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**EXPLO/PC 2.0**

**An Explosive Thermal Analysis Program for Personal Computer**

**EXPLO/PC** was developed as a heat transfer tool for a variety of explosive thermal initiation problems. The finite difference method was used to calculate temperature fields and time to initiation for explosive materials. The code is one dimensional and is programmed for Cartesian, Cylindrical, and Spherical coordinates. Temperature dependent properties phase changes, and multiple heat sources terms are allowed. Multiple source terms use Nth-order Arrhenius kinetics for each material component. Temperature, flux, convection, or radiation boundary conditions may be employed. Internal convection is considered for materials that undergo a solid/liquid phase change. The Crank-Nicholson implicit solution method, which allows large time steps and short running time, is used. The code uses either steady state or transient boundary conditions, with either fixed or variable time steps. The code is written in FORTRAN and originally was developed to run on CRAY computer systems.

We at **Galaxy Advanced Engineering Inc.** have taken steps to produce the PC version, i.e. **EXPLO/PC**. Currently the program is running on IBM or 100% compatibles with Math-Coprocessor under PC/DOS or PC/Windows95/98 and NT operating system. **EXPLO/PC** is capable of producing the plots optionally on the screen, a graphics printer, or a plotter. It uses **GAE Inc.** Graphics Subroutines of Galaxy Advanced Engineering, Inc. Universal Graphics Library (**UGL**) device drivers and fonts.

The **EXPLO/PC** package, includes Universal Graphics Library (**UGL**) which handles all the plotting requirements for the output of the program as well as generating Meta File and post script print out of these plots. To order, please send your company's purchase order to **Galaxy Advanced Engineering Inc.**

The following performance has been experienced running the program on a IBM AT (CPU 80286, Math Coprocessor 80287) under DOS 3.3.

Test Model	Total Run Time
=====	=====
Sphere Induction (25-mm-diam)	22 minutes
layers	25
cycles per print	5
cycles printed	100
thermocouple locations	6
data points per thermocouple	250

If one uses the AT with CPU 80386 and Math-Coprocessor 80387 the program run time cuts by half. This is based upon 25 MHz available speed on the computer.