

# CARVER

## SILVER 7t/SILVER 9t MAGNETIC FIELD POWER AMPLIFIERS SERVICE MANUAL

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# CARVER Corporation

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# SECTION 1

## SAFETY INFORMATION

### WARNING.

Any person performing the procedures described in this manual will be exposed to hazardous voltages and the risk of electric shock.

Carver Corporation assumes that any person who removes the cover from the unit has been properly trained in protecting against avoidable injury and shock.

Therefore, the procedures described here are to be performed by qualified electronics service personnel only.

We recommend that the unit be tested only when line isolation is provided by an isolation transformer. The line cord of the unit must be disconnected and the power supply fully discharged before any components are replaced. Failure to do so may result in severe damage to the unit and the risk of electric shock.

The safety tests described below must be performed properly.



### CAUTION:

Before returning the unit to the customer, one of the following safety tests must be performed.

1. Check the leakage current. Connect the unit to 120 VAC supply and turn the power switch "ON". Using an ammeter, measure the current between the neutral side of the AC supply and chassis ground of the unit under test. If leakage current exceeds 0.5mA, the unit is defective.  
Reverse the polarity of the AC supply and repeat.
2. Measure the resistance from either side of the linecord to chassis ground. If it is less than 500k ohms, the unit is defective.

**WARNING - DO NOT** return the unit to the customer if it fails one of these tests until the problem is located and corrected.

### CAUTION

	<b>CAUTION</b> RISK OF ELECTRIC SHOCK DO NOT OPEN	
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK DO NOT REMOVE COVER (OR BACK) NO USER-SERVICEABLE PARTS INSIDE REFER SERVICING TO QUALIFIED PERSONNEL		



The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure, that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user of the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.



## SECTION 2

### INTRODUCTION

This manual is intended for use by qualified, authorized personnel only.

Due to the unique and complex circuit designs of Carver Corporation, the following procedure is recommended to diagnose & repair problems with speed and accuracy.

The best way to figure out what is wrong is to learn what is working properly first. Then, through the process of elimination, the defective area can be located. Upon locating the defective area, you then would use your own preferred troubleshooting skills.

The removal of parts for testing, should be kept to an absolute minimum. "In circuit" analysis should provide you with enough data to determine correct operation.

Refer to the design history section of the service manual if you locate a part in the circuit that is not the same as the schematic. This section will be of great assistance to you in performing a correct repair.

At Carver Corporation we continually strive for the most reliable, cost-efficient product available.

When updates and service bulletins are sent to you, please take the time to review them and insert them into the correct service manuals.

The Silver 7t was released in March of 1989 and manufactured until April of 1990. It was originally the Anodized Gray color that was characteristic of the Carver product line throughout the 1980's.

About halfway through its production the color was changed to Painted Black, which is now characteristic of the Carver product line in the 1990's.

The Silver 9t was released in April of 1991. The basic amplifier design is the same as the Silver 7t; however, many cosmetic and auxiliary circuit changes were made, including the addition of a lighted meter. Therefore, you will find separate schematics, board layout drawings and parts lists for the Silver 7t and the Silver 9t in this service manual. Please be sure you are referring to the drawings and parts lists that correspond to the model being serviced.

## SECTION 3

### SPECIFICATIONS

#### Specifications for the Silver 7t/Silver 9t

Power Output:	
Continuous Average Output Power:	575 watts into 8 $\Omega$ from 20 Hz to 20 kHz 900 watts into 4 $\Omega$ from 20 Hz to 20 kHz 1000 watts into 2 $\Omega$ from 20Hz to 20 kHz
Power at Clipping:	612 watts into 8 $\Omega$ at 1 kHz
Dynamic Headroom:	1.0dB @ 8 ohms 1.2dB @ 4 ohms
Frequency Response:	20Hz to 20kHz ( $\pm$ 0.5dB S7t) ( $\pm$ 1.0dB S9t)
T.H.D.:	Less than 0.5% 20Hz to 10kHz
IM Distortion:	Less than 0.15%
Noise:	-100 dB A-weighted, referenced to rated power -78 dBW A-weighted, referenced to 1 watt.
Input Impedance:	115k $\Omega$
Sensitivity:	2.3V rms for rated power into 8 ohms
Damping Factor:	Greater than 7 (S7t) Greater than 125 (S9t)
Gain:	29.0dB
Display:	Analog Meter - VU response
Power Consumption:	1400W at full power
Power Requirements:	120VAC/60Hz (USA and Canada) 230VAC/50Hz (Europe)
Dimensions:	11.5" W x 7.0"H x 14.5"D 292mm x 178mm x 368mm
Weight:	19.5 lbs 8.8 kg

Test Note: Accurate measurement depends on a sufficiently "stiff" AC supply. The 60 Hz AC line distortion must be below IHF specifications.



## SECTION 4

### CIRCUIT DESCRIPTION

#### SILVER 7t/SILVER 9t

### TECHNICAL DESCRIPTION

The unconventional design of this amplifier is described in the following circuit description. Read this information carefully before attempting to repair this unit.

This circuit description applies to both the Silver 7t and the Silver 9t amplifiers. Any part of the circuit that is unique to the Silver 7t or the Silver 9t will be identified as such.

The Silver 7t and Silver 9t series of amplifiers consist of the following types of circuit boards:

- \* Amplifier
- \* Primary Circuit and Regulator
- \* Main Power Supply and Protection Circuits
- \* Meter Drive
- \* Meter Light (Silver 9t only)

Refer to the Block Diagram in Section 7 for an illustration of the functional relationships between system components, and to the complete schematic diagrams for the Amplifier, Power Supply, Regulator and Meter Boards in Section 8.

#### Primary Circuit and Regulator Board

The amplifier is fused with an MDA 12 amp fuse on the 115 V units and an MDA 6-1/4 amp fuse on 230V units.

The amplifier is thermally protected by a heatsink mounted 100° C self-resetable thermal breaker in series with the transformer power control circuitry. There is also an internal 150° C resetable thermal switch inside the transformer, in series with primary.

A line filter minimizes normal and common mode noise on the AC line between 0.15 and 30 MHz. It is also used to suppress noise generated by the triac conduction from the AC line.

A voltage conversion switch rewires the transformer primary from a parallel to a series configuration for 230 V operation (Silver 7t only; Silver 9t uses jumper wires).

#### Start-up Sequence

The phase shift voltage at the junction of R8 and R2 is obtained through the heatsink thermal switch and is approximately 110-120V, regardless of whether the amplifier is configured for 115V or 230V operation.

When the power switch on the front of the amplifier is off, it shorts the connection between D and E on the Regulator Board, preventing the phase shift capacitor C4 from charging up.) Once the power switch is turned on, capacitor C4 begins charging up through R8 and either Q2 or Q3, depending on the polarity. The positive half-cycle of the AC line will charge C4 through R8 and Q3. This charging current forward biases the base emitter junction of Q3, causing it to conduct. Q3 turns on Q4, but no gate current can flow because D6 is reverse biased. C4 continues charging until the charge on C4 exceeds the now falling voltage at the junction of the bases of Q2 and Q3, formed by divider R8 and R9. Q3 and Q4 will turn off and C4 will begin to discharge through Q2 because the junction of R8 and R9 is more negative than the emitter of Q3 (C4). Q2 will conduct and turn on Q1, and gate current will flow through forward biased D5, firing and latching the triac. On the negative half cycle, C4 is charged through Q2 and discharged through Q3, Q4, D6 and R10 into the gate of the triac. The triac begins to conduct at a minimum phase angle and applies 30-40 VAC to the primary of the transformer.

The triac is switched on and off every half-cycle of the 60Hz AC line. Thus, the triac switches the AC line current off at a rate twice the line frequency, at

the instant the line current crosses the zero axis. The triac will then remain off for a number of degrees of the sinusoid, before switching on again. The phase angle at which the triac switches on is the "firing angle" of the triac.

This produces enough voltage to the primary of the power transformer to allow the secondary regulator stage on the power supply board to begin to operate.

### Power Supply Regulation

The firing angle of the triac controls the voltage on the primary of the transformer, and is determined by the conduction of the optocoupler U1 on the Regulator Board.

As the conduction of the optocoupler increases, the amount of phase shift on C4 decreases, which increases the conduction angle of the triac. The phototransistor conduction of the optocoupler is controlled by the current through the LED portion of the optocoupler. This LED current is supplied by U1-7 on the power supply board. This differential amplifier senses the secondary supply voltages through R1, R4, R5 and R7. The output voltage at U1-7 increases at the rate determined by C3 (slow start-up). The photo-transistor in the optocoupler will begin to conduct and charge C4 on the regulator board at a faster rate through R2 and D1/D4 or D2/D3 "steering" diodes, depending on the polarity. This decrease in phase shift results in a longer triac conduction time and higher secondary voltages. The idle secondary voltages are set by RP1 on the power supply board.

### Load Regulation

When the amplifier is driven into a load, the DC supplies (rail voltages) will begin to "sag". Differential amplifier U1-7 senses this and increases the LED current to the optocoupler. This action increases the phototransistor conduction, which increases the triac conduction, which increases the primary voltage, which increases the secondary voltages, thus providing steady, regulated DC supplies for the amplifier stage.

### Secondary Voltages

The secondary winding of the power transformer has three taps that supply the three pairs of DC supply voltages ( $\pm 118V$ ,  $\pm 67V$ ,  $\pm 31V$ ), each having its own set of bridge rectifiers and filter capacitors.

Parallel load resistors R43 and R51 on the 31V bridge rectifier insure that the triac remains latched by providing primary holding current after the secondary supply rectifiers stop conducting.

The  $\pm 11.4Vdc$  supply are derived from the  $\pm 31V$  dc supply, and regulated by Q9, Q10 and 12V zener diodes D22 and D23. Resistors R44, R46, R49 and R54 provide a residual DC voltage after the unit is turned off, thus keeping the front end of the amplifier biased up to prevent excessive thumping. The  $\pm 11.4Vdc$  supply powers the op-amps and small-signal transistors.

The +15V/-13Vdc supply is also derived from the  $\pm 31Vdc$  supply. The +15V supply is regulated by R48 and 15V zener diode D26. The -13V supply is derived from the voltage divider R50 and R59. The +15V/-13Vdc supply powers the meter board and power LED.

### Amplifier Stage:

A single standard phono plug on the rear of the amplifier is hard-wired to the power supply board. The signal is transferred to the amplifier board via connector J2.

An N-channel FET (Q1) mutes the input approximately -30dB during turn-on or during a fault condition. The FET drive circuit is located on the power supply board.

Input buffer U1 is a TLO-81 operational amplifier, which provides a high input impedance and a low output impedance for driving the succeeding amplifier stage. Local negative feedback from the output of U1 via R14 and C15 is used for stability and to reduce overall negative feedback.

The output of the input buffer U1 is coupled to Q2 and Q3 which in turn provide a current source for DC biasing, as well as provide DC-level shifting. The latter is required for referencing the audio signal to the top DC supplies to drive the next stage, predrivers and drivers.

The output of the DC-level shifters drives a pair of predriver voltage amplifiers (Q4/Q26 and Q7/Q27). This stage provides full voltage swing to the following current gain stages and also provides "tracking" to the commutator circuits.

The bias network of Q5 and Q6 provides adjustment of the DC idle current through outputs Q20/Q32 and Q22/Q34. Q6 is mounted on the heatsink and provides feedback to prevent thermal runaway and helps maintain a constant idle current. RP1 adjusts the idle current by varying the base voltage at Q6.

The predrivers (Q4/Q26 and Q7/Q27) drive the "driver" stage (Q11/Q28 and Q12/Q33), which in turn provides current amplification for driving the outputs and supply commutating circuitry.

Q9 and Q10 limit the current available to the base of the drivers. These transistors are biased on by the voltage drop across the output emitter resistors, R94 and R95. When Q9 is conducting, it provides a shutdown signal to the power supply board and mute circuitry. (See High Frequency Output for details.)

Current from Q11/Q28 and Q12/Q33 drives the two parallel pairs of high gain, high-linearity output devices Q20/Q32 and Q22/Q34. These devices provide full voltage swing and current drive to the loads.

The active, local bias network of Q21, R87, and R88, provides variable "pull down" of the bases of Q20/Q32 and Q22/Q34 to help prevent common-mode conduction of the output transistors and reduce their turn-off time.

The TFM (Transfer Function Modification) circuitry for the Silver 7t is composed of IC U2, which detects the output current by differentially detecting the voltage drop across R97/R53. When an 8 $\Omega$  load is connected to the amplifier output, the output of U2 reduces the overall gain of the amplifier by approximately 1dB. The combination of R97/R53 and the 0.2 $\Omega$  20W parallel resistors on the output speaker terminal provides a relatively high output impedance and a low damping factor.

The TFM circuitry for the Silver 9t is somewhat different than the Silver 7t. IC U2 acts as an inductor in a gyrator circuit, and provides a low frequency boost of about 1dB below 100Hz. The output resistors R97/R53 and the 0.2 $\Omega$  20W parallel resistors have been removed to lower the output impedance and increase the damping for a "tighter" bass sound.

## Power Supply Commutators

The first supply commutator transistors, Q19/Q31 and Q23/Q35, are used to increase the supply voltages on the collectors of Q20/Q32 and Q22/Q34 from 31 V to 67 V as required.

The diode network of D18, D19, and D20 (and their negative equivalents), in the base of Q20/Q32 and Q22/Q34, provides voltage "lead" for the first supply commutating transistors (Q19/Q31 and Q23/Q35). This allows the supply voltages to anticipate audio demand. As frequency increases, Q20/Q32 and Q22/Q34 require additional "lead"

time to stay ahead of the audio. This is achieved by C22, R60 and D17 (and their negative equivalents).

The second supply commutator pairs (Q17/Q18/Q29/Q30 and Q24/Q25/Q36/Q37) increase the supply voltages on the collectors of Q19/Q31 and Q23/Q35 to increase Q20/Q32 and Q22/Q34 collector voltages to 118 V (no load), as required. (See Figure 4 in Section 8.)

D29 and D30 prevent the first commutator from dumping back into the 31V supply. The second commutators receive their drive from drivers Q14 and Q16.

However, the current at this stage is insufficient to supply enough current to the output transistors and a bootstrap network and current gain stage are required. The main bootstrap network consist of R49, R52, R62, and C19 (and their equivalents on the negative side).

The turn-on threshold for the second commutators is determined by the DC biasing on the base of Q13 and Q15.

D28 and D31 provide supply steering which prevents the commutators from dumping back into the 67V supply.

## Protection Circuitry

Protection functions are shared by the amplifier and the power supply. Active shutdown protection is provided for the following faults.

### Over current:

The amplifiers are protected from short-term excess current through the output stage by electronic current-limiters. When the current through the output transistors becomes excessive, the voltage drop across the emitter resistors R94 and R95 bias the current limiter transistors Q9 and Q10 on, which shunt the drive current via D7 and D9. Q9 provides base current for Q2 on the Power Supply Board through D8 and R37, which drives Q3. Q3 then charges C11 and turns on Q8, which supplies a negative turn-off voltage to the input muting FET on the amp board. This attenuates the input signal, removing the high current condition, turning off all but Q8, which turns off about four seconds later, after C11 discharges through R35 and R34; thus turning off the muting FET's and allowing signal to pass. In this way, the short circuit current is briefly limited to 16 amps until the mute circuit is activated. R56, D13, R57 and D14



determine the V-I limits. The limiters should not activate into loads of 2 ohms or greater with no more than 45° phase shift.

#### DC Offset:

DC offset is sensed by a low-pass differential amplifier located on the power supply board, formed by U1-pins 2 and 3. The capacitor C6 rolls off the output in the audio spectrum while  $\pm$  DC offset and low frequency signals below 5 Hz are amplified. If pin 1 goes positive, current through D6, R18, and U1-6 drives the output of U1-7 negative. This reverse biases the optocoupler LED on the Regulator Board and forces the conduction angle of the triac back to its initial startup position, thereby lowering all secondary power supply voltages and insuring the offset is held to a minimum value.

#### High Frequency Output:

The amplifier drives to clipping up to 20 KHz. At 40 KHz the amplifier drives to approximately 50Vrms, or about 3dB below clipping. C11 on the Amplifier Board forward biases limiter transistor Q9 during negative transitions. Q9 provides base current for Q2 on the Power Supply Board, thus initiating the input muting circuit. This attenuates the high-frequency signal, allowing the mute circuit to reset after a few seconds.

#### Low-Level Supply:

D2 and D3, on the Power Supply Board, insure that the output of U1-7 never goes to its maximum positive state if either the -11.4 or -13 VDC supplies are shorted out.

If the output of U1 were to reach its maximum (+10 to +11 V) at idle, the triac would shift to its maximum conduction angle and cause overvoltage in the 115V, 67V, and 31V DC supplies.

Any +11.4 Vdc supply fault causes DC offset at the amplifier output. (See DC Offset for a full description of the protective mechanism involved.)

#### Overheated Output Transistors:

A 100° C resettable thermal switch, in series with the AC line control circuitry, protects the output transistors if the air vents are blocked or if the unit is run with excessive continuous sinewaves.

#### Overheated Transformer:

A 150° C resettable thermal switch is located inside the power transformer. This switch protects the transformer if the amplifier is overfused or has been run for an extended period of time at excessive power output levels.

#### Major Faults:

The slo-blo line fuse protects the unit from further damage when a major fault such as a shorted triac, shorted transformer, or a major secondary power supply fault occurs.


If the unit is run at or near its rated power, the fuse eventually blows. The rated line fuse allows the unit to be operated without interruption for all musical applications.

#### Meter Board:

The meter drive PCB provides logarithmic DC rectification of the signal coming directly from the amplifier output.

Resistors R1, R2, R3 and transistor Q1 create a variable attenuator to reduce the signal to a usable level, while U1-1 and U1-7 add a fixed gain of about 53dB. D1 rectifies the output of U1-7, and this dc level is used to bias transistor Q1. The larger the signal, the more Q1 is biased on which increases the attenuation of the R1/R2/R3/Q1 network, causing a 2:1 gain compression of the signal. RP1 is used to adjust the dc bias on Q1 to calibrate the meter.

This logarithmic signal is fed to the base of Q2 which rectifies the signal and charges C4. Resistors R10-R12 attenuate the dc level to reduce the current through the meter, and in conjunction with capacitors C5, C6 and C11 provide the meter with a VU type response. Therefore the ballistics of the meter will present an averaged response to the program material.



## SECTION 5

### TEST PROCEDURE

#### Silver 7t/Silver 9t

Use the test procedure described in this section to determine the overall performance of the amplifier. Before beginning the test, read the troubleshooting section to review the types of problems that may be identified by the test. Steps 7 and 8 of the performance test must be completed to ensure the unit meets general safety requirements.

If you do not understand any of the following procedures, or if you do not have the equipment required to complete the tests, please contact the factory.

#### Disassembly Procedure:

To remove Top Cover Assembly (includes Top Panel, Back Cover, Back Housing and Meter Housing):

1. Remove 10 screws (5 on each side) around the bottom perimeter of the Top Cover Assembly.
2. Lift Top Cover Assembly away from chassis.

To remove Chassis Top:

1. Remove 11 screws from the bottom of the unit, securing chassis top to chassis bottom (9 on one side, 2 on the other side).
2. Slide chassis top forward about 4 inches.
3. Remove wires from the meter. Make a note of the polarity of the wires for reinstalling.  
Note: On the Silver 9t, remove the cable tie around the middle of the black and red twisted pair between the power supply board and the meter light board to allow it to extend to its full length.
4. Carefully slide the Chassis Top forward until it clears the front edge of the Chassis Bottom.
5. Set the Chassis Top on its right side next to the Chassis Bottom.

## Required Equipment

Oscilloscope(s)      Note: We recommend the use of two scopes. One scope should be isolated, with no secondary ground reference. Use this scope to observe triac waveforms on the AC line. The second scope can be used to observe the amplifier output and for secondary troubleshooting.

Distortion Analyzer

Variac, 20-30 amp

AC line current monitor

AC line voltage monitor

Two 4Ω load resistors, 500W each (or equivalent)

Digital voltmeter

AC voltmeter

Safety Analyzer (Hi-Pot Tester)

## Presets:

Follow the procedure described below to power up a damaged unit:

- A) Connect an 8 ohm load to the output terminals.
- B) Connect an input cable to the input jack from the distortion analyzer signal output (set to 2kHz).
- C) Set the Variac to minimum.
- D) Set RP1 on the Power Supply Board for minimum VDC (turn the potentiometer fully counter-clockwise).
- E) Set RP1 on the Amplifier Board for minimum idle current (turn the potentiometer fully clockwise).
- F) Set the Audio generator to minimum.

## Step-by-Step Procedure:

### CAUTION

All primary waveforms must be viewed with an isolated, line triggered scope with no secondary ground reference.

**Step 1.** Bring the variac up slowly to approximately 60 VAC line (or to 120 VAC for 230 V units).

- A) AC current flow in line should be less than 0.25 amps.
- B) The start up voltages should be as follows:
  - 1) 118VDC supplies should be approximately 20VDC.
  - 2) 11.4 VDC supplies should be approximately 2-3VDC.
- C) Check amplifier output for DC offset less than 100 mV.

**Step 2.** Bring up the variac to approximately 85 VAC line (or to 170 VAC for 230 V units).

- A) Triac fires and there is a momentary surge of current.
- B) AC current flow in line should be less than 0.5 amps.
- C) Increase audio input to generate a 1 Vrms 2kHz signal at the amplifier output. Small crossover notches should be present on sine wave output.
- D) Check triac firing for good symmetry (see Figure 1).

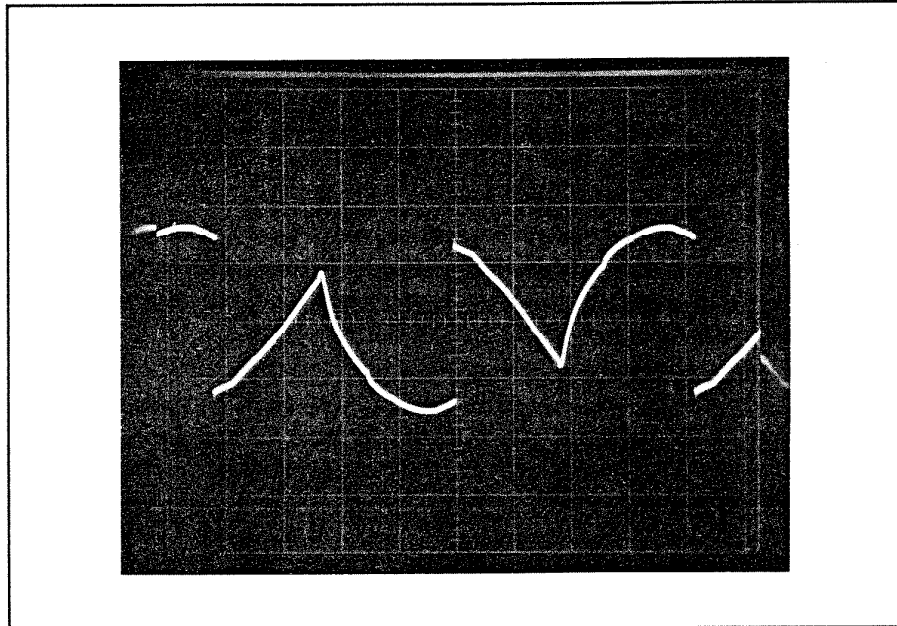


Figure 1: Triac conduction at idle, viewed at MT2.  
(50V/div. Vertical; 2mS/div. Horizontal; Line Sync)

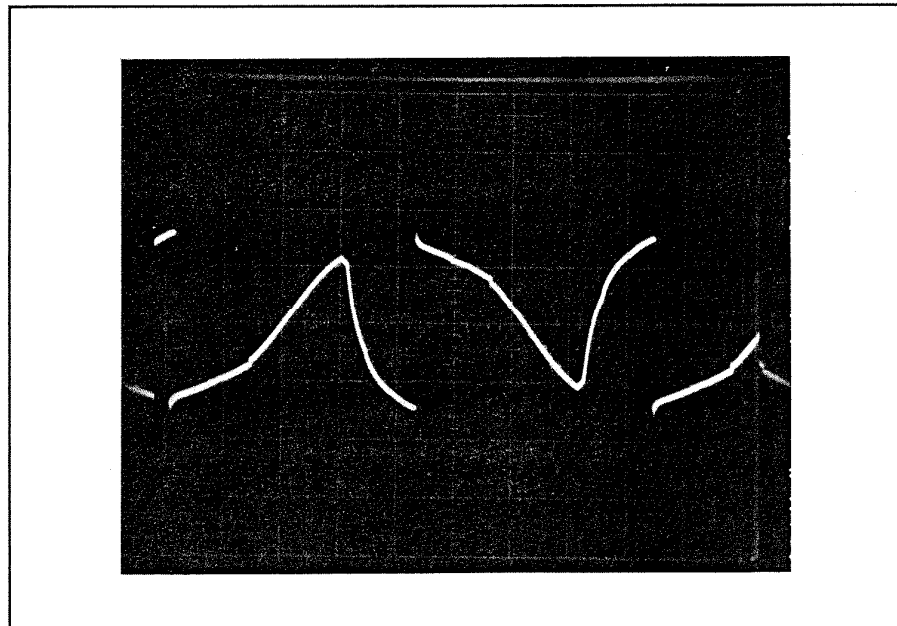


Figure 2: Triac conduction at full power, viewed at MT2.  
(50V/div. Vertical; 2mS/div. Horizontal; Line Sync)

- E) Check all VDC supply levels for power supply regulation:
- 1) 118 VDC supplies should be approximately 92 VDC.
  - 2) 67 VDC supplies should be approximately 51 VDC.
  - 3) 31 VDC supplies should be approximately 23 VDC.
  - 4) 11.4 VDC supplies should be approximately 11.4 VDC.
  - 5) 13 VDC supplies should be approximately 8-9 VDC.
- F) Amplifier offset should be less than 30 mV.

**Step 3.** Increase Variac to 120 VAC (or 230 V for 230 V units).

- A) AC current flow should be less than 1.0 amp.
- B) 118 VDC supply should be approximately 97 VDC.

**Step 4.** Adjust RP1 on the Power Supply Board to obtain a top rail voltage of 118VDC.

- A) Observe normal triac conduction at idle point (See Figure 1).

**Step 5.** Set Amplifier Idle Current.

Note: This adjustment should be made after the unit has been on at least two minutes at idle.

- A) Turn off the input signal.
- B) Adjust RP1 on the Amplifier Board for 2.5mV with meter bridged across both 0.05 ohm, 5W emitter resistors, R94 and R95.

**Step 6.** Amplifier Board.

A) Check frequency response:

- 1) Set output reference to +10dBV (3.16Vrms) at 2kHz.
- 2) Check response at 20Hz and 20kHz. See Figure 3.  
S7t: (+0, -0.5 dB)  
S9t: (+1.0, -0.5dB)

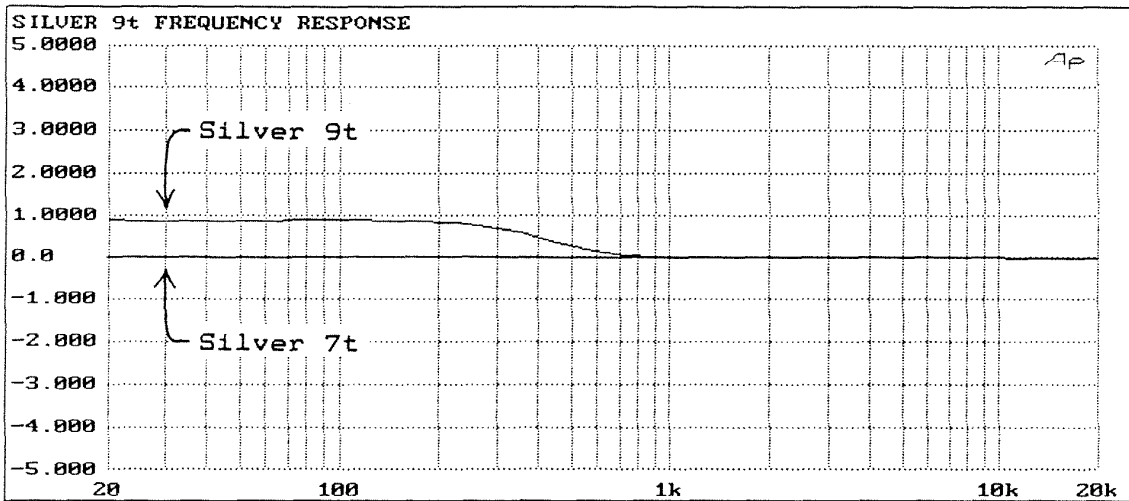


Figure 3: Frequency Response

B1) Adjust Damping (S7t only)

- 1) Connect an 8Ω load to the output.
- 2) Adjust the signal generator to produce a -29dBV (35.5mV rms) signal at 2kHz.
- 3) Adjust RP2 on the amp board to produce a 0dBV (1V rms) output into an 8Ω load.

B2) Check Gain (S9t only)

- 1) Adjust the signal generator to produce a -29dBV (35.5mV rms) signal at 2kHz.
- 2) Verify the output is 0dBV (± 1dB) into an 8Ω load.

C) Check damping at 2kHz.

- S7t: Output should drop 1.0dB (+/-0.1dB) from no load to 8 ohm load.
- S9t: Output should drop less than 0.1dB from no load to 8 ohm load.

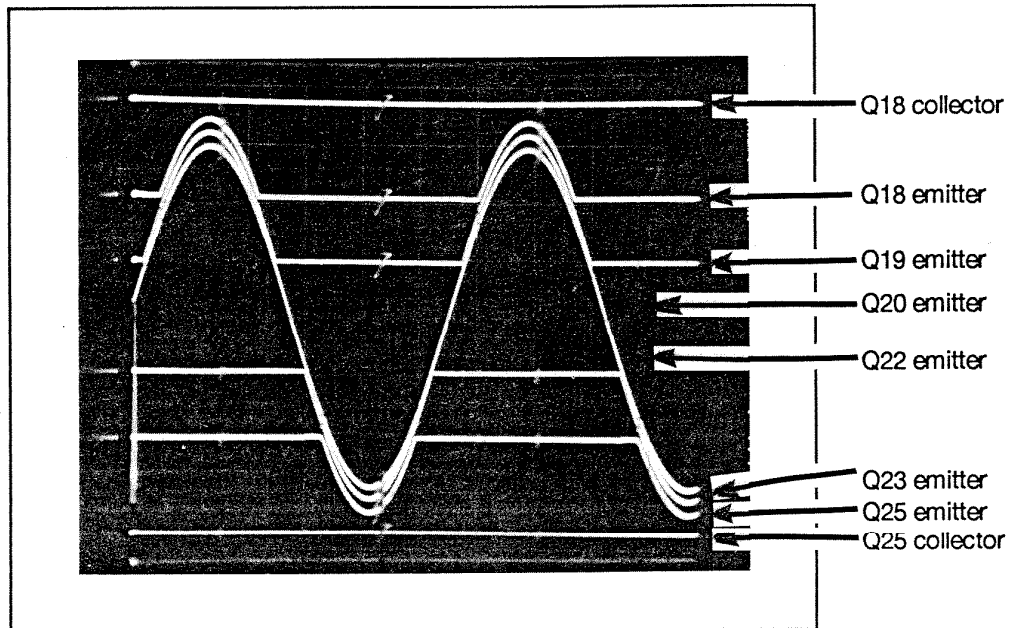


Figure 4: Commutators

D) Increase amplifier output to 67.8 Vrms (575W/8Ω). The commutators should appear as in Figure 4 at 2kHz.

NOTE: The AC line current will exceed the rated value of the line fuse when the amplifier is driven to full power. Since the fuse is slow-blowing, it can withstand the higher current for a few seconds before blowing. Therefore, these tests should be performed quickly to avoid blowing the fuse.

It may be necessary to temporarily replace the 12A line fuse with a 15A slo-blow fuse.

**DO NOT forget to return the 12A fuse after completing these tests!**

Note the maximum triac conduction angle shown in Figure 2.

E) Check full power into 8 ohms at 2kHz.

NOTE: A sufficiently low-impedance AC supply is required to achieve low distortion measurements at full power. If the AC line voltage "sags" at full power, it may be necessary to increase the Variac to bring the line voltage back up to 120VAC.

1) Distortion at 575 watts per channel should be less than 0.5% (see Figure 5).

2) Repeat at 20Hz and 10kHz.

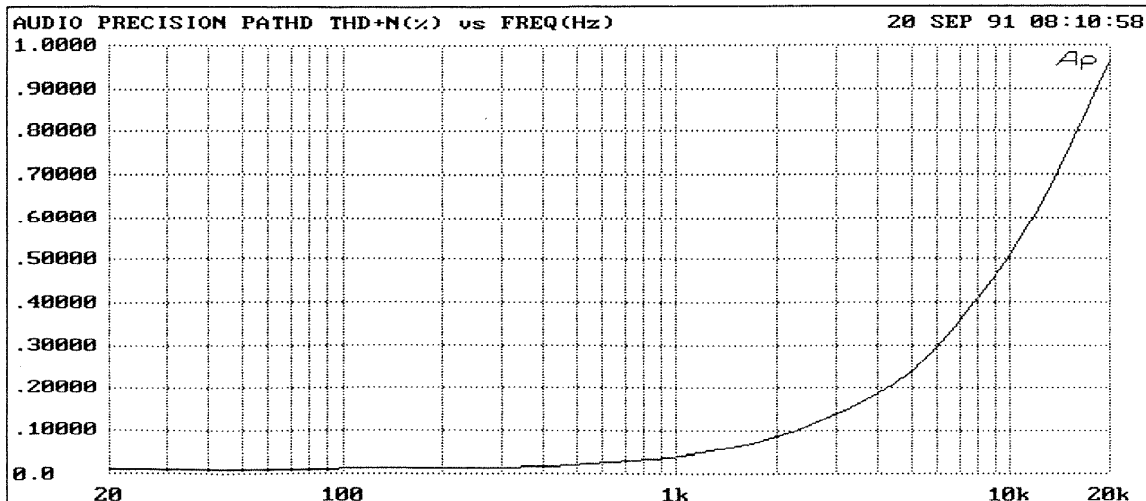


Figure 5: THD vs. Frequency at full power (575W/8Ω)

- 3) Increase output to 600W at 2kHz and verify symmetrical clipping on the positive and negative peaks of the waveform.
- F) Check full power into 4 ohms at 2kHz.
- 1) Connect a 4 ohm load to the output terminals and increase the input until the output is just below clipping. This should be about 900W ( $60\text{Vrms}/4\Omega$ ).
- G) Check full power into 2 ohms at 2kHz.
- 1) Connect a 2 ohm load to the output terminals and increase the input until the output is just below clipping. This should be about 1000W ( $44.7\text{Vrms}/2\Omega$ ).
- H) High-Frequency Shutdown
- 1) Turn signal generator down and set to 40kHz. Connect an 8 ohm load to the output terminals. Slowly increase the input to the amplifier and verify the output exceeds 40Vrms before the amplifier mutes (typically at about 50Vrms output).
- I) Short circuit protection:
- 1) Adjust input level for 20 Vrms output at 2kHz.
  - 2) Short the output to ground.
    - a) The amplifier should mute immediately.
    - b) One mute cycle should last approximately 6 to 8 seconds. Normal operation should return when short is removed.
- J) Noise, with input shorted:
- 1) A-weighted noise should be less than 100 dB below rated power ( $< 675\mu\text{V}$ ) or less than 95dB below rated power unweighted ( $< 1.2\text{mV}$  unweighted).
- K) Check turn-off and turn-on thump, and turn-on delay.
- 1) Increase input level at 2kHz to 0dBV output.
  - 2) Turn the amplifier off and verify a thump of less than 2Vrms (monitor for at least ten seconds).
  - 3) Turn the unit back on and verify less than 1Vrms thump, and the signal reappears between 4 - 10 seconds.
- L) Meter Calibration
- 1) Set the input signal level for 68.7Vrms output into 8 ohms ( $575\text{W}/8\Omega$ ).
  - 2) Adjust RP1 on the meter board for a reading of 0dB (575 watts) on the meter.
  - 3) Check that both meter lamps are lit (Silver 9t only).

**Step 7. Line Leakage:**

With an approved safety analyzer, verify line leakage is less than  $500\mu\text{A}$  from both high and low sides of the line to chassis ground.

**Step 8. Dielectric Breakdown:**

With a calibrated and approved tester, verify that the unit can withstand application of a 1000 VAC signal for at least one second.

Apply the signal between either side of the line and an exposed ground on the unit. The power switch should be ON.

## SECTION 6

### TROUBLESHOOTING GUIDE

The Silver 7t/Silver 9t amplifiers are more complex than a conventional amplifier. This guide will help service technicians isolate and repair electrical faults in the amplifier.

Major faults should be investigated with the loads removed.

#### CAUTION

All primary waveforms must be viewed with an isolated, line triggered scope with no secondary ground reference.

#### Fault 1: No Power.

No Power LED Light at 120 VAC Line.  
No AC Current.

- 1) Determine if AC line voltage is reaching the triac.  
Use AC voltmeter from MT1 to MT2 on triac.
- 2) If AC is not present on triac:
  - a) Check fuse and fuse holder.
  - b) Check line cord.
  - c) Check voltage conversion switch on regulator board (Silver 7t only).
  - d) Check primary winding of transformer for continuity. There is an internal thermal switch in the primary winding.
- 3) If AC is present across triac (MT1-MT2), but triac is not firing:
  - a) Check for phase shift voltage across C4 on regulator board.
  - b) If voltage is not present, either:
    - \* The Power Switch is shorted
    - \* Resistor R8 is open on the Regulator Board.
    - \* Q2 and Q3 are defective on the Regulator Board.
    - \* Check thermal switch on heatsink.
  - c) If voltage is present, either:
    - \* Resistor R10 is open on the Regulator Board.
    - \* The triac is defective.
    - \* Q1 and Q4 are open on the Regulator Board.
    - \* D5 and D6 are open on the Regulator Board.
- 4) Triac fires and the voltage at C4 is less than 4 Vrms.  
All power supplies remain low.
  - a) Opto-coupler CNY-17-2 is defective.
  - b) D1 through D4 are defective on the Regulator Board.
  - c) U1 is defective on the Power Supply Board.
  - d) Resistors associated with U1 are defective.
  - e) Check R2 and R3 on the Regulator Board.
  - f) See Fault 4.



**Fault 2: Greater Than 1 Amp AC Line Current Draw With Small Variac Rotation.**

- 1) Check the following primary components:
  - a) Triac
  - b) Power transformer
  - c) Line filter
  - d) Voltage conversion switch (Silver 7t only)
- 2) Check scope isolation.
- 3) Proceed to next section.

**Fault 3: No Output  
AC Line Current Greater Than 1 Amp After Triac Firing.**

**NOTE:** This condition means that a current drawing fault exists on either the Power Supply Board or the Amplifier Board.

Troubleshooting under these conditions can be simplified by shorting across the triac with a jumper wire. This bypasses the triac control and allows 100% of the line voltage to be applied to the transformer. Therefore, never increase the line voltage beyond about 60 VAC when the triac is bypassed.

**Use Extreme Caution.** Be sure the variac is turned all the way down and unplug the amplifier from the variac. Short across MT1 and MT2, the source and drain of the triac. Do not short the gate of the triac or you may damage the triac and associated circuitry.

- 1) If the Amplifier channel is not offset:
  - a) Check 118 V supply capacitors and rectifiers.
  - b) Check 67 V supply capacitors and rectifiers.Observing excessive ripple voltage on any DC supply can help locate which supply is faulty.
- 2) If the amplifier output is offset,
  - a) and the offset is positive:
    - \* D23 is shorted on the Power Supply Board.
    - \* C17 is shorted on the Power Supply Board.
    - \* D14 and D15 are shorted on the Power Supply Board.
    - \* C14 is shorted on the Power Supply Board.
    - \* Q20/Q32, Q11/Q28, or Q21 is defective on the Amplifier Board.
    - \* Q6 or Q5 is defective on the Amplifier Board.
    - \* Check the predrivers Q4/Q26 and Q7/Q27 and associated resistors and diodes.
    - \* The mica insulator on the Amplifier Board is defective or missing.
  - b) and the offset is negative:
    - \* D22 is shorted on the Power Supply Board.
    - \* C16 is shorted on the Power Supply Board.
    - \* D16 and D17 are shorted on the Power Supply Board.
    - \* C15 is shorted on the Power Supply Board.
    - \* Q22/Q32, Q12/Q33, or Q21 is defective on the Amplifier Board.
    - \* Q6 or Q5 is defective on the Amplifier Board.
    - \* Check the predrivers Q4/Q26 and Q7/Q27 and associated resistors and diodes.
    - \* The mica insulator on the Amplifier Board is defective or missing.

**Fault 4: No Output****AC Line Current Draw is Less Than 1 Amp.**

- 1) If the amplifier output is offset,
  - a) and the offset is positive:
    - \* U1 is defective if the output is positive and if pin 3 is at ground and pin 1 of U2 on the Amplifier Board is at ground.
    - \* U2 is defective if pin 1 or pin 7 is offset on the Amplifier Board.
    - \* Q2 is shorted or Q3 is open on the Amplifier Board.
    - \* Q4/Q26 is shorted or Q7/Q27 is open on the Amplifier Board.
    - \* R34 is open.
  - b) and the offset is negative:
    - \* U1 is defective if the output is negative and if pin 3 is at ground and pin 1 of U2 on the Amplifier Board is at ground.
    - \* U2 is defective if pin 1 or pin 7 is offset on the Amplifier Board.
    - \* Q3 is shorted or Q2 is open on the Amplifier Board.
    - \* Q7/Q27 is shorted or Q4/Q26 is open on the Amplifier Board.
    - \* R32 is open.

**Fault 5: No Output****Power Supply Regulating. No Signal Amplification.**

- 1) Mute drive defective.
  - a) Q8 on the Power Supply Board is shorted.
  - b) Q2 on the Power Supply Board is shorted.
  - c) Q1 on the Amplifier Board is shorted.
- 2) Defective current limiters.
  - a) Q9 on the Amplifier Board is shorted.
  - b) D7 on the Amplifier Board is shorted.
  - c) R94 or R95 have changed value or opened.
- 3) Disrupted signal path.
  - a) Mute FET Q1 is defective.
  - b) A bad solder joint at C3.
  - c) R3 is open.
  - d) Bad solder joint on the input jack connecting wire.
  - e) R97 is open (S7t only).
  - f) 0.2 ohm 20W resistor (binding post) open (S7t only).

**Fault 6: Distorted Amplification (Commutation and Power Supply Fault)**

- 1) First commutator is not supplying sufficient drive to the outputs:
  - a) Q19/Q31 or Q23/Q35 on the Amplifier Board is defective.
  - b) Either D29 or D30 is shorted. (This short causes the commutator current to flow back into the supply rather than to the output transistors.)
  - c) Insufficient voltage lead for the first commutator.
    - \* Either D18, D19, D20, D21, D22, or D23 is defective.

- 2) Second commutator is not supplying sufficient current to the outputs.
  - a) Either Q17/Q18/Q29/Q30 or Q24/Q25/Q36/Q37 is defective.
  - b) Insufficient drive to Q17/Q18/Q29/Q30 or Q24/Q25/Q36/Q37:
    - \* Check drive transistors Q13, Q14, or Q15, Q16.
    - \* Check bootstrap network D12, D35, C19, R49, R52, R62, or D15, D36, C20, R61, R65.
    - \* Either D28 or D31 is shorted. (This short causes second commutator current to flow back into the 67 V supply instead of to the output transistors.)
  - c) Current limiters are defective.
    - \* Check D7, Q9 or D9, Q10.
  - d) Drive circuitry is defective.
    - \* Check drivers Q11/Q28 and Q12/Q33.
    - \* Check R36 and R40.
    - \* Check predrivers Q4/Q26 and Q7/Q27.
    - \* Check fusible resistors R32 and R34.
    - \* Check fusible resistors R35 and R41.
    - \* Check D6 and D10.
    - \* Check Q2 and Q3.

**Fault 7: Drives No Load Ok. Distorts Into 4-8 ohm Load.**

- 1) Defective drive resistors on the Amplifier Board.
  - a) Check R36, R40, R35, R41, R32, and R34.
  - b) Check R23 and R26.
- 2) Overheated emitter resistors.
  - a) Check output emitter resistors R94 and R95.
  - b) Check commutator emitter resistors R84, R93, R92, and R96.
- 3) Leaky current limit transistors.
  - a) Check Q9 and Q10.
- 4) Defective commutator transistors.
  - a) Check Q17/Q18/Q29/Q30, Q24/Q25/Q36/Q37, Q19/Q31, Q22/Q34.
- 5) Defective commutator drive resistors
  - a) Check R66, R74, R73, and R82.
  - b) Check R49, R52, R62, R61, and R65.

**Fault 8: Incorrect Damping (S7t only)**

- 1) 0.2Ω 20W resistor in series with output is defective.
- 2) R97 on the Amplifier Board is defective.
- 3) U2 or R6-R15 is defective.

**Fault 9: Excessive Noise**

- 1) Bad TLO-81 op-amp (U1) on the Amplifier Board causes "hiss" or "popcorn" noise.
- 2) Secondary leads from transformer are not routed downward close to the chassis.
- 3) Improper grounding.
  - a) Signal ground and power supply ground are connected somewhere in addition to the common grounding point on the power supply.
  - b) Transformer center tap (black wire), +118 V caps ground (black wire), speaker ground return (black wire) not soldered properly.
- 4) Bad FET Q1 on the Amplifier Board.
- 5) Triac misfiring causes excessive noise.
- 6) See Service Bulletin SST-4.

**Fault 10: Excessive Turn Off "Thumps"**

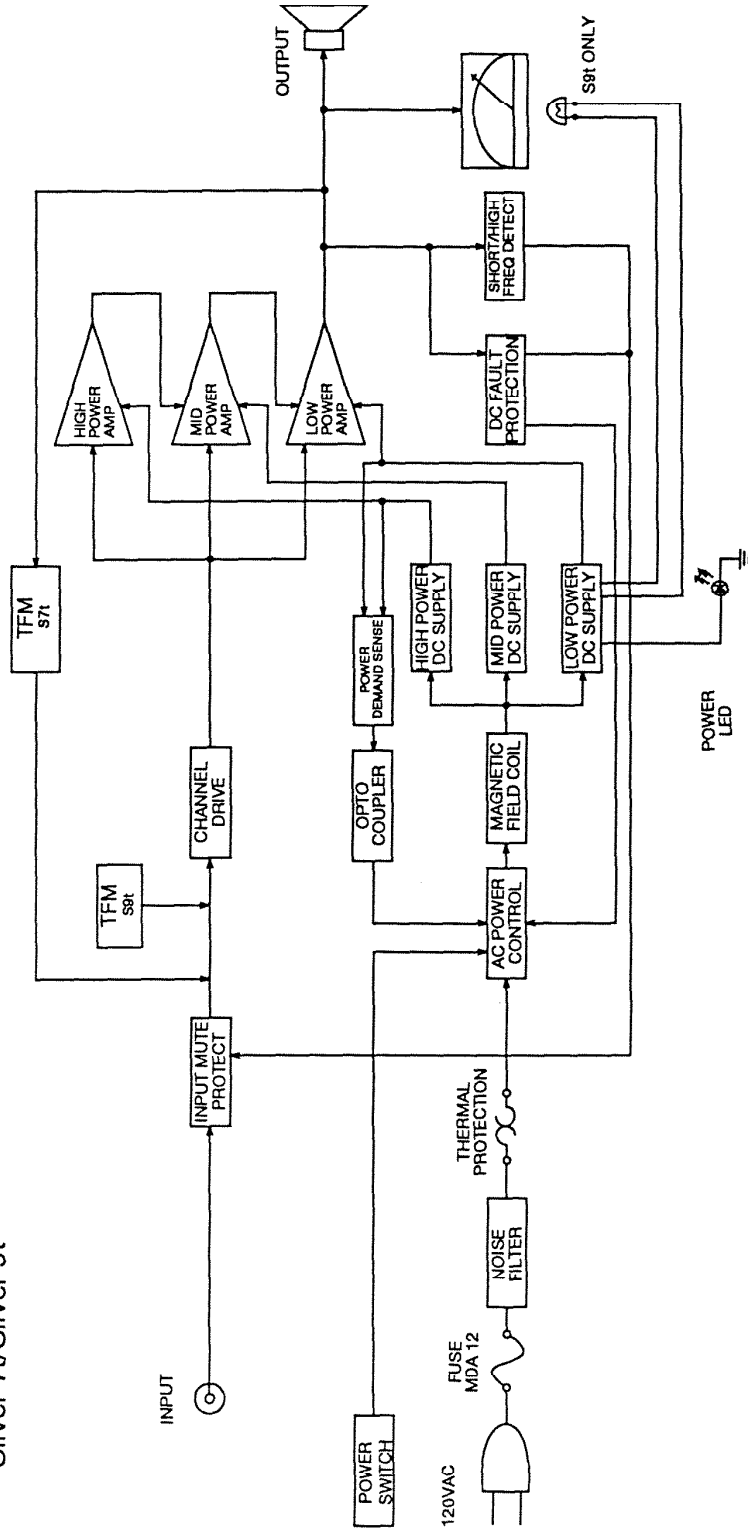
- 1) A delayed turn-off thump suggests a defective part in the low dc volt supplies:
  - a) Check R44, R49, R45, R55, R56, Q9 and C16.
  - b) Check R46, R47, R54, R57, R58, Q10 and C17.
- 2) Delayed turn-on and turn-off thumps indicate one of the following:
  - a) Defective TLO 81 on the Amplifier Board.
  - b) Leaky drivers or predrivers (Q4/Q26, Q7/Q27, Q11/Q28, or Q12/Q33).

**Fault 11: High Frequency Oscillation**

- 1) Output RC network at binding posts:
  - a) Check  $2.7\Omega$  5W.
  - b) Check  $0.33\mu\text{f}$  400 V.
- 2) Check the compensation capacitors, specifically:  
Check C18, C8, C9, and C4.
- 3) Check the feedback networks, specifically:
  - a) Check C15 and R14.
  - b) Check C13 and R39.

# SECTION 7 BLOCK DIAGRAM

**BLOCK DIAGRAM**  
Silver 7t/Silver 9t

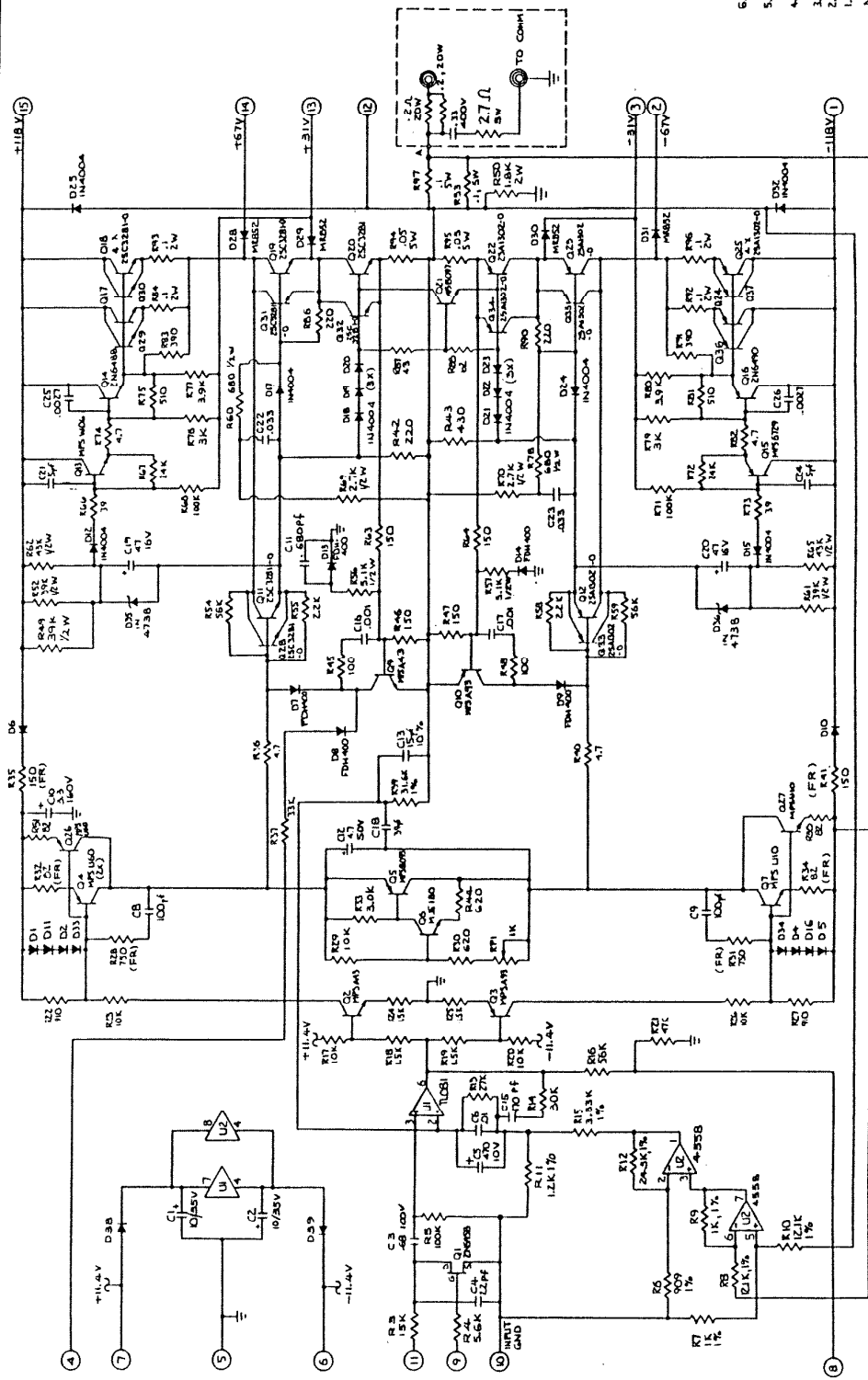




**SECTION 8**  
**SCHEMATICS AND LAYOUTS**

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DATE	REV	DESCRIPTION
1/20/51	1	RELEASED TO PRODUCTION



6. REF. DES. NOT USED: D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, D16, D17, D18, D19, D20, D21, D22, D23, D24, D25, D26, D27, D28, D29, D30, D31, D32, D33, D34, D35, D36, D37, D38, D39, D40, D41, D42, D43, D44, D45, D46, D47, D48, D49, D50, D51, D52, D53, D54, D55, D56, D57, D58, D59, D60, D61, D62, D63, D64, D65, D66, D67, D68, D69, D70, D71, D72, D73, D74, D75, D76, D77, D78, D79, D80, D81, D82, D83, D84, D85, D86, D87, D88, D89, D90, D91, D92, D93, D94, D95, D96, D97, D98, D99, D100.
5. REF. DES. LAST USED: C26, D39, J23, R97, Q37.
4. DASHED LINE (---) MEANS WARD WIRING OR COMPONENTS NOT MOUNTED ON BOARD.
3. CAPACITANCE IS IN MICRO-PARAFS.
2. RESISTANCE IS IN OHMS, 1/4W.
1. DIODES ARE 1N4148.

NOTES: UNLESS OTHERWISE SPECIFIED

DATE	REV	DESCRIPTION
1/20/51	1	RELEASED TO PRODUCTION

DESIGNER	DATE
P. MCGUIRE	11-19-51

PROJECT NO.	605-00576-01
REV.	A
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**CARVER**  
SCHEMATIC, AMP BD.  
SILVER SEVEN T



Part No. 501-00576-01 1 of 1

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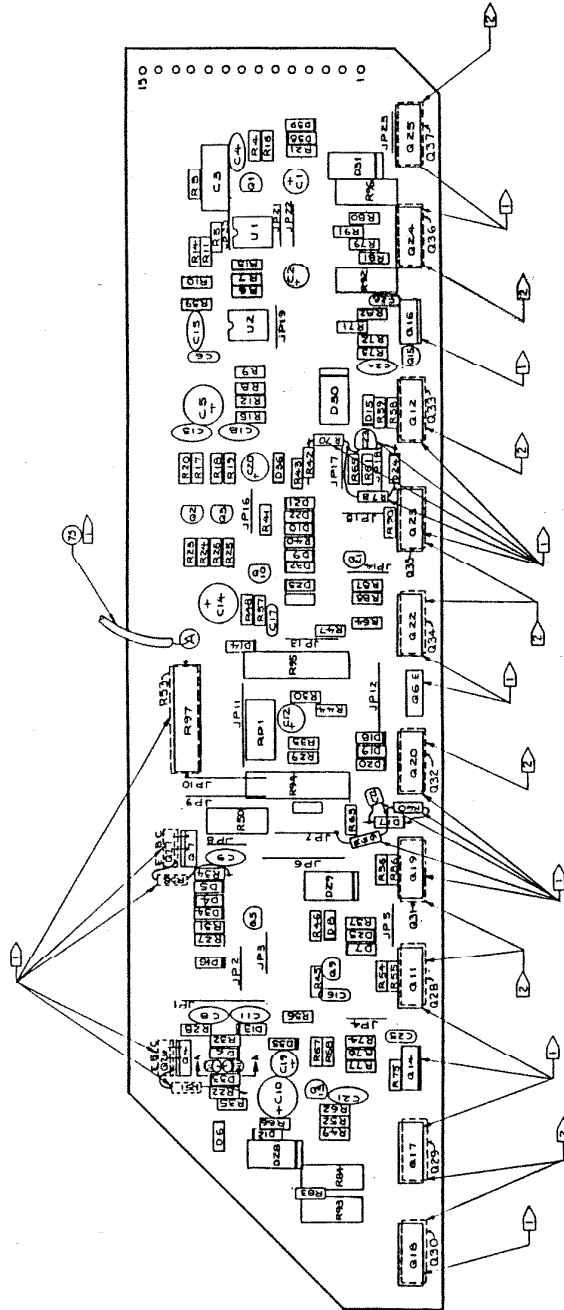
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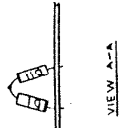
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 ▷ PARTS STUFFED ON 60A-00332-00 FINAL ASSY.



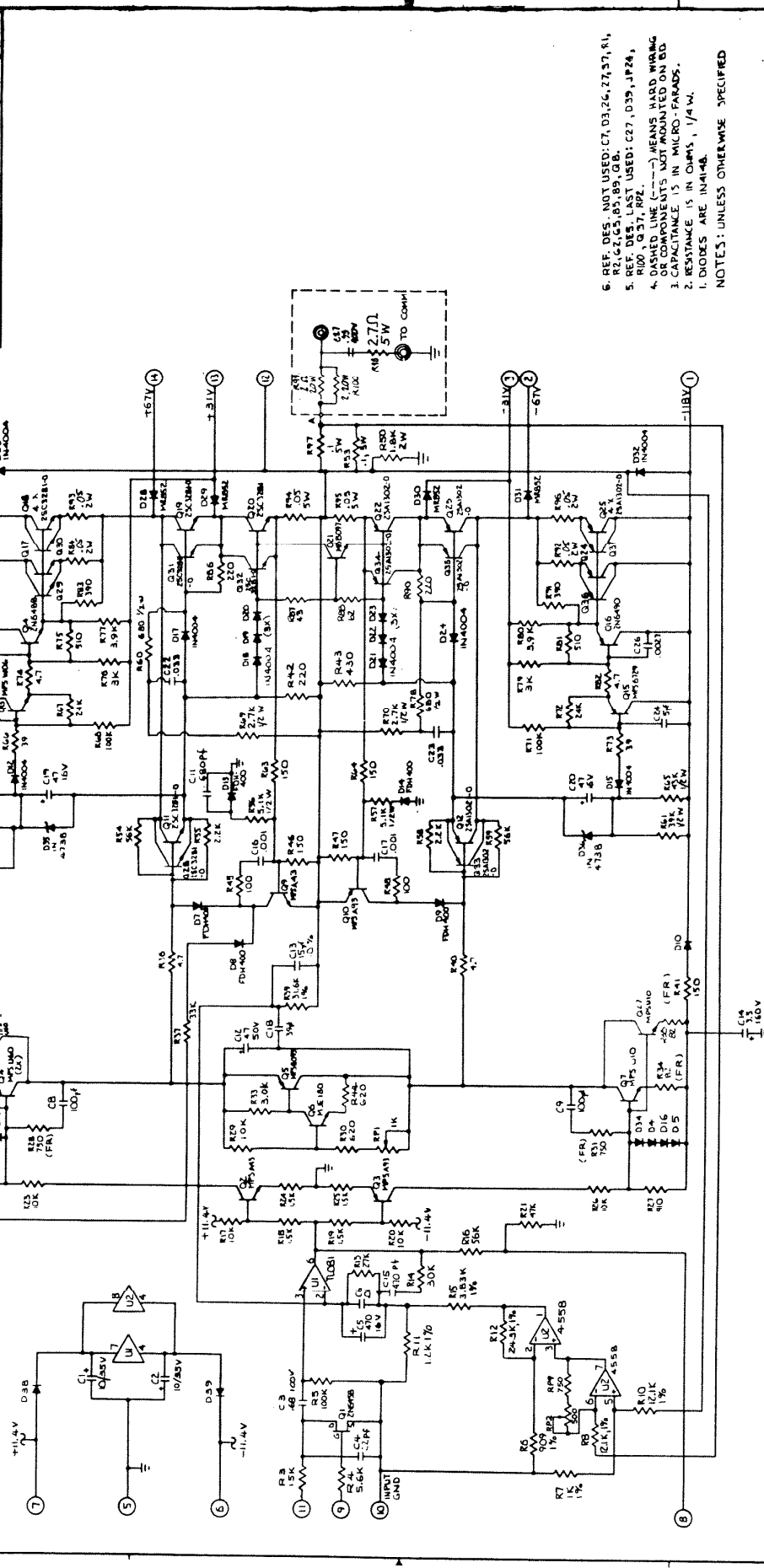
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C	INCORPORATED PER E.C.O. 042	4-27-57	

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 LOCATOR, AMP BD,  
 SILVER SEVEN t

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Scale	1:1	



605-00576-01	
REV	DESCRIPTION
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B	REPLACES 605-00576-01
C	REVISED PER 205 # 1545
D	R/W/P
E	INCORPORATED RCH # 887



605-00576-01	
REV	DESCRIPTION
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E	INCORPORATED RCH # 887

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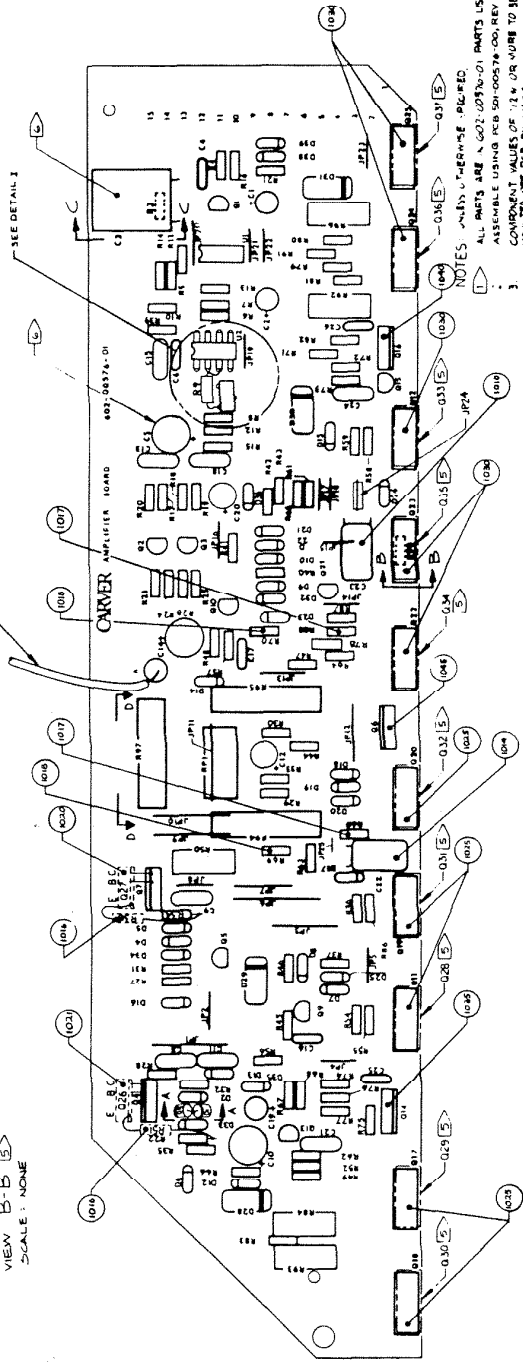
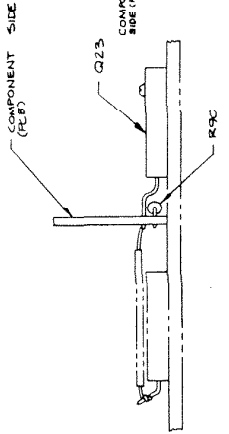
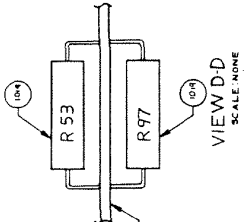
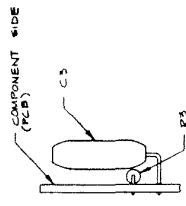
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DESIGNED BY	P. MCGUIRE
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APPROVED BY	
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REVISIONS	
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SHEET NO.	1
SCALE	AS SHOWN

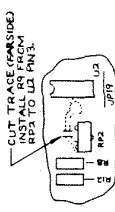
6. REF. DES. NOT USED: C1, D3, 24, 27, 37, R1, R2, 42, 45, 85, 89, G.B.
5. REF. DES. LAST USED: C27, D39, JF24, R100, Q 37, R92.
4. DASHED LINE (---) MEANS HARD WIRING.
3. CAPACITANCE IS IN MICRO-FARADS.
2. RESISTANCE IS IN OHMS, 1/4 W.
1. DIODES ARE 1N4148.

NOTES: UNLESS OTHERWISE SPECIFIED

602-00576-01	1	1
INCORP. ECO # 1537	11-13-79	11-13-79
INCORP. ECO # 1537	7-24-79	7-24-79
INCORP. ECO # 1537	7-24-79	7-24-79
INCORP. ECO # 1537	7-24-79	7-24-79



- NOTES
1. ALL PARTS ARE A 602-00576-01 PARTS LIST REV K. ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.
  2. DIMENSIONS ARE TO CENTER UNLESS OTHERWISE SPECIFIED.
  3. COMPONENTS SHOWN IN PHANTOM ARE TO BE MOUNTED ON CIRCUIT SIDE EXCEPT AS SHOWN IN VIEWS B-B & C-C.
  4. COMPONENTS SHOWN IN PHANTOM ARE REFERENCE ONLY AND SHALL BE INSTALLED AT FINAL ASSY.
  5. COMPONENTS SHOWN WITHOUT REFERENCE DESIGNATORS ARE NOT TO BE INSTALLED.
  6. ALL ITEM NUMBERS 1000 AND ABOVE SHALL BE INSTALLED AFTER SOLDER DIP AT BOARD TOUCH-UP LEVEL.

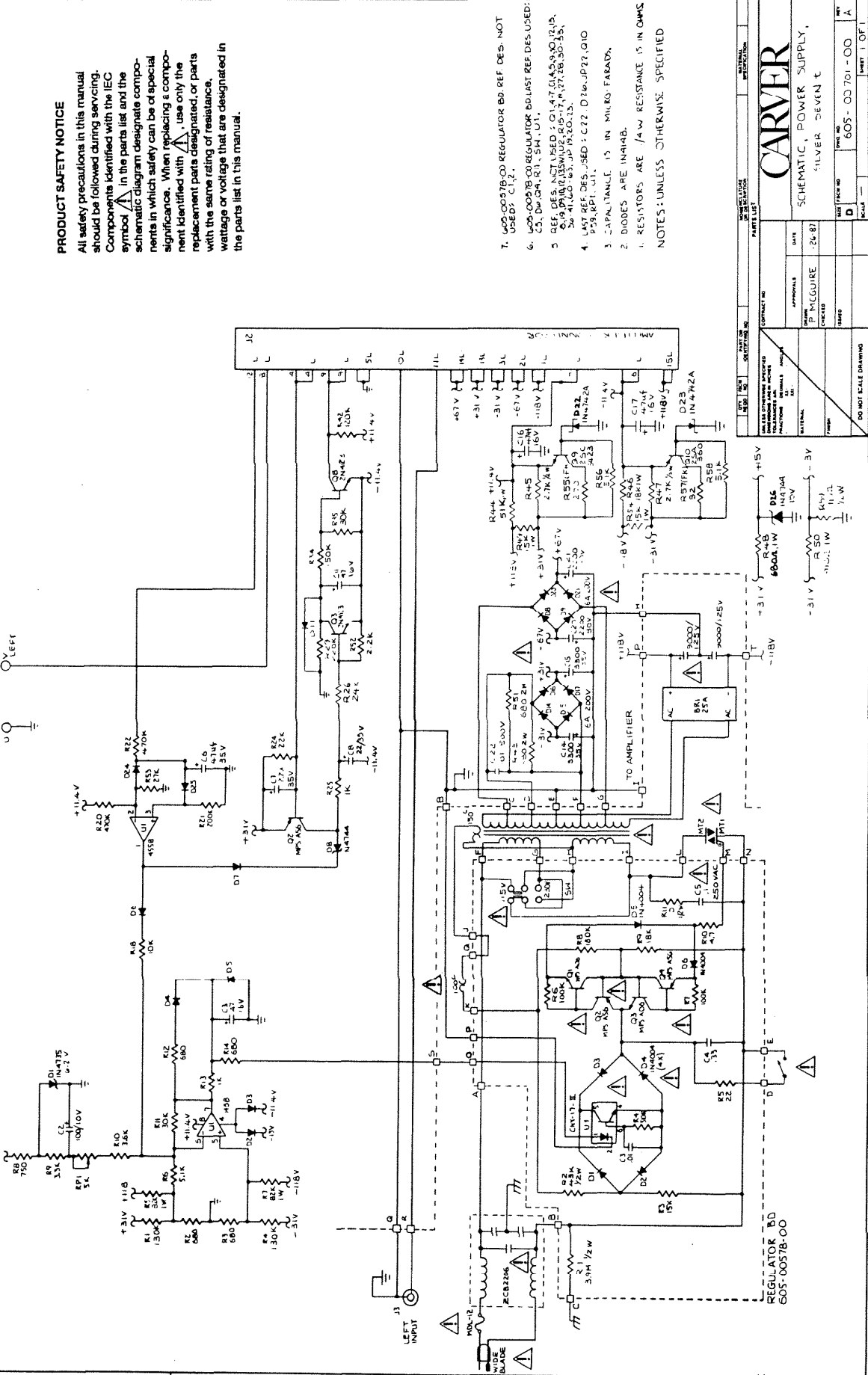


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INCORP. ECO # 1537		7-24-79	7-24-79

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INCORP. ECO # 1537		7-24-79	7-24-79

FORM NO. 605-00 101-00	REV. A	DATE 5-18-69	BY JZ
RELEASED TO PRODUCTION			



**PRODUCT SAFETY NOTICE**

All safety precautions in this manual should be followed during servicing. Components identified with the IEC symbol  $\Delta$  in the parts list and the schematic diagram designate components in which safety can be of special significance. When replacing a component identified with  $\Delta$ , use only the replacement parts designated, or parts with the same rating of resistance, wattage or voltage that are designated in the parts list in this manual.

1. 605-00578-00 REGULATOR BD REF. DES. NOT USED: C1, Z.
2. 605-00578-00 REGULATOR BD LAST REF. DES. USED: C1, Z.
3. 605-00578-00 REGULATOR BD LAST REF. DES. USED: C1, Z.
4. 605-00578-00 REGULATOR BD LAST REF. DES. USED: C1, Z.
5. 605-00578-00 REGULATOR BD LAST REF. DES. USED: C1, Z.
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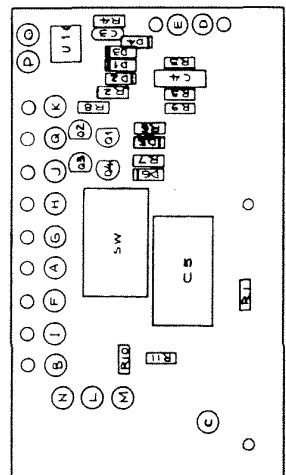
**CARVER**

SCHEMATIC, POWER SUPPLY,  
SILVER SEVEN C

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APPROVALS	DESIGNED	CHECKED	DATE
P. MCCUIRE (24-8)			
MATERIAL		PART LIST	
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FORM NO. 501-00676-00 1		REV. 1
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REV.	DATE	DESCRIPTION
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A		RELEASED PRODUCTION



NOTES: UNLESS OTHERWISE SPECIFIED.

FORM NO. 501-00676-00 1		REV. 1
DESCRIPTION		
REV.	DATE	DESCRIPTION
5		ADDED SW AND DELETED C1, Z, JPL, Z
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DESIGNER	DATE
CHECKED	DATE
APPROVED	DATE

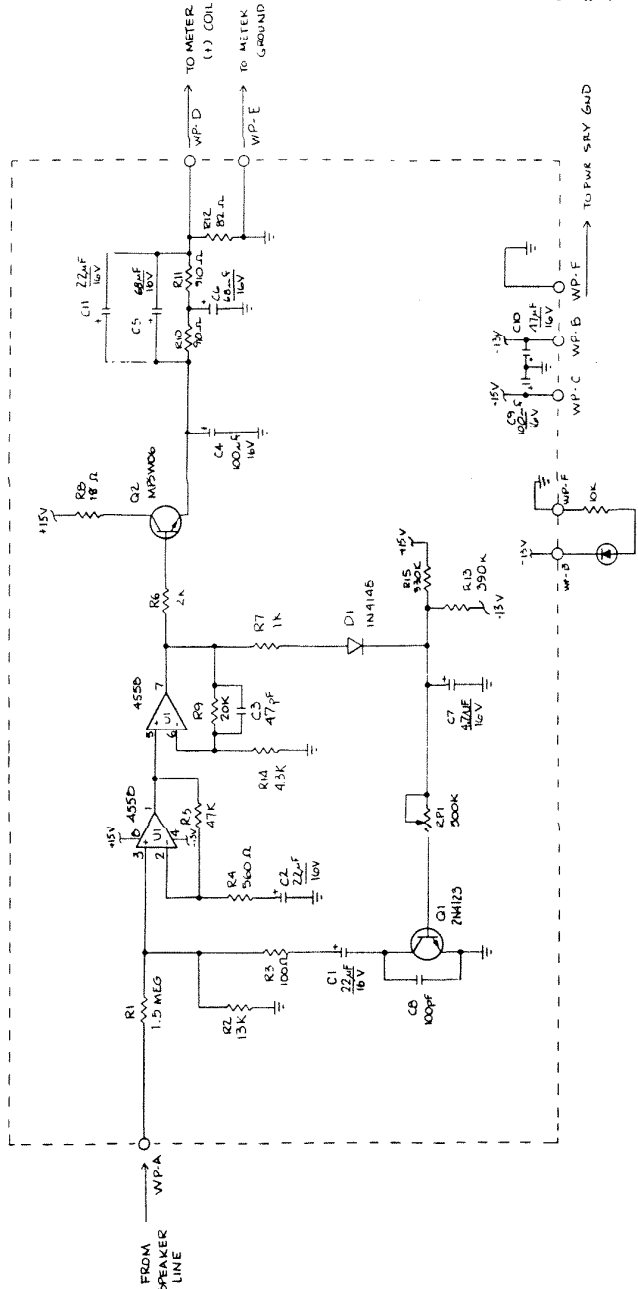
  

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2	SILVER 7c

FORM NO.	REV.
501-00676-00	1

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B		[Signature]		4		7		2/20/89	



- NOTES: UNLESS OTHERWISE SPECIFIED
1. RESISTANCE IS IN OHMS,  $\text{K}\Omega$ ,  $\text{M}\Omega$ .
  2. CAPACITANCE IS IN MICROFARADS.
  3. PART USED: C11, D1, R15, R1, R2, U1.
  4. PART USED: C4, R10, R12.

FORM NO. 605-00700-00		REV. 1	REV. 2	REV. 3	REV. 4	REV. 5	REV. 6	REV. 7	REV. 8
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**CARVER**  
SILVER SEVEN  $\tau$   
METER BOARD SCHEMATIC

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DESIGNED BY	DATE	REV. NO.	REV. DATE
CHECKED BY	DATE	REV. NO.	REV. DATE
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1 2 3 4 5 6 7 8

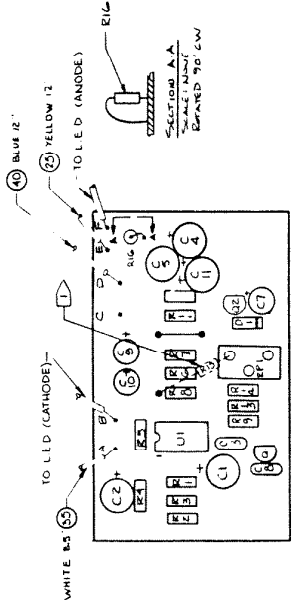
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REV.	DESCRIPTION	DATE	BY	CHKD.	APPROVED
A	RELEASED TO PRODUCTIONS	12-1-67			
B	1/2" x 3/4"	12-1-67			
C	INCORPORATED IN FIG. 1002	1-23-68			

D

C

B

A



NOTES: UNLESS OTHERWISE SPECIFIED:  
 [ ] COMPONENTS DRAWN IN DASHED LINES TO BE MOUNTED ON COUNTER SIDE OF PCB APPROX WHERE SHOWN.  
 [ ] ITEMS ARE ON 602-00700-00 ASSEMBLY, 1/4 SILVER 71 PARTS LIST.

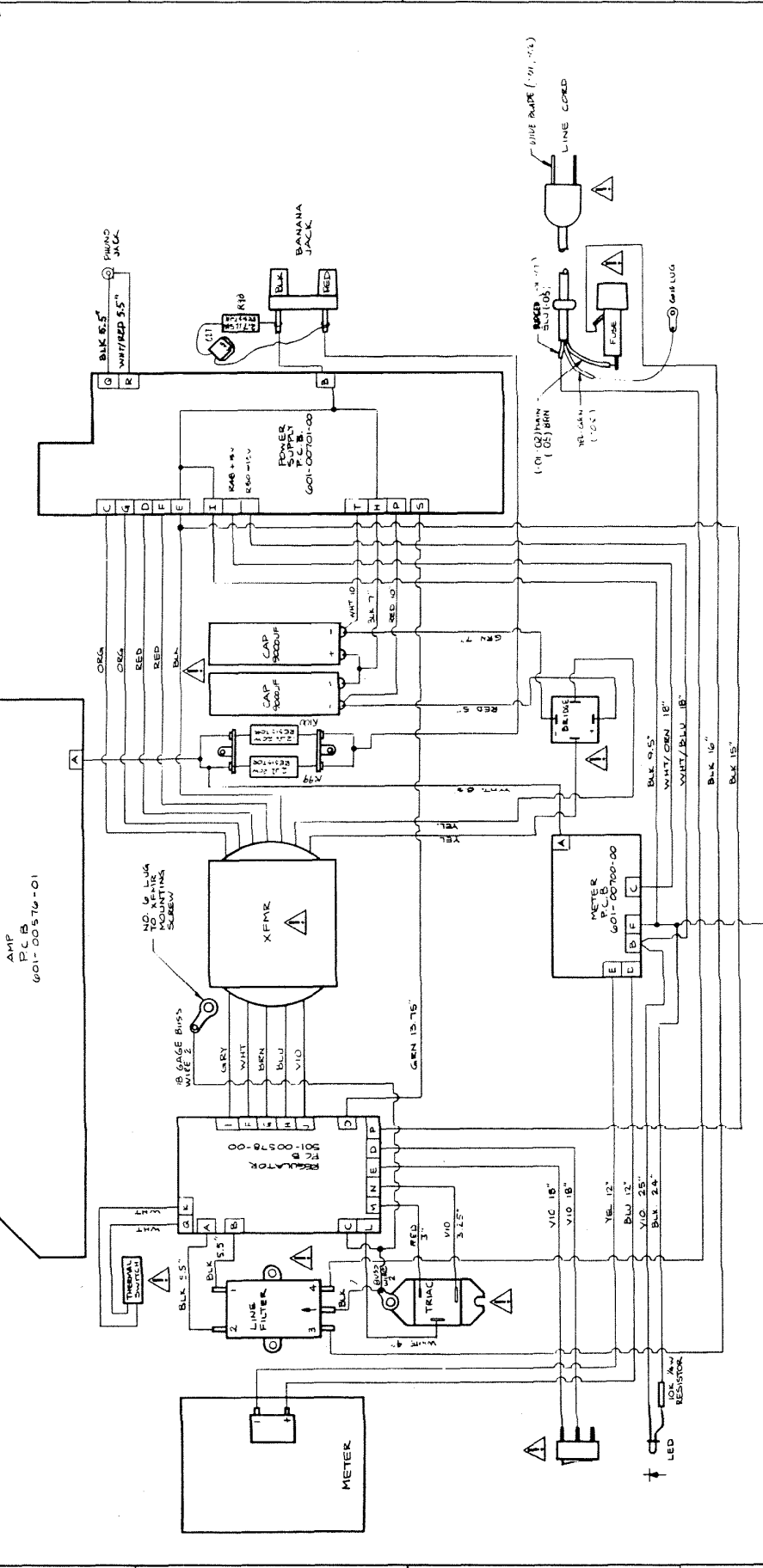
ITEM	WIRE COLOR	LENGTH	FROM	TO
35	WHITE	8.5"	WP-A	1 1/2" DIA. LADDER MOUNT BRG
36	YELLOW	12"	WP-E	METER -
40	BLUE	12"	WP-D	METER +
41	VIOLET	25"	WP-D	LED (CATHODE)
42	BLACK	24"	WP-F	LED (ANODE)

APPROVED	DATE	DESIGNED BY	DATE
		D. K. (RECH-ENSE)	9-28-66
PARTS LIST		CHECKED BY	DATE
			1-1-68
CONTRACT NO.		SCALE	
		D	501-00700-00
SHEET NO.		SHEET 1 OF 1	

1 2 3 4 5 6 7 8



REV	DATE	DESCRIPTION	APPROVED
1	3-20-59	RECEIVED TO PRODUCTION	
2	7-23-59	APPROVED FOR PRODUCTION	
3	1-27-60	REVISIONS	
4	4-27-60	REVISIONS	
5	10-8-60	REVISIONS	
6	3-30-60	REVISIONS	



REV	DATE	DESCRIPTION	APPROVED
1	3-20-59	RECEIVED TO PRODUCTION	
2	7-23-59	APPROVED FOR PRODUCTION	
3	1-27-60	REVISIONS	
4	4-27-60	REVISIONS	
5	10-8-60	REVISIONS	
6	3-30-60	REVISIONS	

**CARVER**  
 WIRING DIAGRAM,  
 SILVER SEVEN T

DATE	3-20-59
BY	J. H. J.
CHECKED	J. H. J.
APPROVED	J. H. J.
SCALE	DO NOT SCALE DRAWING

DO NOT SCALE DRAWING	SCALE	SCALE
SCALE	SCALE	SCALE
SCALE	SCALE	SCALE

SCALE	SCALE	SCALE
SCALE	SCALE	SCALE
SCALE	SCALE	SCALE

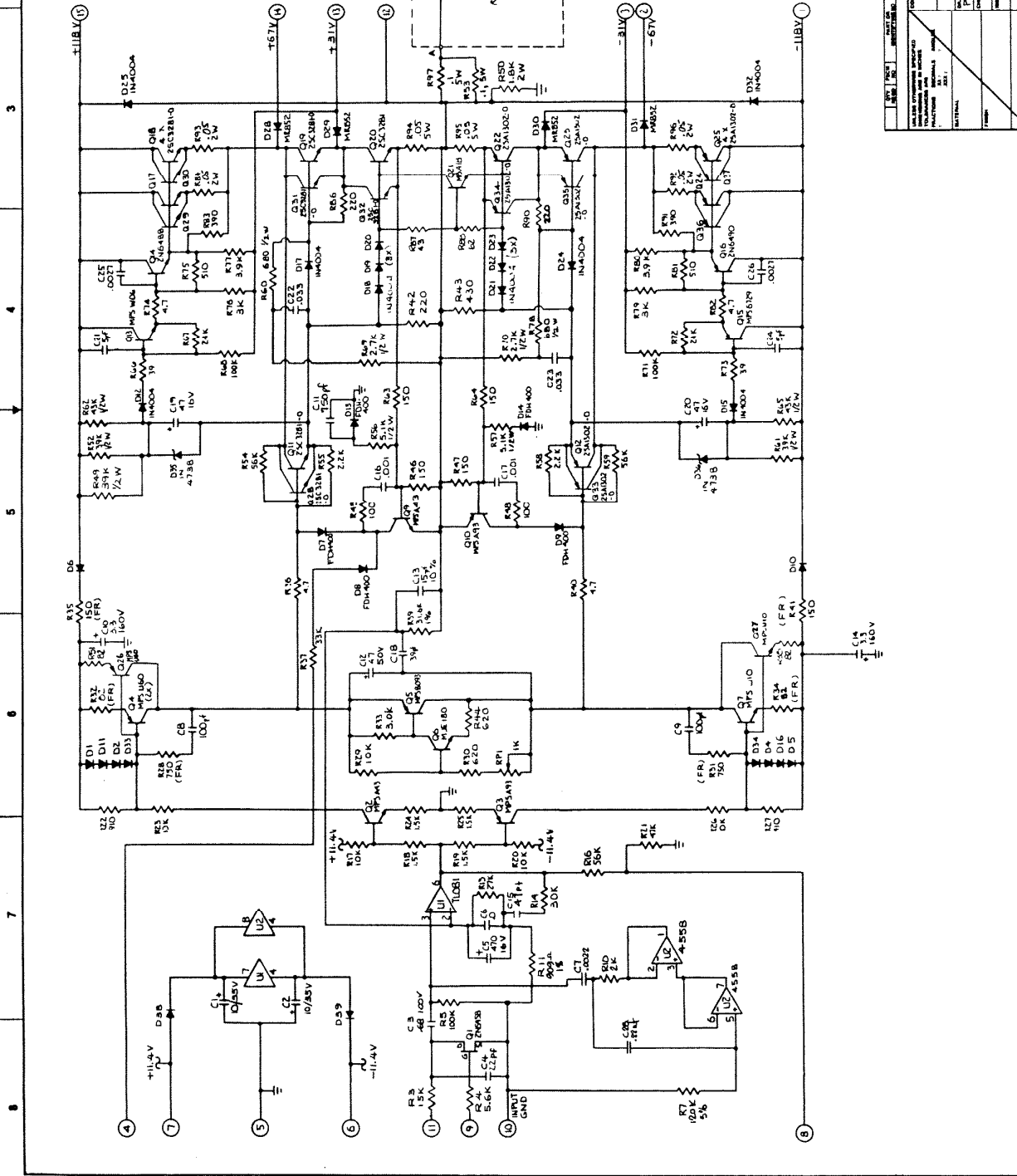
SCALE	SCALE	SCALE
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SCALE	SCALE	SCALE

SCALE	SCALE	SCALE
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SCALE	SCALE	SCALE

SCALE	SCALE	SCALE
SCALE	SCALE	SCALE
SCALE	SCALE	SCALE

SCALE	SCALE	SCALE
SCALE	SCALE	SCALE
SCALE	SCALE	SCALE

REV	DATE	DESCRIPTION	BY	CHKD
1	12/18/67	RELEASED TO PRODUCTION		
2	12/18/67	INCORPORATED ECO # 1645		
3	12/18/67	REPLACED BY PART # 1645		
4	12/18/67	INCORPORATED ECO # 1645		
5	12/18/67	INCORPORATED ECO # 1645		
6	12/18/67	INCORPORATED ECO # 1645		
7	12/18/67	INCORPORATED ECO # 1645		
8	12/18/67	INCORPORATED ECO # 1645		



- REF. DES. NOT USED: D3, 26, 27, 37, 31,
- REF. DES. NOT USED: D9, 99,
- REF. DES. NOT USED: C27, D39, J23,
- REF. DES. NOT USED: R10, 10, 37, R1,
- DASHED LINE (---) MEANS HARD WIRING OR COMPONENTS NOT MOUNTED ON B.D.
- CAPACITANCE IS IN MICRO-FARADS.
- RESISTANCE IS IN OHMS, 1/4W.
- DIODES ARE 1N4148.

NOTES: UNLESS OTHERWISE SPECIFIED

REV	DATE	DESCRIPTION	BY	CHKD
1	11/19/67	RELEASED TO PRODUCTION		
2	11/19/67	INCORPORATED ECO # 1645		
3	11/19/67	REPLACED BY PART # 1645		
4	11/19/67	INCORPORATED ECO # 1645		
5	11/19/67	INCORPORATED ECO # 1645		
6	11/19/67	INCORPORATED ECO # 1645		
7	11/19/67	INCORPORATED ECO # 1645		
8	11/19/67	INCORPORATED ECO # 1645		

**CARVER**  
SILVER NINE

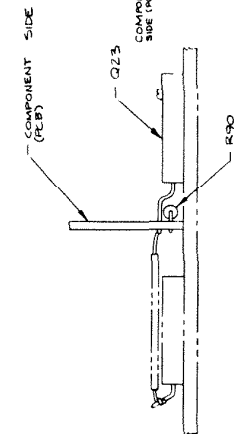
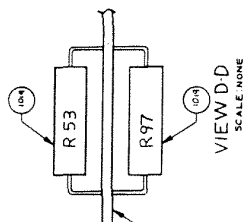
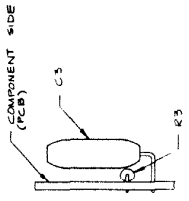
SCHEMATIC, AMP BD.  
SILVER NINE

REV	DATE	DESCRIPTION	BY	CHKD
1	11/19/67	RELEASED TO PRODUCTION		
2	11/19/67	INCORPORATED ECO # 1645		
3	11/19/67	REPLACED BY PART # 1645		
4	11/19/67	INCORPORATED ECO # 1645		
5	11/19/67	INCORPORATED ECO # 1645		
6	11/19/67	INCORPORATED ECO # 1645		
7	11/19/67	INCORPORATED ECO # 1645		
8	11/19/67	INCORPORATED ECO # 1645		

602-00576-01

REV	DESCRIPTION	DATE
G	INCORP CHANGES PER ECO # 1320	12-19-59
H	INCORP ECO #187	7-24-60
J	INCORP ECO #1557	10-19-60
K	INCORP ECO #1672	01-13-61
L	INCORP ECO #1645	2-14-61
M	INCORP ECO #1641	01-19-61

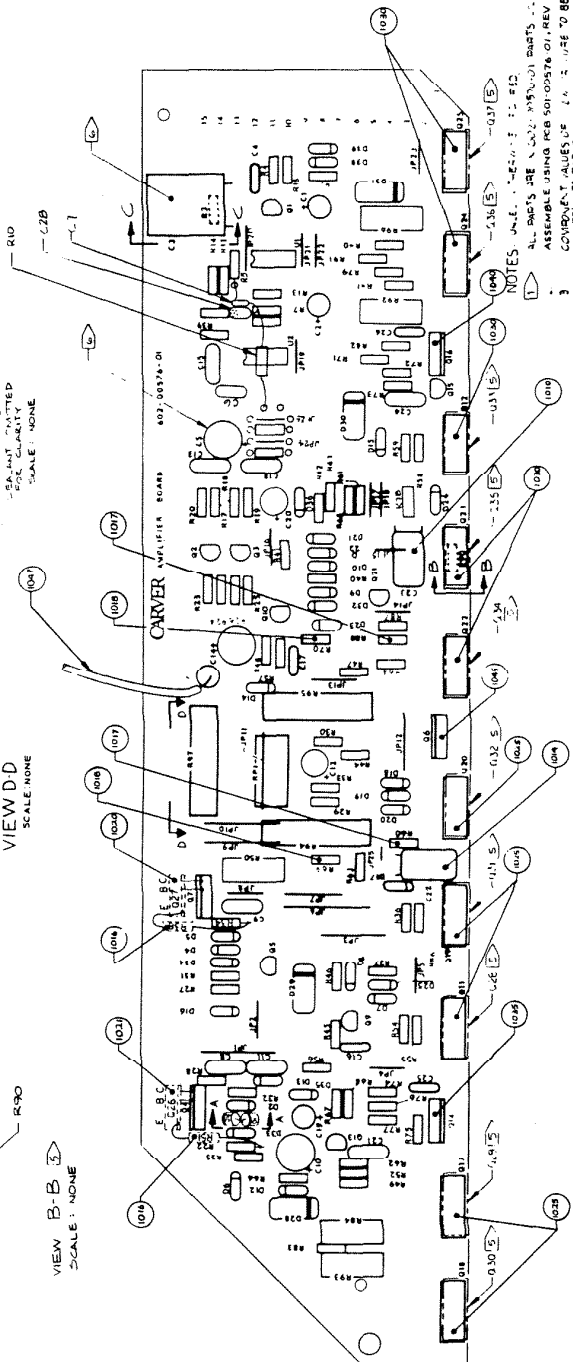
REV	DESCRIPTION	DATE
N	INCORP ECO #1641	01-19-61
O	INCORP ECO #1641	01-19-61
P	INCORP ECO #1641	01-19-61
Q	INCORP ECO #1641	01-19-61
R	INCORP ECO #1641	01-19-61
S	INCORP ECO #1641	01-19-61
T	INCORP ECO #1641	01-19-61
U	INCORP ECO #1641	01-19-61
V	INCORP ECO #1641	01-19-61
W	INCORP ECO #1641	01-19-61
X	INCORP ECO #1641	01-19-61
Y	INCORP ECO #1641	01-19-61
Z	INCORP ECO #1641	01-19-61



VIEW C-C  
SCALE: NONE

VIEW D-D  
SCALE: NONE

VIEW B-B  
SCALE: NONE



- NOTES
- 1 ALL PARTS ARE AS SHOWN UNLESS OTHERWISE SPECIFIED. REV. N.
  - 2 ASSEMBLY USING PCB 501-00576-01 REV. A.
  - 3 COMPONENT VALUES ARE AS SHOWN UNLESS OTHERWISE SPECIFIED.
  - 4 COMPONENTS SHOWN IN CIRCLES ARE TO BE MOUNTED AS SHOWN EXCEPT AS SHOWN OTHERWISE.
  - 5 COMPONENTS SHOWN IN SQUARES ARE TO BE MOUNTED AS SHOWN EXCEPT AS SHOWN OTHERWISE.
  - 6 APPLY SOLDER DIP UNDER COMPONENT AS REQUIRED.
  - 7 COMPONENTS SHOWN WITHOUT REFERENCE DESIGNATORS ARE NOT TO BE INSTALLED.
  - 8 ALL ITEM NUMBERS 1000 AND ABOVE SHALL BE INSTALLED AFTER SOLDER DIP AT BOARD TOUCH UP LEVEL.

602-00576-01		REV. N	1	OF 1
CARVER		ASSY. PCB AMPLIFIER		
APPROVED	DATE	APPROVED	DATE	
J. EDWARDS	12-19-59			
DO NOT SCALE DRAWING				

01	602-00576-01	564	1300	PRINT
02	602-00576-01	564	1300	PRINT
03	602-00576-01	564	1300	PRINT
04	602-00576-01	564	1300	PRINT
05	602-00576-01	564	1300	PRINT
06	602-00576-01	564	1300	PRINT
07	602-00576-01	564	1300	PRINT
08	602-00576-01	564	1300	PRINT
09	602-00576-01	564	1300	PRINT
10	602-00576-01	564	1300	PRINT
11	602-00576-01	564	1300	PRINT
12	602-00576-01	564	1300	PRINT
13	602-00576-01	564	1300	PRINT
14	602-00576-01	564	1300	PRINT
15	602-00576-01	564	1300	PRINT
16	602-00576-01	564	1300	PRINT
17	602-00576-01	564	1300	PRINT
18	602-00576-01	564	1300	PRINT
19	602-00576-01	564	1300	PRINT
20	602-00576-01	564	1300	PRINT

602-00576-01		REV. N	1	OF 1
CARVER		ASSY. PCB AMPLIFIER		
APPROVED	DATE	APPROVED	DATE	
J. EDWARDS	12-19-59			
DO NOT SCALE DRAWING				

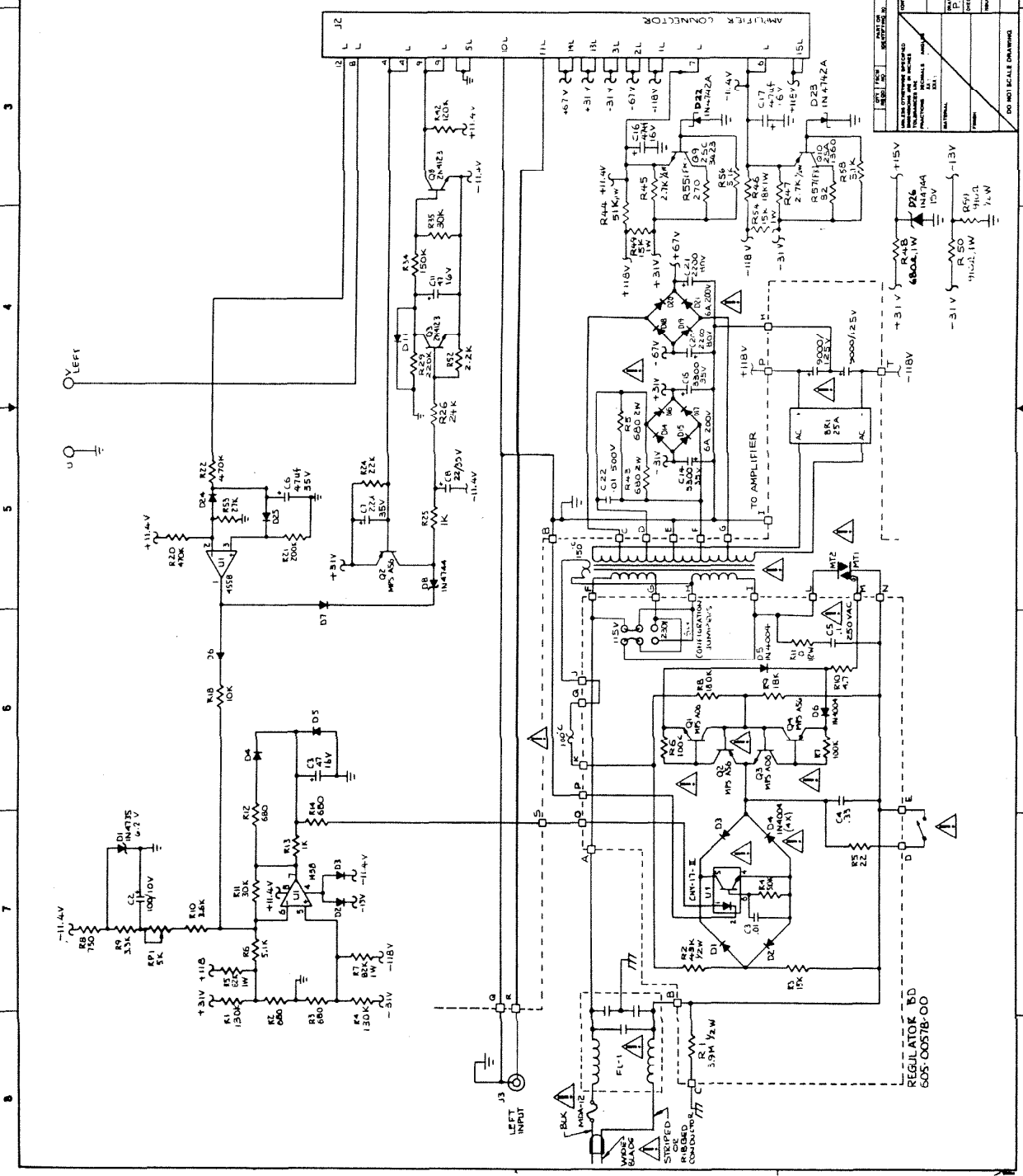
REV	DESCRIPTION	DATE	APPROVED
A	RELEASED TO PRODUCTION	5-20-59	[Signature]
B	INCORPORATED E.C. 1186	11-8-59	[Signature]
C	INCORP E.C. # 1110	5-10-59	[Signature]

**PRODUCT SAFETY NOTICE**

All safety precautions in this manual should be followed during servicing. Components identified with the IEC symbol  $\Delta$  in the parts list and the schematic diagram designate components in which safety can be of special significance. When replacing a component identified with  $\Delta$ , use only the replacement parts designated, or parts with the same rating of resistance, wattage or voltage that are designated in the parts list in this manual.

- 605-0057B-00 REGULATOR BD. REF. DES. NOT USED; C1,7.
- 605-0057B-00 REGULATOR BD. LAST REF. DES. USED: C3, D6, D9, R11, S14, U11.
- REF. DES. NOT USED: C14,7, C16, S9, X0, I2, I3, O, P, R10, R13, R15, R16, R17, R18, R19, R20, R21, R22, R23, R24, R25, R26, R27, R28, R29, R30, R31, R32, R33, R34, R35, R36, R37, R38, R39, R40, R41, R42, R43, R44, R45, R46, R47, R48, R49, R50, R51, R52, R53, R54, R55, R56, R57, R58, R59, R60, R61, R62, R63, R64, R65, R66, R67, R68, R69, R70, R71, R72, R73, R74, R75, R76, R77, R78, R79, R80, R81, R82, R83, R84, R85, R86, R87, R88, R89, R90, R91, R92, R93, R94, R95, R96, R97, R98, R99, R100, R101, R102, R103, R104, R105, R106, R107, R108, R109, R110, R111, R112, R113, R114, R115, R116, R117, R118, R119, R120, R121, R122, R123, R124, R125, R126, R127, R128, R129, R130, R131, R132, R133, R134, R135, R136, R137, R138, R139, R140, R141, R142, R143, R144, R145, R146, R147, R148, R149, R150, R151, R152, R153, R154, R155, R156, R157, R158, R159, R160, R161, R162, R163, R164, R165, R166, R167, R168, R169, R170, R171, R172, R173, R174, R175, R176, R177, R178, R179, R180, R181, R182, R183, R184, R185, R186, 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- LAST REF. DES. USED: C22, D 24, J22, Q10, R53, R41, U1.
- CAPACITANCE IS IN MICRO-FARADS.
- DIODES ARE 1N4148.
- RESISTORS ARE 1/4W RESISTANCE IS IN OHMS.

NOTES: UNLESS OTHERWISE SPECIFIED

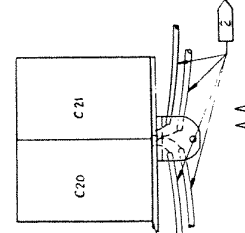
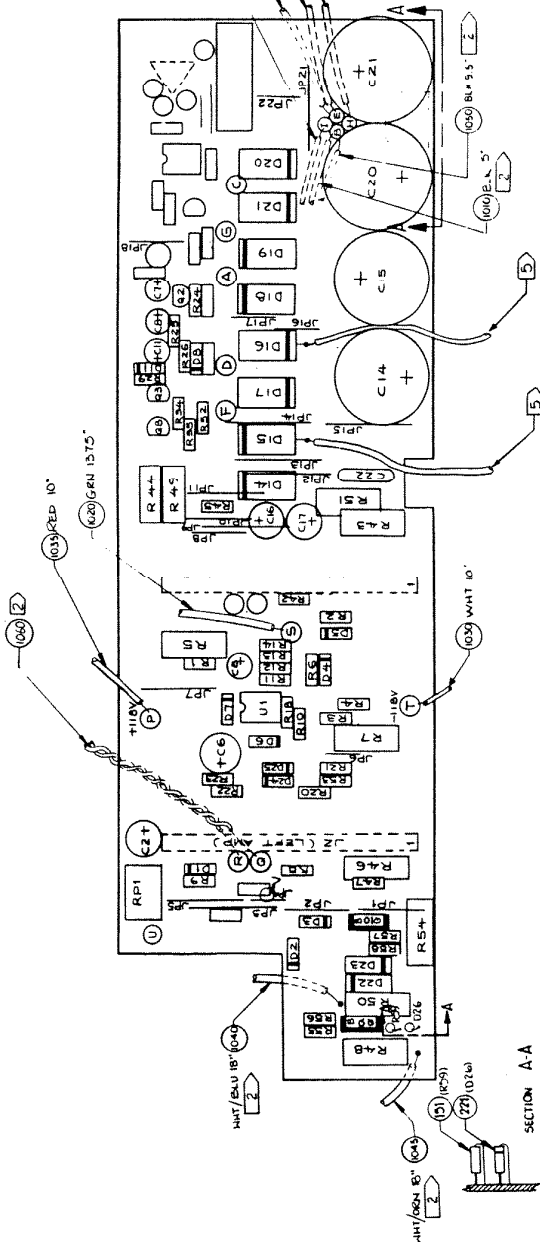


REV	DESCRIPTION	DATE	APPROVED
A	RELEASED TO PRODUCTION	5-20-59	[Signature]
B	INCORPORATED E.C. 1186	11-8-59	[Signature]
C	INCORP E.C. # 1110	5-10-59	[Signature]

REV	DESCRIPTION	DATE	APPROVED
A	RELEASED TO PRODUCTION	5-20-59	[Signature]
B	INCORPORATED E.C. 1186	11-8-59	[Signature]
C	INCORP E.C. # 1110	5-10-59	[Signature]

REGULATOR BD  
605-0057B-00

ITEM	COLOR	LENGTH	FROM	TO
1000	BLK	5"	MP-B	BLK BINDING POST
1025	BLK	7"	MP-11	LARGE CAPS - CENTER
1050	BLK	3"	MP-8	INPUT JACK - TERMINAL
1060	W/RED	5.5"	MP-Q	INPUT JACK - SOLDER LUG
1015	BLK	15"	MP-E	REG. BJ. MP-P
1020	GRN	15.75"	MP-S	REG. BJ. MP-O
1030	WHT	10"	MP-T	LARGE CAPS - (METER)
1035	RED	10"	MP-P	LARGE CAPS - (METER)
1040	WHT/BLU	18"	K-40	METER PCB - MP-C
1050	BLK	9.5"	MP-B	GND LUG - PHONO JACK
1060	BLK	24"	DIS	METER LIGHT PCB
1070	RED	24"	MP-B	METER LIGHT PCB



REV.	DATE	BY	DESCRIPTION
1	11-27-83	JK	ISSUED FOR PRODUCTION
2	11-27-83	JK	REVISIONS
3	11-27-83	JK	REVISIONS
4	11-27-83	JK	REVISIONS
5	11-27-83	JK	REVISIONS
6	11-27-83	JK	REVISIONS
7	11-27-83	JK	REVISIONS
8	11-27-83	JK	REVISIONS

DATE	REV.	BY	DESCRIPTION
11-27-83	1	JK	ISSUED FOR PRODUCTION
11-27-83	2	JK	REVISIONS
11-27-83	3	JK	REVISIONS
11-27-83	4	JK	REVISIONS
11-27-83	5	JK	REVISIONS
11-27-83	6	JK	REVISIONS
11-27-83	7	JK	REVISIONS
11-27-83	8	JK	REVISIONS

REV.	DATE	BY	DESCRIPTION
1	11-27-83	JK	ISSUED FOR PRODUCTION
2	11-27-83	JK	REVISIONS
3	11-27-83	JK	REVISIONS
4	11-27-83	JK	REVISIONS
5	11-27-83	JK	REVISIONS
6	11-27-83	JK	REVISIONS
7	11-27-83	JK	REVISIONS
8	11-27-83	JK	REVISIONS

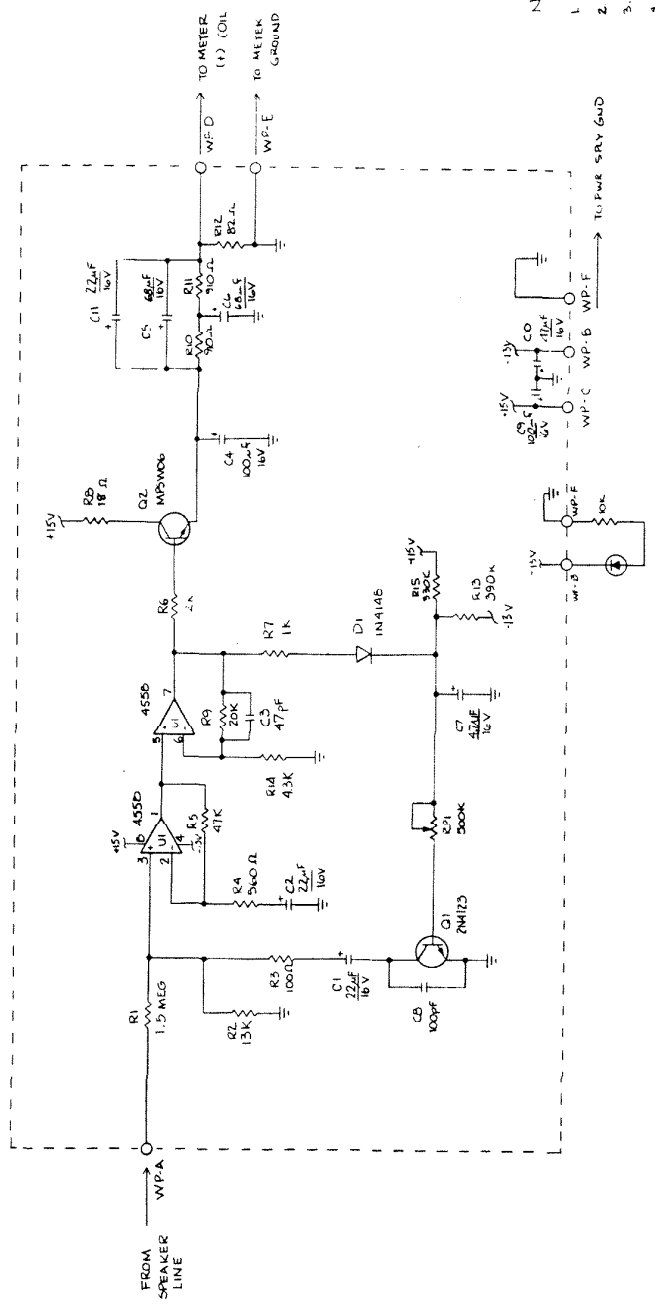
NOTES: UNLESS OTHERWISE SPECIFIED:  
 1) ALL ITEMS ARE ON 602-00701-00 PARTS LIST REV. G.  
 2) INSTALL ON BACK OF BOARD.  
 3) USE PCB, 50% COPPER/10% G.O.  
 4) COMPONENT VALUES OF 1/2W OR MORE TO BE MARKED OFF PCB BY 1/4 IN.  
 5) WIRES ARE CONDUCTED DURING FINAL ASSY. FROM LIGHT METER PCB (602-00702-00).

ITEM	DESCRIPTION	DATE	APPROVED
A	RELEASED TO PRODUCTION	12-1-83	JK
B	INCORPORATED ON ECO 1643	1-6-84	JK
C	INCORPORATED ON ECO 1643	3-20-84	JK
D	INCORPORATED ON ECO 1643	10-1-84	JK
E	INCORPORATED ON ECO 1643	11-27-83	JK
F	INCORPORATED ON ECO 1643	11-27-83	JK
G	INCORPORATED ON ECO 1643	11-27-83	JK

ITEMS CHANGED PER ECO 1643 (R14):  
 FROM: 15, 22, 23, 30, 40, 49, 50, 59, 60, 65, 66, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.



605-00700-00		1	1	1
REV	DESCRIPTION	DATE	APPROVED	
1	ZONE 7, 1, 2, 10, 15, 16, 2, ZONE 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	7-20-89	ALL	
2	ZONE 7, 1, 2, 10, 15, 16, 2, ZONE 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	1-20-87	ALL	
3	RELEASED TO PRODUCTION	1-20-87	ALL	
4	INCORPORATED PER 605-00700-00	4-21-87	ALL	



- NOTES: UNLESS OTHERWISE SPECIFIED
- 1 RESISTANCE IS IN OHMS, KΩ, MΩ.
  - 2 CAPACITANCE IS IN MICROFARADS.
  3. LAST USED: C1, D1, R15, R17, R21, R22, U1.
  4. NOT USED: C2, R19, R23.

605-00700-00		1	1	1
REV	DESCRIPTION	DATE	APPROVED	
1	ZONE 7, 1, 2, 10, 15, 16, 2, ZONE 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	7-20-89	ALL	
2	ZONE 7, 1, 2, 10, 15, 16, 2, ZONE 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	1-20-87	ALL	
3	RELEASED TO PRODUCTION	1-20-87	ALL	
4	INCORPORATED PER 605-00700-00	4-21-87	ALL	

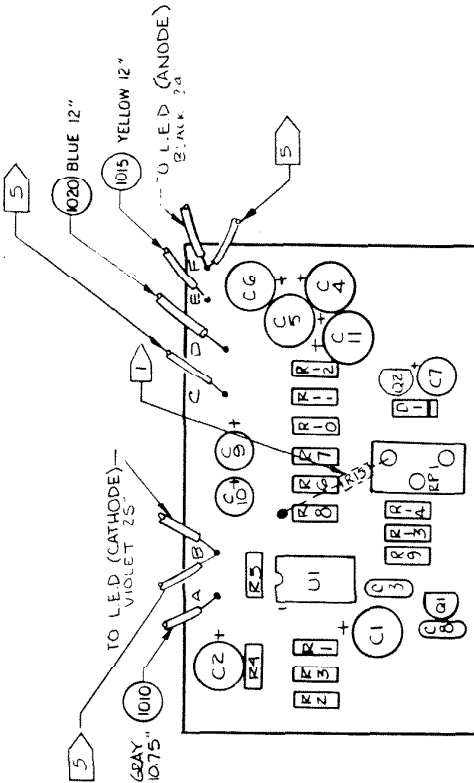
605-00700-00		1	1	1
REV	DESCRIPTION	DATE	APPROVED	
1	ZONE 7, 1, 2, 10, 15, 16, 2, ZONE 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	7-20-89	ALL	
2	ZONE 7, 1, 2, 10, 15, 16, 2, ZONE 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	1-20-87	ALL	
3	RELEASED TO PRODUCTION	1-20-87	ALL	
4	INCORPORATED PER 605-00700-00	4-21-87	ALL	

CARVER  
SILVER NINE  
METER BOARD SCHEMATIC

605-00700-00		1	1	1
REV	DESCRIPTION	DATE	APPROVED	
1	ZONE 7, 1, 2, 10, 15, 16, 2, ZONE 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	7-20-89	ALL	
2	ZONE 7, 1, 2, 10, 15, 16, 2, ZONE 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	1-20-87	ALL	
3	RELEASED TO PRODUCTION	1-20-87	ALL	
4	INCORPORATED PER 605-00700-00	4-21-87	ALL	

602-00700-00 1 F 1 3 4 5 6 7 8

REV	DATE	DESCRIPTION	BY	CHKD
1	3-22-61	REVISED TO PRESENTATION		
2	3-22-61	ECO # 1922		
3	3-22-61	INCORP. ECO # 1041, DELETED RIG. 1. JUMPER ADDED. RIG 12. DELETED 14.		
4	3-22-61	CHANGES PER ECO # 1214: 1) JUMPER ADDED. RIG 12. FROM: 10. 25. 1072. TO: 10. 25. 1078. 2) NOTES 3 AND 4 ADDED. 3) FLAG NOTE SYMBOL ( ) DELETED FROM NOTE 2. 4) JIG NO. CHANGED FROM 201-00700-00 TO 602-00700-00. 5) TITLE CHANGED FROM "SILVER SHEET METER BOARD" TO "ASSY. PCB METER BOARD - SILVER SHEET METER BOARD". 6) REV STATUS CHANGED TO MATCH PARTS LIST		
5	11-21-61			
6	11-21-61			
7	11-21-61			
8	11-21-61			



ITEM	WIRE COLOR	LENGTH	FROM	TO
1010	GRAY	10.75"	WIP-A	WIRE BONDING POST (POS) METER
1015	YELLOW	12"	WIP-E	METER
1020	BLUE	12"	WIP-D	METER
LED 1	VIOLET	25"	WIP-D	LED (CATHODE)
LED 2	BLACK	25"	WIP-F	LED (ANODE)
LED 3	BLACK	9.5"	WIP-E	WIP-F (C-ROST SIDE)
LED 4	WHITE	8"	WIP-D	WIP-E
LED 5	WHITE	18"	WIP-B	WIP-B (RECUT SIDE)

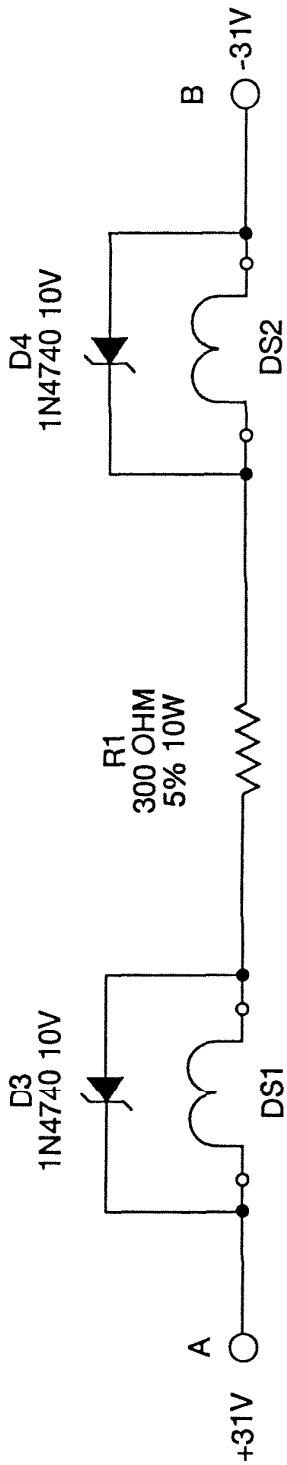
- NOTES - UNLESS OTHERWISE SPECIFIED:
- COMPONENTS DRAWN IN DASHED LINES TO BE MOUNTED ON CIRCUIT SIDE OF PCB APPROX WHERE SHOWN.
  - ALL ITEMS ARE ON 602-00700-00 PARTS LIST REV. E.
  - USE PCB 501-00700-00 REV. A.
  - COMPONENT VALUES OF 1/2W OR MORE TO BE MOUNTED OFF PCB BY 1/4 IN.
  - WIRES ARE CONNECTED DURING FINAL ASSEMBLY FROM THE POWER SUPPLY BD. ITEMS ARE SPECIFIED ON PWR. SUP. PARTS LIST 602-00701-00.

CONTRACT NO.	DATE	REV	DATE
602-00700-00	1/14/61	D	1/14/61
APPROVALS		DATE	
DESIGNED BY: E. KIRCHNER		1/14/61	
DRAWN BY: J. H. HARRIS		1/14/61	
CHECKED BY: J. H. HARRIS		1/14/61	
APPROVED BY: J. H. HARRIS		1/14/61	
TITLE: ASSY. PCB METER BOARD - SILVER SHEET METER BOARD		PARTS LIST NO. 602-00700-00	
DRAWING NO. 602-00700-00		REV. D	
SCALE: DO NOT SCALE DRAWING		SHEET 1 OF 1	

CARVER

ASSY. PCB METER BOARD  
SILVER SHEET METER BOARD





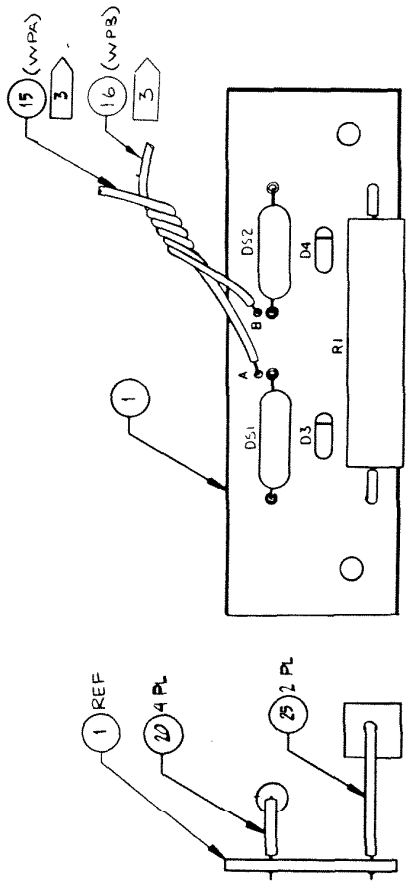
CITY		STATE		COUNTRY	
PART NO.		REV.		DATE	
DRAWN BY		CHECKED BY		DATE	
DESIGNED BY		APPROVED BY		DATE	
MATERIALS		QUANTITY		UNIT	
PARTS		PRICE		TOTAL	
DO NOT SCALE DIMENSIONS		SCALE		SHEET NO.	
SILVER 9T		605-00702-00		A	
SHEET NO.		TOTAL SHEETS		PAGE	
1 of 1		1		A	

**CARVER**

SCHEMATIC,  
METER LIGHT BOARD

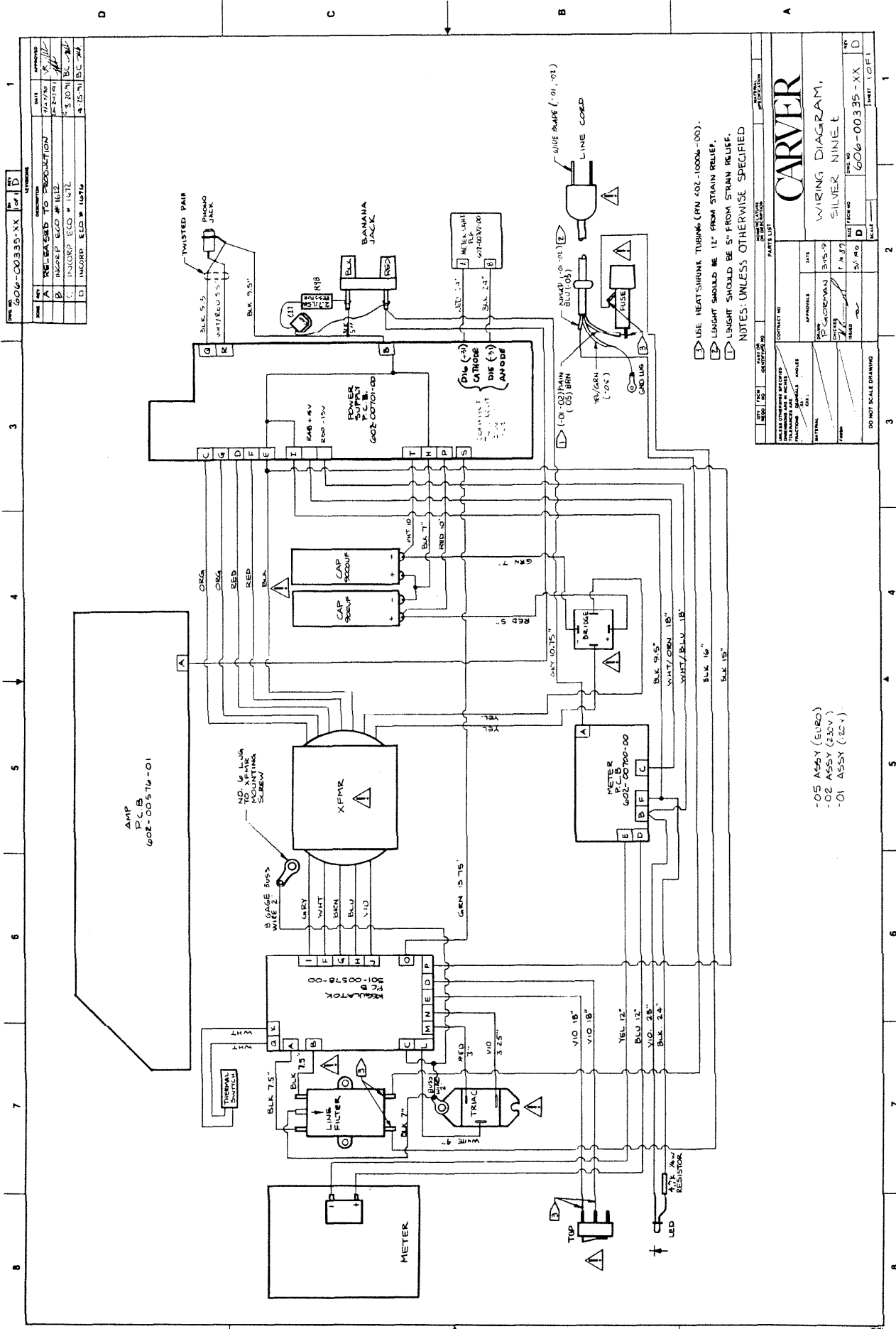
4 3 2 1

DATE	602-00702-00	REV	1	REV	1
ZONE	A	DESCRIPTION	RELEASED TO PRODUCTION	DATE	3-13-90
	B	INGORP ECO #	1672	APPROVED	BC



- 3 TWIST WIRES APPROXIMATELY 2 TURNS PER INCH.
  - 2 ALL ITEMS ARE ON 602-00702-00 PARTS LIST.
  - 1 USE PCB 501-00702-00 REV A.
- NOTES : UNLESS OTHERWISE SPECIFIED,

UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE IN INCHES. DIMENSIONS IN PARENT PARENTHESIS ARE IN MILLIMETERS.		DATE	9-18-00
MATERIAL		APPROVALS	DATE
FINISH		CHECKED	9-18-00
DASH NO		ISSUED	25/1/00
NEXT ASSY		ENG	
APPLICATION		MFG	
607-00332		CARVER	
MIL II		PCB ASSY, METER LIGHT	
USED ON		SIZE	C
DO NOT SCALE DRAWING		DWG. NO	602-00702-00
SCALE 2/1		REV	B
SHEET 1 OF 1			



REV	DESCRIPTION	DATE	BY
A	REVISIONS	10/27/80	W
B	REVISIONS	10/27/80	W
C	REVISIONS	10/27/80	W
D	REVISIONS	10/27/80	W

REV	DESCRIPTION	DATE	BY
A	REVISIONS	10/27/80	W
B	REVISIONS	10/27/80	W
C	REVISIONS	10/27/80	W
D	REVISIONS	10/27/80	W

<p>USE HEAT SHRINK TUBING (FNI 402-10004-00).</p> <p>LENGTH SHOULD BE 12" FROM STRAIN RELIEF.</p> <p>LENGTH SHOULD BE 5" FROM STRAIN RELIEF.</p> <p>NOTES: UNLESS OTHERWISE SPECIFIED</p>	
<p>DO NOT SCALE DRAWING</p>	
<p>CONTRACT NO.</p> <p>DATE</p> <p>DESIGNED BY</p> <p>CHECKED BY</p> <p>APPROVED BY</p> <p>INTERNAL USE ONLY</p>	
<p>WIRING DIAGRAM, SILVER NINE t</p>	
<p>606-00335-XX</p>	
<p>1</p>	

-05 ASSY (6180)  
-02 ASSY (335V)  
-01 ASSY (122V)

Section 9  
**APPENDICES**

Appendix A  
**PARTS ORDERING**

Please provide the Model numbers of the units involved when ordering genuine CARVER replacement parts. Also provide the CARVER part number and the generic part number to confirm the correct part needed.

The Carver Parts Department is open Monday thru Friday, 7:00 a.m. to 4:45 p.m. PST.

The following phone number is to be used for part orders only!

Technical assistance is not available on this line.

**1-800-433-0547**

Or if you prefer to FAX in your part order, please use the following FAX number:

**1-206-775-9180**

From time to time, when it is necessary, we may make a substitution for the original part ordered, due to circuit revisions or part availability.

Random deviation from the original CARVER designated part is not recommended!

Complete PCB replacement is not recommended. You must have prior approval for warranty repair should PCB replacement be necessary.

# Appendix B PARTS LISTS

## SILVER SEVENT AMP BOARD P/N 602-00576-01

### CAPACITORS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
201-00001-00	CAP CER DISC 5pF 10% 1000V	C21,24	
201-00004-00	CAP CER DISC 22pF 10% 1000V	C4	
201-00006-00	CAP CER DISC 39pF 10% 1000V	C18	
201-00012-00	CAP CER DISC 100pF 10% 1000V	C8,9	
201-00023-00	CAP CER DISC 470pF 10% 1000V	C15	
201-00028-00	CAP CER DISC 680pF 10% 1000V	C11	
201-00040-00	CAP CER DISC 15pF 10% 1000V	C13	
204-00003-00	CAP MYLAR .001μF 100V	C16,17	
204-00008-00	CAP MYLAR .0027μF 100V	C25,26	
204-00015-00	CAP MYLAR .01μF 100V	C8	
204-00022-00	CAP MYLAR .033μF 100V	C22,23	
204-00052-00	CAP MYLAR .68μF 100V	C3	
205-00006-00	CAP LYTIC 4.7μF 50V RAD	C12	
205-00010-00	CAP LYTIC 10μF 35V RAD	C1,2	
205-00013-00	CAP LYTIC 47μF 16V RAD	C19,20	
205-00021-00	CAP LYTIC 470μF 16V RAD	C5	*Rev.F
205-00078-00	CAP LYTIC 3.3μF 160V RAD	C10,14	
<b>*HISTORY</b>			
205-00020-00	CAP LYTIC 470μF 10V RAD BLU TWK	C5	Rev.A-E

### RESISTORS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
250-00004-00	RES FL RTD 82 OHM 1/4W PREP .4	R32,34	
250-00005-00	RES FL RDT 150 OHM 1/4W PREP .4	R35,41	
250-00007-00	RES FL RDT 750 OHM 1/4W PREP .4	R28,31	
251-00014-00	RES CFILM 4.7 OHM 1/4W PREP .4	R36,40,74,82	
251-00036-00	RES CFILM 39 OHM 1/4W PREP .4	R66,73	
251-00038-00	RES CFILM 47 OHM 1/4W PREP .4	R87	
251-00041-00	RES CFILM 62 OHM 1/4W PREP .4	R66	
251-00044-00	RES CFILM 82 OHM 1/4W PREP .4	R38,51	

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
251-00046-00	RES CFILM 100 OHM 1/4W PREP .4	R45,48	
251-00050-00	RES CFILM 150 OHM 1/4W PREP .4	R46,47,63,64	
251-00054-00	RES CFILM 220 OHM 1/4W PREP .4	R42,86,90	
251-00060-00	RES CFILM 390 OHM 1/4W PREP .4	R83,91	
251-00061-00	RES CFILM 430 OHM 1/4W PREP .4	R43	
251-00063-00	RES CFILM 510 OHM 1/4W PREP .4	R75,81	
251-00065-00	RES CFILM 620 OHM 1/4W PREP .4	R30,44	
251-00069-00	RES CFILM 910 OHM 1/4W PREP .4	R22,27	
251-00074-00	RES CFILM 1.5 K 1/4W PREP .4	R18,19,24,25	
251-00078-00	RES CFILM 2.2 K 1/4W PREP .4	R55,58	
251-00081-00	RES CFILM 3 K 1/4W PREP .4	R33,76,79	
251-00084-00	RES CFILM 3.9 K 1/4W PREP .4	R77,80	
251-00088-00	RES CFILM 5.6 K 1/4W PREP .4	R4	
251-00094-00	RES CFILM 10 K 1/4W PREP .4	R17,20,23,26,29	
251-00098-00	RES CFILM 15 K 1/4W PREP .4	R3	
251-00103-00	RES CFILM 24 K 1/4W PREP .4	R67,72	
251-00104-00	RES CFILM 27 K 1/4W PREP .4	R13	
251-00105-00	RES CFILM 30 K 1/4W PREP .4	R14	
251-00106-00	RES CFILM 33 K 1/4W PREP .4	R37	
251-00110-00	RES CFILM 47 K 1/4W PREP .4	R21	
251-00112-00	RES CFILM 56 K 1/4W PREP .4	R16,54,59	
251-00118-00	RES CFILM 100 K 1/4W PREP .4	R5,68,71	
251-10066-00	RES CFILM 680 OHM 1/2W PREP .5	R60,78	
251-10080-03	RES CFILM 2.7K 1/2W UNPREP	R69,70	
251-10087-00	RES CFILM 5.1 K 1/2W PREP .5	R56,57	
251-10108-00	RES CFILM 39 K 1/2W PREP .5	R49,52,61	
251-10109-00	RES CFILM 43 K 1/2W PREP .5	R62,65	
252-00285-00	RES MFILM 909 OHM 1/4W 1% .4	R6	
252-00355-00	RES MFILM 1K 1/4W 1% .4	R7	*Rev. E
252-00356-00	RES MFILM 1.21 K 1/4W 1% .4	R11	
252-00368-00	RES MFILM 3.83 K 1/4W 1% .4	R15	
252-00386-00	RES MFILM 12.1 K 1/4W 1% .4	R8,10	
252-00420-00	RES MFILM 24.3 K 1W 1% .4	R12	
252-00427-00	RES MFILM 31.6 K 1/4W 1% .4	R39	
253-20001-00	RES WIRE WOUND .1 OHM 2W	R84,92,93,96	
253-40000-00	RES WIRE WOUND .05 OHM 5W 10%	R94,95	
253-40001-00	RES WIRE WOUND .1 OHM 5W	R53,97	
255-20109-00	RES MET OXIDE 1.8 K 2W	R50	
259-20001-00	TRIM POT 1 K 1/10W PCB MT	RP1	
259-20010-00	TRIM POT 2K 1/10W PCB MT	RP2	Add at Rev. E
<b>*HISTORY</b>			
252-00355-00	RES MFILM 1K 1/4W 1% PREP .4	R7,9	Rev. A-D

# SILVER NINE t AMP BOARD

## P/N 602-00576-01

### CAPACITORS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
201-00001-00	CAP CER DISC 5pF 10% 1000V	C21,24	
201-00004-00	CAP CER DISC 22pF 10% 1000V	C4	
201-00006-00	CAP CER DISC 39pF 10% 1000V	C18	
201-00007-00	CAP CER DISC 47pF 10% 1000V	C15	
201-00012-00	CAP CER DISC 100pF 10% 1000V	C8,9	
201-00027-00	CAP CER DISC 750pF 10% 1000V	C11	
201-00040-00	CAP CER DISC 15pF 10% 1000V	C13	
204-00003-00	CAP MYLAR .001μF 100V	C16,17	
204-00007-00	CAP MYLAR .0022μF 100V	C7	
204-00008-00	CAP MYLAR .0027μF 100V	C25,26	
204-00015-00	CAP MYLAR .01μF 100V	C6	
204-00022-00	CAP MYLAR .033μF 100V	C22,23	Component Side
204-00052-00	CAP MYLAR .68μF 100V	C3	
204-00071-00	CAP MYLAR .22μF 5% 100V	C28	
205-00006-00	CAP LYTIC 4.7μF 50V RAD	C12	
205-00010-00	CAP LYTIC 10μF 35V RAD	C1,2	
205-00013-00	CAP LYTIC 47μF 16V RAD	C19,20	
205-00021-00	CAP LYTIC 470μF 16V RAD	C5	
205-00078-00	CAP LYTIC 3.3μF 160V RAD	C10,14	

### RESISTORS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
250-00004-00	RES FL RTD 82 OHM 1/4W PREP .4	R32,34	
250-00005-00	RES FL RTD 150 OHM 1/4W PREP .4	R35,41	
250-00007-00	RES FL RTD 750 OHM 1/4W PREP .4	R28,31	
251-00014-00	RES CFILM 4.7 OHM 1/4W PREP .4	R36,40,74,82	
251-00036-00	RES CFILM 39 OHM 1/4W PREP .4	R66,73	
251-00038-00	RES CFILM 47 OHM 1/4W PREP .4	R87	
251-00041-00	RES CFILM 62 OHM 1/4W PREP .4	R88	
251-00044-00	RES CFILM 82 OHM 1/4W PREP .4	R38,51	
251-00046-00	RES CFILM 100 OHM 1/4W PREP .4	R45,48	
251-00050-00	RES CFILM 150 OHM 1/4W PREP .4	R46,47,63,64	
251-00054-00	RES CFILM 220 OHM 1/4W PREP .4	R42,86,90	
251-00060-00	RES CFILM 390 OHM 1/4W PREP .4	R83,91	
251-00061-00	RES CFILM 430 OHM 1/4W PREP .4	R43	
251-00063-00	RES CFILM 510 OHM 1/4W PREP .4	R75,81	

## DIODES

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
320-20001-00	DIODE 1N4148 75V PV PREP .4	D2,4-6,10,16,33,34,38,39	
320-20001-03	DIODE 1N4148 75V PV UNPREP	D1,11	
320-20004-00	DIODE 1N4004 400V PREP .4	D12,15,17-25,32	
320-20006-00	DIODE BAV20 400V PREP .4	D7,8,9,13,14	
320-20007-03	DIODE MR 852 UNPREP	D28-31	
320-30006-00	DIODE ZENER 1N4738 8.2V PREP .4	D35,36	

## TRANSISTORS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
321-10000-00	XISTOR 152 NPN 5M SG MPSW06	Q13	
321-10001-00	XISTOR 152 PNP 5M SG MPS6729	Q15	
321-20001-00	XISTOR 202 NPN PWR MPSU10	Q7,27	
321-20002-00	XISTOR 202 PNP PWR MPSU60	Q4,26	
321-30013-00	XISTOR TO3P(L) NPN PWR 29C3281-0	Q11,17-20	
321-30014-00	XISTOR TO3P(L) PNP PWR 29A1302-0	Q12,22-25	
321-40000-00	XISTOR TO92 NPN 5M SG MPS8097	Q21	
321-40001-00	XISTOR TO92 NPN 5M SG MPSA43	Q2,9	
321-40003-00	XISTOR TO92 PNP 5M SG MPS8093	Q5	
321-40004-00	XISTOR TO92 PNP 5M SG MPSA93	Q3,10	
321-40005-00	XISTOR TO92 JFET 5M SG 2N5458	Q1	
321-60004-00	XISTOR TO220 NPN 2N6488	Q14	
321-60006-00	XISTOR TO220 PNP 2N6490	Q16	
321-60007-00	XISTOR TO225AA NPN PWR MJE180	Q6	

## INTEGRATED CIRCUITS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
330-30002-00	IC OP AMP BIFET (TL081) U1		
330-30008-00	IC DUAL OP AMP (4558) U2		

## MISCELLANEOUS ITEMS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
401-00952-00	MONSTER CABLE SPECIAL 1A, 6.5"		From WP-A to output resistors
401-20203-00	BUSS WIRE 22 GA. 1.5"		Use with RP2 Trim Pot Rev. E
401-30003-00	JUMPER INSULATED .4"	JP2-5,8,14-19,21-23	
401-30005-00	JUMPER INSULATED .5"	JP13,20	
401-30006-00	JUMPER INSULATED .6"	JP7,12	
401-30013-00	JUMPER INSULATED .8"	JP1,6,9,10,11	
402-00018-00	SLEEVING BLACK 18AWG 1.4"		
403-10003-00	SEALANT SILICONE RUBBER RTV		
501-00576-00	PCB, AMP SST		



CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
251-00065-00	RES CFILM 620 OHM 1/4W PREP .4	R30,44	
251-00069-00	RES CFILM 910 OHM 1/4W PREP .4	R22,27	
251-00074-00	RES CFILM 1.5 K 1/4W PREP .4	R18,19,24,25	
251-00077-03	RES CFILM 2 K 1/4W UNPREP	R10	
251-00078-00	RES CFILM 2.2 K 1/4W PREP .4	R55,58	
251-00081-00	RES CFILM 3 K 1/4W PREP .4	R33,76,79	
251-00084-00	RES CFILM 3.9 K 1/4W PREP .4	R77,80	
251-00088-00	RES CFILM 5.6 K 1/4W PREP .4	R4	
251-00094-00	RES CFILM 10 K 1/4W PREP .4	R17,20,23,26,29	
251-00098-00	RES CFILM 15 K 1/4W PREP .4	R3	
251-00103-00	RES CFILM 24 K 1/4W PREP .4	R67,72	
251-00104-00	RES CFILM 27 K 1/4W PREP .4	R13	
251-00105-00	RES CFILM 30 K 1/4W PREP .4	R14	
251-00106-00	RES CFILM 33 K 1/4W PREP .4	R37	
251-00110-00	RES CFILM 47 K 1/4W PREP .4	R21	
251-00112-00	RES CFILM 56 K 1/4W PREP .4	R16,54,59	
251-00118-00	RES CFILM 100 K 1/4W PREP .4	R5,68,71	
251-00120-00	RES CFILM 120 K 1/4W PREP .5	R7	
251-10066-00	RES CFILM 680 OHM 1/2W PREP .5	R60,78	
251-10080-03	RES CFILM 2.7 K 1/2W UNPREP	R69,70	Component Side
251-10087-00	RES CFILM 5.1 K 1/2W PREP .5	R56,57	
251-10108-00	RES CFILM 39 K 1/2W PREP .5	R49,52,61	
251-10109-00	RES CFILM 43 K 1/2W PREP .5	R62,65	
252-00285-00	RES MFILM 909 OHM 1/4W 1% .4	R6	
252-00427-00	RES MFILM 31.6 K 1/4W 1% .4	R99	
253-20000-00	RES WIRE WOUND .05 OHM 2W 10%	R84,92,93,96	
253-40000-00	RES WIRE WOUND .05 OHM 5W 10%	R94,95	
253-40001-00	RES WIRE WOUND .1 OHM 5W	R53,97	
255-20109-00	RES MET OXIDE 1.8 K 2W	R50	
259-20001-00	TRIM POT 1K 1/10W PCB MT	RP1	

## DIODES

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
320-20001-00	DIODE 1N4148 75V PV PREP .4	D1-2,4-6,10-11,16,33-34,38-39	
320-20004-00	DIODE 1N4004 400V PREP .4	D12,15,17-25,32	
320-20006-00	DIODE BAV20 400V PREP .4	D7-9,13-14	
320-20007-03	DIODE MR 852 UNPREP	D28-31	
320-30006-00	DIODE ZENER 1N4738 8.2V PREP .4	D35,36	

## TRANSISTORS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
321-10000-00	XISTOR 152 NPN 5M SG MPSW06	Q13	
321-10001-00	XISTOR 152 PNP 5M SG MPS6729	Q15	
321-20001-00	XISTOR 202 NPN PWR MPSU10	Q7,27	
321-20002-00	XISTOR 202 PNP PWR MPSU60	Q4,26	
321-30013-00	XISTOR TO3P(L) NPN PWR 29C3281	Q11,17-20	
321-30014-00	XISTOR TO3P(L) PNP PWR 29A1302	Q12,22-25	
321-40001-00	XISTOR TO92 NPN 5M SG MPSA43	Q2,9	
321-40003-00	XISTOR TO92 PNP 5M SG MPS8093	Q5	
321-40004-00	XISTOR TO92 PNP 5M SG MPSA93	Q3,10	
321-40005-00	XISTOR TO92 JFET 5M SG 2N5458	Q1	
321-40013-01	XISTOR TO92 5M SG MPSA18	Q21	
321-60004-00	XISTOR TO220 NPN 2N6488	Q14	
321-60006-00	XISTOR TO220 PNP 2N6490	Q16	
321-60007-00	XISTOR TO225A NPN PWR MJE180	Q6	

## INTEGRATED CIRCUITS



CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
330-30002-00	IC OP AMP BIFET (TL081)	U1	
330-30008-00	IC DUAL OP AMP (4558)	U2	

## MISCELLANEOUS ITEMS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
401-00952-00	MONSTER CABLE SPECIAL 8.5'		From WP-A to Red Speaker Binding Post
401-20205-00	BUSS WIRE 22 AWG	JP25	
401-30003-00	JUMPER INSULATED .4"	JP2-5,8,14-19,21-25	
401-30005-00	JUMPER INSULATED .5"	JP13,20	
401-30006-00	JUMPER INSULATED .6"	JP7,12	
401-30007-00	JUMPER INSULATED .7"	JP3	
401-30013-00	JUMPER INSULATED .8"	JP1,9,10,11	
401-30014-00	JUMPER INSULATED .9"	JP6	
403-10003-00	SEALANT SILICONE RUBBER RTV		
501-00576-00	PCB, AMP SILVER NINE t		

# SILVER SEVENT/SILVER NINE POWER SUPPLY BOARD P/N 602-00701-00

## CAPACITORS


CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
201-00034-00	CAP CER DISC .01 $\mu$ F 20 % 500V	C22	
205-00002-00	CAP LYTIC 2.2 $\mu$ F 35V RAD	C7	
205-00012-00	CAP LYTIC 22 $\mu$ F 35V RAD	C8	
205-00013-00	CAP LYTIC 47 $\mu$ F 25V RAD	C3,11,16,17	
205-00014-00	CAP LYTIC 47 $\mu$ F 50V RAD	C6	
205-00015-00	CAP LYTIC 100 $\mu$ F 10V RAD	C2	
205-00079-00	CAP LYTIC 300 $\mu$ F 35V RAD	C14,15	
205-00080-00	CAP LYTIC 200 $\mu$ F 80V RAD	C20,21	

## RESISTORS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
250-00004-00	RES FL RTD 82 OHM 1/4 W PREP .4	R57	
250-00006-00	RES FL RTD 270 OHM 1/4W PREP .4	R55	
251-00068-00	RES CFILM 680 OHM 1/4W PREP .4	R2,3,12,14	
251-00067-00	RES CFILM 750 OHM 1/4W PREP .4	R8	
251-00070-00	RES CFILM 1K 1/4W PREP .4	R13,25	
251-00078-00	RES CFILM 2.2K 1/4W PREP .4	R52	
251-00082-00	RES CFILM 3.3K 1/4 W PREP .4	R9	
251-00083-00	RES CFILM 3.6K 1/4 W PREP .4	R10	
251-00087-00	RES CFILM 5.1K 1/4W PREP .4	R6,56,58	
251-00094-00	RES CFILM 10K 1/4W PREP .4	R18	
251-00102-00	RES CFILM 22K 1/4W PREP .4	R24	
251-00103-00	RES CFILM 24K 1/4W PREP .4	R26	
251-00104-00	RES CFILM 27K 1/4W PREP .4	R53	
251-00105-00	RES CFILM 30K 1/4W PREP .4	R11,35	
251-00120-00	RES CFILM 120K 1/4W PREP .4	R42	
251-00121-00	RES CFILM 130K 1/4W PREP .4	R1,4	
251-00122-00	RES CFILM 150K 1/4W PREP .4	R34	
251-00125-00	RES CFILM 200K 1/4W PREP .4	R21	
251-00126-00	RES CFILM 220K 1/4W PREP .4	R29	
251-00134-00	RES CFILM 470K 1/4W PREP .4	R20,22	
251-10069-03	RES CFILM 910 OHM 1/2W UNPREP	R59	
251-10080-00	RES CFILM 2.7K 1/2W PREP .4	R45,47	
255-10088-00	RES MET OXIDE 680 OHM 1W PREP .5	R48	
255-10098-00	RES MET OXIDE 910 OHM 1W	R50	
255-10133-00	RES MET OXIDE 15K 1W	R49,54	

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
255-10136-00	RES MET OXIDE 18K 1W	R46	
255-10145-00	RES MET OXIDE 51K 1W	R44	
255-10150-00	RES MET OXIDE 82K 1W	R5,7	
255-20095-00	RES MET OXIDE 680 OHM 2W	R43,51	
259-20003-00	TRIM POT 5K PCB MOUNT RP1		

## DIODES

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
320-20001-00	DIODE 1N4148 75V PREP .4	D2-7,11,24,25	
320-20010-03	DIODE 6 AMP 200V UNPREP	D14-21	
320-30002-00	DIODE ZENER 1N4744 15V PREP .4	D8	
320-30002-03	DIODE ZENER 1N4744 15V UNPREP	D26	
320-30009-00	DIODE ZENER 1N4735 6.2V PREP .4	D1	
320-30012-00	DIODE ZENER 1N4742 12V PREP .6	D22,23	

## TRANSISTORS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
321-40010-00	XISTOR T092 NPN SM SG 2N4123	Q3,8	
321-40012-00	XISTOR T092 PNP SM SG MPSA56	Q2	
321-90000-00	XISTOR B100 PNP PWR 2SA1360	Q10	
321-90001-00	XISTOR B100 NPN PWR 2SC3423	Q9	

## INTEGRATED CIRCUITS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
330-30008-00	IC DUAL OP AMP (4558) U1		

## MISCELLANEOUS ITEMS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
101-22001-00	BRACKET RTANGLE PC MT 1/2"		
401-10104-00	WIRE 18AWG TEW BLACK 5"		WP-B To Black Binding Post
401-10110-00	WIRE 18 AWG TEW BLACK 15"		WP-E to WP-P Regulator Board
401-10118-00	WIRE 18 AWG TEW GREEN 13.75"		WP-S to WP-O Regulator Board
401-10151-00	WIRE 18 AWG TR-64 BLACK 7"		WP-H to Large Cape Center
401-10181-00	WIRE 18 AWG TR-64 WHITE 10"		WP-T to Large Cape (-) Terminal
401-10182-00	WIRE 18 AWG TR-64 RED 10"		WP-P to Large Cape (+) Terminal
401-10526-00	WIRE 22 AWG TR-64 WHITE/BLUE 18"		From R50 -13V Side to Meter PCB WP-B
401-10551-00	WIRE 22 AWG TR-64 WHITE/ORANGE 18"		From R48 +15V Side to Meter PCB WP-C
401-10635-00	WIRE 22 AWG TR-64 BLACK 9.5"		WP-I to Meter Board WP-F; WP-B to RCA Jack Ground Lug *Rev.G
401-30002-00	JUMPER INSUL .3"	JP4,6	
401-30003-00	JUMPER INSUL .4"	JP16,17,22	
401-30005-00	JUMPER INSUL .5"	JP8,18	
401-30006-00	JUMPER INSUL .6"	JP1,2,10	


CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
401-30007-00	JUMPER INSUL .7"	JP5,7,11	
401-30013-00	JUMPER INSUL .8"	JP3,9,12,13,14,15,21	
401-40003-00	WIRE T #22 1 EA WHITE/RED, BLACK 5.5'		WP-R White/Red to Input Jack, WP-Q Black to Input Jack Solder Lug (Put on back of Board)
501-00701-00	PCB POWER SUPPLY SILVER 71/SILVER 9t		

#### \*HISTORY

401-10603-00	WIRE 22 AWG TR-64 BLACK 8.5'		From WP-B to RCA Jack Ground Lug Rev. A-F
401-10635-00	WIRE 22 AWG TR-64 BLACK 9.5'		WP-I to Meter Board WP-F Rev. A-F

## SILVER SEVENT/SILVER NINEt REGULATOR BOARD P/N 602-00578-XX


### CAPACITORS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
204-00015-00	CAP MYLAR .01μF	C3	
204-00031-00	CAP MYLAR .33μF	C4	
207-10010-00	CAP MET POLY .1μF	C5	



### RESISTORS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
251-00014-00	RES CFILM 4.7 OHM 1/4W PREP .4	R10	
251-00030-00	RES CFILM 22 OHM 1/4W PREP .4	R5	
251-00098-00	RES CFILM 15K 1/4W PREP .4	R3	
251-00100-00	RES CFILM 18K 1/4W PREP .4	R9	
251-00118-00	RES CFILM 100K 1/4W PREP .4	R6,7	
251-00124-00	RES CFILM 180K 1/4W PREP .4	R8	
251-00135-00	RES CFILM 510K 1/4W PREP .4	R4	
251-10022-00	RES CFILM 10 OHM 1/2W PREP .5	R11	
251-10109-00	RES CFILM 43K 1/2W PREP .5	R2	
251-10156-00	RES CFILM 3.9M 1/2W PREP .5	R1	



### DIODES

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
320-20004-00	DIODE 1N4004 400V PREP .4	D1-6	

### TRANSISTORS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
321-40011-00	XISTOR T092 NPN SM SG MPSA43	Q1,3	
321-40012-00	XISTOR T092 PNP SM SG MPSA56	Q2,4	

## MISCELLANEOUS ITEMS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
101-22001-00	BRACKET RTANGLE PC MOUNT 1/2"		
159-20001-00	POP RIVET CE 1/8" .063-.125" GRIP		Use to Mount 1/2" Bracket
318-00002-00	SWITCH CONVENIENCE 115/230V 1A 125VAC		 Silver 7t only
330-40002-00	OPTOISOLATOR PHOTO	U1	
601 00678 00	POD REGULATOR, SILVER 7t/SILVER 9t		

### Wires: S7t

401-10102-00	WIRE 18 AWG TEW BLACK 3"	WP-B to Line Filter Lug-1, WP-A to Line Filter Lug-2 *Rev.B
401-10107-00	WIRE 18 AWG TEW BLACK 7"	WP-L to Triac *Rev.B
401-10122-00	WIRE 18 AWG TEW VIOLET 18"	WP-D to Power Switch; WP-E to Power Switch
401-10148-00	WIRE 18 AWG TEW BLACK/YELLOW 8.5"	WP-N to Triac
401-10149-00	WIRE 18 AWG TEW BLACK/VIOLET 8.5"	WP-M to Triac small lug
401-10602-00	WIRE 22 AWG TEW BLACK 5"	WP-C to Chassis Ground Lug mounted to Triac

### Wires: S9t

401-10122-00	WIRE 18 AWG TEW VIOLET 18"	WP-D to Power Switch; WP-E to Power Switch
401-10142-00	WIRE 18 AWG TEW BLACK 7.5"	WP-B & WP-A to Filter
401-10157-00	WIRE 18 AWG TEW WHITE 4"	WP-L to Triac
401-10161-00	WIRE 18 AWG TEW RED 3"	WP-M to Triac small lug
401-10171-00	WIRE 18 AWG TEW VIOLET 3.25"	WP-N to Triac
401-20101-00	BUSS WIRE 18 AWG	WP-C to Chassis ground lug mounted to Triac

## SILVER SEVENT/SILVER NINEt METER BOARD P/N 602-00700-00

### CAPACITORS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
201-00007-00	CAP CER DISC 47pF 10% 1000V	C3	
201-00012-00	CAP CER DISC 100pF 10% 1000V	C8	
205-00005-00	CAP LYTIC 4.7µF 35V RAD	C7	
205-00011-00	CAP LYTIC 22µF 16V RAD	C1,2,11	
205-00013-00	CAP LYTIC 47µF 25V RAD	C10	
205-00016-00	CAP LYTIC 100µF 25V RAD	C4,9	*Rev. A3
205-00113-00	CAP LYTIC 68µF 16V RAD	C5,6	*Rev. A3
<b>*HISTORY</b>			
205-00010-00	CAP LYTIC 10µF 35V RAD	C5	Rev. A-A2
205-00013-00	CAP LYTIC 47µF 25V RAD	C4	Rev. A-A2
205-00016-00	CAP LYTIC 100µF 25V RAD	C9	Rev. A-A2

## RESISTORS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
251-00028-00	RES CFILM 18 OHM 1/4W PREP .4	R8	
251-00044-00	RES CFILM 82 OHM 1/4W PREP .4	R12	Add at Rev. A3
251-00046-00	RES CFILM 100 OHM 1/4W PREP .4	R3	
251-00064-00	RES CFILM 560 OHM 1/4W PREP .4	R4	
251-00069-00	RES CFILM 910 OHM 1/4W PREP .4	R10,11	*Rev. A3
251-00070-00	RES CFILM 1K 1/4W PREP .4	R7	
251-00077-00	RES CFILM 2K 1/4W PREP .4	R6	
251-00085-00	RES CFILM 4.3K 1/4W PREP .4	R14	
251-00087-00	RES CFILM 13K 1/4W PREP .4	R2	
251-00101-00	RES CFILM 20K 1/4W PREP .4	R9	
251-00110-00	RES CFILM 47K 1/4W PREP .4	R5	
251-00130-03	RES CFILM 330K 1/4 UNPREP	R15	
251-00132-00	RES CFILM 390K 1/4 PREP .4	R13	
251-00146-00	RES CFILM 1.5M 1/4 PREP .4	R1	
259-20019-00	TRIM POT 500K PCB MT NO WHEEL	RP1	*Rev. D (Parts List)
<b>*HISTORY</b>			
251-00069-00	RES CFILM 910 OHM 1/4W PREP .4	R10	Rev. A-A2
251-00090-00	RES CFILM 6.8K 1/4W PREP .4	R11	Rev. A-A2
251-00078-03	RES CFILM 2.2K 1/4W UNPREP	R16	Delete at Rev. C
259-20009-00	TRIM POT 500K PCB MT	RP1	Rev. A-C (Parts List)

## DIODES

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
320-20001-00	DIODE 1N4148 75V PREP .4	D1	

## TRANSISTORS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
321-10000-00	XISTOR 132 NPN 3M 5G MP56729	Q2	
321-40010-00	XISTOR T092 NPN 5M 5G 2N4123	Q1	

## INTEGRATED CIRCUITS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
330-30008-00	IC DUAL OP AMP (4558)	U1	

## MISCELLANEOUS ITEMS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
401-10517-00	WIRE 22AWG TR-64 GRAY 10.75'		WP-A to output resistors.
401-10546-00	WIRE 22AWG TR-64 YELLOW 12'		WP-E to (-) Meter
401-10631-00	WIRE 22AWG TEW BLUE 12'		WP-D to (+) Meter
402-00001-00	SLEEVING CLEAR 10 AWG		
501-00700-00	PCB METER SILVER 7/SILVER 9t		
<b>*HISTORY</b>			
401-30003-00	JUMPER INSULATED .4"		Delete at Rev. A3

## SILVER SEVENT/SILVER NINEt LED PREP P/N 601-00536-00

### RESISTORS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
251-00086-00	RES CFILM 4.7 K 1/4W PREP .4		*Rev.B (Parts List)
<b>*HISTORY</b>			
251-00094-03	RES CFILM 10 K 1/4W UNPREP		Rev.A (Parts List)

### DIODES

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
320-40002-00	LED AMBER		

## MISCELLANEOUS ITEMS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
401-10554-00	WIRE 22 AWG TR-64 VIOLET 25'		To cathode of LED from WP-B (Meter Board)
401-10573-00	WIRE 22 AWG TR-64 BLACK 24'		To anode of LED from WP-F (Meter Board - back side of PCB)
402-00001-00	SLEEVING CLEAR 10 GA		Use around resistor and anode side of LED
402-10002-00	TUBING HEAT SHRINK CLEAR 1/4"		



# SILVER NINEt METER LIGHT BOARD

## P/N 602-00702-00

### RESISTORS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
253-50049-00	RES WIRE WOUND 300 OHM 10W	R1	

### DIODES



CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
320-30000-00	DIODE ZENER 1N4740 10V PREP .4	D3,4	









### MISCELLANEOUS ITEMS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
118-80019-00	STANDOFF 6-32x.25" BRASS		
320-50001-00	LAMP, 12V PIGTAIL	DS1,2	
401-10573-00	WIRE 22AWG TEW BLK 24"		WP-B
401-10573-01	WIRE 22AWG TEW RED 24"		WP-A
402-00006-00	SLEEVING BLK 18 AWG .4"		Use with D1,2
402-00021-00	SLEEVING BLK 18 AWG 1"		Use with R1
501-00702-00	PCB METER LIGHT SILVER 0t		

# SILVER SEVENT FINAL ASSEMBLY



## 604-00332-00

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
101-22001-00	BRACKET RTANGLE PCB MNT 1/2"		
105-40006-00	FUSEHOLDER PANEL MOUNT 120V/240V		
106-30001-00	GROMMET, NEOPRENE		*Rev.L
109-10010-00	PHONO JACK PANEL MOUNT		
111-00002-00	LABEL MONSTER CABLE		
111-20051-00	SOLDER LUG #6		Triac(1), Xfmr(1)
111-20151-00	SOLDER LUG #10		Filter Caps
112-20003-00	MOUNT TYRAP, SCREW MOUNT		Large Cap Mount
112-30001-00	METER POWER 0 - 0.5mA		
115-10001-00	BINDING POST DUAL RED/BLACK		
118-60012-00	SPACER 5/8 x 7/16 OD x 1/4" ID ALUMINUM		
118-80005-00	STANDOFF ROUND #8 x 1/4 x 5/16" ALUMINUM		Use for Xfmr Mounting
118-80016-00	STANDOFF THREADED		Meter Board
118-90003-00	STRN RELIEF MCT.56 WS .15 x .28; 18/2		
119-20001-00	TERMINAL STRIP 3 PIN		
151-20001-00	SCREW MACH PP BLK 440 x 1/4"		Meter Board(4)
151-20002-00	SCREW MACH PP BLK 440 x 3/8"		Filter(2), Small Xistors(3); Rev.A-D,F
151-20004-00	SCREW MACH PP BLK 440 x 9/16"		Cap Bracket(3)
151-20007-00	SCREW MACH PP BLK 440 x 5/16"		Thermal Switch(2); Terminal Strip(2)
151-20008-00	SCREW MACH PP BLK 440 x 7/16"		Xistors(20)
151-20052-00	SCREW MACH PP BLK 6-32 x 3/8"		Triac(2); Cap Bracket(3); Regulator Board(2); Power Supply Bracket(1); Tyrap Mount(2) *Rev.C
151-20106-00	SCREW MACH PP BLK 8-32 x 3/4"		Bridge(1)
151-20109-00	SCREW MACH PP BLK 8-32 x 1.5"		Xfmr(4) *Rev.L
151-20151-01	SCREW MACH PP ZC 10-32 x 1/4"		Caps(4)
151-30001-00	SCREW SHT MTL PP BLK 4 x 1/4" B		Meter to Back Housing(2)
151-30051-00	SCREW SHT MTL PP BLK 6 x 1/4" B		Back Cover to Back Housing(4); Back Housing to Top Chassis(6); Meter Housing to Top Chassis(4); Chassis Top to Chassis Bottom(9)
152-00001-00	NUT HEX 6-32 x 5/16" ZC		Triac(1); Xfmr(1)
152-10001-00	KEPNUT 4-40 ZC		Filter(2); Thermal Switch(2); Terminal Strip(2); Cap Bracket(3) *Rev.C
152-10002-00	KEPNUT 6-32 x 5/16" ZC		Triac(1); Tyrap Mount(2); Xfmr(3); Power Supply Board(1) *Rev.F
152-10003-00	KEPNUT 8-32 x 11/32" ZC		Bridge(1)
154-00007-00	WASHER BELLEVILLE #4 BLK OXIDE		Xistors(20)
154-00302-00	WASH/F BK STL .16ID x .53 OD x .03"		Xfmr Mount
154-10001-00	WASHER FLAT SAE BLACK #4		Cap Bracket(3) Add at Rev.C
154-20051-02	WASHER INT LOCK CAD PLTD #6		Under Power Supply Mounting Screw
154-40007-01	WASH SHLDR TEFLON #4 .050"		Xistors(3) Q6,14,16 *Rev.L
154-40009-01	WASH SHLDR NYLON BLK .265 ID x .365" OD		Input Jack Outside Unit
154-40150-01	WASH FL NY .283 ID x .432 OD x .015"		Input Jack Inside Unit
159-50004-00	TYRAP 7-3/8" WHITE		Large Caps
160-30012-00	HEADER15 PIN 90DG TIN .156 CENTER		
204-00033-00	CAP MYLAH .33µF 400V	C27	
205-00081-00	CAP FILTER LYTIC 9000 µF 125V		



CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
253-40040-00	RES WIRE WOUND 2.7 OHM 5W	R98	Attach to Black Binding Post *Rev.E Parts List
253-50041-00	RES WIRE WOUND FXD 2 Ω 20W 10%	R99,100	
315-13002-00	FUSE MDA12		 *Rev.G
318-20001-00	SWITCH POWER ROCKER SPDT BLACK		
318-50004-00	SWITCH THERMAL U1210005820A		
319-00031-00	RECT BRIDGE 200V 25A		
319-00063-00	TRIAC 103 F/P 35AMP 600V MOT		 *Rev.I
321-30013-00	XISTOR T03P(L) NPN	Q28,29,30,31,32	
321-30014-00	XISTOR T03P(L) PNP	Q33,34,35,36,37	
401-10111-00	WIRE 18 AWG TEW BLACK 18"		Fuseholder to Line Filter
401-10117-00	WIRE 18 AWG TR-64 GREEN 7"		Large Cap (-) to Bridge (-)
401-10152-00	WIRE 18 AWG TEW RED 5"		Large Caps (+) to Bridge (+)
401-20104-00	BUSS WIRE 18 GAGE 2"		(30)Use on Xistors; (2) 2 ohm 20W Lug Connector; (1)#6 Lug on Xfmr to Regulator Board WP-C area
401-90012-00	LINECORD 16/2 AWG POLARIZED		
502-30007-01	CHASSIS BOTTOM SCREENED SILVER SEVEN t		
503-20032-01	PANEL TOP ANODIZED SILVER SEVEN t		
503-40014-01	PANEL FRONT SCREENED SILVER SEVEN t		
503-40016-01	COVER BACK SCREENED SILVER SEVEN t		
503-40062-01	BEZEL METER PANEL ANODIZED		*Rev.C
504-20040-01	CHASSIS TOP ANODIZED SILVER SEVEN t		
504-20062-01	BACK HOUSING PAINTED SILVER SEVEN t		*Rev.C
504-20042-01	METER HOUSING ANODIZED SILVER SEVEN t		
507-00025-00	BRACKET		For Mounting U1210005280A Thermal Switch
507-00031-00	BRACKETCAP MOUNTING SILVER SEVEN t		
512-10618-00	INSULATOR SIL-PAD K-6		
512-10717-01	PLATE METER ANODIZED SILVER SEVEN t		Add 1"x2.5" Double Back Tape *Rev.D
530-20054-00	STICKER SERIAL #		
601-00536-00	ASSY PREP LED SILVER SEVEN t		
602-00576-01	ASSY PCB AMP SILVER SEVEN t		
602-00578-02	ASSY PCB REGULATOR SILVER SEVEN t		
602-00700-00	ASSY PCB METER SILVER SEVEN t		
602-00701-00	ASSY PCB POWER SUPPLY SILVER SEVEN t		
615-00001-00	NOISE FILTER 6A 25V ZCB 2206-11		
617-10032-00	XFMR SILVER SEVEN t		








**\*HISTORY**



106-30002-00	GROMMET, GUM		Rev.A-K
151-20002-00	SCREW MACH PP BLK 440 x 3/8"		Filter (2); Small Xistors(3); Cap Bracket(3) Rev.C-E
151-20052-00	SCREW MACH PP BLK 6-32 x 3/8"		Triac(2); Regulator Board(2); Power Supply Bracket(1); Tyrap Mount(2) Rev.A-B
151-20060-00	SCREW MACH PP BLK 6-32 x 1.25"		Xfmr(4) Rev.F-K
151-20069-00	SCREW MACH PP BLK 6-32 x 1"		Xfmr(4) Rev.A-E
152-10001-00	KEPNUT 4-40 ZC		Filter(2); Thermal Switch(2); Terminal Strip(2) Rev.A-B
152-10002-00	KEPNUT 6-32 x 5/16" ZC		Triac(1); Tyrap Mount(2); Xfmr(3) Rev.A-E
154-40007-01	WASH SHI DR TFFLON #4 .050"		Xistors(2) Rev.A-K

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
255-50010-00	RES METAL OXIDE 3 OHM 5W		Attach to Black Binding Post Rev.A-D Parts List
315-13002-00	FUSE MDQ12		 Rev.A-F
319-00057-00	TRIAC T03 F/P 25AMP 600V MOT		 Rev. A-H
303-40060-01	BEZEL METER PANEL ANODIZED		Rev. A B
504-20041-01	BACK HOUSING ANODIZED SILVER SEVEN t		Rev. B
512-10715-01	PLATE METER ANODIZED SILVER SEVEN t		Rev. A,C
512-10716-01	PLATE METER ANODIZED BENYTON SILVER SEVEN t		Rev. B

## SILVER NINEt FINAL ASSEMBLY P/N 607-00335-01

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
101-22003-00	BRACKET MNT .050"		(4) Front Panel; (4) Top Panel
102-00003-00	CAP PROTECTOR .25"		
105-30005-01	FOOT 1.5" DIA		
105-40014-00	FUSEHOLDER PANEL MNT 120V/230V		
105-50000-00	FUSE CARRIER 120V		
106-30001-00	GROMMET NEOPRENE		Use to mount Transformer
109-10010-00	PHONO JACK PNL MNT		Input Connector
111-00002-00	LABEL MONSTER CABLE		
111-20051-00	SOLDER LUG #6		(1)Triac,(1)Xfmr,(1)Linecord
111-20151-00	SOLDER LUG #10		(4)Filter Cape
112-20003-00	MOUNT TYRAP SCREW MNT		Large Cap Mount
112-30001-00	METER POWER 0-.5mA		Mount using Double Back Foam Tape
115-10001-00	POST BINDING DUAL		Output Connector
118-60012-00	SPACER5/8x7/16"ODx1/4"ID ALUMINUM		Use for Xfmr mounting
118-80005-00	STANDOFF ROUND #8x1/4x5/16" ALUMINUM		Use for Xfmr Mounting, fit inside neoprene grommets
118-80016-00	STANDOFF THREADED 4-40x.25"		(2) Meter Board
118-90004-00	STRAIN RELIEF MCT .156 WS .15 x .28 18/2		Use with Linecord
151-20002-00	SCREW MACH PP BLK 440x3/8"		(2) Filter; (3) Small Xistors; (1) Triac Bracket.
151-20004-00	SCREW MACH PP BLK 440x9/16"		(3) Cap Bracket; (2) Meter Board
151-20007-00	SCREW MACH PP BLK 440x5/16"		Thermal Switch
151-20008-00	SCREW MACH PP BLK 440x7/16"		(20) Xistors, Use with Belleville Washer
151-20052-00	SCREW MACH PP BLK 6-32x3/8"		(2) Triac; (2) Regulator Board; (1) Power Supply Bracket; (2) Tyrap Mount; (4) Top Panel Mount; (1) Linecord Solder Lug
151-20106-00	SCREW MACH PP BLK 8-32x3/4"		(1) Bridge
151-20109-00	SCREW MACH PP BLK 8-32x1.5"		Xfmr Mounting Screws
151-20151-01	SCREW MACH PP ZC 10-32x1/4"		(4) Use with Filter Cape and Lugs
151-30001-00	SCREW SHT MTL PP BLK 4x1/4" A		Meter
151-30051-05	SCREW SELF-TAP PP BLK 6x1/4" F		(4) Back Cover to Back Housing; (5) Back Housing to Top Chassis; (4) Meter Housing to Top Chassis; (9) Chassis Top to Chassis Bottom
152-00001-00	NUT HEX 6-32x5/16" ZC		(1) Triac; (1) Xfmr, use with lugs.
152-10001-00	KEPNUT 4-40 ZC		(2) Filter; (1) Thermal Switch; (3) Cap Bracket; (2) Meter Board; (1) Triac Bracket

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
152-10002-00	KEPNUT 6-32x5/16" ZC		(1) Triac; (2) Tyrap Mount; (3) Xfmr; (1) Power Supply Board; (8) Front Panel Mount; (8) Top Panel Mount; (1) To Linecord Solder Lug
152-10003-00	KEPNUT 8-32x11/32" ZC		(1) Bridge
154-00007-00	WASH BELLEVILLE #4 BLK OXIDE		(20) Xistors
154-00302-00	WASH/F BK STL .16 ID x .53 OD x .03"		(8) Xfmr, above and below grommet.
154-10001-00	WASH FLAT SAE BLACK #4		(3) Cap Bracket
154-20051-02	WASH INT LOCK CAD PLATED #10		(3) Power Supply Board, Regulator Board and Triac mounting screw, Tighten to 6-8 in/lb.
154-40008-01	WASH SHOULDER NYLON #4		(3) Xistors Q6,14,16 *Rev.L
154-40009-01	WASH SHOULDER NYL BLK .265 ID x .365"OD		Input Jack Outside Unit
154-40010-01	WASH SHOULDER NYL A		Use with Fuseholder
154-40150-01	WASHFL NY .263 ID x 432 OD x .015" Thick		Input Jack Inside Unit
159-50004-00	TYRAP 7.4"L NATURAL		Use to secure Large Caps
160-30012-00	HEADER 15 PIN 90DG		Connects Power Board to Amp Board
204-00033-00	CAP MYLAR .33 $\mu$ F 400V	C27	C27 fitted to Output Binding Post
205-00081-00	CAP FILTER LYTIC 9000 $\mu$ F 125V		 Use with #10 lugs and 10-32x1/4" screws
253-40040-00	RES WIRE WOUND 2.7 OHM 5W	R98	R98 fitted to Output Binding Post
315-13002-00	FUSE MDA12		
318-20004-00	SWITCH ROCKER SPDT		
318-50004-00	SWITCH THERMAL U1210005310A		
319-00059-00	RECT BRIDGE 400V 25A		
319-00063-00	TRIAC T03 F/P 35AMP 600V MOT		
321-30013-00	XISTOR T03P(L) NPN PWR 2SC3281	Q28-32	
321-30014-00	XISTOR T03P(L) PNP PWR 2SA1302	Q33-37	
401-10107-00	WIRE 18 AWG TEW BLACK 7"		Solder to Line Filter Ground Lug and the other end to Solder Lug Mounted to Triac
401-10111-00	WIRE 18 AWG TEW BLACK 16"		Fuseholder to Line Filter
401-10117-00	WIRE 18 AWG TR-64 GREEN 7"		Large Cap (-) to Bridge (-)
401-10152-00	WIRE 18 TEW RED 5"		Large Cap (+) to Bridge (+)
401-20101-00	BUSS WIRE 18 GAUGE 1.5"		
401-20104-00	BUSS WIRE 18 GAUGE 2"		(30) Xistors; (1) #6 lug on Xfmr to Regulator Board WP-C area
401-90012-00	LINECORD 16/2 POLARIZED		
402-10006-00	TUBING HEATSHRINK 3/16"ODx3/4"L		Fit to Filter, Power Switch Connections and Fuseholder
403-10002-00	CAULK BLACK LATEX		Apply to Meter Box
403-10003-00	SEALANT SILICONE RUBBER RTV		
403-10011-00	GLUE HOT MELT CLEAR		Use to secure LED to Front Panel
403-10012-00	LOCTITE, DEPEND ADHESIVE		Use to mount Feet
403-10013-00	LOCTITE, DEPEND ACTIVATOR		Use to mount Feet
403-10020-00	LOCTITE, #222		Apply to Xfmr nuts
403-10021-00	LOCTITE, #454 GEL ADHESIVE		Apply to Phono jack nut after assembly
403-20001-00	THERMALCOTE #253		Apply to Triac before assembly
403-40012-00	TAPE FOAM DOUBLE BACK 1/16x1"		Cut at 2.5" (approx.) for meter
502-20077-00	CHASSIS TOP SILVER 9t		
502-30007-01	CHASSIS BTM SILVER 9t		
503-20078-01	PANEL FRONT SCREENED		
503-20082-00	PANEL TOP SILVER 9t		
503-40062-01	BEZEL METER PANEL		Use black silicone to secure housing
504-20074-00	METER HOUSING SILVER 9t		

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
504-20075-00	BACK HOUSING SILVER 9t		
504-20076-01	COVER BACK SILVER 9t		
507-00031-00	BRACKET CAP MOUNTING SILVER 9t		Use Loctite #222 on mounting when assembling
507-00050-00	BRACKET THERMAL SWITCH UNIVERSAL		
511-00008-00	HEATSINK, TRIAC FAB		On Cap Bracket (Item 355)
512-10618-00	INSULATOR SIL-PAD		Use under Amp Board Xistors
512-10717-01	METER PLATE ANODIZED S9T		Add 1"x2" Double Back Tape
530-10155-00	LABEL, 1400 WATTS		
530-10165-00	LABEL, FUSE MDA12		
530-20100-00	STICKER SERIAL #		One Label on back of chassis, one label inside of chassis
601-00536-00	ASSY PREP LED SILVER 9t		
602-00576-01	ASSY PCP AMP SILVER 9t		
602-00578-02	ASSY PCB REGULATOR SILVER 9t		
602-00700-00	ASSY PCB METER SILVER 9t		
602-00701-00	ASSY PCB POWER SUPPLY SILVER 9t		
602-00702-00	ASSY PCB METER LIGHT SILVER 9t		
615-00003-00	LINE FILTER 16A		
617-10032-01	XFMR SILVER 9t		
<b>*HISTORY</b>			
154-40007-01	WASH SHOULDER TEFLON #4 .050"		Xistors Q6,14,16 Up to Rev.L

## SILVER SEVEN t PACKING

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
520-00020-01	BASE BLACK SILVER SEVEN t		Delete at Rev. C
532-10078-00	BAG PLASTIC SILVER SEVEN t		
532-20042-00	BOX SILVER SEVEN t		
532-30027-00	FOAM END CAP SILVER SEVEN t		
607-00332-00	ASSY FINAL SILVER SEVEN t		
990-00032-00	ENVELOPE WARRANTY INFORMATION		
990-20046-00	MANUAL, OWNER'S SILVER SEVEN t		

## SILVER NINE t PACKING

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
101-30003-00	BUMPER RUBBER SQUARE		Use with Base
520-20031-01	BASE BLACK SILVER NINE t		
532-10078-00	BAG PLASTIC 3" x 5"		
532-20042-00	BOX SILVER NINE t		
532-30027-00	FOAM END CAP SILVER NINE t		
607-00335-01	ASSY FINAL SILVER NINE t		
990-00029-00	CARD LIMITED WARRANTY		
990-00031-00	CARD WARRANTY REGISTRATION		
990-20106-00	MANUAL, OWNER'S SILVER NINE t		

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## Appendix C

### DESIGN HISTORY

#### Engineering Change Orders for Model Silver Seven t Magnetic Field Power Amplifier

Note: Revision levels for assemblies are different than revision levels for parts lists and schematic diagrams.

ECO#:1024	DATE:04/21/89	REV.E Final Assembly Parts List - Effective S/N 068
REASON FOR CHANGE:	Use correct resistor type.	
PROCEDURE:	Change R98 to 2.7 ohm 5W wire wound resistor.	
ECO#:1042	DATE:04/27/89	REV.B LED Prep Parts List REV.D Meter Board Parts List REV.F Final Assembly Parts List - Effective S/N 218
REASON FOR CHANGE:	To make power LED brighter; to avoid "bumping" RP1 out of calibration; to improve ground connection.	
PROCEDURE:	Change LED limiting resistor to 4.7k ohms. Remove set wheel from RP1. Use longer X-fmr mounting screws. Add star washer to power supply grounding screw on Regulator board.	
ECO#:1044-1	DATE:05/09/89	REV.B Button-Up Parts List REV.A3 Meter Board REV.B Meter Schematic - Effective S/N 200
REASON FOR CHANGE:	To accomodate new style meter.	
PROCEDURE:	Use new meter plate. On meter board, delete jumper and R16; change C5 and R11; add C6 and R12.	
ECO#:1111-1	DATE:06/26/91	REV.C Button-Up Parts List - Effective S/N 368
REASON FOR CHANGE:	To adjust the height of the meter plate.	
PROCEDURE:	Use two meter plates glued together to increase height.	
ECO#:1149	DATE:07/13/89	REV.I Final Assembly Parts List - Effective S/N 808
REASON FOR CHANGE:	To improve the reliability of the triac.	
PROCEDURE:	Change to a 35A 600V triac.	
ECO#:1168	DATE:07/11/89	REV.D Button-Up Parts List - Effective S/N 408
REASON FOR CHANGE:	To improve the height of the meter plate.	
PROCEDURE:	Use one meter plate and attach with double-sided foam tape.	
ECO#:1256	DATE:10/13/89	REV.F Button-Up Parts List - Effective S/N 1100
REASON FOR CHANGE:	To improve cap bracket mounting; to improve chassis to signal ground.	
PROCEDURE:	Use 9/16" screws for mounting cap bracket. Use a kepnut on the power supply grounding screw on Power Supply board.	

ECO#:1267                      DATE:10/17/89                      REV.G Button-Up Parts List - Effective S/N 1765  
REASON FOR CHANGE:      To meet safety agency approval.  
PROCEDURE:                      Replace MDQ12 fuse with MDA12 fuse.

ECO#:1272                      DATE:10/24/89                      REV.B Amp Schematic - Effective S/N 1581  
REASON FOR CHANGE:      To make damping adjustable.  
PROCEDURE:                      Remove R9 and replace with 2K Trim Pot (RP2).

### **Engineering Change Orders for Model Silver Nine t Magnetic Field Power Amplifier**

ECO#:1734                      DATE:05/22/91                      REV.K Final Assembly Parts List  
Effective S/N 9161460001  
REASON FOR CHANGE:      Improve adherence of feet.  
PROCEDURE:                      Use Loctite Depend Adhesive and Activator.

ECO#:1748                      DATE:06/07/91                      REV.L Final Assembly Parts List  
Effective S/N 9161460001  
REASON FOR CHANGE:      Improve strength of shoulder washer.  
PROCEDURE:                      Use a nylon shoulder washer on Q6, Q14, Q16.



# Appendix D

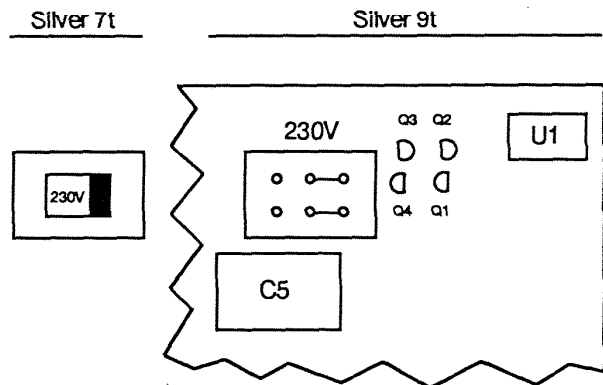
## VOLTAGE CONVERSION FOR SILVER 7t/SILVER 9t

### Bill of Materials

Qty	Part Number	Description
1	315-13004-00	Fuse MDA 6-1/4A
1	315-13002-00	Fuse MDA 12A
1	530-10106-00	Label 6A SLO-BLO
1	530-10107-00	Label 220-240V

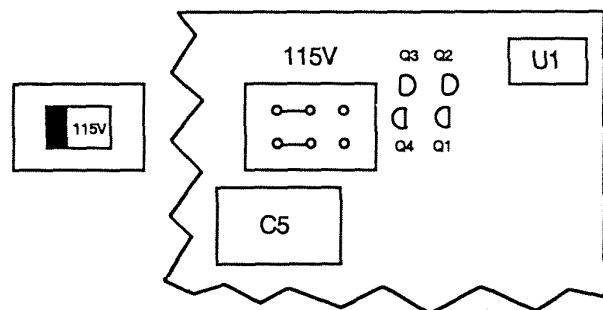
#### Directions for Change (115V to 230V)

- For Silver 7t: Set the switch on the power supply regulator board to the 230V position.  
For Silver 9t: Move jumpers to 230V position.
- Replace the MDA 12A fuse with an MDA 6-1/4A fuse (P/N 315-13004-00).
- Attach the 6A SLO-BLO fuse label (530-10106-00) over the MDA 12 printing near the fuseholder.
- Attach the 220-240V label over the 120 VOLTS printing near the line cord.



#### Directions for Change (220V to 115V)

- For Silver 7t: Set the switch on the power supply regulator board to the 115V position.  
For Silver 9t: Move jumpers to the 115V position.
- Replace the MDA 6-1/4A fuse with an MDA 12A fuse (P/N 315-13002-00).
- Remove the 6A SLO-BLO fuse label near the fuseholder.
- Remove the 220-240V label near the line cord.



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## **Appendix E**

### **SERVICE BULLETINS**

Please insert Carver Service Bulletins pertaining to the Silver 7t or Silver 9t here to ensure proper repair in the future.

CARVER CORPORATION  
SERVICE BULLETIN

Service Bulletin # SST-1A

Model SST

Serial # Below 0218

Reason: If the customer complains that the power L.E.D. is too dim, follow this procedure.

Procedure: 1. Replace 10k ohm resistor with 4.7k ohm resistor which is wired in series with the power L.E.D.

Delete: Qty-1 251-00094-03  
(10k ohm 1/4 watt)

Add: Qty-1 251-00086-00  
(4.7k ohm 1/4 watt)

SERVICE APPROVAL

ENGINEERING APPROVAL

*Walter Reynolds* 5/2/89  
*Tom Richardson* 6-20-89

# CARVER CORPORATION SERVICE BULLETIN

Service Bulletin # SST-3A	Model: SST	Serial nos. All
REASON: To eliminate damping pot drift.		Date: 7/26/90

DELETE	ADD
Qty 2 259-20010-00 2k Pot (RP2)	Qty 2 259-30001-00 500 ohm Pot (RP2)
	Qty 2 251-00067-00 750 ohm 1/4W resistor (R9)
	<i>FOR SILVER MUSE ONLY / EA</i>

## PROCEDURE

On the amp board, replace RP2 with a 500 ohm pot.  
 On the foil side of the board, cut trace between RP2 and U2 pin 3.  
 (See Figure 1A).  
 Solder R9, 750 ohm 1/4W resistor, between RP2 and U2 pin 3.  
 (See Figure 1B).

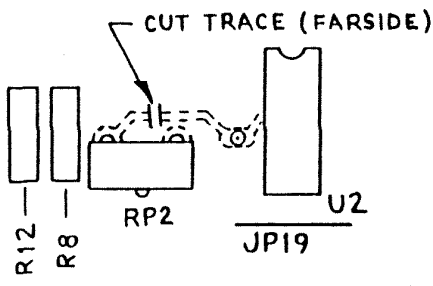


Figure 1A

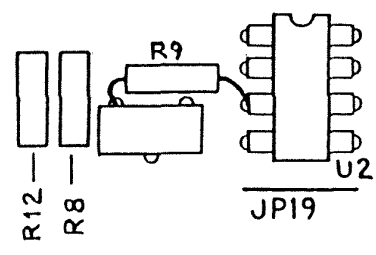
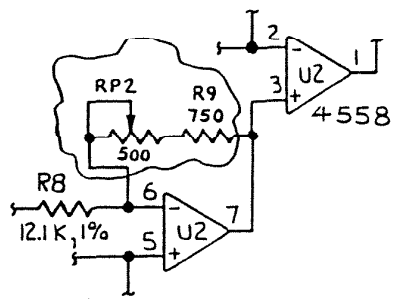


Figure 1B

**Note:** Adjust RP2 for a Gain of 29dB from input to output, with an 8 ohm load.



Engineering approval *Vic Fisher* 1-8-91

Service approval

# CARVER CORPORATION SERVICE BULLETIN

Service Bulletin # SST-4

Model: Silver Seven t

Serial nos. As needed

Reason:

Date: 1/29/91

If customer complains of hum or noise in the outputs.

DELETE

ADD

## PROCEDURE

1. Check continuity of input jack ground from the sleeve of the jack to chassis. In the assembly process, a thread locking glue is applied to the threads of the input jack. Occasionally, heat will cause the glue to migrate and insulate the ground lug on the input jack from the sleeve of the jack.

Note that the input jack is isolated from the chassis with a nylon washer. Connection to ground is made on the power supply board.

To repair:

- a) Tighten nut on input jack, or if this fails,
  - b) Remove input jack and thoroughly clean the threads and ground lug before re-installing.
2. Tighten screw holding the bracket on the right rear side of the power supply board. This provides the connection between power supply ground and chassis ground, and it is important for this electro-mechanical connection to be reliable.

Engineering approval

*V. J. Johnson* 1-29-91

Service approval

*B. Collier*

## NOTES

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NOTES

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