be selected, one as razor-sharp as 80 Hz. Stages are cascaded and Q is kept to a minimum to reduce ringing. A built-in noise limiter reduces impulse noise that is useful both in voice and CW reception.

An internal 2-watt audio amplifier (LM380N) can be used alone. A stereo headphone jack allows CW operators to enjoy the simulated stereo comparison of input and output signals.

All functions are switch-selectable from the front panel. A switch position allows the audio signal to bypass the active filter if defeat is desirable, as during excellent signal copy.

The unit's rear apron contains a jack for the external speaker (not provided), and two phono jacks for separate audio inputs (switch-selectable from the rear panel).

The filter requires an external power supply; any 9- to 18-volt supply will do. An optional 9-volt AC adapter is available for $7.95.

To try out our unit, we plugged it into the external speaker jack of a general-coverage communications receiver. In the high-pass position, we selected a standard amplitude-modulated voice signal with moderate background hiss and some heterodyne interference. We then began to advance the selectivity switch. Immediately, the voice began to sound clearer. The hiss virtually disappeared, as did the annoying whistle of the interfering signal.

On extremely weak SSB signals with strong interference, the most selective position had to be used. Even then, with the restricted audio passband, the voice could be copied.

On CW the unit performed admirably. Dialing through the Novice CW band, we purposely adjusted the receiver to hear a barrage of signals of varying strength and pitch. With the filter switched in, single-signal reception was accomplished. Again, as with the voice reception, progressive switch positions tighten up the audio passband. The sharpest selectivity should be used only with the worst interference.

Using stereo headphones improves CW enhancement enormously. When you compare input and output signals, the CW signal seems to float in the center of your head! Additional improvement is noted when strong pulse-noise interference (such as line noise and static) is present. The noise limiter acts like a scrubber, repressing the noise while passing the audio tone.

The *model MFJ-721* filter is constructed on a single PC board, uses high-quality components (it features stable polystyrene capacitors), and is well engineered. For the serious hobbyist, the *model MFJ-721* would be an asset. It is available for $59.95 from MFJ Enterprises, P. O. Box 494, Mississippi State, MS 39762. **R-E**

## *Micro Software Systems PET Programs*

**CIRCLE 103 ON FREE INFORMATION CARD**

METRIC-CALC, CHEQUE-CHECK AND MICRO-SET I are three interestingly different programs that underline the great versatility of the ever-growing personal computer. All the programs run on an 8K Commodore PET (*P*ersonal *E*lectronic *T*ransactor) computer.

*Metric-Calc* turns a PET into a Reverse Polish Notation (RPN) scientific calculator; and it will be quickly adopted by Hewlett-Packard calculator owners. For those not familiar with RPN, the basic idea is to key in

*continued on page 34*

*continued from page 32*

the operators first (i.e., the numbers) followed by the operation itself. The method has some advantages over more conventional algebraic key sequences, including fewer memory-store operations. Its disadvantages are having to learn a new entry method, and the unavailability of parentheses operations.

You might ask why a computer should act like a calculator. Isn't this diminishing the power of a sophisticated programmable machine? The answer is yes and no! Yes, the computer loses its programming and general flexibility, but only for the time you are running this particular program; and no, it makes available functions that are not otherwise directly addressable.

There are times when my calculator is not at hand or I'm already working at the PET keyboard, when it is convenient to use the PET as a calculator in the immediate mode via PRINT commands. But you have to realize that while PET BASIC is an extended version of the interpreter, many scientific functions are not in its vocabulary. Although sine, cosine, tangent and arctangent are included in the PET, secant, cosecant, arcsine and the other trigonometric functions are not. Natural logarithms are built-in, but common logarithms which are needed for example to calculate attenuation in dB are not.

The *Metric-Calc* program has two modes of operation that can be quickly interchanged while saving the results of the previous mode. In each mode a menu is displayed showing the keyboard operations that represent the various calculator functions. The first mode is the scientific calculator in which the five top values of the stack are continuously displayed. Any value in the 20-level stack can be retrieved on command. By contrast, hand-held calculators typically display one stack element at a time and have a stack that is only four elements deep. Changes in stack contents are indicated by blinking digits even when the previous values and the new values are identical. The second operational mode provides conversions between English and Metric, linear, area, volume, weight and temperature units.

The *Cheque-Check* program helps you balance your monthly checkbook statement. The system provides a choice of six functions that allow you to view or change checkbook entries. Each operation is followed by an automatic summary display that ends with the amount your checkbook balance differs from the adjusted statement balance.

First, you enter the balances on the bank statement and checkbook. Then, as you enter checks and deposits, the total outstanding balance is displayed. After the summary display you can review your entries and attempt to correct the error, each correction being followed by another updated summary. Your final success is rewarded with a congratulatory message. The program itself is much more extensive than the level of necessary math might suggest. Clear instructions and formated summary displays contribute to program complexity.

The third program is *Micro-Set I* (version 1.72), an improved version of a program reviewed in the March 1979 issue. I am happy to report that the problems I encountered the first time around have been corrected. Briefly, *Micro-Set I* is a programming aid that includes the following capabilities: it can renumber lines, delete lines, create and add from specially formated ASCII program files, and report information about your BASIC program.

I experienced one problem while trying to combine two long programs that had a total memory requirement exceeding 8K. I could not successfully add all of the second program to the first program using the ADD command even though the machine I used was equipped with 24K of memory. I followed the total procedure twice. Each time the second load operation terminated at the same place. The cursor was lost and the machine would not respond to any operation. When power is interrupted, this causes the loss of the program. There appears to be some inherent program-size limitation although there were no such warnings in the instructions. Shorter programs did merge correctly, and combined program lengths of less than 8K minus the memory used by *Micro-Set I* are presumably all right.

*Metric-Calc* and *Cheque-Check* sell for $7.95 a copy, and *Micro-Set I* costs $14.95. All are available from Micro Software Systems, P.O. Box 1442, Woodbridge, VA 22193. **R-E**

## SST Model T-4 Antenna Tuner

THERE IS LITTLE QUESTION THAT THE ANTENNA is as important as any other component in radio communications. A properly tuned antenna may make the difference between effective transmission and marginal performance.

Many antennas are designed to be self-resonant to conveniently match coaxial-cable im-