CARVER

PROFESSIONAL

PM-1200

(INCLUDING PM-1.5a)

MAGNETIC FIELD POWER AMPLIFIER

SERVICE MANUAL

CONTENTS Page

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

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 proces of elimination, the defective area can be located. Upon locating the defective area, you then would use you 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.

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 int the correct service manuals.

The Carver PM-1.5a Magnetic Field Power Amplifier was released in March of 1989. It was an updated version of the PM-1.5 power amplifier which had been in production for six years. The PM-1.5a included tw more power output transistors per channel and two fans instead of just one.

In 1990, the Professional line of power amplifiers was renamed to indicate the total power output into 4 ohm Thus, in March of 1990 the PM-1.5a became the PM-1200.

The PM-1200 is a stereo power amplifier rated at 450W per channel into 8 ohms and 600W per channel int 4 ohms. In bridged-mono mode of operation it will deliver 1200W into 8 ohms.

SECTION 3

SPECIFICATIONS

Specifications for the PM-1200 (PM-1.5a) Magnetic Field Power Amplifier

Power Output:

Continuous Average Output Power, both channels driven:

450 watts per channel into 8 ohms from 20 Hz to 20 kHz, with no more than 0.5% THD
600 watts per channel into 4 ohms from 20 Hz to 20 kHz, with no more than 0.5% THD

Bridged-mono operation:

1200 watts into 8 ohms from 20Hz to 20 kHz, with no more than 0.5% THD

Power at Clipping, both channels driven:

500 watts per channel into 8 ohms at 1 kHz

Dynamic Headroom:	1.6dB @ 8 ohms 2.0dB @ 4 ohms
Frequency Response:	20Hz to 20kHz (+0, - 0.5dB)
Crosstalk:	-50dB, 100Hz-10kHz
Damping Factor:	Greater than 200 at 1kHz
Input Impedance:	15k ohms unbalanced; 30k ohms balanced
Input Overload:	+15dBu
Sensitivity:	1.5V rms for rated power into 8 ohms at 1kHz 71mV rms for 1W output into 8 ohms at 1kHz
Gain:	32dB
IM Distortion:	Less than 0.1%
THD:	Less than 0.5%
Noise:	-110dB A-weighted, referenced to rated power (nominal) -107dB A-weighted, referenced to rated power (limit) -83dBW A-weighted, referenced to 1W (nominal) -80dBW A-weighted, referenced to 1W (limit)
Slew Rate:	25V/µS
Power Consumption:	1500W at full power 120W at idle
Power Requirements:	120VAC/60Hz (USA and Canada) 230VAC/50Hz (Europe)
Display:	LED Ladder; 7 indicators per channel 1mS attack time; 500mS decay time
Size (H x W x D):	3.5" x 19" x 10.75" (12" overall) 89mm x 483mm x 273mm (305mm overall)
Weight:	21 lbs. 9.5 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
PM-1200/1.5a

TECHNICAL DESCRIPTION

This section discusses the theory of operation of the PM-1200. All descriptions apply to the electrically identical PM-1.5a as well. For a better understanding of the circuitry involved, refer to the block diagram and schematic diagrams presented later in this manual. Op-amps described in the circuitry use the following notation: IC1(7) means IC1, whose output appears on pin 7. Unless otherwise noted, this discussion centers around the left-channel circuitry. The right-channel circuitry is essentially identical.

LOW LEVEL CIRCUITRY

Input signals enter the circuit via the rear-panel XLR connector, or tip-ring-sleeve (TRS) phone jack. The left channel input circuit includes a phase-reverse switch that is used for mono-bridge operation. IC1(7) is configured as a differential amplifier with a gain of 1.47 driving the right-channel level control. On the amplifier board R1, R2, and U2 form an attenuator whose loss is dependent on the resistance of U2, an LED-LDR module. The drive for the LED portion of U2 comes from the clipping eliminator circuitry, which will be discussed later on.

The PM-1200 may be configured to operate as a conventional 2-channel, stereo amplifier or a single-channel, mono amplifier with high-voltage output. The operational mode is determined by mono-bridge switch SW1. For now, assume that SW1 is set for 2-channel, dual-mode (stereo) operation.

POWER AMPLIFIER CIRCUITRY

The PM-1200 uses the patented Carver Magnetic Field power amplifier circuitry. This innovative circuit uses the combination of a smart power supply and a highly linear, triple-rail power amplifier circuit.

IC1(6) is the input stage, providing differential inputs for input and feedback connections as well as most of the open-loop voltage gain of the circuit. The output of IC1(6) drives Q14 and Q15, operating as common-emitter amplifiers which level-shift the drive signal, provide voltage amplification, and couple it to common-emitter amplifiers Q13 and Q20. Q13 and Q20 provide additional voltage gain, and when combined with the voltage gain of the input op-amp is sufficient to swing the input signal between the +/- 124V power supply rails. Q16 and Q17 are connected as an NPN-PNP conjugate pair and used as a V_{BE} multiplier for bias control. Q16 is thermally connected to the output transistors and together with Q17 provides bias stabilization over a wide temperature range. Overall negative feedback from the output stage via R59 and R3 sets the closed-loop gain at 32 dB.

Up to now, the amplifier circuitry has been fairly conventional. From this point on, there is a marked departure from convention. The PM-1200 uses a triple-stacked output stage, with each stage having access to its own power supply. Each level of the output stage turns on only when needed, which keeps the power dissipation of the output stage at a minimum.

Ignore the negative-going portion of the output stage for now. The positive-going portion of the output stage is comprised of an emitter-follower driver (Q8) and a series-connected output stage (Q7, Q6/Q24). The negative-going portion of the output stage is exactly complementary to the positive-going portion; an emitter-follower PNP driver (Q3) and a series-connected output stage (Q4, Q5/Q25).

The innermost pair, that is, the output transistor pair whose emitters are closest to the output (load) terminals (Q6/Q24, Q5/Q25) are driven from the opposite sides of the V_{BE} multiplier (Q16/Q17). The circuit looks suspiciously like a full-complementary amplifier. It is exactly that. Diodes D15-D17 and

D31 level-shift the drive signal to the requirements of the innermost output transistors while Q23 is a local V_{BE} multiplier to limit the maximum voltage difference between the output transistor bases.

Q18 operates as a VI limiter, sensing the voltage drop across emitter resistor R49, and reducing the drive signal to the output stage under overload conditions. Q19 operates in similar fashion for the negative-portion of the output stage. Q26 senses current limiting in the negative half of the output stage and passes this signal to the power supply as a shutdown signal. C30 causes Q26 to also turn on in the presence of large high-frequency signals.

Q7, the middle output transistor receives its drive via D14. When the drive signal exceeds 36V plus two diode drops, Q7 begins to turn on and supplies additional voltage output capability via the intermediate 76V power supply. When this occurs, D13 disconnects the 36V supply from the amplifier. The same is true for the negative half of the amplifier (Q4, D25, D24). We now have an amplifier capable of swinging the load from approximately +76V to -76V (minus saturation drops, of course).

Now consider the outermost pairs of output transistors (Q9/Q10 and Q1/Q2). These transistors are driven (via Q12/Q11 and Q21/Q22) from the positive and negative sides of the V_{BE} multiplier (Q16/Q17) via zener diodes D34 and D35, which level shift the output signal by the zener voltage towards the 124V power supply rail. As long as the peak AC output voltage remains below the zener voltage, Q12 and Q21 do not conduct. Once the AC output signal exceeds the zener voltage, the outermost output transistors begin to conduct. Diodes D12 and D23 are commutator diodes that disconnect the output stage from the 76V power supply whenever the voltage at the connection point between Q10 and Q7 exceeds 76V. Under high-frequency conditions, C10 and C20 provide phase lead for the outermost output transistors, ensuring that they can "stay ahead" of the audio signal.

Under small-signal conditions, the innermost pair of transistors does all the work. As the signal level grows larger and larger, the middle pair of transistors assumes part of the burden. At the highest signal levels, the outermost pair of transistors assumes the remainder of the burden of providing a high-voltage output signal to the load. This three-stage approach minimizes the voltage across each of the output devices which also minimizes the power dissipation required. Without this approach, the output transistors would be required to support the entire power supply voltage under small-signal conditions and the "unused" portion of the power supply voltage would be turned into heat.

ANTI CLIPPING CIRCUIT

The amplifier's input operational amplifier, IC1(6) also drives a bridge rectifier (D1 through D4). The output of the rectifier drives the LED portion of U2. IC1(6) is inside of the overall feedback loop, thus the signal voltage at this point is quite low, unless the feedback loop loses control (such as at clipping). Under these conditions, the output of the bridge rectifier is sufficient to illuminate the LED in U2, which reduces the resistance of the resistor portion of U2 which reduces the drive signal to the amplifier. The net result is a moderately fast limiter that is activated by amplifier clipping.

MAGNETIC FIELD POWER SUPPLY

The main power supply for the PM-1200 is a triple-voltage design which provides no-load voltages of +/-124, 76 and 36 volts DC. Triac TR1 drives the primary of the magnetic field power transformer. TR1 operates as a phase controlled switch; its gate signal depends on the signal supplied to opto-isolator U2, which isolates the drive circuitry from the AC power line. Diode bridge D1 through D4 provide steering for the phototransistor in U2, allowing the triac to fire on both alternations of the power line. The phototransistor, resistors R4, R3 and R2, capacitors C3 and C2, and diac D5 make up a phase-shift firing circuit that fires the triac earlier or later in the AC cycle depending on the phototransistor's conduction. When the LED in U2 is OFF, the triac conducts earliest in the AC cycle: the power supply is operating at maximum output.

Emitter-followers Q5 and Q6 drive the LED portion of opto-isolator U2. Their base drive is derived from the +/-124V supplies and the +/-36V supplies. RP1 sets the LED current, which in turn sets the no-load (idle) voltage of the power supplies. Under signal conditions, the 125V and 36V supplies will rise and fall as determined by signal / load demands. This changes the LED current, which in turn tells the triac what to do (more LED current, less triac current). This effectively keeps the various supplies at or near their no-load values.

Q2 and Q3 operate as a differential amplifier whose input is the logical OR of the various fault-detection systems. Q4 inverts the output of the diff-amp, and references it to the 76V supply. If Q2 is turned on, Q4 pulls additional LED current through the opto-isolator LED and shuts the power supply down.

DC FAULT PROTECTION

IC1(1) is a differential amplifier whose inputs are the amplifier outputs, severely low-pass filtered. The low-pass filtering prevents the circuit from operating on anything but DC output from the amplifier channels. The gains of the two inputs are different to ensure circuit operation if opposite halves of the amplifier decide to fail at the same time. If IC1(1) is negative-going, D5, R53, and D6 couple the signal to Q3's base, which results in Q4 turning on (via Q3). If IC1(1) is positive-going, D4 couples this signal to Q2's base, again turning on Q4, which disables the power supply.

SHORT CIRCUIT/LOW IMPEDANCE PROTECTION

Q1's input is the output of each channel's protection sense transistors (Q26). If the protection transistors are triggered (low impedance load, output terminals shorted, high-frequency overload, etc.), Q1's collector goes positive. C2 provides a small time lag to allow momentary overloads to pass. When Q1 is triggered, its output drives Q2, which again disables the power supply via Q4.

OVERVOLTAGE PROTECTION

IC1(12) is connected as a comparator. Its inputs are: +5.8Vdc, derived from the +11.5V regulator, and +5.2Vdc which is derived from the +124V supply via voltage divider R1, R2 and R59. If the 124V supply should exceed 141V, IC1(12) triggers, driving Q2 and Q4 through D1, again disabling the power supply.

DISPLAY CIRCUIT

The clipping indicators are driven by transistors Q9, Q12 (left), Q10 and Q11 (right) located on the power supply PCB. Each pair of transistors drives one of the LEDs. The signal for the clipping indicators comes from the main amplifier boards from IC1(6) via voltage divider R97/R12. This is the same signal that operates the anti-clipping opto-isolator. D17 half-wave rectifies the negative-going portion of the signal and drives Q9, which is a switch. C15 and R45 establish the time constant of the clipping indicator. When Q9 turns on, Q12 turns on as well, illuminating the clipping LED (located on the display PCB).

The display driver circuit comprised of IC1(4,3,12,10) and IC2(12,3,4,10) is basically a ladder comparator driving LEDs, with a twist. Assume that the signal at IC1(2) is zero volts and ignore R23 and D4 for now. R12 and R13 are a voltage divider that establishes a reference voltage for the comparators (four per channel). The comparators compare their input signal against the voltages established by the tapped voltage divider made up of R21, R19, R17, and R24. The left channel LEDs are in the following sequence (lowest to highest): D11 (green), D10 (red), D9 (red), D8 (red), D7 (red), D6 (red), D5 (yellow).

The display board receives a positive-going half-wave rectified and smoothed signal from the amplifier outputs via the power supply PCB. With the input signal at zero volts, all of the comparator outputs are at -12V, except for IC1(4) which is high. None of the LEDs (except D11 and D18 power on indicators) have any voltage across them; all are extinguished. As the input signal rises, it crosses, in sequence, the thresholds established at each of the four comparators. First IC1(3) fires; its output goes high, and D10 illuminates. Next IC1(12) fires, its output goes high; D10 extinguishes (no net voltage across it) and D9 illuminates. Finally IC1(10) fires; D9 extinguishes, and (this is the twist) D4/R23 supply current to the bottom of the R17, R19 and R21 voltage divider, which inverts the relationship of the comparators to each other.

When IC1(10) fires, the current through R23 reverses the sequence of the voltages that establish the thresholds for the three comparators. This allows the same comparators to perform double-duty. The new thresholds leave IC1(10) high, IC1(4) low, IC1(12) and IC1(3) low and D8 on. D6 and D7 are off. As the input signal rises further, IC1(12) fires, extinguishing D8 and illuminating D7. Next, IC1(3) fires, extinguishing D7 and illuminating D6. Finally IC1(4) fires, extinguishing D6. The last LED is the clipping indicator, D5.

SECTION 5

CALIBRATION PROCEDURE
PM-1200/1.5a

High Rail Voltage Adjust

With no signal and no load:

1. Adjust RP1 on the power supply board for ±124VDC when measured at the large filter capacitors.
2. Verify the following DC voltages on the power supply board:

D23 Cathode	+76.5VDC (±1V)
D24 Anode	-76.5VDC (±1V)
D27 Cathode	+36.5VDC (±1V)
D28 Anode	-36.5VDC (±1V)
IC1 Pin 7	-11.5VDC (±0.5V)
IC1 Pin 11	+11.5VDC (±0.5V)

Idle Bias Adjust

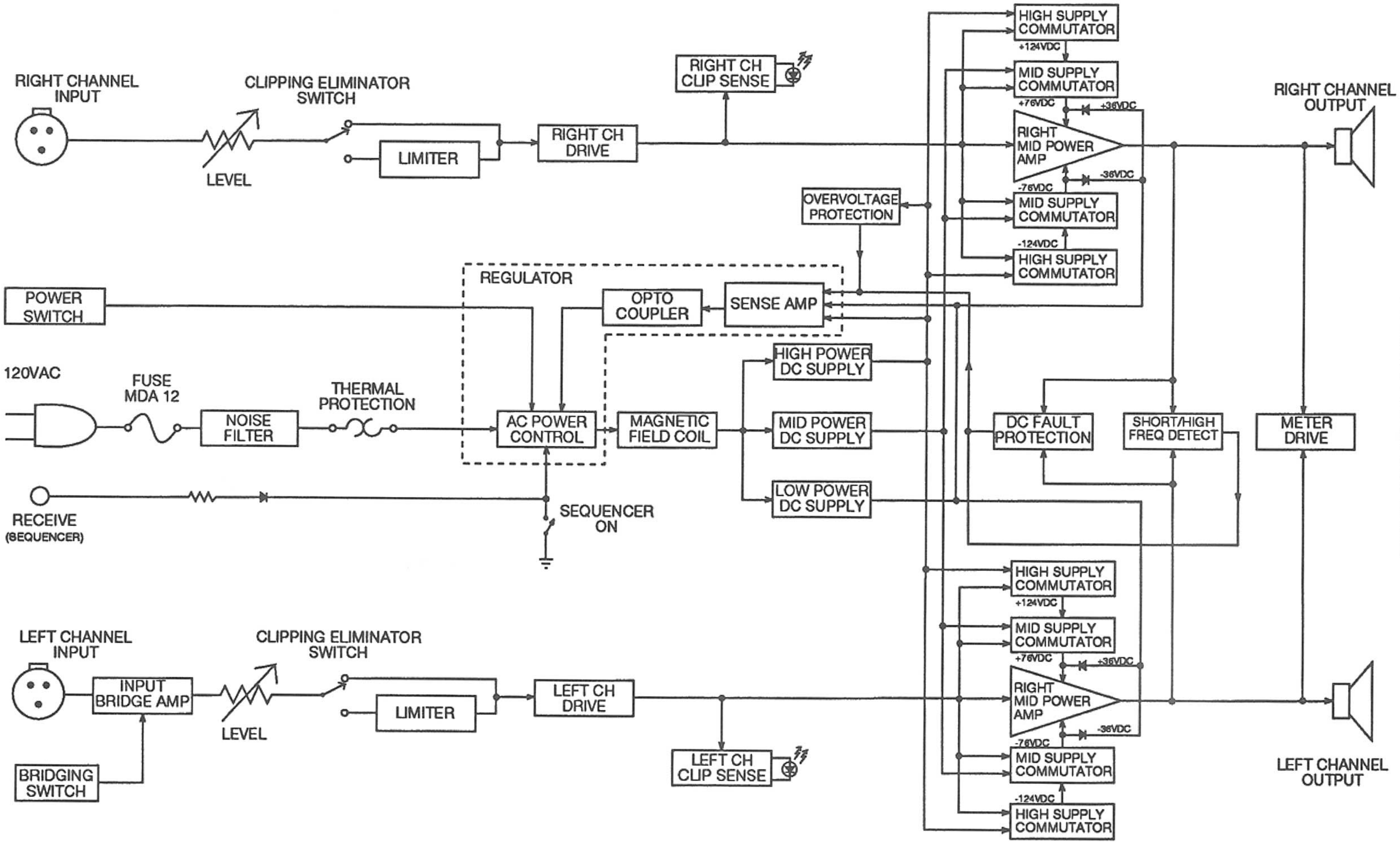
For all version:

With no signal and no load:

1. Adjust RP1 on each amp board for 3.4mVdc across both emitter resistors (R49/R87).

Note: This adjustment should be made after the amplifier has been on approximately two minutes, while it is still cool. After the amplifier warms up, the bias reading may be higher.

BLOCK DIAGRAM
PM-1200



SECTION 7
SCHEMATICS AND LAYOUTS

CONTRACT NO		CARVER CORPORATION	
APPROVALS	DATE		
DRAWN P. MCGUIRE	7-29-88	SCHEMATIC, PCB AMP	REV
CHECKED		PM1.5A/PM-1200	F
		SIZE C — CODE IDENT NO — DRAWING NO 605-001126-07	
		SCALE NONE — SHEET 1 OF 1	

NOTES: UNLESS OTHERWISE SPECIFIED

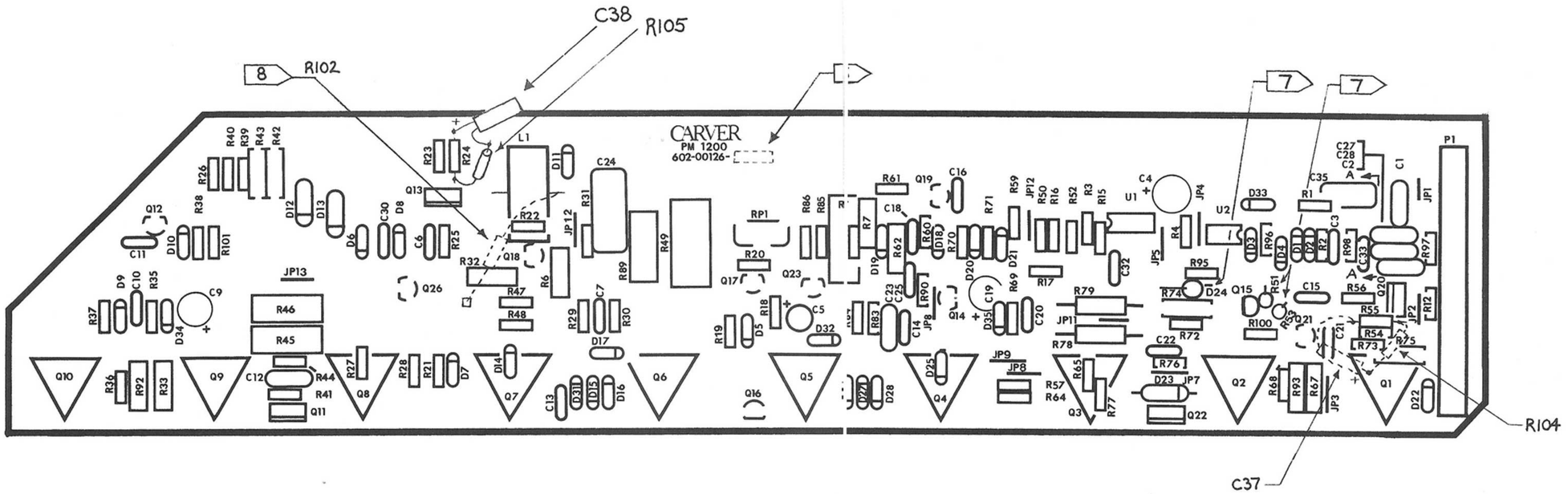
1. ALL RESISTORS ARE 1/4 W.
2. ALL CAPACITANCE IS IN UF.
3. ALL DIODES ARE IN4148.
4. Q1 - Q10 ARE CHASSIS MOUNTED.
5. U1 IS TL0-81.
6. U2 IS CLM 51.

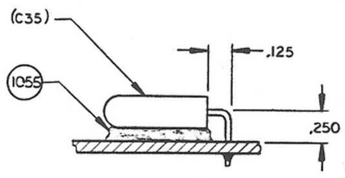
REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	RELEASED TO PRODUCTION	4-28-89	
	B	R86 FROM 47Ω TO 27Ω, ECO 1091	5-22-89	
	C	INCORP ECO # 1231	10-1-89	
	D	INCORP ECO # 1411	3-29-90	
	E	INCORP ECO # 1645	2-7-91	
	F	INCORP ECO # 1647	3-12-91	

DWG. NO.	DIV.	REV.
602-00126-07	1	L

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
	G	INCORPORATED ECO # 1411 P.L. REV STATUS CHANGED FROM "F" TO MATCH WITH DWG'S LATEST REV.	7-9-90 90/1/24	GG CA
	H	INCORP ECO # 1461 LEV	6/5/90	
	J	INCORP ECO # 1589	10/26/90	
	K	INCORP. ECO # 1645	2-6-91	
	L	INCORP ECO # 1647 LV	3-12-91 LV	





SECTION A-A

9

9 BEND C35 AS SHOWN AND SECURE USING RTV, ITEM NO. 1055.

8 SLEEVE RESISTOR AND ENTIRE LENGTH OF BOTH LEADS USING ITEM NO. 1045.

7 COMPONENTS TO BE MOUNTED STANDING UP.

6 MARK DASH NO. AND REV AT LOCATION SHOWN.

5. ALL ITEM NUMBERS 1000 OR ABOVE TO BE INSTALLED AFTER SOLDER POT AT TOUCH UP LEVEL.

4. ALL UNUSED COMPONENT HOLES TO BE MASKED BEFORE SOLDER DIP.

3. COMPONENT VALUES OF LESS THAN 1/2W TO BE FLUSH MOUNTED TO PCB. COMPONENT VALUES OF 1/2W OR MORE TO BE MOUNTED OFF PCB BY 1/4 INCH.

2 ALL ITEMS ARE ON 602-00126-07 PARTS LIST, REV. K.

1. USE PCB 501-00126-00, REV. C.

NOTES: UNLESS OTHERWISE SPECIFIED,

-07	607-75161-00	PM 1.5A (CSA)
-07	607-76161-00	PM 1.5A (240)
-07	607-00120-06	PM 1200 (CSA)
-07	607-00120-05	PM 1200 (EURO)
-07	607-00120-02	PM 1200 (230V)
-07	607-00120-01	PM 1200 (120V)
-07	607-00161-00	PM-1.5A

DASH NO.	NEXT ASSY	USED ON
APPLICATION		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS DECIMALS ANGLES
.XX ±
.XXX ±

MATERIAL 2

FINISH

DO NOT SCALE DRAWING

CONTRACT NO

APPROVALS	DATE
DRAWN	1-4-89
CHECKED C. ADKINS	90/1/24
ENG	
MFG	
QUALITY	

CARVER

ASSY, PCB -AMPLIFIER
PM-1.5A/1200

SIZE D | DWG. NO. 602-00126-07. | REV L

SCALE 2/1 | SHEET 1 OF 1

DWG NO.	SH	REV
602-XX127-01	1	Y

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
	R	INCORPORATED ECO # 1346 DWG REV JUMPED FROM REV "M" TO MATCH CURRENT PARTS LIST REV. ADDED SILKSCREEN. MATCH W/P/L	1-9-90 4-10-90 90/1/29	
	T	INCORP. ECO 1589	10/26/90	
	U	INCORP. ECO # 1645	2-6-91	
	V	INC ECO # 1812 mk	8-20-91	
	W	INC ECO 1848 RAC	9/12/91	
	Y	INC ECO 1942 RAC	12/9/91	

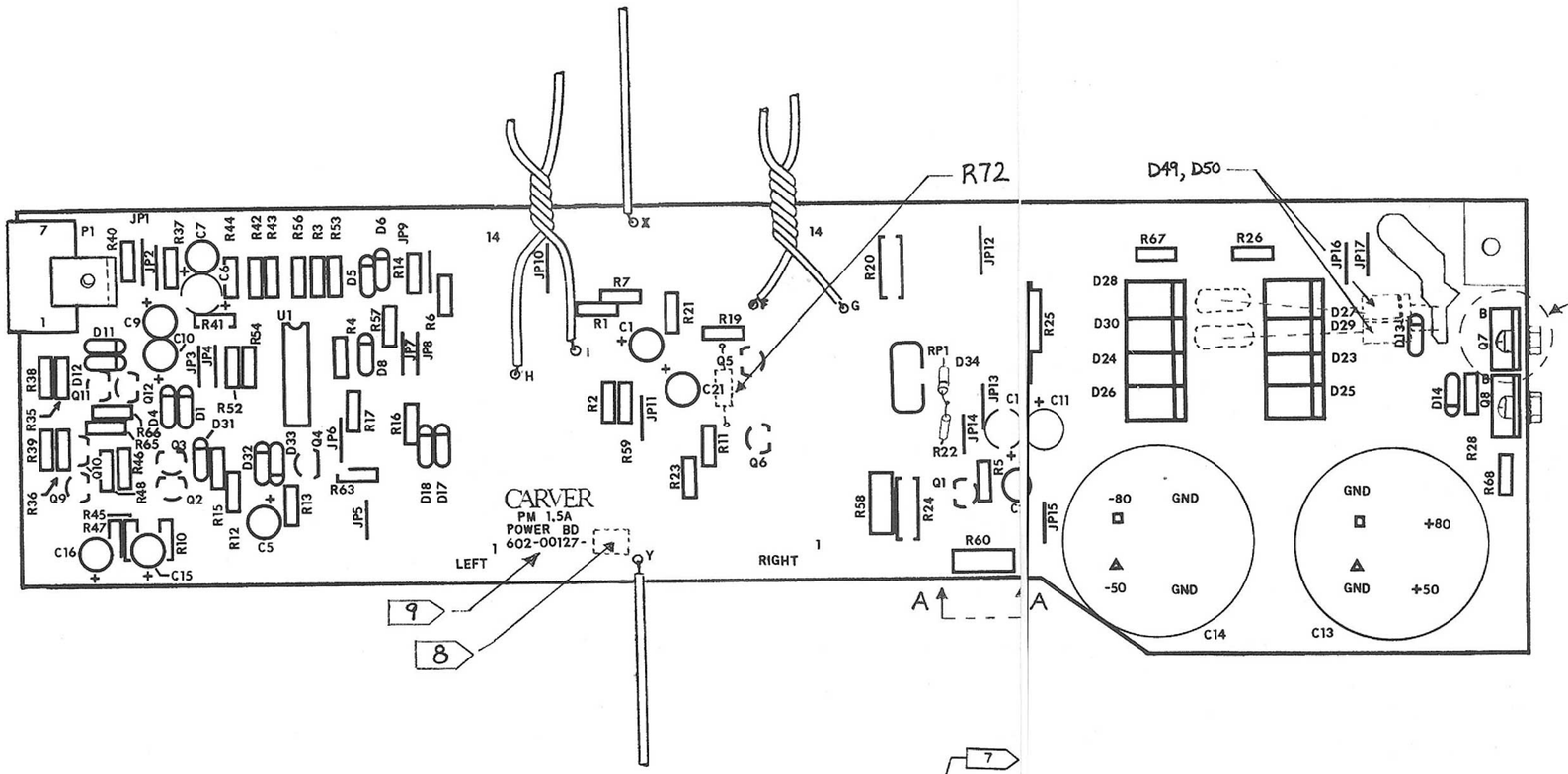
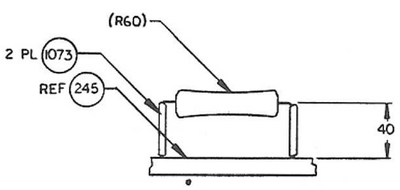
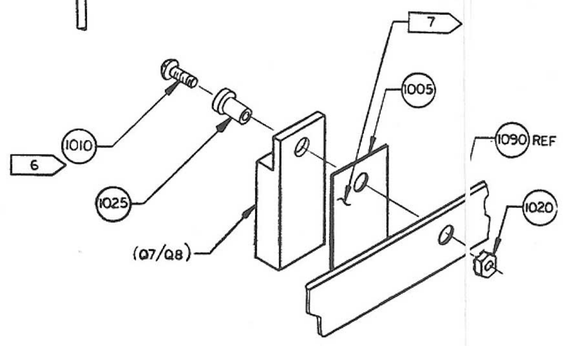


TABLE I

DRAWING NO.	USED ON	
602-00127-01	607-00120-01	120V
602-00127-01	607-00120-06	CSA
602-00127-01	607-00120-18	CLA
602-76127-01	607-00120-02	230V
602-76127-01	607-00120-05	EURO
602-76127-01	607-00120-19	KOREA



VIEW A-A
SCALE 4/1



DETAIL B
(TYP 2 PL)

110V, 230V
(ALL SAME EXCEPT AS NOTED)

9 RE-IDENTIFY WITH APPROPRIATE PREFIX "76" AS REQUIRED.

8 MARK DASH NUMBER USING CONTRASTING, NON-CONDUCTIVE INK.

7 APPLY THERMALCOTE, ITEM 1080 ON BOTH SIDES OF MICA INSULATOR.

6 APPLY LOCKTITE, ITEM 1075 TO SCREWS AS REQUIRED.

5. ALL ITEM NUMBERS 1000 OR ABOVE TO BE INSTALLED AFTER WAVE SOLDER AT TOUCH UP LEVEL.

4. ALL UNUSED COMPONENT HOLES TO BE MASKED BEFORE WAVE SOLDER

3. COMPONENT VALUES OF LESS THAN 1/2W TO BE MOUNTED FLUSH TO PCB. COMPONENT VALUES OF 1/2W OR MORE TO BE MOUNTED OFF PCB BY 1/4 INCH.

2 ALL ITEMS ARE ON 602-00127-01, REV W AND 602-76127-01, REV K.

1. USE ITEM NUMBER 245.

NOTES: UNLESS OTHERWISE SPECIFIED,

	SEE TABLE I	
ENGR. REQ.	NEXT ASSY	USED ON
APPLICATION		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ARE: FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL: 2

FINISH: —

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN	1-9-90
CHECKED E. ADKINS	90/1/29
ENG.	
MFG.	
ISSUED	

CARVER

ASSY, PCB-POWER SUPPLY

SIZE D | DWG NO. 602-XX127-01 | REV Y

SCALE 2/1 | SHEET 1 OF 1

DWG. NO	SH	REV.
605-XX127-XX	1	H

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	F	REDRAWN AND REVISED PER ECO 1788 RAE	9/19/91	
	G	INC ECO 1896 LV	10-9-91	
	H	INC ECO 1897 RAC	10/16/91	

9 INSTALLED AT FINAL ASSY.

8. REF DES NOT USED: C17-C20, R27,28,34, 48-51, 55, 61, 62, 64, 65, 66, Q6, D3, 7, 9, 10, 15, 16, 20, 21, 22, 31, 35-49.
7. LAST USED REF DES: C21, R68, IC1, Q12, D50.
6 SEE TABLE I.
5. IC1 IS A 4136.
4. C13 AND C14 ARE DUAL 2200 uF, 50/80V CAPS.
3. ALL CAPACITANCE IN MICROFARADS.
2. ALL DIODES ARE IN4148.
1. ALL RESISTOR VALUES ARE IN OHMS AND ARE 1/4W.

UNLESS OTHERWISE SPECIFIED:
NOTES:

VERSION	PART NUMBER
120V (DOMESTIC)	605-00127-01
230V (EXPORT)	605-76127-01

DASH NO.	NEXT ASSY	USED ON
	602-76127-01	PM1200
	602-00127-01	PM1200

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL —

FINISH —

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN RA CALDWELL	7/25/91
CHECKED S. MOSES	9-11-91
ISSUED	
ENG.	
MFG.	

CARVER

SCHEMATIC DIAGRAM-
PCB POWER SUPPLY
PM 1200

SIZE	DWG. NO.	REV.
C	6 605-XX127-XX	H

SCALE NONE SHEET 1 OF 1

DWG. NO.	SH	REV.
605-XX129-XX	1	J

REVISIONS

ZONE	REV	DESCRIPTION		DATE	APPROVED
	E	REDRAWN AND REVISED PER ECO 1788	BAR	9/5/91	
	F	INC ECO 1896	LW	10-9-91	ATM
	G	INC ECO 1897	BAR	10/16/91	ATM
	H	INC ECO 1920	LW	11/8/91	BAR
	J	INC ECO 1965	LW	1-27-91	ATM

PRODUCT SAFETY NOTICE

All safety precautions in this manual should be followed during servicing. Components identified with the IEC symbol ⚠ in the parts list and the schematic diagram designate components in which safety can be of special significance. When replacing a component identified with ⚠, 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.

NOTES: UNLESS OTHERWISE SPECIFIED

1. ALL RESISTOR VALUES ARE IN OHMS. ALL RESISTORS ARE 1/4W.
2. DELETED.
3. ALL CAPACITANCE IN MICROFARADS.
4. SEE TABLE I.
5. LAST USED REF DES: TS1, R10, F1, D5, C9, TR1, J5, U2, Q1.
6. REF DES NOT USED C5, C8, J1, J2.

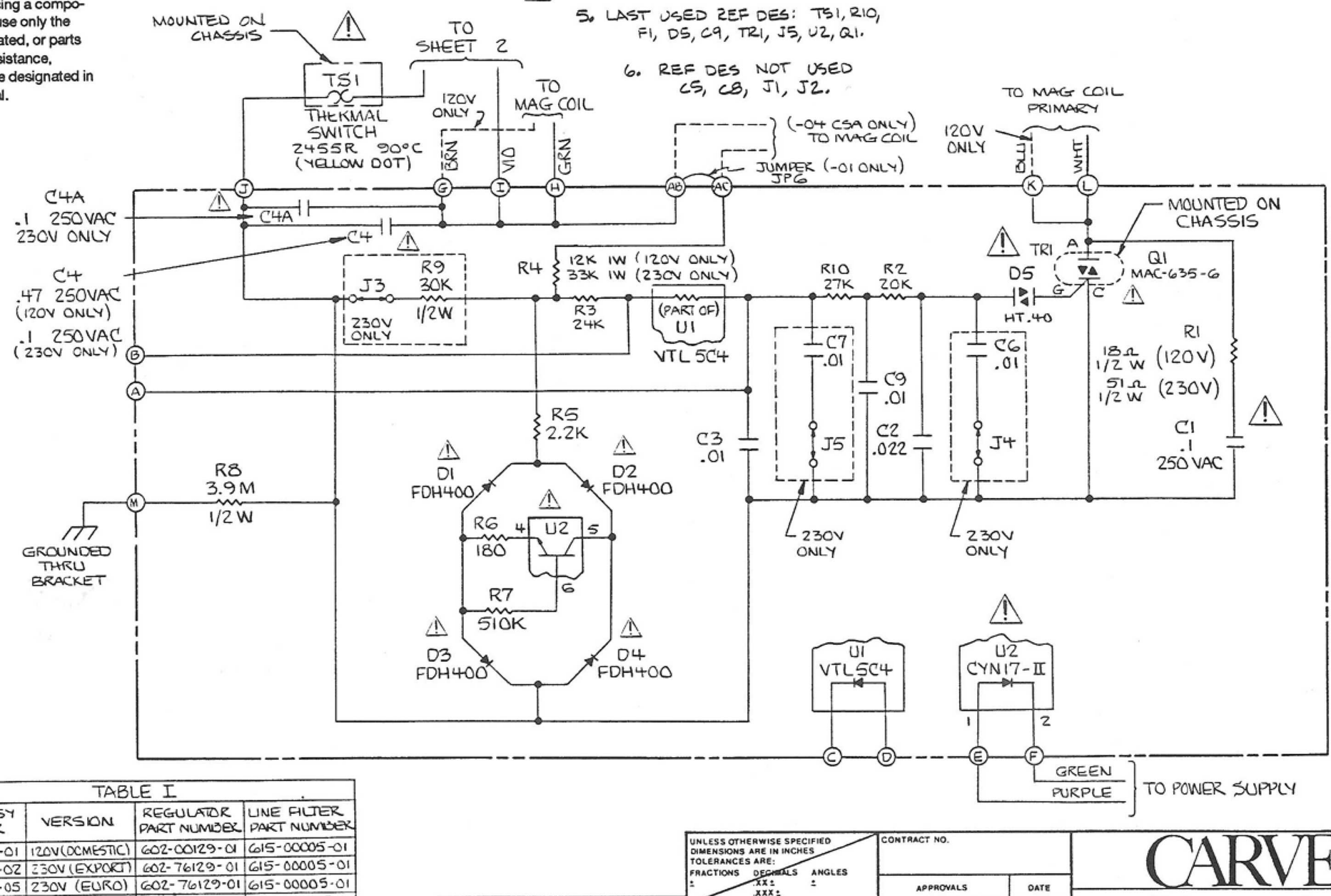


TABLE I

SCHEM. DIAG. DWG. NO.	FINAL ASSY NUMBER	VERSION	REGULATOR PART NUMBER	LINE FILTER PART NUMBER
605-00129-01	607-00120-01	120V(DOMESTIC)	602-00129-01	615-00005-01
605-76129-01	607-00120-02	230V (EXPORT)	602-76129-01	615-00005-01
605-76129-01	607-00120-05	230V (EURO)	602-76129-01	615-00005-01
605-00129-01	607-00120-18	120V (CLA)	602-00129-01	615-00005-01
605-76129-01	607-00120-19	230V KOREA	602-76129-01	615-00005-01
605-00129-04	607-00120-06	120V (CSA)	602-00129-04	615-00005-01
605-76129-01	607-00120-08	230V GERMAN	602-76129-01	615-00004-01

DASH NO.	NEXT ASSY	USED ON
	4	

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL —

FINISH —

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN RA CALDWELL	7/23/91
CHECKED S.MOSES	9-19-91
ISSUED	
ENG.	
MFG.	

CARVER

SCHEMATIC DIAGRAM- PCB REGULATOR, PM 1200

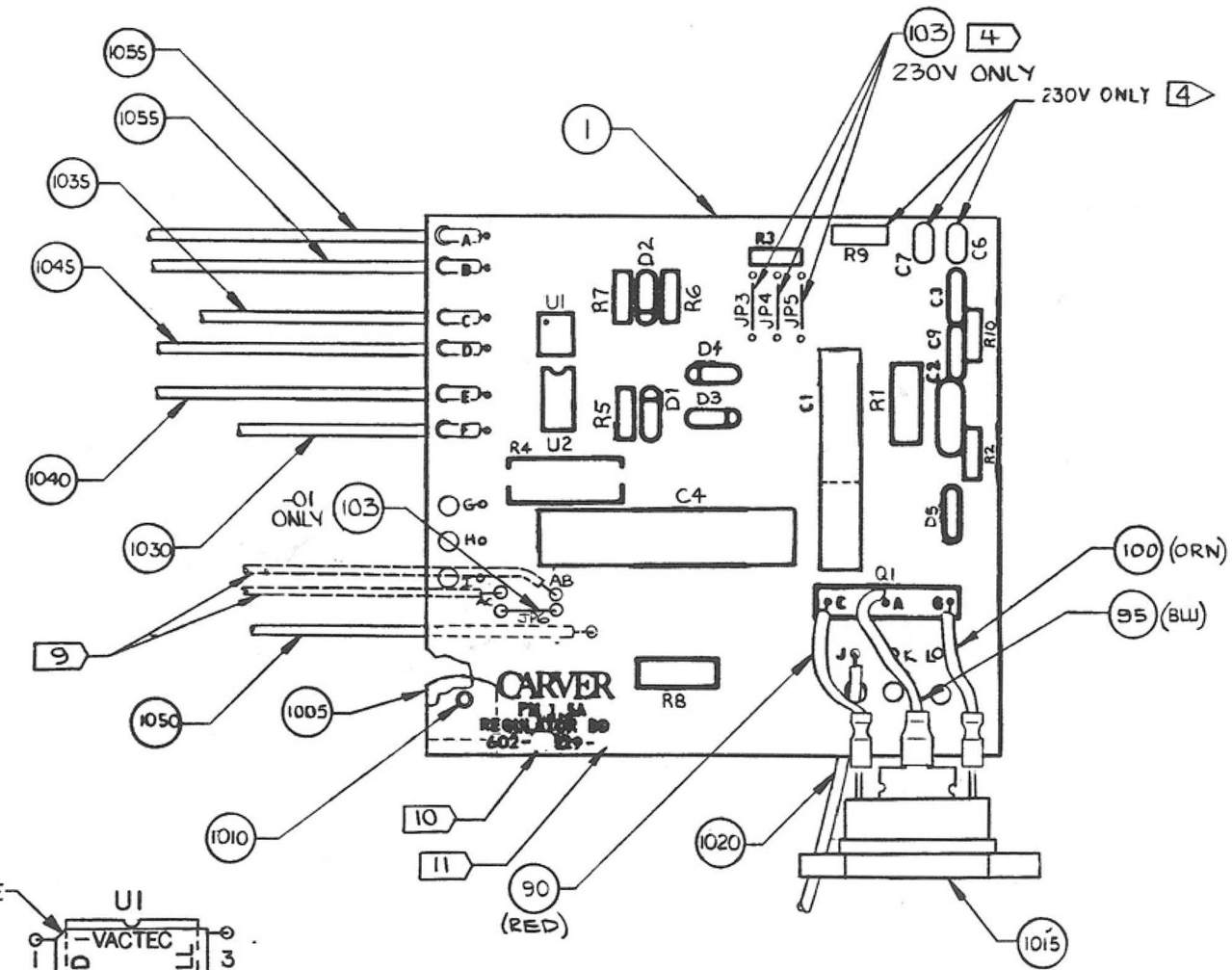
SIZE	DWG. NO.	REV.
C	605-XX129-XX 4	J

SCALE NONE SHEET 1 OF 2

DWG NO	SH	REV.
602-XX129-XX	1	T

REVISIONS

ZONE	REV	DESCRIPTION	DATE	APPROVED
	J	INCORPORATED ECO #1344 DWG REV STATUS JUMPED FROM "G" TO MATCH HIGHEST PL REV STATUS.	11-20-89 9/1/24	GRG. MK CA
	K	INCORP ECO # 1461 LEV	6/5/90	MK MP
	L	INCORP ECO #1577	9/17/90	RJ MK
	M	INCORP ECO #1589	10/31/90	BC MK
	N	INCORP ECO #1641 LEV	2-1-91	MK BC
	P	INCORP ECO #1668	3-20-91	BC MK
	R	INC ECO 1896 LY	10-9-91	dm MK
	T	INC ECO 1897 RAE	10-16-91	dm MK
	U	INC ECO 1965 LY	1-27-92	dm MK



11 IDENTIFY PART WITH APPROPRIATE DASH NUMBER.

10 IDENTIFY PART WITH APPROPRIATE PART NUMBER ("00" FOR 120V, "76" FOR 230V).

9 REF ONLY- TRANSFORMER WIRES.... WIRED AT FINAL ASSY.

8 SEE TABLE 1.

7 INSTALL VTL5C4 WITH "1" TO PIN 1 OF PCB
INSTALL VTL5C4 WITH "4" TO PIN 2 OF PCB
INSTALL VTL5C4 WITH "CELL" TO PIN 3 AND 4 OF PCB.
(VTL5C4 IS AN ACCEPTABLE SUBSTITUTE FOR VTL5C2)

6. ALL ITEM NUMBERS 1000 AND ABOVE TO BE INSTALLED AFTER WAVE SOLDER AT TOUCH UP LEVEL.

5. DELETED

4 R9, C6, C7, JP3, JP4 AND JP5 INSTALLED FOR 230v ONLY.

3. COMPONENT VALUES OF LESS THAN 1/2 W TO BE FLUSH MOUNTED TO PCB. COMPONENT VALUES OF 1/2W OR MORE TO BE MOUNTED OFF PCB BY 1/4"

2 ALL ITEMS ARE ON PARTS LIST 602-00129-01, REV T, AND 602-76129-01 REV R AND 602-00129-04 REV A.

1. USE PCB ITEM NO. 1

NOTES: UNLESS OTHERWISE SPECIFIED,

TABLE 1	
VERSION	PART NO.
120V DOMESTIC	602-00129-01
230V EXPORT	602-76129-01
120V CSA	602-00129-04

DASH NO	NEXT ASSY	USED ON
-01	607-00120-19	PM-1200 (KOREA)
-01	607-00120-18	PM-1200 (CLA)
-01	607-00120-08	PM-1200 (GERMAN)
-04	607-00120-06	PM1200 (CSA)
-01	607-00120-05	PM1200 (EURO)
-01	607-00120-02	PM1200 (230V)
-01	607-00120-01	PM1200 (120V)
-02	607-76161-00	PM1.5A (240V)
-01	607-00161-00	PM1.5A
-04	607-75161-00	PM1.5A (CSA)

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS XX ± .XXX ± ANGLES ±

MATERIAL 2

FINISH

DO NOT SCALE DRAWING

CONTRACT NO

APPROVALS	DATE
DRAWN GRG	11-28-89
CHECKED C. ADKINS	9/1/24
ISSUED	1-30-90
ENG.	
MFG.	

CARVER

ASSY, PCB - REGULATOR
PM1.5A/1200

SIZE	DWG NO	REV.
C	8 602-XX129-XX	U

SCALE 2/1 SHEET 1 OF 1

DWG. NO.	SH	REV.
605-XX129-XX	2	J

REVISIONS

ZONE	REV	DESCRIPTION	DATE	APPROVED
—	—	SEE SHEET 1	—	—

PRODUCT SAFETY NOTICE

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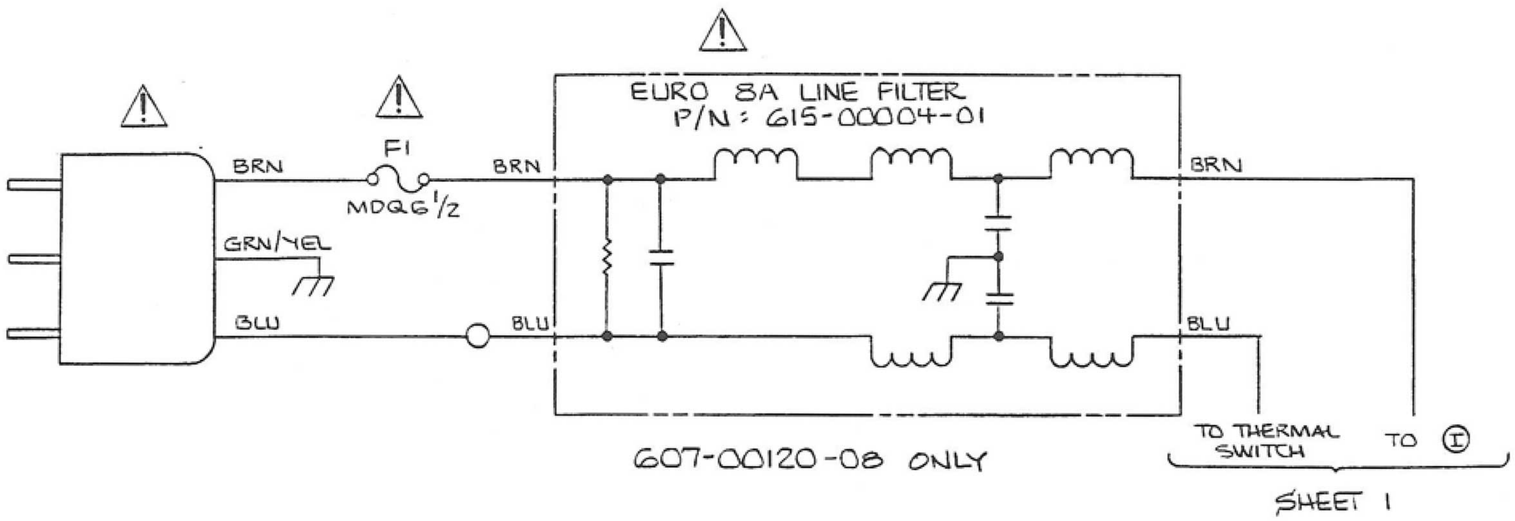
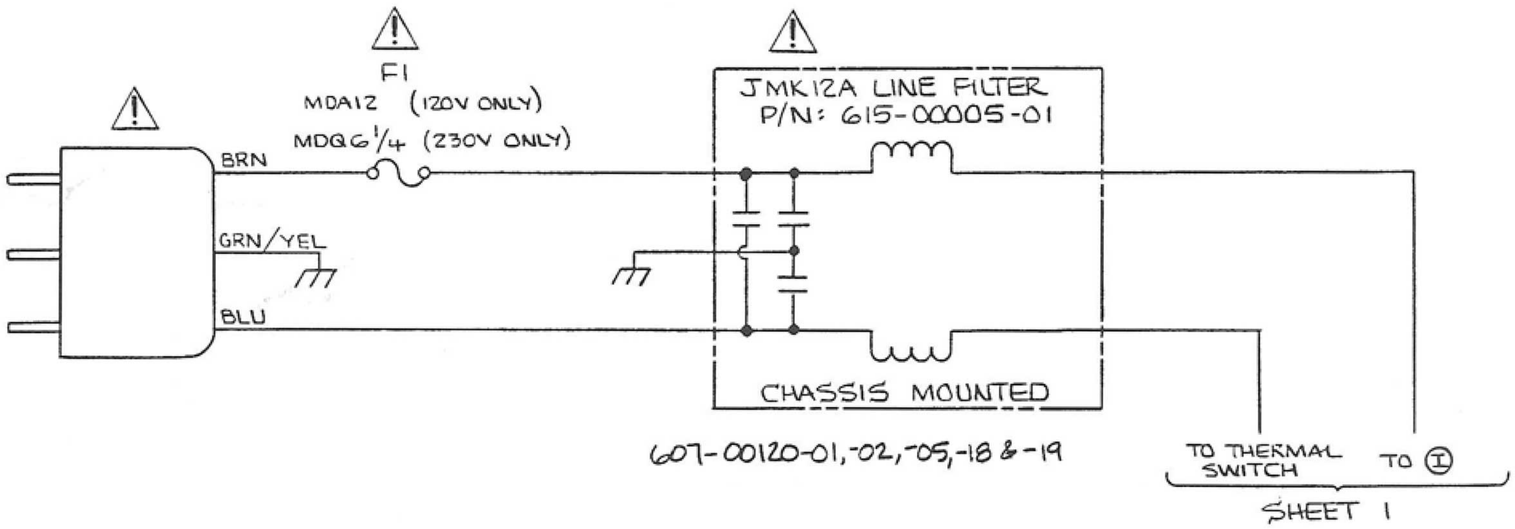




DASH NO	NEXT ASSY	USED ON
APPLICATION		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN RAE	
CHECKED	
ISSUED	
ENG.	
MFG.	

CARVER

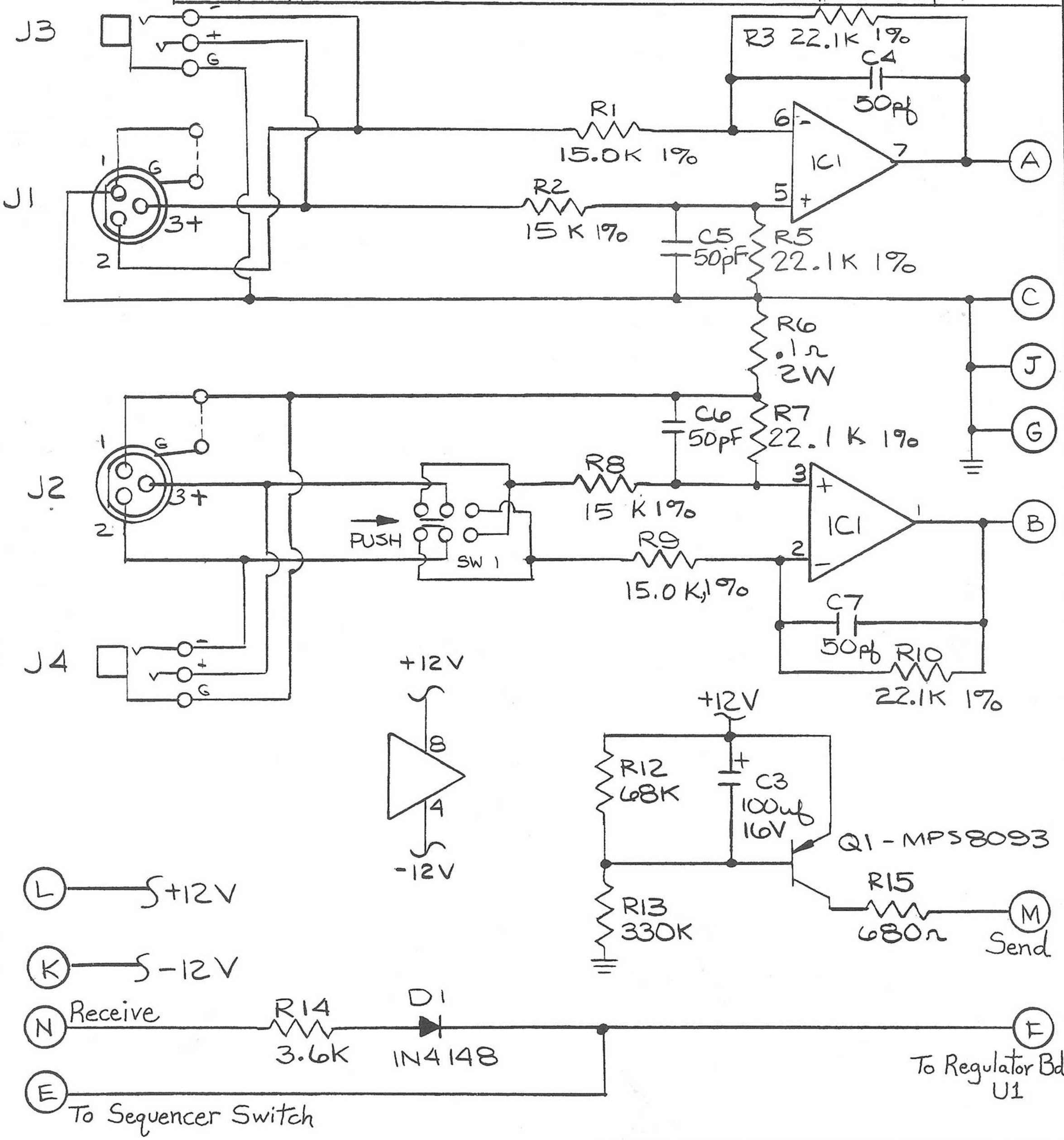
SCHEMATIC DIAGRAM-
PCB REGULATOR,
PM 1200

SIZE	DWG. NO.	REV.
C	605-XX129-XX	J

SCALE NONE SHEET 2

REVISIONS

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	B	SEE ECO 629	11-16-87 S.C	MK.
	C	INCORP ECO 1340	1-25-90	MK



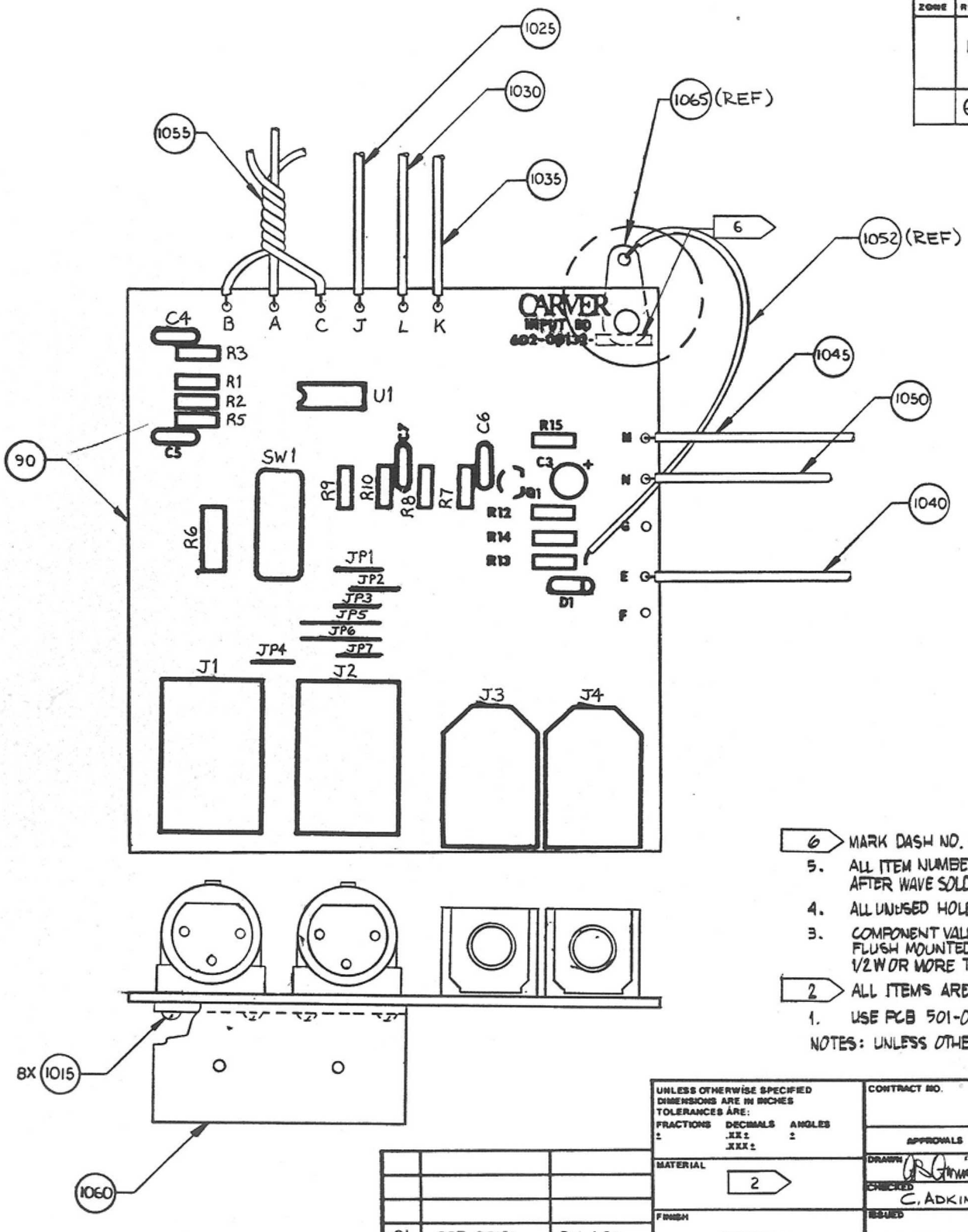
NOTES:

1. IC1 IS A TLO 72
2. UNLESS OTHERWISE NOTED- ALL RESISTORS ARE 1/4W.

CARVER CORPORATION		
P.M.-1.5 INPUT BOARD		
ME. LENO	1-11-83	
		REV C
605-00132-01		

DWG. NO.	SH	REV.
602-00132-01	1	G

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	F	INCORPORATED ECO # 1340 DWG REV STATUS JUMPED FROM "D" TO MATCH PARTS LIST REV.	12-27-89 90/1/24	CA
	G	INCORPORATED ECO# 1632 ADDED SHEET 2	1/8/91	



6 MARK DASH NO. AND REV AT LOCATION SHOWN.

5. ALL ITEM NUMBERS 1000 OR ABOVE TO BE INSTALLED AFTER WAVE SOLDER AT TOUCH UP LEVEL.
4. ALL UNUSED HOLES TO BE MASKED BEFORE WAVE SOLDER.
3. COMPONENT VALUES OF LESS THAN 1/2W TO BE FLUSH MOUNTED TO PCB. COMPONENT VALUES OF 1/2W OR MORE TO BE MOUNTED OFF PCB BY 1/4".

2 ALL ITEMS ARE ON 602-00132-01 PARTS LIST, REV. G.

1. USE PCB 501-00132-00,

NOTES: UNLESS OTHERWISE SPECIFIED,

DASH NO.	NEXT ASSY	USED ON
-01	607-00161	PM 1.5A

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL 2

FINISH —

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN	11/27/89
CHECKED C. ADKINS	90/1/24
ISSUED	
ENG.	
MFG.	

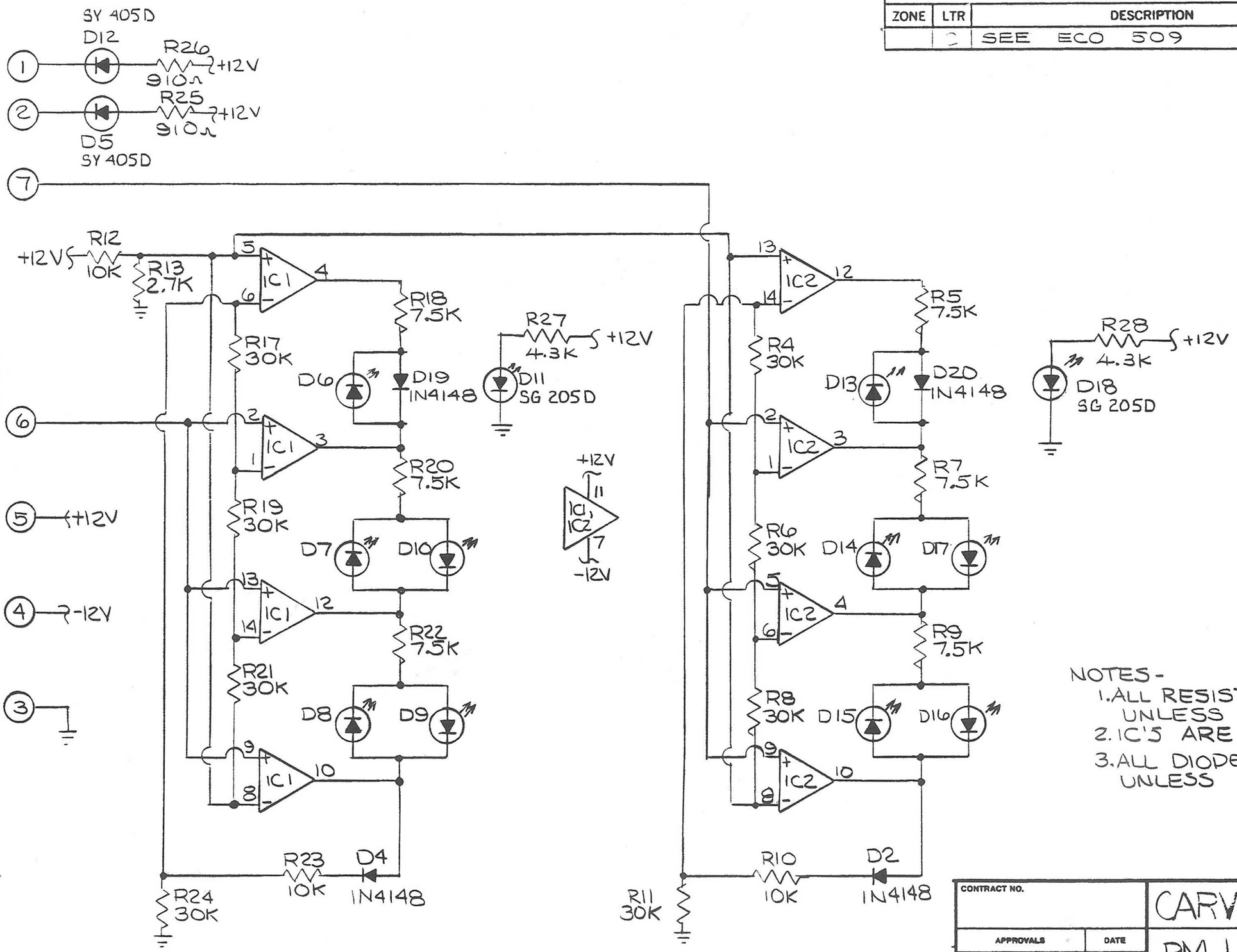
CARVER

ASSY, PCB-INPUT

SIZE C | DWG. NO. 602-00132-01 | REV. G

SCALE 2/1 | SHEET 1 OF 2

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	C	SEE ECO 509	11-16-87 B.C	



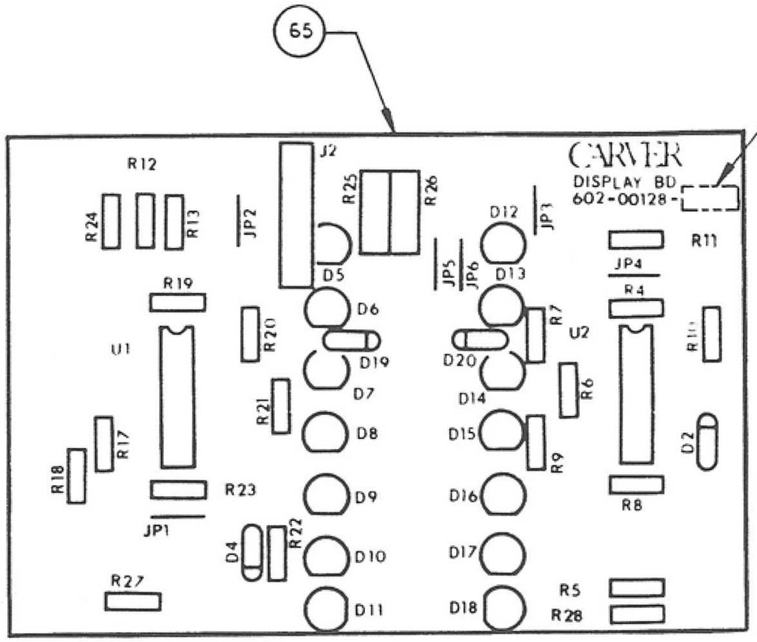
NOTES -
1. ALL RESISTORS ARE 1/4 WATT UNLESS NOTED.
2. IC'S ARE 4136
3. ALL DIODES ARE SR505W UNLESS NOTED.

CONTRACT NO.		CARVER CORPORATION	
APPROVALS	DATE	PM 1.5 DISPLAY	
DRAWN ME LENO	1-18-83		
CHECKED A. HAWLEY	2-1-83	SIZE B / FSCM NO. / DWG. NO. 605-00128-01	REV. C
ISSUED			
-3 rev.2	7-18-83	SCALE —	SHEET 1 OF 1

602-00128-01	1	C

REVISIONS

ZONE	REV	DESCRIPTION	DATE	APPVD
	C	INCORPORATED ECO # 1345 DWG REV STATUS CHANGED FROM "2" TO MATCH PL REV STATUS.	12-18-89 9/1/24	G.S.G. M.K. CA



5. MARK DASH NO. AND REV AT LOCATION SHOWN.
4. ALL UNUSED COMPONENT HOLES TO BE MASKED BEFORE SOLDER DIP.
3. COMPONENT VALUES OF LESS THAN 1/2W TO BE FLUSH MOUNTED TO PCB. COMPONENT VALUES OF 1/2W OR MORE TO BE MOUNTED OFF PCB BY 1/4 INCH.
2. ALL ITEMS ARE ON 602-00128-01 PARTS LIST.
1. USE PCB 501-00128-00

NOTES: UNLESS OTHERWISE SPECIFIED,

DASH NO.	NEXT ASSY	APPLICATION
-01	607-00161	PM-1.5A

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL 2

FINISH —

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS		DATE
DRAWN	[signature]	12-28-89
CHECKED	C. ADKINS	9/1/24
ENG.		
MFG.		
ISSUED	[signature]	1/31/90

CARVER

ASSY, PCB - DISPLAY

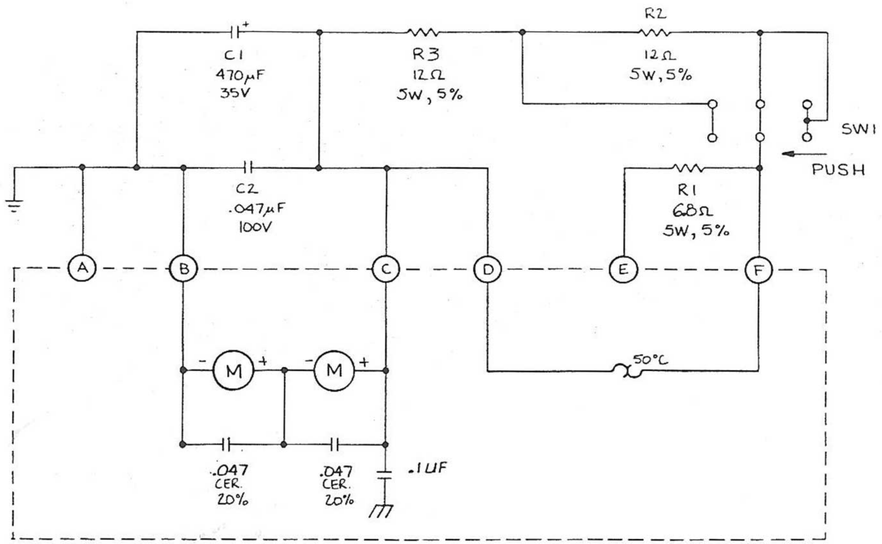
SIZE D | DWG. NO. 602-00128-01 | REV. C

SCALE 2/1 | SHEET 1 OF 1

DWG NO	605-00675-00	SH 1	REV B

REVISIONS

ZONE	REV	DESCRIPTION	DATE	APPROVED
	A	RELEASED TO PRODUCTION	4-28-89	
C5	B	CHG R2 FROM 10Ω TO 12Ω ECO # 1971	7-89	



QTY REQD	FSCM NO	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

CONTRACT NO

APPROVALS	DATE
DRAWN S. Fiscillo	10.4.88
CHECKED	
ISSUED	

CARVER

P.M-1.5A
FAN DRIVE SCHEMATIC

SIZE	FSCM NO.	DWG. NO.	REV
D		605-00675-00	B

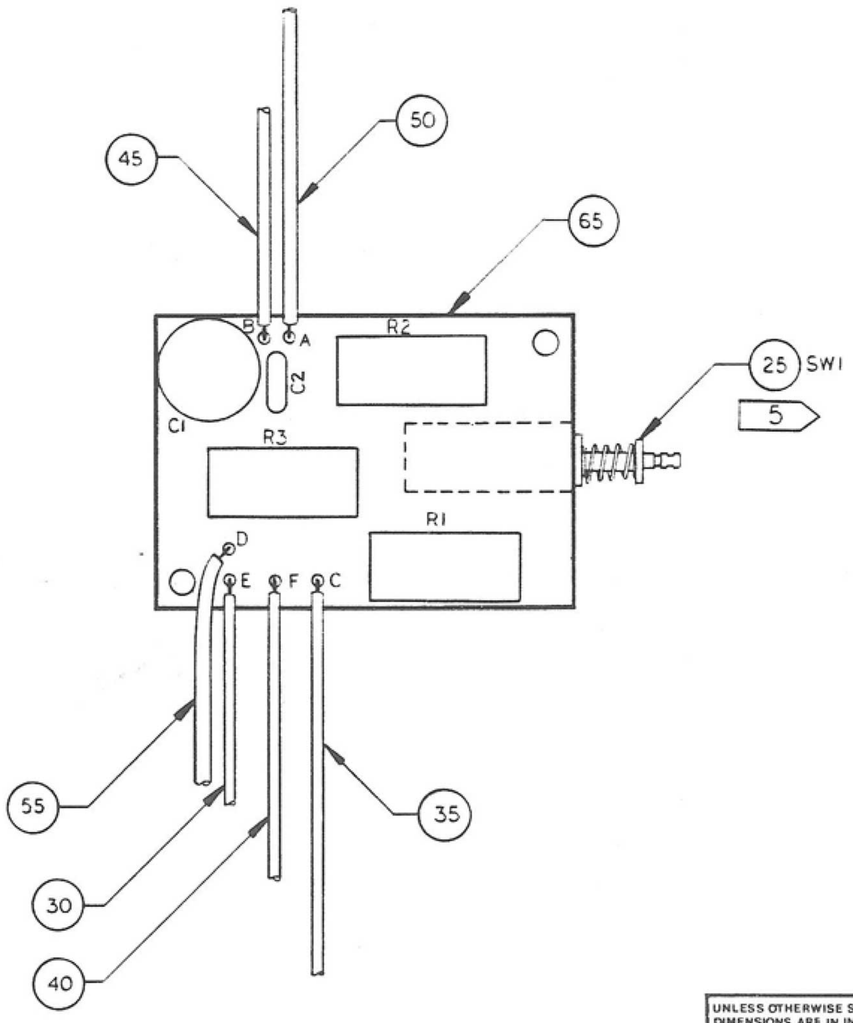
SCALE — SHEET 1 OF 1

26

DWG NO	SH	REV.
602-00675-00	1	B

REVISIONS

ZONE	REV	DESCRIPTION	DATE	APPROVED
	B	INCORPORATED ECO # 1341 THIS DRAWING SUPERSEDES DWG 602-00133-01, REV C	1-8-89 90/1/24	G.S.Q M.K.



5 ITEM MOUNTED ON CIRCUIT SIDE

4. ALL UNUSED HOLES TO BE MASKED BEFORE SOLDER WAVE.

3. COMPONENT VALUES OF LESS THAN 1/2W TO BE FLUSH MOUNTED TO PCB. COMPONENT VALUES OF 1/2W OR MORE TO BE MOUNTED OFF PCB BY 1/4 INCH.

2 ALL ITEMS ARE ON 602-00675-00 PARTS LIST.

1. USE PCB 501-00675-00, REV B.

NOTES: UNLESS OTHERWISE SPECIFIED,

DASH NO.	NEXT ASSY	USED ON
-00	607-00161	PM 1.5A

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL 2

FINISH —

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN	1-8 89
CHECKED C. ADKINS	90/1/24
ISSUED	
ENG.	
MFG.	

CARVER

ASSY, PCB - FAN DRIVE

SIZE	DWG. NO.	REV.
C	602-00675-00	B

SCALE 2/1 SHEET 1 OF 1

SECTION 8

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.

SECTION 9

PARTS LISTS

PM-1200/1.5a AMP BOARD
P/N 602-00126-07

CAPACITORS

CARVER P/N	DESCRIPTION		REF DESIGNATORS	NOTES
201-00001-00	CAP CER DISC	5pF 10% 1000V	C11,21	
201-20004-00	CAP CER DISC	22pF 10% 1000V	C30	
201-00005-00	CAP CER DISC	27pF 10% 1000V	C16	
201-00006-00	CAP CER DISC	39pF 10% 1000V	C14	
201-00012-00	CAP CER DISC	100pF 10% 1000V	C6,15	
201-00013-00	CAP CER DISC	120pF 10% 1000V	C3	
201-00018-00	CAP CER DISC	220pF 10% 1000V	C25	
201-00021-00	CAP CER DISC	330pF 10% 1000V	C32	
201-00023-00	CAP CER DISC	470pF 10% 1000V	C33	
204-00011-00	CAP MYLAR	.0047µF	C10,20	
204-00015-00	CAP MYLAR	.01µF	C7,18	
204-00018-00	CAP MYLAR	.018µF	C12,22	
204-00022-00	CAP MYLAR	.033µF 10%	C13,23	
204-00024-00	CAP MYLAR	.047µF	C1,2,27,28	
204-00031-00	CAP MYLAR	.33µF	C35	
204-00033-00	CAP MYLAR	.33µF/400V	C24	
205-00005-00	CAP LYTIC	4.7µF/35V RAD	C5	*See Note Below
205-00011-00	CAP LYTIC	22µF/16V RAD	C37,38	
205-00013-00	CAP LYTIC	47µF/25V RAD	C9,19	
205-00021-00	CAP LYTIC	470µF/16V RAD	C4	
***TEMPORARY SUBSTITUTE USED**				
206-00001-00	CAP TANT	10µF/16V 10%	C5	

RESISTORS

CARVER P/N	DESCRIPTION		REF DESIGNATORS	NOTES
251-00008-00	RES CFILM	2.7 OHM 1/4W PREP .4	R40	
251-00014-00	RES CFILM	4.7 OHM 1/4W PREP .4	R21,57,72	
251-00030-00	RES CFILM	22 OHM 1/4W PREP .4	R104,105	
251-00032-00	RES CFILM	27 OHM 1/4W PREP .4	R86	
251-00036-00	RES CFILM	39 OHM 1/4W PREP .4	R38,71	

CARVER P/N	DESCRIPTION		REF DESIGNATORS	NOTES
251-00041-00	RES CFILM	62 OHM 1/4W PREP .4	R85	
251-00045-00	RES CFILM	91 OHM 1/4W PREP .4	R24,55	
251-00046-00	RES CFILM	100 OHM 1/4W PREP .4	R29,60	
251-00054-00	RES CFILM	220 OHM 1/4W PREP .4	R30,63	
251-00054-01	RES CFILM	220 OHM 1/4W UNPREP	R48,84	
251-00060-00	RES CFILM	390 OHM 1/4W PREP .4	R44,77	
251-00063-00	RES CFILM	510 OHM 1/4W PREP .4	R41,76	
251-00065-00	RES CFILM	620 OHM 1/4W PREP .4	R31,61	
251-00066-01	RES CFILM	680 OHM 1/4W UNPREP	R47,83	
251-00067-00	RES CFILM	750 OHM 1/4W PREP .4	R25,56	
251-00069-00	RES CFILM	910 OHM 1/4W PREP .4	R3,23,54	
251-00070-00	RES CFILM	1K 1/4W PREP .4	R18	
251-00072-03	RES CFILM	1.2K 1/4W UNPREP	R102	Mount on Circuit Side
251-00074-00	RES CFILM	1.5K 1/4W PREP .4	R17	
251-00074-03	RES CFILM	1.5K 1/4W UNPREP	R51	
251-00076-00	RES CFILM	1.8K 1/4W PREP .4	R16,50	
251-00077-00	RES CFILM	2.0K 1/4W PREP .4	R96	
251-00078-00	RES CFILM	2.2K 1/4W PREP .4	R28,64	
251-00083-00	RES CFILM	3.6K 1/4W PREP .4	R12,98	
251-00084-00	RES CFILM	3.9K 1/4W PREP .4	R37,70	
251-00086-00	RES CFILM	4.7K 1/4W PREP .4	R22	
251-00086-03	RES CFILM	4.7K 1/4W UNPREP	R53	
251-00093-00	RES CFILM	9.1K 1/4W PREP .4	R97	
251-00094-00	RES CFILM	10K 1/4W PREP .4	R15,52,90	
251-00097-00	RES CFILM	13K 1/4W PREP .4	R35,69	
251-00098-00	RES CFILM	15K 1/4W PREP .4	R1	
251-00101-00	RES CFILM	20K 1/4W PREP .4	R20	
251-00102-00	RES CFILM	22K 1/4W PREP .4	R95	
251-00103-00	RES CFILM	24K 1/4W PREP .4	R100,101	
251-00105-00	RES CFILM	30K 1/4W PREP .4	R4,59	
251-00106-00	RES CFILM	33K 1/4W PREP .4	R26	
251-00107-00	RES CFILM	36K 1/4W PREP .4	R19	
251-00108-01	RES CFILM	39K 1/4W UNPREP	R36,68	
251-00112-00	RES CFILM	56K 1/4W PREP .4	R27,65	
251-00117-00	RES CFILM	91K 1/4W PREP .4	R39,73	
251-00120-00	RES CFILM	120K 1/4W PREP .4	R2	
251-10078-00	RES CFILM	2.2K 1/2W PREP .5	R32,62	
251-10080-00	RES CFILM	2.7K 1/2W PREP .5	R6	
251-10080-03	RES CFILM	2.7K 1/2W UNPREP	R7	
251-10082-03	RES CFILM	3.3K 1/2W UNPREP	R42,74	
251-10085-03	RES CFILM	4.3K 1/2W UNPREP	R43,75	
253-10116-00	RES CFILM	33K 1W	R33,67,92,93	
253-20001-00	RES WIRE WOUND	.1 OHM 2W	R45,46,78,79	
253-30025-00	RES WIRE WOUND	2.7 OHM 3W	R89	
253-40000-00	RES WIRE WOUND	.05 OHM 5W 10%	R49,87	
259-20003-00	TRIM POT	5K PCB MOUNT	RP1	

DIODES

CARVER P/N	DESCRIPTION		REF DESIGNATORS	NOTES
320-20001-00	DIODE	1N4148 75V PREP	D1-5,7,18,33	
320-20004-00	DIODE	1N4004 400V PREP .4	D9,11,14-17,20,22,25-28,31,32	
320-20006-00	DIODE	BAV20 400V PREP .4	D6,8,10,19,21	
320-20007-03	DIODE	MR852	D12,13,23,24	
320-30004-00	DIODE	ZENER 1N4736 6.8V PREP	D34	
320-30006-00	DIODE	ZENER 1N4738 8.2V PREP	D35	

TRANSISTORS

CARVER P/N	DESCRIPTION		REF DESIGNATORS	NOTES
321-10000-00	XISTOR	152 NPN SM SG MPSW06	Q12	
321-10001-00	XISTOR	152 PNP SM SG MPS6729	Q21	
321-20001-00	XISTOR	202 NPN PWR MPSU10	Q20	
321-20002-00	XISTOR	202 PNP PWR MPSU60	Q13	
321-40001-00	XISTOR	TO92 NPN SM SG MPSA43	Q14,26	
321-40003-00	XISTOR	TO92 PNP SM SG MPS8093	Q17,19	
321-40004-00	XISTOR	TO92 PNP SM SG MPSA93	Q15	
321-40013-01	XISTOR	TO92 NPN SM SG MPSA18	Q18,23	
321-50000-00	XISTOR	TO98 NPN SM SG 2N3403 W/TAB	Q16	
321-60000-00	XISTOR	TO220 NPN PWR MJE3055	Q11	
321-60002-00	XISTOR	TO220 PNP PWR MJE2955T	Q22	

INTEGRATED CIRCUITS

CARVER P/N	DESCRIPTION		REF DESIGNATORS	NOTES
330-30002-00	IC	TL081 OP AMP BIFET	U1	For French Version use T.I. part only P/N 330-30002-01
330-40008-00	IC	CLM-51 OPTOISOLATOR DIP (or VLT5C4)	U2	*See Note Below
*TEMPORARY SUBSTITUTE USED				
330-40001-00		CLM6000 OPTOISOLATOR AX 60V		
or				
330-40006-00		VLT5C2 OPTOISOLATOR	U2	

MISCELLANEOUS ITEMS

CARVER P/N	DESCRIPTION		REF DESIGNATORS	NOTES
118-50002-00	TRANSISTOR SOCKET			Use on Q1-10
160-30012-00	HEADER 15 PIN 90 DEG TIN .156 CTR		P1	Remove 1 pin before installing.
401-10634-00	WIRE 22AWG TEW GRAY 4.5"			Use on Q24, Q25
401-10602-00	WIRE 22AWG TEW BLACK 5"			Use on Q24, Q25
401-10633-00	WIRE 22AWG TEW RED 5.75"			Use on Q24, Q25
401-30002-00	JUMPER INSULATED #22 .3"		JP1	
401-30003-00	JUMPER INSULATED .4"		JP2-13	
402-00001-00	SLEEVING CLEAR 10 GA.			Use on R102
402-00006-00	SLEEVING BLACK 18 GA. .4"			Use on R49,87
403-10003-00	SEALANT SILICONE RUBBER RTV			Use on C35
501-00126-00	PCB, AMP PM-1.5			
616-00001-00	CHOKE	5µH 18 GA. WIRE	L1	

PM-1200/1.5a POWER SUPPLY BOARD
P/N 602-00127-01

CAPACITORS

CARVER P/N	DESCRIPTION		REF DESIGNATORS	NOTES
205-00001-00	CAP LYTIC	1µF/50V RAD	C9,10,15,16	
205-00003-00	CAP LYTIC	2.2µF/50V 20% RAD	C21	
205-00009-00	CAP LYTIC	4.7µF/100V RAD	C5	
205-00010-00	CAP LYTIC	10µF/35V RAD	C1,C7	
205-00011-00	CAP LYTIC	22µF/16V RAD	C2	
205-00013-02	CAP LYTIC	47µF/25V 20% .2 RAD	C6,11,12	
205-00028-00	CAP LYTIC	2200µF/50V/80V	C13,14	⚠ Dual Capacitor - No longer available Replace with Cap Assy P/N 602-00500-01 See Service Bulletin PM-1200-5

RESISTORS

CARVER P/N	DESCRIPTION		REF DESIGNATORS	NOTES
251-00027-00	RES CFILM	16 OHM 1/4W PREP .4	R63	
251-00030-00	RES CFILM	22 OHM 1/4W PREP .4	R6,7,19	
251-00043-00	RES CFILM	75 OHM 1/4W PREP .4	R68	
251-00057-00	RES CFILM	300 OHM 1/4W PREP .4	R3,4	
251-00067-03	RES CFILM	750 OHM 1/4W PREP .4	R72	Mount on back of board
251-00077-00	RES CFILM	2.0K 1/4W PREP .4	R22	Standup
251-00078-00	RES CFILM	2.2K 1/4W PREP .4	R36,39	
251-00094-00	RES CFILM	10K 1/4W PREP .4	R35,38	
251-00098-00	RES CFILM	15K 1/4W PREP .4	R16	
251-00101-00	RES CFILM	20K 1/4W PREP .4	R2,10	
251-00102-00	RES CFILM	22K 1/4W PREP .4	R5	
251-00104-00	RES CFILM	27K 1/4W PREP .4	R13,53	
251-00107-00	RES CFILM	36K 1/4W PREP .4	R46,48,65,66	
251-00108-00	RES CFILM	39K 1/4W PREP .4	R42	
251-00112-00	RES CFILM	56K 1/4W PREP .4	R15,45,47	
251-00113-00	RES CFILM	62K 1/4W PREP .4	R17	
251-00114-00	RES CFILM	68K 1/4W PREP .4	R11,44	
251-00118-00	RES CFILM	100K 1/4W PREP .4	R43	
251-00121-00	RES CFILM	130K 1/4W PREP .4	R37,40	
251-00123-00	RES CFILM	160K 1/4W PREP .4	R12	
251-00124-00	RES CFILM	180K 1/4W PREP .4	R41,56	
251-00125-00	RES CFILM	200K 1/4W PREP .4	R57	
251-00127-00	RES CFILM	240K 1/4W PREP .4	R59	
251-00128-00	RES CFILM	270K 1/4W PREP .4	R52,54	
251-00130-00	RES CFILM	330K 1/4W PREP .4	R21,23	
251-00133-00	RES CFILM	430K 1/4W PREP .4	R1	
251-00139-00	RES CFILM	750K 1/4W PREP .4	R14	
251-10043-03	RES CFILM	75 OHM 1/2W PREP .5	R67	
251-10083-03	RES CFILM	3.6K 1/2W PREP .5	R26,28	
251-10125-03	RES CFILM	200K 1/2W PREP .5	R20,24	

CARVER P/N	DESCRIPTION		REF DESIGNATORS	NOTES
255-20091-00	RES MET OXIDE	470 OHM 2W	R25	
255-20117-00	RES MET OXIDE	3.6K 2W	R60	With Sleeving
255-20124-00	RES MET OXIDE	6.8K 2W	R58	
259-20002-00	TRIM POT	2K PCB MOUNT	RP1	

DIODES

CARVER P/N	DESCRIPTION		REF DESIGNATORS	NOTES
320-20001-00	DIODE	1N4148 75V PREP	D1,4-6,8,11,12,17,18,31-34	
320-20005-03	DIODE	MR504 400V UNPREP	D49,50	Mount on back of board
320-20010-00	DIODE	6 AMP 200V PREP .75	D23-30	⚠ Standoff D25,26,29,30
320-30001-00	DIODE	ZENER 1N4742 12V PREP .4	D13,14	

TRANSISTORS

CARVER P/N	DESCRIPTION		REF DESIGNATORS	NOTES
321-10001-00	XISTOR	152 PNP SM SG MPS6729	Q4	
321-40001-00	XISTOR	TO92 NPN SM SG MPSA43	Q2	
321-40003-00	XISTOR	TO92 PNP SM SG MPS8093	Q6,9,10	
321-40004-00	XISTOR	TO92 PNP SM SG MPSA93	Q1	
321-40013-01	XISTOR	TO92 NPN SM SG MPSA18	Q3,5,11,12	
321-60000-00	XISTOR	TO220 NPN PWR MJE3055	Q7	
321-60002-00	XISTOR	TO220 PNP PWR MJE2955T	Q8	

INTEGRATED CIRCUITS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
330-30003-00	IC QUAD OP AMP (4136)	U1	

MISCELLANEOUS ITEMS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
108-00003-00	INSULATOR MICA TO220 .005" THICK		Heatsink Bracket Assy
151-20001-00	SCREW MACH PP BLK #440 x 1/4"		Heatsink Bracket Assy
151-30002-00	SCREW SHT MTL PP BLK #4 x 3/8"		Attach Heatsink Bracket to Board
152-10001-00	KEPNUT #4-40 ZC		Heatsink Bracket Assy
154-40007-01	WASHER SHLDR TEFLON #4 x .050"		Heatsink Bracket Assy
159-20002-00	POP RIVET AL OE 1/8"D x 1/4"L		Attach Bracket to Board
160-20002-00	CONNECTOR 7 PIN GOLD	P1	Attach Bracket Assy
401-10114-00	WIRE 18 AWG TR-64 RED 6.5"	WP-X	
401-10117-01	WIRE 18 AWG TR-64 BROWN 7"	WP-Y	
401-30003-00	JUMPER INSUL .4"	JP1-17	
401-40006-00	WIRE T #22 1EA RED/WH,BLK 13"	WP-F,G	
401-40007-00	WIRE T #22 1EA GRN/WHT, BLK 13"	WP-I,H	
402-00006-00	SLEEVING BLACK 18 GA .4"		For R60
403-10020-00	LOCTITE #222		Heatsink Bracket Assy
403-20001-00	THERMALCOTE #253		Heatsink Bracket Assy
501-00127-00	PCB POWER SUPPLY PM-1.5		
507-00003-00	BRACKET, MOLEX CON SUPPORT 90 DG		
511-00004-00	HEATSINK FAB PM-1.5		Heatsink Bracket Assy
602-00500-01	CAPACITOR CARD ASSEMBLY		⚠ Replaces C13, C14 See Service Bulletin PM-1200-5

PM-1200/1.5a REGULATOR BOARD
P/N 602-00129-01

CAPACITORS

CARVER P/N	DESCRIPTION		REF DESIGNATORS	NOTES
201-00033-00	CAP CER DISC	.0047µF/400V 20%	C5	⚠
204-00015-00	CAP MYLAR	.01µF	C3,9	
204-00020-00	CAP MYLAR	.022µF	C2	
207-10005-00	CAP MET POLY	.47µF	C4	⚠
207-10014-01	CAP MET POLY	.47µF/250V CSA	C4	⚠ CSA Version
207-10010-00	CAP MET POLY	.1µF/250V	C1	⚠
207-10015-01	CAP MET POLY	.1µF/250V CSA	C1	⚠ CSA Version

RESISTORS

CARVER P/N	DESCRIPTION		REF DESIGNATORS	NOTES
251-00052-00	RES CFILM	180 OHM 1/4W PREP .4	R6	
251-00078-00	RES CFILM	2.2K 1/4W PREP .4	R5	
251-00101-00	RES CFILM	20K 1/4W PREP .4	R2	
251-00103-00	RES CFILM	24K 1/4W PREP .4	R3	
251-00104-00	RES CFILM	27K 1/4W PREP .4	R10	
251-00135-00	RES CFILM	510K 1/4W PREP .4	R7	
251-10028-00	RES CFILM	18 OHM 1/2W PREP .5	R1	
251-10156-00	RES CFILM	3.9M 1/2W PREP .5	R8	
255-10130-00	RES MET OXIDE	12K 1W	R4	

DIODES

CARVER P/N	DESCRIPTION		REF DESIGNATORS	NOTES
320-20006-00	DIODE	BAV20 400V PREP .4	D1-4	⚠

INTEGRATED CIRCUITS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
330-40002-00	IC CNY17-2 OPTOISOLATOR PHOTOCOUPLER	U2	
330-40008-00	IC CLM-51/VTL5C4 OPTOISOLATOR DIP	U1	

MISCELLANEOUS ITEMS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
101-22001-00	BRACKET RECTANGLE PCB MNT 1/2"		
159-20001-00	POP RIVET CE 1/8"		
319-00001-00	DIAC 40V 1/8W	D5	⚠
319-00062-00	TRIAC T3 F/P 35A 400V MOT	TR1	⚠

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
401-10132-00	WIRE 18 AWG TEW BLACK 8"	WP-J	
401-10134-01	WIRE 18 AWG TEW BROWN 19.25"	WP-F	
401-10135-00	WIRE 18 AWG TEW GRN/WHT 19.25"	WP-C	
401-10136-00	WIRE 18 AWG TEW VIOLET 19.25"	WP-E	
401-10137-00	WIRE 18 AWG TEW VIO/WHT 19.25"	WP-D	
401-20203-00	BUSS WIRE 22 GA 1.5"	WP-M	Mount on back of board
401-30003-00	JUMPER INSULATED .4"	JP6	
501-00129-00	PCB REGULATOR PM-1.5		
550-00002-00	CABLE .250 #18 TEW RED 2.5"	WP-C on Q1	
550-00002-01	CABLE .250 #18 TEW BLUE 2.5"	WP-A on Q1	
550-00009-00	CABLE .250 #18 TEW ORANGE 2.5"	WP-G on Q1	
550-00015-03	CABLE .250 #18 TEW BLACK 10.5"	WP-A,B	

PM-1200/1.5a INPUT BOARD
P/N 602-00132-01

CAPACITORS

CARVER P/N	DESCRIPTION		REF DESIGNATORS	NOTES
201-00008-00	CAP CER DISC	50pF 10% 1000V	C4,5,6,7	
205-00016-00	CAP LYTIC	100µF/25V RAD	C3	

RESISTORS

CARVER P/N	DESCRIPTION		REF DESIGNATORS	NOTES
251-00066-00	RES CFILM	680 OHM 1/4W PREP .4	R15	
251-00083-00	RES CFILM	3.6K 1/4W PREP .4	R14	
251-00114-00	RES CFILM	68K 1/4W PREP .4	R12	
251-00130-00	RES CFILM	330K 1/4W PREP .4	R13	
252-00402-00	RES MFILM	15.0K 1/4W 1% PREP .4	R1,2,8,9	
252-00418-00	RES MFILM	22.1K 1/4W 1% PREP .4	R3,5,7,10	
253-20001-00	RES WIRE WOUND	.1 OHM 2W	R6	Standup

DIODES

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

TRANSISTORS

CARVER P/N	DESCRIPTION		REF DESIGNATORS	NOTES
321-40003-00	XISTOR	TO92 PNP SM SG MPS8093	Q1	

INTEGRATED CIRCUITS

CARVER P/N	DESCRIPTION		REF DESIGNATORS	NOTES
330-30001-00	IC DUAL OP AMP (TL072)	IC1		

MISCELLANEOUS ITEMS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
108-00102-00	INSULATOR RAG PAPER 3.3" x 2.5"		See Service Bulletin PM-1200-2
109-00002-00	JACK RT ANGLE XLR CONNECTOR	J1,2	
109-20001-00	PHONE JACK 1/4" PC MOUNT	J3,4	
111-20001-00	SOLDER LUG #4		See Service Bulletin PM-1200-2
151-20002-00	SCREW MACH PP BLK #440 x 3/8"		See Service Bulletin PM-1200-2
151-30002-00	SCREW SHT MTL PP BLK #4 x 3/8"		
152-10001-00	KEPNUT, #440 ZC		See Service Bulletin PM-1200-2
154-40001-01	WASHER FL/NYL #4 .11"ID x .0245"0D		See Service Bulletin PM-1200-2
318-10000-00	SWITCH PUSH 1 KEY	SW1	
401-10535-00	WIRE 22 AWG TR-64 BLACK 8"	WP-J	
401-10536-00	WIRE 22 AWG TR-64 RED 4.5"	WP-L	
401-10537-01	WIRE 22 AWG TR-64 BROWN 4.5"	WP-K	
401-10539-00	WIRE 22 AWG TR-64 WHT/YEL 21"	WP-E	
401-10580-00	WIRE 22 AWG TR-64 ORANGE 15.75"	WP-M	
401-10581-01	WIRE 22 AWG TR-64 BROWN 15.75"	WP-N	
401-10636-00	WIRE 22 AWG TR-64 BLACK 2.5"		See Service Bulletin PM-1200-2
401-30003-00	JUMPER INSULATED .4"	JP2,4,5	
401-30006-00	JUMPER INSULATED .6"	JP6,7	
401-40003-00	WIRE T #22 1EA WHT/RED, BLACK 5.5"		Cut to 3.5", strip and tin
401-40005-00	WIRE T #22 1EA BLACK, GRN, WHT/RD 17"	WP-A,B,C	
403-10018-00	SEALANT SILICONE RTV		See Service Bulletin PM-1200-2
501-00132-00	PCB INPUT PM-1.5		
507-00001-00	BRACKET PM-1.5 INPUT BD MOUNT		Holds J1,2 in place
531-00004-00	SHIELD PLATE PM-1200		See Service Bulletin PM-1200-2

PM-1200/1.5a DISPLAY BOARD P/N 602-00128-01

RESISTORS

CARVER P/N	DESCRIPTION		REF DESIGNATORS	NOTES
251-00080-00	RES CFILM	2.7K 1/4W PREP .4	R13	
251-00085-00	RES CFILM	4.3K 1/4W PREP .4	R27,28	
251-00091-00	RES CFILM	7.5K 1/4W PREP .4	R5,7,9,18,20,22	
251-00094-00	RES CFILM	10K 1/4W PREP .4	R10,12,23	
251-00105-00	RES CFILM	30K 1/4W PREP .4	R4,6,8,9,11,17,19,21,24	
251-10069-00	RES CFILM	910 OHM 1/2W PREP .5	R25,26	

DIODES

CARVER P/N	DESCRIPTION		REF DESIGNATORS	NOTES
320-20001-00	DIODE	1N4148 75V PREP .4	D2,4,19,20	
320-40001-00	LED RED		D6-10,13-17	
320-40002-00	LED AMBER		D5,12	
320-40004-00	LED GREEN H.E.		D11,18	

INTEGRATED CIRCUITS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
330-30003-00	IC QUAD OP AMP (4136)	U1,2	

MISCELLANEOUS ITEMS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
160-30004-00	HEADER 7 PIN GOLD .7	J2	
401-30003-00	JUMPER INSUL .4"	JP1-6	
501-00128-00	PCB DISPLAY, PM1.5		

PM-1200/1.5a FAN DRIVE BOARD P/N 602-00675-00

CAPACITORS

CARVER P/N	DESCRIPTION		REF DESIGNATORS	NOTES
204-00024-00	CAP MYLAR	.047µF	C2	
205-00042-00	CAP LYTIC	470µF/35V RAD	C1	

RESISTORS

CARVER P/N	DESCRIPTION		REF DESIGNATORS	NOTES
253-40050-00	RES WIRE WOUND	6.8 OHM 5% 5W	R1	
253-40057-00	RES WIRE WOUND	12 OHM 5% 5W	R2,3	

MISCELLANEOUS ITEMS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
318-10000-00	SWITCH PUSH 1 KEY NO FRAME	SW1	
401-10536-00	WIRE 22 AWG TR-64 RED 4.5"	WP-E	
401-10573-01	WIRE 22 AWG TEW BLACK 24"	WP-C	
401-10598-00	WIRE 22 AWG TR-64 BLUE 7"	WP-F	
401-10637-00	WIRE 22 AWG TR-64 BLACK 4"	WP-B	
401-10647-00	WIRE 22 AWG TEW BLACK 26"	WP-A	
401-10648-00	WIRE 22 AWG TEW BROWN 7"	WP-D	
501-00675-00	PCB FAN DRIVE PM-1.5		

PM-1200/1.5a FINAL ASSEMBLY
P/N 607-00120-01

CARVER P/N	ITEM NO.	DESCRIPTION	REF DESIGNATORS	NOTES
101-00001-00	5	BARRIER STRIP	TB1	
101-10004-00	10	BLADE, FAN PLASTIC 2.5 CCW		
101-30001-00	20	BUMPONS RUBBER ROUND MEDIUM		
101-30002-00	25	BUMPONS RUBBER ROUND SMALL		Used as spacers on mounting bracket (Item 515)
105-10005-00	35	FILTER ELEMENT 3" x 5.1" x 3/16"THICK		
105-40002-00	40	FUSEHOLDER PANEL MOUNT DOMESTIC		⚠
105-40014-00 105-50000-00	40	FUSEHOLDER PANEL MOUNT FUSE CARRIER, GRAY		⚠ CSA Version
106-30001-00	45	GROMMET NEOPRENE		
106-30002-00	50	GROMMET GUM		
107-00001-01	55	HANDLE 2.5" ANO BLACK		
108-00001-00	60	INSULATOR MICA TO3		
108-00003-00	65	INSULATOR MICA TO220 .005" THICK		
108-00102-00	70	INSULATOR, RAG PAPER .015"1.25" x 3.25"		Install on top cover with RTV over predriver mod
111-20051-00	75	SOLDER LUG #6		
111-20151-00	80	SOLDER LUG #10		
112-10003-00	85	MOTOR FAN 18V		
112-20001-00	90	MOUNT TYRAP WHITE		
115-10001-00	95	POST BINDING DUAL RED/BLACK		
118-50002-00	100	TRANSISTOR SOCKET TO3 PCB MNT		
118-80001-00	105	STANDOFF HEX THREADED 440 x 1/4"		
118-80002-00	110	STANDOFF ROUND #6 x 1/4"OD x 7/16"H		
118-80005-00	115	STANDOFF ROUND #8 x 1/4" x 5/16" ALUMINUM		
118-80018-00	120	STANDOFF HEX #4 x 3/16"D .688L		Fan Drive PCB Mt.
118-90003-00	125	STRAIN RELIEF MCT.125 WS.355 16/3		
151-00155-00	130	SCREW MACH SCKT H BK 10-32 x 5/8		
151-00159-00	135	SCREW MACH S/H BLK 10-32 x 1-1/8		
151-10116-02	140	SCREW METRIC MA/PP PLT M3 x 16mm		
151-20002-00	145	SCREW MACH PP BLK 440 x 3/8"		
151-20051-00	148	SCREW MACH PP BLK 6-32 x 1/4"		Cover mounting
151-20052-00	150	SCREW MACH PP BLK 6-32 x 3/8"		
151-20053-00	155	SCREW MACH PP BLK 6-32 x 1/2"		Triac Mounting
151-20054-00	160	SCREW MACH PP BLK 6-32 x 3/4"		
151-20102-00	165	SCREW MACH PP BLK 8-32 x 3/8"		Line Filter (2)
151-20106-00	170	SCREW MACH PP BLK 8-32 x 3/4"		
151-20152-00	175	SCREW MACH PP BLK 10-32 x 3/8"		
151-20152-01	180	SCREW MACH PP ZC 10-32 x 3/8"		
151-30052-00	190	SCREW SHT MTL PP BLK 6 x 3/8" 'B'		
151-30058-01	195	SCREW SHT MTL PP ZC 6 x 1" 'B'		
151-31056-00	200	SCREW SHT MTL FHP 6 x 3/4" BLACK OX		
152-00001-00	205	NUT HEX 6-32 x 5/16" ZC		
152-10001-00	210	KEPNUT 4-40 ZC		
152-10002-00	215	KEPNUT 6-32 x 5/16" ZC		
152-10003-00	220	KEPNUT 8-32 x 11/32" ZC		Line Filter (2)

CARVER P/N	ITEM NO.	DESCRIPTION	REF DESIGNATORS	NOTES
154-00003-00	225	WASHER COUNTERSUNK .50"OD x .05"		
154-20052-00	230	WASHER INT LOCK SAE BLK #6		
154-20101-00	233	WASHER INT LOCK BLK #8		Line Filter Mounting
154-20152-00	235	WASHER EXT LOCK BLK OXIDE #10		
154-20351-02	240	WASHER INT LOCK CAD PLTD 1/2"ID		
154-30001-00	243	WASHER SPLIT LOCK BLK #10		Rear Handles
154-40002-01	245	WASHER SHLDR NYL WHT #4		
154-40351-01	250	WASHER FLAT NYL 3/8"ID x 5/8"OD		
159-50001-00	255	TYRAP 3-3/8" L WHT		
160-20014-00		CONNECTOR, SPLICE NYLON INSUL		230V Version; X-fmr blue to brown.
204-00024-00	260	CAP MYLAR .047µF		
204-00027-00	265	CAP MYLAR .1µF		
205-00030-00	270	CAP LYTIC 4800µF/130V	C15,16	⚠
205-00111-00	266	CAP LYTIC 2200µF/50V AL NICHR	C3,4	⚠ See Service Bulletin PM-1200-1
207-10002-00	272	CAP MET POLY .1µF/250V 10% AX	C8	Use on 2-pos ground isolation barrier strip
251-10104-03	274	RES CFILM 27K 1/2W UNPREP	R8	Use on 2-pos ground isolation barrier strip
255-50092-00	275	RES MET OXIDE 6.2K 5% 5W	R9	Use on bridge rectifier
259-10005-00	280	POT 50KB PANEL MOUNT		
315-13002-00	285	FUSE MDA12		⚠ 115V Version
315-14004-00	285	FUSE MDQ 6-1/4		⚠ 230V Version
318-20000-00	290	SWITCH ROCKER DPDT BLK		
318-20004-00	295	SWITCH ROCKER SPDT QUICK DISCONNECT		⚠ Power Switch
318-50000-00	300	SWITCH THERMAL 50 DEG C		
318-50002-00	305	SWITCH THERMAL 90 DEG C		⚠
319-00036-01		RECTIFIER BRIDGE 200V 35A	D2	CSA Version only
319-00059-00	310	RECTIFIER BRIDGE 400V 25A	D1	⚠
320-20004-03	315	DIODE 1N4004 400V UNPREP		
320-40001-00	317	LED RED		
321-30011-00	320	XISTOR TO3 NPN PWR MJ15024		
321-30012-00	325	XISTOR TO3 PNP PWR MJ15025		
401-10063-00		WIRE 16 AWG TR-64 BLACK 13.75"		From AC Terminals on D2 to Gnd Lift, CSA Version only
401-10102-00	330	WIRE 18 AWG TEW BLACK 3"		
401-10105-00	331	WIRE 18 AWG TEW BLACK 5.5"		Use on C3, C4
401-10107-00	335	WIRE 18 AWG TEW BLACK 7"		
401-10113-00	332	WIRE 18 AWG TR-64 RED 4"		Use on "+" side of large filter caps
401-10116-01	333	WIRE 18 AWG TR-64 BROWN 4"		Use on "-" side of large filter caps
401-10121-00	340	WIRE 18 AWG TEW VIOLET 10.5"		
401-10138-00	345	WIRE 18 AWG TR-64 BLACK 3.5"		
401-10140-00	350	WIRE 18 AWG TR-64 RED 18"		
401-10146-00	355	WIRE 18 AWG TR-64 WHITE 18"		
401-10404-00	356	WIRE 20 AWG TR-64 BLUE 8.75"		Use on C3, C4
401-10413-00	357	WIRE 20 AWG TR-64 WHITE 8.75"		Use on C3, C4
401-10542-00	365	WIRE 22 AWG TR-64 BLACK 11"		
401-10547-01	370	WIRE 22 AWG TR-64 BROWN 15"		
401-10551-00	373	WIRE 22 AWG TR-64 WHT/ORN 18"		Seq. Switch to P.S. Bd.
401-10552-00	375	WIRE 22 AWG TR-64 WHT/YEL 8"		
401-10553-00	376	WIRE 22 AWG TR-64 WHT/BLU 12"		
401-10594-01	380	WIRE 22 AWG TR-64 GREEN 2.5"		

CARVER P/N	ITEM NO.	DESCRIPTION	REF DESIGNATORS	NOTES
401-20056-00		BUSS WIRE 16 GA 1.75"		From "-" to "+" terminals of D2, CSA Version only
401-20102-00	400	BUSS WIRE 18 GA 2.5"		
401-20104-00	405	BUSS WIRE 18 GA 2"		
401-20204-00	410	BUSS WIRE 22 GA 3.5"		
401-90014-00	415	LINECORD, EURO 16A BLACK		⚠ 230V Version
401-90019-01	415	LINECORD 16/3 SJT BLACK		⚠ 115V Version
402-00002-00	420	SLEEVING CLEAR 16 GA		
402-00003-00	425	SLEEVING BLACK 18 GA		
402-00004-00	430	SLEEVING IMPREGNATED FIBERGLASS		
402-10002-00	435	TUBING HEAT SHRINK CLEAR 1/4"		
403-10003-00	450	SEALANT SILICONE RUBBER RTV		
403-10007-00	455	PLASTIC ADHESIVE		
403-20001-00	460	THERMALCOTE #253		
403-40001-00	465	TAPE FOAM DOUBLE BACK 1/8" x 1"		
403-40012-00	466	TAPE FOAM DOUBLE BACK 1/16" x 1"		
403-40023-00	470	VELCRO STRIP .25" x .5"		
403-40023-02	480	VELCRO STRIP .25" x 2.3"		
502-30042-01	485	CHASSIS SCREENED PM-1.5a		
502-30042-02	485	CHASSIS SCREENED PM-1200		
503-40005-01	490	PANEL FRONT SCREENED PM-1.5a		
503-20066-01	490	PANEL FRONT SCREENED		
504-10004-01	495	COVER XISTOR PAINTED BLACK PM-1.5		
504-20007-01	500	COVER TOP PAINTED BLACK PM-1.5		
507-00002-00	505	BRACKET PM-1.5 FAN MOUNT		
507-00005-00	510	BRACKET 4800µF/130V CAP MOUNT		
507-00006-00	515	BRACKET 2200µF/50V CAP MOUNT		
507-00070-00	517	BRACKET LINEFILTER		Line Filter Mounting for 615-00005-01
507-00071-00	517	BRACKET LINEFILTER		Line Filter Mounting for 615-00004-01
508-00030-07	520	KNOB 14mm KNURL BLACK 180 DEG		
509-10001-03	525	FERRULE 5/16" PRO PAINT		
510-10001-03	535	HANDLE 2" PRO PAINT		
511-00016-00	540	HEATSINK TRANSISTOR PM-1.5		
512-10201-01	545	STANDOFF #10 x 1/2" x 1/2" BLK OX		
512-10401-03	550	NUT METRIC DRESS 7mm CAD		
530-10154-00	551	LABEL, FUSE 12A 125V SLOW-BLOW		
530-20100-00	555	STICKER SERIAL NUMBER		
532-20006-00		BOX, PACKING		For Packing
532-30042-00		FOAM CORNER BLOCK		For Packing (4 per)
602-00126-07	560	ASSY PCB AMP PM-1.5a/1200		
602-00127-01	565	ASSY PCB POWER SUPPLY PM-1.5/1.5a/1200		
602-00128-01	570	ASSY PCB DISPLAY PM-1.5/1.5a/1200		
602-00129-01	575	ASSY PCB REGULATOR PM-1.5/1.5a/1200		
602-00132-01	580	ASSY PCB INPUT PM-1.5/1.5a/1200		
602-00675-00	585	ASSY PCB FAN DRIVE PM-1.5a/1200		
615-00004-01	590	NOISE FILTER EURO 8A		⚠ German Version *See Note Below
615-00005-01	590	LINEFILTER JMK 12A		⚠ All Versions except German *See Note Below
617-10017-00	595	TRANSFORMER PM-1.5/1.5a/1200		⚠
617-10071-01	595	TRANSFORMER PM-1200, CSA		⚠ CSA Version
***HISTORY**				
615-00002-00	590	NOISE FILTER TDK ZCB2206-02		⚠ Below S/N 91X31600000 (All Versions)

SECTION 11

VOLTAGE CONVERSION FOR PM-1200/1.5a

PM-1200/1.5a Voltage Conversion 120V/60Hz to 240V/50Hz

On Regulator Board

Change C4	from	.47µF/250V	to	.1µF/250V met poly radial (Carver P/N 207-10010-00)
Add C10 (parallel with C4)				.1µF/250V met poly radial (Carver P/N 207-10010-00)
Add C6 (parallel with C2)				.01µF mylar (Carver P/N 204-00015-00)
Add C7 (parallel with C3)				.01µF mylar (Carver P/N 204-00015-00)
Change R4	from	12kΩ 1W	to	33kΩ 2W Wire Wound (Carver P/N 253-20140-00)
Add R9 between point "J" and R3				30kΩ 1/2W (Carver P/N 251-10105-03)
Add jumpers				JP3, JP4 and JP5
Change TR1	from	Q2025	to	Q6035, 35A 600V (Carver P/N 319-00063-00)

Note: An alternative to changing all the above parts is to purchase a tested 240V regulator board (Carver P/N 601-76127-01).

On Power Supply Board

Change R19	from	22Ω 1/4W	to	33Ω 1/4W (Carver P/N 251-00034-00)
Change R59	from	240kΩ 1/4W	to	220kΩ 1/4W (Carver P/N 251-00126-00)

Other

Change fuse	from	MDA12	to	MDA 6-1/4 (Carver P/N 315-13004-00)
Apply label near linecord				220-250V 50Hz (Carver P/N 530-10043-00)
Apply label near fuseholder				6A/240V Slo-Blo 1200W (Carver P/N 530-10072-00)

Power Transformer (Magnetic Field Coil)

Rewire the primary windings on the regulator board so they are in series (see schematic diagram of 240V power supply). Remove brown and blue wires from regulator board and splice together.

PM-1200/1.5a Voltage Conversion
240V/50Hz to 120V/60Hz

On Regulator Board

Change C4	from	.1µF/1000V	to	.47µF/250V met poly (Carver P/N 207-10005-00)
Remove C10				.1µF/1000V metal polyester
Remove C6				.022µF mylar
Remove C7				.01µF mylar
Change R4	from	33kΩ 2W	to	12kΩ 1W Metal Oxide (Carver P/N 255-10130-00)
Remove R9				30kΩ 1/2W

Note: An alternative to changing all the above parts is to purchase a tested 120V regulator board (Carver P/N 602-00129-01).

On Power Supply Board

Change R19	from	43Ω 1/4W	to	22Ω 1/4W (Carver P/N 251-00030-00)
Change R59	from	220kΩ 1/4W	to	240kΩ 1/4W (Carver P/N 251-00127-00)

Other

Change fuse	from	MDA-6 1/4	to	MDA12 (Carver P/N 315-13002-00)
Remove label near linecord				220-250V 50Hz (Carver P/N 530-10043-00)
Remove label near fuseholder				6A/240V Slo-Blo 1200W (Carver P/N 530-10072-00)

Power Transformer (Magnetic Field Coil)

Rewire transformer primary windings on the regulator board so they are in parallel (see schematic diagram of power supply). Separate the brown and blue wires; connect brown wire to point "G" or "H" on the regulator board; connect blue wire to point "K" or "L" on the regulator board.

SECTION 11

SERVICE BULLETINS

Please insert Carver Service Bulletins pertaining to the PM-1200 here to ensure proper repair in the future.

CARVER CORPORATION
SERVICE BULLETIN

Service Bulletin # PM-1.5a-1	Model PM-1.5a	Serial # below 21176

Reason: If the customer compains of the second fan running to slow at idle speed follow this procedure.

Procedure: Change R-2 18 ohm 5 watt 5% to a 12 ohm 5 watt 5%.

Delete:	Add:
Qty-1 253-40064-00 (18 ohm 5 watt 5%)	Qty-1 253-40057-00 (12 ohm 5 wat 5%)

SERVICE APPROVAL Wayne Lemaster 8/2/89

ENGINEERING APPROVAL Tim Richardson 6-30-8

DATE

CARVER CORPORATION
SERVICE BULLETIN

Service Bulletin # PM-1.5A-2	Model PM-1.5a	Serial # before 20850

Reason: Driving the output level to maximum at high frequencies with no load can cause the outputs to fail if this condition is sustained.

Procedure: At location R-86 change the resistor from a 43 ohm to a 27 ohm.

Delete: Qty-1 251-00037-00 (43 ohm)	Add: Qty-1 251-00032-00 (27 ohm)

SERVICE APPROVAL 8/30/89

ENGINEERING APPROVAL 8/30/89

DATE

CARVER CORPORATION
SERVICE BULLETIN

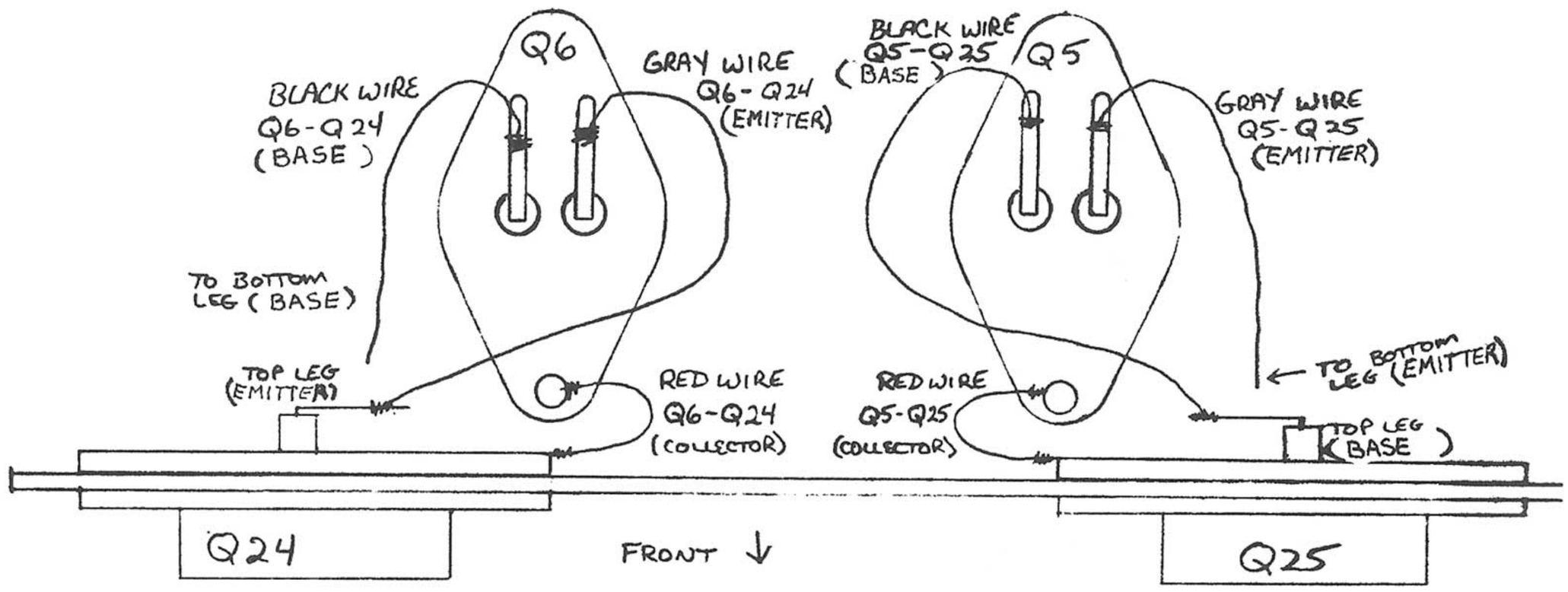
Service Bulletin # PM-1.5A-3A	Model PM-1.5A	Serial # Below 22600

Reason: If the amplifier section in either channel fails the outputs that are mounted away from the boards respectively may be miss-wired.

Procedure: At location Q5 and Q6 check to see if the external outputs are wired correctly. The GREY wire should be connected to the right portion of Q5 transistor socket (emitter). The BLACK wire should b connected the left portion of the Q5 transistor socket (base). The BLACK wire should be connected to the left portion of Q6 transistor socket (base). The GREY wire sould be connected to the right portion transistor socket(emitter). The red wires should be wired to the metal base of the Q5 and Q6 transistor sockets (collector).

ECO #1233

Delete:	Add:



SERVICE APPROVAL Wayne Lynch 10/3/
ENGINEERING APPROVAL [signature] 10/3/

DA

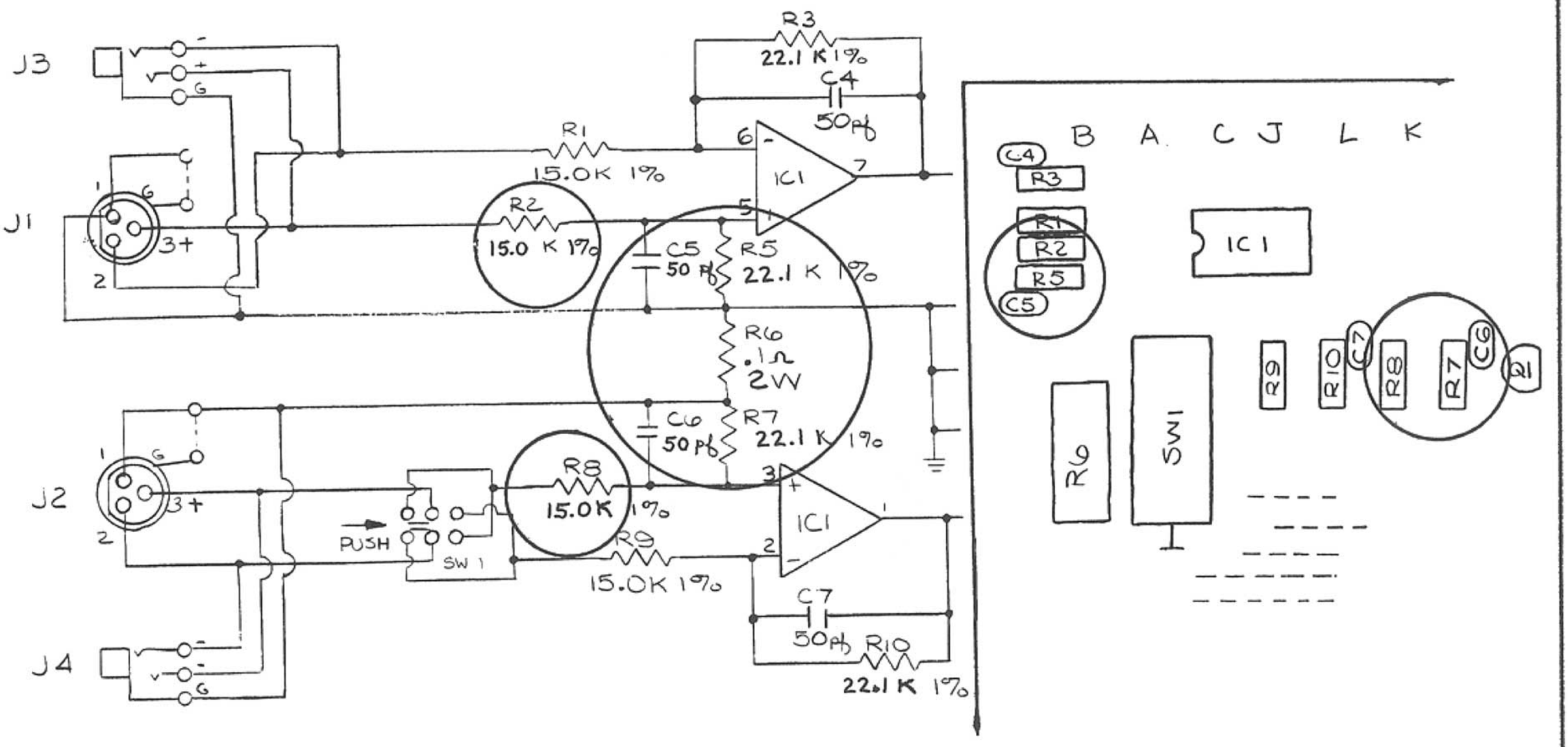
CARVER CORPORATION
SERVICE BULLETIN

Service Bulletin # PM-1.5A-4	Model PM-1.5/1.5A	Serial # AS NEEDED

Reason: To make the input stage truly balanced with balanced drive.

Procedure: At location R2 change from a 6.19K to a 15K 1%.
At location R5 change from a 9.09K to a 22.1K 1%.
At location C5 change from a 100pf to a 50pf.
At location R7 change from a 9.09K to a 22.1K 1%.
At location R8 change from a 6.19K to a 15K 1%.
At location C6 change from a 100pf to a 50pf.

Delete:	Add:
Qty-2 252-00370-00 R2 R8	Qty-2 252-00402-00 R2 R8
Qty-2 252-00377-00 R5 R7	Qty-2 252-00418-00 R5 R7
Qty-2 201-00012-00 C5 C6	Qty-2 201-00008-00 C5 C6



SERVICE APPROVAL

ENGINEERING APPROVAL Dick Richardson 12-14-89

DATE

CARVER CORPORATION
SERVICE BULLETIN

All PM-1.5a's

Service Bulletin # PM-1200-1	Model: PM-1200/PM-1.5a	Serial nos. PM-1200 Below 3200
REASON:		Date: 1/03/90

To reduce filter cap failure due to excessive ripple current.

DELETE	ADD		
	Qty 2	Foam Tape (1.5"x.5")	403-40012-00
	Qty 2	Cap, 2200uF/50V	205-00111-00
	Qty 1	Wire, Black, 18AWG, 5.5"	401-10105-00
	Qty 1	Wire, Blue, 20AWG, 8.75"	401-10404-00
	Qty 1	Wire, White, 20AWG, 8.75"	401-10413-00
	As Required	Silicon RTV	403-10003-00

PROCEDURE

1) Place caps on foam tape and twist + and - leads together as shown in Figure 1.

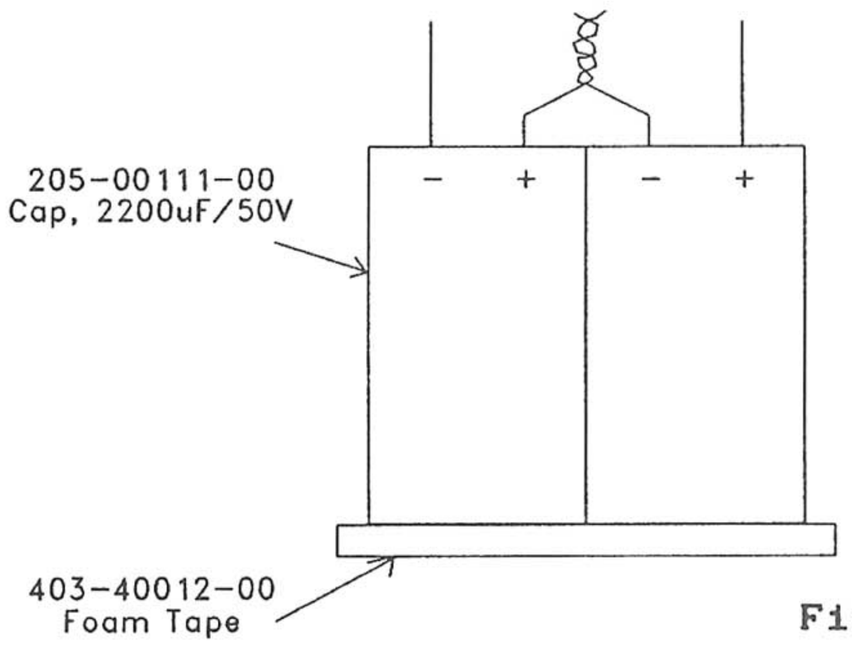


Figure 1

2) Attach wires to cap assembly as shown in Figure 2. Make sure wires are as close to the cap body as possible.

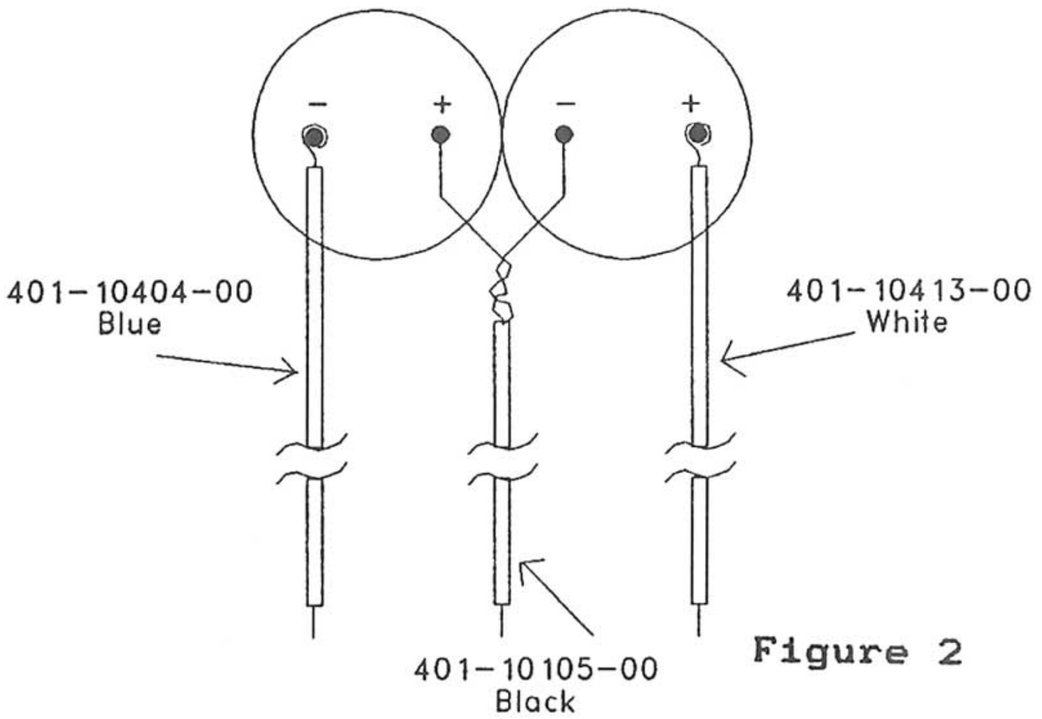


Figure 2

Engineering approval Vic Rodgers 1-8-91

Service approval B Cook

CARVER CORPORATION
SERVICE BULLETIN

Service Bulletin #PM-1200-1	Model: PM-1200/PM-1.5 a	Serial nos.

3) Remove the input board and make the following connections as shown in Figure 3:
   a) attach the blue wire from the negative terminal of the cap assembly to the anode of D28.
   b) attach the white wire from the positive terminal of the cap assembly to the cathode of D27.
   c) attach the black wire from the twisted pair of leads on the cap assembly to the connection at the large filter caps that ties the two together (circuit ground).

4) After the connections have been made, re-install the input board.

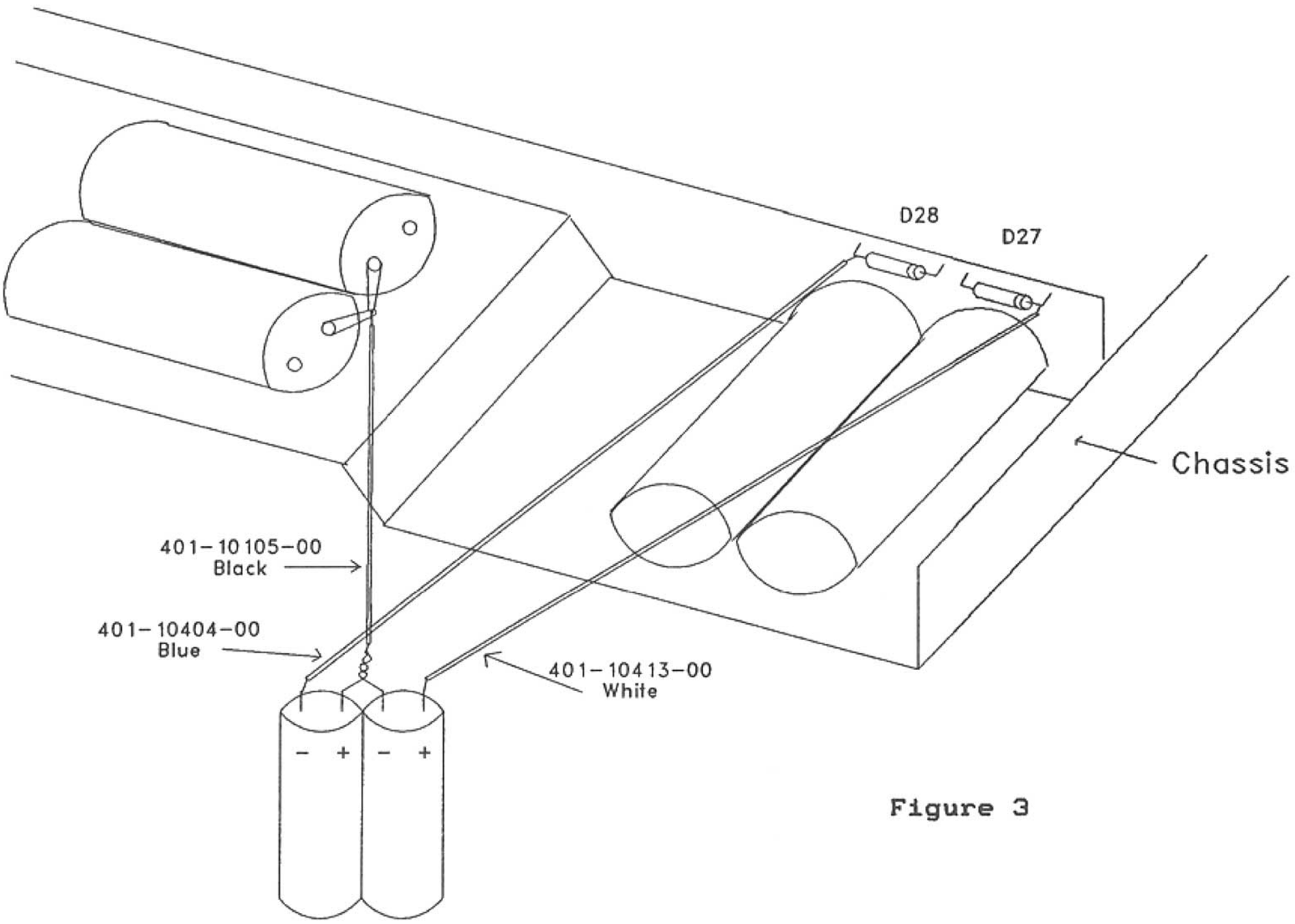


Figure 3

5) Attach second piece of foam tape to back side of cap assembly, and remove backing from foam tape. Apply some silicone RTV to the cap bracket and position the cap assembly as shown in Figure 4. Route the wires as close to the bottom of the chassis as possible.

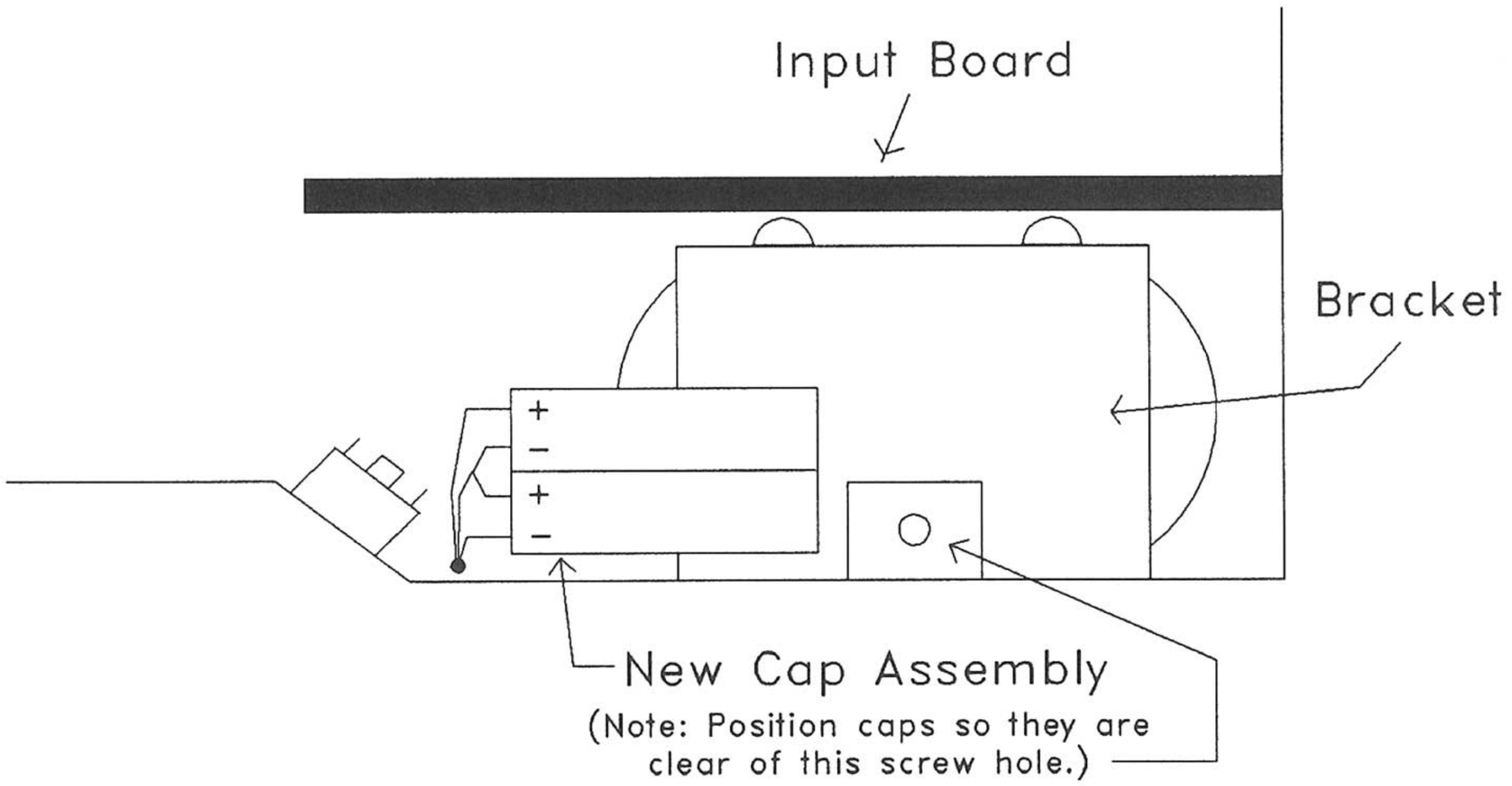


Figure 4

CARVER CORPORATION
SERVICE BULLETIN

All PM-1.5a/PM-1.5's as needed

Service Bulletin # PM-1200-2	Model: PM-1200/PM-1.5a/PM-1.5	Serial nos. PM-1200 Below 03445
REASON:		Date: 1/28/91

To reduce noise in outputs.

DELETE

Qty 2 Jumpers (JP1, JP3)
401-30003-00

ADD

Qty 1	Wire, Twisted Pair, 22AWG WHT/RED & BLK, 3.5" 401-40003-00
Qty 1	Wire, 22AWG Black, 2.5" 401-10636-00
Qty 1	#4 Solder Lug 111-20001-00
Qty 1	#4 X .375" Machine Screw 151-20002-00
Qty 1	#4 Kepnut 152-10001-00
Qty 2	#4 Nylon Washer 154-40001-00
Qty 1	Ragpaper Insulator 3.3" X 2.5" 108-00102-00
Qty 1	Shield Plate 531-00004-00

PROCEDURE

1. Remove input PC Board by removing two nuts and washers securing the 1/4" phone jacks and two screws securing the PCB mounting bracket.
2. Remove jumpers JP1 and JP3.
3. Cut traces leading from the tip and ring of J4 (left channel input 1/4" jack). See Figure 1.
4. Install twisted pair from J4 tip and ring to center pins of SW1. Be sure to maintain correct polarity as shown in the Figure.

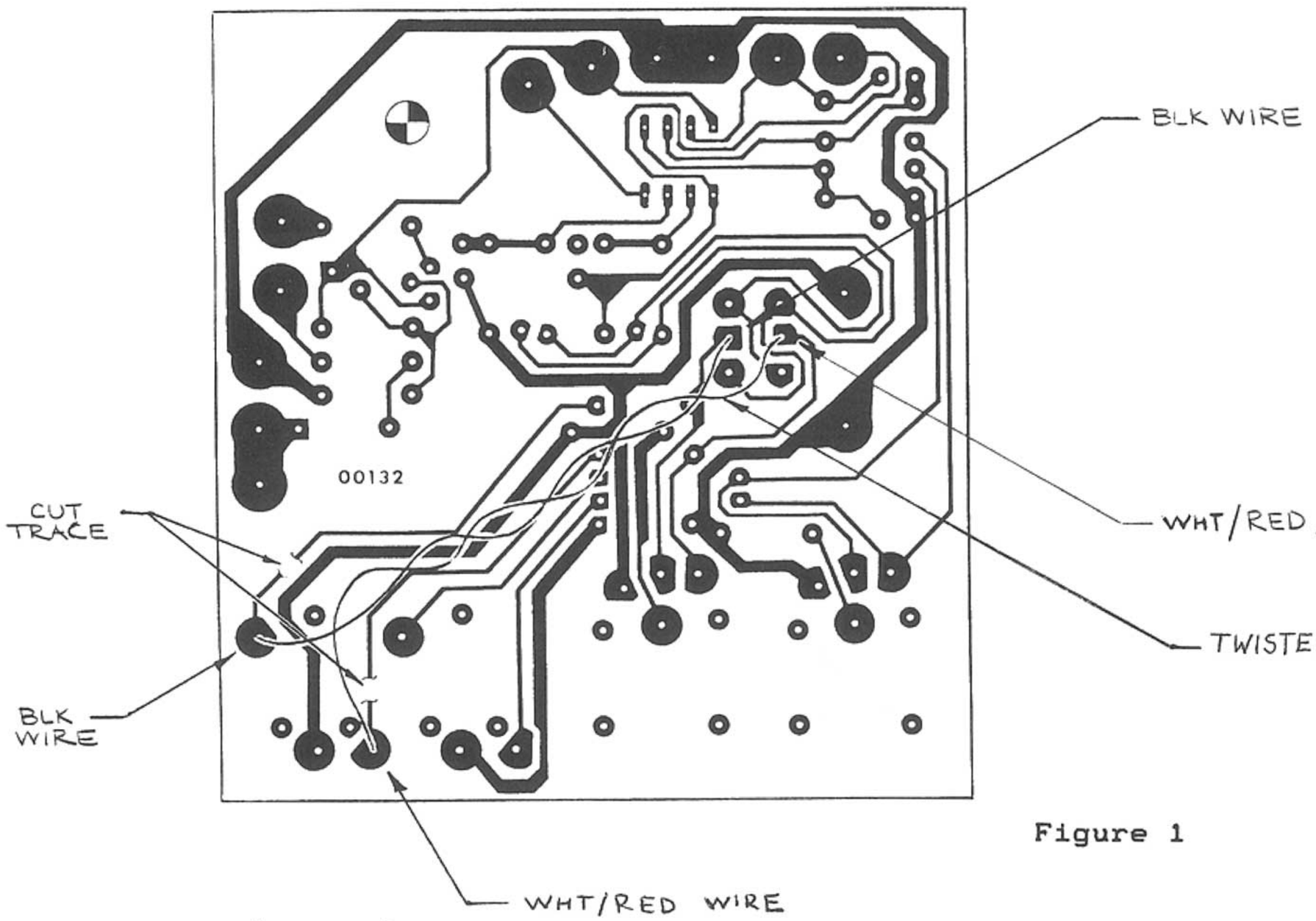


Figure 1

Engineering approval Vic Richardson 1-28-91

Service approval B Coffman

CARVER CORPORATION
SERVICE BULLETIN

Service Bulletin # PM-1200-2	Model: PM-1200/PM-1.5a/PM-1.5	Serial nos. See page 1

5. Solder one end of 2.5" 22AWG black wire (401-10636-00) to #4 solder lug (111-20001-00) and the other end to the ground side of R13 (side nearest edge of board). See Figure 2.
6. Attach 3.3" X 2.5" ragpaper insulator (108-00102-00) and shield (531-00004-00) to underside (foil side) of input board using screw, nut and nylon washers as shown in Figure 3.
   a) Punch a 1/8" diameter hole in the corner of the ragpaper insulator to accommodate screw as shown in the Figure.
   b) Install the screw through the ground lug connected to R13 first.
   c) Use a silicone sealant (RTV) (403-10018-00) or a double-sided tape between the ragpaper insulator and shield to hold the insulator paper in place.
7. Re-install the input board into place.

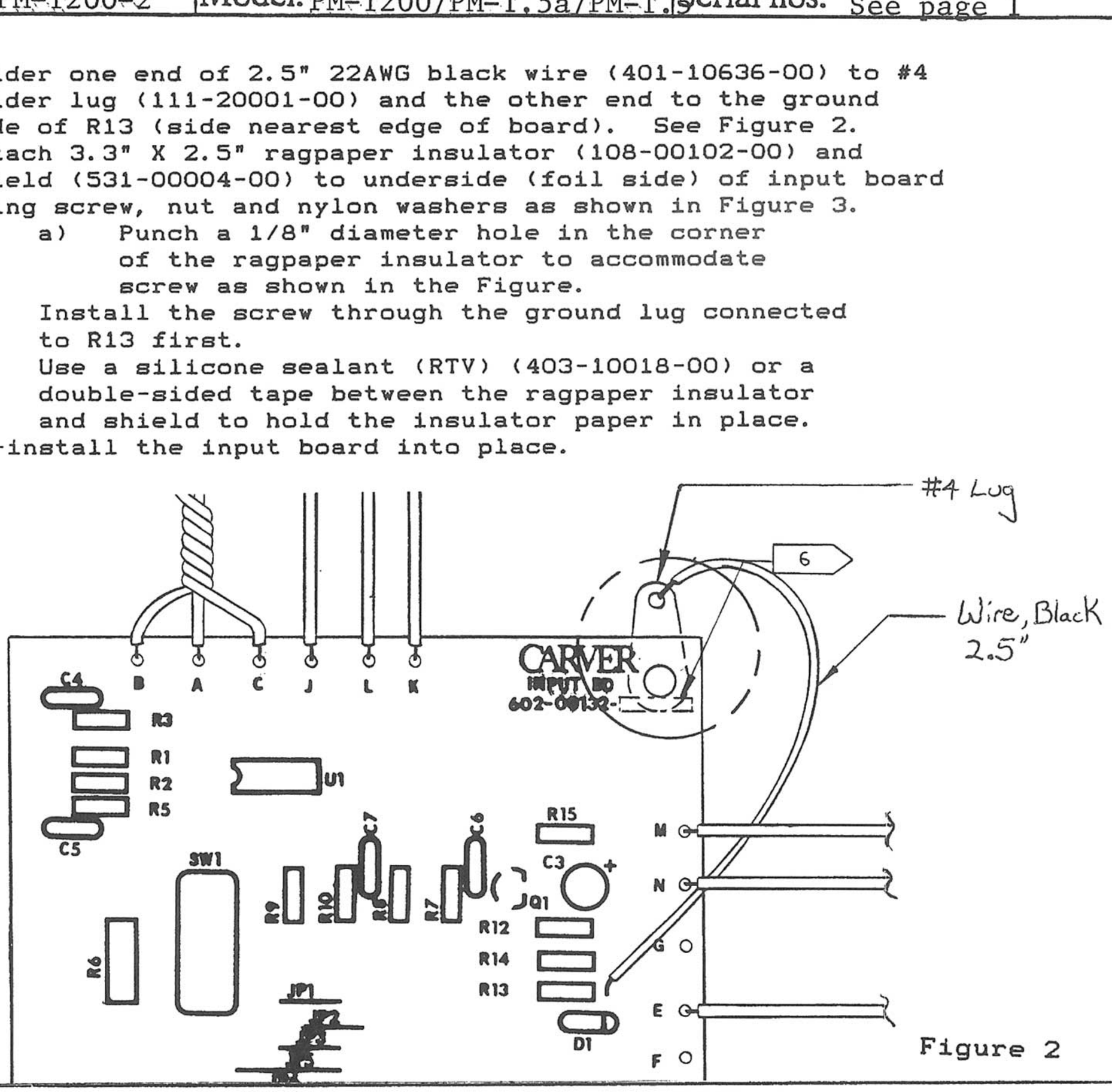


Figure 2

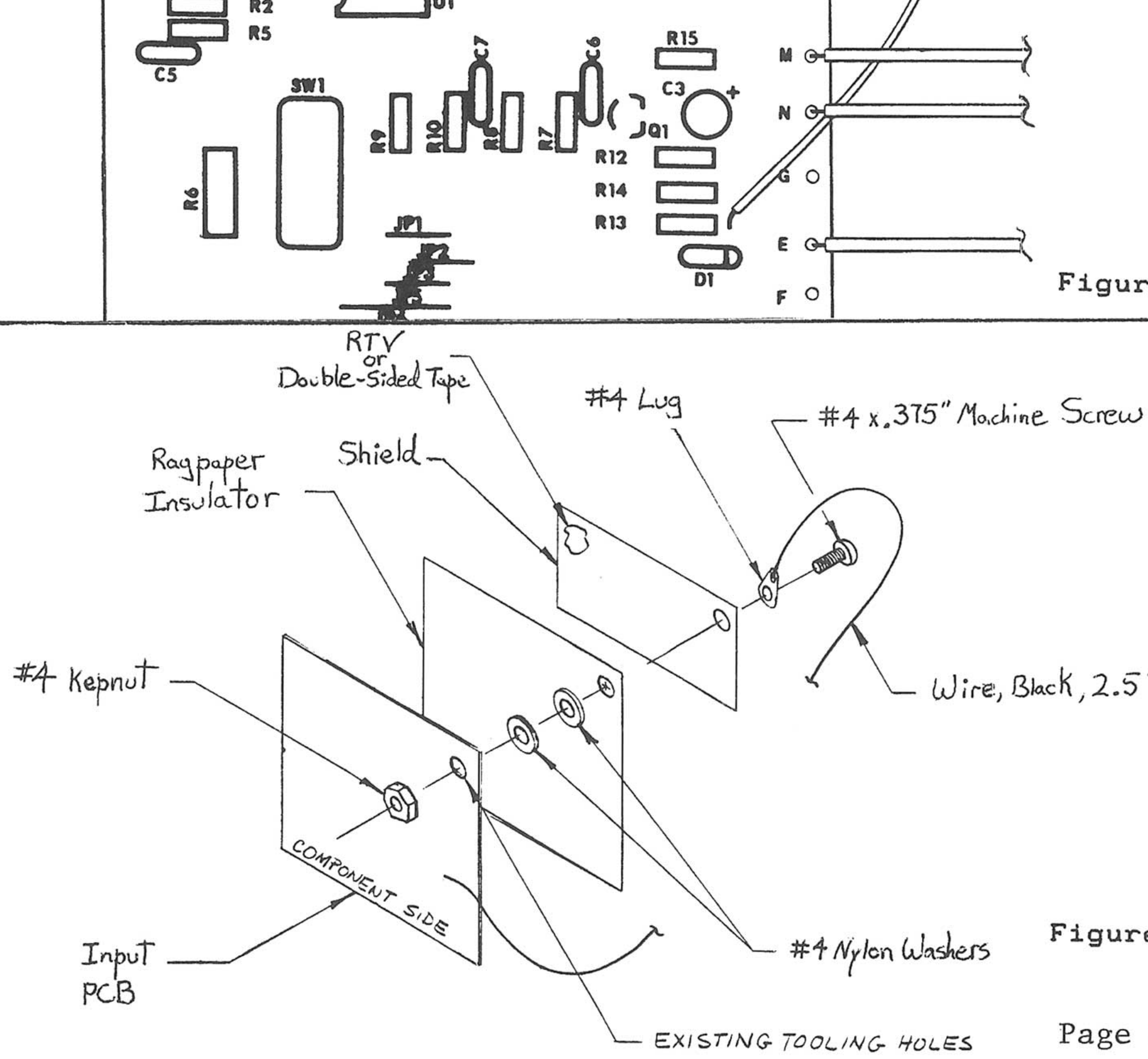


Figure 3

CARVER CORPORATION
SERVICE BULLETIN

Service Bulletin # PM-1200-4	Model: PM-1200	Serial Nos. From 91231600001 to 91631899999
REASON: To improve the reliablility of a particular lot of PM-1200 Magnetic Field Amplifiers.		Date: 7/25/91

DELETE			ADD		
Qty 4	Xistor NPN Pwr C2000 321-30002-00	(Q9L,Q9R, Q10L,Q10R)	Qty 4	Xistor NPN Pwr MJ15024 321-30011-00	(Q9L,Q9R, Q10L,Q10R)
Qty 4	Xistor PNP Pwr C3000 321-30006-00	(Q1L,Q1R, Q2L,Q2R)	Qty 4	Xistor PNP Pwr MJ15025 321-30012-00	(Q1L,Q1R, Q2L,Q2R)

PROCEDURE

During the months of 2/91 through 6/91, some of the PM-1200 power amplifiers were built with C2000 and C3000 power transistors. It has been found that these transistors may suffer from premature failure. When servicing a PM-1200 with a serial number that falls within the range indicated above, please check the high-rail commutator transistors and replace with MJ15024 and MJ15025 transistors as necessary.

Service Approval	Engineering Approval
B Coffman 7/25/91	7-25-91

CARVER CORPORATION
SERVICE BULLETIN

Service Bulletin # PM-1200-5	Model: PM-1200, PM-1.5 all versions	Serial Nos. All
REASON: Part is no longer available.		Date: 1/20/92

DELETE			ADD		
Qty 2	Capacitor, Dual 2200µF/50V/80V 205-00028-00	(C13,14)	Qty 1	Capacitor Card Assy (CCA) 602-00500-01	(C13,14,22,23)

PROCEDURE

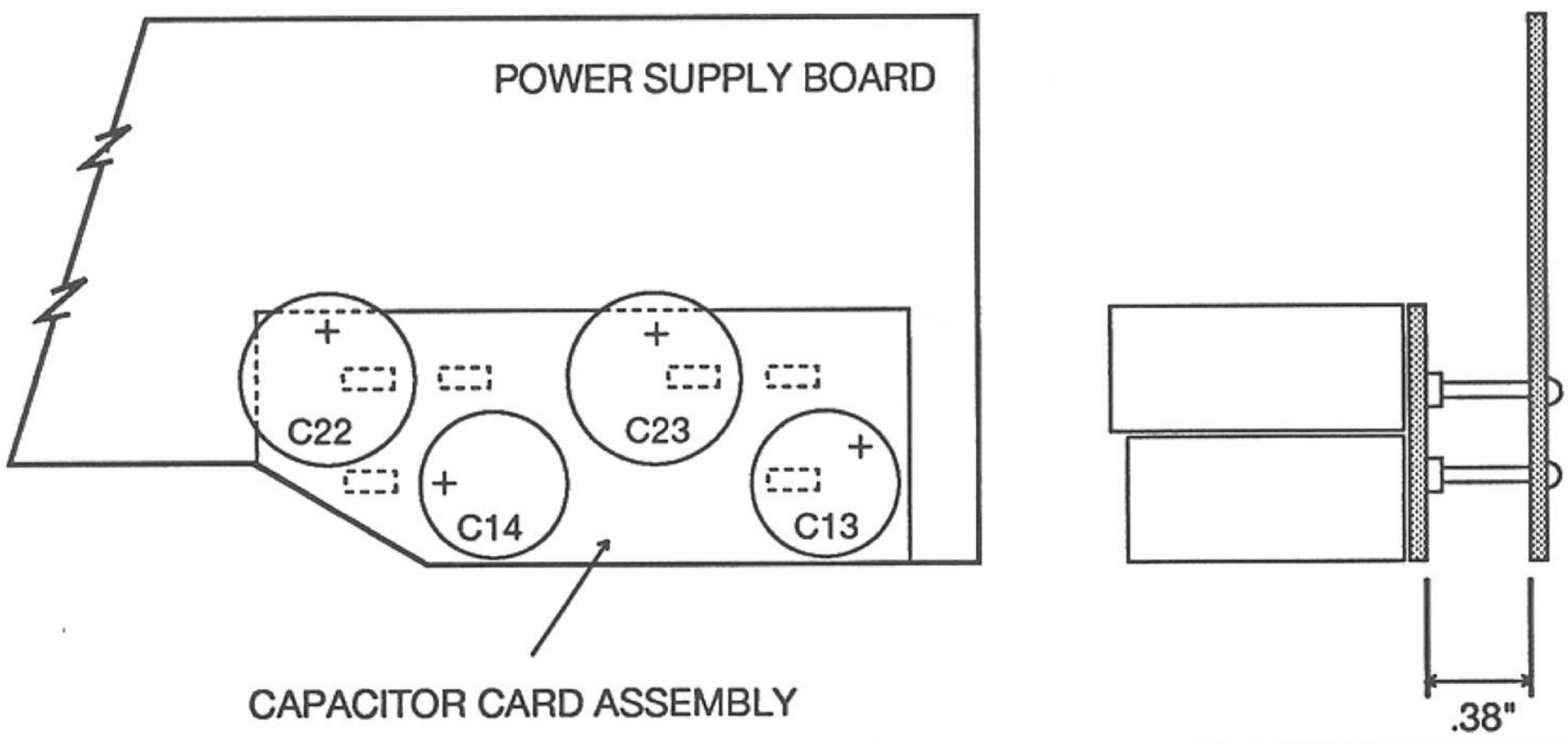
The dual capacitors used for C13 and C14 (P/N 205-00028-00) on the power supply board in the Carver PM-1.5, PM-1.5a and PM-1200 power amplifiers are no longer available.

If replacement of C13/C14 becomes necessary, we are providing a substitute part (Capacitor Card Assembly P/N 602-00500-01) which is pin-for-pin compatible with C13 and C14 on the power supply board.

To install the Capacitor Card Assembly:

1. Remove 2 screws from the bottom of the chassis securing the capacitor bracket located on top of C13 and C14.
2. Unsolder C13 and C14 from the power supply board.

   Note: There are 8 pins per capacitor; 4 electrical connections and 4 connections for mechanical support.
3. Remove C13 and C14 from the power supply board and from the capacitor bracket.
4. Install the Capacitor Card Assembly so that the angled corner of the Card aligns with the angled corner on the power supply board (see illustration below). Solder into place.
5. Reinstall the 2 screws to secure the capacitor bracket in place.



Service Approval	Engineering Approval
B Carlson	Vic Richardson 1-22-93