APPENDIX II

PROGRAM FOR CALCULATING WAVE FLOW IN ONE SPACE DIMENSION FOR PLANE, CYLINDRICAL, OR SPHERICAL GEOMETRY

A. Program Name: BURN

B. Program Description

This program is an adaptation of one written by John O. Erkman at Stanford Research Institute. It integrates the equations of flow through one space and one time dimension for arbitrary initial and boundary conditions. Integration is carried through shock fronts by means of an artificial viscosity. Initial and boundary conditions, input parameters and output statements are contained in subroutines so they may be readily altered.

Subroutine DECIDE contains the input parameters which define the problem. Comments in the Listing (Section C) should make this subroutine self-explanatory, except perhaps for the following:

S is an integer index used to label the various regions in the problem, S = 2,S1

BURN(S) is an index which defines the material in region S; for example if the geometry is spherical and the problem consists of a sphere of explosive surrounded by an Al shell, S1 = 3, BURN(2) = 1, BURN(3) = 4. Other values of BURN(S) are defined in the program listing.

ØPTIØN is an index defining the driving system for the problem. ØPTIØN = 1,2,3, or 4 for a pressure pulse applied to the left boundary.

TAU is a characteristic time parameter for the applied pressure. For its exact meaning, consult the listing of the MAIN program. It's units are microseconds.

LEFTP is in Megabars (Mb)

TQUIT, microseconds

Values of ZØN(S) and L(S) need be given for S = 2, S1.

The primary output consists of tables of values of particle velocity, pressure, etc., vs J for each time and cycle indicated in DESCRIBE.

C. Program Listing and Sample Output