

# HP-25 OWNER'S HANDBOOK ADDENDUM

This addendum contains updating information for the *HP-25 Owner's Handbook*, part number 00025-90001, printed May, June, August, and September 1975.

## Rectangular to Polar Conversion Limitation

The accuracy range for rectangular to polar conversion is exceeded when  $x < 0$ ,  $\left| \frac{y}{x} \right| < 10^{-5}$ , and  $y \neq 0$ —i.e. only for angles within approximately  $\pm .000573^\circ$  of  $180^\circ$ .

In this range the angle  $\theta$  returned in the Y-register following  $\boxed{9}$   $\boxed{\rightarrow P}$  is in error by  $180^\circ$  ( $\pi$  radians, 200 grads). To obtain the correct value of  $\theta$  if calculated  $\theta < 0^\circ$ , add  $180^\circ$ ; if calculated  $\theta > 0^\circ$ , subtract  $180^\circ$ . For example, if  $y = 10^{-8}$  and  $x = -1$  the calculated  $\theta$  is  $-.000000573$ ; adding  $180^\circ$  gives the correct  $\theta$  value of  $+179.9999994^\circ$ .

If, in a user's program, data for a rectangular to polar conversion is expected to fall within the range discussed above, the keystroke routine below may be used to accurately perform the conversion. It may be inserted into any program. (Be sure to change the step number addresses used by the GTO statements in steps 02, 04, 10, 14, 17, when appropriate.)

**Note:** Before using this routine you must store  $180^\circ$  ( $\pi$  radians, 200 grads) in storage register  $R_0$ . The Y-register must contain the value for  $y$  and the X-register the value for  $x$ .

Line	Keycode	Instruction
01	15 41	$g x < 0$
02	13 05	GTO 05
03	15 09	$g \rightarrow P$
04	13 18	GTO 18
05	15 09	$g \rightarrow P$
06	21	$x \leftrightarrow y$
07	14 06	$f \tan$
08	15 06	$g \tan^{-1}$
09	15 41	$g x < 0$
10	13 15	GTO 15
11	24 00	RCL 0
12	41	-
13	21	$x \leftrightarrow y$
14	13 18	GTO 18
15	24 00	RCL 0
16	51	+
17	13 13	GTO 13

### Programming Note—Error Conditions

When the last operation executed by your calculator causes data to be stored in or recalled from a data register (including LAST X) and the calculator is at step 00, an error condition sometimes occurs. This only happens with limited ranges of data. You may never encounter these circumstances which cause the display to go blank when switching to PROGRAM mode. If, however, this should happen:

- Switch back to RUN mode (the word "Error" will appear).

b. Press **GTO** **0** **1** .

c. Switch to PROGRAM mode and press **BST** .

Now continue programming or editing as desired. With the exception of the X-register all of the data and program remain intact.