DIAGNOSTIC PROGRAM

This program can be used to test the calculator and diagnose calculator malfunctions. Simply insert the card and press [A]. The calculator should pause displaying:

-7.777777770 -77

If the calculator does not pause displaying -7.777777770 -77, there is a malfunction in the card reader, program storage, program control, digit entry, the registers of the operational stack, the [x≷y] function, the [R↓] function, the pause command or the display. After the one second pause, the calculator should continue to run for about 50 seconds and finally pause to display the four values below:

1. 07
10.000 06
1.0000 07
10000000.00

These outputs indicate that display formatting is working satisfactorily. If the calculator stops before displaying these values, the code number displayed will correspond to a function or operation in the following table. For instance, if the calculator stopped displaying 27, an error in tangent or arctangent would be indicated.

DIAGNOSTIC CODES

Function or Operation or Register Indicated	Code
STO i, RCL i, R_0, GTO 0, LBL 0, x=y, x≠y	0
ISZ I, R_1	1
R_2	2
R_3	3
R_4	4
R_5	5
R_6	6
R_7	7
R_8	8
R_9	9
R_{S0}	10
R_{S1}	11
R_{S2}	12

Function or Operation or Register Indicated	Code
R_{S3}	13
R_{S4}	14
R_{S5}	15
R_{S6}	16
R_{S7}	17
R_{S8}	18
R_{S9}	19
R_A	20
R_B	21
R_C	22
R_D	23
R_E	24
RCL I, RND, sin, $\sin^{-1}$	25
cos, $\cos^{-1}$	26
tan, $\tan^{-1}$	27
→P, →R	28
→HMS, HMS→	29
Log, 10^x	30
LN, e^x	31
x^2, $\sqrt{x}$	32
ENTER↑, y^x, 1/x, LSTX	33
+, −	34
x, ÷	35
INT, FRC	36
D→R, R→D	37
%	38
$x \leq y$	39
$x > y$	40
$x = 0$	41
$x \neq 0$	42
$x < 0$	43
$x > 0$	44
Flag 0, off	45
Flag 1, off	46
Flag 2, off	47

Function or Operation or Register Indicated	Code
Flag 3, off	48
Flag 0, on	49
Flag 1, on	50
Flag 2, on	51
Flag 3, on	52

Remarks:

If this program runs correctly, it strongly suggests that the calculator is operating correctly. However, the diagnostic is by no means complete or exhaustive. All data storage registers are used.

STEP	INSTRUCTIONS	INPUT DATA/UNITS	KEYS	OUTPUT DATA/UNITS
1	Enter program			
2	Start diagnostic		A	-7.777777770-77
3	See documentation for descrip-			
	tion of outputs.			

DIAGNOSTIC PROGRAM

This program can be used to test the calculator and diagnose calculator malfunctions. Simply insert the card and press **A**. After approximately two seconds, the calculator should pause displaying:

57.0

If the calculator does not pause with this number, there is a malfunction in executing and returning from a subroutine, finding Label 0, program storage, the display, the magnetic card, the PAUSE command or the card reader. After the pause, the calculator should continue to run about one-and-one-half minutes more and then print the three lines shown:

-888.9-90
-8.889-88
-8.888888888-88

This output indicates that printing and display formatting are working correctly. If the calculator stops before displaying ***-8.888888888-88***, a code number corresponding to a function or operation malfunction will be displayed. For instance, if the calculator stopped with ***36.0*** in the display, an error in tangent or arctangent would be indicated. The sole exception is a failure in primary register 0. The calculator will stop execution of the program with the erroneous contents of R_0 displayed.

DIAGNOSTIC CODES

Function or Operation or Register Indicated	Code
STO i, RCL i, R_0, GTO 0, LBL 0, x=y, x≠y	0
ISZ I, R_1	1
R_2	2
R_3	3
R_4	4
R_5	5
R_6	6
R_7	7
R_8	8
R_9	9
R_{S0}	10
R_{S1}	11
R_{S2}	12

Remarks:

If this program runs correctly, it strongly suggests that the calculator is operating correctly. However, the diagnosis is by no means complete or exhaustive. The diagnostic can be made to repetitively loop by changing step 224 from "R/S" to "GTO A". This may aid in detection of intermittent failures. The program relies on the status of the flags to be correctly set by the card. If a flag error occurs, re-insert the diagnostic card and verify repeatability of failure.

ERROR CODES

Malfunction	Code	Malfunction	Code
R_1	1	y^x, LAST x, 1/x	30
R_2	2	$\sqrt{x}$, x^2	31
R_3	3	LN, e^x	32
R_4	4	LOG, 10^x	33
R_5	5	→H.MS, H.MS→, RND	34
R_6	6	→P, →R	35
R_7	7	TAN, TAN^{-1}	36
R_8	8	COS, COS^{-1}	37
R_9	9	DEG, SIN, SIN^{-1}	38
R_{S0}	10	FLAG 2, test cleared	39
R_{S1}	11	FLAG 1, set; LBL9	40
R_{S2}	12	FLAG 2, set; LBL8	41
R_{S3}	13	FLAG 0, clear	42
R_{S4}	14	FLAG 3, test cleared	43
R_{S5}	15	FLAG 0, set by card; LBL7	44
R_{S6}	16	FLAG 3, set by card; LBL6	45
R_{S7}	17	FLAG 1, cleared by card	46
R_{S8}	18	FLAG 2, cleared by card	47
R_{S9}	19	x>0, true; LBL4	48
R_A	20	x<0, false	49
R_B	21	x=0, false	50
R_C	22	x≠0, true; LBL3	51
R_D	23	I-REGISTER	52
R_E	24	x≤y, true; LBL1	53
EEX, %	25	x=y, false	54
D→R, R→D	26	x>y, false	55
FRC, INT	27	ENTER↑, R↓, R↑, x⇄y, STACK (X, Y, Z, T)	56
×, ÷	28	Subroutine execution and return, CLREG,	see text
+, −	29	P⇄S; LBL0	

Function or Operation or Register Indicated	Code
Flag 3, off	48
Flag 0, on	49
Flag 1, on	50
Flag 2, on	51
Flag 3, on	52

Remarks:

If this program runs correctly, it strongly suggests that the calculator is operating correctly. However, the diagnostic is by no means complete or exhaustive. All data storage registers are used.

STEP	INSTRUCTIONS	INPUT DATA/UNITS	KEYS	OUTPUT DATA/UNITS
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