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Brand:	**Maestro**
Model	**G-2 Rhythm 'N Sound For Guitar**
Product:	**Preamp**
Description:	**Service Manual**

Musicparts Document Number: 43694 TechTips: No Pages: 15 Dated: None

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Welcome to MusicParts.Com, Inc. your online resource for technical documents and service information. This PDF package may contain information, schematics, parts lists, images, engineering changes, previous versions, circuit descriptions, and many other unique features about the product you have chosen. This document was assembled from a variety of sources and is the result of our many years in the music repair business.

TECHTIPS: Unique to Musicparts documents are **TECHTIPS** located in critical areas on the schematics. They contain useful information about that area of the schematic such as common problems that we have found and recommended changes. Not all documents will have TechTips.

NOTE: Large original over-sized drawings will need to be taped together. We feel this is better than reducing them and losing fine details.

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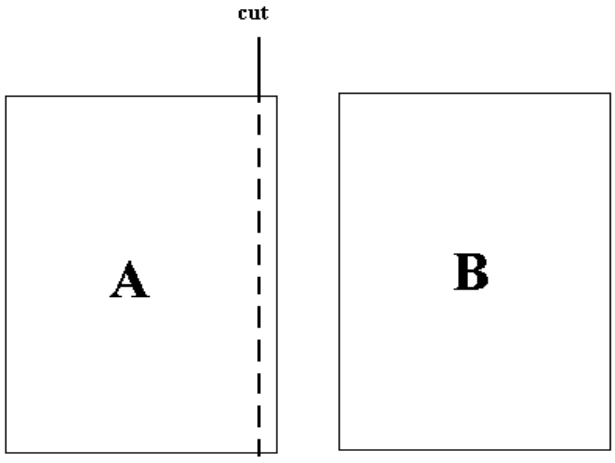
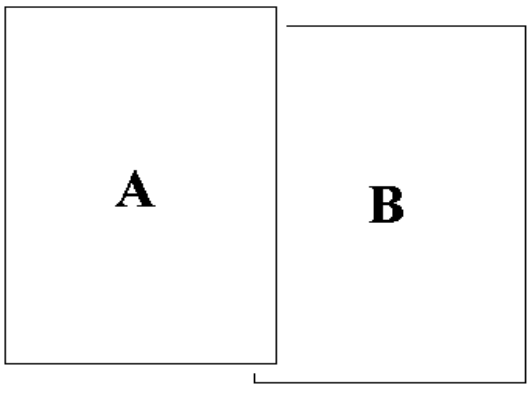
Two Sheet Pasteup Guide

11x17" paper size



It's ok to slightly cut into the black print, as documents contain an intentional extended overlaping printed area.



Only one trim cut is needed, then overlay as shown and tape.

MAESTRO RHYTHM 'N SOUND FOR GUITAR

G-2 SERVICE MANUAL

MAESTRO RHYTHM 'N SOUND FOR GUITAR G-2 SERVICE MANUAL

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SPECIFICATIONS

MAESTRO RHYTHM 'N SOUND FOR GUITAR—MODEL G-2 — A completely transistorized sound modification device designed to be used with a guitar and an amplifier. Dimensions: 4" high x 13¾" wide x 8" deep. Weight: 7¾ lbs. Power Consumption: 3 watts. Fuse: .5 Amp. Slo-Blo.

STANDARD EQUIPMENT INCLUDES: Deluxe Carrying Case • Amplifier Connecting Cable • Footswitch with Cable.

Natural Amplification (Gold Tab).

Color Tones (White Tabs)—Color Tone 1 • Color Tone 2.

Bass Voice (Blue Tab)—String Bass.

Special Effects (Gold Tab)—Fuzz Tone.
(Black Tabs)—Wow Wow • Echo Repeat.

Percussion Voices (Red Tabs)—Bongo • Brush • Tambourine • Clave.

Controls—On/Off Pilot Light • Cancel Bar (Affects all tabs) • Volume (For red Percussion tabs) • Volume (For blue String Bass tab) • Volume and Tone (For gold Natural Amp and Fuzz Tone tabs) • Wow Wow and Echo Repeat Speed (For Wow Wow and Echo Repeat tabs respectively) • Sensitivity (For Percussion and String Bass tabs).

Input Jack—One for Guitar.

Output Jack—One for Amplifier.

Footswitch Jack—For Percussion and Bass Cancel.

Accessories (Available from your Maestro dealer at additional cost). Adjustable chromed stand, carrying bag.

CIRCUIT DESCRIPTION

(Refer to Drawing No. 1)

Q1 INPUT PREAMP NO. 1

Amplifies all input signals from the guitar except those sent to Fuzz Preamp #1 Q18. The No. 1 Input Preamp's output is directly connected to the Input Preamp No. 2 Q2 and through the Natural Amp tabswitch to the Percussion Modulator Q22. In addition, when the Echo Repeat, Wow Wow and Color Tones 1 or 2 tabswitches are off, the output signal from Preamp #1 connects to the Output Preamp Q29.

Q2 INPUT PREAMP NO. 2

Provides a second stage of amplification for the previously amplified guitar signal from Preamp No. 1. This output signal is applied to the Pick Detector Preamp Q3, provided one or more of the following tabswitches are in the on position: Wow Wow, Echo Repeat, Brush, Clave, Tambourine, Bongo and String Bass. When the String Bass tabswitch is in the on position, the signal from Input Preamp No. 2 Q2 is also connected to the Squaring Preamp Q8.

Q3 PICK DETECTOR PREAMP

This circuit provides further amplification of the previously amplified guitar signal from Input Preamp No. 2 Q2 through the Sensitivity Control VR1. By properly adjusting the Sensitivity Control, this circuit amplifies only the strong guitar signal which is produced when a string is initially "picked." The output signal from this preamp is connected to the Pick Detector Q4.

Q4 PICK DETECTOR

The signal from the Pick Detector Preamp Q3 is converted (rectified) to a positive voltage pulse suitable for triggering the one Shot Multivibrator Q5-Q6. Since the positive voltage pulse is capacitively coupled, only rapid voltage changes will be sensed by the One Shot Multivibrator.

Q5-Q6 ONE SHOT MULTIVIBRATOR

When triggered by a positive pulse from the Pick Detector Q4, this circuit momentarily grounds the capacitor connected to the base of the Pulse Former Q7 and, when the Wow Wow tabswitch is on, the base of the Wow Wow Shaper Amp Q25 through Diode D8.

Q7 PULSE FORMER

A strong positive voltage pulse is produced at this transistor's collector when its base is grounded through a capacitor by the One Shot Multivibrator Q5-Q6. The voltage pulse from the Pulse Former is used to key circuits listed below providing their respective tabswitches are in the on position:

Noise Amp Q15 (Brush)
Noise Gate Q16 (Brush)
Tambourine & Clave Generator
Bongo Generator Q17 (Bongo)

In addition to the above circuits, the pulse from the Pulse Former is used to key through Diode D4, Diodes D5 and D6 which are in series with the output from Divider Q12-Q13. Also, the Pulse Former output pulse is used to trigger (through Diode D11) the Echo Repeat Multivibrator Q23-Q24, causing it to restart with the pick of the guitar string.

Q8 SQUARING PREAMP

Amplified guitar signal from Input Preamp No. 2 Q2 is R-C filtered to produce a square waveform signal, and then amplified by this preamp. The output of the Squaring Preamp is connected to the Squaring Driver Q9.

Q9 SQUARING DRIVER

Filtered and amplified guitar signal from the Squaring Preamp Q8 is further amplified and clipped (Diode D3) to provide square waveform drive signal for the Squarer Q10-Q11.

Q10-11 SQUARER

Amplified and clipped guitar signal from the Squaring Driver Q9 is converted to a square-edged waveform signal. This square-edged signal is used to drive the Divider Q12-Q13.

Q12-13 DIVIDER

The square-edged signal from the squarer Q10-Q11 is divided down to a square waveform signal of half the input frequency. Example: A 440 Hertz squared signal becomes a 220 Hertz square waveform signal. The output signal from the Divider is connected to a diode keying circuit (Diodes D5 & D6) which is keyed by the positive voltage pulse from the Pulse Former Q7 through Diode D4. The output of the Divider circuit then connects to the String Bass tabswitch, String Bass Volume Control VR6 and on to the Output Preamp Q29.

Q14 NOISE GENERATOR

A constant B+ voltage applied to the emitter of this transistor causes the internal base emitter junction to Zener breakdown, thus producing a constant random noise signal. The output of the Noise Generator is connected to the Noise Amp. Q15.

Q15 NOISE AMP

When not keyed, this circuit acts as a blocking circuit between the Noise Generator Q14 and the Noise Gate Circuit Q16. Two things happen to the Noise Amp circuit when it is keyed by a positive voltage pulse from the Pulse Former Q7 through Diode D7:

1. It amplifies the noise signal from the Noise Generator Q14. (A positive voltage applied to the base of the Noise Amp. biases it "on.")
2. The amplified noise signal is allowed to pass to the Noise Gate Q16.

Q16 NOISE GATE

Noise signal from the Noise Amp Q15 is amplified and voiced when the Noise Gate is momentarily biased on by a positive voltage pulse from the Pulse Former Q7. Output signal from the Noise Gate is connected to the Brush tabswitch and Tambourine circuit L2.

Q17 BONGO GENERATOR

A low frequency oscillator that produces a short duration audio signal of diminishing amplitude when excited by a positive voltage pulse from the Pulse Former Q7. The output of the Bongo Generator is connected through the Bongo tabswitch and Percussion Volume Control VR7 to the Output Preamp Q29.

L2 CLAVE & TAMBOURINE GENERATOR

A positive voltage pulse from the Pulse Former Q7 excites the Clave Generator (mainly coil L2 and capacitors) into momentary oscillation. The Clave Generator output signal is connected to the Clave tabswitch. When the Tambourine tabswitch is on, the Clave circuit is combined with Brush signal to produce the Tambourine signal.

Q18, Q19 & Q20 FUZZ PREAMPS NO.'s 1, 2 & 3

These three preamps amplify and clip the input signal from the guitar. The output signal is obtained from the third Fuzz Preamp. (The output is like the original input waveform except the waveform peaks are clipped.) The output from Fuzz Preamp No. 3 connects through the Fuzz Tone tabswitch to the Percussion Modulator Q22, or through the Echo Repeat tabswitch to the Wow Wow Preamp Q27 and Output Preamp Q29 when the Wow Wow and Color Tone tabswitches are off.

Q21 PERCUSSION DRIVER

Positive voltage pulses from the Echo Repeat Multivibrator Q23-Q24 are converted into highly linear momentary drain to source resistance changes. These resistance changes effectively ground the emitter element of the Percussion Modulator Q22.

Q22 PERCUSSION MODULATOR

Audio signal from Input Preamp No. 1 Q1 and/or Fuzz Preamp No. 3 Q20 is applied to the base of this transistor. When the transistor's emitter element is momentarily grounded by the Percussion Driver Q21, a short pulse of audio signal is allowed to pass. This audio pulse is applied through the Echo Repeat tabswitch to the Wow Wow Preamp Q27 and to the Output Preamp Q29 when the Wow Wow and Color Tone tabswitches are off.

Q23-Q24 ECHO REPEAT MULTIVIBRATOR

This multivibrator runs continuously except when restarted by a pulse from the Pulse Former Q7 through Diode 11. The multivibrator runs at the speed set by the Repeat Speed Control VR4. As this circuit runs it produces strong positive voltage output pulses that are connected through Diode D10 to the Percussion Driver Q21.

Q25 WOW WOW SHAPER AMP

When the base element of this transistor is momentarily grounded through Diode D8 by the One Shot Multivibrator Q5-Q6, a positive voltage pulse is developed at the collector. This output pulse is connected directly to the Wow Wow Driver Q26.

Q26 WOW WOW DRIVER

A positive voltage pulse from the Wow Wow Shaper Amp Q25 causes this transistor to conduct heavily, thus lighting the P-1 Photocell bulb. When the bulb lights, the resistance of the photocell lowers, changing the tuning of the Wow Wow circuits Q27 and Q28.

Q27 WOW WOW PREAMP
Q28 WOW WOW EMITTER FOLLOWER

Audio signal from Input Preamp #1 Q1, Fuzz Preamp #3 Q20 or Percussion Modulator Q22 is applied to this preamp. The Wow Wow Preamp is a variable tuned circuit that amplifies only the audio signal near the frequency to which it is tuned. This frequency range is approximately 300 to 1700 cycles. The Wow Wow Photocell P1, together with the Emitter Follower Q28, determines the frequency to which the Wow Wow Preamp is tuned by electrically changing the effective value of the .01 capacitor attached to the emitter of this transistor.

Q29 OUTPUT PREAMP
Q30 OUTPUT EMITTER FOLLOWER

All Percussion, Bass, Natural Amp, Fuzztone, Wow Wow and Color Tone signals are combined and amplified by these two circuits. The output signal from the Emitter Follower Q30 connects to the Output Jack and on to a suitable power amplifier.

Q31 REGULATOR

This transistor works in conjunction with Zener Diode Z1 to regulate and filter the D.C. voltage produced by Power Transformer T1, Diodes D1 and D2 plus several resistors and filter capacitors.

ADJUSTMENTS

VR3 BONGO ADJUSTMENT

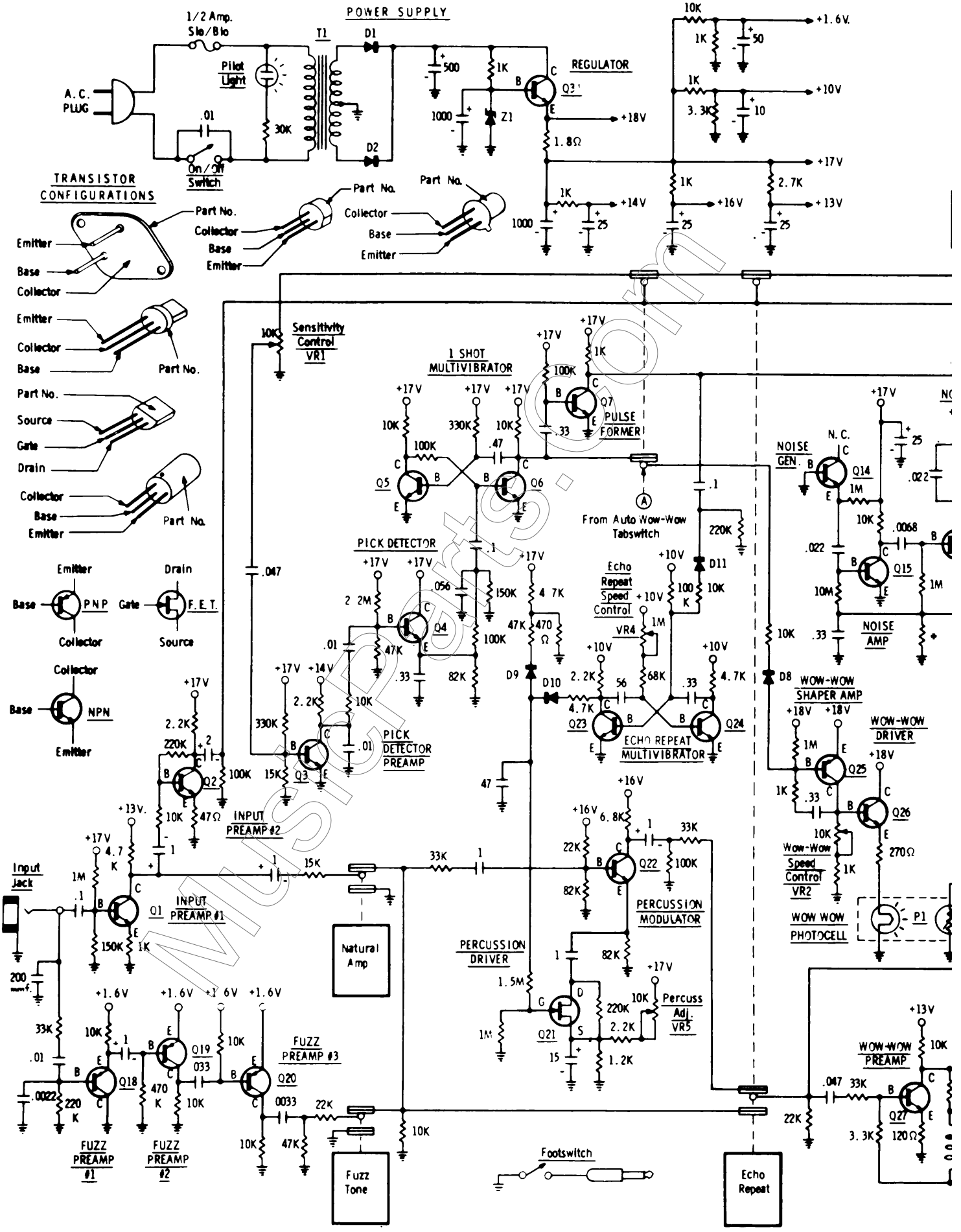
The Bongo adjustment affects the length of the Bongo tone. Adjusting the Bongo length is similar to adjusting the head of an actual Bongo drum. Repeatedly key the Bongo while turning the Bongo adjustment with a small regular screw driver. Too little Bongo length will cause the Bongo to sound dead, too much and the Bongo will sound continuously.

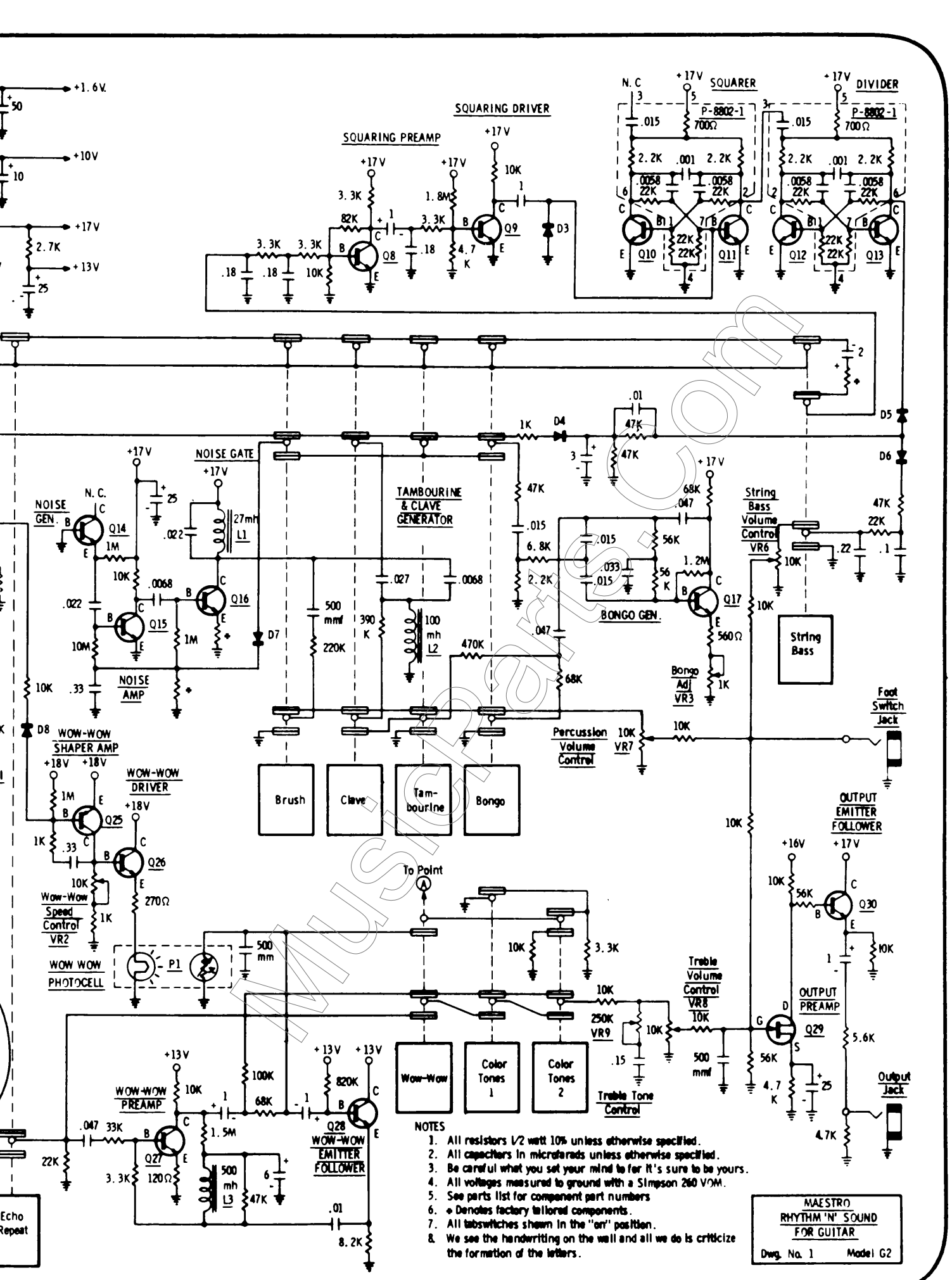
VR5 PERCUSSION ADJUSTMENT

This adjustment affects the length of the percussion repeat sound. Adjustment of the percussion length should be long enough so that it is not choppy and short, enough so that the bursts of sound do not run together.

IMPORTANT

Percussion will not function if adjustment is extreme.





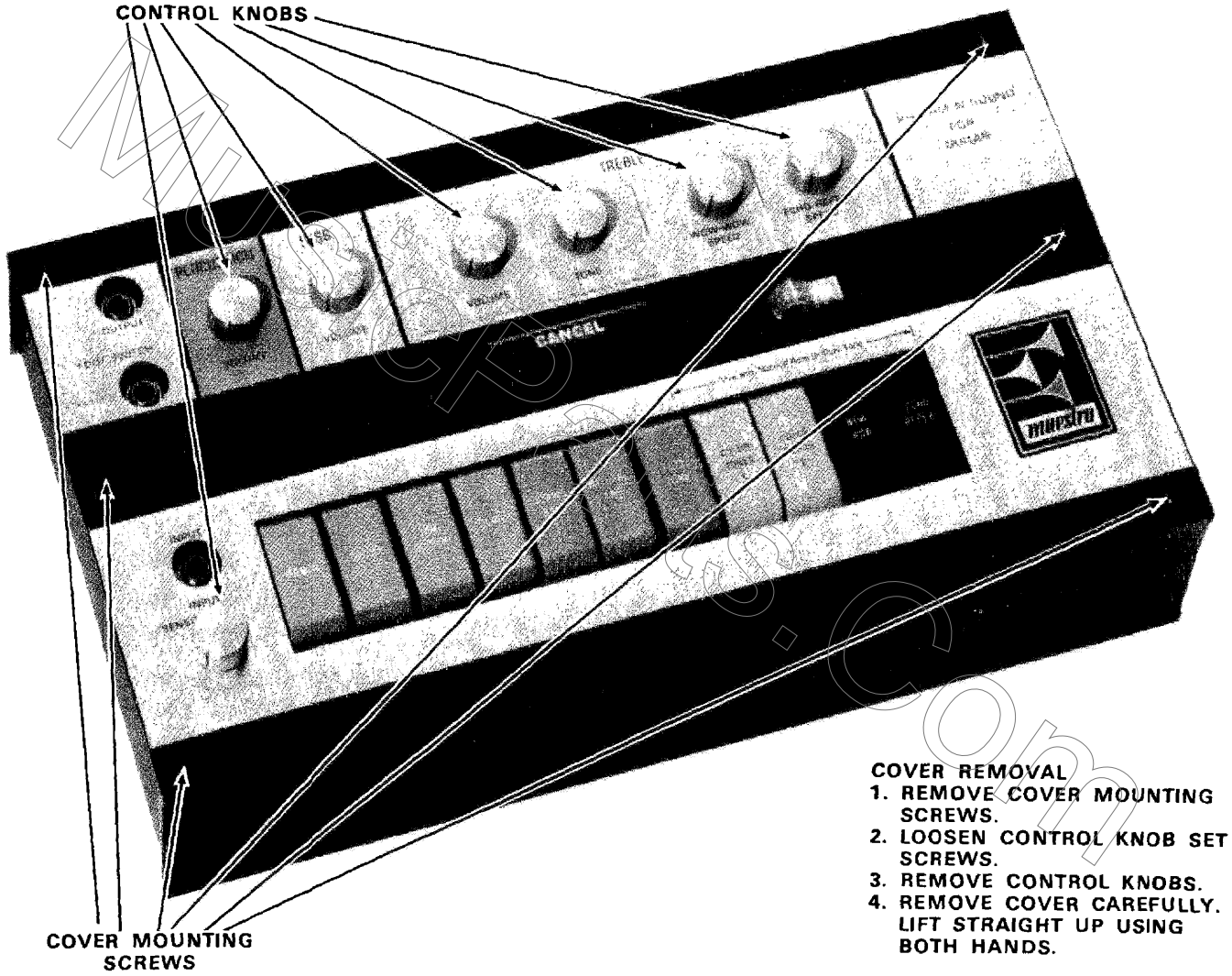
NOTES

1. All resistors 1/2 watt 10% unless otherwise specified.
2. All capacitors in microfarads unless otherwise specified.
3. Be careful what you set your mind to for it's sure to be yours.
4. All voltages measured to ground with a Simpson 260 VOM.
5. See parts list for component part numbers
6. ⊕ Denotes factory tailored components.
7. All tabswitches shown in the "on" position.
8. We see the handwriting on the wall and all we do is criticize the formation of the letters.

MAESTRO
RHYTHM 'N' SOUND
FOR GUITAR

Dwg. No. 1 Model G2

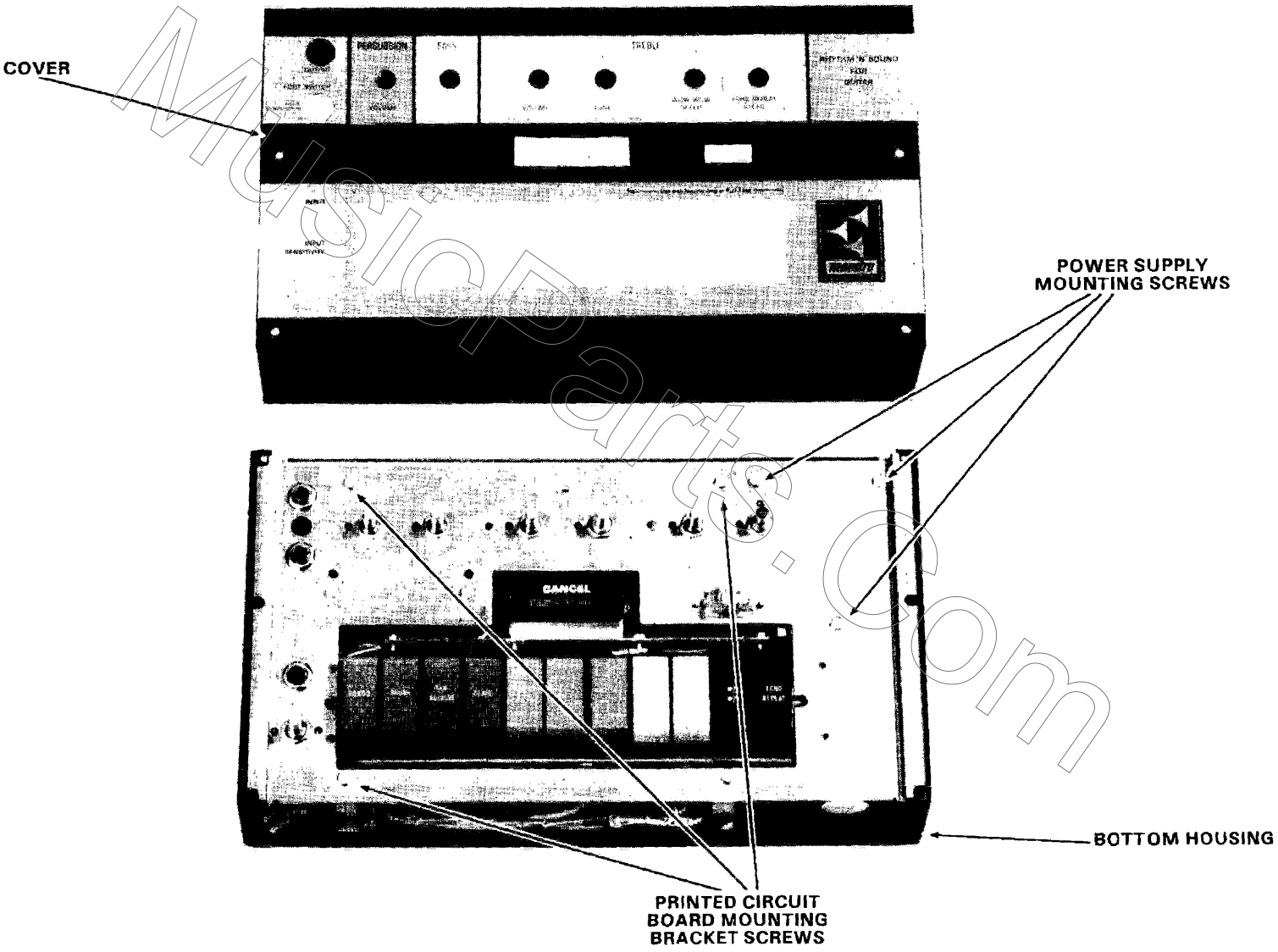
COMPLETE UNIT



COVER REMOVAL
1. REMOVE COVER MOUNTING SCREWS.
2. LOOSEN CONTROL KNOB SET SCREWS.
3. REMOVE CONTROL KNOBS.
4. REMOVE COVER CAREFULLY. LIFT STRAIGHT UP USING BOTH HANDS.

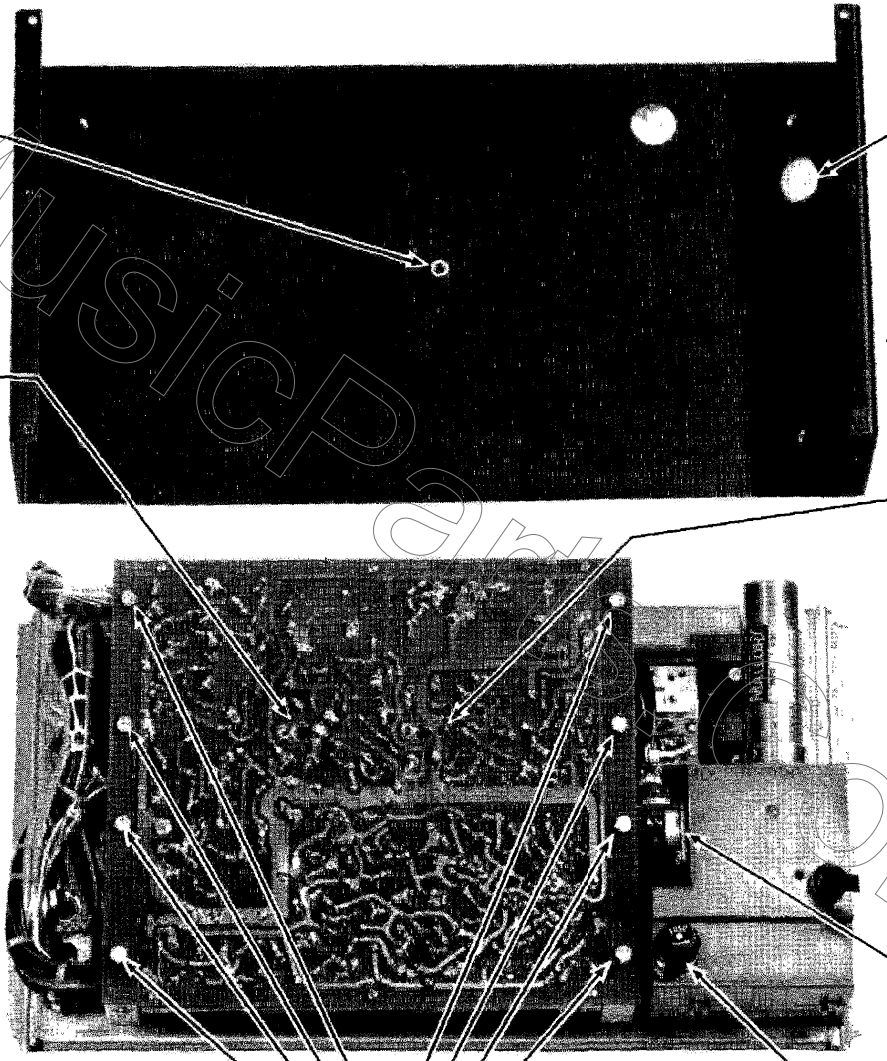
MAIN ASSEMBLY

(Top View Cover Removed)



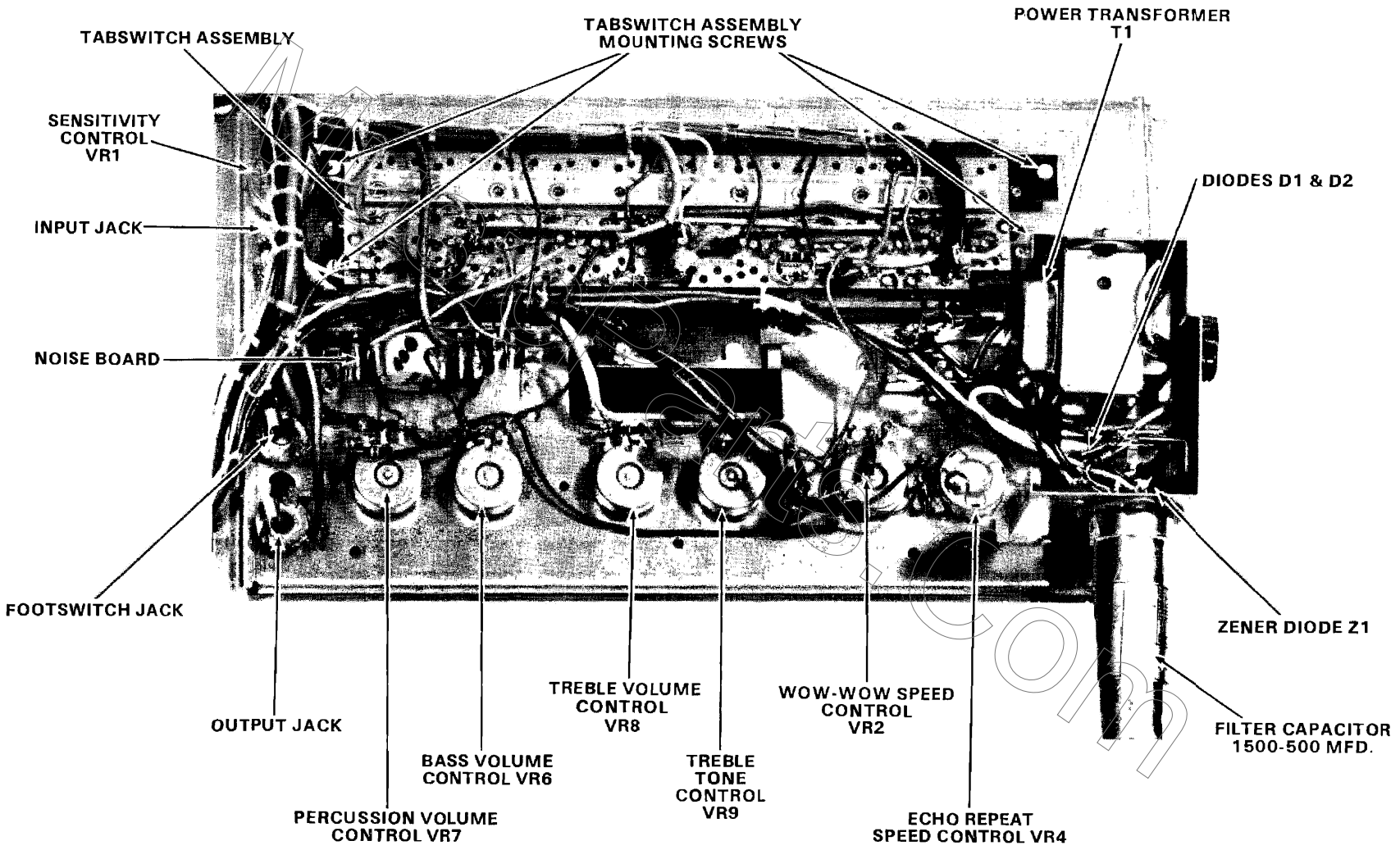
MAIN ASSEMBLY

(Bottom View With Bottom Housing Removed)

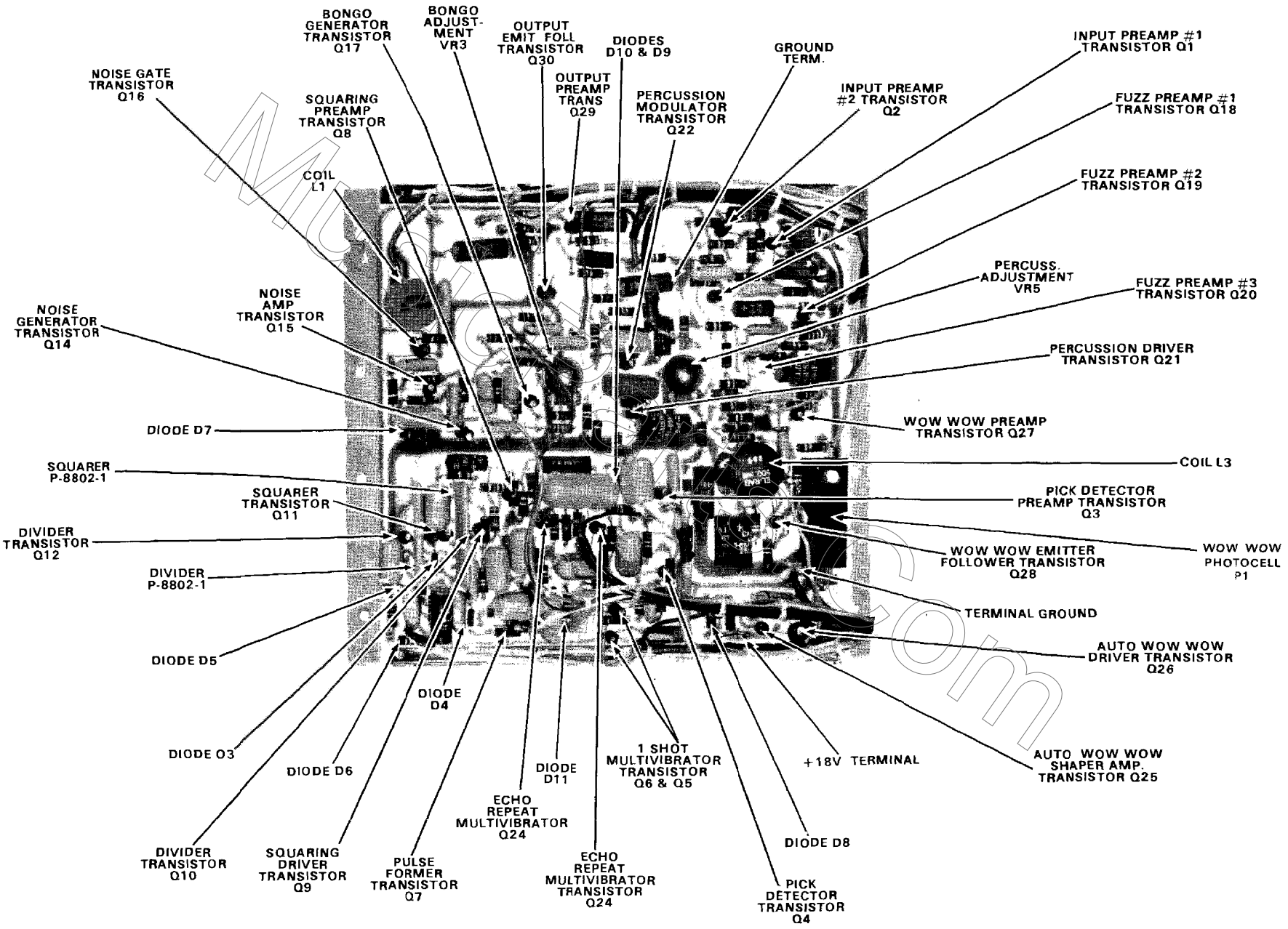


Note: To remove the main assembly from the bottom housing, the A.C. cord & plug must be drawn back through the hole in the bottom housing.

MAIN ASSEMBLY
(Disassembled)



TONE PROCESSOR BOARD



WARRANTY SERVICE

The Maestro Rhythm 'N Sound for Guitar is warranted for one year from date of sale to the original owner. Should the Maestro require factory repair, write to the following for authorization to return the unit for service:

MAESTRO, Service Manager
7373 N. Cicero Ave.
Lincolnwood, Illinois 60646

There is no charge for service during the warranty period, providing the service required is not a result of unauthorized tampering, abuse, or damage . . . and provided examination, in our judgment, disclosed some defect. The repaired Maestro will be returned freight collect, insured.

IMPORTANT

WRITTEN AUTHORIZATION MUST ACCOMPANY UNIT RETURNED FOR SERVICE

PARTS INFORMATION

STANDARD PARTS

Replacements for all standard electronic parts and hardware may be purchased directly from local suppliers generally in less time than would be required to obtain them from the factory.

SPECIAL PARTS

In addition to the standard replacement parts, special electronic and mechanical parts are also used. These parts are manufactured by and to the specifications of the factory. Order these parts directly from the factory since they would be difficult or impossible to obtain from other sources.

PARTS ORDERING INFORMATION

When ordering parts be sure to include the following information:

1. Model and Serial Number
2. Part Number
3. A description of the part
4. Specify how you want the part shipped.

Most special electronic parts and mechanical parts will have a part number stamped on them. In the event that the part number is missing, or you are unable to read the part number, a complete description of the part and where it is used will allow the factory to fill your parts order. When parts are ordered in the proper manner the factory is able to fill your orders promptly—delays that might result are avoided.

ADDRESS PARTS ORDERS TO:

C.M.I. SERVICE DEPT.
7373 No. Cicero Ave.
Chicago, Illinois 60646

IMPORTANT

IN ANY CORRESPONDENCE CONCERNING THIS INSTRUMENT ALWAYS INCLUDE MODEL AND SERIAL NUMBERS

PARTS LIST

Part	Description	Schematic Reference	Part Number
ACCESSORY			
Assembly	Footswitch		935-011515-1
Cable	Output		989-010093
Case	Carrying		978-010085
CABINET ASSEMBLY			
Feet	Rubber		916-010084
Jack	Phone (Input, Output & Footswitch)		910-004802
Knob	Control		915-010086
Potentiometer	Volume (Perc., Bass, Treble)	VR6-8	925-010076
Potentiometer	Sensitivity, Wow Wow Speed	VR1, 2	925-010076-1
Potentiometer	Tone	VR9	925-010076-3
Potentiometer	Repeat Speed	VR4	925-010076-4
Screw	Rubber Feet		816-040032-8
Switch	On/Off with Pilot Light		960-010075
NOISE BOARD			
Assembly	Noise Board		996-012648
Coil	Toroid 100MH	L2	952-010092-5
POWER SUPPLY			
Capacitor	Electrolytic 1000-1000 UF 25V, 50 UF 35V		945-012642
Cord	Power		989-008717-4
Diode	Zener	Z1	919-003309
Diode	Rectifier	D1, 2	919-010623
Fuse	.5 Amp. Slo-Blo		939-013304-8
Holder	Fuse		906-006303
Insulator	Transistor		908-002346
Socket	Transistor		906-012341
Transformer	Power	T1	954-012643
Transistor	Power	Q31	992-003139
TABSWITCH ASSEMBLY			
Capacitor	Electrolytic 2 UF 20V NP		945-008895-32
Contact	Spring		917-005166-1
Guide	Slider		976-005170
Pusher	3 Contact		964-001903
Pusher Short	2 Contact		964-001906
Pusher			964-002357
Spring	Toggle		975-002338-1
Tab	Natural Amp.		915-010072-3
Tab	Bongo		915-010072-19
Tab	Clave		915-010072-21
Tab	Spring Bass		915-010072-23
Tab	Brush		915-010072-25
Tab	Tambourine		915-010072-26
Tab	Fuzz Tone		915-010072-27
Tab	Color Tones 1		915-010072-28
Tab	Color Tones 2		915-010072-29
Tab	Wow Wow		915-010072-30
Tab	Echo Repeat		915-010072-31

PARTS LIST

TONE PROCESSOR BOARD

Part	Description	Schematic Reference	Part Number
Assembly	Tone Processor Board		996-012739
Capacitor	Electrolytic 1 UF 20V		945-008895-11
Capacitor	Electrolytic 2 UF 20V		945-008895-32
Capacitor	Electrolytic 3 UF 50V		945-008895-6
Capacitor	Electrolytic 6 UF 20V		945-008895-7
Capacitor	Electrolytic 10 UF 20V		945-008895-9
Capacitor	Electrolytic 15 UF 20V		945-008895-10
Capacitor	Electrolytic 25 UF 25V		945-008895-8
Capacitor	Electrolytic 50 UF 20V		945-008895-12
Coil	27 MH	L1	952-003308
Coil	Toroid 500 MH	L3	952-010092-2
Diode	Keying	D3-11	919-004799
Lamp	GE 1450		939-011582
Network	Divider/Shaper		949-008802-1
Photocell	Wow Wow	P1	948-011583
Potentiometer	1K (Bongo)	VR3	925-003306-1
Potentiometer	100K (Percuss.)	VR5	925-003306-2
Resistor	2200 Ohm		851-252222
Transistor		Q1-13, 15-17, 22-24, 27, 28, 30	991-002298
Transistor	Noise	Q14	991-003304
Transistor	Preamp	Q18, 19	991-010098
Transistor	Driver, Output (F.E.T.)	Q21, 29	991-011706
Transistor	Shaper	Q25	991-012328
Transistor	Driver	Q26	991-012396
Transistor	Preamp	Q20	991-012637

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Printed in U.S A.