

**THE ENIAC**  
**ELECTRONIC NUMERICAL INTEGRATOR AND COMPUTER**  
 DEVELOPED, DESIGNED AND CONSTRUCTED  
 BY THE  
**MOORE SCHOOL OF ELECTRICAL ENGINEERING**  
 OF THE  
**UNIVERSITY OF PENNSYLVANIA**  
 1944

**D-C voltage hum oscilloscope**  
**D-C voltage meter**  
**D-3 voltage selector switches**  
**D-C voltage chart**

White numbers on the voltage chart indicate voltages at the ends of a power supply. Black numbers indicate voltage pairs in which at least one voltage is derived from a bleeder tap. Behind the voltage chart are the oscilloscope adjustments.

The d-c voltage amplitude and the a-c hum amplitude of every voltage of the ENIAC may be measured with respect to some other voltage at this panel.

**Start and stop switches**

Pushing the start switch turns the amber light on and starts the initiating sequence for the ENIAC, turning on the d-c power supplies, the heaters of the various panels, and the fans, and operating the initial clear. When this sequence has been completed, showing that the ENIAC is ready to operate, the green light goes on.

Pushing the stop switch turns the ENIAC off, including the heaters, the d-c power supplies, and the fans.

**CAUTION: HOLD START BUTTON CLOSED FOR 3 SECONDS TO INSURE PICK-UP OF ALL STARTING RELAYS.**

**D-C power supplies clock**

This shows the number of hours the d-c power supply filaments have been on.

**Initial clear switch**

Though the ENIAC is initially cleared whenever the start switch is operated, an initial clear switch is provided so that the operator can clear the machine without turning it off.

The operation selector switch on the cycling unit must be set at Cont. for initial clearing to take place.

**Selective clear program controls**

**C<sub>1</sub>** - program pulse input terminal for selective clear program control.  
**V<sub>0</sub>** - program pulse output terminal for selective clear program control.

Whenever a program pulse is supplied to a C<sub>1</sub>, all accumulators set to 00 will be cleared, and a program pulse will be emitted from the corresponding C<sub>0</sub> one addition time later. For neon bulbs of associated transceivers see PX-9-305.

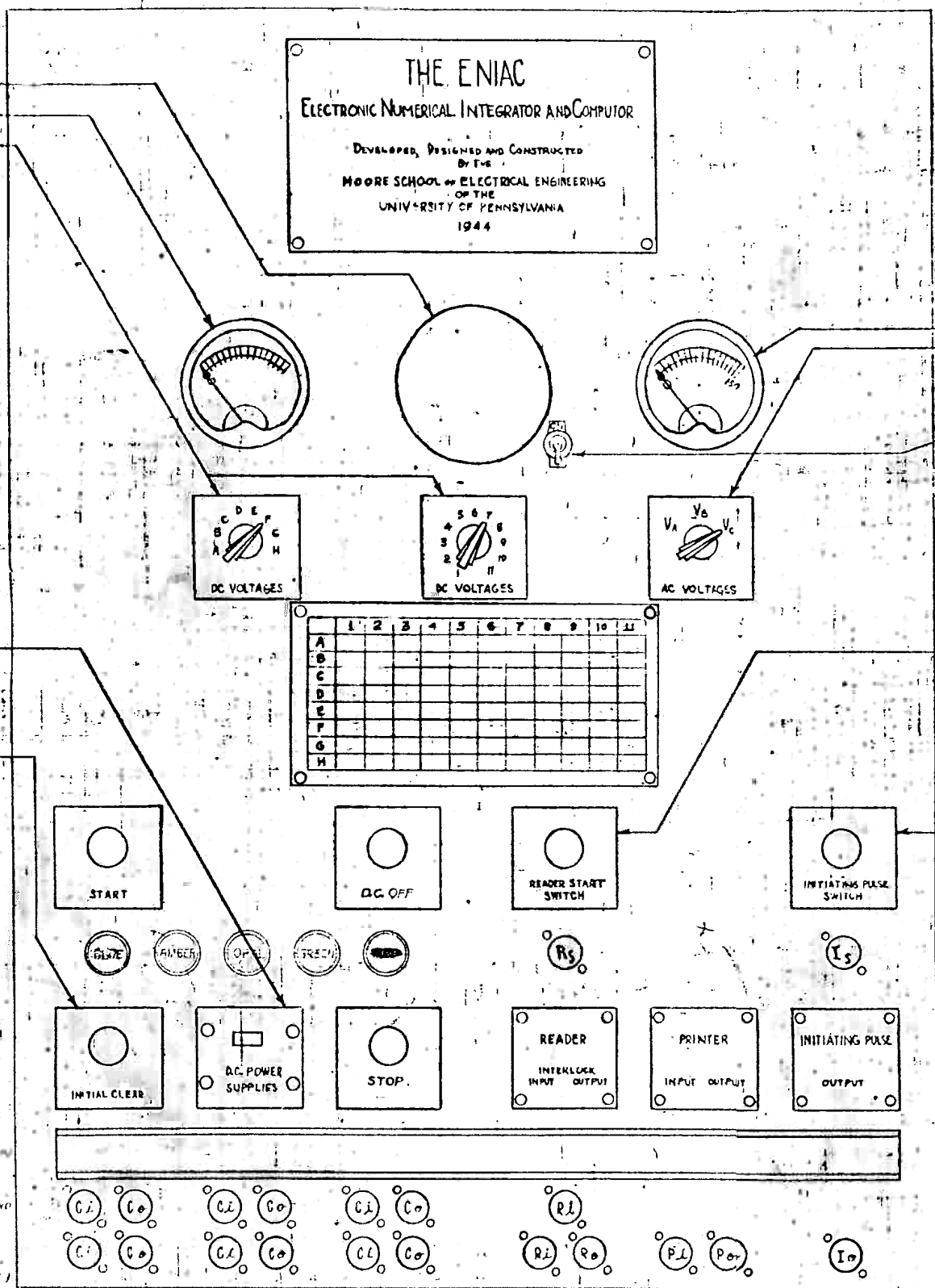
**D-C CONTROL SWITCHES**

Pushing the DC OFF SWITCH WILL TURN OFF THE DIRECT CURRENT TO THE ENIAC. WHEN BOTH THE OPER. AND GREEN LIGHTS ARE OUT THE DIRECT CURRENT IS OFF.

TO TURN THE DIRECT CURRENT ON PUSH THE START SWITCH. THE OPER. LIGHT WILL COME ON IMMEDIATELY, AND AFTER INITIALLY CLEARING THE GREEN LIGHT ALSO WILL COME ON.

**BLUE LIGHT**  
 WHEN ON, THIS INDICATES THAT START, STOP, DC OFF, AND ONE OF THE CONTROL SWITCHES WILL NOT OPERATE FROM ANY PANEL EXCEPT IN THE POWER DISTRIBUTION CENTER.

**RED LIGHT**  
 WHEN ON, THIS INDICATES THAT THE PANELS ARE OVERHEATING DUE TO FAN FAILURE, ETC. AND IF THE FAULT IS NOT IMMEDIATELY REPAIRED ALL POWER TO THE MACHINE WILL BE TURNED OFF. A CALL WILL BE RINGING AT THE POWER DISTRIBUTION CENTER DURING THIS TIME.



**AC voltage meter**  
**AC voltage selector switch**  
 By means of this switch and meter the three phases of one of the three phase systems supplying 140 volts a-c to the filament transformers of the various units may be measured.

**Oscilloscope Switch**  
 TO TURN OSCILLOSCOPE OFF WHEN NOT IN USE

**R<sub>1</sub>** - pulse input terminal for reader interlock.  
**R<sub>2</sub>** - pulse input terminal for reader.  
**R<sub>0</sub>** - program pulse output terminal for reader.

These terminals have to do with the operation of the IBM card reader. Whenever a pulse is supplied to R<sub>1</sub> the IBM reader starts to put a new card in position. After the card is read and the relays have set up the constant transmitter gates the information is ready to be taken from the constant transmitter. A pulse is emitted from R<sub>0</sub> after the constant transmitter is ready and after a pulse has been received on R<sub>2</sub>. The operation of this constant transmitter program control is described on PX-11-302.

**Reader start switch**  
**R<sub>3</sub>** - Terminal for paralleling the reader start switch.  
 Operation of the reader start switch starts IBM card reader. After the card has been read a pulse is emitted from R<sub>0</sub>.  
**R<sub>4</sub>** is a terminal for paralleling the reader start switch with a switch which may be carried anywhere around the ENIAC and which is connected to this terminal via a program line which has no load box, or by means of a special cable.

**Initiating pulse switch**  
**I<sub>1</sub>** - Terminal for paralleling the initiating pulse switch.  
**I<sub>0</sub>** - Program pulse output terminal for initiating pulse.

Whenever the initiating pulse switch is pushed a single program pulse (i.e., a gated GPP) is emitted from I<sub>0</sub>. This pulse may be used to initiate any sequence of operations set up on the ENIAC.

**I<sub>2</sub>** is a terminal for paralleling the initiating pulse switch with a switch which may be carried anywhere around the ENIAC and which is connected to this terminal via a program line which has no load box, or by means of a special cable.

Note: Portable Control Station is shown on PX-9-303.

**P<sub>1</sub>** - pulse input terminal for printer  
**P<sub>0</sub>** - program pulse output terminal for printer

Whenever a pulse is received on P<sub>1</sub> the IBM punch starts to operate and the printer relays start to pick up. A pulse is emitted from P<sub>0</sub> as soon as the relays are set up. Any time after this pulse is emitted P<sub>1</sub> may again be stimulated, but this will not cause a second punching until the first is finished.

MOORE SCHOOL OF ELECTRICAL ENGINEERING UNIVERSITY OF PENNSYLVANIA		
INITIATING UNIT FRONT PANEL		
MATERIAL	FINISH	SCALE
Drawn by: J. DEBESCK	Checked by: 11/1/45	Approved by: Y.H.L. 7-16-45
DEC 1944		<b>PX-9-302</b>

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