CTS-3

1. Name of Program: CTS-3
2. Computer for Which Program is Designed: Philco 2000
   Programming System: FORTRAN
3. Nature of Problem Solved: CTS-3 solves the transport equation in an infinite cylinder. A twelve-group (maximum) formulation is used, with P_1 scattering in each group and P_1 transfer. The spatial mesh spacing, the P_0 and P_1 transfer matrices and the source shape are arbitrary. The program accepts either vacuum or reflecting (cell) boundary conditions.
4. Method of Solution: The program uses the same angular and spatial difference schemes (similar to S_N — see Ref. 1) used in CTS-1 and CTS-2. The standard multigroup approximations are used.
5. Restrictions on the Complexity of the Problem: A maximum of 12 groups, 150 spatial mesh points, and 8×10 angular mesh points (per octant) are allowed. Although the total mean free path, in any group, is completely arbitrary, only five regions with different transfer matrices are allowed. Since the program is intended primarily for thermal studies, the source term is assumed to have the same shape in every group.
6. Typical Running Time: The typical running time range is 0.02 to 0.30 hours, depending on the number of groups, the degree of the angular and spatial approximations, and the problem parameters.
7. Present Status: In production
8. *References:* 1) J. H. Alexander and M. L. Johnson, "S_N1 Cylindrical Cell, N Regions (C)", GA-360, (May 1959).
   2) J.H.Bennett, "CTS-3 – A Multi-Group Transport Program for Infinite Cylinders," WAPD-TM-396, (September 1963).
   3) J. H. Bennett, "CTS-3 Memorandum No. 1," WAPD-R(B)-514, (October 1963).
9. Materials Available to Domestic Users from Philco:
   Binary Program Deck
   FORTRAN Source Deck
   WAPD-TM-396 and WAPD-R(B)-514

J. H. Bennett

Westinghouse Electric Corporation
Bettis Atomic Power Laboratory
Pittsburgh, Pennsylvania