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BI-DIRECTIONAL HANDSHAKING OVER A SINGLE WIRE

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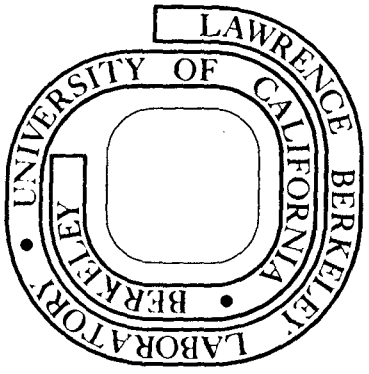

DISCLAIMER

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Handshaking is a bidirectional proposition. After a computer signals a controller, the controller must somehow pass an answer back to the computer. We have for several years been successfully using bidirectional communication over a single signal line to effect handshaking between a computer system and its peripherals. The accompanying figure details this scheme.

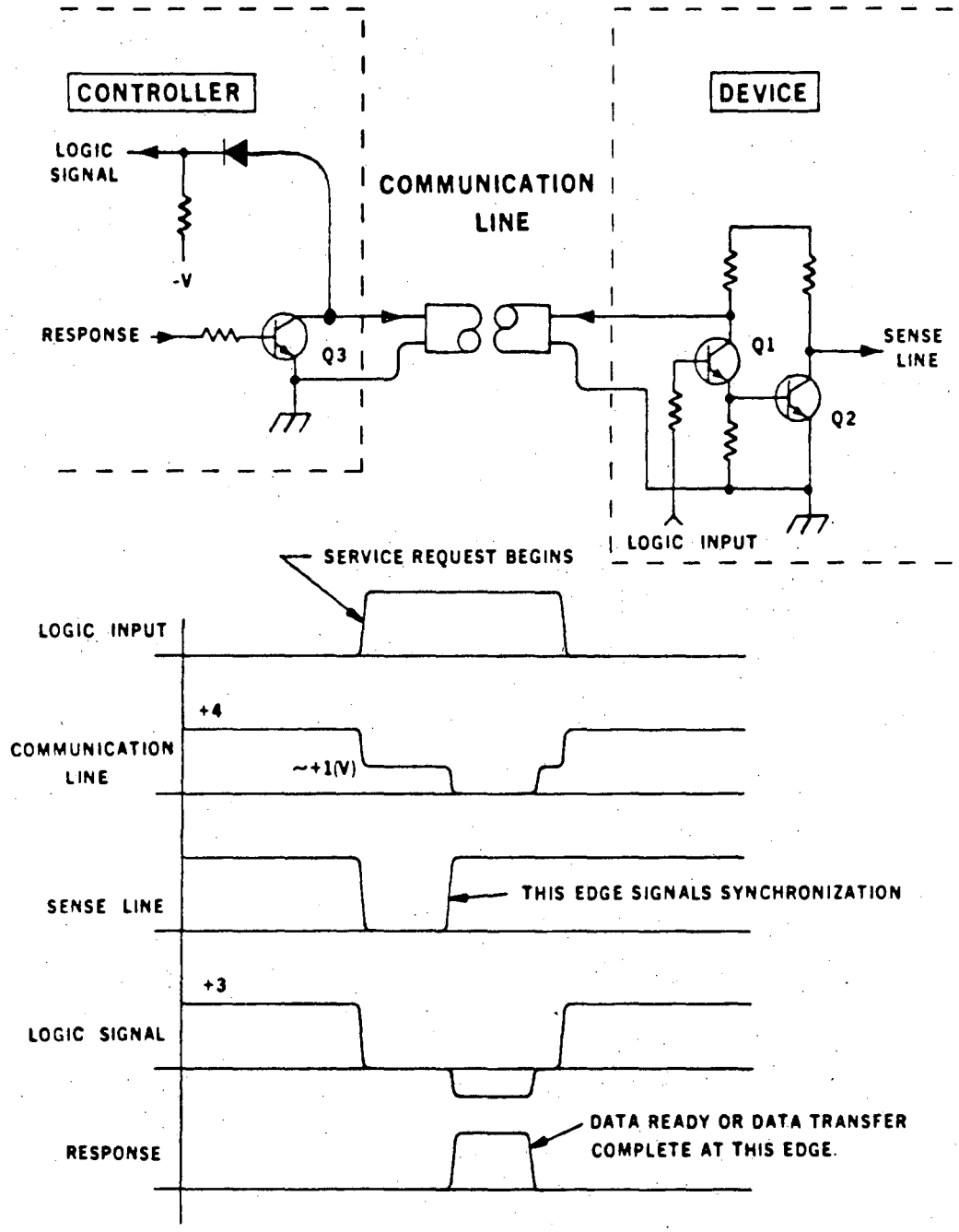
Operationally, the sequence begins with the service request at the device going high at the logic input. This supplies base current into Q_2. The collector voltage at Q_1 (the communication line) is the sum of the base-emitter voltage of Q_2 and the saturation collector-to-emitter voltage Q_1, approximately one volt. Thus the communication line drops to about one volt. Simultaneously, the collector of Q_2 (the sense line) drops nearly to ground.

At the controller end, a diode in series with the signal from the communication line results in a logic signal to be sensed by the controller. The controller responds to this logic signal by raising the response line, suppling base current to Q_3. The collector of Q_3 (the communication line) drops nearly to zero volts, robbing collector current from Q_1 (and the base current from Q_2) at the other end of the communication line. This results in Q_2 switching off and the rise of the sense line.

In summary, the logic input at the device end has signalled the controller by producing the logic signal at the controller end. The controller's response is to switch the sense line at the device end. The handshake is complete.

Reference

Meng, John D., "A Serial Input/Output Scheme for Small Computers," Computer Design, Vol 9, No. 3, Mar, 1970, pp.71-75.



ONE HANDSHAKING SEQUENCE OVER A BIDIRECTIONAL COMMUNICATION LINE

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Figure 1

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