Exhibit B

DIGITAL TELEPHONY AND NETWORK INTEGRATION

Bernhard E. Keiser
and
Eugene Strange

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4.3. DIFFERENTIAL PCM

The formation of a differential waveform was discussed briefly in Chapter 2. It is produced by subtracting from the present value a recent past value or values, or some weighted combination of them. The basis for the quantization of differential waveforms is that once the initial level of a waveform has been established, the information content is expressed by the changes in value of that waveform. Accordingly, only the changes need to be transmitted. As a result, differential PCM (DPCM) can be used at a lower bit rate than PCM with a comparable quality of reproduction. The sampling rate, of course, is presumed to be at the Nyquist rate.

Figure 4–3 shows a typical DPCM system in block diagram form. As can be seen there, instead of direct sampling of the input, as was done in PCM, the difference between the input and a prediction signal (based on past samples) is sampled and coded. For this reason, DPCM also is known as *predictive coding*. The "prediction signal" is derived in the same way as the receiver detects the signal, and is performed in the box labeled "Integrator."

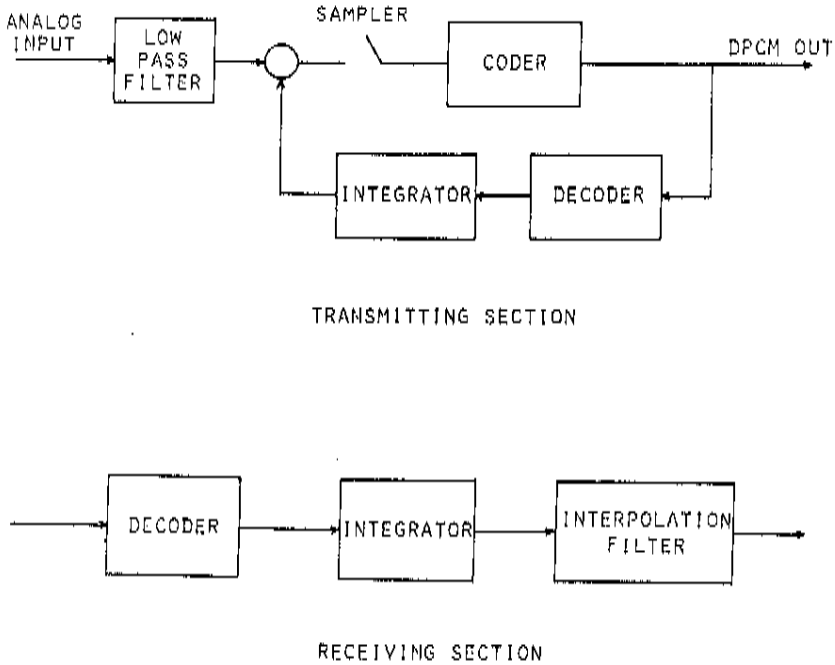

Fig. 4–3. Block diagram of DPCM system using analog differencing.