SESSION 26: DEVELOPMENTS IN THE SIX-PORT TECHNIQUE OF MICROWAVE MEASUREMENT

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In the field of microwave metrology, interest continues to focus on the dual six-port automatic network analyzer, and refinements of it. While the technique is demonstrably capable of unprecedented accuracy, the realization of this performance potential requires a signal source which is both "cleaner" (free from harmonics, etc.) and of higher power (by 10-20 dB.) than required by other network analyzers. In addition, and for the most part, the existing six-port systems fail to provide a real time display, although some interesting results in this area have been reported in England.

In addition to its accuracy potential, the six-port technique also lends itself to the ready application of certain calibration schemes in which the dependence upon external standards has been reduced to either a section of uniform line or a termination of known reflection. These features make the method an especially attractive one in the standards laboratory.

While the six-port technology is well into the stage of practical application, there is also a widespread interest by a number of different groups in further refinements to the method.

Current areas of interest include:

1) Development of techniques to yield a real time display.

2) Implementation at higher frequencies where the use of mixers presents a problem.

3) Modeling of diode behavior to enhance their accuracy potential as detectors in the six-port environment.

4) Design of the six-port network.

5) Calibration of the six-port network analyzer.

These interests are reflected in the papers to be presented in this session. Another area of potential application, but which remains virtually unexplored at this time, is in the area of performance monitoring where simplicity is the prime requisite and a low level of accuracy is adequate.

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