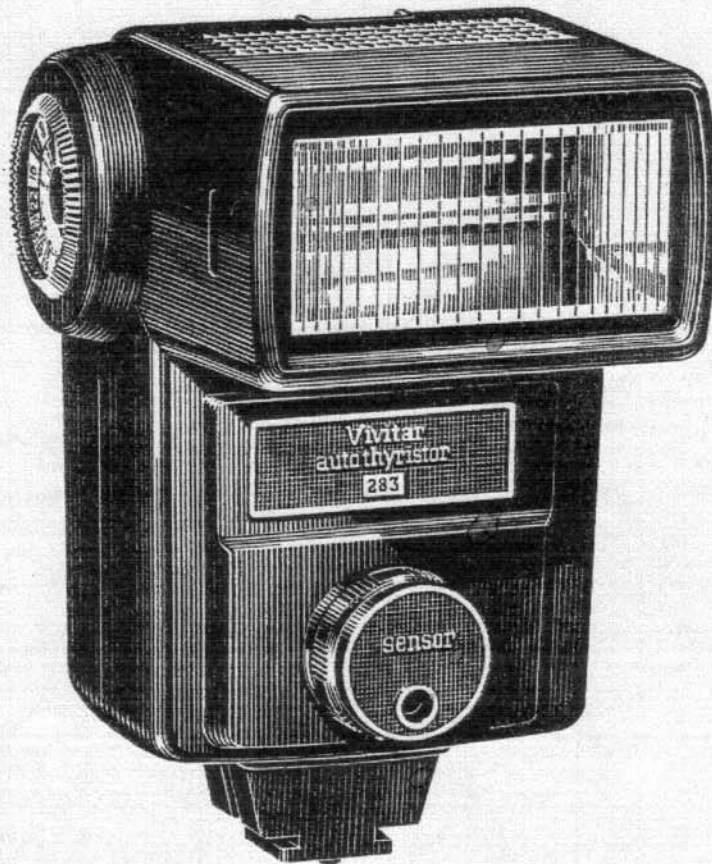


Vivitar

Service Manual



Automatic Electronic Flash Model 283

Publication No. 3746059 / December 1976

Revision A June 1978

Revision B November 1980

Revision C August 1984

HOW TO USE THIS PUBLICATION

HOW TO FIND PART ORDER NUMBERS

Parts are illustrated on exploded view drawings where each part is identified by a reference number or designator. These reference numbers appear in sequence in the parts lists where they are cross-referenced to the part numbers and descriptions.

When a part is not available separately it will be so indicated by a footnote and can be obtained by ordering the assembly containing it. The part number of that assembly may be shown immediately to the right on the same line in an "Included in Assembly" column or at the end of the parts list(s).

CAUTION

This publication is intended for use by persons having skills and equipment needed to service the subject product(s) safely and correctly. Users are cautioned that special tools and/or test equipment may be required for proper disassembly, reassembly, alignment, or adjustment or damage to the product may result.

WARNING

The product herein described is electrically operated. Its servicing will require extreme caution. Improper handling could result in serious or fatal personal injury and damage to the product.

Notice: Information contained herein is subject to change without notice.

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12 Yotsua 3-Chome
Shinjuku-Ku
Tokyo 160, Japan
Tele: 357-6021

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SECTION 1
INTRODUCTION

1.1 SCOPE OF MANUAL

This document is the Service Manual for the Vivitar Electronic Flash Unit Model 283, sold under Vivitar stock number 0233952 and further identified by Vivitar Top Assembly part number 3900277. This manual provides information on principles of operation, operational checkout, troubleshooting, disassembly and reassembly, repair, component replacement, and recommended tools and test equipment. A parts list, exploded view drawings, schematic diagram, PC board layout and wiring view drawings are also provided.

Please note that illustrations and parts lists are based on production data at time of publication, and that details may vary with production changes.

1.2 GENERAL SPECIFICATIONS

Automatic Operating Ranges	PURPLE Mode: 2 ft. to 11 ft. (0.6m to 3.3m) BLUE Mode: 2 ft. to 15 ft. (0.6m to 4.5m) RED Mode: 3 ft. to 30 ft. (0.9m to 9m) YELLOW Mode: 3 ft. to 43 ft. (0.9m to 13m)
Automatic Sensor Measuring Angle	20 degrees
BCPS (Beam Candle Power Seconds)	2,900 (Manual)
Recycle Time (fully charged or fresh batteries)	AC: 7 seconds (Manual), 0.5 to 7 seconds (Automatic) DC: 5 seconds (Manual) with NiCad batteries, 0.5 to 5 seconds (Automatic) with NiCad batteries 9 seconds (Manual) with alkaline batteries, 0.5 to 9 seconds (Automatic) with alkaline batteries
Flash Duration (approximate)	1/1000 second (Manual)
Color Temperature	5500 degrees Kelvin
Angle(s) of Illumination	60 degrees horizontal, 45 degrees vertical
Operating Position(s)	Vertical, with variable tilt reflector assembly
Power Sources	AC: 105-125V with Vivitar SB-4 AC Adapter DC: Four AA alkaline 1.5V batteries or Vivitar Interchangeable NiCad Battery Pack (NC-3)
Flashes per Set of AA alkaline batteries	75 (Manual), 75-800 (Automatic)*
Flashes per 15-minute charge with NiCad Battery Pack	50 (Manual), 50-800 (Automatic)*
Camera/Electronic Flash Synchronization Connection(s)	PC sync cord, hot shoe, or sensor holder cord

*Number of flashes in the Automatic Mode depends on Flash to Subject Distance, room reflectivity, and Auto f-stop setting used.

1.3 GUIDE NUMBERS

MANUAL OPERATION

Table 1-1. Guide Numbers

Guide Numbers (ASA-Feet)

ASA Film Speed	25	64	80	100	125	160	200	400	800
Flash Guide No.	60	96	108	120	135	150	170	240	340

Guide Numbers (DIN-Meter)

DIN Film Speed	15	19	20	21	22	23	24	27	30
Flash Guide No.	18	29	32	36	40	45	51	72	100

Table 1-2. Automatic Operation f-Stop Settings

AUTOMATIC OPERATION

Auto f-Stop settings to the closest half-stop:

Film Speed: ASA	25	64*	80*	100*	125*	160*	200*	400	800
DIN	15	19	20	21	22	23	24	27	30
YELLOW Mode	1.4	2.4	2.4	2.8	3.5	3.5	4	5.6	8
RED Mode	2	3.5	3.5	4	4.7	4.7	5.6	8	11
BLUE Mode	4	6.7	6.7	8	9.5	9.5	11	16	22
PURPLE Mode	5.6	9.5	9.5	11	14	14	16	22	32

*These ASA film speeds differ by only 1/3 of an f-stop. The resulting change in exposure is so slight that a change in the Auto f-stop may not be indicated.

SECTION 2

PRINCIPLES OF OPERATION – CIRCUIT DESCRIPTION

2.1 GENERAL

The Vivitar Model 283 Auto Electronic Flash Unit provides a source of variable-duration, high-intensity light, keyed to preset camera f-stops and automatically compensating for distance by means of auto control circuitry. In any of the four automatic modes of operation, flash duration and intensity are automatically controlled. The manual mode furnishes constant, maximum light output.

The major circuits of the unit are oscillator, rectifier and power storage, flash trigger, quench, light sensing, bounce compensator (BCC), and auto control. There is a neon indicator circuit for the ready light, the calculator dial light, and the sufficient light indicator light. The Model 283 operates from a battery or AC power source. See Figures 2-1 and 2-2.

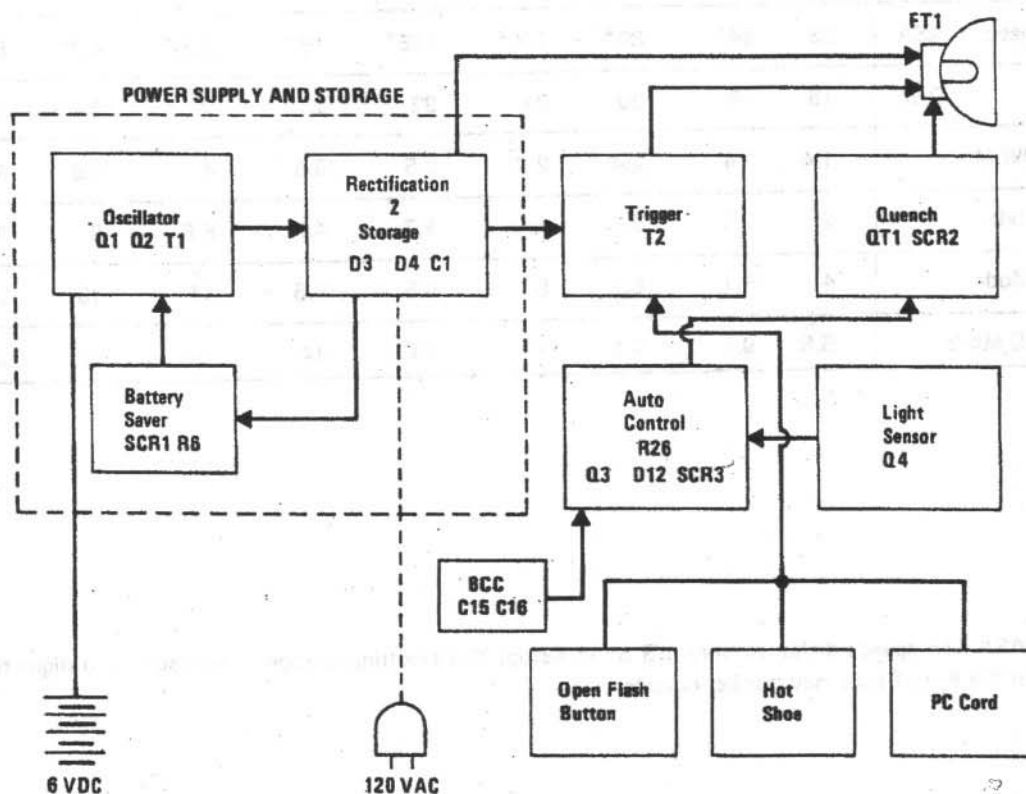


Figure 2-1. Block Diagram, Principles of Operation

Automatic Electronic Flash Model 283

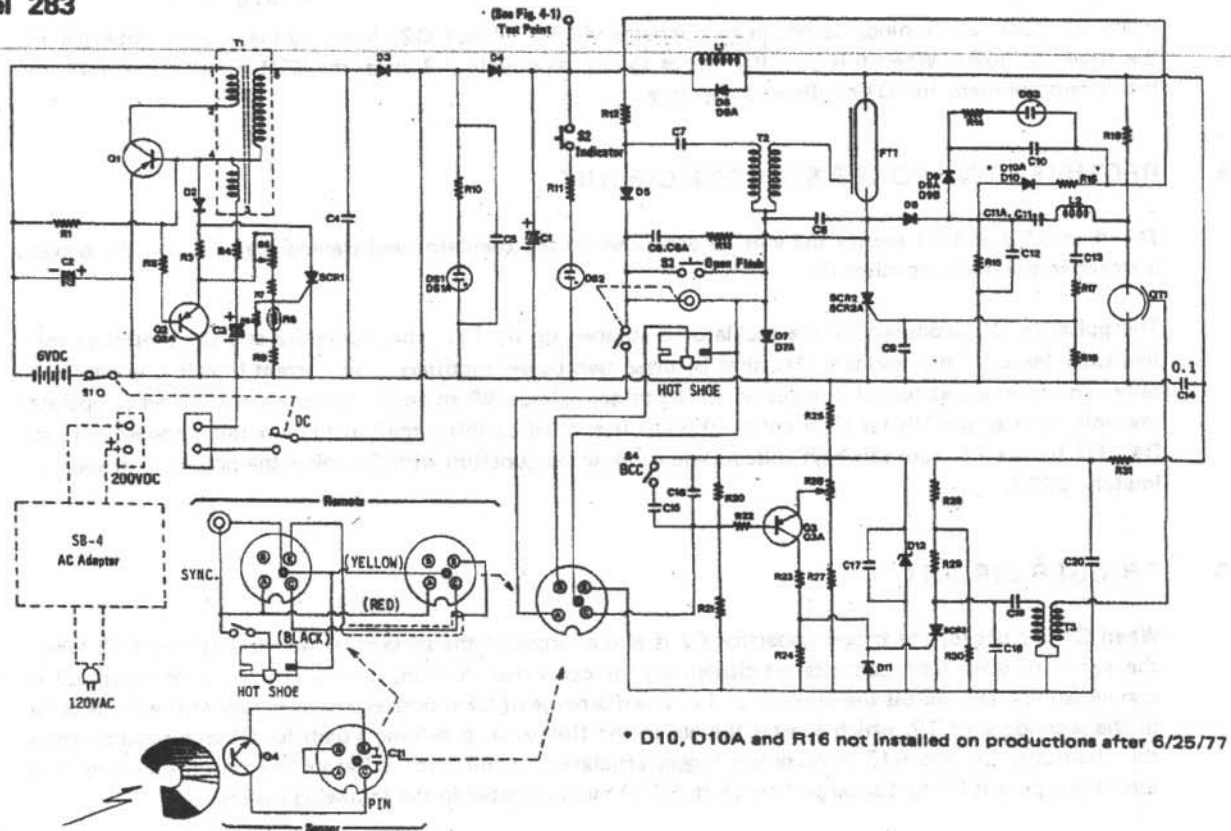


Figure 2-2. Schematic Diagram

2.2 POWER SOURCE

The Model 283 is designed to operate with either of the following: 1 – four AA 1.5V Alkaline batteries, 2 – Vivitar NC-3 battery pack, 3 – Vivitar SB-4 AC adapter, or 4 – Vivitar HVP-1 high voltage battery pack.

2.3 OSCILLATOR CIRCUIT

The basic oscillator circuit consists of a transistor, transformer, and power source. A battery-saving circuit electronically controls power demand on the battery.

The major components of the oscillator circuit are the transistors Q1 and Q2, and the oscillator transformer T1.

The transistor Q1, in conjunction with Q2, acts as an electronic switch that causes the battery power to pulsate. The pulsating DC, while passing through the primary of T1, induces a higher voltage in the secondary winding of the transformer. The transformer output current is rectified and used to charge the main capacitor C1.

2.4 BATTERY SAVER CIRCUIT

The key component of the battery saver circuit is SCR1 which switches off the oscillator circuit when the main capacitor C1 potential reaches the preset voltage. When the charge in the main capacitor drops below the set voltage, SCR1 deactivates and the oscillator switches back on.

The potential of the main capacitor C1 and the gate voltage of SCR1 are set by adjusting R6. This variable resistor is part of the voltage divider chain that also includes R5, R7, R8, and R9 and is in parallel with the capacitor C3. Actually, the voltage of the main capacitor is controlled by that of C3, the potential of which can be set via R6. Whenever C3 – and simultaneously C1 – reach the preset potential, the SCR switches on. That is, SCR1 exhibits a low resistance which effectively places the base of Q1 at the same potential as its emitter. This removes the forward bias on Q1 and thereby shuts off oscillation and stops drain on the battery.

When Q1 stops functioning, C3 begins to discharge via R4, T1 and D2, lowering the positive potential on the anode of SCR1. When this potential drops to approximately 1.2 volts, the SCR switches off, forward bias is reestablished, and Q1 oscillates once more.

2.5 RECTIFIER AND POWER STORAGE CIRCUIT

The diodes D3 and D4 rectify the voltage produced by the oscillator and transformer T1, and the power is stored in the main capacitor C1.

The pulsating DC produced by the oscillator is stepped up by T1. The diodes D3 and D4 chop the negative excursions off the resultant AC, that is, these two power rectifiers allow current flow in one direction only. The main capacitor C1 charges up to the preset voltage. When an AC power source is used to operate the unit, such as the Vivitar SB-4 cord, 200VDC is applied to this circuit at the junction between D3 and D4. D3 blocks T1 from this high voltage, while D4, in conjunction with C1, raises the potential to approximately 320V.

2.6 TRIGGER CIRCUIT

When C1 is charged, the trigger capacitor C7 is also charged to the same potential via R19 and R12. When the synch or open flash contacts are closed, via the open flash button, camera shutter, or PC cord, C7 is connected via D5 across the primary of T2. The discharge of C7 produces a momentary high voltage pulse in the secondary of T2, which ionizes the gas in the flashtube, providing a path for C1 to discharge across the flashtube. C6 and R13 increase the trigger efficiency of this circuit. Before the xenon tube can fully ionize and permit C1 to discharge through it, SCR2 must be gated in the following manner.

The trigger pulse applied from T2 secondary to the flashtube ionizes the gas in the xenon tube FT1. This causes the 300V potential of C1 to appear at the anode of SCR2 and the anode of D8. Current flows through D8, C11, L2, C13, R17 and R18, and the voltage pulse appearing at the junction of R17 and R18 is applied to the gate of SCR2. This causes SCR2 to conduct, and the main capacitor now discharges across FT1, through SCR2 anode to cathode, and back to C1 lower plate. In manual mode, C1 fully discharges and SCR2 reverts to "open" circuit condition upon deionization of FT1. For auto function, see Section 2.8, Quench Circuit.

2.7 AUTO CIRCUIT AND BOUNCE COMPENSATOR CIRCUIT (BCC)

The light from the flash, reflected by the subject, strikes the photo-transistor Q4, causing a current change (increase) through R20, this results in a voltage change across R20 and R21, and the base of Q3 becomes negative. Capacitor C16 integrates the voltage across R20, which upon reaching the required potential, drives Q3 into forward bias. Collector current now passes through R23 and R24. The voltage developed at the junction of R23 and R24 is applied to the gate of SCR3, which, on reaching +0.6V, switches SCR3 on. When this occurs, C19 discharges through SCR3, which acts like a low resistance, through the primary winding of T3, back to the opposite plate of the capacitor. T3 will now have a high voltage induced into its secondary winding providing the trigger pulse necessary to fire QT1.

The bounce compensator circuit is automatically switched on when the unit is set at any of the three bounce angle positions. It increases the light output to compensate for light loss due to reflection by approximately one-half f/stop. This is accomplished by C15 and C16 being connected in parallel, thereby increasing the time constant of the auto circuit.

2.8 QUENCH CIRCUIT

When the quench tube QT1 fires, capacitor C11 discharges through it. With FT1 firing, SCR2 is also conducting, C11 discharge current passes through SCR2 on its return to C11 left hand plate. This current flows through SCR2 in the opposite direction of that coming through FT1 and causes SCR2 to switch off extinguishing the xenon tube FT1.

2.9 SUFFICIENT LIGHT INDICATOR CIRCUIT

The sufficient light indicator neon lamp DS3 works if sufficient light is received by the sensor to make the auto circuit function. The firing of QT1, allows C10 to discharge and ionize DS3.

The potential of the neon lamp DS3 is at the same potential as QT1 which charges up C10. This capacitor cannot discharge, due to D9. Therefore there is no light. When QT1 fires, its resistance becomes very low. C11 can now discharge through it. The voltage at the junction R19, C10, and DS3 drops. C11 discharges at the same time. Consequently current flows through SCR2 and D8; this permits D9 to conduct and C10 discharges, ionizing DS3.

2.10 READY LIGHT NEON INDICATOR CIRCUIT

The neon indicator circuit DS1 consists of resistor R10 and neon lamp DS1. The voltage induced in T1 secondary drives current through diodes D3 and D4, charging C1 during that portion of each oscillation when pin 5 of T1 is positive. DS1 will illuminate when capacitor C1 has reached a set potential (See Section 4.2.6), which is approximately 60% of its energy storage capacity. Resistor R10 controls the neon current when the gas in DS1 ionizes.

2.11 DIAL LIGHT NEON INDICATOR CIRCUIT

This neon indicator circuit consists of resistor R11, neon lamp DS2, and the calculator dial light switch. DS2 will illuminate when contact is made by manually depressing the dial light button.

SECTION 3

DISASSEMBLY AND REASSEMBLY

3.1 GENERAL

This section contains procedures for disassembly, cleaning, electronic and mechanical component removal, and reassembly of the Vivitar Model 283 Automatic Electronic Flash. Disassemble the unit only to the extent necessary for operational checkout, troubleshooting, and repair. Complete exploded view, PC layout wiring diagram, and schematic are provided in Section 5, Figures 5-1 through 5-7.

3.2 DISASSEMBLY

- A. Remove battery cover completely by sliding open and pressing past retaining stop. With flash head tilted to "O", remove alkaline cartridge battery from compartment. Unplug sensor assembly and lay aside. Take off coverplate by heating slightly with soldering iron and lifting off with thin blade. Pry off attaching plate with small screwdriver and lay aside. Figure 3-1.

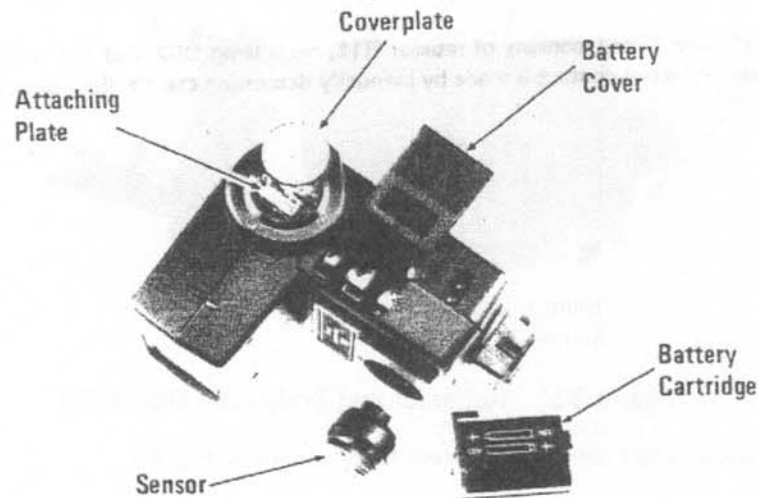


Figure 3-1. Coverplate Removal

- B. Turn reflector case straight up (90° position), remove screws and lift off reflector case UB. Figure 3.2.

WARNING

Do not touch exposed PC board and associated components until you have discharged main capacitor C1 and Capacitor C11. (See Discharge Procedure Page 9, step F.)

Automatic Electronic Flash
Model 283

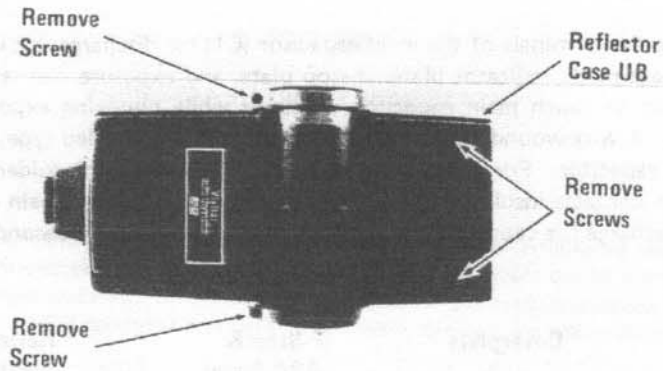


Figure 3-2. Reflector Case Disassembly

C. Lay reflector case UB aside. Lift body case from reflector case UA and position as shown. Fig. 3-3.

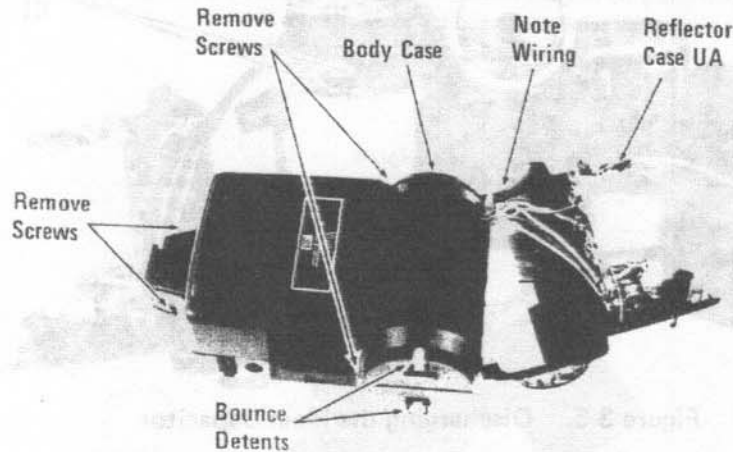


Figure 3-3. Reflector and Body Case Separation

D. Remove bounce angle detents, and screws from body case. Fig. 3-3.

E. Lift back body case LB being careful not to touch main capacitor (C1) contacts or wiring on PC boards. Fig. 3-4.

WARNING

Opening the body case exposes the main capacitor C1 which presents a serious shock hazard even when the power source is removed. Handle the unit with extreme caution until capacitor C1 and capacitor C11 have been fully discharged. (See Step F)

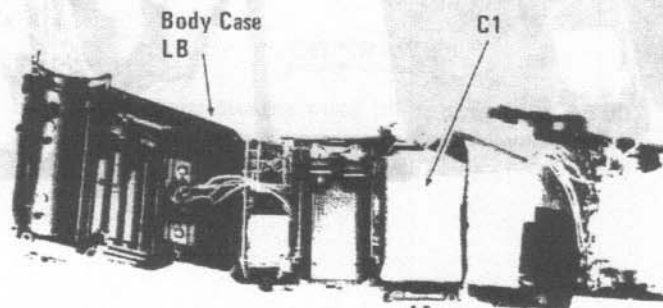


Figure 3-4. Body Case Disassembly

- F. To expose the terminals of the main capacitor (C1) for discharge, lift out the exposure dial coverplate, ASA/footage-mode indicator plate, f-stop plate, and exposure dial reflector assembly. Be extremely careful not to touch main capacitor terminals while removing exposure dial plates and reflector assembly. A wire-wound resistor, preferably a vitreous enameled type, is recommended for discharging the main capacitor. For safest handling, test probes should be soldered to the resistor terminals and the solder contacts insulated. The reflector assembly should remain attached to PC board C by two wires. Discharge the capacitor through the resistor for at least 5 seconds.

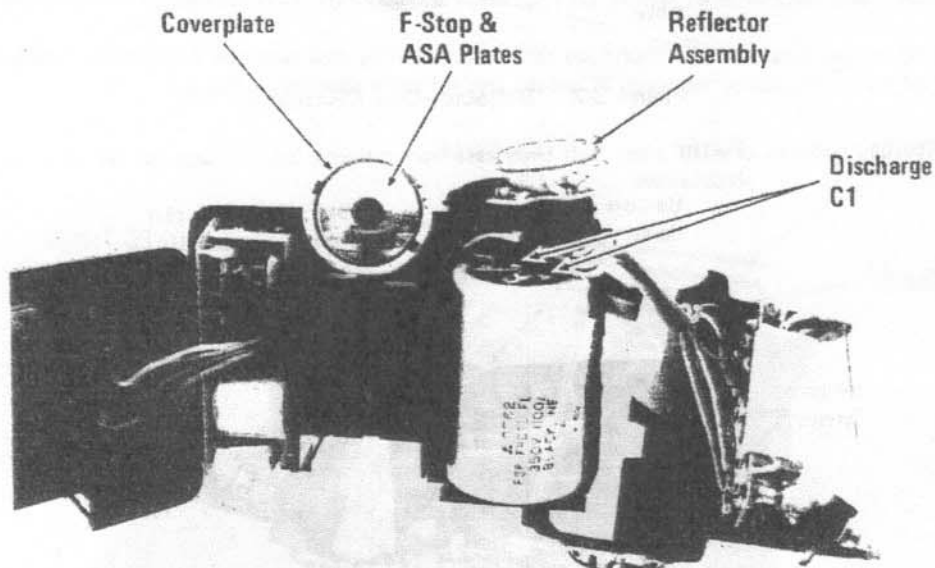


Figure 3-5. Discharging the Main Capacitor

- G. To discharge capacitor C11, position body case halves and reflector case UA as shown. Fig. 3-6.

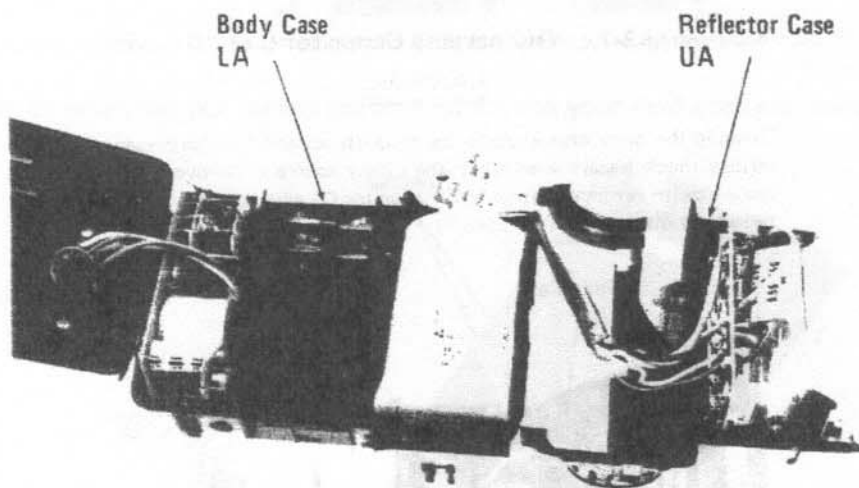


Figure 3-6. Positioning Body Case Halves

WARNING

Capacitor C11 on PC Board A presents a serious shock hazard even after main capacitor C1 has been fully discharged. Be sure that capacitor C11 is fully discharged in the same manner as described in Step F.

- H. Grasp the outside of reflector Case UA — being careful not to touch the PC trigger board A and associated components and leads — and position as shown. Fig. 3.7. Lift the back edge of reflector case UA, and discharge capacitor C11 through a 100 ohm, 10W resistor at terminal points shown.
- I. Slide PC trigger board A and flashtube reflector assembly and lens out of reflector case UA. Remove piece of plastic insulation between PC board and reflector assembly. Fig. 3.7.

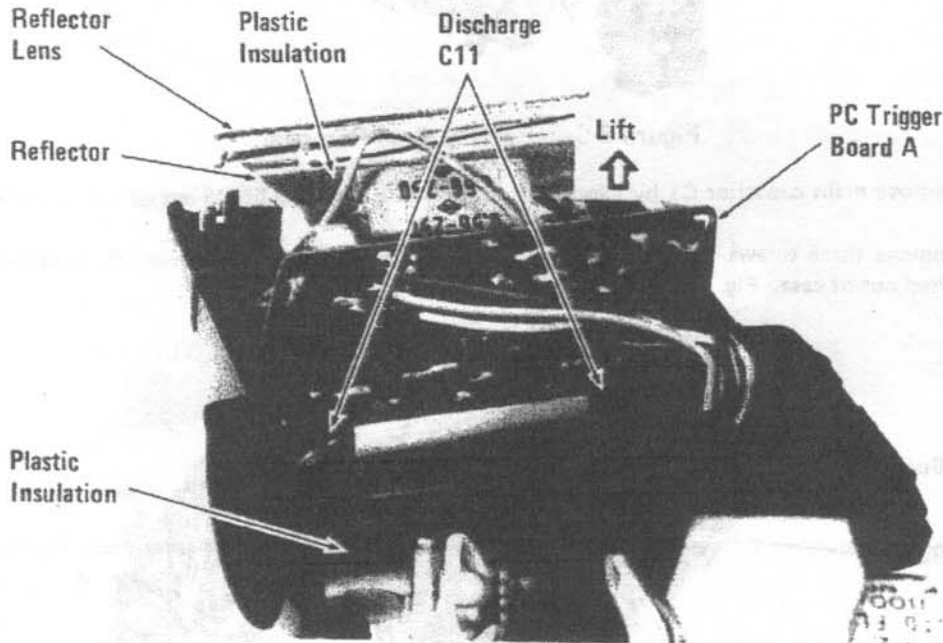


Figure 3-7. Discharging Capacitor C11

- J. Detach sensor receptacle from body case LB by removing screws. Lay body case LB aside. Fig. 3-8.

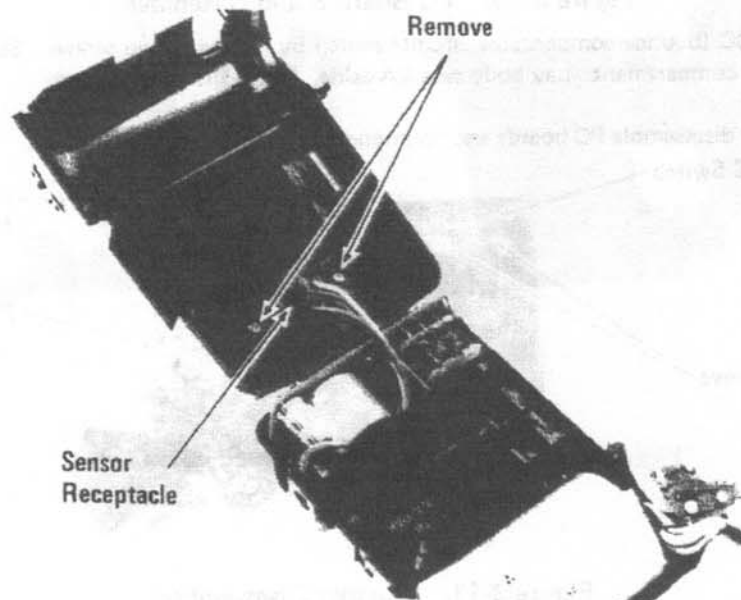


Figure 3-8. Sensor Receptacle Removal

- K. Detach battery terminals from battery case, and lift battery case out of body case LA. Fig. 3-9.
- L. Remove shoe attaching plate and associated piece of plastic insulation. Fig. 3-9.

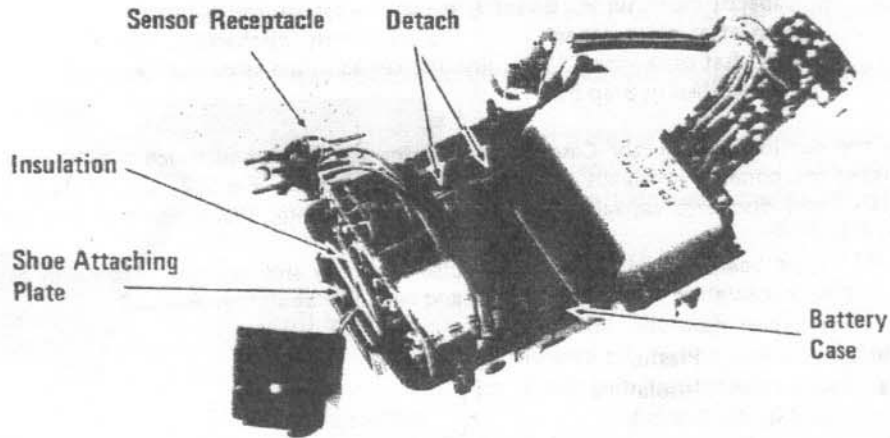


Figure 3-9. Battery Case Removal

- M. Remove main capacitor C1 by carefully breaking glue band and lifting out of case as shown. Fig. 3-10.
- N. Remove three screws from PC board C. Slide PC board B out of grooves. PC board C can now be lifted out of case. Fig. 3-10.

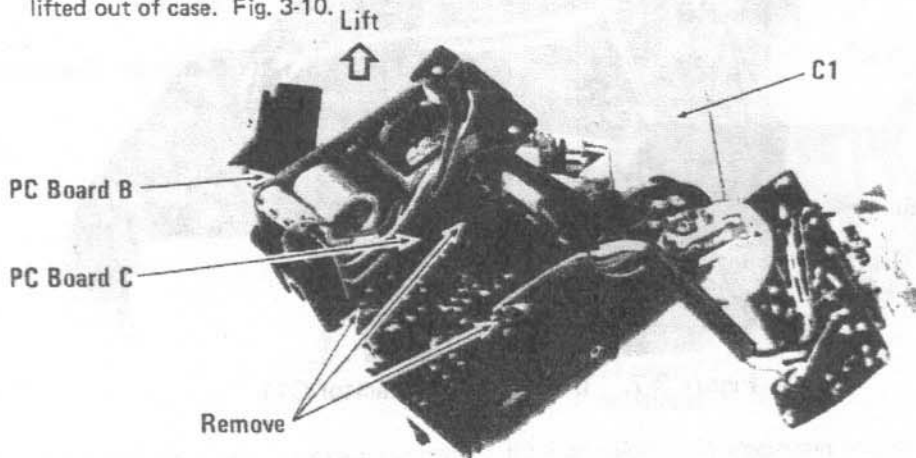


Figure 3-10. PC Board B and C Removal

- O. Detach BCC (bounce compensator circuit) switch by removing two screws. Slide PC-1 receptacle up and out of compartment. Lay body case LA aside. Fig. 3-11.
- P. To further disassemble PC boards and components, desolder leads as required.

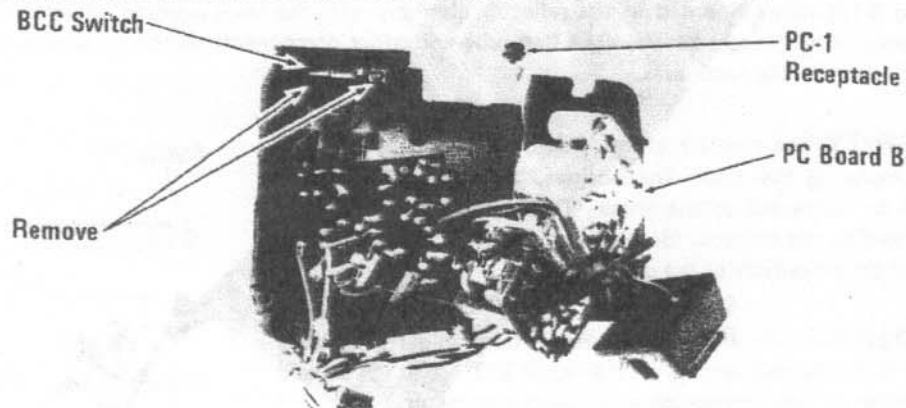


Figure 3-11. Further Disassembly

3.3 FLASHTUBE AND REFLECTOR ASSEMBLY

Handle the flashtube and reflector assembly carefully to avoid damaging the electrode seals.

- A. To remove only the reflector, unsolder the red, positive lead from the flashtube, and gently slip the reflector assembly off the flashtube. Fig. 3-12.
- B. To remove the xenon flashtube, unsolder the 3 lead wires where shown. Be careful not to lose the clear plastic insulating sleeve on the trigger lead of the flashtube. Fig. 3-13.

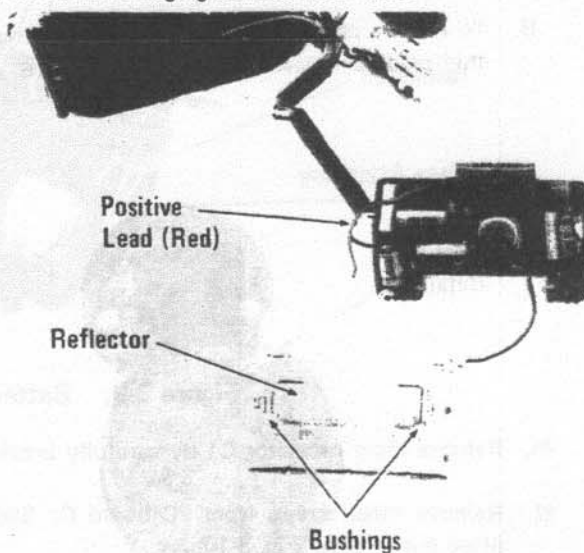


Figure 3-12. Reflector Removal

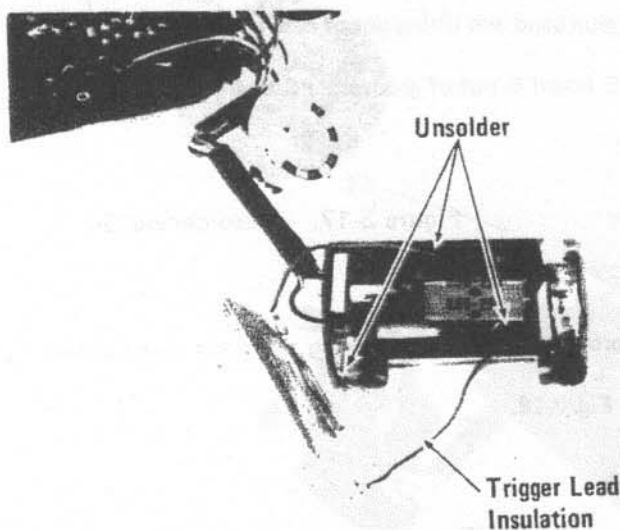


Figure 3-13. Flashtube Removal

3.3.1 POSITIONING. As mentioned above, flashtube removal and replacement should be performed with extreme care to avoid cracking the seals around the metal electrodes. The points where the electrodes enter the glass envelope are the most sensitive areas of the flashtube. Bending the electrodes will cause excessive strain between the glass and the electrodes. The flashtube should be positioned within 2 soft rubber bushings (Figure 3-12) when mounted in the reflector assembly with the leads exerting minimum pressure on the electrodes. Any contact between the flashtube and other components should be avoided to prevent damaging or shorting the electrodes.

3.3.2 POLARITY. The polarity of the flashtube should be checked when replacing the tube. The positive, high voltage lead (red) should be connected to the anode. The negative lead (blue), be connected to the cathode, identified by the position of the trigger lead on the outside of the glass envelope. Fig. 3-14.

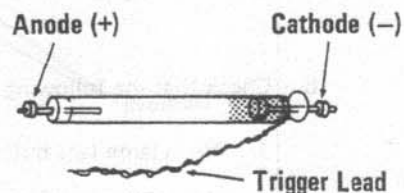


Figure 3-14. Flashtube Polarity

3.3.3 SOLDERING. Ordinary 60/40 Rosin Core solder is suitable for all flashtube connections on the Model 283. Never use an acid core solder for any connection in an electronic circuit.

3.4 REMOTE SENSOR DISASSEMBLY

- A. Remove two screws and lift off rear cover plate as shown. Fig. 3-15.
- B. To remove photo diode Q4, pry off plastic retainer with thin blade and desolder leads. Figures 3-16 and 3-17.

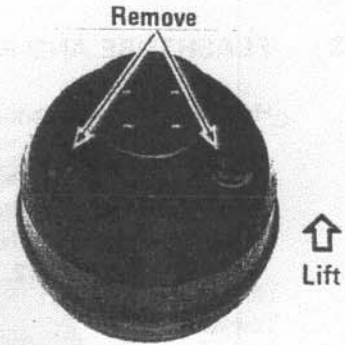


Figure 3-15. Screw Removal

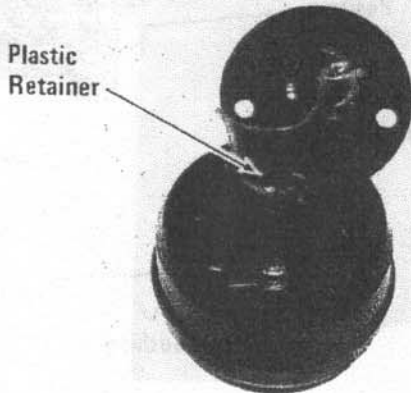


Figure 3-16. Removing the Plastic Retainer

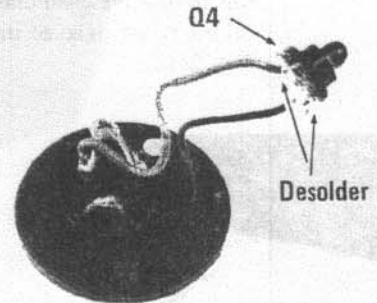


Figure 3-17. Desoldering Q4

3.5 REASSEMBLY

Reassemble the unit by reversing the disassembly procedures and by following the precautions below.

- A. Reinstall BCC contact plate and spring as shown. Fig. 3-18.

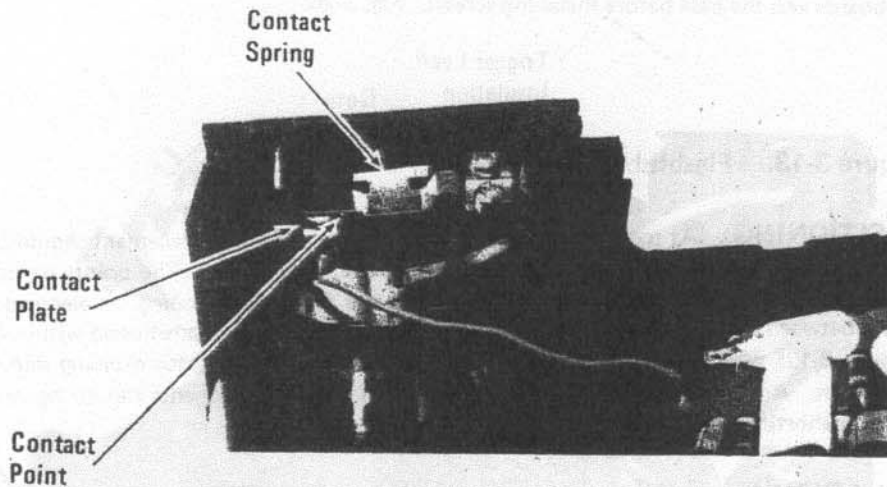


Figure 3-18. Reassembling Body Case LA

- B. Check that the following parts are in place in body case LA :

1. Neon lamp lens button
2. ON-OFF switch knob
3. Exposure dial lamp button
4. Dial detent

C. Make sure that PC-1 receptacle is properly inserted into its compartment as shown. Fig. 3-19.

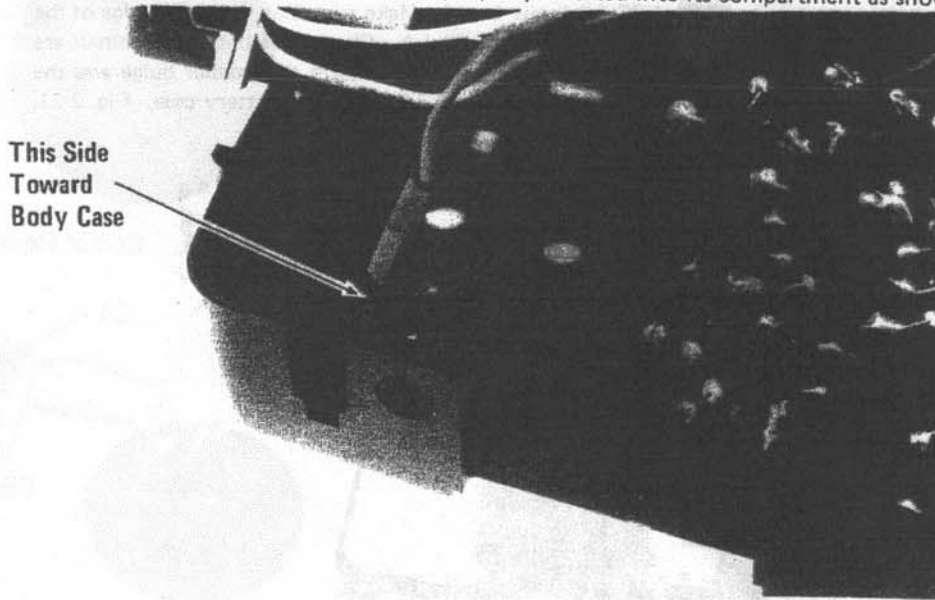


Figure 3-19. Positioning PC-1 Receptacle

D. When replacing PC boards B and C, make certain that wires have not been pinched between the boards and the case before installing screws. Fig. 3-20.

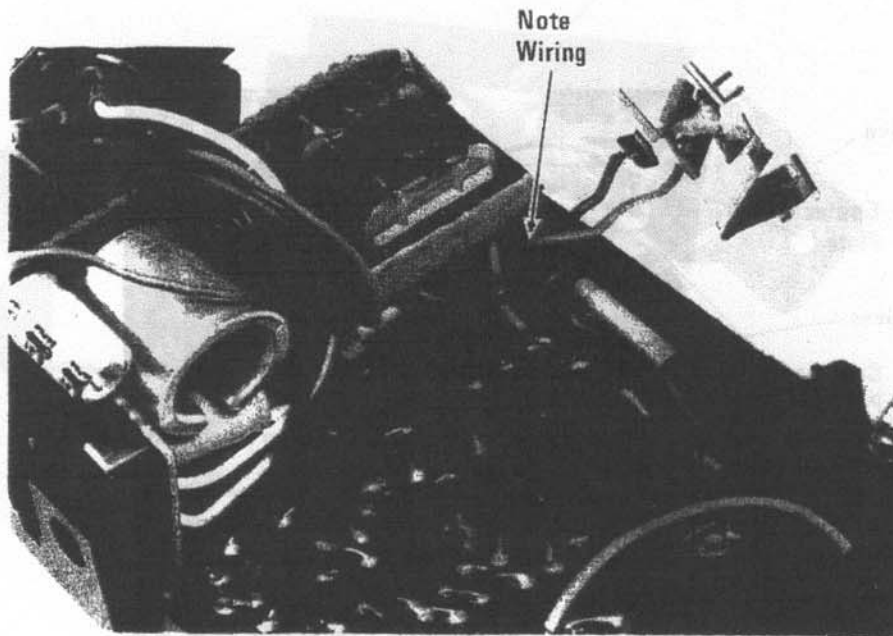


Figure 3-20. Installing PC Boards B and C

- E. Slide groove on battery case onto edge of PC-AC input board. Make sure that the outer edge of the battery compartment is flush with the edge of the body case LA. Check that battery terminals are correctly clipped onto battery case. The positive terminal is the one with the smaller bulge and the red wire. It should be placed where there is a "+" mark on the floor of the battery case. Fig. 3-21.

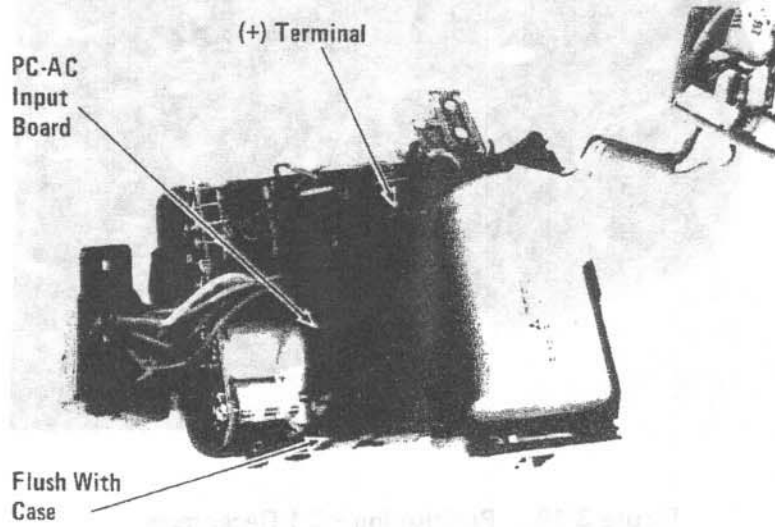


Figure 3-21. Battery Case Installation

- F. When reinstalling the shoe attaching plate, make certain that the protrusions from the screw holes face towards the PC board. Insert plastic insulation between plate and PC board. Fig. 3-22.

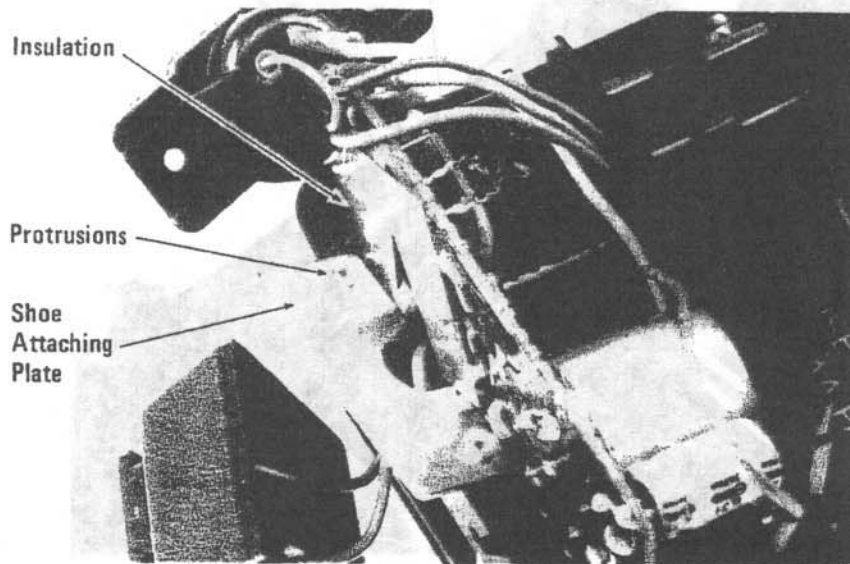


Figure 3-22. Shoe Attaching Plate Position

- G. The exposure dial components (Figures 3-23 and 3-24) must be reassembled correctly. Take the coverplate and hold it with the knurled edge facing you; the serrations on the inner edge of the plate should be towards the bottom. Pick up the ASA/footage indicator plate and hold it so that the numbers are right-side up. Now orient the ASA/footage plate so that the larger of the two black tabs, and the color wedges are at your left. In this position, the ASA/footage plate should fit right into the rear — the side turned away from you — of the coverplate.

There are two notches on the rear of the coverplate that accommodate the two black tabs on the ASA/footage plate. When these two plates are positioned correctly, the large tab on the ASA/footage plate fits into the large notch on the coverplate and the small tab into the small notch. Pick up the f-stop plate with the numbers right-side up, the arrow pointing to your right, and place it behind the assembled coverplate and ASA/footage plate. The arrow must point directly away from the color wedges. Next, insert the two pins on the rear of the f-stop plate into the two holes of the reflector assembly. The pins will fit properly into the holes only if the reflector assembly and the dial plates are properly aligned. The flattened edge of the f-stop plate must coincide with the flattened edge of the reflector assembly. This should place the serrated inner edge of the coverplate directly over these two flattened edges. The serrations must click against the dial detent once the dial is installed in the body case.

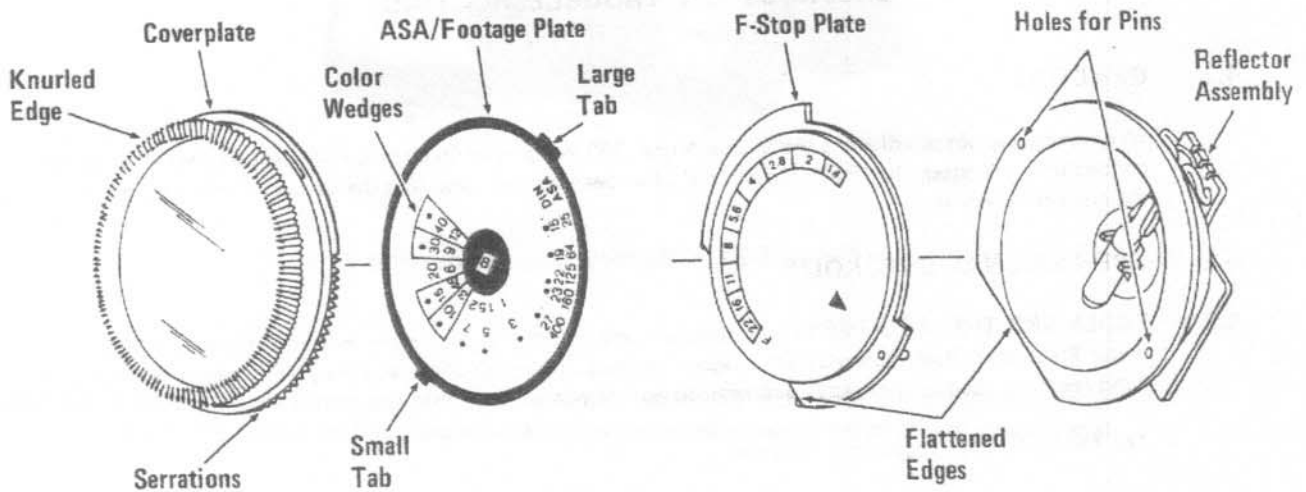


Figure 3-23. Coverplate, Exposure Dial Reassembly

Figure 3-24. f-Stop Plate, Exposure Dial Reassembly

- H. Make certain that after reinstalling the calculator dial parts and the exposure dial reflector assembly, the dial clicks when it is rotated. If it does not, check to see that the dial detent is properly in place. Figures 3-5 and 3-20.
- I. Be sure to insert PC trigger board A into mounting slots in reflector case UA checking that the plastic insulation affixed to the floor of the reflector case is properly positioned. Figures 3-3 and 3-7.
- J. Replace plastic insulation between the reflector assembly and PC trigger board A. Figure 3-7.
- K. When reassembling body case LB and reflector case UA, make certain that the wires from PC trigger board A are not pinched. Fig. 3-3.

3.6 CLEANING

3.6.1 **Mechanical and Electronic Components.** Wipe the large surfaces with a clean, lint-free cloth. Use low pressure, compressed air to blow dust from hard-to-reach places.

3.6.2 **Reflector Assembly and Flashtube Lens.** To clean the diffuser lens, immerse in warm, soapy water and wipe gently with a clean piece of cotton. Rinse in cold water and BLOT dry (do not wipe) with a clean, lint-free cloth or tissue. Do not allow the surface to air dry, which results in water marks. Avoid touching the reflector surface; use dry air or a lens brush to remove dust or lint.

3.7 ELECTRONIC COMPONENT REMOVAL

When removing and replacing electronic components, observe the following precautions.

- A. When applying heat, use a heat sink to avoid damaging the components or circuit board due to heat conduction of component leads.
- B. Apply heat sparingly to the component lead to be removed and lift the lead clear of the junction.
- C. Ensure that new components are placed and dressed the same as the originals.

SECTION 4

CHECKOUT AND TROUBLESHOOTING

4.1 GENERAL

When checking out or adjusting the Vivitar Model 283 Automatic Electronic Flash, ensure that all electrical connections are good, that main capacitor C1 has been formed, and that the battery or power supply is of the correct potential.

4.2 OPERATIONAL CHECKOUT

- 4.2.1 TOOLS AND TEST EQUIPMENT.** No special tools are required for maintenance of the Model 283 Automatic Electronic Flash. Screwdrivers, diagonal cutters, long nose pliers, soldering irons, and other common hand tools are adequate for repair and replacement of parts.

The following test equipment is required:

Volt-Ohm Meter
DC Power Supply
Pulse Photometer

- 4.2.2 MAIN STORAGE CAPACITOR FORMING.** Before performing any operational checkout, form the main storage capacitor C1 by switching the unit on, and, after the ready light glows, firing the flash 5 times by depressing the open flash button. Wait at least 20 seconds between flashes. If the flash cannot be operated, form the capacitor with power supply as described in Section 4.2.5.

- 4.2.3 EXTERNAL CHECKOUT.** Before opening the unit, establish or verify the nature of the trouble. For a quick external check of operations, use a reliable DC power source, and first check whether the battery saver is functioning as indicated by a blinking ready light. Check recycle times in the manual and automatic modes. Check that the sufficient light indicator is functioning and that the calculator dial light works. Test the trigger voltage — across the hot shoe or the PC cord terminal — it should be 200 volts or more. Check the polarity of the hot shoe — the metal ball on the base of the shoe should be positive, the springs on either side of the mounting grooves, negative. Make certain that plugging in the PC cord disconnects the hot shoe.

If you find that the trouble appears to be in the circuitry, first look for obvious signs of defects such as broken wires, broken or discolored components, and arcing or burnt-out transistors or transformers before going through a detailed circuit checkout. Common circuit troubles can often be isolated through voltage, current, and resistance measurements. Circuit checkpoints and normal voltage readings are given in Fig. 4-4, and Section 4.3.5, Pages 25 and 24.

Automatic Electronic Flash Model 283

Isolate the defect to the circuit responsible. An operational check will demonstrate which portions of the circuit are operating correctly. Observe the action of switches and indicators to isolate the fault. Troubleshooting charts are provided in Section 4.4.1.

After you have isolated the defective section of the circuit, isolation of the component responsible for the malfunction can be quickly made. Consider which components, if faulty, could cause the voltages or currents to be as you find them. Refer to the electronic schematic as necessary.

4.2.4 EXTERNAL CHECK AND ADJUSTMENT OF MAIN CAPACITOR VOLTAGE. Main capacitor C1 voltage can be checked and adjusted without opening the unit. Remove nameplate at rear of body case by lifting off with thin blade. If it does not come off readily, apply low heat. To check the main capacitor voltage, insert a long-pointed positive meter probe into the small hole at the right edge of the exposed area and touch the negative probe against the negative pin of the AC receptacle. Voltage should read approximately 320V with the Simpson Digital Multimeter, Model 464. See Figure 4-1 and 4-2.

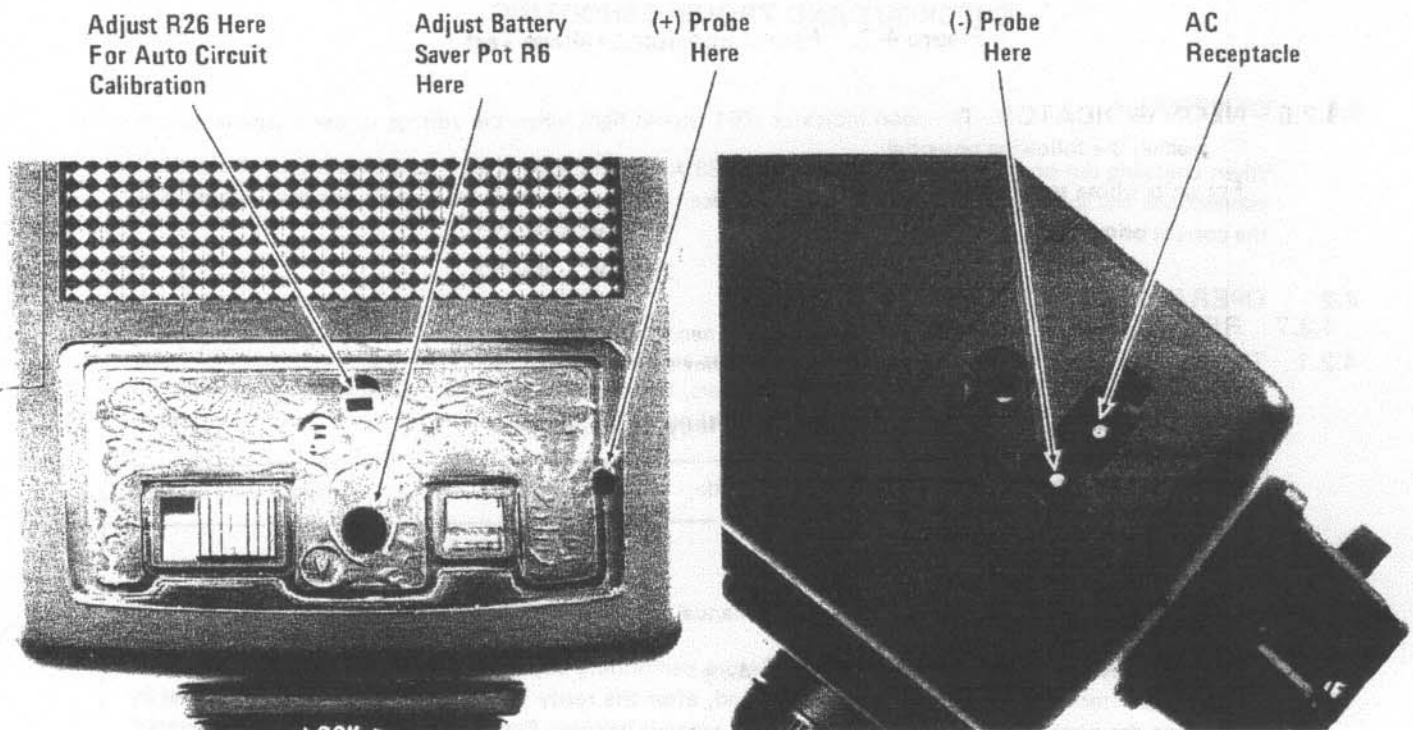


Figure 4-1. Adjustment Points Auto and Battery Saver Circuits

Figure 4-2. Checking Main Capacitor Voltage

If voltage is too low, adjust battery saver pot R6 through hole "V" by turning clockwise. If voltage is higher than specified, reduce by turning R6 counterclockwise (Fig. 4-1). If voltage cannot be brought up to 320V by adjusting R6, check out unit according to No. 5B of Troubleshooting Guide, Section 4.4.

4.2.5 MAIN CAPACITOR LEAKAGE CHECK

- A. Disconnect main capacitor C1 from the circuit (after discharging it through a 100 ohm, 10W resistor) and connect it to the test circuit as shown in Fig. 4-2.
- B. Form the capacitor for two minutes (switch closed, power supply set to 330 VDC).
- C. Open switch and read the leakage current, by measuring voltage across the 1000 ohm resistor. Voltage should measure less than 1 volt, which corresponds to a leakage current of less than 1mA.

D. If the leakage current is greater than 1mA, main capacitor C1 should be replaced.

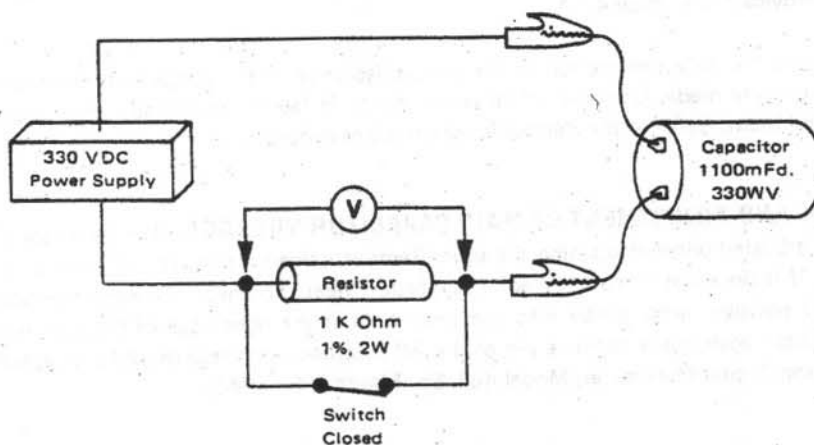


Figure 4-3. Main Capacitor Leakage Test

4.2.6 NEON INDICATOR. The neon indicator NE1 should light when the voltage across the main capacitor C1 reaches the following potential:

For units whose serial number has the first 3 digits

below 606

240VDC + 15VDC

above 606

260VDC + 10VDC

4.2.7 RECYCLE TIME. The time to recycle to the neon indicator voltage (given in paragraph 4.2.6) will depend on the operational mode and the type of power supply.

Table 4-1. Recycle Time

Power Supply	Mode	Recycle Time (seconds)
DC, batteries	NiCad, fully charged	Manual 4 to 5
		Auto 0.5 to 5
Alkaline, fresh	Manual	7 to 9
	Auto	0.5 to 9
HVP	Manual	2 to 3
	Auto	0.5 to 3
AC, with SB-4 adaptor	Manual	8
	Auto	0.5 to 7

4.2.8 FULL POWER LIGHT OUTPUT CHECK. If components that may affect the light output have been replaced, or there is some question concerning this check it with a pulse photometer. In the manual mode, full power output at the rated Guide Number should be 277 lux-seconds. The allowable variation, however, can be minus an f-stop, or as low as 138 lux-seconds, when measured 10 feet from the photo-meter sensor.

4.2.9 CALIBRATING THE AUTO CIRCUIT

To check the auto circuit in the four automatic modes, set up the unit at a distance of 6 feet from the sensor of a pulse photometer in an environment that is nonreflective except for the target. The target should have a reflectance of 36% and measure a minimum of 4 by 4 feet. See that the unit is optically level with the target, flash it 5 times to assure full power in the main capacitor, and wait until the ready light starts to blink. Set the calculator dial of the unit on ASA 25, and test the four color auto modes at the f-stops indicated on the dial. All should test within a tolerance of $\pm 0.5\text{EV}$. Test BLUE auto mode first, then RED, followed by YELLOW. This sequence should require the least amount of adjustment once the blue mode has been calibrated. Check PURPLE mode last. It should fall within tolerance. The appropriate f-stops at ASA 25 and the permissible upper and lower limits of the tolerance in f-stops and lux-seconds are as follows:

ASA 25		Table 4-2. Auto Circuit Calibration Specifications		
BLUE		f4.0		
Variance from Spec. (EV)		f-stop		lux/sec
+0.5	=	4.75	=	173.0
0	=	4.0	=	123.0
-0.5	=	3.36	=	87.0
RED		f2.0		
Variance from Spec. (EV)		f-stop		lux/sec
+0.5	=	2.38	=	43.5
0	=	2.0	=	30.8
-0.5	=	1.68	=	21.7
YELLOW		f1.4		
Variance from Spec. (EV)		f-stop		lux/sec
+0.5	=	1.68	= approx.	21.7
0	=	1.4	= approx.	15.1
-0.5	=	1.18	= approx.	10.6
PURPLE		f5.6		
Variance from Spec. (EV)		f-stop		lux/sec
+0.5	=	6.66	=	341.0
0	=	5.6	=	241.1
-0.5	=	4.71	=	170.5

Adjust the auto modes by turning pot R26 (at hole "F"). To lower lux/sec reading, turn counterclockwise, to raise, clockwise. (Fig. 4-1)

4.3 ELECTRONIC COMPONENTS AND VALUES

Resistance values are listed in ohms, capacitance in microfarads. Except where otherwise indicated:
K = 1000, M = 1,000,000, pF = picoFarad.

4.3.1 MEASUREMENT DATA. The measurements shown should be used only as a reference. Voltage and resistance may vary between units, or as a result of variation in test equipment. All voltage and measurements were taken with the Simpson Digital Multimeter, Model 464.

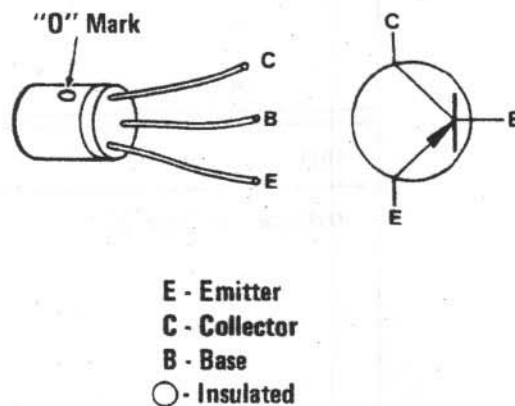
4.3.2 TRANSISTORS

A. Q1 2SB627

Resistance readings between leads. Lead with positive probe is marked (+). (Table 4-3)

Table 4-3. Q1 Resistance Readings

LEADS	OHMS (APPROX.)	
	IN CIRCUIT	OUT OF CIRCUIT
C to E(+)	150	1600
C(+) to E	250	1700
C to B(+)	6	6
C(+) to B	50,000	50,000
E to B(+)	6	6
E(+) to B	50	1,000,000



Voltage readings between main capacitor negative terminal and lead shown. Unit in operation. All readings taken with Simpson Digital Multimeter, Model 464. Second column indicates approximate reading when recycling. (Table 4-4)

Table 4-4. Q1 Voltage Readings

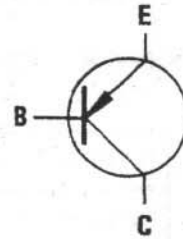
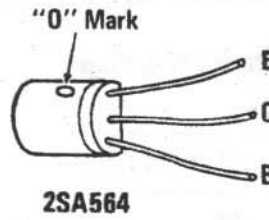
LEADS	VOLTS (APPROX.)	
	Operating	Recycling
Emitter	0	0
Collector	-5.0	-2.8V
Base	Fluctuating to +0.6V	+2.35V

B. Q2 2SA564 - 2SA1115

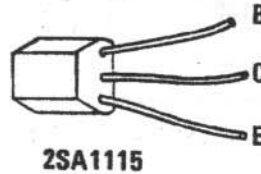
Resistance readings between leads. Lead with positive probe is marked (+). (Table 4-5)

Table 4-5. Q2 Resistance Readings

LEADS	OHMS (APPROX.)	
	In Circuit	Out of Circuit
E to B(+)	20	20
E(+) to B	1000	No Reading
B(+) to C	20	20
B to C(+)	3000	∞
C to E(+)		∞
C(+) to E		∞



E - Emitter
C - Collector
B - Base



Voltage reading between leads. Unit in operation. All readings taken with Simpson Digital Multimeter, Model 464. (Table 4-6)

Table 4-6. Q2 Voltage Readings

LEADS	VOLTS (APPROX.)	
	Operating	Recycling
Emitter	0.6 fluct.	+2.25
Collector	0.V	0V
Base	0.6 fluct.	+3.5V

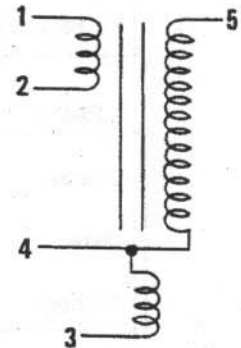
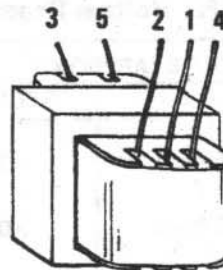
4.3.3 TRANSFORMERS

A. OSCILLATOR TRANSFORMER T1 OSC V-283

Resistance readings between leads. Readings marked (+) show position of positive probe of meter. Tolerance: 10% (Table 4-7)

Table 4-7. T1 Resistance Readings

LEADS	OHMS (APPROX.)	
	In Circuit	Out of Circuit
1 to 2	.3	.3
3 to 4	.7	.7
4 to 5	260	260
3 to 5	260	260
1 to 5(+)	260	
1(+) to 5	15,000	
1 to 3	6	

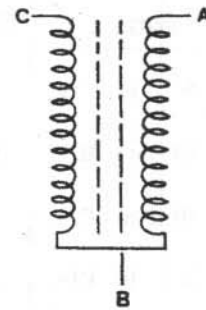


B. TRIGGER TRANSFORMER T2 WS-850TSL

Resistance readings between leads—transformer in circuit. (Table 4-8)

Table 4-8. T2 Resistance Readings
T2 In Circuit

LEADS	OHMS (APPROX.)
A to C	130
A to B	130
C to B	0.2

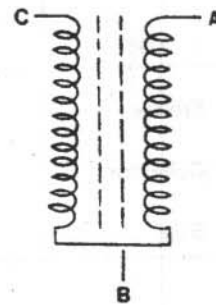


C. TRIGGER TRANSFORMER T3 W-350TSL

Resistance readings between leads—transformer in circuit. (Table 4-9)

Table 4-9. T3 Resistance Readings
T3 In Circuit

LEADS	OHMS (APPROX.)
A to C	40
A to B	40
C to B	0.2



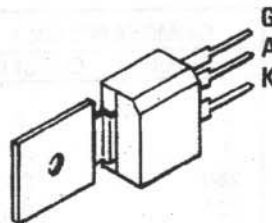
4.3.4 SILICON CONTROLLED RECTIFIERS

A. SCR1 CRO2AM-1

Voltage readings between lead and main capacitor negative. (Table 4-10)

Table 4-10. SCR1 Voltage Readings

LEADS	VOLTS (APPROX.)	
	IDLING	RECYCLING
Anode	0.5 fluct.	+3.35
Gate	0.2 fluct.	+0.53
Cathode	0.	0.



A - Anode
G - Gate
K - Cathode

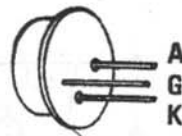


B. SCR2 CR3GZ-8

Resistance readings between leads. Lead with positive probe is marked with (+). (Table 4-11)

Table 4-11. SCR2 Resistance Readings

LEADS	OHMS (APPROX.)
	In Circuit
+G - A	28,000
G - +A	
+G - K	14
G - +K	14
+A - K	
A - +K	25,000



A - Anode
G - Gate
K - Cathode
○ - Insulated

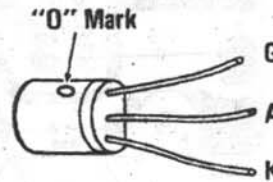


C. SCR3 CRO2AM-6

Resistance readings between leads. Lead with positive probe is marked (+). (Table 4-12)

Table 4-12. SCR3 Resistance Readings

LEADS	METER SCALE	OHMS (APPROX.)
		In Circuit
+G - A		1.5 Meg.
G - +A		1 Meg.
+K - A		1.5 Meg.
K - +A		1.0 Meg.
G - K	RX1	1.6
G - +K	RX1	2.0
+G - K	RX10	120
G - +K	RX10	140



A - Anode
G - Gate
K - Cathode



4.3.5 VOLTAGE READINGS IN CIRCUIT

The following are voltage readings taken with the unit operating, idling, with negative lead connected to the main capacitor negative terminal. The positive lead is as indicated.

Table 4-13. Voltage Readings in Circuit

A.	Junction R31, R28	+330 VDC
B.	Junction R28, R29	+250 VDC
C.	R29 to SCR3 Anode	+230 VDC
D.	SCR3 Cathode	+0.8 VDC
E.	R26 to R27	+0.312 VDC
F.	R20 to R21	+0.35 VDC
G.	SCR3 Gate to CR11 Cathode	+0.8 VDC

The exact location of positive lead placement points is shown in the following PC board wiring view. (Fig. 4-4)

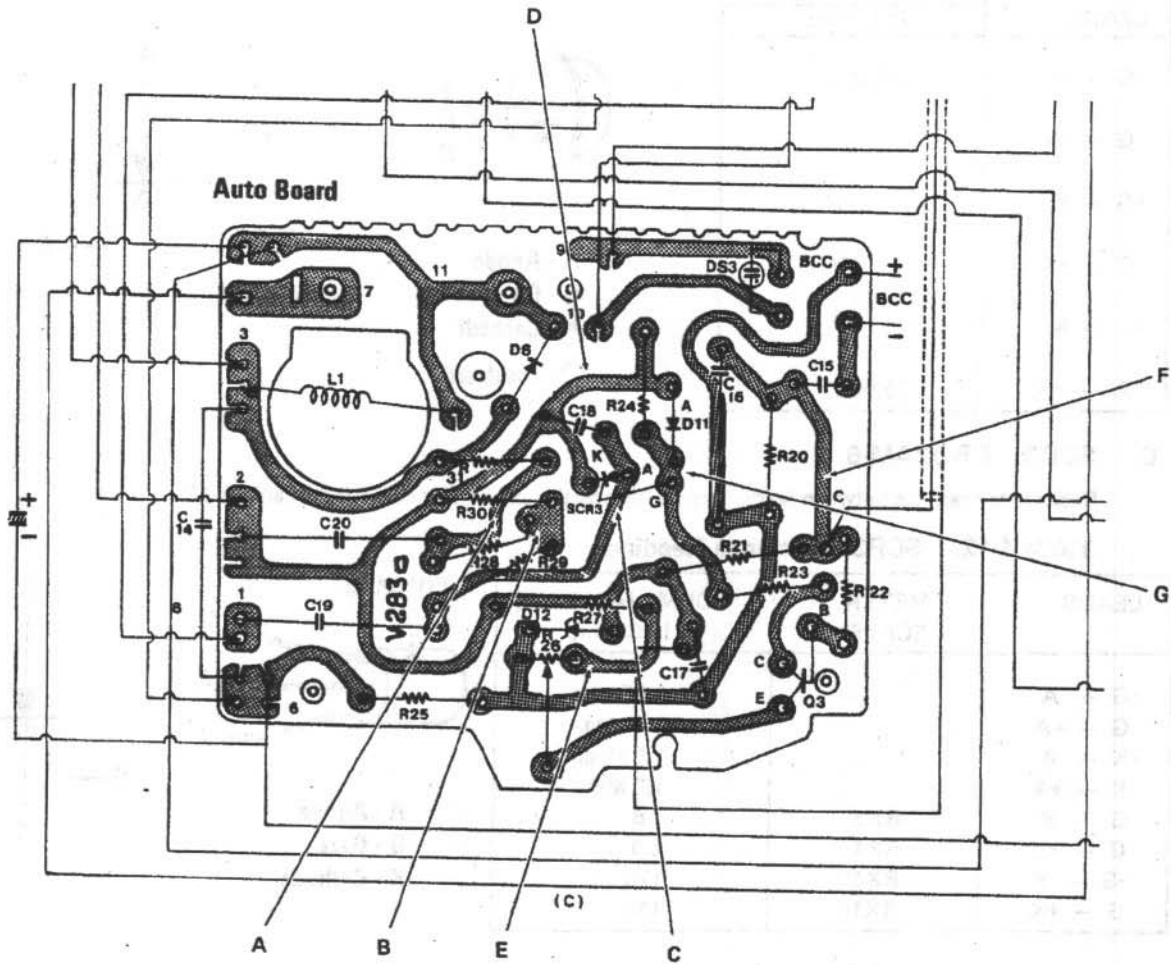


Figure 4-4. Positive Test Lead Locations While Testing Voltages

4.4 TROUBLESHOOTING

The charts in this section present step-by-step procedures for determining and correcting some of the most common troubles that can occur with the Vivitar Model 283 Automatic Electronic Flash. In troubleshooting, also refer to the circuit diagram in Section 5, the principles of operation and circuit descriptions in Section 2, and the operational checkout and electronic component values in 4.2 and 4.3

1. TROUBLE: No flash, no ready light, no oscillation.

ACTION	INDICATION	REMARKS
A. Check battery voltage	GOOD	Go to step B
	BAD	Replace batteries
B. Check battery contacts in cartridge and terminals in case for corrosion; check polarity of terminals	GOOD	Go to step C
	BAD	Clean, replace or reposition
C. Check current draw with power unit	HIGH	Go to step F
	NONE	Go to step D
D. Check continuity between terminals and PC board; check wires for breaks, connections on board for good solder	GOOD	Go to step E
	BAD	Repair or replace
E. Check ON/OFF switch continuity	GOOD	Go to step F
	BAD	Replace switch
F. Check oscillator transistor Q1 resistances (see Sec. 4.3.2)	GOOD	Go to step G
	BAD	Replace Q1
G. Check oscillator transformer T1 (see Sec. 4.3.3 for resistances)	GOOD	Go to step H
	BAD	Replace T1
H. Check transistor Q2 resistances (see Sec. 4.3.2)	GOOD	Go to step I
	BAD	Replace Q2
I. Check all associated components on PC board B	GOOD	Check for damaged components throughout
	BAD	Replace component(s)

2. TROUBLE: Ready light on, but not blinking—battery saver not functioning.

ACTION	INDICATION	REMARKS
A. Check battery voltage, contacts, and terminals	GOOD	Go to step B
	BAD	Replace, clean, or reposition
B. Check voltage of main capacitor C1 (See Sec. 4.2.4) and adjust if necessary	330V	Go to step C
	Less than 330V; cannot be adjusted	Go to step D
C. Replace thyristor SCR1	Ready light light still not blinking	Check associated components
D. Check main capacitor C1 for leakage	Leaks	Replace C1 and, if ready light still doesn't blink, go to step E
	Does not leak	Go to step E
E. Replace diodes D3 and D4	Light does not blink	Check all associated components and wires

3. TROUBLE: No flash, no ready light, but there is oscillation.

ACTION	INDICATION	REMARKS
A. Check oscillator transformer T1 output voltage Connect meter between positive terminal of main capacitor C1 and terminal 5 of T1. Use 500V scale, AC	Average approx. 130VAC average	Go to step B
	B. Check diodes D3 and D4	GOOD
C. Check main capacitor C1 for leakage (see Sec. 4.2.5)	Open circuit or leakage	Replace
	GOOD	Check PC board insulation for leakage
	Leaks	Replace

4. TROUBLE: No flash, ready light and oscillator working—trigger circuit not functioning—sensor fitted to strobe unit.

ACTION	INDICATION	REMARKS
A. Check trigger voltage at hot shoe contacts, or insert PC cord and measure at PC cord receptacle	230V approx.	Go to step B
	No voltage	Go to step C
B. Check for arcing at PC cord receptacle or across hot shoe contacts	Arcs	Go to step D
	No arc	Go to step E
C. Check trigger capacitor C7 for short	No short	Go to step E
	Short	Replace C7
D. Check potential across xenon flashtube FT1	330V approx.	Replace C7
	No voltage	Check connections to L1 and to flashtube FT1 for continuity, SCR2 for open circuit, and trigger lead connection
E. Check D5 and R12 for open circuit	If OK	Check trigger coil T2 and PC board connections
	If open	Replace defective component

5. TROUBLE: Low light level—manual mode.

ACTION	INDICATION	REMARKS
A. Check voltage across C1 (see Sec. 4.2.4)	320V	Go to step D
	Less than 320V	Go to step B if it cannot be adjusted at R6
B. Check battery, inspect protective insulation, look for arcing traces on PC board near C1	GOOD	Go to step C
	BAD	Replace battery or C1, as necessary
C. Check C1 for leakage and capacitance	GOOD	Go to step D
	BAD	Replace C1
D. Check flashtube FT1 for discoloration	NONE	Check alignment of xenon tube, cleanliness of diffused lens and reflector
	Discolored	Replace FT1

6. TROUBLE: Light output not according to specifications, automatic mode—auto circuit not functioning correctly.

ACTION	INDICATION	REMARKS
A. Adjust auto circuit via R26 (see Sec. 4.2.9)	Light output to specifications	Problem solved
	Light output cannot be brought to specifications	Go to step B
B. Check with test sensor	Light output as specified	Problem solved
	Problem not corrected	Go to step C
C. Observe QT1; if not firing, short SCR3 between anode and cathode momentarily	QT1 fires	Go to step D
	If it still does not fire	Check quench trigger capacitor C19, quench tube QT1, or quench trigger transformer T1. Replace as necessary. If still not firing, check power supply to R28, R29, and R31.
D. Replace SCR3	Light output as specified	Problem solved
	Problem not corrected	Go to step E
E. Replace zenor diode D12	Light output as specified	Problem solved
	Problem not corrected	Check auto and quench circuit components

7. TROUBLE: Sufficient light indicator (green light) not functioning—auto circuit working.

ACTION	INDICATION	REMARKS
A. Check lamp DS3	GOOD	Go to step B
	Does not light	Replace lamp DS3
B. Check D9 and C10 for open circuit	GOOD	Check R14 for open
	BAD	Replace diode D9 or C10

8. **TROUBLE:** Sufficient light indicator (green light) stays on or blinks – automatic circuit working.

ACTION	INDICATION	REMARKS
Check D9 for leakage	Leaks	Replace it

9. **TROUBLE:** Calculator dial light not working.

ACTION	INDICATION	REMARKS
Check for voltage at bulb DS2	YES	Replace bulb
	NO	Check wiring to bulb, dial light switch, and R11; replace or repair as necessary

10. **TROUBLE:** No flash via shoe—sensor plugged in—PC cord not connected—unit can be flashed with open flash button

ACTION	INDICATION	REMARKS
A. Check jumper across pins A and B in sensor	GOOD	Go to step B
	FAULTY	Repair
B. Check wires from sensor receptacle to PC board B	GOOD	Go to step C
	DEFECTIVE	Repair or replace
C. Check contact of spring on PC-AC input board (39)	GOOD	Check shoe and connecting wiring; repair as necessary
	No contact	Repair

11. TROUBLE: No flash via PC cord—sensor on unit.

ACTION	INDICATION	REMARKS
A. Check jumper across pins A and B in sensor	GOOD	Go to step B
	Faulty	Repair
B. Check wires from sensor receptacle to PC board B	GOOD	Go to step C
	Defective	Repair or replace
C. Check for trigger voltage at PC cord receptacle contacts—PC spring (+) synchro contact spring (-)	No voltage	Check D5, R12, trigger coil T2, and trigger capacitor C7

12. TROUBLE: Flash works only in manual mode—full light output in auto mode—auto circuit not working.

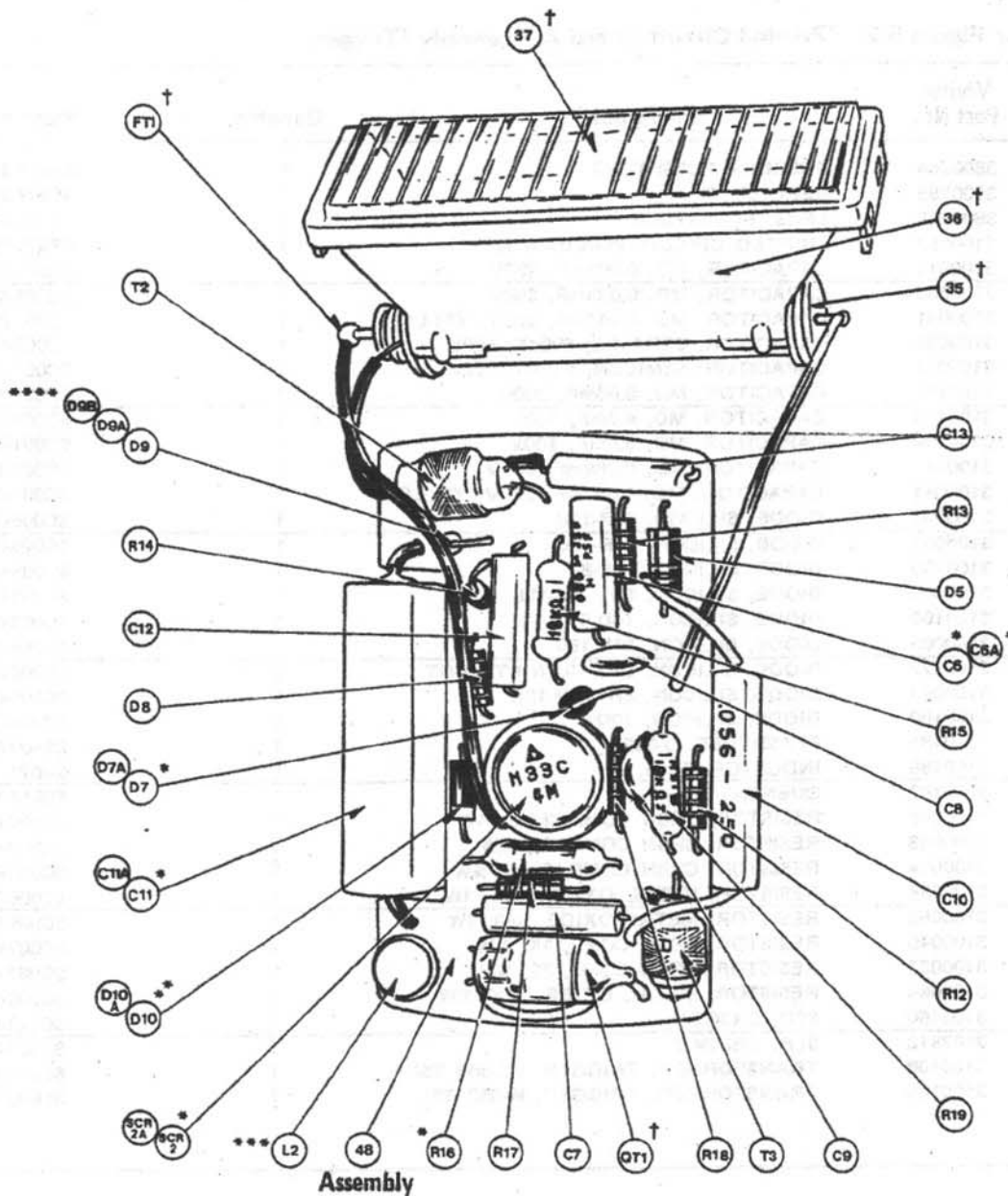
ACTION	INDICATION	REMARKS
A. Substitute test sensor and check unit in auto mode	Unit operates in automatic mode	Defective sensor; check connections; repair or replace sensor assembly as required
	Problem not corrected	Check wiring from sensor receptacle to PC board B and repair, if required. If no defect evident, proceed to step B
B. Check thyristor SCR2 for short; resistance between anode and cathode should read OPEN	Short	Replace SCR2
	GOOD	Test auto circuit per procedure starting with step C
C. Short circuit anode to cathode of SCR3, momentarily	QT1 should fire	If it does not, replace QT1
		If it fires, replace go to step D if auto circuit still does not work
D. Replace trigger coil T3; check C19 and replace if defective	Unit works in auto mode	Problem solved
	Problem not corrected	Check power supply to R28, R29, and R31

Parts List for Figure 5-1. Exploded View — Body

Ref.	Vivitar Part No.	Description	Quantity	Part Code
1	3600244	CASE, BODY UA	1	SS090-15
1A	3103468	CASE, BODY UB	1	SS090-16
2	3600245	CASE, BODY LA	1	SS090-38
2A	3103466	CASE, BODY LB	1	SS090-39
3	3600246	CASE, BATTERY, INSIDE	1	SS027-07
4	3600247	CARTRIDGE, BATTERY	1	SS001-58
5	3600248	COVER, BATTERY COMPARTMENT	1	SS001-42
6	3600206	DIAL, EXPOSURE A	1	SS103-40
7	3600249	PLATE, ASA/FOOTAGE-MODE	1	SS103-62
8	3600250	PLATE, F/STOP	1	SS103-63
9	3600213	PLATE, BOUNCE ANGLE DETENT STOPPER	2	SS178-12
10	3600193	PLATE, DIAL DETENT	1	SS178-06
11	3600069	BUTTON, DIAL LIGHT	1	SS006-18
**12	3600251	LENS, AUTO EXPOSURE INDICATOR	1	SS066-23
13	3600005	LENS, NEON LAMP	1	SS006-15
14	3600252	KNOB, SWITCH ON/OFF	1	SS008-50
**15	3600253	NAMEPLATE	1	SS101-02
**16	3600254	LABEL, BOUNCE ANGLE INDICATOR BCC	1	SS106-51
17	3600255	COVERPLATE, BODY CASE	1	SS101-03
18	3600147	COVERPLATE, REFLECTOR/SHOE	1	SS106-03
19	3600215	SPRING, SET, BOUNCE ANGLE	1	SS178-09
20	3600225	PLATE, ATTACHING, REFLECTOR CASE A	1	SS112-03
21	3600257	PLATE, CONTACT, BCC	1	SS110-31
22	3600258	SPRING, BCC CONTACT	1	SS110-30
23	3600007	TERMINAL, COMMON BATTERY	1	SS109-24
26	3600214	PLATE, SHOE ATTACHING	1	SS112-20
27	3600063	SCREW, PANHD TAP, 2.0x22.0, BLK	2	SG032-01
28	3600219	SCREW, PANHD TAP, 2.0x9.0, BLK	4	SG032-02
29	3600220	SCREW, PANHD, 2.0x10.0, BLK	2	SG000-20
30	3600261	SCREW, PANHD TAP, 2.3x6.0, NI	2	SG022-14
31	3600099	SCREW, PANHD TAP, 2.0x6.0, CR	3	SG022-04
32	3600262	SCREW, PANHD TAP, 2.0x4.0, NI	2	SG023-07
34	3600221	SHOE, MOUNTING	1	SS128-20
44	3600617	RECEPTACLE, SENSOR	1	SS012-13
*45	0235004	SPARE SENSOR	1	N/A
*46	0235026	SC-1 1.2M SENSOR CORD	1	N/A
PC1	3600020	CORD, PC	1	SS700-11

*This is a catalog item and can only be purchased from your Vivitar dealer.

**Not available separately. Consult Complete Parts List for part number of the assembly containing this part.

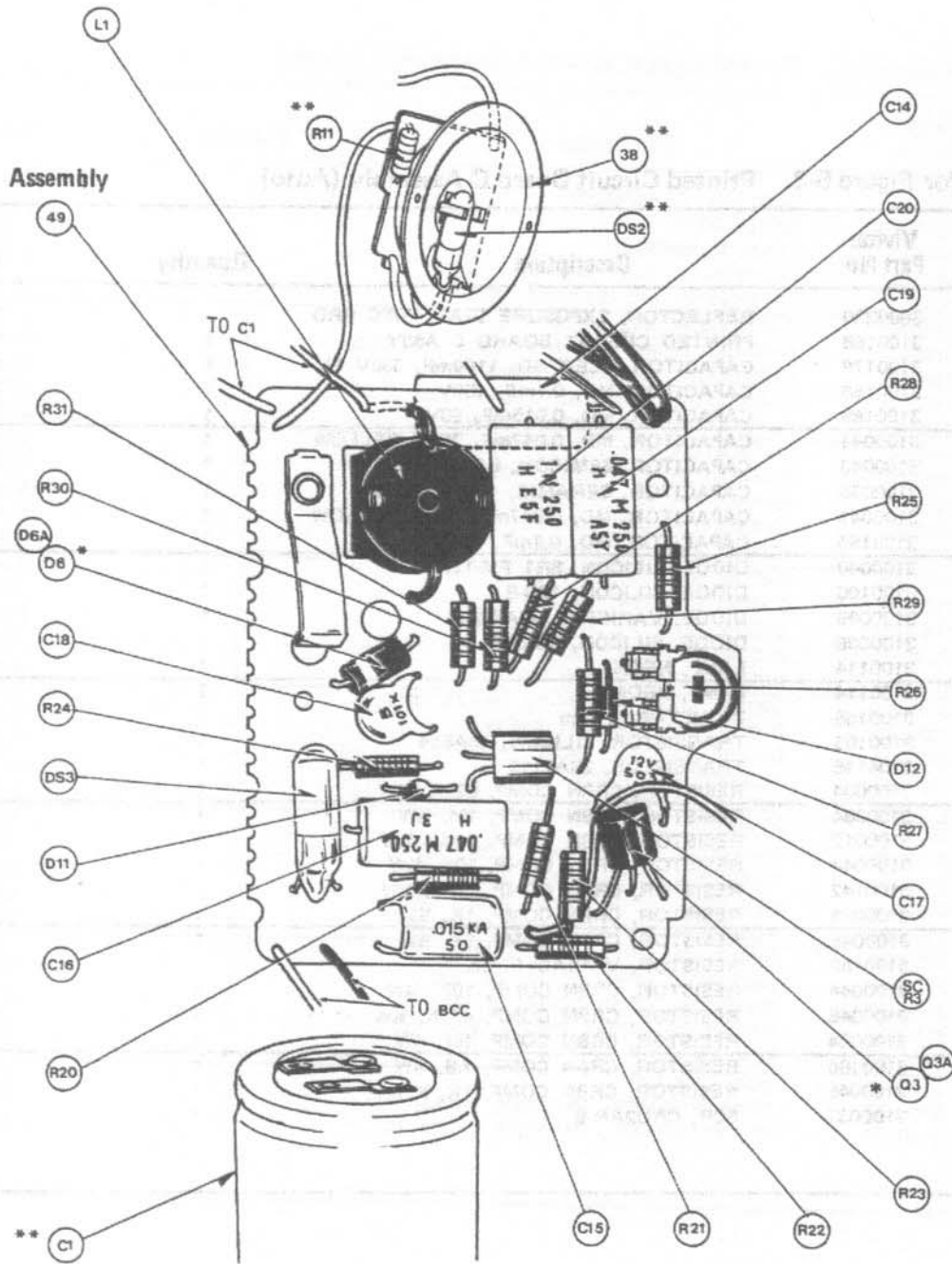


- *Either of these components may be used.
- **D10 or D10A not installed on units produced after 6/77.
- ***On units produced after 8/79, L2 inductor is removed. C11 is changed to 3.9mF.
- ****Vivitar P/N 3100100 (Diode 10D8), 3100003 (Diode S1R 150) or 3100022 (Diode SM1-12) is the proper replacement. However, type SR 1FM-12K (P/N 3100040) used in some production models should be replaced as necessary with the correct type(s) mentioned above.
- †This part is not included in Printed Circuit Board A Assembly, Vivitar P/N 3100167.

Figure 5-2. Printed Circuit Board A Assembly (Trigger)

Parts List for Figure 5-2. Printed Circuit Board A Assembly (Trigger)

Ref.	Vivitar Part No.	Description	Quantity	Part Code
35	3600264	BUSHING, FLASHTUBE	2	SS011-33
36	3600265	REFLECTOR	1	SS003-38
37	3600266	LENS, FLASHTUBE	1	SS005-43
48	3100167	PRINTED CIRCUIT BOARD A ASSY	1	SS300-96
C6	3100011	CAPACITOR, MD, 0.068mF, 250V	1	SC001-11
C6A	3100640	CAPACITOR, MD, 0.033mF, 250V	1	SC001-44
C7	3100041	CAPACITOR, MD, 0.047mF, 250V, YELLOW	1	SC001-08
C8	3100096	CAPACITOR, CERAMIC, 500pF, 500V	1	SC002-03
C9	3100043	CAPACITOR, SEMICON, 0.05mF, 12V	1	SC004-01
C10	3100180	CAPACITOR, MD, 0.56mF, 250V	1	SC001-43
C11	3100154	CAPACITOR, MD, 4.7mF, 100V	1	SC001-34
C11A	3102804	CAPACITOR, MD, 3.9mF, 100V	1	SC001-58
C12	3100011	CAPACITOR, MD, 0.068mF, 250V	1	SC001-11
C13	3100041	CAPACITOR, MD, 0.047mF, 250V, YELLOW	1	SC001-08
D5	3100003	DIODE, SILICON, S1R-150	1	SC005-31
D7	3100003	DIODE, SILICON, S1R-150	1	SC005-31
D7A	3100100	DIODE, SILICON, 10D-8	1	SC005-05
D8	3100040	DIODE, SILICON, SR1 FM-12K	1	SC005-07
D9	3100100	DIODE, SILICON, 10D-8	1	SC005-05
D9A	3100003	DIODE, SILICON, S1R-150	1	SC005-31
D9B	3100022	DIODE, SILICON, SM1-12, WHITE DOT	1	SC005-38
D10	3100040	DIODE, SILICON, SR1 FM-12K	1	SC005-07
D10A	3100100	DIODE, SILICON, 10D-8	1	SC005-05
FT1	3100181	FLASHTUBE, D-382B	1	SS500-30
L2	3100166	INDUCTOR, 7mm	1	SC021-11
QT1	3100182	QUENCHTUBE	1	SS513-12
R12	3100048	RESISTOR, CRBN COMP, 2.2M, 1/4W	1	SC007-02
R13	3100033	RESISTOR, CRBN COMP, 22, 1/4W	1	SC007-45
R14	3100004	RESISTOR, CRBN COMP, 820K, 1/4W	1	SC007-40
R15	3100088	RESISTOR, METAL OXIDE, 18K, 1W	1	SC008-77
R16	3100065	RESISTOR, METAL OXIDE, 560, 1W	1	SC008-97
R17	3100045	RESISTOR, CRBN COMP, 1K, 1/4W	1	SC007-07
R18	3100033	RESISTOR, CRBN COMP, 22, 1/4W	1	SC007-45
R19	3100088	RESISTOR, METAL OXIDE, 18K, 1/4W	1	SC008-77
SCR2	3100160	SCR, CR3GZ-8	1	SC023-19
SCR2A	3102813	SCR, CR3JM-8	1	SC023-31
T2	3100108	TRANSFORMER, TRIGGER, WS-850 TSL	1	SS508-10
T3	3100109	TRANSFORMER, TRIGGER, W-350 TSL	1	SS508-17

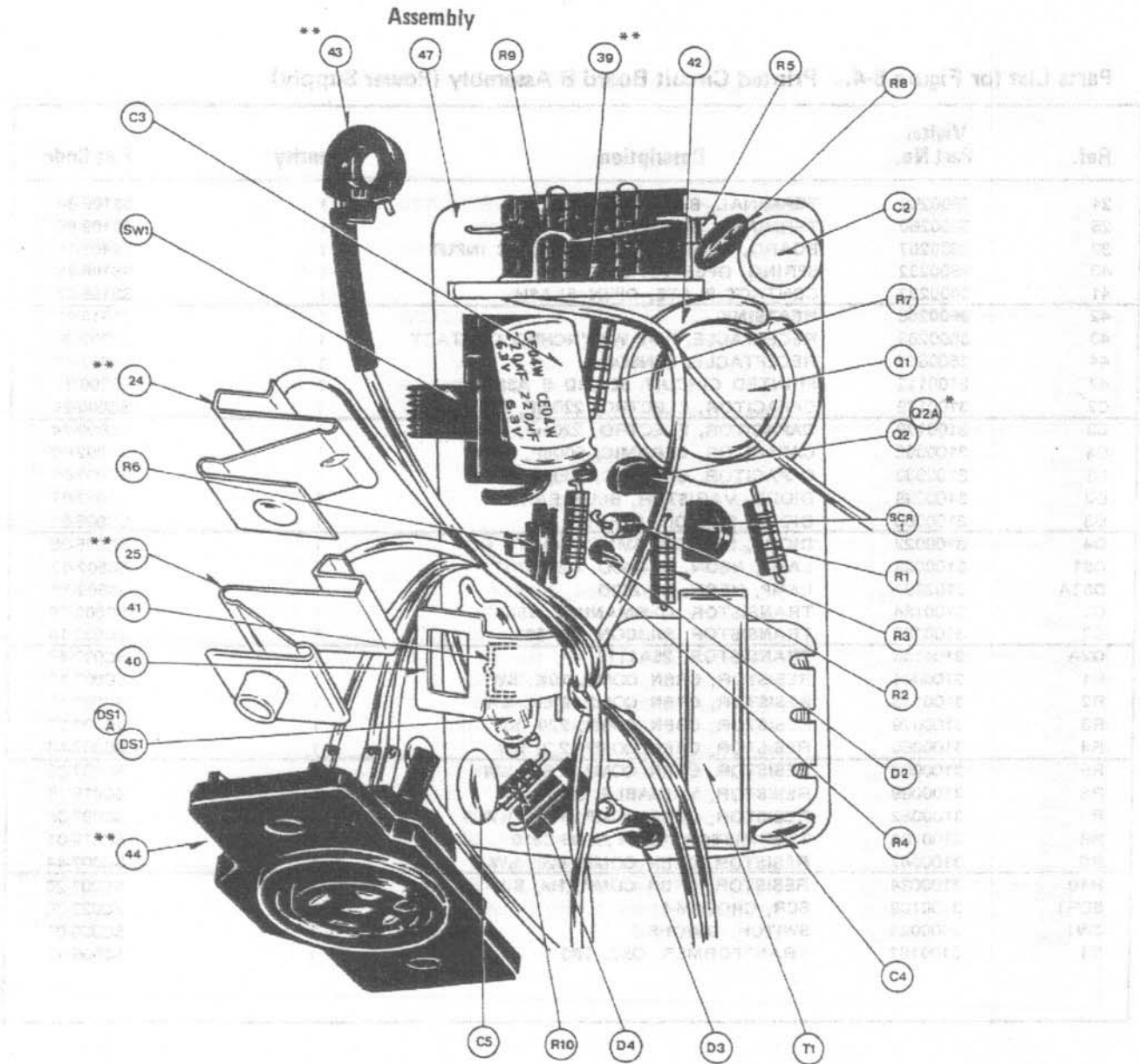


*Either of these components may be used.
 **This part is not included in Printed Circuit Board C Assembly, Vivitar P/N 3100188.

Figure 5-3. Printed Circuit Board C Assembly (Auto)

Parts List for Figure 5-3. Printed Circuit Board C Assembly (Auto)

Ref.	Vivitar Part No.	Description	Quantity	Part Code
38	3600230	REFLECTOR, EXPOSURE DIAL, W/PC BRD	1	SS003-33
49	3100188	PRINTED CIRCUIT BOARD C ASSY	1	SS300-98
C1	3100178	CAPACITOR, ELECTRO, 1100mF, 330V SM	1	SS504-53
C14	3100155	CAPACITOR, MD, 0.1mF, 250V	1	SC001-12
C15	3100189	CAPACITOR, MD, 0.015mF, 50V	1	SC001-45
C16	3100041	CAPACITOR, MD, 0.047mF, 250V YELLOW	1	SC001-08
C17	3100043	CAPACITOR, SEMICON, 0.05mF, 12V	1	SC004-01
C18	3100030	CAPACITOR, CERAMIC, 100pF, 500V	1	SC002-01
C19	3100041	CAPACITOR, MD, 0.047mF, 250V YELLOW	1	SC001-08
C20	3100155	CAPACITOR, MD, 0.1mF, 250V	1	SC001-12
D6	3100040	DIODE, SILICON, SR1 FM-12K	1	SC005-07
D6A	3100100	DIODE, SILICON, 10D-8	1	SC005-05
D11	3100099	DIODE, VARISTOR, MA-26A	1	SC027-04
D12	3100039	DIODE, SILICON, MZ-209	1	SC006-03
DS2	3100114	LAMP, NEON	1	SS502-12
DS3	3100114	LAMP, NEON	1	SS502-12
L1	3100165	INDUCTOR, 14mm	1	SC021-10
Q3	3100183	TRANSISTOR, SILICON, 2SA564	1	SC003-14
Q3A	3104146	TRANSISTOR, 2SA1115	1	SC003-49
R11	3100004	RESISTOR, CRBN COMP, 820K, 1/4W	1	SC007-40
R20	3100084	RESISTOR, CRBN COMP, 1M, 1/4W	1	SC007-20
R21	3100012	RESISTOR, CRBN COMP, 5.6M, 1/4W	1	SC009-51
R22	3100044	RESISTOR, CRBN COMP, 10K, 1/4W	1	SC007-13
R23	3100142	RESISTOR, CRBN COMP, 4.7K, 1/4W	1	SC009-57
R24	3100045	RESISTOR, CRBN COMP, 1K, 1/4W	1	SC007-07
R25	3100045	RESISTOR, CRBN COMP, 1K, 1/4W	1	SC007-07
R26	3100185	RESISTOR, VARIABLE, 3K	1	SC015-20
R27	3100044	RESISTOR, CRBN COMP, 10K, 1/4W	1	SC007-13
R28	3100046	RESISTOR, CRBN COMP, 470K, 1/4W	1	SC007-19
R29	3100084	RESISTOR, CRBN COMP, 1M, 1/4W	1	SC007-20
R30	3100186	RESISTOR, CRBN COMP, 1.8, 1/4W	1	SC009-89
R31	3100045	RESISTOR, CRBN COMP, 1K, 1/4W	1	SC007-07
SCR	3100037	SCR, CRO2AM-6	1	SC023-02



*Either of these components may be used.
 **This part is not included in Printed Circuit Board B Assembly, Vivitar P/N 3100112.

Figure 5-4. Printed Circuit Board B Assembly (Power Supply)

Parts List for Figure 5-4. Printed Circuit Board B Assembly (Power Supply)

Ref.	Vivitar Part No.	Description	Quantity	Part Code
24	3600259	TERMINAL, BATTERY +	1	SS109-64
25	3600260	TERMINAL, BATTERY -	1	SS109-65
39	3600267	BOARD, PRINTED CIRCUIT E, AC INPUT	1	SS401-16
40	3600232	SPRING, OPEN FLASH	1	SS108-25
41	3600233	CONTACT PLATE, OPEN FLASH	1	SS108-28
42	3600268	HEATSINK	1	SS113-22
43	3600269	RECEPTACLE, PC-1 W/SYNCHRO CONTACT	1	SS203-09
44	3600617	RECEPTACLE, SENSOR	1	SS012-13
47	3100112	PRINTED CIRCUIT BOARD B ASSY	1	SS300-97
C2	3100179	CAPACITOR, ELECTRO, 220mF, 6.3V	1	SC000-24
C3	3100179	CAPACITOR, ELECTRO, 220mF, 6.3V	1	SC000-24
C4	3100096	CAPACITOR, CERAMIC, 500pF, 500V	1	SC002-03
C5	3100030	CAPACITOR, CERAMIC, 100pF, 500V	1	SC002-01
D2	3100098	DIODE, VARISTOR, BLUE BAND	1	SC027-01
D3	3100003	DIODE, SILICON, S1R-150	1	SC005-31
D4	3100022	DIODE, SILICON, SM1-12, WHITE DOT	1	SC005-38
DS1	3100026	LAMP, NEON, NE-240D, RED DOT	1	SS502-02
DS1A	3102827	LAMP, NEON, NE-260D	1	SS502-19
Q1	3100184	TRANSISTOR, GERMANIUM, 2S8627	1	SC003-36
Q2	3100183	TRANSISTOR, SILICON, 2SA564	1	SC003-14
Q2A	3104146	TRANSISTOR, 2SA1115	1	SC003-49
R1	3100044	RESISTOR, CRBN COMP, 10K, 1/4W	1	SC007-13
R2	3100135	RESISTOR, CRBN COMP, 5.6K, 1/4W	1	SC007-17
R3	3100079	RESISTOR, CRBN COMP, 220, 1/4W	1	SC007-37
R4	3100080	RESISTOR, CRBN COMP, 2.2, 1/4W	1	SC007-46
R5	3100082	RESISTOR, CRBN COMP, 1.5K, 1/4W	1	SC007-39
R6	3100089	RESISTOR, VARIABLE, 5K	1	SC015-15
R7	3100082	RESISTOR, CRBN COMP, 1.5K, 1/4W	1	SC007-39
R8	3100106	THERMISTOR, GREY, TD5-C210	1	SC010-01
R9	3100047	RESISTOR, CRBN COMP, 820, 1/4W	1	SC007-44
R10	3100084	RESISTOR, CRBN COMP, 1M, 1/4W	1	SC007-20
SCR1	3100102	SCR, CRO2AM-1	1	SC023-05
SW1	3600023	SWITCH, ON/OFF	1	SC300-01
T1	3100187	TRANSFORMER, OSC, 283	1	SS506-42

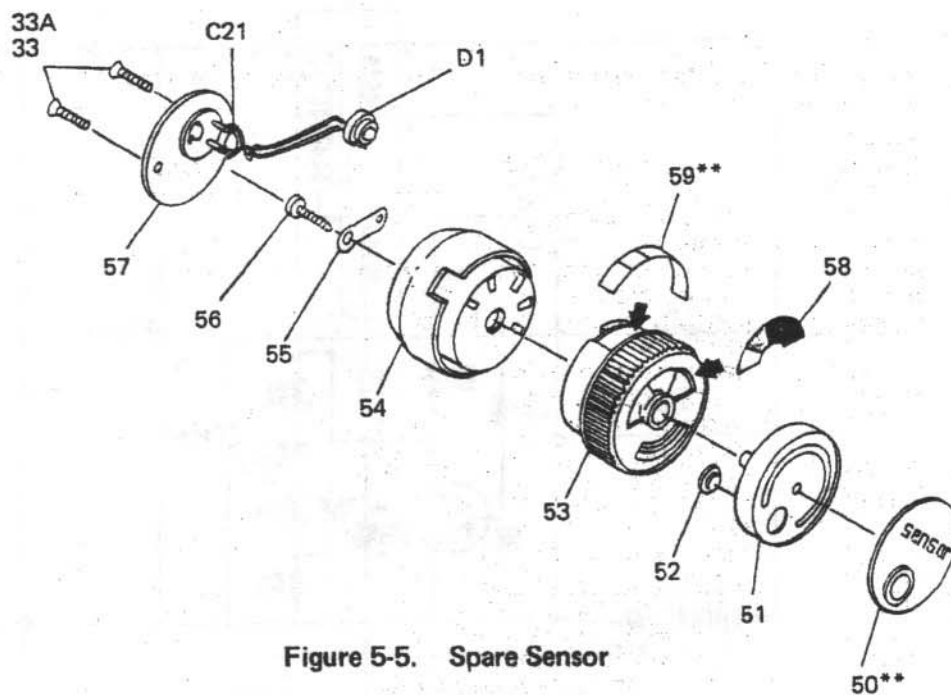


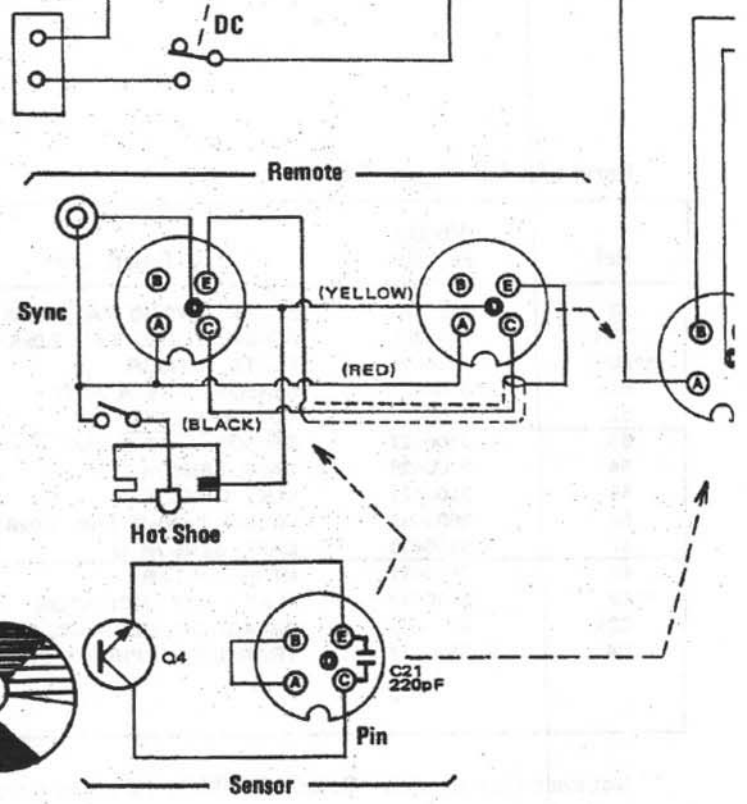
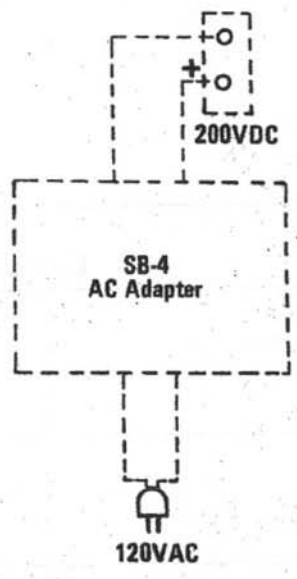
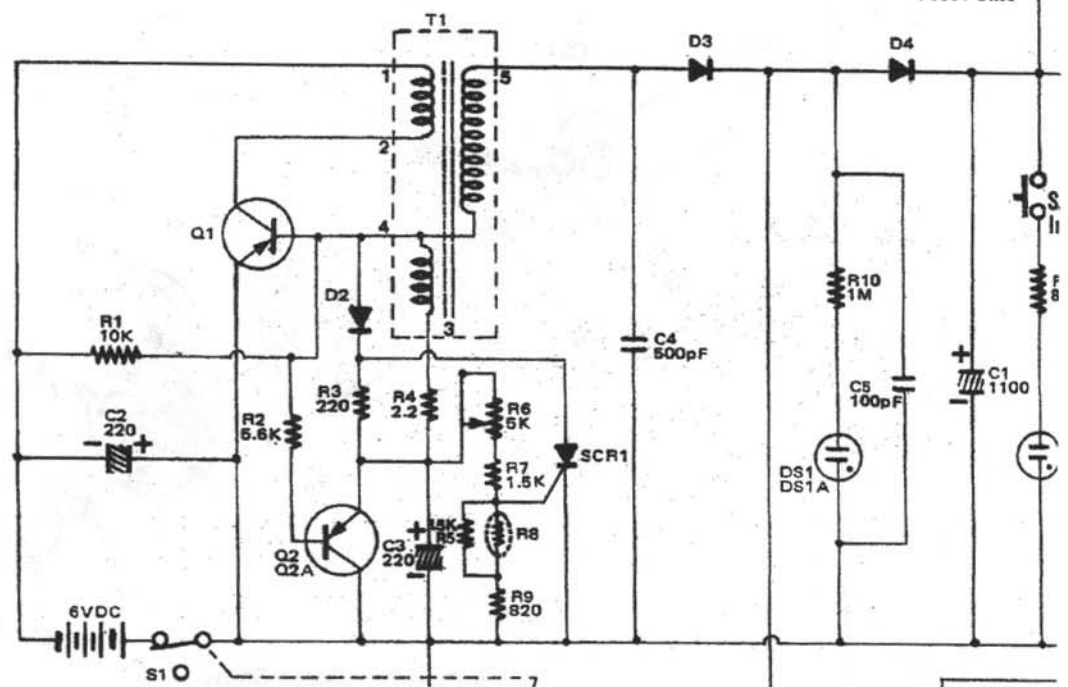
Figure 5-5. Spare Sensor

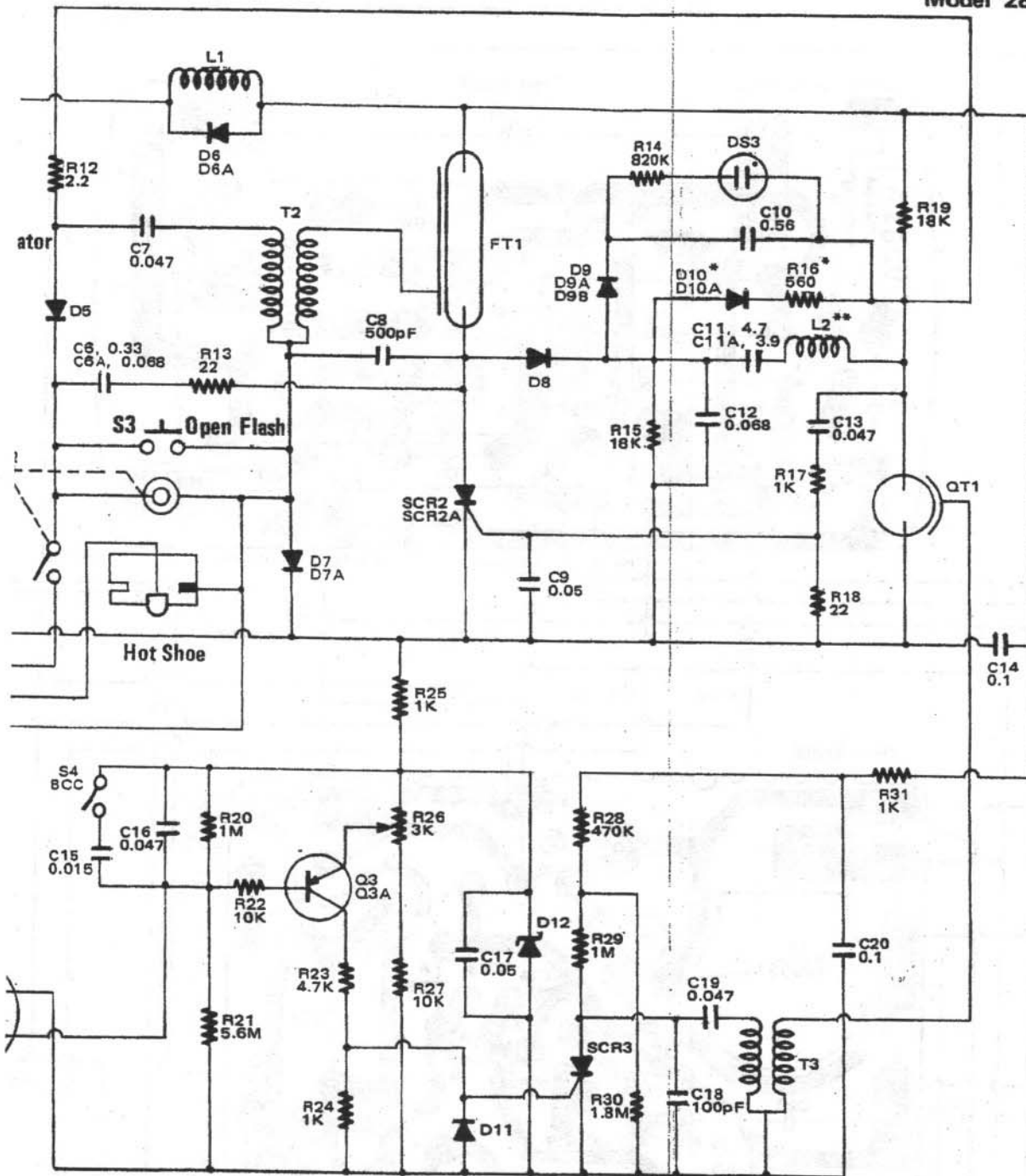
Parts List for Figure 5-5

Ref.	Vivitar Part No.	Description	Quantity	Part Code
33	3600263	SCREW, RNDHD TAP, 2.0x8.0, BLK	2	SG026-01
33A	3103396	SCREW, FLTHD TAP, 2.0x8.0, BLK	2	SG025-10
**50	3100424	PLATE, SENSOR	1	SS106-53
51	3100425	SENSOR CASE A ASSY	1	SS020-26
52	3100426	COVER, FILTER	1	SS022-07
53	3100427	SENSOR CASE B ASSY	1	SS020-27
54	3100428	CASE, SENSOR C	1	SS020-23
55	3100429	LUG, SOLDER	1	N/A
56	3600099	SCREW, PANHD TAP, 2.0x6.0, CR	1	SG022-04
57	3100430	CASE, SENSOR D	1	SS020-24
58	3100431	MESH, FILTER	1	SS025-30
**59	3100432	PLATE, A/M INDICATOR	1	SS106-50
C21	3100433	CAPACITOR, CERAMIC, 220pF, 25V	1	SC002-21
Q4	3100242	TRANSISTOR, PHOTO, PN-123S	1	SS512-09

** Not available separately. Consult Complete Parts List for part number of the assembly containing this part.

(See Fig. 4-1)
Test Point





Unless designated otherwise, all resistances in Ohms, all capacitance in microFarads.

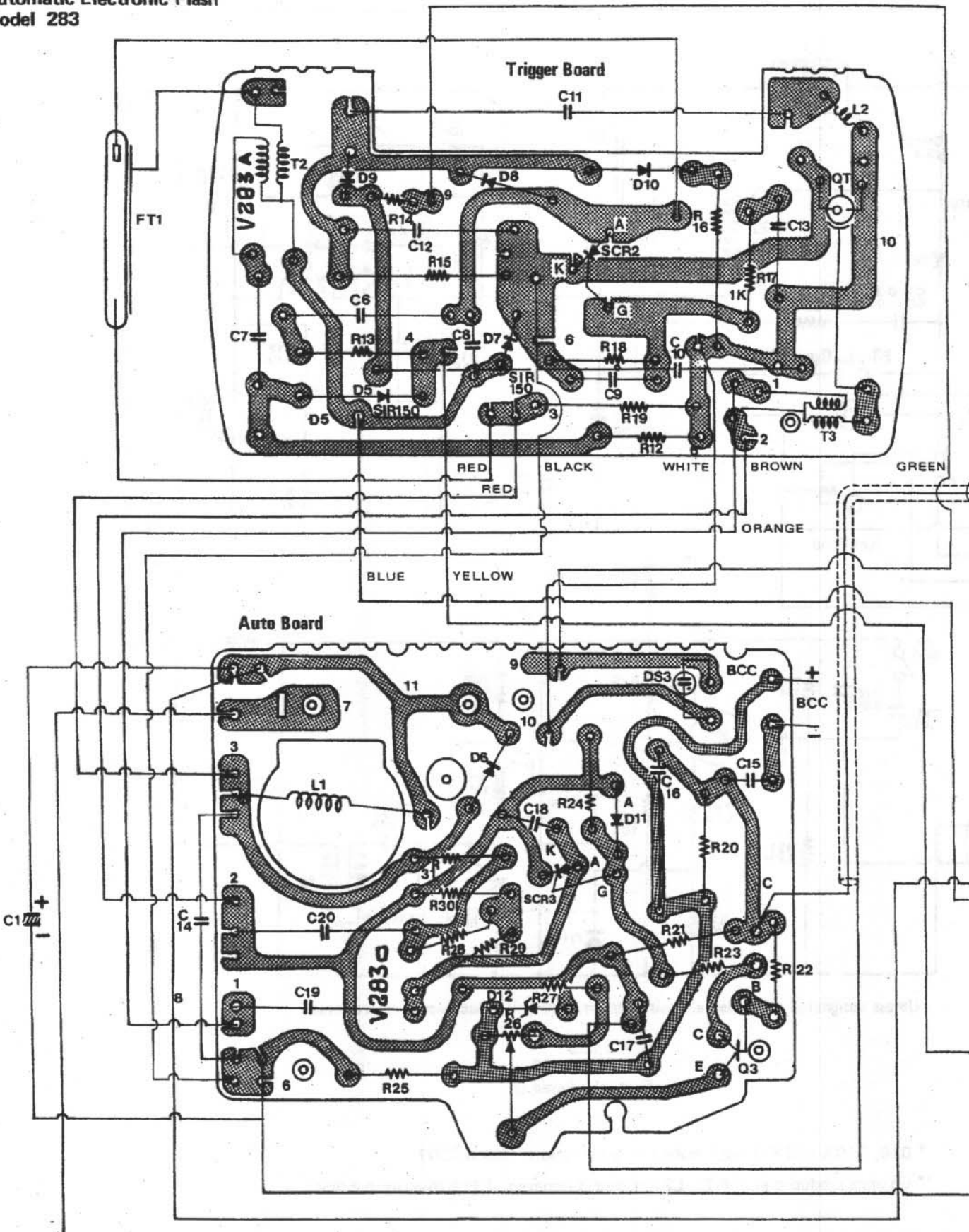
K = 1,000
M = 1,000,000
pF = picoFarad (s)

* D10, D10A and R16 not installed on productions after 6/25/77

** On units produced after 8/79, L2 Inductor is removed. C11 is changed to 3.9mf.

Figure 5-6. Schematic Diagram

Automatic Electronic Flash
Model 283



(C)

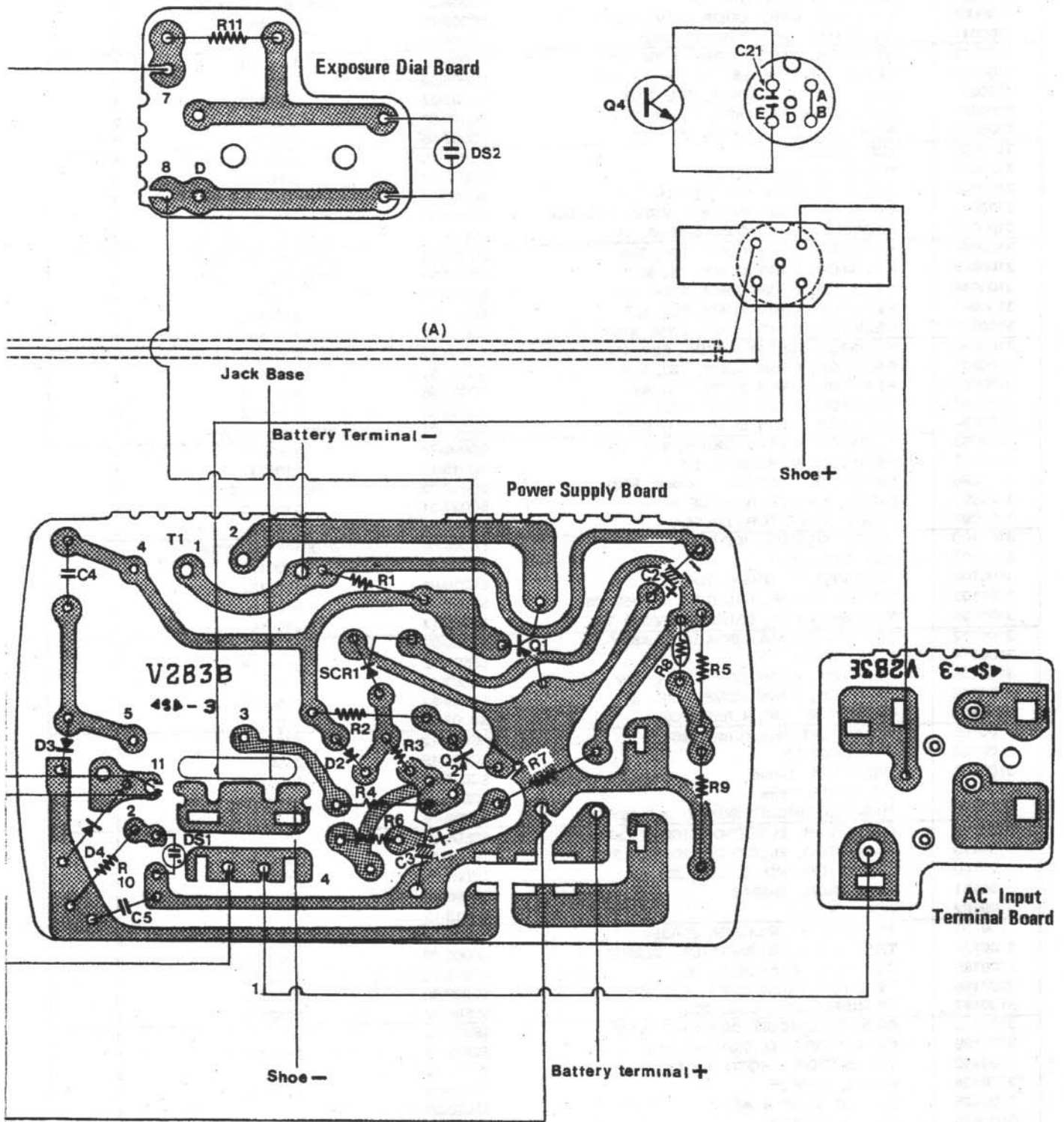


Figure 5-7. Wiring Diagram

COMPLETE PARTS LIST

Vivitar Part No.	Description	Part Code	Included In Assembly	Quantity
**0235004	SPARE SENSOR	N/A		1
**0235026	SC-1 1.2M SENSOR CORD	N/A		1
3100003	DIODE, SILICON, S1R-150	SC005-31	3100167, 3100112	4
3100004	RESISTOR, CRBN COMP, 820K, ¼W	SC007-40	3100167	2
3100011	CAPACITOR, MD, 0.068mF, 250V	SC001-11	3100167	2
3100012	RESISTOR, CARBN COMP, 5.6M, ¼W	SC009-51	3100188	1
3100022	DIODE, SILICON, SM1-12, WHITE DOT	SC005-38	3100112	2
3100025	LAMP, NEON, NE-240D, RED DOT	SS502-02	3100112	1
3100030	CAPACITOR, CERAMIC, 100pF, 500V	SC002-01	3100188, 3100112	2
3100033	RESISTOR, CRBN COMP, 22, ¼W	SC007-45	3100167	2
3100037	SCR, CRO2AM-6	SC023-02	3100188	1
3100039	DIODE, SILICON, MZ-209	SC006-03	3100188	1
3100040	DIODE, SILICON, SR1 FM-12K	SC005-07	3100167, 3100188	3
3100041	CAPACITOR, MD, 0.047mF, 250V, YELLOW	SC001-08	3100167, 3100188	4
3100043	CAPACITOR, SEMICON, 0.05mF, 12V	SC004-01	3100167, 3100188	2
3100044	RESISTOR, CRBN COMP, 10K, ¼W	SC007-13	3100188, 3100112	3
3100045	RESISTOR, CRBN COMP, 1K, ¼W	SC007-07	3100167, 3100188	4
3100046	RESISTOR, CRBN COMP, 470K, ¼W	SC007-19	3100188	1
3100047	RESISTOR, CRBN COMP, 820, ¼W	SC007-44	3100112	1
3100048	RESISTOR, CRBN COMP, 2.2M, ¼W	SC007-02	3100167	1
3100065	RESISTOR, METAL OXIDE, 560, 1W	SC008-97	3100167	1
3100079	RESISTOR, CRBN COMP, 220, ¼W	SC007-37	3100112	1
3100080	RESISTOR, CRBN COMP, 2.2, ¼W	SC007-46	3100112	1
3100082	RESISTOR, CRBN COMP, 1.5K, ¼W	SC007-39	3100112	2
3100084	RESISTOR, CRBN COMP, 1M, ¼W	SC007-20	3100188, 3100112	3
3100088	RESISTOR, METAL OXIDE, 18K, ¼W	SC008-77	3100167	2
3100089	RESISTOR, VARIABLE, 5K	SC015-15	3100112	1
3100096	CAPACITOR, CERAMIC, 500pF, 500V	SC002-03	3100167, 3100112	2
3100098	DIODE, VARISTOR, BLUE BAND	SC027-01	3100112	1
3100099	DIODE, VARISTOR, MA-26A	SC027-04	3100188	1
3100100	DIODE, SILICON, 10D-8	SC005-05	3100167, 3100188	4
3100102	SCR, CRO2AM-1	SC023-05	3100112	1
3100106	THERMISTOR, GREY, TD5-C210	SC010-01	3100112	1
3100108	TRANSFORMER, TRIGGER, WS-850 TSL	SS508-10	3100167	1
3100109	TRANSFORMER, TRIGGER, W-350 TSL	SS508-17	3100167	1
3100112	PRINTED CIRCUIT BOARD B ASSY	SS300-97		1
3100114	LAMP, NEON	SS502-12	3100188	2
3100135	RESISTOR, CRBN COMP, 5.6K, ¼W	SC007-17	3100112	1
3100142	RESISTOR, CRBN COMP, 4.7K, ¼W	SC009-57	3100188	1
3100154	CAPACITOR, MD, 4.7mF, 100V	SC001-34	3100167	1
3100155	CAPACITOR, MD, 0.1mF, 250V	SC001-12	3100188	2
3100160	SCR, CR3GZ-8	SC023-19	3100167	1
3100165	INDUCTOR, 14mm	SC021-10	3100188	1
3100166	INDUCTOR, 7mm	SC021-11	3100167	1
3100167	PRINTED CIRCUIT BOARD A ASSY	SS300-96		1
3100178	CAPACITOR, ELECTRO, 1100mF, 330VSM	SS504-53		1
3100179	CAPACITOR, ELECTRO, 220mF, 6.3V	SC000-24	3100112	2
3100180	CAPACITOR, MD, 0.56mF, 250V	SC001-43	3100167	1
3100181	FLASHTUBE, D-382B	SS500-30		1
3100182	QUENCHTUBE	SS513-12		1
3100183	TRANSISTOR, SILICON, 25A564	SC003-14	3100188, 3100112	2
3100184	TRANSISTOR, GERMANIUM, 2SB627	SC003-36	3100112	1
3100185	RESISTOR, VARIABLE, 3K	SC015-20	3100188	1
3100186	RESISTOR, CRBN COMP, 1.8, ¼W	SC009-89	3100188	1
3100187	TRANSFORMER, OSC, 283	SS506-42	3100112	1
3100188	PRINTED CIRCUIT BOARD C ASSY	SS300-98		1
3100189	CAPACITOR, MD, 0.015mF, 50V	SC001-45	3100188	1
3100242	TRANSISTOR, PHOTO, PN-123S	SS512-09		1
*3100424	PLATE, SENSOR	SS106-53	3100425	1
3100425	SENSOR CASE A ASSY	SS020-26		1
3100426	COVER, FILTER	SS022-07		1

*Not available separately.

**This is a catalogue item and can only be purchased from your Vivitar Dealer.

Automatic Electronic Flash
Model 283

COMPLETE PARTS LIST, Continued

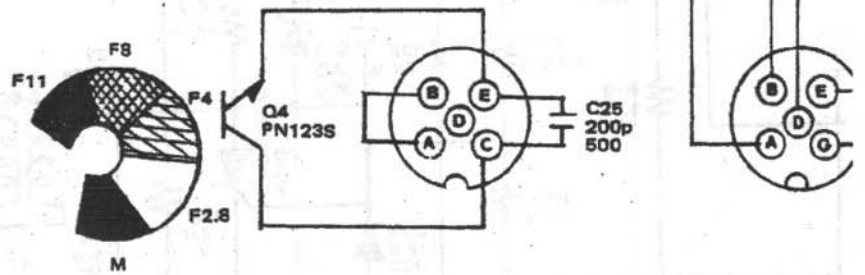
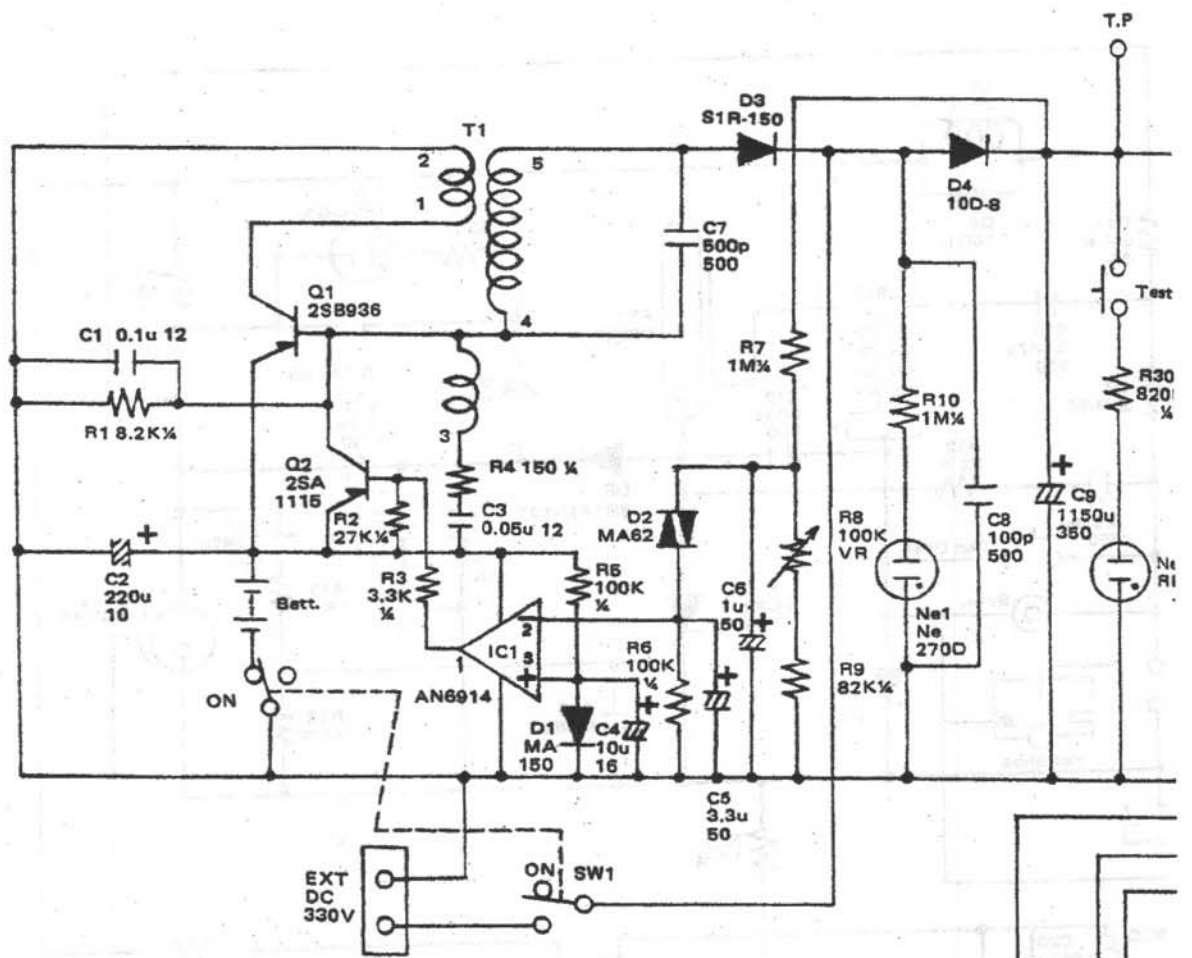
Vivitar Part No.	Description	Part Code	Included In Assembly	Quantity
3100427	SENSOR CASE B ASSY	SS020-27		1
3100428	CASE, SENSOR C	SS020-23		1
3100429	LUG, SOLDER	N/A		1
3100430	CASE, SENSOR D	SS020-24		1
3100431	MESH, FILTER	SS025-30		1
*3100432	PLATE, A/M INDICATOR	SS106-50	3100427	1
3100433	CAPACITOR, CERAMIC, 220pF, 25V	SC002-21		1
3100640	CAPACITOR, MD, 0.033mF, 250V	SC001-44	3100167	1
3102804	CAPACITOR, MD, 3.9mF, 100V	SC001-58	3100167	1
3102813	SCR, CR3JM-8	SC023-31	3100167	1
3102827	LAMP, NEON, NE-2600	SS502-19	3100112	1
3103396	SCREW, FLTHD TAP, 2.0x8.0, BLK	SG025-10		2
3103466	CASE, BODY LB	SS090-39		1
3103468	CASE, BODY UB	SS090-16		1
3104146	TRANSISTOR, 2SA1116	SC003-49	3100188, 3100112	2
3600005	LENS, NEON LAMP	SS006-15		1
3600007	TERMINAL, COMMON BATTERY	SS109-24		1
3600020	CORD, PC	SS700-11		1
3600023	SWITCH, ON/OFF	SC300-01	3100112	1
3600063	SCREW, PANHD TAP, 2.0x22.0, BLK	SG032-01		2
3600069	BUTTON, DIAL LIGHT	SS006-18		1
3600099	SCREW, PANHD TAP, 2.0x6.0, CR	SG022-04		4
3600147	COVERPLATE, REFLECTOR/SHOE	SS106-03		1
3600193	PLATE, DIAL DETENT	SS178-06		1
3600206	DIAL, EXPOSURE A	SS103-40		1
3600213	PLATE, BOUNCE ANGLE DETENT STOPPER	SS178-12		2
3600214	PLATE, SHOE ATTACHING	SS112-20		1
3600215	SPRING, SET, BOUNCE ANGLE	SS178-09		1
3600219	SCREW, PANHD TAP, 2.0x9.0, BLK	SG032-02		4
3600220	SCREW, PANHD, 2.0x10.0, BLK	SG000-20		2
3600221	SHOE, MOUNTING	SS128-20		1
3600225	PLATE, ATTACHING, REFLECTOR CASE A	SS112-03		1
3600230	REFLECTOR, EXPOSURE DIAL, W/PC BRD	SS003-33		1
3600232	SPRING, OPEN FLASH	SS108-25	3100112	1
3600233	CONTACT PLATE, OPEN FLASH	SS108-28	3100112	1
3600244	CASE, BODY UA	SS090-15		1
3600245	CASE, BODY LA	SS090-38		1
3600246	CASE, BATTERY, INSIDE	SS027-07		1
3600247	CARTRIDGE, BATTERY	SS001-58		1
3600248	COVER, BATTERY COMPARTMENT	SS001-42		1
3600249	PLATE, ASA/FOOTAGE-MODE	SS103-62		1
3600250	PLATE, F/STOP	SS103-63		1
*3600251	LENS, AUTO EXPOSURE INDICATOR	SS006-23	3600245	1
3600252	KNOB, SWITCH ON/OFF	SS008-50		1
*3600253	NAMEPLATE	SS101-02	3103466	1
*3600254	LABEL, BOUNCE ANGLE INDICATOR BCC	SS106-51	3600245	1
3600255	COVERPLATE, BODY CASE	SS101-03		1
3600257	PLATE, CONTACT, BCC	SS110-31		1
3600258	SPRING, BCC CONTACT	SS110-30		1
3600259	TERMINAL, BATTERY +	SS109-64		1
3600260	TERMINAL, BATTERY -	SS109-66		1
3600261	SCREW, PANHD TAP, 2.3x6.0, NI	SG022-14		2
3600262	SCREW, PANHD TAP, 2.0x4.0, NI	SG023-07		2
3600263	SCREW, RNDHD TAP, 2.0x8.0, BLK	SG026-01		2
3600264	BUSHING, FLASHTUBE	SS011-33		2
3600265	REFLECTOR	SS003-38		1
3600266	LENS, FLASHTUBE	SS005-43		1
3600267	BOARD, PRINTED CIRCUIT E, AC INPUT	SS401-16		1
3600268	HEATSINK	SS113-22	3100112	1
3600269	RECEPTACLE, PC-1 W/SYNCHRO CONTACT	SS203-09		1
3600617	RECEPTACLE, SENSOR	SS012-13		1

* Not available separately.

SUPPLEMENT 1 INTRODUCTION

This supplement (Pages S1 through S6) provides electronic data and parts identification for the modified circuit boards and other changes found on the Vivitar Model 283 Electronic Flash Unit, starting with Serial No. 8231001. All of the changes are limited to the electronic circuitry and components. The mechanical and functional components are not affected.

Figure S-1 shows revised electrical schematic diagram. Figure S-2 shows the layout and wiring connections of the revised circuit boards. Facing Figure S-2 is the revised parts list of the electronic components. New parts are identified by an asterisk.



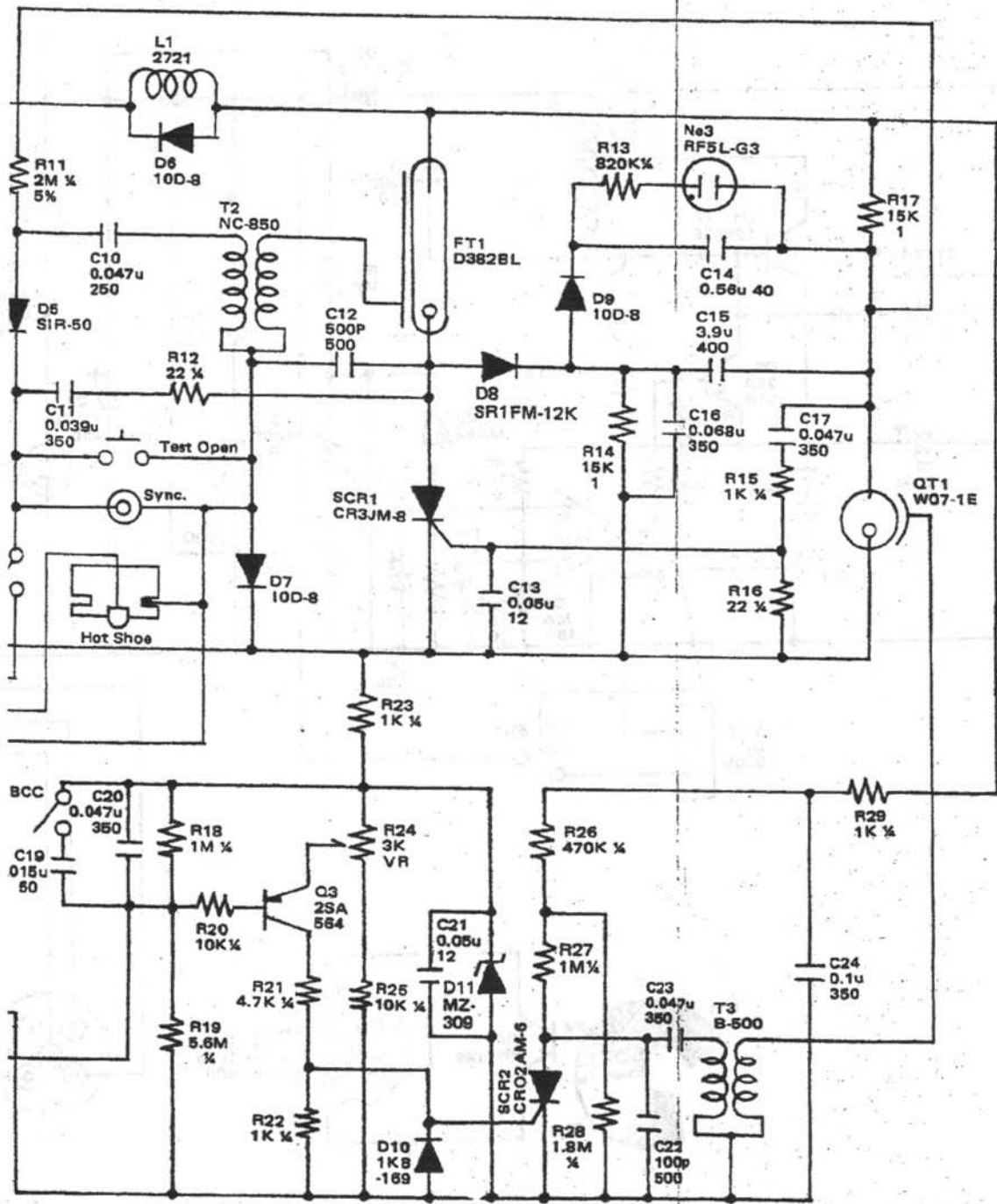


Figure S-1. Electrical Schematic Diagram

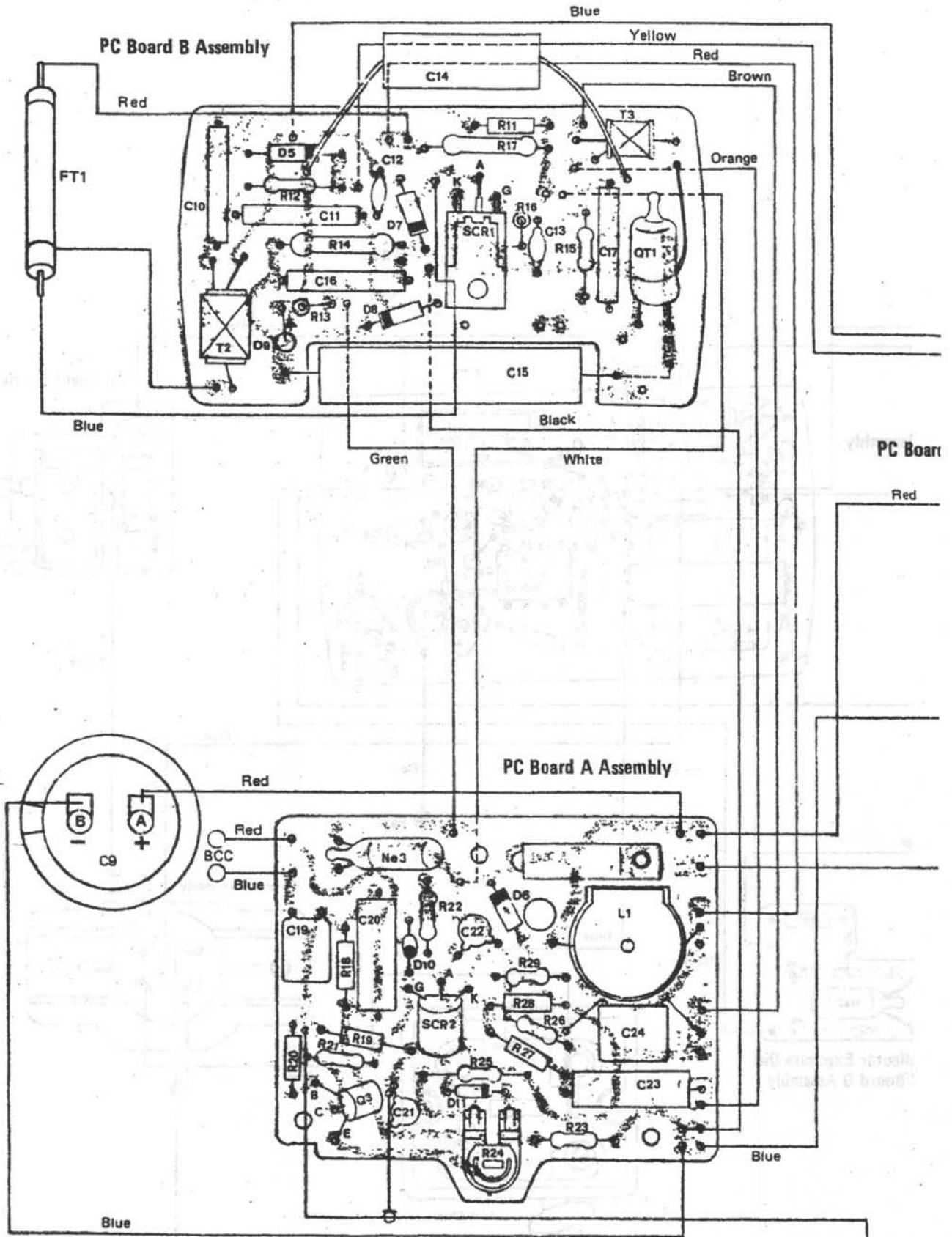
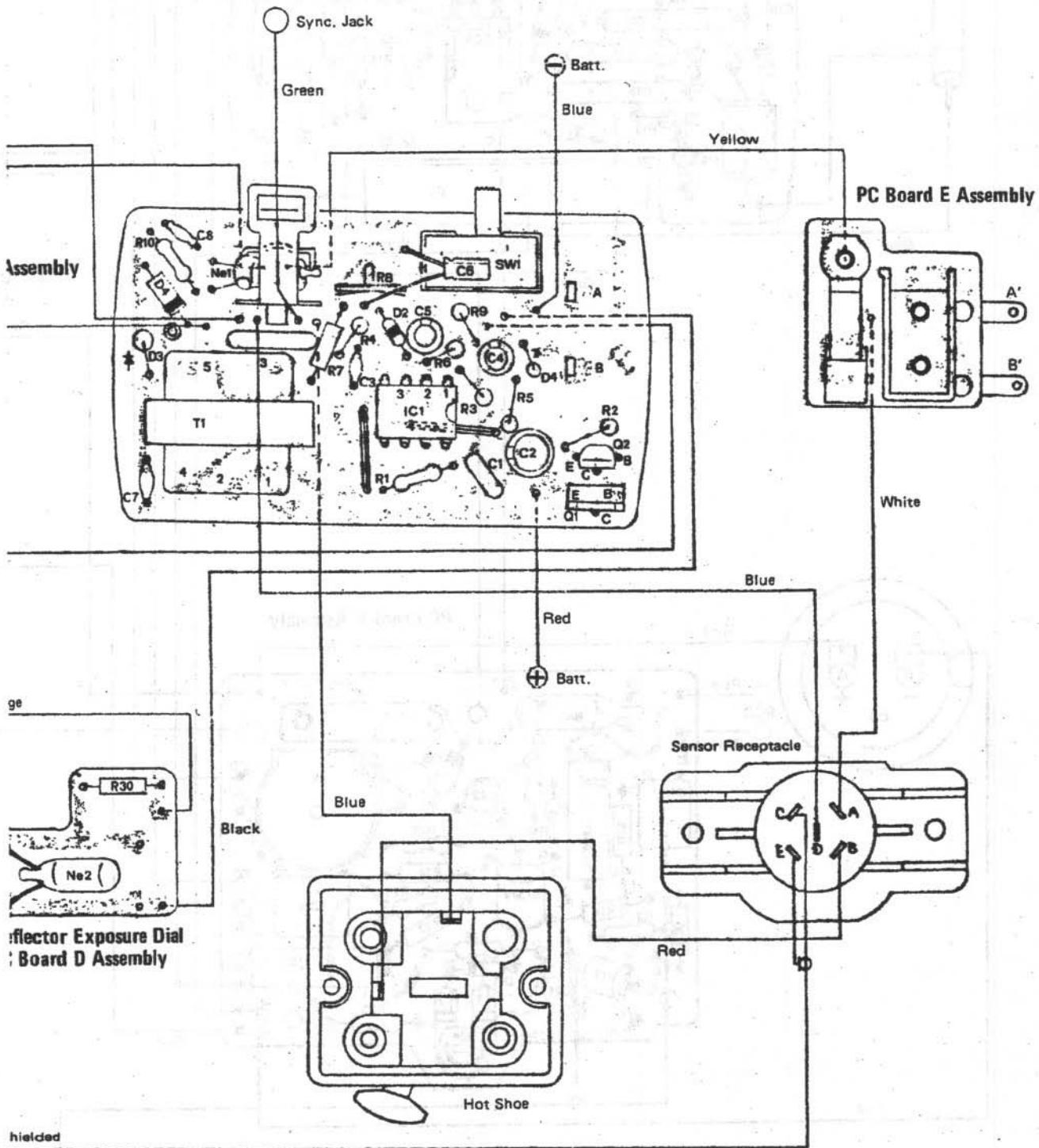


Figure S-2. Printed Circuit Boards and Wiring Connections



ge

Reflector Exposure Dial
Board D Assembly

shielded

Parts List for Figure S-2. Printed Circuit Boards and Wiring Connections

Ref.	Vivitar Part No.	Description	Quantity	Part Code
R1	3110667	RESISTOR, CRBN COMP, 8.2K, 1/4W	1	SC039-76
R2	3110840	RESISTOR, CRBN COMP, 27K, 1/4W	1	SC039-97
R3	3110843	RESISTOR, CRBN COMP, 3.3K, 1/4W	1	SC007-55
R4	3108933	RESISTOR, CRBN COMP, 150, 1/4W	1	SC039-20
R5	3110371	RESISTOR, CRBN COMP, 100K, 1/4W	1	SC007-63
R6	3110371	RESISTOR, CRBN COMP, 100K, 1/4W	1	SC007-63
R7	3100084	RESISTOR, SOLID, 1M, 1/4W	1	SC007-20
R8	3113666	RESISTOR, VARIABLE, 100K, K0AA00B15	1	SC015-83
R9	3113350	RESISTOR, CRBN COMP, 82K, 1/4W	1	SC009-31
R10	3110375	RESISTOR, CRBN COMP, 1M, 1/4W	1	SC007-70
R11	3113708	RESISTOR, SOLID, 2M, 1/4W, 5%	1	SC016-11
R12	3100033	RESISTOR, SOLID, 22, 1/4W	1	SC007-45
R13	3100004	RESISTOR, SOLID, 820K, 1/4W	1	SC007-40
R14	3103727	RESISTOR, METAL OXIDE, 15K, 1W	1	SC008-78
R15	3100045	RESISTOR, SOLID, 1K, 1/4W	1	SC007-07
R16	3100033	RESISTOR, SOLID, 22, 1/4W	1	SC007-45
R17	3103727	RESISTOR, METAL OXIDE, 15K, 1W	1	SC008-78
R18	3100084	RESISTOR, SOLID, 1M, 1/4W	1	SC007-20
R19	3100012	RESISTOR, SOLID, 5.6M, 1/4W	1	SC009-51
R20	3100044	RESISTOR, SOLID, 10K, 1/4W	1	SC007-13
R21	3100142	RESISTOR, SOLID, 4.7K, 1/4W	1	SC009-57
R22	3100045	RESISTOR, SOLID, 1K, 1/4W	1	SC007-07
R23	3100045	RESISTOR, SOLID, 1K, 1/4W	1	SC007-07
R24	3100185	RESISTOR, VARIABLE, 3K, K4AA00B33	1	SC015-20
R25	3100044	RESISTOR, SOLID, 10K, 1/4W	1	SC007-13
R26	3100046	RESISTOR, SOLID, 470K, 1/4W	1	SC007-19
R27	3100084	RESISTOR, SOLID, 1M, 1/4W	1	SC007-20
R28	3100186	RESISTOR, SOLID, 1.8M, 1/4W	1	SC009-89
R29	3100045	RESISTOR, SOLID, 1K, 1/4W	1	SC007-07
R30	3100004	RESISTOR, SOLID, 820K, 1/4W	1	SC007-40
C1	3108900	CAPACITOR, TF, 0.1uF, (J05-IID)	1	SC001-95
C2	3102797	CAPACITOR, ELECTRO, 220uF, 10V (S)	1	SC000-37
C3	3100043	CAPACITOR, SEMICON, 0.05uF, 12V	1	SC004-01
C4	3112738	CAPACITOR, ELECTRO, 10uF, 16V (K)	1	SC000-69
C5	3108924	CAPACITOR, ELECTRO, 3.3uF, 50V (K)	1	SC000-67
C6	3111165	CAPACITOR, ELECTRO, 1uF, 50V (K)	1	SC000-79
C7	3100096	CAPACITOR, CERAMIC, 500pF, 500V	1	SC002-03
C8	3100030	CAPACITOR, CERAMIC, 100pF, 500V	1	SC002-01
C9	3100178	CAPACITOR, MAIN, 1150uF, 350V, 330S, 112W	1	SS504-53
C10	3113709	CAPACITOR, MD, 0.047uF (M40-IT)	1	SC101-97
C11	3113710	CAPACITOR, MD, 0.039uF (M40-IE)	1	SC101-88
C12	3100096	CAPACITOR, CERAMIC, 500pF, 500V	1	SC002-03
C13	3110579	CAPACITOR, TF, 0.047uF (J05-IID)	1	SC101-11
C14	3100180	CAPACITOR, MD, 0.56uF (K40-IT)	1	SC001-43
C15	3113713	CAPACITOR, MD, 3.9uF (K40-IT)	1	SC101-56
C16	3113714	CAPACITOR, MD, 0.068uF (M40-IT)	1	SC101-98
C17	3113709	CAPACITOR, MD, 0.047uF (M40-IT)	1	SC101-97
C19	3100189	CAPACITOR, MYLAR, 0.015uF, 50V	1	SC001-45
C20	3113715	CAPACITOR, MD, 0.047uF (M40-IE)	1	SC101-89
C21	3110579	CAPACITOR, TF, 0.047uF (J05-IID)	1	SC101-11
C22	3100030	CAPACITOR, CERAMIC, 100pF, 500V	1	SC002-01
C23	3113715	CAPACITOR, MD, 0.047uF (M40-IE)	1	SC101-89
C24	3113716	CAPACITOR, MD, 0.1uF (M40-IT)	1	SC101-95
C25	3100031	CAPACITOR, CERAMIC, 200pF, 500V	1	SC002-02
Q1	3110397	TRANSISTOR, 2SB936	1	SC003-69
Q2	3104146	TRANSISTOR, 2SA1115	1	SC003-49
Q3	3100183	TRANSISTOR, 2SA564	1	SC003-14
Q4	3100242	TRANSISTOR, PHOTO, PN-123S	1	SS512-09
IC1	3110868	IC, AN6914	1	SS514-33
D1	3100353	DIODE, SILICON, MA-150	1	SC005-48

Parts List for Figure S-2 cont'd. Printed Circuit Boards and Wiring Connections

Ref.	Vivitar Part No.	Description	Quantity	Part Code
D2	3100667	DIODE, SILICON, MA62	1	SC006-52
D3	3100003	DIODE, SILICON, S1R-150, ORNG/GLD	1	SC005-31
D4	3100100	DIODE, SILICON, 10D-8	1	SC005-05
D5	3100003	DIODE, SILICON, S1R-150, ORNG/GLD	1	SC005-31
D6	3100100	DIODE, SILICON, 10D-8	1	SC005-05
D7	3100100	DIODE, SILICON, 10D-8	1	SC005-05
D8	3100040	DIODE, SILICON, SR1FM-12K	1	SC005-07
D9	3100100	DIODE, SILICON, 10D-8	1	SC005-05
D10	3100101	DIODE, SILICON, KB-169 (GRN)	1	SC027-02
D11	3100661	DIODE, ZENER, MZ309	1	SC006-18
SCR1	3102813	SCR, CR3JM-8	1	SC023-31
SCR2	3100037	SCR, CR02AM-6	1	SC023-02
T1	3100187	TRANSISTOR, OSC, 283	1	SS506-42
T2	3100356	COIL, TRIGGER, NC-850	1	SS508-25
T3	3113717	COIL, TRIGGER, B-500	1	SS508-26
L1	3100165	INDUCTOR, 272L1	1	SC021-10
FT1	3113704	TUBE, XENON, D382BL	1	SS500-86
QT1	3100036	TUBE, QUENCH, W07-1E	1	SS513-11
Ne1	3100113	TUBE, NEON, NE-270D	1	SS502-03
Ne2	3100114	TUBE, NEON, RF5L-G3	1	SS502-12
Ne3	3100114	TUBE, NEON, RF5L-G3	1	SS502-12
SW1	3100663	SWITCH, SLIDE, SS207-A2	1	SC300-26
	3100167	PC BOARD ASSY A	1	SS300-96
	3113718	PC BOARD ASSY B	1	SS303-36
	3100188	PC BOARD ASSY C	1	SS300-98
	3600230	REFLECTOR EXPOSURE DIAL W/PC BOARD D	1	SS003-33
	3600267	PC BOARD E ASSEMBLY	1	SS401-16