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“Ise Electronics to soon mass-produce new type of numeric display tube "Digitron"  
“Jointly developed with Hayakawa, driving voltage only 25V”

Ise Electronics (President Tadashi Nakamura), in collaboration with Hayakawa Electric, has succeeded in developing a new type of numeric display tube called "Digitron" that can be operated at low voltage, and will soon begin mass production. Digitron can be driven at low voltages from 10V to 25V, and can be driven directly by IC, so Hayakawa Electric will be using it in all MOS type IC electronic desk calculators that it will develop soon. Compared to conventional discharge type numeric display tubes, this Digitron is

smaller and less expensive, and as for the problem of lifespan, it has already withstood a lifetime test of more than 3,000 hours, and it is said that Burroughs Corporation of the United States has already approached them about a technical partnership.

While so-called active elements such as vacuum tubes have shown rapid progress and development, numeric display tubes have seen little demand and have shown little progress so far. This has recently come into the spotlight due to the rapid growth of electronic desk calculators and the promotion of digitalization of various measuring instruments.

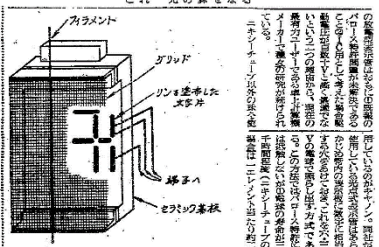
The most commonly used numeric display tube is the Nixie tube. This discharge type display tube is currently being researched by the most popular users, the desktop calculator manufacturers, mainly for two reasons: 1) the Burroughs patent issue has not yet been resolved, and 2) the driving voltage is high at over 100 V when used with ICs, making it suboptimal.

Canon uses bulbs other than Nixie tubes. The light-point display tubes used by the company have holes corresponding to the numbers drilled into the display plate inside the tube beforehand, and these are illuminated with a 6.3 V bulb. This method does not infringe on the Burroughs patent, but 1) the bulb's life is short, at about 3,000 hours (it is said that Nixie tubes have about 20,000 hours per element), and 2) although the voltage is low at

6.3 V, it requires a current of several tens of milliamperes, making it somewhat difficult to drive it as is with current ICs. Digitrons, on the other hand, have a

## 伊勢電子が近く量産 「リシロ」 駆動電圧25Vとまり

三洋電機工業株式会社の伊勢電子部は、日立製作所と共同開発した「リシロ」型駆動電圧25Vの半導体駆動型数値表示管を開発した。この表示管は、従来の放電管型表示管に比べて、駆動電圧が低く、消費電力が少なく、寿命が長いという特徴がある。伊勢電子部は、この表示管の量産に向けて、現在、日立製作所と共同で試験を行っている。また、この表示管は、ICで直接駆動できるという特徴があり、今後の電子計算機や電子測定器などに広く利用される見込みである。



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structure as shown in the figure, and the obvious difference from conventional discharge tubes is that the directly heated cathode is located in front of the anode. This cathode is a direct current type, but it is heated at a low temperature and does not emit light itself, so it does not get in the way even if it is located in front of the characters. The heater voltage is 0.8V and the current is 90mA, but when 25V voltage is applied to the anode side, the heater current is only 7.7mA.

The current flowing through the tube - that is, the anode current - is about 0.7mA per character. Therefore, the power consumption is extremely small, and it can be driven directly by IC, so it is attracting attention as a future numeric display tube. The numbers are displayed as a combination of phosphorus-coated character pieces in a mosaic format. The display method is to apply 25V to the mesh grid and only the necessary parts of the character pieces behind it, while the other character pieces are kept at 0V, and the space charge from the filament only hits the necessary character pieces with electrons, causing them to light up, as in the conventional method.

Another feature of phosphorus paint is that it can be made in various colors other than red. It is said to be bright enough. However, some people say that the mosaic format of the characters is a bit of a drawback, as it is not optimal for Japanese people. In the case of export, this method is easily accepted in Europe and the United States and there are few problems.

Digitron is attracting attention as one result of research into numeric display tubes, which began in earnest in anticipation of the huge demand for desktop calculators (an estimated 300,000 tubes were used in Japan last year), and it is quite likely that even newer, cheaper display methods will be developed in the future. Some people are beginning to say that at least Burroughs' patent for discharge-type numeric display tubes may soon become meaningless.