

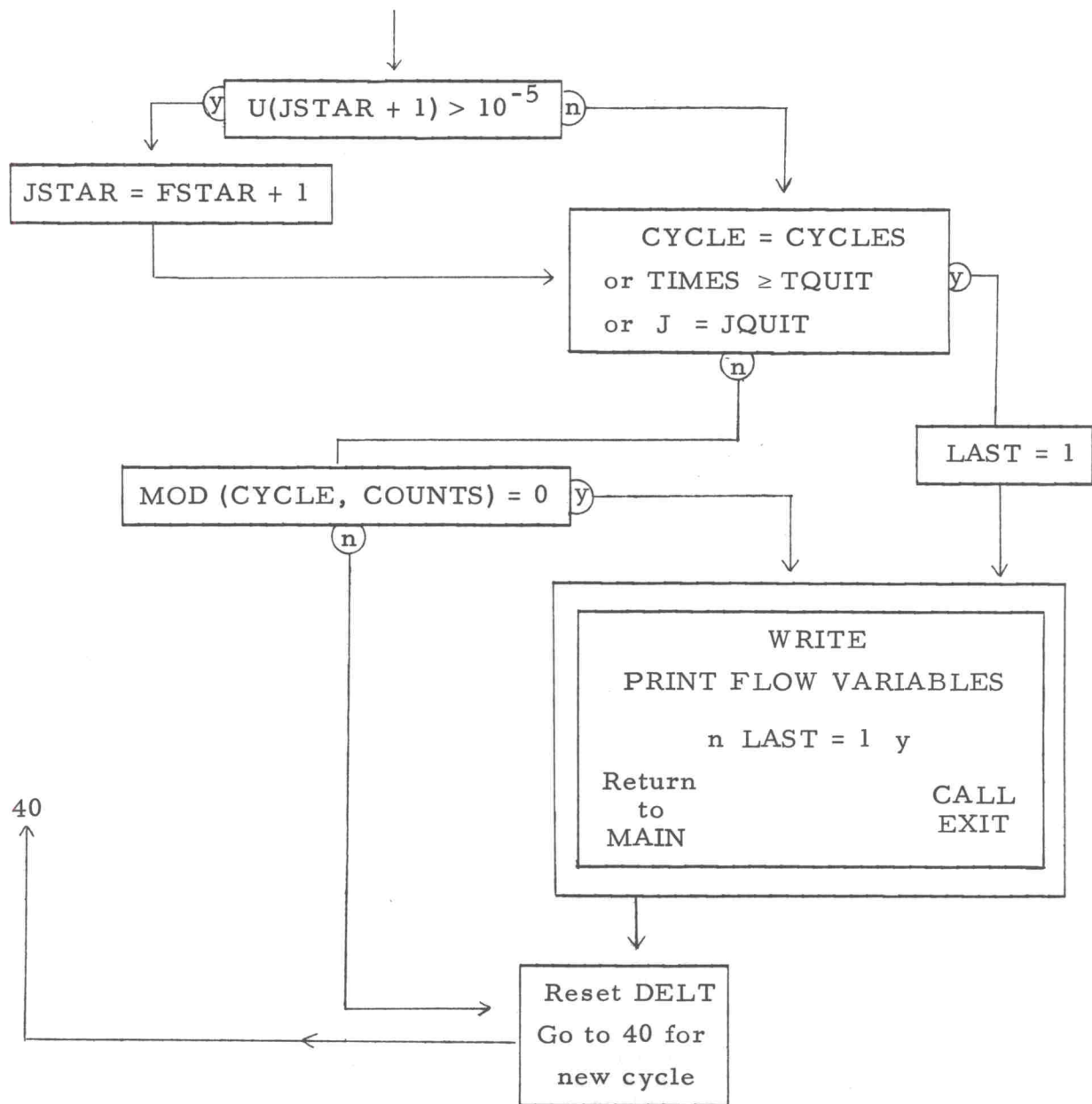


Fig. 1. (c)

Unclassified

Security Classification

DOCUMENT CONTROL DATA - R & D		
<i>(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)</i>		
1. ORIGINATING ACTIVITY (Corporate author) Washington State University Department of Physics, Shock Dynamics Laboratory Pullman, Washington 99163		2a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED 2b. GROUP
3. REPORT TITLE EQUATIONS OF STATE IN SOLIDS (U)		
4. DESCRIPTIVE NOTES (Type of report and inclusive dates) Technical Summary Report No. 1 February 1967		
5. AUTHOR(S) (First name, middle initial, last name) Duvall, George E., Fowles, G. Richard, Horie, Yasuyuki		
6. REPORT DATE February 1967	7a. TOTAL NO. OF PAGES	7b. NO. OF REFS 49
8a. CONTRACT OR GRANT NO. DA-04-200-AMC-1702(X)	9a. ORIGINATOR'S REPORT NUMBER(S) SDL 67-01	
b. PROJECT NO. c. d.	9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report)	
10. DISTRIBUTION STATEMENT This document has been approved for public release and sale; its distribution is unlimited.		
11. SUPPLEMENTARY NOTES	12. SPONSORING MILITARY ACTIVITY U.S. Army Ballistics Research Laboratories Aberdeen Proving Ground, Maryland	
13. ABSTRACT A procedure is described for developing simple approximate equations of state of liquids from Hugoniot P-V relations determined in shock wave measurements. This is applied to a number of liquids and a table of coefficients is given. The formalism of irreversible thermodynamics is applied to time-dependent phase transitions in iron and an approximate set of constitutive relations is obtained in a form suitable for numerical integration with the equations of continuum dynamics. These are applied in an approximate form to study the development of the two-wave structure in iron caused by the α - ϵ phase transition. Finite strain theory is applied to the analysis of shock wave data for quartz, and the results supply enough information to estimate some of the fourth-order elastic constants.		

DD FORM 1473
1 NOV 66

Unclassified

Security Classification