

VIBRO-KING

CUSTOM SHOP SERIES

SERVICE MANUAL



Fender Musical Instruments Corp.
7975 North Hayden Road Scottsdale, AZ 85258

VIBRO-KING

(This is the model name for warranty claims)

SERVICE MANUAL

JUNE 1994 REV A

TYPE CSR 4

IMPORTANT NOTICE:

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For warranty repair service, only Fender specified part numbers are to be used. It is recommended they also be used for post-warranty maintenance and repair.

Parts marked with an asterisk (*) indicate the required use of that specific part. This is necessary for RELIABILITY and SAFETY requirements. **DO NOT USE A SUBSTITUTE!**

A coded naming convention is used in the description of certain parts. The codes and what they mean are as follows:

CAPACITOR CODES

CAP AE = Aluminum Electrolytic
CAP CA = Ceramic Axial
CAP CD = Ceramic Disk
CAP MPF = Metalized Polyester Film
CAP MY = Mylar
CAP PFF = Polyester Film/Foil

RESISTOR CODES

RES CC = Carbon Comp
RES CF = Carbon Film
RES FP = Flame Proof
RES MF = Metal Film
RES WW = Wire Wound

HARDWARE CODES

BLX = Black Oxide
CR = Chrome Plated
HWH = Hex Washer Head
M = Machine Screw
NI = Nickel Plated
OHP = Oval Head Phillips
PB = Particle Board
PHP = Pan Head Phillips
PHPS = Pan Head Phillips Sems
SMA = Sheet Metal "A" Point
SMB = Sheet Metal "B" Point
SS = Stainless Steel
TF = Thread Forming
ZI = Zinc Plated

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THEORY OF OPERATION

J1 and J2 are summed by R11 and R12. These 10K Ω resistors are a lower than usual value for a tube amplifier. This value was chosen for two reasons. 10K Ω is smaller than 33K Ω or 68K Ω therefore the amplifier will produce less noise at high volume settings. Secondly, when linking two or more amplifiers a common trick is to plug the guitar into Input 1 and use Input 2 as the output to the next amplifier. With 68K Ω resistors, 1/10th of the signal is lost with each link.

After the input resistors, the signal is split and fed to V1A and V2A. V1A serves as a preamp for the Reverb Drive, or *Dwell* control. The *Dwell* control feeds V3, a small power tube which drives the Reverb.

V2A is a Cathode-Follower circuit which creates a low impedance, isolated (from the input) signal to drive the *Mix* control (R2).

V2B amplifies the Reverb return (sense) signal and sends it to the *Tone* control (R3). High frequencies are sent (shunted) to ground via C17. Varying R3 will move the wiper closer to or further from C17, thus making the Reverb brighter (Clockwise) or duller (Counterclockwise). The Reverb signal then sums with the Dry signal at the *Mix* control (R2).

After the *Mix* control, the signal travels to the *Send* jack (J3) of the Effects Loop. The signal is then Normaled to the *Return* jack (J4) and drives V4A. This configuration allows the Reverb functions of the Vibro King to be sent out to other amplifiers (via the *Send* jack). It also enables a player to insert a delay unit between the reverb and the amplifier for a Rock-A-Billy type effect. A Volume pedal can also be inserted to control the Guitar and the Reverb.

The V4A circuit contains the *Fat* switch (S1). The *Fat* switch connects C4 to ground to provide a 3dB increase in gain, mostly in the low and mid frequencies. R17 is there to prevent "popping" of the *Fat* switch when actuated. NOTE: the *Fat* switch may pop the first time it is switched. This is due to the warm-up/stabilization cycle of the tube.

The *Volume* control R4A is linked to R4B. R4B reduces the gain of the Reverb at high volume levels. This allows adjustment of the *Volume* without readjusting the Reverb *Mix* control.

From the *Volume* control (R4A), the signal is fed to V4B, the *Tone* control driver section. The signal leaves the tone controls through the *Treble* control (R5), and is fed to the Vibrato and Phase Inverter circuits.

V6B is a low frequency oscillator. The *Speed* control (R8) varies the oscillation frequency. V6A is the Neon Lamp driver. The lamp flashes faster or slower based on the position of the *Speed* control (R8). The brightness of the neon bulb is sensed by two LDRs (Light Dependent Resistors) in parallel. The resistors connect to the *Intensity* control (R9) which varies the amount of attenuation. Because the *Vibrato* circuit connects to the amplifier directly after the *Treble* control, the high frequencies will attenuate before the bass frequencies. This simulates a rotating speaker effect.

(TROUBLESHOOTING TIP: If the Vibrato does not function, first check the footswitch jack. The switching part of the jack serves to short one side of R57 to ground. If R57 is not grounded, the Vibrato will not operate.

If the Vibrato exhibits a clicking sound, the problem is caused by the position of the neon bulb in relation to the LDR's. Adjust the bulb by gently pulling on the leads. Test and repeat as necessary.)

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THEORY OF OPERATION (CONT)

The signal then feeds the Phase Inverter (V5), which is a classic style split-load type, used without feedback.

The output tubes (5881/6L6WGC) are arranged in a push-pull configuration that will produce sixty (60) watts into two (2) Ω .

BIAS PROCEDURE: The bias, measured at pin 5 of V7 or V8 should be set to **-46Vdc**. However, the Bias need not be measured to be accurately set. To set the Bias without removing the chassis, set the *Volume* knob between 1-1/2 to 2. (The *Bias* control is located on the under side of the chassis, next to the power cable.) Adjust the Bias so the amp produces the maximum Hiss. Strum a full chord and let ring. Now, turn the *Bias* control back just to the point that the sound of the guitar loses warmth and sustain. Then increase it slightly. This will ensure minimum crossover distortion and the best sound.

PARTS LIST

PRINTED CIRCUIT BOARD ASSEMBLY

QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
1	080083	BULB NEON TYPE A2B	(USED WITH PHOTOCELLS)
2	031069001	CAP AE RDL 10uF 100V 20%LL	C23,28
4	009512	CAP AE AX 22uF 25V 20%	C4,24,25,41
6	024819	CAP AE AX 22uF 500V	C31-35,38 (@ FILTER CAP PC)
2	026502	CAP AE AX 100uF 100V	C3,22 (C22 @ PWR SUPPLY PC)
2	013638	CAP AE AX 220uf 285V	C29,30 (@ FILTER CAP PC)
1	031780	CAP SLVR MICA 150pF 300V	C7
1	007029001	CAP CD 220pF 1000V 10%LL	C36
1	020917001	CAP CD 250pF 1000V 10%LL	C16 (@R2-3)
4	024824	CAP MPF RDL .01uF 630V 10%	C11,17,(@R3), 38,39
3	024835	CAP MPF RDL .022uf 630V 10%	C9,26,27
5	024846	CAP MPF RDL .1uF 630V 10%	C2,15,18,12
1	024861	CAP MPF RDL .22uF 250V 10%	C5
1	026202001	CAP PFF RDL .0022uF 600V LL	C1
1	026204	CAP PFF RDL .0068uF 600V	C6
1	033620001	CAP PFF RDL .47uF 100V 10% LL	C10
1	064089001	DIODE 1N4003 LL	CR5
4	026730001	DIODE 1N4006 800V LL	CR1-4
2	029690001	DIODE HV 3KV 200mA LL	CR7,8
2	038553	PHOTOCCELL CDSE (LDR)	(2 PCS IN PARALLEL, NO BULB)
2	026368001	RES CF 1/2W 5% 100 Ω LL	R62,63
1	9901218221	RES CF 1/2W 5% 820 Ω LL	R27
6	026549001	RES CF 1/2W 5% 1.5K	R14,20,23,33,34,41
1	026493001	RES CF 1/2W 5% 2.7K LL	R55
1	036955001	RES CF 1/2W 5% 6.8K LL	R37
4	025113001	RES CF 1/2W 5% 10K LL	R11,12 (@INPUT JACKS), 57,59
2	025832001	RES CF 1/2W 5% 22K LL	R17,61,(@R10 BIAS POT)
1	041278001	RES CF 1/2W 5% 39K LL	R26
5	025116001	RES CF 1/2W 5% 100K LL	R24,44,49,56,68
6	025117001	RES CF 1/2W 5% 220K LL	R31,32,40,48,64,65,73
2	041279001	RES CF 1/2W 5% 270K LL	R53,54
3	036957001	RES CF 1/2W 5% 470K LL	R15,21,42
6	9901251021	RES CF 1/2W 5% 1M LL	R13(@INPUT JACKS) R18,25,28,51,52
3	041280001	RES CF 1/2W 5% 2.2M LL	R45,46,58
1	037663001	RES CF 1/2W 5% 10M LL	R50
3*	036468001	RES MOX FP 1W 470 Ω LL	R35(@V8), 36(@V7), 60
1	027352001	RES FILM 1W 5% 91K LL	R29
6	027353001	RES FILM 1W 5% 100K LL	R16,19,22,30,43,47
1	036351001	RES FILM 2W 5% 100 Ω LL	R70 (@V3)
1	041269001	RES CF 2W 5% 1.2K LL	R66 (@ FILTER CAP PC)

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PRINTED CIRCUIT BOARD ASSEMBLY (CONT)

QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
1	041268001	RES CF 2W 5% 10K LL	R67 (@ FILTER CAP PC)
1	036923	RES WW 5W 10% 680Ω	R69
1	047057	RES WW BT 5W 25K	R38 (@FILTER CAP PC)
1 *	028503	THERMISTOR 10 Ω 5A C60-11	TH1

CHASSIS ASSEMBLY

QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
1	018002	BUSHING SNAP 5/16X17/32 BLK	
1	021560	BUSHING SNAP 5/8X27/32 BLK	
1	026038	BUSHING SR .625X.062X37/94 BLK	(@ POWER CABLE)
1	031105	CABLE ASSY PWR .187+.250 120V	(100/120V ONLY)
1	036486	CHOKE	L1
2	031091	CLAMP TUBE (277H-1)	(@V7,8)
1	032219	COLLAR-PILOT LIGHT	
1	017502	CONTROL 10K LIN SCREW ADJ	(BIAS ADJUST)
1	041264	CONTROL B5 MEG LIN	R8 (SPEED CONTROL)
6	041266	CONTROL DUAL B500K LIN	R1,2,4A/B,5,6,9
2	041265	CONTROL DUAL B50K LIN	R3 (TONE), R7 (MID)
1	036702	FUSE HOLDER 3AG FINGER GRIP	(100/120V ONLY)
1	036703	FUSEHOLDER 5mm FINGER GRIP	(220/230/240V ONLY)
1	026559	FUSE TD 1-1/4X1/4 250V 3AMP	F1 (100/120V ONLY)
1	013115	FUSE TD 20mmX5mm 250V 2AMP	F1 (220/230/240V ONLY)
1	021741	HOLDER DIAL LITE ASSEMBLY PILOT	
1	020773	INSULATOR DUAL PHONO JACK	(@ REVERB DUAL PHONO JACK)
1	041469	INSULATOR FILTERCAP PC	
1	023760	JACK PHONE 3/CD DCC 14B	J5 (FOOTSWITCH JACK)
4	068270	JACK PHONE TIP SHUNT L12A 3/8L	J1,2,4,7
2	021626	JACK PHONE 2/CD SOC L11 3/8" L	J3.6
1	020772	JACK PHONO DUAL CHS MT	(REVERB JACK)
1	025718	JEWEL #20 PILOT LITE	
9	041263	KNOB VINTAGE CREAM	
1	031625	NUT HOLDER PILOT LIGHT 1-16/27	
4	022004	NUT KEPS #8-32X1/4 PHP BLX	
2	023580	SOCKET TUBE 8 PIN	(@V7,8)
2	032806	SCRW TF 6-32X1/4 PHP BLX	(GROUND LUG MOUNT)
1	040909	PANEL FRONT ALUM VIBRO-KING	
1	041220	PANEL REAR ALUM VIBRO-KING	
1	021642	PILOT LIGHT #T47	
6	041267	SOCKET TUBE 9PIN PORCEL W/SHLD	(@V1-6)
5	025936	STANDOFF NYLON PCB SNAPIN 3/8"	
1	037835	SWITCH SLIDE SPST	SW1 (FAT SWITCH)
2	036570	SWITCH TOGGLE DPST W/NUTS	S2,3 (POWER/STANDBY)
2	039214	TUBE VACUUM 5881/6L6WGC	V7,8
5	013341	TUBE VACUUM 7025/12AX7	V1,2,4,5,6
1	041255	TUBE VACUUM EL84	V3
8	022319	WSHR FLAT 1/4X9/16NI	
3	022327	WSHR FLAT 8X7/16 NI	
4	9904300100	WSHR LCK INTL 3/8X.681X.032 ZI	(J1,2,6,7)
9	024049	WSHR LCK INTL 5/16X.600X.06 ZI	
8	026401	WSHR SHLDR FIB 3/8X5/8	(FIBER WASHER)
1	036485	XFMR OUTPUT	T2 (OUTPUT XFMR)
1	024038	XFMR OUTPUT 10W SE	T3 (REVERB XFMR)
1	026554	XFMR PWR MUTI VOLT	(100/120/230/240V)

CABINET ASSEMBLY

QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
1	040760	CAB ASSY VIBRO KING	(COMPLETE CABINET)
1	040885	BACK ASSY UPPER VIBRO KING	
1	040886	BACK ASSY LOWER VIBRO KING	
1	031849	BAG-REVERB SPRING UNIT	(BAG ONLY)
1	025722	CABLE ASSY REVERB 1100mm	

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CABINET ASSEMBLY (CONT)

QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
1	038566	CABLE ASSY SPKR RT ANG 13-1/2"	(SPEAKER CABLE)
1	036784	Handle molded brown	
2	024851	Leg 19" amp	
1	036795	Nameplate 62 fender	
2	021998	Nut flex lock 10-32 w/ nylon in	(TILT BACK LEG MOUNT)
1	064063	REVERB UNIT 4 SPRING 4AB3C1B	(PAN)
2	037210	SCREW SMA 2X3/8 OHP NI	(LOGO MOUNT)
8	037952	SCRW SMA #6X1 OHP NI	(BACK BOARD MOUNT)
4	037247	SCRW M 8-32X1 OHP NI	(HANDLE MOUNT)
4	022236	SCRW M 8-32X3-1/4 OHP NI CONE	(CHASSIS MOUNT)
2	022277	SCRW M 10-32X1-1/2 OHP NI	(TILT BACK LEGS MOUNT)
2	031344	SCRW SMA 10X3/4 OHP NI	(LEG STOP MOUNT)
12	043331	SCRW M 10-32X5/8 HWHS BLX	(SPEAKER MOUNT)
3	036457	SPEAKER 10" 8 Ω 30 WATTS	
2	024752	STRAP CHASSIS 4-1/2"	
8	037215	WSHR C'SNK #6 NI	(BACKBOARD ASSY MOUNT)
6	022319	WSHR FLAT 1/4X9/16 NI	(TILT BACK LEGS MOUNT)
2	024646	WASHER LEG STOP TN	
2	022285	WSHR SP LCOK 1/4X.493 ZI	(TILT BACK LEG MOUNT)

FOOTSWITCH ASSEMBLY

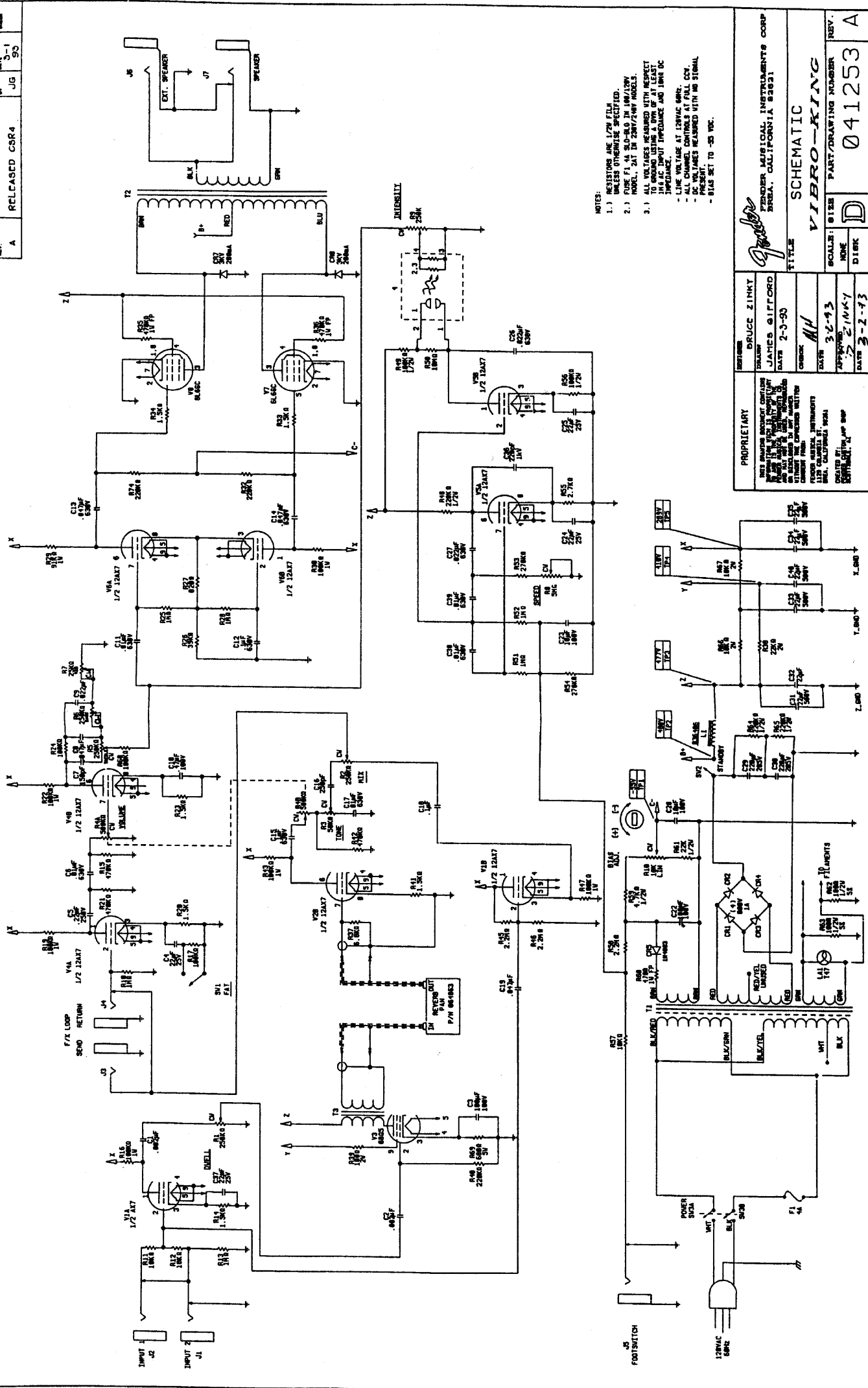
QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
1	041273	FTSW ASSY 2 BTTN VIB/FAT	(COMPLETE FOOTSWITCH)
1	021691	BUSHING SR .500X.100X7/16 BLK	
1	022665	COVER CUP DUAL FTSW ASSY	
1	013172	PLUG PHONE 3 CONDUCTOR 238 RA	
2	024042	SWITCH SPST PUSH BUTTON	S1,2
2	022293	WSHR FLAT .473X.750 NI	

MISCELLANEOUS

QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
1	041223	MANUAL OWNERS VIBRO KING	
1	041727	SCHEM REDUCED VIBRO KING	

VIBRO-KING 212 SPEAKER ENCLOSURE

QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
4	026566	CORNER 2 HOLE W/TAB NI	
4	026568	CORNER 3 HOLE NI	
1	047402	GRILLE ASSY VIBRO KING 212	(COMPLETE GRILLE)
2	025395	HANDLE CAP 1 HOLE NI	
1	037121	HANDLE STRAP BRN	(NO INSERT)
1	032524	INSERT HANDLE	(SPRING STEEL)
1	021956	JACK PHONE OPEN CIRCUIT 11	
2	022244	SCRW M 10-32X1-1/8 OHP NI	(HANDLE MOUNT)
2	047279	SPEAKER 12" 8 Ω CEL VINTAGE	(CELESTION VINTAGE 30 T3903)

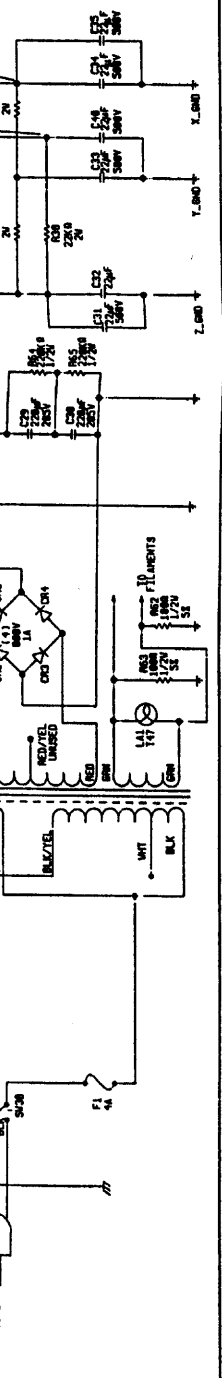


- NOTES:
- 1.) RESISTORS ARE 1/2W FLM UNLESS OTHERWISE SPECIFIED.
 - 2.) ALL VOLTAGES MEASURED WITH RESPECT TO GROUND USING A DVM OF AT LEAST 1MΩ AC INPUT IMPEDANCE AND 10MΩ DC IMPEDANCE.
 - 3.) ALL VOLTAGES MEASURED WITH RESPECT TO GROUND USING A DVM OF AT LEAST 1MΩ AC INPUT IMPEDANCE AND 10MΩ DC IMPEDANCE.
- ALL VALUES MEASURED AT 120VAC 60Hz.
 - ALL VALUES MEASURED WITH NO SIGNAL PRESENT.
 - DC VALUES MEASURED WITH NO SIGNAL PRESENT.
 - BIAS SET TO -35 VDC.

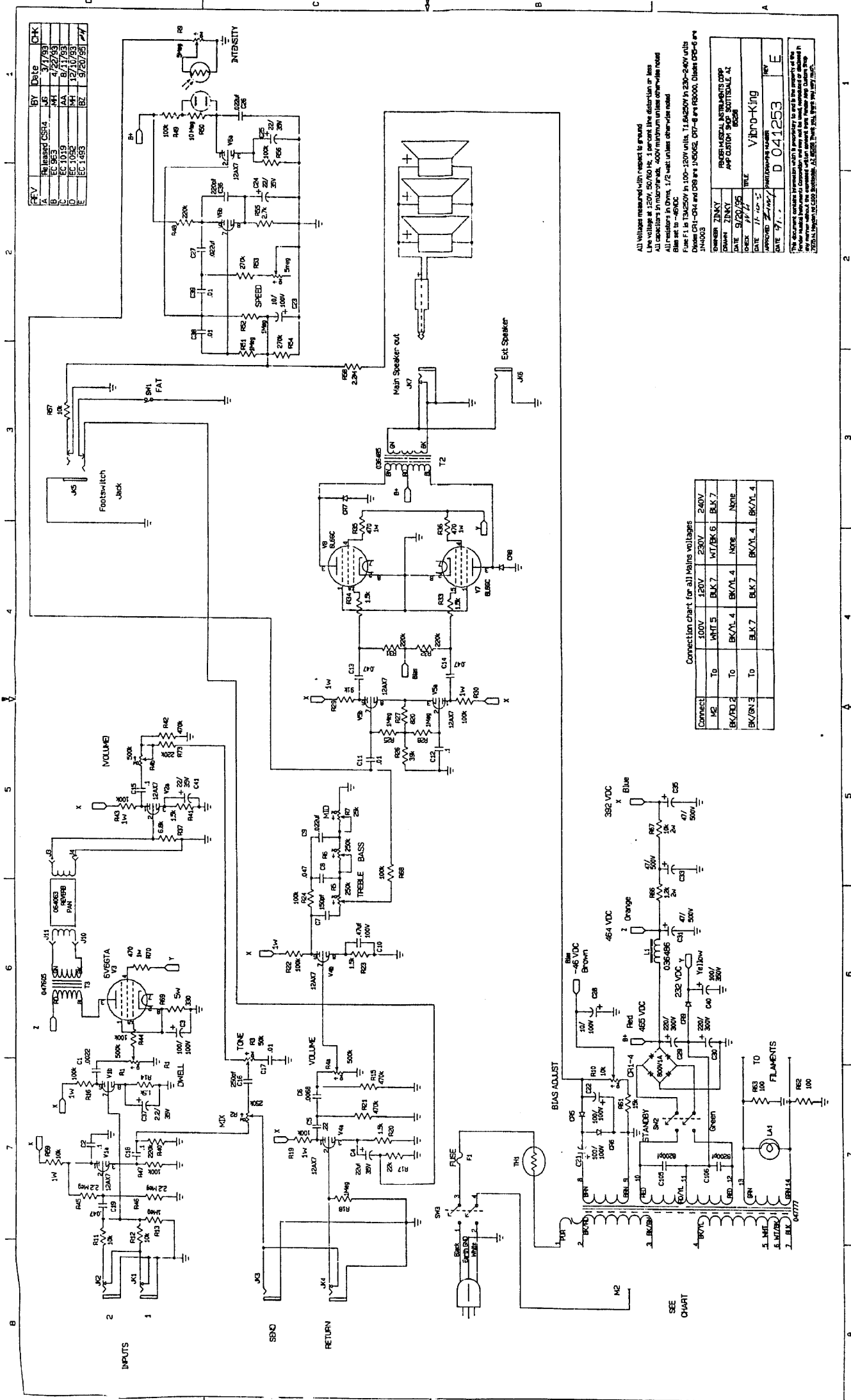
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DESIGNED BY: *James Gifford*
 DRAWN BY: *Bruce Zimny*
 CHECKED BY: *James Gifford*
 DATE: 3-2-93
 APPROVED BY: *James Gifford*
 DATE: 3-2-93

TITLE: **VIBRO-KING**
 SCALE: 0158
 PART/DRAWING NUMBER: 041253
 REV. A



REV	BY	DATE	CHK
A	Revised	3/7/93	
B	EC 963	4/22/93	
C	EC 1019	8/11/93	
D	EC 1052	12/10/93	
E	EC 1493	9/20/95	



All voltages measured with respect to ground.
 Line voltage at 120V, 50/60 Hz. 1 percent line distribution or less.
 All capacitors in microfarads, 500V minimum unless otherwise noted.
 All resistors in Ohms, 1/2-watt unless otherwise noted.
 Bias set to -46VDC.
 Fuse F1 is 15A/250V in 100-120V units, T1 6A/250V in 230-240V units.
 Diodes CR1-CR4 and CR8 are 1N5002, CR7-8 are 1N5000, Diodes CR5-6 are 1N4003.

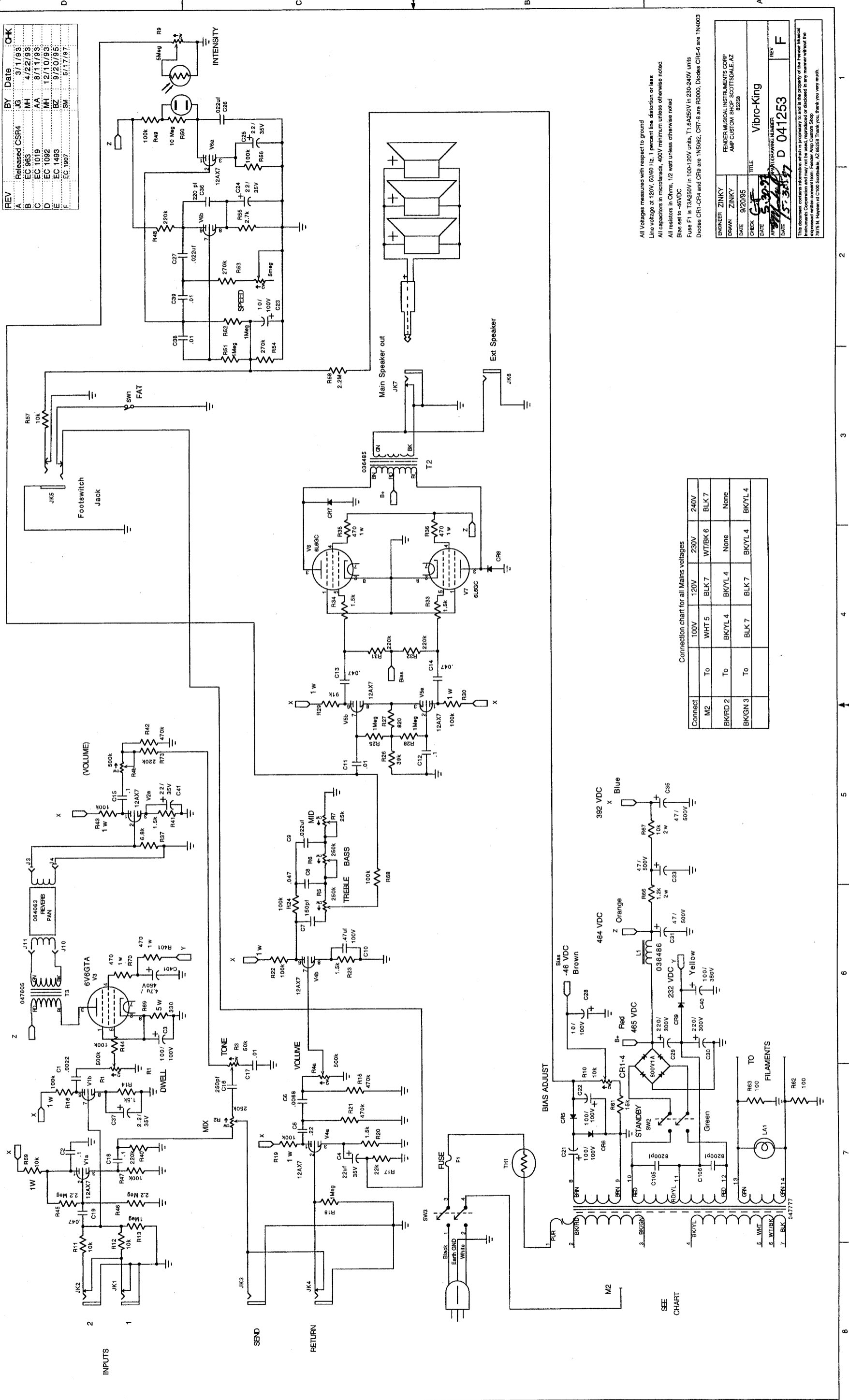
DESIGNER	ZINNY	ROBERT MULLER	DATE	9/20/95	FILE	041293	REV	E
DRAWN	ZINNY	ROBERT MULLER	DATE	9/20/95	FILE	041293	REV	E
CHECKED	ZINNY	ROBERT MULLER	DATE	9/20/95	FILE	041293	REV	E
APPROVED	ZINNY	ROBERT MULLER	DATE	9/20/95	FILE	041293	REV	E

Connection chart for all main voltages

Connect	100V	120V	230V	240V
ME	WHT/5	BLK/7	WTR/6	BLK/7
CR/CR2	To	BLK/4	CR/4	NOTE
CR/CR3	To	BLK/7	BLK/4	CR/4

SEE CHART

REV	BY	Date	CHK
A	JG	3/1/93	
B	EC	4/22/93	
C	AA	8/11/93	
D	MH	12/10/93	
E	BZ	9/20/95	
F	SM	5/17/97	

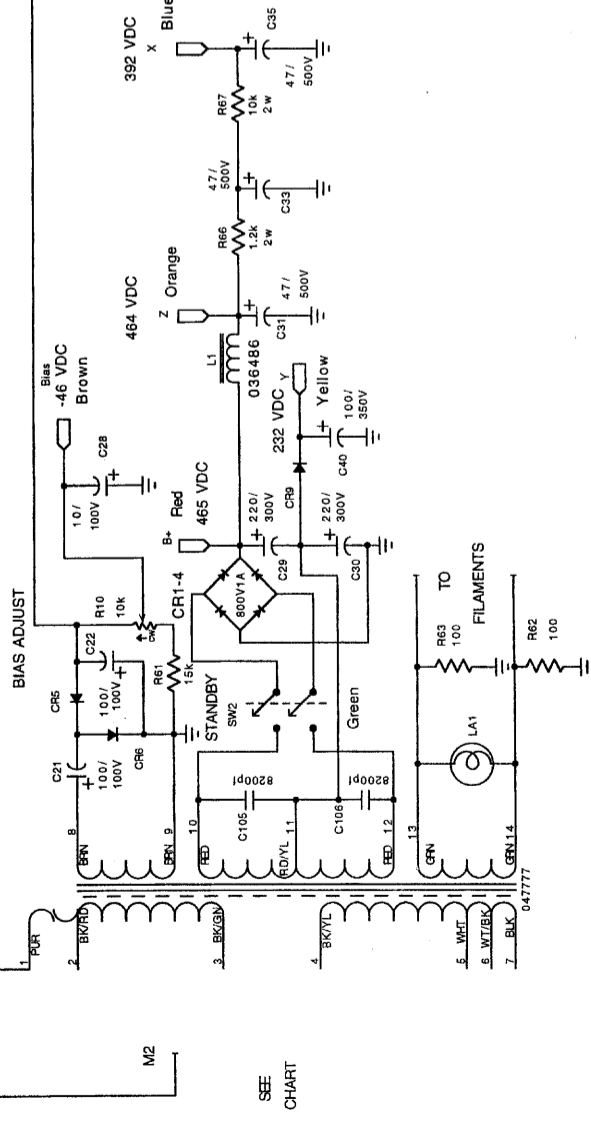


All Voltage measured with respect to ground
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 All capacitors in microfarads, 400V minimum unless otherwise noted
 All resistors in Ohms, 1/2 watt unless otherwise noted
 Bias set to -46VDC
 Fuse F1 is T3A250V in 100-120V units, T1: 6A250V in 230-240V units
 Diodes CR1-CR4 and CR8 are 1N5062, CR7-8 are R3000, Diodes CR5-6 are 1N4003

ENGINEER	ZINKY	FENDER MUSICAL INSTRUMENTS CORP
DRAWN	ZINKY	AMP CUSTOM SHOP, SCOTTSDALE, AZ
CHECK		REG28
DATE	9/20/95	
DATE	5-30-97	
DATE	15-3-97	
TITLE	Vibro-King	
REV	D 041253	
REV	F	

Connection chart for all Mains voltages

Connect	To	100V	120V	230V	240V
M2	To	WHT 5	BLK 7	WT/BK 6	BLK 7
BK/YL 2	To	BK/YL 4	BK/YL 4	None	None
BK/GN 3	To	BLK 7	BLK 7	BK/YL 4	BK/YL 4



SEE CHART

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