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John Minck

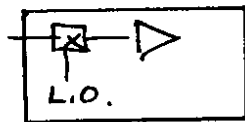
DATE June 25, 1984

Barney Oliver

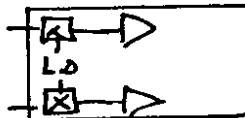
SUBJECT Mixers and "Synthetic Video"

Could you comment on this concept?

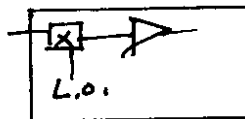
I've always been intrigued and bothered by the fact that HP builds and sells so many different versions of RF and Microwave Downconverters. For example:



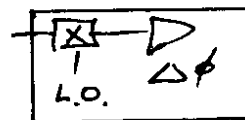
SPECTRUM ANALYZERS



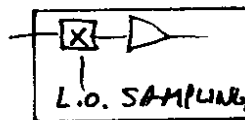
NETWORK ANALYZERS (TWO-CHANNEL)



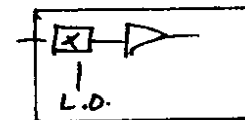
NOISE FIGURE METER



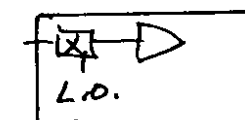
MLA/GROUP DELAY



COUNTERS



MODULATION ANALYZERS



TEST/CALIBRATION RECEIVER

etc.

Almost every instrument gets a new synthesized L.O. design with associated front panel display and keyboard control. And the argument goes that each needs different range, bandwidth, sensitivity, high-frequency IF, sampling mixers, ad nauseam. But of course much of the argument stems from divisional N.I.H. (Some bright spots are beginning to show; the SPD 8970A Noise Figure Meter [10-1500 MHz] uses most of a SAD spectrum analyzer front end, although it too had new design on the synthesized L.O. control and display.)

In my dealings with aero space system customers, I've heard of a new concept called "synthetic video." Instead of running microwave signals from antennas in airplane wingtips to a central receiver they put the downconverter and a fast IF digitizer right at the antenna. Then this "synthetic video" goes back to the computer via fiberoptics.

So, the first part of my concept is to build a common mixer /LO/IF/ A-D converter to serve many applications. A spectrum analyzer would data process the data stream one way, an MLA another, and a network analyzer with a pair of channels another, etc.

Certainly, there would be a few differences, but the recent Anritsu combined spectrum analyzer/MLA poses an interesting threat and sort of pays off my argument.

But the next part of my concept is where I'd appreciate your insight. Without knowing or understanding how the ultra-fast A-D converters work (like the HP 5180), is there any way you could modulate any part of such an A-D with a high level local oscillator signal so that the digital data stream would contain the downconverted intermediate frequency information that could be "digitally-filtered" back into a frequency-domain display such as a spectrum plot? (Whew!)

The whole concept might be trivial, I know, but I worry about a smart competitor getting a jump on HP from a viewpoint of total instrumentation economy of production. Further, our technology in the ultra-fast A-D and D-A is getting very impressive. And I've read of some NBS A-D work with very high speed.

It seemed to me that such ultra-high-speed data handling gives HP a big advantage. Since our new parallel synthesis technology allows us to spread spectrum across a very wide band, then data receivers that process such data should allow us to measure not only system propagation parameters, but also component S-parameters.

Thanks for considering this.

JM:sm

A handwritten signature in cursive script, appearing to be 'John' or similar, written in dark ink.