

remotely switched into or out of the breech pressure line. If the low pressure gauge is inadvertently left in the system above 1500 psi, a burst diaphragm will rupture and a surge check valve will close, thereby isolating it from the system.

Visible on the upper portion of the control panel is a schematic representation of the high pressure piping system. Each valve in the system and its location with respect to the high pressure flow is denoted on the schematic by a numbered, red indicator light. The corresponding number is found between the two rows of pushbuttons. This feature reduces the possibility of actuating a critical valve at an inopportune time.

The electrical control circuit is shown schematically in Appendix A. Appendix B is a parts list showing the principal parts used.

#### IV. INSTRUMENTATION AND ANCILLARY EQUIPMENT

In addition to the gun and control system, electronic instruments were either purchased or built to serve as recording devices. The principal instrumentation consists of ten oscilloscopes. These include six Tektronix type 581/585, two Tektronix type 454, one Tektronix type 519, and one Tektronix type 555. These scopes provide eleven recording channels with a frequency response adequate for use with essentially all currently feasible measurement techniques.

The scopes are supplemented by a 100 MHz time-interval counter, Hewlet-Packard type 5275A with crystal controlled oscillator, and a pulse generator, E-H Co. Model 120D. These are used principally for timing devices.

A number of electronic devices have been constructed by students to serve special purposes. These include timing and tilt pulse-shaping circuits, a quarts-gauge calibration device, and a manganin-gauge power supply. These devices are described in detail below.