XVI. SPEECH COMMUNICATION*

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A. REAL-TIME SPEECH SPECTRUM ANALYZER

As the M. I. T. Speech Synthesizer (DAVO) will soon be controlled by the TX-0 digital computer, it is desirable to have a speech spectrum analyzer that can make use of a real-time speech input so that synthesized utterances may be subjected to immediate analysis. A general system design for a real-time speech spectrum analyzer has been formulated, and a tentative design for some of the circuitry has been completed.

Figure XVI-1 is a function block diagram of the proposed system. A power amplifier is used to drive 36 bandpass filters that have the same bandpass characteristics as the

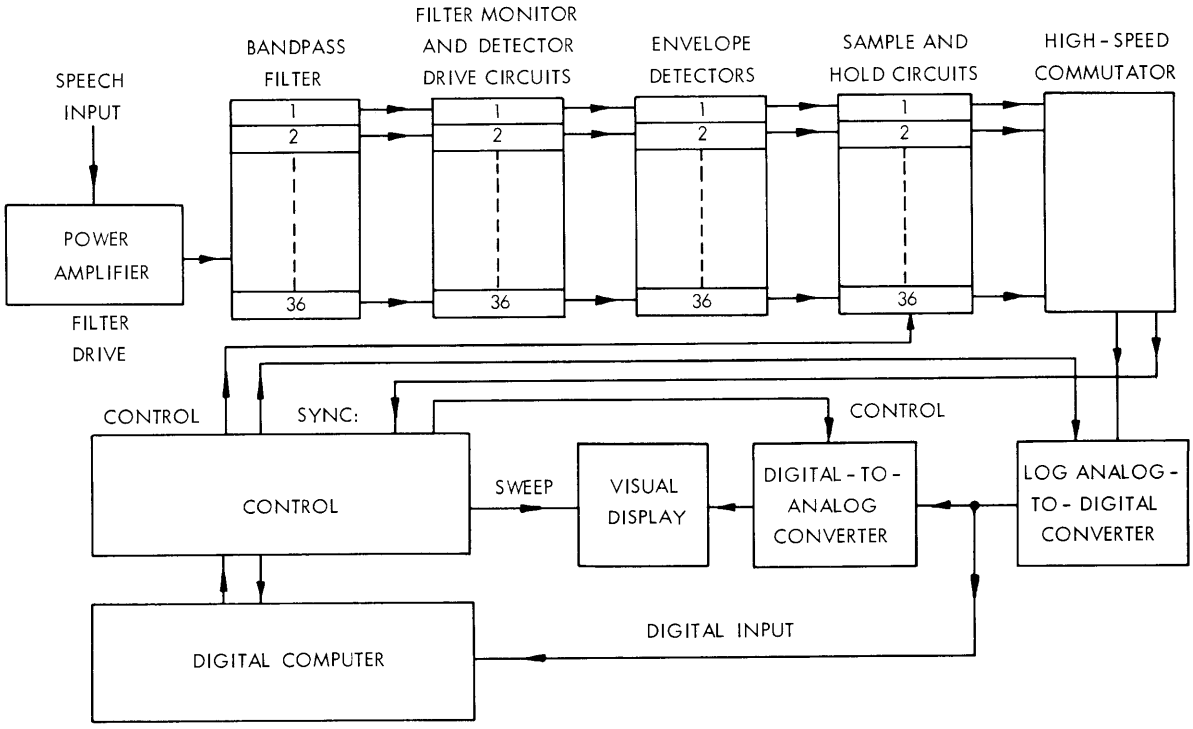

Fig. XVI-1. Function diagram of the real-time speech analyzer.

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filters now in use for speech analysis. The low-level filter output is monitored and amplified to a level that is suitable for driving the envelope detector. The detector output is sampled on command and stored in a holding circuit. The holding circuit outputs are serially scanned by a high-speed commutator, converted to digital form and used as input data to a digital computer.

The bandpass filters, filter drive, filter-output monitor and envelope-detector circuits were developed in detail to determine the best circuit configurations that are consistent with the requirements of cost, reliability, and simplicity. More detailed information on these circuits can be found in the author's thesis.[1]

P. S. Marchese

References

1. P. S. Marchese, A High Speed Speech Analyzer for Use with a Digital Computer, S. B. Thesis, Department of Electrical Engineering, M. I. T., June 1963.