

RECOMP II USERS' PROGRAM NO. 1101

PROGRAM TITLE: SIMULTANEOUS EQUATIONS PROGRAM FOR THE
MODIFIED RECOMP II

PROGRAM CLASSIFICATION: General

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PURPOSE: This program will solve up to 34 simultaneous
linear algebraic equations. The number of
equations and unknowns must be the same.
Equations are presumed to be of the follow-
ing form:

$$a_{11} x_1 + a_{12} x_2 + a_{13} x_3 + \dots + a_{1n} x_n = b_1$$

$$a_{21} x_1 + a_{22} x_2 + a_{23} x_3 + \dots + a_{2n} x_n = b_2$$

⋮

$$a_{n1} x_1 + a_{n2} x_2 + a_{n3} x_3 + \dots + a_{nn} x_n = b_n$$

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$$a_{21} x_1 + a_{22} x_2 + a_{23} x_3 + \dots + a_{2n} x_n = b_2$$

$$\vdots$$

$$a_{n1} x_1 + a_{n2} x_2 + a_{n3} x_3 + \dots + a_{nn} x_n = b_n$$

Use of the Program

- (1) Read in the simultaneous equations program tape.
- (2) Set tab switch to tab, and set 2 tabs at about 15 and 30
- (3) Press "start 1". The computer will print out "N". Type the number of equations as a two digit number, such as 05. (Also see (9) below).
- (4) The computer will then type out "BEGIN DATA INPUT". You may then enter, on the typewriter, the coefficients of the equations in row-wise consecutive order, including the right hand side of the equation. For example, enter

a₁₁ a₁₂ a₁₃ a_{1n} b₁ a₂₁ a₂₂ etc.

The form of entry may be any one of the several listed below. To enter 83.5, you may enter

- (a) 83.5 (carriage return)
- (b) +83.5 (carriage return)
- (c) +.835+2 (carriage return)
- (d) +8.35+1 (carriage return)
- (e) +835-1 (carriage return)

In any of the above cases, the carriage return may be replaced by a space or tab. A space or tab by itself will enter a + zero. Negative numbers must be preceded by a minus sign.

- (5) At the completion of the data entry the computer will ask "ERROR? ROW". If no error in data entry was made, type a carriage return only. If an error was made, type the number of the row as a two digit number. The computer will ask "COL", after which you may type the number of the column as a two digit number. (The b_i column is $n+1$.) Following this, you may enter the corrected number in the same form as in (4) above. After all corrections have been made, type a carriage return when the computer asks for "ROW".
- (6) If a tape or a typed copy of the data is desired, press "start 2". If sense switch "C" is off, the data will be typed. If "C" is on, the data will be punched on tape. Both copies may be obtained, if desired, by using "start 2" twice, once with "C" on and once with "C" off. The tape copy is much faster, of course. At the conclusion of the printout or tape output, the "ERROR?" printout will occur. See (5) above.
- (7) When you are ready to compute, press "start 3". The answers will be printed out.
- (8) Pressing "start 3" with sense switch "D" on, will zero the entire data area.
- (9) Pressing "start 1" with sense switch "B" on will transfer to the "ERROR?" routine as in (5) above. This may be used with (8) above to enter zeros in all positions except those entered through the error routine, such as in a very sparse matrix with almost no non-zero elements.
- (10) The program is self-restoring and may be used repeatedly without re-entering the program tape. In addition, step (9) above may be used to modify just a few locations. To compute with these modifications, use step (7).
- (11) The program occupies:

0000-0477	Program
1000-1177	AN-007.1
1200-1437	AN-014
1500-1717	AN-060
3000-4200	DATA