DIY Spectrum Analyzer Input Protection

May 22, 2019

Spectrum analyzers like the SIGLENT SSA3000X and SVA1000X series are extremely useful instruments that can provide invaluable insight into broadcast signal performance, transmitter troubleshooting, and interference as well as RF device characterization and EMC testing.

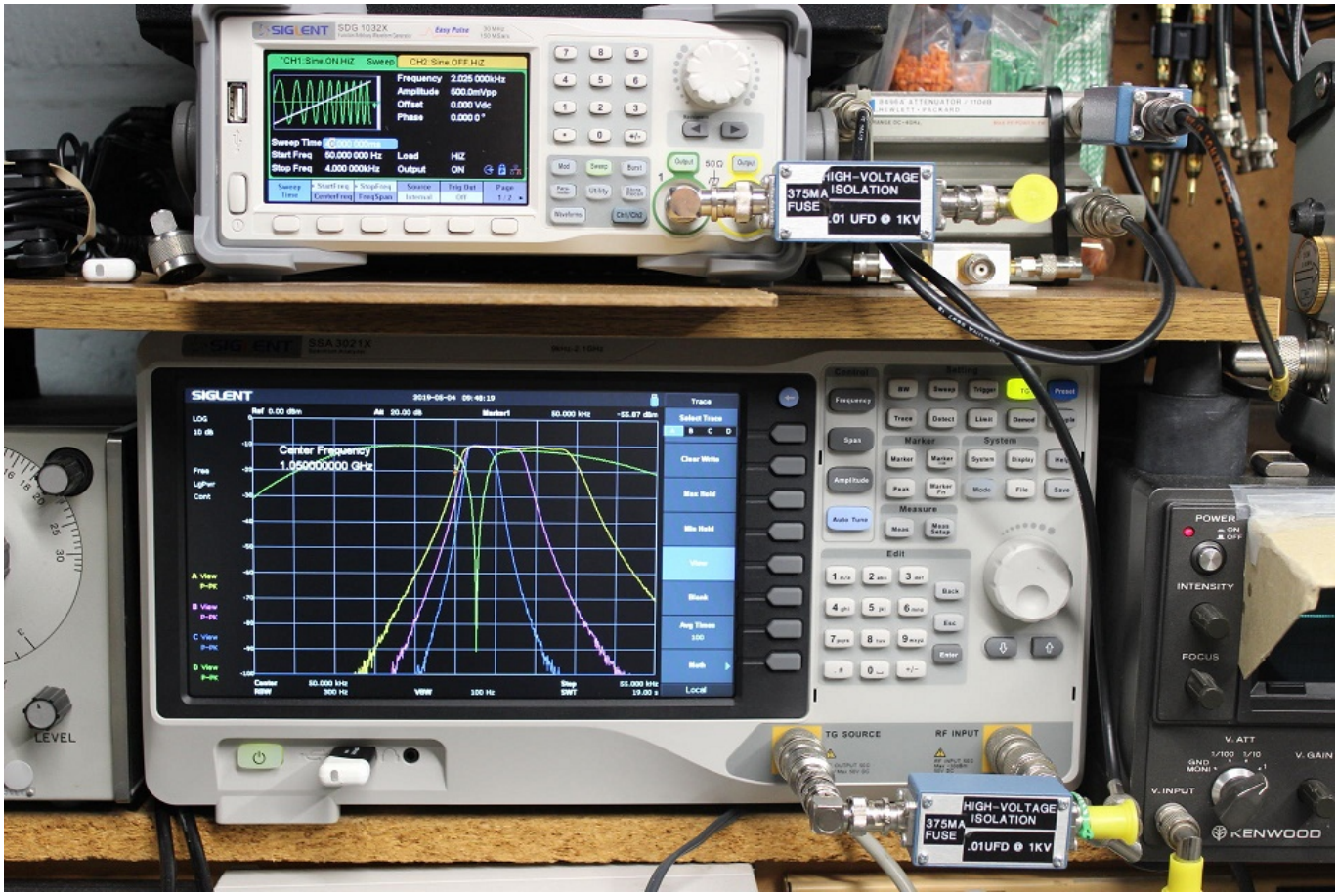
But, like other spectrum analyzers, they are very sensitive and can be damaged easily, if the proper precautions are not followed.

The instruments have standard protection elements that includes a DC blocking capacitor and an automatic attenuator that help to prevent damage from low frequency and higher powered signals. There is even an audible and visible warning if the ADC (Analog-to-Digital Converter) overload.

In addition to this, adding external attenuation and protection can be useful in further preventing damage, especially when connecting to unknown sources such as antennas, transmitters, and LISNs.

One of our customers, Mr. Jeff Covelli (WA8SAJ), is a HAM (Amateur Radio Operator) who recently shared a very simple protection box that can be useful for keeping that sensitive front end functioning when connecting to unknown signal sources.

He uses it to help protect the input on his SIGLENT SDG1032X signal generator as well as his SSA3021X spectrum analyzer:

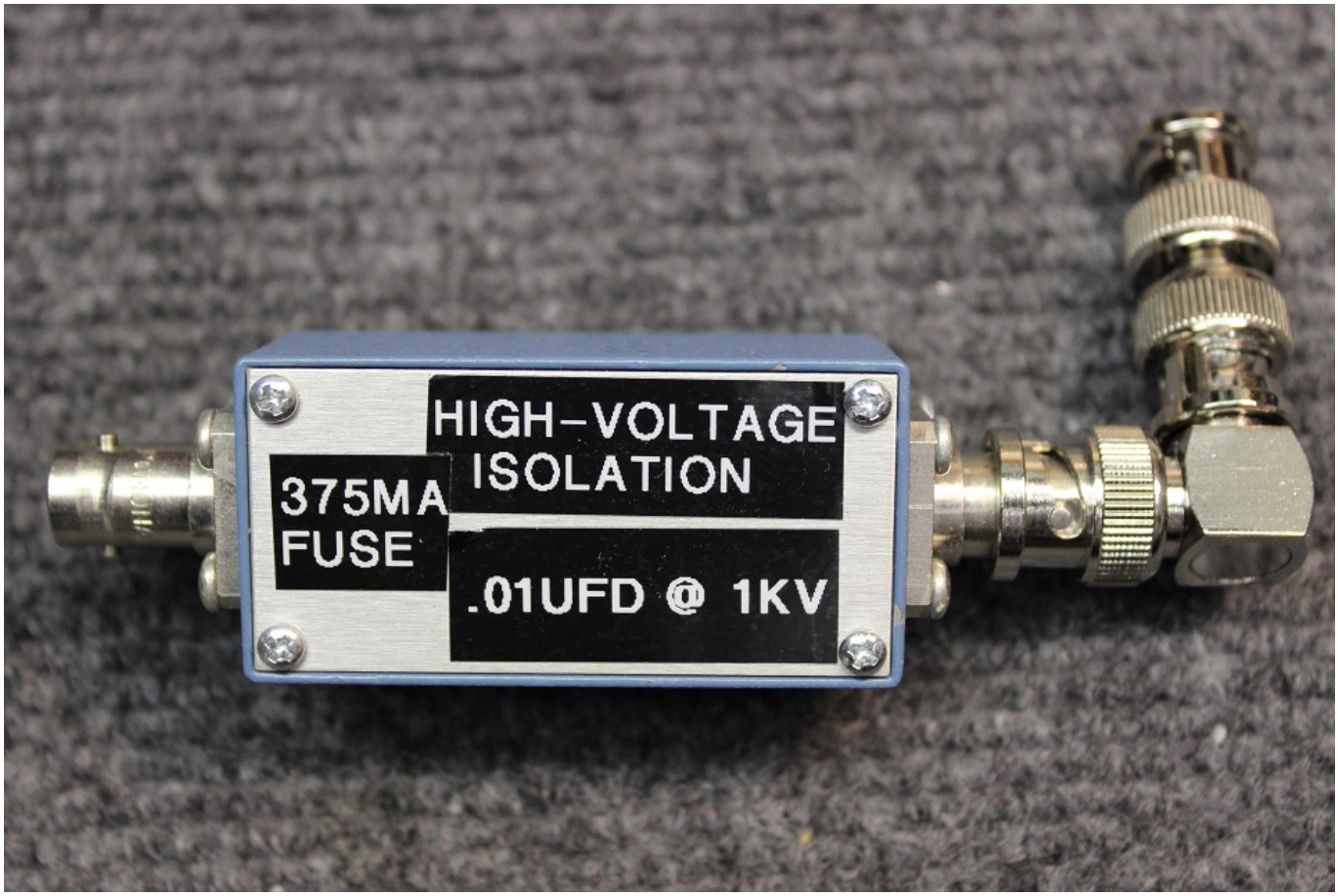


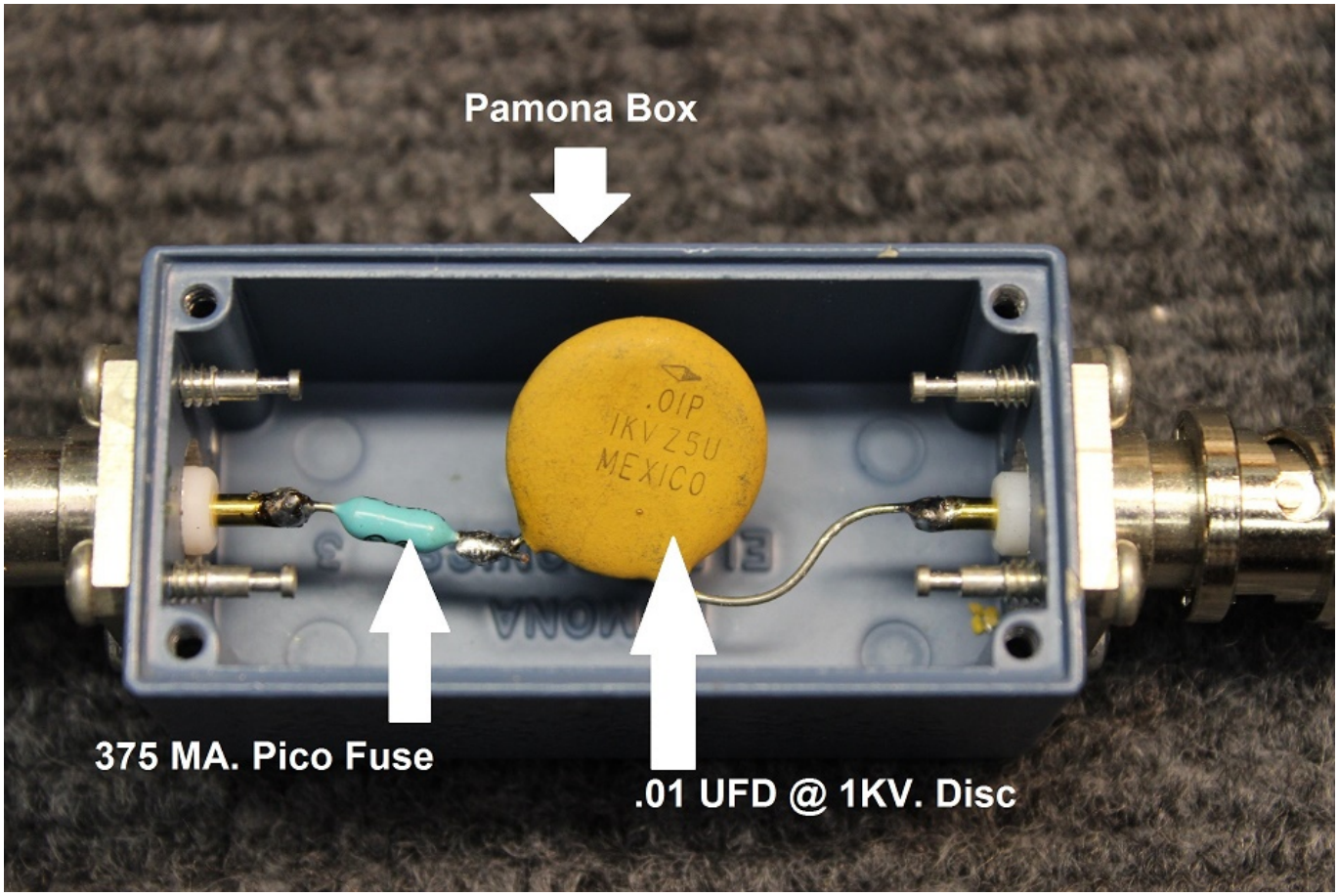
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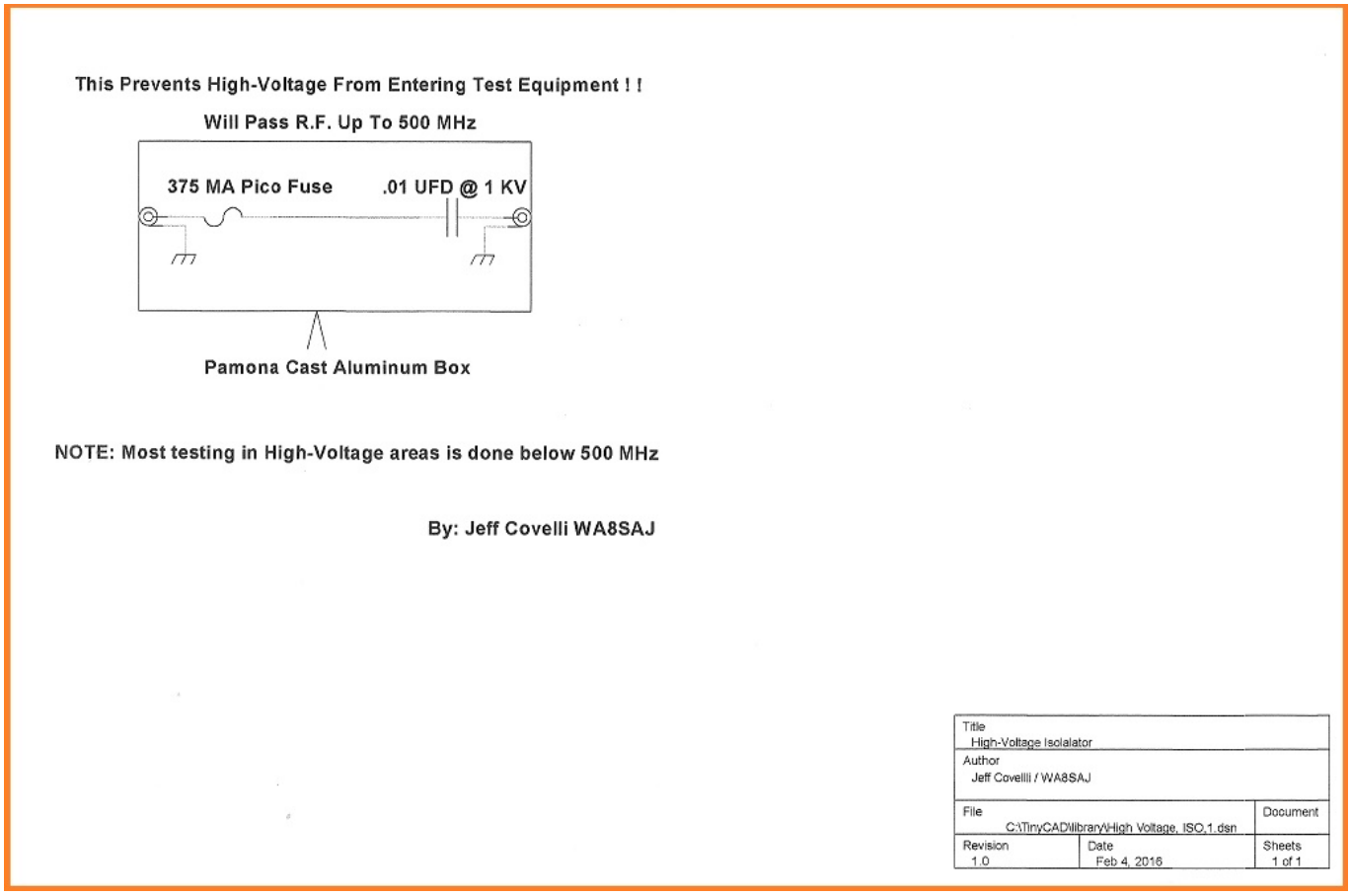
And he has a pretty impressive setup:



And here are the details:


HIGH-VOLTAGE
ISOLATION
375MA
FUSE
.01UFD @ 1KV


Pamona Box
.01P
1KV Z5U
MEXICO
375 MA. Pico Fuse
.01 UFD @ 1KV. Disc



At some point, I hope to characterize this setup and provide S11, S21 information.. but, if your signal is unknown, this will add an additional layer of protection when measuring an unknown signal for the “first time”.

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