

# SERVICING INFORMATION



**BK PRECISION®**

## MODEL 1660

# TRIPLE OUTPUT DC POWER SUPPLY

### PARTS LIST

**SCHEMATIC  
SYMBOL**

**DESCRIPTION**

**B & K-PRECISION  
PART NUMBER**

#### MAIN CHASSIS ASSEMBLY

##### ELECTRICAL PARTS

C107	0.01 $\mu$ F +80/-20%, 1 kV Ceramic Capacitor .....	020-380-9-001
C207	100 $\mu$ F +80/-20%, 50 V Electrolytic Capacitor (Master Output, Slave Output) .....	022-392-9-002
C405	470 $\mu$ F +80/-20%, 16 V Electrolytic Capacitor .....	022-392-9-001
BD401	S10VB20 Bridge Rectifier (10 A, 200 V) .....	157-047-9-001
D212	1N5402 Diode (Master Output, Slave Output) .....	151-136-9-001
D404	1N5402 Diode (5 V Output) .....	151-136-9-001
Q203	2N3055 NPN Power Transistor (Master Output, Slave Output) .....	172-033-9-001
Q402	2N3055 NPN Power Transistor .....	172-033-9-001
S101	Rocker Switch, Illuminated (POWER) .....	093-019-9-001
S601 - 603	Slide Switch, 6 A (A-V, 0-30 V, 4-6.5 V) .....	084-154-9-001
F101	5 A, 250 V 3AG Fast-Acting Fuse .....	191-251-3-005
	Power Transformer .....	065-229-9-001
	Output Terminal Jumper-Strap (2 used) .....	261-195-9-001
	Line Cord Strain Relief .....	380-001-9-001
	Line Cord .....	420-013-9-001
	2-Conductor Cable (3 used; J201 master, J205A master, J205A slave) .....	428-185-9-001
	2-Conductor Cable (master PCB J204-to-master output) .....	428-185-9-002
	2-Conductor Cable (slave PCB J101-to-30 volt PCB J101) .....	428-185-9-003
	2-Conductor Cable (master PCB J401-to-5 volt output) .....	428-185-9-004
	2-Conductor Cable (master PCB J402-to-D403) .....	428-185-9-005
	2-Conductor Cable (slave PCB J204-to-slave output) .....	428-185-9-006
	2-Conductor Cable (slave PCB J207-to-D210, D211) .....	428-185-9-007
	2-Conductor Cable (slave PCB J201-to-30 volt PCB J201B) .....	428-185-9-008
	3-Conductor Cable (master PCB J202-to-30 volt PCB J202A) .....	428-185-9-009
	3-Conductor Cable (master PCB J203-to-30 volt PCB J203A) .....	428-185-9-010
	3-Conductor Cable (slave PCB J202-to-30 volt PCB J202B) .....	428-185-9-011
	3-Conductor Cable (slave PCB J203-to-30 volt PCB J203B) .....	428-185-9-012
	4-Conductor Cable (30 volt PCB J601-to-master display) .....	428-185-9-013
	Jumper Assembly (master PCB A13-to-30 volt PCB A13) .....	428-185-9-014
	Test Lead Assembly (2 feet long) .....	523-986-9-001
	Test Lead Assembly (3 feet long) .....	523-985-9-001
	Fuseholder Assembly (for F101) .....	742-052-9-001

##### MECHANICAL PARTS

	Front Panel, Decorative .....	260-492-9-001
	Front Panel Plastic Bezel .....	380-599-9-002
	Display Bezel (2 used) .....	380-599-9-001
	Display Filter, Red (2 used) .....	753-040-9-001
	Knob, Pushbutton (TRACKING; 2 used) .....	384-090-9-001
	Knob, Control (VOLTAGE, CURRENT, etc; 7 used) .....	751-312-9-001
	Pushbutton Switch Bezel .....	380-596-9-001
	Heatsink (for Q403) .....	747-165-9-001
	Rear Panel Heatsink (2 used) .....	747-165-9-002
	Heat Sink Shield (2 used) .....	256-277-9-001
	Bracket, Potentiometer Mounting (2 used) .....	250-193-9-001
	Bracket, Display PCB Mounting (2 used) .....	250-271-9-001
	Holder, Display Bezel (4 used) .....	250-271-9-002
	Bottom Reinforcement Bracket, Left .....	250-271-9-003

**COMPOSITE  
499-375-9-001**

# PARTS LIST

SCHEMATIC  
SYMBOL

DESCRIPTION

B & K-PRECISION  
PART NUMBER

## MAIN CHASSIS (Continued)

### MECHANICAL PARTS (Continued)

Bottom Reinforcement Bracket, Right .....	250-271-9-004
Sub-Panel (Front Plate) .....	254-130-9-001
Side Frame (Front-to-Rear Support Brace; 2 used) .....	254-131-9-001
Top Cover .....	253-147-9-001
Bottom Cover (Chassis) .....	252-067-9-001
Chassis Rear Plate .....	262-074-9-001
Handle Grip .....	746-076-9-001
Steel Strap, Handle .....	746-076-9-002
Handle End Cap (2 used) .....	746-076-9-003
Foot (4 used) .....	381-152-9-001
3 mm Solder Lug (5 used) .....	724-082-9-004
3.2 x 6.5 x 0.45 mm External-Tooth Solder Lug (2 used) .....	744-039-9-001
Wire Nut, Large .....	653-122-9-001
Wire Nut, Small .....	653-110-9-001
3 x 6 mm ISO Flathead Phillips Machine Screw (Side Frame, S601 - 603, meter bracket; 18 used) ...	634-202-9-002
3 x 12 mm x 0.5 pitch ISO Phillips Machine Screw (Q203, Q402, Q403; 8 used) .....	634-202-9-003
3 x 6 mm x 0.5 pitch ISO Phillips Machine Screw (46 used) .....	634-237-9-001
3 x 8 mm x 0.5 pitch ISO Phillips Machine Screw (8 used) .....	634-238-9-001
3 x 10 mm x 0.5 pitch ISO Phillips Machine Screw (Foot Mounting; 4 used) .....	634-238-9-002
3 x 18 mm ISO Phillips Machine Screw (BD401 Mounting) .....	634-238-9-003
3 x 60 mm x 0.5 pitch Phillips Machine Screw (Internal Heat Sink-to-Bottom Chassis; 2 used) .....	634-238-9-004
4 x 25 mm x 0.7 pitch Phillips Machine Screw (Transformer Mounting; 4 used) .....	634-238-9-005
3 x 10 mm ISO Phillips Flathead Screw (Handle Mounting; 2 used) .....	634-238-9-006
M3 x 0.5 pitch ISO Hex Nut (16 used) .....	653-101-9-001
3.2 x 8 x 0.5 mm Flatwasher (8 used) .....	724-082-9-001
5.3 x 12 x 0.8 mm Flatwasher (4 used) .....	724-088-9-001
3.1 x 5.9 mm Split Lockwasher (9 used) .....	724-082-9-003
13.5 mm Hex Spacer (4 used) .....	759-197-9-001
3-Terminal Binding Post Assembly (2 used) .....	773-135-9-001
2-Terminal Binding Post Assembly (1 used) .....	773-142-9-001
Instruction Manual .....	480-541-9-001

MAIN PC BOARD, MASTER (Assembly 546-032-9-001)

MAIN PC BOARD, SLAVE (Assembly 546-033-9-001)

### RESISTORS

MASTER SLAVE

Unlisted resistors are  $\pm 5\%$ , 1/4 W Carbon Film. See schematic diagram for value.

R101	4.7 k $\Omega$ $\pm 5\%$ , 3 W Metal Film .....	011-003-5-472	X	X
R103	11.3 k $\Omega$ $\pm 1\%$ , 1/4 W Metal Film .....	015-144-1-132	X	X
R104	10.5 k $\Omega$ $\pm 1\%$ , 1/4 W Metal Film .....	015-144-1-052	X	X
R201	1.2 k $\Omega$ $\pm 5\%$ , 1/2 W Carbon Film .....	002-102-5-122	X	X
R202	2 k $\Omega$ $\pm 1\%$ , 1/4 W Metal Film .....	015-144-2-001	X	X
R203	10 k $\Omega$ $\pm 1\%$ , 1/4 W Metal Film .....	015-144-1-002	X	X
R210	13 k $\Omega$ $\pm 1\%$ , 1/4 W Metal Film .....	015-144-1-302	X	X
R211	30.1 k $\Omega$ $\pm 1\%$ , 1/4 W Metal Film .....	015-144-3-012	X	X
R220	150 $\Omega$ $\pm 5\%$ , 2 W Wirewound .....	006-002-5-151	X	X
R222	22 $\Omega$ $\pm 5\%$ , 1/2 W Carbon Film .....	002-102-5-220	X	X
R224	1 k $\Omega$ $\pm 5\%$ , 2 W Metal Film .....	011-002-5-102	X	X
R225A	0.3 $\Omega$ $\pm 5\%$ , 5 W Wirewound .....	004-221-9-001	X	X
R233, 234	2.2 k $\Omega$ $\pm 5\%$ , 1/2 W Carbon Film .....	002-102-5-222	X	X
R401	470 $\Omega$ $\pm 5\%$ , 1 W Carbon Film .....	002-001-5-471	X	
R402	2.37 k $\Omega$ $\pm 1\%$ , 1/4 W Metal Film .....	015-144-2-371	X	
R403	3.01 k $\Omega$ $\pm 1\%$ , 1/4 W Metal Film .....	015-144-3-011	X	
R405	1 k $\Omega$ $\pm 1\%$ , 1/4 W Metal Film .....	015-144-1-001	X	
R407	0.2 $\Omega$ $\pm 5\%$ , 5 W Wirewound .....	004-237-9-002	X	
R411	150 $\Omega$ $\pm 1\%$ , 1/4 W Metal Film .....	015-144-1-500	X	
R412	1 k $\Omega$ $\pm 1\%$ , 1/4 W Metal Film .....	015-144-1-001	X	
VR201, 204	2 k $\Omega$ , 100 ppm Trimmer Potentiometer .....	010-025-9-004	X	X
VR205	2 k $\Omega$ Trimmer Potentiometer .....	010-033-9-005	X	X
VR402	10 k $\Omega$ , 100 ppm Trimmer Potentiometer .....	010-026-9-004	X	
VR403	470 $\Omega$ , 100 ppm Trimmer Potentiometer .....	010-025-9-002	X	
VR405	1 k $\Omega$ Trimmer Potentiometer .....	008-841-9-001	X	

### CAPACITORS

C102	4700 $\mu$ F +80/-20%, 63 V Radial Electrolytic .....	022-392-9-004	X	X
C103, 104	470 $\mu$ F +80/-20%, 35 V Radial Electrolytic .....	022-328-9-004	X	X



# PARTS LIST

SCHEMATIC SYMBOL	DESCRIPTION	B & K-PRECISION PART NUMBER	
<b>DISPLAY DRIVER PC BOARD, MASTER, SLAVE (Continued)</b>			
<b>CAPACITORS</b>			
C101	1000 $\mu$ F +80/-20%, 16 V Radial Electrolytic .....	022-350-9-001	X X
C102	100 $\mu$ F +80/-20%, 16 V Radial Electrolytic .....	022-335-9-002	X X
C201	0.01 $\mu$ F $\pm$ 5%, 630 V Metalized Polyester .....	025-262-9-004	X X
C202	0.1 $\mu$ F $\pm$ 5%, 100 V Metalized Polyester .....	025-262-9-001	X X
C203	100 pF $\pm$ 5%, 50 V NP0 Ceramic .....	031-069-9-003	X X
C204	0.22 $\mu$ F $\pm$ 5%, 100 V Metalized Polyester .....	025-262-9-002	X X
C205	0.47 $\mu$ F $\pm$ 5%, 100 V Metalized Polyester .....	025-262-9-003	X X
<b>DIODES &amp; TRANSISTORS</b>			
BD101	W02M Bridge Rectifier (1 A, 200 V) .....	157-038-9-001	X X
<b>INTEGRATED CIRCUITS</b>			
U101	7805 Positive Voltage Regulator (5 V, 1 A; TO-220 case) .....	307-080-9-001	X X
U201	7107CLP 3-1/2 Digit A/D Converter/Display Driver .....	308-378-9-001	X X
U202	431CLP Programmable Zener Diode .....	307-409-9-001	X X
<b>MISCELLANEOUS</b>			
	40-Pin DIP Socket (for U201) .....	762-017-9-001	X X
	4-Conductor 0.1" PC Header .....	757-144-9-004	X X
	Heatsink (for U101) .....	747-145-9-001	X X
	3 x 8 mm x 0.5 pitch ISO Phillips Machine Screw (for U101 mounting) .....	634-202-9-001	X X
	M3 x 0.5 pitch ISO Hex Nut (U101 mounting) .....	653-101-9-001	X X
	3.2 x 8 x 0.5 mm Flatwasher (U101 mounting) .....	724-082-9-001	X X
	3.1 x 5.9 mm Split Lockwasher (U101 mounting) .....	724-082-9-003	X X
<b>7-SEGMENT DISPLAY PC BOARD ASSEMBLIES (2 used) (Assembly 546-029-9-001)</b>			
<b>RESISTORS</b>			
R212, 213	10 k $\Omega$ $\pm$ 5%, 1/4 W Carbon Film .....	002-104-5-103	
<b>DIODES &amp; TRANSISTORS</b>			
DS1 - 4	7-Segment Display .....	238-047-9-001	
Q201, 202	2SA1015-GR PNP Transistor .....	177-057-9-001	
<b>MISCELLANEOUS</b>			
	8-Conductor 0.1" Right-Angle Header (3 used) .....	757-145-9-001	
	3-Conductor 0.1" Right-Angle Header .....	757-150-9-001	
<b>30-VOLT CONTROL &amp; TRACKING PC BOARD (Assembly 546-030-9-001)</b>			
<b>RESISTORS</b>			
Unlisted resistors are $\pm$ 5%, 1/4 W Carbon Film. See schematic diagram for value.			
R515	28 k $\Omega$ $\pm$ 1%, 1/4 W Metal Film .....	015-144-2-802	
R601	990 k $\Omega$ $\pm$ 1%, 1/4 W Metal Film .....	013-010-9-012	
R602	1 k $\Omega$ $\pm$ 1%, 1/4 W Metal Film .....	015-144-1-001	
R603	0.01 $\Omega$ $\pm$ 1%, 5 W Wirewound (Shunt) .....	004-237-9-001	
R604	10 k $\Omega$ $\pm$ 1%, 1/4 W Metal Film .....	015-144-1-002	
AVR203A, BVR203A	10 k $\Omega$ Potentiometer ( <b>VOLTAGE-COARSE</b> ) .....	008-841-9-002	
AVR203B, BVR203B	1 k $\Omega$ Dual Potentiometer ( <b>VOLTAGE-FINE</b> ) .....	008-841-9-003	
AVR206, BVR206	1 k $\Omega$ Potentiometer ( <b>CURRENT</b> ) .....	008-841-9-001	
VR501	Tracking Adjust PCB Assembly .....	546-028-9-001	
	5 k $\Omega$ , 100 ppm Trimmer Potentiometer for 546-028-9-001 .....	010-033-9-004	
	3-Conductor 0.1" Right-Angle Header for 546-028-9-001 .....	757-150-9-001	
VR601	2 k $\Omega$ , 100 ppm Trimmer Potentiometer .....	010-063-9-001	

## PARTS LIST

SCHEMATIC SYMBOL	DESCRIPTION	B & K-PRECISION PART NUMBER
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### 30-VOLT CONTROL & TRACKING PC BOARD (Continued)

#### CAPACITORS

C503	22 $\mu$ F +80/-20%, 50 V Radial Electrolytic .....	022-335-9-005
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#### DIODES & TRANSISTORS

D501-505	1N4148 Diode.....	151-038-9-001
D508-510, 610	.....	
AD211, BD211	LED, Red (CV).....	158-102-9-001
AD210, BD210	LED, Green (CC).....	158-102-9-002
Q501	2SA1015-GR PNP Transistor.....	177-057-9-001
Q502, 504, 602	2SC1815-GR NPN Transistor .....	176-095-9-001
Q601	2SA1015-GR PNP Transistor.....	177-057-9-001

#### MISCELLANEOUS

RL502-504	ULD-110P Relay (24 V, 10 A).....	441-050-9-001
RL601	Relay (9 VDC Coil).....	441-059-9-001
S501	Dual Pushbutton Switch Assembly (TRACKING select).....	088-181-9-001
A13	0.04" (nominal) PC Terminal.....	757-143-9-001
BJ101, 201, AJ207, BJ207	2-Conductor 0.1" Header.....	257-144-9-002
AJ202, 203, BJ202, 203	3-Conductor 0.1" Header.....	757-144-9-003
J601	4-Conductor 0.1" Header.....	757-144-9-004

### OVERVOLTAGE PROTECT/5-VOLT CONTROL PC BOARD

(Assembly 546-031-9-001)

#### RESISTORS

Unlisted resistors are  $\pm 5\%$ , 1/4 W Carbon Film. See schematic diagram for value.

R605	990 k $\Omega$ $\pm 1\%$ , 1/4 W Metal Film .....	013-010-9-012
R606	900 $\Omega$ $\pm 1\%$ , 1/4 W Metal Film .....	013-142-9-001
R607	0.01 $\Omega$ $\pm 1\%$ , 5 W Wirewound (Shunt).....	004-237-9-001
R608	10 k $\Omega$ $\pm 1\%$ , 1/4 W Metal Film .....	015-144-1-002
VR401	1 k $\Omega$ Dual Potentiometer (4 - 6.5 V Adjust).....	008-841-9-003
VR602	200 $\Omega$ Trimmer Potentiometer .....	010-063-9-002
VR603	2 k $\Omega$ , 100 ppm Trimmer Potentiometer .....	010-063-9-001

#### DIODES & TRANSISTORS

D402	1N750 Zener Diode (4.7 V $\pm 5\%$ , 1/2 W) .....	152-188-9-001
D403	LED, Red (OVERLOAD).....	158-102-9-001

#### MISCELLANEOUS

J402	2-Conductor 0.1" Header.....	757-144-9-002
J403, 404	3-Conductor 0.1" Header.....	757-144-9-003

**NOTE:** The following components are installed on the PC/heatsink assembly located at the rear of the bottom chassis.

R414	127 $\Omega$ $\pm 1\%$ , 1/4 W Metal Film .....	015-144-1-270
VR404	2 k $\Omega$ Trimmer Potentiometer .....	010-033-9-005
C406	2.2 $\mu$ F +80/-20%, 50 V Radial Electrolytic.....	022-392-9-003
Q403	S4008 SCR (TO-220 case) .....	181-017-9-001

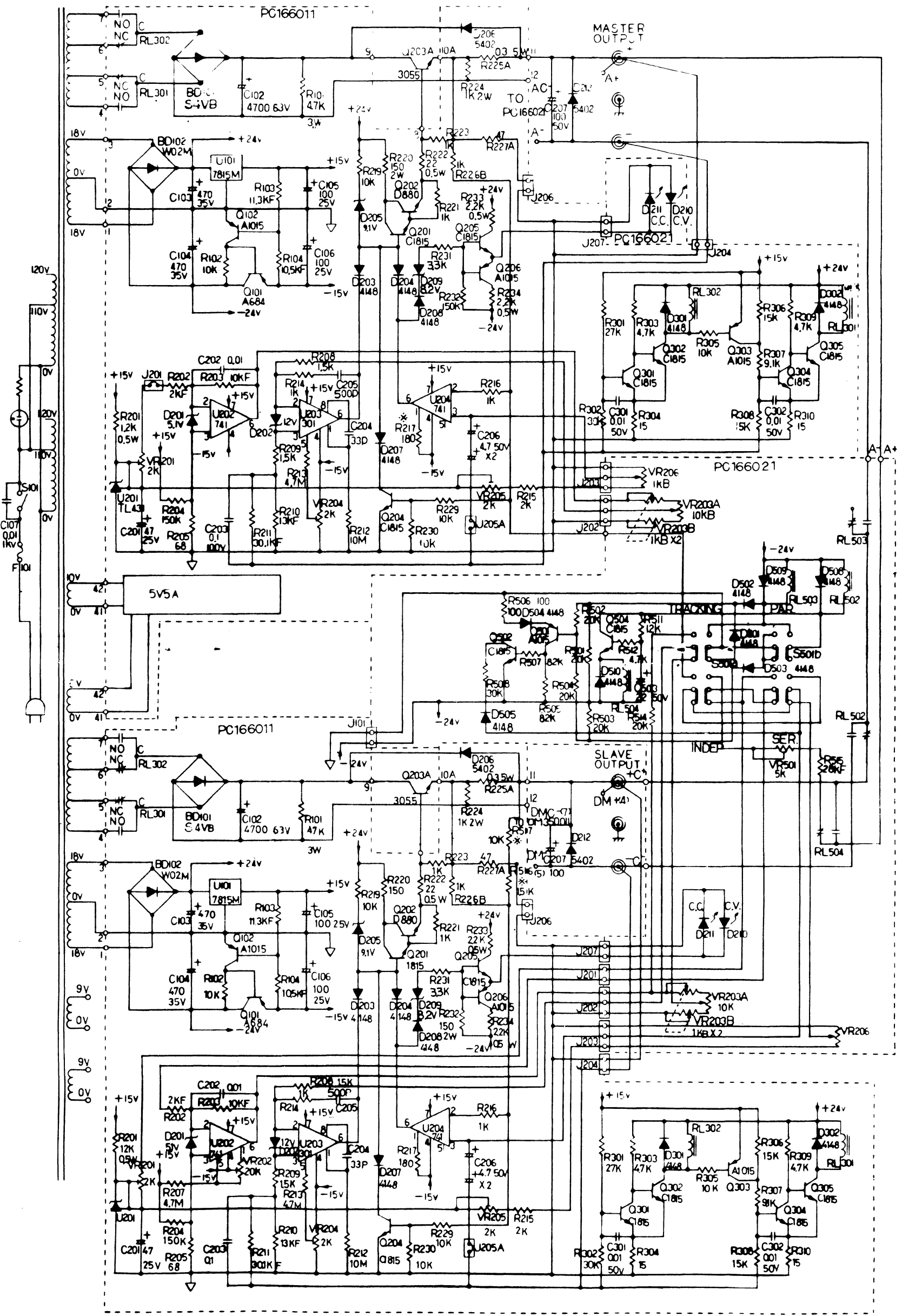
### PARTS ORDERING INFORMATION

Orders will be shipped C.O.D. unless previous open account arrangements have been made or remittance accompanies order. Advance remittance must cover handling and postage or express charges. Specify model and serial number when ordering replacement parts.

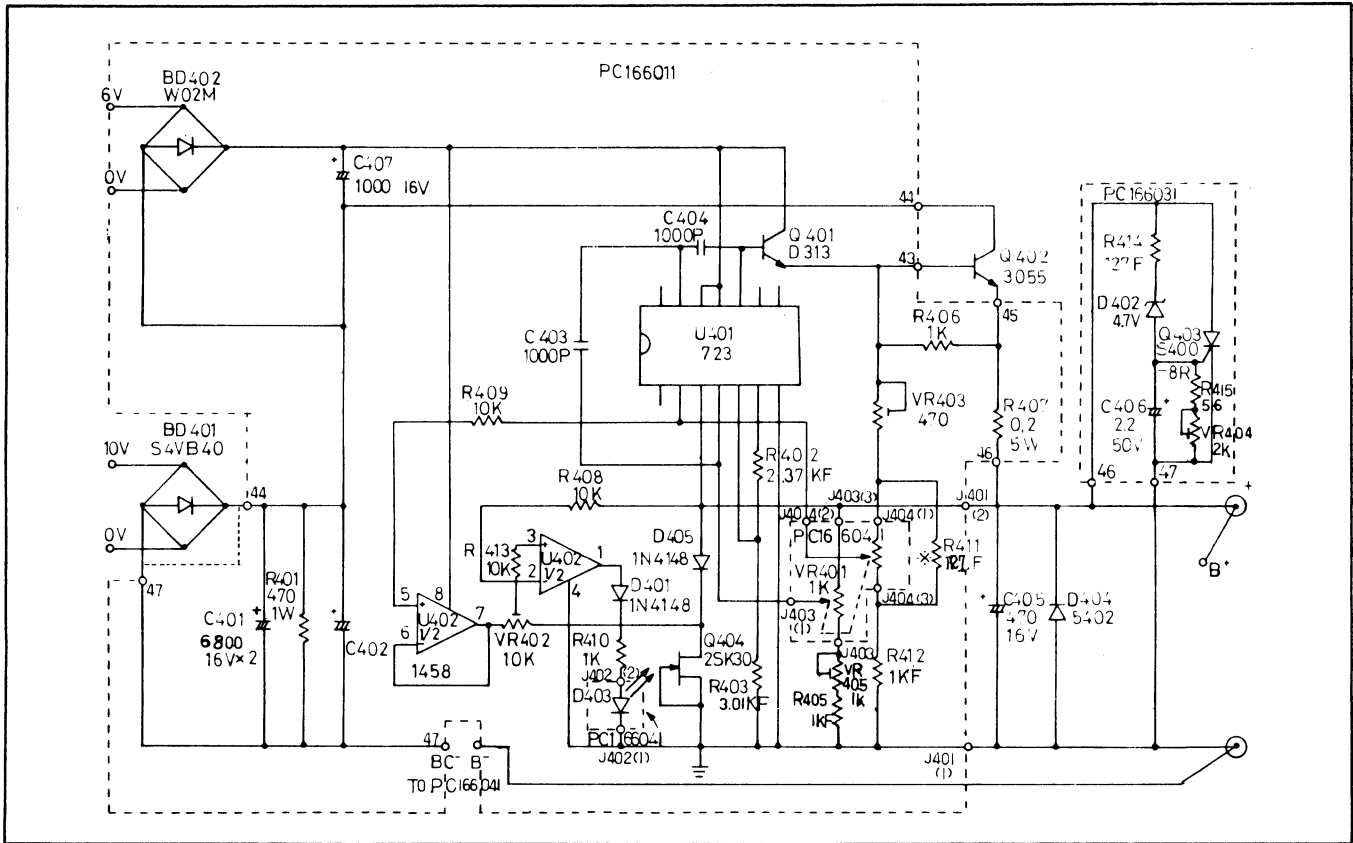
#### ORDER REPLACEMENT PARTS FROM:

**B & K-Precision**, Factory Service Operations  
 Maxtec International Corporation  
 6470 West Cortland Street  
 Chicago, Illinois 60635  
 Telephone: (312) 889-1448

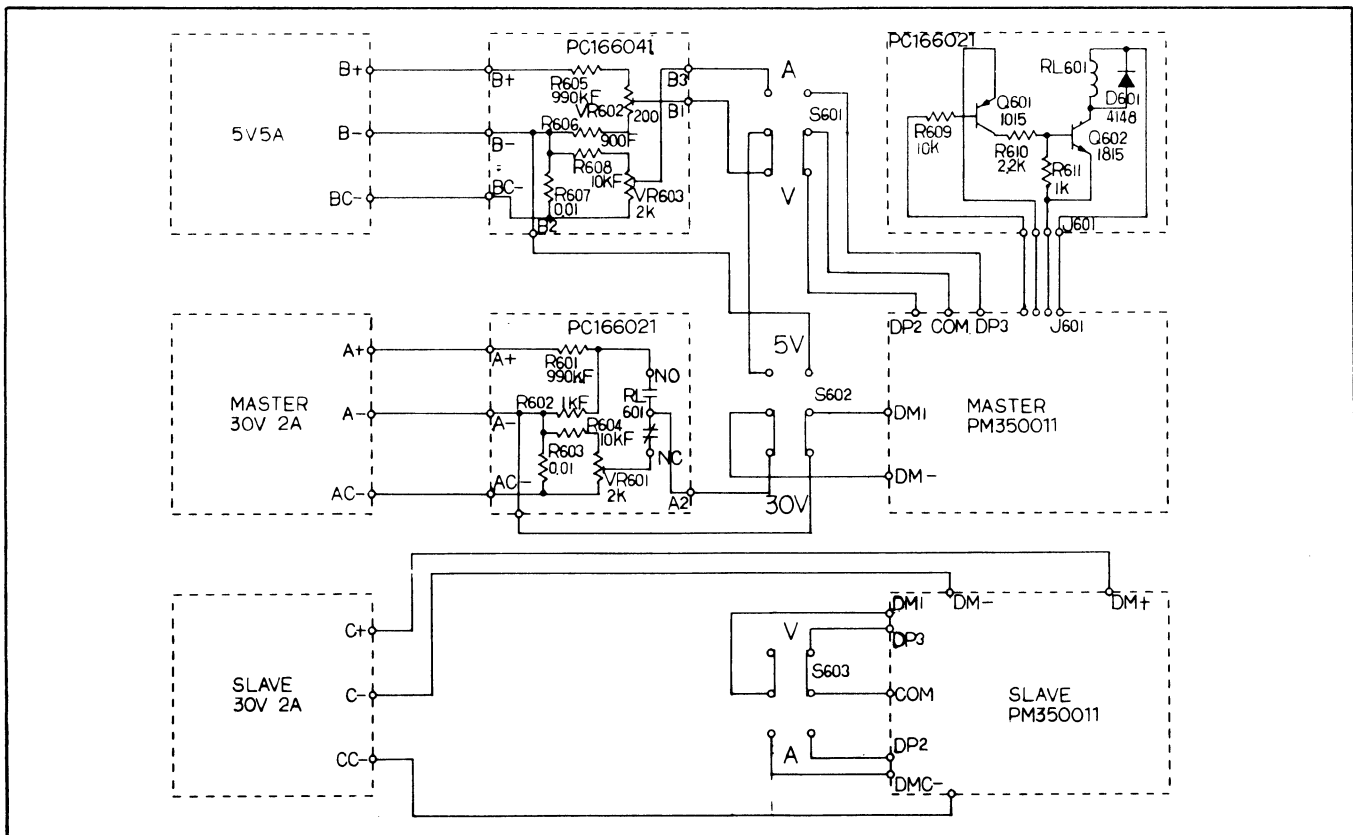
MAIN CHASSIS MASTER & SLAVE PCBs



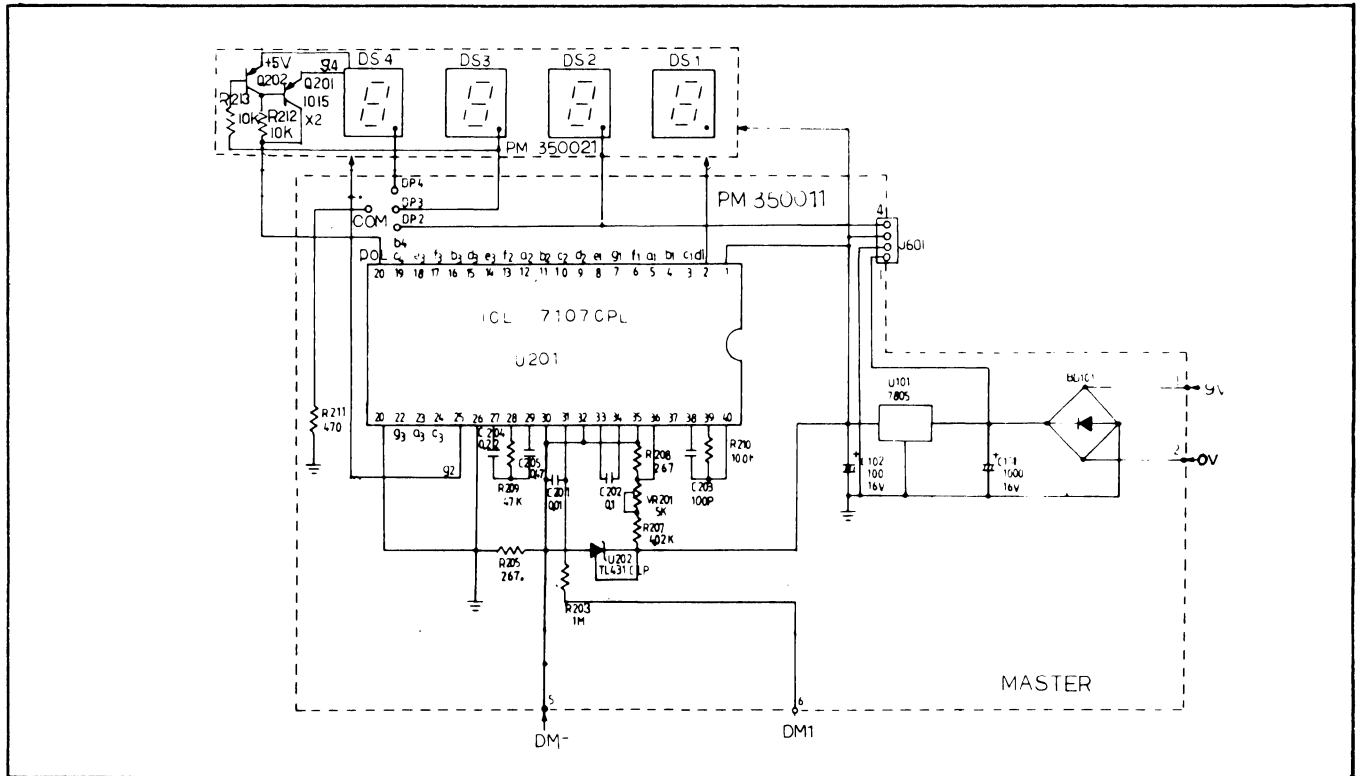
# SCHEMATIC DIAGRAMS



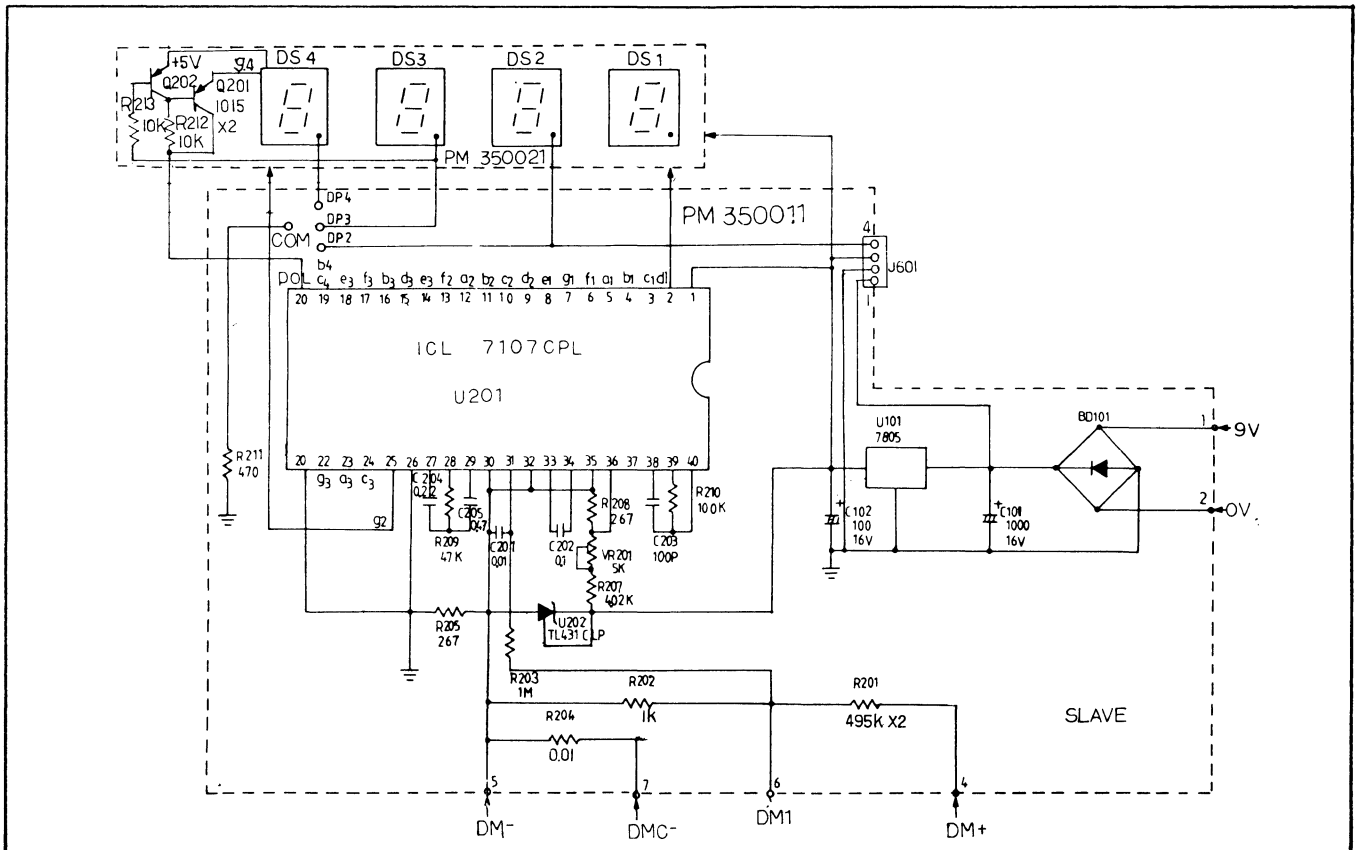
**5V PCB/OVERVOLTAGE PROTECT**



**INTERCONNECT DIAGRAM**



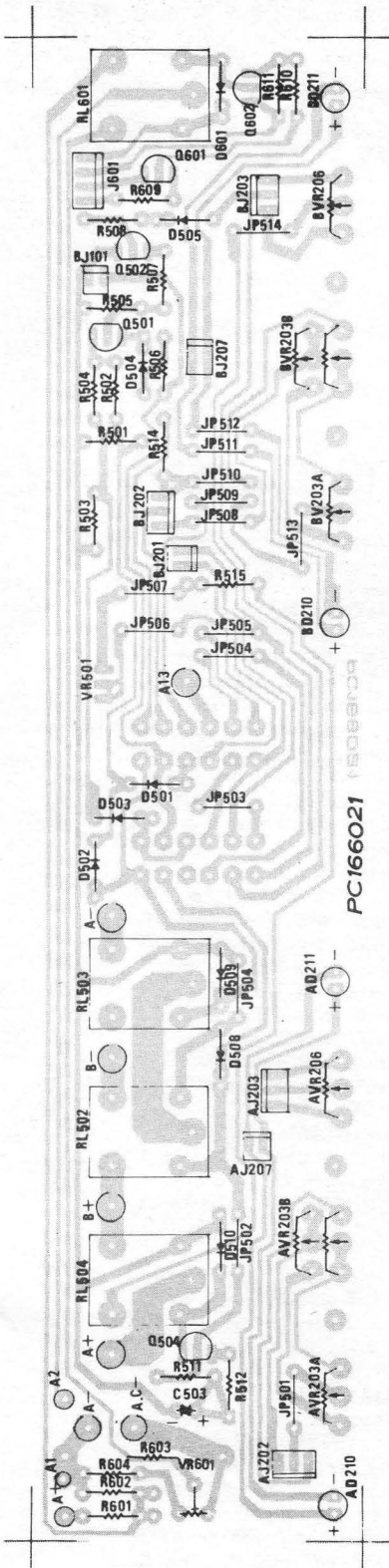
**MASTER DISPLAY CIRCUIT**



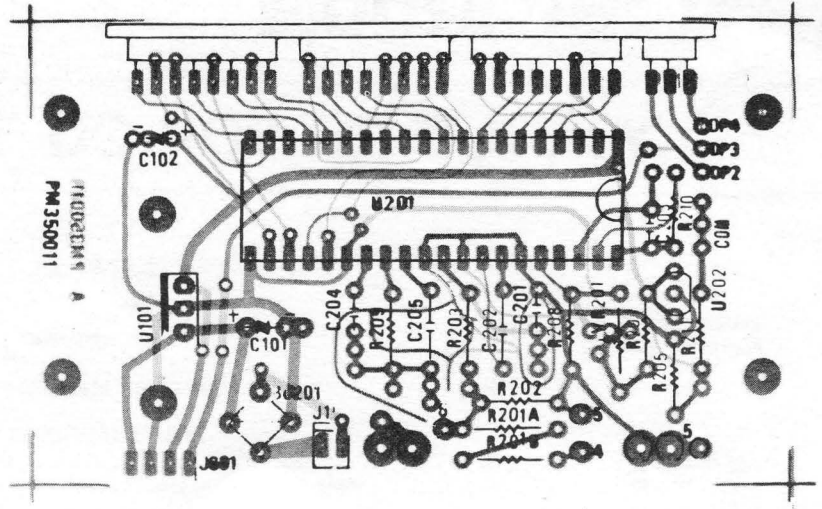
**SLAVE DISPLAY CIRCUIT**







30V CONTROL/TRACKING PCB





**BK PRECISION®**

6470 W. Cortland Street  
Chicago, Illinois 60635