

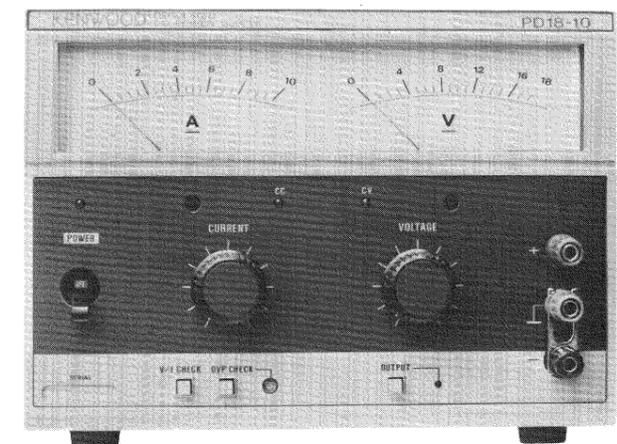
KENWOOD

CONSTANT-VOLTAGE/CURRENT POWER SUPPLY

PD18-10(D) PD35-10(D)

SERVICE MANUAL REVISED EDITION

KENWOOD CORPORATION



(EX. PD18-10)

WARNING

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

SAFETY

Before connecting the instrument to a power source, carefully read the following information, then verify that the proper power cord is used and the proper line fuse is installed for power source. If the power cord is not applied for specified voltage, there is always a certain amount of danger from electric shock.

Line voltage

This instrument operates using ac-power input voltages that 100/120/220/240 V at frequencies from 50 Hz to 60 Hz.

Power cord

The ground wire of the 3-wire (for 120 V operation; 2-wire) ac power plug places the chassis and housing of this instrument at earth ground. Do not attempt to defeat the ground wire connection or float this instrument; to do so may pose a great safety hazard.

The appropriate power cord is supplied by an option that is specified when the instrument is ordered.

Warning

If groundings, especially points \downarrow (V_G) and \downarrow (I_G), are short-circuited during servicing, it could lead to pattern damage due to large amount of current flow on the PCB. Take appropriate care.

CONTENTS

SPECIFICATIONS	3
BLOCK DIAGRAM	5
CIRCUIT DESCRIPTION	6
ADJUSTMENT	10
TROUBLESHOOTING	13
PARTS LIST	16
SCHEMATIC DIAGRAM	28
P.C. BOARD	32
DISASSEMBLY	34
SEMICONDUCTORS	35

SPECIFICATIONS

Model PD		18-10 (D)	35-10 (D)
Output			
Output voltage 10-positions		0 to 18 V	0 to 36 V
Resolution (theoretical)		3.1 mV	6.2 mV
Output current 1-position		0 to 10 A	0 to 10 A
Resolution (theoretical)		15 mA	15 mA
Voltage regulation (CV)			
With input changes of $\pm 10\%$ Note 1)		0.005% + 1 mV	
With load changes of 0 to 100% Note 1)		0.005% + 1 mV	
Ripples/noises (10 Hz to 1 MHz) rms Note 2)		0.5 mV rms	
Transient response, (standard value)		50 μ s, typical	
Temperature characteristic, (standard value)		100 ppm/ $^{\circ}$ C, typical	
Remote control resistance/voltage		approx. 0 to 10 k Ω /0 to 10 V	
Current regulation (CC)			
With input changes of $\pm 10\%$		1 mA	1 mA
With load changes of 0 to 100%		5 mA	5 mA
Ripples/noises (10 Hz to 1 MHz) rms Note 2)		3 mA rms	3 mA rms
Remote control resistance/voltage		approx. 0 to 10 k Ω /0 to 10 V	
Protection			
Operation		turns off power switch	
Temperature detection		100 $^{\circ}$ C	
Overvoltage protection level (standard value)		15 to 110% of rated output voltage	
Meter and indications			
Voltmeter (class 2.5) F.S		18 V	36 V
Ammeter (class 2.5) F.S		10 A	10 A
D type	Voltage at digital display (Auto range)	3-1/2 digits 19.99 V, 199.9 V (FS) two ranges \pm (0.1% rdg + 1 digit) 23 $^{\circ}$ C \pm 5 $^{\circ}$ C; Less than 80% RH	
	Current at digital display (Fix. range)	3-1/2 digits 19.99 A (FS), \pm (0.5% rdg + 1 digit) 23 $^{\circ}$ C \pm 5 $^{\circ}$ C, Less than 80% RH	
Indication of constant voltage operation		CV green LED lights	
Indication of constant current operation		CC red LED lights	
Indication of output		OUTPUT red LED lights when turned on	
Function			
Output switch		Turns on and off output (preset voltage indicated with meter during off time)	
Voltage/current check switch		Preset voltage and current indicated with meters during on time	
Overvoltage preset (OVP)		Indicates the over voltage protection level on the voltmeter during on time	
Remote sensing		Via the rear panel sensor terminal	
Series control		Master/slave control	
Parallel control		Master/slave control	
Operating conditions			
Temperature		0 $^{\circ}$ C to 40 $^{\circ}$ C	
Humidity		Less than 80%	
Cooling		Fan	
Output polarity		Plus or minus	
Withstand voltage to ground		\pm 250 VDC	

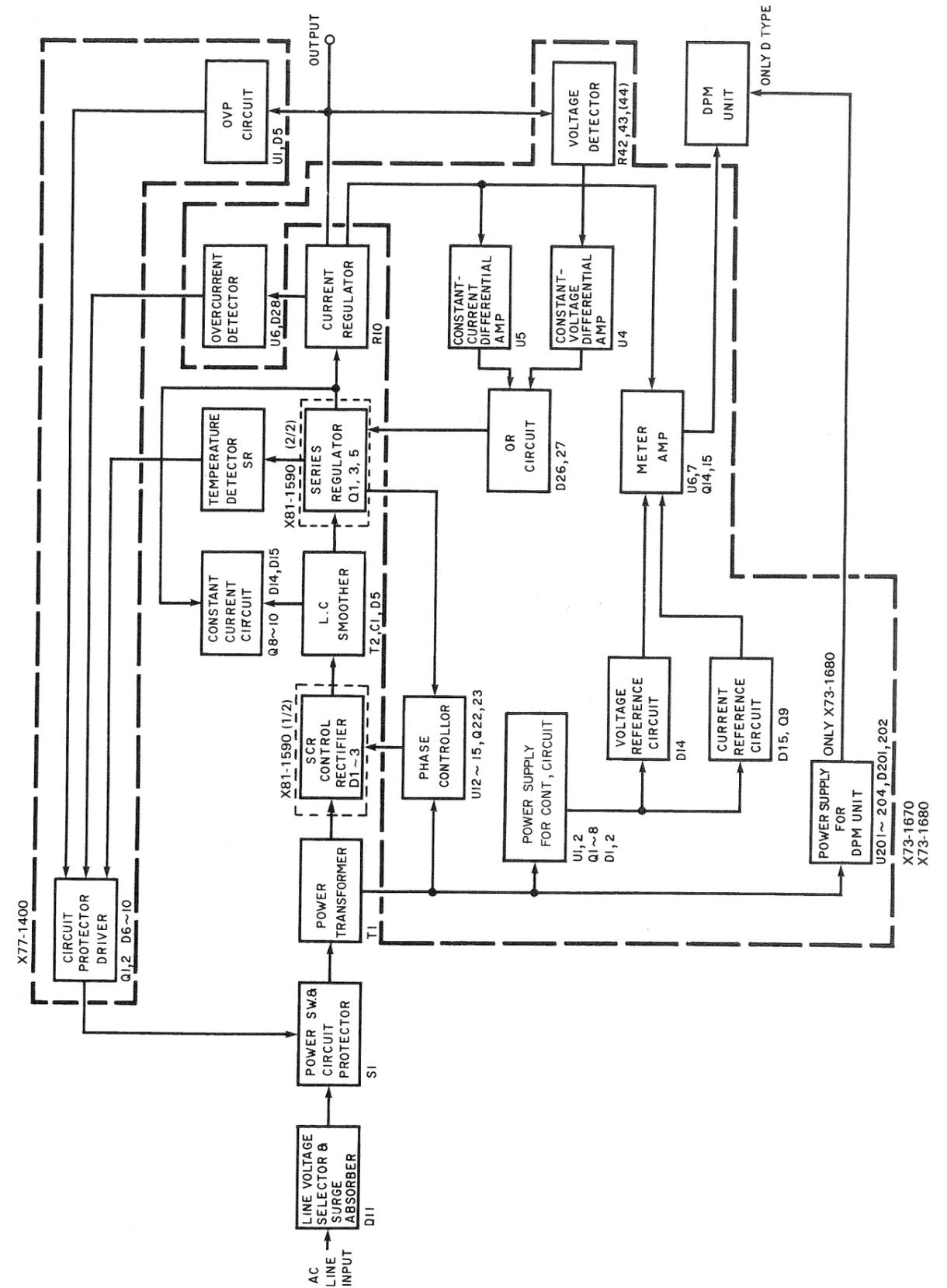
SPECIFICATIONS

Model PD		18-10 (D)	35-10 (D)
Insulation resistance			
Chassis-input line		30 MΩ or more at 500 VDC	
Chassis-output line		20 MΩ or more at 500 VDC	
Power supply			
Input voltage		100/120/220/240 VAC ± 10%, 1φ selectable internally	
Power consumption (at AC 100 V)		Approx. 360 W	Approx. 560 W
		Approx. 530 VA	Approx. 830 VA
Dimensions and weight			
Enclosure dimensions (mm)	(W)	208	208
	(H)	147	147
	(D)	300	300
Maximum dimensions (mm)	(W)	208	208
	(H)	168	168
	(D)	346 (355)	346 (361)
Weight		Approx. 12 kg	Approx. 14 kg
Accessories			
Instruction manual		1	1
Input power cord	100 V, 120 V area	2 or 3-core AC cable, 2 m	2 or 3-core AC cable, 2 or 2.5 m
	220 V, 240 V area	3-core AC cable, (2 m)	
Connector retainer	100 V, 120 V area	NONE	1
	220 V, 240 V area	NONE	NONE
Fuse	100 V, 120 V area	7 A × 2	12 A × 2
	220 V, 240 V area	4 A × 2	6 A × 2

Note: 1. Measured via the sensing terminal.
2. Measured with plus or minus grounded.

■ Circuit and ratings are subject to change without notice due to developments in technology.

BLOCK DIAGRAM



CIRCUIT DESCRIPTION

DESCRIPTION OF BLOCK DIAGRAM

- 1. Voltage selector and surge absorber.**
Selects rated input voltage and limits external noise.
- 2. Power switch (circuit protector)**
This function as a power switch, and breaks the power supply in event of an accident in the power source.
- 3. Power transformer**
Provides auxiliary windings to operate the main and accessory circuits in the transformer.
- 4. SCR control rectification circuit**
A rectification circuit to control the DC level synchronized with AC, with the gate pulse from the phase control circuit.
- 5. L, C smoothing circuit**
Averages the rectified output from the choke coil and capacitor. The choke coil limits transient current for a high power factor and low ripple.
- 6. Phase control circuit**
Generates a trigger pulse AC synchronized with the SCR control rectification circuit to maintain the V_{CE} of the series transistors at a constant voltage.
- 7. Series control circuit**
Used to control high output with a small signal by Darlington connecting the high output power transistor.
- 8. Current detecting circuit**
A stable detection voltage is obtained by effecting adequate derating, using resistor with a low temperature factor.
- 9. Voltage detecting circuit**
A stable detection voltage is obtained using a highly precise metal oxide film resistor with a low temperature factor.
- 10. CC error (differential) amp**
A highly precise amplifier which uses a high-gain, low-drift OP Amp and compares output from the current detecting circuit with the current reference voltage.
- 11. CV error (differential) amp**
A highly precise amplifier which uses a high-gain, low-drift OP Amp and compares output from the voltage detecting circuit with the voltage reference voltage.
- 12. OR circuit**
Selects automatically one (using) the OR circuit from the CV or CC amp depending on output and setting.
- 13. Circuit power source**
Supplies regulated DC voltage to operate the control circuit and provides a protection function.
- 14. Voltage reference circuit**
This circuit is within the control power source feedback loop, and stably drives the temperature compensation zener diode.
- 15. Current reference circuit**
Drives the temperature compensation zener diode using the constant current circuit to provide a stable output.
- 16. OVP circuit**
Detects output voltage within a range of 15%-110% of the rated output voltage, according to the external overvoltage setting.
- 17. Overcurrent detecting circuit**
Detects when the current reaches a level of 125% of the rated current, using the signal from the current detecting circuit.
- 18. Temperature detecting switch**
Detects when the heat sink of series transistor becomes 100 °C with the thermal relay.
- 19. Constant-current circuit**
A discharge circuit for series transistor leakage current and the output capacitor.
- 20. Circuit protector drive circuit**
Drives the protector with the signals that come from the respective detecting circuits. It provides a constant and discharge circuit to minimize influence from small noise, etc.
- 21. Meter amp**
Selects output voltage, voltage or reference voltage with the V/I, OUTPUT and OVP and passes it through the buffer amp to provide stabilized meter output.

CIRCUIT DESCRIPTION

1. MAIN POWER SOURCE (X81-1590)

The AC input voltage is rectified by D1-D3, and the output smoothed by the choke coils T2 and C1. The thyristors D1 and D2 are controlled in the phase control circuit. The rectified voltage goes through the series control transistors Q1, 3, 5 and current detecting resistor R10, and is supplied to the output +OUT terminal. The -OUT terminal goes through D6 and returns to the rectification circuit.

2. REFERENCE VOLTAGE CIRCUIT (X73-1670), (X73-1680)

This circuit generates the control circuit power source and a variable reference voltage for voltage and current (V_{ref} , I_{ref}). The AC voltage is rectified by D1 and, a constant voltage of ± 15 V is generated in the constant voltage circuit which consists of Q1-Q8, U1 and D14.

The reference voltage of ± 15 V is generated by the zener diode D14.

-15 V is generated by the error amplifier U1 (1/2), reference voltage (D14) and the dividing resistors R20 and R21.

+15 V is generated by the error amplifier U1 (2/2) and dividing resistors R9 and R10.

The GND of the ± 15 V is indicated by $\downarrow V_G$ on the circuit diagram, and is connected to the +OUT terminal. The power source of this differential amplifier U1 is supplied by the zener diodes D6 and D9.

V_{ref} is the variable reference voltage for constant voltage control, and the V_{ref} voltage (0-10 V) is output between the rear terminals ③ - ⑤ from U3 (2/2), VR1 VOLTAGE.

I_{ref} is the variable reference voltage for constant current control, and the V_{ref} voltage (0-10 V) is output to the rear terminals ⑧ - ⑩ from U3 (1/2), VR2 CURRENT.

3. VOLTAGE/CURRENT CONTROL CIRCUIT (See Fig. 2)

With the floating type of voltage control, the control circuit is controlled using the +OUT terminal as a reference GND. The GND of the control power source ± 15 V ($\downarrow V_G$) is therefore of equal potential to the +OUT terminal.

The +OUT terminal voltage and a voltage divided by the voltage detecting resistors R42 and R43 are applied to the voltage control feedback amplifier U4.

Both input terminals of U4 are operated to keep the same potential.

The output from the feedback amplifier U4 goes through D26, is amplified by Q12 and Q13, passes through Q7 (Y87), and drives the base of the next stage current amplification circuit Q1, 3, 5. The voltage at both ends of the constant current detecting resistor R10 (0.036 ohms, 40 W) is used as a reference for the next constant current operation.

This point is the GND during constant current operation, is indicated by $\downarrow I_G$ on the circuit diagram, and becomes the reference point.

When the output current I_0 flows, the voltage produced in the current detecting resistor R10 is applied to the control amplifier U5. The voltage divided to I_{ref} voltage feedback by R45 and R46 is applied to U5.

When the voltage at both ends of R10 exceeds this divided voltage (R45 and R46), U5 is operated to drive as the constant current through D27.

The output from U5 drives Q1, 3, 5 (series regulators) through the same route as during constant voltage operation. When the current exceeds the constant current setting value, the operation of the feedback amplifier circuit U4 is simultaneously stopped, and the D26 route is interrupted. Namely D26 and D27 are control OR circuits.

4. METER CIRCUIT

The voltmeter indicating circuit detects voltage from the +OUT terminal, which goes through U2 (2/2) (X77), the OVP CHECK S3b switch, U6 (1/2) (X73), the OUTPUT ON/OFF switch, the V/I CHECK switch, meter amp U7 (2/2) and is applied to the voltmeter.

During V/I CHECK operation, the V_{ref} voltage is applied directly to the meter amp U7 (2/2).

The voltage detected by the current detecting resistor R10 for the ammeter circuit goes through the V/I CHECK switch and is applied to the ammeter amp U7 (1/2).

During V/I CHECK, the I_{ref} voltage is applied directly to the meter amp U7 (1/2). Q1, 3, 5 (series regulators) are controlled by Q10, Q12, Q13 (X73) and Q7 (Y86), by operating the OUTPUT ON/OFF switch, to turn output voltage ON and OFF.

5. OVP CIRCUIT AND OCP CIRCUIT

The D5 (zener diode) (X77) reference voltage that is divided with VR1 and the +OUT terminal voltage divided by R3, R4 is applied to the OVP voltage detecting comparator U1 (1/2) (X77). When the output voltage exceeds the voltage setting of VR1 (OVP setting VR), the output of U1 is inverted. The inverted output goes through D8, Q1 and D9, drives thyristor D10 and turns the breaker switch S1 (APG4) OFF.

The reference (GND) of the OVP circuit is the same as the +OUT terminal V_G of the voltage control circuit.

The detecting voltage generated by the current detecting resistor R10 and the reference voltage of D28 (zener diode) (X73) is applied to the OCP current detecting comparator U6 (2/2) (X73).

If an excessive amount of current flows (overcurrent), the output of U6 (2/2) is inverted, it goes through D7, Q1 and D9 to drive the thyristor D10 and turns the breaker switch S1 (APG 4) OFF.

CIRCUIT DESCRIPTION

Furthermore, the thermal relay provided on the heat sink to prevent overheating of the series regulator transistor detects abnormal temperature rise, and turns the breaker switch S1 OFF through D6. (X77-1400)

The OVP circuit, OIP circuit and overheating prevention protective circuit drive the breaker switch S1 with the OR circuit that consists of D6, D7 and D8. (X77-1400)

6. PHASE CONTROL CIRCUIT (X73-1680)

The PD series power source features a phase control circuit to control the thyristors D1 and D2 (X81-1590) of the main power source rectifying bridge, in order to minimize power loss of the series control transistors (Q1, 3, 5) by maintaining the voltage between the Q1, 3, 5 collectors and emitters, regardless of load. The GND of this phase control circuit consists of the emitter of the series control transistors Q1, 3, 5, with an independent floating circuit from the unit power source.

A stable ± 15 V is generated for the phase control circuit power source by U10 and U11. A sawtooth wave that is synchronized with the AC power source line is generated by D42, D43 and U12. This sawtooth wave is applied to U13 (2/2). (See Fig. 3)

The collector voltage (V_{CE} detecting voltage) of the series control transistor is applied to the error amplifier U13 (1/2). The DC voltage of U13 (1/2) is added to the sawtooth wave of U12 (2/2) and applied to the input of U13 (2/2). The pulse width modulated (PWM) output of U13 (2/2) is finely differentiated by C64, etc., to drive the one shot multi U14.

The output of U14 (trigger gate pulse) is separated from the GND of the phase control circuit, and amplified by Q22 and Q23 to drive the thyristors (D1 and D2).

Note: GND indication of respective circuits

Case \perp Unit GND (Case or Chassis)
 V_G ∇ Voltage control circuit GND
 I_G ∇ Current control circuit GND (one end - point "a" of current detecting resistor R10)
 Phase control circuit GND (emitter point of series control transistors Q1-Qn)

Caution:

Do not short the insulation to the GND of the respective circuits when repairing breakdowns.

This may result in burning of the wiring and/or printed circuit board.

7. DPM UNIT (D type only)

The digital panel meter unit consists of the voltage indicator circuit and current indicator circuit, which both function the same electrically.

U1 (U31) is the 3-1/2 digit indication A/D converter, with a 7 segment LED driver incorporated. U2 (U32) generates the reference voltage.

The optimum value is set with VR1 (VR31), and VR2 (VR32) is for full scale adjustment. The A/D converter is provided with an external circuit constant to enable full scale indication of 1999 when 1.999 V is input, regardless of voltage indication, current indication and type of unit. Namely, these circuit constants are R1 (R31), C3 (C33), C4 (C34) and C5 (C35).

The main amp output of the amp unit (X73) is fed to the attenuator which consists of R20 (R50) and the amp unit R81 (R73). Voltage indication is 3-1/2 digits, but a 2nd attenuator is provided for 2 step auto range in case of indication 20 V or higher. When the indication in the U3 circuit exceeds 1999, a range up signal is output, and a range down signal is output when the indication is 1000 or lower. This signal is latched to the RS flip flop which comprises U4, is passed through Q1, Q2 and drives the decimal point LED. Simultaneously, Q3 drives the analog switch Q4.

Since the ground levels for the meter output of the voltage and current are different, the respective power supplies are isolated.

CIRCUIT DESCRIPTION

PRINCIPLE OF THE FLOATING REGULATOR

V_{ref} : Reference voltage at CV
 I_{ref} : Reference voltage at CC
 V_G : Ground at CV
 I_G : Ground at CC

The output voltage at CC operation

$$V_0 = \frac{R_2}{R_1} V_{ref}$$

The output current at CC operation

$$I_0 = \frac{K}{R_s} I_{ref} \text{ (where } K = \frac{R_4}{R_3 + R_4} \text{)}$$

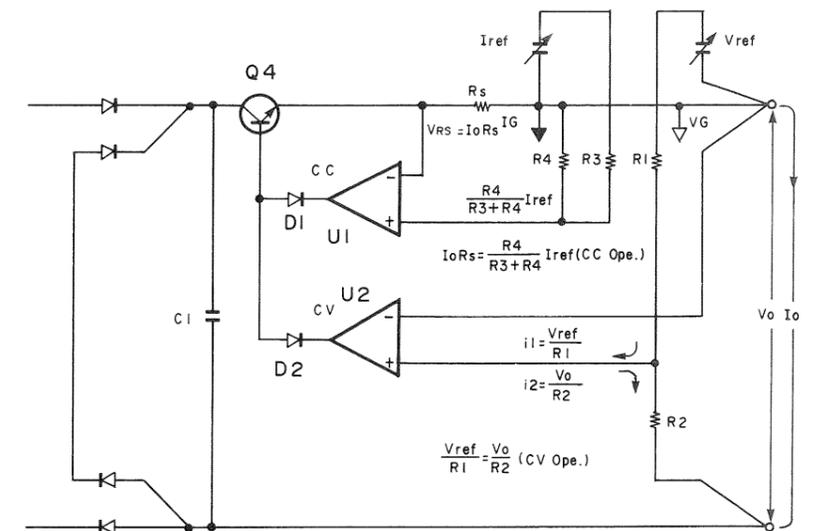


Fig. 2 With the PD series, the constant output voltage and current are obtained by changing the V_{ref} and I_{ref} .

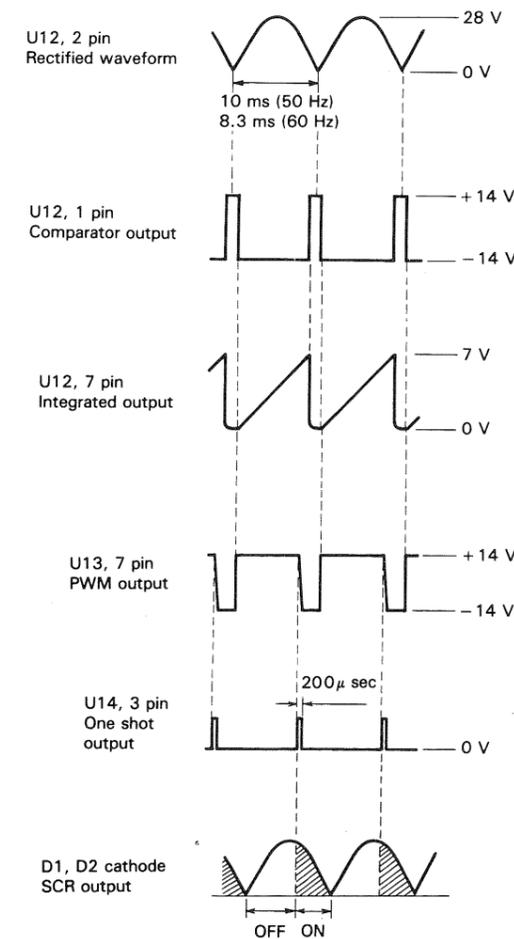


Fig. 3

ADJUSTMENT

ADJUSTMENT

To obtain the best performance, periodically calibrate the unit. Sometimes, only one mode need be calibrated, while at other times, all modes should be calibrated.

When one mode is calibrated, it must be noted that the other modes may be affected

When calibrating all modes, perform the calibration in specified sequence. The following calibration required an accurate measuring instrument and an insulated adjusting flat blade screwdriver.

For optimum adjustment, turn the power on and warm up this equipment sufficiently (more than 30 minutes) before starting.

Before calibrating the unit, check the power supply voltage and the zero of the voltmeter and ammeter.

TEST EQUIPMENT REQUIRED

The following instrument or their equivalent should be used for making adjustment.

Multimeter	8810A	FLUKE
Oscilloscope	CS-5165	KENWOOD

PREPARATION FOR ADJUSTMENT

1) The control and switch settings listed below should be used for each adjustment procedure.

Exceptions to these setting will be noted as occur.

2) Power cord should be correctly connected.

3) Short bar should be connected as follows.

⊕ - ⊕S, ⊖ - ⊖S, ① - ②, ③ - ④, ⑥ - ⑦, ⑧ - ⑨, ⑩ - ⊖ (on the front panel)

4) Heat sink should be insulated with respect to the chassis.

5) Unless otherwise specified, set each control as follows after completion of each adjustment.

POWER	ON
VOLTAGE	Maximum counterclockwise position
CURRENT	Maximum counterclockwise position
OUTPUT	OFF (■)
V/I CHECK	OFF (■)
OVP CHECK	OFF (■)
OVP adj. control	Maximum clockwise position

Item	Control and setting	Test Equip.	Adj. Control	Specifications	Procedure
C1 Voltage check		8810A		Less than 10V	Connect a multimeter to measure the voltage between C1 (+ side) and (- side).
± 15V check		8810A		± 15V ± 0.5V	Connect a multimeter to measure the voltage between OUTPUT (⊕) on the front panel and ± 15V test points on the AMP unit, respectively.
V_{CE} voltage coarse	VOLTAGE; maximum clockwise position CURRENT; maximum clockwise position	8810A	VR20	Approx 4.5V	Connect a multimeter to measure the voltage between collector and emitter of the transistor on the heat sink. See Fig. 4.
V_{REF} offset	OUTPUT; OFF VOLTAGE; minimum counterclockwise position CURRENT; maximum clockwise position	8810A	VR2	0V ± 0.5mV	Connect a multimeter between OUTPUT terminal ⊕S and control terminal NO.3 on the rear panel.
V_{REF} gain	VOLTAGE; maximum clockwise position CURRENT; maximum clockwise position	8810A	VR1	10.25V ± 0.03 V	Connect a multimeter between OUTPUT terminal ⊕S and control terminal NO.3 on the rear panel.
V meter offset	VOLTAGE; minimum counterclockwise position CURRENT; maximum clockwise position		VR8	0V D type; 0V ± 0V	Make adjustment while observing the V meter on the front panel.

ADJUSTMENT

Item	Control and setting	Test Equip.	Adj. Control	Specifications	Procedure
V OUT offset	OUTPUT; ON VOLTAGE; minimum counterclockwise position CURRENT; maximum clockwise position		VR11	0 V D type; 0 V ± 0 V	Make adjustment while observing the V meter on the front panel.
V meter gain	CURRENT; maximum clockwise position V/I CHECK; OFF	8810A	VR7	Specified voltage(full scale) D type; specified voltage ± 1 digit	Connect a multimeter between OUTPUT terminal ⊕ and ⊖ on the front panel. Rotating the VOLTAGE control to indicate specified voltage range on the multimeter. Make adjustment while observing the V meter on the front panel.
V check	OUTPUT; ON CURRENT; maximum clockwise position V/I CHECK; ON	8810A	VR5	Specified voltage (full scale) D type; specified voltage ± 1 digit	
I_{REF} offset	OUTPUT; ON VOLTAGE; maximum clockwise position CURRENT; minimum counterclockwise position	8810A Load (1) Current detecting resistor	VR4	10mV ± 1mV	Connect the multimeter between control terminal NO.8 and NO.11 on the rear panel.
I_{REF} gain	OUTPUT; ON VOLTAGE; maximum clockwise position CURRENT; optimum position		VR3	+ 2.5% for specified current	1 Connect a load (1) which can accept the specified current value. 2 Make adjustment so that the current value of the load (1) displays + 2.5% for the specified current value while measuring the current value.
I meter offset	OUTPUT; OFF VOLTAGE; maximum clockwise position CURRENT; minimum counterclockwise position		VR10	0A D type; 0A ± 0A	
I meter gain	OUTPUT; ON VOLTAGE; maximum clockwise position CURRENT; optimum position V/I CHECK; OFF	8810A Load (1) Current detecting resistor	VR9	Specified current value(full scale) D type; specified current value ± 1 digit	1 Connect a load (1) which can accept the specified current value. 2 Set the value to specified current value by using the CURRENT control. 3 Make adjustment so that the value of I meter on the front panel becomes the specified current value.
I check	V/I CHECK; ON VOLTAGE; maximum clockwise position CURRENT; optimum position	8810A Load (1) Current detecting resistor	VR6	Specified current value (full scale) D type; specified current value ± 1 digit	

Note: Be sure to adjust the I_{REF} gain, I meter offset and I check when the CC indicator is lit.

ADJUSTMENT

Item	Control and setting	Test Equip.	Adj. Control	Specifications	Procedure
V _{OE} voltage fine	VOLTAGE; maximum clockwise position CURRENT; maximum clockwise position	Load (2)	VR20	4.5V ± 0.1V	Repeat entire procedure for V _{CE} coarse adjustment. Be sure to connect a load with which 10% current value for specified current can be supplied.

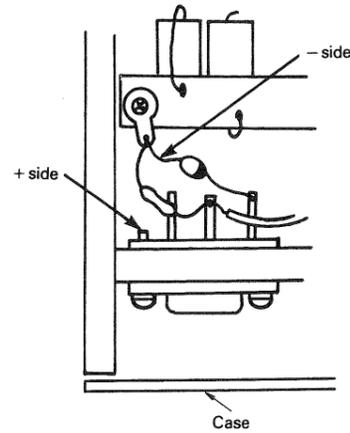


Fig. 4 Right side of heatsink

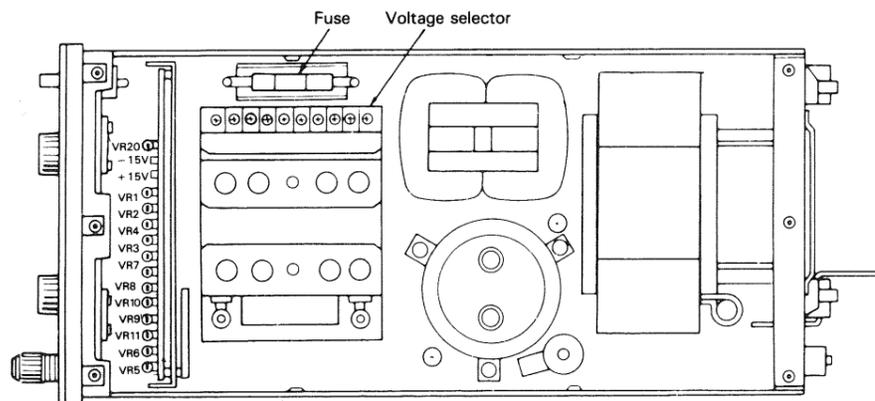


Fig. 5 Location of adj. control

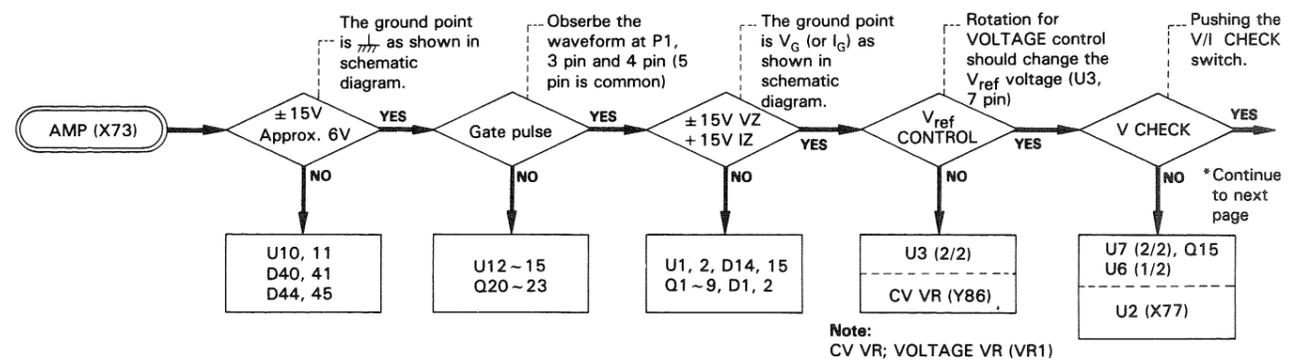
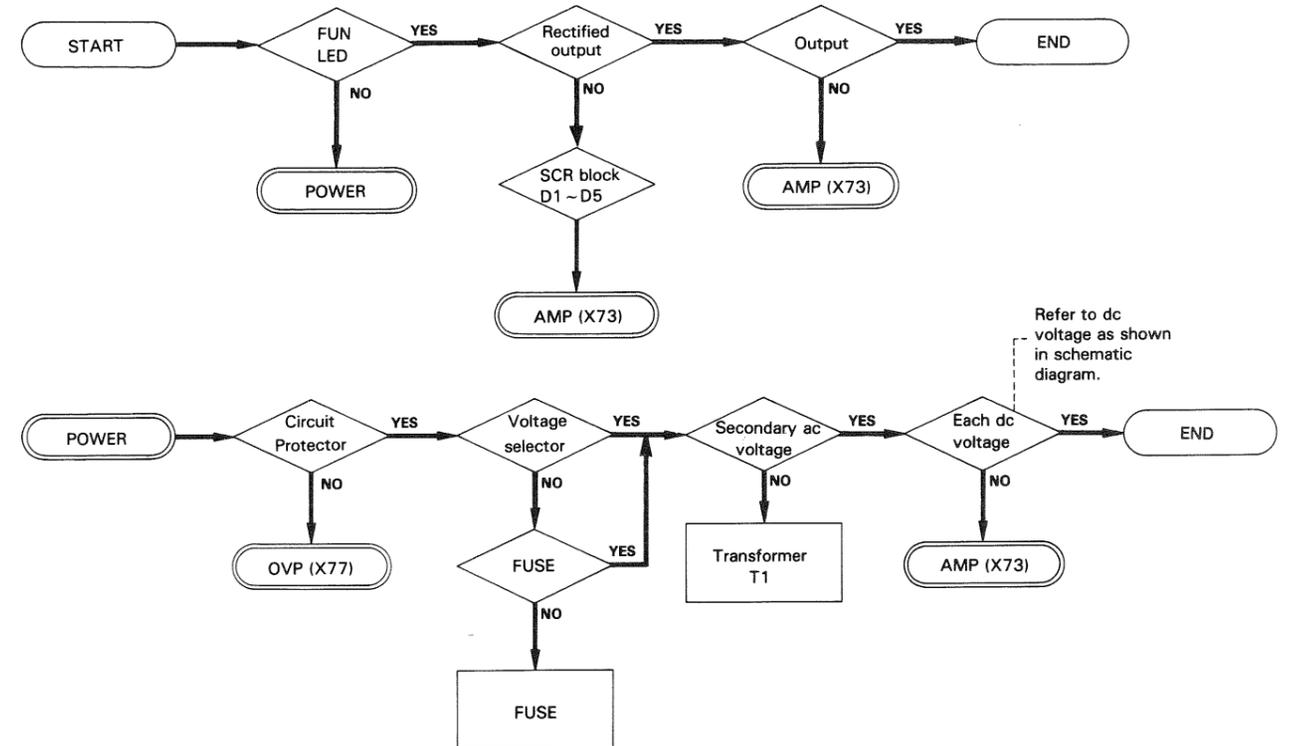
Current detecting resistor	10mΩ	50W, 0.1%	Note: With an electronic load (35 V, 30 A) for load (1) and (2), the adjustment may be easy.
Load (1)	0.1Ω	300W, 5%	
Load (2)	5Ω	150W, 5%	

TROUBLESHOOTING

Index:
 Y86 ... Main chassis
 X73 ... X73-1670 (or X73-1680): AMP UNIT
 X77 ... X77-1400: OVP UNIT

Note:
 Check and judgement
 Malfunction
 Item

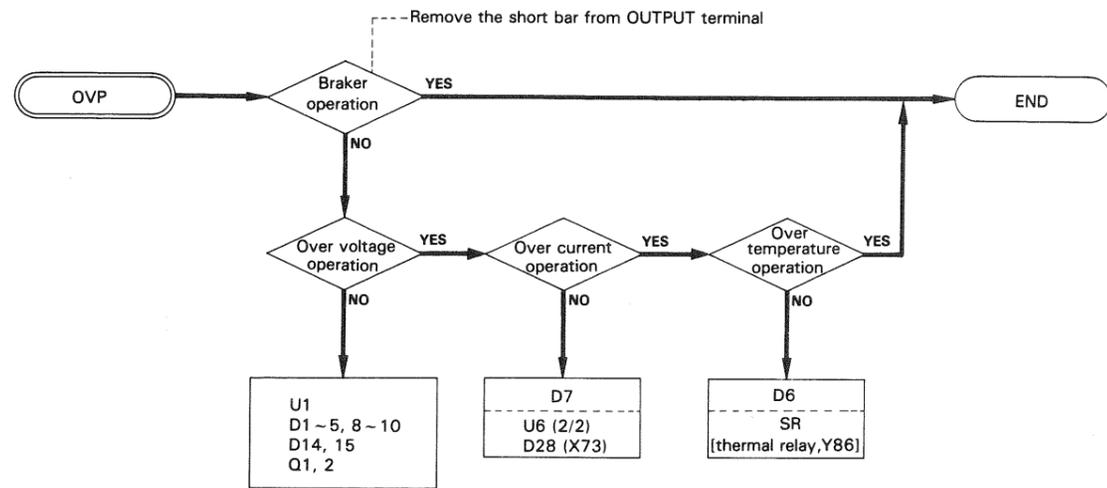
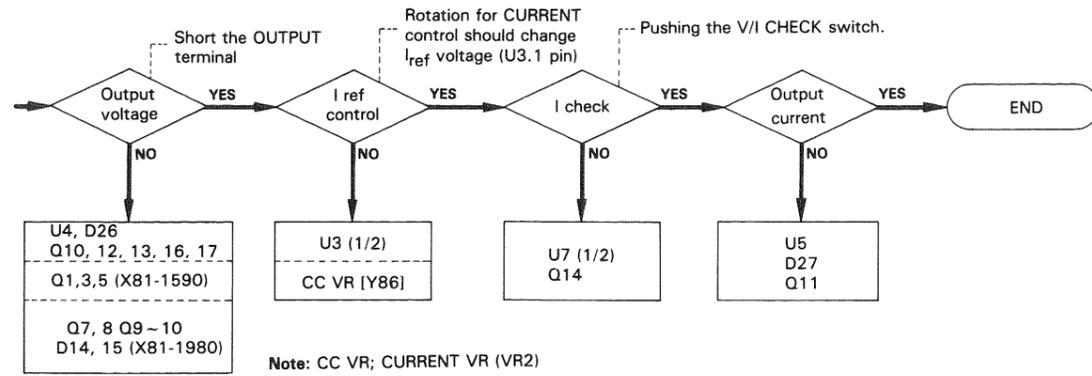
1. ANALOG METER SECTION



Note:
 CV VR; VOLTAGE VR (VR1)

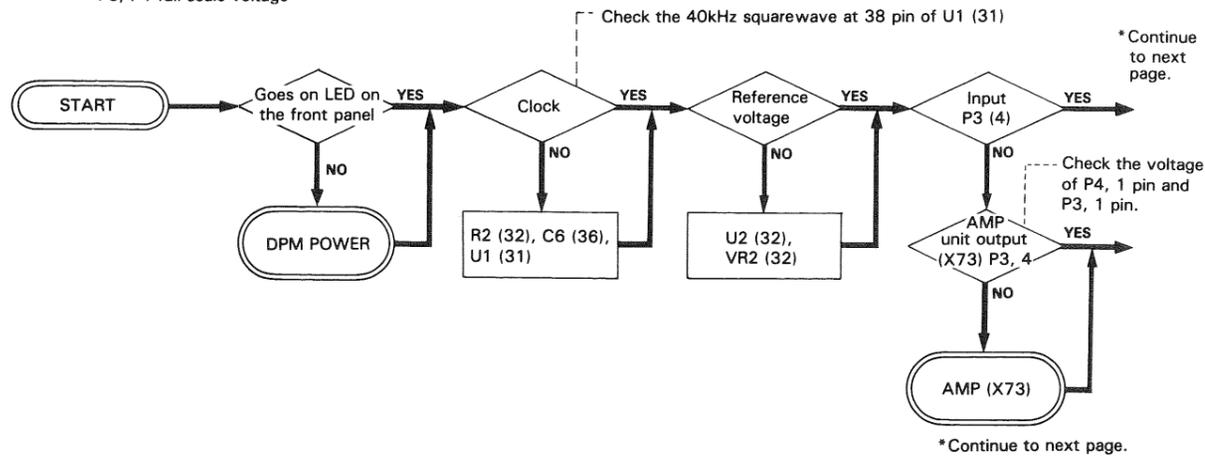
TROUBLESHOOTING

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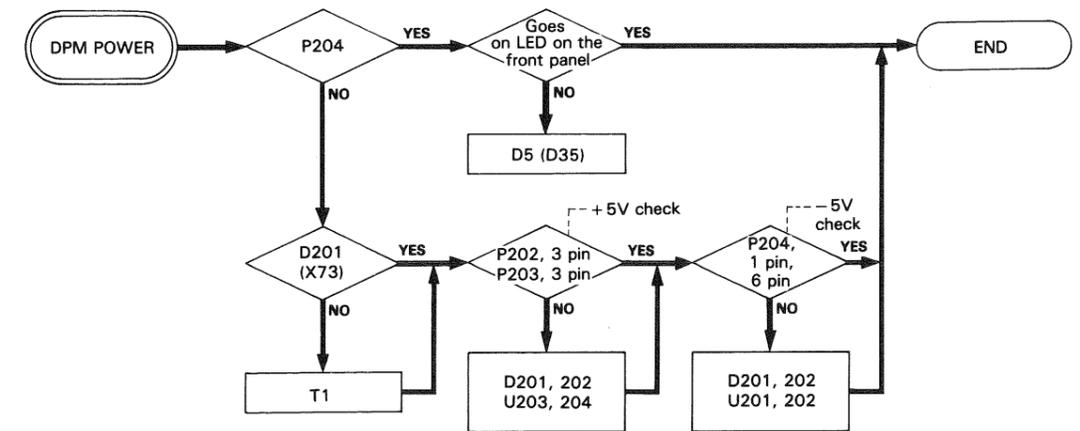
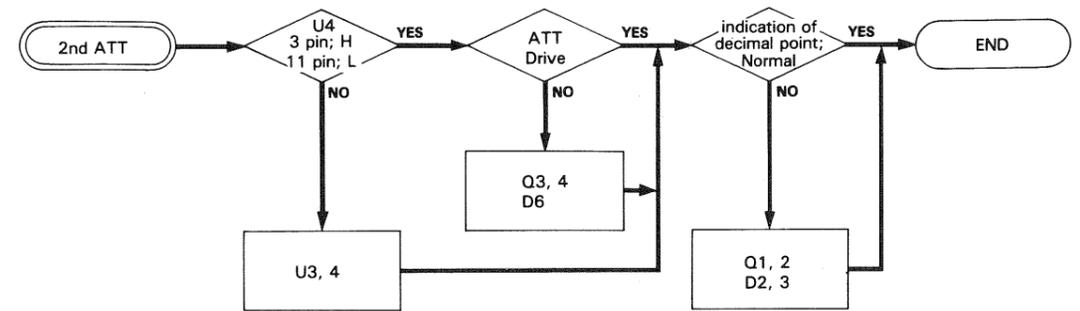
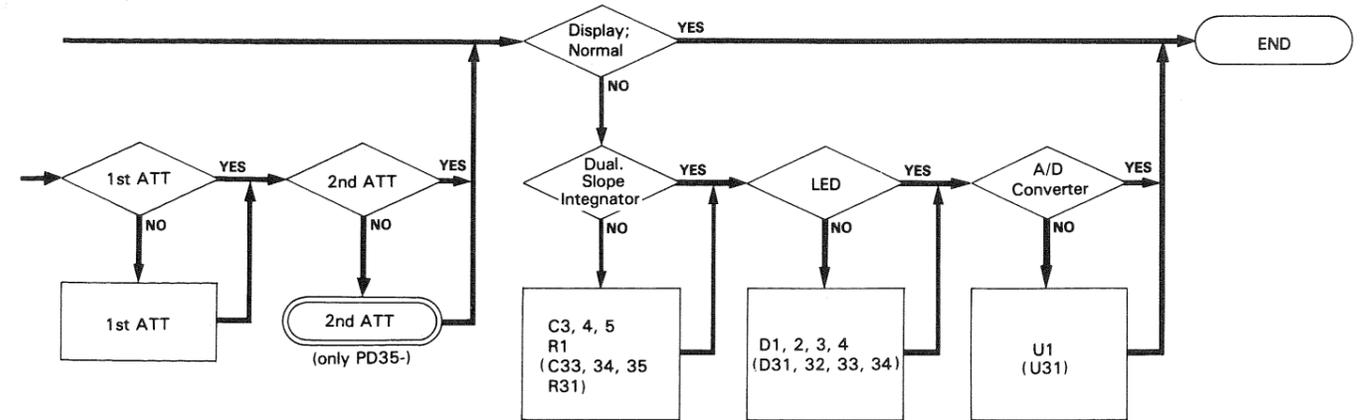
2. DIGITAL POWER METER SECTION

Power supply of P204; ±5V
P3, P4 full scale voltage



TROUBLESHOOTING

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PARTS LIST

PD18-10 (Y86-1220-00)

REF. NO	PARTS NO	NAME & DESCRIPTION
B31	0735-05	METER (18V-10A)
B40	2851-03	NAME PLATE, MODEL NO.
B41	0782-04	FUSE RATING LABEL
B42	1930-04	LABEL, 100 120 0 100 120J
B42	3820-05	LABEL, 50X15J
B50	7585-30	INSTRUCTION MANUAL; JAPANESE
B50	7586-30	INSTRUCTION MANUAL; ENGLISH
E23	0541-05	EARTH LUG
E23	0564-05	EARTH LUG
E29	0536-14	SHORTING BAR, CONTROL TERMINAL
E29	0537-14	SHORTING BAR, REAR OUTPUT
H01	5785-24	CARTON BOX
H10	2823-12	FOAMED STYRENE PAD (F)
H10	2824-12	FOAMED STYRENE PAD (R)
J21	2912-05	RING/HOLDER FOR LED
J21	4561-04	BRACKET, FOR METER
J32	0876-05	BOSS
J61	0525-05	CARD SPACER
J61	0526-05	LOCKING CARD SPACER
N09	0623-04	SCREW, SEMS PAN HD M3X8
N09	0626-04	SCREW, SEMS PAN HD M3X10
N09	0654-05	SCREW, SEMS PAN HD M4X8
N09	0723-05	SCREW, SEMS PAN HD M5X10
N09	0725-15	SCREW, SEMS PAN HD M4X12
N09	0726-05	SCREW, SEMS PAN HD M4X10
N09	0732-05	SCREW, TRUSS HD M5X8
N09	0735-05	SCREW, SEMS PAN HD M4X6
N09	0748-04	SCREW, SEMS PAN HD M4X12
N09	0942-04	SCREW, SEMS PAN HD M3X8
N14	0404-04	FLANGE NUT M3
N14	0620-05	FLANGE NUT M4
N19	0717-05	INSULATING WASHER
N19	0726-04	WASHER M5
N30	4016-41	SCREW, PAN HD M4X16
N32	3006-41	SCREW, FLAT HD M3X6
N33	4008-41	SCREW, OVAL HD M4X8
N88	4012-41	SCREW, FLAT HD TAPTITE 2X8
N89	3008-41	SCREW, BINDING TAPTITE 3X8
N89	3012-41	SCREW, BINDING TAPTITE 3X12
N89	3014-41	SCREW, BINDING TAPTITE 3X14
N89	4014-41	SCREW, BINDING TAPTITE 4X14
C1	C90-0955-05	CAP. ELECTRO 12000 35V
C2	C90-0919-15	CAP. ELECTRO 1000 20% 50V
C3	C90-0920-05	CAP. ELECTRO 1000 20% 50V
C4	C91-0594-05	CAP. METALIZED 0.1 10% 250V
C5		NO USE
C6	E31-2686-05	SPARK KILLER ASS'Y
C10	CE04EWIE101M	CAP. ELECTRO 100 20% 25V
C11	CE04EWIE101M	CAP. ELECTRO 100 20% 25V
D1	CRO9C	THYRISTOR
D2	CRO9C	THYRISTOR
D8	AR4133S	LED: RED
D9	AR4133S	LED: RED
D10	BG4133S	LED: GREEN
D11	TNR15G431K	VARIATOR
P1	E10-1061-05	EDGE CARD CONNECTOR
P2	E10-3661-05	EDGE CARD CONNECTOR
R10	R92-1195-05	RES. FIXED 0.036 5% 40W
R14	R92-1157-05	RES. FIXED 470 10% 10W
S1	S59-1502-05	SWITCH (CIRCUIT PROTECTOR)
SR	S51-1518-05	THERMAL SENSOR
T1	L01-9546-15	POWER TRANSFORMER
T2	L15-0407-05	CHOKE COIL
VR1	R29-0505-05	V. R. 10K
VR2	R05-3511-05	V. R. 10K
1	A01-1152-03	CASE
2	A10-1446-22	CHASSIS
3	A20-2794-05	PANEL (DIECAST)
4	A21-1081-03	DECORATIVE PANEL
5	B07-0713-04	ESCUTCHEON
6	B40-2765-04	SERIAL NO. PLATE
7	E18-0363-05	INLET SOCKET
8	E20-0491-05	TERMINAL BLOCK 4P
9	E20-1291-15	TERMINAL BLOCK 12P
10	E21-0653-03	TERMINAL, BULE
11	E21-0665-03	TERMINAL, GLAY
12	E21-0666-03	TERMINAL, RED
13	E29-0506-04	SHORTING BAR
14A	E30-1818-05	JIS POWER CORD SET
14B	E30-1819-15	IEC POWER CORD SET
14C	E30-1821-15	SAA POWER CODE SET
14D	E30-1929-05	BS POWER CORD
14E	E30-1820-05	UL/CSA POWER CORD SET
15	F01-0853-14	HEAT SINK
16	F01-0854-34	HEAT SINK
17A	F06-4026-05	FUSE (6.4X30MM) 4A/250V
17B	F06-7027-05	FUSE (6.4X30MM) 7A/250V
18	F19-0712-05	CAP FOR DP-652
19	F20-0657-25	INSULATOR
20	J02-0049-14	LEG
21	J11-0504-05	CLAMPER
22	J13-0033-15	FUSE HOLDER
23	J21-0392-04	HOLDER FOR OUTPUT LEAD
24	J21-2948-04	BRACKET, RIGHT
25	J21-2949-04	BRACKET, LEFT
26	J21-4513-03	BRACKET, FOR PCB
27	J21-4557-04	BRACKET, FOR TRANSISTOR
28	J21-4558-04	BRACKET, FOR TRANSISTOR
29	J21-4559-04	BRACKET, FOR HEAT SINK
30	J21-4560-04	BRACKET, FOR HEAT SINK
32	J21-4570-23	BRACKET, FOR PCB
33	K01-0544-05	HANDLE
34	K21-0877-13	KNOB
35	K27-0528-14	KNOB, FOR PUSH SW
36	T40-0422-05	FAN
37	X73-1670-00	AMPLIFIER UNIT
39	X77-1400-00	OVV UNIT
40	X81-1590-00	RECTIFIER UNIT
42	R19-0743-03	FILTER
43	F07-0928-05	METER COVER

REF. NO	PARTS NO	NAME & DESCRIPTION
18	F19-0712-05	CAP FOR DP-652
19	F20-0657-25	INSULATOR
20	J02-0049-14	LEG
21	J11-0504-05	CLAMPER
22	J13-0033-15	FUSE HOLDER
23	J21-0392-04	HOLDER FOR OUTPUT LEAD
24	J21-2948-04	BRACKET, RIGHT
25	J21-2949-04	BRACKET, LEFT
27	J21-4557-04	BRACKET, FOR TRANSISTOR
28	J21-4558-04	BRACKET, FOR TRANSISTOR
29	J21-4559-14	BRACKET, FOR HEAT SINK
30	J21-4560-04	BRACKET, FOR HEAT SINK
32	J21-4570-23	BRACKET, FOR PCB
33	K01-0544-05	HANDLE
34	K21-0877-13	KNOB
35	K27-0528-14	KNOB, FOR PUSH SW
36	T40-0422-05	FAN
37	X73-1670-00	AMPLIFIER UNIT
39	X77-1400-00	OVV UNIT
40	X81-1590-00	RECTIFIER UNIT
41	X81-1980-05	C. I UNIT

PD18-10D (Y86-1230-00)

REF. NO	PARTS NO	NAME & DESCRIPTION
B40	2853-03	NAME PLATE, MODEL NO.
B41	0782-04	FUSE RATING LABEL
B42	1930-04	LABEL, 100 120 0 100 120J
B42	3820-05	LABEL, 50X15J
B50	7585-30	INSTRUCTION MANUAL; JAPANESE
B50	7586-30	INSTRUCTION MANUAL; ENGLISH
E23	0541-05	EARTH LUG
E23	0564-05	EARTH LUG
E29	0536-14	SHORTING BAR, CONTROL TERMINAL
E29	0537-14	SHORTING BAR, REAR OUTPUT
F20	0647-05	INSULATOR, FOR TRANSISTOR
H01	5787-24	CARTON BOX
H10	2823-12	FOAMED STYRENE PAD (F)
H10	2824-12	FOAMED STYRENE PAD (R)
J21	2912-05	RING/HOLDER FOR LED
J32	0876-05	BOSS
J61	0525-05	CARD SPACER
J61	0526-05	LOCKING CARD SPACER
N09	0623-04	SCREW, SEMS PAN HD M3X8
N09	0626-04	SCREW, SEMS PAN HD M3X10
N09	0654-05	SCREW, SEMS PAN HD M4X8
N09	0723-05	SCREW, SEMS PAN HD M5X10
N09	0725-15	SCREW, SEMS PAN HD M4X12
N09	0726-05	SCREW, SEMS PAN HD M4X10
N09	0732-05	SCREW, TRUSS HD M5X8
N09	0735-05	SCREW, SEMS PAN HD M4X6
N09	0742-04	SCREW, SEMS PAN HD M3X8
N09	0948-04	SCREW, SEMS PAN HD M4X12
N14	0404-04	FLANGE NUT M3
N14	0620-05	FLANGE NUT M4
N19	0191-05	INSULATING WASHER
N19	0717-05	INSULATING WASHER
N19	0726-04	WASHER M5
N32	3006-41	SCREW, FLAT HD M3X6
N32	3008-41	SCREW, FLAT HD M3X8
N33	4008-41	SCREW, OVAL HD M4X8
N88	4012-41	SCREW, FLAT HD TAPTITE 2X8
N89	3008-41	SCREW, BINDING TAPTITE 3X8
N89	3012-41	SCREW, BINDING TAPTITE 3X12
N89	3014-41	SCREW, BINDING TAPTITE 3X14
N89	4014-41	SCREW, BINDING TAPTITE 4X14
C1	C90-0955-05	CAP. ELECTRO 12000 35V
C2	C90-0919-15	CAP. ELECTRO 1000 20% 50V
C3	C90-0920-05	CAP. ELECTRO 1000 20% 50V
C4	C91-0594-05	CAP. METALIZED 0.1 10% 250V
C5		NO USE
C6	E31-2686-05	SPARK KILLER ASS'Y
C10	CE04EWIE101M	CAP. ELECTRO 100 20% 25V
C11	CE04EWIE101M	CAP. ELECTRO 100 20% 25V
D1	CRO9C	THYRISTOR
D2	CRO9C	THYRISTOR
D8	AR4133S	LED: RED
D9	AR4133S	LED: RED
D10	BG4133S	LED: GREEN
D11	TNR15G431K	VARIATOR
P1	E10-1061-05	EDGE CARD CONNECTOR
P2	E10-3661-05	EDGE CARD CONNECTOR
R10	R92-1195-05	RES. FIXED 0.036 5% 40W
R14	R92-1157-05	RES. FIXED 470 10% 10W
S1	S59-1502-05	SWITCH (CIRCUIT PROTECTOR)
SR	S51-1518-05	THERMAL SENSOR

PARTS LIST

REF. NO	PARTS NO	NAME & DESCRIPTION
T1	L01-9546-15	POWER TRANSFORMER
T2	L15-0407-05	CHOKE COIL
U203	UPC7805H	IC, VOLTAGE REGULATOR
U204	UPC7805H	IC, VOLTAGE REGULATOR
VR1	R29-0505-05	V. R. 10K
VR2	R05-3511-05	V. R. 10K
1	A01-1152-03	CASE
2	A10-1446-22	CHASSIS
3	A20-2794-15	PANEL (DIECAST)
4	A21-1088-03	DECORATIVE PANEL
5	B07-0713-04	ESCUTCHEON
6	B40-2765-04	SERIAL NO. PLATE
7	E18-0363-05	INLET SOCKET
8	E20-0491-05	TERMINAL BLOCK 4P
9	E20-1291-15	TERMINAL BLOCK 12P
10	E21-0653-03	TERMINAL, BULE
11	E21-0665-03	TERMINAL, GLAY
12	E21-0666-03	TERMINAL, RED
13	E29-0506-04	SHORTING BAR
14A	E30-1818-05	JIS POWER CORD SET
14B	E30-1819-15	IEC POWER CORD SET
14C	E30-1821-15	SAA POWER CODE SET
14D	E30-1929-05	BS POWER CORD
14E	E30-1820-05	UL/CSA POWER CORD SET
15	F01-0853-14	HEAT SINK
16	F01-0854-34	HEAT SINK
17A	F06-4026-05	FUSE (6.4X30MM) 4A/250V
17B	F06-7027-05	FUSE (6.4X30MM) 7A/250V
18	F19-0712-05	CAP FOR DP-652
19	F20-0657-25	INSULATOR
20	J02-0049-14	LEG
21	J11-0504-05	CLAMPER
22	J13-0033-15	FUSE HOLDER
23	J21-0392-04	HOLDER FOR OUTPUT LEAD
24	J21-2948-04	BRACKET, RIGHT
25	J21-2949-04	BRACKET, LEFT
26	J21-4513-03	BRACKET, FOR PCB
27	J21-4557-04	BRACKET, FOR TRANSISTOR
28	J21-4558-04	BRACKET, FOR TRANSISTOR
29	J21-4559-04	BRACKET, FOR HEAT SINK
30	J21-4560-04	BRACKET, FOR HEAT SINK
32	J21-4570-23	BRACKET, FOR PCB
33	K01-0544-05	HANDLE
34	K21-0877-13	KNOB
35	K27-0528-14	KNOB, FOR PUSH SW
36	T40-0422-05	FAN
37	X73-1680-00	AMPLIFIER UNIT
38	X76-1260-05	DPM UNIT
39	X77-1400-00	OVV UNIT
40	X81-1590-00	RECTIFIER UNIT
41	X81-1980-05	C. I UNIT
42	R19-0743-03	FILTER
43	F07-0928-05	METER COVER

PD35-10 (Y86-1240-00)

REF. NO	PARTS NO	NAME & DESCRIPTION
B31	0731-05	METER (35V-10A)
B40	2855-03	NAME PLATE (KENWOOD)
B41	0781-04	CAUTION LABEL (FUSE)
B42	1930-04	LABEL, 100 120 0 100 120J
B42	3820-05	LABEL, 50X15J
B50	7585-30	INSTRUCTION MANUAL; JAPANESE
B50	7586-30	INSTRUCTION MANUAL; ENGLISH
E23	0541-05	EARTH LUG
E23	0564-05	EARTH LUG
E29	0536-14	SHORTING BAR, CONTROL TERMINAL
E29	0537-14	SHORTING BAR, REAR OUTPUT
H01	5789-24	CARTON BOX
H10	2823-12	FOAMED STYRENE PAD (F)
H10	2824-12	FOAMED STYRENE PAD (R)
J21	2912-05	RING/HOLDER FOR LED
J21	4561-04	BRACKET, FOR METER
J32	0876-05	BOSS
J61	0526-05	LOCKING CARD SPACER
N09	0623-04	SCREW, SEMS PAN HD M3X8
N09	0626-04	SCREW, SEMS PAN HD M3X10
N09	0654-05	SCREW, SEMS PAN HD M4X8
N09	0723-05	SCREW, SEMS PAN HD M5X10
N09	0725-15	SCREW, SEMS PAN HD M4X12
N09	0726-05	SCREW, SEMS PAN HD M4X10
N09	0732-05	SCREW, TRUSS HD M5X8
N09	0735-05	SCREW, SEMS PAN HD M4X6
N09	0748-04	SCREW, SEMS PAN HD M4X12
N14	0404-04	FLANGE NUT M3
N14	0620-05	FLANGE NUT M4
N19	0717-05	INSULATING WASHER
N19	0726-04	WASHER M5
N30	4016-41	SCREW, PAN HD M4X16
N32	3006-41	SCREW, FLAT HD M3X6
N33	4008-41	SCREW, OVAL HD M4X8

REF. NO	PARTS NO	NAME & DESCRIPTION
N88	4012-41	SCREW, FLAT HD TAPTITE 2X8
N89	3008-41	SCREW, BINDING TAPTITE 3X8
N89	3012-41	SCREW, BINDING TAPTITE 3X12
N89	3014-41	SCREW, BINDING TAPTITE 3X14
N89	4014-41	SCREW, BINDING TAPTITE 4X14
C1	C90-0957-05	CAP. ELECTRO 15000 63V
C2	C90-0919-15	CAP. ELECTRO 1000 20% 50V
C3	C90-0920-05	CAP. ELECTRO 1000 20% 50V
C4	C91-0594-05	CAP. METALIZED 0.1 10% 250V
C5		NO USE
C6	E31-2686-05	SPARK KILLER ASS'Y
C10	CE04EWIE101M	CAP. ELECTRO 100 20% 25V
C11	CE04EWIE101M	CAP. ELECTRO 100 20% 25V
D1	CRO9C	THYRISTOR
D2	CRO9C	THYRISTOR
D8	AR4133S	LED: RED
D9	AR4133S	LED: RED
D10	BG4133S	LED: GREEN
D11	TNR15G431K	VARIATOR
P1	E10-1061-05	EDGE CARD CONNECTOR
P2	E10-3661-05	EDGE CARD CONNECTOR
R10	R92-1195-05	RES. FIXED 0.036 5% 40W
R14	R92-1158-05	RES. CARBON 470 10% 20W
R20	R92-1159-05	RES. CARBON 220 10% 20W
S1	S59-1502-05	SWITCH (CIRCUIT PROTECTOR)
SR	S51-1518-05	THERMAL SENSOR
T1	L01-9546-15	POWER TRANSFORMER
T2	L15-0408-05	CHOKE COIL
VR1	R29-0505-05	V. R. 10K
VR2	R05-3511-05	V. R. 10K

PARTS LIST

PD35-10D (Y86-1250-00)

REF. NO	PARTS NO	NAME & DESCRIPTION
B40-2857-03	NAME PLATE (KENWOOD)	
B41-0781-04	CAUTION LABEL (FUSE)	
B42-1930-04	LABEL, F0 100 120 0 100 120J	
B42-3820-05	LABEL, F50X15J	
B50-7585-30	INSTRUCTION MANUAL: JAPANESE	
B50-7786-30	INSTRUCTION MANUAL: JAPANESE	
E23-0541-05	EARTH LUG	
E23-0564-05	EARTH LUG	
E29-0536-14	SHORTING BAR, CONTROL TERMINAL	
E29-0537-14	SHORTING BAR, REAR OUTPUT	
F20-0647-05	INSULATOR, FOR TRANSISTOR	
H01-5791-24	CARTON BOX	
H10-2823-12	FOAMED STYRENE PAD (F)	
H10-2824-12	FOAMED STYRENE PAD (R)	
J21-2912-05	RING/HOLDER FOR LED	
J32-0876-05	BOSS	
J61-0049-05	WIRE BAND	
J61-0525-05	CARD SPACER	
J61-0526-05	LOCKING CARD SPACER	
N09-0623-04	SCREW, SEMS PAN HD M3X8	
N09-0626-04	SCREW, SEMS PAN HD M3X10	
N09-0654-05	SCREW, SEMS PAN HD M4X8	
N09-0723-05	SCREW, SEMS PAN HD M5X10	
N09-0725-15	SCREW, SEMS PAN HD M4X12	
N09-0732-05	SCREW, TRUSS HD M5X8	
N09-0735-05	SCREW, SEMS PAN HD M4X6	
N09-0748-04	SCREW, SEMS PAN HD M4X12	
N14-0404-04	FLANGE NUT M3	
N14-0620-05	FLANGE NUT M4	
N19-0191-05	INSULATING WASHER	
N19-0717-05	INSULATING WASHER	
N19-0726-04	WASHER M5	
N32-3006-41	SCREW, FLAT HD M3X6	
N32-3008-41	SCREW, FLAT HD M3X8	
N33-4008-41	SCREW, OVAL HD M4X8	
N88-4012-41	SCREW, FLAT HD TAPTITE 2X8	
N89-3008-41	SCREW, BINDING TAPTITE 3X8	
N89-3012-41	SCREW, BINDING TAPTITE 3X12	
N89-3014-41	SCREW, BINDING TAPTITE 3X14	
N89-4014-41	SCREW, BINDING TAPTITE 4X14	
C1	C90-0957-05	CAP. ELECTRO 15000 63V
C2	C90-0919-15	CAP. ELECTRO 1000 20% 50V
C3	C90-0920-05	CAP. ELECTRO 1000 20% 50V
C4	C91-0594-05	CAP. METALIZED 0.1 10% 250V
C5	NO USE	
C6	E31-2686-05	SPARK KILLER ASS'Y
C10	CE04EW1E101M	CAP. ELECTRO 100 20% 25V
C11	CE04EW1E101M	CAP. ELECTRO 100 20% 25V
D1	CRO9C	THYRISTOR
D2	CRO9C	THYRISTOR
D8	AR4133S	LED: RED
D9	AR4133S	LED: RED
D10	BG4133S	LED: GREEN
D11	TNR15G431K	VARIATOR
P1	E10-1061-05	EDGE CARD CONNECTOR
P2	E10-3661-05	EDGE CARD CONNECTOR
R10	R92-1195-05	RES. FIXED 0.036 5% 40W
R14	R92-1158-05	RES. CARBON 470 10% 20W
R20	R92-1159-05	RES. CARBON 220 10% 20W
S1	S59-1502-05	SWITCH (CIRCUIT PROTECTOR)
SR	S51-1518-05	THERMAL SENSOR
T1	L01-9556-15	POWER TRANSFORMER
T2	L15-0408-05	CHOKO COIL
U203	UPC7805H	IC, VOLTAGE REGULATOR
U204	UPC7805H	IC, VOLTAGE REGULATOR
VR1	R29-0505-05	V. R. 10K
VR2	R05-3511-05	V. R. 10K
1	A01-1152-03	CASE
2	A10-1446-22	CHASSIS
3	A20-2794-05	PANEL (DIECAST)
4	A21-1088-03	DECORATIVE PANEL
5	B07-0713-04	ESCUTCHEON
6	B40-2765-04	SERIAL NO. PLATE
7	E18-0363-05	INLET SOCKET
8	E20-0491-05	TERMINAL BLOCK 4P
9	E20-1291-05	TERMINAL BLOCK 12P
10	E21-0653-03	TERMINAL, BLUE
11	E21-0665-03	TERMINAL, GLAY
12	E21-0666-03	TERMINAL, RED
13	E29-0506-04	SHORTING BAR
14A	E30-1873-05	JIS POWER CORD SET
14B	E30-1819-15	IEC POWER CORD SET
14C	E30-1821-15	SAA POWER CODE SET
14D	E30-1929-05	BS POWER CORD

REF. NO	PARTS NO	NAME & DESCRIPTION
14E	E30-1881-05	UL/CSA POWER CORD SET
15	F01-0853-14	HEAT SINK
16	F01-0854-34	HEAT SINK
17A	F05-6028-05	FUSE (6.4X30MM) 6A/250V
17B	F05-1232-05	FUSE (6.4X30MM) 12A/250V
18	F19-0712-05	CAP FOR DP-652
19	F20-0657-25	INSULATOR
20	J02-0049-14	LEG
21	J11-0504-05	CLAMPER
22	J13-0506-05	FUSE HOLDER
23	J21-0392-04	HOLDER FOR OUTPUT LEAD
24	J21-2948-04	BRACKET, RIGHT
25	J21-2949-04	BRACKET, LEFT
26	J21-4513-03	BRACKET, FOR PCB
27	J21-4557-04	BRACKET, FOR TRANSISTOR
28	J21-4558-04	BRACKET, FOR TRANSISTOR
29	J21-4559-14	BRACKET, FOR HEAT SINK
30	J21-4560-04	BRACKET, FOR HEAT SINK
31	J21-4563-04	BRACKET, FOR CONNECTOR
32	J21-4570-23	BRACKET, FOR PCB
33	K01-0544-05	HANDLE
34	K21-0877-13	KNOB
35	K27-0528-14	KNOB, FOR PUSH SW
36	T40-0422-05	FAN
37	X73-1680-01	AMPLIFIER UNIT
38	X76-1260-06	DPN UNIT
39	X77-1400-01	QVP UNIT
40	X81-1590-00	RECTIFIER UNIT
41	X81-1980-06	C.I UNIT
42	B19-0743-03	FILTER
43	F07-0928-05	METER COVER

PD18-10 AMP UNIT (X73-1670-00)

REF. NO	PARTS NO	NAME & DESCRIPTION
E23-0047-04	TERMINAL	
F01-0846-05	HEAT SINK, EXTRUDED	
F01-0856-14	HEAT SINK	
J25-5099-22	PCB (UNMOUNTED)	
N09-0623-04	SCREW, SEMS PAN HD M3X8	
C1	CF92V1H473J	CAP. POLYESTER 0.047 5% 50V
C2	CF92V1H473J	CAP. POLYESTER 0.047 5% 50V
C3	C90-0924-05	CAP. ELECTRO 330 20% 50V
C4	CE04EW1E100M	CAP. ELECTRO 10 20% 25V
C5	CE04DW1E221M	CAP. ELECTRO 220 20% 25V
C6	C90-0939-05	CAP. ELECTRO 470 20% 35V
C7	CE04EW1E100M	CAP. ELECTRO 10 20% 25V
C8	CE04EW1E100M	CAP. ELECTRO 10 20% 25V
C9	CE04DW1E221M	CAP. ELECTRO 220 20% 25V
C10	C90-0924-05	CAP. ELECTRO 330 20% 50V
C11	CE04EW1E101M	CAP. ELECTRO 100 20% 25V
C12	CE04EW1HR33M	CAP. ELECTRO 0.33 20% 50V
C13	CE04EW1H477M	CAP. ELECTRO 4.7 20% 50V
C14	CE04EW1E100M	CAP. ELECTRO 10 20% 25V
C15	CE04AW1H010M	CAP. ELECTRO 1 20% 50V
C16	CC45CH1H101J	CAP. CERAMIC 100P 5% 50V
C17	CE04AW1H010M	CAP. ELECTRO 1 20% 50V
C18	CC45CH1H101J	CAP. CERAMIC 100P 5% 50V
C19	CE04AW1H2R2M	CAP. ELECTRO 2.2 20% 50V
C20	CQ92P2A471J	CAP. NYLAR 470P 5% 100V
C21	NO USE	
C22	CQ92P2A332J	CAP. NYLAR 3300P 5% 100V
C23	NO USE	
C24	CF92V1H332J	CAP. POLYESTER 3300P 5% 50V
C28	CC45CH1H101J	CAP. CERAMIC 100P 5% 50V
C29	NO USE	
C30	CC45CH1H101J	CAP. CERAMIC 100P 5% 50V
C31	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V
C32	CC45CH1H101J	CAP. CERAMIC 100P 5% 50V
C33	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V
C34	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V
C35	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V
C36	CF92V1H473J	CAP. POLYESTER 0.047 5% 50V
C37	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V
C38	CF92V1H473J	CAP. POLYESTER 0.047 5% 50V
C39	CF92V1H473J	CAP. POLYESTER 0.047 5% 50V
C40	CF92V1H473J	CAP. POLYESTER 0.047 5% 50V
C41	CF92V1H473J	CAP. POLYESTER 0.047 5% 50V
C42	CC45CH1H101J	CAP. CERAMIC 100P 5% 50V
C43	CC45CH1H101J	CAP. CERAMIC 100P 5% 50V
C44	CF92V1H472J	CAP. POLYESTER 4700P 5% 50V
C45	CF92V1H472J	CAP. POLYESTER 4700P 5% 50V
C50	CF92V1H473J	CAP. POLYESTER 0.047 5% 50V
C51	CF92V1H473J	CAP. POLYESTER 0.047 5% 50V
C52	C90-0924-05	CAP. ELECTRO 330 20% 50V
C53	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V
C54	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V
C55	CE04EW1E100M	CAP. ELECTRO 10 20% 25V
C56	C90-0924-05	CAP. ELECTRO 330 20% 50V
C57	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V
C58	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V
C59	CE04EW1E100M	CAP. ELECTRO 10 20% 25V

PARTS LIST

REF. NO	PARTS NO	NAME & DESCRIPTION
C60	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V
C61	CC45CH1H470J	CAP. CERAMIC 47P 5% 50V
C62	C91-0595-05	CAP. PLASTIC 0.033 2% 100V
C63	CC45CH1H101J	CAP. CERAMIC 100P 5% 50V
C64	CF92V1H102J	CAP. POLYESTER 1000P 5% 50V
C65	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V
C66	CF92V1H472J	CAP. POLYESTER 4700P 5% 50V
C67	CE04EW1E100M	CAP. ELECTRO 10 20% 25V
C68	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V
C69	CF92V1H473J	CAP. POLYESTER 0.047 5% 50V
C72	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V
C73	CF92V1H224J	CAP. POLYESTER 0.22 5% 50V
C74	CC45CH1H101J	CAP. CERAMIC 100P 5% 50V
C75	CE04EW1E100M	CAP. ELECTRO 10 20% 25V
C76	CE04EW1C471M	CAP. ELECTRO 470 20% 16V
D1	S1VB20	DIODE, BRIDGE
D2	S1VB20	DIODE, BRIDGE
D3	DSA1A2	DIODE
D4	DSA1A2	DIODE
D5	NO USE	
D6	RD13F(B2)	DIODE, ZENER 12.97V
D7	MTZ9.1JC	DIODE, ZENER 9.07V
D8	1SS132	DIODE
D9	RD13F(B2)	DIODE, ZENER 12.97V
D10	MTZ9.1JC	DIODE, ZENER 9.07V
D11	1SS132	DIODE
D12	MTZ4.7JA	DIODE, ZENER 4.56V
D13	1SS132	DIODE
D14	HZT7A3	DIODE, ZENER 6.75V
D15	HZT7A3	DIODE, ZENER 6.75V
D16	1SS132	DIODE
D17	1SS132	DIODE
D18	1SS132	DIODE
D19	1SS132	DIODE
D20	1SS132	DIODE
D21	1SS132	DIODE
D22	1SS132	DIODE
D23	1SS132	DIODE
D24	1SS132	DIODE
D25	1SS132	DIODE
D26	1SS132	DIODE
D27	1SS132	DIODE
D28	MTZ5.1JB	DIODE, ZENER 5.07V
D29	1SS132	DIODE
D30	MTZ5.1JB	DIODE, ZENER 5.07V
D31	DSA1A2	DIODE
D32	DSA1A2	DIODE
D40	S1VB20	DIODE, BRIDGE
D41	S1VB20	DIODE, BRIDGE
D42	DSA1A2	DIODE
D43	DSA1A2	DIODE
D44	DSA1A2	DIODE
D45	DSA1A2	DIODE
D46	MTZ6.2JB	DIODE, ZENER 6.12V
D47	1SS132	DIODE
D48	1SS132	DIODE
D49	1SS132	DIODE
D50	1SS132	DIODE
D51	RD10F(B2)	DIODE, ZENER 9.75V
D52	RD10F(B2)	DIODE, ZENER 9.75V
D53	1SS132	DIODE
D54	1SS132	DIODE
D55	1SS132	DIODE
D56	1SS132	DIODE
D57	1SS132	DIODE
D58	1SS132	DIODE
D59	MTZ8.2JC	DIODE, ZENER 8.24V
D60	1SS132	DIODE
D61	1SS132	DIODE
D62	1SS132	DIODE
D63	1SS132	DIODE
D64	1SS132	DIODE
D65	1SS132	DIODE
P3	E40-0273-05	PIN CONNECTOR 2P
P4	E40-0273-05	PIN CONNECTOR 2P
Q1	2SD1406(Y)	TR. SI, NPN
Q2	2SC2785(F)	TR. SI, NPN
Q3	2SC2785(F)	TR. SI, NPN
Q4	2SA1408(O)	TR. SI, PNP
Q5	2SB1015(Y)	TR. SI, PNP
Q6	2SA1175(F)	TR. SI, PNP
Q7	2SA1175(F)	TR. SI, PNP
Q8	2SC3621(O)	TR. SI, NPN
Q9	2SC3064(F)	TR. SI, NPN
Q10	2SC2785(F)	TR. SI, NPN
Q11	2SC2785(F)	TR. SI, NPN
Q12	2SC2459(GR)	TR. SI, NPN
Q13	2SC3621(O)	TR. SI, NPN
Q14	2SK170(BL)	FET, N-CHANNEL
Q15	2SK170(BL)	FET, N-CHANNEL
Q16	2SK170(BL)	FET, N-CHANNEL
Q17	2SK170(BL)	FET, N-CHANNEL

REF. NO	PARTS NO	NAME & DESCRIPTION
Q20	2SK170(BL)	FET, N-CHANNEL
Q21	2SC2785(F)	TR. SI, NPN
Q22	2SC3621(O)	TR. SI, NPN
Q23	2SC3621(O)	TR. SI, NPN
R1	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R2	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R3	RD14DB3D471J	RES. CARBON 470 5% 2W
R4	R92-1161-05	RES. CARBON 560 5% 1/4W
R5	RD14DB2H512J	RES. CARBON 5.1K 5% 1/2W
R6	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R7	RD14DB2H2R7J	RES. CARBON 2.7 5% 1/2W
R8	RD14BB2C153J	RES. CARBON 15K 5% 1/6W
R9	R92-1144-05	RES. METAL FILM 7.5K 1% 1/5W
R10	R92-1144-05	RES. METAL FILM 7.5K 1% 1/5W
R11	RD14DB3D471J	RES. CARBON 470 5% 2W
R12	R92-1161-05	RES. CARBON 560 5% 1/4W
R13	RD14DB2H512J	RES. CARBON 5.1K 5% 1/2W
R14	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R15	RD14DB2H2R7J	RES. CARBON 2.7 5% 1/2W
R16	RD14BB2C153J	RES. CARBON 15K 5% 1/6W
R17	RD14BB2C682J	RES. CARBON 6.8K 5% 1/6W
R18	R92-1138-05	RES. METAL FILM 360 1% 1/5W
R19	R92-1131-05	RES. METAL FILM 430 1% 1/5W
R20	R92-1135-05	RES. METAL FILM 2.7K 1% 1/5W
R21	R92-1484-05	RES. FIXED 3.3K 1% 5W
R24	RD14BB2C153J	RES. CARBON 15K 5% 1/6W
R25	RD14BB2C153J	RES. CARBON 15K 5% 1/6W
R26	RD14BB2C243J	RES. CARBON 24K 5% 1/6W
R27	RD14BB2C820J	RES. CARBON 82 5% 1/6W
R28	RD14BB2C182J	RES. CARBON 1.8K 5% 1/6W
R29	RD14BB2C181J	RES. CARBON 180 5% 1/6W
R30	RD14BE2E5101D	RES. METAL FILM 5.1K 0.5% 1/4W
R31	RD14BB2C102J	RES. CARBON 1K 5% 1/6W

PARTS LIST

REF. NO	PARTS NO	NAME & DESCRIPTION	RES.	QUANTITY	UNIT
R95	RD14BB2C750J	RES. CARBON	75	5%	1/6W
R98	R92-1061-05	JUMPING RES.	ZERO OHM (5MM)		
R99	NO USE				
R100	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R101	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R102	RD14BB2H392J	RES. CARBON	3.9K	5%	1/2W
R103	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R104	RD14BB2C153J	RES. CARBON	15K	5%	1/6W
R105	RD14BB2C123J	RES. CARBON	12K	5%	1/6W
R106	RD14BB2C332J	RES. CARBON	3.3K	5%	1/6W
R107	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W
R108	R92-1152-05	RES. METAL FILM	470K	1%	1/5W
R109	RD14BB2C104J	RES. CARBON	100K	5%	1/6W
R110	RD14BB2C222J	RES. CARBON	2.2K	5%	1/6W
R111	R92-1149-05	RES. METAL FILM	22K	1%	1/5W
R112	RD14BB2C682J	RES. CARBON	6.8K	5%	1/6W
R113	R92-1151-05	RES. METAL FILM	330K	1%	1/5W
R114	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R115	RD14BB2C104J	RES. CARBON	100K	5%	1/6W
R116	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W
R117	RD14BB2C224J	RES. CARBON	220K	5%	1/6W
R118	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R119	RD14BB2C122J	RES. CARBON	1.2K	5%	1/6W
R120	RD14BB3D472J	RES. CARBON	4.7K	5%	2W
R121	RD14BB2C104J	RES. CARBON	100K	5%	1/6W
R122	R92-1076-05	RES. METAL GLAZE	27M	5%	1/2W
R123	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W
R124	RD14BB2C105J	RES. CARBON	1M	5%	1/6W
R127	RD14BB2C911J	RES. CARBON	910	5%	1/6W
R128	R92-1133-05	RES. METAL FILM	5.6K	1%	1/5W
R129	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W
R130	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R131	R92-1149-05	RES. METAL FILM	22K	1%	1/5W
R132	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R133	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R134	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R135	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R136	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W
R137	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R138	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R139	RD14BB3A330J	RES. CARBON	33	5%	1W
R140	RD14BB3A330J	RES. CARBON	33	5%	1W
R141	RD14BB2H102J	RES. CARBON	1K	5%	1/2W
R142	RD14BB2H102J	RES. CARBON	1K	5%	1/2W
R143	NO USE				
R144	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
U1	NJM072BD	IC, JFET INPUT OP AMP			
U2	NJM7815A	IC, VOLTAGE REGULATOR			
U3	NJM072BD	IC, JFET INPUT OP AMP			
U4	OP07DP	IC, OPERATIONAL AMPRIPLIER			
U5	OP07DP	IC, OPERATIONAL AMPRIPLIER			
U6	UPC4558C	IC, OP AMP			
U7	NJM072BD	IC, JFET INPUT OP AMP			
U10	NJM7815A	IC, VOLTAGE REGULATOR			
U11	UPC7915H-1	IC, 3-TERMINAL REGULATOR			
U12	UPC4558C	IC, OP AMP			
U13	NJM072BD	IC, JFET INPUT OP AMP			
U14	HA17555PS	IC, TIMER			
U15	TLP521-1(A)	IC, PHOTO COUPLER			
VR1	R12-1532-05	RES. SEMI FIXED	2KB		
VR2	R12-4511-05	RES. SEMI FIXED	50KB		
VR3	R12-2518-05	RES. SEMI FIXED	5KB		
VR4	R12-4511-05	RES. SEMI FIXED	50KB		
VR5	R12-3522-05	RES. SEMI FIXED	10KB		
VR6	R12-3523-05	RES. SEMI FIXED	20KB		
VR7	R12-2513-05	RES. SEMI FIXED	5KB		
VR8	R12-4508-05	RES. SEMI FIXED	50KB		
VR9	R12-2513-05	RES. SEMI FIXED	5KB		
VR10	R12-4508-05	RES. SEMI FIXED	50KB		
VR11	R12-4508-05	RES. SEMI FIXED	50KB		
VR20	R12-3522-05	RES. SEMI FIXED	10KB		

PD18-10D AMP UNIT (X73-1680-00)

REF. NO	PARTS NO	NAME & DESCRIPTION	RES.	QUANTITY	UNIT
E23	0047-04	TERMINAL			
F01	0846-05	HEAT SINK, EXTRUDED			
F01	0856-14	HEAT SINK			
J25	5099-22	PCB (UNMOUNTED)			
N09	0623-04	SCREW, SEMS PAN HD M3X8			
C1	CF92V1H473J	CAP. POLYESTER	0.047	5%	50V
C2	CF92V1H473J	CAP. POLYESTER	0.047	5%	50V
C3	C90-0924-05	CAP. ELECTRO	330	20%	50V
C4	CE04EW1E100M	CAP. ELECTRO	10	20%	25V
C5	CE04DW1E221M	CAP. ELECTRO	220	20%	25V
C6	C90-0939-05	CAP. ELECTRO	470	20%	35V
C7	CE04EW1E100M	CAP. ELECTRO	10	20%	25V
C8	CE04EW1E100M	CAP. ELECTRO	10	20%	25V
C9	CE04DW1E221M	CAP. ELECTRO	220	20%	25V
C10	C90-0924-05	CAP. ELECTRO	330	20%	50V
C11	CE04EW1E101M	CAP. ELECTRO	100	20%	25V
C12	CE04EWHR33M	CAP. ELECTRO	0.33	20%	50V
C13	CE04EWH4R7M	CAP. ELECTRO	4.7	20%	50V
C14	CE04EW1E100M	CAP. ELECTRO	10	20%	25V
C15	CE04AW1H010M	CAP. ELECTRO	1	20%	50V
C16	CC45CH1H101J	CAP. CERAMIC	100P	5%	50V
C17	CE04AW1H010M	CAP. ELECTRO	1	20%	50V
C18	CC45CH1H101J	CAP. CERAMIC	100P	5%	50V
C19	CE04AW1H2R2M	CAP. ELECTRO	2.2	20%	50V
C20	CQ92P2A471J	CAP. NYLAR	470P	5%	100V
C21	NO USE				
C22	CQ92P2A332J	CAP. NYLAR	3300P	5%	100V
C23	NO USE				
C24	CF92V1H332J	CAP. POLYESTER	3300P	5%	50V
C28	CC45CH1H101J	CAP. CERAMIC	100P	5%	50V
C29	NO USE				
C30	CC45CH1H101J	CAP. CERAMIC	100P	5%	50V
C31	CF92V1H103J	CAP. POLYESTER	0.01	5%	50V
C32	CC45CH1H101J	CAP. CERAMIC	100P	5%	50V
C33	CF92V1H103J	CAP. POLYESTER	0.01	5%	50V
C34	CF92V1H103J	CAP. POLYESTER	0.01	5%	50V
C35	CF92V1H103J	CAP. POLYESTER	0.01	5%	50V
C36	CF92V1H473J	CAP. POLYESTER	0.047	5%	50V
C37	CF92V1H103J	CAP. POLYESTER	0.01	5%	50V
C38	CF92V1H473J	CAP. POLYESTER	0.047	5%	50V
C39	CF92V1H473J	CAP. POLYESTER	0.047	5%	50V
C40	CF92V1H473J	CAP. POLYESTER	0.047	5%	50V
C41	CF92V1H473J	CAP. POLYESTER	0.047	5%	50V
C42	CC45CH1H101J	CAP. CERAMIC	100P	5%	50V
C43	CC45CH1H101J	CAP. CERAMIC	100P	5%	50V
C44	CF92V1H472J	CAP. POLYESTER	4700P	5%	50V
C45	CF92V1H472J	CAP. POLYESTER	4700P	5%	50V
C50	CF92V1H473J	CAP. POLYESTER	0.047	5%	50V
C51	CF92V1H473J	CAP. POLYESTER	0.047	5%	50V
C52	C90-0924-05	CAP. ELECTRO	330	20%	50V
C53	CF92V1H103J	CAP. POLYESTER	0.01	5%	50V
C54	CF92V1H103J	CAP. POLYESTER	0.01	5%	50V
C55	CE04EW1E100M	CAP. ELECTRO	10	20%	25V
C56	C90-0924-05	CAP. ELECTRO	330	20%	50V
C57	CF92V1H103J	CAP. POLYESTER	0.01	5%	50V
C58	CF92V1H103J	CAP. POLYESTER	0.01	5%	50V
C59	CE04EW1E100M	CAP. ELECTRO	10	20%	25V
C60	CF92V1H103J	CAP. POLYESTER	0.01	5%	50V
C61	CC45CH1H470J	CAP. CERAMIC	47P	5%	50V
C62	C91-0595-05	CAP. PLASTIC	0.033	2%	100V
C63	CC45CH1H101J	CAP. CERAMIC	100P	5%	50V
C64	CF92V1H102J	CAP. POLYESTER	1000P	5%	50V
C65	CF92V1H103J	CAP. POLYESTER	0.01	5%	50V
C66	CF92V1H472J	CAP. POLYESTER	4700P	5%	50V
C67	CE04EW1E100M	CAP. ELECTRO	10	20%	25V
C68	CF92V1H103J	CAP. POLYESTER	0.01	5%	50V
C69	CF92V1H473J	CAP. POLYESTER	0.047	5%	50V
C70	CE04AW1E100M	CAP. ELECTRO	10	20%	25V
C71	CE04AW1E100M	CAP. ELECTRO	10	20%	25V
C72	CF92V1H103J	CAP. POLYESTER	0.01	5%	50V
C73	CF92V1H224J	CAP. POLYESTER	0.22	5%	50V
C74	CC45CH1H101J	CAP. CERAMIC	100P	5%	50V
C75	CE04EW1E100M	CAP. ELECTRO	10	20%	25V
C76	CE04EW1C471M	CAP. ELECTRO	470	20%	16V
C201	CE04EW1E471M	CAP. ELECTRO	470	20%	25V
C202	CE04EW1E470M	CAP. ELECTRO	47	20%	25V
C203	CE04EW1E471M	CAP. ELECTRO	470	20%	25V
C204	CE04EW1E470M	CAP. ELECTRO	47	20%	25V
C205	CF92V1H473J	CAP. POLYESTER	0.047	5%	50V
C206	CF92V1H103J	CAP. POLYESTER	0.01	5%	50V
C207	CF92V1H473J	CAP. POLYESTER	0.047	5%	50V
C208	CF92V1H103J	CAP. POLYESTER	0.01	5%	50V
C209	CF92V1H473J	CAP. POLYESTER	0.047	5%	50V
C210	CF92V1H103J	CAP. POLYESTER	0.01	5%	50V
C211	CF92V1H473J	CAP. POLYESTER	0.047	5%	50V
C212	CF92V1H103J	CAP. POLYESTER	0.01	5%	50V

D1	S1VB20	DIODE, BRIDGE
D2	S1VB20	DIODE, BRIDGE
D3	DSA1A2	DIODE

PARTS LIST

REF. NO	PARTS NO	NAME & DESCRIPTION	RES.	QUANTITY	UNIT
D4	DSA1A2	DIODE			
D5	NO USE				
D6	RD13F(B2)	DIODE, ZENER	12.97V		
D7	MTZ9.1JC	DIODE, ZENER	9.07V		
D8	1SS132	DIODE			
D9	RD13F(B2)	DIODE, ZENER	12.97V		
D10	MTZ9.1JC	DIODE, ZENER	9.07V		
D11	1SS132	DIODE			
D12	MTZ4.7JA	DIODE, ZENER	4.56V		
D13	1SS132	DIODE			
D14	MTZ7A3	DIODE, ZENER	6.75V		
D15	MTZ7A3	DIODE, ZENER	6.75V		
D16	1SS132	DIODE			
D17	1SS132	DIODE			
D18	1SS132	DIODE			
D19	1SS132	DIODE			
D20	1SS132	DIODE			
D21	1SS132	DIODE			
D22	1SS132	DIODE			
D23	1SS132	DIODE			
D24	1SS132	DIODE			
D25	1SS132	DIODE			
D26	1SS132	DIODE			
D27	1SS132	DIODE			
D28	MTZ5.1JB	DIODE, ZENER	5.07V		
D29	1SS132	DIODE			
D30	MTZ5.1JB	DIODE, ZENER	5.07V		
D31	DSA1A2	DIODE			
D32					

PARTS LIST

REF. NO	PARTS NO	NAME & DESCRIPTION	QTY	UNIT
R107	RD14BB2C472J	RES. CARBON 4.7K	5%	1/6W
R108	R92-1152-05	RES. METAL FILM 470K	1%	1/5W
R109	RD14BB2C104J	RES. CARBON 100K	5%	1/6W
R110	RD14BB2C222J	RES. CARBON 2.2K	5%	1/6W
R111	R92-1149-05	RES. METAL FILM 22K	1%	1/5W
R112	RD14BB2C682J	RES. CARBON 6.8K	5%	1/6W
R113	R92-1151-05	RES. METAL FILM 330K	1%	1/5W
R114	RD14BB2C470J	RES. CARBON 47	5%	1/6W
R115	RD14BB2C104J	RES. CARBON 100K	5%	1/6W
R116	RD14BB2C472J	RES. CARBON 4.7K	5%	1/6W
R117	RD14BB2C224J	RES. CARBON 220K	5%	1/6W
R118	RD14BB2C103J	RES. CARBON 10K	5%	1/6W
R119	RD14BB2C122J	RES. CARBON 1.2K	5%	1/6W
R120	RD14DB3D472J	RES. CARBON 4.7K	5%	2W
R121	RD14BB2C104J	RES. CARBON 100K	5%	1/6W
R122	R92-1076-05	RES. METAL GLAZE27M	5%	1/2W
R123	RD14BB2C472J	RES. CARBON 4.7K	5%	1/6W
R124	RD14BB2C105J	RES. CARBON 1M	5%	1/6W
R127	RD14BB2C911J	RES. CARBON 910	5%	1/6W
R128	R92-1133-05	RES. METAL FILM 5.6K	1%	1/5W
R129	RD14BB2C472J	RES. CARBON 4.7K	5%	1/6W
R130	RD14BB2C103J	RES. CARBON 10K	5%	1/6W
R131	R92-1149-05	RES. METAL FILM 22K	1%	1/5W
R132	RD14BB2C102J	RES. CARBON 1K	5%	1/6W
R133	RD14BB2C103J	RES. CARBON 10K	5%	1/6W
R134	RD14BB2C103J	RES. CARBON 10K	5%	1/6W
R135	RD14BB2C102J	RES. CARBON 1K	5%	1/6W
R136	RD14BB2C472J	RES. CARBON 4.7K	5%	1/6W
R137	RD14BB2C102J	RES. CARBON 1K	5%	1/6W
R138	RD14BB2C102J	RES. CARBON 1K	5%	1/6W
R139	RD14DB3A330J	RES. CARBON 33	5%	1W
R140	RD14DB3A330J	RES. CARBON 33	5%	1W
R141	RD14DB2H102J	RES. CARBON 1K	5%	1/2W
R142	RD14DB2H102J	RES. CARBON 1K	5%	1/2W
R143	NO USE			
R144	RD14BB2C103J	RES. CARBON 10K	5%	1/6W
U1	NJM072BD	IC,JFET INPUT OP AMP		
U2	NJM7815A	IC,VOLTAGE REGULATOR		
U3	NJM072BD	IC,JFET INPUT OP AMP		
U4	OP07DP	IC,OPERATIONAL AMPRIFIER		
U5	OP07DP	IC,OPERATIONAL AMPRIFIER		
U6	UPC4558C	IC,OP AMP		
U7	NJM072BD	IC,JFET INPUT OP AMP		
U10	NJM7815A	IC,VOLTAGE REGULATOR		
U11	UPC7915H-1	IC,3-TERMINAL REGULATOR		
U12	UPC4558C	IC,OP AMP		
U13	NJM072BD	IC,JFET INPUT OP AMP		
U14	HA17555PS	IC,TIMER		
U15	TLP521-1(A)	IC,PHOTO COUPLER		
U201	LM79L05ACZ	IC,REGULATOR		
U202	LM79L05ACZ	IC,REGULATOR		
VR1	R12-1532-05	RES. SEMI FIXED 2KB		
VR2	R12-4511-05	RES. SEMI FIXED 50KB		
VR3	R12-2518-05	RES. SEMI FIXED 5KB		
VR4	R12-4511-05	RES. SEMI FIXED 50KB		
VR5	R12-3555-05	RES. SEMI FIXED 10K		
VR6	R12-3556-05	RES. SEMI FIXED 20K		
VR7	R12-1531-05	RES. SEMI FIXED 3KB		
VR8	R12-4511-05	RES. SEMI FIXED 50KB		
VR9	R12-1531-05	RES. SEMI FIXED 3KB		
VR10	R12-4511-05	RES. SEMI FIXED 50KB		
VR11	R12-4511-05	RES. SEMI FIXED 50KB		
VR20	R12-3522-05	RES. SEMI FIXED 10KB		

PD35-10 AMP UNIT (X73-1670-01)

REF. NO	PARTS NO	NAME & DESCRIPTION	QTY	UNIT
E23	0047-04	TERMINAL		
F01	0846-05	HEAT SINK, EXTRUDED		
F01	0856-14	HEAT SINK		
J25	5099-22	PCB (UNMOUNTED)		
N09	0623-04	SCREW, SEMS PAN HD M3X8		
C1	CF92V1H473J	CAP. POLYESTER 0.047	5%	50V
C2	CF92V1H473J	CAP. POLYESTER 0.047	5%	50V
C3	C90-0924-05	CAP. ELECTRO 330	20%	50V
C4	CE04EW1E100M	CAP. ELECTRO 10	20%	25V
C5	CE04DW1E221M	CAP. ELECTRO 220	20%	25V
C6	C90-0939-05	CAP. ELECTRO 470	20%	35V
C7	CE04EW1E100M	CAP. ELECTRO 10	20%	25V
C8	CE04EW1E100M	CAP. ELECTRO 10	20%	25V
C9	CE04DW1E221M	CAP. ELECTRO 220	20%	25V
C10	C90-0924-05	CAP. ELECTRO 330	20%	50V
C11	CE04EW1E101M	CAP. ELECTRO 100	20%	25V
C12	CE04EWHR33M	CAP. ELECTRO 0.33	20%	50V
C13	CE04EWH4R7M	CAP. ELECTRO 4.7	20%	50V
C14	CE04EW1E100M	CAP. ELECTRO 10	20%	25V
C15	CE04AW1H010M	CAP. ELECTRO 1	20%	50V
C16	CC45CH1H101J	CAP. CERAMIC 100P	5%	50V
C17	CE04AW1H010M	CAP. ELECTRO 1	20%	50V
C18	CC45CH1H101J	CAP. CERAMIC 100P	5%	50V
C19	CE04AW1H010M	CAP. ELECTRO 1	20%	50V
C20	CQ92P2A471J	CAP. MYLAR 470P	5%	100V
C21	NO USE			
C22	CQ92P2A332J	CAP. MYLAR 3300P	5%	100V
C23	NO USE			
C24	CF92V1H332J	CAP. POLYESTER 3300P	5%	50V
C28	CC45CH1H101J	CAP. CERAMIC 100P	5%	50V
C29	NO USE			
C30	CC45CH1H101J	CAP. CERAMIC 100P	5%	50V
C31	CF92V1H103J	CAP. POLYESTER 0.01	5%	50V
C32	CC45CH1H101J	CAP. CERAMIC 100P	5%	50V
C33	CF92V1H103J	CAP. POLYESTER 0.01	5%	50V
C34	CF92V1H103J	CAP. POLYESTER 0.01	5%	50V
C35	CF92V1H103J	CAP. POLYESTER 0.01	5%	50V
C36	CF92V1H473J	CAP. POLYESTER 0.047	5%	50V
C37	CF92V1H103J	CAP. POLYESTER 0.01	5%	50V
C38	CF92V1H473J	CAP. POLYESTER 0.047	5%	50V
C39	CF92V1H473J	CAP. POLYESTER 0.047	5%	50V
C40	CF92V1H473J	CAP. POLYESTER 0.047	5%	50V
C41	CF92V1H473J	CAP. POLYESTER 0.047	5%	50V
C42	CC45CH1H101J	CAP. CERAMIC 100P	5%	50V
C43	CC45CH1H101J	CAP. CERAMIC 100P	5%	50V
C44	CF92V1H472J	CAP. POLYESTER 4700P	5%	50V
C45	CF92V1H472J	CAP. POLYESTER 4700P	5%	50V
C50	CF92V1H473J	CAP. POLYESTER 0.047	5%	50V
C51	CF92V1H473J	CAP. POLYESTER 0.047	5%	50V
C52	C90-0924-05	CAP. ELECTRO 330	20%	50V
C53	CF92V1H103J	CAP. POLYESTER 0.01	5%	50V
C54	CF92V1H103J	CAP. POLYESTER 0.01	5%	50V
C55	CE04EW1E100M	CAP. ELECTRO 10	20%	25V
C56	C90-0924-05	CAP. ELECTRO 330	20%	50V
C57	CF92V1H103J	CAP. POLYESTER 0.01	5%	50V
C58	CF92V1H103J	CAP. POLYESTER 0.01	5%	50V
C59	CE04EW1E100M	CAP. ELECTRO 10	20%	25V
C60	CF92V1H103J	CAP. POLYESTER 0.01	5%	50V
C61	CC45CH1H470J	CAP. CERAMIC 47P	5%	50V
C62	C91-0595-05	CAP. PLASTIC 0.033	2%	100V
C63	CC45CH1H101J	CAP. CERAMIC 100P	5%	50V
C64	CF92V1H102J	CAP. POLYESTER 1000P	5%	50V
C65	CF92V1H103J	CAP. POLYESTER 0.01	5%	50V
C66	CF92V1H472J	CAP. POLYESTER 4700P	5%	50V
C67	CE04EW1E100M	CAP. ELECTRO 10	20%	25V
C68	CF92V1H103J	CAP. POLYESTER 0.01	5%	50V
C69	CF92V1H473J	CAP. POLYESTER 0.047	5%	50V
C72	CF92V1H103J	CAP. POLYESTER 0.01	5%	50V
C73	CF92V1H224J	CAP. POLYESTER 0.22	5%	50V
C74	CC45CH1H101J	CAP. CERAMIC 100P	5%	50V
C75	CE04EW1E100M	CAP. ELECTRO 10	20%	25V
C76	CE04EW1C471M	CAP. ELECTRO 470	20%	16V
D1	S1VR20	DIODE, BRIDGE		
D2	S1VR20	DIODE, BRIDGE		
D3	DSA1A2	DIODE		
D4	DSA1A2	DIODE		
D5	NO USE			
D6	RD13F(B2)	DIODE, ZENER 12.97V		
D7	MTZ9.1JC	DIODE, ZENER 9.07V		
D8	1SS132	DIODE		
D9	RD13F(B2)	DIODE, ZENER 12.97V		
D10	MTZ9.1JC	DIODE, ZENER 9.07V		
D11	1SS132	DIODE		
D12	MTZ4.7JA	DIODE, ZENER 4.56V		
D13	1SS132	DIODE		
D14	HZT7A3	DIODE, ZENER 6.75V		
D15	HZT7A3	DIODE, ZENER 6.75V		
D16	1SS132	DIODE		
D17	1SS132	DIODE		
D18	1SS132	DIODE		

PARTS LIST

REF. NO	PARTS NO	NAME & DESCRIPTION	QTY	UNIT
D19	1SS132	DIODE		
D20	1SS132	DIODE		
D21	1SS132	DIODE		
D22	1SS132	DIODE		
D23	1SS132	DIODE		
D24	1SS132	DIODE		
D25	1SS132	DIODE		
D26	1SS132	DIODE		
D27	1SS132	DIODE		
D28	MTZ5.1JB	DIODE, ZENER 5.07V		
D29	1SS132	DIODE		
D30	MTZ5.1JB	DIODE, ZENER 5.07V		
D31	DSA1A2	DIODE		
D32	DSA1A2	DIODE		
D40	S1VR20	DIODE, BRIDGE		
D41	S1VR20	DIODE, BRIDGE		
D42	DSA1A2	DIODE		
D43	DSA1A2	DIODE		
D44	DSA1A2	DIODE		
D45	DSA1A2	DIODE		
D46	MTZ6.2JB	DIODE, ZENER 6.12V		
D47	1SS132	DIODE		
D48	1SS132	DIODE		
D49	1SS132	DIODE		
D50	1SS132	DIODE		
D51	RD10F(B2)	DIODE, ZENER 9.75V		
D52	RD10F(B2)	DIODE, ZENER 9.75V		
D53	1SS132	DIODE		
D54	1SS132	DIODE		
D55	1SS132	DIODE		
D56	1SS132	DIODE		
D57	1SS132	DIODE		
D58	1SS132	DIODE		
D59	MTZ8.2JC	DIODE, ZENER 8.24V		
D60	1SS132	DIODE		
D61	1SS132	DIODE		
D62	1SS132	DIODE		
D63	1SS132	DIODE		
D64	1SS132	DIODE		
D65	1SS132	DIODE		
P3	E40-0273-05	PIN CONNECTOR 2P		
P4	E40-0273-05	PIN CONNECTOR 2P		
Q1	2SD1406(Y)	TR. SI, NPN		
Q2	2SC2785(F)	TR. SI, NPN		
Q3	2SC2785(F)	TR. SI, NPN		
Q4	2SA1408(O)	TR. SI, PNP		
Q5	2SB1015(Y)	TR. SI, PNP		
Q6	2SA1175(F)	TR. SI, PNP		
Q7	2SA1175(F)	TR. SI, PNP		
Q8	2SC3621(O)	TR. SI, NPN		
Q9	2SC3064(F)	TR. SI, NPN		
Q10	2SC2785(F)	TR. SI, NPN		
Q11	2SC2785(F)	TR. SI, NPN		
Q12	2SC2459(GR)	TR. SI, NPN		
Q13	2SC3621(O)	TR. SI, NPN		
Q14	2SK170(BL)	FET, N-CHANNEL		
Q15	2SK170(BL)	FET, N-CHANNEL		
Q16	2SK170(BL)	FET, N-CHANNEL		
Q17	2SK170(BL)	FET, N-CHANNEL		
Q20	2SK170(BL)	FET, N-CHANNEL		
Q21	2SC2785(F)	TR. SI, NPN		
Q22	2SC3621(O)	TR. SI, NPN		
Q23	2SC3621(O)	TR. SI, NPN		
R1	RD14BB2C101J	RES. CARBON 100	5%	1/6W
R2	RD14BB2C101J	RES. CARBON 100	5%	1/6W
R3	RD14DB3D471J	RES. CARBON 470	5%	2W
R4	R92-1161-05	RES. CARBON 560	5%	1/4W
R5	RD14DB2H512J	RES. CARBON 5.1K	5%	1/2W
R6	RD14BB2C102J	RES. CARBON 1K	5%	1/6W
R7	RD14DB2H2R7J	RES. CARBON 2.7	5%	1/2W
R8	RD14BB2C153J	RES. CARBON 15K	5%	1/6W
R9	R92-1144-05	RES. METAL FILM 7.5K	1%	1/5W
R10	R92-1144-05	RES. METAL FILM 7.5K	1%	1/5W
R11	RD14DB3D471J	RES. CARBON 470	5%	2W
R12	R92-1161-05	RES. CARBON 560	5%	1/4W
R13	RD14DB2H512J	RES. CARBON 5.1K	5%	1/2W
R14	RD14BB2C102J	RES. CARBON 1K	5%	1/6W
R15	RD14DB2H2R7J	RES. CARBON 2.7	5%	1/2W
R16	RD14BB2C153J	RES. CARBON 15K	5%	1/6W
R17	RD14BB2C682J	RES. CARBON 6.8K	5%	1/6W
R18	R92-1138-05	RES. METAL FILM 360	1%	1/5W
R19	R92-1131-05	RES. METAL FILM 430	1%	1/5W
R20	R92-1135-05	RES. METAL FILM 2.7K	1%	1/5W
R21	R92-1484-05	RES. FIXED 3.3	1%	5W
R24	RD14BB2C153J	RES. CARBON 15K	5%	1/6W
R25	RD14BB2C153J	RES. CARBON 15K	5%	1/6W
R26	RD14BB2C243J	RES. CARBON 24K	5%	1/6W
R27	RD14BB2C820J	RES. CARBON 82	5%	1/6W
R28	RD14BB2C182J	RES. CARBON 1.8K	5%	1/6W
R29	RD14BB2C181J	RES. CARBON 180	5%	1/6W
R30				

PARTS LIST

REF. NO	PARTS NO	NAME & DESCRIPTION
R132	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R133	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R134	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R135	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R136	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W
R137	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R138	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R139	RD14DB3A330J	RES. CARBON 33 5% 1W
R140	RD14DB3A330J	RES. CARBON 33 5% 1W
R141	RD14DB2H102J	RES. CARBON 1K 5% 1/2W
R142	RD14DB2H102J	RES. CARBON 1K 5% 1/2W
R143	NO USE	
R144	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
U1	NJM072BD	IC,JFET INPUT OP AMP
U2	NJM7815A	IC,VOLTAGE REGULATOR
U3	NJM072BD	IC,JFET INPUT OP AMP
U4	OP07DP	IC,OPERATIONAL AMPRIFFIER
U5	OP07DP	IC,OPERATIONAL AMPRIFFIER
U6	UPC4558C	IC,OP AMP
U7	NJM072BD	IC,JFET INPUT OP AMP
U10	NJM7815A	IC,VOLTAGE REGULATOR
U11	UPC7915H-1	IC,3-TERMINAL REGULATOR
U12	UPC4558C	IC,OP AMP
U13	NJM072BD	IC,JFET INPUT OP AMP
U14	HA17555PS	IC,TIMER
U15	TLP521-1(A)	IC,PHOTO COUPLER
VR1	R12-1532-05	RES. SEMI FIXED 2KB
VR2	R12-4511-05	RES. SEMI FIXED 50KB
VR3	R12-2518-05	RES. SEMI FIXED 5KB
VR4	R12-4511-05	RES. SEMI FIXED 50KB
VR5	R12-3522-05	RES. SEMI FIXED 10KB
VR6	R12-3523-05	RES. SEMI FIXED 20KB
VR7	R12-2513-05	RES. SEMI FIXED 5KB
VR8	R12-4508-05	RES. SEMI FIXED 50KB
VR9	R12-2513-05	RES. SEMI FIXED 5KB
VR10	R12-4508-05	RES. SEMI FIXED 50KB
VR11	R12-4508-05	RES. SEMI FIXED 50KB
VR20	R12-3522-05	RES. SEMI FIXED 10KB

PD35-10D AMP UNIT (X73-1680-01)

REF. NO	PARTS NO	NAME & DESCRIPTION
E23	0047-04	TERMINAL
F01	0846-05	HEAT SINK, EXTRUDED
F01	0856-14	HEAT SINK
J25	5099-22	PCB (UNMOUNTED)
N09	0623-04	SCREW, SEMS PAN HD M3X8
C1	CF92V1H473J	CAP. POLYESTER 0.047 5% 50V
C2	CF92V1H473J	CAP. POLYESTER 0.047 5% 50V
C3	C90-0924-05	CAP. ELECTRO 330 20% 50V
C4	CE04EW1E100M	CAP. ELECTRO 10 20% 25V
C5	CE04DW1E221M	CAP. ELECTRO 220 20% 25V
C6	C90-0939-05	CAP. ELECTRO 470 20% 35V
C7	CE04EW1E100M	CAP. ELECTRO 10 20% 25V
C8	CE04EW1E100M	CAP. ELECTRO 10 20% 25V
C9	CE04DW1E221M	CAP. ELECTRO 220 20% 25V
C10	C90-0924-05	CAP. ELECTRO 330 20% 50V
C11	CE04EW1E101M	CAP. ELECTRO 100 20% 25V
C12	CE04EW1HR33M	CAP. ELECTRO 0.33 20% 50V
C13	CE04EW1H4R7M	CAP. ELECTRO 4.7 20% 50V
C14	CE04EW1E100M	CAP. ELECTRO 10 20% 25V
C15	CE04AW1H010N	CAP. ELECTRO 1 20% 50V
C16	CC45CH1H101J	CAP. CERAMIC 100P 5% 50V
C17	CE04AW1H010N	CAP. ELECTRO 1 20% 50V
C18	CC45CH1H101J	CAP. CERAMIC 100P 5% 50V
C19	CE04AW1H010N	CAP. ELECTRO 1 20% 50V
C20	CQ92P2A471J	CAP. NYLAR 470P 5% 100V
C21	NO USE	
C22	CQ92P2A332J	CAP. NYLAR 3300P 5% 100V
C23	NO USE	
C24	CF92V1H332J	CAP. POLYESTER 3300P 5% 50V
C28	CC45CH1H101J	CAP. CERAMIC 100P 5% 50V
C29	NO USE	
C30	CC45CH1H101J	CAP. CERAMIC 100P 5% 50V
C31	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V
C32	CC45CH1H101J	CAP. CERAMIC 100P 5% 50V
C33	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V
C34	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V
C35	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V
C36	CF92V1H473J	CAP. POLYESTER 0.047 5% 50V
C37	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V
C38	CF92V1H473J	CAP. POLYESTER 0.047 5% 50V
C39	CF92V1H473J	CAP. POLYESTER 0.047 5% 50V
C40	CF92V1H473J	CAP. POLYESTER 0.047 5% 50V
C41	CF92V1H473J	CAP. POLYESTER 0.047 5% 50V
C42	CC45CH1H101J	CAP. CERAMIC 100P 5% 50V
C43	CC45CH1H101J	CAP. CERAMIC 100P 5% 50V
C44	CF92V1H472J	CAP. POLYESTER 4700P 5% 50V
C45	CF92V1H472J	CAP. POLYESTER 4700P 5% 50V

REF. NO	PARTS NO	NAME & DESCRIPTION
C50	CF92V1H473J	CAP. POLYESTER 0.047 5% 50V
C51	CF92V1H473J	CAP. POLYESTER 0.047 5% 50V
C52	C90-0924-05	CAP. ELECTRO 330 20% 50V
C53	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V
C54	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V
C55	CE04EW1E100M	CAP. ELECTRO 10 20% 25V
C56	C90-0924-05	CAP. ELECTRO 330 20% 50V
C57	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V
C58	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V
C59	CE04EW1E100M	CAP. ELECTRO 10 20% 25V
C60	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V
C61	CC45CH1H470J	CAP. CERAMIC 47P 5% 50V
C62	C91-0595-05	CAP. PLASTIC 0.033 2% 100V
C63	CC45CH1H101J	CAP. CERAMIC 100P 5% 50V
C64	CF92V1H102J	CAP. POLYESTER 1000P 5% 50V
C65	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V
C66	CF92V1H472J	CAP. POLYESTER 4700P 5% 50V
C67	CE04EW1E100M	CAP. ELECTRO 10 20% 25V
C68	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V
C69	CF92V1H473J	CAP. POLYESTER 0.047 5% 50V
C70	CE04AW1E100M	CAP. ELECTRO 10 20% 25V
C71	CE04AW1E100M	CAP. ELECTRO 10 20% 25V
C72	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V
C73	CF92V1H224J	CAP. POLYESTER 0.22 5% 50V
C74	CC45CH1H101J	CAP. CERAMIC 100P 5% 50V
C75	CE04EW1E100M	CAP. ELECTRO 10 20% 25V
C76	CE04EW1C471M	CAP. ELECTRO 470 20% 16V
C201	CE04EW1E471M	CAP. ELECTRO 470 20% 25V
C202	CE04EW1E470M	CAP. ELECTRO 47 20% 25V
C203	CE04EW1E471M	CAP. ELECTRO 470 20% 25V
C204	CE04EW1E470M	CAP. ELECTRO 47 20% 25V
C205	CF92V1H473J	CAP. POLYESTER 0.047 5% 50V
C206	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V
C207	CF92V1H473J	CAP. POLYESTER 0.047 5% 50V
C208	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V
C209	CF92V1H473J	CAP. POLYESTER 0.047 5% 50V
C210	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V
C211	CF92V1H473J	CAP. POLYESTER 0.047 5% 50V
C212	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V

REF. NO	PARTS NO	NAME & DESCRIPTION
D1	S1VB20	DIODE, BRIDGE
D2	S1VB20	DIODE, BRIDGE
D3	DSA1A2	DIODE
D4	DSA1A2	DIODE
D5	NO USE	
D6	RD13F(B2)	DIODE, ZENER 12.97V
D7	MTZ9.1JC	DIODE, ZENER 9.07V
D8	ISS132	DIODE
D9	RD13F(B2)	DIODE, ZENER 12.97V
D10	MTZ9.1JC	DIODE, ZENER 9.07V
D11	ISS132	DIODE
D12	MTZ4.7JA	DIODE, ZENER 4.56V
D13	ISS132	DIODE
D14	HZ77A3	DIODE, ZENER 6.75V
D15	HZ77A3	DIODE, ZENER 6.75V
D16	ISS132	DIODE
D17	ISS132	DIODE
D18	ISS132	DIODE
D19	ISS132	DIODE
D20	ISS132	DIODE
D21	ISS132	DIODE
D22	ISS132	DIODE
D23	ISS132	DIODE
D24	ISS132	DIODE
D25	ISS132	DIODE
D26	ISS132	DIODE
D27	ISS132	DIODE
D28	MTZ5.1JB	DIODE, ZENER 5.07V
D29	ISS132	DIODE
D30	MTZ5.1JB	DIODE, ZENER 5.07V
D31	DSA1A2	DIODE
D32	DSA1A2	DIODE

REF. NO	PARTS NO	NAME & DESCRIPTION
D40	S1VB20	DIODE, BRIDGE
D41	S1VB20	DIODE, BRIDGE
D42	DSA1A2	DIODE
D43	DSA1A2	DIODE
D44	DSA1A2	DIODE
D45	DSA1A2	DIODE
D46	MTZ6.2JB	DIODE, ZENER 6.12V
D47	ISS132	DIODE
D48	ISS132	DIODE
D49	ISS132	DIODE
D50	ISS132	DIODE
D51	RD10F(B2)	DIODE, ZENER 9.75V
D52	RD10F(B2)	DIODE, ZENER 9.75V
D53	ISS132	DIODE
D54	ISS132	DIODE
D55	ISS132	DIODE
D56	ISS132	DIODE
D57	ISS132	DIODE
D58	ISS132	DIODE
D59	MTZ8.2JC	DIODE, ZENER 8.24V
D60	ISS132	DIODE
D61	ISS132	DIODE
D62	ISS132	DIODE
D63	ISS132	DIODE

PARTS LIST

REF. NO	PARTS NO	NAME & DESCRIPTION
D64	ISS132	DIODE
D65	ISS132	DIODE
D201	S1VB20	DIODE, BRIDGE
D202	S1VB20	DIODE, BRIDGE
P3	E40-0273-05	PIN CONNECTOR 2P
P4	E40-0273-05	PIN CONNECTOR 2P
P201	E40-0673-05	PIN CONNECTOR 6P
P202	E40-0373-05	PIN CONNECTOR 3P
P203	E40-0373-05	PIN CONNECTOR 3P
P204	E40-0673-05	PIN CONNECTOR 6P
P205	E40-0273-05	PIN CONNECTOR 2P
Q1	2SD1406(Y)	TR. SI, NPN
Q2	2SC2785(F)	TR. SI, NPN
Q3	2SC2785(F)	TR. SI, NPN
Q4	2SA1408(O)	TR. SI, PNP
Q5	2SB1015(Y)	TR. SI, PNP
Q6	2SA1175(F)	TR. SI, PNP
Q7	2SA1175(F)	TR. SI, PNP
Q8	2SC3621(O)	TR. SI, NPN
Q9	2SC3064(F)	TR. SI, NPN
Q10	2SC2785(F)	TR. SI, NPN
Q11	2SC2785(F)	TR. SI, NPN
Q12	2SC2459(GR)	TR. SI, NPN
Q13	2SC3621(O)	TR. SI, NPN
Q14	2SK170(BL)	FET, N-CHANNEL
Q15	2SK170(BL)	FET, N-CHANNEL
Q16	2SK170(BL)	FET, N-CHANNEL
Q17	2SK170(BL)	FET, N-CHANNEL
Q20	2SK170(BL)	FET, N-CHANNEL
Q21	2SC2785(F)	TR. SI, NPN
Q22	2SC3621(O)	TR. SI, NPN
Q23	2SC3621(O)	TR. SI, NPN

REF. NO	PARTS NO	NAME & DESCRIPTION
R1	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R2	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R3	RD14DB3D471J	RES. CARBON 470 5% 2W
R4	R92-1161-05	RES. CARBON 560 5% 1/4W
R5	RD14DB2H512J	RES. CARBON 5.1K 5% 1/2W
R6	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R7	RD14DB2H2R7J	RES. CARBON 2.7 5% 1/2W
R8	RD14BB2C153J	RES. CARBON 15K 5% 1/6W
R9	R92-1144-05	RES. METAL FILM 7.5K 1% 1/5W
R10	R92-1144-05	RES. METAL FILM 7.5K 1% 1/5W
R11	RD14DB3D471J	RES. CARBON 470 5% 2W
R12	R92-1161-05	RES. CARBON 560 5% 1/4W
R13	RD14DB2H512J	RES. CARBON 5.1K 5% 1/2W
R14	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R15	RD14DB2H2R7J	RES. CARBON 2.7 5% 1/2W
R16	RD14BB2C153J	RES. CARBON 15K 5% 1/6W
R17	RD14BB2C682J	RES. CARBON 6.8K 5% 1/6W
R18	R92-1138-05	RES. METAL FILM 360 1% 1/5W
R19	R92-1131-05	RES. METAL FILM 430 1% 1/5W
R20	R92-1135-05	RES. METAL FILM 2.7K 1% 1/5W
R21	R92-1484-05	RES. FIXED 3.3 1% 5W

REF. NO	PARTS NO	NAME & DESCRIPTION
R24	RD14BB2C153J	RES. CARBON 15K 5% 1/6W
R25	RD14BB2C153J	RES. CARBON 15K 5% 1/6W
R26	RD14BB2C243J	RES. CARBON 24K 5% 1/6W
R27	RD14BB2C820J	RES. CARBON 82 5% 1/6W
R28	RD14BB2C182J	RES. CARBON 1.8K 5% 1/6W
R29	RD14BB2C181J	RES. CARBON 180 5% 1/6W
R30	RN14BE2E5101D	RES. METAL FILM 5.1K 0.5% 1/4W
R31	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R32	R92-1150-05	RES. METAL FILM 100K 1% 1/5W
R33	R92-1138-05	RES. METAL FILM 360 1% 1/5W
R34	RD14BB2C151J	RES. CARBON 150 5% 1/6W
R35	R92-1146-05	RES. METAL FILM 11K 1% 1/5W
R36	RN14BE2E5601D	RES. METAL FILM 5.6K 0.5% 1/4W
R37	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R38	R92-1150-05	RES. METAL FILM 100K 1% 1/5W
R39	R92-1138-05	RES. METAL FILM 360 1% 1/5W
R40	RD14BB2C221J	RES. CARBON 220 5% 1/6W
R41	R92-1147-05	RES. METAL FILM 16.2K 1% 1/5W
R42	RN14BE2H1002DKW	RES. METAL FILM 10K 0.5% 1/2W
R43	RN14BE2H1802DKW	RES. METAL FILM 18K 0.5% 1/2W
R44	RN14BE2H1802DKW	RES. METAL FILM 18K 0.5% 1/2W
R45	RN14BE2H1002DKW	RES. METAL FILM 10K 0.5% 1/2W
R46	RN14BE2H3740DKW	RES. METAL FILM 374 0.5% 1/2W
R47	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R48	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R49	R92-1135-05	RES. METAL FILM 2.7K 1% 1/5W
R50	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R51	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R52	R92-1134-05	RES. METAL FILM 1K 1% 1/5W
R53	RD14BB2C162J	RES. CARBON 1.6K 5% 1/6W
R54	R92-1140-05	RES. METAL FILM 4.3K 1% 1/5W
R55	R92-1131-05	RES. METAL FILM 430 1% 1/5W
R56	RD14BB2C122J	RES. CARBON 1.2K 5% 1/6W
R57	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R58	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R59	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R60	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R61	RD14BB2C102J	RES. CARBON 1K 5% 1/6W

REF. NO	PARTS NO	NAME & DESCRIPTION
R62	RD14BB2C122J	

PARTS LIST

REF. NO	PARTS NO	NAME & DESCRIPTION
U201	LN79L05ACZ	IC,REGULATOR
U202	LN79L05ACZ	IC,REGULATOR
VR1	R12-1532-05	RES. SEMI FIXED 2KB
VR2	R12-4511-05	RES. SEMI FIXED 50KB
VR3	R12-2518-05	RES. SEMI FIXED 5KB
VR4	R12-4511-05	RES. SEMI FIXED 50KB
VR5	R12-3555-05	RES. SEMI FIXED 10K
VR6	R12-3556-05	RES. SEMI FIXED 20K
VR7	R12-1531-05	RES. SEMI FIXED 3KB
VR8	R12-4511-05	RES. SEMI FIXED 50KB
VR9	R12-1531-05	RES. SEMI FIXED 3KB
VR10	R12-4511-05	RES. SEMI FIXED 50KB
VR11	R12-4511-05	RES. SEMI FIXED 50KB
VR20	R12-3522-05	RES. SEMI FIXED 10KB

PD18-10D DPM UNIT (X76-1260-05)

REF. NO	PARTS NO	NAME & DESCRIPTION
C1	J25-5119-02	PCB (UNMOUNTED)
C2	CE04CW1A470M	CAP. ELECTRO 47 20% 10V
C3	CE04CW1A100M	CAP. ELECTRO 10 20% 10V
C4	CF92V1H224J	CAP. POLYESTER 0.22 5% 50V
C5	CF92V1H473J	CAP. POLYESTER 0.047 5% 50V
C6	CF92V1H104J	CAP. POLYESTER 0.1 5% 50V
C7	CM93BD2A101J	CAP. NICA 100P 5% 100V
C8	CF92V1H223J	CAP. POLYESTER 0.022 5% 50V
C9	NO USE	
C10	CE04CW1V2R2M	CAP. ELECTRO 2.2 20% 35V
C11	C91-0591-05	CAP. CERAMIC 0.22 50V
D1	GL-9D03D	LED
D2	GL-9D03D	LED
D3	GL-9D03D	LED
D4	GL-9D03D	LED
D5	LT-9002D	LED
D31	GL-9D03D	LED
D32	GL-9D03D	LED
D33	GL-9D03D	LED
D34	GL-9D03D	LED
D35	LT-9002D	LED
P3	E31-2513-15	WIRE ASS'Y;I
P4	E31-2512-15	WIRE ASS'Y;V
P204	E31-2520-15	WIRE ASS'Y
R1	RN14BK2C4703F	RES. METAL FILM 470K 1% 1/6W
R2	RN14BK2C1103F	RES. METAL FILM 110K 1% 1/6W
R3	RD14BB2C182J	RES. CARBON 1.8K 5% 1/6W
R4	RN14BE2E1502F	RES. METAL FILM 15K 1% 1/4W
R5	RN14BE2E1002F	RES. METAL FILM 10K 1% 1/4W
R6	RD14BB2C161J	RES. CARBON 160 5% 1/6W
R7	RD14BB2C391J	RES. CARBON 390 5% 1/6W
R18	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R19	NO USE	
R20	RN14BC2E1502F	RES. METAL FILM 15K 1% 1/4W
R25	RN14BC2E1802F	RES. METAL FILM 18K 1% 1/4W
R26	RD14BB2C161J	RES. CARBON 160 5% 1/6W
R31	RN14BK2C4703F	RES. METAL FILM 470K 1% 1/6W
R32	RN14BK2C1103F	RES. METAL FILM 110K 1% 1/6W
R33	RD14BB2C182J	RES. CARBON 1.8K 5% 1/6W
R34	RN14BE2E1502F	RES. METAL FILM 15K 1% 1/4W
R35	RN14BE2E1002F	RES. METAL FILM 10K 1% 1/4W
R36	RD14BB2C161J	RES. CARBON 160 5% 1/6W
R37	RD14BB2C391J	RES. CARBON 390 5% 1/6W
R48	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R49	NO USE	
R50	RN14BC2E6201F	RES. METAL FILM 6.2K 1% 1/4W
R55	RN14BC2E1802F	RES. METAL FILM 18K 1% 1/4W
R56	RD14BB2C161J	RES. CARBON 160 5% 1/6W
U1	TSC7107CPL-A	IC, OPERATIONAL AMPLIFIER
U2	LN336Z-2.5	IC, REFERENCE DIODE
U31	TSC7107CPL-A	IC, OPERATIONAL AMPLIFIER
U32	LN336Z-2.5	IC, REFERENCE DIODE
VR1	R12-3546-05	RES. SEMI FIXED 10K
VR2	R12-0568-05	RES. SEMI FIXED 500

REF. NO	PARTS NO	NAME & DESCRIPTION
VR31	R12-3546-05	RES. SEMI FIXED 10K
VR32	R12-0568-05	RES. SEMI FIXED 500

PD35-10D DPM UNIT (X76-1260-06)

REF. NO	PARTS NO	NAME & DESCRIPTION
C1	J25-5119-02	PCB (UNMOUNTED)
C2	CE04CW1A470M	CAP. ELECTRO 47 20% 10V
C3	CE04CW1A100M	CAP. ELECTRO 10 20% 10V
C4	CF92V1H224J	CAP. POLYESTER 0.22 5% 50V
C5	CF92V1H473J	CAP. POLYESTER 0.047 5% 50V
C6	CF92V1H104J	CAP. POLYESTER 0.1 5% 50V
C7	CM93BD2A101J	CAP. NICA 100P 5% 100V
C8	CF92V1H223J	CAP. POLYESTER 0.022 5% 50V
C9	C91-1205-05	CAP. CERAMIC 0.1 80/-20% 50V
C10	NO USE	
C11	CE04CW1V2R2M	CAP. ELECTRO 2.2 20% 35V
C12	C91-0591-05	CAP. CERAMIC 0.22 50V
C31	CE04CW1A470M	CAP. ELECTRO 47 20% 10V
C32	CE04CW1A100M	CAP. ELECTRO 10 20% 10V
C33	CF92V1H224J	CAP. POLYESTER 0.22 5% 50V
C34	CF92V1H473J	CAP. POLYESTER 0.047 5% 50V
C35	CF92V1H104J	CAP. POLYESTER 0.1 5% 50V
C36	CM93BD2A101J	CAP. NICA 100P 5% 100V
C37	CF92V1H223J	CAP. POLYESTER 0.022 5% 50V
D1	GL-9D03D	LED
D2	GL-9D03D	LED
D3	GL-9D03D	LED
D4	GL-9D03D	LED
D5	LT-9002D	LED
D6	1SS132	DIODE
D7	1S1544A	DIODE
D8	1S1544A	DIODE
D9	1SS132	DIODE
D31	GL-9D03D	LED
D32	GL-9D03D	LED
D33	GL-9D03D	LED
D34	GL-9D03D	LED
D35	LT-9002D	LED
Q1	DTC144EF	TR. SI, NPN
Q2	DTC144EF	TR. SI, NPN
Q3	DTA124EF	TR. SI, PNP
Q4	2SK117(GR)	FET, N-CHANNEL
R1	RN14BK2C4703F	RES. METAL FILM 470K 1% 1/6W
R2	RN14BK2C1103F	RES. METAL FILM 110K 1% 1/6W
R3	RD14BB2C182J	RES. CARBON 1.8K 5% 1/6W
R4	RN14BE2E1502F	RES. METAL FILM 15K 1% 1/4W
R5	RN14BE2E1002F	RES. METAL FILM 10K 1% 1/4W
R6	RD14BB2C161J	RES. CARBON 160 5% 1/6W
R9	RD14BB2C123J	RES. CARBON 12K 5% 1/6W
R10	RD14BB2C333J	RES. CARBON 33K 5% 1/6W
R11	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R12	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R13	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R14	R92-1061-05	JUMPING RES. ZERO OHM (5MM)
R15	RD14BB2C301J	RES. CARBON 300 5% 1/6W
R16	RD14BB2C301J	RES. CARBON 300 5% 1/6W
R17	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R18	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R19	RN14BC2E1601F	RES. METAL FILM 1.6K 1% 1/4W
R20	RN14BC2E2203F	RES. METAL FILM 220K 1% 1/4W
R21	RN14BK2C2001F	RES. METAL FILM 2K 1% 1/6W
R22	RN14BK2C1501F	RES. METAL FILM 1.5K 1% 1/6W
R23	RN14BK2C1301F	RES. METAL FILM 1.3K 1% 1/6W
R24	RN14BK2C2201F	RES. METAL FILM 2.2K 1% 1/6W
R25	RN14BC2E1802F	RES. METAL FILM 18K 1% 1/4W
R26	RD14BB2C161J	RES. CARBON 160 5% 1/6W
R27	RD14BB2C364J	RES. CARBON 360K 5% 1/6W
R28	R92-1171-05	RES. METAL FILM 12K 1% 1/5W
R29	R92-1144-05	RES. METAL FILM 7.5K 1% 1/5W
R30	NO USE	
R31	RN14BK2C4703F	RES. METAL FILM 470K 1% 1/6W
R32	RN14BK2C1103F	RES. METAL FILM 110K 1% 1/6W
R33	RD14BB2C182J	RES. CARBON 1.8K 5% 1/6W
R34	RN14BE2E1502F	RES. METAL FILM 15K 1% 1/4W
R35	RN14BE2E1002F	RES. METAL FILM 10K 1% 1/4W
R36	RD14BB2C161J	RES. CARBON 160 5% 1/6W
R37	RD14BB2C391J	RES. CARBON 390 5% 1/6W
R48	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R49	NO USE	
R50	RN14BC2E6201F	RES. METAL FILM 6.2K 1% 1/4W
R55	RN14BC2E1802F	RES. METAL FILM 18K 1% 1/4W
R56	RD14BB2C161J	RES. CARBON 160 5% 1/6W

PARTS LIST

REF. NO	PARTS NO	NAME & DESCRIPTION
U1	TSC7107CPL-A	IC, OPERATIONAL AMPLIFIER
U2	LM336Z-2.5	IC, REFERENCE DIODE
U3	LM339N	IC, QUAD COMPARATOR
U4	MC14011BCP	IC, QUAD 2-INPUT NAND GATE
U31	TSC7107CPL-A	IC, OPERATIONAL AMPLIFIER
U32	LM336Z-2.5	IC, REFERENCE DIODE
VR1	R12-3546-05	RES. SEMI FIXED 10K
VR2	R12-0568-05	RES. SEMI FIXED 500
VR3	R12-0568-05	RES. SEMI FIXED 500
VR31	R12-3546-05	RES. SEMI FIXED 10K
VR32	R12-0568-05	RES. SEMI FIXED 500

PD18-10/PD18-10D OVP UNIT (X77-1400-00)

REF. NO	PARTS NO	NAME & DESCRIPTION
	J19-1641-14	HOLDER FOR LED
	J25-5158-33	PCB (UNMOUNTED)
C1	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V
C2	CE04EW1C101M	CAP. ELECTRO 100 20% 16V
C3	CK45B1H102K	CAP. CERAMIC 1000P 10% 50V
C4	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V
C5	CE04EW1C101M	CAP. ELECTRO 100 20% 16V
C6	CE04EW1C101M	CAP. ELECTRO 100 20% 16V
C7	CE04EW1H470M	CAP. ELECTRO 47 20% 50V
D1	DSA1A2	DIODE
D2	DSA1A2	DIODE
D3	DSA1A2	DIODE
D4	DSA1A2	DIODE
D5	RD6.2E(B3)	DIODE, ZENER 6.34V
D6	1SS132	DIODE
D7	1SS132	DIODE
D8	1SS132	DIODE
D9	1SS132	DIODE
D10	GSM2B2A30	SCR
D11	DSA1A2	DIODE
D12	1SS132	DIODE
D13	LN222RP	LED: RED
D14	DSA1A2	DIODE
D15	DSA1A2	DIODE
D16	1SS132	DIODE
D17	1SS132	DIODE
P5	E40-0273-05	PIN CONNECTOR 2P
P6	E40-1373-05	PIN CONNECTOR 13P
P7	E40-0273-05	PIN CONNECTOR 2P
P8	E40-0373-05	PIN CONNECTOR 3P
P9	E40-0273-05	PIN CONNECTOR 2P
P10	E40-0273-05	PIN CONNECTOR 2P
P11	E40-0273-05	PIN CONNECTOR 2P
P12	E40-0273-05	PIN CONNECTOR 2P
P302	E40-0273-05	PIN CONNECTOR 2P
P303	NO USE	
P304	E40-0273-05	PIN CONNECTOR 2P
P305	E40-0273-05	PIN CONNECTOR 2P
Q1	2SC3621(O)	TR. SI, NPN
Q2	2SA1175(F)	TR. SI, PNP
Q3	2SC2785(F)	TR. SI, NPN
Q4	2SC2785(F)	TR. SI, NPN
Q5	2SA1175(F)	TR. SI, PNP
R1	RD14DB3A102J	RES. CARBON 1K 5% 1W
R2	RD14DB3A102J	RES. CARBON 1K 5% 1W
R3	RN14BE2E3831D	RES. METAL FILM 3.83K 0.5% 1/4W
R4	RN14BE2H1002DKW	RES. METAL FILM 10K 0.5% 1/2W
R5	RN14BC2E2200F	RES. METAL FILM 220 1% 1/4W
R6	RN14BC2E1000F	RES. METAL FILM 100 1% 1/4W
R7	RN14BC2H7500F	RES. METAL FILM 750 1% 1/2W
R8	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R9	RD14BB2C392J	RES. CARBON 3.9K 5% 1/6W
R10	RD14BB2C471J	RES. CARBON 470 5% 1/6W
R11	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R12	RD14BB2C272J	RES. CARBON 2.7K 5% 1/6W
R13	RD14BB2C471J	RES. CARBON 470 5% 1/6W
R14	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R15	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R16	RD14BB2C223J	RES. CARBON 22K 5% 1/6W
R17	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R18	RD14BB2C221J	RES. CARBON 220 5% 1/6W
R19	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R20	RD14BB2C362J	RES. CARBON 3.6K 5% 1/6W
R21	RD14BB2C182J	RES. CARBON 1.8K 5% 1/6W
R22	RD14BB2C621J	RES. CARBON 620 5% 1/6W
R23	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R24	RD14DB2H222J	RES. CARBON 2.2K 5% 1/2W
R25	RD14DB2H102J	RES. CARBON 1K 5% 1/2W
R26	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R27	RD14BB2C512J	RES. CARBON 5.1K 5% 1/6W

REF. NO	PARTS NO	NAME & DESCRIPTION
R28	RD14BB2C361J	RES. CARBON 360 5% 1/6W
R31	R92-0150-05	JUMPING RES. ZERO OHM (10MM)
R32	RD14BB2C183J	RES. CARBON 18K 5% 1/6W
R33	RD14BB2C272J	RES. CARBON 2.7K 5% 1/6W
R34	RD14BB2E162J	RES. CARBON 1.6K 5% 1/4W
S1	S40-1519-05	PUSH SWITCH
S2	S40-1518-05	PUSH SWITCH
S3	S40-1518-05	PUSH SWITCH
U1	NJM311D	IC, COMPARATOR
U2	UPC4558C	IC, OP AMP
VR1	R12-1542-05	RES. SEMI FIXED 2.5K

PD36-10/PD36-10D OVP UNIT (X77-1400-01)

REF. NO	PARTS NO	NAME & DESCRIPTION
	J19-1641-14	HOLDER FOR LED
	J25-5158-33	PCB (UNMOUNTED)
C1	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V
C2	CE04EW1C101M	CAP. ELECTRO 100 20% 16V
C3	CK45B1H102K	CAP. CERAMIC 1000P 10% 50V
C4	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V
C5	CE04EW1C101M	CAP. ELECTRO 100 20% 16V
C6	CE04EW1C101M	CAP. ELECTRO 100 20% 16V
C7	CE04EW1H470M	CAP. ELECTRO 47 20% 50V
D1	DSA1A2	DIODE
D2	DSA1A2	DIODE
D3	DSA1A2	DIODE
D4	DSA1A2	DIODE
D5	RD6.2E(B3)	DIODE, ZENER 6.34V
D6	1SS132	DIODE
D7	1SS132	DIODE
D8	1SS132	DIODE
D9	1SS132	DIODE
D10	GSM2B2A30	SCR
D11	DSA1A2	DIODE
D12	1SS132	DIODE
D13	LN222RP	LED: RED
D14	DSA1A2	DIODE
D15	DSA1A2	DIODE
D16	1SS132	DIODE
D17	1SS132	DIODE
P5	E40-0273-05	PIN CONNECTOR 2P
P6	E40-1373-05	PIN CONNECTOR 13P
P7	E40-0273-05	PIN CONNECTOR 2P
P8	E40-0373-05	PIN CONNECTOR 3P
P9	E40-0273-05	PIN CONNECTOR 2P
P10	E40-0273-05	PIN CONNECTOR 2P
P11	E40-0273-05	PIN CONNECTOR 2P
P12	E40-0273-05	PIN CONNECTOR 2P
P302	E40-0273-05	PIN CONNECTOR 2P
P303	NO USE	
P304	E40-0273-05	PIN CONNECTOR 2P
P305	E40-0273-05	PIN CONNECTOR 2P
Q1	2SC3621(O)	TR. SI, NPN
Q2	2SA1175(F)	TR. SI, PNP
Q3	2SC2785(F)	TR. SI, NPN
Q4	2SC2785(F)	TR. SI, NPN
Q5	2SA1175(F)	TR. SI, PNP
R1	RD14DB3A102J	RES. CARBON 1K 5% 1W
R2	RD14DB3A102J	RES. CARBON 1K 5% 1W
R3	RN14BE2E3831D	RES. METAL FILM 3.83K 0.5% 1/4W
R4	RN14BE2H2402DKW	RES. METAL FILM 24K 0.5% 1/2W
R5	RN14BC2E2200F	RES. METAL FILM 220 1% 1/4W
R6	RN14BC2E1000F	RES. METAL FILM 100 1% 1/4W
R7	RN14BC2H7500F	RES. METAL FILM 750 1% 1/2W
R8	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R9	RD14BB2C392J	RES. CARBON 3.9K 5% 1/6W
R10	RD14BB2C471J	RES. CARBON 470 5% 1/6W
R11	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R12	RD14BB2C272J	RES. CARBON 2.7K 5% 1/6W
R13	RD14BB2C471J	RES. CARBON 470 5% 1/6W
R14	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R15	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R16	RD14BB2C223J	RES. CARBON 22K 5% 1/6W
R17	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R18	RD14BB2C221J	RES. CARBON 220 5% 1/6W
R19	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R20	RD14BB2C362J	RES. CARBON 3.6K 5% 1/6W
R21	RD14BB2C182J	RES. CARBON 1.8K 5% 1/6W
R22	RD14BB2C621J	RES. CARBON 620 5% 1/6W
R23	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R24	RD14DB2H222J	RES. CARBON 2.2K 5% 1/2W
R25	RD14DB2H102J	RES. CARBON 1K 5% 1/2W
R26	RD14BB2H102J	RES. CARBON 10K 5% 1/2W
R27	RD14BB2C103J	RES. CARBON 10K 5% 1/6W

REF. NO	PARTS NO	NAME & DESCRIPTION
R27	RD14BB2C512J	RES. CARBON 5.1K 5% 1/6W
R28	RD14BB2C361J	RES. CARBON 360 5% 1/6W
R31	R92-0150-05	JUMPING RES. ZERO OHM (10MM)
R32	RD14BB2C183J	RES. CARBON 18K 5% 1/6W
R33	RD14BB2C272J	RES. CARBON 2.7K 5% 1/6W
R34	RD14BB2E162J	RES. CARBON 1.6K 5% 1/4W
S1	S40-1519-05	PUSH SWITCH
S2	S40-1518-05	PUSH SWITCH
S3	S40-1518-05	PUSH SWITCH
U1	NJM311D	IC, COMPARATOR
U2	UPC4558C	IC, OP AMP
VR1	R12-1542-05	RES. SEMI FIXED 2.5K

PD18-10/PD18-10D PD35-10/PD35-10D RECTIFIER UNIT (X81-1590-00)

REF. NO	PARTS NO	NAME & DESCRIPTION
	J25-5100-03	PCB (UNMOUNTED)
C7	CF93AN2E154K	CAP. POLYESTER 0.15 10% 250V
C8	CF93AN2E154K	CAP. POLYESTER 0.15 10% 250V
C9	CF93AN2E154K	CAP. POLYESTER 0.15 10% 250V
D3	CTM-32R	DIODE
D4	NO USE	
D5	CTM-32R	DIODE
D6	CTM-32R	DIODE
D16	DSA1A2	DIODE
J1	E23-0555-05	G. TERMINAL
J2	E23-0555-05	G. TERMINAL
J3	E23-0555-05	G. TERMINAL
J4	E23-0555-05	G. TERMINAL
J5	E23-0555-05	G. TERMINAL
J6	E23-0555-05	G. TERMINAL
J7	E23-0555-05	G. TERMINAL
J8	E23-0555-05	G. TERMINAL
J9	E23-0556-05	G. TERMINAL
P21	E40-0373-05	PIN CONNECTOR 3P
P22	E40-0273-05	PIN CONNECTOR 2P
P23	E40-0573-05	PIN CONNECTOR 5P
Q1	2SC3280(R)	TR. SI, NPN
Q2	NO USE	
Q3	2SC3280(R)	TR. SI, NPN
Q4	NO USE	
Q5	2SC3280(R)	TR. SI, NPN
R1	R92-1160-05	RES. FIXED 0.15 5% 3W
R2	NO USE	
R3	R92-1160-05	RES. FIXED 0.15 5% 3W
R4	NO USE	
R5	R92-1160-05	RES. FIXED 0.15 5% 3W
R6	NO USE	
R7	RD14DB2H101J	RES. CARBON 100 5% 1/2W
R11	RD14DB3A330J	RES. CARBON 33 5% 1W
R12	RD14DB3A330J	RES. CARBON 33 5% 1W
R13	RD14DB3A330J	RES. CARBON 33 5% 1W

PD18-10/PD18-10D C.I UNIT (X81-1980-05)

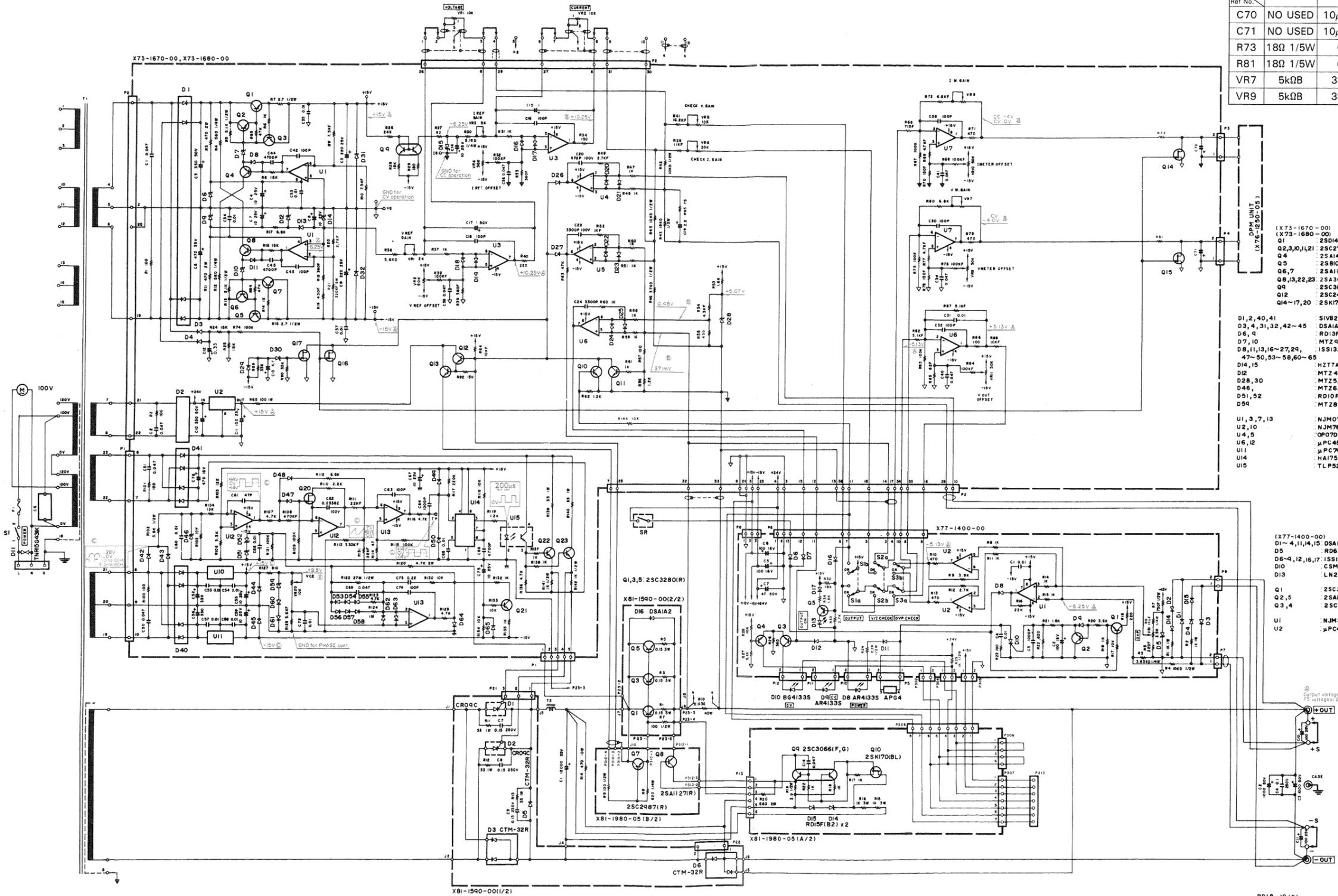
REF. NO	PARTS NO	NAME & DESCRIPTION
	J25-5157-03	PCB (UNMOUNTED)
C14	CF92V1H473J	CAP. POLYESTER 0.047 5% 50V
D14	RD15F(B2)	DIODE ZENER
D15	RD15F(B2)	DIODE ZENER
P13	E40-0673-05	PIN CONNECTOR 6P
P307	E40-0773-05	PIN CONNECTOR 7P
P308	E40-0873-05	PIN CONNECTOR 8P
P309	E40-0473-05	PIN CONNECTOR 4P
P310	E40-0473-05	PIN CONNECTOR 4P
P311	NO USE	
P312	E40-0373-05	PIN CONNECTOR 3P
Q7	2SC2987(R)	TR. SI, NPN
Q8	2SA1227(Q)	TR. SI, PNP
Q9	2SC3066(F,G)	TR. SI, NPN
Q10	2SK170(BL)	FET, N-CHANNEL
R8	RD14BB2E821J	RES. CARBON 820 5% 1/4W
R9	RD14DB2H101J	RES. CARBON 100 5% 1/2W
R15	RD14DB3F102J	RES. CARBON 1K 5% 3W
R16	RD14DB3F102J	RES. CARBON 1K 5% 3W
R17	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R18	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R19	RD14DB2H3R9J	RES. CARBON 3.9 5% 1/2W
R20	RD14DB3D561J	RES. CARBON 560 5% 2W
R21	NO USE	
R22	RD14BB2C102J	RES. CARBON 1K 5% 1/6W

PD35-10/PD35-10D C.I UNIT (X81-1980-06)

REF. NO	PARTS NO	NAME & DESCRIPTION
	J25-5157-03	PCB (UNMOUNTED)
C14	CF92V1H473J	CAP. POLYESTER 0.047 5% 50V
D14	RD15F(B2)	DIODE ZENER
D15	RD15F(B2)	DIODE ZENER
P13	E40-0673-05	PIN CONNECTOR 6P
P307	E40-0773-05	PIN CONNECTOR 7P
P308	E40-0873-05	PIN CONNECTOR 8P
P309	E40-0473-05	PIN CONNECTOR 4P
P310	E40-0473-05	PIN CONNECTOR 4P
P311	E40-0273-05	PIN CONNECTOR 2P
P312	E40-0373-05	PIN CONNECTOR 3P
Q7	2SC2987(R)	TR. SI, NPN
Q8	2SA1227(Q)	TR. SI, PNP
Q9	2SC3066(F,G)	TR. SI, NPN
Q10	2SK170(BL)	FET, N-CHANNEL
R8	RD14BB2E821J	RES. CARBON 820 5% 1/4W
R9	RD14DB2H101	

PD18-10(D) SCHEMATIC DIAGRAM

PD Ref No.	PD18-10	PD18-10D
C70	NO USED	10μ 25V
C71	NO USED	10μ 25V
R73	18Ω 1/5W	0Ω
R81	18Ω 1/5W	0Ω
VR7	5kΩB	3kΩB
VR9	5kΩB	3kΩB



CAUTION 1:
 Condition of measurement.
 CC VR → MAX.
 CV VR → MAX.
 OUTPUT → OPEN
 OUTPUT SW → ON
 OVP VR → MAX.
 At measurement, the DMM
 GND line is the + output
 terminal
 (Front panel ⊕ or rear panel
 ⊖)
 (In the circuit diagram, indicat-
 ed with "⊕".)

ⓐ: Measured voltage obtained under
 measuring condition of CAUTION 1.
 ⓑ: Measured voltage obtained under
 measuring condition of CAUTION 2.
 ⓒ: Measured voltage obtained under
 measuring condition of CAUTION 3.

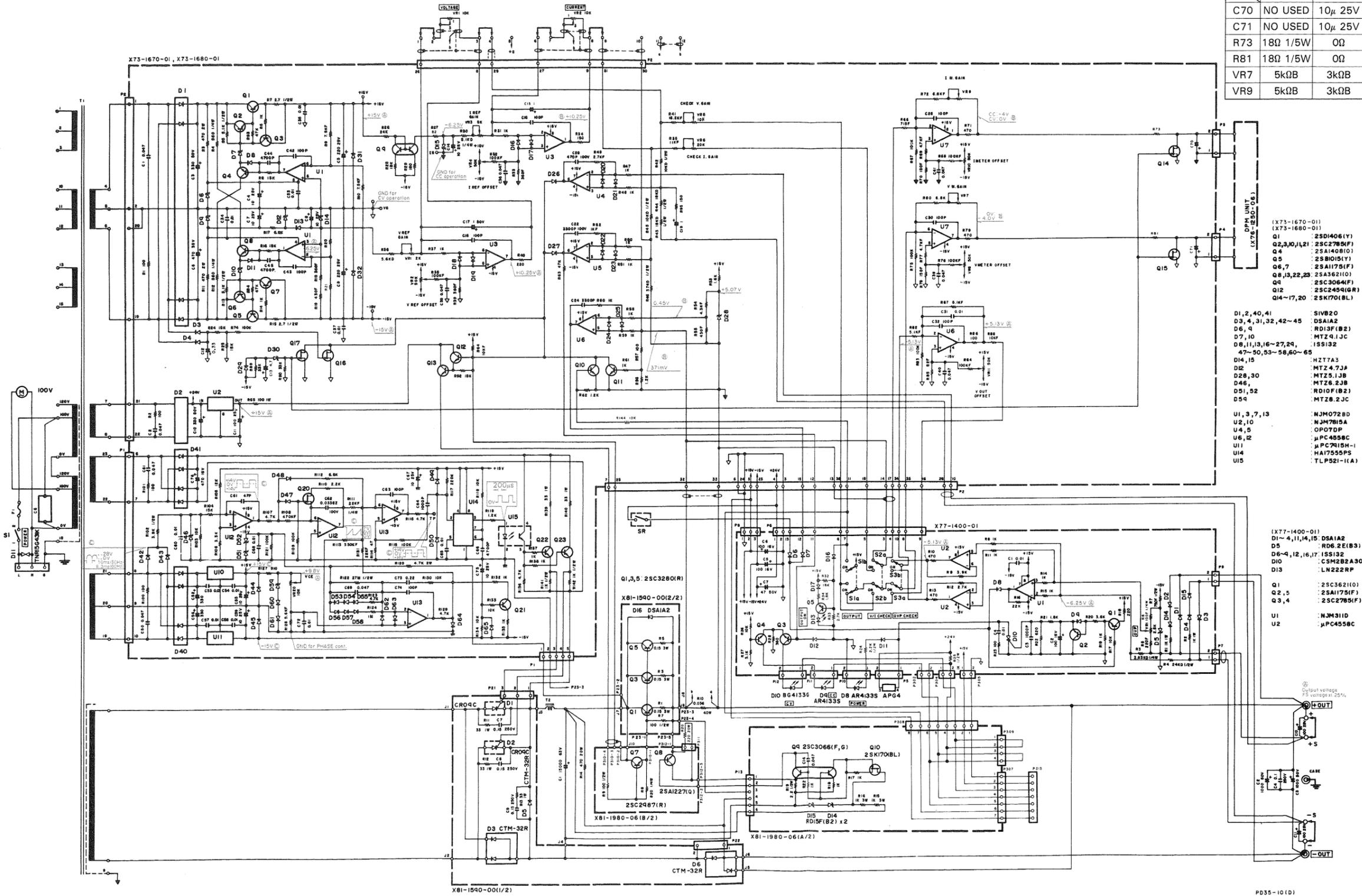
CAUTION 2:
 Condition of measurement
 CC VR → MAX.
 CV VR → MAX.
 OUTPUT → SHORT
 OUTPUT SW → ON
 OVP VR → MAX.
 At measurement, the DMM
 GND line is the rear panel
 terminal board No. 11 (in the
 circuit diagram, connected to
 point "a").

CAUTION 3:
 Condition of measurement
 CC VR → MAX.
 CV VR → MAX.
 OUTPUT → OPEN
 OUTPUT SW → ON
 OVP VR → MAX.
 GND for PHASE control
 (GND for checking the phase
 control circuit;
 emitter of Q1-Q6)

- (X73-1670-00)
- (X73-1680-00)
- Q1 2SD406(V)
- Q2,3,10,12 2SC2785(F)
- Q4 2SA1408(O)
- Q5 2SB1015(Y)
- Q6,7 2SA1175(F)
- Q8,13,22,23 2SA363(O)
- Q9 2SC3064(F)
- Q12 2SC2459(GR)
- Q14~17,20 2SK170(BL)
- SIV820
- DSAIA2
- RD1SF(B2)
- MTZ4.1JC
- ISSI32
- WT7TA3
- MTZ4.7JA
- MTZ5.1JB
- MTZ6.2JB
- RD10F(B2)
- MTZ8.2JC
- NJM0728D
- NJM7815A
- OP07D
- μPC4558C
- μPC7815H-1
- HA17555PS
- TLP521-1(A)
- (X77-1400-00)
- D1~4,11,14,15 DSAIA2
- D5 RD6.2E(B3)
- D6~4,12,16,17 ISSI32
- D10 CSM2B2A30
- D13 LN222RP
- Q1 2SC3621(O)
- Q2,5 2SA1175(F)
- Q3,4 2SC2785(F)
- U1 NJM311D
- U2 μPC4558C

PD35-10(D) SCHEMATIC DIAGRAM

Ref No.	PD35-10	PD35-10D
C70	NO USED	10 μ 25V
C71	NO USED	10 μ 25V
R73	18 Ω 1/5W	0 Ω
R81	18 Ω 1/5W	0 Ω
VR7	5k Ω B	3k Ω B
VR9	5k Ω B	3k Ω B



CAUTION 1:
 Condition of measurement:
 CC VR → MAX.
 CV VR → MAX.
 OUTPUT SW → OPEN
 OVP VR → MAX.
 At measurement, the DMM GND line is the + output terminal (Front panel ⊕ or rear panel ⊕S).
 (In the circuit diagram, indicated with "ⓐ".)

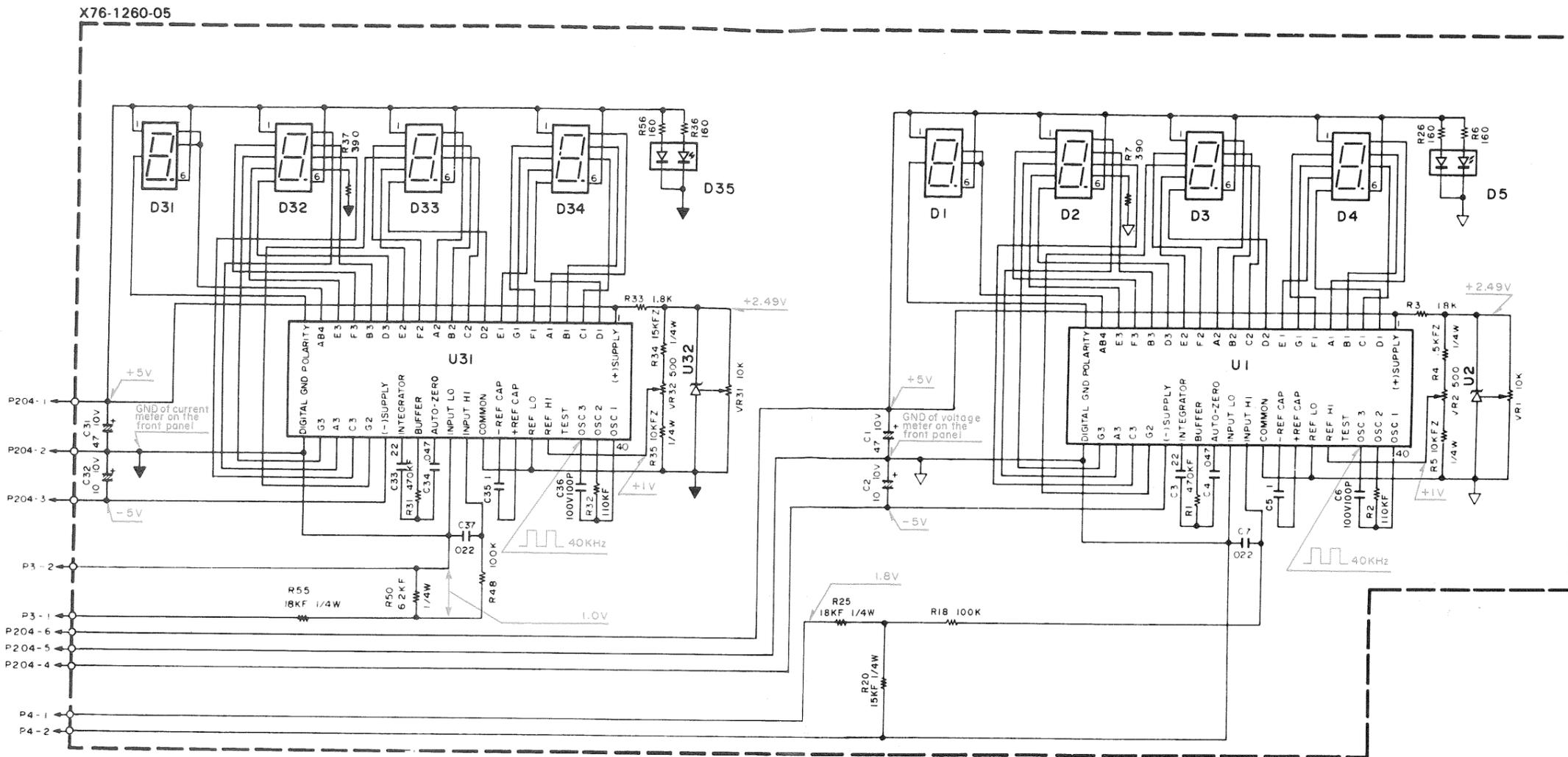
CAUTION 2:
 Condition of measurement:
 CC VR → MAX.
 CV VR → MAX.
 OUTPUT SW → SHORT
 OVP VR → MAX.
 At measurement, the DMM GND line is the rear panel terminal board No. 11 (in the circuit diagram, connected to point "a").

CAUTION 3:
 Condition of measurement:
 CC VR → MAX.
 CV VR → MAX.
 OUTPUT SW → OPEN
 OVP VR → MAX.
 GND for PHASE control (GND for checking the phase control circuit; (emitter of Q1-Q6))

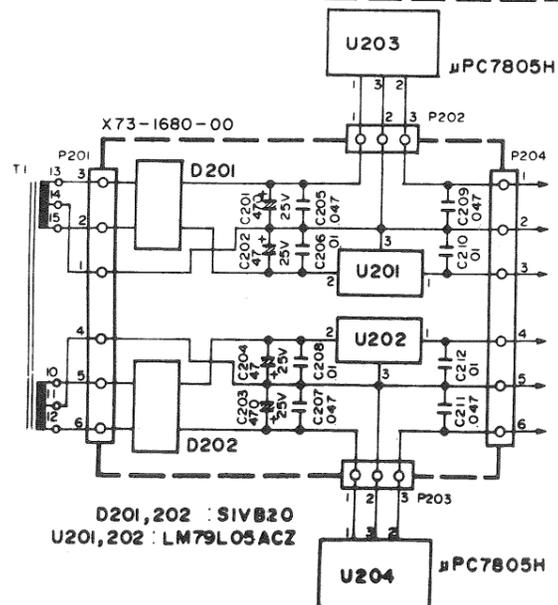
- (X73-1670-01)
- (X73-1680-01)
- Q1 : 2SD1406(Y)
- Q2,3,10,12 : 2SC278(F)
- Q4 : 2SA1408(O)
- Q5 : 2SB1015(Y)
- Q6,7 : 2SA175(F)
- Q8,13,22,23 : 2SA1561(O)
- Q9 : 2SC3066(F)
- Q12 : 2SC2459(GR)
- Q14~17,20 : 2SK170(BL)
- D1,2,40,41 : SIV820
- D3,4,31,32,42~45 : DSA1A2
- D6,9 : RD13F(B2)
- D7,10 : MTZ4.1JC
- D8,11,13,16~27,29,47~50,53~58,60~65 : ISS132
- D14,15 : HZ17A3
- D16 : MTZ4.7J3
- D28,30 : MTZ5.1JB
- D46 : MTZ6.2JB
- D51,52 : RD10F(B2)
- D59 : MTZ8.2JC
- U1,3,7,13 : NJM0728D
- U2,10 : NJM7815A
- U4,5 : OP07DP
- U6,12 : μ PC4558C
- U11 : μ PC715H-1
- U14 : HA1755PS
- U15 : TLP521-1(A)

- (X77-1400-01)
- D1~4,11,14,15 : DSA1A2
- D5 : RD6.2E(B3)
- D6~9,12,16,17 : ISS132
- D10 : CSM2B2A30
- D13 : LN222RP
- Q1 : 2SC161(O)
- Q2,5 : 2SA175(F)
- Q3,4 : 2SC2785(F)
- U1 : NJM311D
- U2 : μ PC4558C

PD18-10(D) SCHEMATIC DIAGRAM

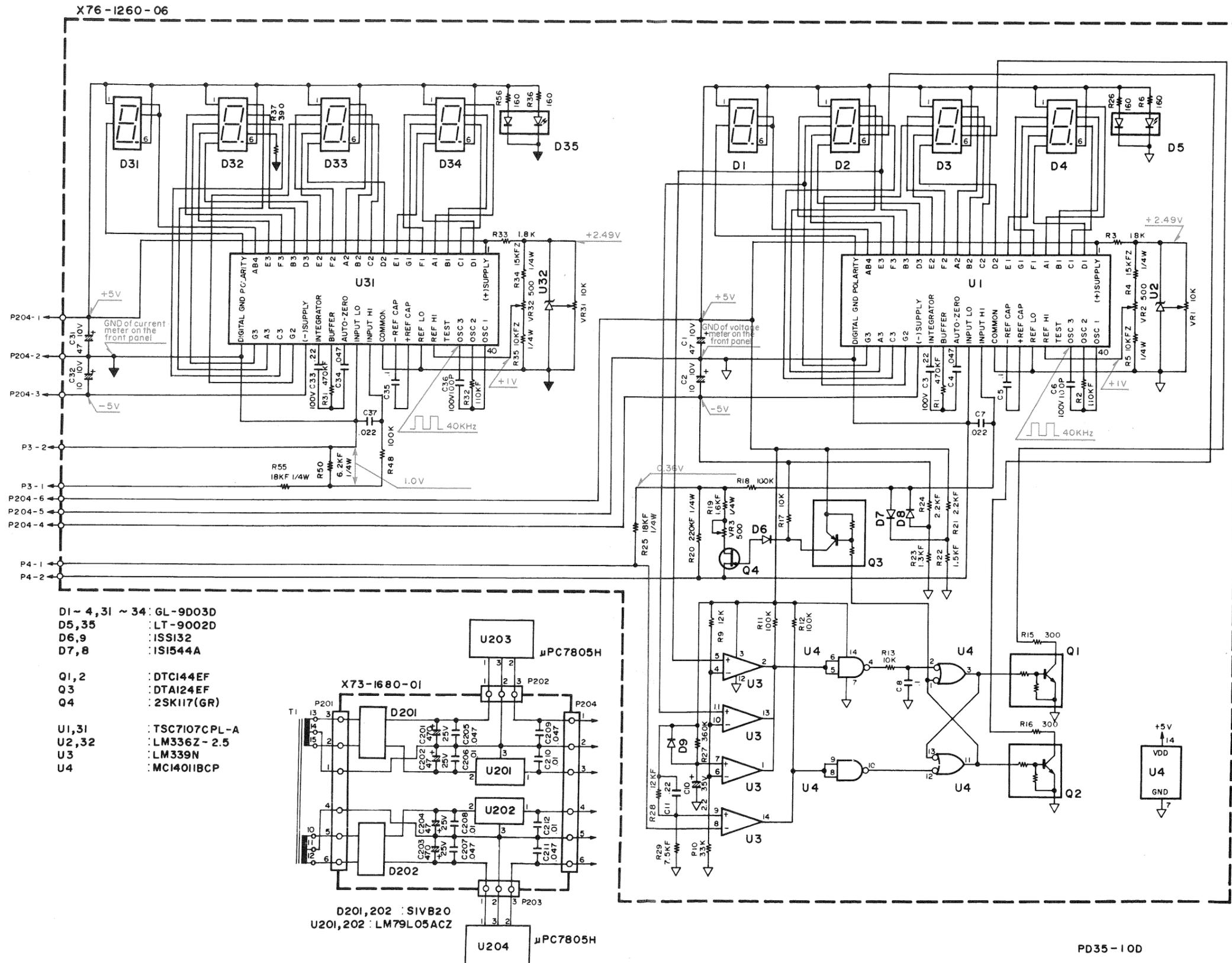


- D1 ~ 4, 31 ~ 34 : GL-9D03D
- D5, 35 : LT-9002D
- U1, 31 : TSC7107CPL-A
- U2, 32 : LM336Z-2.5



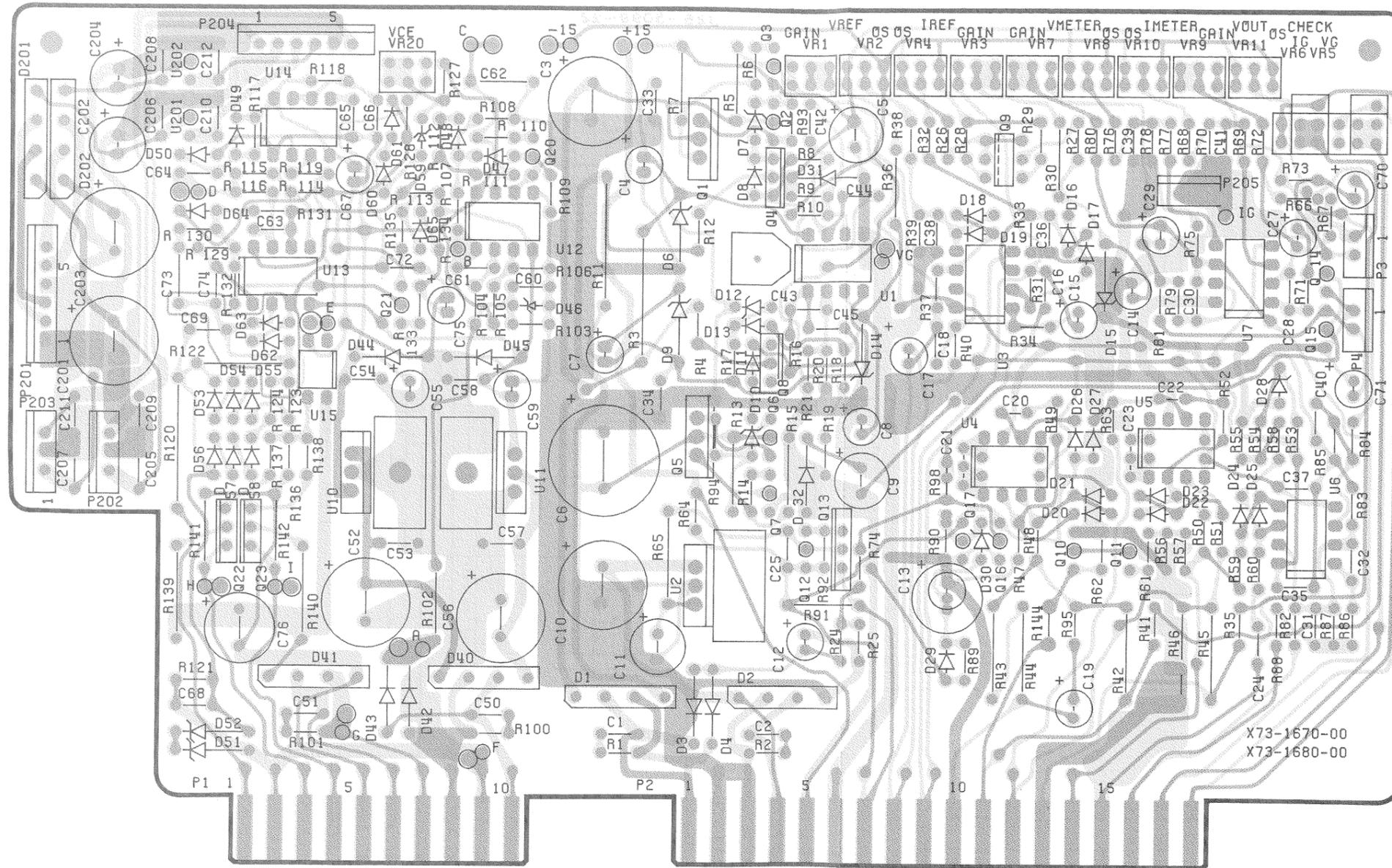
PD18-10D

PD35-10(D) SCHEMATIC DIAGRAM

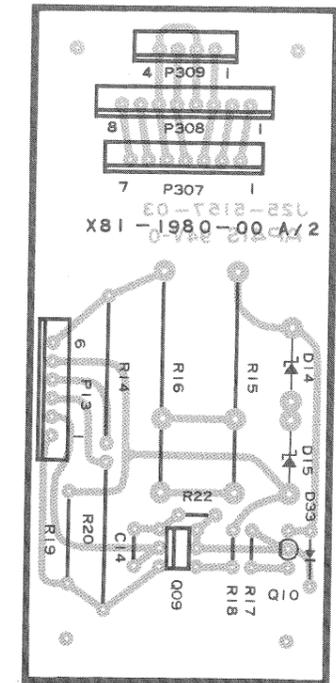


P.C. BOARD

AMP UNIT (X73-1670, X73-1680)

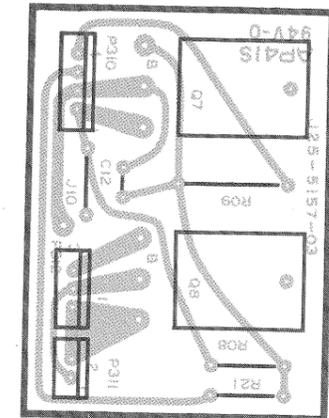


C.I UNIT (X81-1980 A/2)



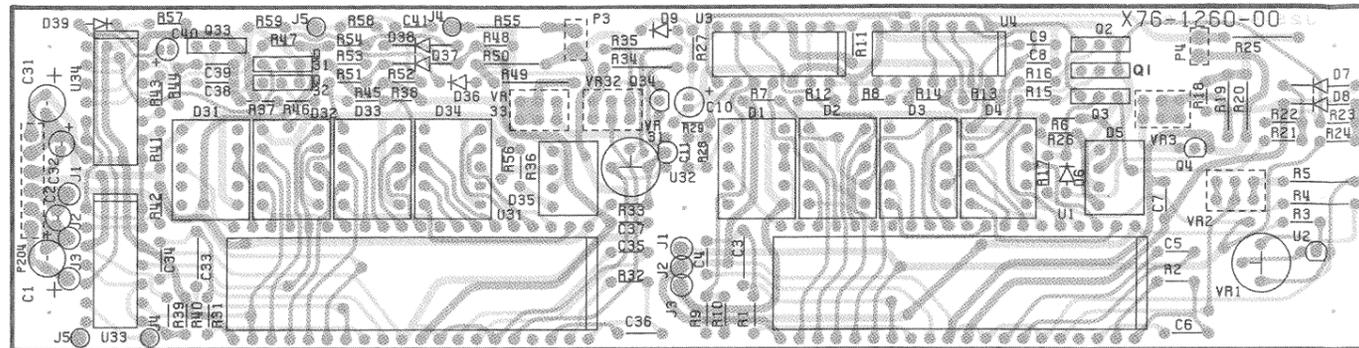
C.I UNIT (X81-1980 B/2)

Pattern side view

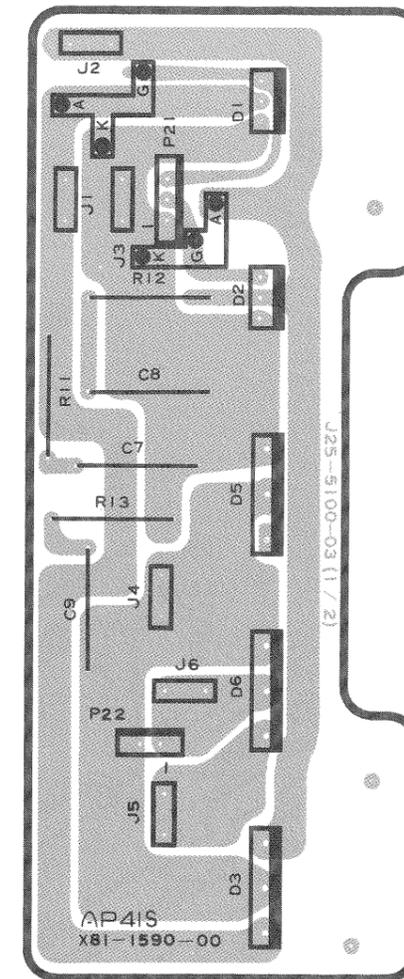


P.C. BOARD

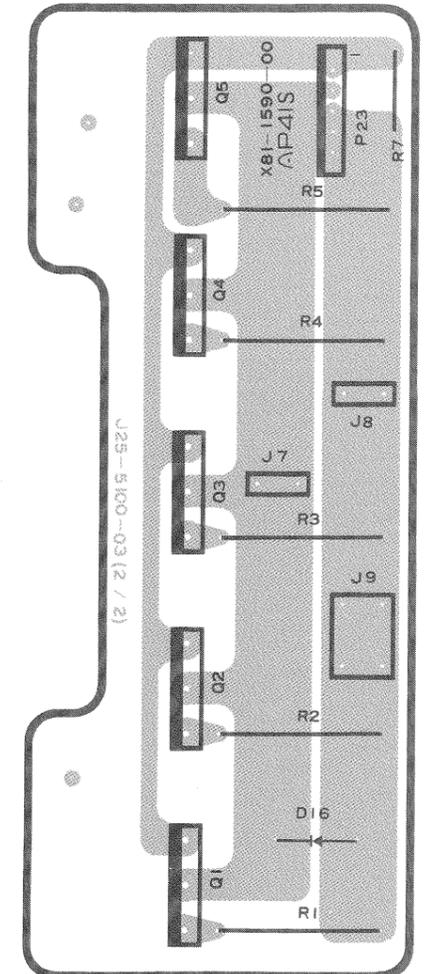
DPM UNIT (X76-1260)



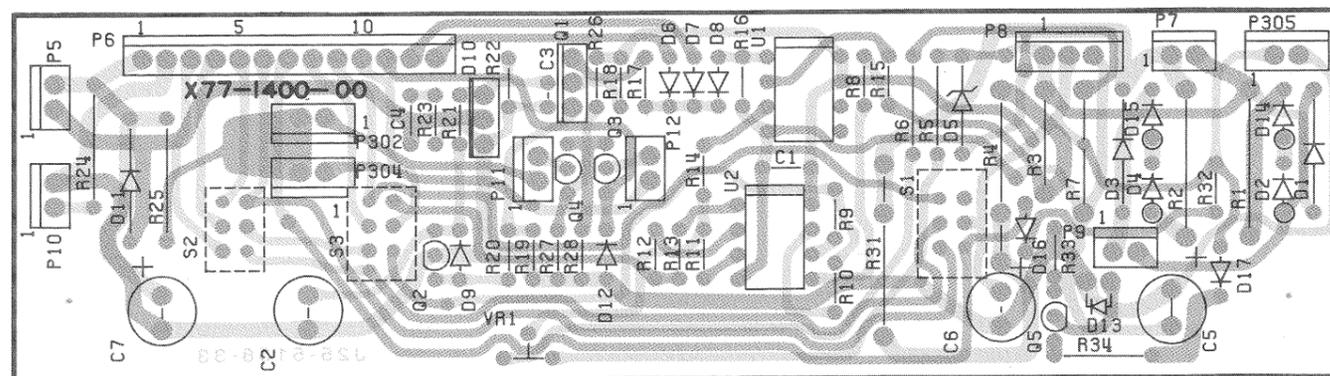
RECTIFIER UNIT (X81-1590-00)



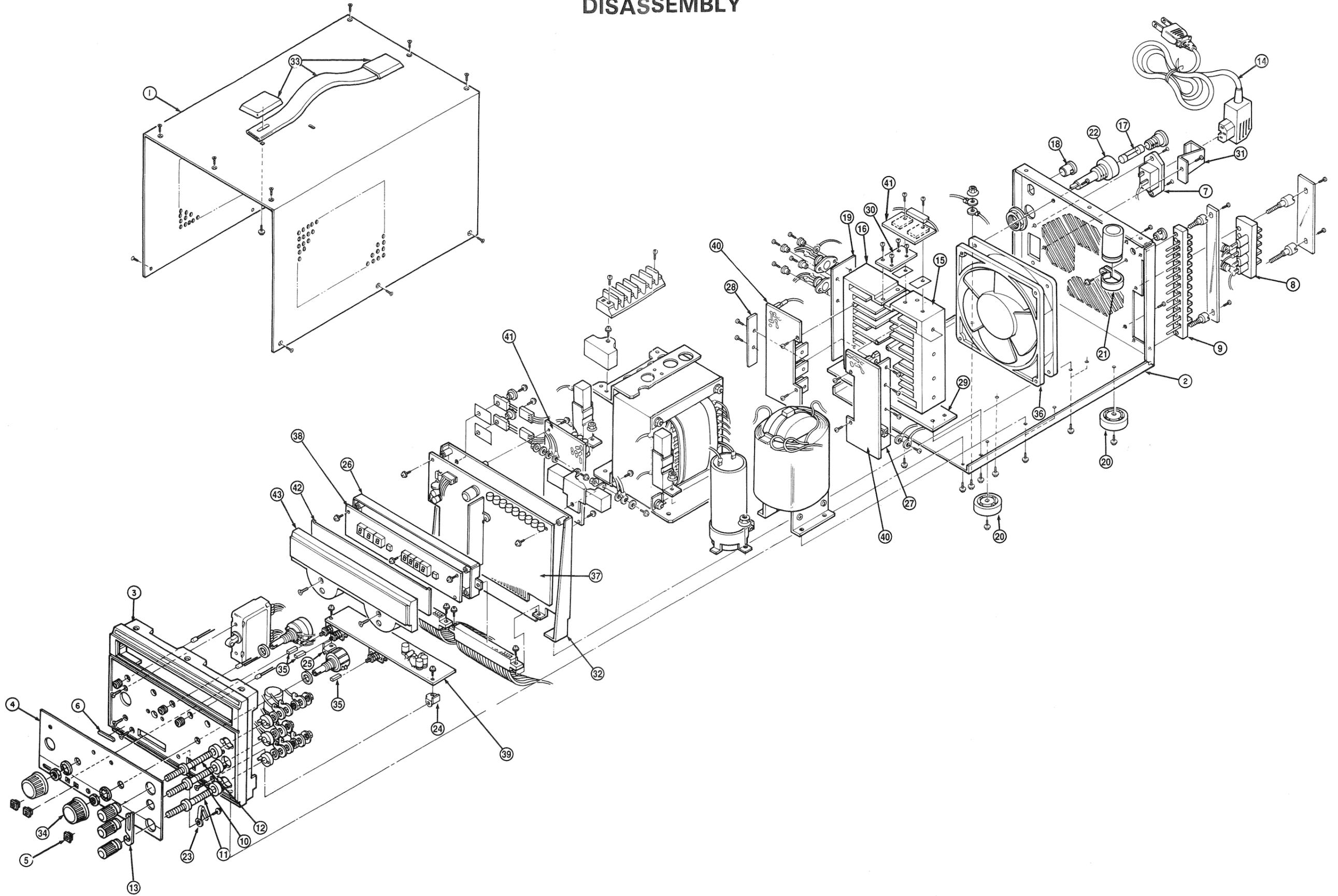
Pattern side view



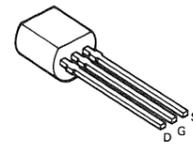
OVP UNIT (X77-1400)



DISASSEMBLY



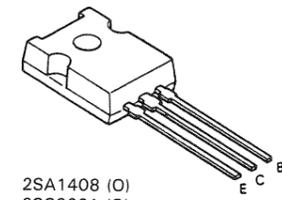
SEMICONDUCTORS



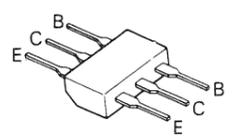
2SK170 (BL)
2SK117 (GR)



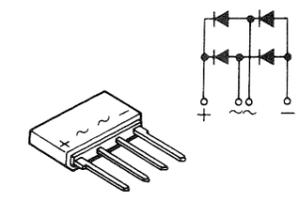
2SA1175 (F)
2SC2785 (F)



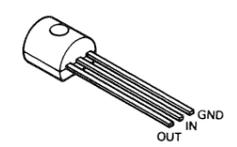
2SA1408 (O)
2SC3621 (O)



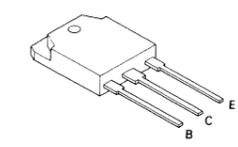
2SC3064 (F)
2SC3066 (F, G)



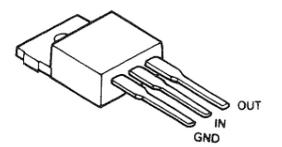
S1VB20



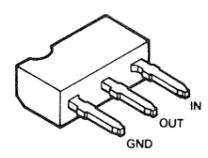
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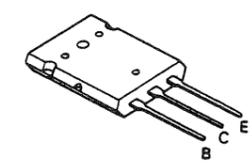
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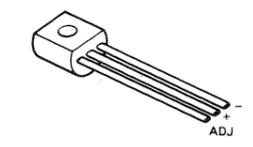
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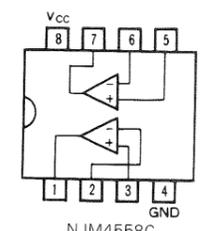
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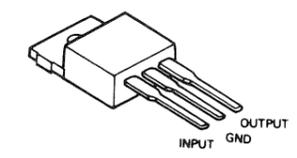
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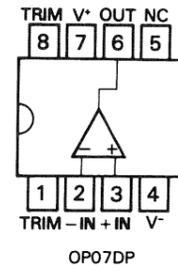
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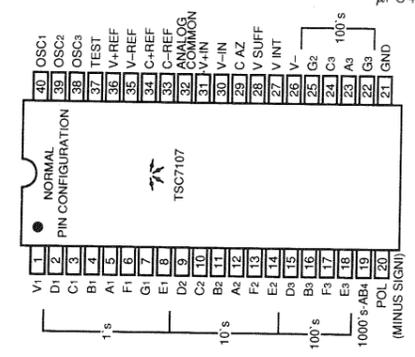
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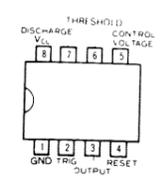
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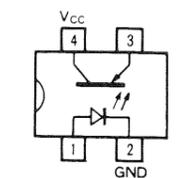
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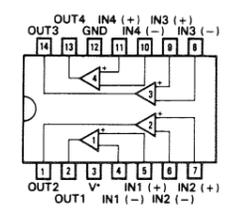
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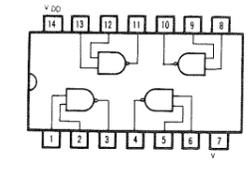
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