

HMS+

Programmer: Dr. Bill Hazelton

Date: March, 2005.

Line	Instruction	Display	User Instructions
D0001	LBL D		Enter first angle. Press ENTER. Enter second angle. Press XEQ D. (Angles in DDD.MMSS format) Angle sum displayed (in HP notation)
D0002	→HR		
D0003	x < > y		
D0004	→HR		
D0005	+		
D0006	→HMS		
D0007	RTN		

Notes

- (1) General program to add two angles, bearings or directions in DDD.MMSS format (HP notation), and produce a result in the same format.
- (2) Key in the first angle. Press ENTER. Key in the second angle. Stack will contain:

Stack Register	Contents
T	
Z	
Y	First angle in DMS
X	Second angle in DMS

Press XEQ D. The sum of the two angles in HP notation will be in the X register.

- (3) Negative values will work correctly.

Sample Computation

$$123^\circ 45' 56'' + 321^\circ 54' 32'' = 445^\circ 40' 28''$$

Storage Registers Used

None

Labels Used

Label **D** Length = 21 Checksum = 90C4

Use the length (LN=) and Checksum (CK=) values to check if program was entered correctly. Use the sample computation to check proper operation after entry.

HMS-

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Line	Instruction	Display	User Instructions
E0001	LBL E		Enter first angle. Press ENTER.
E0002	→HR		
E0003	x < > y		Enter second angle. Press XEQ E.
E0004	→HR		
E0005	x < > y		(Angles in DDD.MMSS format)
E0006	-		
E0007	→HMS		
E0008	RTN		
			Angle sum displayed (in HP notation)

Notes

- (1) General program to get the difference between two angles, bearings or directions in DDD.MMSS format (HP notation), and produce a result in the same format.
- (2) Key in the first angle. Press ENTER. Key in the second angle. Stack will contain:

Stack Register	Contents
T	
Z	
Y	First angle in DMS
X	Second angle in DMS

Press XEQ E. The difference between the two angles in HP notation will be in the X register. The second angle will be subtracted from the first.

- (3) Negative values will work correctly.

Sample Computation

$$321^{\circ} 54' 32'' - 123^{\circ} 45' 56'' = 198^{\circ} 08' 36''$$

Storage Registers Used

None

Labels Used

Label E Length = 24 Checksum = 7DAF

Use the length (LN=) and Checksum (CK=) values to check if program was entered correctly. Use the sample computation to check proper operation after entry.

Clear Stack

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Line	Instruction	Display	User Instructions
C0001	LBL C		Press XEQ C.
C0002	CL x		
C0003	R ↓		
C0004	CL x		
C0005	R ↓		
C0006	CL x		
C0007	R ↓		
C0008	CL x		
C0009	RTN	0.0000	Stack is now zeroed.

Notes

- (1) General program clear the 4-register stack in the calculator. This is a useful thing to do before starting some computations, but the HP-33S has no in-built function to do this.
- (2) Press XEQ C. The stack will be set to all registers containing zero. The stack will contain:

Stack Register	Contents
T	0.0000
Z	0.0000
Y	0.0000
X	0.0000

Storage Registers Used

None

Labels Used

Label C Length = 27 Checksum = 8E87

Use the length (LN=) and Checksum (CK=) values to check if program was entered correctly. Use the sample computation to check proper operation after entry.

Clear Stack

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Line	Instruction	Display	User Instructions
C0001	LBL C		Press XEQ C.
C0002	CL x		
C0003	ENTER		
C0004	ENTER		
C0005	ENTER		
C0006	RTN	0.0000	Stack is now zeroed.

Notes

- (1) General program clear the 4-register stack in the calculator. This is a useful thing to do before starting some computations, but the HP-33S has no in-built function to do this.
- (2) Press XEQ C. The stack will be set to all registers containing zero. The stack will contain:

Stack Register	Contents
T	0.0000
Z	0.0000
Y	0.0000
X	0.0000

Storage Registers Used

None

Labels Used

Label C Length = 18 Checksum = 1B47

Use the length (LN=) and Checksum (CK=) values to check if program was entered correctly. Use the sample computation to check proper operation after entry.