

C-50 SERIES CAMERA BATTERY PACK 016-0270-00

SPECIFICATION

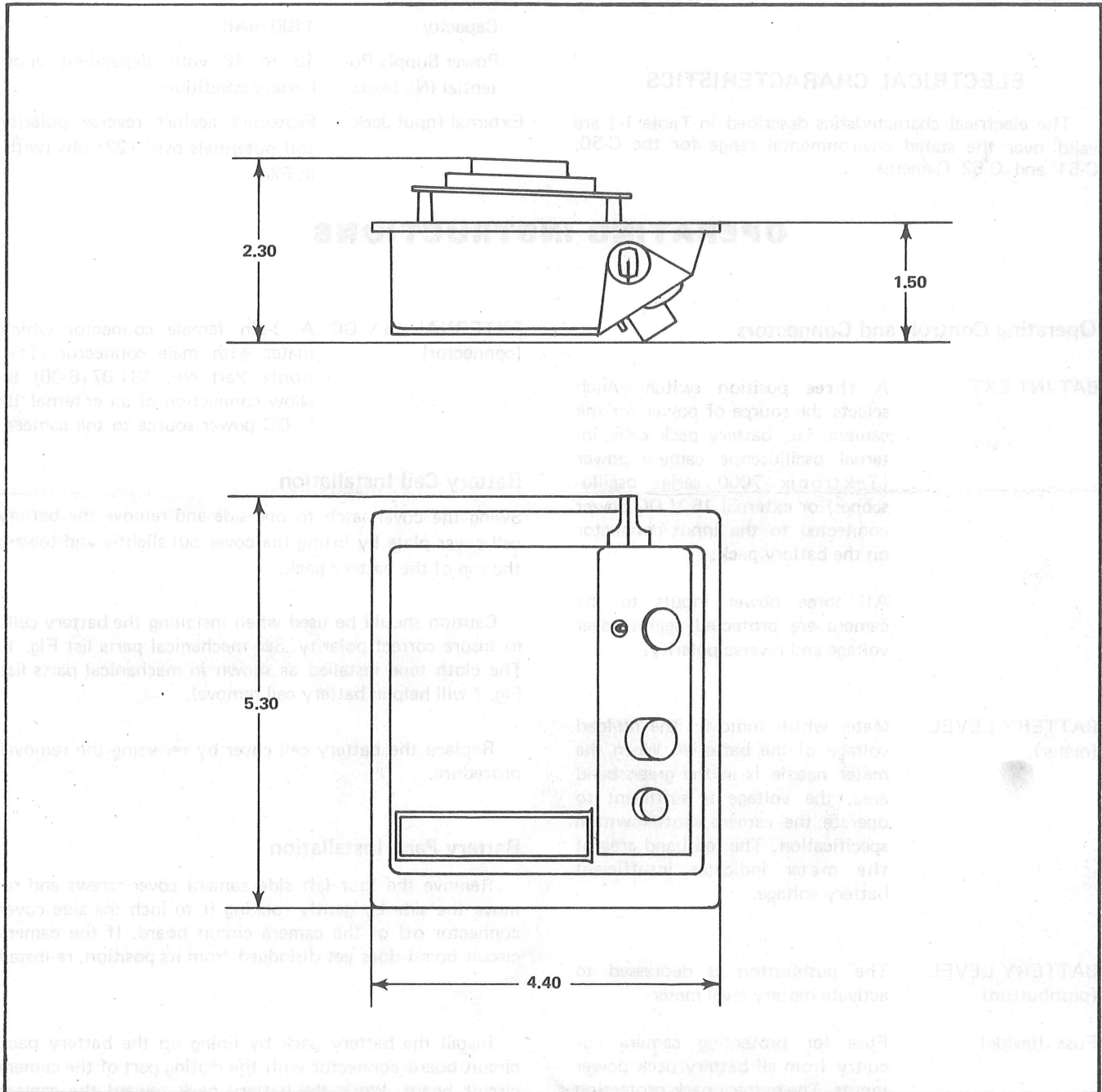


Fig. 1-1. Dimensions of the Battery Pack for the C-50, C-51 and C-52 Cameras.

General Information

The battery pack (016-0270-00) is designed to provide an auxiliary power source for the use of C-50, C-51 and C-52 Cameras on oscilloscopes which are not equipped with camera power outputs. The battery pack provides for the camera to be powered from the oscilloscope camera power, battery pack power, or an external DC voltage source. All three power inputs to the camera from the battery pack are protected against over voltages and reverse polarity.

TABLE 1-1

Characteristic	Performance Requirement
Batteries	
Type	AA Alkaline cell
Number of Cells	12
Nominal Voltage per Cell	1.5 V
Capacity	1100 mAh
Power Supply Potential (No load)	13 to 18 volts dependent upon battery condition
External Input Jack	Protected against reverse polarity and potentials over +22 volts (within 5%)

ELECTRICAL CHARACTERISTICS

The electrical characteristics described in Table 1-1 are valid over the stated environmental range for the C-50, C-51 and C-52 Cameras.

OPERATING INSTRUCTIONS

Operating Controls and Connectors

BAT-INT-EXT

A three position switch which selects the source of power for the camera, i.e., battery pack cells, internal oscilloscope camera power (Tektronix 7000 series oscilloscopes) or external 15 V DC power connected to the input connector on the battery pack.

All three power inputs to the camera are protected against over voltage and reverse polarity.

BATTERY LEVEL (meter)

Meter which indicates the no-load voltage of the batteries. When the meter needle is in the green band area, the voltage is sufficient to operate the camera shutter within specification. The red band area of the meter indicates insufficient battery voltage.

BATTERY LEVEL (pushbutton)

The pushbutton is depressed to activate battery level meter.

Fuse (inside)

Fuse for protecting camera circuitry from all battery pack power inputs. The battery pack protection circuits are designed to blow the fuse if trouble occurs.

EXTERNAL 15 V DC (connector)

A 3-pin female connector which mates with male connector (Tektronix Part No. 131-0716-00) to allow connection of an external 15 V DC power source to the camera.

Battery Cell Installation

Swing the cover latch to one side and remove the battery cell cover plate by lifting the cover out slightly and toward the top of the battery pack.

Caution should be used when installing the battery cells to insure correct polarity. See mechanical parts list Fig. 1. The cloth tape installed as shown in mechanical parts list Fig. 1 will help in battery cell removal.

Replace the battery cell cover by reversing the removal procedure.

Battery Pack Installation

Remove the four left side camera cover screws and remove the side by gently rocking it to inch the side cover connector off of the camera circuit board. If the camera circuit board does get dislodged from its position, re-install it.

Install the battery pack by lining up the battery pack circuit board connector with the mating part of the camera circuit board. Work the battery pack toward the camera frame until it is against the camera. Install the four screws removed from the previous cover.

FUNCTIONAL DESCRIPTION

ELECTRICAL DESCRIPTION

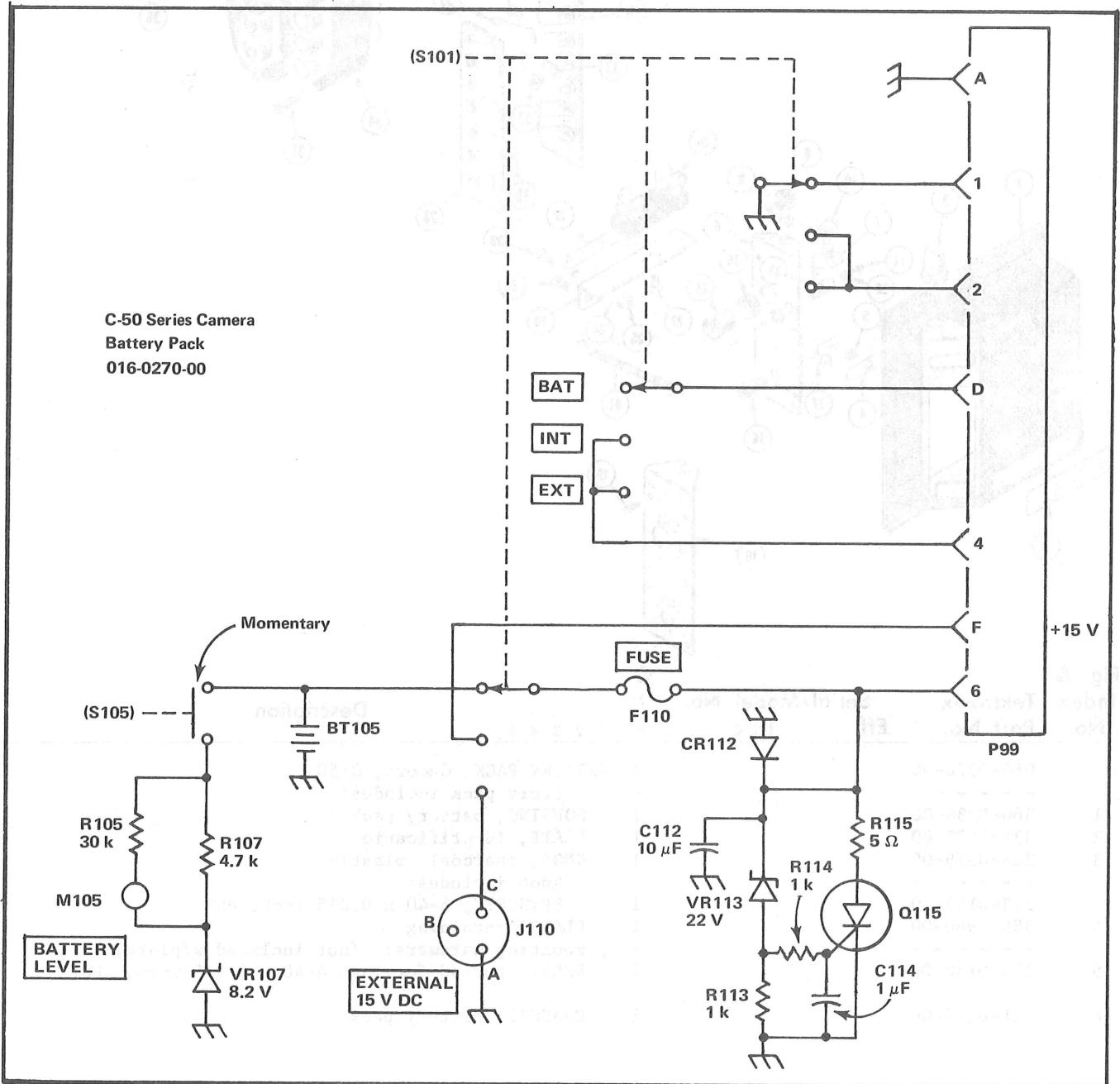
Refer to the complete circuit diagram for the battery pack at the rear of the manual during the following circuit description.

The battery level check circuitry consists of pushbutton S105, R105, R107, meter M105 and Zener diode VR107. The total battery pack voltage is dropped across R107 and VR107. The voltage developed across R107 is applied across M105 and meter calibration resistor R105 to indicate the voltage in the battery pack.

The reverse polarity circuitry consists of CR112 connected between pin 6 of P99 and ground. CR112 will short

any reverse polarity voltage to ground and cause fuse F110 to blow.

The over-voltage protection circuitry includes C112, Zener Diode VR113, R113, R115 and silicon-controlled rectifier (SCR) Q115. When an over-voltage (greater than 22 volts, $\pm 5\%$) is applied to pin 6 of P99, VR113 turns on, and drops 22 volts of the applied voltage with any excess voltage developed across R113, causing Q115 to turn on. With SCR Q115 turned on, the total applied voltage at pin 6 of P99 is dropped across R115 and the SCR, which will probably cause fuse F110 to blow. C112 is necessary to prevent the turn-on transient, which occurs when power is first applied to the camera, from turning on the over-voltage protection circuitry.



MECHANICAL PARTS LIST

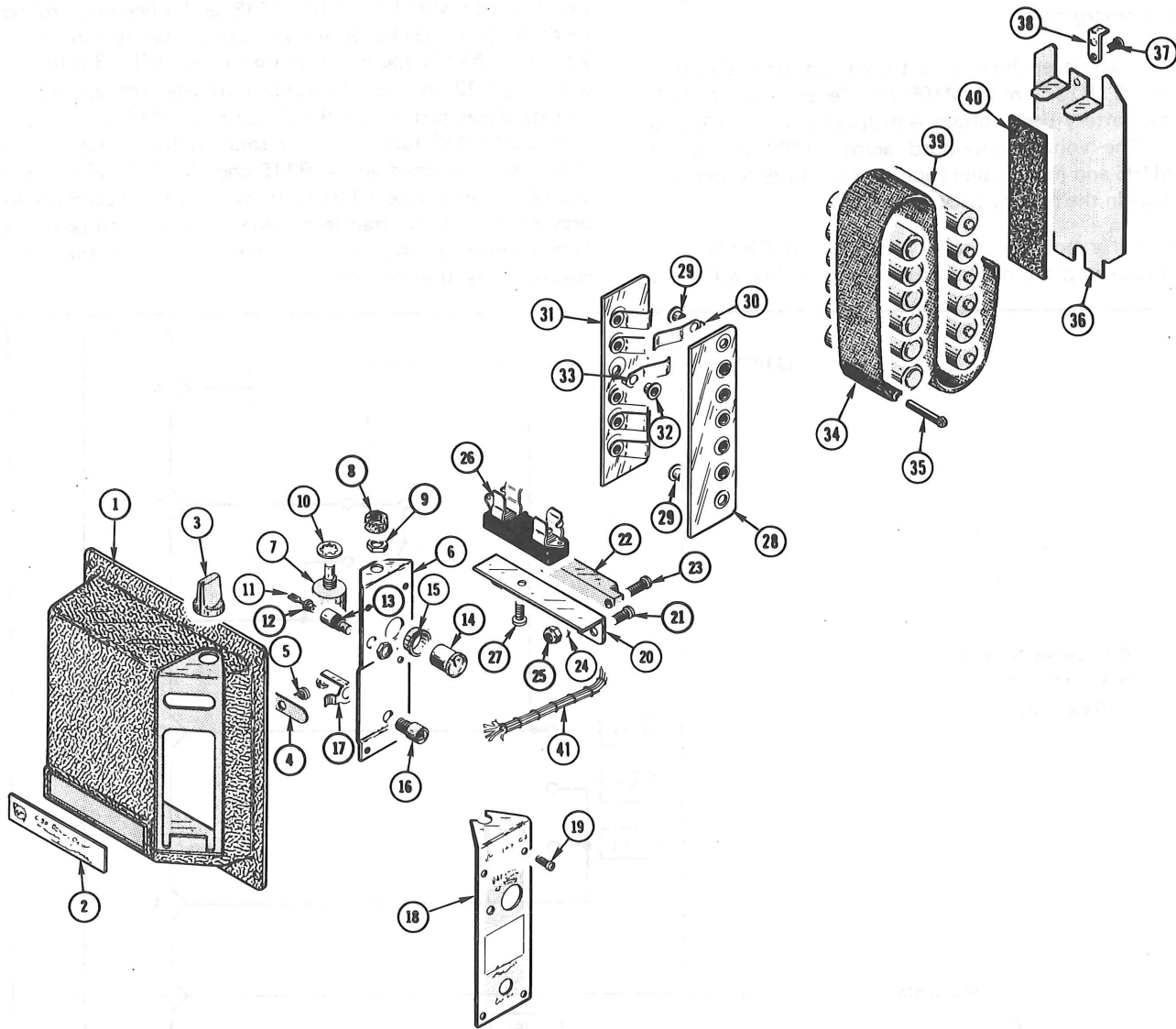


Fig. & Index No.	Tektronix Part No.	Serial/Model No.		Qty	Description
		Eff	Disc		
	016-0270-00			1	BATTERY PACK, Camera, C-50
	- - - - -			-	battery pack includes:
1	380-0236-00			1	HOUSING, battery pack
2	334-1685-00			1	PLATE, identification
3	366-0379-00			1	KNOB, charcoal, plastic
	- - - - -			-	knob includes:
	213-0153-00			1	SETSCREW, 5-40 x 0.215 inch, HSS
4	386-1940-00			1	PLATE, retaining
	- - - - -			-	mounting hardware: (not included w/plate)
5	213-0138-00			1	SCREW, thread forming, 4-40 x 0.188 inch, PHS
6	441-0986-00			1	CHASSIS, battery pack

C-50 Series Battery Pack—016-0270-00

Fig. & Index No.	Tektronix Part No.	Serial/Model No.		Q f y	Description
		Eff	Disc		
					1 2 3 4 5
7	260-1220-00			1	SWITCH, rotary--BAT/INT/EXT
	- - - - -			-	mounting hardware: (not included w/switch)
8	214-1288-00			1	GASKET, light seal, felt
9	210-0583-00			1	NUT, hex., 0.25-32 x 0.312 inch
10	210-0046-00			1	WASHER, lock, internal, 0.261 x 0.40 inch OD
11	131-0433-00			8	CONNECTOR, terminal stud
	- - - - -			-	mounting hardware for each: (not included w/connector)
12	358-0241-00			1	BUSHING, plastic
13	260-0735-00			1	SWITCH, push, SPST--BATTERY LEVEL
14	149-0031-00			1	METER, battery level, panel mount
	- - - - -			-	mounting hardware: (not included w/meter)
15	352-0243-00			1	HOLDER, indicator, plastic
16	131-0717-00			1	CONNECTOR, 3 contact, female, recessed
	- - - - -			-	mounting hardware: (not included w/connector)
17	214-1537-00			1	HEATSINK
18	333-1407-00			1	PANEL, front, battery pack
	- - - - -			-	mounting hardware: (not included w/panel)
19	213-0055-00			4	SCREW, thread forming, 2-32 x 0.25 inch, RHS
20	407-0941-00			1	PLATE, connector mounting
	- - - - -			-	mounting hardware: (not included w/plate)
21	213-0138-00			2	SCREW, thread forming, 4-40 x 0.188 inch, PHS
22	131-0581-00			1	CONNECTOR, receptacle, electrical, 12 contact
	- - - - -			-	mounting hardware: (not included w/connector)
23	211-0014-00			2	SCREW, 4-40 x 0.50 inch, PHS
24	210-0994-00			2	WASHER, flat, 0.125 ID x 0.251 inch OD
25	210-0589-00			2	NUT, locking, 4-40 x 0.25 inch
26	352-0031-00			1	FUSEHOLDER
	- - - - -			-	mounting hardware: (not included w/fuseholder)
27	213-0054-00			1	SCREW, thread cutting, 6-32 x 0.312 inch, PHS
28	670-1366-00			1	CIRCUIT BOARD ASSEMBLY, right
	- - - - -			-	circuit board assembly includes:
	388-1925-00			1	CIRCUIT BOARD
29	210-0778-01			7	EYELET, metallic, 0.145 inch long
30	131-1029-00			6	CONTACT, electrical
31	670-1367-00			1	CIRCUIT BOARD ASSEMBLY, left
	- - - - -			-	circuit board assembly includes:
	388-1926-00			1	CIRCUIT BOARD
32	210-0778-01			6	EYELET, metallic, 0.145 inch lon
33	131-1029-00			6	CONTACT, electrical
34	214-1538-00			1	PULL TAPE, battery removal, cotton twill
35	214-1549-00			1	PIN, retaining
36	200-1206-00			1	COVER, battery pack
	- - - - -			-	mounting hardware: (not included w/cover)
37	213-0138-00			1	SCREW, thread forming, 4-40 x 0.188 inch, PHS
38	105-0254-00			1	LATCH, cover
39	006-0513-00			12	BATTERY, alkaline, AA, 1.5 volts
40	124-0247-00			1	INSULATION, sponge
41	179-1634-00			1	WIRING HARNESS

C-50 Series Battery Pack

ELECTRICAL PARTS LIST

Values are fixed unless marked Variable.

Ckt. No.	Tektronix Part No.	Serial/Model No. Eff	Disc	Description		
Battery						
BT105	006-0513-00			Battery, 1.5 V		
Capacitor						
Tolerance $\pm 20\%$ unless otherwise indicated.						
C112	290-0301-00		10 μF	Elect.	20 V	10%
C114	290-0267-00		1 μF	Elect.	35 V	
Semiconductor Device, Diodes						
CR112	152-0066-00		Silicon	1N3194		
VR107	152-0217-00		Zener	1N756A	400 mW, 8.2 V, 5%	
VR113	152-0281-00		Zener	1N969B	400 mW, 22 V, 5%	
Fuse						
F110	159-0025-00		0.5 A	3 AG	Fast-Blo	
Connectors						
J110	131-0717-00			Receptacle, electrical		
P99	131-0581-00			Receptacle, electrical, 12 contact, female		
Meter						
M105	149-0031-00			Battery level 0-200 μA , $\pm 15\%$		
Transistor						
Q115	151-0503-00		SCR	2N5060, 30 V		
Resistors						
Resistors are fixed, composition, $\pm 10\%$ unless otherwise indicated.						
R105	315-0303-00		30 $\text{k}\Omega$	1/4 W		5%
R107	315-0472-00		4.7 $\text{k}\Omega$	1/4 W		5%
R113	315-0102-00		1 $\text{k}\Omega$	1/4 W		5%
R114	315-0102-00		1 $\text{k}\Omega$	1/4 W		5%
R115	308-0555-00		5 Ω	3 W	WW	5%
Switches						
Wired or Unwired						
S101	260-1220-00			Rotary		
S105	260-0735-00			Push		