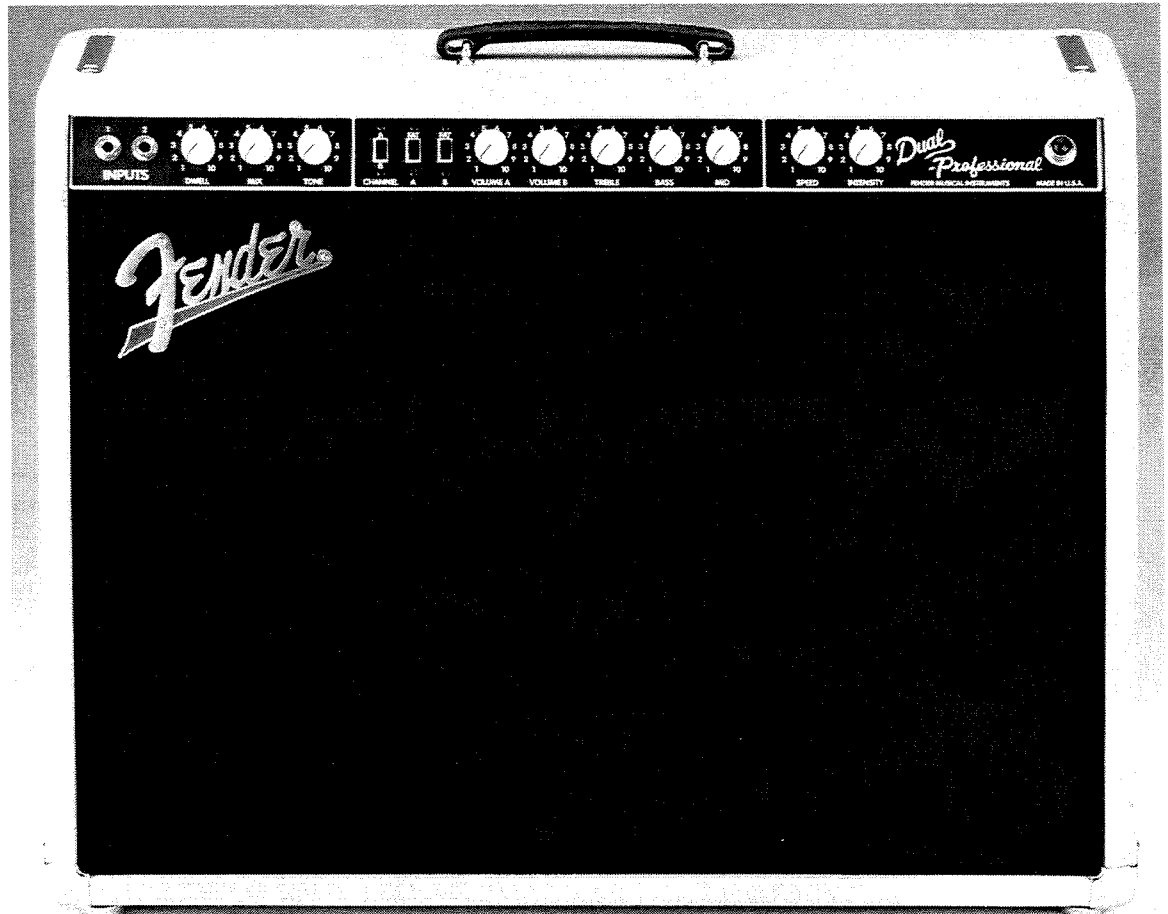


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CUSTOM SHOP SERIES

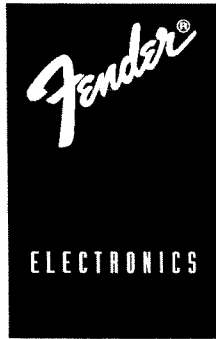
SERVICE MANUAL



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



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CUSTOM SHOP SERIES

SERVICE MANUAL

MAY 1995 TYPE CSR 11

IMPORTANT NOTICE:

The information contained herein is CONFIDENTIAL and PROPRIETARY to Fender Musical Instruments Co. It is disclosed solely for use by qualified technicians for purposes of equipment maintenance and service. It is not to be disclosed to others without the expressed permission of Fender Musical Instruments Co. All specifications subject to change without notice.

Part numbers ending with the three digit suffix "001" indicate a component prepped with long leads.

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

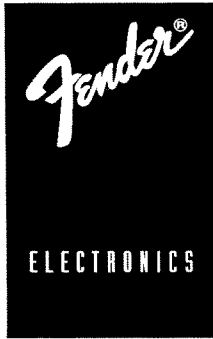
CAP AE = Aluminum Electrolytic
 CAP CA = Ceramic Axial
 CAP CD = Ceramic Disk
 CAP MPF = Metalized Polyester Film
 CAP MY = Mylar
 CAP PFF = Polyester Film/Foil

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 R310 and R311. These 10KΩ resistors are a lower than usual value for a tube amplifier. This value was chosen for two reasons. 10KΩ is smaller than 33KΩ or 68KΩ, 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 68KΩ resistors, 1/10th of the signal is lost with each link. After the input resistors, the signal feeds V1A.

V1A is the first preamp stage. The output from the cathode feeds the *Mix* control. The output from the plate feeds V1B, which drives the *Dwell* control. The *Dwell* control feeds V3, a small power tube (6V6GTA) which drives the Reverb transformer.

V2A amplifies the Reverb return (sense) signal and sends a portion of it (via R14) to the *Tone* control (P3). The bulk of the signal is sent through a pair of pots (P4B & P5B), which are selected by Relay RLY1. P4B and P5B are ganged with the Volume pots respectively. This feature reduces the gain of the Reverb at high volume levels. This allows adjustment of the *Volume* without readjusting the Reverb *Mix* control. High frequencies are sent (shunted) to ground via the *Tone* control and C302. Varying P3 will move the wiper closer to or further from C302, thus making the Reverb brighter (Clockwise) or duller (Counterclockwise). The Reverb signal then sums with the Dry signal at the *Mix* control (P2).

After the *Mix* control, the signal travels to the *Send* jack (J3) of the Effects Loop. The signal is then Normalled to the *Return* jack (J4) and drives V4B. This configuration allows the Reverb functions of the Dual Professional 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. To get a stronger, louder sound without reverb, plug the guitar into the *Effects Return* jack.

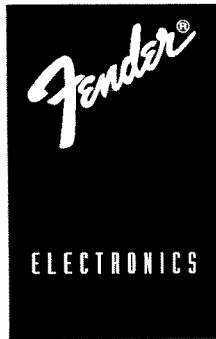
V4B drives the A & B *Volume* controls. Relay RLY2 selects the signal from the A or B *Volume* controls and also selects the A or B *Fat* switches respectively. The *Fat* switches (SW303 & 304) ground C12 to provide a 3dB increase in gain, mostly in the low and mid frequencies. R19 is there to prevent "popping" of the *Fat* switches when actuated. NOTE: the *Fat* switches may pop the first time they are switched. This is due to the warm-up/stabilization cycle of the tube.

From RLY1, the signal is fed to V4A, the Tone control driver section. The signal leaves the tone controls through the *Treble* control (P6), and is fed to the Phase Inverter circuit. The Phase Inverter (V5) is a classic style split-load type, used without feedback.

V6A & B make up a Direct -Coupled Low Frequency Oscillator. The *Speed* control (P9) varies the oscillation frequency. The *Intensity* control (P10) varies the amount of low frequency modulation applied to the output tubes.

The output tubes (5881/6L6WGC) are arranged in a push-pull configuration that will produce one-hundred (100) watts into four (4) or eight (8) ohms.

BIAS PROCEDURE: The Bias, measured at pin 5 of V7, 8, 9 & 10 should be set to - 47Vdc. 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 centered on the under side of the chassis) Adjust the Bias so the amp produces the maximum Hiss. Strum a full chord and let ring. Now, turn the the Bias control back just to the point that the sound of the guitar loses warmth and sustain. Then increase it slightly. This will insure minimum crossover distortion and the best sound.



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TEST POINT VOLTAGES

ALL VOLTAGES MEASURED WITH RESPECT TO GROUND USING A DVM OF AT LEAST 1MΩ AC INPUT IMPEDANCE AND 10MΩ DC INPUT IMPEDANCE. VOLTAGES MAY VARY ± 20%.

TEST CONDITIONS:

MIX, TONE, SPEED, AND INTENSITY CONTROLS SET TO FULL CCW.

ALL OTHER CONTROLS SET TO "5½" (50% ROTATION).

FAT SWITCHES OFF.

"A" CHANNEL ACTIVE.

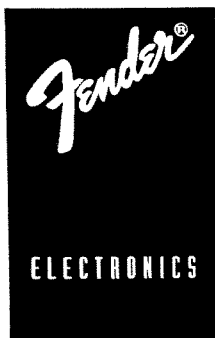
30mV R.M.S., 1kHz INPUT SIGNAL AT JK1.

LINE VOLTAGE 120VAC.

4 OHM RESISTIVE LOAD.

- ①. THESE MEASUREMENTS WILL VARY RELATIVE TO THE REVERB PAN AND RECOVERY TUBE. THE MINIMUM GAIN FROM PIN 2 TO PIN 1 SHOULD BE 49.

TEST POINT	PIN #	VOLTS AC R.M.S.	VOLTS DC
JK1		30mV R.M.S. 1kHz	
V1A	PIN 1	72.5mV	130 VDC
	PIN 3	27.5mV	13.7 VDC
V1B	PIN 6	2.86V	101.5 VDC
	PIN 8		1.04 VDC
V2A	PIN 1	≈360mV ①	110 VDC
	PIN 2	≈7mV ①	
	PIN 3		910 mVDC
V3	PIN 3	29.2V	456 VDC
	PIN 4		236 VDC
	PIN 5	1.23V	
	PIN 8		14.4 VDC
V4A	PIN 1	3.73V	242 VDC
	PIN 2	195mV	
	PIN 3		2.15 VDC
V4B	PIN 6	522mV 1.10V (FAT ON)	255 VDC
	PIN 7	25.8mV	
	PIN 8		1.92 VDC
	PIN 1	7.4V	317 VDC
V5A	PIN 2	265mV	35.4 VDC
	PIN 3		49 VDC
	PIN 6	6.3V	316 VDC
V5B	PIN 7	1.4mV	34.5 VDC
	PIN 1		147 VDC
V6A	PIN 3		1.7 VDC
	PIN 6		339 VDC
V6B	PIN 8		150 VDC
	PIN 3	25V	465 VDC
V7,8	PIN 3	25V	465 VDC
V9,10	PIN 3	25V	465 VDC
JK7		2.56V	
P10 INTENSITY	PIN 2 WIPER	80 V p/p, INTENSITY FULL CW ≈3.5Hz, SPEED AT FULL CCW ≈9Hz, SPEED AT FULL CW NO SIGNAL APPLIED	



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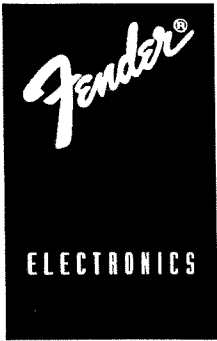
CUSTOM SHOP SERIES

PARTS LIST

REFERENCE DESIGNATORS 1-99 LOCATED ON MAIN BOARD
 100-199 ON POWER SUPPLY
 200-299 ON FILTER CAP BOARD
 300-399 FLY WIRED ON CHASSIS COMPONENTS

CIRCUIT BOARD ASSEMBLY

QTY	PART #	DESCRIPTION	REFERENCE	DESIGNATION
1	026517001	CAP AE AX 2.2UF 50V	C4	
3	009512001	CAP AE AX 22UF 25V 20%	C6,12,24	
2	024819	CAP AE AX 22UF 500V	C205,208	
1	024820	CAP AE AX 47UF 350V	C22	
3	041589	CAP AE AX 47UF 500V 20%	C204,206,207	
5	026502	CAP AE AX 100UF 100V	C7,21,102,103,104	
1	028953	CAP AE AX 100UF 350V +50%-10%	C203	
2	013638	CAP AE AX 220UF 285V	C201,202	
1	018741	CAP AE AX 2200UF 50V	C101	
2	025979	CAP CD 50PF 1000V 10%	C303,304	
1	031780	CAP SLVR MICA 150PF 300V	C13	
1	020917	CAP CD 250PF 1000V 10%	C301	
2	025995	CAP CD 8200PF 1000V	C105,106	
2	024849	CAP MP.068UF 400V	C23,26	
1	024824	CAP MPF RDL.01UF 630V 10%	C302	
1	024835	CAP MPF RDL.022UF 630V 10%	C16	
3	024839	CAP MPF.033UF 400V	C15,25,27	
3	024846	CAP MPF RDL.047UF 630V 10%	C9,19,20	
5	024855	CAP MPF RDL.1UF 630V 10%	C1,8,18,28,29	
1	024876	CAP MPF RDL.68UF 250V 10%	C2	
1	037666	CAP PFF .001UF 400V 10%	C17	
4	026202	CAP PFF .0022UF 600V	C3,5,10,11	
3	064089	DIODE 1N4003	CR5,6,7	
5	026730	DIODE 1N4006 800V	D201, CR1-4	
2	006260	DIODE 1N4448 SIGNAL LL	D1,2	
2	029690	DIODE HV 3KV 200MA	D301,302	
13	031523	JUMPER WIRE 24GA.4X.175		
1	048405	PCB FILTER CAP DUAL PROF	(RAW PCB)	
1	048751	PCB MAIN DUAL PROF	(RAW PCB)	
1	048750	PCB PWR SUPPLY DUAL PROF	(RAW PCB)	
2	036613	RELAY DPDT DIP 24 VOLT 8.3MA	RLY1,2	
2	026368001	RES CF 1/2W 5% 100Ω	R314,315(ON CHASSIS)	
1	025941001	RES CF 1/2W 5% 560Ω	R3	
1	9901218221	RES CF 1/2W 5% 820Ω	R26	



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CUSTOM SHOP SERIES

PARTS LIST

CIRCUIT BOARD ASSEMBLY CONTINUED

QTY	PART #	DESCRIPTION	REFERENCE	DESIGNATION
8	026549001	RES CF 1/2W 5% 1.5K	R7,9,18,21,(301-304 ON CHASSIS)	
1	036926001	RES CF 1/2W 5% 4.7K	R35	
2	036955001	RES CF 1/2W 5% 6.8K	R10,(309 ON CHASSIS)	
1	041270001	RES CF 1/2W 5% 8.2K	R15	
2	025113001	RES CF 1/2W 5% 10K	R310,311(ON CHASSIS)	
1	031900001	RES CF 1/2W 5% 15K	R313(ON CHASSIS)	
1	048903001	RES CF 1/2W 5% 18K	R27	
1	025832001	RES CF 1/2W 5% 22K	R19	
1	037665001	RES CF 1/2W 5% 27K	R39	
2	036956001	RES CF 1/2W 5% 33K	R36,313	
1	028857001	RES CF 1/2W 5% 68K	R33	
1	025116001	RES CF 1/2W 5% 100K	R23	
1	048346001	RES CF 1/2W 5% 120K	R5	
1	025834001	RES CF 1/2W 5% 150K	R13	
3	025117001	RES CF 1/2W 5% 220K	R17,30,32	
2	041279001	RES CF 1/2W 5% 270K	R37,38	
1	039186001	RES CF 1/2W 5% 330K	R24	
2	036957001	RES CF 1/2W 5% 470K	R34,204	
6	9901251021	RES CF 1/2W 5% 1 MEG	R1,2,20,25,28,(312 ON CHASSIS)	
1	041280001	RES CF 1/2W 5% 2.2M	R14	
1	041269001	RES CF 2W 5% 1.2K	R201	
1	041268001	RES CF 2W 5% 10K	R202	
1	041737001	RES CF 2W 5% 33K	R6	
1	048766001	RES CF 2W 5% 82K	R203	
2	028045001	RES FILM 1W 5% 220Ω	R101,102	
5	036468	RES MOX FP 1W 470Ω	(R305-308 @ V7,8,9,10)(R316 @ V3)	
1	027349001	RES FILM 1W 5% 10K	R4	
1	027352001	RES FILM 1W 5% 91K	R31	
6	027353001	RES FILM 1W 5% 100K	R8,12,16,22,29,40	
1	041256001	RES WW 5W 10% 470Ω	R11	
6	025936	STANDOFF NYLON PCB SNAPIN 3/8"	(CIRCUIT BOARD MOUNT)	
1	028503	THERMISTOR 10Ω 5A C60-11	TH101	



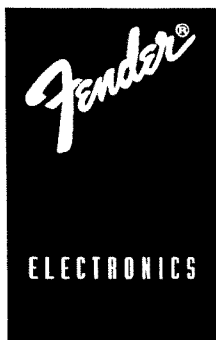
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PARTS LIST

CHASSIS ASSEMBLY

QTY	PART #	DESCRIPTION	REFERENCE	DESIGNATION
6	018022	BUSHING SNAP 5/16X17/32 BLK	(WIRE FEED THROUGH)	
2	012560	BUSHING SNAP 5/8X27/32 BLK	(@ POWER TRANSFORMER)	
1	026038	BUSHING SR.625X.062X37/64 BLK	(@ POWER CABLE 100/120V)	
1	026541	CABLE ASSY PWR W/.250 TAB	(POWER CABLE 120V)	
1	036486	CHOKE	L1	
1	048862	CHS ASSY 120V DUAL PROFESSIONAL		
1	047467	CHS DUAL PROFESSIONAL	(RAW CHASSIS)	
1	032219	COLLAR-PILOT LIGHT		
1	017502	CONTROL 10K LIN SCRW ADJ	P11	(BIAS ADJUST)
8	041266	CONTROL DUAL 500K LIN	P1,2,4-7,9,10	(DWELL,MIX,VOLUME B,VOLUME A TREBLE,BASS,SPEED,INTENSITY)
2	041265	CONTROL DUAL 50K LIN	P3,8	(TONE,MID)
1	025239	COVER CAPACITOR CUSTOM AMPS		
1	036702	FUSE HOLDER 3AG FINGER GRIP		
1	013737	FUSE TD 1-1/4X1/4 250V 4A	F301	
1	021741	HOLDER IDAL LITE ASSY PILOT	(SOCKET, PILOT LAMP)	
1	020773	INSULATOR DUAL PHONO JACK		
1	041469	INSULATOR FILTERCAP PC	(BENEATH FILTER CAP BOARD)	
1	021626	JACK PHONE 2/CD SOC L11 3/8"L	JK3	(SEND)
1	023760	JACK PHONE 3/CD DCC 14B	JK5	(FOOTSWITCH)
4	068270	JACK PHONE TIP SHUNT L12A 3/8L	JK1,2,4,7	(INPUTS,RETURN,SPEAKER)
1	041701	JACK PHONE TRANSFER 13A	JK6	(EXTERNAL SPEAKER)
1	020772	JACK PHONO DUAL CHS MT	REVERB JACKS	
1	025718	JEWEL #20 PILOT LITE	(RED LENSE)	
10	041263	KNOB VINTAGE CREAM		
1	016669	LED RED PNL MT SUPER BRITE	LED 1	
1	031625	NUT HOLDER PILOT LIGHT 1/16-27		
4	028272	NUT KEP 1/4X20 FOJ	(POWER TRANSFORMER MOUNT)	
4	022004	NUT KEPS #8-32 ZINC	(OUTPUT TRANSFORMER MOUNT)	
1	047553	PANEL FRONT DUAL PROFESSIONAL		
1	048747	PANEL REAR DUAL PROFESSIONAL		
1	021642	PILOT LIGHT #T47		
4	026501	SCRW C 1/4-20X1/2 HH BLK	(POWER TRANSFORMER MOUNT)	
6	014172	SCRW M 4-40X1/4 PHP BLX	(@ CHANNEL,FAT SWITCHES)	
4	026553	SCRW M 8-32X3/8 PHP BLX	(OUTPUT TRANSFORMER MOUNT)	
40	038900	SCRW TF 6-32X1/4 PHP ZI	(VARIOUS HARDWARE MOUNT)	
10	032908	SCRW TF 6-32X3/8 PHP ZI		
6	028937	SCRW TF 6-32X5/8 PHP ZI TAPTYT	(CIRCUIT BOARD MOUNT)	
4	041349	STRIP 5 TERMINAL .375 C-C		
3	037835	SWITCH SLIDE SPST	SW303,304,305	(CHANNEL,FAT A/B)



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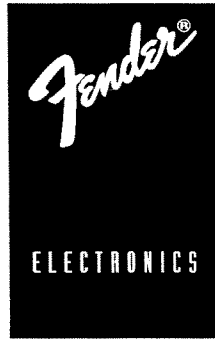
PARTS LIST

CHASSIS ASSEMBLY CONTINUED

QTY	PART #	DESCRIPTION	REFERENCE	DESIGNATION
2	036570	SWITCH TOGGLE DPST W/NUTS	SW301,302	(POWER/STANDBY)
1	023564	TUBE 6V6GTA STR391A	V3	(REVERB DRIVE TUBE)
5	013341	TUBE 7025/12AX7A SOVIET MADE	V1,2,4,5,6	
1	020424	TUBE RING UNIVERSAL (277H-2)	(@ V3, 6V6GTA)	
4	031091	TUBE RING LARGE (277H-A)	(@ POWER TUBES)	
5	023580	TUBE SOCKET 8 PIN	(@ V3,7,8,9,10)	
5	041267	TUBE SOCKET 9 PIN PORCEL W/SHLD	(@ V1,2,4,5,6)	
4	039214	TUBE VACUUM 5881/6L6WGC	V7,8,9,10	
10	026401	WSHR SHLDR FIBER 3/8X5/8	(@ INPUTS,EFFECTS LOOP,FTSW)	
1	047777	XFMR PWR MULTI V DUAL PRO	T1	(100V/110/120/220/230/240V)
1	026478	XFMR OUTPUT	T2	
1	047605	XFMR OUTPUT/6V6 REVERB DRIVER	T3	

CABINET ASSEMBLY

QTY	PART #	DESCRIPTION	REFERENCE	DESIGNATION
1	047451009	BACK ASSY LOWER DUAL PROF		
1	047451010	BACK ASSY UPPER DUAL PROF		
1	047451	CABINET ASSY DUAL PROFESSIONAL		
1	038566	CABLE ASSY SPKR RT ANG 13-1/2"	(SPEAKER CABLE)	
1	025722	CABLE REVERB 1100MM	(REVERB CABLE)	
1	022491	CLAMP CABLE NYL SCRW MNT 5/16		
.6	040883	CLOTH GRILLE OXBLOOD		
4	026566	CORNER 2 HOLE W/TAB NI		
4	019276	GLIDE CAB 1.24X.335 NI	(NO INSERT)	
1	047451008	GRILLE/BAFFLE ASSY DUAL PROF		
1	036784	HANDLE MOLDED BROWN		
4	019275	INSERT GLIDE CUSHION 1.27 DIA	(RUBBER ONLY)	
2	024828	LEG AMP TILT 16"		
1	036795	NAMEPLATE 62 FENDER	(LOGO)	
2	021998	NUT FLEX LOCK 10-32 W/NYLON IN	(TILT BACK LEG MOUNT)	
8	021972	NUT T 10-32X3/4 STR 3 PRNG BLX	(SPEAKER MOUNT)	
4	064162	NUT T 8-32X1/2 STR 3 PRNG BLX	(HANDLE MOUNT)	
1	028547	REVERB ASSY W/BAG	(PAN,BAG,CABLE,CARDBOARD)	
1	031849	REVERB BAG	(BAG ONLY)	
1	064063	REVERB UNIT 4 SPRING 4AB3C1B	(PAN ONLY)	
2	022277	SCRW M 10-32X1-1/2 OHP NI	(TILT BACK LEG MOUNT)	



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PARTS LIST

CABINET ASSEMBLY CONTINUED

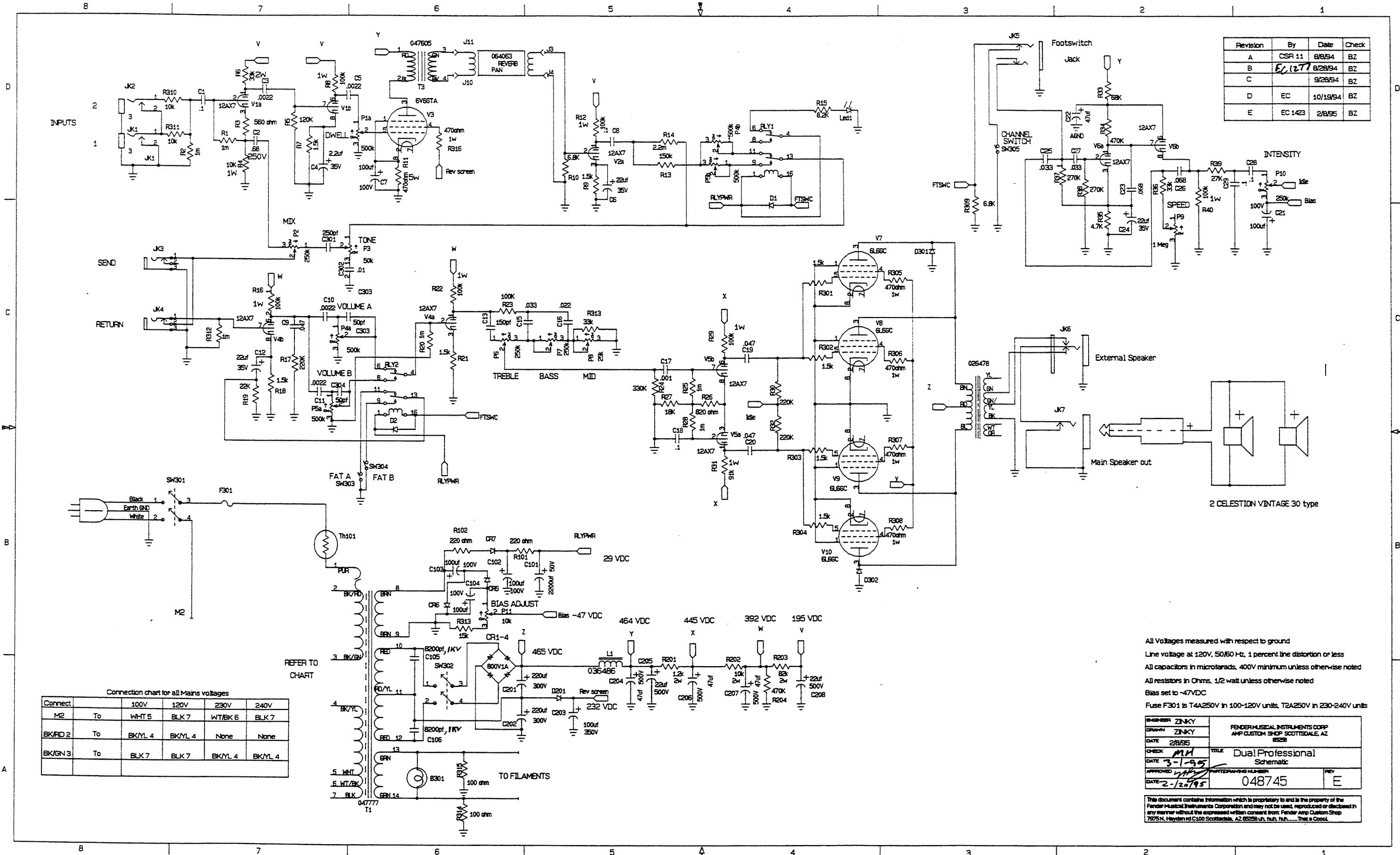
QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
8	043331	SCRW M 10-32X5/8 HWHS BLX	(SPEAKER MOUNT)
4	037247	SCRW M 8-32X1 OHP NI	(HANDLE MOUNT)
4	022236	SCRW M 8-32X3-1/4 OHP NI CONE	(CHASSIS MOUNT)
8	029828	SCRW PB 8X3/4 PHP ZI	
8	037952	SCRW SMA #6X1 OHP NI	(BACK BOARD MOUNT)
2	031344	SCRW SMA 10X3/4 OHP NI	(TILT BACK LEG STOP MOUNT)
4	037210	SCRW SMA 2X3/8 OHP NI	(LOGO MOUNT)
7	011678	SCRW SMA 8X1-1/2 OHP BLX	(GRILLE/BAFFLE MOUNT)
4	026571	SCRW SMA 8X5/8 THP NI	(CORNER MOUNT)
4	026625	SCRW WOOD 8X1 FH	(GLIDE MOUNT)
2	047279	SPEAKER 12" 8 OHM CEL VINTAGE	(CELESTION VINTAGE 30)
2	024752	STRAP CHASSIS 4-1/2" NICKEL	(CHASSIS MOUNT)
8	037215	WSHR C'SNK #6 NI	(BACK BOARD MOUNT)
6	022319	WSHR FLAT 1/4X9/16 NI	(TILT BACK LEG MOUNT)
2	022327	WSHR FLAT 8X7/16 NI	(REVERB BAG MOUNT)
7	029527	WSHR FNSH 8-5/8 FLNGD BLX WX	(GRILLE/BAFFLE MOUNT)
2	024646	WSHR LEG STOP TN	(TILT BACK LEG STOP)
2	022285	WSHR SP LOCK 1/4X.493 ZI	(TILT BACK LEG MOUNT)

FOOTSWITCH ASSEMBLY

QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
1	048868	FTSWITCH ASSY 2 BTN VIN VIB/CHA	(COMPLETE FOOTSWITCH)
1	013172	PLUG PHONE 3 CONDUCTOR 238 RA	
2	024042	SWITCH SPST PUSH BUTTON	

MISCELLANEOUS

QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
1	048749	MANUAL OWNERS DUAL PRO	
1	048746	SCHEMATIC REDUCED DUAL PRO	



Revision	By	Date	Check
A	CSR 11	8/8/94	BZ
B	EC	8/28/94	BZ
C	EC	9/28/94	BZ
D	EC	10/19/94	BZ
E	EC 1423	2/8/95	BZ

Connection chart for all Mains voltages

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

All Voltages measured with respect to ground
 Line voltage at 120V, 50/60 Hz, 1 percent line distortion or less
 All capacitors in microfarads, 400V minimum unless otherwise noted
 All resistors in Ohms, 1/2 watt unless otherwise noted
 Bias set to -47VDC
 Fuse F301 is T4A250V in 100-120V units, T2A250V in 230-240V units

DESIGNED ZINKY	FENDER MUSICAL INSTRUMENTS CORP
DRAWN ZINKY	AMP CUSTOM SHOP, SCOTTSDALE, AZ
DATE 2/8/95	85258
CHECK M1	TITLE Dual Professional
DATE 3-1-95	Schematic
APPROVED [Signature]	PART NUMBER 048745
DATE 2-20-95	REV E

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