WANL-TME-324

(Serial: CD-1533)

REACTOR CONTROL PANEL, ETS-1 CTO CONSOLE, DRAWING 707J888

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MASTER

April 22, 1963

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by

W. M. Kendziorek
Control System Design
Control Development

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Note called WANK 5-8-63 Key switch to off - EP - Fwd
asked for locked
control to be locked
Off in off position
1/11/63

WANK-TME-324
(Serial-CD-1533)

REACTOR CONTROL PANEL - 1 CTO CONSOLE

Drawing 707J888

The Reactor Control Panel has the necessary instrumentation and control functions to permit the Lead Reactor Engineer to perform pre-test reactor check-out operations and to monitor vital reactor parameters during the test run and cooldown period. To illustrate the functions of the various controls let us look at a typical experimental run.

1. Control Drum Actuator Test

Turn the DRUM CONTROL key switch to FWD and remove the key. The key will then be taken to the test cell building and the actuator checkout procedure will take place. The controls located in the test cell building are arranged in such a fashion that only one drum at a time may be away from its minimum reactivity position. The drums cannot be controlled from the C. P. when the key is in the test cell building, except that in case of emergency, the reactor may be scrammed from the C. P.

2. Physics Test

The key is returned to the C. P. and used to turn the DRUM CONTROL switch to the C. P. position. The test cell area will then be secured, and, upon orders from the Lead Test Engineer, the Lead Reactor Engineer will proceed to bring the reactor to a very low power level. He will first push the PHYSICS TEST button to establish the test conditions. Then he will push each of the twelve drum unlocking buttons in turn observing the corresponding drum position indicator to assure himself that the drum does not move upon being unlocked. When all twelve drums have been unlocked, as indicated by the lighted pushbuttons, he will move all drums individually by means of the twelve drum position control potentiometers. The automatic scram system will scram the reactor if a power level greater than 0.1% or a short period should take place. The reactor may also be scrammed by pushing the PHYSICS TEST SCRAM button on the control panel. Drum worth measurements, can then be carried out by manipulating the drum position controls and observing power level and period. The digital display is useful here to measure count rate for various pre-set time intervals. At the conclusion of the physics tests, all drums will be returned to zero and locked by means of the position controls and the LOCK ALL DRUMS pushbutton.

3. Power Run

The Lead Reactor Engineer will, upon command from the Lead Test Engineer, push the REACTOR READY button and then proceed to unlock all drums. When the ENGINE START-UP button, located on the Engine Control Panel, is pushed, all control passes to the Lead Test Engineer. The Lead Reactor Engineer will monitor reactor performance by means of his nuclear power, period, drum position, and chamber temperature indicators during the power run. He may, by means of pushbuttons located below the nuclear indicators, select any channel for display. Control will always be by means of the auctioneered signal.

4. Shut-down

After the engine has been shutdown and the automatic cool-down process has been initiated by the Lead Test Engineer, the Lead Reactor Engineer will observe the core temperature monitor. This is an automatic temperature scanning system checking vital reactor components. When any component temperature exceeds a preset limit, a corresponding push button will light up. By pressing that button, the actual temperature reading will be displayed. The Lead Reactor Engineer may then decide to advise the Lead Test Engineer to override the automatic cooldown system to provide additional cooling pulses.

Reference:

WANL-TME-295
DWG 707J870
DWG 707J888

W. M. Kendziorek
Control System Design
Control Development

/crm

- 14 BUY FROM POTTER & BRUMFIELD, PRINCETON, IND OR EQUAL
- 15 ATTACH RUBBER FEET, ITEM 15, TO CABINET, ITEM 1, AT APPROXIMATE LOCATION SHOWN
- 12 MARK NOMENCLATURE ON CABINET AT LOCATION SHOWN USING WHITE VERTICAL GOTHIC LETTERING CHARACTER HEIGHT TO BE APPROXIMATELY .12
- 11 BUY FROM ALPHA WIRE CO, NEW YORK, N Y OR EQUAL
- 10 BUY FROM BURNDY CORP, NORWALK, CONN OR EQUAL
- 9 BUY FROM HEYMAN MFG CO, KENILWORTH, NEW JERSEY OR EQUAL
- 8 BUY FROM SIGMA INSTRUMENTS INC, BOSTON, MASS OR EQUAL
- 7 BUY FROM BUD RADIO, INC, CLEVELAND, OHIO OR EQUAL
- 6 BUY FROM THE ARROW HART & HEGEMAN ELECTRIC CO, HARTFORD, CONNECTICUT OR EQUAL
- 5 BUY FROM CONTROLS CO OF AMERICA, CHICAGO, ILL OR EQUAL
- 4 BUY FROM INTERNATIONAL RESISTANCE CO, ST PETERSBURG, FLORIDA OR EQUAL
- 3 BUY FROM BOURNS INC, RIVERSIDE, CALIFORNIA OR EQUAL
- 2 BUY FROM CENTRALAB, MILWAUKEE, WISCONSIN OR EQUAL
- 1 BUY FROM SIMPSON ELECTRIC CO, CHICAGO, ILL, OR EQUAL

NOTES

ITEM NO.	DESCRIPTION	QTY	UNIT	PRICE	TOTAL
13	40 LAMP, 28VDC	1			
39	WIRE, AWG #22	1			
38	SCHEMATIC DIAGRAM	1			
37	WIRING DIAGRAM	1			
36	SOLDER, 60/40, 1/2 LB, ROSIN CORE	1			
35	TUBING, LACING	1			
34	SLEEVING	1			
33	WIRE, AWG #20, THINER, BARE	1			
32	WIRE, AWG #20	1			
31	WIRE, SHIELDED, AWG #20	1			
30	SPIRAL TUBE LACING	1			
29	PLUG, ELECTRICAL	1			
28	PLUG, ELECTRICAL	1			
27	PLUG, ELECTRICAL	1			
26	PLUG, ELECTRICAL	1			
25	BUSHING	1			
24	BUSHING	1			
23	WASHER, 1/12 LOCK	1			
22	NUT, HEX, 1/12-40	1			
21	WASHER, 1/12 LOCK	1			
20	NUT, HEX, 1/12-40	1			
19	SCREW, 1/16-32 X .31 LG, PAN HD	1			
18	SCREW, TAPPING, 1/16-32 X .31 LG, PAN HD	1			
17	NUT, HEX, 1/16-32	1			
16	SCREW, 1/16-32 X .31 LG, PAN HD	1			
15	RELAY, TYPE R	1			
14	RELAY, D.P.D.T., 1000 Ω	1			
13	FEET	1			
12	SWITCH, SPST	1			
11	LAMP ASSY	1			
10	KNOB	1			
9	POTENTIOMETER, 50K	1			
8	METER, 25-0-25 GA	1			
7	SWITCH	1			
6	COMPONENT BOARD ASSY	1			
5	COMPONENT BOARD ASSY	1			
4	BRACKET	1			
3	COVER	1			
2	COVER	1			
1	CONTROL CABINET	1			

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13	FEET	1			
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15	RELAY, TYPE R	1			
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19	SCREW, 1/16-32 X .31 LG, PAN HD	1			
20	NUT, HEX, 1/12-40	1			
21	WASHER, 1/12 LOCK	1			
22	NUT, HEX, 1/12-40	1			
23	WASHER, 1/12 LOCK	1			
24	BUSHING	1			
25	BUSHING	1			
26	PLUG, ELECTRICAL	1			
27	PLUG, ELECTRICAL	1			
28	PLUG, ELECTRICAL	1			
29	PLUG, ELECTRICAL	1			
30	SPIRAL TUBE LACING	1			
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32	WIRE, AWG #20	1			
33	WIRE, AWG #20, THINER, BARE	1			
34	SLEEVING	1			
35	TUBING, LACING	1			
36	SOLDER, 60/40, 1/2 LB, ROSIN CORE	1			
37	WIRING DIAGRAM	1			
38	SCHEMATIC DIAGRAM	1			
39	WIRE, AWG #22	1			
40	LAMP, 28VDC	1

NOTES:
1 ALL RESISTORS ARE $\frac{1}{2}W \pm 5\%$ UNLESS OTHERWISE SPECIFIED.

REFERENCE DRAWINGS
NEXT ASSEMBLY DWG 909E45SG01

REV	BY	DATE	DESCRIPTION	CODE	PART OR IDENTIFYING NO.	MATERIAL	SPECIFICATION	UNIT WT.	ZONE
LIST OF MATERIALS									
1	W. J. H. H.	5-24-62	REVISION			WESTINGHOUSE ELECTRIC CORPORATION			
2	W. J. H. H.	5-24-62	REVISION						
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