6. Restrictions on the Complexity: The number of scalar-flux data points, the number of x coordinates and μ coordinates at which the angular flux is to be reconstructed must each be less than 46.
7. Typical Running Time: IBM-709: One minute.
8. Related Program: The program uses the general matrix algebra program RAMP[2], which is supplied as part of the operating package. The program DPN-FIT is in fact a set of instruction-data cards which control the operation of RAMP.
9. Present Status: In use.
10. *References:*

   [1]G. R. Dalton and H. G. Cofer, "Neutron Angular Flux Measurements Without Collimators," being reviewed for *Nucl. Sci. Eng.*

   [2]Private communication from M. J. Ohanian (1964).

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1. Name of Program: ISOPOWER
2. Computer for Which Program is Designed: IBM 7090
   Programing System: FORTRAN II
3. Nature of Problem Solved: ISOPOWER can be used to calculate the power output of radioisotopes in W/g, W/cm^3, and curie/g of source. The program calculates and sums the contributions to the total power output from all isotopes in a decay chain and from different chains of a mixed radioisotopic power source. The results will be printed out and, if desired, plotted as power output vs time curves on an associated electroplotter.
4. Method of Solution: The growth and decay of members of each decay chain are computed using a generalized solution to the Bateman equations, which describe such processes. Input data to ISOPOWER must include the amount of each parent radioisotope present, the half-lives and average energy of radiation for all members

of each chain, and the densities of the various elements or their compounds which are used in the source.
5. Basic Physics Approximations in the Problem Formulation: The results calculated using program ISOPOWER are maximum theoretical power output values which assume, in a thermal application, that all the radiation coming from a source is converted to thermal energy either within the source itself or in associated shielding.
6. Restrictions on Complexity of the Problem: This program will handle up to 20 isotopes in a chain and sum the contributions to total power output from up to 20 chains.
7. Typical Running Time: (IBM 7090)—This program performed calculations for several cases with an output of 480 lines in 72 sec. The average rate was 10 calculations/sec.
8. Related Programs: ISOPOWER requires a subroutine for the particular electroplotter associated with the computer being used. At present, this program uses a plotting subroutine written for the Benson-Lehner Model-J Electroplotter.
9. Status: Presently in use.
10. *Reference:*

    [1]Charles W. Friend and J. R. Knight, "ISOPOWER—Computer Program for Calculating Power Output of Single or Mixed Radioisotopic Power Sources Written in FORTRAN II," USAEC Rept. ORNL-3826, Oak Ridge National Laboratory (to be published).
11. Material Available: Program decks and referenced document from the authors.

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