



HEATH DESK- TOP CALCU- LATOR

A Ham-Convenience product of the Electronic Age. Once you have one you would betray your own mother in order to keep it!

This article should not be read by anyone who enjoys the manipulation of numbers from one side of a page to another. If you have ever noticed yourself even slightly smiling while performing a simple task such as finding the LC Constant for a particular frequency – Go Away!

Now, as the *rest* of us all know, the bad guy within those too-numerous electronic equations is the Algebra. In theory, equation solving is easy. Values are simply plugged-in for the variables and the end product is happily solved. (Ho!) In *practice* however, the easy part of equation solving is over more-and-more as the Algebraic calculations go on-and-on. Somewhere near the bottom of the second page, (where you neatly dropped a set of brackets) trouble usually begins. It is not immediately noticeable because of your search for that decimal point that was there just a minute ago . . . you are not even aware that you are moments away from rediscovering Avagadro's number.

The Heath IC-2008 electronic calculator kit can restore faith in anyone's mathematical prowess. It adds, subtracts, multiplies and divides faster than any living EE graduate, and is undoubtedly more accurate. It will read to 8 digits (with polarity and overrange indication) and features a floating or selectable fixed decimal point. Besides the numerals, addition and subtraction buttons, etc., it has buttons for polarity change, constant (K) storage, display Clear (to erase the last entry only) and machine Clear (to completely clear the calculator). The seven segment display tubes are neon filled and are large and bright enough to be read from across the room. The unit operates from 115V ac and sells for \$129.95.

Assembly

The first thing I looked for in the pile of components was the heart of the unit, a Large Scale Integration (LSI) 40 pin IC. I took it out of its plastic box and examined it closely . . . quite an IC! Later, as I neared



A few hours of assembly and those bags of parts start to look like . . . a calculator.

completion of the calculator, I noticed a CAUTION notice warning the builder not to touch the pins on the IC as a measure against static damage. The notice was on page 32 of the assembly manual! Fortunately the IC received no damage but handling could have been avoided with a small caution sticker on the box that contained the IC.

The circuitry is assembled on two separate boards. The main board holds the power supply and calculator components. The smaller board holds the Sperry Rand SP-733 readouts and their associated driver transistors. Heath's instructions were excellent and no problem was encountered while assembling the boards. In most cases, eight or ten parts were mounted before a quick pass was made down the board with a soldering iron.

Care must be taken when mounting the big IC in its socket because 40 pins tend to go in 40 different directions all at once. A preliminary adjustment of the socket pins on the circuit board will help to avoid this problem.

The rear half of the unit contains the actual electronics while all available space to the front of the display tubes is filled with the push button switches. The buttons press-fit onto the switch stems.

The calculator was turned on after it was completed and the No. 8 button was pushed a few times to check the operation of the

display. One of the segments did not want to light and the problem was traced to its driver transistor. A slight tap on the transistor caused the segment to light, so a touch of solder was added to all three leads as a remedy for the mysterious bad joint. There were no further problems and the unit was tested.

The three pages of testing instructions are laid out well and are easy to follow. Tests take about fifteen minutes.

Operation is extremely simple. Just tap out the numbers you are working with while specifying to the machine the function it should perform. Complete operating instructions are included to help you become familiar with the various functions. The constant feature is really a bonus. This lets you store a preselected number in the calculator that will either multiply or divide into any number or series of numbers as fast as you can push the buttons. By entering 18 as a dividing constant you can get the 8 MHz crystal frequencies for the 2m FM channels by pushing the buttons for each 2m frequency followed by a quick push on the TOTAL bar. Receive crystals are just as easy. If you have a 10.7 MHz i-f, subtract 10.7 from the 2m frequency and divide by 3. A complete correlation chart can be made for any rig in just a few minutes. And of course that stock of weird crystals you have around the shack can be multiplied-up by entering each frequency as a constant and working up the keyboard to see if anything interesting shows on the display.

Add One

The Heath Calculator, besides being mathematical, can solve other problems (grief) as well. The time and energy saved while using this little machine is phenomenal. If a mistake is made part way through the problem you are working on, just erase everything and start over. You'll have the new solution in less time than it would take to find the mistake if you were working on paper. Even if you never particularly enjoyed working with formulas, this calculator will have you designing your own coils, filters and solid state rf amplifiers within a week.

...WA9FPP/1