Kenneth Antonelli (left) and Mark Rosenstein with the computer, EMMERACK, which they designed and built.

Two 9th graders build a computer for teaching

A labor of love for two Memorial Junior High School students in South Euclid turned out to be "a real drag" long before the project was finished recently. But the result is drawing admiring looks from both students and teachers.

The result is EMMERACK, a sophisticated computer conceived and built by 9th graders Mark Rosenstein and Kenneth Antonelli, both 14.

The boys put in nine-hour days all summer except when each went on brief family vacations, and put the finishing touches on EMMERACK in mid-October. The name of their object is an acronym, they explain, for Electronic Manual Machine Evaluating Roots and Computing Kinetically.

While their fellow students think over this revelation, Mark and Kenneth explain that the main function of their device is to show how a modern computer works.

"IT'S A TEACHING tool," says Kenneth with the earnestness of a young professor making an important point. "This makes clear what is happening in the computer."

Kenneth explained the groupings of some 100 tiny light bulbs and the same number of switches, and pointed out different areas that include a computation unit, memory core, an "upper accumulator," and a "lower X register."

Meanwhile, Mark got out a custom-made computer card for EMMERACK and with strips of electrician's tape fastened it to a drum made from a large tin can. Sure enough, when the drum rotated and tiny metal loops mounted on a wooden bar probed through openings in the punched card, lights twinkled on.

The computer was saying something important, its inventors claim, but in its own language they call WIERD, for Written Idiomatic Expressions Reduced Drastically. And they are aware of the spelling of a sound-alike word.

IN THEIR INTRODUCTION to the EMMERACK manual, Kenneth and Mark say their device not only shows the student how the individual sections of a computer work and how information is relayed, but also give the student "a way of logically thinking out a program that will be operational on the computer itself."

They assure students that if they follow the instructions, they are "in for a rewarding experience working with the machine of the future."

Both students say their project became tedious after they were sure it would work and do what was expected of it. But they continued their day and night routine of drilling, sawing, soldering, and fitting. They combed through the inventory of a dozen electronics parts stores looking for the right parts, made others in the workshop, and scavenged others from "the local garbage dump."

They were also bicycling to the library for all the books they could find on computers. The completed EMMERACK includes about $150 worth of parts the boys had to buy, they said, as well as countless hours of research and construction.

THE TWO got their start in computerology last year as students in a math class taught by Robert Lavan. They devised a control box linked to strings of lights on a chart that dealt with such topics as "graphing equations and cartesian products."

In spite of their complaints that building EMMERACK became a bore, the two computer buffs have a quick answer for their next project: a faster-acting, transistorized model of the current one, to be called, naturally, EMMERACK II.

Lavan, both boys' math teacher again this year, is impressed by their resourcefulness and imaginative approaches. Assistant principal Larry Cirillo adds, "They're good citizens, too."

But neither student sees computers in his future.

Mark, son of Dr. and Mrs. Edward Rosenstein, said he may go into medicine. Kenneth, son of Mr. and Mrs. Anthony Antonelli, leans toward dentistry. Meanwhile, there are more electronics parts catalogues to pore over and more books in the library to check out.