

ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

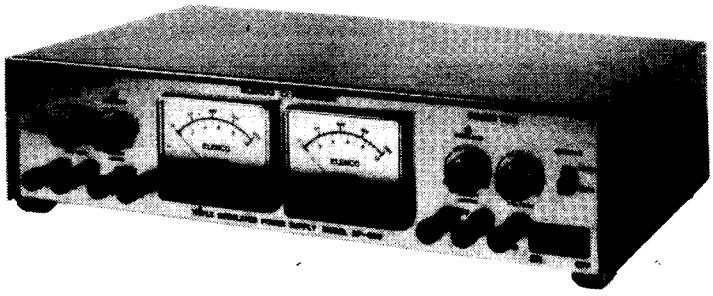
All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Visit our website - *Click HERE*

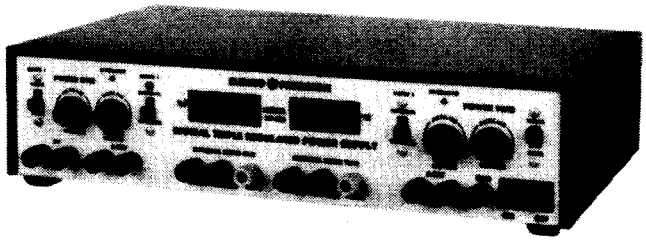
POWER SUPPLY

MODELS XP-660 / XP-765

Variable Regulated



Model XP-660



Model XP-765

Instruction Manual

ELENCO ELECTRONICS, INC.

Copyright © 1990 Elenco Electronics, Inc. REV-B
Revised 1994

753660

Specifications for model XP-660 @ 120VAC input

	0-20V Supplies	5V Supply
Input Voltage	110-135VAC 60 Hertz	Same
Output Voltage	0-20VDC Variable	5VDC ± .1V
Output Current	0-1A over 0-20V range	0-5A
Load Regulation	Less than .1V over 0-20V range	Less than .15V
Line Regulation	Less than .1V 110V to 130V	Less than .15V
Ripple RMS	Less than 5MV	Less than 10MV
Current Protection	.05 to 1A Variable current limiting	Current foldback
Short Protection	.05 to 1A current limit	Current foldback
Output Impedance	.1 ohms	.03 ohms

Specifications for model XP-765 @ 120VAC input

	0-20V Supplies	5V Supply
Input Voltage	110-135VAC 60 Hertz	Same
Output Voltage	0-20VDC Variable	5VDC ± .1V
Output Current	0-1A over 0-20V range	0-5A
Load Regulation	Less than .1V over 0-20V range	Less than .15V
Line Regulation	Less than .1V 110V to 130V	Less than .15V
Ripple RMS	Less than 5MV	Less than 10MV
Current Protection	.05 to 1A Variable current limiting	Current foldback
Short Protection	.05 to 1A Current limit	Current foldback
Output Impedance	.1 ohms	.03 ohms

Specifications model XP-765 meter

	Volts Position	Current Position
Range	0-99.9 Volts	0-9.99 Amps
Input Impedance	10 Meg ohms	.1 ohms
Accuracy	1% ± 1 digit	2%
Resolution	100 Millivolts	10 Milliamps

Circuit Description

The Elenco XP-660 and XP-765 use the same basic power and regulator circuit. The only difference is in the display function. The XP-660 has two 0-1MA analog meters. These meters convert to a voltmeter by placing a 21K ohm resistor in series or an ampmeter by placing a .4 ohm shunt resistor across the meter.

The model XP-765 has two 3 digit LED meters. The digital meters can be isolated from the power supply to be used externally to measure voltage or current.

When referring to the schematic diagrams, the circuit components associated with each supplies can be identified by its number. The 5V supply begins with 100. The 0-20V Power One Supply begins with 300 numbers and the 0-20V Power Two Supply begins with 200 numbers. The basic circuit of these supplies consist of 1) The power source, 2) The regulator, 3) The readout circuit. These circuits are shown in figure 1 and will be discussed in detail in the following paragraphs.

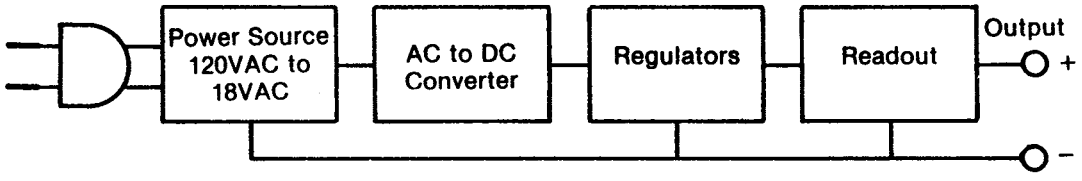


Figure 1 Block Diagram of 0-20V Power Supply

Power Source

The power supply for the model XP-660 and XP-765 consists of a transformer with four isolated and step down winding. Connected to each winding is a diode bridge and a filter capacitor. The components on the Power One Supply are diodes D301, D302, D303, D304 and capacitor C304. These components convert the 120VAC input to 25VDC.

0-20V Regulators

Figure 2 shows a simplified circuit of the 0-20V regulator circuit. This circuit consists of a high gain amplifier transistor Q305. The gain of this stage is over 100,000 because of its extremely high load impedance. This load consists of a current source transistor Q301 and its biasing circuit. The effective resistance of this circuit is over 500,000 ohms. Transistor Q302 is a power device that controls the output current. Transistors Q303 and 304 are emitter followers used to prevent loading of the current source. Q301, resistor R305 and VR303 form a closed negative feedback loop. If you analyze this loop you will find that when the output voltage goes down due to increase output current, the voltage at the base of transistor Q305 goes negative. This reduces the current in transistor Q305 and thus the collector voltage will increase, returning the output voltage to very near its original value. The high gain is essential to the output voltage. Diode D309 is added to prevent drift with temperature changes and to allow the output voltage to go to zero.

To protect the regulator from overload and short circuit, transistor Q306 is added. Whenever the voltage drops across resistor R305 reaches .6V, transistor Q306 will conduct and lower the collector voltage of amplifier Q305. To obtain variable current limiting, transistor Q306 is prebiased via resistor R309 and VR301. This will allow the output current limit between .05V and 1 amp. Transistor Q307 and Q308 are added to light the overload LED.

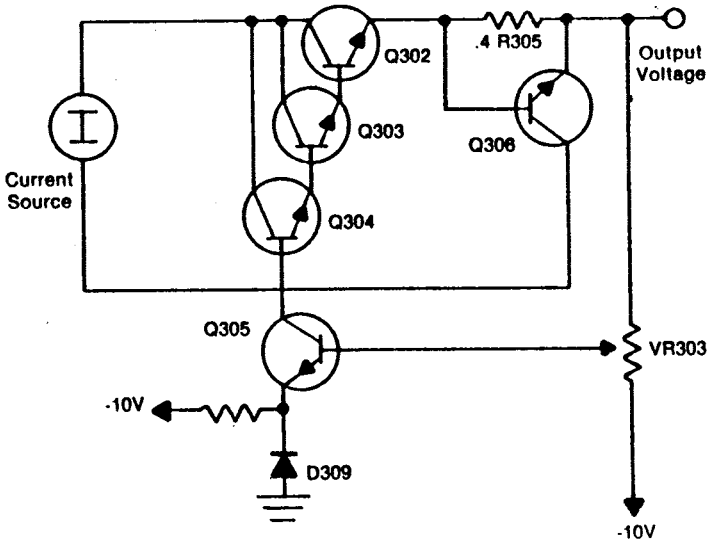


Figure 2 Simplified Regulator Circuit

5V Regulator

The circuit of the 5V regulator is shown on the schematic with components beginning with number 100. The heart of the regulator is IC1. This IC contains the same basic circuit as the 0-20V regulator, previously described. Transistor Q102 is the pass transistor that controls the output current. Transistor Q101 is used to increase the impedance of the pass transistor. Resistor R104 senses the current and shuts down the IC if current exceeds 5 amps. The regulator features a current foldback circuit which reduces the current to less than 1 amp when the output is shorted. Resistors R105 and R106 form the current foldback circuit. Resistors R102 and R103 are added to form a stable 3.8V reference voltage for the IC to operate.

Dual Digital Volts/ Current Meters

The model XP-765 uses two independent completely isolated digital meters to measure voltage and current. The voltmeter reads 0 to 99.9VDC with resolution of .1V. Accuracy is 1% of reading ± 1 digit. The current meter reads 0 to 9.99 amps with resolution of 10 milliamps. Accuracy is 2% ± 1 digit.

Note the circuit diagram in figure 3. The heart of the meter is the IC CA3162. This IC is a analog to digital converter. The output of this IC has four data lines A, B, C, D which contain the digital equivalent of the DC voltage. The data is fed to a seven segment readout IC CA3161. This IC converts the digital data to light the proper LED segment. To save on wiring the LED readouts are strobed, that is each are switched on in sequence one at a time. Transistors Q401, Q402 and Q403 control the switching.

The digital meters in the XP-765 are designed to read only positive voltages. In the event that a negative voltage is applied to the input, the meter will display a " ⊏ " sign in place of the "-" sign for voltage 0 to 9.99 volts. Over 10V will overload the meter and display " ⊏⊏⊏ ". This is normal in the design, simply reverse the meter leads to correct the display.

The same " ⊏ " may appear when the meter is at zero voltage and the auto zero circuit is set close to the minus side. Readjusting the zero pot will eliminate this effect. See calibration section for setting the zero control.

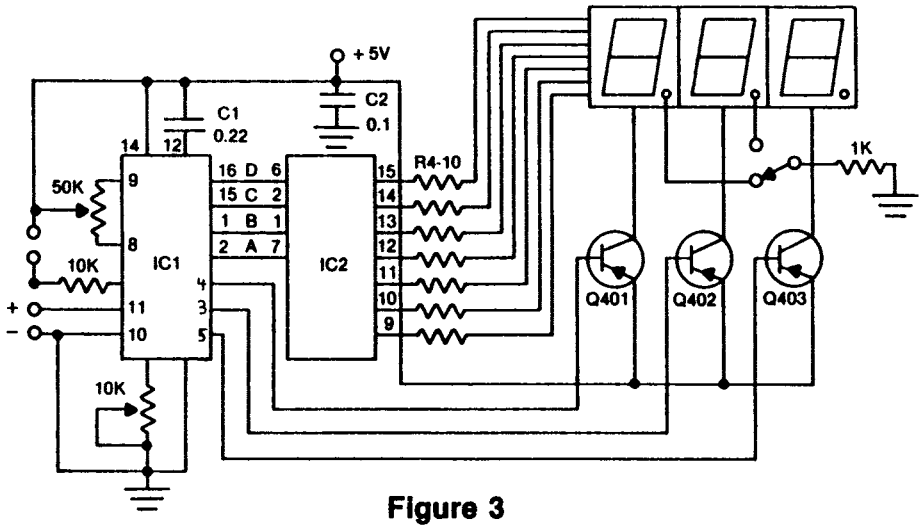


Figure 3

Operation Instructions

1) Check the voltage rating of the equipment to be powered. Care must be taken not to exceed this rating.

2) Plug the line cord into a 120V 60Hz AC outlet.

3) Adjust the voltage control to the desired voltage. Load variation will have practically no effect on the voltage setting due to the special regulation circuit.

4) Connect the positive lead of your equipment to the red output terminal marked (+) and the negative lead to the black terminal marked (-).

5) Adjust the current limiting control to maximum counterclockwise position. Switch your equipment on. The overload light will glow if excessive current is drawn. Increase this control until the light goes out and stays out during normal use. Your equipment is now protected from high current surges. An alternate method of adjusting current limiting is to short the output and adjust the current to a desired value. Remove the short. This will now limit the current to your setting.

6) Meters can be switched to read voltage or current.

Elenco's model XP-660 and XP-765 are extremely versatile power supplies. All supplies are completely isolated from each other. This means they have separate grounds. By tying the ground terminal of one supply to the positive terminal of the other, you can obtain an output of 0-40V @ 1 ampere. Also by stacking the 5V terminal you can increase the output to 45V.

The 0-20V supplies have an adjustable current overload feature, a red LED will light when current limiting is activated. The current limit control adjusts the maximum current the supply will allow before automatically turning down the output voltage. This limit is between 50MA to 1 Amp. You can set to your desired limit by shorting out the output terminal and adjusting the current limit control to the desired current. Remove the short and attach the load. The maximum current drawn will be per your setting.

All three power supply are protected against external shorts. The 0-20V supplies are protected by the current limiting feature. If the output is shorted the maximum current drawn will depend on the current limit control setting. The 5V supply features a current foldback circuit. This circuit will limit the output current to less than 1 Amp. When the short is removed the output voltage will automatically reset to 5V.

External Meter Instruction for Model XP-765

1) To use either meter externally simply switch the slide switch to external. For voltage measurement use the volts terminal. The meter may be floated above ground, for example you may use it to measure base to emitter bias of a transistor.
2) For external current measurement use the amps and meter ground terminals. You may read up to 2 Amps. Be careful if you exceed the 2 Amps limit a 2 Amps fuse will blow. To replace fuse you must remove the power supply cover.

Safety Precautions

Certain safety precautions must be observed when this power supply is used with external circuits that are connected to AC power lines. There is always some danger when working with electrical equipment or circuits that operate at hazardous voltages. You should thoroughly familiarize yourself with the equipment before working on it. HIgh voltage may appear at unexpected points in defective equipment.

The Elenco power supplies are equipped with three wire line cords which ground the chassis to power line ground. **DO NOT CUT OFF OR DISABLE THE GROUND PLUG.**

The power supply secondary circuits are isolated from the 120V primary circuit via the power transformer. When working with other equipment, this may not always be the case. Always be familiar with the equipment rating. Keep in mind that defective equipment can have dangerous voltages at unexpected points. CAUTION: When removing cover for fuse replacement always disconnect power cord from AC socket. Service repair should only be done by qualified personel who are knowledgeable of electrical hazards.

Maintenance and Calibration

The Elenco model 660 and 765 have been designed and manufactured to require no routine maintenance. The circuits are protected by design from external short or overload. The following information is provided in the event the supply requires service or re-calibration.

Fixed 5VDC Regulation Calibration

1) Connect an accurate digital meter to the output of the 5V supply.
2) Adjust the variable resistor VR101 to read 5.0 VDC.

Variable 0-20VDC Regulator Calibration

1) Connect an accurate digital meter to the output of the 0-20V supply.
2) Set the voltage pot to maximum position.
3) Adjust the variable resistor VR302 of Power One Supply for 20.0V. Adjust VR202 for Power Two Supply.

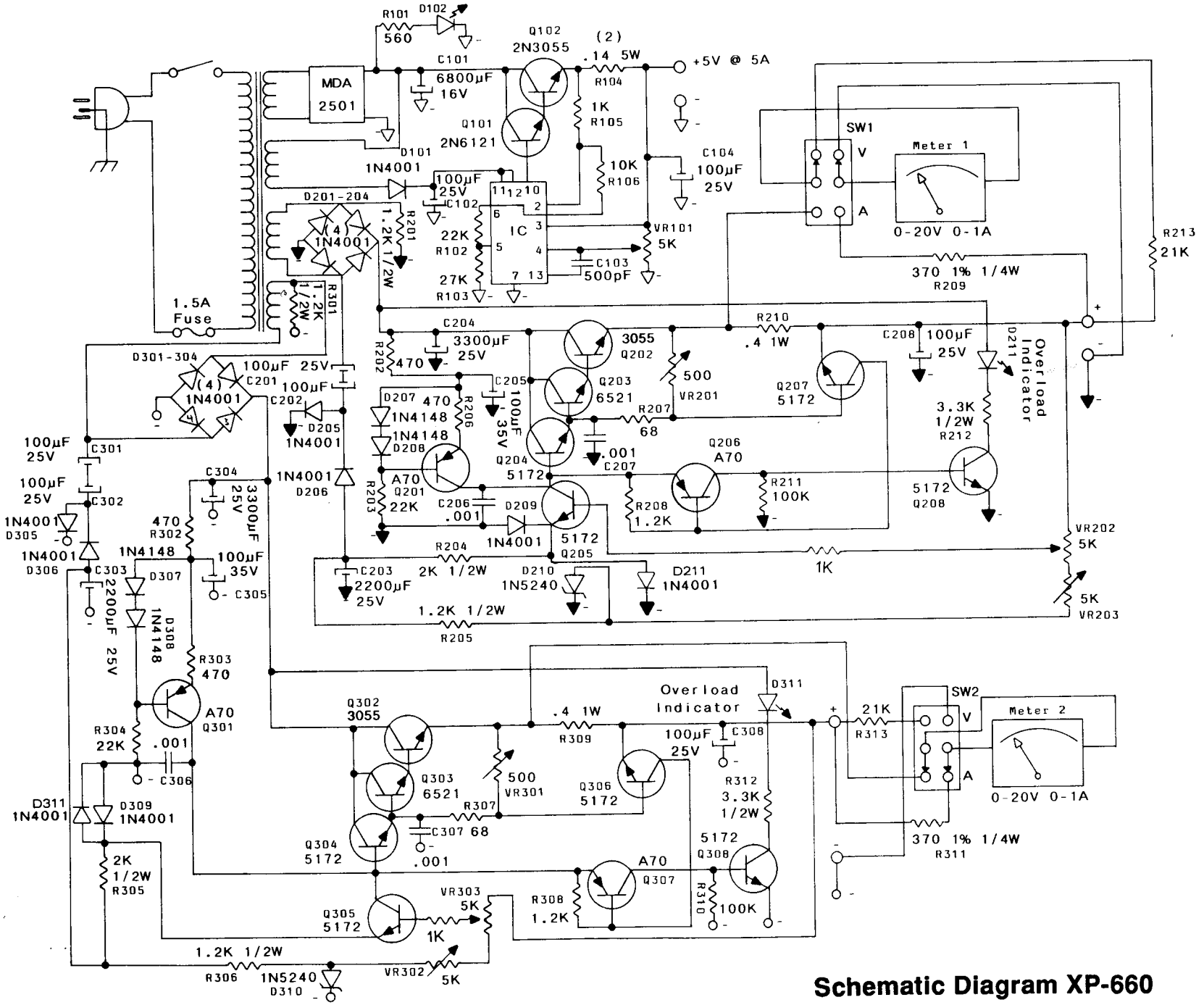
Digital Meter Calibration on Model XP-765

1) Remove the two screws that hold the digital meters to the front case.
2) Note there are two small pots for each meter. The pot to the right controls the zero. The one on the left controls the accuracy of the meter.
3) Adjust the zero pot (right side trimpot) to display 00.0. Should a " ⊏ " appear on the display, this indicates the meter is reading a minus voltage. This is normal for this design. Adjust the zero control pot to eliminate the " ⊏ " display.
4) To set the accuracy of the meter you need another very accurate digital meter. Place the meter to the output of the supply under adjustment . Adjust the accuracy pot (left side trimpot) to read the correct voltage.

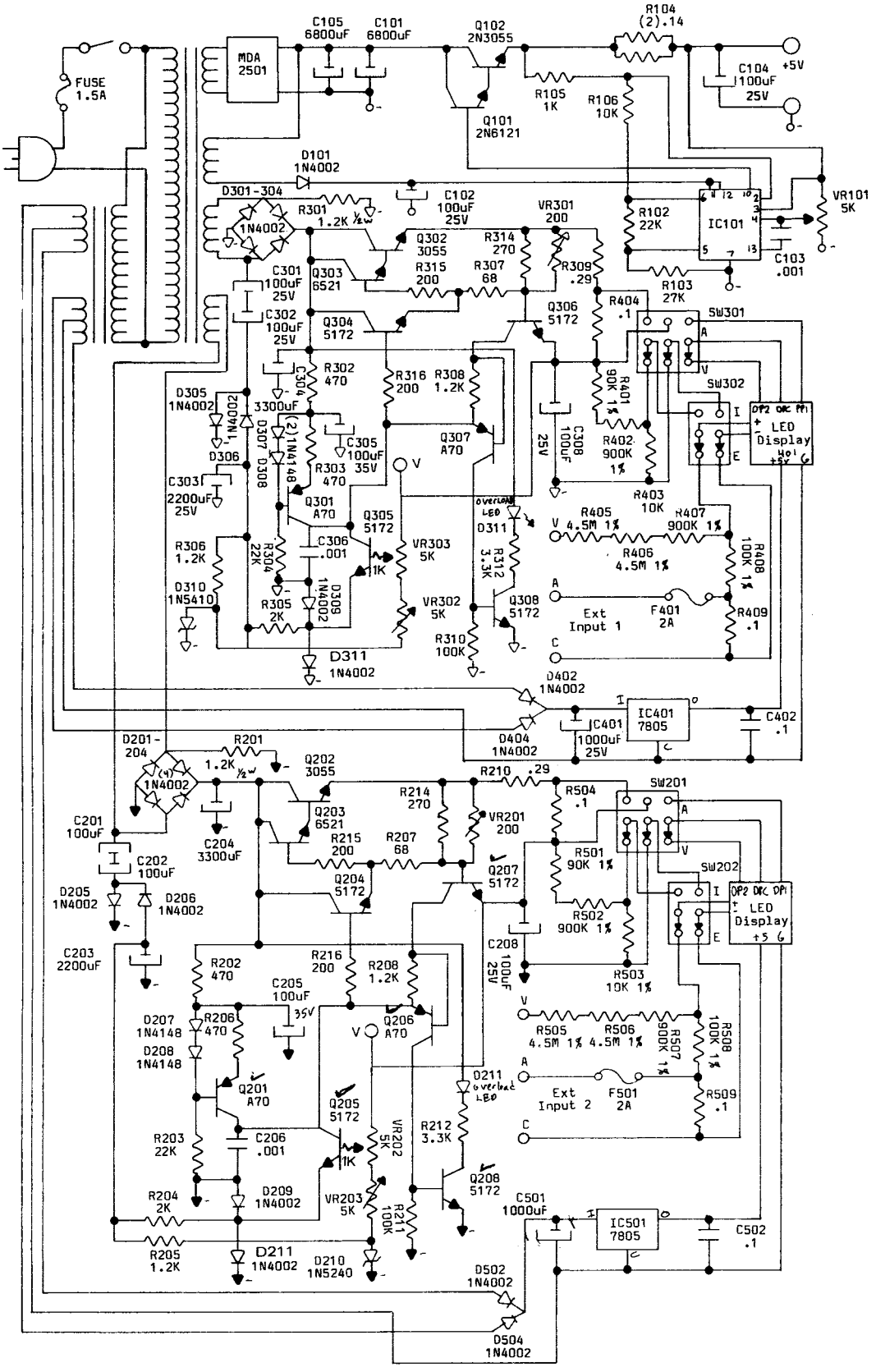
Parts List XP-660

Qty	Description	Part#
	Resistors	
2	Resistor .14Ω 5W	101405
2	Resistor .39Ω 2W	103911
2	Resistor 68Ω 1/4W	126800
2	Resistor 180Ω 1/4W	131800
2	Resistor 365Ω 1/4W	133630
5	Resistor 470Ω 1/4W	134700
2	Resistor 680Ω 1/4W	136800
3	Resistor 1KΩ 1/4W	141000
2	Resistor 2KΩ 1/4W	142000
4	Resistor 1.2KΩ 1/4W	141200
2	Resistor 2KΩ 1/4W	142000
1	Resistor 2.2KΩ 1/4W	142200
1	Resistor 2.7KΩ 1/4W	142700
2	Resistor 21KΩ 1/4W	152130
2	Resistor 22KΩ 1/2W	152201
2	Resistor 33KΩ 1/4W	153300
2	Resistor 100KΩ 1/4W	161000
3	Trim Pot 5K	191451
2	Pot panel 200Ω	192320
2	Pot panel 5K	192450
	Capacitors	
1	Capacitor .001MFD	231036
4	Lytic 100MFD 16V	281044
5	Lytic 100MFD 25V	281045
3	Lytic 100MFD 25V axial	281055
2	Lytic 2200MFD 25V	292225
2	Lytic 3300MFD 25V	293345
1	Lytic 6800MFD 16V	296824
	Semiconductors	
1	Diode bridge 6 amp	310148
17	Diode 1N4002	314002
4	Diode 1N4148	314148
2	Diode Zener 1N5240	315240
3	LED Diode red	350001
4	Transistor A70	320070
1	Transistor 2N3055	323055
10	Transistor 5172	315172
3	Transistor 2N6121/TIP120	326121
1	Integrated Circuit MC1723	331723

Qty	Description	Part#
	Miscellaneous	
1	Transformer	440660
1	PC Board	516600
1	Fuse 1.5A Slo Blo	520150
2	Switch slide DPDT	541111
1	Switch rocker	547102
2	Volt/Amp Meter	571020
1	Cover	611060
1	Chassis	611660
1	Heatsink 1 TO-3	615025
2	Heatsink Ham Rod	615100
1	Bushing Strain 3 wire	624003
3	Binding Post black	625010
3	Binding Post red	625011
1	Binding Post green	625015
3	Header 2 pin	591322
2	Header 4 pin	591344
6	Header 6 pin	591366
4	Knob 1910	622008
4	Stand-off 4-40	625005
13	Cable Ties	628982
2	Screw 4-40x1/4	641430
4	Screw 4-40x3/16	641432
7	Screw 4-40x1/2	641460
4	Screw 8-32x1/2	641850
16	Screw 6x3/8	642660
11	Nut 4-40	644400
4	Nut 8-32	644800
2	Nut 3/8x32	644960
4	Washer flat #8	645008
1	Washer 1/8"	645600
12	Washer flat #6	645610
1	Lockwasher #4	646401
1	Lockwasher #6 int	646600
4	Lockwasher #8 int	646808
12	Lockwasher #10 spring	646830
2	Lockwasher 3/8	646900
5	Lug ground	661001
11	Lug solder #8	661002
4	Connector wire	661014
1	Fuse Holder	663000
1	IC Socket 14 pin	664014



Schematic Diagram XP-660



Schematic Diagram XP-765

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP