PROGRAM TITLE: RECOMP ALGEBRAIC TRANSLATOR (RAT I)

PROGRAM CLASSIFICATION: Executive & Control

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PURPOSE: The RAT I Program performs manipulations
of the type usually performed on a slide
rule; however, RAT I is faster than the
slide rule and far more precise.

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PROGRAM TITLE: RAT I (RECOMP ALGEBRAIC TRANSLATOR)

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PURPOSE

The RAT I Program performs manipulations of the type usually performed
on a slide rule; however, RAT I is faster than the slide rule and
far more precise.

OPERATOR'S INSTRUCTIONS

1. Enter the RAT I program tape.

2. Press "start 1" or "start 2". The former prints out the title.
    (See note below)

3. Type in the number to be operated on. The number may be typed
    in using several formats interchangeably. For example, 12.4 may
    be typed in as:

    a.   12.4 (space)
    b.   +12.4 (space)
    c.   +124-1 (space)
    d.   +.124 + 2 (space)
    e.   +.00124 + 4 (space), etc.

4. Type the operation code. The codes are as follows:

+	add	(	sin
-	subtract	)	cos
:	multiply	&	$\tan^{-1}$ or inverse tangent
/	divide	?	$\log_{10}$
$	square root	!	power (such as x^y)
;	exponential	s	printout of answer

5. Type the number operating on the previous number. There will be an
    operating number only for the add, subtract, multiply, divide, and
    power operations. If there is no operating number, type a space.
    This is important.

6. The result of the operation is now the new number being operated on.
    To perform further operations, proceed as in No. 4 above. If a print-
    out is desired, of course, the printout operation may be typed. After
    a printout, one may either proceed by operating on the number printed
    out by proceeding from No. 4 above, or by pressing "start 2" twice,
    start a new computation as in No. 2 above.

    NOTE: If a 10 significant figure printout is desired, turn sense
           switch "B" on at any time before printout.

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PRECAUTIONS

1. Do not type too fast. The computer is never ready to accept a new operation until the typewriter hits a blank. In case of error (for this or any other reason) press "start 2" and proceed.

2. Certain of the operations have limitations in the numbers which they will accept, as follows:

$	square root	$X \geq 0$
;	exponential	$X < 10^{35}$
( )	sin or cos	$\lvert X \rvert < 8\pi$
?	$\log_{10}$	$X > 0$
!	powers	$X > 0$

3. If the end of a line is approached and a carriage return is desired, the carriage must be returned by hand except for the following exception: If desired, a carriage return may be substituted for a space when a number is typed in.

4. All angles are in radians.

EXAMPLE

Suppose it is desired to perform the following computation: $\sin \sqrt{\dfrac{(63 \times 45 + 2)\ 15}{455}}$

The type-in would be in the following sequence:

1) 63 (space)   8) /
2) :   9) 455 (space)
3) 45 (space)   10) $
4) +   11) (space)
5) 2 (space)   12) (
6) :   13) (space)
7) 15 (space)   14) s   (printout)

Copy of computer run:

(Without 10 digit printout)

    63 : 45 + 2 : 15 / 455 $ (s
    -.24370 + 0

(With 10 digit printout)

    63 : 45 + 2 : 15 / 455 $ (s
    -.2437031565 + 0