LOAD BALANCE CONTROLLER

I. GENERAL DESCRIPTION

The load balance controller consists of a proportional delayed controller with two inverting amplifiers. Additional circuits are incorporated to give an adjustable deadband with independent threshold adjustments and independent adjustable limits in both positive and negative directions to limit signal fed to speed or voltage controllers.

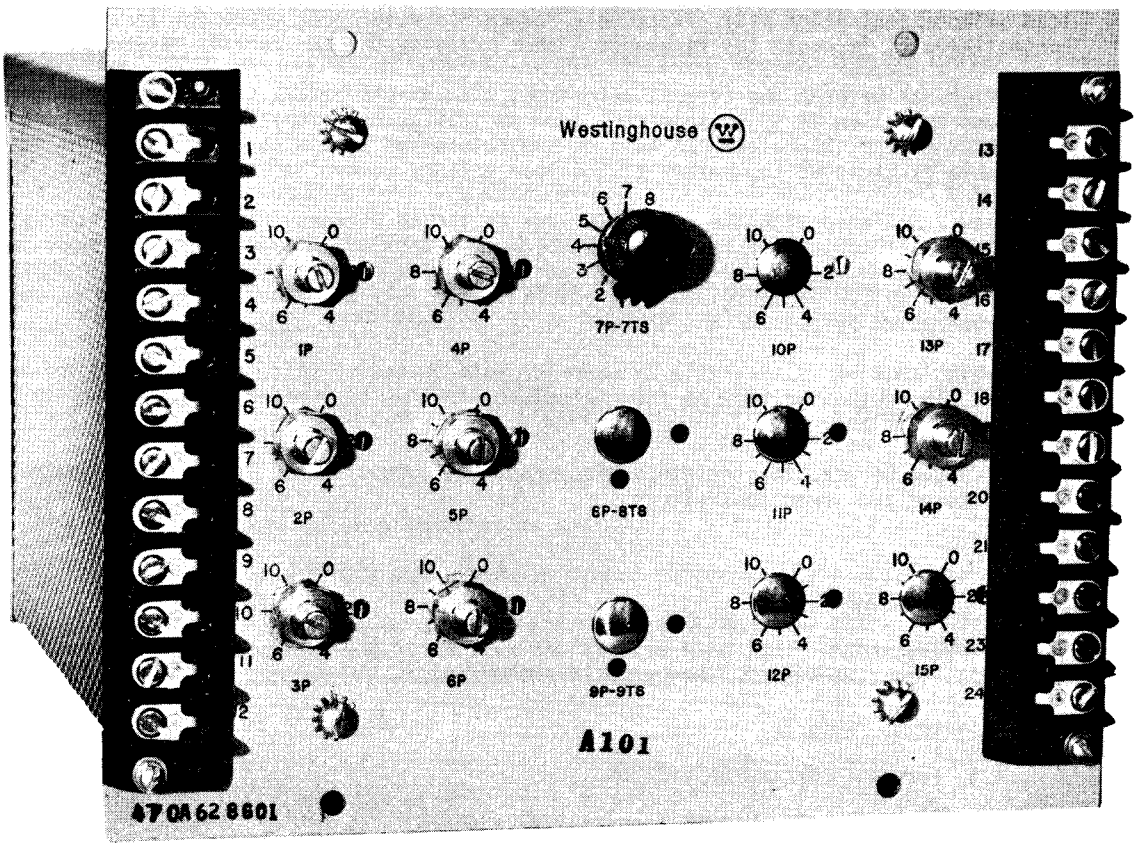

FIGURE #1

The module shown in Figure #1, contains P101A operational amplifiers (IL 16-800-24) their associated function boards, limiter circuit board and sequencing relay board extending from a 9" x 7" faceplate on which are mounted front accessible adjusting potentiometers, selector switches and screw type terminals to which all external connections are made.

4.2 Apply +24 volts to terminal #1.

4.3 Adjust pot 6P so that output voltage at terminal #9 does not exceed $-V_{MAX}$.

4.4 Remove +24 volts from terminal #1 and reconnect to terminal #13.

4.5 Adjust pot 5P so that voltage output at terminal #19 does not exceed $+V_{MAX}$.

4.6 Remove reference voltage from terminal #13.

4.7 Turn switch 7TS to position indicated in table below which is determined by the value of the lead in the speed controller feedback.

Lead in Speed Controller	Switch Position 7TS #
0 TO 30 ms	1
30 TO 120 ms	2
120 TO 240 ms	3
240 TO 360 ms	4
360 TO 480 ms	5
480 TO 600 ms	6

5.0 Adjustment of Load Balance Controller Gain

5.1 Reconnect controller lead previously disconnected from terminal #1 (ensure that terminal #19 [or #20] is connected to the same controller as the lead from terminal #1 orginates from).

5.2 Reconnect lead previously disconnected from terminal #13 (ensure that terminal #9 [or #10] is connected to the input of the same controller as the lead from terminal #13 orginates from).

5.3 Turn pot 2P full CCW. Mechanically couple the two drives and energize relay 1CR. Slowly increase the speed reference to the two drives until both are running at base speed.

5.4 Connect Simpson between PSC and terminal #19 of the load balance controller and adjust the reference of one drive until the output of the load balance controller (terminal #19) is zero.

5.5 Connect Simpson between terminals #1 and #13.

5.6 Increase the reference of one drive by 1% of base speed (or rated voltage).

5.7 Adjust pot 2P CW until the voltage on the Simpson is less than or equal to $\frac{I_R}{I_C} \times 1$ volts. (I_R = rated amps; I_C = current limit amps)

5.8 Apply 1% reference steps to one drive and record speed (or voltage) responses of both drives. These should be similar.

5.9 De-energize relay 1CR if deadband is desired.

V. SERVICE

Using the procedure outlined in Section IV, any problem can be isolated to either a component on a function board or a faulty A101A transistorized operational amplifier. Our component board designs, utilizing stand-off terminals, facilitate the replacement of components using the proper sized (wattage) soldering iron. However, proper servicing of the A101A TOA requires instruments and techniques particular to transistorized, low noise level circuits. Customers without the proper facilities are advised to return the defective unit to:

Westinghouse Electric Corporation
Industrial Systems Division
P. O. Box 225
Buffalo, New York 14240

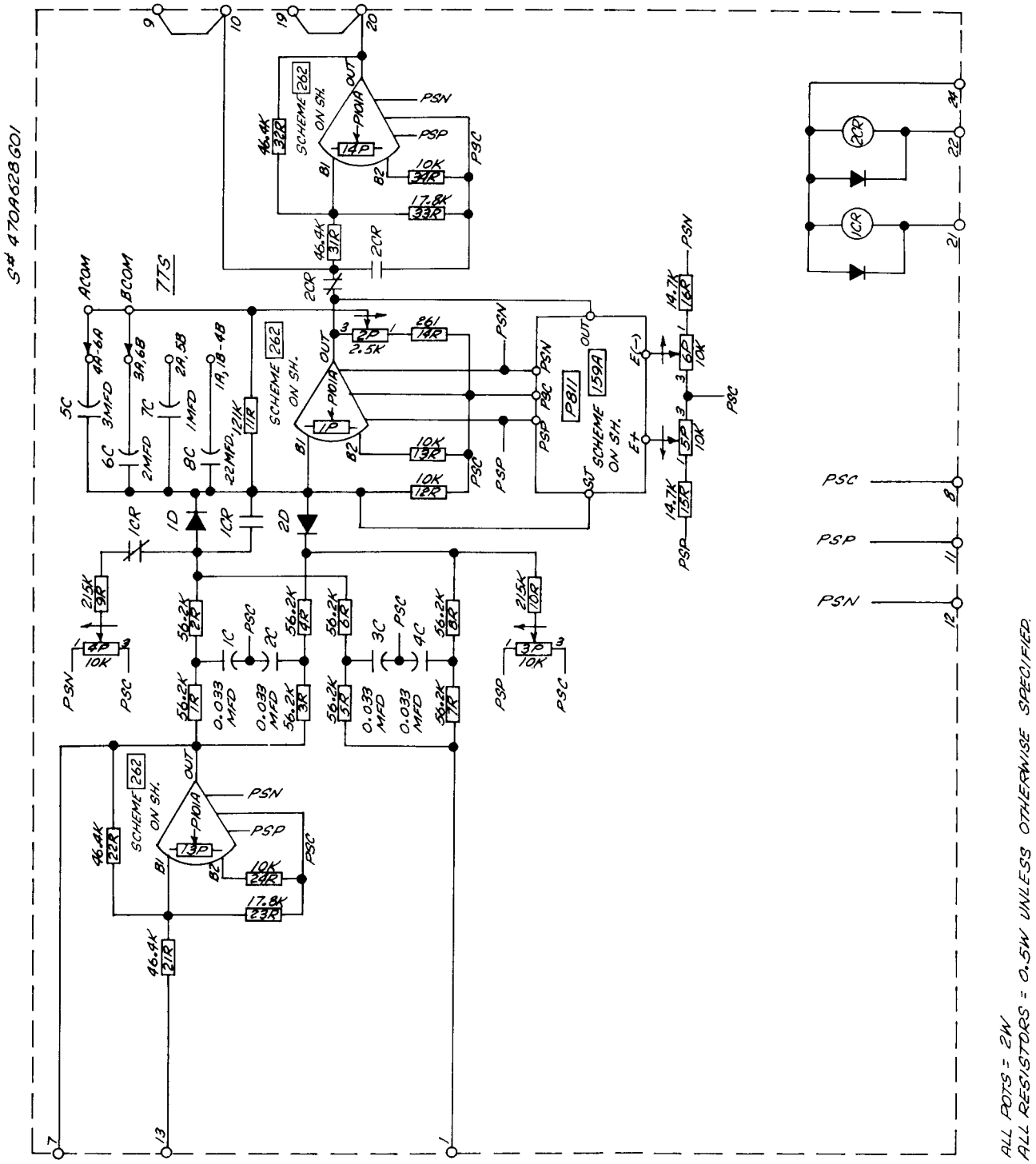

Figure #2

LOAD BALANCE CONTROLLER & INVERTERS