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# CARVER

*Powerful • Musical • Accurate*

M-1.0t

## MAGNETIC FIELD POWER AMPLIFIER SERVICE MANUAL

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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 M-1.0t Magnetic Field Power Amplifier was released in June of 1986. The original version of the amplifier had inverting outputs; that is, the right channel output is inverted (180 degrees) from the left channel output.

Starting at serial number 4500 (or 70100000), the M-1.0t was redesigned to include a stereo/mono switch, which inverts the right channel for bridged mono use. In normal stereo operation, both channels are in phase. Therefore, you will find separate schematic and board layout drawings for the M-1.0t Inverting (Inv.) and Non-Inverting (N.I.) models in this service manual. Please be sure you are referring to the drawings that correspond to the model being serviced.



## SECTION 3

### SPECIFICATIONS

#### Specifications for the M-1.0t

Inv. = Inverting Version  
N.I. = Non-Inverting Version

#### Power Output:

Continuous Average Power Output :

200 watts per channel into 8Ω from 20 Hz to 20 kHz, with no more than 0.15% THD

400 watts per channel into 4Ω from 20 Hz to 20 kHz, with no more than 0.15% THD

Bridged-mono operation:

1000 watts into 8Ω from 20Hz to 20 kHz, with no more than 0.15% THD

Power at Clipping:

400 watts per channel into 8Ω at 1 kHz (Inv. version)

350 watts per channel into 8Ω at 1 kHz (N.I. version)

Dynamic Headroom:

3.8dB @ 8 ohms (Inv. version) 4.1dB @ 8 ohms (N.I.)

2.9dB @ 4 ohms (Inv. version) 3.1dB @ 4 ohms (N.I.)

Frequency Response:

20Hz to 20kHz (+ 0dB, - 0.5dB)

T.H.D.:

Less than 0.15% 20Hz to 6kHz

IM Distortion:

Less than 0.1%

Noise:

-100 dB A-weighted, referenced to rated power

-82 dBW A-weighted, referenced to 1 watt.

Input Impedance:

51kΩ (Inv. version)

100kΩ (N.I. version)

Sensitivity:

1.75V rms for rated power into 8 ohms at 1 kHz (Inv.)

1.3V rms for rated power into 8 ohms at 1 kHz (N.I.)

125mV rms for 1W output into 8 ohms at 1 kHz (Inv.)

95mV rms for 1W output into 8 ohms at 1 kHz (N.I.)

Damping Factor:

Greater than 9 - Tube Characteristics

Gain:

27dB (Inv. version)

30dB (N.I. version)

Display:

Peak responding, 1mS attack, 1 second delay

7 LED indicators per channel

Power Consumption:

1200W at full power

Power Requirements:

120VAC/60Hz (USA and Canada)

230VAC/50Hz (Europe)

Dimensions:

3.75" H x 19"W x 13.5"D

95mm x 483mm x 343mm

Weight:

19 lbs

8.6 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

### CALIBRATION PROCEDURE M-1.0t

#### High Rail Voltage Adjust

With no signal and no load:

1. Adjust SVR301 for +100VDC at TP5 and -100VDC at TP6.
2. Verify the following DC voltages:

D126 Anode	+61VDC ( $\pm 1V$ )
D128 Anode	+30VDC ( $\pm 1V$ )
D130 Cathode	-30VDC ( $\pm 1V$ )
D132 Cathode	-60VDC ( $\pm 1V$ )

Inverting Version

IC301 Pin 11	-12VDC ( $\pm 0.5V$ )
IC301 Pin 4	+12VDC ( $\pm 0.5V$ )

Non-Inverting Version

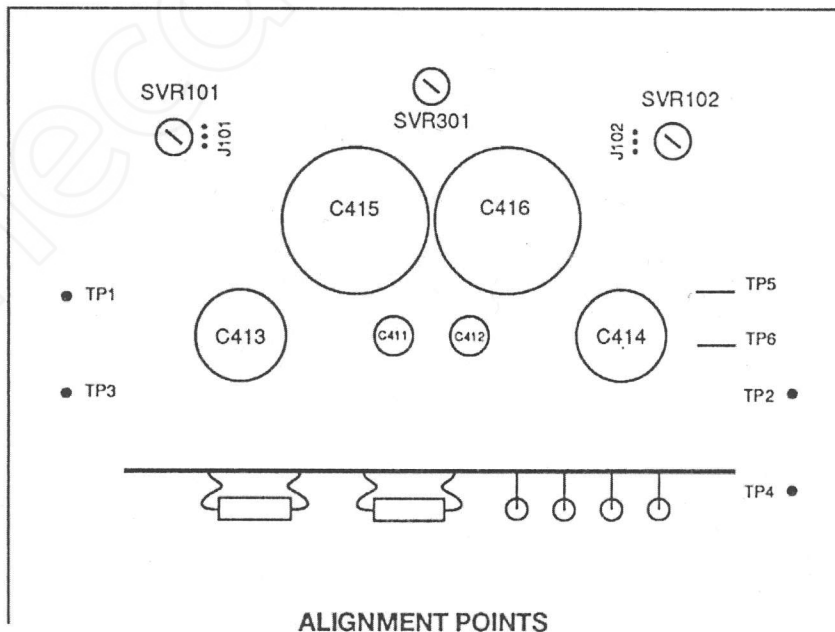
IC301 Pin 4	-12VDC ( $\pm 0.5V$ )
IC301 Pin 8	+12VDC ( $\pm 0.5V$ )

#### Idle Bias Adjust

With no signal and no load:

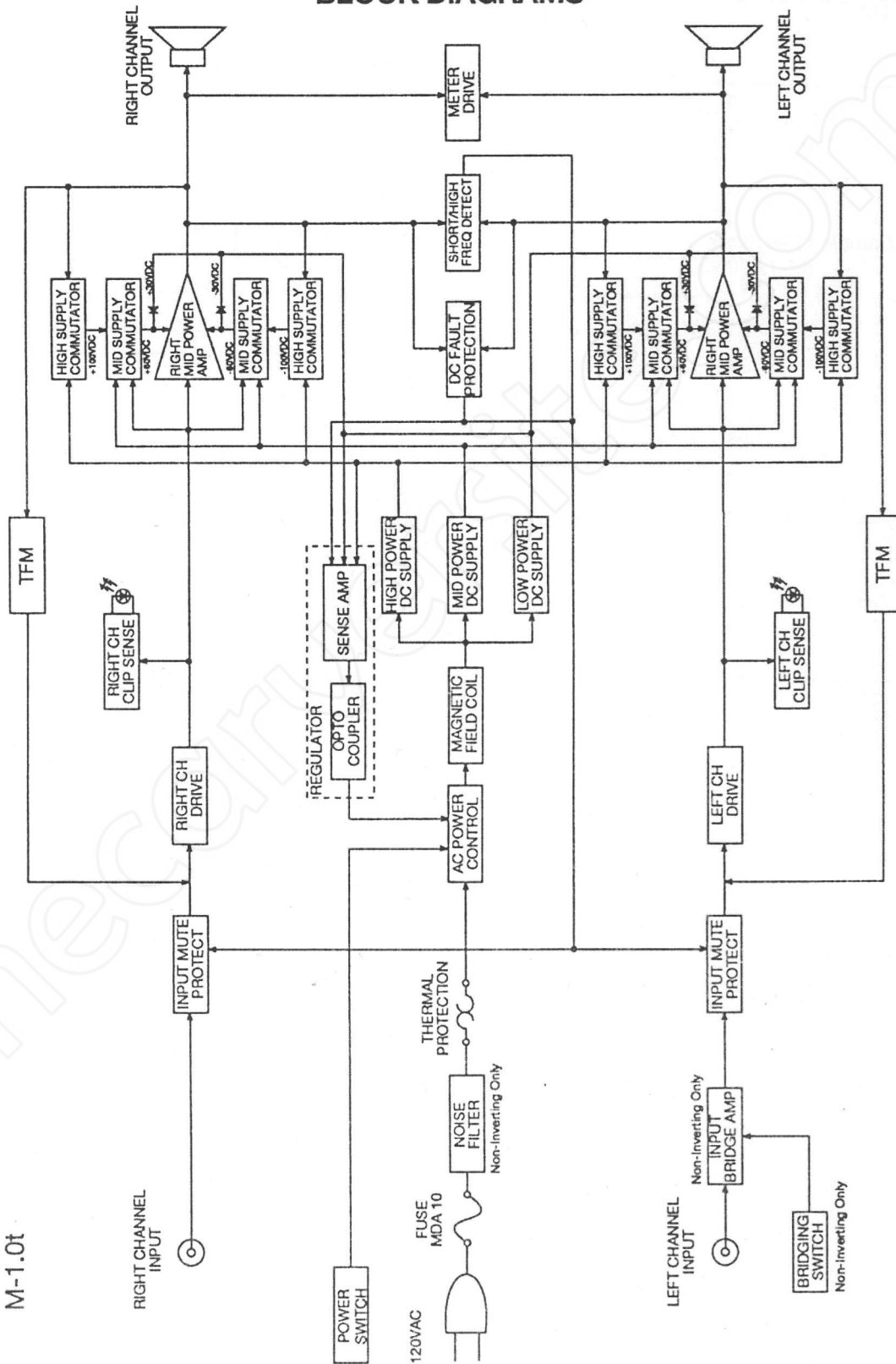
1. Adjust SVR101 for 0.5mV between TP1 and TP3.
2. Adjust SVR102 for 0.5mV between TP2 and TP4.

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



# SECTION 5 BLOCK DIAGRAMS

**BLOCK DIAGRAM**  
M-1.0t



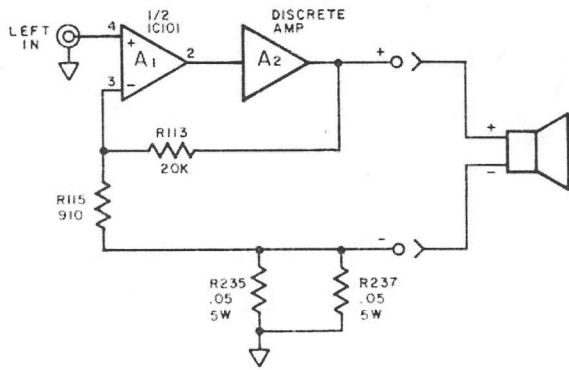


Figure 1: Damping Feedback (M-1.0t Inv.)

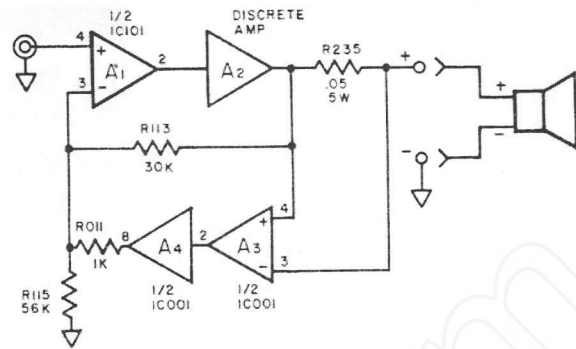


Figure 2: Damping Feedback (M-1.0t N.I.)

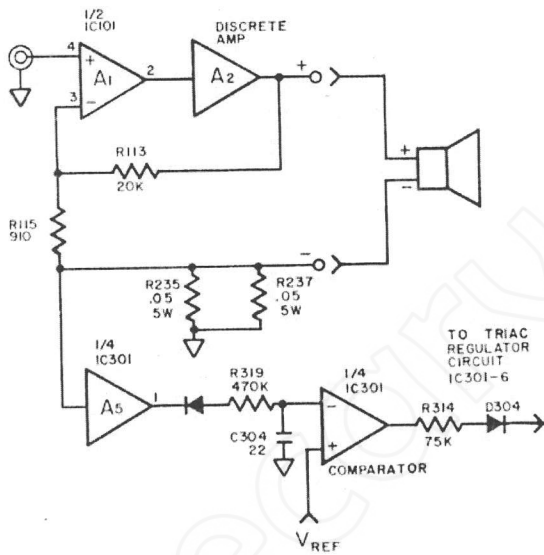


Figure 3: Damping and Current Limiter (M-1.0t Inv.)

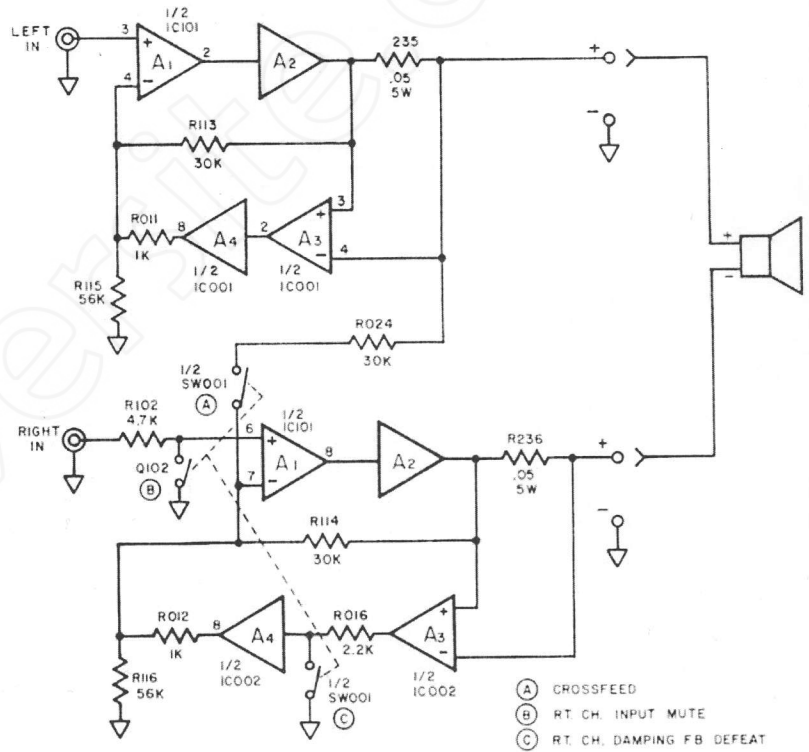


Figure 4: Mono Bridging and Damping Feedback (M-1.0t N.I.)

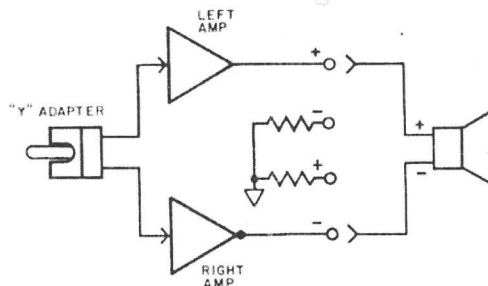


Figure 5: Mono Bridged Connection (M-1.0t N.I.)

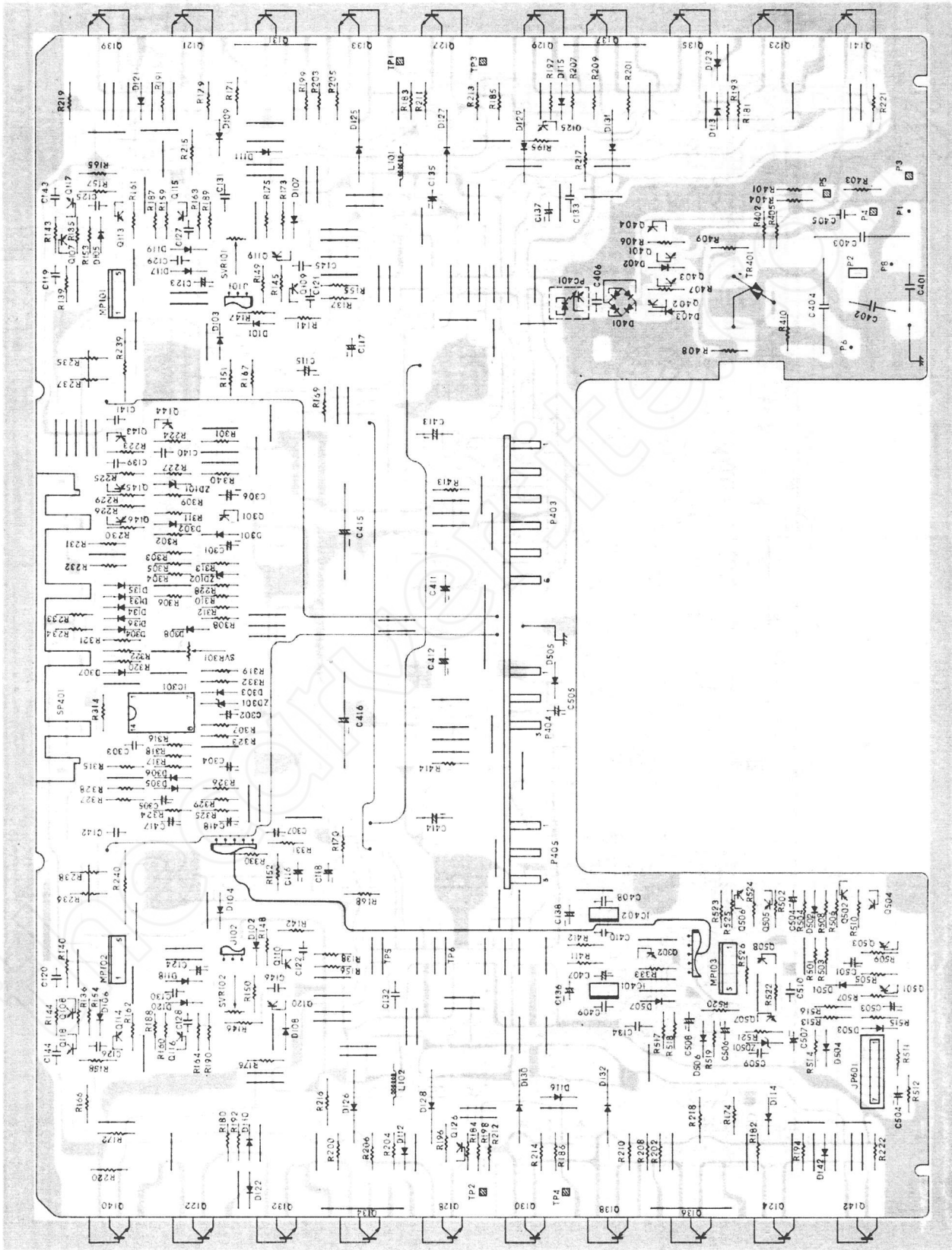
**SECTION 6**  
**SCHEMATICS AND LAYOUTS**

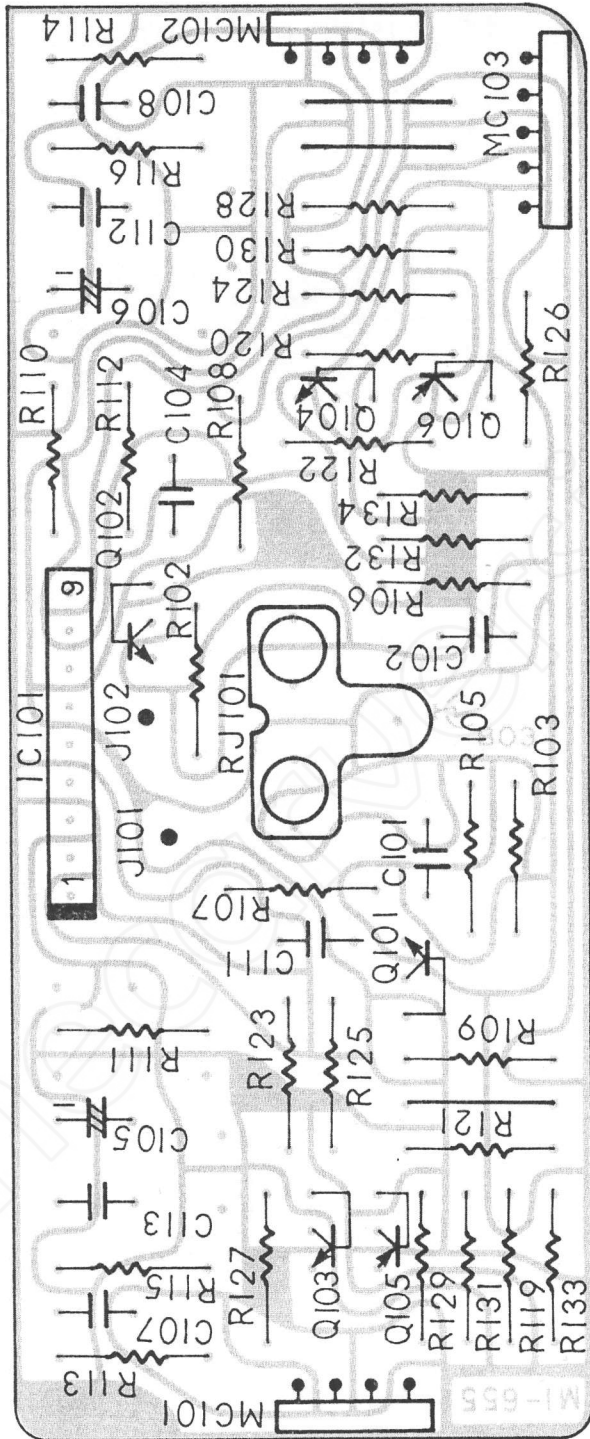
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M-1.0t Input Board Layout (Inv.) .....	12
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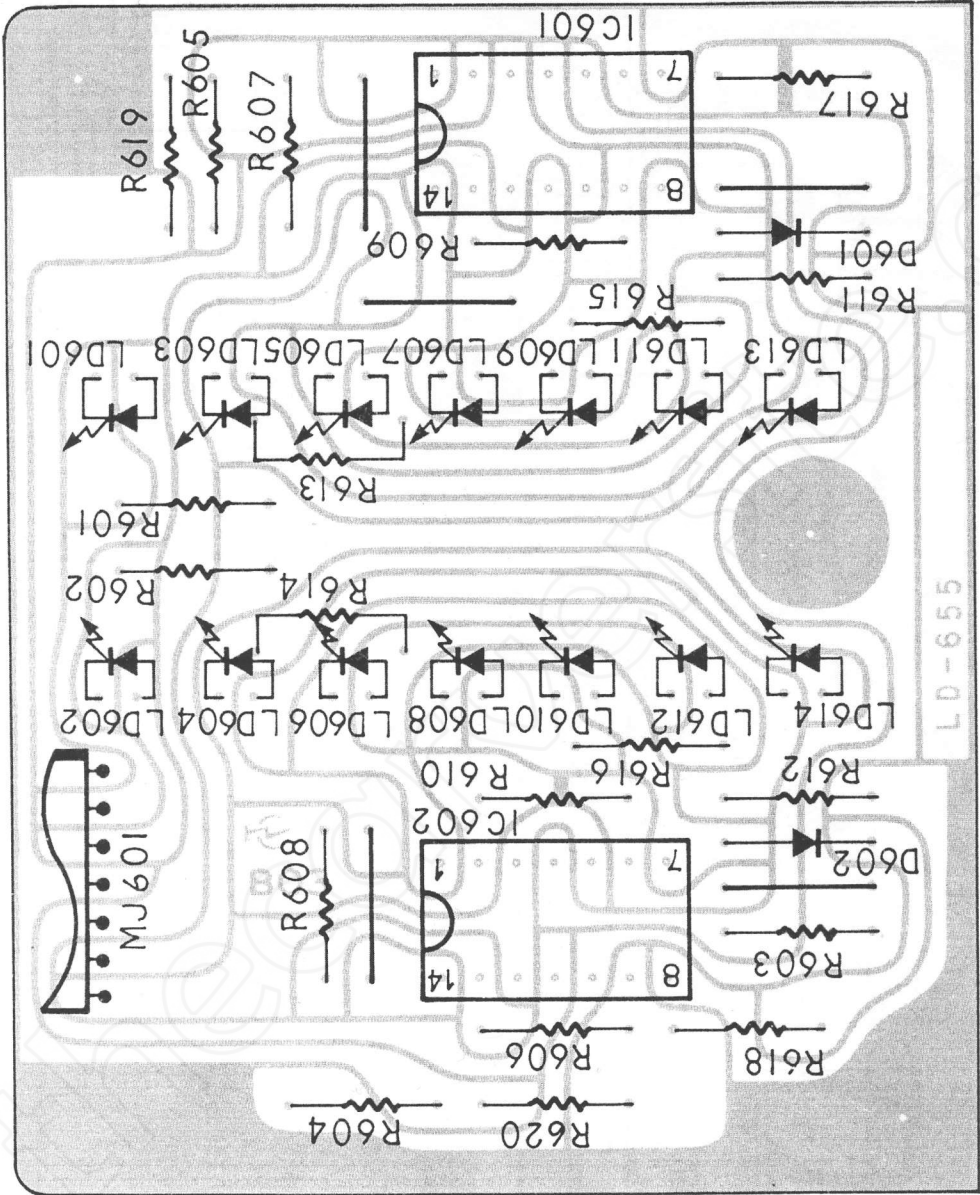
MA-655 Main Amplifier P.C. Board INVERTING





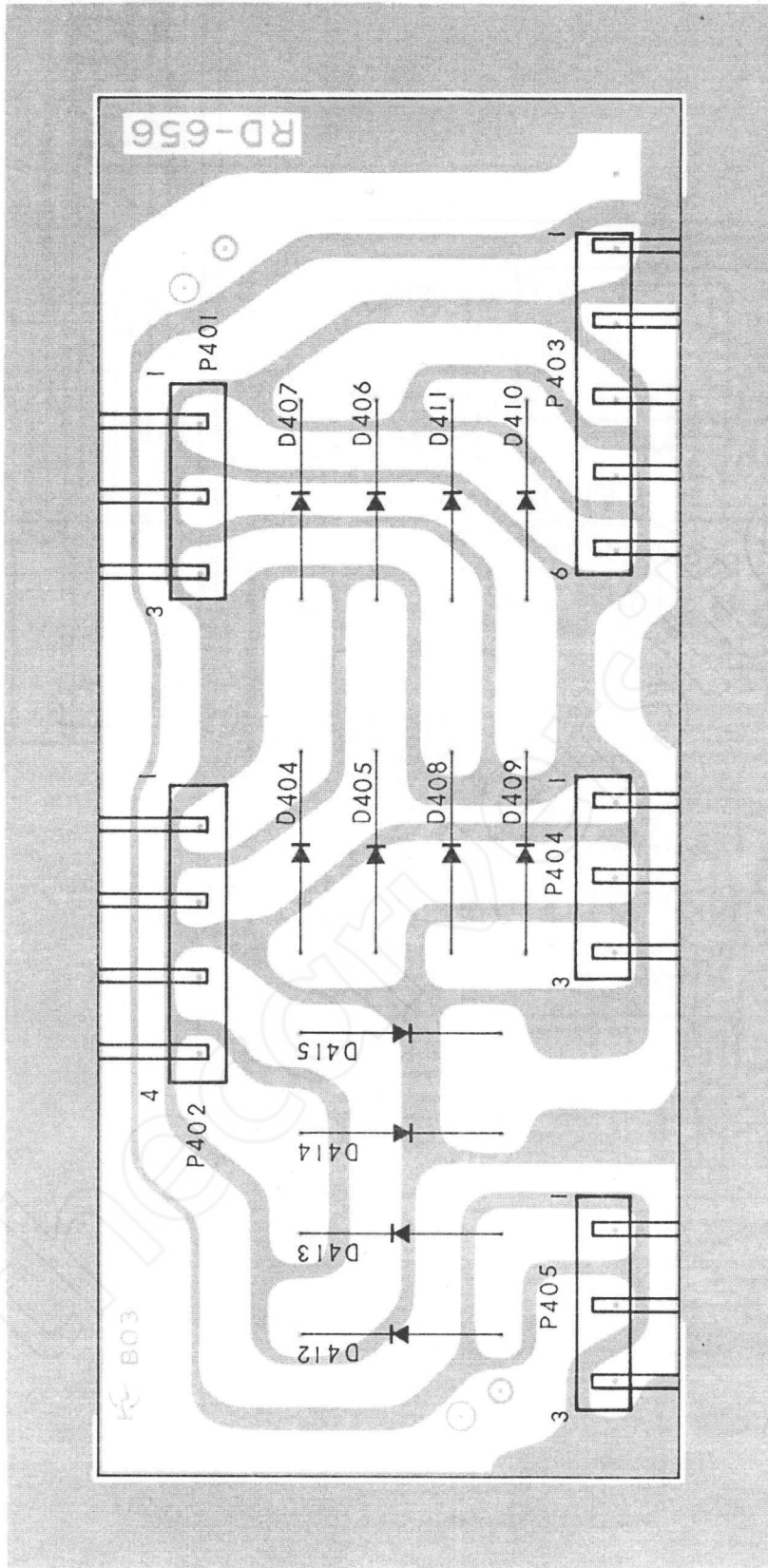
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DRAWN BY: _____		CHECKED BY: _____		DATE: _____	
APPROVALS: _____		SCALE: M-1.0t		SHEET: A	
<h1>CARVER</h1> <p>PCB ASSY INPUT BOARD, INVERTING</p>					
<p>DO NOT SCALE DRAWING</p>					



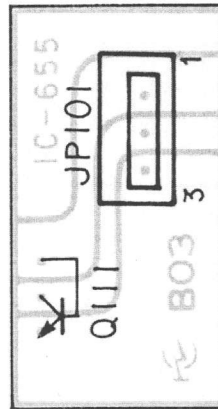
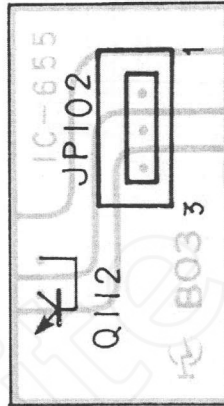
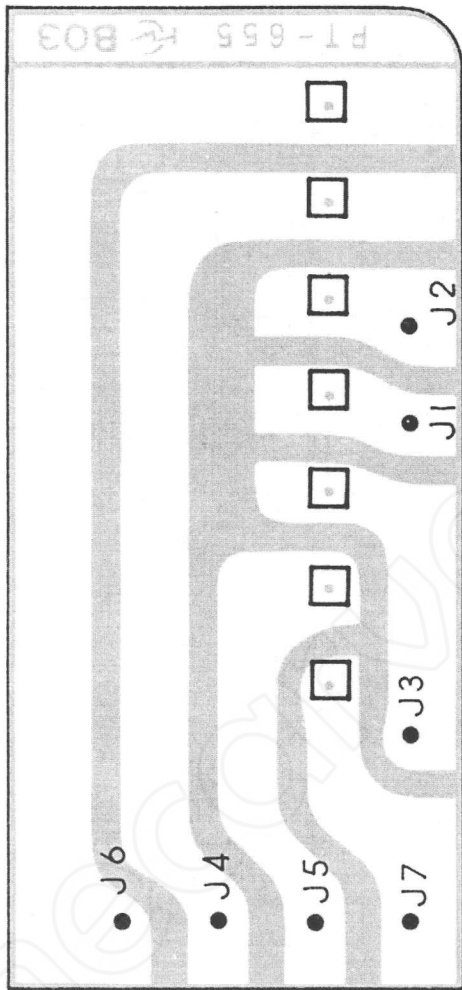


DATE	REV. NO.	DESIGNER	DATE
APPROVED	DATE	DESIGNED	DATE
CHECKED	DATE	ASSEMBLED	DATE
PRINTED	DATE	TESTED	DATE
DO NOT SCALE DRAWING			

NATIONAL SPECIFICATION  
 CARVER  
 PCB ASSY  
 DISPLAY BOARD, INVERTING  
 SCALE: M-1.01  
 SHEET: A



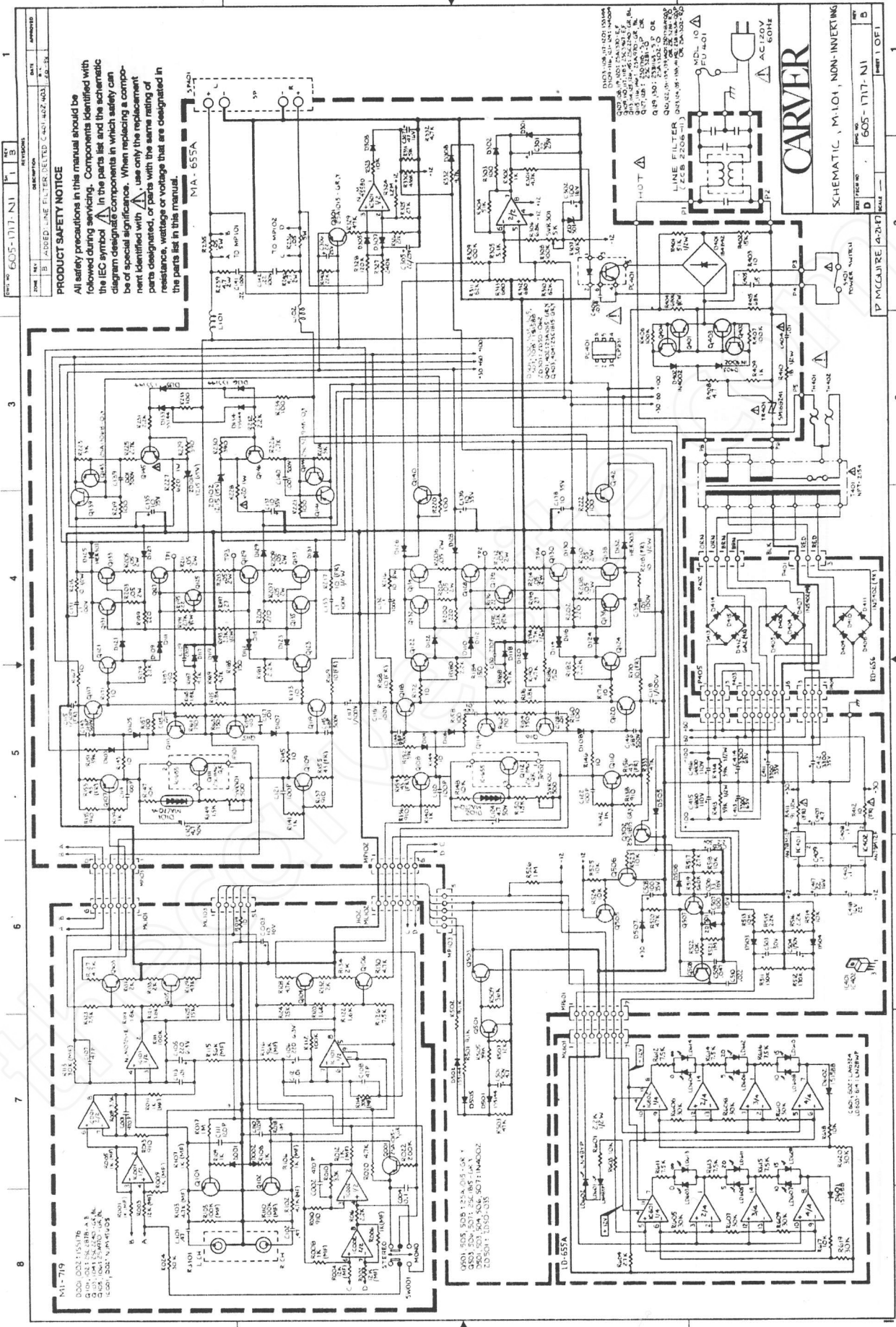
DATE	REV	BY	CHKD	DATE	BY	CHKD
CONTRACT NO. DATE OF ORDER ORDER NO.			PARTS LIST			
DRAWN CHECKED INSP.			DATE			
MATERIALS			APPROVALS			
FINISH			DATE			
DO NOT SCALE DRAWING			SIZE FORM NO. DATE NO.			
SCALE			M-1.0t			
SHEET			A			



QTY.	PRICE	DATE	PART OR IDENTIFIER	QUANTITY	DESCRIPTION	MATERIAL
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES FRACTIONS DECIMALS ANGLES ARE IN DEGREES			CONTRACT NO.	APPROVAL	DATE	
MATERIAL			GROUP			
FINISH			CHECKED			
DO NOT SCALE DIMENSIONS			MAILED			
SIZE	FORM NO.	DATE, IN.	REV.	SCALE	REVISION	
			A	M-1.0t		

**CARVER**

PCB ASSY  
POWER XFMR AND IDLING BOARD  
INVERTING



REV.	DATE	DESCRIPTION	BY	APPROVED
1				

**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.

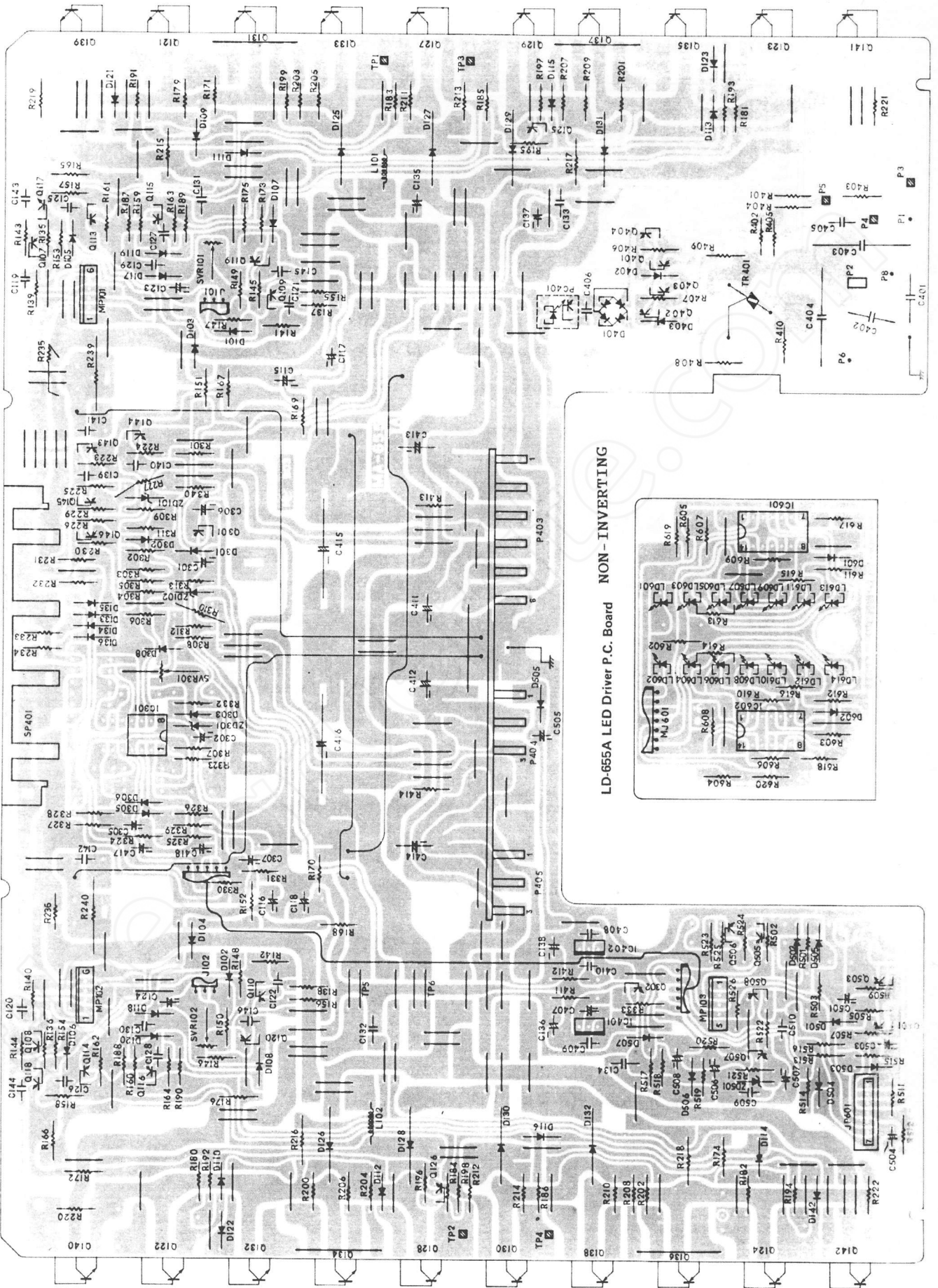
MA-655A

**CARVER**

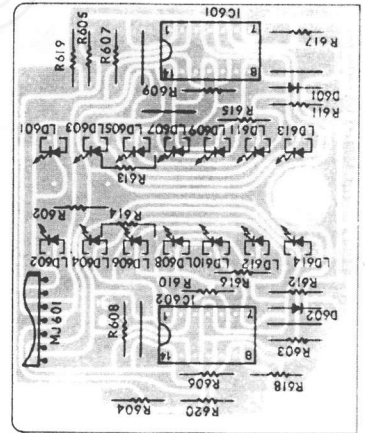
SCHMATIC, M-101, NON-INVERTING  
 P McCAULEY, 4-2-74  
 605-1717-N1  
 SHEET 1 OF 1



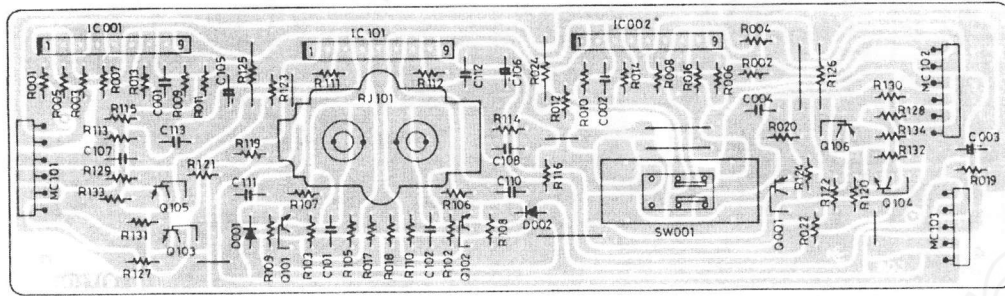
MA-655A Main Amplifier P.C. Board NON - INVERTING



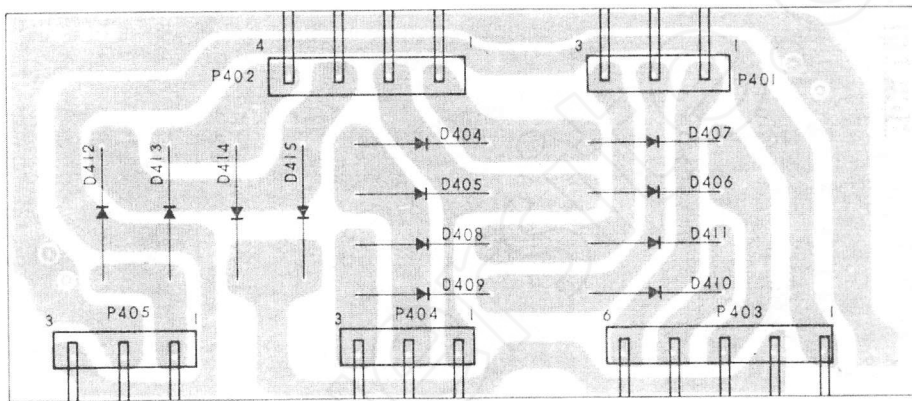
LD-655A LED Driver P.C. Board NON - INVERTING



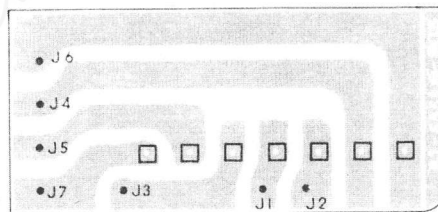
MI-719 First Main Amplifier P.C. Board NON-INVERTING



RD-656 Rectifier Diode P.C. Board NON-INVERTING



PT-655A Power Transformer P.C. Board NON-INVERTING



IC-655A Idling Transistor P.C. Board NON-INVERTING



## **SECTION 7**

### **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 6

## PARTS LIST

**M-1.0t Assembly**  
**P/N 607-00351-01**

### CAPACITORS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
205-00003-00	CAP LYTIC 2.2 $\mu$ F/50V 20% RAD	C501 (LATER REV.)	
BC8332MA50CC3	CAP LYTIC 3300 $\mu$ F/63V	C413,414	
LSS2Q682MLMAZO	CAP LYTIC 6800 $\mu$ F/110V	C415,416	
MS-25TW220M-RT	CAP LYTIC 22 $\mu$ F/25V	C301,305,306	
MS100TW1R0M-RT	CAP LYTIC 1 $\mu$ F/100V	C115-118	
NS-10TW101M-RT	CAP LYTIC 100 $\mu$ F/10V	C507	
NS-16TW100M-RT	CAP LYTIC 10 $\mu$ F/16V	C003	
NS-16TW101M-RT	CAP LYTIC 100 $\mu$ F/16V	C302	
NS-16TW220M-RT	CAP LYTIC 22 $\mu$ F/16V	C417,418	
NS-16TW330M-RT	CAP LYTIC 33 $\mu$ F/16V	C506	
NS-16TW470M-RT	CAP LYTIC 47 $\mu$ F/16V	C307	
NS-35TW100M-RT	CAP LYTIC 10 $\mu$ F/35V	C135-138	
NS-35TW101M-RT	CAP LYTIC 100 $\mu$ F/35V	C508	
NS-35TW332M-KF	CAP LYTIC 3300 $\mu$ F/35V	C411,412	
NS-50TW1R0M-RT	CAP LYTIC 1 $\mu$ F/50V	C503,504	
NS-50TW2R2M-RT	CAP LYTIC 2.2 $\mu$ F/50V	C505	
NS-50TW4R7M-RT	CAP LYTIC 4.7 $\mu$ F/50V	C123,124,407, (C501 EARLY REV.)	
NS6R3TW221M-RT	CAP LYTIC 220 $\mu$ F/6.3V	C105,106	
ECQV1H104JZ-RT	CAP METAL FILM .1 $\mu$ F	C004,408-410	
ECQV1H393JZ-RT	CAP METAL FILM .039 $\mu$ F	C406	
ECQV1H474JZ-RT	CAP METAL FILM .47 $\mu$ F	C101,102	
ECQU1A332MH	CAP METAL FILM .0033 $\mu$ F	C401,402	
MMS104M	CAP METAL FILM .1 $\mu$ F	C403,404	
MMW100TW154KRT	CAP METAL FILM .15 $\mu$ F/100V	C405	
MMW100TW224KRT	CAP METAL FILM .22 $\mu$ F/100V	C141,142	
MY-50VU103J-RT	CAP MYLAR .01 $\mu$ F/50V	C112,113	
MY-50VU473J-RT	CAP MYLAR .047 $\mu$ F/50V	C509	
MY-100VS104K	CAP MYLAR .1 $\mu$ F/100V	C131-134	
HE40SJSL470KRT	CAP CER DISC 47pF	C107,108	
HE50SJSL101KRT	CAP CER DISC 100pF	C119-122	
HE50SJSL121KRT	CAP CER DISC 120pF	C110,111	
HE70SJSL271KRT	CAP CER DISC 270pF	C129,130	
HE70SJYF103ZRT	CAP CER DISC .01 $\mu$ F	C125-128	
HE90SJSL471KRT	CAP CER DISC 470pF	C001,002	
HE90SJYF223ZRT	CAP CER DISC .022 $\mu$ F	C510	
HM60SJSL680KRT	CAP CER DISC 68pF/500V	C143-146	
HM60SJYB102KRT	CAP CER DISC .001 $\mu$ F/500V	C139,140	



# RESISTORS

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
251-00111-00	RES CFILM 51 K 1/4W PREP .4		To Foil Side of Amp Bd. MA655A See Service Bulletin M-1.0t-6A
251-00149-00	RES CFILM 2.0 M 1/4W		To Foil Side of Input Bd. MI-719 See Service Bulletin M-1.0t-6A
KA16ST100J-AT	RES CFILM 10 OHM 1/8W	R19	
KA16ST102J-AT	RES CFILM 1 K 1/8W	R108,109	
KA16ST104J-AT	RES CFILM 100 K 1/8W	R111,112	
KA16ST105J-AT	RES CFILM 1 M 1/8W	R017,018	
KA16ST162J-AT	RES CFILM 1.6 K 1/8W	R119-122	
KA16ST202J-AT	RES CFILM 2 K 1/8W	R131-134	
KA16ST204J-AT	RES CFILM 200 K 1/8W	R022	
KA16ST222J-AT	RES CFILM 2.2 K 1/8W	R016	
KA16ST472J-AT	RES CFILM 4.7 K 1/8W	R020,127-130	
KA16ST752J-AT	RES CFILM 7.5 K 1/8W	R123-126	
KA25ST100J-AT	RES CFILM 10 OHM 1/4W	R143-146,171-174,403	
KA25ST101J-AT	RES CFILM 100 OHM 1/4W	R157-160,219-222,233,234,303	
KA25ST102J-AT	RES CFILM 1 K 1/4W	R139-142,302,409	
KA25ST103J-AT	RES CFILM 10 K 1/4W	R147,148,323,513,514,518,522-525,603,617,618	
KA25ST104J-AT	RES CFILM 100 K 1/4W	R308,309,406,407	
KA25ST105J-AT	RES CFILM 1 M 1/4W	R521,526	
KA25ST123J-AT	RES CFILM 12 K 1/4W	R507	
KA25ST124J-AT	RES CFILM 120 K 1/4W	R328	
KA25ST125J-AT	RES CFILM 1.2 M 1/4W	R324	
KA25ST134J-AT	RES CFILM 130 K 1/4W	R511,512	
KA25ST151J-AT	RES CFILM 150 OHM 1/4W	R183-186	
KA25ST152J-AT	RES CFILM 1.5 K 1/4W	R149,150	
KA25ST153J-AT	RES CFILM 15 K 1/4W	R402	
KA25ST182J-AT	RES CFILM 1.8 K 1/4W	R165,166,175,176	
KA25ST220J-AT	RES CFILM 22 OHM 1/4W	R195,196	
KA25ST221J-AT	RES CFILM 220 OHM 1/4W	R199-202	
KA25ST222J-AT	RES CFILM 2.2 K 1/4W	R179-182,231,232,515,516	
KA25ST223J-AT	RES CFILM 22 K 1/4W	R340	
KA25ST244J-AT	RES CFILM 240 K 1/4W	R327	
KA25ST270J-AT	RES CFILM 27 OHM 1/4W	R197,198	
KA25ST272J-AT	RES CFILM 2.7 K 1/4W	R225,226,517,604	
KA25ST273J-AT	RES CFILM 27 K 1/4W	R325,326	
KA25ST302J-AT	RES CFILM 3 K 1/4W	R223,224	
KA25ST303J-AT	RES CFILM 30 K 1/4W	R605-610,619,620	
KA25ST362J-AT	RES CFILM 3.6 K 1/4W	R307	
KA25ST363J-AT	RES CFILM 36 K 1/4W	R509	
KA25ST391J-AT	RES CFILM 390 OHM 1/4W	R229,230	
KA25ST393J-AT	RES CFILM 39 K 1/4W	R151,152,505	
KA25ST4R7J-AT	RES CFILM 4.7 OHM 1/4W	R408	
KA25ST434J-AT	RES CFILM 430 K 1/4W	R330	
KA25ST472J-AT	RES CFILM 4.7 K 1/4W	R187-190,301,332	
KA25ST473J-AT	RES CFILM 47 K 1/4W	R329,333,503,520	
KA25ST512J-AT	RES CFILM 5.1 K 1/4W	R305	

CARVER P/N	DESCRIPTION		REF DESIGNATORS	NOTES
KA25ST513J-AT	RES CFILM	51 K 1/4W	R304,331	
KA25ST564J-AT	RES CFILM	560 K 1/4W	R519	
KA25ST623J-AT	RES CFILM	62 K 1/4W	R310,311	
KA25ST681J-AT	RES CFILM	680 OHM 1/4W	R312,313	
KA25ST682J-AT	RES CFILM	6.8 K 1/4W	R306	
KA25ST683J-AT	RES CFILM	68 K 1/4W	R405	
KA25ST751J-AT	RES CFILM	750 OHM 1/4W	R161-164	
KA25ST752J-AT	RES CFILM	7.5 K 1/4W	R611-616	
KA25ST911J-AT	RES CFILM	910 OHM 1/4W	R135-138	
KA25ST912J-AT	RES CFILM	9.1 K 1/4W	R501,502	
KA50XT180J-AT	RES CFILM	18 OHM 1/2W	R410	
KA50XT222J-AT	RES CFILM	2.2 K 1/2W	R601	
KA50XT272J-AT	RES CFILM	2.7 K 1/2W	R191-194	
KA50XT393J-AT	RES CFILM	39 K 1/2W	R413,414	
KA50XT513J-AT	RES CFILM	51 K 1/2W	R401	
KA50XT684J-AT	RES CFILM	680 K 1/2W	R404	
MF16ST102G-AT	RES MFILM	1 K 1/8W	R005-008,011,012,106,107	
MF16ST104G-AT	RES MFILM	100 K 1/8W	R105,110	
MF16ST123G-AT	RES MFILM	12 K 1/8W	R001-004	
MF16ST303G-AT	RES MFILM	30 K 1/8W	R024,113,114	
MF16ST332G-AT	RES MFILM	3.3 K 1/8W	R009,010	
MF16ST472G-AT	RES MFILM	4.7 K 1/8W	R102,103	
MF16ST563G-AT	RES MFILM	56 K 1/8W	R115,116	
MF16ST911G-AT	RES MFILM	910 OHM 1/8W	R013,014	
SA-1WT621J-LP	RES MET OXIDE	620 OHM 1W	R227,228	
SA-2WT4R7J-LP	RES MET OXIDE	4.7 OHM 2W	R239,240	
FR25ST100J-LP	RES FLAME PROOF	10 OHM 1/4W	R167-170,412	⚠
FR25ST430J-LP	RES FLAME PROOF	43 OHM 1/4W	R153-156	⚠
FR50ST100J-LP	RES FLAME PROOF	10 OHM 1/2W	R215-218	⚠
FR50ST910J-LP	RES FLAME PROOF	91 OHM 1/2W	R411	⚠
MPC75R05K-LF	RES CEMENT	.05 OHM 5W	R235,236	
MPC76R05K-LF	RES CEMENT	.05 OHM 2W	R203-214	
SVR-08T3B501	TRIM POT	500 OHM 1/8W	SVR101,102	
SVR-08T3B502	TRIM POT	5 K 1/8W	SVR301	

## DIODES

CARVER P/N	DESCRIPTION		REF DESIGNATORS	NOTES
1B4B42	BRIDGE RECTIFIER	D401		
1N4002-AT	DIODE	1N4002	D402,403,501,503-507	
1N4004-AT	DIODE	1N4004	D109-116,121-124	
1N5402-F	DIODE	1N5402	D404-411	

CARVER P/N	DESCRIPTION		REF DESIGNATORS	NOTES
1SS144-AT	DIODE	1SS144	D103-108,117-120,133-136,502,505	
1SS176-AT	DIODE	1SS176	D001,002	
1S1588-AT	DIODE	1S1588	D301-303,305,306,308,601,602	
6A2-F	DIODE	6A2	D412-415	
HER303-F OR 30DF2FC	DIODE	HER303 30DF2FC	D125-132	
LN28WP	LED	RED	LD603-614	
LN48YP	LED	AMBER	LD601,602	
MA27QA-AT	DIODE	MA27QA	D101,102	
ZD50-035-AT	DIODE	ZENER 1/2W 3.5V	ZD501	
ZD50-062-AT	DIODE	ZENER 1/2W 6.2V	ZD301	
ZD50-137-AT	DIODE	ZENER 1/2W 13.7V	ZD101,102	







## TRANSISTORS

CARVER P/N	DESCRIPTION		REF DESIGNATORS	NOTES
2SA1015-GR-RT OR 2SA1015-Y-RT	XISTOR	2SA1015	Q001,301,401,402,501,505,508	
2SA1302LB-RO OR 2SB1163A-QSP	XISTOR	2SA1302 2SB1163	Q123,124,135-138,141,142	
2SA1370-E,F	XISTOR	2SA1370	Q107,108,119,120	
2SA970-BL-RT OR 2SA970-GR,RT	XISTOR	2SA970	Q105,106,146	
2SA970-GR,BL	XISTOR	2SA970	Q115,116	
2SB1163A-S,P	XISTOR	2SA1163	Q129,130	
2SC1815-GR-RT OR 2SC1815-Y-RT	XISTOR	2SC1815	Q302,403,404,503,506,507	
2SC1846-Q,R	XISTOR	2SC1846	Q111,112	
2SC2240-BL-RT OR 2SC2240-GR-RT	XISTOR	2SC2240	Q103,104,125,126,145	
2SC2240-GR,BL	XISTOR	2SC2240	Q113,114	
2SC2878-A,B	XISTOR	2SC2878	Q101,102	
2SC3281-R,O OR 2SD1718A-Q,S,P	XISTOR	2SC3281 2SD1718	Q121,122,131-134,139,140	
2SC3298B-O,Y	XISTOR	2SC3298	Q144	
2SC3467-E,F	XISTOR	2SC3467	Q109,110,117,118	
2SD1718A-S,P	XISTOR	2SD1718	Q127,128	
321-40005-00	XISTOR TO92 JFET SM SG 2N 5458			To Foil Side of Input Bd. MI-719 See Service Bulletin M-1.0t-6A
321-60001-00	XISTOR TO220 NPN PWR MJE15030 (or FT317B)		Q117,118	Was 2SC3467
321-60003-00	XISTOR TO220 PNP PWR MJE15031 (or FT417B)		Q119,120	Was 2SA1370
321-60008-00	XISTOR TO200 PNP PWR 2SA1370			
321-60009-00	XISTOR TO200 NPN PWR 2SC3467			


## INTEGRATED CIRCUITS

CARVER P/N	DESCRIPTION		REF DESIGNATORS	NOTES
AN78M12F	IC	7812	IC401	
AN79M12F	IC	7912	IC402	
LA6324	IC	LA6324	IC601,602	
NJM-072S-E	IC	NJM072	IC101	
NJM4558D	IC	NJM4558	IC301	
NJM4560S	IC	NJM4560	IC001,002	
TLP631	PHOTOCOUPLER		PC401	

## MISCELLANEOUS ITEMS

CARVER P/N	DESCRIPTION		REF DESIGNATORS	NOTES
104001	AIR-CORE COIL		L101,102	
105-40006-00 OR FH-032C	FUSEHOLDER AND CARRIER FUSEHOLDER AND CARRIER		FH401	
108-00102-00	INSULATOR RAG PAPER .015"			
108-00201-00	INSULATION, FIBERGLASS 1" THICK			
111-20051-00	SOLDER LUG #6			Use on Line Filter
118-90001-00 OR NO.5167	STRAIN RELIEF MCT .062 WS .15 x .28" 18/2 STRAIN RELIEF			
171825-5	MICRO PLUG		MP103	
171825-6	MICRO PLUG		MP101,102	
159-50001-00	TYRAP 3-3/8" L WHT			
315-13006-00 OR FU-621034T-S	FUSE, MDA 10 (120V Version) FUSE 10A		FU401	
315-13005-00	FUSE, MDA 5 (220V Version)			
318-50004-00 OR U12-10005-280A	THERMAL SWITCH U12-10005-280A THERMAL SWITCH U12-10005-280ATH402			
401-10171-00	WIRE 18 AWG TEW VIOLET 3.25"			Use on Line Filter
401-10541-00	WIRE 22 AWG TR-64 BLACK 3.5"			Use on Line Filter
401-10129-01	WIRE 18 AWG TEW BROWN 5"			
401-90012-00 OR ACC-022DHG7EIA	LINECORD 16/2 POLARIZED LINECORD			
402-00007-00	SLEEVING BLK UL .294 ID x 1.97" LONG			
402-00008-00	SLEEVING BLK UL .294 ID x .75" LONG			
402-00009-00	SLEEVING BLK UL .294 ID x 9.0" LONG			
402-10006-00	HEATSHRINK TUBING 3/16" OD x 3/4" L			Use on Line Filter
403-10003-00	SEALANT, SILICONE RUBBER RTV			
42A1P01A	MAIN PCB ASSY WITH RD PCB ASSY, M-1.0t (N.I.)			
4SA1P03B	INPUT PCB ASSY, M-1.0t (N.I.)			
503-40023-01 OR N21349B-2	PANEL, BACK SCREEN (NON-INVERTING) PANEL, BACK SCREEN (NON-INVERTING)			
507-00025-00	BRACKET, THERMAL SWITCH			
532-20006-00	BOX, M-1.0t			
532-30007-00	FOAM CORNER BLOCKS			
5494-03C	CONNECTOR		JP101,102	
5494-07C	CONNECTOR		JP601	
59BS4795	GROUND LUG		P002	
617-10033-01 OR NPT-2154	TRANSFORMER, M-1.0t UL TRANSFORMER, M-1.0t		T401	

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
990-20028-00	OWNER'S MANUAL M-1.0t (Non-Inverting)		
ACC-022DHG7EIA OR 401-90012-00	LINECORD LINECORD 16/2 POLARIZED		
BK4006A	HANDLE		
FH-032C OR 105-40006-00	FUSEHOLDER AND CARRIER FUSEHOLDER AND CARRIER	FH401	
FU-621034T-S OR 315-13006-00	FUSE 10A FUSE, MDA 10 (120V Version)	FU401	
MC05-485	MICRO SOCKET ASSY	MC103	
MC06-484B	MICRO SOCKET ASSY	MC101,102	
N21348-1	FRONT PANEL, M-1.0t		
N21349B	PANEL, BACK SCREENED (INVERTING)		
N21349B-2 OR 503-40023-01	PANEL, BACK SCREEN (NON-INVERTING) PANEL, BACK SCREEN (NON-INVERTING)		
N21350	TOP COVER, M-1.0t		
N21351	BOTTOM PAN, M-1.0t		
N21352	CHASSIS, FRONT BOTTOM		
N30887	LED GUIDE		
N30888	CHASSIS, CENTER RIGHT		
N30889	CHASSIS, CENTER LEFT		
N30890	CHASSIS, SUPPORT (P.T.)		
N30896-70-BK	HEAT SINK		
N30897	CHASSIS, FRONT SUB RIGHT		
N30898	CHASSIS, FRONT SUB LEFT		
N42222-2	FITTINGS (THERMAL RELAY)		
N43808-1	SPACER		
N44092-GY3	HANDLE SPACER		
N44236	LOCK PLATE		For Mono Switch
N44372-40-BK	HEAT SINK		
N44604	SIDE CAP, M-1.0t		For Front Panel
N44604A	SIDE CAP, M-1.0t		For Front Panel (New Rev.)
N44605	FITTINGS (HEAT SINK)		
N45307	BRACKET, LINE FILTER		
NO.5167 OR 118-90001-00	STRAIN RELIEF STRAIN RELIEF MCT .062 WS .15 x .28' 18/2		
NO.7102	FOOT		
NPT-2154 OR 617-10033-01	POWER TRANSFORMER, M-1.0t POWER TRANSFORMER, M-1.0t UL	T401	
RP-001	TERMINAL PIN	P003-005,TP001-004	
SM16GZ41	TRIAC	TR401	
SSB022	SLIDE SWITCH	SW001	
SW-6100150	POWER SWITCH	S401	
T5764-AA	RCA JACK 2P	RJ101	
TPM+30x08B	SCREW, TAP BIND		Use on Line Filter
TPM+30x08Y	SCREW, TAP ROUND		Use on Line Filter
TSB+40x08-B	SCREW, TOP COVER		
U12-10005-200A	THERMAL SWITCH U12-10005-200A	TH401	
U12-10005-280A OR 318-50004-00	THERMAL SWITCH U12-10005-280A THERMAL SWITCH U12-10005-280A	TH402	

CARVER P/N	DESCRIPTION	REF DESIGNATORS	NOTES
WB-3	TERMINAL PIN	P401,404,405	
WB-4	TERMINAL PIN	P402	
WB-6	TERMINAL PIN	P403	
YKD31-0316	SPEAKER SOCKET, 4P (BLK-RD-BLK-RD)	SP401	Inverting Version
YKD31-0353	SPEAKER SOCKET, 4P (RD-BLK-BLK-RD)	SP401	Non-Inverting Version
YKD31-0377	SPEAKER SOCKET, 4P (RD-BLK-BLK-RD)	SP401	Non-Inverting Version (Consumer Safe)
ZCB2206-11	NOISE FILTER		 After S/N 8500 (or 70900000)

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# SECTION 9

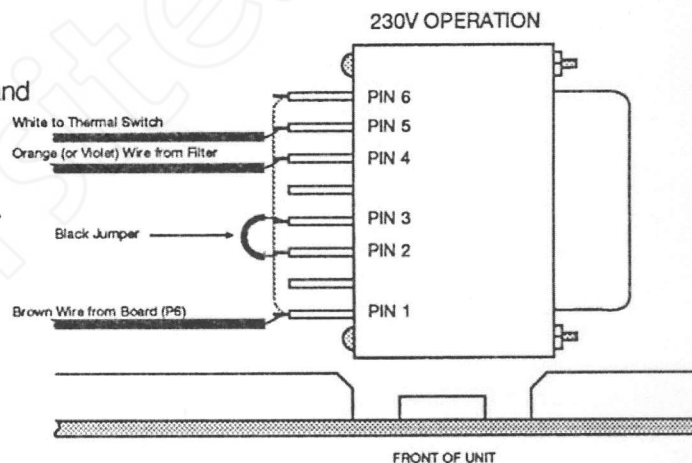
## VOLTAGE CONVERSION FOR M-1.0t

### Bill of Materials

Qty	Part Number	Description
1	315-13005-00	Fuse MDA 5A
1	315-13006-00	Fuse MDA 10A
1	530-10095-00	Label 5A SLO-BLO
1	530-10094-00	Label 230VAC/50HZ

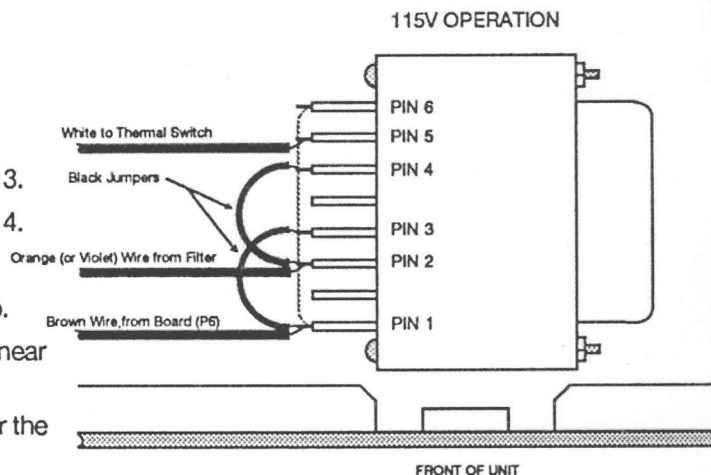
### Directions for Change (115V to 230V)

1. Remove black jumper wires from pins 1 & 3 and pins 2 & 4.
2. Remove orange wire from pin 2.
3. Add black jumper wire connecting pins 2 & 3.
4. Solder orange wire to pin 4.
5. Change fuse from 10A slo-blo to 5A slo-blo.
6. Add 230V/50Hz label to back panel near the linecord.
7. Add 5A fuse label to back panel near the fuseholder.



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

1. Remove black jumper wire from pins 2 & 3.
2. Remove orange wire from pin 4.
3. Add black jumper wire connecting pins 1 & 3.
4. Add black jumper wire connecting pins 2 & 4.
5. Solder orange wire to pin 2.
6. Change fuse from 5A slo-blo to 10A slo-blo.
7. Remove 230V/50Hz label from back panel near the linecord.
8. Remove 5A fuse label from back panel near the fuseholder.





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## **SECTION 10**

### **SERVICE BULLETINS**

Please insert Carver Service Bulletins pertaining to the M-1.0t here to ensure proper repair in the future.

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CARVER CORPORATION  
SERVICE BULLETIN

Service Bulletin # M-1.0t-2    Model M-1.0t    Serial # as needed

Reason: TO IMPROVE PRE-DRIVER RELIABILITY (Q117 - Q120).

Procedure: If the amplifier has shorted predrivers:  
Replace Q117, Q118 2SC3467 transistors with MJ15030 (or FT317) transistors.  
Replace Q119, Q120 2SA1370 transistors with MJ15031 (or FT417) transistors.  
  
Install so that the "tab" side corresponds to the "flat" side as shown on the part locator drawing.

Delete: Qty-2 321-60009-00  
          2SC3467 transistors  
  
Qty-2 321-60008-00  
          2SA1370 transistors

Add: Qty-2 321-60001-00  
          MJ15030 (or FT317) transistor  
  
Qty-2 321-60003-00  
          MJ15031 (or FT417) transistor

SERVICE APPROVAL \_\_\_\_\_  
ENGINEERING APPROVAL \_\_\_\_\_

11/18/88    DATE

# CARVER CORPORATION SERVICE BULLETIN

Service Bulletin # M-1.0t-3

Model M-1.0t

Serial # All

Reason: New Power Transformer being used.

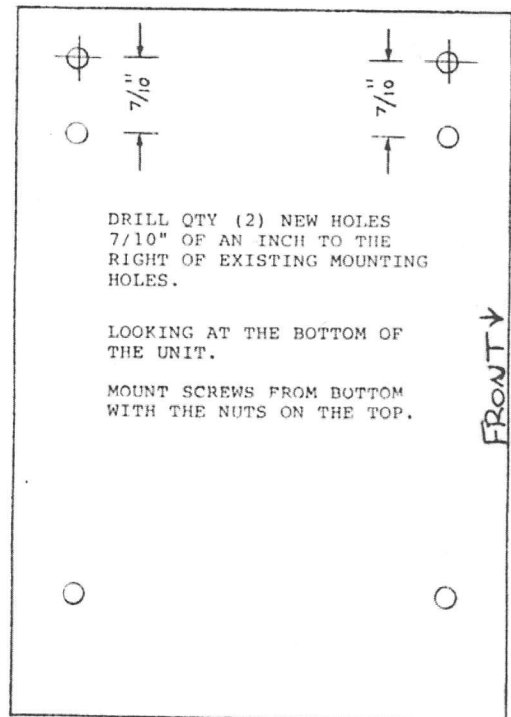
Procedure: When replacing the Power Transformer in the M-1.0t from the original type to the current type, two new mounting holes must be drilled into the bottom sub-panel.

The new Transformer is also wired differently, with the correct connections listed below by terminal number

Delete: Qty (1) NPT-2154 Transformer

Add: Qty (1) 617-10033-01 Transformer  
 Qty (4) 151-20152-00  
       10-32 X 3/8 Phillips Screw  
 Qty (4) 152-10004-00  
       10-32 Kepnut

	11	ORANGE TO P402-4
WHITE FROM } 13	10	RED TO P401-3
THERMAL SWITCH } 12	9	BROWN TO P402-2
BLACK TO TAP-2 4	8	BLACK TO P401-1
BLACK TO TAP-1 3	7	BROWN TO P402-1
ORANGE-SUPPLY 2	6	RED TO P401-2
BLACK-SUPPLY 1	5	ORANGE TO P402-3



SERVICE APPROVAL \_\_\_\_\_  
 ENGINEERING APPROVAL \_\_\_\_\_

*[Signature]*  
 4/17/89

DATE

CARVER CORPORATION  
SERVICE BULLETIN

Service Bulletin # M-1.0t-4

Model M-1.0t

Serial # 10756 to 12558

Reason: Power Transformer Primary wires have the potential to short out against the chassis due to the mounting location of the transformer

- Procedure:
1. Remove screws that hold top cover; remove cover.
  2. Check clearance between the transformer windings and the chassis. This clearance must equal or exceed .050 inches.
  3. If clearance is less than that required, remove the two left mounting screws and relocate the transformer and position to center of mounting plate.
  4. Drill two new mounting holes using the transformer mounting lugs as a guide.
  5. Check for any loose metal shavings; Mount two screws.

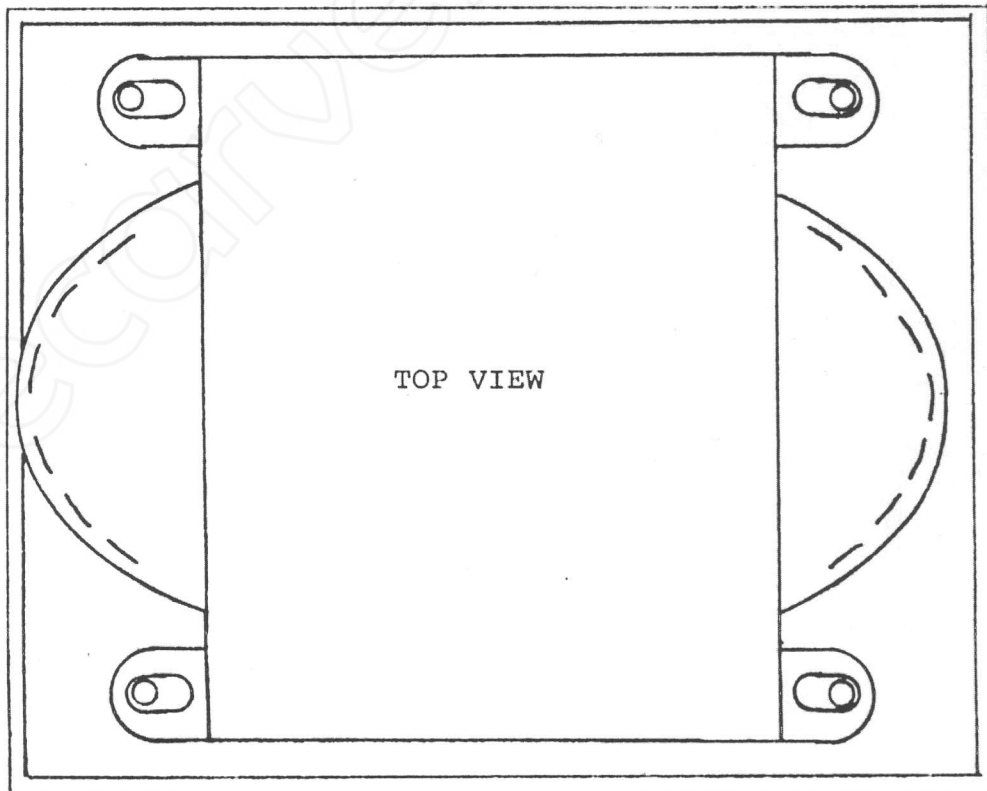
Delete: Old serial number, submit with warranty claim.  
CALL SERVICE DEPARTMENT AT 1-800-443-0547 FOR MAILING OF NEW SERIAL NUMBER LABEL.

Add: Insulating Paper 108-00102-00  
NEW SERIAL NUMBERS

REAR OF UNIT

PROBLEM AREA

INCORRECT POSITION



FRONT OF UNIT

INCORRECT POSITIONING OF TRANSFORMER

SERVICE APPROVAL

ENGINEERING APPROVAL

*Wayne Simpson* 6-2-89  
*Pat Richardson* 6-2-89

DAT

CARVER CORPORATION  
SERVICE BULLETIN

Service Bulletin # M-1.0t-4

Model M-1.0t

Serial # 10756 to 12558

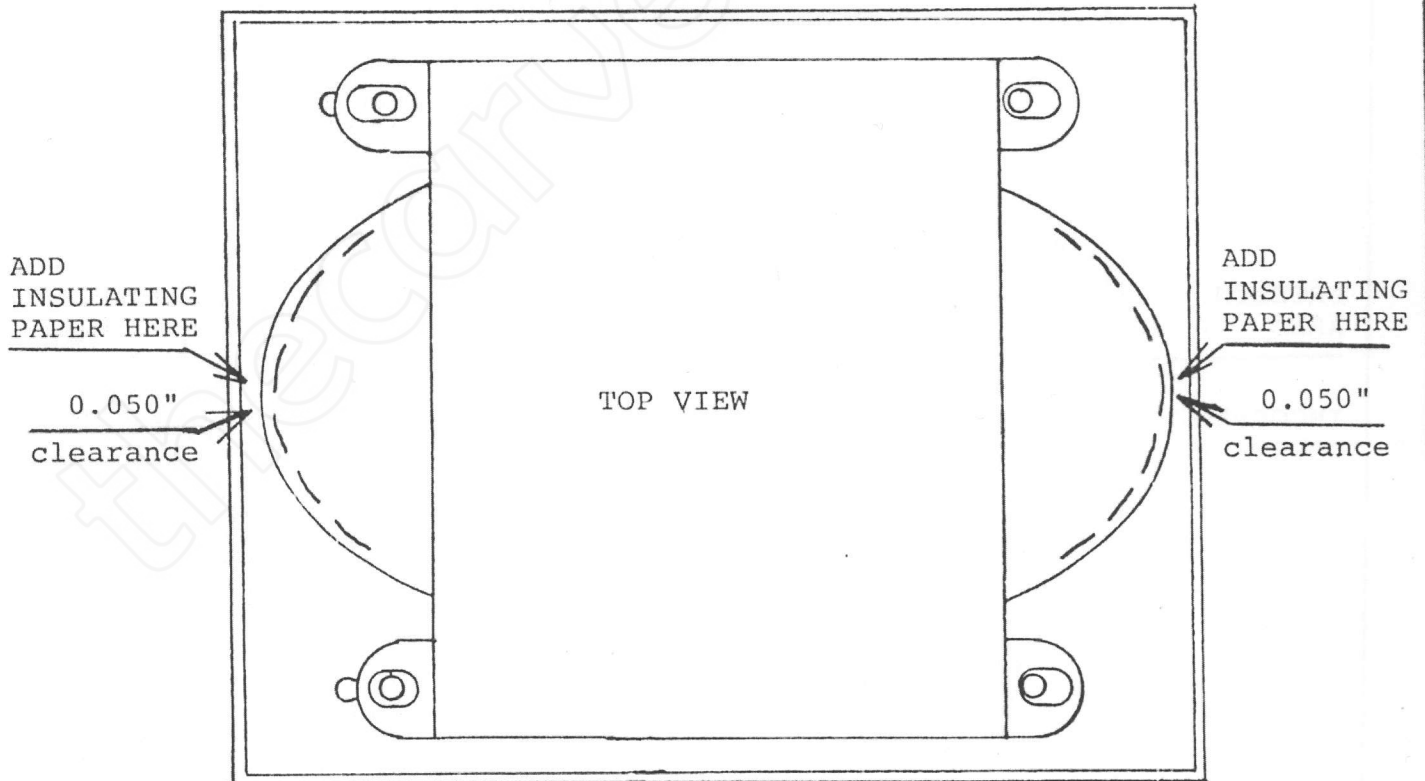
Reason: SEE PAGE ONE.

- Procedure: 6. Install (2-1/2)" x (1-1/2)" Insulating paper (108-00102-00) with a 90 degree bend 3/4" from the end of the (2-1/2)" dimension in the left bottom corner of the Transformer mounting pan. The paper is secured on the bottom side with a SMALL amount of RTV (epoxy). This paper is to be used on BOTH SIDES if the clearance on the right side of the transformer is less than .050 inches. SEE BELOW
7. Hi-Pot all units at 1250v.
8. Function test any units that have had new mounting holes.

Delete:

Add:

REAR OF UNIT



FRONT OF UNIT

CORRECT POSITION OF TRANSFORMER

SERVICE APPROVAL

ENGINEERING APPROVAL

*Wayne R. Smith* 6-2-89  
*Thos. Richardson* 6-3-89

DATE

CARVER CORPORATION  
SERVICE BULLETIN

Service Bulletin # M-1.0t-4

Model M-1.0t

Serial # 10756 to 12558

Reason: Power Transformer Primary wires have the potential to short out against the chassis due to the mounting location of the transformer

- Procedure:
1. Remove screws that hold top cover; remove cover.
  2. Check clearance between the transformer windings and the chassis. This clearance must equal or exceed .050 inches.
  3. If clearance is less than that required, remove the two left mounting screws and relocate the transformer and position to center of mounting plate.
  4. Drill two new mounting holes using the transformer mounting lugs as a guide.
  5. Check for any loose metal shavings; Mount two screws.

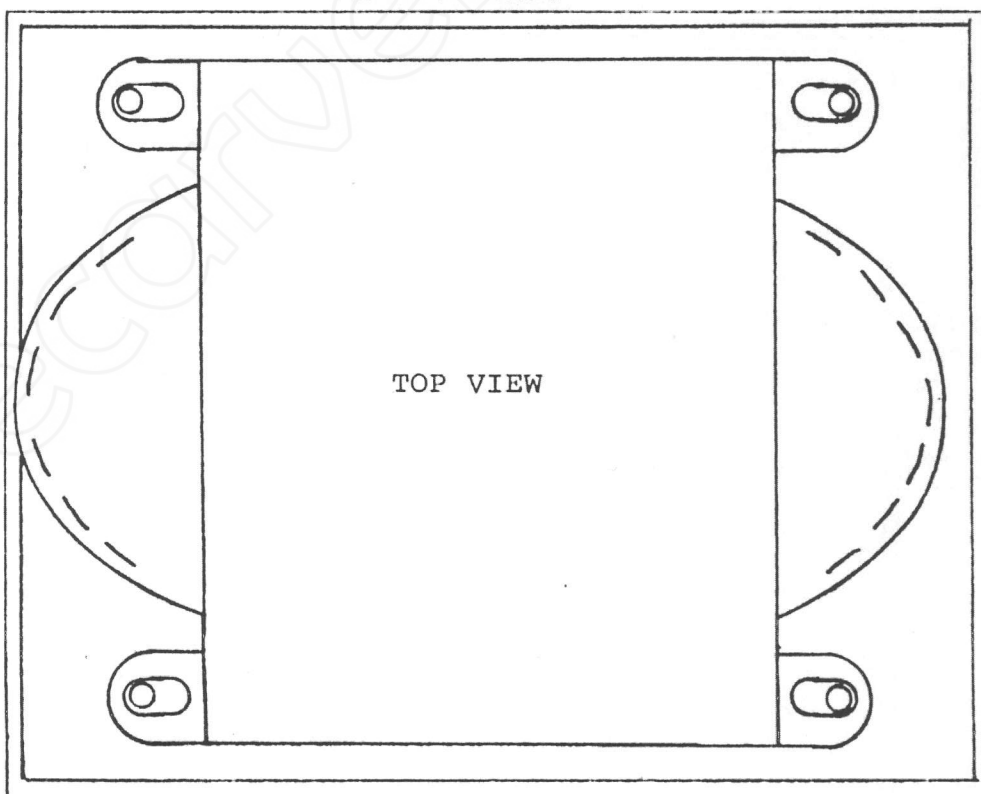
Delete: Old serial number, submit with warranty claim.  
CALL SERVICE DEPARTMENT AT 1-800-443-0547 FOR MAILING OF NEW SERIAL NUMBER LABEL.

Add: Insulating Paper 108-00102-00  
NEW SERIAL NUMBERS

REAR OF UNIT

PROBLEM AREA

INCORRECT POSITION



FRONT OF UNIT

INCORRECT POSITIONING OF TRANSFORMER

SERVICE APPROVAL

ENGINEERING APPROVAL

*Wayne Ruppert* 6-2-89  
*2nd Richardson* 6-3-89

DATI

**CARVER CORPORATION  
SERVICE BULLETIN**

Service Bulletin # M-1.0t-6A	Model M-1.0t	Ser.# As Needed
Problem: Turn on / turn off thump.		Date 11/01/89

Note: Units after S/N 4482 or 70100000 have a stereo/mono switch on the rear panel (non-inverting version).

**PROCEDURE**

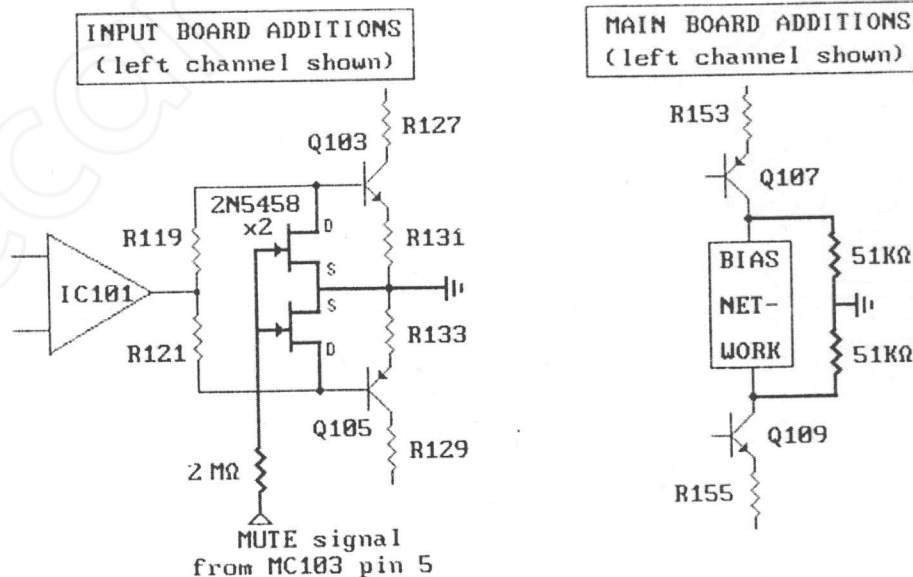
**Note:** Turn-off thump in excess of 2 volts p-p may indicate unbalanced  $\pm 12V$  supplies, leaky input op amp IC101, or shorted commutator transistor. Check these components before proceeding.

1. Remove input board and install FET's and 2 M $\Omega$  resistors as indicated in Fig. 2 and 3. All components must be installed on the foil side of the board. Re-install board.
2. Install 51 K $\Omega$  resistors on the foil side of the main board as indicated in Fig. 4 and 5.
3. Power up amplifier and test performance. Turn-off thumps should be less than 200 mV into 8 $\Omega$  dummy loads. May be monitored on DC coupled scope set to slowest sweep setting.

Delete:

Add:

Qty. 4	321-40005-00	(2N5458 FET)
Qty. 4	251-00111-00	(51K $\Omega$ $\frac{1}{4}$ watt)
Qty. 2	251-00149-00	(2M $\Omega$ $\frac{1}{4}$ watt)



All added parts shown in bold.

Fig. 1.

Engineering Approval *Wayne Stewart* 11/9/89

Service Approval *Wayne Stewart* 11/9/89 Page 1 of 3



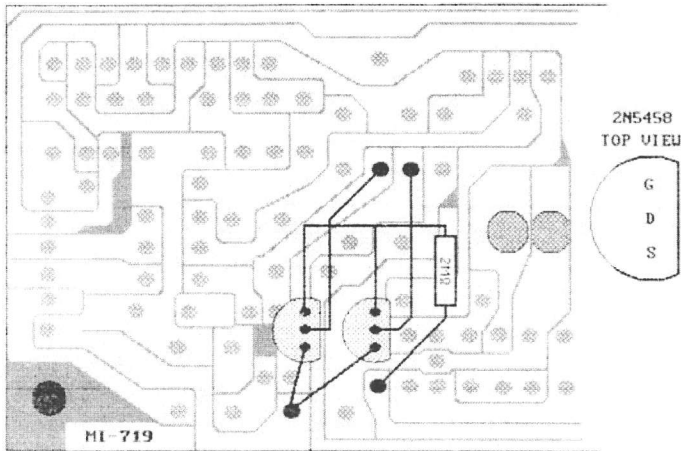


Fig. 2. Input board left side

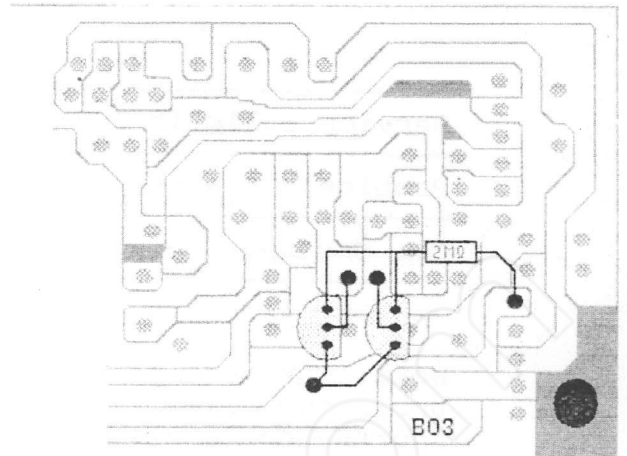


Fig. 3. Input board right side

### Non-Inverting Version (Stereo/Mono switch on rear panel)

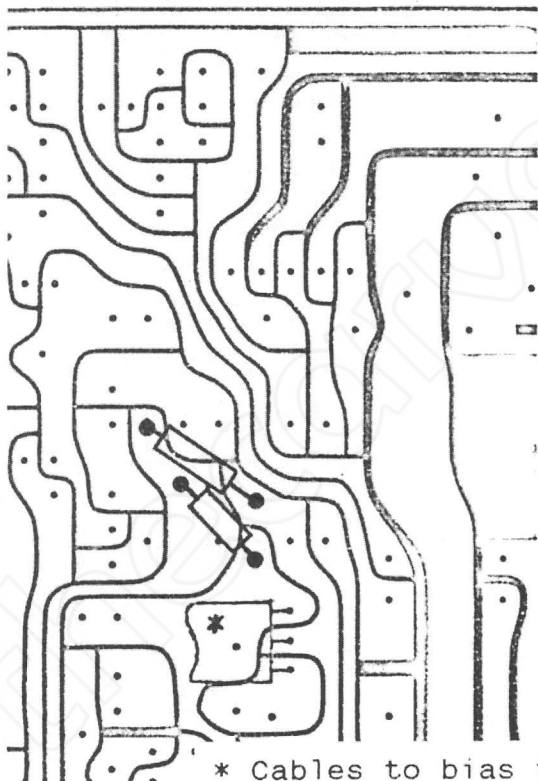


Fig. 4  
Main board R. channel  
Bottom view

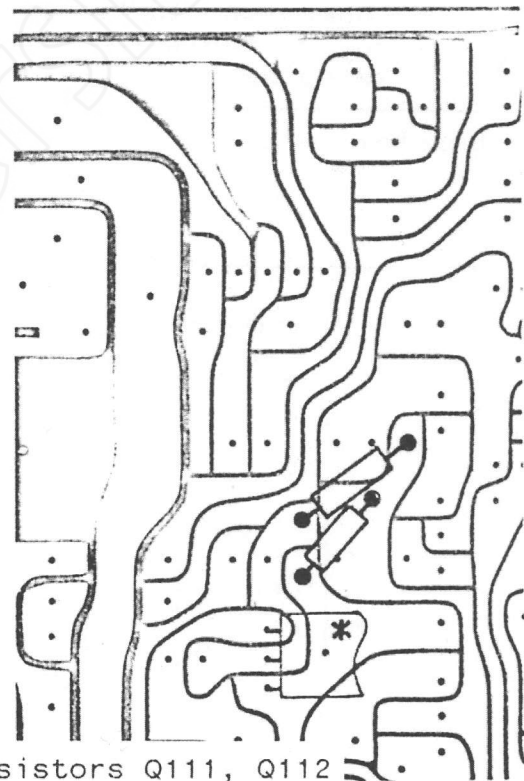
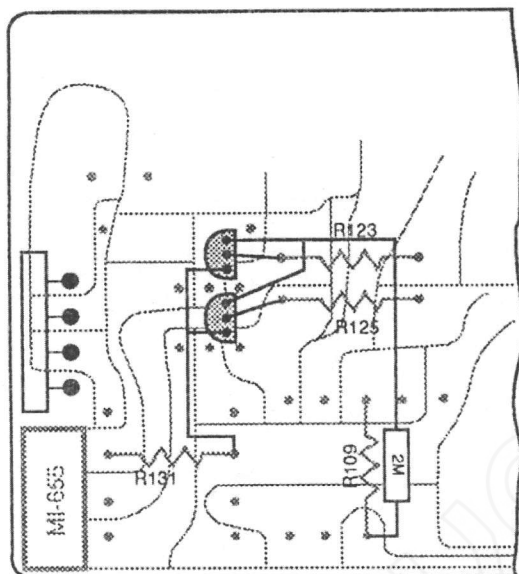


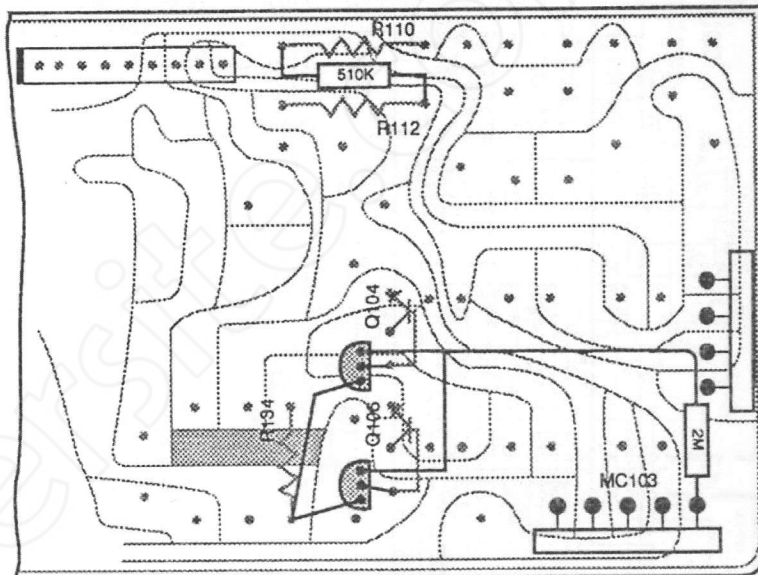
Fig. 5  
Main board L. channel  
Bottom view

\* Cables to bias transistors Q111, Q112

Turn on/Turn off thump modification for M-1.0t Inverting Version (no Stereo/Mono switch on rear panel)

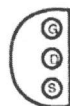


Input board left side



Input board right side

2N5458  
TOP VIEW



1. In addition to the procedure described on page 1, install a 510K ohm 1/4W resistor between R110 and R112 as shown above.





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