

INSTRUCTION MANUAL  
MODEL DLVP 50-120-1500A DYNALOAD

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# INSTRUCTION MANUAL - MODEL DLVP 50-120-1500A

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## 1.0 INTRODUCTION

The Dynaload is a precision instrument which simulates electrical loads to test power supplies, generators, servo systems, batteries, and similar electrical power sources. It simulates, at the option of the user, resistive loads (amps/volt) or may be switched to a constant current load characteristic (current regulated at a pre-selected value) or a constant voltage type of load (similar to a battery or a zener diode). Provisions are also made for external programming in automated test set ups. The external programming voltage is from 0-10V with an input impedance of 10K minimum. Load current is directly proportional to programming voltage, and the sensitivity is adjustable with the front panel current adjustments.

In addition to the constant current external programming, the Dynaload may be programmed by an external resistance to function as a resistive load. The load resistance is inversely proportional to the programming resistance.

The pulse load may be varied in frequency and 10-100% duty cycle (pulse width). Frequency ranges are 20-200 Hz, 100-1000 Hz, and 500-5000Hz.

Pulse amplitude is independently controlled and may be added to a preselected DC current by the combination of the front panel controls. The meter normally reads peak pulse current, so the DC current should be preset, and the pulse current is the difference between peak reading and the previous DC reading. The output of the internal pulse generator is available at the rear panel (TB1-1). The pulse wave form may be modified by inserting wave shaping circuitry between TB1-1 and TB1-2, which are normally jumpered together by a clip on the terminal block.

The circuit breaker used to connect the source to the power devices in the load is electronically controlled and senses overcurrent, over dissipation (volts x amps), and overvoltage.

In the event of an overvoltage or overtemperature condition, protection circuits open the electronic circuit breaker. In the event of an overcurrent or overpower condition, circuitry is activated to limit the load current, and a front panel "power limit" LED is lit. If the current and power are increased further, protective circuitry will open the electronic circuit breaker. The power transistors are turned off prior to the circuit breaker opening.

## 2.0 SPECIFICATIONS

THE FOLLOWING RATINGS APPLY:

LOAD VOLTAGE: 3 TO 50V  
 LOAD CURRENT: 0 TO 120A  
 POWER DISSIPATION: 0 TO 1500W  
 OVERLOAD RATING: 20%  
 SELF-PROTECTION -- OVERVOLTAGE: <60V  
                                   OVERCURRENT: <140A  
                                   OVERPOWER: <1750W

2.1 MODE SELECTOR SWITCH POSITION

(From left to right)

- POSITION 1: Constant resistance 0-5 A/V as determined by the front panel DC load adjust
- POSITION 2: Constant resistance 0-30 A/V as determined by the front panel DC load adjust
- POSITION 3: Constant current 0-30A as determined by the front panel DC load adjust
- POSITION 4: Constant current 0-120A as determined by the front panel load adjust
- POSITION 5  
AND  
POSITION 6: A variable duty cycle pulse load with 0-30A and 0-120A ranges. The frequency ranges of 20-200, 100-1K, and 500-5K are selected by the three frequency range switches directly above the pulse load range switches.
- POSITION 7: External modulation -- will program from 0-120A with 0-10V applied to the external modulation terminals (TB1-3 and TB2-5). Modulation sensitivity is directly adjustable by the front panel DC load adjust control.
- POSITION 8: Constant voltage load. In this position, the load is similar to a battery being charged or a constant voltage zener diode; no current is drawn until the source voltage reaches the regulating voltage. The voltage at which the Dyna-Dynaload regulates is adjustable by the front panel volts control.

2.2 FRONT PANEL CONTROLS

- S1: AC ON/OFF switch and indicator lamp
- S2: DC load ON/OFF switch and indicator lamp
- M1: Load current range as selected by front panel current range select switch, 0-6V, 0-18V, or 0-60V
- S3: Short current switch.
- M2: Load current range as selected by front panel current range select switch: 0-12A, 0-36A, or 0-120A

-----  
N O T E

WHEN TESTING LOW CURRENT SOURCES, IT MAY BE ADVISABLE TO USE AN EXTERNAL FUSE OR CIRCUIT BREAKER TO PROTECT THE SOURCE.  
-----

-----  
C A U T I O N

THE METER RANGE SELECTOR SWITCH SHOULD ALWAYS BE MAINTAINED IN THE HIGHEST VOLTAGE OR HIGHEST CURRENT POSITION EXCEPT WHEN READINGS ARE BEING TAKEN. ALTHOUGH THE METERS HAVE HIGH OVERLOAD CAPABILITY, THEY MAY BE DAMAGED BY OVERLOADS IN THE LOWER RANGE POSITIONS.  
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Provision is made to connect the load by front panel binding posts for load currents of less than 15A. When the load currents are greater than 15A, the studs on the rear of the unit should be used.

CURRENT SAMPLE: This is provided for measuring the combinations of steady state and pulse load current with an oscilloscope. The current sample output is calibrated for one millivolt per amp of load current.

SYNC OUT: This is a pulse output which is of the same frequency as the internal pulse generator, and may be used to trigger an oscilloscope.

PEAK AVERAGE SWITCH: This switch places the ammeter control circuitry in either a peak pulse current reading or an average current reading mode.

DC LOAD CURRENT ADJUST: Course and fine adjust controls with a 10 to 1 ratio for precisely setting the load current for the constant current and amps/volt ranges. This control is also functional in the pulse mode to adjust the DC load component.

PULSE LOAD CURRENT ADJUST: Course and fine adjust controls for the 0-30A and 0-120A pulse ranges.

RATE/WIDTH CONTROLS: The rate control continuously adjusts the frequency of the pulse within the frequency range selected. The width control adjusts the duty cycle of the pulse from 10% to 100%.

VOLTS CONTROL: This control sets the threshold voltage at which the Dynaload will regulate the voltage present at the input by drawing the load current required to bring the voltage down to the value set. The "knee" of the threshold is approximately 500 A/V.



2.3 REAR PANEL CONNECTIONS: -- TABLE 1

<u>REAR PANEL CONNECTIONS</u>	
E+	PLUS LOAD. CONNECT TO THE POSITIVE TERMINAL OF THE SOURCE TO BE TESTED.
E-	MINUS LOAD. CONNECT TO THE MINUS TERMINAL OF THE SOURCE TO BE TESTED.
TB1-1	OUTPUT OF THE PULSE GENERATOR.
TB1-2	INPUT TO PULSE LOAD RANGE SWITCHES. TERMINALS TB1-1 AND TB1-2 ARE NORMALLY JUMPED TOGETHER.
TB1-3	EXTERNAL MODULATION INPUT. CALIBRATED FOR 12A PER 1 VOLT INPUT.
TB1-4	10V REFERENCE FOR USE AS PROGRAMMING VOLTAGE.
TB1-5	RESISTANCE PROGRAMMING. ACCESS PIN TO FRONT PANEL DC LOAD ADJUST POTENTIOMETER. MODE SELECTOR SWITCHES TO THE A/V RANGES.
TB2-1	STATUS INDICATION OF ELECTRONIC CIRCUIT BREAKER MODE. WITH CIRCUIT BREAKER CLOSED, A 5V SIGNAL WILL BE PRESENT AT THIS PIN. WITH THE CIRCUIT BREAKER OPEN, NO VOLTAGE WILL BE PRESENT.
TB2-2	DC ON. A SHORT FROM THIS PIN TO CIRCUIT COMMON WILL CLOSE THE CIRCUIT BREAKER.
TB2-3	DC OFF. A SHORT FROM THIS PIN TO CIRCUIT COMMON WILL OPEN THE CIRCUIT BREAKER.
TB2-4	SHORT. THE SHORT CIRCUIT CONTACTOR CAN BE ENERGIZED BY PULLING THIS PIN TO CIRCUIT COMMON. THE SHORT CIRCUIT WILL REMAIN AS LONG AS THE PIN IS KEPT LOW.
TB2-5	CIRCUIT GROUND IS THE CONNECTION TO THE CURRENT REGULATORS CIRCUIT COMMON AND IS ELECTRICALLY CONNECTED TO THE E-STUD.
<u>NOTE*</u>	
F1	AC LINE FUSE A1, SB.

NOTE\*: THE CONTROL OF THE CIRCUIT BREAKER REQUIRES ONLY A MOMENTARY CONNECTION TO THE CIRCUIT COMMON TO CHANGE THE STATE OF THE BREAKER. THE PROTECTION CIRCUITRY IS NOT ALTERED BY THESE CONTROL PINS OR THE FRONT PANEL DC LOAD-ON SWITCH. THE CIRCUIT BREAKER AND SHORT CIRCUIT CONTROL PINS REQUIRE LESS THAN 10MA TO CIRCUIT COMMON.

### 3.0 OPERATING INSTRUCTIONS

The following procedure is recommended for connecting the Dynaload:

- A. Set the AC and DC Dynaload ON/OFF switches to off.
- B. Set the meter range switches in their maximum voltage and current positions.
- C. Set the load adjustments controls in the counter-clockwise position.
- D. Set the mode selector switch to the desired mode.
- E. Connect the Dynaload to a standard 115V, 50-60 Hertz power source (optional input voltage ranges are available),
- F. Connection the source to be tested to the load terminals of the Dynaload. E+ and E- on the rear of the unit. Two terminals are provided in parallel for each polarity for simplified connections.
- G. If external modulation is to be used, the external programming voltage should also be connected.
- H. Set the AC power switch to ON, the AC ON indicator lamp should light.
- I. The DC ON circuit breaker should now be actuated by pressing the momentary contact "DC LOAD-ON" switch.
- J. The indicator lamp in the "DC LOAD-ON" switch should light.

The resistive load characteristics of the Dynaload simulate a pure resistance down to approximately 1 to 2 volt input; for a given resistance setting, the current is directly proportional to the voltage over wide dynamic ranges. In the very low voltages, the power transistors will saturate.

### 3.2 CONSTANT CURRENT MODE

Some power sources, such as variable power supplies, are rated at a fixed maximum load current and adjustable over a predetermined voltage range (for example, 5-30V @ 20A). If the resistive load characteristic were used for this type of test, it would be necessary to reset the load each time the power supply voltage was changed in order to maintain the full load current. However if the load is set to the 0-30A range, and a load of 20A is applied, then the power supply can be adjusted from 5-30V, and the load current will remain constant.

It should be noted that many power supplies are designed for short circuit protection by internal current limiting and bendback, and therefore, may not start up into a constant current type of load. Accordingly, the constant resistance characteristic should be used as a load when simulating short circuit protection and recovery of most solid state power supplies unless otherwise specified by the manufacturer.

### 3.3 EXTERNAL MODULATION

In the external modulation mode, the Dynaload acts as a constant current load with the constant current proportional to the external voltage applied to TB1-3 and TB1-5.

The Dynaload will program from 0-120A if the DC load adjustments are set in the maximum clockwise position. The programming sensitivity may be reduced proportionately by the front panel DC load adjust controls. Turning the load adjust counterclockwise reduces the programming sensitivity. The input impedance of the external modulation terminals is approximately 10K ohms.

The linearity of the external program is set to be within 1% above 1A.

The transient response of the Dynaload is determined by the feedback loop characteristics of the constant current regulator to achieve precision programming.

### 3.4 PULSE MODE

The pulse load may be varied from 0-30A or from 0-120A peak current by the pulse amplitude control on the front panel. The frequency may be varied from approximately 20-5000 Hz by the pulse frequency control and range switches on the front panel. This pulse load may be superimposed on top of a constant DC load, which may be selected by the DC load control on the front panel.

If the pulse is to be used down to a no-load state, the DC load controls should be turned fully counterclockwise. The maximum total of the pulse and DC load will be limited around 120A by the internal current limit protection.

The rise time of the load current pulse is approximately 50 us for 0-120A. If this is too fast for the application, the wave form may be altered by inserting a network between TB1-1 and TB1-2.

The DC pulse load may be mixed in any combination through the use of the separate DC load course and fine and the pulse load coarse and fine controls. When the 0-30A pulse mode is used, the DC load control is calibrated to a 0-30A range and the pulse load control also has a 30A range. The 120A range functions similarly.

### 3.5 CONSTANT VOLTS MODE

In the constant volts mode, the Dynaload acts as an adjustable power zener diode. The regulating voltage is programmable from approximately 2-50V by the front panel volts adjust control. The constant volts position is used to simulate a battery to a battery charger, or the Dynaload may also be used as a shunt regulator for special applications.

### 3.6 POWER RATING

The Model DLVP 50-120-1500 will dissipate 1500W continuously. In order to assure that overheating does not occur, the sides and rear of the Dynaload should be clear for the air intake and the air exhaust. The cooling air enters from the sides and leaves from the rear. The Dynaload should periodically be checked for dust accumulation. If the power devices should exceed 125°C, a thermal cutout will trip the circuit breaker.

### 3.7 PROTECTIVE CIRCUITS

The Dynaload has internal current limiting at approximately 120A maximum, at which point the power limit lamp is lit, and if the load current exceeds approximately 130A, the circuit breaker will trip. The Dynaload also incorporates reverse voltage protection by reverse diode. If the input is hooked up backwards, the source will be shorted. In the event that an overvoltage is applied to the Dynaload, an internal overvoltage circuit will open the circuit breaker, thereby protecting all internal circuits.

The voltage current product is also monitored to prevent an overpower condition from happening. Accordingly, the current limit characteristic are set at approximately 125A, which is maintained to approximately 12V. At this point, the current limit characteristic is reduced as the

input voltage is increased, thereby limiting the maximum power which may be programmed into the Dynaload. When the load exceeds 125A or 1500W, the power limit indicator will be lit.

### 3.8 SPECIAL APPLICATIONS

The Dynaload may be used for AC load testing, within its ratings, by the use of an external bridge rectifier so that the Dynaload sees pulsating DC, but the AC source sees an AC load. The effect of the rectifier is to slightly distort the Dynaload characteristics at low voltages and currents. The Dynaload is not normally recommended for testing AC sources above 1000 cycles due to its limited speed of response, unless the user specifically recognizes the load characteristics at higher frequencies.

The Dynaload may also be used as a current or voltage regulator rather than a load for special applications as described in Sections 3.2 and 3.5.

### 3.9 EFFECTS OF CABLE INDUCTANCE ON PULSE LOADING

When the Dynaload is used for high current pulse loading, the effects of cable inductance must be considered. The critical parameters are the 50 microsecond rise time and the 3V minimum compliance specifications. If the inductance of the cables from the voltage source is great enough to cause the voltage at the Dynaload to go below 3V, then

excessive current wave form distortion will occur. This is because the power devices are driven into saturation in an attempt to reach the programmed current which cannot occur because of the low collector voltage. Once in a saturated state, the response time is much slower. The result is a significant overshoot on the rising edge of the pulse. The peak reading ammeter will measure this peak and give deceiving results.

In order to prevent this from occurring, it should be noted that:

1. 1 microhenry = 2.4 feet of wire (total).
2. 50A @ 50 microseconds rise time = 1 volt drop with 1 microhenry.
3. The inductive drop cannot exceed the difference between the source voltage and the 3V compliance.

For example: To test a 10V source with a 100A pulse, the maximum cable length would be:

$$E \text{ Max drop} = 7V$$

$$E = L \frac{di}{dt} \qquad 7V = L \frac{100A}{50\mu s}$$

$$L = 3.5 \text{ microhenries maximum}$$

Maximum cable length = 8.4 feet total  
or 4.2 feet from source to Dynaload.

If the distance from the load to the source must be greater than this, there are several methods to increase the maximum distance. One way is to use several insulated



conductors. This cuts the inductance in half if 4 are used instead of 2, or by one-third if 6 are used. This doubles or triples the maximum length, respectively. Another method is to slow down the rise time of the pulse generator before applying it to the regulation loop. This can be done by removing the jumper on TB1 and inserting an R-C network between the pulse-out and pulse-in terminals. Increasing this rise time to 50 microseconds will double the maximum cable length. The third method is to use a large electrolytic capacitor at the Dynaload studs that can supply the current necessary to counteract the inductive drop of the cable. If the previous example required 15 feet of total cable length or 6.25 microhenries, which would be 12.5V of inductive drop, then the capacitor would have to supply 5.5V @ 100A for 50 microseconds. By the formula:

$$E = \frac{I T}{C}$$

The capacitor required would be 900 microfarads.

## 4.0 CALIBRATION PROCEDURES

4.1 VOLTMETER CALIBRATENO LOAD CURRENT, CIRCUIT BREAKER CLOSED

6V RANGE; SET 3V.	(2.94 - 3.06V)	R37
18V RANGE; SET 9V.	(8.82 - 9.18V)	R38
60V RANGE; SET 30V.	(29.4 - 30.6V)	R39

4.2 AMMETER CALIBRATEPEAK-AVG SWITCH IN AVG POSITION

12A RANGE; SET 10A.	(9.8 - 10.2A)	R40
* Check @ 2A reading. (1.96 - 2.04A)		
36A RANGE; SET 30A.	(29.4 - 30.6A)	R41
120A RANGE; SET 100A.	(93 - 102A)	R42
* Adjust R77 if necessary.		

4.3 CURRENT CALIBRATE SAMPLE

Set @ 100mV with 100A load. (R64)

4.4 AMPS PER VOLT CALIBRATE

Apply 4V to unit; measure voltage with digital at TP1 and TP2.

With coarse load, adjust full clockwise.

0-5 A/V RANGE; SET 20A.	(19.8 - 20.2A)	R35
0-30 A/V RANGE; SET 120A.	(119 - 121A)	R36

4.5 CONSTANT CURRENT CALIBRATE

With course load, adjust full clockwise, 10V applied to unit.

0-30A RANGE	(29.75 - 30.25A)	R33
0-120A RANGE	(119 - 121A)	R34

4.6 CURRENT LIMIT CALIBRATE

SET C. L. at 10V. (120 - 130A) R85

4.7 POWER LIMIT CALIBRATE

SET P. L. (34 - 39A) AT 45V. R94

SET P. L. (43 - 50A) AT 35V. R94

SET P. L. (60 - 70A) AT 25V. R94  
Check power limit indicator.

4.8 LINEARITY CALIBRATE

A 0-10V power supply with high resolution of adjustment will be required to accurately set the program voltage. The program voltage is applied to the external modulation pin at TB1-3. The calibration should be done with a 10V source voltage.

<u>PROGRAM VOLTAGE</u>	<u>LOAD CURRENT</u>
0.5V	_____ (5.88A - 6.12A)
1.0V	_____ (11.76A - 12.24A)
4.0V	_____ (47.04A - 48.96A)
7.0V	_____ (82.32A - 85.68A)
10.0V	_____ (117.6A - 122.4A)

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N O T E

R67 IS USED TO ADJUST LOW CURRENT SET, AND R32 IS USED TO ADJUST HIGH CURRENT.  
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## 5.0 THEORY OF OPERATION

### 5.1 CIRCUITS REGULATOR LOOP

Operation amplifiers U3 and U4 process a voltage that is derived from either the reference for constant current or from the source voltage in the amps per volt mode. Operational amplifier U5 is used as an error amplifier that compares the processed voltage from U3, U4 and the voltage drop generated on SH101 from the load current. The output of U5 is sent through a current gain stage (Q2) and then directly to the power transistors to control the load current. The power transistor section consists of 3 drivers and 32 main transistors. Each main transistor has an emitter resistor that allows equal current sharing. The emitter resistors are of the fusible type such that the failure of any one transistor will cause the resistor to open and that transistor will be isolated from the bank by the individual base steering diodes.

A voltage is applied through R17 and/or R31 to pin 2 (inverting input) of U3 that is determined by the front panel load adjust controls. If the DC load adjust is adjusted for 120A, then +0.6V will be present on D4 and R17. Pin 2 of U3 is a virtual null and should not be measured. The output of U3 will be -0.9V and is sent through R46 to U4, Pin 2. The output of U4 will be +0.2V and is applied to Pin 3 (non-inverting) of U5. This is now the reference

voltage for comparison with the shunt voltage. The shunt voltage is applied to Pin 2 of U5 through R65. Error amplifier U5 will control the loop to maintain equal voltages on Pins 2 and 3.

If the processed reference voltage on Pin 3 of U5 is greater than the shunt voltage, then the output on Pin 6 will drive Q2 harder, which will in turn increase the drive current to the power transistor configuration. This will increase the load current from the source until the shunt voltage reaches the reference voltage, at which point the error amplifier will reduce the drive, and the loop will equalize in regulatory fashion.

The RC networks around U5 determine the speed of response of U5 and are made to be slower than the sum of the other components in the loop to assure that U5 is the controlling factor. The response time of the loop is approximately 50 us for a 0-120A step.

Potentiometer R67 is used to balance the input section of U5 and to compensate for ground potential differences from shunt to the PCB. This control is used to calibrate the linearity in the external program mode.

Transistor Q3 is used to actively shut down the power section if the shunt voltage should exceed that programmed and therefore, improves the fall time during high current pulse loading.

## 5.2 PEAK READING AMMETER

The basic principle involved in the peak reading ammeter circuit is to charge a capacitor to a value proportional to the peak voltage developed across the shunt. The voltage must not decay more than 2% between successive pulses. This is accomplished by operational amplifiers U6 and U7.

---

### N O T E

THE VOLTAGE GAIN OF AN OPERATIONAL AMPLIFIER IS DIRECTLY PROPORTIONAL TO THE RATIO OF INPUT CURRENT TO FEEDBACK CURRENT. THREE CONFIGURATIONS ARE USED IN THE UNIT.

THE INVERTING AMPLIFIER, WHERE THE INPUT IS TO PIN 2, HAS A VOLTAGE GAIN EQUAL TO THE FEEDBACK RESISTOR FROM PIN 6, DIVIDED BY THE INPUT RESISTOR TO PIN 2. IN THIS CONFIGURATION, THE QUIESCENT OUTPUT VOLTAGE IS EQUAL TO THE VOLTAGE ON PIN 3.

THE VOLTAGE FOLLOWER, WHERE THE INPUT IS TO PIN 3, HAS UNITY GAIN IF PIN 2 IS CONNECTED TO THE OUTPUT ONLY.

THE COMPARATOR OR ERROR AMPLIFIER CONFIGURATION WILL COMPARE THE VOLTAGES PRESENT ON PIN 2 AND 3, AND THE OUTPUT WILL BE HIGH IF PIN 3 IS GREATER, OR LOW IF PIN 2 IS GREATER.

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The input amplifier of the peak reading ammeter U7. The circuit consists of an inverting amplifier (U7), a storage capacitor (C9), and a high impedance voltage follower (U6). The gain of the circuit is determined by the input resistor selected by the ammeter range switches and an overall feedback resistor R56.

As a voltage pulse is impressed on the shunt by a current pulse, U7 amplifies and inverts the signal to -5V peak for a full scale reading. Transistors Q4 and Q5 supply the current required to instantaneously pull capacitor C9 to this -5V potential. Capacitor C9 is now charged to a voltage proportional to the peak of the load current waveform. Voltage follower U6 transfers this voltage to the ammeter through R74 without loading down C9. Potentiometer R77 is used to zero the ammeter. The peak average switch S4 is out of the circuit for peak reading and shorts out CR9 for average reading. Shorting CR9 causes R71 to load down C9, and therefore, the pulse current is not stored. The ammeter sees the pulse current waveform and will give a mechanically averaged reading.

### 5.3 CURRENT LIMIT/POWER LIMIT

Operational amplifier U8 performs the function of current limit and power limit by comparing a reference set by R85 to a combination of the shunt voltage and input source voltage. If the source voltage is below 13V, then the comparison is just reference to shunt voltage. When the shunt voltage exceeds the value set by R85, the output of U8 will go negative and shut down the drive to the power transistors through the power limit indicator and R62. When the product of source voltage and shunt voltage exceeds 1500W, the drive will similarly be limited. This is

accomplished by zener diodes, VR7 and VR10. A portion of the source voltage is added to the shunt voltage by VR7 and VR10, such that, as the source voltage increases, the current limit point is reduced. The power limit curve is a dual slope approximation.

#### 5.4 ELECTRONIC CIRCUIT BREAKER

A J-K flip-flop (U9) is used to energize a power contractor through Q8. The front panel DC load-on switch is a momentary contact type that grounds Pin 12 of U9 to change the state of the flip-flop. The set input (Pin 13), reset (Pin 2), and output (Pins 8, 9) are brought out to TB2-1 for remote control and status. The current limit section (U8) is directly connected to the reset input and will override any other control in the event of an overcurrent, over-voltage, or over-power condition.

#### 5.5 OVERVOLTAGE PROTECTION

Operational amplifier U8 also provides overvoltage protection through the use of R89, VR8, and VR9. If the source voltage exceeds 50V, these zener diodes will cause the voltage on Pin 2 to rise rapidly and put the loop into power limit. The circuit breaker will trip because of the connection from U8 to the reset input of U9.



#### 5.6 PULSE GENERATOR

Integrated circuit U1 (A3) is a variable pulse width oscillator whose frequency is determined by the value of capacitance from Pin 7 to ground. The pulse width is determined by the DC reference voltage present at Pin 2. Pin 10 is a 5V reference. The output of the oscillator (Pins 12, 13) is inverted by Q2 (A3) and sent to the pulse load adjust controls. Transistor Q1 on A3 is used to generate a spike from the pulse generators output for triggering an oscilloscope.

#### 5.7 SHORT CIRCUIT

Power contactor K1 is provided for testing the short circuit current of a power supply. The contactor is energized by Q6 and Q7. A current path of less than 10mA from TB2-4 to circuit ground is needed to energize the contactor.

#### 5.8 POWER SUPPLY CIRCUITRY

Power is applied through F1 and S1 to the two fans and the primary of T101. The two primaries of T101 may be connected in parallel for 115 VAC, or in series for 230V operation. Secondary 8, 9, 10 is rectified and filtered both positive and negative. Three Pin regulators U1 and U2 regulate the raw DC to +12V for all of the operational amplifiers and mode indicator lamps. Secondary 5, 6, 7 is rectified and filtered to 28V for the short circuit and circuit breaker contactors.

TRANSISTOR DEVICES INC.

RANDOLPH, NJ 07869

CAGE CODE: 09004

REPORT: EN\_100

PARTS LIST : PL 3810-105902

DOCUMENT/PART NUMBER : A105902

DLVP 50-120-1500

REV. DATE : 06/10/92

REVISION LETTER : A

SHEET : 1

AUTHENTICATION: \_\_\_\_\_

CIRCL. FIND	DESIG. NO.	QUANTITY	UM	CAGE	PART NUMBER	NOMENCLATURE	DRAW SIZE	MIL-SPEC /DRAWING NO.	NOTE NO.
A1		1.000	EA		1058931-105902	"T" PC ASSY DLVP A1		A105902	
A2		1.000	EA		105896-1	PC ASSY SPS3352, DLVP-50- D 120-1500 (A2)		D105896	
A3		1.000	EA		1058991-105902	PC ASSY DLVP A3 COMMON PULSER BOARD		A105902	
B101		1.000	EA		4715FS-12T-850	FAN 115V 113CFM UL CSA VD E 2000 V HI POT			
B102		1.000	EA		4715FS-12T-850	FAN 115V 113CFM UL CSA VD E 2000 V HI POT			
CR101		1.000	EA		J1N645-1	DIODE GI			
CR102		1.000	EA		J1N645-1	DIODE GI			
CR103		1.000	EA		J1N645-1	DIODE GI			
CR104		1.000	EA		J1N645-1	DIODE GI			
CR105		1.000	EA		J1N645-1	DIODE GI			
CR106		1.000	EA		J1N645-1	DIODE GI			
CR107		1.000	EA		J1N645-1	DIODE GI			
CR108		1.000	EA		J1N645-1	DIODE GI			
CR109		1.000	EA		J1N645-1	DIODE GI			
CR110		1.000	EA		1N5624	RECTIFIER 610, STANDARD R RECOVERY 200V 3A GLASS AXIAL LEAD MI 9500/43E			
CR111		1.000	EA		J1N645-1	DIODE GI			
CR112		1.000	EA		J1N645-1	DIODE GI			
CR113		1.000	EA		J1N645-1	DIODE GI			

REPORT: EN\_100

TRANSISTOR DEVICES INC.

RANDOLPH, NJ 07869

CAGE CODE: 09004

PARTS LIST : PL 3810-105902  
DOCUMENT/PART NUMBER : A105902  
DLVP 50-120-1500

REV. DATE : 06/10/92  
REVISION LETTER : A  
SHEET : 2

CIRC. FIND								
DESG. NO.	QUANTITY	UM	CAGE	PART NUMBER	NOMENCLATURE	DRAW SIZE	MIL-SPEC /DRAWING NO.	NOTE NO.
CR114	1.000	EA	J1N645-1		DIODE GI			
CR115	1.000	EA	J1N645-1		DIODE GI			
CR116	1.000	EA	J1N645-1		DIODE GI			
CR117	1.000	EA	J1N645-1		DIODE GI			
CR118	1.000	EA	J1N645-1		DIODE GI			
CR119	1.000	EA	J1N645-1		DIODE GI			
CR120	1.000	EA	J1N645-1		DIODE GI			
CR121	1.000	EA	J1N645-1		DIODE GI			
CR122	1.000	EA	J1N645-1		DIODE GI			
CR123	1.000	EA	J1N645-1		DIODE GI			
CR124	1.000	EA	J1N645-1		DIODE GI			
CR125	1.000	EA	J1N645-1		DIODE GI			
CR126	1.000	EA	J1N645-1		DIODE GI			
CR127	1.000	EA	J1N645-1		DIODE GI			
CR128	1.000	EA	J1N645-1		DIODE GI			
CR129	1.000	EA	J1N645-1		DIODE GI			
CR130	1.000	EA	1NS624		RECTIFIER GIC, STANDARD R RECOVERY 200V 3A GLASS AXIAL LEAD MI 9500/432			
CR131	1.000	EA	J1N645-1		DIODE GI			
CR132	1.000	EA	J1N645-1		DIODE GI			
CR133	1.000	EA	J1N645-1		DIODE GI			
CR134	1.000	EA	J1N645-1		DIODE GI			

REPORT: EN\_100

TRANSISTOR DEVICES INC.  
 RANDOLPH, NJ 07869  
 CAGE CODE: 09004

PARTS LIST : PL 3810-105902  
 DOCUMENT/PART NUMBER : A105902  
 DLVP 50-120-1500

REV. DATE : 06/10/92  
 REVISION LETTER : A  
 SHEET : 3

CIRC. FIND	QUANTITY	UM	CAGE	PART NUMBER	NOMENCLATURE	DRAW SIZE	MIL-SPEC /DRAWING NO.	NOTE NO.
CR135	1.000	EA	J1N645-1		DIODE GI			
CR136	1.000	EA	1N1184		RECTIFIER IR			
DS1	1.000	EA	HLMP-3000		DIODE, LED RED			
DS2	1.000	EA	HLMP-3000		DIODE, LED RED			
DS3	1.000	EA	HLMP-3000		DIODE, LED RED			
DS4	1.000	EA	HLMP-3000		DIODE, LED RED			
F1	1.000	EA	MDL-1		GFUSE 1A 250V SLOW BLOW			
J5	1.000	EA	09-50-3081		CONN MOLEX 2139-8A			
J6	1.000	EA	09-50-3061		CONN MOLEX			
J7	1.000	EA	09-50-3081		CONN MOLEX 2139-8A			
J8	1.000	EA	03-06-1022		CONN MOLEX			
K1	1.000	EA	70-903		RELAY POWER CONTACTOR			
K2	1.000	EA	70-903		RELAY POWER CONTACTOR			
M1	1.000	EA	100992		MTR LARGE 3-02 0-1MA		A100992	
M2	1.000	EA	105712		MTR LARGE 3-02 0-1MA		A105712	
P1	1.000	EA	09-50-3061		CONN MOLEX			
P3	1.000	EA	09-50-3071		CONN MOLEX			
P4	1.000	EA	09-50-3161		CONN MOLEX			
P8	1.000	EA	03-06-2022		CONN MOLEX			
Q101	1.000	EA	2N5629		XSTR 100V TO-204AA SILCO NPN RCA, (SUB MJ15001) MOT, SOLITRON			
Q102	1.000	EA	2N5629		XSTR 100V TO-204AA SILCO NPN RCA, (SUB MJ15001)			

TRANSISTOR DEVICES INC.

RANDOLPH, NJ 07869

CAGE CODE: 09004

REPORT: EN\_100

PARTS LIST : PL 3810-105902  
 DOCUMENT/PART NUMBER : A105902  
 DLVP 50-120-1500

REV. DATE : 06/10/92  
 REVISION LETTER : A  
 SHEET : 4

CIRC. FIND DESG. NO.	QUANTITY	UM	CAGE	PART NUMBER	NOMENCLATURE	DRAW SIZE	MIL-SPEC /DRAWING NO.	NOTE NO.
					MOT, SOLITRON			
Q103	1.000	EA	2N5629		XSTR 100V TO-204AA SILCO NPN RCA, (SUB MJ15001) MOT, SOLITRON			
Q104	1.000	EA	2N5629		XSTR 100V TO-204AA SILCO NPN RCA, (SUB MJ15001) MOT, SOLITRON			
Q105	1.000	EA	2N5629		XSTR 100V TO-204AA SILCO NPN RCA, (SUB MJ15001) MOT, SOLITRON			
Q106	1.000	EA	2N5629		XSTR 100V TO-204AA SILCO NPN RCA, (SUB MJ15001) MOT, SOLITRON			
Q107	1.000	EA	2N5629		XSTR 100V TO-204AA SILCO NPN RCA, (SUB MJ15001) MOT, SOLITRON			
Q108	1.000	EA	2N5629		XSTR 100V TO-204AA SILCO NPN RCA, (SUB MJ15001) MOT, SOLITRON			
Q109	1.000	EA	2N5629		XSTR 100V TO-204AA SILCO NPN RCA, (SUB MJ15001) MOT, SOLITRON			
Q110	1.000	EA	2N5039		XSTR MIL-S-19500/439			
Q111	1.000	EA	2N5629		XSTR 100V TO-204AA SILCO NPN RCA, (SUB MJ15001) MOT, SOLITRON			
Q112	1.000	EA	2N5629		XSTR 100V TO-204AA SILCO NPN RCA, (SUB MJ15001) MOT, SOLITRON			
Q113	1.000	EA	2N5629		XSTR 100V TO-204AA SILCO NPN RCA, (SUB MJ15001) MOT, SOLITRON			
Q114	1.000	EA	2N5629		XSTR 100V TO-204AA SILCO NPN RCA, (SUB MJ15001)			

REPORT: EN 100

TRANSISTOR DEVICES INC.  
 RANDOLPH, NJ 07069  
 CAGE CODE: 09004

PARTS LIST : PL 3810-105902  
 DOCUMENT/PART NUMBER : A105902  
 DLVP 50-120-1500

REV. DATE : 06/10/92  
 REVISION LETTER : A  
 SHEET : 5

CIRC. FIND

DESIG. NO.	QUANTITY	UM	CAGE	PART NUMBER	NOMENCLATURE	DRAW SIZE	MIL-SPEC /DRAWING NO.	NOTE NO.
					MOT, SOLITRON			
Q115	1.000	EA	2N5629		XSTR 100V TO-204AA SILCO NPN RCA, (SUB MJ15001) MOT, SOLITRON			
Q116	1.000	EA	2N5629		XSTR 100V TO-204AA SILCO NPN RCA, (SUB MJ15001) MOT, SOLITRON			
Q117	1.000	EA	2N5629		XSTR 100V TO-204AA SILCO NPN RCA, (SUB MJ15001) MOT, SOLITRON			
Q118	1.000	EA	2N5629		XSTR 100V TO-204AA SILCO NPN RCA, (SUB MJ15001) MOT, SOLITRON			
Q119	1.000	EA	2N5629		XSTR 100V TO-204AA SILCO NPN RCA, (SUB MJ15001) MOT, SOLITRON			
Q120	1.000	EA	2N5039		XSTR MIL-5-19500/439			
Q120	1.000	EA	2N5629		XSTR 100V TO-204AA SILCO NPN RCA, (SUB MJ15001) MOT, SOLITRON			
Q121	1.000	EA	2N5629		XSTR 100V TO-204AA SILCO NPN RCA, (SUB MJ15001) MOT, SOLITRON			
Q122	1.000	EA	2N5629		XSTR 100V TO-204AA SILCO NPN RCA, (SUB MJ15001) MOT, SOLITRON			
Q123	1.000	EA	2N5629		XSTR 100V TO-204AA SILCO NPN RCA, (SUB MJ15001) MOT, SOLITRON			
Q124	1.200	EA	2N5629		XSTR 100V TO-204AA SILCO NPN RCA, (SUB MJ15001) MOT, SOLITRON			
Q125	1.000	EA	2N5629		XSTR 100V TO-204AA SILCO NPN RCA, (SUB MJ15001)			

REPORT: EN\_100

TRANSISTOR DEVICES INC.

RANDOLPH, NJ 07869

CAGE CODE: 09004

PARTS LIST : PL 3810-105902  
 DOCUMENT/PART NUMBER : A105902  
 DLVP 50-120-1500

REV. DATE : 06/10/92  
 REVISION LETTER : A  
 SHEET : 6

CIRC. FIND

DESIG. NO.	QUANTITY	UM	CAGE	PART NUMBER	NOMENCLATURE	DRAW SIZE	MIL-SPEC /DRAWING NO.	NOTE NO.
					MOT, SOLITRON			
Q126	1.000	EA	2N5629		XSTR 100V TO-204AA SILCO NPN RCA, (SUB MJ15001) MOT, SOLITRON			
Q127	1.000	EA	2N5629		XSTR 100V TO-204AA SILCO NPN RCA, (SUB MJ15001) MOT, SOLITRON			
Q128	1.000	EA	2N5629		XSTR 100V TO-204AA SILCO NPN RCA, (SUB MJ15001) MOT, SOLITRON			
Q129	1.000	EA	2N5629		XSTR 100V TO-204AA SILCO NPN RCA, (SUB MJ15001) MOT, SOLITRON			
Q130	1.000	EA	2N5039		XSTR MIL-S-19500/439			
Q130	1.000	EA	2N5629		XSTR 100V TO-224AA SILCO NPN RCA, (SUB MJ15001) MOT, SOLITRON			
Q131	1.000	EA	2N5629		XSTR 100V TO-204AA SILCO NPN RCA, (SUB MJ15001) MOT, SOLITRON			
Q132	1.000	EA	2N5629		XSTR 100V TO-204AA SILCO NPN RCA, (SUB MJ15001) MOT, SOLITRON			
R1	1.000	EA	100226		POT 2.5K/500K OHM OBSOLE TE SEE 81A2D-640-A12/A23		8100226	
R1A	*ERR*	EA	100226		POT 2.5K/500K OHM OBSOLE TE SEE 81A2D-640-A12/A23		8100226	
R2	1.000	EA	100225		POT 2.5K/250 OHM OBSOLET E SEE 81A2D-640-A12/A07		8100225	
R2A	1.000	EA	100225		POT 2.5K/250 OHM OBSOLET E SEE 81A2D-640-A12/A07		8100225	
R3	*ERR*	EA	100225		POT 2.5K/250 OHM OBSOLET E SEE 81A2D-640-A12/A07		8100225	

REPORT: EN\_100

TRANSISTOR DEVICES INC.  
 RANDOLPH, NJ 07869  
 CAGE CODE: 09004

PARTS LIST : PL 3810-105902  
 DOCUMENT/PART NUMBER : A105902  
 DLVP 50-120-1500

REV. DATE : 06/10/92  
 REVISION LETTER : A  
 SHEET : 7

CIRC. FIND	DESIG. NO.	QUANTITY	UM	CAGE	PART NUMBER	NOMENCLATURE	DRAW SIZE	MIL-SPEC /DRAWING NO.	NOTE NO.
	R3A	*ERR*	EA		100225	POT 2.5K/250 OHM OBSOLET E SEE 81A2D-640-A12/A07		5100225	
	R4	1.000	EA		CM44464	POT 10K OHM OBSOLETE SEE 81A1D-A28-A15			
	R101	1.000	EA		CP5-.1-10	RES .1 OHM 5W 10% DALE			
	R101A	1.000	EA		RCR076471KS	RES 470 OHM 1/4W 10%			
	R102	1.000	EA		CP5-.1-10	RES .1 OHM 5W 10% DALE			
	R102A	1.000	EA		RCR076471KS	RES 470 OHM 1/4W 10%			
	R103	1.000	EA		CP5-.1-10	RES .1 OHM 5W 10% DALE			
	R103A	1.000	EA		RCR076471KS	RES 470 OHM 1/4W 10%			
	R104	1.000	EA		CP5-.1-10	RES .1 OHM 5W 10% DALE			
	R104A	1.000	EA		RCR076471KS	RES 470 OHM 1/4W 10%			
	R105	1.000	EA		CP5-.1-10	RES .1 OHM 5W 10% DALE			
	R105A	1.000	EA		RCR076471KS	RES 470 OHM 1/4W 10%			
	R106	1.000	EA		CP5-.1-10	RES .1 OHM 5W 10% DALE			
	R106A	1.000	EA		RCR076471KS	RES 470 OHM 1/4W 10%			
	R107	1.000	EA		CP5-.1-10	RES .1 OHM 5W 10% DALE			
	R107A	1.000	EA		RCR076471KS	RES 470 OHM 1/4W 10%			
	R108	1.000	EA		CP5-.1-10	RES .1 OHM 5W 10% DALE			
	R108A	1.000	EA		RCR076471KS	RES 470 OHM 1/4W 10%			
	R109	1.000	EA		CP5-.1-10	RES .1 OHM 5W 10% DALE			
	R109A	1.000	EA		RCR076471KS	RES 470 OHM 1/4W 10%			
	R111	1.000	EA		CP5-.1-10	RES .1 OHM 5W 10% DALE			



REPORT: EN\_100

TRANSISTOR DEVICES INC.

RANDOLPH, NJ 07869

CAGE CODE: 09004

PARTS LIST : PL 3810-105902

DOCUMENT/PART NUMBER : A105902

DLVP 50-120-1500

REV. DATE : 06/10/92

REVISION LETTER : A

SHEET : 8

CIRC. FIND	DESG. NO.	QUANTITY	UM	CAGE	PART NUMBER	NOMENCLATURE	DRAW SIZE	MIL-SPEC /DRAWING NO.	NOTE NO.
	R111A	1.000	EA		RCR076471KS	RES 470 OHM 1/4W 10%			
	R112	1.000	EA		CP5-.1-10	RES .1 OHM 5W 10% DALE			
	R112A	1.000	EA		RCR076471KS	RES 470 OHM 1/4W 10%			
	R113	1.000	EA		CP5-.1-10	RES .1 OHM 5W 10% DALE			
	R113A	1.000	EA		RCR076471KS	RES 470 OHM 1/4W 10%			
	R114	1.000	EA		CP5-.1-10	RES .1 OHM 5W 10% DALE			
	R114A	1.000	EA		RCR076471KS	RES 470 OHM 1/4W 10%			
	R115	1.000	EA		CP5-.1-10	RES .1 OHM 5W 10% DALE			
	R115A	1.000	EA		RCR076471KS	RES 470 OHM 1/4W 10%			
	R116	1.000	EA		CP5-.1-10	RES .1 OHM 5W 10% DALE			
	R116A	1.000	EA		RCR076471KS	RES 470 OHM 1/4W 10%			
	R117	1.000	EA		CP5-.1-10	RES .1 OHM 5W 10% DALE			
	R117A	1.000	EA		RCR076471KS	RES 470 OHM 1/4W 10%			
	R118	1.000	EA		CP5-.1-10	RES .1 OHM 5W 10% DALE			
	R118A	1.000	EA		RCR076471KS	RES 470 OHM 1/4W 10%			
	R119	1.000	EA		CP5-.1-10	RES .1 OHM 5W 10% DALE			
	R119A	1.000	EA		RCR076471KS	RES 470 OHM 1/4W 10%			
	R120	1.000	EA		RCR206101KS	RES 100 OHM 1/2W 10%			
	R121	1.000	EA		CP5-.1-10	RES .1 OHM 5W 10% DALE			
	R121A	1.000	EA		RCR076471KS	RES 470 OHM 1/4W 10%			
	R122	1.000	EA		CP5-.1-10	RES .1 OHM 5W 10% DALE			
	R122A	1.000	EA		RCR076471KS	RES 470 OHM 1/4W 10%			
	R123	1.000	EA		CP5-.1-10	RES .1 OHM 5W 10% DALE			

REPORT: EN 100

TRANSISTOR DEVICES INC.

RANDOLPH, NJ 07869

CAGE CODE: 09004

PARTS LIST : PL 3810-105902

DOCUMENT/PART NUMBER : A105902

DLVP 50-120-1500

REV. DATE : 06/10/52

REVISION LETTER : A

SHEET : 9

CIRC. FIND

DESG. NO.	QUANTITY	UM	CAGE	PART NUMBER	NOMENCLATURE	DRAW SIZE	MIL-SPEC /DRAWING NO.	NOTE NO.
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R123A	1.000	EA		RCR07G471KS	RES 470 OHM 1/4W 10%			
R124	1.000	EA		CPS-.1-10	RES .1 OHM 5W 10% DALE			
R124A	1.000	EA		RCR07G471KS	RES 470 OHM 1/4W 10%			
R125	1.000	EA		CPS-.1-10	RES .1 OHM 5W 10% DALE			
R125A	1.000	EA		RCR07G471KS	RES 470 OHM 1/4W 10%			
R126	1.000	EA		CPS-.1-10	RES .1 OHM 5W 10% DALE			
R126A	1.000	EA		RCR07G471KS	RES 470 OHM 1/4W 10%			
R127	1.000	EA		CPS-.1-10	RES .1 OHM 5W 10% DALE			
R127A	1.000	EA		RCR07G471KS	RES 470 OHM 1/4W 10%			
R128	1.000	EA		CPS-.1-10	RES .1 OHM 5W 10% DALE			
R128A	1.000	EA		RCR07G471KS	RES 470 OHM 1/4W 10%			
R129	1.000	EA		CPS-.1-10	RES .1 OHM 5W 10% DALE			
R129A	1.000	EA		RCR07G471KS	RES 470 OHM 1/4W 10%			
R131	1.000	EA		CPS-.1-10	RES .1 OHM 5W 10% DALE			
R131A	1.000	EA		RCR07G471KS	RES 470 OHM 1/4W 10%			
R132	1.000	EA		CPS-.1-10	RES .1 OHM 5W 10% DALE			
R132A	1.000	EA		RCR07G471KS	RES 470 OHM 1/4W 10%			
R133	1.000	EA		CPS-.1-10	RES .1 OHM 5W 10% DALE			
R133A	1.000	EA		RCR07G471KS	RES 470 OHM 1/4W 10%			
R134	1.000	EA		CPS-.1-10	RES .1 OHM 5W 10% DALE			
R134A	1.000	EA		RCR07G471KS	RES 470 OHM 1/4W 10%			
R135	1.000	EA		CPS-.1-10	RES .1 OHM 5W 10% DALE			

TRANSISTOR DEVICES INC.

REPORT: EN\_100

RANDOLPH, NJ 07869

CAGE CODE: 09004

PARTS LIST : PL 3810-105902  
 DOCUMENT/PART NUMBER : A105902  
 DLVP 50-120-1500

REV. DATE : 06/10/92  
 REVISION LETTER : A  
 SHEET : 10

CIRC. FIND	DESB. NO.	QUANTITY	UM	CAGE	PART NUMBER	NOMENCLATURE	DRAW SIZE	MIL-SPEC /DRAWING NO.	NOTE NO.
	R135A	1.000	EA		RCR07G471KS	RES 470 OHM 1/4W 10%			
	R136	1.000	EA		CP5-.1-10	RES .1 OHM SW 10% DALE			
	R136A	1.000	EA		RCR32G473KS	RES 47K 1W 10% A-B			
	R137	1.000	EA		CP5-39-10	RES 39 OHM SW 10% DALE			
	S1	1.000	EA		881K21810PT01A70	SWITCH SPST PUSHBUTTON			
	S2	1.000	EA		881K11810PT03A13	SWITCH SPST PUSHBUTTON			
	S3	1.000	EA		4001	SWITCH PUSHBUTTON			
	T101	1.000	EA		105512	XFMR, 100.127VAC 47-53HZ GR. 6		8105512	
	T81	1.000	EA		670A-YSY-5	TERM BLK BEAU 77505-49			
	T82	1.000	EA		670A-YSY-5	TERM BLK BEAU 77505-49			
	TH101	1.000	EA		2450-088-227	SWITCH THERMAL 120DEG C N C			
	TP1	1.000	EA		899-102	BINDING POST RED HH SMITH			
	TP2	1.000	EA		899-103	BINDING POST BLACK HH SMITH			
	TP3	1.000	EA		1499-102	BANANA JACK RED HH SMITH			
	TP4	1.000	EA		1499-103	BANANA JACK BLACK HH SMITH			
	TP5	1.000	EA		1499-102	BANANA JACK RED HH SMITH			
	XF1	1.000	EA		47B-441	FUSE HOLDER MFG:BUSSMAN			
	XTB1	1.000	EA		600J	JUMPER BNP MFR: KULKA			
	*ERR*	2.000	EA		02-06-1101	CONN PINS MOLEX FEMALE			
	*ERR*	2.000	EA		02-06-2101	CONN, PIN, MALE 1560T 7M/REEL MOLEX			

REPORT: EN\_100

TRANSISTOR DEVICES INC.

RANDOLPH, NJ 07863

CAGE CODE: 09004

PARTS LIST : PL 3810-105902

DOCUMENT/PART NUMBER : A105902

DVLP 50-120-1500

REV. DATE : 06/10/92

REVISION LETTER : A

SHEET : 11

CIRC. FIND

DESG. NO.	QUANTITY	UM	CAGE	PART NUMBER	NOMENCLATURE	DRAW SIZE	MIL-SPEC /DRAWING NO.	NOTE NO.
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*ERR*	52.000	EA		08-50-0105	CONN PIN (CHAIN) 18-24AWG 2478T TIN-PLATE 7M/REEL MOLEX			
*ERR*	1.000	EA		1214	BUSHING BLK HEYMAN			
*ERR*	1.000	EA		2351	SHAFT EXTENDER			
*ERR*	1.000	EA		3810-106095	"T" MECH PARTS SET DVLP M ED CASE			
*ERR*	1.000	EA		3810-MET	"T" METAL SET DVLP 50-120 -1500			
*ERR*	8.000	EA		18376-2	WASHER, INSULATOR NYLON, A MOLDING PLASTIC PER MIL-M-20693 .625 D. 190 I.D. .055 THK		18376	
*ERR*	1.000	EA		105730	INSULATOR EPOGLASS		A105730	
*ERR*	8.000	EA		108543-3	NUT HEX BNP EXTRA THIN 3 /8-32 1/2"AF 3/32THK		5108543-3	
*ERR*	1.000	EA		REVISION-HISTORY	REVISION HISTORY-REV, ECU , DESCRIPTION			
*ERR*	1.000	EA		XB141060	LINE CORD CONDUCT 18GA SJ 6FT			

AR - AS REQUIRED, ALT - ALTERNATIVE, OPT - OPTIONAL, DO - DELETION OPTIONAL, REF - REFERENCE

REPORT: EN\_100

TRANSISTOR DEVICES INC.

RANDOLPH, NJ 07869

CAGE CODE: 09004

PARTS LIST : PL 3910-105902

DOCUMENT/PART NUMBER : A105902

QWP 50-120-1500

REV. DATE : 06/10/92

REVISION LETTER : A

SHEET : 12

NOTE NO. RH 16062: REV A: A2 PC ASSY P/N WAS 1053361-105902. 12.6.91

REPORT: EN\_100

TRANSISTOR DEVICES INC.

RANDOLPH, NJ 07869

CAGE CODE: 09004

PARTS LIST : PL 1058931-105902

DOCUMENT/PART NUMBER : A105902

"T" PC ASSY DLVP A1

REV. DATE : 06/10/92

REVISION LETTER :

SHEET : 1

AUTHENTICATION: \_\_\_\_\_

CIRC. FIND DESG. NO.	QUANTITY	UM	CAGE	PART NUMBER	NOMENCLATURE	DRAW SIZE	MIL-SPEC /DRAWING NO.	NOTE NO.
A1	1.000	EA		105891	PC BOARD		D105891	
P2A	1.000	EA		26-20-2081	CONN MOLEX 8 PIN			
P2B	1.000	EA		09-64-1062	CONN MOLEX			
P2C	1.000	EA		26-20-2081	CONN MOLEX 8 PIN			
P2D	1.000	EA		09-64-1092	CONN MOLEX			
P5	1.000	EA		26-20-2081	CONN MOLEX 8 PIN			
P6	1.000	EA		09-64-1062	CONN MOLEX			
S4	1.000	EA		TT11DG-VRA-1	SWITCH SPDT TOGGLE			
S5	1.000	EA		106872-1	SWITCH 3POSN PB W/ PEM NU TS MOD. 65031K-206A		B106872-1	
S6	1.000	EA		106872-1	SWITCH 3POSN PB W/ PEM NU TS MOD. 65031K-206A		B106872-1	
S7	1.000	EA		106872-2	SWITCH 3POSN PB W/ PEM NU TS MOD. 65031K-206A		B106872-2	

REPORT: EN\_100

TRANSISTOR DEVICES INC.

RANDOLPH, NJ 07869

CAGE CODE: 09004

PARTS LIST : PL 105896-1

DOCUMENT/PART NUMBER : D D105896

PC ASSY SFS3352, DLVP-50-120-1500 (A2)

REV. DATE : 06/10/92

REVISION LETTER : 02

SHEET : 1

AUTHENTICATION: \_\_\_\_\_

CIRC. FIND DESG. NO.	QUANTITY	UM	CAGE	PART NUMBER	NOMENCLATURE	DRAW SIZE	MIL-SPEC /DRAWING NO.	NOTE NO.
A2	1.000	EA		105894	PC BOARD		D105894	
C1	1.000	EA		KMC50T471M12X30LL	CAPACITOR AXIAL W/END SEA LS 470UF @ 50V SOLVENT PROOF MFG: D CHEMICON			
C2	1.000	EA		KMC50T471M12X30LL	CAPACITOR AXIAL W/END SEA LS 470UF @ 50V SOLVENT PROOF MFG: D CHEMICON			
C3	1.000	EA		KMC50T471M12X30LL	CAPACITOR AXIAL W/END SEA LS 470UF @ 50V SOLVENT PROOF MFG: D CHEMICON			
C4	1.000	EA		3073BA100T025JPT	CAPACITOR ELECTROLYTIC A XIAL 10UF @ 25V MFG: MEPCO			
C5	1.000	EA		3073BA100T025JPT	CAPACITOR ELECTROLYTIC A XIAL 10UF @ 25V MFG: MEPCO			
C6	1.000	EA		3073BA339T063JPT	CAPACITOR ELECT. AXIAL 3 .3UF @ 63V			
C7	1.000	EA		712A1BB472PK401SK	CAP .0047UF 400V SHORT, C RIMFED LEADS MFR:MEPCO			
C8	1.000	EA		712A1BB472PK401SK	CAP .0047UF 400V SHORT, C RIMFED LEADS MFR:MEPCO			
C9	1.000	EA		CK06BX103K	CAP .01UF 200V CERAMIC			
C10	1.000	EA	99392	712A1BB103PK401SK	CAP, MTLZ POLYEST FILM, .01UF, 400V, 10%, CAP .01UF 400V MEPCO T, CRIMPED LEADS			
C11	1.000	EA	99392	712A1BB103PK401SK	CAP, MTLZ POLYEST FILM, .01UF, 400V, 10%, CAP .01UF 400V MEPCO T, CRIMPED LEADS			

REPORT: EN\_100

TRANSISTOR DEVICES INC.

RANDOLPH, NJ 07869

CAGE CODE: 09004

PARTS LIST : PL 105896-1  
 DOCUMENT/PART NUMBER : D 0105896  
 PC ASSY SPS3352, DLVP-50-120-1500 (A2)

REV. DATE : 06/10/92  
 REVISION LETTER : 62  
 SHEET : 2

CIRC. FIND	DES. NO.	QUANTITY	UM	CAGE	PART NUMBER	NOMENCLATURE	DRAW SIZE	MIL-SPEC /DRAWING NO.	NOTE NO.
	C12	1.000	EA	99392	712A18B103PK401SK	CAP, MTLZ POLYEST FILM, .01UF, 400V, 10%, CAP .01UF 400V MEPCO T, CRIMPED LEADS			
	C13	1.000	EA	99392	712A18B103PK401SK	CAP, MTLZ POLYEST FILM, .01UF, 400V, 10%, CAP .01UF 400V MEPCO T, CRIMPED LEADS			
	C14	1.000	EA	99392	712A18B103PK401SK	CAP, MTLZ POLYEST FILM, .01UF, 400V, 10%, CAP .01UF 400V MEPCO T, CRIMPED LEADS			
	C15	1.000	EA	99392	712A18B103PK401SK	CAP, MTLZ POLYEST FILM, .01UF, 400V, 10%, CAP .01UF 400V MEPCO T, CRIMPED LEADS			
	C16	1.000	EA	99392	712A18B103PK401SK	CAP, MTLZ POLYEST FILM, .01UF, 400V, 10%, CAP .01UF 400V MEPCO T, CRIMPED LEADS			
	C17	1.000	EA	99392	712A18B103PK401SK	CAP, MTLZ POLYEST FILM, .01UF, 400V, 10%, CAP .01UF 400V MEPCO T, CRIMPED LEADS			
	C18	1.000	EA		712A18B102PK401SK	CAP .001UF 400V MEPCO SHD RT, CRIMPED LEADS			
	C19	1.000	EA		3073BA100T025JPT	CAPACITOR ELECTROLYTIC AXIAL 10UF @ 25V MFG: MEPCO			
	C20	1.000	EA		712A18B473PK251SK	CAP .047UF 250V MEPCO SHD RT, CRIMPED LEADS			
	C21	1.000	EA		712A18B473PK251SK	CAP .047UF 250V MEPCO SHD RT, CRIMPED LEADS			
	C22	1.000	EA		712A18B472PK401SK	CAP .0047UF 400V SHORT, CRIMPED LEADS MFR:MEPCO			



REPORT: EN\_100

TRANSISTOR DEVICES INC.  
 RANDOLPH, NJ 07069  
 CAGE CODE: 09004

PARTS LIST : PL 105896-1  
 DOCUMENT/PART NUMBER : D D105896  
 PC ASSY SFS3352, DLVP-50-120-1500 (AE)

REV. DATE : 06/10/92  
 REVISION LETTER : 62  
 SHEET : 3

CIRC. FIND

DESIG. NO.	QUANTITY	UM	CAGE	PART NUMBER	NOMENCLATURE	DRAW SIZE	MIL-SPEC /DRAWING NO.	NOTE NO.
C23	1.000	EA	99392	712A18B103PK401SK	CAP, MTLZ POLYEST FILM, .01UF, 400V, 10%, CAP .01UF 400V MEPCO T, CRIMPED LEADS			
C24	1.000	EA		3073BA229T063JPT	CAP 2.2UF 63V			
C25	1.000	EA	99392	712A18B103PK401SK	CAP, MTLZ POLYEST FILM, .01UF, 400V, 10%, CAP .01UF 400V MEPCO T, CRIMPED LEADS			
C26	1.000	EA		712A1KK474PK251LC	CAP .47UF 250VDC LONG STR AIGHT LEADS			
C27	1.000	EA		712A1KK474PK251LC	CAP .47UF 250VDC LONG STR AIGHT LEADS			
C28	1.000	EA		712A18B472PK401SK	CAP .0047UF 400V SHORT, C RIMPED LEADS MFR:MEPCO			
CR1	1.000	EA		1N5624	RECTIFIER GIC, STANDARD R RECOVERY 200V 3A GLASS AXIAL LEAD MI 9500/432			
CR2	1.000	EA		1N5624	RECTIFIER GIC, STANDARD R RECOVERY 200V 3A GLASS AXIAL LEAD MI 9500/432			
CR3	1.000	EA		J1N645-1	DIODE GI			
CR4	1.000	EA		J1N645-1	DIODE GI			
CR5	1.000	EA		J1N645-1	DIODE GI			
CR6	1.000	EA		J1N645-1	DIODE GI			
CR7	1.000	EA		J1N645-1	DIODE GI			
CR9	1.000	EA		1N4148	DIODE, SWITCHING 75V 200 mA DO-35 COMPUTER DIODE REVE BREAKDOWN VOLTAGE 100			

REPORT: EN\_100

TRANSISTOR DEVICES INC.  
 RANDOLPH, NJ 07869  
 CAGE CODE: 09004

PARTS LIST : PL 105896-1  
 DOCUMENT/PART NUMBER : D D105896  
 PC ASSY SPS3352, DLVP-50-120-1500 (A2)

REV. DATE : 06/10/52  
 REVISION LETTER : 62  
 SHEET : 4

CIRC. FIND  
 DESG. NO. QUANTITY UM CAGE PART NUMBER NOMENCLATURE DRAW MIL-SPEC NOTE  
 SIZE /DRAWING NO. NO.

DESG. NO.	QUANTITY	UM	CAGE	PART NUMBER	NOMENCLATURE	DRAW SIZE	MIL-SPEC /DRAWING NO.	NOTE NO.
CR10	1.000	EA	J1N645-1		DIODE GI			
CR11	1.000	EA	1N4245		RECT, 200V, 1A, DO-204AP, (MANU: GIC) GLASS AXIAL LEAD			
CR12	1.000	EA	J1N645-1		DIODE GI			
CR15	1.000	EA	J1N645-1		DIODE GI			
CR16	1.000	EA	J1N645-1		DIODE GI			
CR17	1.000	EA	J1N645-1		DIODE GI			
CR18	1.000	EA	J1N645-1		DIODE GI			
CR19	1.000	EA	J1N645-1		DIODE GI			
J1	1.000	EA	26-20-2081		CONN MOLEX 8 PIN			
JEA	1.000	EA	09-52-3081		CONN MOLEX			
JEB	1.000	EA	09-52-3081		CONN MOLEX			
JEC	1.000	EA	09-52-3081		CONN MOLEX			
JED	1.000	EA	09-52-3091		CONN MOLEX A2145-9A			
J3	1.000	EA	26-20-2081		CONN MOLEX 8 PIN			
J4	1.000	EA	26-20-2161		CONN MOLEX 16 PIN			
J2	1.000	EA	2N3254		XSTR			
J3	1.000	EA	2N2907A		XSTR, 60V, PNP, TO-18, MF R: RAY, MOT PNBP 60V 600MA TO-18			
J4	1.000	EA	2N2907A		XSTR, 60V, PNP, TO-18, MF R: RAY, MOT PNBP 60V 600MA TO-18			
J5	1.000	EA	2N2215A		XSTR RAY, MOT, PHILLIPS, AMPEREX			

REPORT: EN\_100

TRANSISTOR DEVICES INC.  
RANDOLPH, NJ 07869  
CAGE CODE: 09004

PARTS LIST : PL 105696-1  
DOCUMENT/PART NUMBER : D D105696  
PC ASSY SFS3352, DLVP-50-120-1500 (A2)

REV. DATE : 06/10/92  
REVISION LETTER : 62  
SHEET : 5

CIRC. FIND	QTY	UM	CAGE	PART NUMBER	NOMENCLATURE	DRAW	MIL-SPEC	NOTE
DESG. NO.	QUANTITY	UM	CAGE	PART NUMBER	NOMENCLATURE	SIZE	/DRAWING NO.	NO.
Q6	1.000	EA	2N2907A		XSTR, 60V, PNP, TO-18, MF R: RAY, MOT PNBP 60V 600MA TO-18			
Q7	1.000	EA	2N3054		XSTR			
Q8	1.000	EA	2N3054		XSTR			
Q9	1.000	EA	2N2219A		XSTR RAY, MOT, PHILLIPS, AMPEREX			
Q10	1.000	EA	2N2222A		XSTR 40V .8A NPN TO-18 MF R: MOT, RAY, 565 40V 800MA			
R1	1.000	EA	RLR20C10R0GR		RES 10 OHM 1/2W 2% DALE			
R2	1.000	EA	RCR326122KS		RES 1.2K 1W 10% A-B			
R3	1.000	EA	RLR20C3301GR		RES 3.3K 1/2W 2% DALE TAPE & REEL			
R4	1.000	EA	3386X-102		POT CERMET 1K BOURNS			
R5	1.000	EA	3386X-102		POT CERMET 1K BOURNS			
R6	1.000	EA	RLR20C3301GR		RES 3.3K 1/2W 2% DALE TAPE & REEL			
R7	1.000	EA	RLR20C2200GR		RES 220 OHM 1/2W 2% DALE			
R8	1.000	EA	RLR20C2200GR		RES 220 OHM 1/2W 2% DALE			
R9	1.000	EA	RLR20C4700GR		RES 470 OHM 1/2W 2% DALE			
R10	1.000	EA	RLR20C4701GR		RES 4.7K 1/2W 2% DALE			
R11	1.000	EA	RLR20C10R0GR		RES 10 OHM 1/2W 2% DALE			
R12	1.000	EA	RLR20C6800GR		RES 680 OHM 1/2W 2% DALE			
R13	1.000	EA	RLR20C6800GR		RES 680 OHM 1/2W 2% DALE			
R14	1.000	EA	RLR20C6800GR		RES 680 OHM 1/2W 2% DALE			

REPORT: EN\_100

TRANSISTOR DEVICES INC.

RANDOLPH, NJ 07863

CAGE CODE: 09004

PARTS LIST : PL 105896-1  
 DOCUMENT/PART NUMBER : D D105896  
 PC ASSY SPS3352, DLVP-50-120-1500 (AE)

REV. DATE : 06/10/92  
 REVISION LETTER : 62  
 SHEET : 6

CIRC. FIND DESG. NO.	QUANTITY	UM	CAGE	PART NUMBER	NOMENCLATURE	DRAW SIZE	MIL-SPEC /DRAWING NO.	NOTE NO.
R15	1.000	EA		RLR20C47006R	RES 470 OHM 1/2W 2% DALE			
R16	1.000	EA		RLR20C39016R	RES 3.9K 1/2W 2% DALE			
R17	1.000	EA		RN55C1542F	RES 15.4K 1/8W 1%, MFR-25			
R18	1.000	EA		RN55C1472F	RES 14.7K 1/8W 1%, MFR-25			
R19	1.000	EA		RN55C5622F	RES 56.2K 1/8W 1%, MFR-25			
R20	1.000	EA		RN55C1212F	RES 12.1K 1/8W 1%, MFR-25			
R21	1.000	EA		RN55C2261F	RES 2.26K 1/8W 1%, MFR-25			
R22	1.000	EA		RN55C2742F	RES 27.4K 1/8W 1%, MFR-25			
R23	1.000	EA		RN55C4671F	RES 4.67K 1/8W 1%, MFR-25			
R24	1.000	EA		RN55C5621F	RES 5.62K 1/8W 1%, MFR-25			
R25	1.000	EA		RN55C1542F	RES 15.4K 1/8W 1%, MFR-25			
R26	1.000	EA		RN55C5622F	RES 56.2K 1/8W 1%, MFR-25			
R27	1.000	EA		RN55C1000F	RES 100 OHM 1/8W 1%, MFR-25			
R28	1.000	EA		RN55C4640F	RES 464 OHM 1/8W 1%, MFR-25			
R29	1.000	EA		RN55C1001F	RES 1K 1/8W 1%, MFR-25			
R30	1.000	EA		RLR20C27006R	RES 270 OHM 1/2W 2% DALE			
R31	1.000	EA		RLR20C27026R	RES 27K 1/2W 2% DALE			
R32	1.000	EA		3386X-502	POT CERMET 5K BOURNS			
R33	1.000	EA		3386X-203	POT CERMET 20K BOURNS			
R34	1.000	EA		3386X-502	POT CERMET 5K BOURNS			
R35	1.000	EA		3386X-203	POT CERMET 20K BOURNS			

REPORT: EN\_100

TRANSISTOR DEVICES INC.  
 RANDOLPH, NJ 07869  
 CAGE CODE: 09004

PARTS LIST : PL 105896-1  
 DOCUMENT/PART NUMBER : D 0105896  
 PC ASSY SFS3352, DLVP-50-120-1500 (A2)

REV. DATE : 06/10/92  
 REVISION LETTER : 62  
 SHEET : 7

CIRC. FIND	DESE. NO.	QUANTITY	UM	CAGE	PART NUMBER	NOMENCLATURE	DRAW SIZE	MIL-SPEC /DRAWING NO.	NOTE NO.
	R36	1.000	EA		3386X-502	POT CERMET 5K BOURNS			
	R37	1.000	EA		3386X-102	POT CERMET 1K BOURNS			
	R38	1.000	EA		3386X-502	POT CERMET 5K BOURNS			
	R39	1.000	EA		3386X-103	POT CERMET 10K BOURNS			
	R40	1.000	EA		3386X-501	POT CERMET 500 OHM BOURNS			
	R41	1.000	EA		3386X-102	POT CERMET 1K BOURNS			
	R42	1.000	EA		3386X-202	POT CERMET 2K BOURNS			
	R43	1.000	EA		RLR20C6800GR	RES 680 OHM 1/2W 2% DALE			
	R44	1.000	EA		RLR20C4701GR	RES 4.7K 1/2W 2% DALE			
	R45	1.000	EA		RLR20C4701GR	RES 4.7K 1/2W 2% DALE			
	R46	1.000	EA		RLR20C2202GR	RES 22K 1/2W 2% DALE			
	R47	1.000	EA		RLR20C4701GR	RES 4.7K 1/2W 2% DALE			
	R48	1.000	EA		RLR20C1501GR	RES 1.5K 1/2W 2% DALE			
	R49	1.000	EA		RLR20C4701GR	RES 4.7K 1/2W 2% DALE			
	R50	1.000	EA	81349	RLR20C1000GR	RES, FIXED FILM, 100, 1/2 W, 2%		MIL-R-39017/E	
	R52	1.000	EA		RLR20C1001GR	RES 1K 1/2W 2% DALE			
	R53	1.000	EA		ROR426121RS	RES 120 OHM 2W 10% A-B			
	R54	1.000	EA		RLR20C1501GR	RES 1.5K 1/2W 2% DALE			
	R55	1.000	EA		RLR20C2201GR	RES 2.2K 1/2W 2% DALE			
	R56	1.000	EA		RLR20C6800GR	RES 68K 1/2W 2% DALE			
	R57	1.000	EA		RLR20C1001GR	RES 1K 1/2W 2% DALE			
	R58	1.000	EA		RLR20C1002GR	RES 10K 1/2W 2% DALE			

REPORT: EN\_100

TRANSISTOR DEVICES INC.

RANDOLPH, NJ 07869

CAGE CODE: 09004

PARTS LIST : PL 105896-1  
 DOCUMENT/PART NUMBER : D D105896  
 PC ASSY SPS3352, DLVP-50-120-1500 (A2)

REV. DATE : 06/10/92  
 REVISION LETTER : 62  
 SHEET : 8

DIRC. FIND DESG. NO.	QUANTITY	UM	CAGE	PART NUMBER	NOMENCLATURE	DRAW SIZE	MIL-SPEC DRAWING NO.	NOTE NO.
R59	1.000	EA		RLR20C3300GR	RES 330 OHM 1/2W 2% DALE			
R60	1.000	EA		RLR20C1202GR	RES 12K 1/2W 2% DALE			
R61	1.000	EA		RLR20C4700GR	RES 470 OHM 1/2W 2% DALE			
R62	1.000	EA		RLR20C3300GR	RES 330 OHM 1/2W 2% DALE			
R63	1.000	EA		RLR20C4700GR	RES 470 OHM 1/2W 2% DALE			
R64	1.000	EA		3388X-201	POT CERMET 200 OHM -SID E ADJUST MFG: BOURNS			
R65	1.000	EA	81349	RLR20C1000GR	RES, FIXED FILM, 100, 1/2 W, 2%		MIL-R-39017/2	
R66	1.000	EA		RLR20C1001GR	RES 1K 1/2W 2% DALE			
R67	1.000	EA		3388X-502	POT CERMET 5K BOURNS			
R68	1.000	EA		RLR20C1001GR	RES 1K 1/2W 2% DALE			
R69	1.000	EA		RLR20C4701GR	RES 4.7K 1/2W 2% DALE			
R70	1.000	EA		RLR20C1001GR	RES 1K 1/2W 2% DALE			
R71	1.000	EA		RLR20C1001GR	RES 1K 1/2W 2% DALE			
R72	1.000	EA		RLR20C10R0GR	RES 10 OHM 1/2W 2% DALE			
R73	1.000	EA		RLR20C1001GR	RES 1K 1/2W 2% DALE			
R74	1.000	EA		RLR20C4701GR	RES 4.7K 1/2W 2% DALE			
R75	1.000	EA		RLR20C2701GR	RES 2.7K 1/2W 2% DALE			
R76	1.000	EA		RLR20C2701GR	RES 2.7K 1/2W 2% DALE			
R77	1.000	EA		3388X-502	POT CERMET 5K BOURNS			
R78	1.000	EA		RLR20C2701GR	RES 2.7K 1/2W 2% DALE			
R79	1.000	EA		RLR20C2700GR	RES 270 OHM 1/2W 2% DALE			

REPORT: EN\_100

TRANSISTOR DEVICES INC.

RANDOLPH, NJ 07869

CASE CODE: 09004

PARTS LIST : PL 105896-1  
DOCUMENT/PART NUMBER : D D105896  
PC ASSY SPS3352, DLVP-50-120-1500 (A2)

REV. DATE : 06/10/92  
REVISION LETTER : 62  
SHEET : 9

CIRC. FIND	DESIG. NO.	QUANTITY	UM	CASE	PART NUMBER	NOMENCLATURE	DRAW SIZE	MIL-SPEC /DRAWING NO.	NOTE NO.
	R80	1.000	EA		RLR20C10016R	RES 1K 1/2W 2% DALE			
	R81	1.000	EA		RLR20C2200GR	RES 220 OHM 1/2W 2% DALE			
	R82	1.000	EA		RLR20C33016R	RES 3.3K 1/2W 2% DALE TAPE & REEL			
	R83	1.000	EA		RLR20C10016R	RES 1K 1/2W 2% DALE			
	R84	1.000	EA		RLR20C56016R	RES 5.6K 1/2W 2% DALE			
	R85	1.000	EA		3386X-501	POT CERMET 500 OHM BOURNS			
	R86	1.000	EA		RLR20C10026R	RES 10K 1/2W 2% DALE			
	R88	1.000	EA		RLR20C10016R	RES 1K 1/2W 2% DALE			
	R89	1.000	EA		3386X-502	POT CERMET 5K BOURNS			
	R90	1.000	EA		RLR20C33016R	RES 3.3K 1/2W 2% DALE TAPE & REEL			
	R91	1.000	EA		RLR20C2200GR	RES 22K 1/2W 2% DALE			
	R92	1.000	EA		RLR20C3900GR	RES 390 OHM 1/2W 2% DALE			
	R93	1.000	EA		RLR20C18016R	RES 1.8K 1/2W 2% DALE			
	R94	1.000	EA		3386X-201	POT CERMET 200 OHM -510 E ADJUST MFG: BOURNS			
	R95	1.000	EA		RLR20C12026R	RES 12K 1/2W 2% DALE			
	R96	*ERR*	EA		RLR20C4700GR	RES 470 OHM 1/2W 2% DALE			
	R97	1.000	EA		RLR20C33016R	RES 3.3K 1/2W 2% DALE TAPE & REEL			
	R98	1.000	EA		RLR20C10016R	RES 1K 1/2W 2% DALE			
	R99	1.000	EA		RLR20C10016R	RES 1K 1/2W 2% DALE			
	R100	1.000	EA		RLR20C10016R	RES 1K 1/2W 2% DALE			

REPORT: EN\_100

TRANSISTOR DEVICES INC.

RANDOLPH, NJ 07069

CAGE CODE: 09004

PARTS LIST : PL 105896-1  
 DOCUMENT/PART NUMBER : D D105896  
 PC ASSY SPS3352, DLVP-50-120-1500 (AE)

REV. DATE : 06/10/92  
 REVISION LETTER : 62  
 SHEET : 10

CIRC. FIND	DESIG. NO.	QUANTITY	UM	CAGE	PART NUMBER	NOMENCLATURE	DRAW SIZE	MIL-SPEC /DRAWING NO.	NOTE NO.
	R101	1.000	EA		RCR076106KS	RES 10 MEGΩ 1/4W 10%			
	R102	1.000	EA		RCR076103KS	RES 10K 1/4W 10%			
	R103	1.000	EA		RCR076103KS	RES 10K 1/4W 10%			
	U1	1.000	EA		MC7808CT	IC LINEAR			
	U2	1.000	EA		MC7908CT	IC LINEAR			
	U3	1.000	EA		CA3140E	IC LINEAR			
	U4	1.000	EA		CA3140E	IC LINEAR			
	U5	1.000	EA		CA3140E	IC LINEAR			
	U6	1.000	EA		CA3140E	IC LINEAR			
	U7	1.000	EA		CA3140E	IC LINEAR			
	U8	1.000	EA		LM741CN	IC LINEAR OP AMP 8 PIN DI P FAIRCHILD, MCT			
	U9	1.000	EA		SN747EN	IC DIGITAL			
	VR1	1.000	EA		1N5350B	DIODE, ZENER 5 WATT 5% 13V MOTOROLA			
	VR2	1.000	EA		1N5350B	DIODE, ZENER 5 WATT 5% 13V MOTOROLA			
	VR4	1.000	EA		1N821	DIODE, ZENER			
	VR5	1.000	EA		1N759A	DIODE, ZENER			
	VR6	1.000	EA		1N759A	DIODE, ZENER			
	VR7	1.000	EA		1N964B	DIODE, ZENER			
	VR8	1.000	EA		1N969B	DIODE, ZENER			
	VR9	1.000	EA		1N969B	DIODE, ZENER			



REPORT: EN\_100

TRANSISTOR DEVICES INC.

RANDOLPH, NJ 07069

CAGE CODE: 09004

PARTS LIST : PL 105896-1  
 DOCUMENT/PART NUMBER : D D105896  
 PC ASSY SPE3352, DLYP-50-120-1500 (A2)

REV. DATE : 06/10/92  
 REVISION LETTER : 62  
 SHEET : 11

CIRC. FIND	DESB. NO.	QUANTITY	UM	CAGE	PART NUMBER	NOMENCLATURE	DRAW SIZE	MIL-SPEC /DRAWING NO.	NOTE NO.
	VR10	1.000	EA		1N5638	DIODE, ZENER			
	XU1	1.000	EA		106094	REGULATOR HEATSINK BRACKE T		A106094	
	XU2	1.000	EA		105667	REGULATOR HEATSINK BRACKE T		A105667	
	XU3	1.000	EA		2-640463-3	IC SOCKET 8-PIN PHOS. BRO NZE IN TUBES 50/TUBE SUB FOR 614260-3			
	XU4	1.000	EA		2-640463-3	IC SOCKET 8-PIN PHOS. BRO NZE IN TUBES 50/TUBE SUB FOR 614260-3			
	XU5	1.000	EA		2-640463-3	IC SOCKET 8-PIN PHOS. BRO NZE IN TUBES 50/TUBE SUB FOR 614260-3			
	XU6	1.000	EA		2-640463-3	IC SOCKET 8-PIN PHOS. BRO NZE IN TUBES 50/TUBE SUB FOR 614260-3			
	XU7	1.000	EA		2-640463-3	IC SOCKET 8-PIN PHOS. BRO NZE IN TUBES 50/TUBE SUB FOR 614260-3			
	XU8	1.000	EA		2-640463-3	IC SOCKET 8-PIN PHOS. BRO NZE IN TUBES 50/TUBE SUB FOR 614260-3			
	XU9	1.000	EA		2-640357-3	IC SOCKET 14 PIN IN TUBES 30 PER TUBE SUB FOR 641261-3			
	*ERR*	4.000	EA		120-095	ASTR PAD MFR: BIVAR			
	*ERR*	2.000	EA		101906	XSTR PAD (503-226N)	A	101906	
	*ERR*	6.000	EA		MS15795-305	WASHER FLAT SST NO. 6			
	*ERR*	6.000	EA		MS35335-58	WSHR EXTERNAL TOOTH SST N O. 6			

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TRANSISTOR DEVICES INC.

RANDOLPH, NJ 07869

CAGE CODE: 09004

PARTS LIST : PL 105896-1  
DOCUMENT/PART NUMBER : D 0105836  
PC ASSY SPS3352, DLVP-50-120-1500 (A2)

REV. DATE : 06/10/92  
REVISION LETTER : 62  
SHEET : 12

CIRC. FIND								
DESG. NO.	QUANTITY	UM	CAGE	PART NUMBER	NOMENCLATURE	DRAW SIZE	MIL-SPEC /DRAWING NO.	NOTE NO.
*ERR*	6.000	EA	M551957-28		MSCR SST 6-32 X 3/8 FFNH			
*ERR*	6.000	EA	NAS671C-6		NUT HEX SST 6-32			

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TRANSISTOR DEVICES INC.

RANDOLPH, NJ 07869

CAGE CODE: 05004

PARTS LIST : PL 105396-1  
DOCUMENT/PART NUMBER : D D105396  
PC ASSY SPS3352, DLVP-50-100-1500 (A2)

REV. DATE : 06/10/92  
REVISION LETTER : G2  
SHEET : 13

NOTE NO. RH	REV. A :REVISED AFTER PROTOTYPE.	12/21/78
	REV. B :ADDED NEW REGULATOR H/S BRKT.	12/29/78
	REV. C :UPDATED TO PCB D105394 REV. C.	12/29/78
	REV. D :MOVED CR8, CR10, C12 & C25.	ECN 11027 5/30/79
	REV. E :REVISED FOR DLVP 3000.	6/03/79
	REV. F :ADDED R107, R108, VR11, CR20 (2) JUMPERS, R109 & R110.	11/21/80
	REV. G :ADDED SHEET 2.	4/07/81
	REV. G1:PARTS LIST P/N WAS 1058961-105902.	8/27/91
	REV. G2:ADDED X02, X07 & X08'S HARDWARE. ECN 16362	12/06/91

NOTE NO. DOC	APPLICABLE DOCUMENTS:
	D105394 PC BOARD
	D105396 ASSY
	A105667 REGULATOR H/S BRKT
	A106094 REGULATOR H/S BRKT

REPORT: EN\_100

TRANSISTOR DEVICES INC.

RANDOLPH, NJ 07869

CAGE CODE: 09004

PARTS LIST : PL 1058991-105902

DOCUMENT/PART NUMBER : A105902

PC ASSY BLVP A3

REV. DATE : 06/10/92

REVISION LETTER :

SHEET : 1

AUTHENTICATION: \_\_\_\_\_

CIRC. FIND DESG. NO.	QUANTITY	UM	CAGE	PART NUMBER	NOMENCLATURE	DRAW SIZE	MIL-SPEC /DRAWING NO.	NOTE NO.
A3	1.000	EA		105897	PC BOARD DN PANELS-REF.DWG. D & D		B105897	
C1	1.000	EA		712A18B473PK251SK	CAP .047UF 250V MPPCO SHO RT, CRIMPED LEADS			
C2	1.000	EA		712A18B102PK401SK	CAP .001UF 400V MPPCO SHO RT, CRIMPED LEADS			
C3	1.000	EA		CX06BX474K	CAP .47UF 50V CERAMIC			
C4	1.000	EA		712A18D104PK251SK	CAP .1UF 250V MPPCO SHORT , CRIMPED LEADS			
C5	1.000	EA		712A18D683PK251SK	CAP .068UF 250V MPPCO SHO RT, CRIMPED LEADS			
C6	1.000	EA		712A18E223PK401SK	CAPACITOR RADIAL LEAD .222UF @ 400V MFG: MPPCO			
C7	1.000	EA		712A18E152PK401SK	CAP .0015UF 400V MPPCO SH ORT, CRIMPED LEADS			
C8	1.000	EA		712A18E222PK401SK	CAP .0022UF 400V MPPCO SH ORT, CRIMPED LEADS			
C9	1.000	EA		712A18E222PK401SK	CAP .0022UF 400V MPPCO SH ORT, CRIMPED LEADS			
CR1	1.000	EA		J1N645-1	DIODE GI			
CR2	1.000	EA		J1N645-1	DIODE GI			
F7	1.000	EA		26-22-2081	CONN MOLEX 8 PIN			
Q1	1.000	EA		2N2219A	XSTR RAY, MOT, PHILLIPS, AMEREX			
Q2	1.000	EA		2N2107A	XSTR, 60V, PNP, TO-18, MF R: RAY, MOT PNP 60V 600MA TO-18			

TRANSISTOR DEVICES INC.

RANDOLPH, NJ 07869

CAGE CODE: 05004

REPORT: EN\_100

PARTS LIST : PL 1058991-105902  
 DOCUMENT/PART NUMBER : A105902  
 PC ASSY DLVP A3

REV. DATE : 06/10/92  
 REVISION LETTER :  
 SHEET : 2

CIRC. FIND	DESIG. NO.	QUANTITY	UM	CAGE	PART NUMBER	NOMENCLATURE	DRAW SIZE	MIL-SPEC / DRAWING NO.	NOTE NO.
R1		1.000	EA		RLR20C2701GR	RES 2.7K 1/2W 2% DALE			
R2		1.000	EA		RLR20C1002GR	RES 10K 1/2W 2% DALE			
R3		1.000	EA	81349	RLR20C1002GR	RES, FIXED FILM, 100, 1/2 W, 2%		MIL-R-39017/2	
R4		1.000	EA		RLR20C1002GR	RES 10K 1/2W 2% DALE			
R5		1.000	EA		RLR20C1002GR	RES 10K 1/2W 2% DALE			
R6		1.000	EA		RLR20C1001GR	RES 1K 1/2W 2% DALE			
R7		1.000	EA		RLR20C1001GR	RES 1K 1/2W 2% DALE			
R8		1.000	EA		RLR20C2703GR	RES 270K 1/2W 2% DALE			
R9		1.000	EA		RLR20C2702GR	RES 27K 1/2W 2% DALE			
R10		1.000	EA		RLR20C4702GR	RES 47K 1/2W 2% DALE			
R3		1.000	EA		106872-1	SWITCH 3POSN PB W/ REM NO TS MOD. 55031K-206A		3106872-1	
U1		1.000	EA		UC3584C	IC LINEAR, UNITHODE-PULSE WIDTH MODULATOR, CERAMIC 16-PIN 40V 100MA			
X01		1.000	EA		101906	XSTR PAD (503-025N)	A		101906
X02		1.000	EA		100-095	XSTR PAD MFR: BIVAR			
*ERR*		1.000	EA		2-640352-3	IC SOCKET 16 PIN			

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TRANSISTOR DEVICES INC.

RANDOLPH, NJ 07869

CAGE CODE: 09024

PARTS LIST : PL 1052991-105902  
DOCUMENT/PART NUMBER : A105902  
PC ASSY DLVP A3

REV. DATE : 06/10/92

REVISION LETTER :

SHEET : 3

NOTE NO. RH NO NOTES ENTERED FOR THIS NOTE NUMBER



