08	7100C04S
6.987E-01	1.673E-07	3.302E-09	2.419E-08	4.874E-14	4.558E-07	6.193E-08	7100C04S
7.129E-01	1.633E-07	3.231E-09	2.485E-08	4.999E-14	4.536E-07	6.174E-08	7100C04S
7.272E-01	1.593E-07	3.162E-09	2.563E-08	5.124E-14	4.516E-07	6.155E-08	7100C04S
7.415E-01	1.553E-07	3.094E-09	2.642E-08	5.249E-14	4.497E-07	6.138E-08	7100C04S
7.557E-01	1.513E-07	3.026E-09	2.722E-08	5.374E-14	4.480E-07	6.123E-08	7100C04S
7.700E-01	1.473E-07	2.958E-09	2.801E-08	5.499E-14	4.465E-07	6.109E-08	7100C04S
7.842E-01	1.433E-07	2.890E-09	2.880E-08	5.624E-14	4.450E-07	6.095E-08	7100C04S
7.985E-01	1.393E-07	2.822E-09	2.959E-08	5.749E-14	4.435E-07	6.081E-08	7100C04S
8.127E-01	1.353E-07	2.754E-09	3.038E-08	5.874E-14	4.420E-07	6.067E-08	7100C04S
8.270E-01	1.313E-07	2.686E-09	3.117E-08	5.999E-14	4.405E-07	6.053E-08	7100C04S
8.412E-01	1.273E-07	2.618E-09	3.196E-08	6.124E-14	4.390E-07	6.039E-08	7100C04S
8.555E-01	1.233E-07	2.550E-09	3.275E-08	6.249E-14	4.375E-07	6.025E-08	7100C04S
8.697E-01	1.193E-07	2.482E-09	3.354E-08	6.374E-14	4.360E-07	6.011E-08	7100C04S
8.840E-01	1.153E-07	2.414E-09	3.433E-08	6.499E-14	4.345E-07	6.000E-08	7100C04S
8.982E-01	1.113E-07	2.346E-09	3.512E-08	6.624E-14	4.330E-07	5.989E-08	7100C04S
9.125E-01	1.073E-07	2.278E-09	3.591E-08	6.749E-14	4.315E-07	5.978E-08	7100C04S
9.267E-01	1.033E-07	2.210E-09	3.670E-08	6.874E-14	4.300E-07	5.967E-08	7100C04S
9.410E-01	9.93E-08	2.142E-09	3.749E-08	6.999E-14	4.285E-07	5.956E-08	7100C04S
9.552E-01	9.53E-08	2.074E-09	3.828E-08	7.124E-14	4.270E-07	5.945E-08	7100C04S
9.695E-01	9.13E-08	1.996E-09	3.907E-08	7.249E-14	4.255E-07	5.934E-08	7100C04S
9.837E-01	8.73E-08	1.928E-09	3.986E-08	7.374E-14	4.240E-07	5.923E-08	7100C04S
9.980E-01	8.33E-08	1.860E-09	4.065E-08	7.499E-14	4.225E-07	5.912E-08	7100C04S
1.014E+00	7.93E-08	1.792E-09	4.144E-08	7.624E-14	4.210E-07	5.901E-08	7100C04S
1.037E+00	7.53E-08	1.724E-09	4.223E-08	7.749E-14	4.195E-07	5.890E-08	7100C04S
1.071E+00	7.13E-08	1.656E-09	4.302E-08	7.874E-14	4.180E-07	5.879E-08	7100C04S
1.095E+00	6.73E-08	1.588E-09	4.381E-08	7.999E-14	4.165E-07	5.868E-08	7100C04S

1.124E+00	1.627E-07	1.169E-08	1.966E-08	3.962E-14	3.946E-07	5.526E-08	7130C01LS
1.156E+00	1.664E-07	1.194E-08	1.023E-08	4.068E-14	3.893E-07	4.463E-08	7130C01LS
1.190E+00	1.692E-07	1.181E-08	1.071E-08	4.153E-14	3.536E-07	3.993E-08	7130C01LS
1.212E+00	1.681E-07	1.182E-08	1.066E-08	4.136E-14	3.799E-07	3.48E-08	7130C01LS
1.243E+00	1.799E-07	1.242E-08	1.224E-08	4.443E-14	3.745E-07	2.81E-08	7130C01LS
1.277E+00	1.890E-07	1.301E-08	1.351E-08	4.684E-14	3.688E-07	2.10E-08	7130C01LS
1.314E+00	1.745E-07	1.61E-08	1.192E-08	4.335E-14	3.633E-07	1.42E-08	7130C01LS
1.34E+00	1.78E-07	1.25E-08	1.247E-08	4.59E-14	3.580E-07	0.76E-08	7130C01LS
1.363E+00	1.739E-07	1.253E-08	1.201E-08	4.357E-14	3.529E-07	0.11E-08	7130C01LS
1.393E+00	1.715E-07	1.199E-08	1.183E-08	4.312E-14	3.477E-07	4.845E-08	7130C01LS
1.421E+00	1.712E-07	1.208E-08	1.190E-08	4.318E-14	3.423E-07	4.884E-08	7130C01LS
1.450E+00	1.741E-07	1.226E-08	1.239E-08	4.405E-14	3.379E-07	4.820E-08	7130C01LS
1.487E+00	1.639E-07	1.190E-08	1.044E-08	4.167E-14	3.317E-07	4.739E-08	7130C01LS
1.515E+00	1.599E-07	1.711E-08	1.711E-08	4.332E-14	3.270E-07	6.80E-08	7130C01LS
1.542E+00	1.547E-07	1.157E-08	1.026E-08	3.958E-14	3.229E-07	4.625E-08	7130C01LS
1.569E+00	1.602E-07	1.144E-08	1.108E-08	4.111E-14	3.187E-07	4.569E-08	7130C01LS
1.604E+00	1.693E-07	1.190E-08	1.244E-08	4.363E-14	3.129E-07	4.493E-08	7130C01LS
1.630E+00	1.676E-07	1.188E-08	1.232E-08	4.331E-14	3.085E-07	4.435E-08	7130C01LS
1.665E+00	1.669E-07	1.187E-08	1.238E-08	4.333E-14	3.027E-07	4.357E-08	7130C01LS
1.698E+00	1.76E-07	1.149E-08	1.123E-08	4.103E-14	2.989E-07	4.307E-08	7130C01LS
1.715E+00	1.675E-07	1.123E-08	1.048E-08	3.950E-14	2.948E-07	4.250E-08	7130C01LS
1.750E+00	1.408E-07	1.040E-08	1.919E-08	3.690E-14	2.897E-07	4.181E-08	7130C01LS
1.783E+00	1.429E-07	1.053E-08	1.960E-08	3.761E-14	2.850E-07	4.117E-08	7130C01LS
1.808E+00	1.320E-07	1.010E-08	1.819E-08	3.484E-14	2.815E-07	4.070E-08	7130C01LS
1.841E+00	1.367E-07	1.036E-08	1.897E-08	3.624E-14	2.771E-07	4.008E-08	7130C01LS
1.865E+00	1.390E-07	1.051E-08	1.936E-08	3.693E-14	2.737E-07	3.960E-08	7130C01LS
1.898E+00	1.351E-07	1.982E-09	1.894E-08	3.603E-14	2.693E-07	3.899E-08	7130C01LS
1.930E+00	1.372E-07	1.008E-08	1.936E-08	3.674E-14	2.649E-07	3.838E-08	7130C01LS
1.962E+00	1.380E-07	1.017E-08	1.959E-08	3.709E-14	2.605E-07	3.775E-08	7130C01LS
1.988E+00	1.330E-07	9.969E-09	1.897E-08	3.586E-14	2.573E-07	3.729E-08	7130C01LS
1.017E+00	1.263E-07	9.735E-09	1.806E-08	3.18E-14	2.532E-07	3.672E-08	7130C01LS
1.049E+00	1.270E-07	9.787E-09	1.817E-08	3.431E-14	2.492E-07	3.614E-08	7130C01LS
1.079E+00	1.309E-07	9.86E-09	1.873E-08	3.87E-14	2.453E-07	3.558E-08	7130C01LS
1.079E+00	1.408E-07	9.339E-09	2.01E-08	3.39E-14	2.418E-07	3.500E-08	7130C01LS
1.110E+00	1.246E-07	9.462E-09	1.784E-08	3.413E-14	2.373E-07	3.444E-08	7130C01LS
1.141E+00	1.264E-07	9.683E-09	1.809E-08	3.475E-14	2.330E-07	3.403E-08	7130C01LS
1.163E+00	1.304E-07	9.799E-09	1.866E-08	3.598E-14	2.285E-07	3.347E-08	7130C01LS
1.193E+00	1.305E-07	9.710E-09	1.870E-08	3.614E-14	2.245E-07	3.332E-08	7130C01LS
1.201E+00	1.367E-07	9.567E-09	1.95E-08	3.791E-14	2.205E-07	3.292E-08	7130C01LS
1.222E+00	1.146E-07	8.642E-09	1.642E-08	3.671E-14	2.167E-07	3.244E-08	7130C01LS
1.253E+00	1.099E-07	8.736E-09	1.575E-08	3.067E-14	2.134E-07	3.196E-08	7130C01LS
1.283E+00	1.121E-07	8.742E-09	1.607E-08	3.141E-14	2.01E-07	3.150E-08	7130C01LS
1.312E+00	1.116E-07	8.761E-09	1.601E-08	3.140E-14	1.98E-07	3.092E-08	7130C01LS
1.348E+00	1.13E-07	8.930E-09	1.597E-08	3.145E-14	1.729E-07	3.045E-08	7130C01LS
1.37E+00	1.182E-07	9.12E-09	1.62E-08	3.35E-14	1.689E-07	2.995E-08	7130C01LS
1.40E+00	1.205E-07	8.291E-09	1.730E-08	4.43E-14	1.638E-07	2.964E-08	7130C01LS
1.424E+00	1.203E-07	8.216E-09	1.726E-08	3.432E-14	1.599E-07	2.945E-08	7130C01LS
1.435E+00	1.126E-07	8.489E-09	1.617E-08	3.219E-14	1.557E-07	2.902E-08	7130C01LS
1.463E+00	1.034E-07	8.125E-09	1.495E-08	2.966E-14	1.995E-07	2.861E-08	7130C01LS
1.491E+00	1.010E-07	7.165E-09	1.431E-08	2.908E-14	1.967E-07	2.832E-08	7130C01LS
1.50E+00	1.127E-07	6.655E-09	1.621E-08	3.293E-14	1.849E-07	2.692E-08	7130C01LS
1.780E+00	9.969E-08	5.95E-09	1.398E-08	2.93E-14	1.680E-07	2.22E-08	7130C01LS
1.920E+00	9.10E-08	4.479E-09	1.325E-08	2.99E-14	1.551E-07	1.975E-08	7130C01LS
1.132E+00	7.373E-08	4.435E-09	1.066E-08	2.2309E-14	1.240E-07	1.814E-08	7130C01LS
1.291E+00	6.552E-08	4.100E-09	9.626E-09	2.127E-14	1.111E-07	1.626E-08	7130C01LS
1.503E+00	5.46E-08	5.01E-09	8.041E-09	1.823E-14	1.026E-07	1.504E-08	7130C01LS
1.682E+00	1.17E-08	1.37E-09	7.430E-09	1.718E-14	9.281E-08	1.357E-08	7130C01LS
1.81E+00	4.33E-08	5.15E-09	6.87E-09	1.545E-14	8.28E-08	1.259E-08	7130C01LS
1.21E+00	4.03E-08	5.67E-09	6.444E-09	1.346E-14	7.655E-08	1.155E-08	7130C01LS

4.379E+00	3.651E-08	2.364E-09	5.337E-09	1.346E-14	7.260E-08	1.066E-08	7130C01HS
4.577E+00	3.255E-08	2.161E-09	4.767E-09	1.232E-14	6.576E-08	9.664E-09	7130C01HS
4.774E+00	3.045E-08	2.087E-09	4.467E-09	1.183E-14	6.955E-08	8.755E-09	7130C01HS
4.921E+00	2.936E-08	2.027E-09	4.401E-09	1.185E-14	5.811E-08	9.103E-09	7130C01HS
5.115E+00	2.800E-08	1.961E-09	4.233E-09	1.155E-14	4.941E-08	7.269E-09	7130C01HS
5.307E+00	2.653E-08	1.795E-09	3.752E-09	1.028E-14	4.420E-08	6.499E-09	7130C01HS
5.488E+00	2.263E-08	1.666E-09	3.356E-09	9.238E-15	3.982E-08	3.556E-09	7130C01HS
5.635E+00	2.100E-08	1.470E-09	3.872E-09	8.527E-15	3.660E-08	5.382E-09	7130C01HS
5.825E+00	1.810E-08	1.337E-09	2.661E-09	7.382E-15	3.289E-08	4.836E-09	7130C01HS
6.003E+00	1.645E-08	1.264E-09	2.418E-09	6.738E-15	2.981E-08	4.384E-09	7130C01HS
6.200E+00	1.443E-08	1.171E-09	2.121E-09	5.936E-15	2.677E-08	3.937E-09	7130C01HS
6.384E+00	1.358E-08	1.152E-09	1.997E-09	5.613E-15	2.415E-08	3.556E-09	7130C01HS
6.567E+00	1.170E-08	1.045E-09	1.720E-09	4.857E-15	2.188E-08	3.218E-09	7130C01HS
6.749E+00	1.239E-08	1.056E-09	1.821E-09	5.164E-15	1.969E-08	2.896E-09	7130C01HS
6.929E+00	1.089E-08	9.891E-10	1.601E-09	4.559E-15	1.759E-08	2.588E-09	7130C01HS
7.109E+00	9.547E-09	9.398E-10	1.403E-09	4.013E-15	1.575E-08	2.317E-09	7130C01HS
7.287E+00	8.852E-09	9.073E-10	1.301E-09	3.737E-15	1.412E-08	2.076E-09	7130C01HS
7.464E+00	8.950E-09	8.80E-10	1.316E-09	3.794E-15	1.254E-08	1.845E-09	7130C01HS
7.639E+00	7.535E-09	7.717E-10	1.108E-09	3.207E-15	1.110E-08	1.633E-09	7130C01HS
7.814E+00	5.901E-09	7.048E-10	8.675E-10	2.522E-15	9.922E-09	1.460E-09	7130C01HS
7.988E+00	5.069E-09	6.46E-10	7.452E-10	2.176E-15	8.967E-09	1.320E-09	7130C01HS
8.203E+00	5.444E-09	6.522E-10	8.003E-10	2.348E-15	7.837E-09	1.154E-09	7130C01HS
8.361E+00	4.039E-09	6.01E-10	6.016E-10	1.772E-15	7.083E-09	1.043E-09	7130C01HS
8.539E+00	3.166E-09	5.896E-10	5.830E-10	1.724E-15	6.366E-09	9.374E-10	7130C01HS
8.710E+00	2.760E-09	5.633E-10	4.057E-10	1.205E-15	5.791E-09	8.529E-10	7130C01HS
8.925E+00	3.012E-09	5.590E-10	4.428E-10	1.322E-15	5.171E-09	7.617E-10	7130C01HS
9.092E+00	2.632E-09	5.339E-10	3.870E-10	1.159E-15	4.699E-09	6.924E-10	7130C01HS
9.259E+00	3.666E-09	4.710E-10	3.368E-10	1.621E-15	4.174E-09	6.151E-10	7130C01HS
9.467E+00	2.852E-09	4.538E-10	3.899E-10	1.179E-15	3.517E-09	5.185E-10	7130C01HS
9.632E+00	2.077E-09	4.295E-10	3.044E-10	9.239E-16	3.127E-09	4.612E-10	7130C01HS
9.796E+00	1.330E-09	3.954E-10	1.955E-10	5.955E-16	2.646E-09	4.202E-10	7130C01HS
1.000E+01	1.993E-09	4.113E-10	2.930E-10	8.969E-16	2.509E-09	3.704E-10	7130C01HS
1.016E+01	1.622E-09	4.017E-10	2.387E-10	7.314E-16	2.220E-09	3.279E-10	7130C01HS
1.037E+01	1.528E-09	3.795E-10	2.250E-10	6.902E-16	1.889E-09	2.792E-10	7130C01HS
1.059E+01	1.026E-09	3.769E-10	1.512E-10	7.128E-16	1.685E-09	2.451E-10	7130C01HS
1.073E+01	1.608E-09	3.595E-10	2.371E-10	7.290E-16	1.421E-09	2.103E-10	7130C01HS
1.089E+01	1.678E-09	3.038E-10	2.476E-10	7.621E-16	1.159E-09	1.715E-10	7130C01HS
1.108E+01	1.264E-09	3.072E-10	1.898E-10	5.846E-16	8.772E-10	1.299E-10	7130C01HS
1.124E+01	7.632E-10	2.834E-10	1.128E-10	3.480E-16	7.133E-10	1.057E-10	7130C01HS
1.144E+01	6.361E-10	2.520E-10	9.414E-11	2.905E-16	5.734E-10	8.502E-11	7130C01HS
1.163E+01	6.099E-10	2.460E-10	9.034E-11	2.792E-16	4.550E-10	6.749E-11	7130C01HS
1.179E+01	2.94E-10	2.18E-10	1.512E-10	3.603E-16	3.395E-10	5.04E-11	7130C01HS
1.198E+01	2.931E-10	2.29E-10	1.029E-10	3.185E-16	1.953E-10	2.896E-11	7130C01HS
1.218E+01	7.249E-10	5.462E-10	1.077E-10	3.338E-16	5.348E-11	7.934E-12	7130C01HS
1.233E+01	-1.252E-11	3.789E-09	-1.860E-12	-5.774E-18	0.	0.	7130C01HS

1 CF-252 10 CM POLY AT R=2M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING
 COMPILATION DATE OF THIS CODE VERSION

11:06:08U 10/18/77
 10/18/77U 09.13.04

30 GROUP OUTPUT

GROUP#	ENERGY UP-BOUND-MEV	DIFFERENTIAL FLUX N/CM2-SEC-MEV	INTEGRAL FLUX N/CM2-SEC	FLUX PER UNIT LETHARGY N/CM2-SEC
30	4.000000E-07	0.	0.	0.
29	3.180000E-06	0.	0.	0.
28	2.520000E-05	0.	0.	0.
27	2.000000E-04	0.	0.	0.
26	1.590000E-03	0.	0.	0.
25	1.261000E-02	0.	0.	0.
24	1.000000E-01	0.	0.	0.
23	2.236000E-01	3.386824E-07	4.186114E-08	5.479660E-08
22	5.000000E-01	2.795685E-07	7.727274E-08	1.011479E-07
21	5.946000E-01	2.106016E-07	1.992291E-08	1.152622E-07
20	7.071000E-01	1.809197E-07	2.035347E-08	1.177516E-07
19	8.409000E-01	1.164917E-07	1.558659E-08	9.016456E-08
18	1.000000E+00	1.416337E-07	2.253710E-08	1.303852E-07
17	1.257400E+00	1.727934E-07	4.447703E-08	1.550319E-07
16	1.581100E+00	1.704283E-07	5.516764E-08	2.418804E-07
15	1.988200E+00	1.467485E-07	5.974130E-08	2.618947E-07
14	2.500000E+00	1.196026E-07	6.11263E-08	2.664003E-07
13	2.973000E+00	1.010685E-07	4.780540E-08	2.765739E-07
12	3.535500E+00	6.875329E-08	3.867373E-08	2.97404E-07
11	4.204500E+00	4.519482E-08	3.023333E-08	1.749039E-07
10	5.000000E+00	3.303228E-08	2.627718E-08	1.520228E-07
9	5.764800E+00	2.453119E-08	1.876145E-08	1.320367E-07
8	6.646500E+00	1.482016E-08	1.305693E-08	9.196871E-08
7	7.663100E+00	9.853249E-09	1.001885E-08	7.051233E-08
6	8.932000E+00	4.676954E-09	5.481957E-09	5.858089E-08
5	1.018600E+01	2.412461E-09	3.258752E-09	2.294395E-08
4	1.174500E+01	1.155844E-09	1.801961E-09	1.267441E-08
3	1.354100E+01	3.285915E-10	5.901503E-10	4.154382E-09
2	1.561200E+01	0.	0.	0.
1	1.800000E+01	0.	0.	0.

1 PUBE BARE AT R= 1M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING
COMPILATION DATE OF THIS CODE VERSION

14:44:40R 10/17/77
10/14/77U 16.03.47

ENERGY (MEV)	PHI (NEUT/CM2-SEC-MEV)	DEL-PHI	DOSE (MR/HR-MEV)	KERMA (ERG/GM-SEC-MEV)	INTEGRAL (NEUT/CM2-SEC)	INT-DOSE (MR/HR)	FILE-ID
1.642E-01	1.579E-06	7.896E-08	4.002E-08	1.186E-13	1.128E-06	1.067E-06	608N0023
1.659E-01	1.742E-06	4.017E-08	4.741E-08	1.378E-13	8.090E-06	1.067E-06	608N0023
1.096E-01	1.944E-06	4.533E-08	5.670E-08	1.618E-13	8.048E-06	1.065E-06	608N0023
1.322E-01	1.160E-06	5.225E-08	6.755E-08	1.891E-13	8.002E-06	1.064E-06	608N0023
1.549E-01	3.32E-06	5.563E-08	7.819E-08	2.148E-13	7.951E-06	1.062E-06	608N0023
1.775E-01	4.31E-06	5.698E-08	8.740E-08	2.356E-13	7.897E-06	1.060E-06	608N0023
3.002E-01	4.65E-06	7.73E-08	9.506E-08	2.51E-13	7.941E-06	1.058E-06	608N0023
3.228E-01	4.45E-06	6.81E-08	1.014E-07	2.63E-13	7.786E-06	1.056E-06	608N0023
3.456E-01	4.07E-06	5.467E-08	1.067E-07	2.719E-13	7.731E-06	1.054E-06	608N0023
3.681E-01	3.42E-06	5.270E-08	1.13E-07	2.784E-13	7.677E-06	1.051E-06	608N0023
3.908E-01	2.66E-06	5.066E-08	1.157E-07	2.838E-13	7.625E-06	1.049E-06	608N0023
4.134E-01	1.92E-06	4.862E-08	1.198E-07	2.886E-13	7.574E-06	1.046E-06	608N0023
4.361E-01	1.13E-06	4.65E-08	1.239E-07	2.928E-13	7.525E-06	1.043E-06	608N0023
4.587E-01	1.03E-06	4.380E-08	1.279E-07	2.968E-13	7.478E-06	1.040E-06	608N0023
4.814E-01	1.95E-06	4.461E-08	1.315E-07	2.993E-13	7.433E-06	1.037E-06	608N0023
5.041E-01	1.861E-06	5.273E-08	1.334E-07	3.087E-13	7.390E-06	1.034E-06	608N0023
5.267E-01	1.763E-06	4.797E-08	1.293E-07	3.02E-13	7.349E-06	1.031E-06	608N0023
5.494E-01	1.659E-06	4.047E-08	1.245E-07	2.962E-13	7.310E-06	1.028E-06	608N0023
5.720E-01	1.548E-06	3.278E-08	1.188E-07	2.86E-13	7.274E-06	1.026E-06	608N0023
5.947E-01	1.434E-06	3.021E-08	1.126E-07	2.77E-13	7.240E-06	1.023E-06	608N0023
6.173E-01	1.316E-06	2.760E-08	1.057E-07	2.65E-13	7.209E-06	1.021E-06	608N0023
6.400E-01	1.192E-06	2.479E-08	9.796E-08	2.513E-13	7.181E-06	1.018E-06	608N0023
6.626E-01	1.064E-06	2.200E-08	9.844E-08	2.442E-13	7.155E-06	1.016E-06	608N0023
6.853E-01	9.332E-07	1.106E-08	8.027E-08	2.33E-13	7.132E-06	1.014E-06	608N0023
7.079E-01	8.023E-07	4.33E-08	7.059E-08	2.19E-13	7.113E-06	1.013E-06	608N0023
7.306E-01	7.40E-07	3.74E-08	6.067E-08	2.00E-13	7.096E-06	1.011E-06	608N0023
7.533E-01	5.537E-07	2.015E-08	5.099E-08	1.88E-13	7.082E-06	1.010E-06	608N0023
7.760E-01	1.546E-06	1.003E-07	1.662E-07	3.441E-13	6.920E-06	9.931E-07	711JA01LS
7.987E-01	1.530E-06	9.938E-08	1.690E-07	3.481E-13	6.880E-06	9.886E-07	711JA01LS
8.214E-01	1.392E-06	9.215E-08	1.588E-07	3.268E-13	6.823E-06	9.823E-07	711JA01LS
8.441E-01	1.347E-06	9.025E-08	1.587E-07	3.229E-13	6.788E-06	9.782E-07	711JA01LS
8.668E-01	1.224E-06	8.51E-08	1.454E-07	3.04E-13	6.741E-06	9.726E-07	711JA01LS
8.895E-01	1.171E-06	8.27E-08	1.397E-07	2.829E-13	6.712E-06	9.692E-07	711JA01LS
9.122E-01	1.103E-06	8.004E-08	1.325E-07	2.677E-13	6.671E-06	9.643E-07	711JA01LS
9.349E-01	9.733E-07	7.545E-08	1.177E-07	2.371E-13	6.637E-06	9.602E-07	711JA01LS
9.576E-01	8.961E-07	7.308E-08	1.091E-07	2.192E-13	6.606E-06	9.564E-07	711JA01LS
9.803E-01	8.899E-07	7.413E-08	1.088E-07	2.183E-13	6.583E-06	9.536E-07	711JA01LS
1.006E+00	8.473E-07	7.046E-08	1.049E-07	2.087E-13	6.554E-06	9.501E-07	711JA01LS
1.029E+00	8.053E-07	6.893E-08	1.009E-07	1.798E-13	6.467E-06	9.457E-07	711JA01LS
1.052E+00	8.051E-07	7.127E-08	1.000E-07	1.931E-13	6.500E-06	9.434E-07	711JA01LS
1.075E+00	7.593E-07	7.097E-08	9.523E-08	1.892E-13	6.476E-06	9.404E-07	711JA01LS
1.098E+00	6.951E-07	7.037E-08	8.771E-08	1.738E-13	6.453E-06	9.375E-07	711JA01LS
1.121E+00	6.745E-07	7.121E-08	8.562E-08	1.693E-13	6.432E-06	9.348E-07	711JA01LS
1.144E+00	6.380E-07	7.172E-08	8.148E-08	1.607E-13	6.411E-06	9.322E-07	711JA01LS
1.167E+00	6.584E-07	6.994E-08	8.472E-08	1.666E-13	6.385E-06	9.289E-07	711JA01LS
1.190E+00	7.06E-07	7.25E-08	9.109E-08	1.798E-13	6.365E-06	9.262E-07	711JA01LS
1.213E+00	6.622E-07	7.325E-08	8.618E-08	1.688E-13	6.345E-06	9.237E-07	711JA01LS
1.236E+00	5.875E-07	7.280E-08	7.689E-08	1.502E-13	6.327E-06	9.213E-07	711JA01LS
1.259E+00	5.767E-07	7.507E-08	7.603E-08	1.481E-13	6.305E-06	9.184E-07	711JA01LS
1.282E+00	5.464E-07	7.623E-08	7.242E-08	1.408E-13	6.289E-06	9.163E-07	711JA01LS
1.305E+00	4.797E-07	7.090E-08	6.392E-08	1.240E-13	6.275E-06	9.144E-07	711JA01LS

1.669E+00	3.686E-07	7.094E-08	4.949E-08	9.577E-14	6.259E-06	9.124E-07	711JA01LS
1.695E+00	3.176E-07	7.168E-08	4.284E-08	8.273E-14	6.251E-06	9.112E-07	711JA01LS
1.730E+00	1.104E-07	7.416E-08	4.214E-08	8.118E-14	6.240E-06	9.097E-07	711JA01LS
1.759E+00	7.81E-07	7.770E-08	5.162E-08	9.922E-14	6.230E-06	9.083E-07	711JA01LS
1.794E+00	5.293E-07	7.771E-08	7.276E-08	1.395E-13	6.214E-06	9.061E-07	711JA01LS
1.830E+00	5.344E-07	8.014E-08	7.397E-08	1.414E-13	6.195E-06	9.035E-07	711JA01LS
1.856E+00	6.102E-07	8.373E-08	8.488E-08	1.620E-13	6.180E-06	9.014E-07	711JA01LS
1.890E+00	6.279E-07	8.679E-08	8.791E-08	1.673E-13	6.159E-06	8.985E-07	711JA01LS
1.924E+00	6.60E-07	8.867E-08	8.547E-08	1.625E-13	6.138E-06	8.955E-07	711JA01LS
1.958E+00	7.90E-07	9.197E-08	8.111E-08	1.59E-13	6.117E-06	8.927E-07	711JA01LS
1.983E+00	5.654E-07	8.539E-08	8.059E-08	1.524E-13	6.103E-06	8.906E-07	711JA01LS
2.017E+00	4.572E-07	8.517E-08	6.539E-08	1.237E-13	6.085E-06	8.881E-07	711JA01LS
2.050E+00	5.204E-07	8.848E-08	7.446E-08	1.414E-13	6.069E-06	8.858E-07	711JA01LS
2.083E+00	6.126E-07	9.289E-08	8.768E-08	1.672E-13	6.051E-06	8.831E-07	711JA01LS
2.115E+00	6.273E-07	9.517E-08	8.979E-08	1.719E-13	6.031E-06	8.803E-07	711JA01LS
2.146E+00	7.703E-07	9.643E-08	1.103E-07	2.120E-13	6.009E-06	8.772E-07	711JA01LS
2.177E+00	8.228E-07	9.879E-08	1.178E-07	2.265E-13	6.008E-06	8.771E-07	711JA01LS
2.199E+00	6.453E-07	1.017E-07	1.211E-07	2.336E-13	5.982E-06	8.733E-07	711JA01LS
2.211E+00	9.220E-07	1.046E-07	1.321E-07	2.559E-13	5.953E-06	8.692E-07	711JA01LS
2.243E+00	9.525E-07	1.043E-07	1.365E-07	2.655E-13	5.923E-06	8.649E-07	711JA01LS
2.274E+00	6.749E-07	9.870E-08	1.254E-07	2.449E-13	5.895E-06	8.608E-07	711JA01LS
2.305E+00	8.263E-07	1.001E-07	1.185E-07	3.222E-13	5.869E-06	8.571E-07	711JA01LS
2.318E+00	8.131E-07	1.025E-07	1.297E-07	3.255E-13	5.858E-06	8.555E-07	711JA01LS
2.336E+00	8.244E-07	1.014E-07	1.182E-07	3.255E-13	5.843E-06	8.534E-07	711JA01LS
2.367E+00	8.585E-07	1.037E-07	1.232E-07	4.322E-13	5.817E-06	8.497E-07	711JA01LS
2.397E+00	7.706E-07	1.002E-07	1.106E-07	1.192E-13	5.793E-06	8.462E-07	711JA01LS
2.428E+00	7.903E-07	1.024E-07	1.135E-07	2.57E-13	5.768E-06	8.427E-07	711JA01LS
2.455E+00	8.091E-07	5.305E-08	1.162E-07	3.222E-13	5.739E-06	8.385E-07	711JA01LS
2.495E+00	8.368E-07	5.522E-08	1.202E-07	4.11E-13	5.714E-06	8.349E-07	711JA01LS
2.510E+00	8.890E-07	6.066E-08	1.277E-07	5.66E-13	5.701E-06	8.330E-07	711JA01LS
2.536E+00	9.441E-07	6.407E-08	1.359E-07	7.88E-13	5.541E-06	8.100E-07	711JA01LS
2.552E+00	1.156E-06	7.717E-08	1.723E-07	3.609E-13	5.362E-06	7.843E-07	711JA01LS
2.576E+00	1.339E-06	8.545E-08	1.933E-07	4.161E-13	5.078E-06	7.433E-07	711JA01LS
2.603E+00	1.421E-06	8.955E-08	2.056E-07	4.516E-13	4.848E-06	7.100E-07	711JA01LS
2.633E+00	1.412E-06	9.127E-08	2.046E-07	4.587E-13	4.610E-06	6.755E-07	711JA01LS
2.655E+00	1.396E-06	9.834E-08	2.026E-07	4.669E-13	4.295E-06	6.299E-07	711JA01LS
2.682E+00	1.364E-06	8.722E-08	2.983E-07	4.696E-13	3.965E-06	5.965E-07	711JA01LS
2.702E+00	1.178E-06	7.850E-08	1.715E-07	4.138E-13	3.798E-06	5.576E-07	711JA01LS
2.724E+00	1.137E-06	7.640E-08	1.639E-07	4.079E-13	3.620E-06	5.316E-07	711JA01LS
2.749E+00	1.084E-06	7.496E-08	1.585E-07	4.004E-13	3.371E-06	4.953E-07	711JA01LS
2.775E+00	1.082E-06	7.480E-08	1.585E-07	4.107E-13	3.145E-06	4.622E-07	711JA01LS
2.798E+00	1.089E-06	7.548E-08	1.610E-07	4.252E-13	2.975E-06	4.373E-07	711JA01LS
2.820E+00	1.080E-06	7.483E-08	1.586E-07	4.296E-13	2.751E-06	4.045E-07	711JA01LS
2.842E+00	1.027E-06	7.210E-08	1.510E-07	4.126E-13	2.59E-06	3.729E-07	711JA01LS
2.864E+00	9.488E-07	6.863E-08	1.395E-07	3.822E-13	2.401E-06	3.530E-07	711JA01LS
2.886E+00	8.84E-07	6.646E-08	1.306E-07	3.596E-13	2.212E-06	3.252E-07	711JA01LS
2.908E+00	8.84E-07	6.684E-08	1.306E-07	3.614E-13	2.029E-06	2.983E-07	711JA01LS
2.930E+00	9.06E-07	6.330E-08	1.136E-07	3.163E-13	1.869E-06	2.747E-07	711JA01LS
2.952E+00	1.095E-06	7.983E-08	1.111E-07	3.65E-13	1.720E-06	2.510E-07	711JA01LS
2.974E+00	6.815E-07	6.057E-08	1.002E-07	3.68E-13	1.620E-06	2.362E-07	711JA01LS
2.996E+00	7.082E-07	6.053E-08	1.041E-07	3.931E-13	1.485E-06	2.184E-07	711JA01LS
3.018E+00	5.677E-07	5.474E-08	8.345E-08	2.360E-13	1.363E-06	2.04E-07	711JA01LS
3.040E+00	4.163E-07	5.046E-08	6.120E-08	1.739E-13	1.269E-06	1.866E-07	711JA01LS
3.062E+00	3.717E-07	5.020E-08	6.038E-08	1.723E-13	1.191E-06	1.751E-07	711JA01LS
3.084E+00	3.717E-07	5.020E-08	6.038E-08	1.723E-13	1.04E-06	1.623E-07	711JA01LS
3.106E+00	5.04E-07	5.533E-08	8.091E-08	2.30E-13	1.004E-06	1.476E-07	711JA01LS
3.128E+00	5.862E-07	5.648E-08	8.618E-08	4.92E-13	8.979E-07	1.320E-07	711JA01LS
3.150E+00	5.474E-07	5.513E-08	8.046E-08	3.37E-13	7.936E-07	1.167E-07	711JA01LS
3.172E+00	5.985E-07	5.089E-08	7.328E-08	1.40E-13	6.739E-07	9.910E-08	711JA01LS
3.194E+00	4.364E-07	4.534E-08	6.415E-08	1.881E-13	5.893E-07	8.666E-08	711JA01LS

8.343E+00	3.180E-07	4.286E-08	4.675E-08	1.376E-13	5.263E-07	7.740E-08	711JA01HS
8.530E+00	3.222E-07	4.223E-08	4.736E-08	1.401E-13	4.664E-07	6.860E-08	711JA01HS
8.711E+00	3.705E-07	4.181E-08	5.446E-08	1.617E-13	4.038E-07	5.939E-08	711JA01HS
8.936E+00	3.822E-07	3.860E-08	4.148E-08	1.238E-13	3.03E-07	4.860E-08	711JA01HS
9.113E+00	3.57E-07	3.501E-08	3.465E-08	1.039E-13	2.845E-07	4.186E-08	711JA01HS
9.289E+00	2.266E-07	3.463E-08	3.331E-08	1.03E-13	2.438E-07	3.588E-08	711JA01HS
9.463E+00	1.957E-07	3.185E-08	2.877E-08	8.696E-14	2.071E-07	3.048E-08	711JA01HS
9.681E+00	2.035E-07	3.009E-08	2.991E-08	9.087E-14	1.636E-07	2.408E-08	711JA01HS
9.853E+00	1.850E-07	2.765E-08	2.720E-08	8.298E-14	1.302E-07	1.917E-08	711JA01HS
1.007E+01	1.575E-07	2.516E-08	2.316E-08	7.092E-14	9.300E-08	1.371E-08	711JA01HS
1.024E+01	1.121E-07	1.137E-08	1.649E-08	5.055E-14	7.009E-08	1.034E-08	711JA01HS
1.041E+01	7.816E-08	1.902E-08	1.151E-08	3.532E-14	5.392E-08	7.958E-09	711JA01HS
1.062E+01	6.044E-08	1.627E-08	8.910E-09	2.738E-14	5.937E-08	5.814E-09	711JA01HS
1.079E+01	7.018E-08	1.520E-08	1.035E-08	3.185E-14	2.826E-08	4.176E-09	711JA01HS
1.100E+01	4.374E-08	1.116E-08	6.460E-09	1.989E-14	1.630E-08	2.411E-09	711JA01HS
1.117E+01	3.534E-08	9.599E-09	5.224E-09	1.610E-14	9.580E-09	1.417E-09	711JA01HS
1.137E+01	1.660E-08	8.944E-09	4.456E-09	7.578E-15	4.385E-09	6.495E-10	711JA01HS
1.158E+01	1.140E-09	5.834E-09	9.093E-10	2.810E-15	1.998E-09	2.962E-10	711JA01HS
1.174E+01	5.620E-09	5.333E-09	3.883E-10	1.201E-15	1.297E-09	1.923E-10	711JA01HS
1.195E+01	5.530E-09	3.351E-09	8.203E-10	2.540E-15	4.412E-10	6.545E-11	711JA01HS
1.211E+01	4.75E-12	5.531E-09	8.128E-13	2.519E-18	7.076E-13	-1.051E-13	711JA01HS
1.231E+01	-8.005E-13	7.771E-09	-1.189E-13	-3.691E-19	-8.005E-14	-1.189E-14	711JA01HS
1.251E+01	0.	6.017E-09	0.	0.	0.	0.	711JA01HS
1.268E+01	0.	5.219E-09	0.	0.	0.	0.	711JA01HS
1.287E+01	0.	6.468E-09	0.	0.	0.	0.	711JA01HS

1 PUBE BARE AT R= 1M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING
COMPILATION DATE OF THIS CODE VERSION

10/14/77U 14:44:40R 10/17/77
16.05.47

30 GROUP OUTPUT

GROUP#	ENERGY UP-BOUND-MEV	DIFFERENTIAL FLUX N/CM2-SEC-MEV	INTEGRAL FLUX N/CM2-SEC	FLUX PER UNIT LETHARGY N/CM2-SEC
30	4.000000E-07	0.	0.	0.
29	3.180000E-06	0.	0.	0.
28	2.520000E-05	0.	0.	0.
27	2.000000E-04	0.	0.	0.
26	1.590000E-03	0.	0.	0.
25	1.261000E-02	0.	0.	0.
24	1.000000E-01	0.	0.	0.
23	2.360000E-01	1.691716E-06	2.090960E-07	2.737196E-07
22	5.000000E-01	2.251297E-06	6.222585E-07	8.145192E-07
21	9.460000E-01	1.663592E-06	1.573758E-07	9.104840E-07
20	1.071000E-01	1.127100E-06	1.267988E-07	7.335732E-07
19	6.409000E-01	7.812829E-07	1.045357E-07	6.047130E-07
18	1.000000E+00	1.403826E-06	2.233487E-07	1.292151E-06
17	1.257400E+00	1.019138E-06	2.623260E-07	1.150301E-06
16	1.581100E+00	6.820837E-07	2.207905E-07	9.680473E-07
15	1.988200E+00	4.976513E-07	2.025939E-07	8.881335E-07
14	2.500000E+00	3.617789E-07	3.898784E-07	1.709508E-06
13	3.973000E+00	1.050987E-06	4.971168E-07	2.676026E-06
12	5.535500E+00	1.383429E-06	7.781789E-07	4.502024E-06
11	8.204500E+00	1.283112E-06	8.584017E-07	4.965642E-06
10	1.000000E+00	1.090878E-06	8.677933E-07	5.020492E-06
9	1.764800E+00	9.476558E-07	7.247672E-07	5.100663E-06
8	2.646500E+00	7.076418E-07	6.239277E-07	4.381977E-06
7	3.663100E+00	5.003971E-07	5.087037E-07	3.80241E-06
6	4.835200E+00	4.183230E-07	4.903164E-07	3.450810E-06
5	1.018600E+01	3.104260E-07	2.842434E-07	2.001277E-06
4	1.174500E+01	4.826352E-08	7.524282E-08	5.292336E-07
3	1.354100E+01	7.147297E-10	1.283655E-09	9.036327E-09
2	1.561200E+01	0.	0.	0.
1	1.800000E+01	0.	0.	0.

1 PUBE 25 CM H2O AT R=1M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING
 10/14/77U 14:05:18R 10/17/77
 16:05:47

ENERGY (MEV)	PHI (NEUT/CM2-SEC-MEV)	DEL-PHI	DOSE (MR/HR-MEV)	KERMA (ERG/GM-SEC-MEV)	INTEGRAL (NEUT/CM2-SEC)	INT-DOSE (MR/HR)	FILE-ID
1.642E-01	2.436E-07	1.218E-08	6.176E-09	1.830E-14	9.995E-07	1.309E-07	605N001S
1.869E-01	2.409E-07	5.267E-09	6.551E-09	1.804E-14	9.940E-07	1.308E-07	605N001S
2.098E-01	2.508E-07	5.724E-09	7.315E-09	2.087E-14	9.884E-07	1.306E-07	605N001S
2.322E-01	2.666E-07	6.657E-09	8.399E-09	2.351E-14	9.825E-07	1.305E-07	605N001S
2.549E-01	2.800E-07	6.698E-09	9.416E-09	2.587E-14	9.763E-07	1.303E-07	605N001S
2.775E-01	2.824E-07	6.587E-09	1.016E-08	2.736E-14	9.699E-07	1.300E-07	605N001S
3.002E-01	2.766E-07	6.429E-09	1.067E-08	2.822E-14	9.636E-07	1.298E-07	605N001S
3.228E-01	2.671E-07	6.119E-09	1.104E-08	2.867E-14	9.574E-07	1.296E-07	605N001S
3.455E-01	2.554E-07	5.771E-09	1.132E-08	2.886E-14	9.515E-07	1.293E-07	605N001S
3.681E-01	2.436E-07	5.462E-09	1.158E-08	2.896E-14	9.459E-07	1.290E-07	605N001S
3.908E-01	2.327E-07	5.166E-09	1.186E-08	2.911E-14	9.405E-07	1.288E-07	605N001S
4.134E-01	2.231E-07	4.923E-09	1.220E-08	2.938E-14	9.353E-07	1.285E-07	605N001S
4.361E-01	2.149E-07	4.716E-09	1.260E-08	2.977E-14	9.304E-07	1.282E-07	605N001S
4.587E-01	2.078E-07	4.534E-09	1.305E-08	3.029E-14	9.256E-07	1.279E-07	605N001S
4.814E-01	2.012E-07	4.364E-09	1.356E-08	3.087E-14	9.209E-07	1.276E-07	605N001S
5.041E-01	1.947E-07	4.208E-09	1.396E-08	3.125E-14	9.164E-07	1.273E-07	605N001S
5.267E-01	1.882E-07	4.031E-09	1.380E-08	3.077E-14	9.121E-07	1.270E-07	605N001S
5.494E-01	1.819E-07	3.857E-09	1.365E-08	3.029E-14	9.079E-07	1.267E-07	605N001S
5.720E-01	1.738E-07	3.587E-09	1.349E-08	2.981E-14	9.039E-07	1.264E-07	605N001S
5.947E-01	1.659E-07	3.494E-09	1.334E-08	2.936E-14	8.999E-07	1.261E-07	605N001S
6.173E-01	1.643E-07	3.456E-09	1.320E-08	2.892E-14	8.967E-07	1.258E-07	605N001S
6.400E-01	1.586E-07	3.377E-09	1.304E-08	2.843E-14	8.925E-07	1.255E-07	605N001S
6.626E-01	1.518E-07	3.468E-09	1.276E-08	2.770E-14	8.890E-07	1.252E-07	605N001S
6.853E-01	1.421E-07	2.986E-09	1.222E-08	2.642E-14	8.857E-07	1.249E-07	605N001S
7.079E-01	1.275E-07	2.692E-09	1.122E-08	2.415E-14	8.826E-07	1.246E-07	605N001S
7.306E-01	1.075E-07	2.357E-09	9.681E-09	2.075E-14	8.798E-07	1.244E-07	605N001S
7.533E-01	8.395E-08	3.487E-09	7.730E-09	1.649E-14	8.778E-07	1.242E-07	605N001S
7.760E-01	7.732E-07	1.143E-08	1.889E-08	3.900E-14	8.562E-07	1.220E-07	719JA02LS
7.987E-01	1.732E-07	1.146E-08	1.965E-08	4.028E-14	8.493E-07	1.212E-07	719JA02LS
8.214E-01	1.675E-07	1.118E-08	1.950E-08	3.977E-14	8.449E-07	1.207E-07	719JA02LS
8.441E-01	1.601E-07	1.091E-08	1.899E-08	3.855E-14	8.386E-07	1.200E-07	719JA02LS
8.668E-01	1.557E-07	1.067E-08	1.855E-08	3.758E-14	8.349E-07	1.195E-07	719JA02LS
8.895E-01	1.523E-07	1.049E-08	1.826E-08	3.693E-14	8.293E-07	1.188E-07	719JA02LS
9.122E-01	1.478E-07	9.826E-09	1.863E-08	3.593E-14	8.245E-07	1.183E-07	719JA02LS
9.349E-01	1.408E-07	9.121E-09	1.708E-08	3.435E-14	8.197E-07	1.177E-07	719JA02LS
9.576E-01	1.378E-07	1.026E-08	1.710E-08	3.433E-14	8.161E-07	1.173E-07	719JA02LS
9.803E-01	1.299E-07	1.027E-08	1.756E-08	3.516E-14	8.113E-07	1.167E-07	719JA02LS
1.006E+00	1.246E-07	1.033E-08	1.775E-08	3.545E-14	8.065E-07	1.161E-07	719JA02LS
1.029E+00	1.279E-07	1.441E-07	1.795E-08	3.575E-14	8.017E-07	1.155E-07	719JA02LS
1.052E+00	1.311E-07	1.073E-08	1.850E-08	3.677E-14	7.970E-07	1.149E-07	719JA02LS
1.075E+00	1.343E-07	1.098E-08	1.894E-08	3.754E-14	7.923E-07	1.143E-07	719JA02LS
1.098E+00	1.375E-07	1.140E-08	2.008E-08	3.972E-14	7.873E-07	1.137E-07	719JA02LS
1.121E+00	1.406E-07	1.135E-08	1.993E-08	3.933E-14	7.825E-07	1.130E-07	719JA02LS
1.144E+00	1.437E-07	1.139E-08	2.042E-08	4.021E-14	7.776E-07	1.124E-07	719JA02LS
1.167E+00	1.477E-07	1.131E-08	2.030E-08	3.985E-14	7.719E-07	1.116E-07	719JA02LS
1.190E+00	1.506E-07	1.125E-08	1.998E-08	3.915E-14	7.666E-07	1.110E-07	719JA02LS
1.213E+00	1.536E-07	1.138E-08	2.030E-08	3.967E-14	7.621E-07	1.104E-07	719JA02LS
1.236E+00	1.565E-07	1.132E-08	2.008E-08	3.916E-14	7.577E-07	1.098E-07	719JA02LS
1.259E+00	1.466E-07	1.115E-08	1.942E-08	3.776E-14	7.520E-07	1.091E-07	719JA02LS
1.282E+00	1.458E-07	1.092E-08	1.942E-08	3.769E-14	7.479E-07	1.085E-07	719JA02LS
1.305E+00	1.497E-07	1.121E-08	2.009E-08	3.886E-14	7.424E-07	1.078E-07	719JA02LS

1.693E+00	1.509E-07	1.131E-08	2.034E-08	3.929E-14	7.367E-07	1.079E-07	719JA02LS
1.729E+00	1.496E-07	1.132E-08	2.031E-08	3.912E-14	7.332E-07	1.066E-07	719JA02LS
1.759E+00	1.447E-07	1.122E-08	2.019E-08	3.766E-14	7.288E-07	1.060E-07	719JA02LS
1.794E+00	1.464E-07	1.108E-08	2.013E-08	3.859E-14	7.237E-07	1.053E-07	719JA02LS
1.821E+00	1.513E-07	1.134E-08	2.090E-08	3.999E-14	7.197E-07	1.047E-07	719JA02LS
1.856E+00	1.547E-07	1.161E-08	2.152E-08	4.106E-14	7.144E-07	1.040E-07	719JA02LS
1.891E+00	1.572E-07	1.177E-08	2.202E-08	4.191E-14	7.089E-07	1.032E-07	719JA02LS
1.926E+00	1.506E-07	1.157E-08	2.123E-08	4.032E-14	7.035E-07	1.025E-07	719JA02LS
1.951E+00	1.554E-07	1.184E-08	2.202E-08	4.173E-14	6.997E-07	1.019E-07	719JA02LS
1.985E+00	1.605E-07	1.219E-08	2.295E-08	4.327E-14	6.943E-07	1.012E-07	719JA02LS
1.019E+00	1.811E-07	1.167E-08	2.195E-08	4.197E-14	6.900E-07	1.004E-07	719JA02LS
1.053E+00	1.502E-07	1.150E-08	2.149E-08	4.085E-14	6.838E-07	9.965E-08	719JA02LS
1.086E+00	1.502E-07	1.158E-08	2.150E-08	4.102E-14	6.788E-07	9.894E-08	719JA02LS
1.119E+00	1.581E-07	1.197E-08	2.264E-08	4.336E-14	6.737E-07	9.821E-08	719JA02LS
1.151E+00	1.624E-07	1.191E-08	2.326E-08	4.473E-14	6.686E-07	9.748E-08	719JA02LS
1.185E+00	1.758E-07	1.230E-08	2.570E-08	4.947E-14	6.672E-07	9.726E-08	719JA02HS
1.84E+00	1.703E-07	1.238E-08	2.440E-08	4.710E-14	6.629E-07	9.665E-08	719JA02LS
2.16E+00	1.675E-07	1.229E-08	2.400E-08	4.653E-14	6.574E-07	9.588E-08	719JA02LS
2.48E+00	1.646E-07	1.306E-08	3.59E-08	4.591E-14	6.521E-07	9.512E-08	719JA02LS
2.79E+00	1.807E-07	1.294E-08	3.591E-08	5.061E-14	6.468E-07	9.435E-08	719JA02LS
3.11E+00	1.833E-07	1.262E-08	3.628E-08	5.154E-14	6.410E-07	9.351E-08	719JA02LS
3.34E+00	1.825E-07	1.236E-08	3.618E-08	5.148E-14	6.368E-07	9.291E-08	719JA02HS
3.48E+00	1.746E-07	1.208E-08	3.05E-08	4.911E-14	6.353E-07	9.271E-08	719JA02LS
3.75E+00	1.676E-07	1.297E-08	4.05E-08	4.753E-14	6.300E-07	9.195E-08	719JA02LS
4.04E+00	1.713E-07	1.279E-08	4.45E-08	4.677E-14	6.248E-07	9.119E-08	719JA02LS
4.34E+00	1.775E-07	1.107E-08	3.549E-08	5.074E-14	6.195E-07	9.044E-08	719JA02LS
4.73E+00	1.778E-07	1.102E-08	3.554E-08	5.108E-14	6.126E-07	8.945E-08	719JA02LS
5.30E+00	1.824E-07	1.101E-08	3.621E-08	5.278E-14	6.023E-07	8.797E-08	719JA02HS
7.05E+00	1.728E-07	1.043E-08	2.488E-08	5.118E-14	5.713E-07	8.350E-08	719JA02HS
8.76E+00	1.767E-07	1.043E-08	2.547E-08	5.350E-14	5.714E-07	7.920E-08	719JA02HS
1.03E+00	1.521E-07	9.166E-09	2.198E-08	4.747E-14	5.041E-07	7.381E-08	719JA02HS
2.74E+00	1.424E-07	8.598E-09	2.060E-08	4.542E-14	4.789E-07	7.017E-08	719JA02HS
4.45E+00	1.252E-07	7.895E-09	1.814E-08	4.085E-14	4.560E-07	6.686E-08	719JA02HS
6.72E+00	1.120E-07	7.087E-09	1.626E-08	3.764E-14	4.291E-07	6.295E-08	719JA02HS
8.43E+00	9.052E-08	6.744E-09	1.544E-08	3.850E-14	4.104E-07	6.024E-08	719JA02HS
9.53E+00	9.975E-08	6.463E-09	1.544E-08	3.825E-14	3.889E-07	5.709E-08	719JA02HS
4.210E+00	1.006E-07	6.497E-09	1.468E-08	3.629E-14	3.731E-07	5.480E-08	719JA02HS
4.438E+00	1.062E-07	6.833E-09	1.553E-08	3.946E-14	3.495E-07	5.136E-08	719JA02HS
4.651E+00	1.081E-07	6.896E-09	1.584E-08	4.130E-14	3.267E-07	4.802E-08	719JA02HS
4.809E+00	1.080E-07	6.892E-09	1.585E-08	4.213E-14	3.096E-07	4.551E-08	719JA02HS
4.018E+00	9.731E-08	6.137E-09	1.490E-08	3.894E-14	2.881E-07	4.236E-08	719JA02HS
3.29E+00	9.398E-08	6.178E-09	1.389E-08	3.789E-14	2.553E-07	3.945E-08	719JA02HS
3.65E+00	9.229E-08	6.143E-09	1.357E-08	3.724E-14	2.363E-07	3.753E-08	719JA02HS
5.75E+00	8.861E-08	6.024E-09	1.306E-08	3.601E-14	2.186E-07	3.474E-08	719JA02HS
7.84E+00	8.044E-08	5.672E-09	1.182E-08	3.278E-14	1.866E-07	3.214E-08	719JA02HS
9.75E+00	7.930E-08	5.720E-09	1.166E-08	3.246E-14	2.033E-07	2.990E-08	719JA02HS
1.84E+00	7.131E-08	5.326E-09	1.048E-08	3.933E-14	1.876E-07	2.758E-08	719JA02HS
3.33E+00	7.443E-08	5.574E-09	1.079E-08	3.722E-14	1.768E-07	2.593E-08	719JA02HS
5.59E+00	6.137E-08	4.853E-09	9.021E-09	3.934E-14	1.512E-07	2.403E-08	719JA02HS
6.724E+00	6.438E-08	4.942E-09	9.463E-09	3.662E-14	1.390E-07	2.223E-08	719JA02HS
6.918E+00	6.085E-08	4.807E-09	8.944E-09	3.546E-14	1.275E-07	2.044E-08	719JA02HS
7.110E+00	5.954E-08	4.740E-09	8.752E-09	3.503E-14	1.163E-07	1.874E-08	719JA02HS
7.301E+00	5.723E-08	4.671E-09	8.412E-09	3.417E-14	1.052E-07	1.710E-08	719JA02HS
7.490E+00	6.081E-08	4.849E-09	8.939E-09	3.579E-14	9.376E-08	1.547E-08	719JA02HS
7.679E+00	5.173E-08	4.887E-09	8.755E-09	3.630E-14	8.329E-08	1.376E-08	719JA02HS
7.865E+00	5.913E-08	4.686E-09	8.692E-09	3.430E-14	6.968E-08	1.210E-08	719JA02HS
8.098E+00	4.962E-08	4.208E-09	7.294E-09	2.913E-14	6.139E-08	1.025E-08	719JA02HS
8.282E+00	4.045E-08	3.758E-09	5.946E-09	1.748E-14	5.447E-08	9.029E-09	719JA02HS
8.456E+00	3.914E-08	3.579E-09	5.754E-09	1.698E-14	4.663E-08	8.011E-09	719JA02HS
8.647E+00	4.299E-08	3.646E-09	6.319E-09	1.874E-14		6.858E-09	719JA02HS

8.818E+00	3.672E-08	3.232E-09	5.397E-09	1.607E-14	3.981E-08	5.857E-09	719JA02HS
9.053E+00	2.735E-08	2.577E-09	4.021E-09	1.204E-14	3.228E-08	4.750E-09	719JA02HS
9.232E+00	2.529E-08	2.736E-09	3.717E-09	1.117E-14	2.757E-08	4.057E-09	719JA02HS
9.411E+00	2.333E-08	2.569E-09	3.429E-09	1.035E-14	2.322E-08	3.418E-09	719JA02HS
9.632E+00	1.876E-08	2.300E-09	2.757E-09	8.368E-15	1.857E-08	2.734E-09	719JA02HS
9.808E+00	1.828E-08	2.137E-09	2.686E-09	8.187E-15	1.531E-08	2.255E-09	719JA02HS
9.984E+00	1.803E-08	2.026E-09	2.651E-09	8.112E-15	1.212E-08	1.785E-09	719JA02HS
1.020E+01	1.053E-08	1.678E-09	1.550E-09	4.751E-15	9.030E-09	1.332E-09	719JA02HS
1.037E+01	1.134E-08	1.530E-09	1.670E-09	5.124E-15	7.170E-09	1.058E-09	719JA02HS
1.059E+01	1.184E-08	1.387E-09	1.745E-09	5.361E-15	4.620E-09	6.822E-10	719JA02HS
1.076E+01	7.267E-09	1.121E-09	1.072E-09	3.296E-15	2.996E-09	4.428E-10	719JA02HS
1.093E+01	3.890E-09	9.276E-10	5.743E-10	1.768E-15	2.048E-09	3.028E-10	719JA02HS
1.115E+01	2.992E-09	7.064E-10	4.422E-10	1.363E-15	1.291E-09	1.910E-10	719JA02HS
1.136E+01	2.530E-09	6.111E-10	3.742E-10	1.155E-15	7.111E-10	1.053E-10	719JA02HS
1.152E+01	1.285E-09	4.058E-10	1.903E-10	5.877E-16	4.059E-10	6.013E-11	719JA02HS
1.173E+01	1.013E-09	4.110E-10	1.501E-10	4.643E-16	1.646E-10	2.438E-11	719JA02HS
1.190E+01	3.688E-10	2.704E-10	5.470E-11	1.693E-16	7.11E-11	6.975E-12	719JA02HS
1.211E+01	1.220E-10	2.760E-10	1.811E-11	5.613E-17	-4.421E-12	-6.696E-13	719JA02HS
1.231E+01	6.393E-11	2.882E-10	9.500E-12	2.948E-17	-2.301E-11	-3.431E-12	719JA02HS
1.248E+01	-2.720E-13	2.981E-10	-4.045E-14	-1.257E-19	-2.843E-11	-4.235E-12	719JA02HS
1.268E+01	-2.812E-13	3.109E-10	-4.185E-14	-1.302E-19	-2.637E-11	-4.226E-12	719JA02HS
1.288E+01	-1.683E-10	3.237E-10	-2.507E-11	-7.806E-17	-1.151E-11	-1.715E-12	719JA02HS
1.304E+01	2.435E-11	3.344E-10	3.630E-12	1.131E-17	0.	0.	719JA02HS

1 PUBE 25 CM H2O AT R=1M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING
COMPILATION DATE OF THIS CODE VERSION

14:48:18R 10/17/77
10/14/77U 16.05.47

30 GROUP OUTPUT

GROUP#	ENERGY UP-BOUND-MEV	DIFFERENTIAL FLUX N/CM2-SEC-MEV	INTEGRAL FLUX N/CM2-SEC	FLUX PER UNIT LETHARGY N/CM2-SEC
30	4.001000E-07	0.	0.	0.
29	3.180000E-06	0.	0.	0.
28	2.520000E-05	0.	0.	0.
27	2.000000E-04	0.	0.	0.
26	1.590000E-03	0.	0.	0.
25	1.261000E-02	0.	0.	0.
24	1.000000E-01	0.	0.	0.
23	2.236000E-01	2.452349E-07	3.031103E-08	3.967901E-08
22	5.000000E-01	2.444672E-07	6.757627E-08	8.845548E-08
21	5.946000E-01	1.826186E-07	1.727572E-08	9.994715E-08
20	7.071000E-01	1.533083E-07	1.724719E-08	9.978073E-08
19	8.409000E-01	1.071398E-07	1.433531E-08	8.292622E-08
18	1.000000E+00	1.613825E-07	2.967595E-08	1.485445E-07
17	1.257400E+00	1.471831E-07	3.787979E-08	1.661030E-07
16	1.581100E+00	1.532506E-07	4.960723E-08	2.175010E-07
15	1.988200E+00	1.508509E-07	6.141140E-08	2.692161E-07
14	2.500000E+00	1.681074E-07	8.603734E-08	3.772497E-07
13	3.979000E+00	1.735329E-07	8.302707E-08	4.803458E-07
12	3.535500E+00	1.419355E-07	7.984096E-08	4.619066E-07
11	4.204500E+00	1.065514E-07	7.128285E-08	4.123540E-07
10	5.000000E+00	1.052370E-07	8.371602E-08	4.843269E-07
9	5.764800E+00	9.119744E-08	6.974781E-08	4.908611E-07
8	6.646500E+00	7.262038E-08	6.402939E-08	4.506567E-07
7	6.663100E+00	6.054551E-08	6.155056E-08	4.331910E-07
6	8.395200E+00	4.725838E-08	3.539153E-08	3.898415E-07
5	1.018600E+01	2.221251E-08	3.000466E-08	2.112543E-07
4	1.174500E+01	5.792725E-09	9.030855E-09	6.352013E-08
3	1.354100E+01	9.492862E-11	1.704882E-10	1.200157E-09
2	1.561200E+01	0.	0.	0.
1	1.800000E+01	0.	0.	0.

1 PUBE 5 CM D20 AT R= 1M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING
COMPILATION DATE OF THIS DOCUMENT

10/14/77U 14:49:42R 10/17/77
16.05.47

ENERGY (MEV)	PHI (NEUT/CM2-SEC-MEV)	DEL-PHI	DOSE (MR/HR-MEV)	KERMA (ERG/GM-SEC-MEV)	INTEGRAL (NEUT/CM2-SEC)	INT-DOSE (MR/HR)	FILE-ID
1.529E-01	3.002E-06	1.501E-07	7.351E-08	2.198E-13	6.349E-06	7.939E-07	608N003S
1.756E-01	2.916E-06	6.460E-08	7.657E-08	2.247E-13	6.282E-06	7.922E-07	608N003S
1.982E-01	2.830E-06	6.737E-08	8.360E-08	2.408E-13	6.215E-06	7.904E-07	608N003S
2.209E-01	2.744E-06	7.714E-08	9.419E-08	2.662E-13	6.146E-06	7.886E-07	608N003S
2.435E-01	2.658E-06	7.681E-08	1.040E-07	2.985E-13	6.078E-06	7.868E-07	608N003S
2.662E-01	2.572E-06	7.435E-08	1.110E-07	3.020E-13	6.002E-06	7.837E-07	608N003S
2.889E-01	2.486E-06	7.201E-08	1.153E-07	3.080E-13	5.931E-06	7.811E-07	608N003S
3.115E-01	2.400E-06	6.796E-08	1.179E-07	3.090E-13	5.862E-06	7.785E-07	608N003S
3.341E-01	2.314E-06	6.290E-08	1.188E-07	3.056E-13	5.797E-06	7.758E-07	608N003S
3.568E-01	2.228E-06	5.799E-08	1.185E-07	2.991E-13	5.736E-06	7.731E-07	608N003S
3.795E-01	2.142E-06	5.311E-08	1.173E-07	2.906E-13	5.680E-06	7.704E-07	608N003S
4.021E-01	2.056E-06	4.839E-08	1.158E-07	2.815E-13	5.628E-06	7.678E-07	608N003S
4.248E-01	1.970E-06	4.412E-08	1.143E-07	2.726E-13	5.581E-06	7.652E-07	608N003S
4.474E-01	1.884E-06	4.046E-08	1.132E-07	2.650E-13	5.537E-06	7.626E-07	608N003S
4.701E-01	1.798E-06	3.733E-08	1.120E-07	2.591E-13	5.496E-06	7.601E-07	608N003S
4.927E-01	1.712E-06	3.471E-08	1.131E-07	2.551E-13	5.458E-06	7.575E-07	608N003S
5.154E-01	1.626E-06	3.252E-08	1.105E-07	2.469E-13	5.422E-06	7.550E-07	608N003S
5.380E-01	1.540E-06	3.058E-08	1.066E-07	2.372E-13	5.389E-06	7.525E-07	608N003S
5.607E-01	1.454E-06	2.870E-08	1.029E-07	2.280E-13	5.357E-06	7.501E-07	608N003S
5.833E-01	1.368E-06	2.685E-08	9.899E-08	2.183E-13	5.327E-06	7.479E-07	608N003S
6.060E-01	1.282E-06	2.493E-08	9.493E-08	2.084E-13	5.299E-06	7.457E-07	608N003S
6.287E-01	1.196E-06	2.311E-08	9.076E-08	1.984E-13	5.273E-06	7.435E-07	608N003S
6.513E-01	1.110E-06	2.145E-08	8.670E-08	1.887E-13	5.249E-06	7.415E-07	608N003S
6.740E-01	1.024E-06	1.993E-08	8.288E-08	1.796E-13	5.226E-06	7.396E-07	608N003S
6.966E-01	9.38E-07	1.853E-08	7.920E-08	1.709E-13	5.204E-06	7.378E-07	608N003S
7.193E-01	8.52E-07	1.722E-08	7.549E-08	1.621E-13	5.184E-06	7.360E-07	608N003S
7.419E-01	7.66E-07	1.590E-08	7.141E-08	1.527E-13	5.166E-06	7.344E-07	608N003S
7.647E-01	6.80E-07	1.468E-08	6.749E-08	1.431E-13	5.149E-06	7.328E-07	718JA04LS
7.874E-01	5.94E-07	1.345E-08	6.367E-08	1.337E-13	5.132E-06	7.312E-07	718JA04LS
8.100E+00	5.08E-07	1.222E-08	5.996E-08	1.245E-13	5.115E-06	7.296E-07	718JA04LS
8.327E+00	4.22E-07	1.100E-08	5.633E-08	1.153E-13	5.099E-06	7.280E-07	718JA04LS
8.554E+00	3.36E-07	9.78E-09	5.279E-08	1.061E-13	5.083E-06	7.264E-07	718JA04LS
8.781E+00	2.50E-07	8.62E-09	4.936E-08	9.79E-14	5.067E-06	7.248E-07	718JA04LS
9.008E+00	1.64E-07	7.46E-09	4.603E-08	8.94E-14	5.051E-06	7.232E-07	718JA04LS
9.235E+00	7.8E-08	6.30E-09	4.280E-08	8.10E-14	5.035E-06	7.216E-07	718JA04LS
9.462E+00	6.94E-08	5.14E-09	3.967E-08	7.26E-14	5.019E-06	7.200E-07	718JA04LS
9.689E+00	6.08E-08	4.00E-09	3.654E-08	6.42E-14	5.003E-06	7.184E-07	718JA04LS
9.916E+00	5.22E-08	2.84E-09	3.341E-08	5.58E-14	4.987E-06	7.168E-07	718JA04LS
1.014E+00	4.36E-08	1.68E-09	3.028E-08	4.74E-14	4.971E-06	7.152E-07	718JA04LS
1.037E+00	3.50E-08	5.62E-10	2.715E-08	3.90E-14	4.955E-06	7.136E-07	718JA04LS
1.060E+00	2.64E-08	1.46E-10	2.402E-08	3.06E-14	4.939E-06	7.120E-07	718JA04LS
1.083E+00	1.78E-08	3.60E-11	2.090E-08	2.22E-14	4.923E-06	7.104E-07	718JA04LS
1.106E+00	9.2E-09	8.84E-12	1.777E-08	1.38E-14	4.907E-06	7.088E-07	718JA04LS
1.129E+00	4.4E-09	2.08E-12	1.464E-08	5.4E-15	4.891E-06	7.072E-07	718JA04LS
1.152E+00	2.5E-09	4.22E-13	1.151E-08	2.0E-15	4.875E-06	7.056E-07	718JA04LS
1.175E+00	1.6E-09	9.36E-14	8.38E-09	7.6E-16	4.859E-06	7.040E-07	718JA04LS
1.198E+00	7.4E-10	2.10E-14	5.25E-09	2.8E-16	4.843E-06	7.024E-07	718JA04LS
1.221E+00	4.6E-10	4.24E-15	3.14E-09	1.0E-16	4.827E-06	7.008E-07	718JA04LS
1.244E+00	2.8E-10	9.28E-16	1.93E-09	3.6E-17	4.811E-06	7.000E-07	718JA04LS
1.267E+00	1.9E-10	2.08E-16	1.22E-09	1.3E-17	4.795E-06	7.000E-07	718JA04LS
1.290E+00	1.0E-10	4.62E-17	7.09E-10	4.8E-18	4.779E-06	7.000E-07	718JA04LS
1.313E+00	6.2E-11	1.04E-17	4.33E-10	1.7E-18	4.763E-06	7.000E-07	718JA04LS
1.336E+00	3.4E-11	2.32E-18	2.60E-10	6.2E-19	4.747E-06	7.000E-07	718JA04LS
1.359E+00	1.6E-11	5.00E-19	1.51E-10	2.2E-19	4.731E-06	7.000E-07	718JA04LS
1.382E+00	8.2E-12	1.08E-19	8.69E-11	8.0E-20	4.715E-06	7.000E-07	718JA04LS
1.405E+00	4.4E-12	2.32E-20	5.00E-11	2.8E-20	4.699E-06	7.000E-07	718JA04LS
1.428E+00	2.2E-12	5.00E-21	2.81E-11	1.0E-20	4.683E-06	7.000E-07	718JA04LS
1.451E+00	1.2E-12	1.10E-21	1.51E-11	3.6E-21	4.667E-06	7.000E-07	718JA04LS
1.474E+00	6.2E-13	2.32E-22	8.69E-12	1.3E-21	4.651E-06	7.000E-07	718JA04LS
1.497E+00	3.4E-13	5.00E-23	5.00E-12	4.8E-22	4.635E-06	7.000E-07	718JA04LS
1.520E+00	1.8E-13	1.10E-23	2.81E-12	1.7E-22	4.619E-06	7.000E-07	718JA04LS
1.543E+00	9.2E-14	2.32E-24	1.51E-12	6.2E-23	4.603E-06	7.000E-07	718JA04LS
1.566E+00	4.4E-14	5.00E-25	8.69E-13	2.2E-23	4.587E-06	7.000E-07	718JA04LS
1.589E+00	2.2E-14	1.10E-25	5.00E-13	8.0E-24	4.571E-06	7.000E-07	718JA04LS
1.612E+00	1.2E-14	2.32E-26	2.81E-13	2.8E-24	4.555E-06	7.000E-07	718JA04LS
1.635E+00	6.2E-15	5.00E-27	1.51E-13	1.0E-24	4.539E-06	7.000E-07	718JA04LS
1.658E+00	3.4E-15	1.10E-27	8.69E-14	3.6E-25	4.523E-06	7.000E-07	718JA04LS
1.681E+00	1.8E-15	2.32E-28	5.00E-14	1.3E-25	4.507E-06	7.000E-07	718JA04LS
1.704E+00	9.2E-16	5.00E-29	2.81E-14	4.8E-26	4.491E-06	7.000E-07	718JA04LS
1.727E+00	4.4E-16	1.10E-29	1.51E-14	1.7E-26	4.475E-06	7.000E-07	718JA04LS
1.750E+00	2.2E-16	2.32E-30	8.69E-15	6.2E-27	4.459E-06	7.000E-07	718JA04LS
1.773E+00	1.2E-16	5.00E-31	5.00E-15	2.2E-27	4.443E-06	7.000E-07	718JA04LS
1.796E+00	6.2E-17	1.10E-31	2.81E-15	8.0E-28	4.427E-06	7.000E-07	718JA04LS
1.819E+00	3.4E-17	2.32E-32	1.51E-15	2.8E-28	4.411E-06	7.000E-07	718JA04LS
1.842E+00	1.8E-17	5.00E-33	8.69E-16	1.0E-28	4.395E-06	7.000E-07	718JA04LS
1.865E+00	9.2E-18	1.10E-33	5.00E-16	3.6E-29	4.379E-06	7.000E-07	718JA04LS
1.888E+00	4.4E-18	2.32E-34	2.81E-16	1.3E-29	4.363E-06	7.000E-07	718JA04LS
1.911E+00	2.2E-18	5.00E-35	1.51E-16	4.8E-30	4.347E-06	7.000E-07	718JA04LS
1.934E+00	1.2E-18	1.10E-35	8.69E-17	1.7E-30	4.331E-06	7.000E-07	718JA04LS
1.957E+00	6.2E-19	2.32E-36	5.00E-17	6.2E-31	4.315E-06	7.000E-07	718JA04LS
1.980E+00	3.4E-19	5.00E-37	2.81E-17	2.2E-31	4.299E-06	7.000E-07	718JA04LS
2.003E+00	1.8E-19	1.10E-37	1.51E-17	8.0E-32	4.283E-06	7.000E-07	718JA04LS
2.026E+00	9.2E-20	2.32E-38	8.69E-18	2.8E-32	4.267E-06	7.000E-07	718JA04LS
2.049E+00	4.4E-20	5.00E-39	5.00E-18	1.0E-32	4.251E-06	7.000E-07	718JA04LS
2.072E+00	2.2E-20	1.10E-39	2.81E-18	3.6E-33	4.235E-06	7.000E-07	718JA04LS
2.095E+00	1.2E-20	2.32E-40	1.51E-18	1.3E-33	4.219E-06	7.000E-07	718JA04LS
2.118E+00	6.2E-21	5.00E-41	8.69E-19	4.8E-34	4.203E-06	7.000E-07	718JA04LS
2.141E+00	3.4E-21	1.10E-41	5.00E-19	1.7E-34	4.187E-06	7.000E-07	718JA04LS
2.164E+00	1.8E-21	2.32E-42	2.81E-19	6.2E-35	4.171E-06	7.000E-07	718JA04LS
2.187E+00	9.2E-22	5.00E-43	1.51E-19	2.2E-35	4.155E-06	7.000E-07	718JA04LS
2.210E+00	4.4E-22	1.10E-43	8.69E-20	8.0E-36	4.139E-06	7.000E-07	718JA04LS
2.233E+00	2.2E-22	2.32E-44	5.00E-20	2.8E-36	4.123E-06	7.000E-07	718JA04LS
2.256E+00	1.2E-22	5.00E-45	2.81E-20	1.0E-36	4.107E-06	7.000E-07	718JA04LS
2.279E+00	6.2E-23	1.10E-45	1.51E-20	3.6E-37	4.091E-06	7.000E-07	718JA04LS
2.302E+00	3.4E-23	2.32E-46	8.69E-21	1.3E-37	4.075E-06	7.000E-07	718JA04LS
2.325E+00	1.8E-23	5.00E-47	5.00E-21	4.8E-38	4.059E-06	7.000E-07	718JA04LS
2.348E+00	9.2E-24	1.10E-47	2.81E-21	1.7E-38	4.043E-06	7.000E-07	718JA04LS
2.371E+00	4.4E-24	2.32E-48	1.51E-21	6.2E-39	4.027E-06	7.000E-07	718JA04LS
2.394E+00	2.2E-24	5.00E-49	8.69E-22	2.2E-39	4.011E-06	7.000E-07	718JA04LS
2.417E+00	1.2E-24	1.10E-49	5.00E-22	8.0E-40	4.000E-06	7.000E-07	718JA04LS
2.440E+00	6.2E-25	2.32E-50	2.81E-22	2.8E-40	3.984E-06	7.000E-07	718JA04LS
2.463E+00	3.4E-25	5.00E-51	1.51E-22	1.0E-40	3.968E-06	7.000E-07	718JA04LS
2.486E+00	1.8E-25	1.10E-51	8.69E-23	3.6E-41	3.952E-06	7.000E-07	718JA04LS
2.509E+00	9.2E-26	2.32E-52	5.00E-23	1.3E-41	3.936E-06	7.000E-07	718JA04LS
2.532E+00	4.4E-26	5.00E-53	2.81E-23	4.8E-42	3.920E-06	7.000E-07	718JA04LS
2.555E+00	2.2E-26	1.10E-53	1.51E-23	1.7E-42	3.904E-06	7.000E-07	718JA04LS
2.578E+00	1.2E-26	2.32E-54	8.69E-24	6.2E-43	3.888E-06	7.000E-07	718JA04LS
2.601E+00	6.2E-27	5.00E-55	5.00E-24	2.2E-43	3.872E-06	7.000E-07	718JA04LS
2.624E+00							

1.678E+00	5.048E-07	5.386E-08	6.786E-08	1.312E-13	4.528E-06	5.588E-07	718JA04LS
1.703E+00	4.390E-07	5.272E-08	5.930E-08	1.145E-13	4.516E-06	5.72E-07	718JA04LS
1.739E+00	4.762E-07	5.509E-08	6.477E-08	1.247E-13	4.499E-06	5.950E-07	718JA04LS
1.765E+00	4.710E-07	5.287E-08	6.439E-08	1.237E-13	4.487E-06	6.533E-07	718JA04LS
1.800E+00	4.846E-07	4.70E-08	6.669E-08	1.278E-13	4.470E-06	6.510E-07	718JA04LS
1.834E+00	3.316E-07	7.40E-08	7.384E-08	1.408E-13	4.453E-06	6.486E-07	718JA04LS
1.867E+00	5.835E-07	6.077E-08	8.320E-08	1.587E-13	4.434E-06	6.461E-07	718JA04LS
1.901E+00	6.378E-07	6.72E-08	9.949E-08	1.702E-13	4.413E-06	6.431E-07	718JA04LS
1.926E+00	6.543E-07	6.455E-08	9.224E-08	1.751E-13	4.397E-06	6.408E-07	718JA04LS
1.959E+00	6.577E-07	6.285E-08	9.332E-08	1.767E-13	4.376E-06	6.378E-07	718JA04LS
1.992E+00	6.878E-07	6.473E-08	9.821E-08	1.855E-13	4.353E-06	6.346E-07	718JA04LS
2.024E+00	7.560E-07	6.828E-08	1.081E-07	2.048E-13	4.330E-06	6.313E-07	718JA04LS
2.056E+00	7.275E-07	6.786E-08	7.041E-07	1.979E-13	4.307E-06	6.279E-07	718JA04LS
2.088E+00	6.733E-07	6.31E-08	1.894E-07	1.895E-13	4.284E-06	6.247E-07	718JA04LS
2.120E+00	6.514E-07	6.380E-08	9.325E-08	1.797E-13	4.261E-06	6.218E-07	718JA04LS
2.151E+00	7.682E-07	6.538E-08	1.100E-07	2.107E-13	4.262E-06	6.216E-07	718JA04HS
2.182E+00	7.755E-07	6.730E-08	9.688E-08	1.863E-13	4.240E-06	6.184E-07	718JA04LS
2.213E+00	7.056E-07	6.786E-08	1.011E-07	1.951E-13	4.218E-06	6.153E-07	718JA04LS
2.245E+00	6.985E-07	7.743E-08	1.001E-07	1.939E-13	4.197E-06	6.122E-07	718JA04LS
2.276E+00	7.441E-07	6.977E-08	1.067E-07	2.076E-13	4.169E-06	6.082E-07	718JA04LS
2.307E+00	7.828E-07	7.21E-08	1.122E-07	2.193E-13	4.146E-06	6.049E-07	718JA04LS
2.338E+00	8.315E-07	7.381E-08	1.192E-07	2.331E-13	4.122E-06	6.012E-07	718JA04LS
2.369E+00	8.283E-07	7.760E-08	1.168E-07	2.330E-13	4.120E-06	5.976E-07	718JA04LS
2.400E+00	8.508E-07	7.428E-08	1.220E-07	2.403E-13	4.095E-06	5.937E-07	718JA04LS
2.431E+00	9.401E-07	7.484E-08	1.349E-07	2.663E-13	4.068E-06	5.899E-07	718JA04LS
2.462E+00	9.016E-07	7.332E-08	1.294E-07	2.569E-13	4.034E-06	5.851E-07	718JA04LS
2.493E+00	9.009E-07	4.987E-08	1.294E-07	2.577E-13	4.006E-06	5.813E-07	718JA04LS
2.524E+00	8.485E-07	5.233E-08	1.219E-07	2.436E-13	3.982E-06	5.784E-07	718JA04LS
2.555E+00	8.618E-07	5.441E-08	1.238E-07	2.477E-13	3.976E-06	5.750E-07	718JA04LS
2.586E+00	8.945E-07	5.583E-08	1.287E-07	2.630E-13	3.821E-06	5.685E-07	718JA04LS
2.617E+00	9.954E-07	6.076E-08	1.434E-07	2.991E-13	3.665E-06	5.583E-07	718JA04HS
2.648E+00	1.029E-06	6.323E-08	1.485E-07	3.182E-13	3.443E-06	5.538E-07	718JA04HS
2.679E+00	1.074E-06	6.511E-08	1.553E-07	3.394E-13	3.271E-06	5.478E-07	718JA04HS
2.710E+00	9.745E-07	6.151E-08	1.611E-07	3.465E-13	3.102E-06	5.445E-07	718JA04HS
2.741E+00	9.087E-07	5.720E-08	1.318E-07	3.018E-13	2.965E-06	5.403E-07	718JA04HS
2.772E+00	8.565E-07	5.415E-08	1.245E-07	2.908E-13	2.750E-06	5.370E-07	718JA04HS
2.803E+00	8.161E-07	5.232E-08	1.188E-07	2.846E-13	2.575E-06	5.305E-07	718JA04HS
2.834E+00	7.650E-07	4.954E-08	1.115E-07	2.723E-13	2.455E-06	5.262E-07	718JA04HS
2.865E+00	7.580E-07	4.977E-08	1.107E-07	2.777E-13	2.289E-06	5.236E-07	718JA04HS
2.896E+00	7.708E-07	5.133E-08	1.28E-07	3.025E-13	2.132E-06	5.195E-07	718JA04HS
2.927E+00	7.870E-07	5.058E-08	1.154E-07	2.802E-13	2.013E-06	5.151E-07	718JA04HS
2.958E+00	7.366E-07	4.850E-08	1.082E-07	2.904E-13	1.858E-06	5.111E-07	718JA04HS
2.989E+00	7.343E-07	4.804E-08	1.079E-07	2.943E-13	1.711E-06	5.071E-07	718JA04HS
3.020E+00	6.529E-07	4.427E-08	9.588E-08	2.626E-13	1.607E-06	5.036E-07	718JA04HS
3.051E+00	6.174E-07	4.253E-08	9.073E-08	2.494E-13	1.489E-06	4.995E-07	718JA04HS
3.082E+00	6.233E-07	4.684E-08	9.163E-08	2.530E-13	1.363E-06	4.956E-07	718JA04HS
3.113E+00	5.457E-07	4.030E-08	8.022E-08	2.25E-13	1.249E-06	4.917E-07	718JA04HS
3.144E+00	5.154E-07	3.871E-08	7.576E-08	2.111E-13	1.151E-06	4.878E-07	718JA04HS
3.175E+00	4.500E-07	3.626E-08	6.614E-08	1.850E-13	1.076E-06	4.839E-07	718JA04HS
3.206E+00	4.469E-07	3.653E-08	6.570E-08	1.846E-13	9.902E-07	4.799E-07	718JA04HS
3.237E+00	4.159E-07	4.04E-08	6.114E-08	1.725E-13	9.087E-07	4.760E-07	718JA04HS
3.268E+00	3.871E-07	3.294E-08	5.163E-08	1.613E-13	8.332E-07	4.721E-07	718JA04HS
3.299E+00	3.576E-07	3.171E-08	5.257E-08	1.475E-13	7.636E-07	4.682E-07	718JA04HS
3.330E+00	3.884E-07	3.250E-08	5.709E-08	1.633E-13	6.948E-07	4.643E-07	718JA04HS
3.361E+00	3.961E-07	3.292E-08	5.823E-08	1.672E-13	6.224E-07	4.604E-07	718JA04HS
3.392E+00	3.824E-07	3.223E-08	5.621E-08	1.621E-13	5.511E-07	4.565E-07	718JA04HS
3.423E+00	3.733E-07	3.188E-08	5.487E-08	1.589E-13	4.826E-07	4.526E-07	718JA04HS
3.454E+00	3.349E-07	2.950E-08	4.923E-08	1.434E-13	4.027E-07	4.487E-07	718JA04HS
3.485E+00	3.446E-07	3.718E-08	4.33E-08	1.267E-13	3.467E-07	4.448E-07	718JA04HS
3.516E+00	2.743E-07	5.31E-08	4.033E-08	1.184E-13	2.960E-07	4.409E-07	718JA04HS

8.399E+00	2.522E-07	2.343E-08	3.708E-08	1.093E-13	2.526E-07	3.715E-08	718JA04HS
8.583E+00	2.243E-07	2.187E-08	3.297E-08	9.761E-14	2.088E-07	3.070E-08	718JA04HS
8.795E+00	1.855E-07	1.905E-08	2.728E-08	8.116E-14	1.651E-07	2.428E-08	718JA04HS
8.979E+00	1.734E-07	1.841E-08	2.548E-08	7.619E-14	1.323E-07	1.945E-08	718JA04HS
9.152E+00	1.355E-07	1.621E-08	1.992E-08	5.977E-14	1.056E-07	1.553E-08	718JA04HS
9.367E+00	9.299E-08	1.389E-08	1.357E-08	4.123E-14	8.100E-08	1.192E-08	718JA04HS
9.538E+00	8.500E-08	1.251E-08	1.250E-08	3.784E-14	6.578E-08	9.682E-09	718JA04HS
9.708E+00	8.391E-08	1.203E-08	1.233E-08	3.750E-14	5.143E-08	7.572E-09	718JA04HS
9.920E+00	5.489E-08	1.018E-08	8.069E-09	2.465E-14	3.671E-08	5.409E-09	718JA04HS
1.009E+01	4.451E-08	8.885E-09	6.545E-09	2.005E-14	2.825E-08	4.165E-09	718JA04HS
1.028E+01	3.465E-08	8.020E-09	5.099E-09	1.563E-14	2.154E-08	3.177E-09	718JA04HS
1.046E+01	2.739E-08	7.181E-09	4.036E-09	1.239E-14	1.533E-08	2.263E-09	718JA04HS
1.063E+01	2.045E-08	6.194E-09	3.015E-09	9.262E-15	1.127E-08	1.664E-09	718JA04HS
1.084E+01	1.427E-08	5.081E-09	2.107E-09	6.481E-15	7.619E-09	1.126E-09	718JA04HS
1.100E+01	1.510E-08	4.257E-09	2.230E-09	6.857E-15	5.289E-09	7.793E-10	718JA04HS
1.121E+01	1.081E-08	3.357E-09	1.569E-09	4.837E-15	2.569E-09	3.804E-10	718JA04HS
1.141E+01	7.654E-10	2.741E-09	1.133E-10	3.496E-16	1.432E-09	2.122E-10	718JA04HS
1.157E+01	2.668E-09	2.711E-09	3.951E-10	1.221E-15	1.157E-09	1.715E-10	718JA04HS
1.177E+01	3.505E-09	2.655E-09	5.195E-10	1.607E-15	5.395E-10	8.004E-11	718JA04HS
1.193E+01	1.765E-10	2.455E-09	2.618E-11	8.107E-17	2.451E-10	3.638E-11	718JA04HS
1.213E+01	1.138E-09	2.563E-09	1.689E-10	5.235E-16	1.137E-10	1.686E-11	718JA04HS
1.233E+01	-4.875E-13	2.671E-09	-5.947E-14	-2.156E-19	-4.193E-14	-6.231E-15	718JA04HS
1.249E+01	-2.517E-14	2.760E-09	-3.743E-15	-1.163E-20	-2.517E-15	-3.743E-16	718JA04HS
1.269E+01	0.	2.874E-09	0.	0.	0.	0.	718JA04HS

1 PUBE 5 CM D20 AT R= 1M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING
COMPILATION DATE OF THIS CODE VERSION

14:49:42R 10/17/77
10/14/77U 16.05.47

30 GROUP OUTPUT

GROUP#	ENERGY UP-BOUND-MEV	DIFFERENTIAL FLUX N/CM2-SEC-MEV	INTEGRAL FLUX N/CM2-SEC	FLUX PER UNIT LETHARGY N/CM2-SEC
30	4.000000E-07	0.	0.	0.
29	3.180000E-06	0.	0.	0.
28	2.520000E-05	0.	0.	0.
27	2.000000E-04	0.	0.	0.
26	1.590000E-03	0.	0.	0.
25	1.261000E-02	0.	0.	0.
24	1.000000E-01	0.	0.	0.
23	2.236000E-01	2.994059E-06	3.700656E-07	4.844387E-07
22	5.000000E-01	2.501098E-06	6.913035E-07	9.048973E-07
21	5.946000E-01	1.406673E-06	1.330712E-07	7.698719E-07
20	7.071000E-01	1.049915E-06	1.181154E-07	6.833369E-07
19	8.409000E-01	8.293824E-07	1.109714E-07	6.419420E-07
18	1.000000E+00	8.861845E-07	1.409920E-07	8.156885E-07
17	1.257400E+00	6.550344E-07	1.686058E-07	7.393373E-07
16	1.581100E+00	5.988150E-07	1.938364E-07	8.498682E-07
15	1.988200E+00	5.519093E-07	2.246823E-07	9.849650E-07
14	2.500000E+00	7.838199E-07	4.011590E-07	1.758970E-06
13	2.973000E+00	9.447647E-07	4.469737E-07	2.585349E-06
12	3.535000E+00	1.009301E-06	5.677916E-07	3.284516E-06
11	4.204500E+00	8.328226E-07	5.571583E-07	3.223023E-06
10	5.000000E+00	7.619217E-07	6.061087E-07	3.506554E-06
9	5.764800E+00	6.474142E-07	4.951424E-07	3.484642E-06
8	6.646500E+00	4.706046E-07	4.149321E-07	2.920407E-06
7	7.663100E+00	3.918795E-07	3.882188E-07	2.732272E-06
6	8.835200E+00	2.736325E-07	3.207247E-07	2.257236E-06
5	1.018600E+01	9.893457E-08	1.336408E-07	9.409271E-07
4	1.174500E+01	1.515857E-08	2.363221E-08	1.662213E-07
3	1.354100E+01	3.485149E-10	6.259328E-10	4.406274E-09
2	1.561200E+01	0.	0.	0.
1	1.800000E+01	0.	0.	0.

1 PUBE 10 CM D20 AT R=1M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING
COMPILATION DATE OF THIS CODE VERSION

10/14/77U 14:51:13R 10/17/77
16.05.47

ENERGY (MEV)	PHI (NEUT/CM2-SEC-MEV)	DEL-PHI	DOSE (MR/HR-MEV)	KERMA (ERG/GH-SEC-MEV)	INTEGRAL (NEUT/CM2-SEC)	INT-DOSE (MR/HR)	FILE-ID
1.529E-01	2.739E-06	1.370E-07	6.707E-08	2.006E-13	4.578E-06	5.654E-07	604N002S
1.756E-01	2.637E-06	5.756E-08	6.847E-08	2.009E-13	4.518E-06	5.639E-07	604N002S
1.982E-01	2.602E-06	5.905E-08	7.327E-08	2.110E-13	4.459E-06	5.623E-07	604N002S
2.209E-01	2.681E-06	6.662E-08	8.096E-08	2.288E-13	4.399E-06	5.605E-07	604N002S
2.435E-01	2.705E-06	6.467E-08	8.755E-08	2.429E-13	4.338E-06	5.586E-07	604N002S
2.662E-01	2.629E-06	6.109E-08	9.180E-08	2.577E-13	4.277E-06	5.566E-07	604N002S
2.889E-01	2.474E-06	5.754E-08	9.210E-08	2.460E-13	4.220E-06	5.545E-07	604N002S
3.115E-01	2.266E-06	5.251E-08	9.128E-08	2.392E-13	4.166E-06	5.524E-07	604N002S
3.341E-01	2.080E-06	4.691E-08	8.906E-08	2.291E-13	4.116E-06	5.504E-07	604N002S
3.568E-01	1.873E-06	4.185E-08	8.601E-08	2.171E-13	4.071E-06	5.484E-07	604N002S
3.795E-01	1.680E-06	3.722E-08	8.274E-08	2.049E-13	4.031E-06	5.465E-07	604N002S
4.021E-01	1.509E-06	3.310E-08	7.965E-08	1.936E-13	3.995E-06	5.446E-07	604N002S
4.248E-01	1.360E-06	2.958E-08	7.702E-08	1.837E-13	3.963E-06	5.429E-07	604N002S
4.474E-01	1.238E-06	2.671E-08	7.514E-08	1.759E-13	3.933E-06	5.411E-07	604N002S
4.701E-01	1.138E-06	2.445E-08	7.413E-08	1.703E-13	3.906E-06	5.395E-07	604N002S
4.927E-01	1.059E-06	2.264E-08	7.394E-08	1.667E-13	3.881E-06	5.378E-07	604N002S
5.154E-01	9.961E-07	2.117E-08	7.223E-08	1.614E-13	3.858E-06	5.361E-07	604N002S
5.380E-01	9.455E-07	2.000E-08	7.014E-08	1.560E-13	3.836E-06	5.345E-07	604N002S
5.607E-01	9.049E-07	1.905E-08	6.867E-08	1.521E-13	3.815E-06	5.329E-07	604N002S
5.833E-01	8.720E-07	1.825E-08	6.769E-08	1.493E-13	3.795E-06	5.314E-07	604N002S
6.060E-01	8.447E-07	1.760E-08	6.709E-08	1.473E-13	3.776E-06	5.299E-07	604N002S
6.287E-01	8.219E-07	1.703E-08	6.679E-08	1.460E-13	3.757E-06	5.283E-07	604N002S
6.513E-01	8.024E-07	1.650E-08	6.670E-08	1.451E-13	3.738E-06	5.268E-07	604N002S
6.740E-01	7.836E-07	1.602E-08	6.664E-08	1.444E-13	3.720E-06	5.253E-07	604N002S
6.966E-01	7.597E-07	1.561E-08	6.609E-08	1.426E-13	3.703E-06	5.238E-07	604N002S
7.193E-01	7.495E-07	1.527E-08	6.527E-08	1.408E-13	3.686E-06	5.223E-07	604N002S
7.419E-01	7.641E-07	1.373E-08	6.046E-08	1.293E-13	3.670E-06	5.209E-07	604N002S
7.645E-01	6.582E-07	4.442E-08	7.100E-08	1.469E-13	3.559E-06	5.098E-07	720JAC3LS
7.871E-01	6.040E-07	4.169E-08	6.786E-08	1.393E-13	3.533E-06	5.070E-07	720JAC3LS
8.097E-01	5.615E-07	3.937E-08	6.477E-08	1.323E-13	3.518E-06	5.053E-07	720JAC3LS
8.323E-01	5.302E-07	3.783E-08	6.276E-08	1.275E-13	3.497E-06	5.028E-07	720JAC3LS
8.549E-01	4.720E-07	3.359E-08	5.783E-08	1.140E-13	3.478E-06	4.906E-07	720JAC3LS
8.775E-01	4.489E-07	3.467E-08	5.378E-08	1.071E-13	3.467E-06	4.993E-07	720JAC3LS
8.999E-01	4.234E-07	3.381E-08	5.104E-08	1.030E-13	3.452E-06	4.975E-07	720JAC3LS
9.223E-01	4.114E-07	3.412E-08	4.994E-08	1.005E-13	3.437E-06	4.957E-07	720JAC3LS
9.447E-01	4.247E-07	3.266E-08	5.192E-08	1.042E-13	3.422E-06	4.938E-07	720JAC3LS
9.671E-01	4.487E-07	3.559E-08	5.509E-08	1.103E-13	3.412E-06	4.926E-07	720JAC3LS
9.895E-01	4.406E-07	3.584E-08	5.445E-08	1.088E-13	3.397E-06	4.907E-07	720JAC3LS
1.011E+00	4.649E-07	3.793E-08	5.783E-08	1.140E-13	3.478E-06	4.986E-07	720JAC3LS
1.033E+00	4.489E-07	3.467E-08	5.378E-08	1.071E-13	3.467E-06	4.993E-07	720JAC3LS
1.055E+00	4.234E-07	3.381E-08	5.104E-08	1.030E-13	3.452E-06	4.975E-07	720JAC3LS
1.077E+00	4.114E-07	3.412E-08	4.994E-08	1.005E-13	3.437E-06	4.957E-07	720JAC3LS
1.099E+00	4.247E-07	3.266E-08	5.192E-08	1.042E-13	3.422E-06	4.938E-07	720JAC3LS
1.121E+00	4.487E-07	3.559E-08	5.509E-08	1.103E-13	3.412E-06	4.926E-07	720JAC3LS
1.143E+00	4.406E-07	3.584E-08	5.445E-08	1.088E-13	3.397E-06	4.907E-07	720JAC3LS
1.165E+00	4.649E-07	3.793E-08	5.783E-08	1.140E-13	3.478E-06	4.986E-07	720JAC3LS
1.187E+00	4.489E-07	3.467E-08	5.378E-08	1.071E-13	3.467E-06	4.993E-07	720JAC3LS
1.209E+00	4.234E-07	3.381E-08	5.104E-08	1.030E-13	3.452E-06	4.975E-07	720JAC3LS
1.231E+00	4.114E-07	3.412E-08	4.994E-08	1.005E-13	3.437E-06	4.957E-07	720JAC3LS
1.253E+00	4.247E-07	3.266E-08	5.192E-08	1.042E-13	3.422E-06	4.938E-07	720JAC3LS
1.275E+00	4.487E-07	3.559E-08	5.509E-08	1.103E-13	3.412E-06	4.926E-07	720JAC3LS
1.297E+00	4.406E-07	3.584E-08	5.445E-08	1.088E-13	3.397E-06	4.907E-07	720JAC3LS
1.319E+00	4.649E-07	3.793E-08	5.783E-08	1.140E-13	3.478E-06	4.986E-07	720JAC3LS
1.341E+00	4.489E-07	3.467E-08	5.378E-08	1.071E-13	3.467E-06	4.993E-07	720JAC3LS
1.363E+00	4.234E-07	3.381E-08	5.104E-08	1.030E-13	3.452E-06	4.975E-07	720JAC3LS
1.385E+00	4.114E-07	3.412E-08	4.994E-08	1.005E-13	3.437E-06	4.957E-07	720JAC3LS
1.407E+00	4.247E-07	3.266E-08	5.192E-08	1.042E-13	3.422E-06	4.938E-07	720JAC3LS
1.429E+00	4.487E-07	3.559E-08	5.509E-08	1.103E-13	3.412E-06	4.926E-07	720JAC3LS
1.451E+00	4.406E-07	3.584E-08	5.445E-08	1.088E-13	3.397E-06	4.907E-07	720JAC3LS
1.473E+00	4.649E-07	3.793E-08	5.783E-08	1.140E-13	3.478E-06	4.986E-07	720JAC3LS
1.495E+00	4.489E-07	3.467E-08	5.378E-08	1.071E-13	3.467E-06	4.993E-07	720JAC3LS
1.517E+00	4.234E-07	3.381E-08	5.104E-08	1.030E-13	3.452E-06	4.975E-07	720JAC3LS
1.539E+00	4.114E-07	3.412E-08	4.994E-08	1.005E-13	3.437E-06	4.957E-07	720JAC3LS
1.561E+00	4.247E-07	3.266E-08	5.192E-08	1.042E-13	3.422E-06	4.938E-07	720JAC3LS
1.583E+00	4.487E-07	3.559E-08	5.509E-08	1.103E-13	3.412E-06	4.926E-07	720JAC3LS
1.605E+00	4.406E-07	3.584E-08	5.445E-08	1.088E-13	3.397E-06	4.907E-07	720JAC3LS
1.627E+00	4.649E-07	3.793E-08	5.783E-08	1.140E-13	3.478E-06	4.986E-07	720JAC3LS
1.649E+00	4.489E-07	3.467E-08	5.378E-08	1.071E-13	3.467E-06	4.993E-07	720JAC3LS
1.671E+00	4.234E-07	3.381E-08	5.104E-08	1.030E-13	3.452E-06	4.975E-07	720JAC3LS
1.693E+00	4.114E-07	3.412E-08	4.994E-08	1.005E-13	3.437E-06	4.957E-07	720JAC3LS
1.715E+00	4.247E-07	3.266E-08	5.192E-08	1.042E-13	3.422E-06	4.938E-07	720JAC3LS
1.737E+00	4.487E-07	3.559E-08	5.509E-08	1.103E-13	3.412E-06	4.926E-07	720JAC3LS
1.759E+00	4.406E-07	3.584E-08	5.445E-08	1.088E-13	3.397E-06	4.907E-07	720JAC3LS
1.781E+00	4.649E-07	3.793E-08	5.783E-08	1.140E-13	3.478E-06	4.986E-07	720JAC3LS
1.803E+00	4.489E-07	3.467E-08	5.378E-08	1.071E-13	3.467E-06	4.993E-07	720JAC3LS
1.825E+00	4.234E-07	3.381E-08	5.104E-08	1.030E-13	3.452E-06	4.975E-07	720JAC3LS
1.847E+00	4.114E-07	3.412E-08	4.994E-08	1.005E-13	3.437E-06	4.957E-07	720JAC3LS
1.869E+00	4.247E-07	3.266E-08	5.192E-08	1.042E-13	3.422E-06	4.938E-07	720JAC3LS
1.891E+00	4.487E-07	3.559E-08	5.509E-08	1.103E-13	3.412E-06	4.926E-07	720JAC3LS
1.913E+00	4.406E-07	3.584E-08	5.445E-08	1.088E-13	3.397E-06	4.907E-07	720JAC3LS
1.935E+00	4.649E-07	3.793E-08	5.783E-08	1.140E-13	3.478E-06	4.986E-07	720JAC3LS
1.957E+00	4.489E-07	3.467E-08	5.378E-08	1.071E-13	3.467E-06	4.993E-07	720JAC3LS
1.979E+00	4.234E-07	3.381E-08	5.104E-08	1.030E-13	3.452E-06	4.975E-07	720JAC3LS
2.001E+00	4.114E-07	3.412E-08	4.994E-08	1.005E-13	3.437E-06	4.957E-07	720JAC3LS
2.023E+00	4.247E-07	3.266E-08	5.192E-08	1.042E-13	3.422E-06	4.938E-07	720JAC3LS
2.045E+00	4.487E-07	3.559E-08	5.509E-08	1.103E-13	3.412E-06	4.926E-07	720JAC3LS
2.067E+00	4.406E-07	3.584E-08	5.445E-08	1.088E-13	3.397E-06	4.907E-07	720JAC3LS
2.089E+00	4.649E-07	3.793E-08	5.783E-08	1.140E-13	3.478E-06	4.986E-07	720JAC3LS
2.111E+00	4.489E-07	3.467E-08	5.378E-08	1.071E-13	3.467E-06	4.993E-07	720JAC3LS
2.133E+00	4.234E-07	3.381E-08	5.104E-08	1.030E-13	3.452E-06	4.975E-07	720JAC3LS
2.155E+00	4.114E-07	3.412E-08	4.994E-08	1.005E-13	3.437E-06	4.957E-07	720JAC3LS
2.177E+00	4.247E-07	3.266E-08	5.192E-08	1.042E-13	3.422E-06	4.938E-07	720JAC3LS
2.199E+00	4.487E-07	3.559E-08	5.509E-08	1.103E-13	3.412E-06	4.926E-07	720JAC3LS
2.221E+00	4.406E-07	3.584E-08	5.445E-08	1.088E-13	3.397E-06	4.907E-07	720JAC3LS
2.243E+00	4.649E-07	3.793E-08	5.783E-08	1.140E-13	3.478E-06	4.986E-07	720JAC3LS
2.265E+00	4.489E-07	3.467E-08	5.378E-08	1.071E-13	3.467E-06	4.993E-07	720JAC3LS
2.287E+00	4.234E-07	3.381E-08	5.104E-08	1.030E-13	3.452E-06	4.975E-07	720JAC3LS
2.309E+00	4.114E-07	3.412E-08	4.994E-08	1.005E-13	3.437E-06	4.957E-07	720JAC3LS
2.331E+00	4.247E-07	3.266E-08	5.192E-08	1.042E-13	3.422E-06	4.938E-07	720JAC3LS
2.353E+00	4.487E-07	3.559E-08	5.509E-08	1.103E-13	3.412E-06	4.926E-07	720JAC3LS
2.375E+00	4.406E-07	3.584E-08	5.445E-08	1.088E-13	3.397E-06	4.907E-07	720JAC3LS
2.397E+00	4.649E-07	3.793E-08	5.783E-08	1.140E-13	3.478E-06	4.986E-07	720JAC3LS
2.419E+00	4.489E-07	3.467E-08	5.378E-08	1.071E-13	3.467E-06	4.993E-07	720JAC3LS
2.441E+00	4.234E-07	3.381E-08	5.104E-08	1.030E-13	3.452E-06	4.975E-07	720JAC3LS
2.463E+00	4.114E-07	3.412E-0					

1.705E+00	4.638E-07	4.199E-08	6.267E-08	1.210E-13	3.194E-06	4.646E-07	720JA03LS
1.742E+00	4.797E-07	4.337E-08	6.528E-08	1.256E-13	3.177E-06	4.622E-07	720JA03LS
1.779E+00	4.970E-07	4.507E-08	6.948E-08	1.334E-13	3.159E-06	4.597E-07	720JA03LS
1.806E+00	4.954E-07	4.337E-08	6.829E-08	1.307E-13	3.145E-06	4.579E-07	720JA03LS
1.849E+00	5.123E-07	4.470E-08	7.077E-08	1.358E-13	3.127E-06	4.54E-07	720JA03LS
1.877E+00	5.065E-07	4.502E-08	7.073E-08	1.348E-13	3.109E-06	4.529E-07	720JA03LS
1.912E+00	5.168E-07	4.609E-08	7.266E-08	1.381E-13	3.091E-06	4.504E-07	720JA03LS
1.936E+00	5.119E-07	4.634E-08	7.234E-08	1.372E-13	3.078E-06	4.485E-07	720JA03LS
1.973E+00	4.882E-07	4.605E-08	6.945E-08	1.314E-13	3.060E-06	4.460E-07	720JA03LS
1.007E+00	5.123E-07	4.571E-08	6.327E-08	1.311E-13	3.043E-06	4.436E-07	720JA03LS
2.041E+00	4.831E-07	4.528E-08	6.917E-08	1.328E-13	3.026E-06	4.412E-07	720JA03LS
2.075E+00	4.716E-07	4.545E-08	6.748E-08	1.286E-13	3.010E-06	4.386E-07	720JA03LS
1.106E+00	4.920E-07	4.670E-08	6.703E-08	1.347E-13	2.994E-06	4.366E-07	720JA03LS
1.141E+00	4.989E-07	4.746E-08	7.143E-08	1.372E-13	2.978E-06	4.342E-07	720JA03LS
1.174E+00	5.384E-07	4.756E-08	7.711E-08	1.487E-13	2.961E-06	4.318E-07	720JA03LS
1.174E+00	1.130E-07	1.001E-08	8.780E-08	1.693E-13	2.961E-06	4.318E-07	720JA03LS
2.207E+00	4.961E-07	4.644E-08	6.916E-08	1.265E-13	2.941E-06	4.293E-07	720JA03LS
2.239E+00	5.716E-07	1.159E-08	8.192E-08	1.592E-13	2.923E-06	4.263E-07	720JA03LS
2.271E+00	5.997E-07	1.342E-08	8.597E-08	1.678E-13	2.904E-06	4.236E-07	720JA03LS
2.303E+00	6.337E-07	1.63E-08	9.088E-08	1.780E-13	2.884E-06	4.208E-07	720JA03LS
2.343E+00	6.222E-07	1.69E-08	8.925E-08	1.757E-13	2.859E-06	4.172E-07	720JA03LS
2.352E+00	6.538E-07	1.75E-08	9.524E-08	1.877E-13	2.853E-06	4.163E-07	720JA03LS
2.374E+00	6.129E-07	1.75E-08	8.800E-08	1.738E-13	2.839E-06	4.143E-07	720JA03LS
2.405E+00	6.312E-07	1.450E-08	8.600E-08	1.797E-13	2.820E-06	4.115E-07	720JA03LS
2.436E+00	6.885E-07	1.903E-08	9.168E-08	1.825E-13	2.800E-06	4.087E-07	720JA03LS
2.475E+00	6.956E-07	4.112E-08	9.990E-08	1.999E-13	2.774E-06	4.050E-07	720JA03LS
2.550E+00	6.974E-07	4.342E-08	1.002E-07	2.024E-13	2.722E-06	3.975E-07	720JA03LS
2.725E+00	7.048E-07	4.368E-08	1.015E-07	2.093E-13	2.599E-06	3.798E-07	720JA03LS
2.898E+00	7.564E-07	4.569E-08	1.091E-07	2.297E-13	2.473E-06	3.616E-07	720JA03LS
3.128E+00	7.409E-07	4.802E-08	1.071E-07	2.319E-13	2.301E-06	3.368E-07	720JA03LS
3.301E+00	7.166E-07	4.362E-08	1.040E-07	2.301E-13	2.174E-06	3.185E-07	720JA03LS
3.474E+00	6.523E-07	4.105E-08	9.455E-08	2.136E-13	2.056E-06	3.013E-07	720JA03LS
3.705E+00	5.715E-07	3.621E-08	8.302E-08	1.929E-13	1.914E-06	2.808E-07	720JA03LS
3.875E+00	5.516E-07	3.492E-08	8.024E-08	1.904E-13	1.819E-06	2.669E-07	720JA03LS
4.086E+00	5.084E-07	2.299E-08	7.411E-08	1.805E-13	1.706E-06	2.505E-07	720JA03LS
4.247E+00	5.168E-07	3.311E-08	7.544E-08	1.873E-13	1.625E-06	2.386E-07	720JA03LS
4.478E+00	5.441E-07	4.480E-08	7.959E-08	2.032E-13	1.502E-06	2.207E-07	720JA03LS
4.693E+00	5.257E-07	3.392E-08	7.705E-08	2.020E-13	1.387E-06	2.039E-07	720JA03LS
4.853E+00	4.985E-07	3.244E-08	7.318E-08	1.956E-13	1.305E-06	1.919E-07	720JA03LS
4.054E+00	4.759E-07	1.133E-08	6.995E-08	1.906E-13	1.202E-06	1.768E-07	720JA03LS
4.257E+00	4.376E-07	9.29E-08	6.433E-08	1.761E-13	1.114E-06	1.638E-07	720JA03LS
4.417E+00	4.498E-07	1.004E-08	6.613E-08	1.817E-13	1.043E-06	1.534E-07	720JA03LS
4.630E+00	3.89E-07	7.44E-08	5.592E-08	1.592E-13	9.53E-07	1.423E-07	720JA03LS
4.836E+00	3.625E-07	6.37E-08	5.329E-08	1.479E-13	8.28E-07	1.285E-07	720JA03LS
4.029E+00	3.335E-07	5.41E-08	4.902E-08	1.367E-13	8.091E-07	1.190E-07	720JA03LS
4.243E+00	3.118E-07	4.66E-08	4.583E-08	1.284E-13	7.401E-07	1.088E-07	720JA03LS
4.393E+00	3.124E-07	4.70E-08	4.293E-08	1.291E-13	6.933E-07	1.019E-07	720JA03LS
4.592E+00	2.896E-07	3.04E-08	4.257E-08	1.203E-13	6.334E-07	9.312E-08	720JA03LS
4.789E+00	2.95E-07	3.44E-08	4.447E-08	1.262E-13	5.750E-07	8.454E-08	720JA03LS
4.994E+00	2.658E-07	1.88E-08	3.589E-08	1.1E-14	4.16E-07	7.641E-08	720JA03LS
7.179E+00	2.203E-07	0.015E-08	3.239E-08	9.278E-14	4.724E-07	6.945E-08	720JA03LS
7.372E+00	1.91E-07	0.035E-08	3.220E-08	9.267E-14	4.300E-07	6.322E-08	720JA03LS
7.563E+00	1.412E-07	0.123E-08	3.545E-08	1.025E-13	3.860E-07	5.676E-08	720JA03LS
7.753E+00	1.375E-07	0.090E-08	3.491E-08	1.014E-13	3.405E-07	5.007E-08	720JA03LS
7.942E+00	1.492E-07	0.079E-08	3.663E-08	1.068E-13	3.46E-07	4.331E-08	720JA03LS
8.176E+00	1.033E-07	7.82E-09	3.989E-08	7.65E-14	3.55E-07	3.877E-08	720JA03LS
8.349E+00	1.709E-07	1.641E-08	2.513E-08	6.399E-14	0.92E-07	3.077E-08	720JA03LS
8.542E+00	1.590E-07	1.535E-08	2.337E-08	1.774E-14	2.609E-08	2.609E-08	720JA03LS
8.727E+00	1.467E-07	1.478E-08	2.156E-08	6.406E-14	1.491E-07	2.193E-08	720JA03LS
8.915E+00	1.189E-07	1.317E-08	1.749E-08	5.218E-14	1.242E-07	1.826E-08	720JA03LS

9.142E+00	1.050E-07	1.223E-08	1.544E-08	4.632E-14	9.873E-08	1.453E-08	720JA03HS
9.323E+00	9.331E-08	1.143E-08	1.372E-08	4.132E-14	8.078E-08	1.189E-08	720JA03HS
9.503E+00	7.685E-08	1.031E-08	1.130E-08	3.418E-14	6.546E-08	9.637E-09	720JA03HS
9.682E+00	6.133E-08	9.394E-09	9.015E-09	2.739E-14	5.310E-08	7.819E-09	720JA03HS
9.905E+00	5.481E-08	8.584E-09	8.058E-09	2.461E-14	4.015E-08	5.915E-09	720JA03HS
1.008E+01	4.420E-08	7.396E-09	6.499E-09	1.990E-14	3.148E-08	4.641E-09	720JA03HS
1.030E+01	3.721E-08	6.601E-09	5.478E-09	1.680E-14	2.253E-08	3.324E-09	720JA03HS
1.046E+01	2.777E-08	5.519E-09	4.092E-09	1.256E-14	1.668E-08	2.463E-09	720JA03HS
1.070E+01	1.916E-08	4.986E-09	2.826E-09	8.688E-15	1.152E-08	1.702E-09	720JA03HS
1.087E+01	1.791E-08	4.253E-09	2.643E-09	8.132E-15	8.367E-09	1.237E-09	720JA03HS
1.104E+01	1.502E-08	3.680E-09	2.219E-09	6.835E-15	5.568E-09	8.234E-10	720JA03HS
1.126E+01	1.052E-08	2.621E-09	1.555E-09	4.795E-15	2.758E-09	4.082E-10	720JA03HS
1.147E+01	6.312E-09	2.282E-09	9.342E-10	2.885E-15	9.913E-10	1.469E-10	720JA03HS
1.164E+01	6.438E-10	1.486E-09	9.536E-11	2.947E-16	4.001E-10	5.935E-11	720JA03HS
1.185E+01	1.718E-09	1.701E-09	2.548E-10	7.885E-16	1.521E-10	2.258E-11	720JA03HS
1.202E+01	-5.989E-10	1.609E-09	-8.887E-11	-2.753E-16	5.692E-11	6.481E-12	720JA03HS
1.223E+01	-1.519E-12	1.681E-09	-2.256E-13	-6.998E-19	1.200E-10	1.784E-11	720JA03HS
1.244E+01	6.499E-10	1.756E-09	9.662E-11	3.001E-16	5.189E-11	7.715E-12	720JA03HS
1.260E+01	-4.781E-13	1.817E-09	-7.084E-14	-2.202E-19	-5.857E-14	-8.716E-15	720JA03HS
1.280E+01	-5.345E-14	1.891E-09	-7.961E-15	-2.477E-20	-5.613E-15	-8.359E-16	720JA03HS
1.301E+01	0.	1.974E-09	0.	0.	0.	0.	720JA03HS
1.317E+01	0.	2.036E-09	0.	0.	0.	0.	720JA03HS

1 PUBE 10 CM D20 AT R=1M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING
 COMPILATION DATE OF THIS CODE VERSION

14:51:13R 10/17/77
 10/14/77U 16.05.47

30 GROUP OUTPUT

GROUP#	ENERGY UP-BOUND-MEV	DIFFERENTIAL FLUX N/CM2-SEC-MEV	INTEGRAL FLUX N/CM2-SEC	FLUX PER UNIT LETHARGY N/CM2-SEC
30	4.000000E-07	0.	0.	0.
29	3.180000E-06	0.	0.	0.
28	2.520000E-05	0.	0.	0.
27	2.000000E-04	0.	0.	0.
26	1.590000E-03	0.	0.	0.
25	1.261000E-02	0.	0.	0.
24	1.000000E-01	0.	0.	0.
23	2.236000E-01	2.683674E-06	3.317022E-07	4.342185E-07
22	5.000000E-01	1.873186E-06	5.177487E-07	6.777188E-07
21	5.946000E-01	9.351573E-07	8.846588E-08	5.118116E-07
20	7.071000E-01	8.027060E-07	9.030443E-08	5.224412E-07
19	8.409000E-01	6.739295E-07	9.017176E-08	5.216214E-07
18	1.000000E+00	6.243409E-07	9.933264E-08	5.746746E-07
17	1.257400E+00	4.507293E-07	1.160177E-07	5.087381E-07
16	1.581100E+00	4.415319E-07	1.429239E-07	6.266442E-07
15	1.988200E+00	4.757516E-07	1.936785E-07	8.495501E-07
14	2.500000E+00	5.786062E-07	2.961307E-07	1.298450E-06
13	2.973000E+00	7.198138E-07	3.404719E-07	1.969770E-06
12	3.535500E+00	7.109828E-07	3.992278E-07	2.313716E-06
11	4.204500E+00	5.527957E-07	3.695203E-07	2.139319E-06
10	5.000000E+00	5.197791E-07	4.134843E-07	2.392154E-06
9	5.764800E+00	4.322434E-07	3.305798E-07	2.326507E-06
8	6.646500E+00	3.231710E-07	2.849399E-07	2.005486E-06
7	7.653100E+00	2.513338E-07	2.555059E-07	1.798243E-06
6	8.695200E+00	1.944024E-07	2.278590E-07	1.533654E-06
5	1.018600E+01	7.931254E-08	1.071354E-07	7.530988E-07
4	1.174500E+01	1.710962E-08	2.667390E-08	1.876156E-07
3	1.354100E+01	1.694227E-10	3.042832E-10	2.142012E-09
2	1.561200E+01	0.	0.	0.
1	1.800000E+01	0.	0.	0.

1 PUBE 15 CM D20 AT R=1M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING
 10/14/77U 14:57:44R 10/17/77
 16.05.47

ENERGY (MEV)	PHI (NEUT/CM ² -SEC-MEV)	DEL-PHI	DOSE (MR/HR-MEV)	KERMA (ERG/GM-SEC-MEV)	INTEGRAL (NEUT/CM ² -SEC)	INT-DOSE (MR/HR)	FILE-ID
1.529E-01	2.102E-06	1.051E-07	5.146E-08	1.539E-13	3.089E-06	3.784E-07	602N003S
1.756E-01	1.962E-06	4.305E-08	1.533E-08	1.513E-13	3.089E-06	3.772E-07	602N003S
1.962E-01	1.920E-06	4.653E-08	5.407E-08	1.557E-13	3.995E-06	3.760E-07	602N003S
2.209E-01	1.943E-06	4.843E-08	5.868E-08	1.658E-13	3.995E-06	3.747E-07	602N003S
2.435E-01	1.925E-06	4.599E-08	6.233E-08	1.729E-13	3.995E-06	3.734E-07	602N003S
2.662E-01	1.833E-06	4.260E-08	6.363E-08	1.732E-13	3.866E-06	3.719E-07	602N003S
2.888E-01	1.692E-06	3.927E-08	6.298E-08	1.682E-13	3.829E-06	3.705E-07	602N003S
3.115E-01	1.534E-06	3.508E-08	6.126E-08	1.605E-13	3.792E-06	3.691E-07	602N003S
3.341E-01	1.373E-06	3.078E-08	5.877E-08	1.512E-13	3.621E-06	3.677E-07	602N003S
3.568E-01	1.222E-06	2.715E-08	5.609E-08	1.416E-13	3.730E-06	3.664E-07	602N003S
3.795E-01	1.090E-06	2.404E-08	5.369E-08	1.330E-13	3.703E-06	3.652E-07	602N003S
4.021E-01	9.802E-07	2.144E-08	5.175E-08	1.258E-13	3.680E-06	3.640E-07	602N003S
4.248E-01	8.907E-07	1.933E-08	5.043E-08	1.203E-13	3.659E-06	3.628E-07	602N003S
4.474E-01	8.207E-07	1.769E-08	4.982E-08	1.166E-13	3.639E-06	3.617E-07	602N003S
4.701E-01	7.686E-07	1.648E-08	4.905E-08	1.150E-13	3.621E-06	3.606E-07	602N003S
4.927E-01	7.314E-07	1.563E-08	5.106E-08	1.151E-13	3.604E-06	3.594E-07	602N003S
5.154E-01	7.062E-07	1.501E-08	5.121E-08	1.144E-13	3.588E-06	3.583E-07	602N003S
5.380E-01	6.905E-07	1.459E-08	5.122E-08	1.139E-13	3.572E-06	3.571E-07	602N003S
5.607E-01	6.826E-07	1.436E-08	1.80E-08	1.147E-13	3.557E-06	3.559E-07	602N003S
5.833E-01	6.803E-07	1.585E-08	2.82E-08	1.155E-13	3.541E-06	3.547E-07	602N003S
6.060E-01	6.802E-07	1.767E-08	4.03E-08	1.168E-13	3.529E-06	3.535E-07	602N003S
6.287E-01	6.768E-07	1.808E-08	4.99E-08	1.202E-13	3.510E-06	3.523E-07	602N003S
6.513E-01	6.636E-07	1.640E-08	5.16E-08	1.200E-13	3.495E-06	3.511E-07	602N003S
6.740E-01	6.350E-07	1.330E-08	5.400E-08	1.170E-13	3.481E-06	3.498E-07	602N003S
6.966E-01	5.862E-07	1.229E-08	5.100E-08	1.100E-13	3.467E-06	3.486E-07	602N003S
7.193E-01	5.165E-07	1.072E-08	4.597E-08	9.873E-14	3.454E-06	3.475E-07	602N003S
7.419E-01	4.312E-07	7.45E-09	4.86E-08	9.394E-14	3.466E-06	3.486E-07	602N003S
7.645E-01	4.111E-07	2.739E-08	4.439E-08	1.185E-14	3.372E-06	3.395E-07	725JA03LS
7.871E-01	4.002E-07	2.663E-08	4.503E-08	9.243E-14	3.355E-06	3.376E-07	725JA03LS
8.097E-01	3.890E-07	2.607E-08	4.496E-08	9.181E-14	3.345E-06	3.364E-07	725JA03LS
8.323E-01	3.546E-07	2.412E-08	4.199E-08	8.528E-14	3.318E-06	3.347E-07	725JA03LS
8.549E-01	3.241E-07	2.249E-08	3.866E-08	7.830E-14	3.318E-06	3.332E-07	725JA03LS
8.775E-01	3.089E-07	1.92E-08	3.702E-08	7.484E-14	3.310E-06	3.323E-07	725JA03LS
8.999E-01	2.882E-07	1.69E-08	3.343E-08	7.010E-14	3.295E-06	3.310E-07	725JA03LS
9.223E-01	2.752E-07	1.060E-08	3.343E-08	6.724E-14	3.289E-06	3.298E-07	725JA03LS
9.447E-01	2.863E-07	1.17E-08	3.502E-08	7.024E-14	3.279E-06	3.286E-07	725JA03LS
9.671E-01	3.037E-07	1.84E-08	3.740E-08	7.482E-14	3.269E-06	3.273E-07	725JA03LS
9.895E-01	3.143E-07	2.66E-08	3.889E-08	7.766E-14	3.262E-06	3.264E-07	725JA03LS
1.011E+00	3.278E-07	3.28E-08	4.090E-08	8.141E-14	3.247E-06	3.246E-07	725JA03LS
1.033E+00	3.211E-07	3.18E-08	4.022E-08	8.095E-14	3.236E-06	3.233E-07	725JA03LS
1.055E+00	3.151E-07	2.99E-08	3.982E-08	7.910E-14	3.225E-06	3.220E-07	725JA03LS
1.077E+00	3.108E-07	2.75E-08	3.952E-08	7.808E-14	3.216E-06	3.207E-07	725JA03LS
1.099E+00	3.054E-07	2.69E-08	3.908E-08	7.703E-14	3.206E-06	3.194E-07	725JA03LS
1.121E+00	3.089E-07	2.61E-08	3.975E-08	7.818E-14	3.197E-06	3.182E-07	725JA03LS
1.143E+00	3.212E-07	3.41E-08	4.167E-08	8.169E-14	3.184E-06	3.165E-07	725JA03LS
1.165E+00	3.367E-07	4.16E-08	4.393E-08	8.594E-14	3.174E-06	3.153E-07	725JA03LS
1.187E+00	3.468E-07	4.65E-08	4.698E-08	8.856E-14	3.164E-06	3.149E-07	725JA03LS
1.209E+00	3.551E-07	5.31E-08	4.995E-08	9.101E-14	3.151E-06	3.141E-07	725JA03LS
1.231E+00	3.451E-07	4.88E-08	4.588E-08	8.910E-14	3.140E-06	3.108E-07	725JA03LS
1.253E+00	3.284E-07	2.395E-08	4.399E-08	8.518E-14	3.127E-06	3.091E-07	725JA03LS
1.275E+00	3.225E-07	2.371E-08	4.340E-08	8.389E-14	3.116E-06	3.079E-07	725JA03LS

1.723E+00	3.180E-07	2.356E-08	4.312E-08	8.311E-14	2.106E-06	3.063E-07	725JA03LS
1.753E+00	3.180E-07	3.379E-08	4.347E-08	8.360E-14	2.097E-06	3.050E-07	725JA03LS
1.789E+00	3.245E-07	4.413E-08	4.456E-08	8.546E-14	2.085E-06	3.034E-07	725JA03LS
1.826E+00	3.369E-07	4.442E-08	4.660E-08	8.913E-14	2.073E-06	3.017E-07	725JA03LS
1.859E+00	3.456E-07	4.456E-08	4.670E-08	8.914E-14	2.064E-06	3.004E-07	725JA03LS
1.889E+00	3.504E-07	4.478E-08	5.048E-08	9.051E-14	2.051E-06	2.987E-07	725JA03LS
1.924E+00	3.758E-07	6.72E-08	2.296E-08	9.006E-13	2.038E-06	2.969E-07	725JA03LS
1.960E+00	3.838E-07	7.11E-08	4.446E-08	1.031E-13	2.025E-06	2.950E-07	725JA03LS
1.994E+00	3.889E-07	7.39E-08	5.54E-08	1.049E-13	2.012E-06	2.931E-07	725JA03LS
2.029E+00	3.796E-07	6.73E-08	4.30E-08	1.029E-13	1.998E-06	2.912E-07	725JA03LS
2.063E+00	3.856E-07	7.01E-08	5.17E-08	1.050E-13	1.985E-06	2.893E-07	725JA03LS
2.097E+00	3.838E-07	7.03E-08	4.484E-08	1.048E-13	1.972E-06	2.874E-07	725JA03LS
2.131E+00	3.904E-07	7.37E-08	5.39E-08	1.048E-13	1.959E-06	2.856E-07	725JA03LS
2.164E+00	3.754E-07	6.67E-08	4.37E-08	1.036E-13	1.946E-06	2.837E-07	725JA03LS
2.176E+00	4.343E-07	7.03E-08	6.221E-08	1.200E-13	1.941E-06	2.830E-07	725JA03HS
2.197E+00	3.890E-07	7.56E-08	5.573E-08	1.078E-13	1.933E-06	2.818E-07	725JA03LS
2.230E+00	3.934E-07	9.08E-08	6.638E-08	1.095E-13	1.920E-06	2.800E-07	725JA03LS
2.263E+00	4.227E-07	9.87E-08	6.059E-08	1.181E-13	1.906E-06	2.780E-07	725JA03LS
2.298E+00	4.389E-07	9.01E-08	6.284E-08	1.230E-13	1.893E-06	2.761E-07	725JA03LS
2.347E+00	4.03E-07	9.57E-08	6.315E-08	1.241E-13	1.879E-06	2.740E-07	725JA03LS
2.359E+00	4.550E-07	1.167E-08	6.529E-08	1.288E-13	1.864E-06	2.720E-07	725JA03LS
2.378E+00	4.897E-07	3.302E-08	7.027E-08	1.389E-13	1.855E-06	2.707E-07	725JA03HS
2.399E+00	4.764E-07	3.49E-08	6.837E-08	1.355E-13	1.845E-06	2.692E-07	725JA03LS
2.430E+00	4.989E-07	3.21E-08	7.162E-08	1.425E-13	1.830E-06	2.671E-07	725JA03LS
2.462E+00	4.65E-07	7.30E-08	7.273E-08	1.453E-13	1.814E-06	2.648E-07	725JA03LS
2.493E+00	4.043E-07	9.60E-08	7.245E-08	1.453E-13	1.798E-06	2.625E-07	725JA03LS
2.577E+00	4.093E-07	9.05E-08	7.321E-08	1.483E-13	1.786E-06	2.584E-07	725JA03HS
2.752E+00	4.905E-07	9.00E-08	7.062E-08	1.461E-13	1.668E-06	2.498E-07	725JA03HS
2.927E+00	4.100E-07	9.00E-08	7.356E-08	1.555E-13	1.581E-06	2.312E-07	725JA03HS
3.161E+00	4.679E-07	7.76E-08	6.762E-08	1.471E-13	1.466E-06	2.147E-07	725JA03HS
3.336E+00	4.601E-07	7.06E-08	6.661E-08	1.480E-13	1.385E-06	2.029E-07	725JA03HS
3.70E+00	3.220E-07	3.75E-08	6.68E-08	1.300E-13	1.285E-06	1.885E-07	725JA03HS
3.745E+00	3.552E-07	1.41E-08	6.82E-08	1.205E-13	1.205E-06	1.790E-07	725JA03HS
3.914E+00	3.367E-07	9.23E-08	4.900E-08	1.168E-13	1.162E-06	1.705E-07	725JA03HS
4.130E+00	3.391E-07	9.04E-08	4.945E-08	1.210E-13	1.089E-06	1.599E-07	725JA03HS
4.292E+00	3.454E-07	9.35E-08	4.045E-08	1.259E-13	1.033E-06	1.518E-07	725JA03HS
4.526E+00	3.411E-07	9.55E-08	4.993E-08	1.282E-13	9.528E-07	1.400E-07	725JA03HS
4.744E+00	3.539E-07	9.24E-08	4.749E-08	1.253E-13	8.803E-07	1.294E-07	725JA03HS
4.905E+00	3.335E-07	9.24E-08	4.781E-08	1.245E-13	8.202E-07	1.217E-07	725JA03HS
5.119E+00	3.095E-07	1.839E-08	4.550E-08	1.241E-13	7.605E-07	1.118E-07	725JA03HS
5.316E+00	2.892E-07	1.716E-08	4.251E-08	1.168E-13	7.015E-07	1.031E-07	725JA03HS
5.477E+00	2.727E-07	1.657E-08	4.008E-08	1.103E-13	6.563E-07	9.648E-08	725JA03HS
5.693E+00	2.548E-07	1.570E-08	3.745E-08	1.036E-13	5.993E-07	8.811E-08	725JA03HS
5.895E+00	2.409E-07	1.443E-08	3.381E-08	9.396E-14	5.501E-07	8.087E-08	725JA03HS
5.910E+00	2.109E-07	1.363E-08	3.101E-08	8.661E-14	5.06E-07	7.403E-08	725JA03HS
6.311E+00	2.15E-07	1.391E-08	3.25E-08	9.197E-14	4.595E-07	6.755E-08	725JA03HS
6.462E+00	1.951E-07	1.244E-08	2.862E-08	8.118E-14	4.280E-07	6.292E-08	725JA03HS
6.663E+00	1.783E-07	1.139E-08	2.621E-08	7.417E-14	3.903E-07	5.738E-08	725JA03HS
6.862E+00	1.760E-07	1.120E-08	2.588E-08	7.357E-14	3.551E-07	5.220E-08	725JA03HS
7.060E+00	1.735E-07	1.121E-08	2.576E-08	7.359E-14	3.203E-07	4.709E-08	725JA03HS
7.256E+00	1.802E-07	1.128E-08	2.640E-08	7.602E-14	2.85E-07	4.197E-08	725JA03HS
7.451E+00	1.796E-07	1.120E-08	2.640E-08	7.610E-14	2.504E-07	3.681E-08	725JA03HS
7.645E+00	1.796E-07	1.120E-08	2.640E-08	7.645E-14	2.156E-07	3.169E-08	725JA03HS
7.837E+00	1.737E-07	1.075E-08	2.554E-08	7.430E-14	1.816E-07	2.670E-08	725JA03HS
8.028E+00	1.576E-07	9.771E-09	2.317E-08	6.770E-14	1.500E-07	2.205E-08	725JA03HS
8.265E+00	1.303E-07	8.23E-09	1.915E-08	5.629E-14	1.159E-07	1.704E-08	725JA03HS
8.449E+00	1.071E-07	7.24E-09	1.344E-08	4.645E-14	9.474E-08	1.353E-08	725JA03HS
8.639E+00	9.074E-08	6.078E-09	1.334E-08	3.95E-14	8.086E-08	1.108E-08	725JA03HS
8.816E+00	7.269E-08	5.110E-09	1.069E-08	3.181E-14	6.089E-08	8.956E-09	725JA03HS
9.011E+00	6.052E-08	4.463E-09	8.896E-09	2.660E-14	4.791E-08	7.047E-09	725JA03HS

9.241E+00	4.943E-08	3.767E-09	7.265E-09	2.185E-14	3.526E-08	5.188E-09	725JAO3HS
9.424E+00	3.842E-08	3.213E-09	5.647E-09	1.705E-14	2.722E-08	4.007E-09	725JAO3HS
9.605E+00	2.662E-08	2.626E-09	3.913E-09	1.187E-14	2.134E-08	3.142E-09	725JAO3HS
9.832E+00	2.131E-08	2.277E-09	3.133E-09	9.552E-15	1.590E-08	2.342E-09	725JAO3HS
1.001E+01	1.838E-08	2.055E-09	2.702E-09	8.270E-15	1.237E-08	1.823E-09	725JAO3HS
1.019E+01	1.425E-08	1.807E-09	2.097E-09	6.425E-15	9.430E-09	1.391E-09	725JAO3HS
1.041E+01	9.144E-09	1.496E-09	1.347E-09	4.133E-15	6.856E-09	1.012E-09	725JAO3HS
1.059E+01	8.980E-09	1.359E-09	1.324E-09	4.066E-15	5.225E-09	7.718E-10	725JAO3HS
1.081E+01	6.910E-09	1.152E-09	1.020E-09	3.136E-15	3.477E-09	5.140E-10	725JAO3HS
1.099E+01	4.859E-09	9.426E-10	7.176E-10	2.209E-15	2.418E-09	3.577E-10	725JAO3HS
1.116E+01	4.224E-09	7.465E-10	6.243E-10	1.924E-15	1.646E-09	2.436E-10	725JAO3HS
1.138E+01	3.109E-09	6.486E-10	4.600E-10	1.420E-15	6.294E-10	1.244E-10	725JAO3HS
1.159E+01	9.948E-10	4.248E-10	1.473E-10	4.552E-16	4.385E-10	6.059E-11	725JAO3HS
1.178E+01	6.360E-10	3.583E-10	9.426E-11	2.916E-16	2.699E-10	4.005E-11	725JAO3HS
1.198E+01	5.355E-10	3.186E-10	7.915E-11	2.451E-16	1.412E-10	2.096E-11	725JAO3HS
1.215E+01	4.157E-10	2.789E-10	6.172E-11	1.913E-16	6.053E-11	9.004E-12	725JAO3HS
1.236E+01	2.093E-10	2.931E-10	-3.111E-11	-9.655E-17	3.887E-11	5.789E-12	725JAO3HS
1.257E+01	1.079E-10	2.941E-10	1.606E-11	4.991E-17	4.951E-11	7.369E-12	725JAO3HS
1.272E+01	2.240E-10	3.231E-10	3.335E-11	1.037E-16	2.461E-11	3.664E-12	725JAO3HS
1.294E+01	-1.577E-12	3.165E-10	-2.351E-14	-7.321E-20	-1.718E-14	-2.560E-15	725JAO3HS
1.314E+01	-7.399E-13	3.293E-10	-1.104E-13	-3.442E-21	-6.659E-16	-9.933E-17	725JAO3HS
1.332E+01	0.	3.409E-10	0.	0.	0.	0.	725JAO3HS

1 PUBE 15 CM D20 AT R=1M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING
 COMPILE DATE OF THIS CODE VERSION

14:57:44R 10/17/77
 10/14/77U 16.05.47

30 GROUP OUTPUT

GROUP#	ENERGY UP-BOUND-MEV	DIFFERENTIAL FLUX N/CM2-SEC-MEV	INTEGRAL FLUX N/CM2-SEC	FLUX PER UNIT LETHARGY N/CM2-SEC
30	4.000000E-07	0.	0.	0.
29	3.180000E-06	0.	0.	0.
28	2.520000E-05	0.	0.	0.
27	2.000000E-04	0.	0.	0.
26	1.590000E-03	0.	0.	0.
25	1.261000E-02	0.	0.	0.
24	1.000000E-01	0.	0.	0.
23	2.236000E-01	2.025079E-06	2.502997E-07	3.276577E-07
22	5.000000E-01	1.267592E-06	3.503623E-07	4.586146E-07
21	5.846000E-01	6.920160E-07	5.546472E-08	3.787404E-07
20	7.071000E-01	6.473563E-07	7.282759E-08	4.213319E-07
19	8.409000E-01	4.435346E-07	5.934493E-08	3.432358E-07
18	1.000000E+00	4.047203E-07	6.439100E-08	3.723248E-07
17	1.257400E+00	3.070866E-07	7.904410E-08	3.466087E-07
16	1.581100E+00	3.221328E-07	1.042744E-07	4.571870E-07
15	1.988200E+00	3.435462E-07	1.398577E-07	6.131097E-07
14	2.500000E+00	4.281131E-07	2.191083E-07	9.607287E-07
13	3.273000E+00	5.017583E-07	3.979317E-07	1.373062E-06
12	3.535500E+00	4.592466E-07	2.583476E-07	1.494627E-06
11	4.204500E+00	3.528215E-07	2.359038E-07	1.364645E-06
10	5.000000E+00	3.336641E-07	2.654298E-07	1.535606E-06
9	5.764800E+00	2.629505E-07	2.164311E-07	1.523168E-06
8	6.648500E+00	2.132848E-07	1.880532E-07	1.323571E-06
7	7.663100E+00	1.780310E-07	1.809864E-07	1.273777E-06
6	8.835200E+00	1.303611E-07	1.527963E-07	1.075369E-06
5	1.018500E+01	3.702172E-08	5.002245E-08	3.521939E-07
4	1.174500E+01	5.905834E-09	9.207196E-08	6.476043E-08
3	1.354100E+01	1.557039E-10	2.796442E-10	1.968564E-09
2	1.561200E+01	0.	0.	0.
1	1.800000E+01	0.	0.	0.

1 PUBE 25 CM D20 AT R=1M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING
COMPIATION DATE OF THIS CODE VERSION

14:59:20R 10/17/77
10/14/77U 16.05.47

ENERGY (MEV)	PHI (NEUT/CM2-SEC-MEV)	DEL-PHI	DOSE (MR/HR-MEV)	KERMA (ERG/GM-SEC-MEV)	INTEGRAL (NEUT/CM2-SEC)	INT-DOSE (MR/HR)	FILE-ID
1.529E-01	9.862E-07	4.931E-08	2.415E-08	7.221E-14	1.416E-06	1.748E-07	6290C01S
1.756E-01	8.908E-07	1.913E-08	3.339E-08	6.865E-14	1.395E-06	1.743E-07	6290C01S
1.982E-01	8.524E-07	1.918E-08	4.00E-08	6.912E-14	1.375E-06	1.738E-07	6290C01S
2.209E-01	8.546E-07	2.145E-08	5.81E-08	7.293E-14	1.356E-06	1.732E-07	6290C01S
2.435E-01	8.432E-07	2.003E-08	7.730E-08	7.571E-14	1.337E-06	1.726E-07	6290C01S
2.662E-01	8.006E-07	1.854E-08	7.80E-08	7.566E-14	1.318E-06	1.720E-07	6290C01S
2.888E-01	7.389E-07	1.718E-08	7.51E-08	7.348E-14	1.301E-06	1.713E-07	6290C01S
3.115E-01	6.707E-07	1.535E-08	6.78E-08	7.019E-14	1.285E-06	1.707E-07	6290C01S
3.341E-01	5.994E-07	1.346E-08	5.66E-08	6.601E-14	1.270E-06	1.701E-07	6290C01S
3.568E-01	5.309E-07	1.183E-08	4.37E-08	6.152E-14	1.258E-06	1.696E-07	6290C01S
3.795E-01	4.686E-07	1.037E-08	3.08E-08	5.716E-14	1.246E-06	1.690E-07	6290C01S
4.021E-01	4.139E-07	9.064E-09	1.85E-08	5.312E-14	1.236E-06	1.685E-07	6290C01S
4.248E-01	3.672E-07	7.946E-09	0.79E-08	4.959E-14	1.227E-06	1.680E-07	6290C01S
4.474E-01	3.296E-07	7.068E-09	2.001E-08	4.684E-14	1.220E-06	1.676E-07	6290C01S
4.701E-01	3.014E-07	6.426E-09	1.962E-08	4.508E-14	1.212E-06	1.671E-07	6290C01S
4.927E-01	2.819E-07	5.983E-09	1.968E-08	4.437E-14	1.206E-06	1.667E-07	6290C01S
5.154E-01	2.704E-07	5.696E-09	1.981E-08	4.380E-14	1.200E-06	1.662E-07	6290C01S
5.380E-01	2.663E-07	5.566E-09	1.976E-08	4.394E-14	1.193E-06	1.658E-07	6290C01S
5.607E-01	2.697E-07	5.606E-09	0.47E-08	4.534E-14	1.187E-06	1.653E-07	6290C01S
5.833E-01	2.793E-07	5.809E-09	2.168E-08	4.781E-14	1.181E-06	1.649E-07	6290C01S
6.060E-01	2.921E-07	7.137E-09	3.20E-08	5.093E-14	1.175E-06	1.644E-07	6290C01S
6.287E-01	3.033E-07	8.546E-09	3.86E-08	5.386E-14	1.168E-06	1.638E-07	6290C01S
6.513E-01	3.081E-07	9.134E-09	5.61E-08	5.573E-14	1.161E-06	1.632E-07	6290C01S
6.740E-01	3.019E-07	8.222E-09	5.67E-08	5.562E-14	1.154E-06	1.627E-07	6290C01S
6.968E-01	2.805E-07	5.983E-09	4.41E-08	5.265E-14	1.147E-06	1.621E-07	6290C01S
7.193E-01	2.440E-07	5.109E-09	1.71E-08	4.663E-14	1.142E-06	1.616E-07	6290C01S
7.419E-01	2.980E-07	9.953E-09	1.803E-08	3.854E-14	1.137E-06	1.611E-07	6290C01S
7.645E-01	1.869E-07	1.275E-08	2.034E-08	4.201E-14	1.102E-06	1.577E-07	726JA02LS
7.871E-01	1.868E-07	1.271E-08	2.116E-08	4.338E-14	1.095E-06	1.569E-07	726JA02LS
8.097E-01	1.836E-07	1.253E-08	2.136E-08	4.356E-14	1.090E-06	1.563E-07	726JA02LS
8.323E-01	1.716E-07	1.186E-08	2.034E-08	4.130E-14	1.083E-06	1.555E-07	726JA02LS
8.549E-01	1.555E-07	1.135E-08	1.976E-08	4.000E-14	1.077E-06	1.548E-07	726JA02LS
8.775E-01	1.513E-07	1.098E-08	1.815E-08	3.657E-14	1.073E-06	1.543E-07	726JA02LS
8.999E-01	1.407E-07	1.051E-08	1.699E-08	3.425E-14	1.068E-06	1.537E-07	726JA02LS
9.223E-01	1.287E-07	1.012E-08	1.564E-08	3.145E-14	1.063E-06	1.531E-07	726JA02LS
9.447E-01	1.365E-07	1.057E-08	1.672E-08	3.352E-14	1.058E-06	1.525E-07	726JA02LS
9.671E-01	1.331E-07	1.028E-08	1.640E-08	3.280E-14	1.054E-06	1.520E-07	726JA02LS
9.895E-01	1.420E-07	1.087E-08	1.761E-08	3.514E-14	1.049E-06	1.514E-07	726JA02LS
1.011E+00	1.506E-07	1.133E-08	1.890E-08	3.742E-14	1.044E-06	1.508E-07	726JA02LS
1.033E+00	1.529E-07	1.160E-08	1.921E-08	3.819E-14	1.039E-06	1.502E-07	726JA02LS
1.055E+00	1.605E-07	1.201E-08	2.029E-08	4.019E-14	1.034E-06	1.495E-07	726JA02LS
1.077E+00	1.586E-07	1.201E-08	2.017E-08	3.986E-14	1.029E-06	1.489E-07	726JA02LS
1.099E+00	1.534E-07	1.191E-08	1.953E-08	3.870E-14	1.024E-06	1.483E-07	726JA02LS
1.121E+00	1.543E-07	1.177E-08	1.990E-08	3.911E-14	1.018E-06	1.474E-07	726JA02LS
1.143E+00	1.577E-07	1.205E-08	2.046E-08	4.012E-14	1.013E-06	1.468E-07	726JA02LS
1.165E+00	1.577E-07	1.182E-08	1.972E-08	3.858E-14	1.008E-06	1.462E-07	726JA02LS
1.187E+00	1.631E-07	1.244E-08	2.144E-08	4.181E-14	1.003E-06	1.454E-07	726JA02LS
1.209E+00	1.605E-07	1.271E-08	2.194E-08	4.271E-14	9.977E-07	1.448E-07	726JA02LS
1.231E+00	1.670E-07	1.284E-08	2.220E-08	4.312E-14	9.929E-07	1.442E-07	726JA02LS
1.253E+00	1.664E-07	1.267E-08	2.228E-08	4.315E-14	9.866E-07	1.433E-07	726JA02LS
1.275E+00	1.580E-07	1.235E-08	2.126E-08	4.109E-14	9.825E-07	1.428E-07	726JA02LS

1.721E+00	1.541E-07	1.226E-08	2.086E-08	4.025E-14	9.766E-07	1.420E-07	726JA02LS
1.760E+00	1.558E-07	1.253E-08	1.28E-08	4.090E-14	9.706E-07	1.412E-07	726JA02LS
1.787E+00	1.467E-07	1.223E-08	0.13E-08	3.862E-14	9.665E-07	1.406E-07	726JA02LS
1.823E+00	1.565E-07	1.241E-08	1.63E-08	4.137E-14	9.610E-07	1.398E-07	726JA02LS
1.859E+00	1.671E-07	1.303E-08	3.26E-08	4.438E-14	9.552E-07	1.390E-07	726JA02LS
1.895E+00	1.671E-07	1.320E-08	3.64E-08	4.503E-14	9.508E-07	1.384E-07	726JA02LS
1.91E+00	1.70E-07	1.347E-08	3.94E-08	4.568E-14	1.145E-07	1.375E-07	726JA02LS
1.955E+00	1.755E-07	1.370E-08	4.56E-08	4.714E-14	9.385E-07	1.367E-07	726JA02LS
1.990E+00	1.779E-07	1.389E-08	4.53E-08	4.798E-14	9.323E-07	1.358E-07	726JA02LS
1.024E+00	1.740E-07	1.350E-08	4.48E-08	4.713E-14	9.263E-07	1.350E-07	726JA02LS
0.958E+00	1.847E-07	1.405E-08	4.64E-08	4.824E-14	9.202E-07	1.341E-07	726JA02LS
0.92E+00	1.964E-07	1.447E-08	4.69E-08	4.848E-14	9.137E-07	1.332E-07	726JA02LS
1.125E+00	2.131E-07	1.548E-08	5.11E-08	5.048E-14	9.072E-07	1.322E-07	726JA02LS
1.158E+00	2.168E-07	1.568E-08	5.105E-08	5.076E-14	8.998E-07	1.313E-07	726JA02LS
1.191E+00	0.055E-07	1.500E-08	4.958E-08	5.071E-14	8.928E-07	1.302E-07	726JA02LS
1.191E+00	0.231E-07	1.568E-08	5.196E-08	5.177E-14	8.928E-07	1.302E-07	726JA02HS
1.224E+00	0.244E-07	1.577E-08	5.216E-08	6.239E-14	8.854E-07	1.291E-07	726JA02LS
1.256E+00	0.243E-07	1.557E-08	5.215E-08	6.262E-14	8.783E-07	1.281E-07	726JA02LS
1.288E+00	0.186E-07	1.518E-08	5.14E-08	6.128E-14	8.712E-07	1.271E-07	726JA02LS
1.320E+00	0.085E-07	1.504E-08	4.991E-08	6.043E-14	8.643E-07	1.261E-07	726JA02LS
1.360E+00	0.097E-07	1.565E-08	5.308E-08	5.935E-14	8.560E-07	1.249E-07	726JA02LS
1.369E+00	0.390E-07	1.614E-08	5.430E-08	6.773E-14	8.540E-07	1.246E-07	726JA02HS
1.391E+00	0.222E-07	1.646E-08	5.190E-08	6.731E-14	8.489E-07	1.239E-07	726JA02LS
1.422E+00	0.297E-07	1.634E-08	5.298E-08	6.556E-14	8.419E-07	1.229E-07	726JA02LS
1.453E+00	0.352E-07	1.386E-08	3.77E-08	6.739E-14	8.347E-07	1.218E-07	726JA02LS
1.492E+00	0.364E-07	1.444E-08	3.424E-08	6.855E-14	8.254E-07	1.205E-07	726JA02LS
1.568E+00	0.418E-07	1.467E-08	3.476E-08	7.033E-14	8.072E-07	1.179E-07	726JA02HS
1.741E+00	0.325E-07	1.421E-08	3.348E-08	6.919E-14	7.662E-07	1.120E-07	726JA02HS
1.915E+00	0.347E-07	1.386E-08	3.385E-08	7.144E-14	7.255E-07	1.061E-07	726JA02HS
1.146E+00	0.095E-07	1.258E-08	3.028E-08	6.574E-14	6.742E-07	9.871E-08	726JA02HS
1.320E+00	0.008E-07	1.205E-08	3.066E-08	6.445E-14	6.385E-07	9.354E-08	726JA02HS
1.551E+00	1.746E-07	1.082E-08	5.33E-08	6.777E-14	5.981E-07	8.726E-08	726JA02HS
1.724E+00	1.586E-07	9.842E-09	3.05E-08	6.368E-14	5.663E-07	8.308E-08	726JA02HS
1.894E+00	1.556E-07	9.609E-09	2.64E-08	5.996E-14	5.396E-07	7.919E-08	726JA02HS
1.107E+00	1.557E-07	8.630E-09	2.70E-08	5.40E-14	5.065E-07	7.437E-08	726JA02HS
1.321E+00	1.577E-07	8.670E-09	3.04E-08	5.772E-14	4.729E-07	5.947E-08	726JA02HS
1.500E+00	1.535E-07	9.515E-09	2.47E-08	7.52E-14	4.451E-07	6.540E-08	726JA02HS
1.715E+00	1.513E-07	8.449E-09	2.18E-08	8.29E-14	4.123E-07	6.060E-08	726JA02HS
1.875E+00	1.509E-07	8.341E-09	2.15E-08	9.37E-14	3.881E-07	5.705E-08	726JA02HS
1.067E+00	1.462E-07	9.067E-09	1.49E-08	8.56E-14	3.565E-07	5.243E-08	726JA02HS
1.261E+00	1.378E-07	8.561E-09	0.26E-08	5.48E-14	3.291E-07	4.838E-08	726JA02HS
1.441E+00	1.271E-07	8.129E-09	1.869E-08	1.138E-14	3.079E-07	4.526E-08	726JA02HS
1.655E+00	1.119E-07	7.449E-09	1.64E-08	4.545E-14	2.823E-07	4.150E-08	726JA02HS
1.859E+00	1.059E-07	7.192E-09	1.557E-08	4.324E-14	2.601E-07	3.824E-08	726JA02HS
1.083E+00	1.020E-07	7.082E-09	1.507E-08	4.183E-14	2.399E-07	3.527E-08	726JA02HS
1.259E+00	1.102E-07	7.400E-09	1.42E-08	4.042E-14	2.190E-07	3.190E-08	726JA02HS
1.419E+00	9.699E-08	6.699E-09	1.42E-08	0.19E-14	0.015E-07	2.962E-08	726JA02HS
1.618E+00	9.034E-08	6.269E-09	1.32E-08	3.754E-14	1.828E-07	2.688E-08	726JA02HS
1.816E+00	8.713E-08	6.059E-09	1.28E-08	3.638E-14	1.653E-07	2.430E-08	726JA02HS
1.012E+00	9.309E-08	6.294E-09	1.36E-08	3.904E-14	1.476E-07	2.170E-08	726JA02HS
1.207E+00	8.311E-08	8.82E-09	1.22E-08	3.502E-14	1.304E-07	1.917E-08	726JA02HS
1.400E+00	7.925E-08	8.45E-09	1.16E-08	3.334E-14	1.153E-07	1.667E-08	726JA02HS
1.592E+00	8.945E-08	6.043E-09	1.31E-08	3.803E-14	9.95E-08	1.499E-08	726JA02HS
1.782E+00	9.196E-08	6.034E-09	1.31E-08	3.928E-14	8.133E-08	1.196E-08	726JA02HS
1.019E+00	8.808E-08	4.792E-09	1.01E-08	2.924E-14	6.236E-08	9.169E-09	726JA02HS
1.207E+00	5.175E-08	3.936E-09	7.608E-09	2.233E-14	5.110E-08	7.513E-09	726JA02HS
1.381E+00	4.96E-08	3.636E-09	7.149E-09	2.077E-14	4.242E-08	6.236E-09	726JA02HS
1.575E+00	4.065E-08	2.56E-09	5.976E-09	1.76E-14	3.383E-08	4.874E-09	726JA02HS
1.757E+00	3.109E-08	2.72E-09	5.370E-09	1.359E-14	2.730E-08	4.015E-09	726JA02HS
1.947E+00	3.075E-08	2.62E-09	4.520E-09	1.350E-14	2.142E-08	3.151E-09	726JA02HS

9.175E+00	2.068E-08	2.111E-09	3.039E-09	9.125E-15	1.556E-08	2.289E-09	726JA02HS
9.355E+00	1.560E-08	1.840E-09	2.293E-09	6.912E-15	1.228E-08	1.807E-09	726JA02HS
9.537E+00	1.447E-08	1.650E-09	2.126E-09	6.439E-15	9.558E-09	1.407E-09	726JA02HS
9.761E+00	1.254E-08	1.463E-09	1.843E-09	5.611E-15	6.534E-09	9.622E-10	726JAC2HS
9.939E+00	7.388E-09	1.189E-09	1.085E-09	3.320E-15	4.760E-09	7.014E-10	726JA02HS
1.012E+01	5.503E-09	1.016E-09	8.098E-10	2.461E-15	3.593E-09	5.299E-10	726JA02HS
1.034E+01	3.155E-09	8.607E-10	4.645E-10	1.425E-15	2.641E-09	3.897E-10	726JA02HS
1.051E+01	1.495E-09	8.395E-10	2.204E-10	6.769E-16	2.245E-09	3.315E-10	726JA02HS
1.073E+01	3.354E-09	6.977E-10	4.947E-10	1.521E-15	1.712E-09	2.528E-10	726JA02HS
1.091E+01	3.951E-09	6.972E-10	5.833E-10	1.795E-15	1.054E-09	1.556E-10	726JA02HS
1.112E+01	1.918E-09	4.803E-10	2.832E-10	8.726E-16	4.384E-10	6.484E-11	726JA02HS
1.129E+01	1.008E-09	3.079E-10	1.487E-10	4.587E-16	1.900E-10	2.813E-11	726JA02HS
1.151E+01	3.505E-10	2.701E-10	5.189E-11	1.603E-16	4.081E-11	6.061E-12	726JA02HS
1.168E+01	-2.032E-10	2.480E-10	-3.010E-11	-9.307E-17	2.829E-11	4.209E-12	726JA02HS
1.189E+01	3.810E-11	2.595E-10	5.650E-12	1.749E-17	4.562E-11	6.777E-12	726JA02HS
1.205E+01	2.786E-10	2.694E-10	4.137E-11	1.282E-16	1.869E-11	2.780E-12	726JA02HS
1.227E+01	-4.678E-13	2.811E-10	-6.947E-14	-2.155E-19	-1.053E-11	-1.557E-12	726JA02HS
1.248E+01	-1.313E-10	2.936E-10	-1.953E-11	-6.066E-17	3.307E-12	5.011E-13	726JA02HS
1.264E+01	-4.556E-11	3.038E-10	-6.783E-12	-2.109E-17	1.746E-11	2.606E-12	726JA02HS
1.284E+01	-4.093E-13	3.164E-10	-6.037E-14	-1.879E-19	2.206E-11	3.290E-12	726JA02HS
1.305E+01	4.859E-11	3.299E-10	7.245E-12	2.258E-17	1.700E-11	2.536E-12	726JA02HS
1.322E+01	1.514E-10	3.411E-10	2.259E-11	7.047E-17	0.	0.	726JA02HS

1 PUBE 25 CM D20 AT R=1M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING
COMPILE DATE OF THIS CODE VERSION

10/14/77U 14:59:20R 10/17/77
16.05.47

30 GROUP OUTPUT

GROUP#	ENERGY UP-BOUND-MEV	DIFFERENTIAL FLUX 1/CM2-SEC-MEV	INTEGRAL FLUX N/CM2-SEC	FLUX PER UNIT LETHARGY N/CM2-SEC
30	4.000000E-07	0.	0.	0.
29	3.180000E-06	0.	0.	0.
28	2.520000E-05	0.	0.	0.
27	2.000000E-04	0.	0.	0.
26	1.590000E-03	0.	0.	0.
25	1.261000E-02	0.	0.	0.
24	1.000000E-01	0.	0.	0.
23	2.236000E-01	9.292830E-07	1.148594E-07	1.502580E-07
22	3.000000E-01	5.425600E-07	1.499636E-07	1.962482E-07
21	5.948000E-01	2.724013E-07	2.575916E-08	1.490852E-07
20	7.071000E-01	2.961853E-07	3.332084E-08	1.927722E-07
19	8.409000E-01	2.046788E-07	2.738603E-08	1.584214E-07
18	1.000000E+00	1.873379E-07	2.980545E-08	1.724351E-07
17	1.257400E+00	1.471124E-07	3.786872E-08	1.660457E-07
16	1.581100E+00	1.550826E-07	5.020023E-08	2.201009E-07
15	1.988200E+00	1.640468E-07	6.678346E-08	2.927662E-07
14	2.500000E+00	2.131189E-07	1.090742E-07	4.782501E-07
13	2.973000E+00	2.356195E-07	1.114480E-07	6.447727E-07
12	3.535500E+00	2.030582E-07	1.142203E-07	6.608023E-07
11	4.204500E+00	1.593874E-07	1.066302E-07	6.168291E-07
10	5.000000E+00	1.531035E-07	1.217938E-07	7.046206E-07
9	5.764800E+00	1.297354E-07	9.922164E-08	6.982878E-07
8	6.465000E+00	1.020125E-07	8.994441E-08	6.305388E-07
7	7.663100E+00	8.665971E-08	8.609826E-08	6.200329E-07
6	8.835200E+00	5.741355E-08	6.729443E-08	4.736130E-07
5	1.018600E+01	1.600460E-08	2.161901E-08	1.522133E-07
4	1.174500E+01	2.051687E-09	3.214170E-09	2.260743E-08
3	1.354100E+01	4.913888E-11	8.825344E-11	6.212629E-10
2	1.561200E+01	0.	0.	0.
1	1.800000E+01	0.	0.	0.

1 PUBE 20 CM ALUMINUM AT R=1M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING
COMPILATION DATE OF THIS CODE VERSION

14:47:07R 10/17/77
10/14/77U 16.05.47

ENERGY (MEV)	PHI (NEUT/CM ² -SEC-MEV)	DEL-PHI	DOSE (MR/HR-MEV)	KERMA (ERG/GM-SEC-MEV)	INTEGRAL (NEUT/CM ² -SEC)	INT-DOSE (MR/HR)	FILE-ID
1.642E-01	2.997E-06	1.499E-07	7.599E-08	2.251E-13	6.759E-06	7.557E-07	603N003S
1.869E-01	3.412E-06	8.094E-08	9.279E-08	2.698E-13	6.866E-06	7.538E-07	603N003S
2.096E-01	3.835E-06	9.058E-08	1.119E-07	3.191E-13	6.604E-06	7.515E-07	603N003S
2.322E-01	4.235E-06	1.012E-07	1.324E-07	3.709E-13	6.513E-06	7.487E-07	603N003S
2.549E-01	4.545E-06	1.083E-07	1.524E-07	4.188E-13	6.413E-06	7.455E-07	603N003S
2.775E-01	4.824E-06	1.113E-07	1.699E-07	4.630E-13	6.308E-06	7.419E-07	603N003S
3.002E-01	5.111E-06	1.11E-07	1.888E-07	5.034E-13	6.205E-06	7.39E-07	603N003S
3.228E-01	5.469E-06	1.083E-07	1.941E-07	5.040E-13	6.093E-06	7.35E-07	603N003S
3.455E-01	5.540E-06	1.035E-07	2.013E-07	5.130E-13	5.989E-06	7.291E-07	603N003S
3.681E-01	5.328E-06	9.765E-08	2.058E-07	5.145E-13	5.886E-06	7.245E-07	603N003S
3.908E-01	4.091E-06	9.129E-08	2.086E-07	5.118E-13	5.793E-06	7.198E-07	603N003S
4.134E-01	3.832E-06	8.496E-08	2.06E-07	5.071E-13	5.703E-06	7.15E-07	603N003S
4.361E-01	3.632E-06	7.943E-08	2.03E-07	5.033E-13	5.618E-06	7.103E-07	603N003S
4.587E-01	3.440E-06	7.689E-08	2.01E-07	5.01E-13	5.535E-06	7.054E-07	603N003S
4.814E-01	3.274E-06	7.088E-08	2.07E-07	5.024E-13	5.462E-06	7.004E-07	603N003S
5.041E-01	3.128E-06	6.721E-08	2.243E-07	5.021E-13	5.399E-06	6.954E-07	603N003S
5.267E-01	3.001E-06	6.403E-08	2.201E-07	4.907E-13	5.320E-06	6.904E-07	603N003S
5.494E-01	2.888E-06	6.135E-08	2.167E-07	4.810E-13	5.253E-06	6.854E-07	603N003S
5.720E-01	2.794E-06	5.895E-08	2.137E-07	4.722E-13	5.189E-06	6.805E-07	603N003S
5.947E-01	2.676E-06	5.646E-08	2.101E-07	4.623E-13	5.127E-06	6.757E-07	603N003S
6.173E-01	2.557E-06	5.364E-08	2.054E-07	4.499E-13	5.068E-06	6.710E-07	603N003S
6.400E-01	2.423E-06	5.048E-08	1.991E-07	4.343E-13	5.012E-06	6.665E-07	603N003S
6.626E-01	2.275E-06	4.710E-08	1.912E-07	4.152E-13	4.958E-06	6.620E-07	603N003S
6.853E-01	2.115E-06	4.351E-08	1.819E-07	3.932E-13	4.909E-06	6.578E-07	603N003S
7.079E-01	1.94E-06	3.973E-08	1.712E-07	3.685E-13	4.863E-06	6.538E-07	603N003S
7.306E-01	1.775E-06	3.593E-08	1.598E-07	3.425E-13	4.821E-06	6.501E-07	603N003S
7.533E-01	1.605E-06	3.230E-08	1.482E-07	3.162E-13	4.782E-06	6.466E-07	603N003S
7.760E-01	2.692E-06	1.648E-07	1.920E-07	6.037E-13	4.432E-06	6.107E-07	728JA02LS
7.987E-01	2.603E-06	1.587E-07	1.939E-07	6.029E-13	4.326E-06	5.990E-07	728JA02LS
8.214E-01	2.548E-06	1.567E-07	1.953E-07	6.026E-13	4.259E-06	5.914E-07	728JA02LS
8.441E-01	2.452E-06	1.500E-07	1.905E-07	5.900E-13	4.164E-06	5.803E-07	728JA02LS
8.668E-01	2.372E-06	1.444E-07	1.80E-07	5.732E-13	4.075E-06	5.696E-07	728JA02LS
8.895E-01	2.263E-06	1.397E-07	1.712E-07	5.548E-13	4.015E-06	5.601E-07	728JA02LS
9.122E-01	2.164E-06	1.333E-07	1.610E-07	5.264E-13	3.946E-06	5.542E-07	728JA02LS
9.349E-01	2.018E-06	1.258E-07	1.451E-07	4.930E-13	3.869E-06	5.448E-07	728JA02LS
9.576E-01	1.925E-06	1.195E-07	1.355E-07	4.724E-13	3.798E-06	5.362E-07	728JA02LS
9.803E-01	1.844E-06	1.142E-07	1.270E-07	4.542E-13	3.734E-06	5.283E-07	728JA02LS
1.006E+00	1.745E-06	1.094E-07	1.185E-07	4.315E-13	3.675E-06	5.210E-07	728JA02LS
1.029E+00	1.668E-06	1.046E-07	1.079E-07	4.140E-13	3.615E-06	5.140E-07	728JA02LS
1.052E+00	1.605E-06	1.017E-07	1.014E-07	4.001E-13	3.564E-06	5.073E-07	728JA02LS
1.075E+00	1.558E-06	9.853E-08	1.967E-07	3.898E-13	3.514E-06	5.009E-07	728JA02LS
1.098E+00	1.511E-06	9.577E-08	1.920E-07	3.794E-13	3.466E-06	4.949E-07	728JA02LS
1.121E+00	1.497E-06	9.524E-08	1.914E-07	3.774E-13	3.418E-06	4.887E-07	728JA02LS
1.144E+00	1.488E-06	9.386E-08	1.917E-07	3.769E-13	3.358E-06	4.811E-07	728JA02LS
1.167E+00	1.485E-06	9.221E-08	1.84E-07	3.654E-13	3.317E-06	4.744E-07	728JA02LS
1.190E+00	1.425E-06	9.034E-08	1.856E-07	3.634E-13	3.271E-06	4.698E-07	728JA02LS
1.213E+00	1.412E-06	8.901E-08	1.854E-07	3.618E-13	3.216E-06	4.625E-07	728JA02LS
1.236E+00	1.403E-06	8.876E-08	1.852E-07	3.607E-13	3.175E-06	4.572E-07	728JAC2LS
1.259E+00	1.358E-06	8.616E-08	1.802E-07	3.502E-13	3.135E-06	4.519E-07	728JA02LS
1.282E+00	1.307E-06	8.326E-08	1.747E-07	3.386E-13	3.086E-06	4.453E-07	728JA02LS
1.305E+00	1.263E-06	8.062E-08	1.697E-07	3.282E-13	3.050E-06	4.405E-07	728JA02LS

1.713E+00	1.224E-06	7.819E-08	1.656E-07	3.194E-13	3.005E-06	4.344E-07	728JA02LS
1.750E+00	1.225E-06	7.821E-08	1.668E-07	3.211E-13	3.927E-06	4.263E-07	728JA02LS
1.777E+00	1.224E-06	7.789E-08	1.677E-07	3.219E-13	3.927E-06	4.263E-07	728JA02LS
1.813E+00	1.223E-06	7.748E-08	1.655E-07	3.246E-13	3.882E-06	4.177E-07	728JA02LS
1.848E+00	1.219E-06	7.683E-08	1.694E-07	3.234E-13	3.840E-06	4.118E-07	728JA02LS
1.875E+00	1.244E-06	7.784E-08	1.737E-07	3.311E-13	3.806E-06	4.071E-07	728JA02LS
1.910E+00	1.207E-06	7.576E-08	1.696E-07	3.224E-13	3.763E-06	4.011E-07	728JA02LS
1.944E+00	1.187E-06	7.429E-08	1.680E-07	3.185E-13	3.723E-06	3.954E-07	728JA02LS
1.978E+00	1.170E-06	7.301E-08	1.666E-07	3.150E-13	3.683E-06	3.897E-07	728JA02LS
2.012E+00	1.125E-06	7.019E-08	1.608E-07	3.041E-13	3.644E-06	3.841E-07	728JA02LS
2.025E+00	1.150E-06	6.839E-08	1.645E-07	3.115E-13	3.629E-06	3.820E-07	728JA02HS
2.046E+00	1.096E-06	6.721E-08	1.565E-07	2.976E-13	3.605E-06	3.786E-07	728JA02LS
2.079E+00	1.076E-06	6.561E-08	1.540E-07	2.935E-13	3.569E-06	3.735E-07	728JA02LS
2.112E+00	1.051E-06	6.387E-08	1.504E-07	2.879E-13	3.540E-06	3.685E-07	728JA02LS
2.145E+00	1.023E-06	6.182E-08	1.458E-07	2.816E-13	3.509E-06	3.636E-07	728JA02LS
2.178E+00	1.030E-06	6.142E-08	1.475E-07	2.845E-13	3.466E-06	3.583E-07	728JA02LS
2.210E+00	9.912E-07	6.006E-08	1.420E-07	2.751E-13	3.434E-06	3.541E-07	728JA02LS
2.222E+00	1.032E-06	5.960E-08	1.478E-07	2.869E-13	3.422E-06	3.524E-07	728JA02HS
2.242E+00	9.642E-07	5.803E-08	1.382E-07	2.687E-13	3.402E-06	3.495E-07	728JA02LS
2.274E+00	9.577E-07	5.641E-08	1.379E-07	2.680E-13	3.371E-06	3.451E-07	728JA02LS
2.306E+00	9.289E-07	5.476E-08	1.332E-07	2.610E-13	3.341E-06	3.408E-07	728JA02LS
2.337E+00	9.012E-07	5.405E-08	1.293E-07	2.543E-13	3.313E-06	3.367E-07	728JA02LS
2.376E+00	8.703E-07	5.287E-08	1.249E-07	2.469E-13	3.278E-06	3.318E-07	728JA02LS
2.407E+00	8.524E-07	5.221E-08	1.224E-07	2.428E-13	3.251E-06	3.279E-07	728JA02LS
2.420E+00	8.235E-07	5.182E-08	1.182E-07	2.349E-13	3.240E-06	3.264E-07	728JA02HS
2.438E+00	8.284E-07	6.876E-08	1.189E-07	2.369E-13	3.226E-06	3.242E-07	728JA02LS
2.476E+00	8.226E-07	6.083E-08	1.181E-07	2.354E-13	3.194E-06	3.197E-07	728JA02LS
2.667E+00	8.896E-07	6.438E-08	1.280E-07	2.621E-13	3.031E-06	2.962E-07	728JA02HS
2.839E+00	8.787E-07	4.430E-08	9.780E-08	2.045E-13	1.896E-06	2.768E-07	728JA02HS
3.010E+00	7.222E-07	4.675E-08	1.042E-07	2.226E-13	1.776E-06	2.595E-07	728JA02HS
3.239E+00	7.233E-07	4.139E-08	1.048E-07	2.297E-13	1.610E-06	2.356E-07	728JA02HS
3.411E+00	6.896E-07	4.539E-08	9.990E-08	2.240E-13	1.489E-06	2.180E-07	728JA02HS
3.639E+00	5.378E-07	3.820E-08	7.808E-08	1.800E-13	1.349E-06	1.977E-07	728JA02HS
3.811E+00	5.240E-07	3.744E-08	7.528E-08	1.795E-13	1.308E-06	1.845E-07	728JA02HS
4.025E+00	4.375E-07	3.350E-08	6.209E-08	1.540E-13	1.155E-06	1.695E-07	728JA02HS
4.183E+00	4.133E-07	3.310E-08	6.029E-08	1.465E-13	1.087E-06	1.597E-07	728JA02HS
4.412E+00	4.434E-07	3.473E-08	6.482E-08	1.642E-13	9.894E-07	1.453E-07	728JA02HS
4.572E+00	4.298E-07	3.400E-08	6.293E-08	1.625E-13	9.196E-07	1.351E-07	728JA02HS
4.785E+00	3.764E-07	3.205E-08	5.523E-08	1.464E-13	8.337E-07	1.225E-07	728JA02HS
4.955E+00	3.395E-07	2.553E-08	5.492E-08	1.454E-13	7.549E-07	1.101E-07	728JA02HS
5.151E+00	3.181E-07	2.286E-08	4.647E-08	1.269E-13	6.931E-07	1.031E-07	728JA02HS
5.344E+00	2.869E-07	2.164E-08	4.547E-08	1.157E-13	6.429E-07	9.452E-08	728JA02HS
5.555E+00	2.962E-07	2.203E-08	4.354E-08	1.200E-13	5.814E-07	8.548E-08	728JA02HS
5.766E+00	2.156E-07	1.897E-08	3.170E-08	8.783E-14	5.274E-07	7.754E-08	728JA02HS
5.958E+00	2.083E-07	1.895E-08	3.062E-08	8.521E-14	4.867E-07	7.156E-08	728JA02HS
6.119E+00	2.073E-07	1.888E-08	3.047E-08	8.512E-14	4.533E-07	6.664E-08	728JA02HS
6.318E+00	1.806E-07	1.888E-08	2.744E-08	7.703E-14	4.141E-07	6.088E-08	728JA02HS
6.515E+00	1.806E-07	1.779E-08	2.686E-08	7.779E-14	3.779E-07	5.660E-08	728JA02HS
6.712E+00	1.328E-07	1.626E-08	2.499E-08	5.522E-14	3.471E-07	5.102E-08	728JA02HS
6.906E+00	1.375E-07	1.695E-08	2.315E-08	6.588E-14	3.189E-07	4.689E-08	728JA02HS
7.100E+00	1.563E-07	1.312E-08	2.298E-08	6.571E-14	2.885E-07	4.241E-08	728JA02HS
7.292E+00	1.473E-07	1.288E-08	2.166E-08	6.220E-14	2.593E-07	3.813E-08	728JA02HS
7.485E+00	1.596E-07	1.333E-08	2.349E-08	6.775E-14	2.302E-07	3.384E-08	728JA02HS
7.672E+00	1.666E-07	1.351E-08	2.453E-08	7.109E-14	1.991E-07	2.980E-08	728JA02HS
7.907E+00	1.562E-07	1.256E-08	2.366E-08	6.691E-14	1.812E-07	2.570E-08	728JA02HS
8.093E+00	1.410E-07	1.151E-08	2.072E-08	6.065E-14	1.335E-07	1.963E-08	728JA02HS
8.278E+00	1.252E-07	1.039E-06	1.841E-08	5.410E-14	1.089E-07	1.601E-08	728JA02HS
8.453E+00	9.735E-08	8.981E-09	1.431E-08	4.224E-14	9.244E-08	1.315E-08	728JA02HS
8.645E+00	8.341E-08	8.108E-09	1.226E-08	3.636E-14	7.208E-08	1.060E-08	728JA02HS
8.860E+00	6.736E-08	5.833E-09	9.902E-09	2.951E-14	5.586E-08	8.218E-09	728JA02HS

9.054E+00	4.649E-08	4.829E-09	5.835E-09	2.046E-14	4.483E-08	6.595E-09	728JA02HS
9.234E+00	5.328E-08	4.797E-09	7.832E-09	2.355E-14	3.585E-08	5.275E-09	728JA02HS
9.458E+00	3.113E-08	3.838E-09	4.576E-09	1.383E-14	2.640E-08	3.885E-09	728JA02HS
9.636E+00	2.487E-08	3.360E-09	3.555E-09	1.109E-14	2.142E-08	3.153E-09	728JA02HS
9.813E+00	2.365E-08	3.219E-09	3.476E-09	1.059E-14	1.712E-08	2.522E-09	728JA02HS
1.003E+01	1.830E-08	2.697E-09	2.691E-09	8.238E-15	1.257E-08	1.853E-09	728JA02HS
1.021E+01	1.532E-08	2.515E-09	2.254E-09	6.908E-15	9.546E-09	1.408E-09	728JA02HS
1.043E+01	1.110E-08	2.046E-09	1.636E-09	5.020E-15	6.640E-09	9.798E-10	728JA02HS
1.060E+01	1.124E-08	1.530E-09	1.656E-09	5.088E-15	4.741E-09	7.000E-10	728JA02HS
1.081E+01	8.016E-09	1.148E-09	1.183E-09	3.639E-15	2.719E-09	4.018E-10	728JA02HS
1.099E+01	5.592E-09	9.555E-10	8.258E-10	2.543E-15	1.494E-09	2.210E-10	728JA02HS
1.120E+01	1.424E-09	6.143E-10	2.105E-10	6.488E-16	7.578E-10	1.122E-10	728JA02HS
1.137E+01	8.020E-10	5.022E-10	1.185E-10	3.661E-16	5.687E-10	8.426E-11	728JA02HS
1.158E+01	1.297E-09	4.580E-10	1.920E-10	5.933E-16	3.483E-10	5.164E-11	728JA02HS
1.175E+01	6.960E-10	4.280E-10	1.031E-10	3.190E-16	1.789E-10	2.655E-11	728JA02HS
1.198E+01	4.684E-11	3.297E-10	6.963E-12	2.156E-17	1.009E-10	1.499E-11	728JA02HS
1.217E+01	4.333E-10	3.683E-10	6.434E-11	1.995E-16	5.050E-11	7.500E-12	728JA02HS
1.233E+01	8.172E-11	2.876E-10	1.272E-11	3.949E-17	8.983E-12	1.335E-12	728JA02HS
1.254E+01	-3.837E-14	3.002E-10	-5.763E-15	-1.797E-20	-3.693E-15	-5.493E-16	728JA02HS
1.273E+01	0.	3.123E-10	0.	0.	0.	0.	728JA02HS
1.290E+01	0.	4.011E-10	0.	0.	0.	0.	728JA02HS
1.310E+01	0.	3.983E-09	0.	0.	0.	0.	728JA02HS

1 PUBE 20 CM ALUMINUM AT R=1M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING
 COMPILATION DATE OF THIS CODE VERSION

14:47:07R 10/17/77
 10/14/77U 16.05.47

30 GROUP OUTPUT

GROUP#	ENERGY UP-BOUND-MEV	DIFFERENTIAL FLUX N/CM2-SEC-MEV	INTEGRAL FLUX N/CM2-SEC	FLUX PER UNIT LETHARGY N/CM2-SEC
30	4.000000E-07	0.	0.	0.
29	3.180000E-06	0.	0.	0.
28	2.520000E-05	0.	0.	0.
27	2.000000E-04	0.	0.	0.
26	1.580000E-03	0.	0.	0.
25	1.261000E-02	0.	0.	0.
24	1.000000E-01	0.	0.	0.
23	2.236000E-01	3.259793E-06	4.029104E-07	5.274345E-07
22	5.000000E-01	4.146320E-06	1.146043E-06	1.500139E-06
21	5.946000E-01	2.904532E-06	2.747688E-07	1.589651E-06
20	7.071000E-01	2.338979E-06	2.631351E-07	1.522324E-06
19	8.409000E-01	1.858713E-06	2.486958E-07	1.436644E-06
18	1.000000E+00	2.525007E-06	4.017286E-07	2.324143E-06
17	1.257400E+00	2.117519E-06	3.450493E-07	2.390043E-06
16	1.581100E+00	1.517598E-06	4.912463E-07	2.153850E-06
15	1.988200E+00	1.245022E-06	5.068485E-07	2.221929E-06
14	2.500000E+00	9.700368E-07	4.964648E-07	2.176860E-06
13	2.973000E+00	7.860052E-07	3.717805E-07	2.150903E-06
12	3.535500E+00	7.009158E-07	3.942651E-07	2.280955E-06
11	4.204500E+00	4.927988E-07	3.296824E-07	1.907131E-06
10	5.000000E+00	4.091728E-07	3.254969E-07	1.683115E-06
9	5.764800E+00	2.946842E-07	2.253745E-07	1.586108E-06
8	6.646500E+00	1.944248E-07	1.714243E-07	1.206532E-06
7	7.662100E+00	1.531141E-07	1.356556E-07	1.095501E-06
6	8.895200E+00	1.220494E-07	1.430471E-07	1.006734E-06
5	1.018600E+01	3.527663E-08	4.765168E-08	3.355020E-07
4	1.174500E+01	6.245077E-09	9.736074E-09	6.848039E-08
3	1.354100E+01	1.015894E-10	1.824545E-10	1.264394E-09
2	1.561200E+01	0.	0.	0.
1	1.800000E+01	0.	0.	0.

1 PUBE 2 CM POLY AT R=1M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING
 COMPILATION DATE OF THIS CODE VERSION

15.00.24R 10/17/77
 10/14/77U 16.05.47

ENERGY (MEV)	PHI (NEUT/CM2-SEC-MEV)	DEL-PHI	DOSE (MR/HR-MEV)	KERMA (ERG/GM-SEC-MEV)	INTEGRAL (NEUT/CM2-SEC)	INT-DOSE (MR-HR)	FILE-10
1.529E-01	1.833E-06	9.154E-08	4.487E-08	1.342E-13	7.100E-06	9.169E-07	610N002S
1.756E-01	1.040E-06	4.337E-08	4.999E-08	1.467E-13	7.058E-06	9.158E-07	610N002S
1.982E-01	2.031E-06	4.710E-08	5.718E-08	1.697E-13	7.014E-06	9.146E-07	610N002S
2.209E-01	2.188E-06	5.307E-08	6.608E-08	1.867E-13	6.965E-06	9.132E-07	610N002S
2.435E-01	2.308E-06	5.497E-08	7.471E-08	2.072E-13	6.915E-06	9.116E-07	610N002S
2.662E-01	2.361E-06	5.505E-08	8.198E-08	2.231E-13	6.862E-06	9.099E-07	610N002S
2.888E-01	3.62E-06	5.474E-08	8.794E-08	2.349E-13	6.809E-06	9.079E-07	610N002S
3.115E-01	3.36E-06	5.356E-08	9.325E-08	2.444E-13	6.755E-06	9.059E-07	610N002S
3.341E-01	2.29E-06	5.184E-08	9.803E-08	2.522E-13	6.703E-06	9.037E-07	610N002S
3.568E-01	2.39E-06	5.301E-08	1.028E-07	2.595E-13	6.652E-06	9.014E-07	610N002S
3.795E-01	2.189E-06	5.387E-08	1.078E-07	2.671E-13	6.601E-06	8.990E-07	610N002S
4.021E-01	2.142E-06	5.298E-08	1.131E-07	2.750E-13	6.552E-06	8.965E-07	610N002S
4.248E-01	2.097E-06	5.008E-08	1.187E-07	2.832E-13	6.504E-06	8.939E-07	610N002S
4.474E-01	2.049E-06	4.522E-08	1.244E-07	2.911E-13	6.457E-06	8.912E-07	610N002S
4.701E-01	1.894E-06	4.342E-08	1.298E-07	2.983E-13	6.411E-06	8.883E-07	610N002S
4.927E-01	1.930E-06	4.180E-08	1.348E-07	3.038E-13	6.367E-06	8.853E-07	610N002S
5.154E-01	1.855E-06	3.993E-08	1.345E-07	3.038E-13	6.324E-06	8.822E-07	610N002S
5.380E-01	1.767E-06	3.782E-08	1.310E-07	2.915E-13	6.283E-06	8.792E-07	610N002S
5.607E-01	1.664E-06	3.538E-08	1.263E-07	2.795E-13	6.244E-06	8.763E-07	610N002S
5.833E-01	1.549E-06	3.264E-08	1.203E-07	2.652E-13	6.208E-06	8.735E-07	610N002S
6.060E-01	1.427E-06	2.990E-08	1.134E-07	2.489E-13	6.174E-06	8.709E-07	610N002S
6.287E-01	1.299E-06	3.778E-08	1.056E-07	2.307E-13	6.140E-06	8.684E-07	610N002S
6.513E-01	1.164E-06	4.282E-08	9.379E-08	2.108E-13	6.115E-06	8.651E-07	610N002S
6.740E-01	1.027E-06	4.456E-08	8.731E-08	1.892E-13	6.091E-06	8.640E-07	610N002S
6.966E-01	8.896E-07	4.270E-08	7.739E-08	1.669E-13	6.069E-06	8.622E-07	610N002S
7.193E-01	7.591E-07	3.759E-08	6.756E-08	1.451E-13	6.050E-06	8.605E-07	610N002S
7.419E-01	6.407E-07	3.127E-08	5.833E-08	1.247E-13	6.034E-06	8.591E-07	610N002S
7.646E-01	5.094E-07	6.642E-08	1.009E-07	1.089E-13	5.966E-06	8.481E-07	718JA02LS
7.872E-01	3.784E-07	6.849E-08	8.911E-08	9.31E-13	5.869E-06	8.421E-07	718JA02LS
8.098E-01	9.461E-07	6.675E-08	1.002E-07	2.214E-13	5.844E-06	8.393E-07	718JA02LS
8.324E-01	9.437E-07	6.662E-08	1.115E-07	2.266E-13	5.810E-06	8.353E-07	718JA02LS
8.550E-01	9.266E-07	6.434E-08	1.062E-07	2.153E-13	5.777E-06	8.314E-07	718JA02LS
8.776E-01	8.710E-07	6.431E-08	1.041E-07	2.108E-13	5.756E-06	8.289E-07	718JA02LS
9.002E-01	8.476E-07	6.381E-08	1.020E-07	2.058E-13	5.728E-06	8.253E-07	718JA02LS
9.228E-01	7.89E-07	6.152E-08	9.416E-08	1.835E-13	5.689E-06	8.222E-07	718JA02LS
9.454E-01	7.496E-07	6.090E-08	9.126E-08	1.834E-13	5.676E-06	8.193E-07	718JA02LS
9.680E-01	7.710E-07	6.081E-08	9.454E-08	1.895E-13	5.648E-06	8.158E-07	718JA02LS
9.906E-01	7.670E-07	6.176E-08	9.463E-08	1.892E-13	5.623E-06	8.128E-07	718JA02LS
1.013E+00	8.098E-07	6.421E-08	1.005E-07	2.005E-13	5.598E-06	8.097E-07	718JA02LS
1.036E+00	8.086E-07	6.515E-08	1.010E-07	2.010E-13	5.572E-06	8.065E-07	718JA02LS
1.059E+00	7.876E-07	6.487E-08	9.892E-08	1.969E-13	5.547E-06	8.034E-07	718JA02LS
1.082E+00	7.876E-07	6.53E-08	1.028E-07	2.028E-13	5.533E-06	8.003E-07	718JA02LS
1.105E+00	8.212E-07	6.808E-08	1.044E-07	2.063E-13	5.499E-06	7.972E-07	718JA02LS
1.128E+00	8.266E-07	6.654E-08	1.057E-07	2.084E-13	5.474E-06	7.941E-07	718JA02LS
1.151E+00	8.952E-07	6.240E-08	8.955E-08	1.761E-13	5.444E-06	7.903E-07	718JA02LS
1.174E+00	6.773E-07	6.257E-08	8.773E-08	1.721E-13	5.424E-06	7.877E-07	718JA02LS
1.197E+00	6.793E-07	6.337E-08	8.769E-08	1.727E-13	5.403E-06	7.852E-07	718JA02LS
1.220E+00	6.476E-07	6.408E-08	8.498E-08	1.659E-13	5.380E-06	7.820E-07	718JA02LS
1.243E+00	5.988E-07	6.340E-08	8.577E-08	1.539E-13	5.357E-06	7.792E-07	718JA02LS
1.266E+00	6.176E-07	6.234E-08	8.202E-08	1.594E-13	5.341E-06	7.768E-07	718JA02LS
1.289E+00	6.088E-07	6.299E-08	8.128E-08	1.576E-13	5.325E-06	7.746E-07	718JA02LS

1.678E+00	6.599E-07	6.610E-08	8.870E-08	1.715E-13	5.302E-06	7.715E-07	718JAO2LS
1.703E+00	6.986E-07	6.859E-08	9.436E-08	1.821E-13	5.285E-06	7.692E-07	718JAO2LS
1.739E+00	6.607E-07	6.844E-08	8.985E-08	1.730E-13	5.260E-06	7.659E-07	718JAO2LS
1.765E+00	6.975E-07	6.736E-08	9.534E-08	1.832E-13	5.243E-06	7.635E-07	718JAO2LS
1.800E+00	6.181E-07	7.322E-08	1.126E-07	1.588E-13	5.218E-06	7.599E-07	718JAO2LS
1.834E+00	6.522E-07	7.433E-08	1.139E-07	1.772E-13	5.188E-06	7.565E-07	718JAO2LS
1.867E+00	7.657E-07	7.351E-08	1.064E-07	2.035E-13	5.162E-06	7.524E-07	718JAO2LS
1.901E+00	7.615E-07	7.445E-08	1.069E-07	2.032E-13	5.136E-06	7.487E-07	718JAO2LS
1.926E+00	7.833E-07	7.609E-08	1.104E-07	2.097E-13	5.117E-06	7.460E-07	718JAO2LS
1.959E+00	7.835E-07	7.371E-08	1.112E-07	2.105E-13	5.091E-06	7.424E-07	718JAO2LS
1.992E+00	7.418E-07	7.330E-08	1.059E-07	2.001E-13	5.066E-06	7.388E-07	718JAO2LS
2.024E+00	6.989E-07	7.297E-08	9.966E-08	1.893E-13	5.043E-06	7.355E-07	718JAO2LS
2.056E+00	7.233E-07	7.478E-08	7.478E-08	1.772E-13	5.020E-06	7.320E-07	718JAO2LS
2.088E+00	6.821E-07	7.457E-08	9.762E-08	1.863E-13	4.997E-06	7.290E-07	718JAO2LS
2.120E+00	7.987E-07	7.605E-08	1.143E-07	2.191E-13	4.974E-06	7.256E-07	718JAO2LS
2.151E+00	7.183E-07	7.451E-08	1.029E-07	1.978E-13	4.950E-06	7.223E-07	718JAO2LS
2.182E+00	7.092E-07	7.531E-08	1.016E-07	1.961E-13	4.928E-06	7.191E-07	718JAO2LS
2.213E+00	8.806E-07	7.871E-08	1.261E-07	4.355E-13	4.928E-06	7.191E-07	718JAO2LS
2.242E+00	7.809E-07	8.223E-08	1.199E-07	2.168E-13	4.902E-06	7.154E-07	718JAO2LS
2.272E+00	9.434E-07	8.251E-08	1.352E-07	6.333E-13	4.869E-06	7.105E-07	718JAO2LS
2.282E+00	9.276E-07	8.190E-08	1.330E-07	5.999E-13	4.841E-06	7.066E-07	718JAO2LS
2.313E+00	8.872E-07	8.553E-08	1.272E-07	2.496E-13	4.813E-06	7.025E-07	718JAO2LS
2.343E+00	9.581E-07	8.644E-08	1.374E-07	7.066E-13	4.785E-06	6.986E-07	718JAO2LS
2.350E+00	8.752E-07	8.251E-08	1.256E-07	2.474E-13	4.778E-06	6.976E-07	718JAO2LS
2.373E+00	9.634E-07	8.203E-08	1.382E-07	7.732E-13	4.757E-06	6.946E-07	718JAO2LS
2.410E+00	9.147E-07	8.193E-08	1.313E-07	6.068E-13	4.723E-06	6.896E-07	718JAO2LS
2.439E+00	8.725E-07	5.742E-08	1.253E-07	2.495E-13	4.697E-06	6.859E-07	718JAO2LS
2.469E+00	8.466E-07	5.775E-08	1.219E-07	2.436E-13	4.671E-06	6.822E-07	718JAO2LS
2.539E+00	9.190E-07	6.003E-08	1.321E-07	2.663E-13	4.609E-06	6.733E-07	718JAO2LS
2.562E+00	9.803E-07	6.286E-08	1.412E-07	2.925E-13	4.397E-06	6.428E-07	718JAO2LS
2.591E+00	1.191E-06	7.221E-08	1.660E-07	3.509E-13	4.224E-06	6.176E-07	718JAO2LS
2.621E+00	1.171E-06	7.038E-08	1.691E-07	3.847E-13	4.224E-06	6.176E-07	718JAO2LS
2.631E+00	1.147E-06	7.259E-08	1.650E-07	3.677E-13	3.777E-06	5.533E-07	718JAO2LS
2.647E+00	1.134E-06	7.136E-08	1.644E-07	3.715E-13	3.590E-06	5.262E-07	718JAO2LS
2.694E+00	1.037E-06	6.579E-08	1.506E-07	3.495E-13	3.351E-06	4.915E-07	718JAO2LS
2.722E+00	9.792E-07	6.327E-08	1.424E-07	3.372E-13	3.187E-06	4.677E-07	718JAO2LS
2.744E+00	9.309E-07	6.032E-08	1.357E-07	2.929E-13	2.994E-06	4.396E-07	718JAO2LS
2.762E+00	9.304E-07	6.074E-08	1.358E-07	3.379E-13	2.805E-06	4.120E-07	718JAO2LS
2.782E+00	8.907E-07	5.857E-08	1.202E-07	3.302E-13	3.092E-06	3.895E-07	718JAO2LS
2.804E+00	8.274E-07	5.536E-08	1.212E-07	3.155E-13	2.475E-06	3.638E-07	718JAO2LS
2.839E+00	8.833E-07	5.880E-08	1.297E-07	3.459E-13	2.301E-06	3.383E-07	718JAO2LS
2.890E+00	9.187E-07	5.999E-08	1.350E-07	3.670E-13	2.165E-06	3.183E-07	718JAO2LS
2.910E+00	8.426E-07	5.618E-08	1.239E-07	3.386E-13	1.989E-06	2.924E-07	718JAO2LS
2.935E+00	7.479E-07	5.160E-08	1.095E-07	3.018E-13	1.842E-06	2.708E-07	718JAO2LS
2.977E+00	7.263E-07	5.078E-08	1.071E-07	2.953E-13	1.693E-06	2.489E-07	718JAO2LS
3.006E+00	6.998E-07	5.091E-08	1.028E-07	2.808E-13	1.459E-06	2.299E-07	718JAO2LS
3.041E+00	6.411E-07	4.822E-08	9.424E-08	2.620E-13	1.452E-06	2.145E-07	718JAO2LS
3.055E+00	5.221E-07	4.337E-08	7.675E-08	2.144E-13	1.342E-06	1.973E-07	718JAO2LS
3.077E+00	5.856E-07	4.581E-08	8.608E-08	2.416E-13	1.237E-06	1.818E-07	718JAO2LS
3.097E+00	5.373E-07	4.276E-08	7.899E-08	2.226E-13	1.130E-06	1.662E-07	718JAO2LS
3.105E+00	4.879E-07	4.073E-08	7.163E-08	2.028E-13	1.034E-06	1.520E-07	718JAO2LS
3.122E+00	4.486E-07	3.908E-08	6.584E-08	1.874E-13	9.481E-07	1.391E-07	718JAO2LS
3.158E+00	3.829E-07	3.672E-08	5.629E-08	1.608E-13	8.690E-07	1.248E-07	718JAO2LS
3.242E+00	4.134E-07	3.766E-08	6.077E-08	1.743E-13	7.958E-07	1.170E-07	718JAO2LS
3.255E+00	4.506E-07	3.946E-08	6.624E-08	1.908E-13	7.167E-07	1.054E-07	718JAO2LS
3.267E+00	4.147E-07	3.830E-08	6.095E-08	1.764E-13	6.380E-07	9.380E-08	718JAO2LS
3.283E+00	4.619E-07	3.870E-08	6.788E-08	1.975E-13	5.389E-07	7.924E-08	718JAO2LS
3.301E+00	4.398E-07	3.858E-08	6.465E-08	1.899E-13	4.582E-07	6.738E-08	718JAO2LS
3.311E+00	3.411E-07	3.230E-08	5.014E-08	1.471E-13	3.892E-07	5.716E-08	718JAO2LS
3.353E+00	2.837E-07	2.891E-08	4.171E-08	1.228E-13	3.378E-07	4.968E-08	718JAO2LS

8.583E+00	2.940E-07	2.813E-08	4.322E-08	1.280E-13	2.714E-07	3.991E-08	718JA02HS
8.755E+00	2.315E-07	2.541E-08	3.403E-08	1.012E-13	2.262E-07	3.327E-08	718JA02HS
8.936E+00	2.083E-07	2.339E-08	3.052E-08	9.141E-14	1.864E-07	2.742E-08	718JA02HS
9.109E+00	1.466E-07	2.049E-08	2.134E-08	6.438E-14	1.537E-07	2.291E-08	718JA02HS
9.324E+00	1.185E-07	1.858E-08	1.743E-08	5.250E-14	1.272E-07	1.972E-08	718JA02HS
9.495E+00	1.293E-07	1.795E-08	1.901E-08	5.749E-14	1.060E-07	1.560E-08	718JA02HS
9.708E+00	1.020E-07	1.638E-08	1.500E-08	4.561E-14	8.136E-08	1.198E-08	718JA02HS
9.878E+00	7.892E-08	1.438E-08	1.160E-08	3.541E-14	6.597E-08	9.718E-09	718JA02HS
1.005E+01	8.960E-08	1.368E-08	1.317E-08	4.034E-14	5.148E-08	7.588E-09	718JA02HS
1.026E+01	6.577E-08	1.151E-08	9.680E-09	2.968E-14	3.517E-08	5.188E-09	718JA02HS
1.042E+01	3.744E-08	9.754E-09	5.514E-09	1.692E-14	2.691E-08	3.972E-09	718JA02HS
1.063E+01	3.165E-08	9.420E-09	4.666E-09	1.434E-14	1.966E-08	2.903E-09	718JA02HS
1.084E+01	3.425E-08	7.748E-09	3.055E-09	1.355E-14	1.274E-08	1.883E-09	718JA02HS
1.100E+01	1.623E-08	5.859E-09	2.397E-09	7.381E-15	8.698E-09	1.287E-09	718JA02HS
1.121E+01	1.325E-08	5.143E-09	1.958E-09	6.037E-15	5.603E-09	8.293E-10	718JA02HS
1.137E+01	1.306E-08	4.186E-09	1.931E-09	5.960E-15	3.499E-09	5.181E-10	718JA02HS
1.157E+01	8.640E-09	3.738E-09	1.279E-09	3.953E-15	1.330E-09	1.971E-10	718JA02HS
1.177E+01	-4.468E-10	2.652E-09	-6.622E-11	-2.048E-15	5.104E-10	7.575E-11	718JA02HS
1.193E+01	1.320E-09	2.954E-09	2.255E-10	6.981E-16	4.245E-10	6.301E-11	718JA02HS
1.213E+01	1.364E-09	3.082E-09	2.025E-10	6.277E-16	1.361E-10	2.021E-11	718JA02HS
1.233E+01	-1.485E-12	3.212E-09	-2.206E-13	-6.847E-19	-1.247E-13	-1.853E-14	718JA02HS
1.249E+01	-3.277E-14	3.320E-09	-4.873E-15	-1.514E-20	-3.277E-15	-4.873E-16	718JA02HS
1.269E+01	0.	3.456E-09	0.	0.	0.	0.	718JA02HS

¹ PUBE 2 CM POLY AT R=1M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING
COMPILATION DATE OF THIS CODE VERSION

15:00:24R 10/17/77
10/14/77U 16.05.47

30 GROUP OUTPUT

GROUP#	ENERGY UP-BOUND-MEV	DIFFERENTIAL FLUX N/CM2-SEC-MEV	INTEGRAL FLUX N/CM2-SEC	FLUX PER UNIT LETHARGY N/CM2-SEC
30	4.000000E-07	0.	0.	0.
29	3.180000E-06	0.	0.	0.
28	2.520000E-05	0.	0.	0.
27	2.000000E-04	0.	0.	0.
26	1.590000E-03	0.	0.	0.
25	1.261000E-02	0.	0.	0.
24	1.000000E-01	0.	0.	0.
23	2.236000E-01	1.922681E-06	2.376434E-07	3.110898E-07
22	5.000000E-01	2.194731E-06	6.066237E-07	7.940537E-07
21	5.946000E-01	1.715662E-06	1.623016E-07	9.389818E-07
20	7.071000E-01	1.164066E-06	1.309574E-07	7.376322E-07
19	8.409000E-01	7.321802E-07	9.795304E-08	5.666920E-07
18	1.000000E+00	9.259415E-07	1.473173E-07	8.522829E-07
17	1.257400E+00	8.210830E-07	2.113468E-07	9.267564E-07
16	1.581100E+00	7.460820E-07	2.415067E-07	1.058877E-06
15	1.988200E+00	7.202347E-07	2.932076E-07	1.285367E-06
14	2.500000E+00	6.294804E-07	4.245281E-07	1.861437E-06
13	2.979000E+00	1.006078E-06	4.758751E-07	2.753134E-06
12	3.535500E+00	1.150526E-06	6.471710E-07	3.744100E-06
11	4.204500E+00	9.903464E-07	6.625417E-07	3.832641E-06
10	5.000000E+00	8.828868E-07	7.023364E-07	4.063266E-06
9	5.764800E+00	7.800640E-07	5.965930E-07	4.198617E-06
8	6.646500E+00	5.746632E-07	5.066806E-07	3.566159E-06
7	7.663100E+00	4.312700E-07	4.384291E-07	3.085691E-06
6	8.835200E+00	3.466870E-07	4.063518E-07	2.859873E-06
5	1.018600E+01	1.241302E-07	1.676750E-07	1.180552E-06
4	1.174500E+01	2.554988E-08	3.983227E-08	2.801672E-07
3	1.354100E+01	2.858810E-10	5.134423E-10	3.614394E-09
2	1.561200E+01	0.	0.	0.
1	1.800000E+01	0.	0.	0.

1 PUBE 5 CM POLY AT R=1M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA ACQUISITION
COMPILED DATE OF THIS CODE VERSION

10/14/77U 15:01:30R 10/17/77
16:05:47

ENERGY (MEV)	PHI (NEUT/CM ² -SEC-MEV)	DEL-PHI	DOSE (MR/HR-MEV)	KERMA (ERG/GM-SEC-MEV)	INTEGRAL (NEUT/CM ² -SEC)	INT-DOSE (MR/HR)	FILE-10
1.529E-01	1.368E-06	6.840E-08	3.349E-08	1.002E-13	5.444E-06	7.019E-07	609N002S
1.758E-01	1.185E-06	3.169E-08	3.719E-08	1.091E-13	5.412E-06	7.011E-07	609N002S
1.982E-01	1.521E-06	3.498E-08	4.284E-08	1.234E-13	5.379E-06	7.002E-07	609N002S
2.209E-01	1.661E-06	4.069E-08	5.016E-08	1.418E-13	5.343E-06	6.991E-07	609N002S
2.435E-01	1.769E-06	4.216E-08	5.728E-08	1.589E-13	5.304E-06	6.979E-07	609N002S
2.662E-01	1.820E-06	4.246E-08	6.319E-08	1.720E-13	5.263E-06	6.965E-07	609N002S
2.898E-01	1.824E-06	4.242E-08	6.790E-08	1.814E-13	5.222E-06	6.950E-07	609N002S
3.115E-01	1.798E-06	4.141E-08	7.180E-08	1.882E-13	5.181E-06	6.935E-07	609N002S
3.341E-01	1.749E-06	3.975E-08	7.487E-08	1.926E-13	5.141E-06	6.918E-07	609N002S
3.568E-01	1.684E-06	3.792E-08	7.732E-08	1.952E-13	5.102E-06	6.901E-07	609N002S
3.795E-01	1.610E-06	3.597E-08	7.930E-08	1.964E-13	5.064E-06	6.883E-07	609N002S
4.021E-01	1.534E-06	3.399E-08	8.100E-08	1.965E-13	5.029E-06	6.865E-07	609N002S
4.248E-01	1.458E-06	3.203E-08	8.256E-08	1.969E-13	4.995E-06	6.846E-07	609N002S
4.474E-01	1.384E-06	3.020E-08	8.404E-08	1.967E-13	4.963E-06	6.827E-07	609N002S
4.701E-01	1.314E-06	2.845E-08	8.559E-08	1.966E-13	4.932E-06	6.808E-07	609N002S
4.927E-01	1.252E-06	2.690E-08	8.744E-08	1.971E-13	4.903E-06	6.789E-07	609N002S
5.154E-01	1.197E-06	2.557E-08	8.833E-08	1.940E-13	4.875E-06	6.769E-07	609N002S
5.380E-01	1.149E-06	2.442E-08	8.923E-08	1.896E-13	4.849E-06	6.749E-07	609N002S
5.607E-01	1.105E-06	2.333E-08	8.987E-08	1.857E-13	4.823E-06	6.730E-07	609N002S
5.833E-01	1.065E-06	2.234E-08	8.266E-08	1.823E-13	4.795E-06	6.711E-07	609N002S
6.060E-01	1.027E-06	2.142E-08	8.199E-08	1.791E-13	4.766E-06	6.693E-07	609N002S
6.287E-01	9.910E-07	2.059E-08	8.052E-08	1.760E-13	4.752E-06	6.674E-07	609N002S
6.513E-01	9.531E-07	1.975E-08	7.923E-08	1.724E-13	4.730E-06	6.656E-07	609N002S
6.740E-01	9.102E-07	1.880E-08	7.740E-08	1.677E-13	4.709E-06	6.639E-07	609N002S
6.966E-01	8.598E-07	1.764E-08	7.480E-08	1.613E-13	4.689E-06	6.621E-07	609N002S
7.193E-01	8.019E-07	1.633E-08	7.137E-08	1.533E-13	4.670E-06	6.605E-07	609N002S
7.419E-01	7.389E-07	1.492E-08	6.727E-08	1.433E-13	4.653E-06	6.589E-07	609N002S
7.647E-01	7.733E-07	1.490E-08	6.549E-08	1.771E-13	4.528E-06	6.465E-07	718JA03LS
7.874E-01	8.008E-07	5.511E-08	8.925E-08	1.835E-13	4.497E-06	6.431E-07	718JA03LS
8.100E-01	8.087E-07	5.561E-08	9.247E-08	1.892E-13	4.477E-06	6.408E-07	718JA03LS
8.326E-01	8.034E-07	5.522E-08	9.489E-08	1.929E-13	4.447E-06	6.374E-07	718JA03LS
8.552E-01	7.798E-07	4.400E-08	9.274E-08	1.881E-13	4.419E-06	6.340E-07	718JA03LS
8.778E-01	7.764E-07	4.461E-08	9.808E-08	1.879E-13	4.400E-06	6.318E-07	718JA03LS
9.004E-01	7.708E-07	4.438E-08	9.271E-08	1.872E-13	4.373E-06	6.295E-07	718JA03LS
9.230E-01	7.577E-07	4.366E-08	9.170E-08	1.847E-13	4.348E-06	6.266E-07	718JA03LS
9.456E-01	6.952E-07	1.600E-08	8.464E-08	1.701E-13	4.326E-06	6.229E-07	718JA03LS
9.682E-01	6.159E-07	1.84E-08	8.779E-08	1.759E-13	4.300E-06	6.197E-07	718JA03LS
9.908E-01	5.916E-07	1.43E-08	8.533E-08	1.706E-13	4.277E-06	6.169E-07	718JA03LS
1.013E+00	7.175E-07	2.66E-08	8.908E-08	1.777E-13	4.255E-06	6.141E-07	718JA03LS
1.038E+00	6.845E-07	2.07E-08	8.850E-08	1.701E-13	4.232E-06	6.113E-07	718JA03LS
1.063E+00	6.869E-07	2.248E-08	8.632E-08	1.713E-13	4.211E-06	6.087E-07	718JA03LS
1.088E+00	7.207E-07	4.39E-08	9.108E-08	1.804E-13	4.190E-06	6.060E-07	718JA03LS
1.113E+00	7.111E-07	4.57E-08	9.038E-08	1.786E-13	4.168E-06	6.033E-07	718JA03LS
1.138E+00	7.229E-07	4.03E-08	9.242E-08	1.722E-13	4.147E-06	6.005E-07	718JA03LS
1.163E+00	6.901E-07	3.11E-08	8.899E-08	1.748E-13	4.129E-06	5.977E-07	718JA03LS
1.188E+00	6.805E-07	3.06E-08	8.814E-08	1.729E-13	4.109E-06	5.944E-07	718JA03LS
1.213E+00	6.941E-07	4.09E-08	9.040E-08	1.770E-13	4.080E-06	5.918E-07	718JA03LS
1.238E+00	6.646E-07	3.56E-08	8.718E-08	1.702E-13	4.054E-06	5.885E-07	718JA03LS
1.263E+00	6.676E-07	4.06E-08	8.805E-08	1.715E-13	4.036E-06	5.861E-07	718JA03LS
1.288E+00	6.302E-07	1.52E-08	8.369E-08	1.626E-13	4.012E-06	5.830E-07	718JA03LS
1.313E+00	6.331E-07	2.08E-08	8.451E-08	1.639E-13	3.995E-06	5.807E-07	718JA03LS

1.678E+00	6.157E-07	5.192E-08	8.276E-08	1.601E-13	3.973E-06	5.777E-07	718JA03LS
1.703E+00	6.212E-07	5.282E-08	8.390E-08	1.619E-13	3.957E-06	5.756E-07	718JA03LS
1.739E+00	6.107E-07	5.304E-08	8.306E-08	1.599E-13	3.935E-06	5.726E-07	718JA03LS
1.765E+00	6.361E-07	5.264E-08	8.695E-08	1.671E-13	3.919E-06	5.704E-07	718JA03LS
1.800E+00	6.617E-07	5.447E-08	9.105E-08	1.743E-13	3.896E-06	5.673E-07	718JA03LS
1.834E+00	7.784E-07	5.564E-08	9.387E-08	1.796E-13	3.874E-06	5.642E-07	718JA03LS
1.867E+00	6.552E-07	5.542E-08	9.133E-08	1.742E-13	3.852E-06	5.611E-07	718JA03LS
1.901E+00	6.354E-07	5.514E-08	8.915E-08	1.696E-13	3.830E-06	5.580E-07	718JA03LS
1.926E+00	6.802E-07	5.743E-08	9.590E-08	1.821E-13	3.813E-06	5.557E-07	718JA03LS
1.959E+00	6.359E-07	5.425E-08	9.022E-08	1.709E-13	3.792E-06	5.527E-07	718JA03LS
1.992E+00	6.610E-07	5.707E-08	9.438E-08	1.783E-13	3.770E-06	5.496E-07	718JA03LS
2.024E+00	6.966E-07	5.679E-08	9.635E-08	1.824E-13	3.749E-06	5.466E-07	718JA03LS
2.056E+00	6.976E-07	5.811E-08	9.718E-08	1.827E-13	3.727E-06	5.434E-07	718JA03LS
2.088E+00	7.009E-07	5.888E-08	1.003E-07	1.914E-13	3.704E-06	5.402E-07	718JA03LS
2.120E+00	7.659E-07	6.013E-08	1.096E-07	2.101E-13	3.681E-06	5.369E-07	718JA03LS
2.151E+00	7.87E-07	5.909E-08	1.128E-07	2.160E-13	3.681E-06	5.369E-07	718JA03LS
2.182E+00	7.436E-07	7.94E-08	1.065E-07	2.048E-13	3.657E-06	5.335E-07	718JA03LS
2.213E+00	7.013E-07	8.03E-08	1.005E-07	1.939E-13	3.635E-06	5.303E-07	718JA03LS
2.245E+00	7.421E-07	8.879E-08	1.063E-07	2.050E-13	3.612E-06	5.270E-07	718JA03LS
2.276E+00	7.466E-07	6.059E-08	1.070E-07	2.084E-13	3.589E-06	5.239E-07	718JA03LS
2.307E+00	7.769E-07	6.026E-08	1.114E-07	2.176E-13	3.561E-06	5.196E-07	718JA03LS
2.338E+00	7.722E-07	6.119E-08	1.107E-07	2.155E-13	3.557E-06	5.191E-07	718JA03LS
2.369E+00	7.584E-07	6.008E-08	1.088E-07	2.134E-13	3.537E-06	5.162E-07	718JA03LS
2.400E+00	7.706E-07	8.20E-08	1.105E-07	2.176E-13	3.514E-06	5.129E-07	718JA03LS
2.431E+00	7.338E-07	6.89E-08	1.033E-07	2.081E-13	3.491E-06	5.097E-07	718JA03LS
2.462E+00	7.240E-07	7.96E-08	1.039E-07	2.063E-13	3.464E-06	5.058E-07	718JA03LS
2.493E+00	7.210E-07	4.958E-08	1.035E-07	2.062E-13	3.443E-06	5.028E-07	718JA03LS
2.524E+00	7.000E-07	4.790E-08	1.005E-07	2.010E-13	3.422E-06	4.997E-07	718JA03LS
2.555E+00	7.732E-07	4.806E-08	1.110E-07	2.222E-13	3.417E-06	4.990E-07	718JA03LS
2.586E+00	7.766E-07	4.790E-08	1.117E-07	2.284E-13	3.281E-06	4.794E-07	718JA03LS
2.617E+00	8.517E-07	5.149E-08	1.227E-07	2.599E-13	3.145E-06	4.601E-07	718JA03LS
2.648E+00	8.302E-07	5.093E-08	1.199E-07	2.962E-13	2.962E-06	4.335E-07	718JA03LS
2.679E+00	8.580E-07	5.198E-08	1.241E-07	7.11E-13	2.824E-06	4.135E-07	718JA03LS
2.710E+00	7.941E-07	5.004E-08	1.150E-07	5.64E-13	2.687E-06	3.938E-07	718JA03LS
2.741E+00	7.775E-07	4.827E-08	1.128E-07	5.89E-13	2.515E-06	3.688E-07	718JA03LS
2.772E+00	7.344E-07	4.564E-08	1.067E-07	4.94E-13	2.390E-06	3.507E-07	718JA03LS
2.803E+00	6.621E-07	4.221E-08	9.639E-08	3.10E-13	2.245E-06	3.295E-07	718JA03LS
2.834E+00	6.341E-07	4.051E-08	9.245E-08	2.14E-13	2.151E-06	3.181E-07	718JA03LS
2.865E+00	6.596E-07	4.227E-08	9.637E-08	4.16E-13	2.005E-06	2.945E-07	718JA03LS
2.896E+00	6.570E-07	4.182E-08	9.616E-08	4.72E-13	1.869E-06	2.747E-07	718JA03LS
2.927E+00	6.321E-07	4.034E-08	9.265E-08	4.27E-13	1.771E-06	2.603E-07	718JA03LS
2.958E+00	6.097E-07	3.959E-08	8.954E-08	4.40E-13	1.645E-06	2.418E-07	718JA03LS
2.989E+00	6.182E-07	3.91E-08	9.088E-08	4.78E-13	1.522E-06	2.237E-07	718JA03LS
3.020E+00	6.196E-07	3.876E-08	9.109E-08	4.58E-13	1.463E-06	2.181E-07	718JA03LS
3.051E+00	5.620E-07	3.689E-08	8.261E-08	2.71E-13	1.425E-06	1.940E-07	718JA03LS
3.082E+00	5.358E-07	3.574E-08	7.876E-08	1.75E-13	1.208E-06	1.776E-07	718JA03LS
3.113E+00	4.818E-07	3.401E-08	7.083E-08	1.965E-13	1.109E-06	1.630E-07	718JA03LS
3.144E+00	4.185E-07	3.104E-08	6.151E-08	1.714E-13	1.026E-06	1.508E-07	718JA03LS
3.175E+00	3.849E-07	2.976E-08	5.659E-08	1.583E-13	9.632E-07	1.416E-07	718JA03LS
3.206E+00	4.427E-07	2.807E-08	5.308E-08	1.828E-13	8.841E-07	1.300E-07	718JA03LS
3.237E+00	3.696E-07	2.845E-08	5.194E-08	1.074E-13	8.187E-07	1.187E-07	718JA03LS
3.268E+00	3.368E-07	2.709E-08	4.981E-08	1.412E-13	7.408E-07	1.089E-07	718JA03LS
3.299E+00	3.034E-07	2.555E-08	4.460E-08	1.270E-13	6.807E-07	1.001E-07	718JA03LS
3.330E+00	3.085E-07	2.568E-08	4.535E-08	1.297E-13	6.241E-07	9.176E-08	718JA03LS
3.361E+00	3.165E-07	2.609E-08	4.652E-08	1.336E-13	5.666E-07	8.331E-08	718JA03LS
3.392E+00	3.238E-07	2.642E-08	4.755E-08	1.371E-13	5.081E-07	7.470E-08	718JA03LS
3.423E+00	3.420E-07	2.709E-08	4.999E-08	1.455E-13	4.478E-07	6.584E-08	718JA03LS
3.454E+00	3.139E-07	2.512E-08	4.615E-08	1.493E-13	3.730E-07	5.793E-08	718JA03LS
3.485E+00	2.399E-07	2.176E-08	3.527E-08	1.031E-13	3.243E-07	4.768E-08	718JA03LS
3.516E+00	2.394E-07	2.093E-08	3.519E-08	1.033E-13	2.816E-07	4.141E-08	718JA03LS

8.399E+00	2.466E-07	2.036E-05	3.626E-08	1.069E-13	2.415E-07	3.552E-08	718JA03HS
8.583E+00	2.031E-07	1.835E-05	2.985E-08	8.838E-14	2.001E-07	2.944E-08	718JA03HS
8.798E+00	1.483E-07	1.574E-05	2.181E-08	6.488E-14	1.627E-07	2.393E-08	718JA03HS
8.979E+00	1.297E-07	1.455E-05	1.908E-08	5.695E-14	1.373E-07	2.019E-08	718JA03HS
9.152E+00	1.438E-07	1.419E-05	2.113E-08	6.341E-14	1.136E-07	1.672E-08	718JA03HS
9.367E+00	1.225E-07	1.295E-05	1.600E-08	5.430E-14	8.501E-08	1.251E-08	718JA03HS
9.538E+00	7.032E-08	1.057E-05	1.034E-08	3.130E-14	6.853E-08	1.009E-08	718JA03HS
9.708E+00	7.475E-08	1.017E-05	1.099E-08	3.341E-14	5.620E-08	8.274E-09	718JA03HS
9.920E+00	6.598E-08	9.097E-05	9.699E-08	2.963E-14	4.128E-08	6.082E-09	718JA03HS
1.009E+01	4.475E-08	7.840E-09	6.582E-09	2.018E-14	3.187E-08	4.698E-09	718JA03HS
1.026E+01	3.492E-08	7.104E-09	5.140E-09	1.875E-14	2.509E-08	3.701E-09	718JA03HS
1.046E+01	3.788E-08	6.424E-09	5.581E-09	1.713E-14	1.781E-08	2.629E-09	718JA03HS
1.063E+01	2.275E-08	5.666E-09	3.353E-09	1.030E-14	1.266E-08	1.870E-09	718JA03HS
1.084E+01	1.538E-08	4.291E-09	2.270E-09	6.982E-15	8.656E-09	1.279E-09	718JA03HS
1.100E+01	1.660E-08	4.097E-09	2.451E-09	7.549E-15	6.098E-09	9.017E-10	718JA03HS
1.121E+01	7.287E-09	3.039E-09	1.077E-09	3.321E-15	3.590E-09	5.312E-10	718JA03HS
1.141E+01	8.886E-09	2.508E-09	1.315E-09	4.059E-15	1.972E-09	2.920E-10	718JA03HS
1.157E+01	6.753E-09	2.261E-09	9.999E-10	3.089E-15	7.212E-10	1.068E-10	718JA03HS
1.177E+01	3.443E-10	1.593E-09	5.103E-11	1.579E-16	1.154E-11	1.715E-12	718JA03HS
1.193E+01	3.698E-10	1.650E-09	-5.485E-11	-1.698E-16	1.358E-11	2.021E-12	718JA03HS
1.213E+01	2.537E-10	1.721E-09	3.767E-11	1.168E-16	2.519E-11	3.740E-12	718JA03HS
1.233E+01	1.158E-13	1.795E-09	-1.064E-13	-3.301E-19	-1.148E-13	-1.705E-14	718JA03HS
1.249E+01	-2.717E-15	1.854E-09	-4.076E-14	-1.255E-19	-3.577E-14	-5.320E-15	718JA03HS
1.269E+01	-8.600E-14	1.930E-09	-1.280E-14	-3.981E-20	0.	0.	718JA03HS

1 PUBE 5 CM POLY AT R=1M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING
 COMPILATION DATE OF THIS CODE VERSION

15:01:30R 10/17/77
 10/14/77U 16.05.47

30 GROUP OUTPUT

GROUP#	ENERGY UP-BOUND-MEV	DIFFERENTIAL FLUX N/CM2-SEC-MEV	INTEGRAL FLUX N/CM2-SEC	FLUX PER UNIT LETHARGY N/CM2-SEC
30	4.000000E-07	0.	0.	0.
29	3.180000E-06	0.	0.	0.
28	2.520000E-05	0.	0.	0.
27	2.000000E-04	0.	0.	0.
26	1.590000E-03	0.	0.	0.
25	1.281000E-02	0.	0.	0.
24	1.000000E-01	0.	0.	0.
23	2.236000E-01	1.438398E-06	1.777860E-07	2.327328E-07
22	5.000000E-01	1.606515E-06	4.440408E-07	5.812371E-07
21	5.946000E-01	1.133978E-06	1.072743E-07	6.206262E-07
20	7.071000E-01	9.487257E-07	1.067316E-07	5.174781E-07
19	8.409000E-01	7.645115E-07	1.022916E-07	5.917319E-07
18	1.000000E+00	7.960857E-07	1.268572E-07	7.327571E-07
17	1.257400E+00	7.447310E-07	1.916938E-07	8.405779E-07
16	1.581100E+00	6.952553E-07	2.250541E-07	9.867410E-07
15	1.988200E+00	6.431568E-07	2.618291E-07	1.147810E-06
14	2.500000E+00	7.312598E-07	3.742588E-07	1.641020E-06
13	2.973000E+00	8.114539E-07	3.838177E-07	2.220543E-06
12	3.635000E+00	8.204929E-07	4.615273E-07	2.670089E-06
11	4.204500E+00	6.986854E-07	4.674205E-07	2.703912E-06
10	5.000000E+00	6.388008E-07	5.081660E-07	2.939921E-06
9	5.764800E+00	5.749945E-07	4.397558E-07	3.094850E-06
8	6.646500E+00	4.166108E-07	3.673256E-07	2.585341E-06
7	7.663100E+00	3.210322E-07	3.263613E-07	2.296321E-06
6	8.835200E+00	2.448544E-07	2.869939E-07	2.019841E-06
5	1.018600E+01	9.560897E-08	1.291486E-07	9.092987E-07
4	1.174500E+01	1.783594E-08	2.780623E-08	1.955800E-07
3	1.354100E+01	1.675002E-11	3.008304E-11	2.117705E-10
2	1.561200E+01	0.	0.	0.
1	1.800000E+01	0.	0.	0.

1 PUBE 10 CM POLY AT R=1M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING
COMPILATION DATE OF THIS CODE VERSION

10/14/77U 15:02:48R 10/17/77
16.05.47

ENERGY (MEV)	PHI (NEUT/CM2-SEC-MEV)	DEL-PHI	DOSE (MR/HR-MEV)	KERMA (ERG/GM-SEC-MEV)	INTEGRAL (NEUT/CM2-SEC)	INT-DOSE (MR/HR)	FILE-ID
1.529E-01	9.243E-07	4.622E-08	2.263E-08	6.768E-14	3.159E-06	4.010E-07	607N002S
1.758E-01	9.351E-07	2.089E-08	2.455E-08	7.205E-14	3.138E-06	4.005E-07	607N002S
1.982E-01	9.897E-07	2.276E-08	2.745E-08	7.378E-14	3.116E-06	3.999E-07	607N002S
2.209E-01	1.056E-06	2.584E-08	3.188E-08	9.010E-14	3.093E-06	3.992E-07	607N002S
2.435E-01	1.109E-06	2.642E-08	3.592E-08	9.962E-14	3.068E-06	3.985E-07	607N002S
2.662E-01	1.128E-06	2.630E-08	3.916E-08	1.066E-13	3.043E-06	3.976E-07	607N002S
2.888E-01	1.122E-06	2.602E-08	4.175E-08	1.115E-13	3.017E-06	3.967E-07	607N002S
3.115E-01	1.100E-06	2.525E-08	4.390E-08	1.151E-13	2.992E-06	3.957E-07	607N002S
3.341E-01	1.075E-06	2.421E-08	4.567E-08	1.175E-13	2.968E-06	3.947E-07	607N002S
3.568E-01	1.028E-06	2.313E-08	4.720E-08	1.191E-13	2.944E-06	3.937E-07	607N002S
3.795E-01	9.867E-07	2.202E-08	4.859E-08	1.203E-13	2.921E-06	3.926E-07	607N002S
4.021E-01	9.449E-07	2.093E-08	4.989E-08	1.213E-13	2.899E-06	3.915E-07	607N002S
4.248E-01	9.041E-07	1.985E-08	5.119E-08	1.221E-13	2.878E-06	3.903E-07	607N002S
4.474E-01	8.633E-07	1.887E-08	5.255E-08	1.230E-13	2.858E-06	3.891E-07	607N002S
4.701E-01	8.297E-07	1.798E-08	5.402E-08	1.241E-13	2.839E-06	3.879E-07	607N002S
4.927E-01	7.972E-07	1.713E-08	5.565E-08	1.255E-13	2.821E-06	3.867E-07	607N002S
5.154E-01	7.683E-07	1.640E-08	5.722E-08	1.245E-13	2.803E-06	3.854E-07	607N002S
5.380E-01	7.437E-07	1.580E-08	5.877E-08	1.227E-13	2.786E-06	3.842E-07	607N002S
5.607E-01	7.230E-07	1.525E-08	5.987E-08	1.215E-13	2.769E-06	3.829E-07	607N002S
5.833E-01	7.054E-07	1.478E-08	6.076E-08	1.207E-13	2.753E-06	3.817E-07	607N002S
6.060E-01	6.908E-07	1.440E-08	6.148E-08	1.204E-13	2.737E-06	3.805E-07	607N002S
6.287E-01	6.778E-07	1.408E-08	6.206E-08	1.203E-13	2.722E-06	3.792E-07	607N002S
6.513E-01	6.647E-07	1.375E-08	6.252E-08	1.202E-13	2.706E-06	3.780E-07	607N002S
6.740E-01	6.494E-07	1.341E-08	6.222E-08	1.196E-13	2.692E-06	3.767E-07	607N002S
6.966E-01	6.283E-07	1.292E-08	6.166E-08	1.179E-13	2.677E-06	3.755E-07	607N002S
7.193E-01	5.997E-07	1.227E-08	6.037E-08	1.146E-13	2.663E-06	3.742E-07	607N002S
7.419E-01	5.627E-07	1.145E-08	5.823E-08	1.096E-13	2.650E-06	3.731E-07	607N002S
9.076E-01	5.995E-07	3.848E-08	5.948E-08	1.355E-13	3.955E-06	3.955E-07	720JA05LS
9.348E-01	5.963E-07	3.829E-08	6.588E-08	1.357E-13	3.538E-06	3.617E-07	720JA05LS
9.610E-01	5.800E-07	3.764E-08	6.581E-08	1.349E-13	3.522E-06	3.600E-07	720JA05LS
9.966E-01	5.630E-07	3.637E-08	6.641E-08	1.351E-13	3.500E-06	3.574E-07	720JA05LS
1.037E+00	5.330E-07	3.452E-08	6.335E-08	1.285E-13	3.480E-06	3.550E-07	720JA05LS
1.062E+00	5.113E-07	3.378E-08	6.106E-08	1.236E-13	3.466E-06	3.534E-07	720JA05LS
1.095E+00	4.917E-07	3.242E-08	5.932E-08	1.194E-13	3.442E-06	3.518E-07	720JA05LS
1.132E+00	4.871E-07	3.147E-08	5.835E-08	1.139E-13	3.432E-06	3.493E-07	720JA05LS
1.164E+00	4.462E-07	3.030E-08	5.433E-08	1.092E-13	3.417E-06	3.475E-07	720JA05LS
1.202E+00	4.564E-07	3.056E-08	5.599E-08	1.122E-13	3.400E-06	3.454E-07	720JA05LS
1.236E+00	4.389E-07	2.987E-08	5.419E-08	1.083E-13	3.385E-06	3.436E-07	720JA05LS
1.258E+00	4.430E-07	3.015E-08	5.493E-08	1.095E-13	3.375E-06	3.424E-07	720JA05LS
1.302E+00	4.412E-07	3.010E-08	5.517E-08	1.097E-13	3.356E-06	3.399E-07	720JA05LS
1.344E+00	4.397E-07	3.097E-08	5.597E-08	1.089E-13	3.382E-06	3.412E-07	720JA05LS
1.366E+00	4.412E-07	2.997E-08	5.585E-08	1.106E-13	3.328E-06	3.364E-07	720JA05LS
1.397E+00	4.312E-07	2.962E-08	5.491E-08	1.084E-13	3.314E-06	3.347E-07	720JA05LS
1.428E+00	4.459E-07	3.012E-08	5.713E-08	1.125E-13	3.301E-06	3.329E-07	720JA05LS
1.458E+00	4.318E-07	2.957E-08	5.564E-08	1.094E-13	3.287E-06	3.312E-07	720JA05LS
1.498E+00	4.220E-07	3.001E-08	5.480E-08	1.074E-13	3.270E-06	3.290E-07	720JA05LS
1.529E+00	4.147E-07	2.864E-08	5.415E-08	1.099E-13	3.258E-06	3.274E-07	720JA05LS
1.557E+00	4.168E-07	2.889E-08	5.468E-08	1.069E-13	3.248E-06	3.258E-07	720JA05LS
1.595E+00	4.008E-07	2.808E-08	5.302E-08	1.032E-13	3.230E-06	3.238E-07	720JA05LS
1.624E+00	3.990E-07	2.786E-08	5.308E-08	1.031E-13	3.219E-06	3.222E-07	720JA05LS
1.661E+00	3.893E-07	2.737E-08	5.215E-08	1.010E-13	3.204E-06	3.203E-07	720JA05LS

1.655E+00	4.021E-07	2.802E-08	5.413E-09	1.046E-13	2.194E-06	3.190E-07	720JA05LS
1.723E+00	4.022E-07	2.818E-08	5.453E-09	1.051E-13	1.79E-06	3.170E-07	720JA05LS
1.761E+00	4.124E-07	2.856E-08	5.632E-09	1.082E-13	1.64E-06	3.148E-07	720JA05LS
1.789E+00	4.091E-07	2.821E-08	5.616E-09	1.077E-13	1.53E-06	3.133E-07	720JA05LS
1.824E+00	4.037E-07	2.836E-08	5.654E-09	1.084E-13	1.38E-06	3.113E-07	720JA05LS
1.859E+00	4.050E-07	2.813E-08	5.637E-09	1.075E-13	1.24E-06	3.093E-07	720JA05LS
1.894E+00	3.994E-07	2.798E-08	5.596E-09	1.065E-13	1.10E-06	3.074E-07	720JA05LS
1.920E+00	3.966E-07	2.786E-08	5.565E-09	1.061E-13	0.99E-06	3.059E-07	720JA05LS
1.955E+00	3.837E-07	2.727E-08	5.439E-09	1.030E-13	0.86E-06	3.040E-07	720JA05LS
1.989E+00	3.907E-07	2.738E-08	5.575E-09	1.053E-13	0.73E-06	3.021E-07	720JA05LS
2.023E+00	3.965E-07	2.767E-08	5.765E-09	1.074E-13	0.58E-06	3.002E-07	720JA05LS
2.056E+00	4.038E-07	2.838E-08	5.860E-09	1.094E-13	0.48E-06	2.983E-07	720JA05LS
2.089E+00	4.070E-07	2.823E-08	5.825E-09	1.112E-13	0.32E-06	2.964E-07	720JA05LS
1.122E+00	4.350E-07	2.955E-08	6.227E-09	1.193E-13	0.18E-06	2.944E-07	720JA05LS
1.155E+00	4.355E-07	2.934E-08	6.236E-09	1.200E-13	0.04E-06	2.923E-07	720JA05LS
1.188E+00	4.742E-07	2.988E-08	6.791E-09	1.307E-13	0.04E-06	2.923E-07	720JA05LS
1.220E+00	4.491E-07	2.899E-08	6.433E-09	1.243E-13	1.989E-06	2.901E-07	720JA05LS
1.252E+00	4.326E-07	2.919E-08	6.319E-09	1.202E-13	1.975E-06	2.881E-07	720JA05LS
1.283E+00	4.545E-07	2.972E-08	6.515E-09	1.268E-13	1.961E-06	2.861E-07	720JA05LS
1.315E+00	4.460E-07	2.936E-08	6.395E-09	1.250E-13	1.947E-06	2.841E-07	720JA05LS
1.347E+00	4.430E-07	2.995E-08	6.353E-09	1.248E-13	1.929E-06	2.815E-07	720JA05LS
1.379E+00	4.750E-07	2.972E-08	6.813E-09	1.339E-13	1.926E-06	2.811E-07	720JA05LS
1.411E+00	4.540E-07	3.086E-08	6.514E-09	1.284E-13	1.914E-06	2.795E-07	720JA05LS
1.443E+00	4.469E-07	3.067E-08	6.414E-09	1.269E-13	1.901E-06	2.775E-07	720JA05LS
1.475E+00	4.696E-07	3.139E-08	6.742E-09	1.339E-13	1.886E-06	2.754E-07	720JA05LS
1.507E+00	4.729E-07	2.925E-08	6.791E-09	1.355E-13	1.868E-06	2.729E-07	720JA05LS
1.539E+00	4.869E-07	2.869E-08	6.994E-09	1.401E-13	1.854E-06	2.707E-07	720JA05LS
1.571E+00	4.594E-07	2.793E-08	6.601E-09	1.329E-13	1.834E-06	2.679E-07	720JA05LS
1.603E+00	4.412E-07	2.677E-08	6.350E-09	1.306E-13	1.754E-06	2.656E-07	720JA05LS
1.635E+00	4.677E-07	2.771E-08	6.743E-09	1.416E-13	1.676E-06	2.452E-07	720JA05LS
1.667E+00	4.456E-07	2.668E-08	6.439E-09	1.390E-13	1.572E-06	2.302E-07	720JA05LS
1.699E+00	4.799E-07	2.603E-08	6.306E-09	1.464E-13	1.522E-06	1.929E-07	720JA05LS
1.731E+00	4.094E-07	2.482E-08	5.933E-09	1.336E-13	1.424E-06	2.087E-07	720JA05LS
1.763E+00	3.814E-07	2.294E-08	5.536E-09	1.282E-13	1.334E-06	2.056E-07	720JA05LS
1.795E+00	3.561E-07	2.139E-08	5.180E-09	1.225E-13	1.270E-06	1.864E-07	720JA05LS
1.827E+00	4.300E-07	2.074E-08	4.999E-09	1.212E-13	1.197E-06	1.757E-07	720JA05LS
1.859E+00	4.214E-07	2.071E-08	4.947E-09	1.248E-13	1.142E-06	1.676E-07	720JA05LS
1.891E+00	4.433E-07	2.023E-08	4.805E-09	1.265E-13	1.064E-06	1.564E-07	720JA05LS
1.923E+00	4.603E-07	2.990E-08	4.881E-09	1.265E-13	1.011E-06	1.488E-07	720JA05LS
1.955E+00	4.310E-07	1.980E-08	4.857E-09	1.292E-13	9.404E-07	1.382E-07	720JA05LS
1.987E+00	3.264E-07	1.947E-08	4.798E-09	1.306E-13	8.714E-07	1.281E-07	720JA05LS
2.019E+00	2.12E-07	1.902E-08	4.721E-09	1.290E-13	8.209E-07	1.207E-07	720JA05LS
2.051E+00	3.74E-07	1.824E-08	4.482E-09	1.231E-13	7.605E-07	1.118E-07	720JA05LS
2.083E+00	3.87E-07	1.707E-08	4.149E-09	1.144E-13	1.927E-07	1.027E-07	720JA05LS
2.115E+00	1.560E-07	1.576E-08	3.164E-09	1.043E-13	6.426E-07	9.447E-08	720JA05LS
2.147E+00	2.49E-07	1.449E-08	3.306E-09	9.208E-14	5.964E-07	8.768E-08	720JA05LS
2.179E+00	2.09E-07	1.417E-08	3.247E-09	9.076E-14	5.605E-07	8.241E-08	720JA05LS
2.211E+00	1.210E-07	1.411E-08	3.248E-09	9.124E-14	5.168E-07	7.598E-08	720JA05LS
2.243E+00	1.905E-07	1.228E-08	2.800E-09	7.903E-14	4.752E-07	7.002E-08	720JA05LS
2.275E+00	1.815E-07	1.177E-08	2.698E-09	7.503E-14	4.398E-07	6.466E-08	720JA05LS
2.307E+00	1.725E-07	1.136E-08	2.595E-09	7.085E-14	3.988E-07	5.951E-08	720JA05LS
2.339E+00	1.765E-07	1.151E-08	2.377E-09	7.423E-14	3.718E-07	5.466E-08	720JA05LS
2.371E+00	1.617E-07	1.085E-08	2.496E-09	6.829E-14	3.393E-07	4.989E-08	720JA05LS
2.403E+00	1.698E-07	1.125E-08	2.429E-09	7.205E-14	3.078E-07	4.526E-08	720JA05LS
2.435E+00	1.652E-07	1.100E-08	2.242E-09	7.042E-14	2.762E-07	4.061E-08	720JA05LS
2.467E+00	1.581E-07	1.051E-08	2.349E-09	6.769E-14	2.458E-07	3.614E-08	720JA05LS
2.499E+00	1.398E-07	1.035E-08	1.951E-09	5.677E-14	2.172E-07	3.072E-08	720JA05LS
2.531E+00	1.327E-07	8.967E-09	1.592E-09	5.338E-14	1.818E-07	2.674E-08	720JA05LS
2.563E+00	1.083E-07	7.734E-09	1.571E-09	4.701E-14	1.607E-07	2.364E-08	720JA05LS
2.595E+00	1.066E-07	5.54E-09	1.571E-09	4.659E-14	1.403E-07	2.064E-08	720JA05LS

8.837E+00	9.935E-08	7.158E-09	1.460E-08	4.350E-14	1.226E-07	1.803E-08	720JA05HS
9.074E+00	8.600E-08	6.388E-09	1.264E-08	3.787E-14	1.006E-07	1.480E-08	720JA05HS
9.254E+00	8.340E-08	6.162E-09	1.226E-08	3.688E-14	8.537E-08	1.256E-08	720JA05HS
9.433E+00	7.384E-08	5.613E-09	1.085E-08	3.279E-14	7.129E-08	1.049E-08	720JA05HS
9.611E+00	7.247E-08	5.380E-09	1.065E-08	3.231E-14	5.827E-08	8.579E-09	720JA05HS
9.832E+00	5.883E-08	4.600E-09	8.647E-09	2.637E-14	4.375E-08	6.446E-09	720JA05HS
1.001E+01	4.924E-08	4.044E-09	7.238E-09	2.216E-14	3.413E-08	5.032E-09	720JA05HS
1.023E+01	3.891E-08	3.383E-09	5.726E-09	1.755E-14	2.445E-08	3.606E-09	720JA05HS
1.040E+01	3.009E-08	2.897E-09	4.431E-09	1.360E-14	1.858E-08	2.743E-09	720JA05HS
1.057E+01	2.573E-08	2.503E-09	3.792E-09	1.165E-14	1.384E-08	2.044E-09	720JA05HS
1.079E+01	2.097E-08	2.101E-09	3.094E-09	9.514E-15	8.704E-09	1.286E-09	720JA05HS
1.096E+01	1.397E-08	1.617E-09	2.063E-09	6.350E-15	5.734E-09	8.479E-10	720JA05HS
1.117E+01	8.160E-09	1.281E-09	1.206E-09	3.717E-15	3.410E-09	5.047E-10	720JA05HS
1.134E+01	6.483E-09	9.694E-10	9.590E-10	2.959E-15	2.166E-09	3.207E-10	720JA05HS
1.155E+01	4.289E-09	8.139E-10	6.350E-10	1.962E-15	1.035E-09	1.533E-10	720JA05HS
1.176E+01	1.210E-09	4.138E-10	1.793E-10	5.547E-16	4.572E-10	6.782E-11	720JA05HS
1.193E+01	1.361E-09	4.154E-10	2.019E-10	6.252E-16	2.386E-10	3.541E-11	720JA05HS
1.214E+01	3.653E-10	2.945E-10	5.423E-11	1.681E-16	5.733E-11	8.512E-12	720JA05HS
1.230E+01	1.469E-10	2.854E-10	2.183E-11	6.774E-17	1.636E-11	2.428E-12	720JA05HS
1.251E+01	1.320E-10	2.979E-10	1.962E-11	6.097E-17	-1.293E-11	-1.926E-12	720JA05HS
1.272E+01	-1.383E-10	3.106E-10	-2.059E-11	-6.405E-17	-1.226E-11	-1.824E-12	720JA05HS
1.292E+01	-2.418E-11	3.233E-10	-3.603E-12	-1.122E-17	3.989E-12	5.950E-13	720JA05HS
1.308E+01	7.404E-11	3.339E-10	1.104E-11	3.442E-17	0.	0.	720JA05HS

1 PUBE 10 CM POLY AT R=1M (FOR 1.0 N/SEC)

TIME AND DATE OF DATA REPORTING
 COMPILATION DATE OF THIS CODE VERSION

15:02:48R 10/17/77
 10/14/77U 16.05.47

30 GROUP OUTPUT

GROUP#	ENERGY UP-BOUND-MEV	DIFFERENTIAL FLUX N/CM2-SEC-MEV	INTEGRAL FLUX N/CM2-SEC	FLUX PER UNIT LETHARGY N/CM2-SEC
30	4.000000E-07	0.	0.	0.
29	3.180000E-06	0.	0.	0.
28	3.200000E-05	0.	0.	0.
27	1.000000E-04	0.	0.	0.
26	1.590000E-03	0.	0.	0.
25	1.261000E-02	0.	0.	0.
24	1.000000E-01	0.	0.	0.
23	2.360000E-01	9.522656E-07	1.177000E-07	1.540766E-07
22	3.000000E-01	9.948658E-07	2.749812E-07	3.599428E-07
21	3.946000E-01	7.376968E-07	6.978612E-08	4.037415E-07
20	7.071000E-01	6.621184E-07	7.448832E-08	4.309997E-07
19	6.409000E-01	6.750688E-07	7.734561E-08	4.474253E-07
18	1.000000E+00	5.873807E-07	9.345227E-08	5.406546E-07
17	1.257400E+00	4.821166E-07	1.240958E-07	5.441650E-07
16	1.581100E+00	4.318592E-07	1.397928E-07	6.129161E-07
15	1.988200E+00	4.003343E-07	1.630575E-07	7.148135E-07
14	2.500000E+00	4.426450E-07	2.265457E-07	9.933997E-07
13	3.973000E+00	4.554605E-07	3.154328E-07	1.246368E-06
12	6.535300E+00	4.325998E-07	4.433374E-07	1.407768E-06
11	4.204500E+00	3.616886E-07	5.419697E-07	1.399735E-06
10	3.000000E+00	3.343370E-07	6.59651E-07	1.538702E-06
9	1.764800E+00	3.003869E-07	8.297435E-07	1.616856E-06
8	6.46500E-01	1.93940E-07	1.934397E-07	1.361482E-06
7	6.63100E-01	7.21008E-07	1.749576E-07	1.231346E-06
6	6.835200E+00	1.353843E-07	1.586539E-07	1.116805E-06
5	1.018600E+01	7.147511E-08	9.654858E-08	6.797712E-07
4	1.174500E+01	1.650438E-08	2.573032E-08	1.809787E-07
3	1.354100E+01	2.958276E-10	3.13063E-10	3.740148E-09
2	1.561200E+01	0.	0.	0.
1	1.800000E+01	0.	0.	0.