The quartz gauge calibration circuit consists mainly of a unijunction pulse generator, a monostable multivibrator, and two switching transistors. Referring to the circuit diagram of Figure 20, a unijunction transistor U1 pulses a monostable multi-vibrator I1 with a repetition rate of approximately 1 KHz. With each pulse from U1, I1 turns on and remains on for about 5 micro-seconds. Initially when I1 is off current flows from point A in the circuit through transistor T1 to the negative supply voltage. As I1 turns on the current is switched to flow through transistor T2. This sends a current pulse down the instrumentation cable that is to be used in monitoring the quartz gauge output. The current before switching is measured accurately by the use of a precision digital ammeter. Therefore, the magnitude of the voltage step produced on the oscilloscope is related to an accurately known current value, since the inductor time-constant is large compared to the five microsecond time interval of the switched current pulse. The magnitude of the current step may be varied from 80 ma to 300 ma by varying the supply voltage from 4 to 15 volts.

C. Manganin Gauge Pressure Transducer

The manganin gauge pressure transducer is a useful device at pressures in excess of those observable by quartz gauges or if the validity of the calculation necessary to eliminate the error due to impedance mismatch at the specimen-quartz interface is in doubt.[10] Auxiliary equipment needed for the manganin gauge technique consists of a constant current supply, an adequate gauge and mounting facility, and proper recording oscilloscopes and cables.

1. Constant Current Supply*

The present supply utilizes an inductor as the essential component in maintaining constant current during the recording time of the gauge. The operating characteristics can be understood with

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