

REV NO. <input type="radio"/>	TITLE	P3K-AL-0194	CONT ON SHEET 2	SH NO. (
P3K-AL-0194	STOP VALVE AMPLIFIER CIRCUIT BOARD TEST	115D3311 G2, C		
CONT ON SHEET 2	SH NO. 1	FIRST MADE FOR PHILADELPHIA ELECTRIC	170X463/X464	G3 G4

### GENERAL DESCRIPTION

This amplifier is used for the prime purpose of Chest/Shell warming. The by-pass valve stem lift needed for prewarming, requires a max. +2.50 VDC at the stop valve position unit input. This requires an input resistance in the position unit circuit of (20K Ohms). A 20K Ohm load resistance in parallel with this input resistor was installed on the stop valve amplifier board to increase the ceiling limit current to a practical value.

Inputs to the board consists of the speed error signal and a Chest/Shell warming signal. The board has one operational amplifier which sums the inputs with their corresponding gains. (Equal to the feedback resistance divided by the resistance seen by the input in question).

The output signal is fed to the stop valve position unit. This signal is applied to the position unit via relay contact KL154 which closed during pre-warming. This signal can be limited to a voltage range of -0.25 to +1.25 VDC by biasing the output. This bias is supplied by +30 volts through a resistance network and contact KT103 (closed under normal operation) to -22 volts. This reverse biases CR1 when the amplifier output is greater than +2.50 VDC and forward biases CR1 when the amplifier is less than +2.50 VDC, (effectively tying the amplifier output to the card output). The output transistor circuit is used for current amplification to drive the external load.

NOTE: This instruction is used for G2, G3, & G4.

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PRINTS

MADE BY J. None May 23, 1975	APPROVALS	Steam Turbine	DIV OR DEPT.	P3K-AL-0194
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REV. NO. 

TITLE

CONT ON SHEET

3

SH NO.

P3K-AL-0194

STOP VALVE AMPLIFIER CIRCUIT BOARD TEST 115D3311 G2,G3,G

CONT ON SHEET

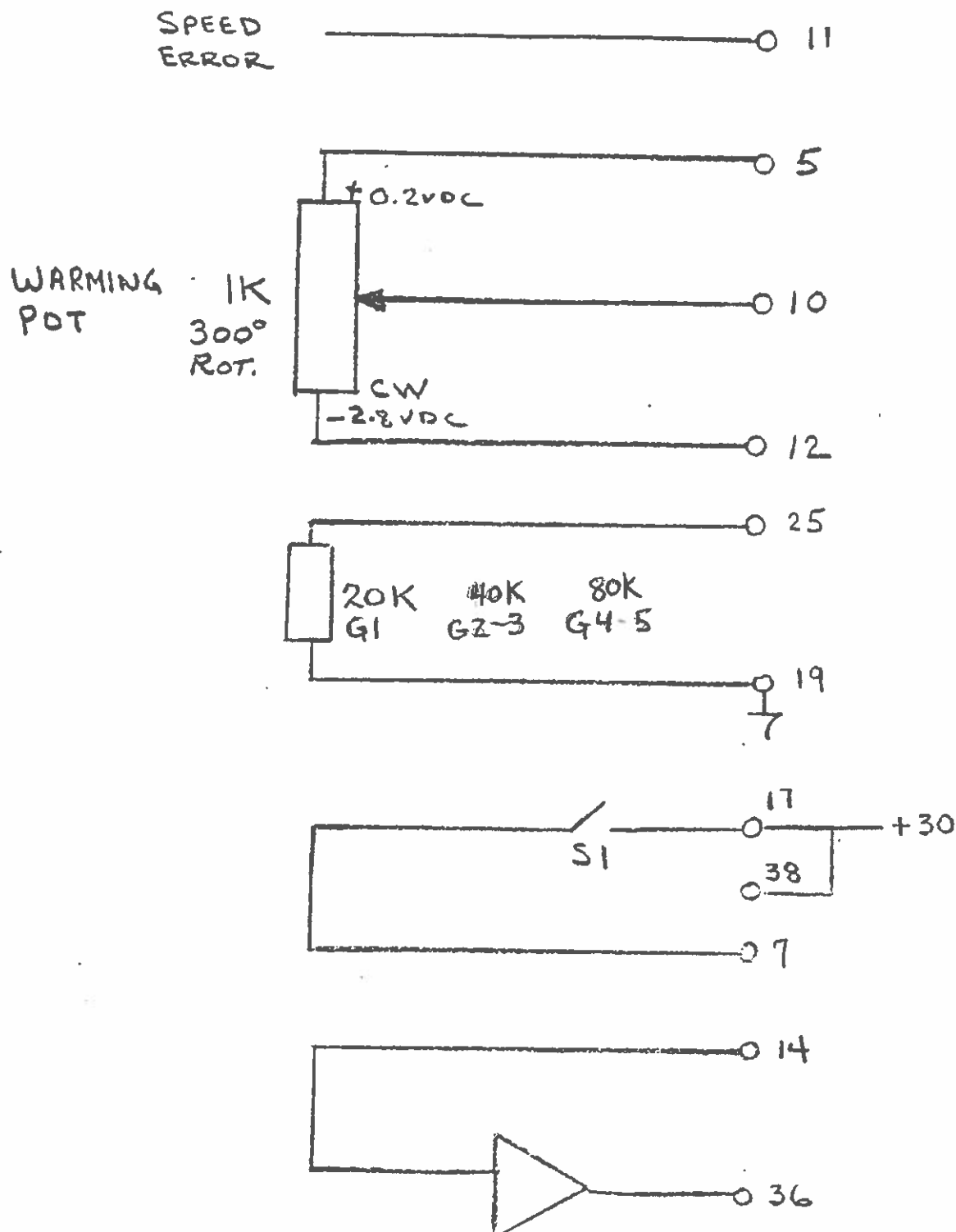
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SH NO.

2

FIRST MADE FOR PHILADELPHIA ELECTRIF

170X463/X464

TEST SET-UP

REVIS

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MADE BY

D. Mone May 23, 1975

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Steam Turbine

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P3K-AL-0194

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LOCATION

CONT ON SHEET

3

SH NO. 2

REV NO. 0

TITLE

CONT ON SHEET

4

SH NO. 3

P3K-AL-0194

STOP VALVE AMPLIFIER CIRCUIT BOARD TEST 115D3311

CONT ON SHEET 4

SH NO. 3

FIRST MADE FOR PHILADELPHIA ELECTRIC 170X463/X464

TEST PROCEDURE FOR 115D3311 G4 (W/RC NETWORK & INCREASED GAIN)

Input voltage should be set to  $\pm 10$  MV DC.

Output voltage should be read within  $\pm 100$  MV DC of stated values, unless specified otherwise.

1. Hook up card as per test set up S1 should be closed and the warming rate pot (1K Ohms) should be max CCW.
2. Connect a power supply to the speed error input, and set the voltage to +0.025 VDC.
3. Monitor Pin 10 and adjust R3 and R4 to obtain a voltage range of +0.2V to -2.8 VDC.
4. Set warming rate pot for -0.7 VDC at pin 10.
5. Adjust R1 to obtain +0.5 VDC at TP8. This setting of R1 checks for low ceiling limit value.
6. Increase warming rate pot maximum CW  $\approx -2.8$  VDC.  
NOTE: That output at TP8 does not change.
7. Adjust R1 so that output at TP8 increases to +2.5 VDC. This setting of R1 checks upper ceiling limit value.
8. Increase the speed error signal slowly in the positive direction and notice the voltage at TP8 goes to zero. (Stop Valve By-Pass Closed).
9. Reduce the speed error signal +0.025 VDC.
10. The voltage at TP8 will go to +2.50 VDC.
11. Open S1 and the voltage at TP8 will be -10.5 VDC  $\pm 1.00$  VDC.
12. Close S1.
13. Decrease warming rate pot <sup>PIN 10</sup> and note that the output at TP8 decreases toward zero.

END OF TEST

MADE BY D. Mone May 23, 1975

APPROVALS

Steam Turbine

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P3K-AL-0194

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MAY 23 1975

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LOCATION

CONT ON SHEET

4

SH NO. 3

REV. NO. 0

TITLE

CONT ON SHEET

SH NO. 4

P3K-AL-0194

STOP VALVE AMPLIFIER CIRCUIT BOARD TEST 115D3311 G2, G3, G4

CONT ON SHEET 5

SH NO. 4

FIRST MADE FOR PHILADELPHIA ELECTRIC 170X463/X464

TEST PROCEDURE FOR 115D3311 G3 & G4G3 - W/RC NETWORK  
G2 - W/O RC NETWORKG3 R13  
200KInput voltage should be set to  $\pm 10$  MV DC.Output voltage should be read within  $\pm 100$  MV DC of stated values, unless specified otherwise.

1. Hook up card as per test set up S1 should be closed and the warming rate pot (1K Ohms) should be max CCW.
2. Connect a power supply to the speed error input, and set the voltage to +0.025 VDC. *PIN 11*
3. ~~Monitor Pin 10~~ and adjust R3 and R4 to obtain a voltage range of +0.2V to -2.8 VDC. *TP7 COM PIN 19*
4. Set warming rate pot for -0.7 VDC at pin 10.
5. Adjust R1 to obtain  $\pm 0.5$  VDC at TP8. This setting of R1 checks for low ceiling limit value. *25 G3*
6. Increase warming rate pot maximum CW  $\approx -2.8$  VDC.  
NOTE: That output at TP8 does not change.
7. Adjust R1 so that output at TP8 increases to +1.25 VDC. This setting of R1 checks upper ceiling limit value.
8. Increase the speed error signal slowly in the positive direction and notice the voltage at TP8 goes to zero (Stop Valve By-Pass Closed).
9. Reduce the speed error signal +0.025 VDC.
10. The voltage at TP8 will go to +1.25 VDC.
11. Open S1 and the voltage at TP8 will be -10.5 VDC  $\pm 1.00$  VDC.
12. Close S1.
13. Decrease warming rate pot and note that the output at TP8 decreases toward zero.

END OF TEST

MADE BY D. Mone May 23, 1975

APPROVALS

Steam Turbine

DIV OR DEPT.

P3K-AL-0194

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MAY 23 1975

Schenectady, N.Y.

LOCATION

CONT ON SHEET

5

SH NO. 4

REV NO. <u>0</u>	TITLE	CONT ON SHEET	SH NO. <u>5</u>
P3K-AL-0194	STOP VALVE AMPLIFIER CIRCUIT BOARD TEST 115D3311 G2, G3, G4		
CONT ON SHEET <u>5</u>	SH NO. <u>4</u>	FIRST MADE FOR	PHILADELPHIA ELECTRIC 170X463/X464

TEST PROCEDURE FOR 115D3311 G3 & G4

G3 - W/RC NETWORK  
G2 - W/O RC NETWORK

Input voltage should be set to  $\pm 10$  MV DC.

Output voltage should be read within  $\pm 100$  MV DC of stated values, unless specified otherwise.

1. Hook up card as per test set up S1 should be closed and the warming rate pot (1K Ohms) should be max CCW.
2. Connect a power supply to the speed error input, and set the voltage to +0.025 VDC. *PIN 11*
3. Monitor Pin 10 and adjust R3 and R4 to obtain a voltage range of +0.2V to -2.8 VDC.
4. Set warming rate pot for -0.7 VDC at pin 10.
5. Adjust R1 to obtain +0.5 VDC at TP8. This setting of R1 checks for low ceiling limit value. *25*
6. Increase warming rate pot maximum CW -2.8 VDC.  
NOTE: That output at TP8 does not change.
7. Adjust R1 so that output at TP8 increases to +1.25 VDC. This setting of R1 checks upper ceiling limit value.
8. Increase the speed error signal slowly in the positive direction and notice the voltage at TP8 goes to zero (Stop Valve By-Pass Closed).
9. Reduce the speed error signal +0.025 VDC.
10. The voltage at TP8 will go to +1.25 VDC.
11. Open S1 and the voltage at TP8 will be -10.5 VDC  $\pm 1.00$  VDC.
12. Close S1.
13. Decrease warming rate pot and note that the output at TP8 decreases toward zero.

END OF TEST

MADE BY D. Mone May 23, 1975	APPROVALS	Steam Turbine	DIV OR DEPT.	P3K-AL-0194
ISSUED MAY 23 1975		Schenectady, N.Y.	LOCATION	CONT ON SHEET <u>5</u> SH NO. <u>4</u>

17/11/88  
6/12/88

6

115 D3311G4

Power Supplies: -22VDC To pin 21,40  
+30VDC To pin 17,38  
Common pin 19

- Connect pin 7 To +30VDC  
- Hook up external op amp Board (see Schematic).

Connect 10K  $\Omega$  from pin 5 To Common.

Read TP5 = +15.5 TO +15.9VDC with R3 CW.

" TP5 = +13.1 TO +15.3VDC with R3 CCW.

Remove 10K  $\Omega$  from pin 5 & put on pin 12.

Read TP7 = -14.3VDC to -14.6VDC with R4 CW.

" TP7 = -11.8VDC to -13.8VDC with R4 CCW.

Remove 10K  $\Omega$  from pin 12.

put +5.00VDC into pin 10. Read TP8 = 5.00V  $\pm$  .1VDC.

Remove +5VDC at pin 10.

put +5.00VDC into pin 11. Read TP8 = 9.9 TO 10.2VDC.

Remove +5VDC at pin 11.

put +2.00VDC into pin 24. Read TP8  $\approx$  -8.0VDC.

Run R1 CW. Put -3.0VDC into pin 24 - TP8 should be limited at about +2.8VDC.

Run R1 CCW. ~~start~~ out put should limit at  $\sim$  -1.0VDC.

(change input voltages, see that highest out put goes is

1.2VDC @ -10.0VDC)

See  
pin 11  
5.5V  
does  
work

REV  
NO. 0

TITLE

CONT ON SHEET

SH NO. 5

P3K-AL-0194

STOP VALVE AMPLIFIER CIRCUIT BOARD TEST

115D3311 G2,G3

CONT ON SHEET

SH NO.

5

FIRST MADE FOR PHILADELPHIA ELECTRIC

170X463/X464

REVISE

PREPARED BY

*J. Dombrosky*

DATE

*9/25/73*J. Dombrosky  
EHC DESIGN ENGINEERING

APPROVED BY

*C. Bugg*

DATE

*5/21/75*C. Bugg  
EHC TEST ENGINEER

APPROVED BY

*P.C. Callan*

DATE

*5-22-75*P.C. Callan - MANAGER  
EHC DESIGN ENGINEERING

PRINTS

MADE BY  
D. Mone May 23, 1975

APPROVALS

Steam Turbine

DIV OR  
DEPT.

P3K-AL-0194

ISSUED

MAY 23 1975

Schenectady, N.Y.

LOCATION

CONT ON SHEET

SH NO.

5

PHILADELPHIA  
ELECTRIC

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