Technical Manual

MAINTENANCE INSTRUCTIONS FOR

STROBONARS 782 AND 892

Honeywell
PHOTOGRAPHIC PRODUCTS DIVISION
Q73004107-001

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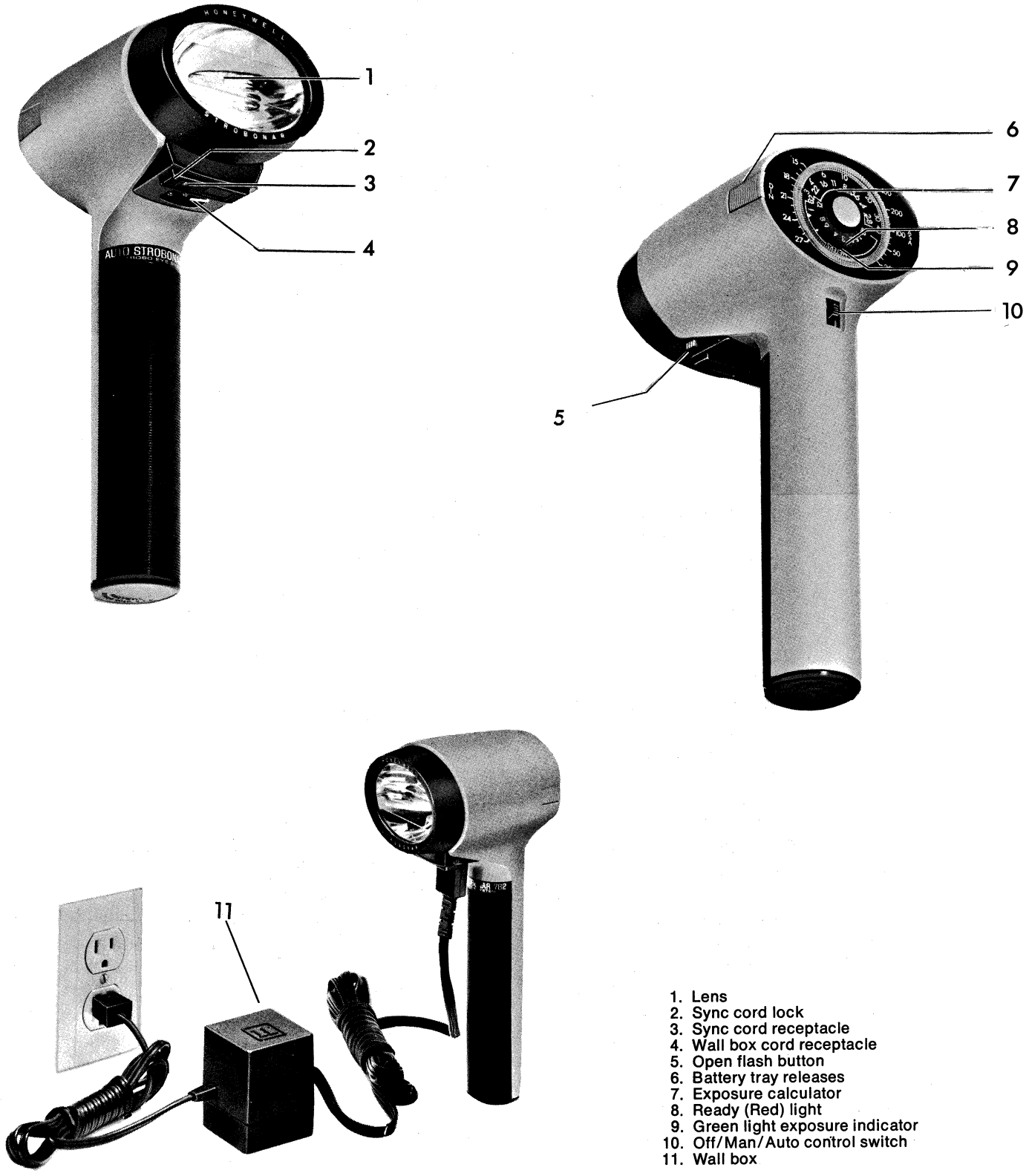

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Figure 1-1. Auto/Strobonar 782

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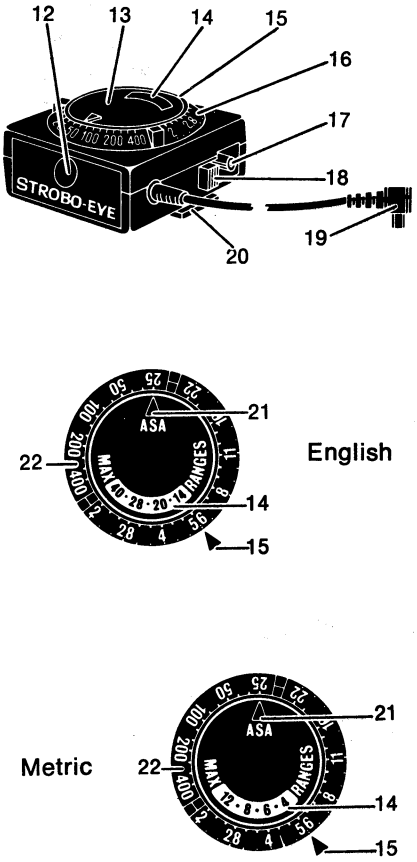

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SECTION 1

INTRODUCTION

1-1. SCOPE OF MANUAL.

This manual provides maintenance instructions for the Honeywell Auto/Strobonars 782 and 892, the Strobo-Eye Remote Sensor Accessory and the wall box. The manual includes information on operational checkout, principles of operation, troubleshooting, disassembly, repair, component replacement and recommended test equipment. A list of replaceable parts, exploded view illustrations and schematic diagrams are also provided.

1-2. UNIT DESCRIPTION.

The Auto/Strobonar/Strobo-Eye system consists of three major assemblies; Auto/Strobonar 782 or 892, wall box and Strobo-Eye Remote Sensor Accessory. The Auto/Strobonar provides a source of repeating photo flash light and can operate as an automatic flash when connected to the Strobo-Eye Remote Sensor Accessory.

1-3. AUTO/STROBONAR 782 (See Figure 1-1).

The Auto/Strobonar 782 is powered by either battery or AC. Battery power is supplied by four "Sub-C" welded nickel cadmium cells located in the replaceable tray at the back of the flash head. AC power is supplied by the wall box (11) which also contains the battery charger.

On the back of the Auto/Strobonar are mounted an exposure calculator (7), an Off/Man/Auto control switch (10), a ready (red) light (8) and an exposure (green) indicator (9). The sync cord receptacle (3) and wall box cord receptacle (4) are located under the flash head. An open flash button (5) on the side of the flash head provides a means of open flashing or test flashing the unit.

1-4. AUTO/STROBONAR 892 (See Figure 1-2).

The Auto/Strobonar 892 is powered by either battery or AC. Battery power is supplied by a high voltage battery (either the Pro-Pak II or Permacad Power Pak) located in a separate case. AC power is supplied by the wall box (11).

On the back of the Auto/Strobonar are mounted an exposure calculator (7), an Off/Man/Auto control switch (10), a ready (red) light (8) and an exposure (green) indicator (9). The sync cord receptacle (3) and wall box cord receptacle (4) are located under the flash head. An open flash button (5) on the side of the flash head provides a means of open flashing or test flashing the unit.

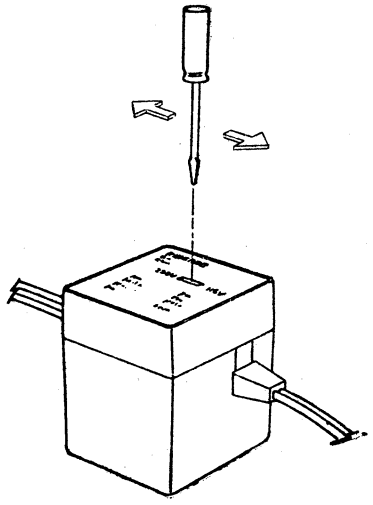
1-5. WALL BOX (See Figures 1-1 and 1-2).

The wall box (11) provides AC operation and battery charging for the Model 782 and AC operation only for the Model 892. Connecting the wall box to the Auto/Strobonar through the 3-prong receptacle (6) under the flash head allows the unit to charge the batteries (782) or operate on AC power (782 and 892) depending upon the position of the Off/Man/Auto control switch (10).

The wall box accepts either 105-129 VAC, 50-60 Hz or 208-258 VAC, 50-60 Hz depending upon the position of the voltage selector switch on the base of the wall box.

CAUTION

You must select the proper input voltage by positioning the switch, located on the bottom of the charger, to the correct position. Operating the wall box with the voltage selector switch set to the wrong position will damage the charger.



1-6. STROBO-EYE REMOTE SENSOR ACCESSORY (See Figure 1-3).

NOTE

ONLY the yellow dial Strobo-Eye Remote Sensor Accessories will operate properly with the Model 782 and 892 Auto/Strobonars, or the Strobo-Eyes as modified per Honeywell Service Bulletin No. 324. Capacitor C4 (in the old style, blue dial Strobo-Eyes) has been replaced by a zener diode CR4 to prevent "full light, full quench and noise trigger problems". Check to be sure the proper Strobo-Eye circuit is being used with the Auto/Strobonar before servicing either of the units.

The Remote Sensor Accessory automatically controls exposure from the position of the sensor. The sensor measures the light reflected from the subject and supplies a signal to the Auto/Strobonar to activate the automatic (quench) circuit.

The Remote Sensor Accessory may be mounted on the camera accessory shoe or mounted off-camera with the use of an extension cord. The flash unit sync cord receptacle and the camera connector are located on the side of the Accessory.

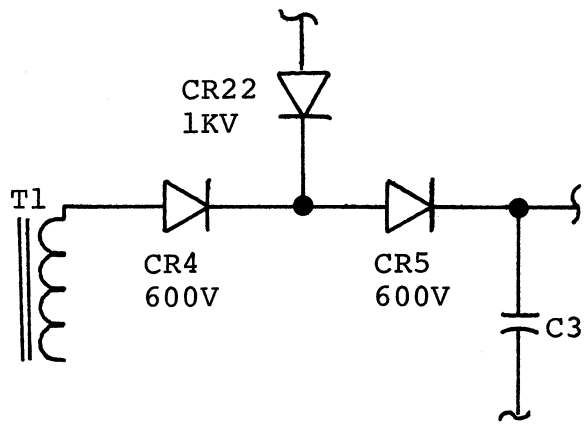
Exposure scales and dials are mounted on the top of the unit to permit selection of four f/stops or ranges, depending upon the film speed selected. The sensor is located on the front surface of the unit.

1-7. DESIGN CHANGES.

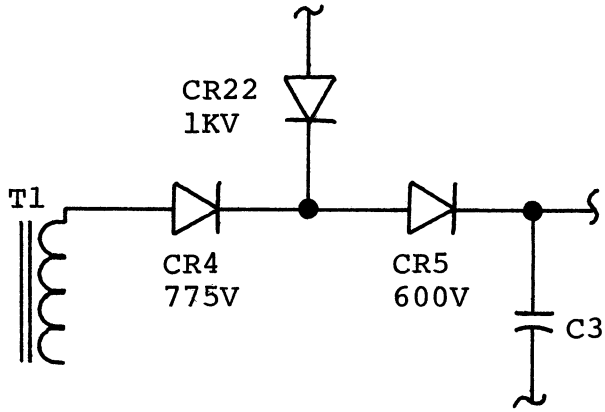
Several changes in the electronic circuit have been added to the Auto/Strobonars to improve their performance and to eliminate problems encountered in production.

The CR4, CR5 and CR22 diode arrangement in the Auto/Strobonar 782 has been changed because it was discovered that if the Auto/Strobonar was operated on battery and AC at the same time, reverse voltage on CR4 would blow the diode, causing it to fail. If the diode shorted, transformer 2T1 in the wall box would also fail. If the diode CR4 opened, diode CR1 and transistor Q1 would fail in the oscillator circuit.

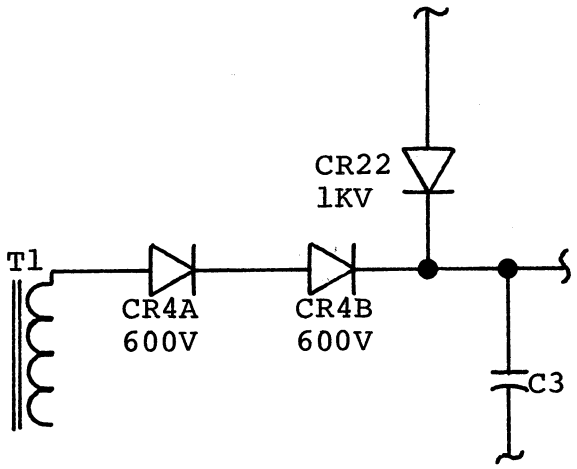
The initial design is shown in SKETCH A. In some units, diode CR4 has been replaced with a 775 reverse voltage diode, as shown in SKETCH B. Other units have been changed by eliminating diode CR5 and adding two diodes in place of CR4 as shown in SKETCH C. The present production run of Auto/Strobonar 782's has had an additional diode added to the circuit and the electrical connection revised as shown in SKETCH D and in the Auto/Strobonar 782 schematic on page 5-33 of the Service Manual.



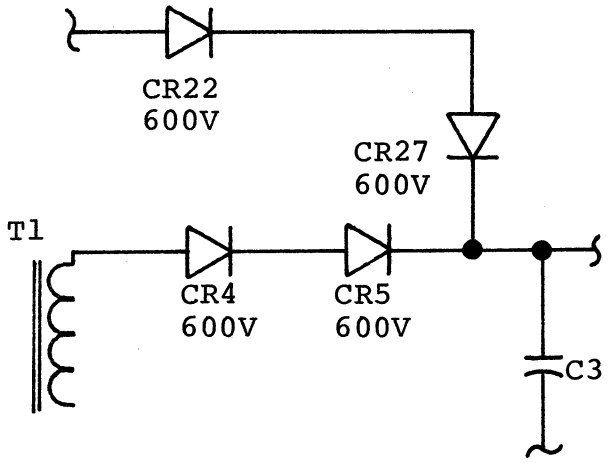
SKETCH A



SKETCH B



SKETCH C



SKETCH D

1-8. SPECIFICATIONS.

1-9. AUTO/STROBONAR - WALL BOX.

NOTE

For those service centers utilizing test equipment measuring light output in lux-seconds, rather than lumen-seconds, the following conversion equation is provided:

$$\text{Lux-seconds/m}^2 = 10.764 \times \text{Lumen-seconds/ft}^2$$

a. Power Source.

Battery (782)	Four "Sub C" size (welded) nickel cadmium rechargeable cells.
Battery (892)	Pro-Pak II (510 volt battery - Eveready Type 497 - regulated).
Battery (892)	Permacad Power Pak (rechargeable nickel cadmium cells).
AC	Wall box.

b. Wall Box Input Voltage.

105-129 VAC, 50-60 Hz, or
210-258 VAC, 50-60 Hz.

c. Wall Box Output Voltage.

2J3, pins A-C ..... 340 ±20 VDC at 0.05 amp.
2J3, pins B-C ..... 14 VAC at 0.3 amp.

d. Battery Conditioning.

782 ..... 80% of full charge within 3 hours at 117 VAC, 50-60 Hz.

892 ..... Refer to Permacad Power Pak Service Manual.

e. Equivalent Battery Source.

782 ..... 5.25 ±0.1 VDC with impedance of 0.25 ohms. NOTE: A 100 ufd capacitor must be connected across the battery contacts when an equivalent battery source is used.

892 ..... 355 ±5 VDC with impedance of 1500 ohms.

f. Storage Capacitor Forming.

Form for one hour minimum at maximum anode voltage.

g. Guide Number.

Automatic ..... Not applicable.

Manual ..... 90 for ASA 25 film.

h. Flash Duration.

Full Power ..... Approximately 1/500 second.

Automatic ..... Vary between 1/50,000 to about 1/500 second.

i. Automatic Range.

Total range of 3.5 to 23 feet.

..... 4 to 23 feet.

..... 3.5 to 17 feet.

j. Recycle.

(Using fresh or fully charged battery and formed storage capacitor and measured at 5th flash).

782 ..... Battery ..... 8 seconds maximum.

..... AC .....12 seconds maximum.

892 ..... Permacad Power Pak ... 5 seconds max.

..... Pro-Pak II ..... 8 seconds max. for first 30% of battery life.

..... AC ..... 12 seconds maximum.

k. Number of Flashes.

782 ..... 72 minimum before recycle time exceeds 15 seconds.

892 ..... Permacad Power Pak - minimum of 90 flashes before recycle time exceeds 8 seconds. Flash rate - one flash per 30 seconds.

892 ..... Pro-Pak II - minimum of 70 flashes before recycle exceeds 10 seconds. Flash rate - one flash per 60 seconds.

l. Full Power Light Output.

Minimum 160 lumen-seconds per square foot (or 2560 beam-candle-power-seconds) at cut-off when measured 4 feet from the flash head. Measurement must be made with fresh or fully charged batteries and a formed storage capacitor. Unit must be flashed for measurement after 30 seconds of power operation.

m. Auto-Quench Light Output.

Nominal 6.4 lumen-seconds per square foot at 8 feet with sensor set for f/2.8 at ASA 25.

n. Angle of Illumination.

About 60^{o} horizontally and 40^{o} vertically.

o. Color Temperature.

Approximately noon daylight.

p. Shutter Synchronization.

Between the lens shutters ..... X-sync all speeds.

Focal plane shutters..... X-sync - usually 1/60 second.

q. Off/Man/Auto Control Switch.

3 position switch, selects automatic or manual mode of operation or off position.

r. Open Flash Button.

Push button to open flash or test flash the Auto/ Strobonar.

s. Green Light.

Proper automatic exposure indicator.

t. Physical Size.

4.2" deep x 3.6" wide x 9.3" wide.

u. Weight.

782 ..... 25 ounces complete with batteries.

892 ..... 18 ounces (without battery).

1-10. STROBO-EYE REMOTE SENSOR ACCESSORY (YELLOW DIAL).

a. Mount.

Standard universal shoe mount.

b. Connector.

Locking tip connector or standard PC connector.

c. Maximum Ranges Scale.

Selection of four ranges.

d. ASA Scale.

Select ASA number of film.

e. f/Stop Scale.

Selection of four f/stop settings for each film speed.

f. Sensor Angle.

12 degrees.

1-11. COMPONENT REFERENCE DESIGNATIONS.

To avoid component reference designator duplication, each unit in the system, such as the Auto/Strobonar, wall box, etc., has been assigned a prefix number. A prefix has, therefore, been added to each reference designator as shown below.

UNIT	PREFIX	EXAMPLE
Auto/Strobonar 782-892	No Prefix	R1
SCR Test Circuit	#1 Prefix	1R1
Wall Box	#2 Prefix	2R1
Resistor R10 Test Circuit	#3 Prefix	3R1
Resistor R2 Test Circuit	#4 Prefix	4R1
Resistor R6 Test Circuit	#5 Prefix	5R1
Strobo-Eye Remote Sensor Accessory	#6 Prefix	6R1
Strobo-Eye Test Circuit	#7 Prefix	7R1

SECTION 2

PRINCIPLES OF OPERATION

2-1. GENERAL.

The Auto/Strobonars 782 and 892 provide a source of repeating photoflash light. When coupled with the Honeywell Strobo-Eye Remote Sensor Accessory, it operates as an automatic electronic flash unit.

The main xenon flashtube and main flashtube trigger circuit are located in the Auto/Strobonar. The quench or dump tube (a xenon flashtube with much lower impedance than the main flashtube) and associated trigger circuit are also located in the Auto/Strobonar. Circuits for measuring the light level reflected from the subject and for generating a light control signal are located in the Strobo-Eye Remote Sensor Accessory.

The Auto/Strobonar 782 is powered by four "Sub-C" size welded nickel cadmium cells. The Auto/Strobonar 892 is powered by a high voltage battery (either the Pro-Pak II or Permacad Power Pak) located in a separate pack. The wall box provides AC operation only for the Model 892 and provides AC operation and battery charging for the Model 782.

A three position switch (Off/Man/Auto) connects the battery to the oscillator/rectifier circuit (782) and also selects the automatic or manual mode of operation. The oscillator/rectifier circuit (782) converts the low dc voltage from the battery to high dc voltage which is stored in the energy storage capacitor C3. Closing the camera shutter contacts (J2) or the open flash button (S2) triggers the xenon flashtube which converts the stored energy into light. The trigger circuit utilizes an SCR to improve trigger reliability and prevents shutter contact arcing.

The Auto/Strobonars and Strobo-Eye have an automatic circuit to regulate light output. Using a light activated silicon-controlled rectifier (LASCR) in the Strobo-Eye, the automatic circuit detects and integrates (sums) light reflected from the subject. When the reflected light reaches a predetermined level, the flashtube is turned off automatically.

The aperture selector on the front of the Strobo-Eye selects a range of 4 f/stops or any point between the largest and smallest f/stop. The selector positions the varying size aperture in front of the light sensing window of the LASCR, thereby controlling the amount of light reaching the LASCR during a flash. Each aperture corresponds to an f/stop to be set on the camera for the type of film being used; thus, providing a selection of shooting ranges and depth-of-field control.

2-2. CIRCUIT DESCRIPTION (See Figures 5-17 and 5-18).

The circuit description is keyed to the system schematics, Figure 5-17 (782) and Figure 5-18 (892). The system schematics include the individual schematics for the wall box, Strobo-Eye Remote Sensor Accessory and the Auto/Strobonar. Description of the various circuits are provided.

2-3. OSCILLATOR CIRCUIT - Model 782 (See Figure 5-17).

The transistor-driven stored energy flyback oscillator converts the low dc voltage from the battery BT1 to high dc voltage which is stored in the high energy storage capacitor C3. The polarity of the transformer in the oscillator circuit prevents the secondary from conducting when the magnetic field in the primary is building. When the primary is opened (Q1 off), the magnetic field collapses and current flows in the secondary, charging the energy storage capacitor C3. The stored energy flyback circuit allows a portion of the magnetic energy to remain in the core of the transformer at the time the succeeding oscillation starts.

The primary current flow circuit consists of BT1, S1A, winding N1 of transformer T1 and transistor Q1. With the Off/Man/Auto control switch set to Auto or Man, Q1 is forward-biased by the current flowing through N1, R1, R2 and the base-emitter junction of Q1. This is the starting loop causing the oscillator to start running initially.

As the collector of Q1 falls in voltage toward the emitter, current flows through N1 and the emitter-base junction of Q1 to the battery. This is the primary current flow circuit. The current flowing in N1 induces a voltage in winding N3. The voltage is positive at pins 2 and 6 of T1 during the primary current flow cycle.

The forward base drive circuit consists of transformer winding N3, R2, Q1 and CR3. As voltage is induced in N3 from N1, current flows through R2, the base-emitter junction of Q1, through CR3 and back to pin 3 of T1. Pin 2 in the primary winding, pin 6 in the base drive winding and pin 1 in the secondary winding are all positive. At this time, current cannot flow in the secondary circuit to charge C3 because CR4 and CR5 are reverse-biased. Consequently, when current is flowing in the primary circuit (N1), no current is flowing in the secondary, except for the tuning network consisting of capacitor C2 and resistor R3. With the base-emitter drive circuit completed through CR3 and as the regenerative feedback of N1 and N3 increases, Q1 saturates.

A shorted or open CR3 will cause the oscillator circuit to be inoperable because of the loss of base drive for transistor Q1.

Assuming there is constant current flowing into the base of Q1, the collector current will increase linearly with time. The collector current, from the time Q1 was turned on, is building flux (or storing energy) in the core of T1. This current (or flux in the core) is becoming increasingly large. For an incremental unit of time, there is an incremental increase in current. This current continues to increase until a point is reached where Q1 base current times the gain of Q1 (βI_b) can no longer supply collector current. At this point, Q1 comes out of saturation because its base drive is insufficient to keep it saturated.

Q1 starts to turn off. The collector voltage starts to rise and the voltage across N1 starts to decrease. The induced voltage across N3 decreases. The collector voltage rises toward the battery positive causing the voltages across the windings to switch, making pins 7, 3, and 4 more positive.

As the voltages on the windings switch, the magnetic field collapses and current flows out of the secondary winding N2. With diodes CR4 and CR5 forward-biased, current flows from pin 4 in the secondary winding to charge the energy storage capacitor C3. The voltage appearing on C3 is the same value appearing across N2 for any oscillator cycle. Since the storage capacitor is charged by the secondary when the magnetic field is collapsing, the current flowing from pin 4 of winding N2 is linearly decreasing.

During the period of time the magnetic field is collapsing and the storage capacitor is being charged, the stored energy flyback circuit is operating. The flyback circuit consists of winding N3, C1, CR2 and R2. Current flows from pin 3 of N3, through C1, CR2 (anode to cathode), R2 and to pin 6 of N3. The voltage across N3 is a constant voltage. Capacitor C1 is charged through R2. The charging time constant of C1-R2 determines the flyback time constant. R2 is a selected resistor to provide peak collector current for transistor Q1. Refer to paragraph 3-16 for selection of resistor R2.

CR2 anode is positive by .7 volt with respect to the cathode. This same voltage is impressed across the emitter-base of Q1 with the emitter being more positive than the base. Q1 is therefore reverse-biased and held off.

When C1 is charged to the same voltage across N3, current flow ceases in the flyback circuit. Since there is no longer a voltage drop across CR2, the base of Q1 starts rising from a negative .7 volts due to the current flowing through R1 and R2 from pin 7 of N1. Transistor Q1 turns on and the drive cycle is again initiated.

The flyback cycle is accomplished before the magnetic field in the transformer has completely collapsed. Therefore, Q1 is turned on and the drive is initiated before the magnetic flux in the core reaches zero and the stored energy totally expended.

The oscillator circuit is turned off when the storage capacitor reaches its rated value by turning transistor Q2 on. When Q2 is on and its collector voltage is low, base voltage cannot be generated on Q1. If the base of Q1 is not positive by .7 volt, the oscillator cannot operate.

Q2 is turned on by sensing the voltage across C3 by the divider network R4 and R6. The charging voltage across C3 must be a minimum of 200 volts before the divider network (R4-R6) senses a voltage since CR16 subtracts 200 volts from the anode voltage. The cutoff neon VR2 ignites when the voltage at the junction of R4-R6 reaches 150 volts.

The point VR2 turns on is determined by the values of R4 and R6. R6 is a selected resistor that insures VR2 turns on at the proper anode voltage (350 volts). Refer to paragraph 3-17 for selection of resistor R6.

With VR2 on, current flows to the base of Q3 and resistor R24. R24 insures there is current flow in VR2 before the base of Q3 rises. The Darlington transistor Q3 multiplies the small current flowing in VR2 (approximately 40 ua) to provide sufficient base current to turn Q2 on. Q2 collector current is provided by battery positive through S1A and R25.

Summarily, Q2 is on when VR2 is on; whenever Q2 is on, Q1 is off. Therefore, when VR2 is on, Q1 is off and the oscillator circuit is off.

Diode CR1 protects Q1 during the reverse recovery time of CR4 and CR5. A shorted or open CR1 will cause Q1 to fail. Always check CR1 if Q1 is found to be defective.

Diodes CR4 and CR5 are high-speed, 200 nanosecond reverse recovery diodes. A defective diode(s) CR4 and/or CR5 will cause Q1 and/or CR1 to fail. Two diodes (CR4 and CR5) are required to meet the extremely fast rise and fall times of the oscillator because of the use of the silicon transistor in the oscillator circuit. Very rapid voltage changes are produced on N3 as Q1 is turned on and off.

The neon ready light VR1 circuit consists of diodes CR16, resistors R10 and R14 and the neon VR1. A portion of the voltage across the energy storage capacitor C3 is impressed across the neon ready light. Resistors R14 and R10 act as a voltage divider to establish the firing voltage of VR1. Diode CR16 subtracts 200 volts from the anode voltage.

The value of resistor R10 is selected to insure that VR1 ignites with 300 ±5 VDC applied across the neon ready light circuit. Refer to paragraph 3-18 to determine the value of R10. The selection and replacement of R10 is required only when it is necessary to replace diode CR16 or the neon VR1.

2-4. BATTERY OPERATION - Model 892 (See Figure 5-18).

With the external battery connected to the Auto/Strobonar and all power switches turned on, the storage capacitor C3 is charged through CR22, CR7 and switch S1 to the battery voltage. Diodes CR7 and CR22 isolate the power input prongs of the wall box receptacle beneath the flash head to prevent the possibility of electrical shock. One diode is all that is electrically necessary to isolate the input, but two diodes are required to obtain U.L. approval.

The neon ready light VR1 circuit consists of diode CR16, resistors R10 and R14 and the neon VR1. A portion of the voltage across the energy storage capacitor C3 is impressed across the neon ready light. Resistors R14 and R10 act as a voltage divider to establish the firing voltage of VR1. Diode CR16 subtracts 200 volts from the anode voltage.

The value of resistor R10 is selected to insure that VR1 ignites with 300 ±5 VDC applied across the neon ready light circuit. Refer to paragraph 3-18 to determine the value of R10. The selection and replacement of R10 is required only when it is necessary to replace diode CR16 or the neon VR1.

2-5. WALL BOX (Models 782 and 892).

The wall box serves as an AC power supply for the Model 892 and as an AC power supply and battery charger for the Model 782. The wall box operates on either 105-129 VAC, 50-60 Hz or 208-258 VAC, 50-60 Hz power.

Connection to the Auto/Strobonar is made through the three wire cord to the plug-in wall box cord receptacle located beneath the flash head on the Auto/Strobonar. Refer to Figure 1-1 or 1-2. The voltage selector switch on the base of the wall box must be properly positioned depending upon the available voltage.

2-6. AC OPERATION (Models 782 and 892).

The wall box provides a regulated 340 volts to pins A and C of 2J3 (on the wall box) to charge the storage capacitor C3 in the Auto/Strobonar when operating on AC. The voltage selector switch 2S1 selects the line voltage available.

Transformer 2T1 is wound so the source impedance is the same in either switch position. The secondary winding N3 provides high voltage to the bridge circuit for full wave operation and to the regulator circuit to supply regulated anode voltage to the storage capacitor C3.

When pin 3 of the transformer 2T1 is positive (+) with respect to pin 1, current flows through diode 2CR2, the regulator circuit, battery switch S1, isolation diodes CR22 and CR5 (782) or CR7 (892), storage capacitor C3 and diode 2CR4 to pin 1 of 2T1. This current charges the storage capacitor toward anode voltage.

On the next half cycle of AC input, pin 1 of 2T1 is positive (+) with respect to pin 3. Current now flows through diode 2CR1, the regulator circuit, S1, CR22, CR5 (782) or CR7 (892), C3 and 2CR3 to pin 3 of 2T1. The storage capacitor C3 is charged on both half cycles of AC. Although only one cycle of AC operation has been explained, it takes several cycles for C3 to charge to full anode voltage.

The regulator circuit consists of 2SCR1, 2R1, 2CR5, 2CR6, 2C1 and 2R2. The gate of 2SCR1 is clamped to 340 volts (anode voltage) with respect to pin C of 2J3 by the voltage drop across 2CR5 and 2CR6. The current through 2R1 and the gate of 2SCR1 gates 2SCR1 on when the voltage on the cathode of 2SCR1 is less than the gate voltage.

As the storage capacitor C3 approaches full charge (regulated anode voltage of 340 volts), the voltage on the cathode of 2SCR1 is at a higher potential than the voltage at the gate of 2SCR1. The gate of 2SCR1 is back-biased, preventing 2SCR1 from gating on.

Capacitor 2C1 and resistor 2R2 reduce noise across the gate-cathode of 2SCR1.

When capacitor C3 is charged to anode voltage, a portion of the voltage across C3 is impressed across the neon ready light VR1. VR1 lights and the Auto/Strobonar is ready to flash.

Diodes CR22 and CR5 (782) or CR7 (892) isolate the power input prongs of the wall box cord receptacle P3 on the bottom of the flash head to prevent the possibility of electrical shock. One diode is all that is electrically necessary to isolate the input but two diodes are required to obtain U.L. approval.

2-7. BATTERY CHARGING - Model 782 (See Figure 5-17).

With the wall box connected to the Auto/Strobonar 782 and the Off/Man/Auto control switch set to Off, 14 VAC is supplied to the Auto/Strobonar to charge the batteries.

Transformer 2T1 is wound so the source impedance is the same with the voltage selector switch 2S1 in either the 105-129 VAC or 208-258 VAC position. The transformer steps down the AC line voltage so that the voltage between pins B and C of 2J3 is 14 VAC with 105-129 VAC between pins 7 and 6 or with 208-258 VAC between pins 7 and 5. The secondary winding N4 provides the low AC voltage to charge the batteries.

Half-wave rectifier CR14 and limiting resistor R27 comprise the charging circuit for the four nickel-cadmium cells of BT1. The circuit supplies a constant charging current of 0.3 ampere to BT1. It takes approximately 5 hours to fully charge the batteries.

When pin 4 of 2T1 is positive, current flows through 2J3-P3, pin B, R27, CR14 and BT1 to charge the batteries. On the half-cycle when pin 4 is negative, CR14 is back-biased and no current flows.

The storage capacitor C3 is automatically formed by the AC circuit when the batteries are being charged. The capacitor is formed through 2J3-P3, pin A, diodes CR22 and CR5, storage capacitor C3 and back to 2J3-P3, pin C.

2-8. TRIGGER CIRCUIT (Models 782 and 892).

The trigger circuit provides a high voltage pulse to the exterior of the flashtube. This pulse ionizes the xenon gas in the tube, initiating a discharge path through the tube for the energy stored in capacitor C3. The trigger circuit includes an SCR for improved trigger reliability and to prevent arcing on the shutter contacts.

The flashtube trigger coil T2 ignites the flashtube FT1 by impressing a few thousand volts to the exterior of the flashtube.

As the storage capacitor C3 charges, resistor R9 and R21 (782) or CR23 (892) act as a voltage divider, producing about 200 volts at the anode of SCR2. The trigger capacitor C6 charges through the primary of T2 and R9 to the anode voltage of SCR2. Transistor Q4 is turned on by the base current path through R20 and CR10. The voltage at the signal line (junction of CR10 and R12) is about 1.2 volts which is required to keep Q4 on. SCR2 cannot turn on when Q4 is on because SCR2 gate is shorted to ground by Q4. Capacitor C8 charges through R9, R12, CR10 and R43.

The main flashtube FT1 is triggered by either closing the Open Flash switch S2 or closing the camera shutter contacts at J2. Closing either contact causes the voltage at the anode of CR10 to drop, removing the base current drive from Q4 and Q4 turns off. With Q4 off, current flows from SCR2 anode to gate, turning on SCR2. This provides a discharge path for FT1 trigger capacitor C6. C6 discharges through the primary of T2 and SCR2 providing the high voltage pulse to fire FT1. Capacitor C7 is a noise filter and resistor R8 (across the primary of T2) reduces flyback ringing.

If the Off/Man/Auto control switch S1B is in the Auto position, the voltage at the anode of CR10 will be .6 volts when the Open Flash button S2 or the camera shutter contacts are closed.

When FT1 fires, the signal line (junction of CR10 and R12) will go negative as a result of the charge of C8. The signal line was at 1.2 volts positive until J2 is shorted with the shutter contact closure or when S2 is closed. So the signal line will drop from two diode drops to one diode drop or to about .6 volts positive until SCR2 fires as a result of turning off Q4.

In manual operation, with the Off/Man/Auto control switch S1B set to Man, the signal line will continue to go negative until it gets to 24 volts and zener diode CR10 fires and holds it at 24 volts. It will stay at a negative 24 volts because C8 will continue discharging into the signal line as long as the voltage across C3 falls as the flashtube is firing. After the flash is completed, the signal line will return to 1.2 volts as C3 is charged for the next flash.

Capacitor C28 and resistor R44 decouple the Open Flash switch S2. If S2 is closed and held closed, Q4 will turn off, SCR2 will turn on, and the flash will take place as previously discussed. After the flash is completed and anode voltage again appears on C3, current will flow through R20, R44, C28 and CR11 to charge C28 to about a volt so Q4 can turn back on even though S2 is held closed.

If C28 was shorted and S2 held closed, Q4 would stay off after the initial flash. Therefore, the Auto/Strobonar would continue to self-flash because SCR2 would act like a relaxation oscillator.

2-9. AUTOMATIC CIRCUIT (Model 782 and 892).

With the Strobo-Eye Remote Sensor Accessory attached, the automatic circuit regulates exposure at distances of 3 to 23 feet, depending upon the aperture setting in front of the Strobo-Eye sensor. Exposure is controlled by the position of the Auto/Strobonar in respect to the subject.

The Strobo-Eye uses a photosensitive SCR (LASCR) as a transducer to detect the light reflected from the subject and to convert the light to electrical energy. The Strobo-Eye automatic circuit then integrates (sums) this electrical analog of reflected light. When the integrated electrical analog reaches a predetermined level, a light control signal is generated and applied to the Auto/Strobonar at J2. This signal triggers the xenon-filled quench tube FT2. The quench tube is connected across flashtube FT1. When both tubes are ionized, FT2 has much less impedance (1/10 or less) than FT1, thus shorting FT1 and quenching the light source.

With Off/Man/Auto control switch S1 closed and Strobo-Eye connected at J2, closing the camera shutter contacts will drop the signal line from about 1.8 volts to the diode drop across 6CR1 which is about .6 volt. This turns off Q4 in the Auto/Strobonar

and fires the main flashtube FT1 as discussed previously. Note that until SCR2 is fired, there is no voltage on the Strobo-Eye circuit and 6LASCR1 cannot conduct for there is no voltage produced as a result of ambient light. This is because the signal line is at 1.8 volts and diode 6CR2 is therefore back-biased. So the integrating or summing circuit, composed of 6C3 and 6R1 is at 0 volts until the main flashtube fires and powers the Strobo-Eye.

When the main flashtube fires, the signal line will go negative as a result of the charge on C8 as SCR2 anode voltage falls. This forward biases 6CR2 and current will flow in the Strobo-Eye circuit as the signal line goes negative. The signal line continues to go negative until zener 6CR3 fires. Thus, 6Q1 is forward biased and turns on. The signal line at this point will be a constant -16 VDC, plus the two diode drops of 6CR2 and base-emitter junction of 6Q1 or to about 17.2 volts negative.

Note that diodes CR9 and CR10 in the Auto/Strobonar do not turn on because the signal line is held at a negative 17.2 VDC and it would have to go to a negative 24 VDC for CR10 to fire.

When 6Q1 turns on, the reference voltage, established by the charge on 6C4 and controlled by the reference voltage adjust pot 6R3, is at the cathode of 6LASCR1. Now, as the light reflected from the subject falls on 6LASCR1, current flows in the anode-gate portion to charge 6C3 through 6R1. Resistor 6R1 is an anticipation resistor and the voltage across it is directly proportional to the light intensity and the voltage across 6C3 is proportional to the integral of the light intensity. So as the light continues to fall on 6LASCR1, the gate will continue to rise as 6C3 charges until a point is reached where the gate voltage exceeds the reference voltage at the cathode of 6LASCR1. At this point, 6LASCR1 turns on and the 12 to 15 VDC that was across it will be applied directly to the signal line as a positive going automatic control signal. This signal is used to fire the quench tube FT2.

The quench tube trigger circuit in the Auto/Strobonar consisting of SCR3, C13 and T3 and associated circuitry functions identically to the main flashtube trigger circuit.

The positive going leading edge of the automatic control signal is coupled through C10 to the gate of SCR3. SCR3 then turns on, providing a discharge path for trigger capacitor C13. Capacitor C13 discharges to the primary of T3, providing a high energy ringing pulse to fire FT2. Firing FT2 turns off the main flashtube by rapidly discharging the energy stored in capacitor C3.

Capacitor 6C1 and 6C2 are noise filters. Zener diode 6CR2 couples the control signal to the signal line when 6LASCR1 turns on.

2-10. GREEN LIGHT CIRCUIT - Model 782 (See Figure 5-17).

The green light VR3 lights when the quench tube FT2 fires if the Off/Man/Auto control switch is in the Auto position. The lamp can be used in two ways; either to test for proper automatic exposure or to indicate proper exposure. The green light does not operate when the Auto/Strobonar is powered by AC. VR3 lights when SCR1 turns on. If SCR1 is off, VR3 is off. SCR1 turns off each time the main flashtube FT1 fires and turns on each time the quench tube FT2 fires. The green light is on as long as FT2 is being fired on successive flashes, unless the Off/Man/Auto switch is set to Off and then set back to Auto. Because the flash and quench occur within millionths of a second of each other, the green light will appear to be always on.

Capacitor C4 will charge through R26 to the anode voltage of SCR2. When SCR2 fires, capacitor C4 will discharge through CR12 and R26 to ground, driving the anode of SCR1 negative in respect to ground, commutating it off. When SCR3 turns on as a result of an automatic control signal and C13 discharges through the primary of T3, the negative signal is applied to the cathode of SCR1 through C5. This will turn on SCR1 and current will flow through VR3 and SCR1, turning on the green light.

Capacitor C5 couples the quench signal from T3 to the cathode of SCR1 and R22 is a current limiting resistor for VR3. Resistor R7 is a clamp that holds SCR1 off from its own leakage current at high temperature. It desensitizes the SCR. Capacitor C4 is the commutating capacitor for SCR1 and controls its turn off time. If the green light will not turn off, check C4. Capacitor C26 is a noise filter.

2-11. GREEN LIGHT CIRCUIT - Model 892 (See Figure 5-18).

When SCR2 fires, a negative going voltage spike is produced and coupled to the anode of SCR4 through C11 to turn off the green light VR3.

When SCR2 turns on (as a result of an automatic control signal - whether or not FT2 fired) a negative signal is applied to the cathode of SCR4 through capacitor C16. SCR4 gate is clamped to ground potential through R33 so when the gate voltage exceeds the cathode voltage, current flows through the gate-cathode circuit of SCR4, turning on SCR4 and VR3. SCR4 cathode is forward-biased, causing diode CR17 to conduct.

A separate power supply powers the green light VR3 when the anode voltage across C3 falls to 30 to 50 VDC when the main flashtube or quench tube is fired. The length of time of this decay is approximately 3 to 4 seconds. The power supply consists of CR18, R31, R32, CR24 and C17.

When the anode voltage is high, current flows to charge C17. The path for current flow is through CR18, R31 and C17. C17 charges to about 220 volts. Resistors R32 and R30 act as a voltage divider to establish the firing voltage of VR3. Diode CR24 subtracts 150 volts from the anode voltage.

When the flashtube fires, the anode voltage collapses and C17 supplies power for the green light VR3 by discharging through R32, R30, VR3, SCR4 (turned on by the auto-quench signal from SCR2) and R34 until the anode voltage of C3 has recovered.

Resistor R30 is a current limiting resistor for C17 and CR24 acts as a voltage regulator to charge C17 at a faster rate.

SECTION 3

CHECKOUT AND TROUBLESHOOTING

3-1. GENERAL.

To checkout or troubleshoot the Auto/Strobonar/Strobo-Eye flash system, first determine which unit is at fault or malfunctioning. Substitute the suspected faulty Auto/Strobonar with another known to be operating properly. If the system is still malfunctioning, substitute the Strobo-Eye Remote Sensor Accessory with a unit known to be operating properly.

If it is necessary to replace any components in the automatic circuit while servicing the Auto/Strobonar or Strobo-Eye units, it will be necessary to calibrate the Strobo-Eye circuit.

When checking out the Auto/Strobonar, insure that all electrical connections are good; that the storage capacitor has been formed; and that the battery is fresh or fully charged before checking or adjusting the Auto/Strobonar. The storage capacitor is automatically formed by flashing the unit a few times, allowing a minute or so between flashes.

WARNING

> When you are repairing the unit, discharge the storage capacitor through a 100 ohm, 2 watt resistor to insure that the unit is safe to work on.

3-2. OPERATIONAL CHECKOUT.

3-3. TEST EQUIPMENT.

You will find the following test equipment is required for operational check of the Auto/Strobonar.

Volt-Ohm Meter - Triplett Model 630-NA or equivalent.

DC Power Supply - Variable d-c voltage to 380 volts, Honeywell Model 230 Power Panel or equivalent.

Quench Tester - Honeywell Model CE319 or equivalent.

OR Pulse Photometer - Honeywell Model CE237 and incident light sensor, Model CE238 or equivalent.

AND an 18% reflectance, neutral gray card, 5 foot minimum diameter.

Strobo-Eye Teast Circuit (See Figure 3-6).

3-4. STORAGE CAPACITOR C3 FORMING.

Before performing any operational checkout, form the storage capacitor C3 for at least one hour at anode voltage. Flash the unit a few times to accelerate forming.

3-5. STORAGE CAPACITOR C3 LEAKAGE CHECK.

Form the storage capacitor before checking the capacitor for leakage. Disconnect one end of capacitor C3 from the circuit. Using a d-c power supply, form the capacitor for one hour at 360 volts with a 1K ohm, 1% resistor in series with the capacitor. With 360 volts across C3, connect a voltmeter in parallel with the 1K ohm resistor. Measure the leakage current of C3 by reading the voltage across the 1K ohm resistor. If the leakage current exceeds 1 ma (1 volt across the 1K ohm resistor), replace C3.

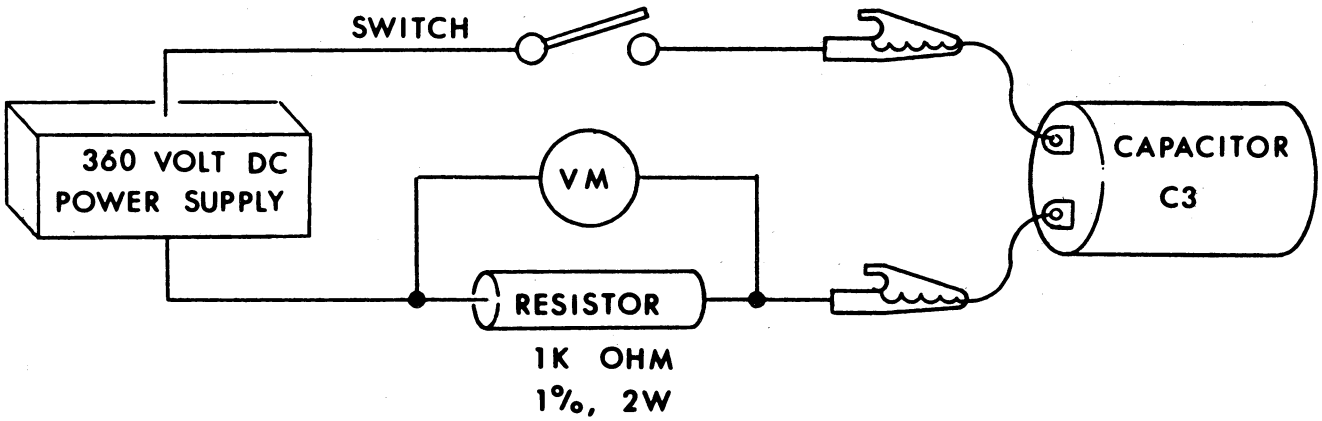


Figure 3-1. Storage Capacitor Leakage Test.

3-6. RECYCLE TIME.

3-7. BATTERY OPERATION (Model 782).

With the batteries fully charged, the unit should recycle to the neon indicator within 8 seconds after flashing.

3-8. BATTERY OPERATION (Model 892).

Permacad Power Pak - The unit should recycle to the neon indicator within 5 seconds after flashing.

Pro-Pak II - With the unit operating on the first 30% of the high voltage battery, the unit should recycle to the neon indicator voltage within 8 seconds after flashing.

3-9. AC OPERATION (Models 782 and 892).

With the wall box connected, the unit should recycle within 12 seconds at nominal input.

3-10. BATTERY CHARGING.

3-11. BATTERY (Model 782).

The batteries should be charged to 80% of full charge capacity at 3 hours at nominal line voltage. When fully charged (3600 amp-seconds), the batteries will produce a minimum of 72 flashes before recycle time to neon exceeds 15 seconds. Flash rate to be one flash every 30 seconds.

3-12. BATTERY (Model 892).

(Refer to the Permacad Power Pak Service Manual.)

3-13. FULL POWER LIGHT OUTPUT CHECK.

Check that the full power center light output is a minimum of 160 lumen-seconds per square foot (or 2560 beam-candle-power-seconds) when measured at cutoff with the Auto/Strobonar four feet from the diffusing lens of the light meter.

3-14. AUTO QUENCH LIGHT OUTPUT CHECK.

Position the Auto/Strobonar and Strobo-Eye four feet from the center of an 18% reflectance neutral gray target which has a minimum diameter of five feet. The diffusing lens of the light meter must be at the center of the target. Activate the quench circuit by setting the Off/Man/Auto control switch to Auto.

Set the Strobo-Eye and camera lens to f/2.0. Flash the Auto/Strobonar and measure its light output. The light output should be between 4.5 and 4.8 lumen seconds per square foot.

3-15. ANODE VOLTAGE CHECK (See Figures 1-1 and 1-2).

Insure the storage capacitor C3 is formed before checking the anode voltage. Remove the battery tray (782) or storage tray (892) as shown in Figure 5-1, page 5-3. Connect an equivalent battery source (5.25 ±0.1 VDC with impedance of 0.25 ohms) to the battery contacts exposed on the circuit board on the Model 782. On the Model 892, connect an equivalent battery source (355 ±3 VDC with impedance of 1500 ohms) to the 3-prong receptacle (4) under the flash head.

Set the Off/Man/Auto control switch (10) to Man or Auto. Connect the plus (+) and minus (-) terminal probes on the voltmeter as shown in Figure 5-2 on page 5-3. Wait until the neon ready light (8) lights and then flash the unit several times while observing the reading on the meter.

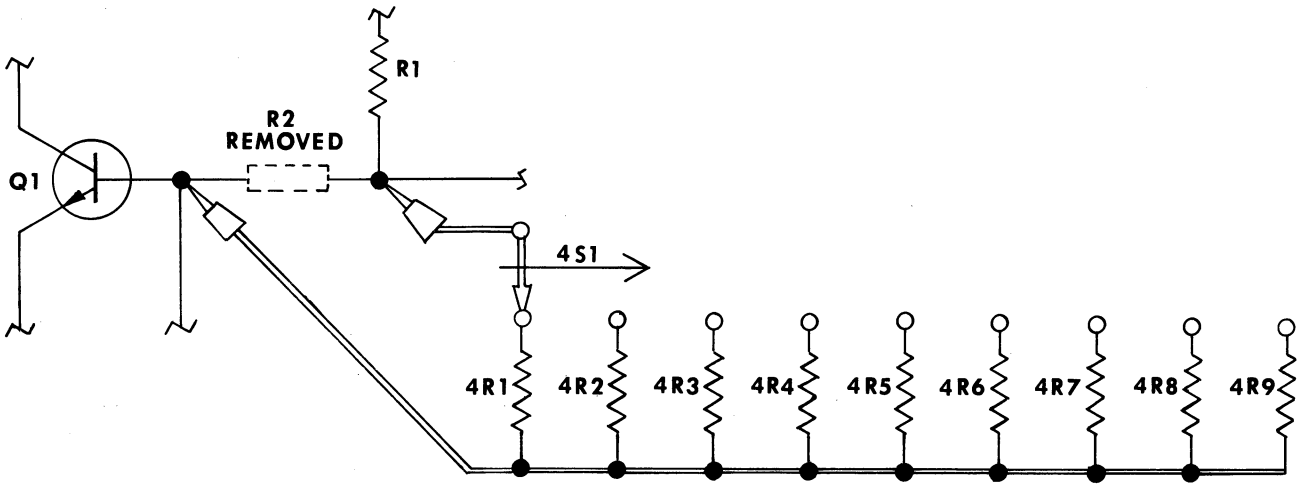
NOTE

It may be necessary to remove the solder resist from the clad on the circuit board when measuring the anode voltage. The resist has a varnish appearance and protects the clad. Be careful not to damage the clad when removing the coating.

3-16. RESISTOR R2 SELECTION.

Resistor R2 requires selection and replacement if it fails or if the peak collector current of Q1 requires correction. Remove resistor R2 from the circuit and connect the Resistor Selector Circuit as shown in Figure 3-2. Select the highest value resistor, 4R1, and advance through the test resistors until the peak collector current of Q1 is achieved. Be sure you start with the highest resistor value first.

If you have not built the Resistor Selector Circuit, simply replace R2 with the resistor values listed in Figure 3-2, starting with the highest value first.



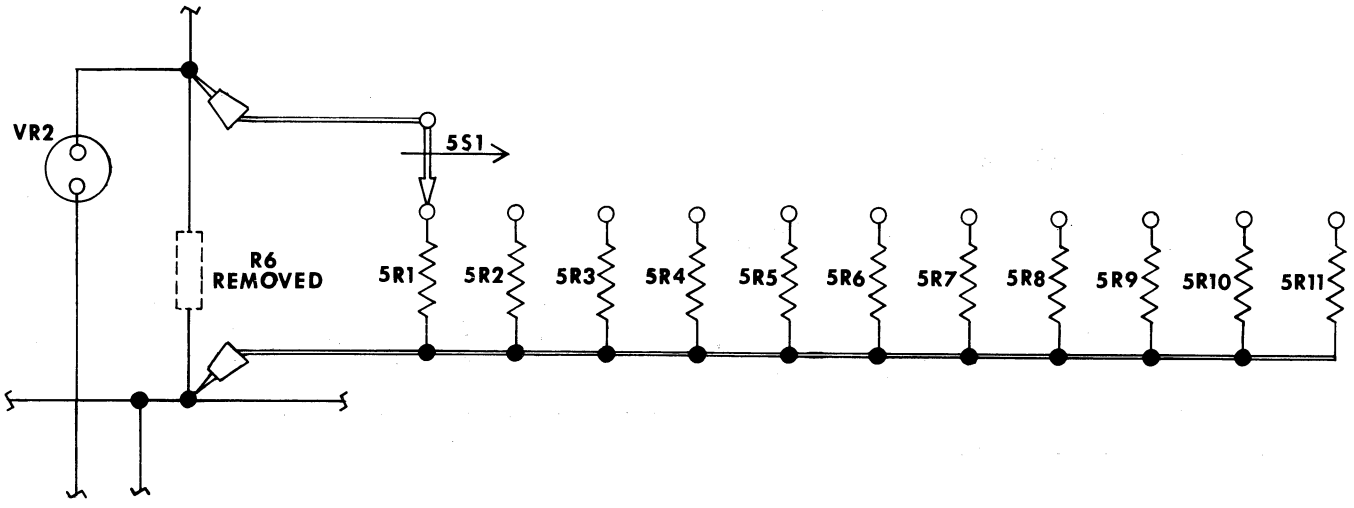
RESISTOR	VALUE (1 W, 5%)	PART NO.
4R1	56 ohms	H73004070-533
4R2	47 ohms	-531
4R3	39 ohms	-529
4R4	33 ohms	-527
4R5	27 ohms	-525
4R6	22 ohms	-523
4R7	18 ohms	-521
4R8	15 ohms	-519
4R9	12 ohms	-517

Figure 3-2. Resistor R2 Selector Circuit.

3-17. RESISTOR R6 SELECTION.

Resistor R6 requires selection and replacement if it fails or if the cutoff neon VR2 must be replaced. Apply 150 VDC at the junction of R4 and R6. With R6 removed, connect the Resistor Selector Circuit as shown in Figure 3-3. Select the lowest value resistor, 5R1, and advance through the test resistors until VR2 lights. Be sure you start with the lowest resistor value first.

If you have not built the Resistor Selector Circuit, simply replace R6 with the resistor values listed in Figure 3-3, starting with the lowest value first.



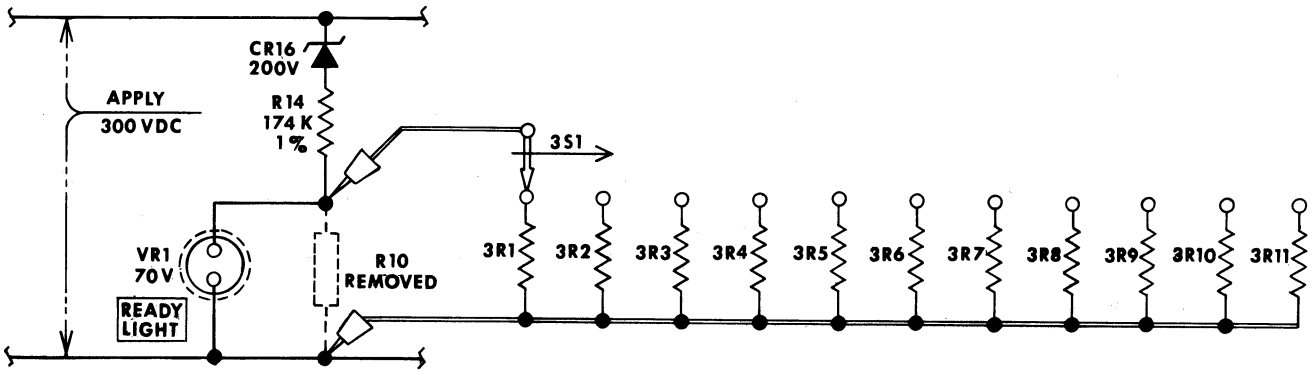
RESISTOR	VALUE (¼ W, 1%)	PART NO.
5R1	82.5 K	H73003356-489
5R2	90.9 K	-493
5R3	102.0 K	-502
5R4	115.0 K	-507
5R5	130.0 K	-512
5R6	143.0 K	-516
5R7	169.0 K	-523
5R8	191.0 K	-528
5R9	221.0 K	-534
5R10	237.0 K	-537
5R11	261.0 K	-541

Figure 3-3. Resistor R6 Selector Circuit.

3-18. RESISTOR R10 SELECTION (Model 782 - 892).

Resistor R10 requires selection and replacement only if CR16 is defective and must be replaced or if the neon itself must be replaced. Apply 300 ±5 volts d-c across the ready light circuit CR16, R14, VR1 and R10. With R10 removed, connect the Resistor Selector Circuit as shown in Figure 3-4. Select the lowest value resistor, 3R1, and advance through the test resistors until VR1 lights. Be sure you start with the lowest resistor value first.

If you have not built the Resistor Selector Circuit, simply replace R10 with the resistor values listed below, starting with the lowest value first.



RESISTOR	VALUE (¼ W, 5%)	PART NO.
3R1	220 K	H16759940-305
3R2	240 K	-306
3R3	300 K	-308
3R4	390 K	-311
3R5	510 K	-314
3R6	620 K	-316
3R7	750 K	-318
3R8	910 K	-320
3R9	1.1 M	-322
3R10	1.5 M	-325
3R11	2.0 M	-328

Figure 3-4. Resistor R10 Selector Circuit.

3-19. TROUBLESHOOTING.

For assistance in troubleshooting the Auto/Strobonar and Strobo-Eye Remote Sensor Accessory, refer to the circuit description in Section 2, the troubleshooting data charts in Section 3-29 and to the schematic in Section 5.

NOTES

Observe polarity (indicated by green dot) when replacing VR1 in the Auto/Strobonar.

3-20. TECHNIQUES.

The first step in troubleshooting a defective Auto/Strobonar/ Strobo-Eye flash system is to determine which unit is at fault. Replace the Auto/Strobonar with another known to be operating properly. If the system is still malfunctioning, replace the Strobo-Eye Remote Sensor Accessory with a unit known to be operating properly.

Look for obvious things: broken wires, broken or discolored components, or evidence of physical damage. Faults such as arcing and burned-out resistors or transformers can often be detected by sight, smell, or sound. Most faults can be located by voltage, current and resistance measurements. Check electrical connections at connectors.

Isolate the section of the circuit responsible for the fault An operational check will demonstrate what the circuit is doing or wh it is NOT doing. Observe the actions of switches and indicators to isolate the fault.

Having isolated the defective section of the circuit, isolate the component responsible for the malfunction. Consider which components, if faulty, could cause the voltages or currents to be as you find them. Refer to the schematic diagrams located in Section 5.

3-21. COMPONENT CHECKS.

No attempt is made in the troubleshooting data to describe how to test or check a particular part. The method of checking and testing is left to the technician. However, the technician is reminded of the following points:

a. Turn off power and discharge C3 before making resistance measurements.

b. Set ohmmeter to the lowest range when checking continuity.

c. Set ohmmeter to the highest range when checking high resistance.

d. Capacitors which are shorted can be found by resistance measurements.

e. Check the large electrolytic capacitor (C3) for leakage current. Refer to paragraph 3-5.

f. A capacitor which is suspected of being open can be checked by substituting a good capacitor and seeing if this makes the unit operational.

3-22. PRECAUTIONS.

Follow the listed precautions while troubleshooting the Auto/Strobonar.

a. Use extreme caution to avoid shorting components when making voltage measurements on the circuit board.

b. If the high voltage battery is of questionable condition or if excessive d-c testing is required, substitute an equivalent power supply.

3-23. SCR TEST CIRCUIT (See Figure 3-5)

To check out the SCR, remove it from the circuit and either substitute a good SCR or set up the test circuit as shown in Figure 3-5. Select the proper meter (1M1 or 1M2) by determining the range of the SCR to be tested. Position switch 1S3 to select the proper meter.

Insert the suspected SCR in the test circuit, close switch 1S2 and adjust potentiometer 1R3 for 0 current on the meter. With switch 1S2 closed, hold switch 1S1 closed and adjust potentiometer 1R3 until the meter reverses and moves in a negative direction. The readings on the SCR's should be as follows:

SCR1	-	20 ua maximum
SCR2	-	200 ua maximum
SCR3	-	20 ma maximum
SCR4	-	.1 - 10 ua maximum
2SCR1	-	20 ua maximum

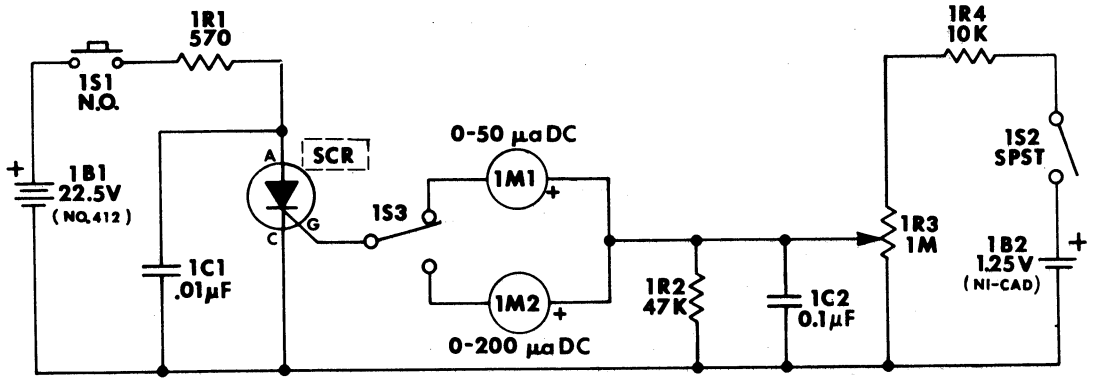


Figure 3-5. SCR Test Circuit

3-24. SEMICONDUCTOR CHECK.

An ohmmeter will detect catastrophic defects in the transistors or diodes. First determine the polarity of the ohmmeter with a volt-meter or diode. In each pair of resistance readings, the high resistance reading should be at least 10 times the low resistance reading. Use the same ohmmeter range for both readings in each pair.

3-25. PNP TRANSISTOR.

a. Base to emitter, positive lead to base - high resistance. Base to emitter, positive lead to emitter - low resistance.

b. Base to collector, positive lead to base - high resistance. Base to collector, positive lead to collector - low resistance.

3-26. NPN TRANSISTOR.

a. Base to emitter, positive lead to base - low resistance. Base to emitter, positive lead to emitter - high resistance.

b. Base to collector, positive lead to base - low resistance. Base to collector, positive lead to collector - high resistance.

3-27. DIODE.

a. Resistance across a good diode with the positive lead to the anode is low.

b. Resistance across a good diode with the positive lead to the cathode is high.

3-28. LASCR.

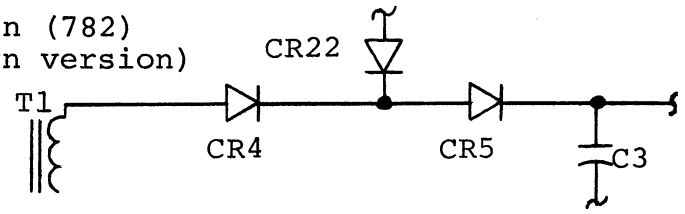
a. Gate to cathode, positive lead to gate - low resistance. Gate to cathode, positive lead to cathode - high resistance.

b. Anode to cathode, positive lead to anode with gate shorted to cathode and the component shielded from light - high resistance.

c. Anode to cathode, positive lead to cathode with gate shorted to cathode and the component shielded from light - high resistance.

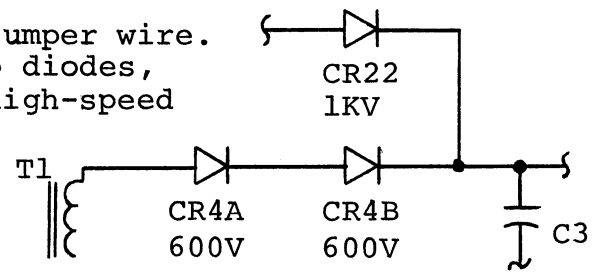
3-29. TROUBLESHOOTING.

1. TROUBLE: No AC Operation (782)
(Initial design version)



ACTION	INDICATION	REMARKS
a. Check for 300-365 VRMS across N3 of transformer 2T1 in the wall box.	Good	Go to step e.
	Bad	Replace 2T1 and go to step b and/or c.
b. Check diode CR4 in the Strobonar for short.	Good	Go to step e.
	Bad	Replace diode as described below ⚠1.
c. Check diode CR4 in the Strobonar for open.	Good	Go to step e.
	Bad	Replace diode as described below ⚠1 and go to step d.
d. Check CR1 and Q1 in the Strobonar.	Good	Go to step e.
	Bad	Replace CR1 and/or Q1.
e. Check C3.	Good	Go to step f.
	Bad	Replace C3.
f. Check diodes 2CR1, 2CR2, 2CR3 or 2CR4.	Good	Go to step g.
	Bad	Replace defective diode(s).
g. Check 2SCR1.	Good	Go to step h.
	Bad	Replace 2SCR1.
h. Check 2R1.	Good	Check 2CR5 and/or 2CR6.
	Bad	Replace 2R1.

⚠1 Replace diode CR5 with a jumper wire. Replace diode CR4 with two diodes, CR4A and CR4B. Use 600V high-speed diodes.



2. TROUBLE: No AC Operation (Advanced design version of 782 and 892).

ACTION	INDICATION	REMARKS
a. Substitute wall box for one known to be operating properly.	AC Operation	Go to step c.
	No AC Operation	Go to step b.
b. Check capacitor C3.	Good	Check all electrical connections.
	Bad	Replace C3.
c. Check for 300-365 VRMS across N3 of transformer 2T1 in the wall box.	Good	Go to step e.
	Bad	Go to step d.
d. Check transformer 2T1.	Good	Go to step e.
	Bad	Replace 2T1.
e. Check diodes 2CR1, 2CR2, 2CR3 or 2CR4.	Good	Go to step f.
	Bad	Replace defective diode(s).
f. Check 2SCR1.	Good	Go to step g.
	Bad	Replace 2SCR1.
g. Check 2R1.	Good	Check 2CR5 and/or 2CR6.
	Bad	Replace 2R1.

3. TROUBLE: No Battery Charge Operation (782).

ACTION	INDICATION	REMARKS
a. Substitute wall box for one known to be operating properly.	Charge	Go to step d.
	No Charge	Go to step b.
b. Check R27 and/or CR14.	Good	Go to step c.
	Bad	Replace R27 and/or CR14.
c. Check BT1 for dead cell.	Good	Check all electrical connections.
	Bad	Replace BT1.

2. CONTINUED

ACTION	INDICATION	REMARKS
d. Check switch 2S1.	Good	Go to step e.
	Bad	Replace 2S1.
e. Check transformer 2T1 secondary for 14 VAC across N3.	Good	Check all electrical connections.
	Bad	Replace 2T1.

3. TROUBLE: No Flash - Battery or AC.

ACTION	INDICATION	REMARKS
a. Check for 340-355 volts at anode of FT1 with power applied to Auto/Strobonar.	Good	Go to step b.
	Bad	Go to step e.
b. Measure for 100 VDC or greater between SCR2 anode and cathode.	100 VDC or greater.	Go to step c.
	Below 100 VDC.	Check SCR2 and C6 for short. Replace defective component.
c. Momentarily short SCR2 anode to cathode.	FT1 flashes.	Go to step d.
	No flash,but contacts spark.	Check FT1, T2 and FT1 trigger lead connections. Repair or replace defect.
	No spark.	Check C6 and/or T2 for open.
d. Check SCR2.	Good	Go to step e.
	Bad	Replace SCR2.
e. Check storage capacitor C3. (See para. 3-5.)	Good	Go to step f.
	Bad	Replace C3.
f. Check for broken flashtube and/or connections.	Good	Check for faulty trigger circuit.
	Bad	Replace FT1.

4. TROUBLE: No Flash - Trigger Circuit NOT Functioning.		
ACTION	INDICATION	REMARKS
a. Check C6 for open or short.	Good	Go to step b.
	Bad	Replace C6.
b. Check for R9, R21 (782) and/or CR23 (892) for open.	Good	Go to step c.
	Bad	Replace defective component.
c. Check for T2 primary or secondary open or shorted.	Good	Go to step d.
	Bad	Replace T2.
d. Check R8 for short.	Good	Go to step e.
	Bad	Replace R8.
e. Short SCR2 anode to cathode.	FT1 flashes.	Go to step f.
	No flash.	Go to step g.
f. Check SCR2.	Good	Go to step g.
	Bad	Replace SCR2.
g. Check FT1 for open circuit or cracked envelope.	Good	Check all connections to FT1.
	Bad	Replace FT1.

5. TROUBLE: Low Anode Voltage		
ACTION	INDICATION	REMARKS
a. Check for discharged battery.	Good	Go to step b.
	Bad	Charge or replace battery.
b. Check wall box circuit if operating on AC.	Good	Go to step c.
	Bad	Repair defect.
c. Check storage capacitor leakage (See para. 3-5).	Good	Check all associated components.
	Bad	Replace storage capacitor C3.

6. TROUBLE: Low Light Level - Manual Operation

ACTION	INDICATION	REMARKS
a. Measure anode voltage across C3 after 30 seconds.	340 VDC or less.	Go to Low Anode Voltage troubleshooting chart and/or step b.
	340 VDC	Go to step b.
b. Check for discolored or misaligned flashtube or reflector.	Good	Check for discolored or dirty reflector or lens (See para. 4-9).
	Bad	Replace flashtube assembly (See para. 4-4).

7. TROUBLE: Ready Light Malfunction.

ACTION	INDICATION	REMARKS
a. Check C3 for low anode voltage (less than 310 VDC).	Good	Go to step b.
	Bad	Determine cause of low anode voltage.
b. Check R14 and/or R10.	Good	Go to step c. (See para. 3-18).
	Bad	Replace defective component.
c. Check diode CR16.	Good	Go to step d.
	Bad	Replace CR16.
d. Check connections and wiring to VR1.	Good	Check VR1.
	Bad	Repair connection and/or wiring.

7. TROUBLE: No Quench.

ACTION	INDICATION	REMARKS
a. Substitute the Strobo-Eye with one known to be good, making sure all connections are good.	No quench.	Go to step b.
	Quench	Go to para. 3-30 for Strobo-Eye testing.
b. Short SCR3 anode to cathode.	FT2 flashes.	Go to step c.
	No flash.	Go to step e.
c. Check SCR3.	Good	Go to step d.
	Bad	Replace SCR3.
d. Check S1B.	Good	Check C10, C12, R17 and associated circuitry.
	Bad	Repair S1B.
e. Check C13.	Good	Go to step f.
	Bad	Replace C13.
f. Check T3.	Good	Check FT2 and associated connections. If necessary, replace entire optics assembly (See para. 4-4).
	Bad	Replace T3.

8. TROUBLE: Unit quenches - No green light.

ACTION	INDICATION	REMARKS
a. Short SCR1 anode to cathode and check green light.	Lighted	Go to step b.
	Not lighted.	Check VR3, R22, R7 and associated connections. Replace or repair defects.
b. Check SCR1.	Good	Check C5 and R7 and associated connections. Replace or repair defects.
	Bad	Replace SCR1.

3-30. STROBO-EYE TROUBLESHOOTING.

3-31. GENERAL.

Perform the following troubleshooting procedures after isolating trouble to the Strobo-Eye Remote Sensor Accessory. The Strobo-Eye automatic quench circuit receives operating power only while the main flashtube FT1 is on. Since the flashtube is on for a very short time (about 1/500 second or shorter) dynamic testing is possible only if you have test equipment that can remember the measurement such as a storage oscilloscope or photographs of the actual waveforms from a regular scope.

If you don't have this equipment, you can troubleshoot the Strobo-Eye automatic circuit by testing each component until you discover the fault or you can use the Honeywell Strobo-Eye Tester.

3-32. TESTER.

The tester was designed for quick and easy checkout of the Strobo-Eye automatic circuit. The internal power supply provides a constant current to act as a reference when checking the circuit. Three resistance circuits, selected by the rotary switch 7S2, provide three different readings on the meters. The measurements should be taken with the Strobo-Eye sensor covered and uncovered.

A PC cord from 7J1 connects the Strobo-Eye to the tester with meter VM_1 indicating the voltage reading between the signal line and ground.

The single lead probe from jack 7J2 is used to sense the voltage on the center tap of the potentiometer in the Strobo-Eye circuit. Meter VM_2 displays the voltage reading between the signal line and the potentiometer.

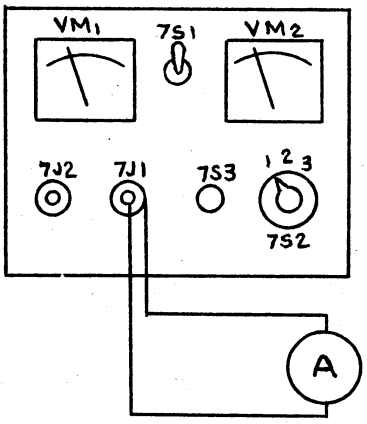
If an erroneous reading is suspected, push switch 7S3 to reset the meters.

NOTES

The numerical readings on the meters and in Table 3-1 are reference numbers only. Actual voltage values are approximately one-half of the reference numbers listed.

Disregard the word "MICROAMPERES" listed on the meters. The meters actually record voltage measurements.

To check out the tester to insure it is operating properly, connect an ammeter to jack 7J1 as shown in the sketch. Select each of the three positions on switch 7S2 and check that the readings on the ammeter are as follows:



Position 1	-	120 ua
Position 2	-	860 ua
Position 3	-	1.8 ua

3-33. STROBO-EYE TEST.

If you are troubleshooting the Strobo-Eye, remove the accessory foot to gain access to reference adjust potentiometer 6R3. Refer to para. 4-10 and Figure 5-15 for disassembly instructions. Set the potentiometer 6R3 to the center of the adjustment range.

Set the ON-OFF switch 7S1 on the tester to the ON position. Connect the PC cord from jack 7J1 on the tester to the flash sync cord receptacle on the Strobo-Eye. Voltage measurements will be indicated on meter VM_1.

Touching the single lead probe from 7J2 on the tester to the center tap of 6R3 as shown in Figure 3-6 will provide voltage measurements on meter VM_2.

Perform checkout per Table 3-1, covering and uncovering the sensor as instructed and selecting the three positions by use of the rotary switch 7S2. If an erroneous reading is suspected, push switch 7S3 to reset the meters.

Compare the readings on the meters with the readings listed in Table 3-1. The voltages listed in Table 3-1 are approximate readings only and are intended to provide the technician with a reference to check his unit.

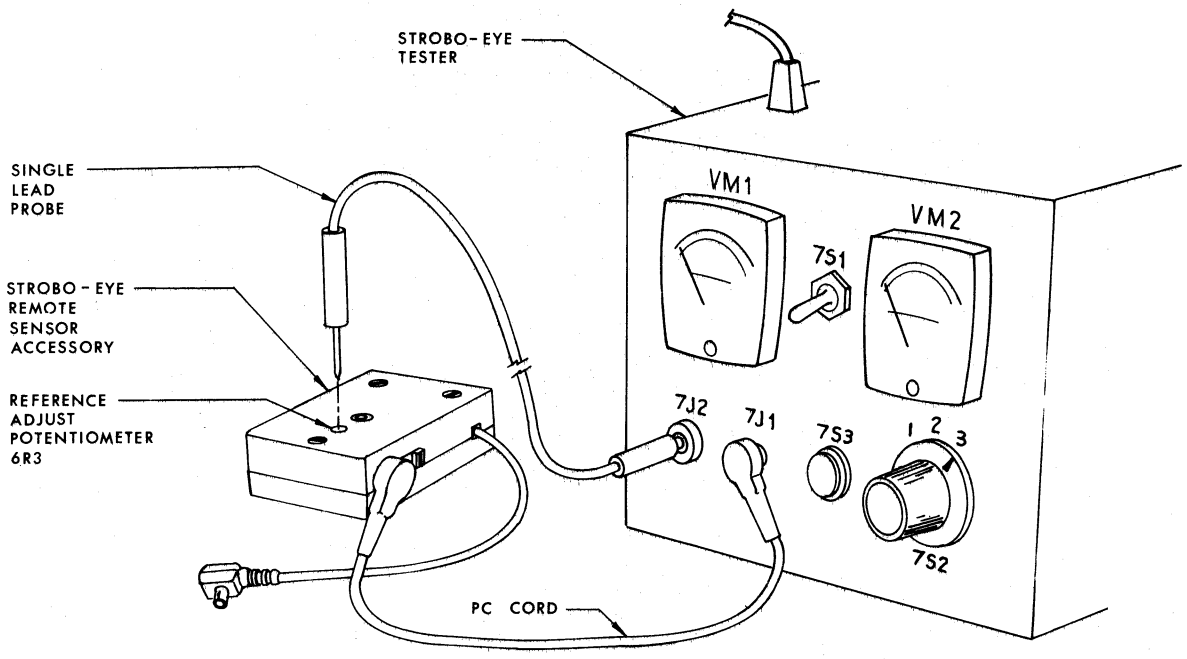


Figure 3-6. Strobo-Eye Remote Sensor Accessory Test Layout

SENSOR	SWITCH POS.1		SWITCH POS.2		SWITCH POS.3		REMARKS
	VM_1	VM_2	VM_1	VM_2	VM_1	VM_2	
Covered Uncovered	11 11	9 9	34 18	6 15	35 19	6 15	Normal Normal
Covered Uncovered	6 6	2 2	34 13	6 10	35 19	6 15	6Q1 emitter to collector short. Replace 6Q1.
Covered Uncovered	12 12	9 9	33 19	15 15	34 19	15 15	6Q1 emitter to base short. Replace 6Q1.
Covered Uncovered	2 2	1 1	2 3	1 1	2 3	1 1	Diode 6CR3 short. Replace 6CR3.
Covered Uncovered	12 12	9 9	43 19	15 15	50 50	15 15	Diode 6CR3 open. Replace 6CR3.
Covered Uncovered	- -	0 0	- -	0 0	- -	0 0	Diode 6CR4 short. Ignore VR1 readings. Replace 6CR4.
Covered Uncovered	11 12	9 9	34 32	6 28	35 34	6 30	Diode 6CR4 open. Replace 6CR4.
Covered Uncovered	12 12	9 9	34 34	6 6	35 35	6 6	6LASCR1 cathode to gate short. Replace 6LASCR1.
Covered Uncovered	11 11	10 10	17 17	15 15	17 17	15 15	6LASCR1 cathode to anode short. Replace 6LASCR1.

Table 3-1. Strobo-Eye Test Voltage Measurements.

SECTION 4

MAINTENANCE

4-1. GENERAL.

This section contains procedures for disassembly, cleaning, electrical component removal and reassembly of the Auto/Strobonar Models 782 and 892 and the Strobo-Eye Remote Sensor Accessory.

You should disassemble the units to the extent necessary for operational checkout, troubleshooting and repair. Reassembly is the reverse of disassembly. Special reassembly instructions are included where required.

4-2. TOOLS.

It is not necessary for you to have special tools or fixtures to perform maintenance on the Auto/Strobonars or to replace any parts or components. Ordinary screwdrivers, diagonal cutters, long nose pliers, a soldering iron and other common hand tools are adequate to perform all repair and replacement procedures. A small tip, low wattage soldering iron is required when repairing the Strobo-Eye unit.

4-3. AUTO/STROBONAR MODELS 782 AND 892 DISASSEMBLY (See Figure 5-1).

Disassembly of the Auto/Strobonars, to the extent necessary for operational checkout and troubleshooting, is described for you in the following procedure.

WARNING

Before you start disassembling the Auto/Strobonar, press the open flash button several times to insure the storage capacitor C3 is discharged as much as possible at this time. The capacitor presents a serious shock hazard if charged. When the Auto/Strobonar is disassembled to the point where you have access to the capacitor, it should be discharged through a 100 ohm, 2W resistor to insure the unit is safe to work on. Be sure you handle the unit with extreme caution until you are SURE the capacitor is discharged.

a. Squeeze the two tray release buttons (1, Figure 5-1) and withdraw the battery or storage tray.

b. Remove the two screws (2, Figure 5-1) that hold the chassis assembly to the housing, and pull the chassis assembly out of the front of the housing.

c. To remove the nose ring assembly from the chassis assembly, remove the three screws (3, Figure 5-1) that hold the nose ring assembly to the chassis. Separate the nose ring from the chassis.

d. Continue disassembly as required. See Figures 5-3 through 5-12.

4-4. REFLECTOR AND FLASHTUBE.

To remove the reflector and flashtube assembly, disassemble the Auto/Strobonar as described in paragraph 4-3. Handle the flashtube and reflector assembly gently to avoid damaging the electrode seals and the ends of the flashtube.

Since the nickel ribbon leads from the quench tube are welded to the electrodes on the main flashtube FT1, it is impractical to replace the quench tube or the flashtube as separate items. Therefore, it is recommended that the flashtube and quench tube be replaced as a complete assembly, namely the Optics Assembly as illustrated in Figure 5-6.

It is <u>important</u> that when you remove the red and black leads to the storage capacitor from the main flashtube electrodes and also the red lead to transformer T2 on the main circuit board, you should NOT cut the leads, but should unsolder them from the flashtube. Impedance between the flashtube and quench tube and the storage capacitor must be 75×10^{-3} ohms total. Wire length and size from the flashtube to the storage capacitor and the nickel ribbon from the flashtube to the quench tube is critical for quench reliability and light linearity in the automatic mode.

4-5. SOLDERING.

Soldering the high voltage leads on the flashtube may be done with any high quality Sn 63 solder with a resin core flux. Caution should be taken to avoid exerting any pressure on the metal electrode leads when soldering.

4-6. REASSEMBLY.

You should reassemble the unit by reversing the disassembly procedures and by following the precautions and assembly procedures listed.

a. Check to make sure you have replaced all the insulators on the circuit board.

b. Check that you have properly positioned the reflector and flashtube assembly to avoid damaging the flashtube.

c. Check that the operational switch and open flash button operate properly.

d. Insure that all leads are properly dressed and are not shorted to other leads or components.

4-7. CLEANING

4-8. MECHANICAL AND ELECTRICAL COMPONENTS.

Wipe the large surfaces with a clean, dry, lint-free cloth. Use low pressure compressed air to blow dust from hard-to-reach areas. When using compressed air, always direct the first blast of air at the floor to remove moisture from the air line.

4-9. REFLECTOR AND LENS.

To remove the reflector or lens to clean, you will have to disassemble the Auto/Strobonar as described in paragraph 4-3.

To clean the reflector, use low pressure compressed air to blow the dust from the reflector. It is important that you do not touch the inside of the reflector, especially around the flashtube. The reflector is subject to burn spots if it is touched.

4-10. STROBO-EYE REMOTE SENSOR ACCESSORY DISASSEMBLY (See Figure 5-15).

a. Remove the nameplate (1).

b. Remove the flat head screw (2), attaching the foot (3) to the bottom case (5). Remove the foot.

c. Remove the three Phillips Head screws (4) securing the bottom case to the top case assembly (9). Separate the two cases.

d. Remove the lens (7) to avoid misplacing it.

e. Lift out the circuit board assembly (8) if necessary to repair.

NOTE

If any parts in the top cover assembly need to be repaired or replaced, the whole top cover assembly must be replaced.

4-11. ELECTRICAL COMPONENT REMOVAL.

When removing or replacing electrical components, you should observe the following precautions:

a. When applying heat, you should use a heat sink to avoid damaging the components or circuit board due to heat conduction of the component leads.

b. You should apply heat sparingly to the component lead to be removed and lift the lead clear of the junction.

c. You should insure that component replacement and lead dressing of new components be the same as for the original.

d. If any components are replaced in the automatic (quench) circuit, it will be necessary to recalibrate that circuit.

SECTION 5

PARTS LISTS AND DIAGRAMS

5-1. GENERAL.

This section includes a listing of all replaceable parts, exploded views of all assemblies and schematics for the Auto/ Strobonars 782 and 892. The following explains the column headings as used in the parts lists:

INDEX REF - Lists the reference (or call-out) number of each part as shown in the illustrations.

SCHEM REF - Lists the schematic reference designator of electrical parts.

HONEYWELL PART NO. - Lists the number by which an item may be ordered.

DESCRIPTION - Lists the part name and specifications required for identification.

QTY/UNIT - Lists the total quantity of each item used in the unit or assembly.

5-2. SCHEMATIC REFERENCE PREFIXES.

Prefix numbers have been added to the schematic reference designators to avoid designator duplication. Each unit has been assigned a prefix number, as shown in the chart.

UNIT	PREFIX	EXAMPLE
Auto/Strobonars 782 and 892	No Prefix	R1
SCR Test Circuit	#1 Prefix	1R1
Wall Box	#2 Prefix	2R1
Resistor R10 Test Circuit	#3 Prefix	3R1
Resistor R2 Test Circuit	#4 Prefix	4R1
Resistor R6 Test Circuit	#5 Prefix	5R1
Strobo-Eye Remote Sensor Accessory	#6 Prefix	6R1
Strobo-Eye Test Circuit	#7 Prefix	7R1

5-3. ORDERING INFORMATION.

When ordering spare or replacement parts, specify the unit model number, item description, Honeywell part number and quantity required.

Order parts from: Honeywell
Photographic Products Division
P.O. Box 22083
Denver, Colorado 80222

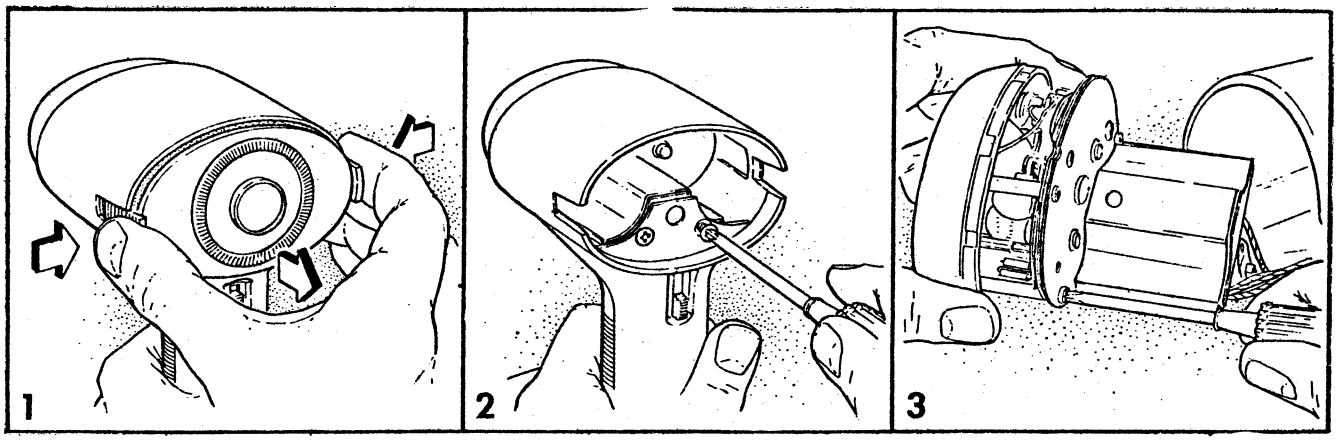
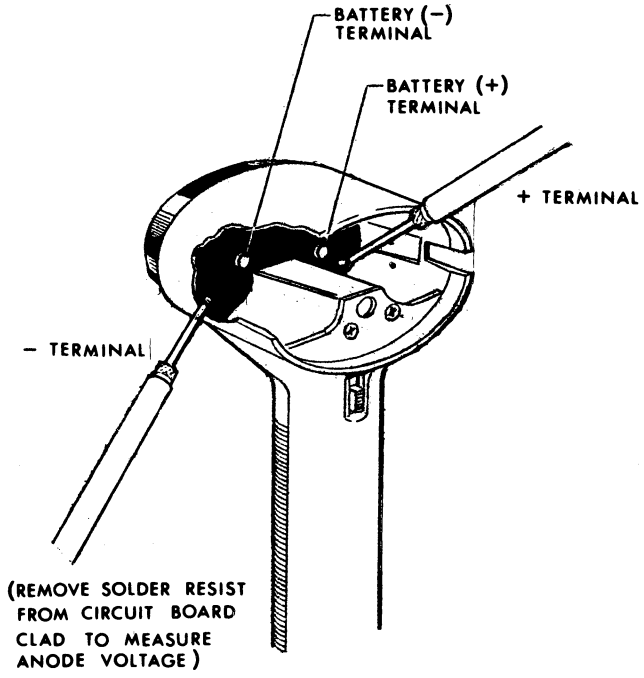
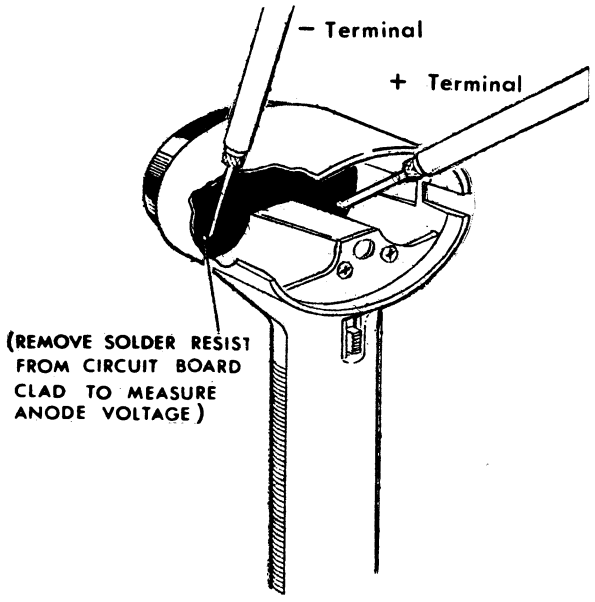


Figure 5-1.
Disassembly Procedure.



MODEL 782



MODEL 892

Figure 5-2.
Anode Voltage Check.

REF INDEX	REF SCHEM	HONEYWELL PART NO.	DESCRIPTION	QTY 782	QTY 892
		Not Supplied	Auto/Strobonar 782 Assembly	1	
		Not Supplied	Auto/Strobonar 892 Assembly		1
1		H73003521 001	Battery and Tray Assy (See Figure 5-7)	1	
2		H16761246 023	Screw, Flat Head	2	2
3		H16759761 005	Housing	1	
3		H16759761 006	Housing		1
4		H73003565 001	Switch Guard	1	1
5		Not Supplied	Chassis Assembly (See Figure 5-4)	1	
5		Not Supplied	Chassis Assembly (See Figure 5-5)		1
6		H73000595 003	Sleeving	2	2
7		H73003511 003	Decal	1	
7		H73003511 006	Decal		1
8		H73003685 002	Handle Cover	1	1
9	C3	H73003518 002	Capacitor	1	1
10		H16766627 001	Handle Bushing	1	1
11		H73003520 002	Tray Assembly (See Figure 5-8)		1
12		H73004120 003	Capacitor & Housing Assy	1	
13		H73004121 003	Capacitor & Housing Assy		1

1. The Honeywell part number for the coiled power cord connecting the Auto/Strobonar 892 to the Pro-Pak II and to the Permacad Power Pak is H73003661-002.

2. Items No. 3, 7, 8, 9 and 10 are preassembled to make up the Capacitor and Housing assemblies, Items No. 12 and 13 for service.

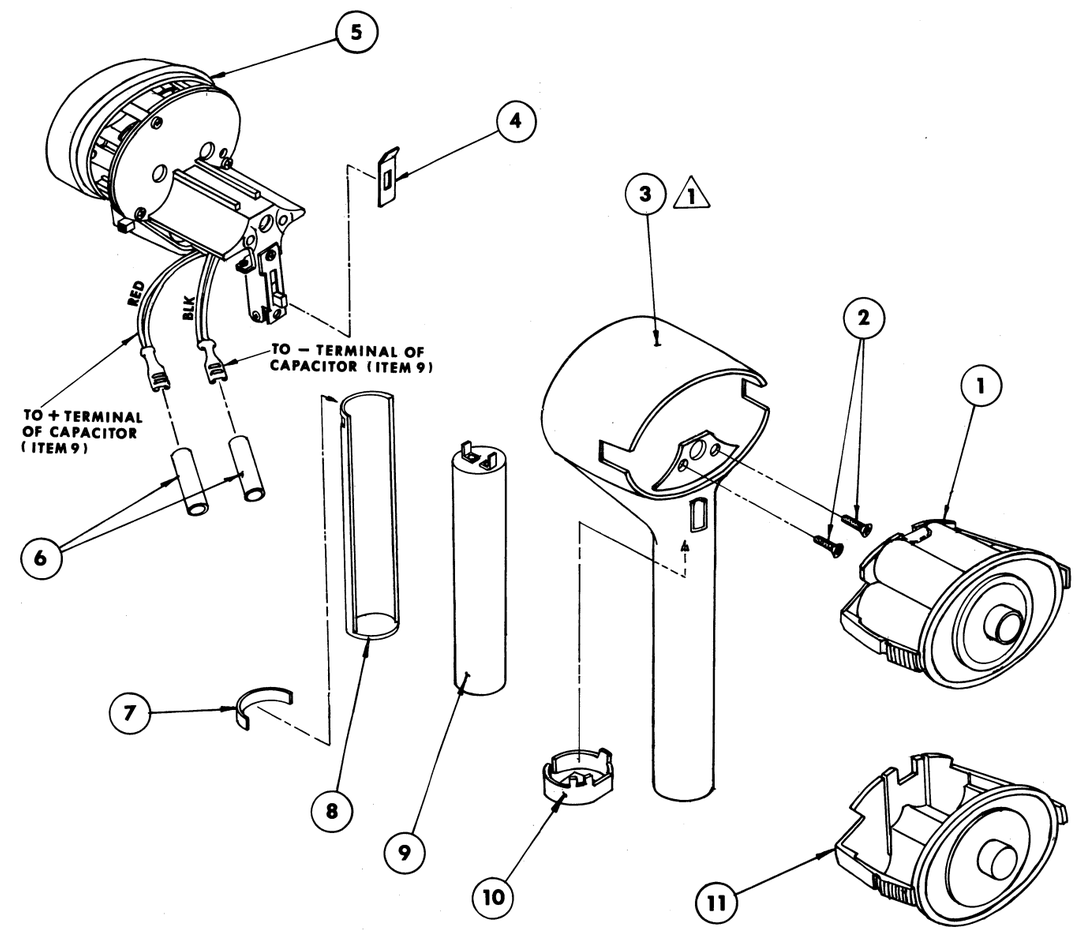


Figure 5-3.
Exploded View -
Auto/Strobonar 782-892

REF INDEX	REF SCHEM	HONEYWELL PART NO.	DESCRIPTION	QTY
		Not Supplied	Chassis Assembly - Auto/ Strobonar 782	1
1		H73003485 002	Optics Assembly (See Figure 5-6)	1
2		H16750977 146	Sleeving	1
3		H73003836 001	Circuit Board No. 1 Assy (See Figure 5-9)	1
4		H73003837 001	Circuit Board No. 2 Assy (See Figure 5-11)	1
5		H73003580 001	Chassis	1
6		H73000042 026	Screw, Fillister Hd	3
7		H16765280 201	Screw, Flat Hd	1
8		H73003510 001	Switch Assembly	1
9		H73003604 004	Receptacle Assembly	1
10		H16754482 002	Terminal	2

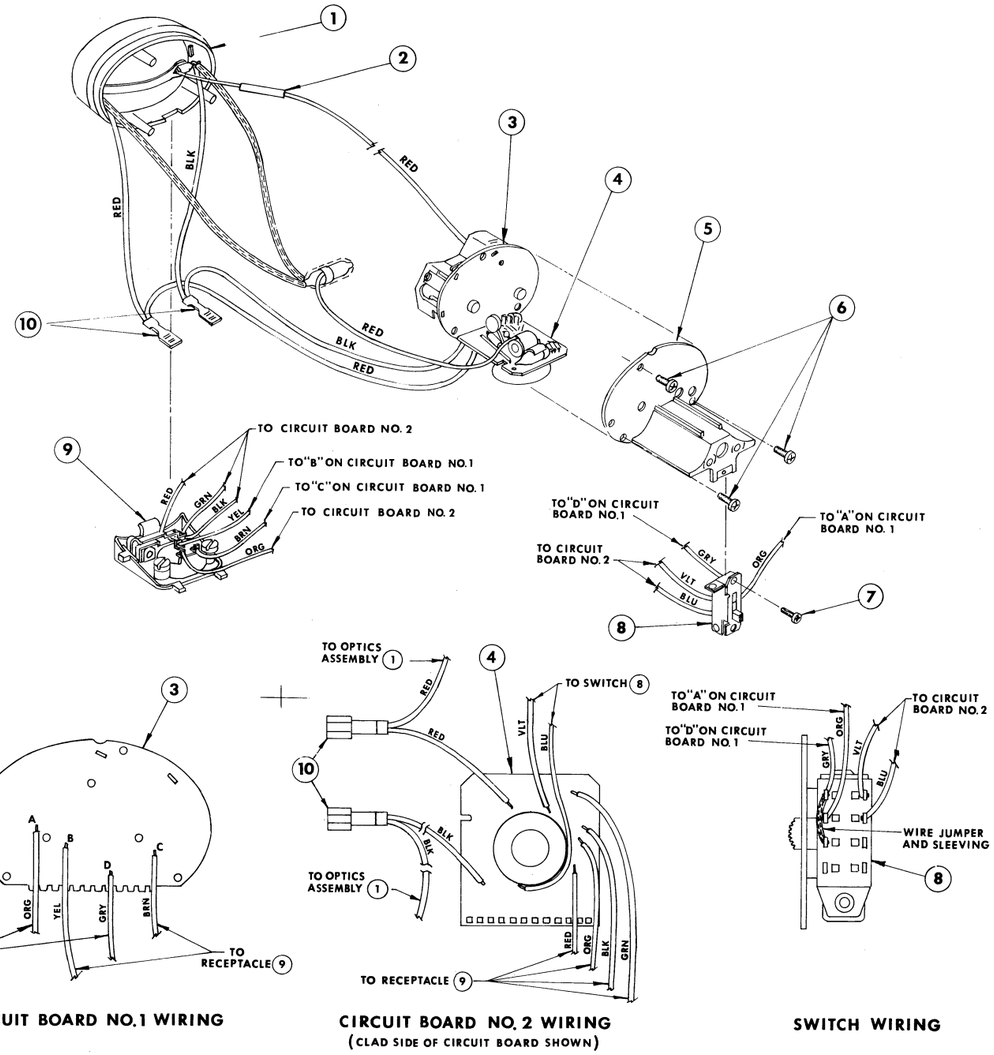
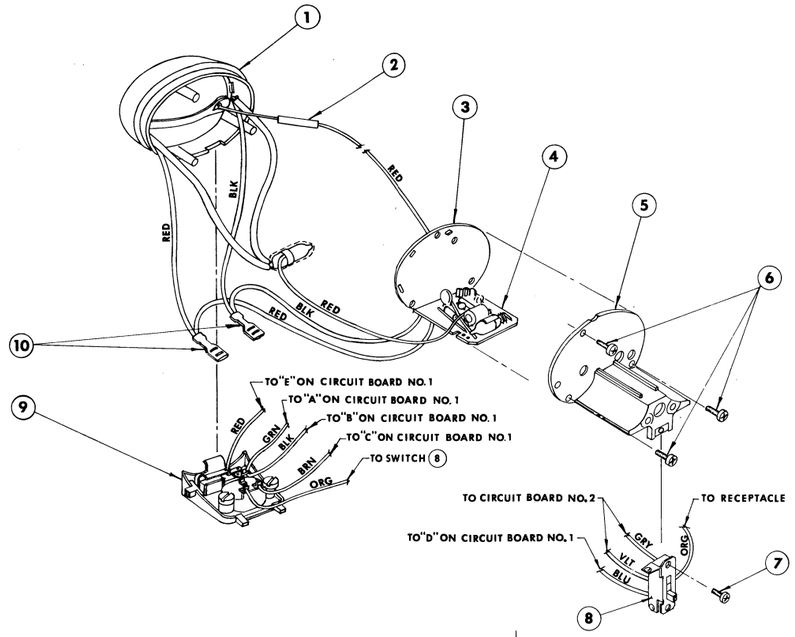
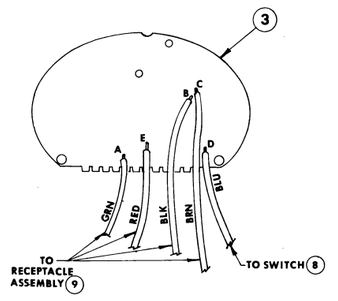


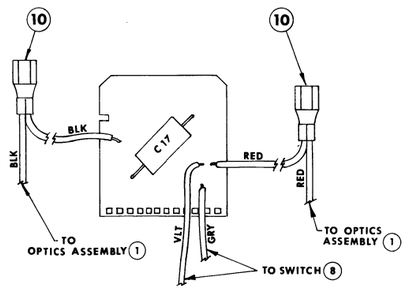
Figure 5-4.
Chassis Assembly -
Auto/Strobonar 782

REF INDEX	REF SCHEM	HONEYWELL PART NO.	DESCRIPTION	QTY
		Not Supplied	Chassis Assembly - Auto/Strobonar 892	1
1		H73003485 002	Optics Assembly (See Figure 5-6)	1
2		Hl6750977 146	Sleeving	1
3		H73003838 001	Circuit Board No. 1 Assy (See Figure 5-10)	1
4		H73003839 001	Circuit Board No. 2 Assy (See Figure 5-12)	1
5		H73003580 001	Chassis	1
6		H73000042 026	Screw, Fillister Hd	3
7		Hl6765280 201	Screw, Flat Hd	1
8		H73003510 001	Switch Assembly	1
9		H73003604 006	Receptacle Assembly	1
10		Hl6754482 002	Terminal	2

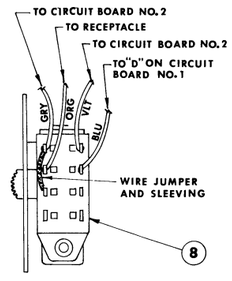




CIRCUIT BOARD NO.1 WIRING



CIRCUIT BOARD NO. 2 WIRING
(CLAD SIDE OF CIRCUIT BOARD SHOWN)



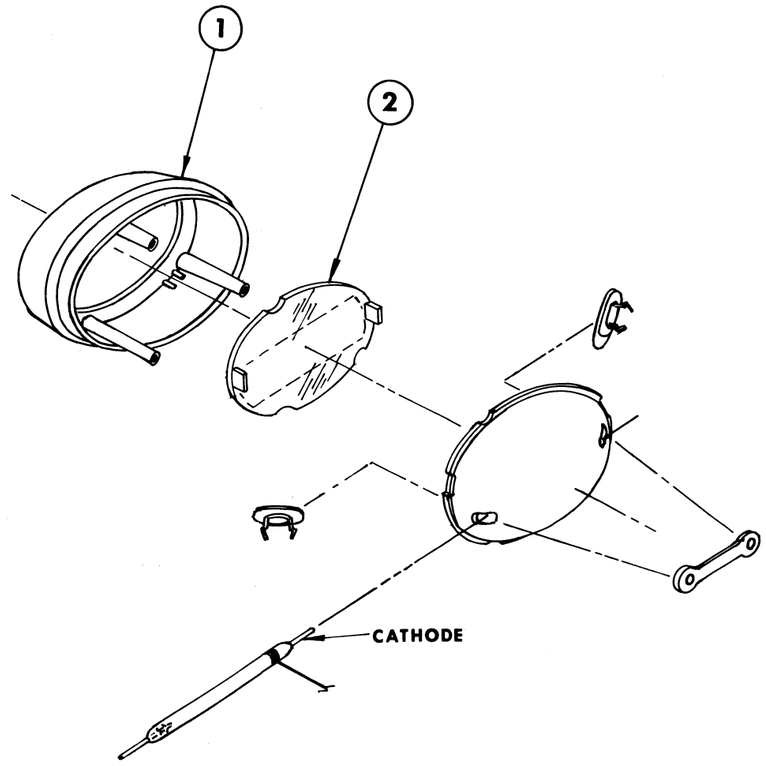
SWITCH WIRING

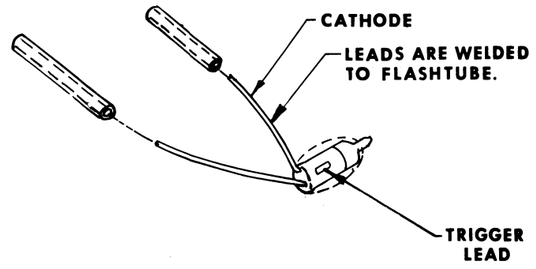
Figure 5-5.
Chassis Assembly -
Auto/Strobonar 892

REF INDEX	REF SCHEM	HONEYWELL PART NO.	DESCRIPTION	QTY
		H73003485 002	Optics Assembly	1
1		H16766498 002	Nose Ring	1
2		H73003470 001	Lens	1

NOTES:

The Optics Assembly is supplied ONLY as a complete assembly since some components are welded together. Individual parts as listed in the parts list above will NOT be supplied. Refer to paragraph 4-4.





QUENCH TUBE ASSEMBLY

Figure 5-6.
Optics Assembly -
Auto/Strobonar 782-892

REF INDEX	REF SCHEM	HONEYWELL PART NO.	DESCRIPTION	QTY 710	QTY 780
		H73003521 001	Battery and Tray Assy	1	1
1		H73002980 001	Filler	1	1
2		H73003512 001	Battery Assembly	1	1
3		H16750977 159	Sleeving	1	1
4		H16765479 001	Spring Clip	1	1
5		H73003520 001	Tray Assembly	1	1
6		H73000427 005	E-Ring	1	1
7		H16759851 001	Spring	1	1
8		Not Supplied	Tray	1	1
9		Not Supplied	Detent Spring	1	1
10		Not Supplied	Back Plate	1	1
11		H73003568 001	Calculator	1	1
12		H73000003 001	Shaft	1	1
13		H73000008 002	Knob Decal	1	1

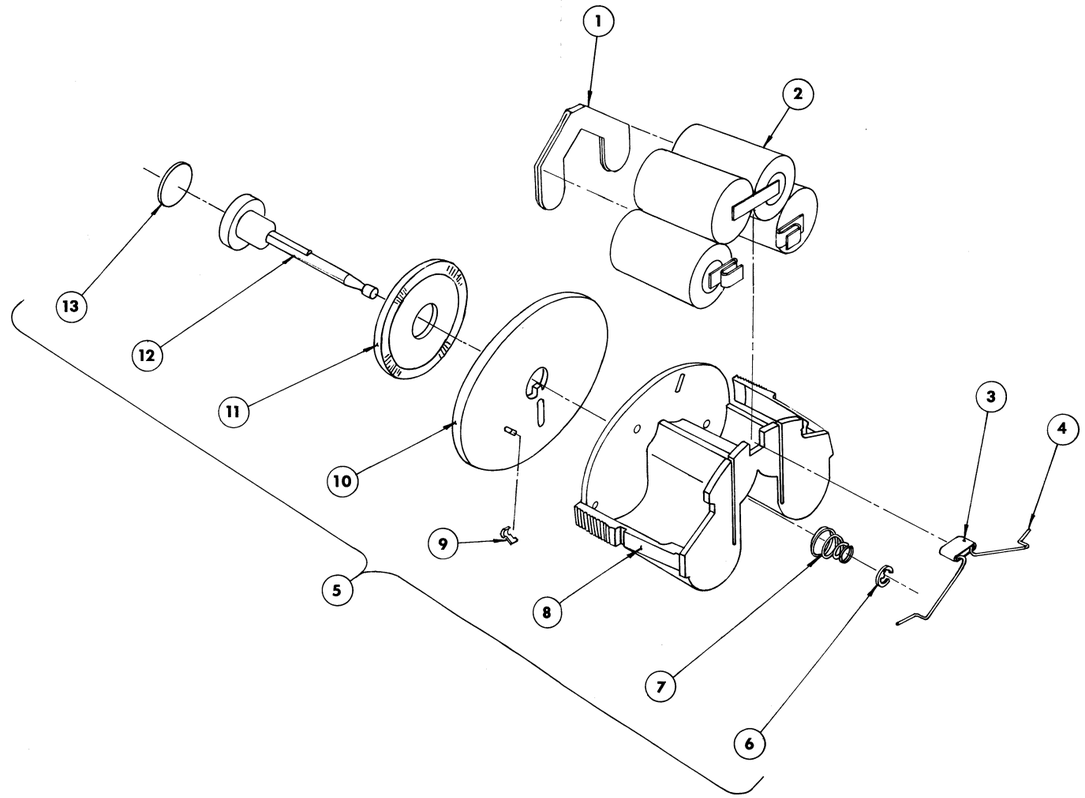


Figure 5-7.
Battery Tray Assembly -
Auto/Strobonar 782

REF		HONEYWELL		QTY	
INDEX	SCHEM	PART NO.	DESCRIPTION	810	890
		H73003520 002	Tray Assembly	1	1
1		H73000427 005	E-Ring	1	1
2		H16759851 001	Spring	1	1
3		H16738656 001	Spring, Detent	1	1
4		H73000008 002	Knob Decal	1	1
5		H73000003 001	Shaft	1	1
6		H73003568 001	Calculator	1	1
7		Not Supplied	Back-Plate	1	1
8		Not Supplied	Tray	1	1

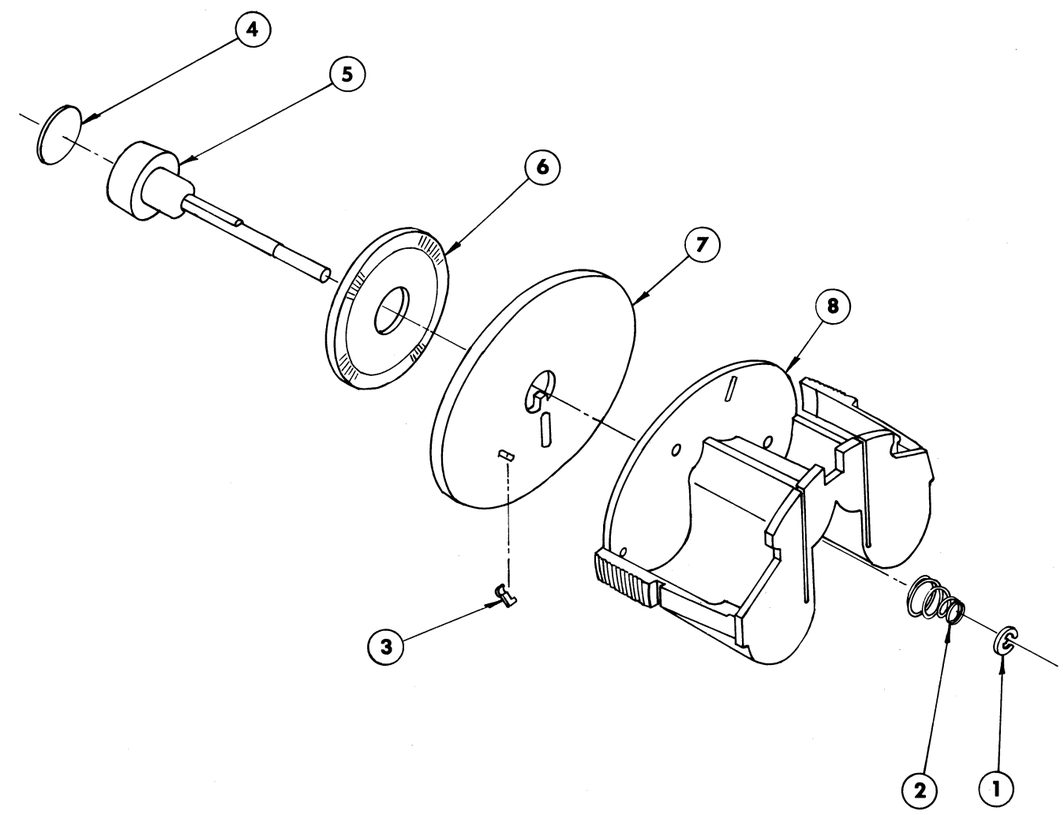


Figure 5-8.
Storage Tray Assembly -
Auto/Strobonar 892

REF INDEX	REF SCHEM	HONEYWELL PART NO.	DESCRIPTION	QTY
		H73003836 001	Circuit Board No. 1 Assembly	1
1		H73003477 001	Circuit Board	1
2	CR12	H73001970 003	Diode, 200V	1
3	C8	H73003664 113	Capacitor, .1 uf, 250V	1
4	R27	H73000683 228	Resistor, 1.3 ohm,1.5W,5%	1
5	SCR1	H73002511 010	Silicon Controlled Rectifier 200V	1
6	C4	H73002737 013	Capacitor, .1 uf, 250V	1
7	R7	H16759940 041	Resistor, 470 ohm, ¼W,10%	1
8	C26	H73002426 005	Capacitor, 3300 pf, 50V	1
9	C5	H73002737 013	Capacitor, .1 uf, 250V	1
10	R22	H16759940 005	Resistor, 15 ohm,¼W, 10%	1
11	R6	H73003356 ⚠1	Resistor ⚠1	1
12	C14	H73002620 013	Capacitor, 820 pf, 1KV	1
13	VR2	H73003022 003	Neon	1
14	CR15	H73001970 001	Diode, 50V	1
15	R24	H16759940 113	Resistor, 470K, ¼W, 10%	1
16	Q3	H73001889 001	Transistor, Darlington	1
17		H73003540 001	Heat Sink	1
18	Q1	H73003317 001	Transistor, Power	1
19		H16750045 009	Screw, Self-Tap	1
20	CR2	H73001970 001	Diode, 50V	1
21	R2	H73004070 ⚠2	Resistor ⚠2	1
22	Q2	H73003382 001	Transistor, Silicon, NPN	1
23	CR1	H73003381 001	Diode, Zener, 47V	1
24		H73000428 002	Contact Rivet	2
25	R1	H16759940 049	Resistor, 1K, ¼W, 10%	1
26	CR3	H73001970 003	Diode, 200V	1
27	C1	H73003664 113	Capacitor, .1 uf, 250V	1
28	R25	H16759940 025	Resistor, 100 ohm,¼W, 10%	1
29	R43	H16759940 297	Resistor, 100K, ¼W, 5%	1
30	CR9	H73001970 001	Diode, 50V	1
31	Q4	H16759913 002	Transistor, Silicon, NPN	1
32	CR10	H73002602 003	Diode, Zener, 24V	1

REF INDEX	REF SCHEM	HONEYWELL PART NO.	DESCRIPTION	QTY
33	R11	H16758183 872	Resistor, 1.8M, ½W, 10%	1
34	R20	H16758183 876	Resistor, 3.9M, ½W, 10%	1
35	R12	H16759940 077	Resistor, 15K, ¼W, 10%	1
36	T2	H73000577 005	Transformer, Trigger	1
37	R9	H16759940 332	Resistor, 3M, ¼W, 5%	1
38	CR16	H73003554 261	Diode, Zener, 200V	1
39	R8	H16759940 009	Resistor, 22 ohm, ¼W, 10%	1
40	R21	H16759940 135	Resistor, 3.9M, ¼W, 10%	1
41	R4	H73003356 512	Resistor, 130K, ¼W, 1%	1
42	C6	H73002737 015	Capacitor,.15 uf, 250V	1
43		H73003928 009	Wire, Bare, 22 Ga.	A/R
44	CR14	H73001970 001	Diode, 50V	1
45	R26	H16759940 145	Resistor, 10M, ¼W, 10%	1
46	SCR2	H73002511 013	Silicon Controlled Rectifier 200V	1

(1) Refer to paragraph 3-17 for selection of resistor R6.
(2) Refer to paragraph 3-16 for selection of resistor R2.

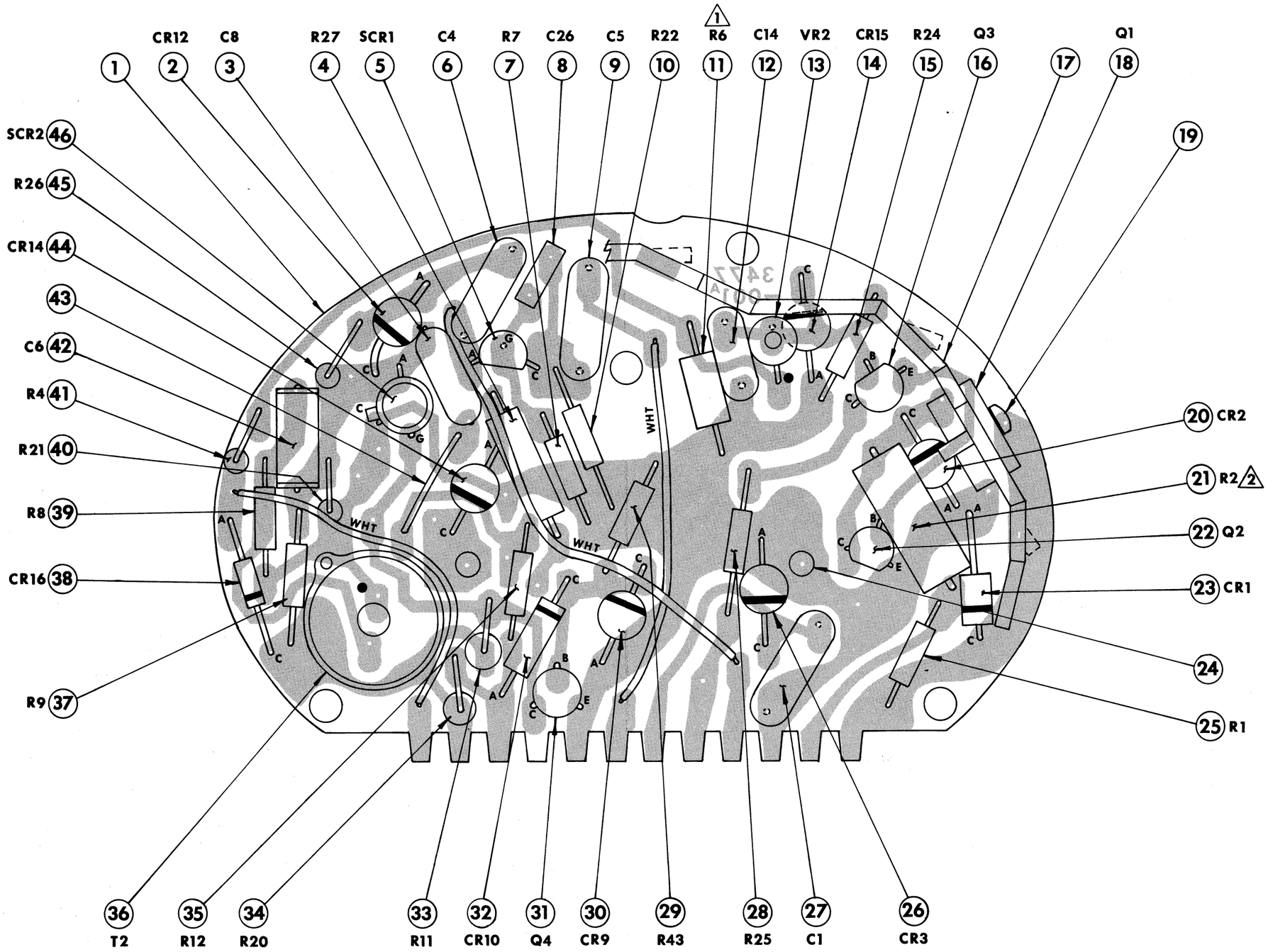


Figure 5-9.
Circuit Board No. 1 Assy -
Auto/Strobonar 782

REF INDEX	REF SCHEM	HONEYWELL PART NO.	DESCRIPTION	QTY
		H73003838 001	Circuit Board No. 1 Assy	1
1		H73003477 002	Circuit Board	1
2	T2	H73000577 005	Transformer	1
3	C7	H73001150 025	Capacitor, .001 uf, 500V	1
4	R11	H16758183 872	Resistor, 1.8M, ½W, 10%	1
5	Q4	H16759913 002	Transistor, NPN	1
6	R43	H16759940 297	Resistor, 100K, ¼W, 5%	1
7	CR9	H73001970 001	Diode, 50V	1
8	C28	H73003202 013	Capacitor, 1 uf, 35V	1
9	CR16	H73003554 061	Diode, Zener, 200V	1
10	R14	H73003356 524	Resistor, 174K, ¼W, 1%	1
11	R10	H73003356 ⚠1	Resistor ⚠1	1
12	R18	H16759940 135	Resistor, 3.9M, ¼W, 10%	1
13	R15	H16759940 135	Resistor, 3.9M, ¼W, 10%	1
14	C13	H73002737 013	Capacitor, .1 uf, 250V	1
15	R17	H16759940 049	Resistor, 1K, ¼W, 10%	1
16	R44	H16759940 121	Resistor, 1M, ¼W, 10%	1
17	C12	H73002426 002	Capacitor, 1000 pf, 50V	1
18	CR25	H73003522 002	Diode, 100V	1
19	C10	H73002426 005	Capacitor, .0033 uf, 50V	1
20	CR10	H73002602 003	Diode, Zener, 24V	1
21	R12	H16759940 077	Resistor, 15K, ¼W, 10%	1
22	R20	H16758183 876	Resistor, 3.9M, ½W, 10%	1
23	C8	H73003664 113	Capacitor, .1 uf, 250V	1
24	C11	H73001150 022	Capacitor, 470 pf, 500V	1
25	CR23	H73003554 061	Diode, Zener, 200V	1
26	R9	H16759940 332	Resistor, 3M, ¼W, 5%	1
27	R8	H16759940 009	Resistor, 22 ohm, ¼W, 10%	1
28	C6	H73002737 015	Capacitor, .15 uf, 250V	1
29	SCR2	H73002511 013	SCR, 200V	1

⚠1 Refer to paragraph 3-18 for selection of resistor R10.

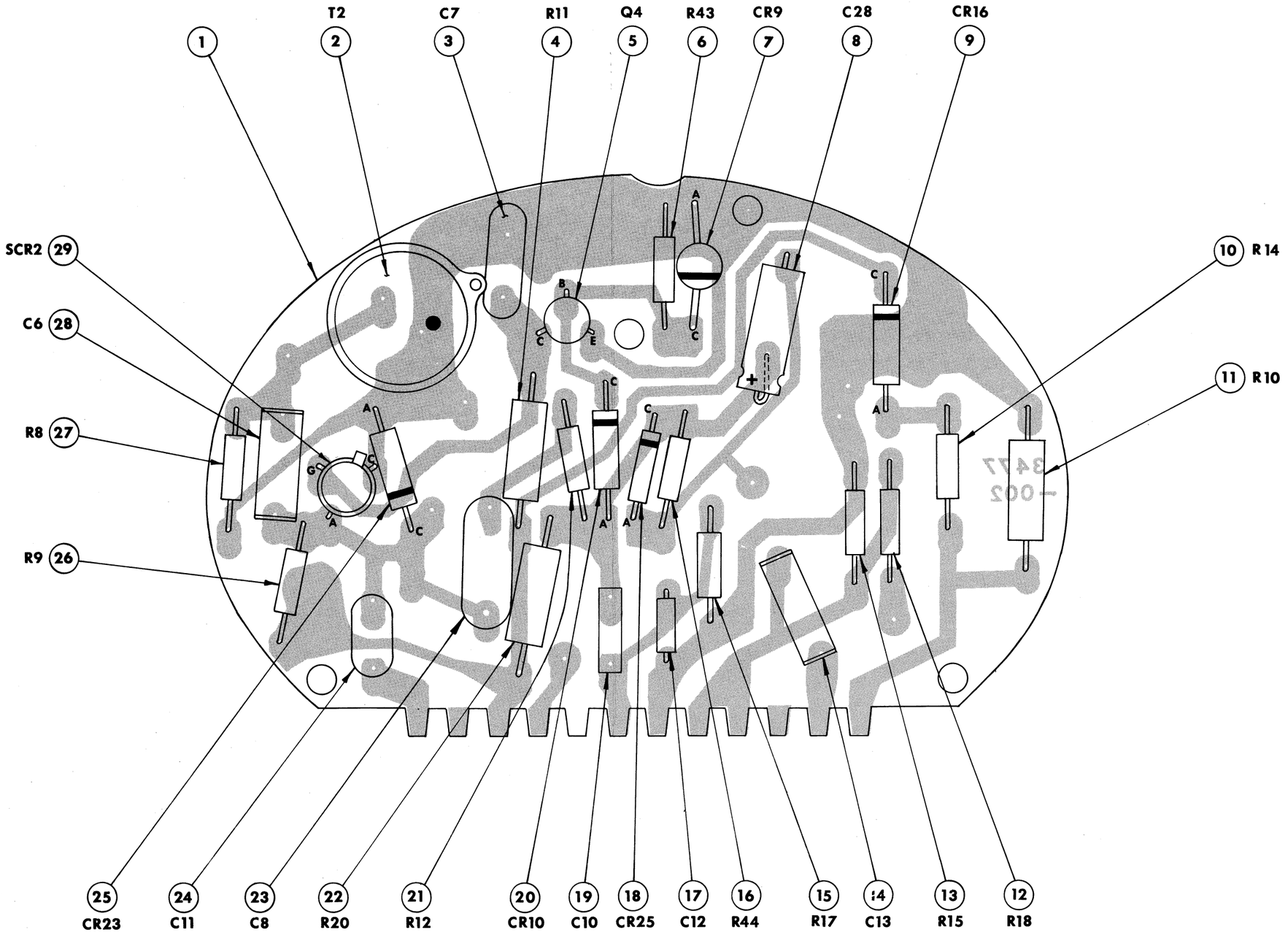
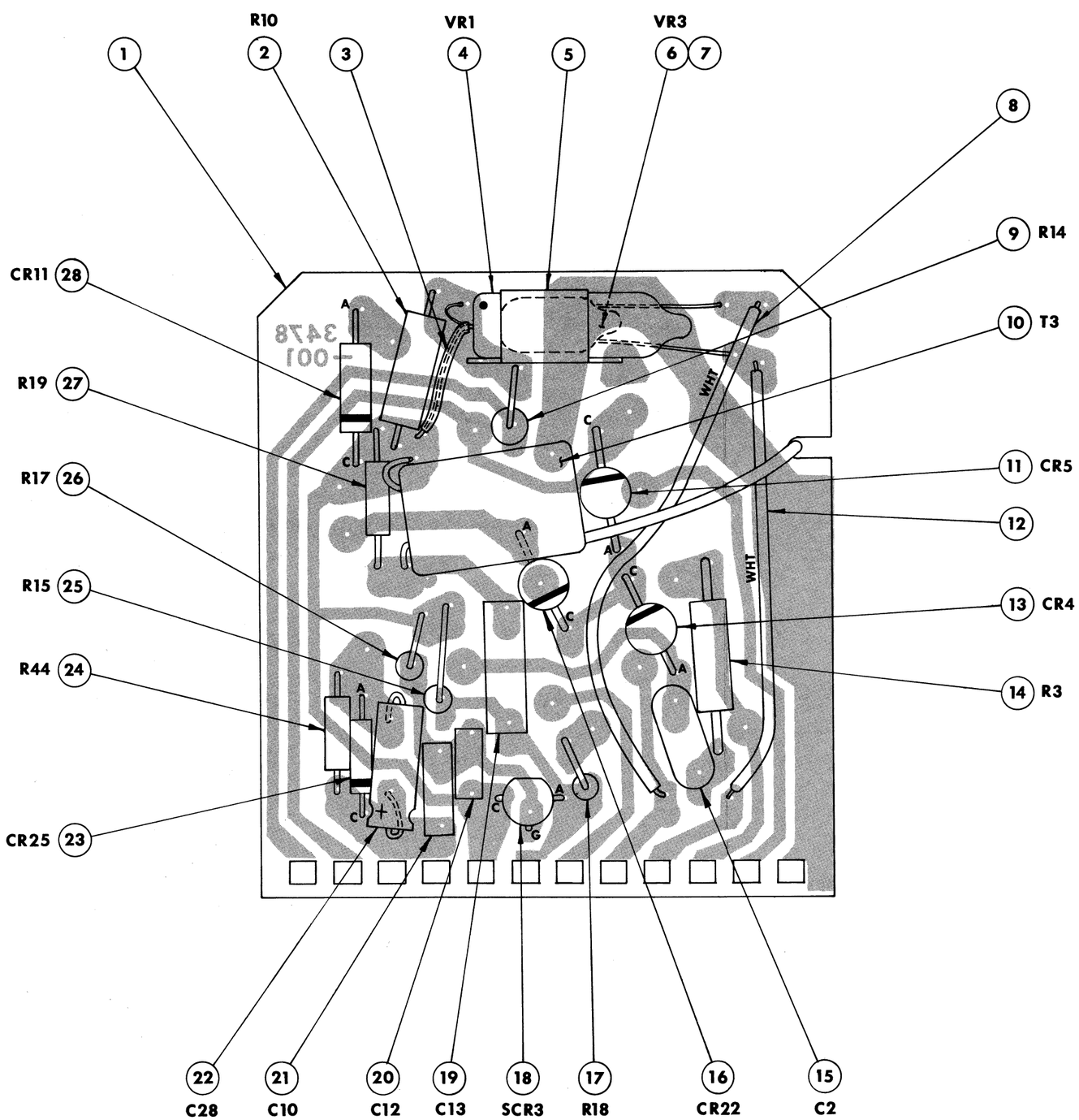
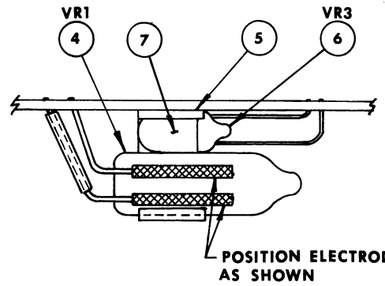


Figure 5-10.
Circuit Board No. 1 Assy -
Auto/Strobonar 892

REF INDEX	REF SCHEM	HONEYWELL PART NO.	DESCRIPTION	QTY
		H73003837 001	Circuit Board No. 2 Assy	1
1		H73003478 001	Circuit Board	1
2	R10	H73003450 ⚠1	Resistor ⚠1	1
3		H16750977 438	Sleeving	1
4	VR1	H73003022 005	Neon	1
5		H16766821 001	Dual Retainer	1
6	VR3	H73003265 001	Lamp, 6V, .060A	1
7		H73002897 007	Green Lens	1
8		H73000602 006	Wire, Wht, #22	1
9	R14	H73003356 524	Resistor, 174K, ¼W, 1%	1
10	T3	H73002568 004	Transformer	1
11	CR5	H73002061 002	Diode, 600V	1
12		H73000602 016	Wire, Wht, #22	1
13	CR4	H73002061 002	Diode, 600V	1
14	R3	H16758183 832	Resistor, 1K, ½W, 10%	1
15	C2	H73002620 013	Capacitor, 820 pf, 1KV	1
16	CR22	H73001970 007	Diode, 1KV	1
17	R18	H16759940 135	Resistor, 3.9M, ¼W, 10%	1
18	SCR3	H73002511 014	SCR, 200V	1
19	C13	H73002737 013	Capacitor, .1 uf, 250V	1
20	C12	H73002426 002	Capacitor, 1000 pf, 50V	1
21	C10	H73002426 005	Capacitor, .0033 uf, 50V	1
22	C28	H73003202 013	Capacitor, 1 uf, 35V	1
23	CR25	H73003522 002	Diode, 100V	1
24	R44	H16759940 121	Resistor, 1M, ¼W, 10%	1
25	R15	H16759940 135	Resistor, 3.9M, ¼W, 10%	1
26	R17	H16759940 049	Resistor, 1K, ¼W, 10%	1
27	R19	H16759940 165	Resistor, 5.6 ohm, ¼W, 10%	1
28	CR11	H73001937 001	Diode, 50V	1
29	T1	H73003366 002	Transformer	1

⚠1 Refer to paragraph 3-18 for selection of resistor R10.





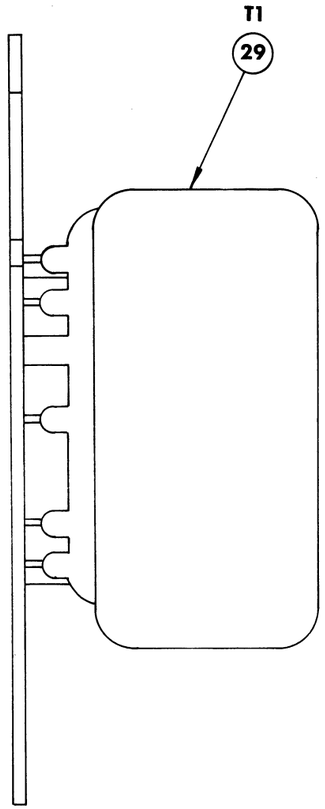


Figure 5-11.
Circuit Board No. 2 Assy -
Auto/Strobonar 782

REF INDEX	REF SCHEM	HONEYWELL PART NO.	DESCRIPTION	QTY
		H73003839 001	Circuit Board No. 2 Assy	1
1		H73003478 002	Circuit Board	1
2	VR1	H73003022 005	Neon	1
3	VR3	H73002865 001	Neon	1
4		H16766821 001	Dual Retainer	1
5	CR24	H73003554 256	Diode, Zener, 150V	1
6	R33	H16759940 089	Resistor, 47K, ¼W, 10%	1
7	C26	H73002426 005	Capacitor, .0033 uf, 50V	1
8		H16750977 438	Sleeving	A/R
9	T3	H73002568 004	Transformer	1
10	R19	H16759940 165	Resistor, 5.6K, ¼W, 10%	1
11	R34	H16759940 049	Resistor, 1K, ¼W, 10%	1
12	CR17	H73001970 003	Diode, 200V	1
13	SCR4	H73002511 012	SCR, 230V	1
14	C16	H73003664 113	Capacitor, .1 uf, 250V	1
15	SCR3	H73002511 014	SCR, 200V	1
16	CR11	H73001937 001	Diode, 50V	1
17	CR22	H73001970 007	Diode, 1KV	1
18	CR7	H73001970 007	Diode, 1KV	1
19	R32	H16759940 294	Resistor, 75K, ¼W, 5%	1
20	CR18	H73001970 004	Diode, 400V	1
21	R45	H16759940 145	Resistor, 10M, ¼W, 10%	1
22	R31	H16759940 294	Resistor, 75K, ¼W, 5%	1
23	R30	H16759940 297	Resistor, 100K, ¼W, 5%	1
24	C17	H73002825 002	Capacitor, 10 uf, 250V	1
25		H73003153 001	Insulator	1

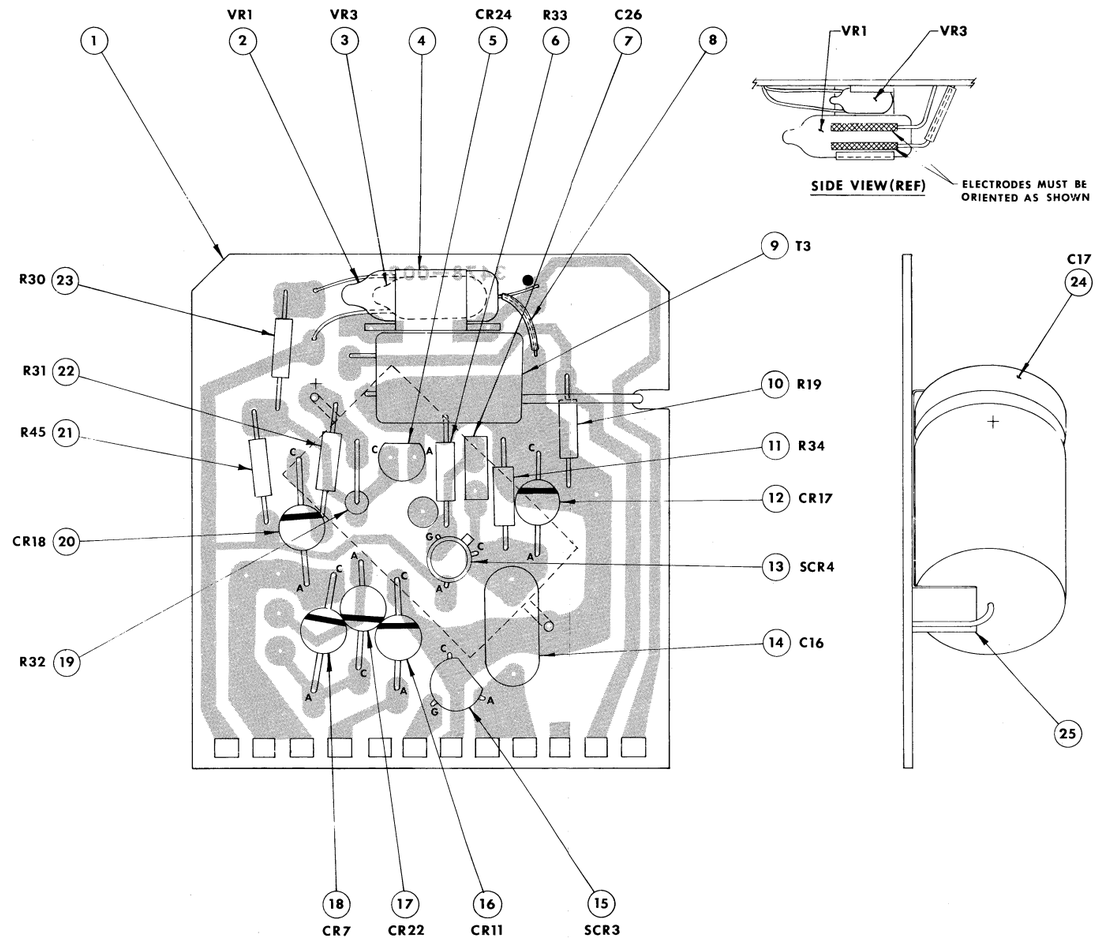
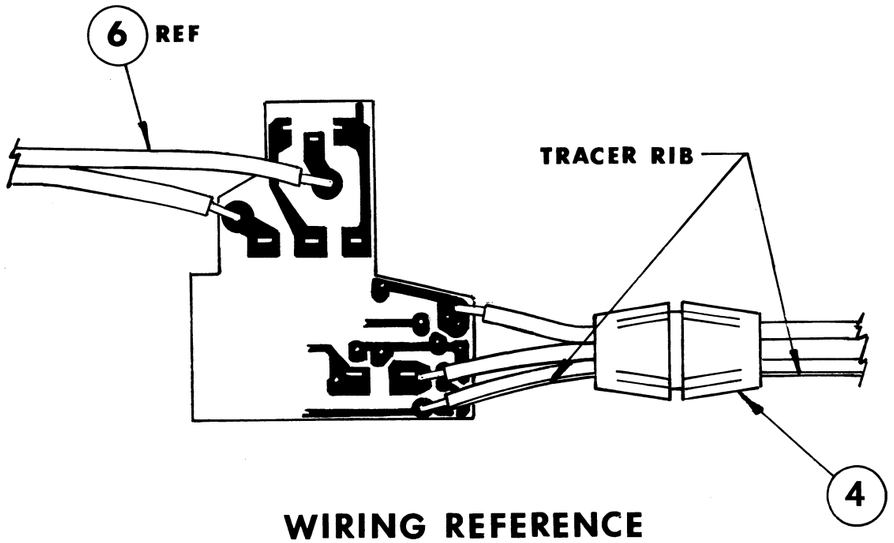


Figure 5-12.
Circuit Board No. 2 Assy -
Auto/Strobonar 892

REF INDEX	REF SCHEM	HONEYWELL PART NO.	DESCRIPTION	QTY
		H73003718 001	Wall Box Assembly	1
1		H73003766 002	Decal	1
2		H16756377 023	Screw	2
3		H73002930 001	Base	1
4		H16766484 007	Cable Assembly	1
5		H73003776 001	Circuit Board Assy. (See Fig. 5-14)	1
6		H73001140 002	Power Cord	1
7		H73001173 001	Cover	1



WIRING REFERENCE
(CLAD SIDE SHOWN)

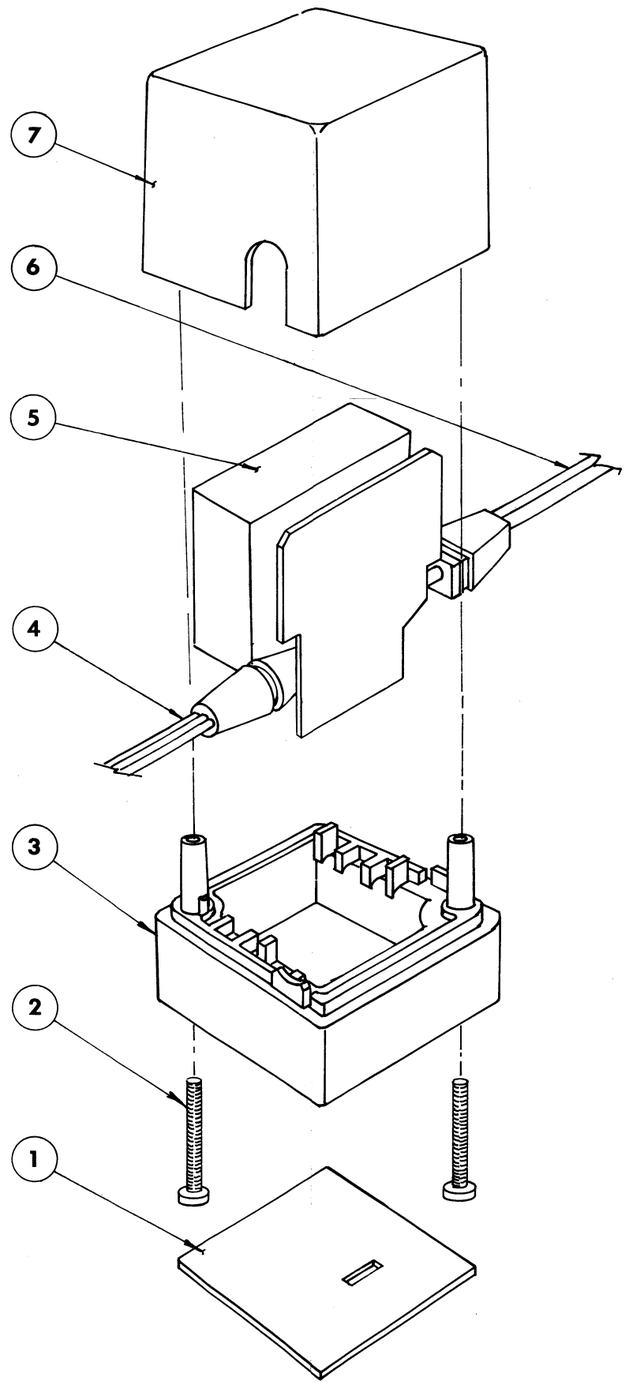


Figure 5-13.
Wall Box Assembly

REF INDEX	REF SCHEM	HONEYWELL PART NO.	DESCRIPTION	QTY
		H73003776 001	Wall Box Circuit Bd. Assy.	1
1		H73003699 001	Circuit Board	1
2	2T1	H73003708 001	Transformer	1
3	2CR4	H73001970 005	Diode, 600V	1
4	2CR1	H73001970 005	Diode, 600V	1
5	2CR3	H73001970 005	Diode, 600V	1
6	2CR2	H73001970 005	Diode, 600V	1
7	2R1	H16759940 313	Resistor, .47M, ¼W, 50%	1
8	2R2	H16759940 328	Resistor, 2M, ¼W, 5%	1
9	2SCR1	H73002511 010	SCR, 200V	1
10	2CR6	H73003531 255	Zener, Diode, 140V	1
11	2CR5	H73003531 261	Zener, Diode, 200V	1
12	2C1	H73002426 001	Capacitor, 1000 pf, 50V	1
13	2S1	H73002937 004	Switch	1
14		H73003139 001	Spacer, Switch	1

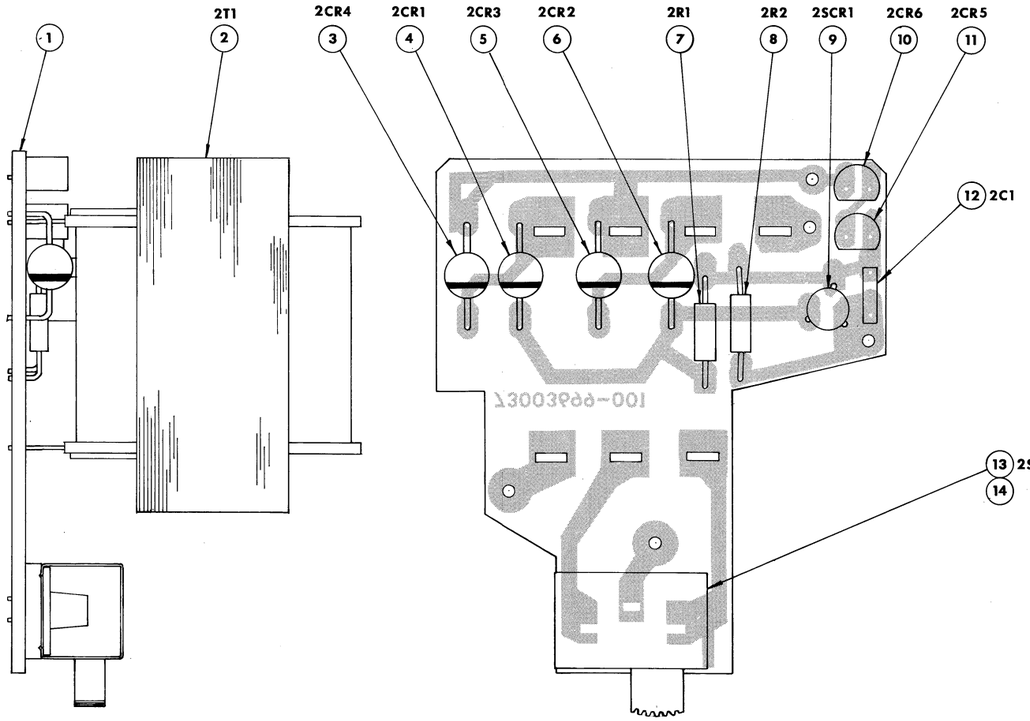


Figure 5-14.
Wall Box
Circuit Board Assembly

REF INDEX	REF SCHEM	HONEYWELL PART NO.	DESCRIPTION	QTY
		H73002799 003	Strobo-Eye Remote Sensor Accessory Assembly	1
1		H73002809 001	Nameplate	1
2		H73004080 225	Screw, Flat Head	1
3		H73002756 001	Foot	1
4		H73002640 009	Screw, Self-Tapping, 2-56	3
5		H73002741 001	Case, Bottom	1
6		H73002824 003	Insert, Threaded	1
7		H73002182 001	Lens	1
8		H73002740 002	Circuit Board Assy. (See Figure 5-16)	1
9		H73003200 003	Top Case Assembly	1

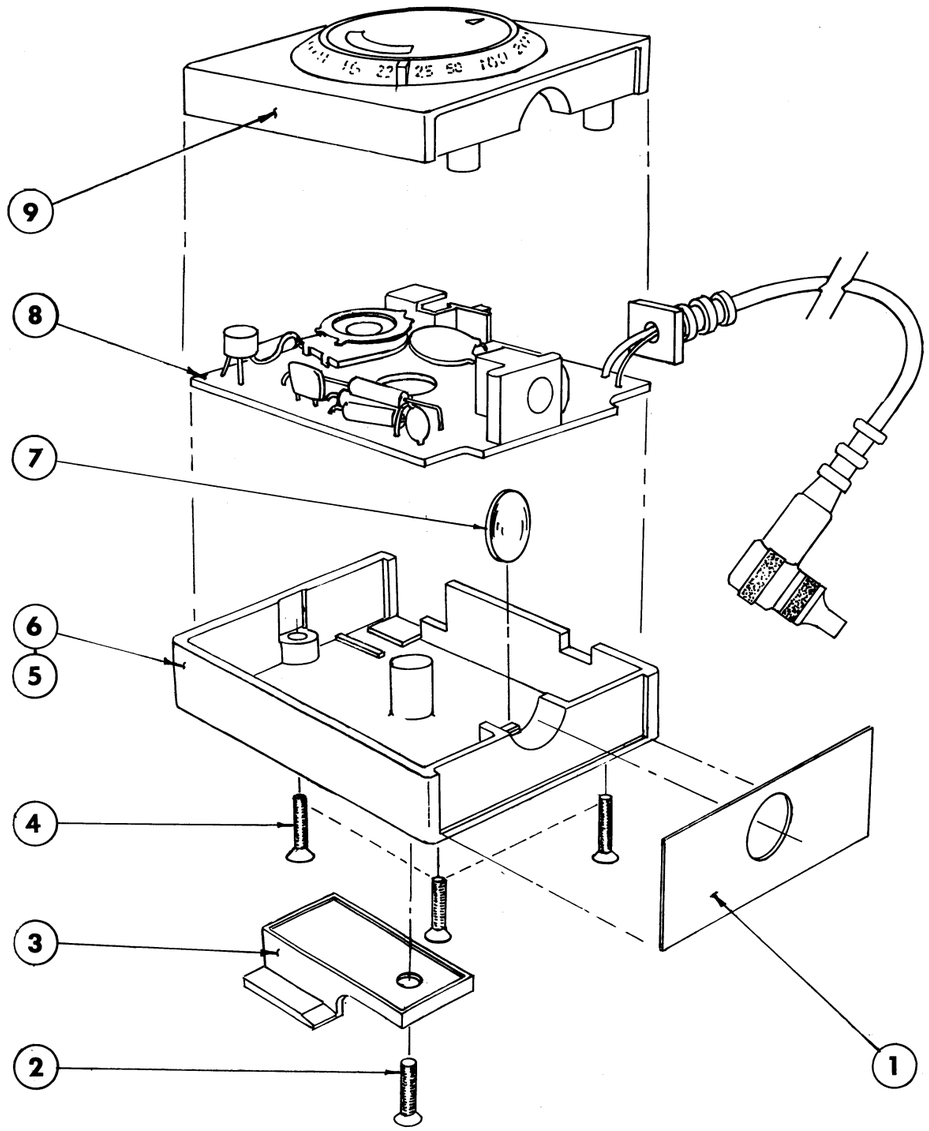


Figure 5-15.
Exploded View -
Strobo-Eye Remote
Sensor Accessory

REF INDEX	REF SCHEM	HONEYWELL PART NO.	DESCRIPTION	QTY
		H73002740 002	Circuit Board Assembly - Remote Sensor Accessory	1
1		H73002736 001	Circuit Board	1
2	6R3	H16762587 114	Resistor, Var., 15K	1
3		H73002802 001	PC Module Assembly	1
4	6C1	H73001150 024	Capacitor, 680 pf	1
5	6CR4	H73003531 217	Diode, zener, 8.2V	1
6	6CR1	H73001970 005	Diode, 600V	1
7		H73002826 002	Cord, PC	1
8	6C2	H73002426 001	Capacitor, 100 pf	1
9	6C3	△3	Capacitor △3	1
10		H16750978 038	Tubing, Teflon, 1/4 Lg.	1
11	6LASCR1	△3	LASCR Kit △3	1
12		H73002186 001	Lens	1
13		H73002778 001	Lens, IR Filter	1
14	6CR2	H73001970 005	Diode, 600V	1
15	6R1	△3	Resistor △3	1
16	6R4	H16759940 089	Resistor, 47K, 10%, 1/4W	1
17	6R2	H16759940 280	Resistor, 20K, 5%, 1/4W	1
18	6CR3	H73002602 002	Diode, Zener, 16V	1
19	6R5	H16759940 025	Resistor, 100 ohm ,10%,1/4W	1
20	6Q1	H16759913 003	Transistor, NPN	1

NOTES:

△1 Anode toward board surface.

△2 Indicated area to be free of components, except for items 11 and 12.

△3 The following components make up the LASCR Kit, Honeywell Part No. H73003970-006.

If 6LASCR1 is:	Capacitor 6C3 must be:	Resistor 6R1 must be:
H73000533 813 or H73000533 814	H73002426 002 1000 pf, 50V	H16759940 279 18K, ¼W, 5%

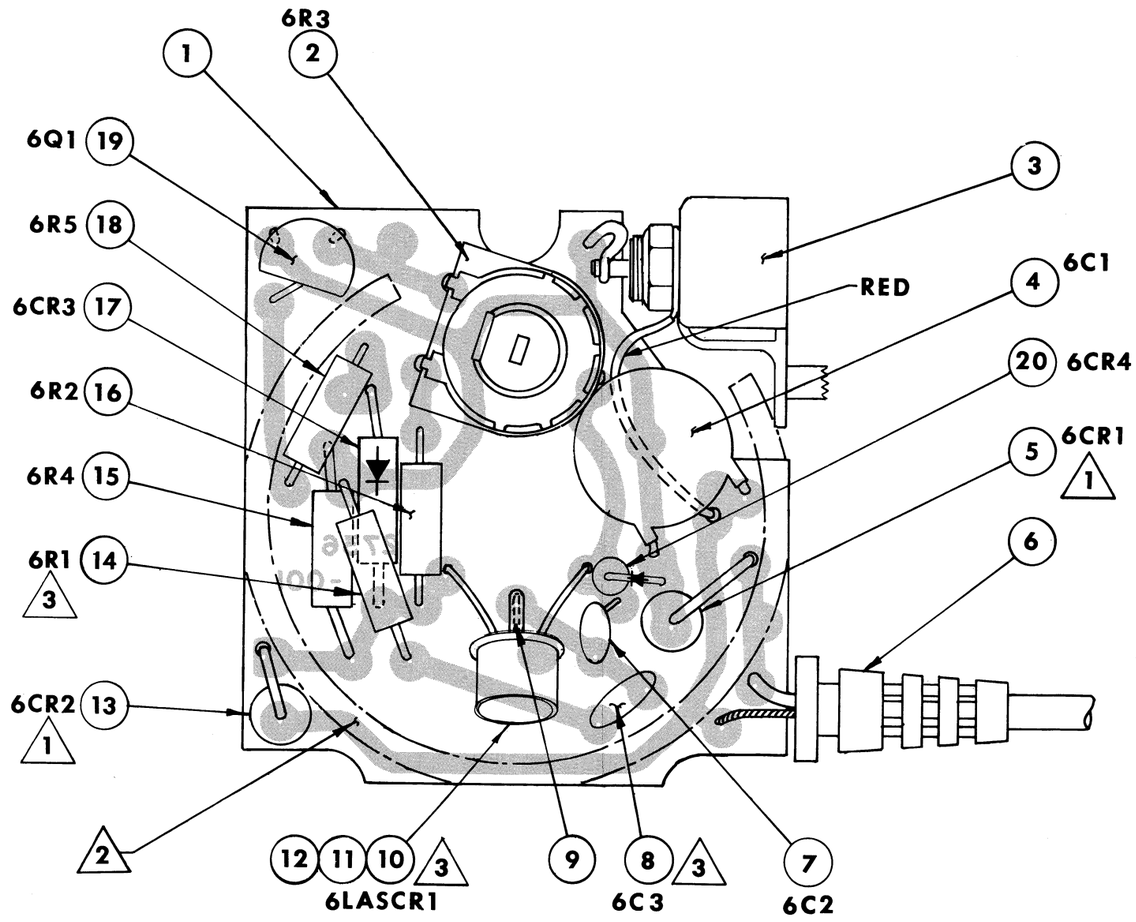
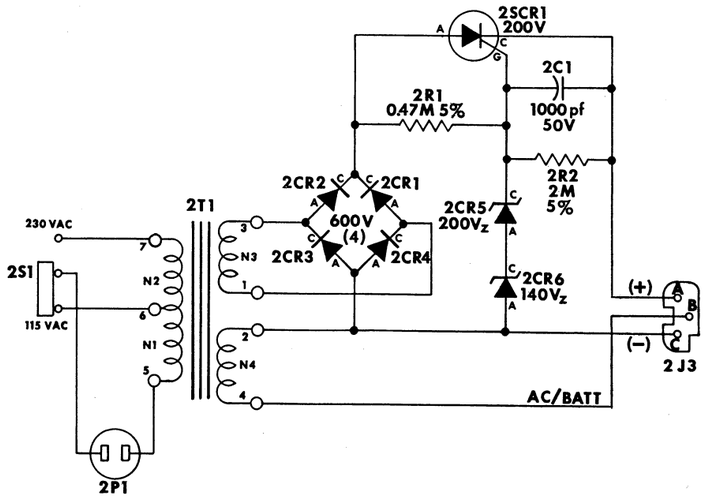
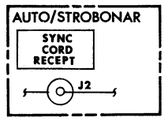
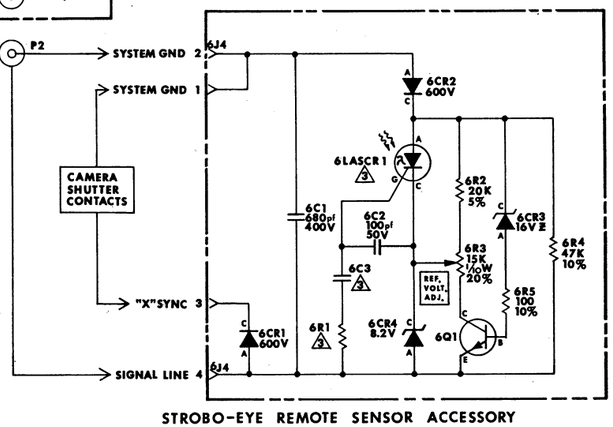


Figure 5-16.
Circuit Board Assy - Strobo-Eye Remote Sensor Accessory

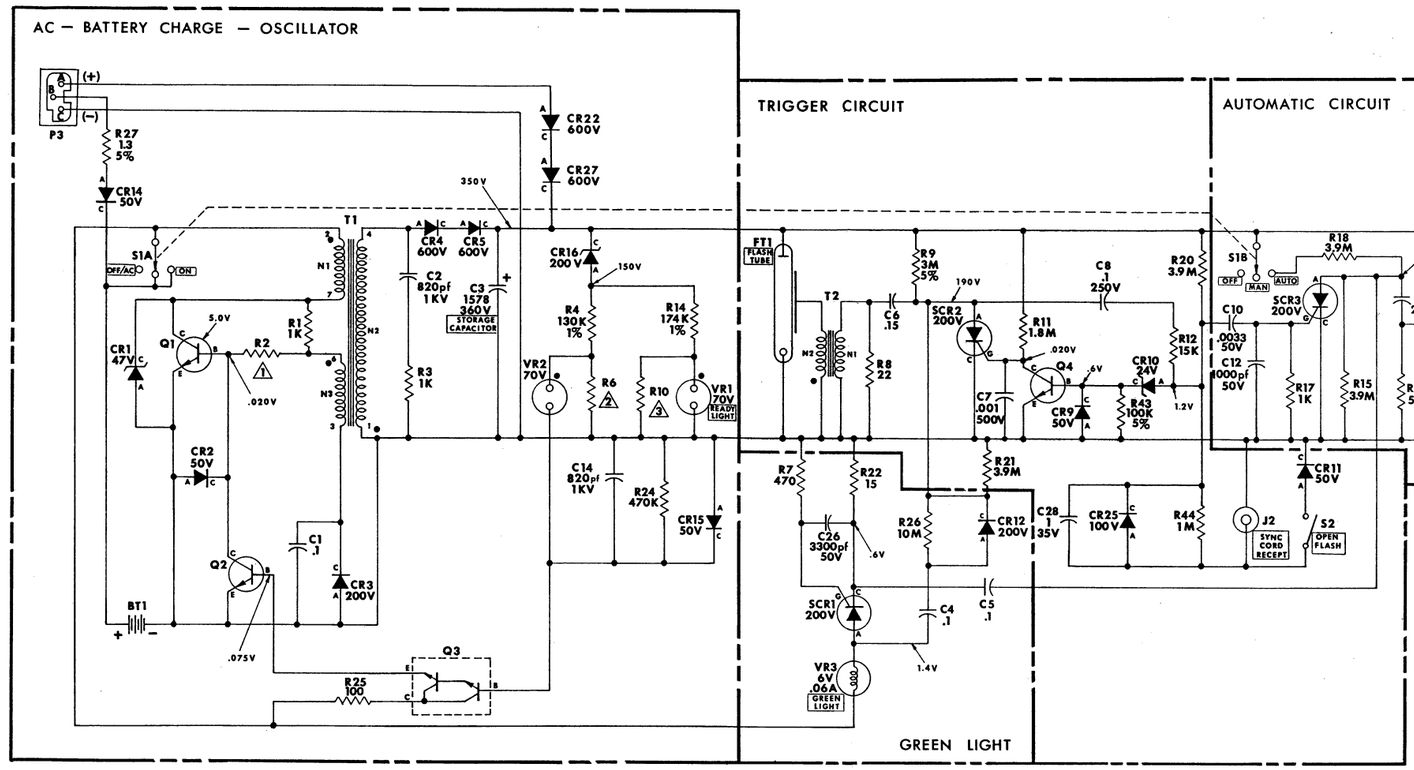


WALL BOX





STROBO-EYE REMOTE SENSOR ACCESSORY



NOTES: WALL BOX

1. All resistance values in ohms.
2. All capacitance values in microfarads.

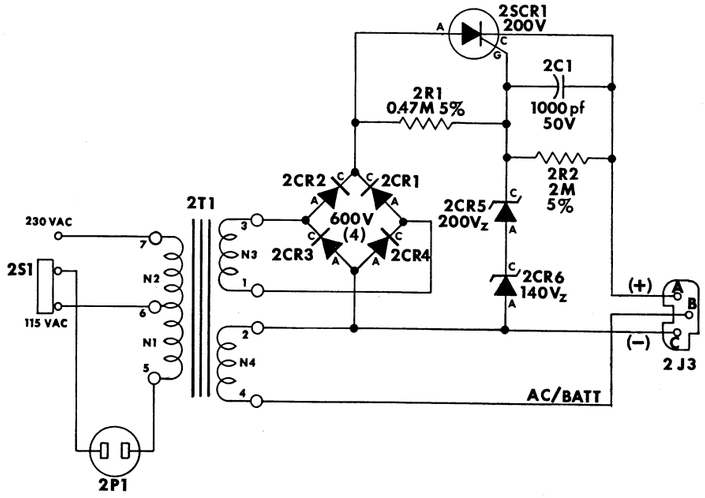
NOTES: STROBO-EYE REMOTE SENSOR ACCESSORY

1. All resistance values in ohms.
2. All capacitance values in microfarads.
3. Resistor 6R1 and capacitor 6C3 values depend upon 6LASCR1. Refer to the parts list on page 5-31/5-32.

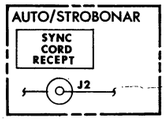
NOTES: AUTO/STROBONAR 782

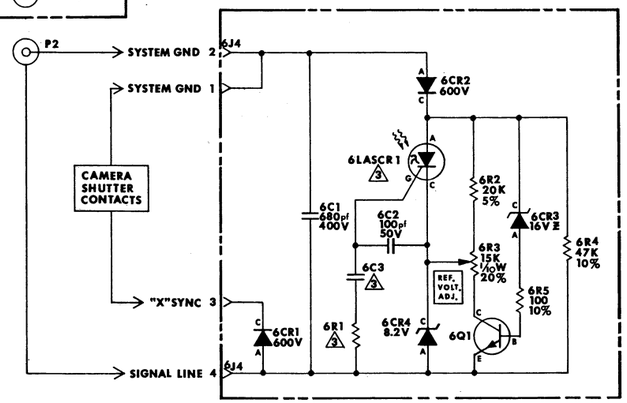
1 Refer to paragraph 3-16 for selection of resistor R2.
2 Refer to paragraph 3-17 for selection of resistor R6.
3 Refer to paragraph 3-18 for selection of resistor R10.
4. All resistance values in ohms, ½W, 10%.
5. All capacitance values in microfarads.

Figure 5-17.
Schematic Diagram - Auto/Strobonar 782 - Remote Sensor Accessory - Wall Box

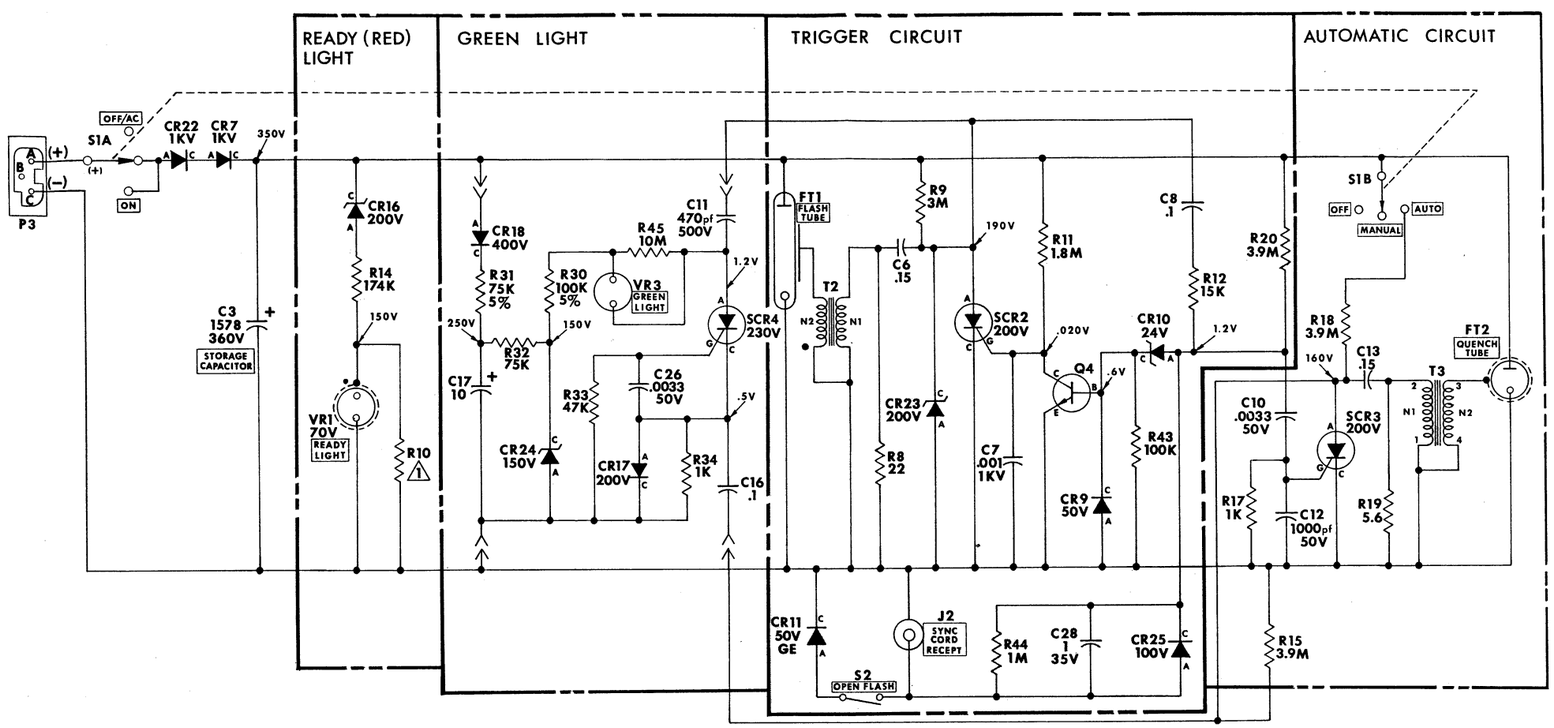


WALL BOX





STROBO-EYE REMOTE SENSOR ACCESSORY



NOTES: WALL BOX

1. All resistance values in ohms.
2. All capacitance values in microfarads.

NOTES: STROBO-EYE REMOTE SENSOR ACCESSORY

1. All resistance values in ohms.
2. All capacitance values in microfarads.
3 Resistor 6R1 and capacitor 6C3 values depend upon 6LASCR1. Refer to the parts list on page 5-31/5-32.

NOTES: AUTO/STROBONAR 892

1 Refer to paragraph 3-18 for selection of resistor R10.
2. All resistance values in ohms, ¼W, 10%.
3. All capacitance values in microfarads.

Figure 5-18.
Schematic Diagram - Auto/Strobonar 892 - Remote Sensor Accessory - Wall Box