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DC POWER SUPPLY

GPR-HIGH SERIES
(ANALOG / DIGITAL TYPE)

User Manual

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1. INTRODUCTION

The regulated DC power supply have been designed to provide the most often required in the laboratory, schools and production lines.

The output voltage is continuously adjustable between 0 to rating voltage in one range by means of a coarse and fine potentionmeter, the load current may have any value from 0 to rating current and adjusted by means of a coarse and fine potentionmeter. Both outputs can accurately read on voltmeter and ammeter.

Both stability and ripple are extremely good to meet the requirements of modern circuit design. The unit can be used as either constant voltage or current source. The various operation mode are described in more detail in the Operation Instruction section.

For applications when outputs greater than rating V is need, the unit can be connected up in series.

For applications in audio production lines, the continuous or dynamic load internal selectable.

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2-2 Constant Voltage Operation

(1) Output voltage ranges 0 to rating voltage continuously adjustable.

(2) Voltage regulation
line regulation≤0.01%+3mV
load regulation ≤0.01%+5mV
load regulation≤0.02%+5mV (≥10A)

(3) Recovery time≤100μs (50% Load change, Minimum load 0.5A)

(4) Ripple & Noise ≤ 1mV rms (5Hz~1MHz)

(5) Temperature coefficient ≤300PPM/°C

2-3 Constant Current Operation

(1) Output current range 0 to rating current continuously adjustable.

(2) Current regulation
line regulation ≤ 0.2%+3mA
load regulation ≤0.2%+5mA

(3) Ripple current≤5mA rms. (≤20A), ≤10mA rms (≤30A).
≤20mA rms (≤50A)

2-4 Indicator Meter

(1) Digital Type
Display: 3½ Digits 0.5" Red LED Display.
Accuracy: ±(0.5% of rdg + 2 digits)
Voltage range: 19.99V of full scale (rating voltage ≤18V).
199.9V of full scale (rating voltage ≤180V).
1999V of full scale (rating voltage ≤1800V)
Current range: 1.999A of full scale (rating current ≤1.8A)
19.99A of full scale (rating current ≤18A)
199.9A of full scale (rating current ≤180A).

(2) Analog Type
Meter: Voltmeter and Ammeter each one
Class: 2.5
Dimensions: 60x80 m/m;

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3-2 High Voltage Circuit (FIG. 2)

The power supply consists of an AC input circuit and transformer, a bias supply consisting of a rectifier and filter and reference voltage source, a main rectifier circuit consisting of the main rectifier and filter, a series regulator, a current comparator, a voltage comparator, a reference voltage amplifier, and a transistor driver consisting of rectifier and filter.

The circuit element are several of integrated circuit (U201, U202, U203, U204, U101, U205).

The circuit is discussed with reference to the block diagram Function Description.

Single phase input power is applied to transformer through the input circuit.

Auxiliary rectifier D101-D104 provides a bias voltage filtered by capacitor C101, C102 for the preregulator U101, Q101, Q102, that provides a regulator voltage for element of action.

The bias voltage is provide by auxiliary rectifier (D302~D305) to turn the transistor (Q303~Qn) ON.

The main rectifier is make by rectifiers and filters and then regulated via a series regulator and deliver to the output.

U204 provides a reference voltage for U205, U205 acted as a current limter. When current is over predominate rating, it acted and decreased the current. U201 provides a reference voltage for U202, U202 is a invertor amplifier, U205 is a comparator amplifier. It's may be made comparator for reference voltage and detector feedback voltage, and then deliver to Q202, Q203, this time output voltage is calibrated.

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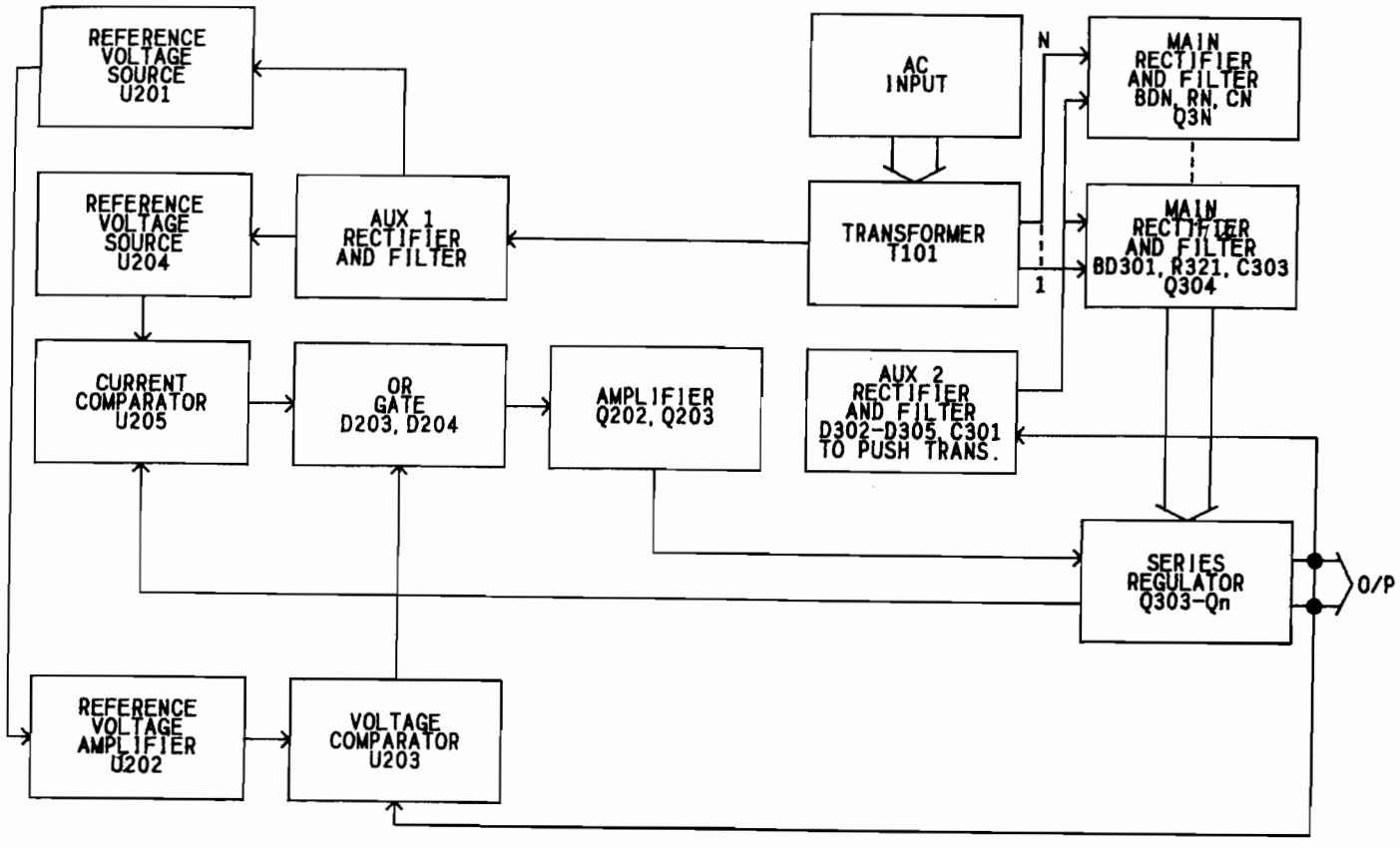
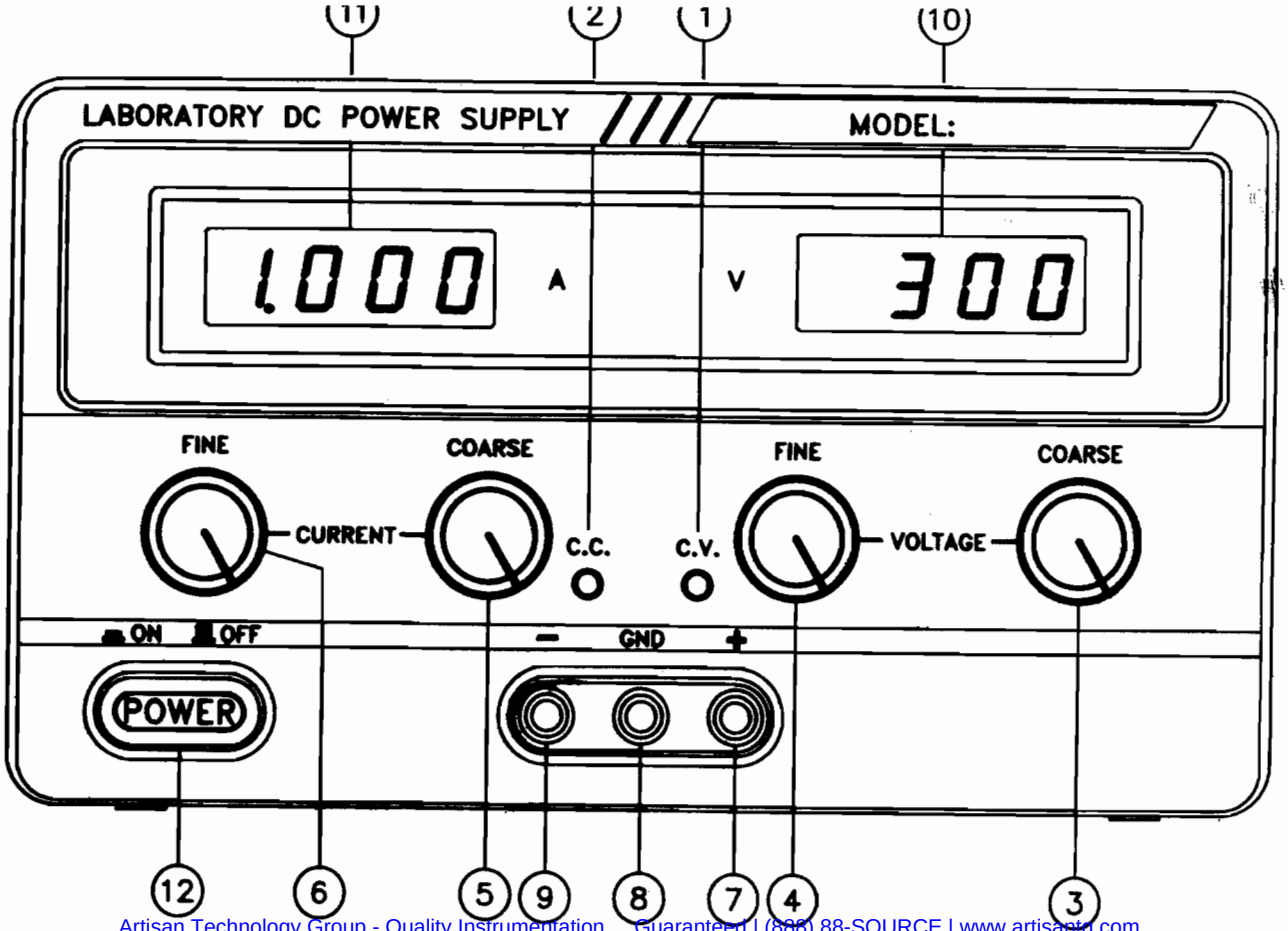


Fig. 2 Block Diagram (More then 100V)

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Fig. 4-1 Front Panel (Digital Type)

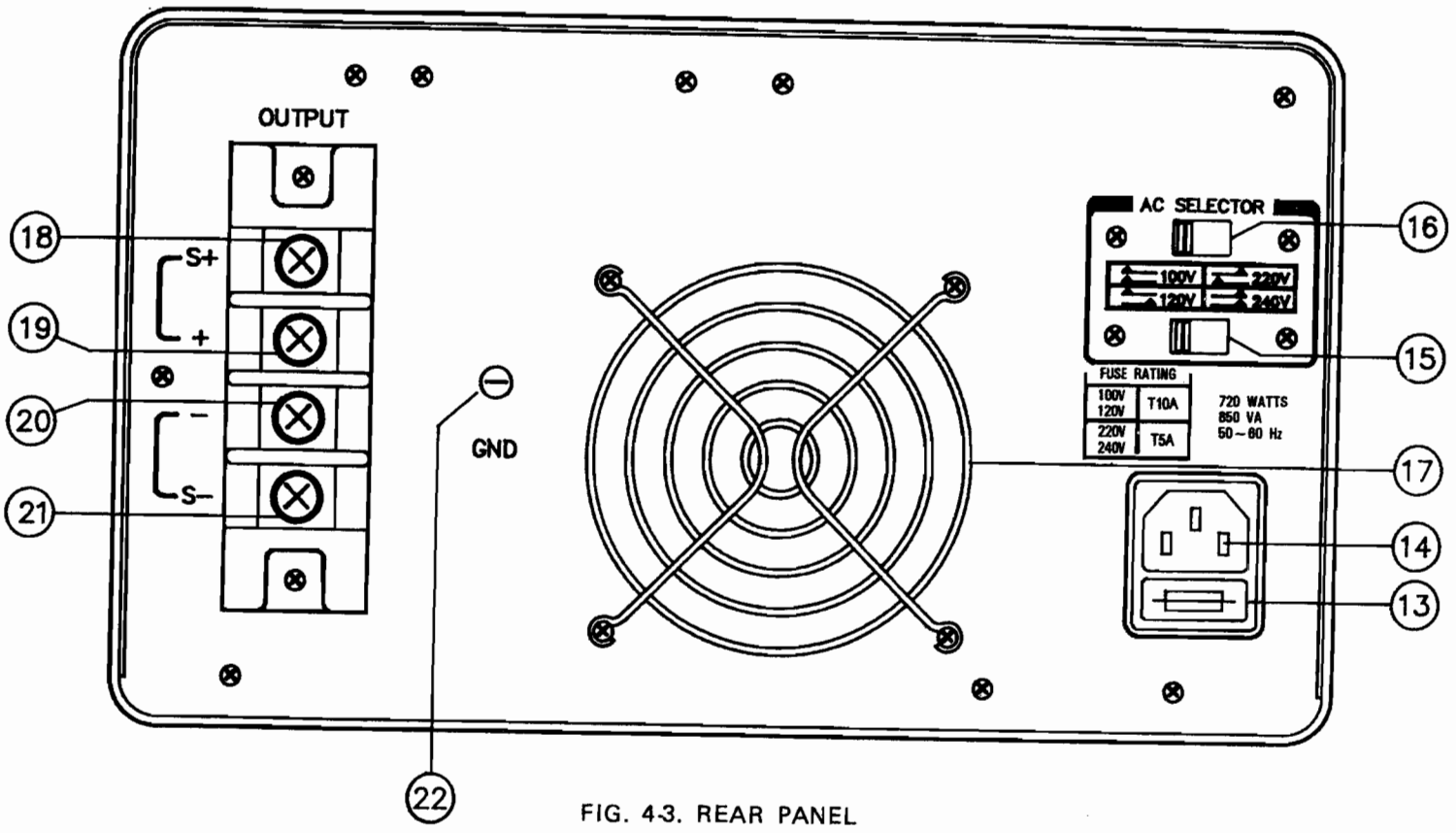


FIG. 4-3. REAR PANEL

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increases in load. The crossover point is indicated by the front panel LED indicators. The crossover point is reached when the CV indicator goes off and the CC indicator comes on.

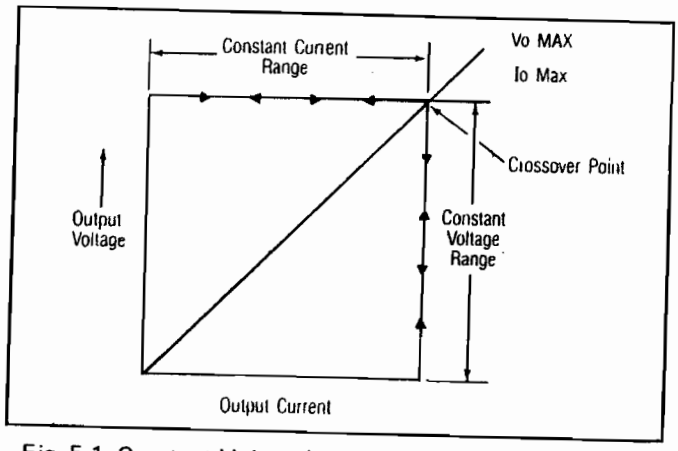


Fig. 5-1 Constant Voltage/Constant Current Characteristic.

Similarly, crossover from the constant current to the constant voltage mode automatically occurs from a decrease in load. A good example of this would be seen when charging a12 Volts battery. Initially, the open circuit voltage of the power supply may be preset for 13.8 volts. A low battery will place a heavy load on the supply and it will operate in the constant current mode, which may be adjusted for a 1 amp charging rate. As the battery becomes charged, and its voltage approaches 13.8 volts, its load decreases to the point where it no longer demands the full 1 amp charging rate. This is the crossover point where the power supply goes into the constant voltage mode.

5-4 Operation Mode

(1) Single Operation

Use the supply as it is for single operation.

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6. MAINTENANCE

WARNING

The following instructions are for use by qualified personnel only. To avoid electrical shock, do not perform any servicing other than contained in the operating instructions unless you are qualified to do so.

6-1 Fuse Replacement

If the fuse blows, the CV or CC indicators will not light and the power supply will not operate. The fuse should not normally open unless a problem has developed in the unit. Try to determine and correct the cause of the blown fuse, then replace only with a fuse of the correct rating and type.

The fuse is located on the rear panel (see Fig. 4-3).

6-2 Line Voltage Conversion

The primary winding of the power transformer is tapped to permit operation from 100, 120, 220, or 240 VAC, 50/60 Hz line voltage. Conversion from one line voltage to another is done by change AC selects switch as shown in Fig. 4-3.

The rear panel identifies the line voltage to which the unit was factory setted. To convert to a different line voltage, perform the following procedure:

(1) Make sure the power cord is unplugged.
(2) Change the AC selects switch to the desired line voltage position.
(3) A change in line voltage may also require a corresponding change of fuse value. Install the correct fuse value as listed on rear panel.

6-3 Adjustments

This unit was accurately adjusted at the factory before shipment. Readjustment is recommended only if repairs have been made in a circuit affecting adjustment accuracy, or if you have a reason to believe the unit is out of adjustment. However, adjustments should be attempted only if a multimeter with an accuracy of ±0.1% dcv or better is available (GOOD WILL Model GDM-8035G or equivalent).

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6-3-2 High Voltage Model (More then 100V)

If readjustment is required, use the following procedure. Locations of the adjustments are shown in Fig. 6-1 and FIG. 6-3.

(1) Adjustment of the Rating Voltage
   A. Connect an accurate (±0.1%) external multimeter to measure the dc voltage at output terminals of the power supply.
   B. Set the COARSE and FINE VOLTAGE controls to minimum (fully counterclockwise).
   C. Adjust trimmer pot VR204 for a reading of 0 volts on the multimeter.
   D. Turn the COARSE and FINE VOLTAGE controls to maximum (fully clockwise).
   E. Adjust trimmer pot VR201 for a reading of rate volts x1.05 on the multimeter.
   F. Set the COARSE and FINE VOLTAGE controls for a reading of rate volts on the multimeter.
   G. Adjust trimmer pot VR208 (VR201 digital type) for a reading of rate volts on the volt meter (Digital Panel meter, digital type) of the power supply.

(2) Adjustment of the Rating Current
   A. Set the COARSE and FINE VOLTAGE controls to 5 Volts.
   B. Set the COARSE and FINE CURRENT controls to minimum (fully counterclockwise).
   C. Connect the external multimeter to measure dc current at the output terminals of the power supply.
   D. Setting and turn the COARSE and FINE CURRENT controls to maximum (fully clockwise).
   E. Adjust trimmer pot VR205 for rate amps x 1.05 on the multimeter.
   F. Readjust the CURRENT control for a reading of rate amps on the multimeter.
   G. Adjust trimmer pot VR209 (VR202 digital type) to calibrate the Ammeter (Digital panel meter, digital type) of the power supply for the same reading as the multimeter.

NOTE: Be sure to wear rubber insulating gloves whenever operation this power supply in order to guard against electric shock hazards.

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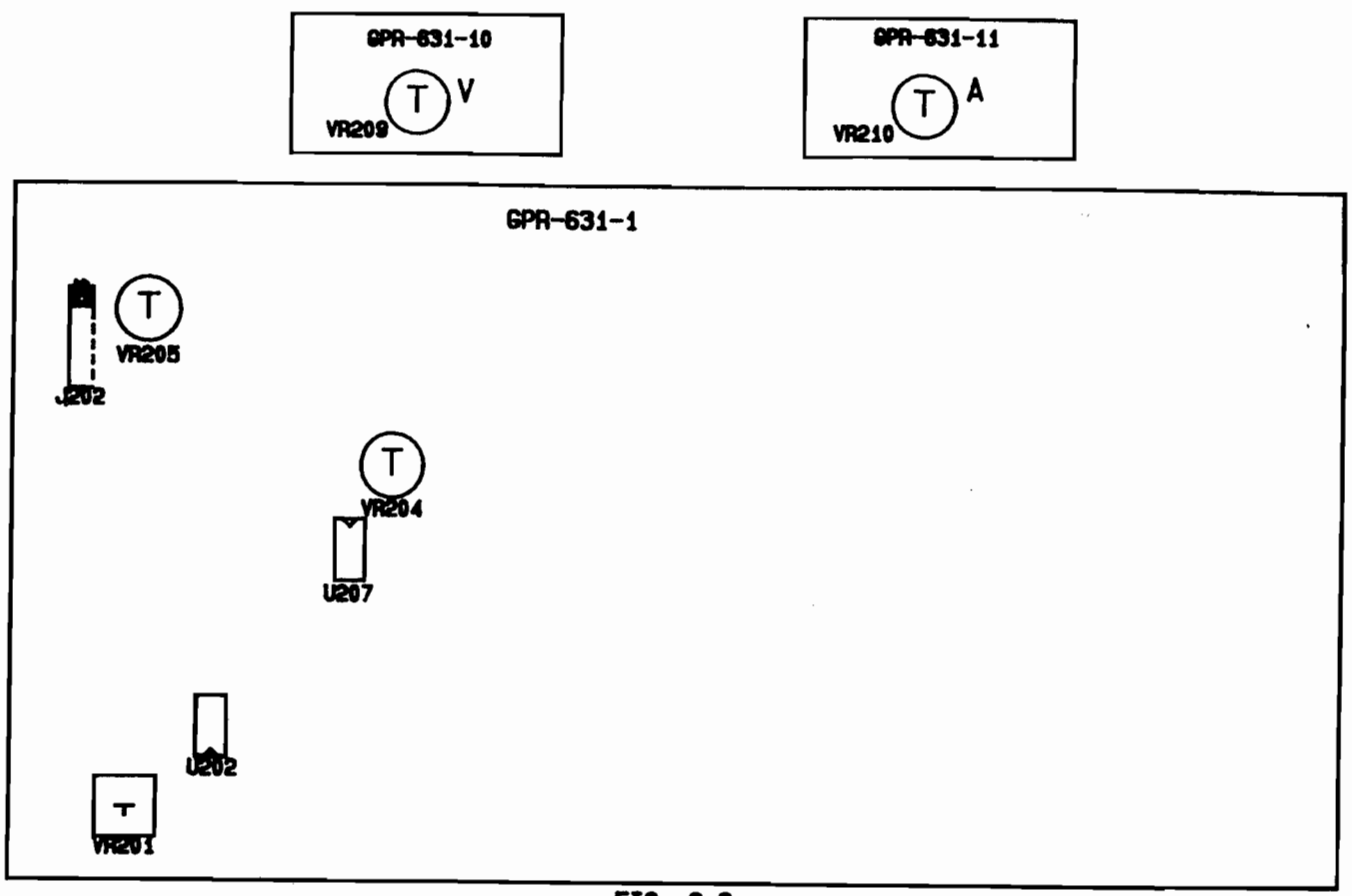


FIG. 6-2

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