

The Fetron, a solid state vacuum tube replacement – page 1



These were JFET based devices made into little metal cans with pins poking out the bottom. They were replacements for tubes (Valves to us DownUnder) and as far as I can find out Fetrons were made to replace at least the following common valve types. 6AK5 or 408A, 6AM6, 6CB6A, 12AT7, 12AU7 and 12AX7. There were also many more that replaced the specialised tubes in telephone exchange equipment.

In 1958, Stanislas Teszner, a polish scientist, working for a subsidiary of General Electric in France developed the first field-effect transistor without an insulated gate, made in Germanium alloy for operation in high frequency range and sold under the trade name of TECNITRON. In the USA, Teledyne made the first junction field-effect (JFET) transistor in 1960.

In 1967 Teledyne launched onto the market the Fetron, a linear semiconductor system using this type of transistor. The FETRON comprised a set of junction-field-effect device cascode-connected. It was originally developed to replace the enormous quantities of thermionic tubes used in telephone systems. The original idea was to cut power consumption and heat generation in telephone offices, where there were literally thousands of tubes in carrier and repeater bays all over the world.

Now about this time Teledyne were not the only company working on this idea. Western Electric were also working on what they called Hybrid Integrated Networks (HIN) to replace the tubes in their telephone equipment. It seems from the evidence, the Western Electric devices were in operation long before Teledyne released the Fetron but they were only used in the companies equipment and never sold to other users. These devices have been completely forgotten about. They had type numbers like KS21077, 078, 079 and 081.

Although Fetrons were US\$12.00 each the idea caught on and Teledyne sold Instrument Upgrade kits using Fetrons for oscilloscopes and other test equipment. For example, the HP400 and the CA plug-ins for Tektronix 500 series. Heathkit sold a refit kit for its IMA-18-1 CTVM that replaced a 6AL5 and a 12AU7 providing improved stability and instant turn on.

Another company to find a use for Fetrons was Mesa Boogie in the 70's who used one in the place of a first stage originally using a 12AX7. Mesa Boogie made high power Guitar Amplifiers in relatively small cabinets with very large speakers and lots of output power. A sure fire recipe for problems with acoustic feedback.

Ampex studio equipment also used Fetrons to replace 12AX7 valves in their equipment for much the same reason the Guitar Amplifier company used them. I believe the device Ampex used was not packaged using a standard seven or nine pin valve socket but a special eight pin socket.

The Fetron, a solid state vacuum tube replacement – page 2

In the 1980's a third company got into the act with Skytec Tubesters, FET based replacement devices for Drake and Collins communication equipment.

In the early 1990's Fetron like devices were shown by Kirkwood Radio Labs and these devices were Vudo tubes but as I can't find any more information on these on the web I guess they were an idea that did not last long.

My quest to find out more about these devices from the past lead me to the Tube Collectors Association, a very well organised group with a home base in Ashland, Oregon. A visit to their web site is well worth while. <http://www.tubecollectors.org/>. An overseas membership to the TCA costs, one year US\$25, two years, US\$49; three years, US\$73. Very reasonable when you see the quality of their news letter, published by monthly.

In particular I have been given a great deal of assistance by Ludwell Sibley, KB2EVN, one of the directors of the Association. As he says it, he had a small part to play in the development of Fetrons in the Phone industry and he was kind enough to mail me back issues of the society's journals and some original promotional material by Teledyne.



Some time ago I received an email from Dr Hugo Holden in Queensland, about a one off radio receiver using Fetrons. He built this in 2007 as an interesting exercise. Dr Hugo has been quite active in restoring vintage Televisions, I will put links to these projects on my links page. There is a good description of his radio in the PDF file below this entry on the web page. There is also a copy of the article featured in the May 1973 Practical Wireless magazine.

Written by and Copyright, Phil. Storr © Last updated 25th April 2012