

To: Mark Takeuchi  
Re: BER  
November 4, 1990

Attached are some interesting results.

1. "1280 BER - HP400FL vs HP3400A" plot.

This plot - and its tests - illustrates something I have often wondered about but never confirmed experimentally.

THE ACVM MAKES A BIG DIFFERENCE!

The plot shows your 1280A/M data of 11/02/88 (dotted line), a new run I did Saturday morning using the HP400FL (dashed), and a third run made Saturday using the HP3400A "true RMS" meter. There is about a 1.5 dB difference in the measurement of noise between the two meters. It makes quite a difference in the BER curves!

I also did my attenuator settings a little different. I set the "0 dB reference" with 10 dB of attenuation inserted. Obviously, I had to crank-up the ST-8000 modulator output up by 10 dB to do this. I think we should always do this to assure that the attenuator itself sees the correct 600 ohm load and that attenuator step changes are really what we think they should be. This probably explains at least part of differences shown between your measurements and mine using the HP400FL.

This series of test also illustrates the extreme sensitivity of BER measurements to noise level - a 1 dB shift can cause a 10:1 shift in BER - or more.

2. Comparison between 1280A/M and ST-8000 (old version):

Today (Sunday), I started by reconfirming the upper-level 1280A BER results obtained Saturday. They all repeated and I feel pretty confident about the repeatability of the procedure.

The ST-8000 results are very gratifying. I am still collecting data at this writing, but the standard ST-8000 appears to be about 1 dB in S/N better than the 1280; about 10:1 BER difference for -5 dB S/N.

3. Note the plot format. I put all the data points in one plot - no line, symbols only. I then plotted lines for "average" values at each S/N. I used two files for each set of data - "FDAT0075.BER" for data points and "FAVG0075.BER" for average. This helps to show data spread.

4. While waiting on the BER runs, I made a test diagram and wrote a test procedure. Comments please!

GWH