

Ant Farm In The Keyboard

Dr. Ken Gilleo
E-T Trends

www.et-trends.com

Computer keyboards are big business but this is a very cost-conscious product. The keyboard switch, once complicated mechanical contrivance that required one for every key, is now a simple membrane switch array. Everything has been made simply by printing the right kinds of ink.

The amazingly simple product is called a membrane switch keyboard. The process begins with a roll of thin plastic film made polyester, the same polymer used in everything from cheap suits to recording tapes. A conductor pattern is printed on the film with ink that contains metal to provide the conductivity. A switch pattern is printed that corresponds to your keyboard with one switch contact for each key that will ultimately press down on that switch when you hit the key.

Insulator ink is also printed to insure that electrical contact can only occur in the switch locations. A spacer is added that is nothing more than the same plastic film with circular cutouts at each switch location. The switch conductor array is folded over with the spacer inside and the end result is an array of switches that are activated by pressing down on the film over the spacer hole that causes the conductive ink pad to touch the corresponding pad on the bottom layer. The membrane switch is the essence of simplicity and not much more than plastic and some metal powder.

One would think that nothing much could happen to the simple membrane switch once it was installed into the keyboard, but things can and do go wrong. And when there is a problem, the switch maker gets the bad parts back and is often asked to explain why things went wrong and what he is going to do about.

The New England switch maker had seen many "returns" in the ten years of making these switches but better designs evolved over the years and serious problems were rare. A switch might come in that had been puncture by a knife or even shot with a gun, and no one expect a redesign that was bulletproof. But did come back that had an unusual problem – ants!

The lab had a laugh about the ant farm in the keyboard but didn't think much of it since there was nothing edible in the switch or in the entire keyboard assembly. The dismissed it as a one-a-million oddity until another ant-containing keyboard came in about 2 weeks later, and then a third. The first though was that someone had spilled some sugar-containing beverage and it had seemed inside the housing.

Modern keyboards have a protective rubber sheet between the keys and membrane switch that keeps out fluids while also providing spring action in some. But nothing could be found using various lighting including black light. The customer insisted that there was a membrane switch problem and decided that it was the adhesives because ants like glue. But the adhesive was synthetic and not really glue that is derived from animals.

No amount of testing, discussions with entomologists or biologists shed any light on the ants in the keyboard phenomenon and to this day, we don't have a clue. The ant problem More or less went away, although it may show up once in a while, but one or two occurrences in tens of millions of keyboards is insignificant. So this is another one of our UNSOLVED mysteries.