The modulated specifications for the IR-PHY were reviewed by the IR committee and are presented here, based on the July 11, 1994 instruction of the joint MAC-PHY. After review, the previously approved specifications were again approved unanimously by the IR committee on July 12, 1994. The following is a summary of the technical aspects of this review.

**Overview of IR Transmitters**

The Infrared diode (transmitter) is a non-linear element. There are no known techniques available today that allow the IR diode to operate in a linear region—eliminating the possibility of using any linearly-modulated scheme.

**Why was FQPSK Proposed?**

FQPSK is a patented filtered offset QPSK technique that is well suited for power efficient, non-linear operation. The specification includes time- and frequency-domain masks. Although the patented technique satisfies the IR committee specifications, there may be other non-patented techniques that meet the specifications as well. All IEEE IP requirements have been met.

**Comparative Study of Alternatives**

The IR committee revisited submissions related to FQPSK and alternative techniques, which are documented in many 802.11 and other public domain documents. The review concluded that FQPSK is:

- 6 dB to 15 dB more power efficient than all other considered alternatives and is the only technique that achieves a BER of $10^{-5}$ at $E_b/N_0 = 13$ dB.

- Doubles the transmitted bit rate [capacity] compared to other alternatives for the current IR technology limit of 30 MHz.