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SINCE 1975

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INSTRUCTIONS

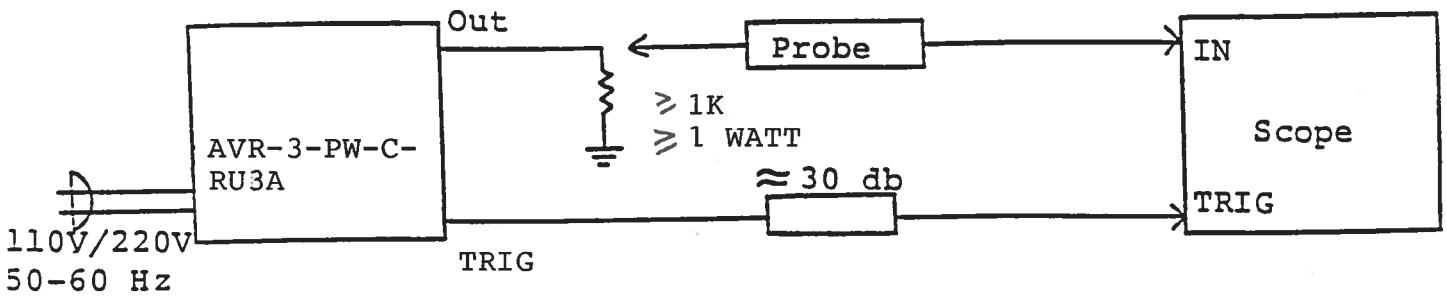
MODEL AVR-3-C-PN-RU3A PULSE GENERATOR

S.N.:

WARRANTY

Avtech Electrosystems Ltd. warrants products of its manufacture to be free from defects in material and workmanship under conditions of normal use. If, within one year after delivery to the original owner, and after prepaid return by the original owner, this Avtech product is found to be defective, Avtech shall at its option repair or replace said defective item. This warranty does not apply to units which have been dissembled, modified or subjected to conditions exceeding the applicable specifications or ratings. This warranty is the extent of the obligation or liability assumed by Avtech with respect to this product and no other warranty or guarantee is either expressed or implied.

Fig. 1 PULSE GENERATOR TEST ARRANGEMENT



Notes:

1) The bandwidth capability of components and instruments used to display the pulse generator output signal (attenuators, cables, connectors, etc.) should exceed 100 MHz.

2) This unit was specifically designed to drive high impedance loads (RL > 1K). The unit may fail if operated into low impedance loads (eg. 50Ω).

3) The output pulse train from the unit resembles that shown in Fig. 2. CAUTION: The pulse train repetition interval (i.e. time between trigger pulses) should always exceed 20 (PWP and PWN). The output stage may fail if this duty cycle is exceeded.

4) The output pulse widths for the positive and negative outputs are controlled by means of the front panel one turn PW P and PW N controls and by the PW RANGE controls.

	PW min	PW max
Range 1	0.1 us	1.0 us
Range 2	1.0 us	10 us
Range 3	10 us	100 us
Range 4	100 us	1 ms

5) The output pulse amplitudes for the positive and negative outputs are controlled by means of the front panel one turn AMP P and AMP N controls.

6) The T1 controls determine the time interval between the double pulses as follows:

	MIN	MAX
Range 1	0.1 us	1.0 us
Range 2	1.0 us	10 us
Range 3	10 us	100 us
Range 4	0.1 ms	1.0 ms

7) The T2 controls determine the time interval between the positive and negative voltage swings as follows:

	MIN	MAX
Range 1	0.1 us	1.0 us
Range 2	1.0 us	10 us
Range 3	10 us	100 us
Range 4	0.1 ms	1.0 ms

8) The TRIG output channel provides TTL level signals. To avoid overdriving the TRIG input channel of some scopes, a 30 db attenuator should be placed at the input to the scope trigger channel. The TRIG output precedes the main output when the front panel ADVANCE-DELAY switch is in the ADVANCE position. The TRIG output lags the main output when the switch is in the DELAY position.

9) To obtain a stable output display the PRF control on the front panel should be set mid range. The front panel TRIG switch should be in the INT position. The DELAY controls and the scope triggering controls are then adjusted to obtain a stable output. The scope may then be used to set the desired PRF by rotating the PRF and PRF FINE controls.

10) An external clock may be used to control the output PRF of the AVR unit by setting the front panel TRIG toggle switch in the EXT position and applying a 0.2 usec (approx.) TTL level pulse to the TRIG BNC connector input. For operation in this mode, the scope time base must also be triggered by the external clock rather than from the TRIG output.

11) For single pulse manual operation, set the front panel INT-EXT-MAN switch in the MAN position and push the SINGLE PULSE button.

12) The DELAY control controls the relative delay between the reference output pulse provided at the TRIG output and the main output. This delay is variable over the range of 0.1 us to 1 ms. The TRIG output precedes the main output when the ADVANCE-DELAY switch is in the ADVANCE position and lags when the switch is in the DELAY position.

	MIN	MAX
Range 1	0.1 us	1.0 us
Range 2	1.0 us	10 us
Range 3	10 us	100 us
Range 4	100 us	1 ms

13) AVR-3 units with a serial number higher than 5600 are protected by an automatic overload protective circuit which controls the front panel overload light. If the unit is overloaded (by operating at an exceedingly high duty cycle or by operating into a short circuit), the protective circuit will turn the output of the instrument OFF and turn the indicator light ON. The light will stay ON (i.e. output OFF) for about 5 seconds after which the instrument will attempt to turn ON (i.e. light OFF) for about 1 second. If the overload condition persists, the instrument will turn OFF again (i.e. light ON) for another 5 seconds. If the overload condition has been removed, the instrument will turn on and resume normal operation. Overload conditions may be removed by:

1) Reducing PRF (i.e. switch to a lower range)
2) Reducing pulse width (i.e. switch to a lower range)
3) Removing output load short circuit (if any)

14) The unit can be converted from 110 to 220V 50-60 Hz operation by adjusting the voltage selector card in the rear panel fused voltage selector-cable connector assembly.

15) For additional assistance:

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(1) ON-OFF Switch. Applies basic prime power to all stages.

(2) PRF Control. Varies PRF from 1 Hz to 1 kHz as follows:

1 Hz	to	10 Hz
10 Hz	to	100 Hz
100 Hz	to	1 kHz

(3) DELAY Control. Controls the relative delay between the reference output pulse provided at the TRIG output (4) the main output (5). This delay is variable over the range of 0.1 to about 1 ms. Delay LEADS or LAGS depending on the position of the ADVANCE-DELAY switch.

	MIN	MAX
Range 1	0.1 us	1.0 us
Range 2	1.0 us	10 us
Range 3	10 us	100 us
Range 4	100 us	1 ms

(4) TRIG Output. This output is used to trigger the scope time base. The output is a TTL level 100 ns (approx.) pulse capable of driving a fifty ohm load. This output precedes the output at (5) if the two position ADVANCE-DELAY switch is in the ADVANCE position. This output follows the output at (5) if the switch is in the DELAY position. The delay range is variable from 0.1 us to 1 ms. The external trigger signal is applied at this input when the EXT-INT toggle switch is in the EXT position.

(5) OUT Connector. BNC connector provides output to a high impedance load ($R_L \geq 1K$).

(6) The output pulse widths for the positive and negative outputs are controlled by means of the front panel one turn PW P and PW N controls and by the PW RANGE controls as follows:

	PW MIN	PW MAX
Range 1	0.1 us	1.0 us
Range 2	1.0 us	10 us
Range 3	10 us	100 us
Range 4	100 us	1 ms

(7) The output pulse amplitudes for the positive and negative outputs are controlled by means of the front panel one turn AMP P and AMP N controls.

(8) The T1 controls determine the time interval between the double pulses as follows:

	MIN	MAX
Range 1	0.1 us	1.0 us
Range 2	1.0 us	10 us
Range 3	10 us	100 us
Range 4	0.1 ms	1.0 ms

(9) The T2 controls determine the time interval between the positive and negative voltage as follows:

	MIN	MAX
Range 1	0.1 us	1.0 us
Range 2	1.0 us	10 us
Range 3	10 us	100 us
Range 4	0.1 ms	1.0 ms

(10) INT-EXT-MAN Control. With this toggle switch in the INT position, the PRF of the AVR unit is controlled via an internal clock which in turn is controlled by the PRF control. With the toggle switch in the EXT position, the AVR unit requires a 0.2 usec TTL level pulse applied at the TRIG input in order to trigger the output stages. In addition, in this mode, the scope time base must be triggered by the external trigger source.

(11) SINGLE PULSE. For single pulse manual operation, set the front panel INT-EXT-MAN switch in the MAN position and push the SINGLE PULSE button.

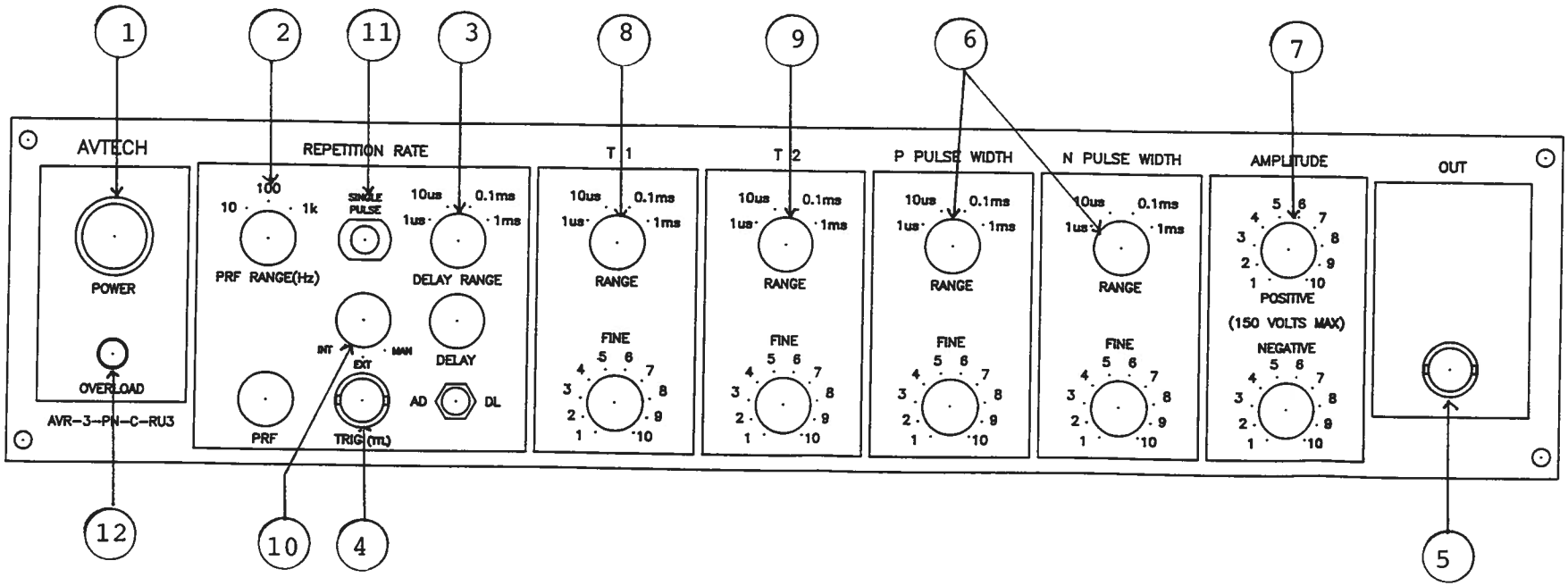


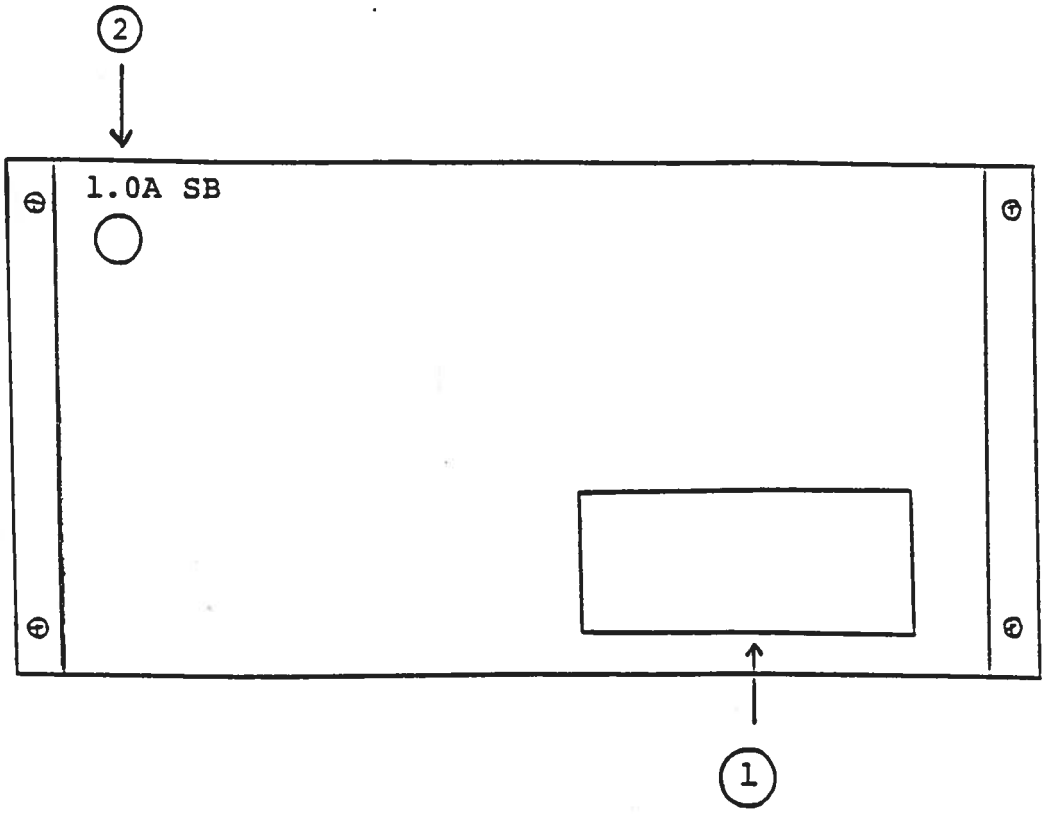
FIG 2. FRONT PANEL CONTROLS

(12) OVERLOAD INDICATOR. AVR-3-PW-C units with a serial number higher than 5600 are protected by an automatic overload protective circuit which controls the front panel overload light. If the unit is overloaded (by operating at an exceedingly high duty cycle or by operating into a short circuit), the protective circuit will turn the output of the instrument OFF and turn the indicator light ON. The light will stay ON (i.e. output OFF) for about 5 seconds after which the instrument will attempt to turn ON (i.e. light OFF) for about 1 second. If the overload condition persists, the instrument will turn OFF again (i.e. light ON) for another 5 seconds. If the overload condition has been removed, the instrument will turn on and resume normal operation. Overload conditions may be removed by:

1) Reducing PRF (i.e. switch to a lower range)
2) Reducing pulse width (i.e. switch to a lower range)
3) Removing output load short circuit (if any)

Fig. 3

BACK PANEL CONTROLS



(1) FUSED CONNECTOR, VOLTAGE SELECTOR. The detachable power cord is connected at this point. In addition, the removable cord is adjusted to select the desired input operating voltage. The unit also contains the main power fuse (0.5 A SB).

(2) 1.0A SB. Fuse which protects the output stage if the output duty cycle rating is exceeded.

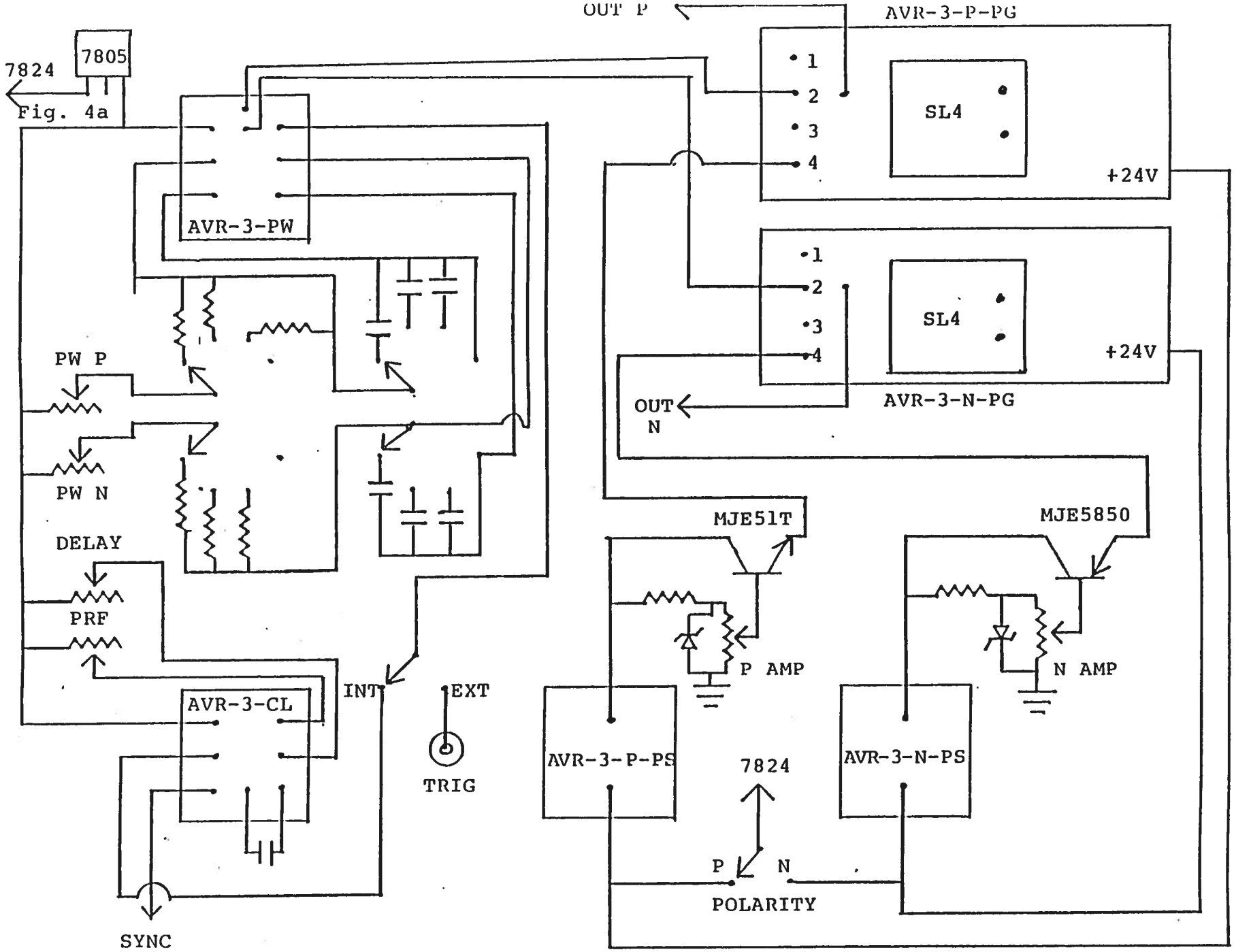


Fig. 4b SYSTEM BLOCK DIAGRAM (FOR NON EA, EW OPTION UNITS)

Fig. 4a

POWER SUPPLY

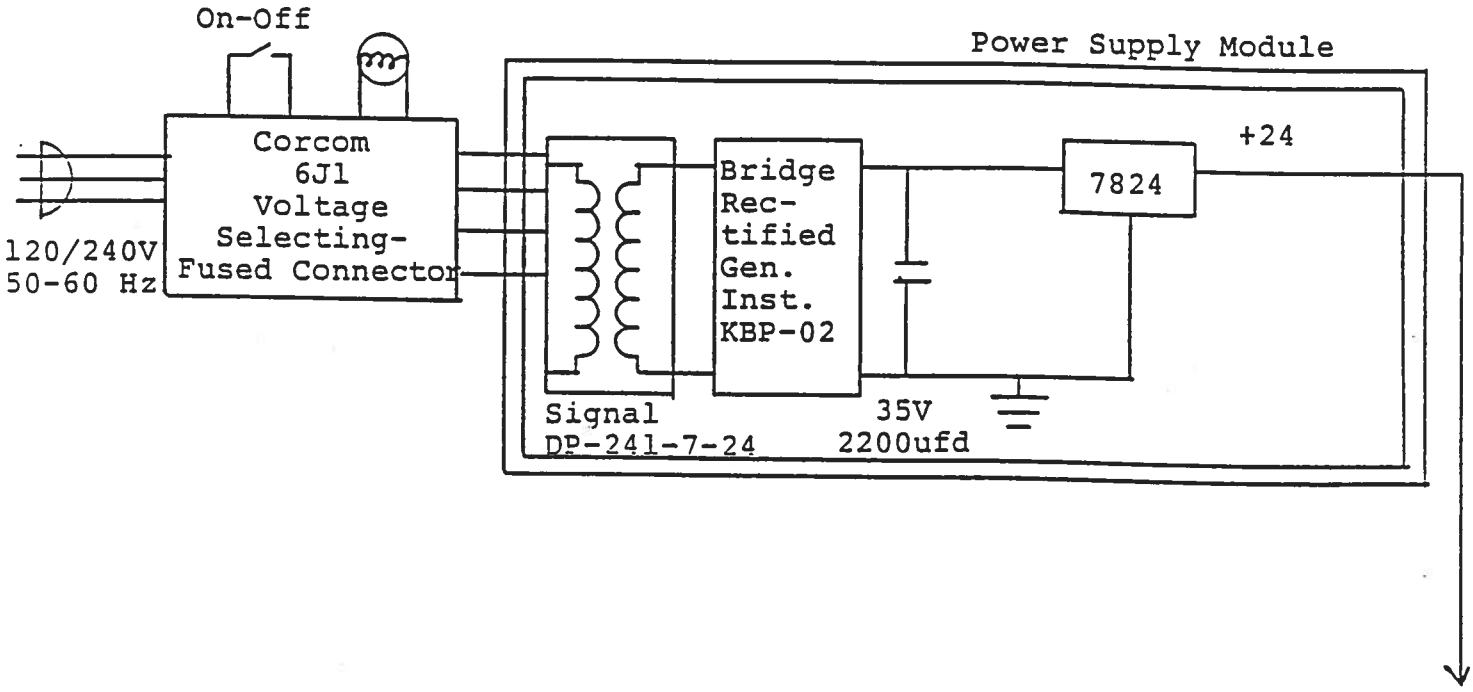


Fig. 4b

SYSTEM DESCRIPTION AND REPAIR PROCEDURE

The AVR-3-C-PS-PN-RU3A consists of the following basic modules:

1) AVR-3-RU3-PG pulse generator module
2) AVR-OL overload module
3) +24V power supply board
4) AVR-3-PS-RU3 power supply module
5) AVR-3-RU3-T pulse width module
6) AVR-3-RU3-CL clock module

In the event of an instrument malfunction, it is most likely that the rear panel 1.0A SB fuse or some of the output switching elements (SL22T) may have failed due to an output short circuit condition or to a high duty cycle condition. The switching elements may be accessed by removing the cover plate on the bottom side of the instrument. NOTE: First turn off the prime power. The elements may be removed from their sockets by means of a needle nosed pliers. The SL22T is a selected VMOS power transistor in a TO 220 packages and may be checked on a curve tracer. If defective, replacement units should be ordered directly from Avtech. When replacing the SL22T switching elements, take care to insure that the short lead (of the three leads) is adjacent to the black dot on the chassis.

Jul 20/94