

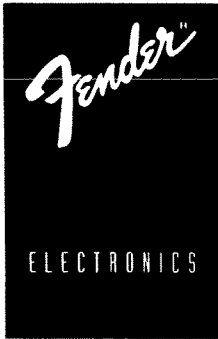
BXR 60

BASS EXTENDED RANGE

SERVICE MANUAL



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



BXR 60

BASS EXTENDED RANGE

SERVICE MANUAL

JUNE 1994 REV A

TYPE PR 261

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.

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 asterick (*) 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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SPECIFICATIONS

Type Specification: PR 261

Power requirements: 120VAC, 60Hz, 180 watts

POWER AMPLIFIER SECTION:

Power output: 60 watts R.M.S. @ 5% THD

Rated load impedance: 8 Ohms

Distortion: Less than .1% @ 1kHz, at onset of clipping,
Less than 1% @ 1kHz, at maximum compression.

Sensitivity: 0.95 volts R.M.S.

Input impedance: 22k ohms

DELTACOMP™ range: 20dB

PREAMP SECTION:

Input impedance:

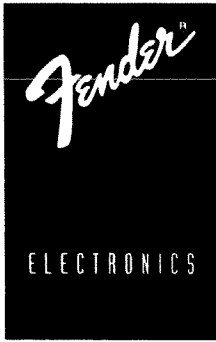
Input 1	Greater than 420k ohms (typically greater than 1 megaohm in the passband)
Input 2	136k ohms

Sensitivity for 60 watts: Input 1 6 mV
Input 2 12 mV
VOLUME at maximum, all tone controls at "0" detent, no enhancements activated.

Equalizer: +/- 12 dB at 80 Hz (low), 500 Hz (low mid), 2.5 kHz (high mid), and 6 kHz (high)

PHYSICAL SPECIFICATIONS:

Height:	22-1/2 inches	(57.2 cm)
Width:	18 inches	(45.7 cm)
Depth:	12 inches	(30.5 cm)
Weight:	45 lbs.	(20.9 kg)



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THEORY OF OPERATION

J1 is a high sensitivity input which can be driven with as much as 2.5 volts R.M.S. J2 is a low sensitivity input which is recommended for Bass Guitars with active pickups, and can handle as much as 5 volts R.M.S.

U1A is a "cheater" Sallen Key filter with gain. It provides a high pass filter at about 70Hz. R31 and C21 create a gradual boost in the high frequencies. This sets up the initial response of the amplifier. R29, R30, C39, and C40 are used for local power supply decoupling for the first two opamp stages. This minimizes noise in the front end of the preamp.

U1B is a variable gain stage. The Volume Control is used as the feedback resistor. This allows a gain adjustment from less than 1 to about 23.

The signal then couples to the Notch Filter circuit. When engaged, this filter provides a narrow band notch of about -20db at 650Hz. The signal then feeds a unity gain amp (U2A) which acts as a buffer to the tone control stage.

The first tone control stage consists of a low and high frequency shelving filter. The Low provides ± 12 db at 80Hz, and the High ± 12 db at 6kHz. The second tone stage consists of two peaking filters. Gytrators U3A and U3B, in conjunction with U4A, provide ± 12 db at 500Hz (low-mid) and 2.5kHz (high-mid).

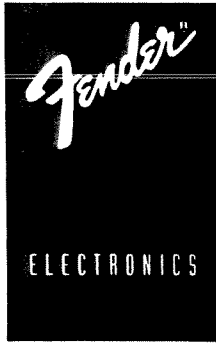
U4B is a summing amplifier with a gain of 1. It combines the Tape Input jacks with the output from U4A. The signal from U4B drives the preamp out jack (J3), is normalled through the power amp in jack, and feeds the input to the power amplifier.

The output of U5A is controlled by the Deltacomp™ compressor circuitry. The amplifier output voltage is sensed by the full wave rectified comparator U5B. As the output of the amplifier approaches clipping, the comparator output goes negative. This charges C26-29 through R44 and CR4-7. As Q2 turns on, current flows to U6. U6 is an operational transconductance amplifier. The current supplied to pin 5 controls the output amplitude of U6. The inverting input of U6 senses the power amp input signal from pin 1 of U5A. U6 inverts the signal and mixes it with the input signal at pin 3 of U5A. This results in a cancellation effect which reduces the amplitude to the input of the power amp. This prevents the amp from clipping. When the amplifier output decreases, C26-29 discharge through R43, and release the Deltacomp™.

JFET Q1 provides a 2-3 second turn on delay for the input of the power amp. When the power is turned on, C25 charges through R53. This pinches off the FET, removing the ground from the power amp input. When the power is switched off, C25 immediately discharges through CR1, which mutes the input to the power amp.

U7 is a high voltage op amp which drives the output transistors. CR10-13 are the Bias diodes. They have a precise temperature characteristic of 2mV decrease in knee voltage, per increase in degree Celsius. This, in conjunction with being mounted through the heatsink, provides excellent thermal tracking capability. Each pair of diodes provides 1.2 VDC to turn on the Darlington output transistors.

CR16-19 make up a simple output protection circuit. If the amplifier output is shorted to ground, the voltage across the diodes will increase, turning them on. The drive signal from U7 will then pass through the diodes to the output, limiting the drive to the output transistors. This circuit protects against momentary shorts only. Longer term shorts (2-5 sec) may damage the output transistors, the protection circuit, and U7.



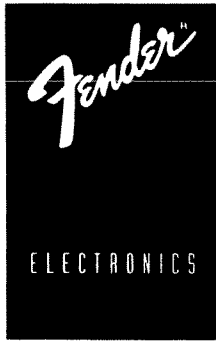
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PARTS LIST

PRINTED CIRCUIT BOARD ASSEMBLY

QTY	PART #	DESCRIPTION	REFERENCE	DESIGNATION
1	047529	PCB ASSY BXR60 BASS AMP	(STUFFED)	
1	028101	BUTTON PUSH SWITCH RED	(@ S1)	
1	029719	CABLE FLAT 5 CKT 10"	P4-P5	
12	026517	CAP AE AX 2.2 μ F 50V	C4,6,10,14,22-29	
2	038692	CAP AE AX 10 μ F 35V	C20,32	
2	028465	CAP AE RDL 22 μ F 25V 20%	C35,36	
4	028471	CAP AE RDL 47 μ F 50V 20%	C33,34,45,46	
2	041048	CAP AE RDL 2200 μ F 50V	C43,44	
1	038873	CAP CA 22PF 100V	C5	
2	038698	CAP CA 47PF 100V	C3,19	
2	039263	CAP CA 1000PF 100V	C18,30	
2	039264	CAP CA 1500PF 100V	C13,16	
2	039268	CAP CA 4700PF 100V	C1,2	
6	038703	CAP CA .1 μ F 50V	C37-42	
1	027278	CAP MPF .1 μ F 63V 10%	C15	
1	027280	CAP MPF .15 μ F 63V	C21	
2	027283	CAP MPF .33 μ F 63V	C11,12	
4	033590	CAP PFF RDL .022 μ F 100V 10%	C7-9,17	
4	033591	CAP PFF RDL .033 μ F 100V 10%	C31	
1	037323	CONTROL SNAPIN 50K 15A	R8	
4	047551	CONTROL SNAPIN 10K 2B CNTR DET	R14,17,20-21	
2	064089	DIODE 1N4003	CR14,15	
11	006260	DIODE 1N4448 SIGNAL	CR1-9,16-17	
4	029045	DIODE 6A 400V 6A4 LEAD FORMED	CR22-25	
4	028776 *	DIODE BIAS BYV26D LEAD FORMED	CR10-13	
2	027329	DIODE ZEN 1N5228B 3.9V 1/2W 5%	CR18,19	
2	028119	DIODE ZEN 1N5353B 16V 5W 5%	CR20,21	
2	026000	FSTN TAB MALE PCB MT.187X.032	CP11,12	
8	025802	FSTN TAB MALE.250X.032 PCB MT	CP3-10	
2	025996	FUSE CLIP PCB .250 & 5MM FUSE	XF1	
1	048827	FUSE QA 1-1/4X1/4 250V 2A	(100/120V ONLY)	
1	020789	FUSE QA 20mmX5mm 250V 1 AMP	(230/240V EXPORT ONLY)	
2	027393	HDR WFR PIN/SKT MLX 09-18-5033	P1,2	
1	027397	HDR WFR PIN/SKT MLX 09-18-5037	P3	
1	027404	IC CA3080AE OTA	U6	
5	016795	IC DUAL OP AMP TL072	U1-5	
1	028047	IC OP AMP MC1436/SG1436Y	U7	
1	040903	INSULATOR MICA TO-218	(@ Q3,4)	
4	037036	JACK PHONE PCB MONO CA PREMIUM	J1-4	
2	031570	JACK PHONE PCB STEREO PREMIUM	J5-6	
1	025933	JACK PHONO DUAL PC MTG	J7	



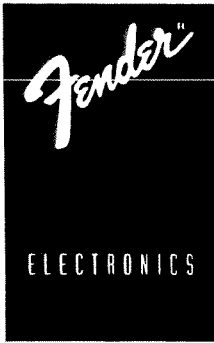
BXR 60

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PARTS LIST

PRINTED CIRCUIT BOARD ASSEMBLY CONTINUED

QTY	PART #	DESCRIPTION	REFERENCE	DESIGNATION
21	020888	JUMPER WIRE 22GA	W1-21	
1	028039	LED RED 5X5MM SLB-55VR3	LD1	
1	047528	PCB FAB BXR 60	(RAW PCB)	
1	047536	HEATSINK PLATE/COUPLER BXR 60		
3	024952	RES CF 1/4W 5% 100Ω	R29,30,36	
4	024965	RES CF 1/4W 5% 1K	R28,31,51,55	
4	024969	RES CF 1/4W 5% 1.5K	R12,13,65,66	
5	024971	RES CF 1/4W 5% 2.2K	R7,24,25,44,50	
1	024973	RES CF 1/4W 5% 3.3K	R6	
3	024977	RES CF 1/4W 5% 4.7K	R38,39,81	
1	028948	RES CF 1/4W 5% 6.2K	R11	
1	024979	RES CF 1/4W 5% 6.8K	R35	
12	024981	RES CF 1/4W 5% 10K	R4,16,19,22,32,47,48,49,76-79	
2	029539	RES CF 1/4W 5% 13K	R9,10	
2	024987	RES CF 1/4W 5% 22K	R18,34	
2	024988	RES CF 1/4W 5% 27K	R54,61	
4	024989	RES CF 1/4W 5% 33K	R15,33,45,46	
4	028990	RES CF 1/4W 5% 51K	R40-43	
2	024995	RES CF 1/4W 5% 68K	R1,2	
1	024997	RES CF 1/4W 5% 100K	R27	
2	024998	RES CF 1/4W 5% 120K	R26,37	
1	025059	RES CF 1/4W 5% 220K	R23	
2	025060	RES CF 1/4W 5% 270K	R3,80	
2	029617	RES CF 1/4W 5% 750K	R5,56	
2	025069	RES CF 1/4W 5% 1M	R52,53	
2	031767	RES CF 1/2W 5% 15Ω	R69,70	
1	028861	RES CF 1/2W 5% 3.3K	R75	
2	041272	RES CF 1/2W 5% 5.6K	R63,64	
2	028029	RES FILM 1W 5% 1.5K	R59,60	
1	028045	RES FILM 1W 5% 220Ω	R62	
2	028030	RES FILM 1W 5% 680Ω	R57,58	
1	034705	RES FILM 2W 5% 270Ω	R71	
2	028028 *	RES WW BT 5W 10% .47Ω	R67,68	
1	036940	RES WW 5W 10% 270Ω	R72	
2	041256	RES WW 5W 10% 470Ω	R73,74	
2	027638	SCRW TF 4-40X3/8 HWHS ZI	(@ Q3,4)	
2	032908	SCRW TF 6-32X3/8 PHP ZI	(PCB TO HEATSINK MOUNT)	
1	9904701440	SPACER LED .7X.125 BLUE	(@ LD1)	
1	028091	SWITCH PUSH SLFLK SHORT STROKE	S1	
1	028503 *	THERMISTOR 10Ω 5A C60-11	TH1	
2	028169	WSHR SHLDR NYL 5/32X1/4	(@ Q3,4)	



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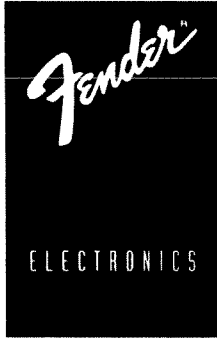
PARTS LIST

PRINTED CIRCUIT BOARD ASSEMBLY CONTINUED

QTY	PART #	DESCRIPTION	REFERENCE	DESIGNATION
1	014689	XSTR N-CH JFET J111 TO-92	Q1	
1	028114	XSTR NPN TIP142 TO-218AC	Q3	
1	014408	XSTR PNP DARLNGTN MPSA63 TO-92	Q2	
1	028115	XSTR PNP TIP147 TO-218AC	Q4	

CHASSIS ASSEMBLY

QTY	PART #	DESCRIPTION	REFERENCE	DESIGNATION
5	033206	BUSHING KNOB SPACER	(@ CONTROLS)	
1	026038	BUSHING SR .625X.062X37/64 BLK	(@ PWR CABLE 100/120V ONLY)	
1	010401	BUSHING SR .625X.125X37/64 WHT	(@ PWR CABLE 230/240V ONLY)	
1	026527	CABLE ASSY PWR 120V .187 TABS	(100/120V ONLY)	
1	026528	CABLE ASSY PWR 230V .187 TABS	(230V ONLY)	
1	036479	CABLE ASSY PWR AUST .187 TABS	(240V AUSTRALIA ONLY)	
1	040992	CABLE ASSY PWR 5A UK .187 TABS	(240V UNITED KINGDOM ONLY)	
1	048305	CHS ASSY BXR 60 120V	(COMPLETE CHASSIS)	
1	047532	CHS BXR 60	(RAW CHASSIS)	
1	028560	END BELL XFMR 85W	(@ TRANSFORMER)	
5	026402	KNOB POINTER BLACK		
4	028591	NUT ACORN 8-32	(TRANSFORMER MOUNT)	
1	047533	PANEL FRONT BXR 60		
1	047534	PANEL REAR BXR 60		
1	9904101560	SCRW 6X3/8 HI-LO PHP BLX	(@ J7 TAPE INPUT JACKS)	
6	017433	SCRW M 6-32X3/8 PHP BLX	(PCB MOUNT)	
2	038900	SCRW TF 6-32X1/4 PHP ZI	(GROUND LUG MOUNT)	
2	027636	SCRW TF 8-32X5/8 HWH BLX	(HEATSINK TO CHASSIS MOUNT)	
1	025935	SWITCH POWER DPST	S2	
1	023978	TUBING SHRINK 1/2 BLACK	(@ XFMR PRIMARY WIRES)	
4	030007	WSHR LCK INTL 8X.330X.02 ZI	(TRANSFORMER MOUNT)	
1	027668	XFMR PWR 120V 85W	(120V DOMESTIC ONLY)	
1	039357	XFMR PWR EXP DELUX 112	(100/115/230V EXPORT)	



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PARTS LIST

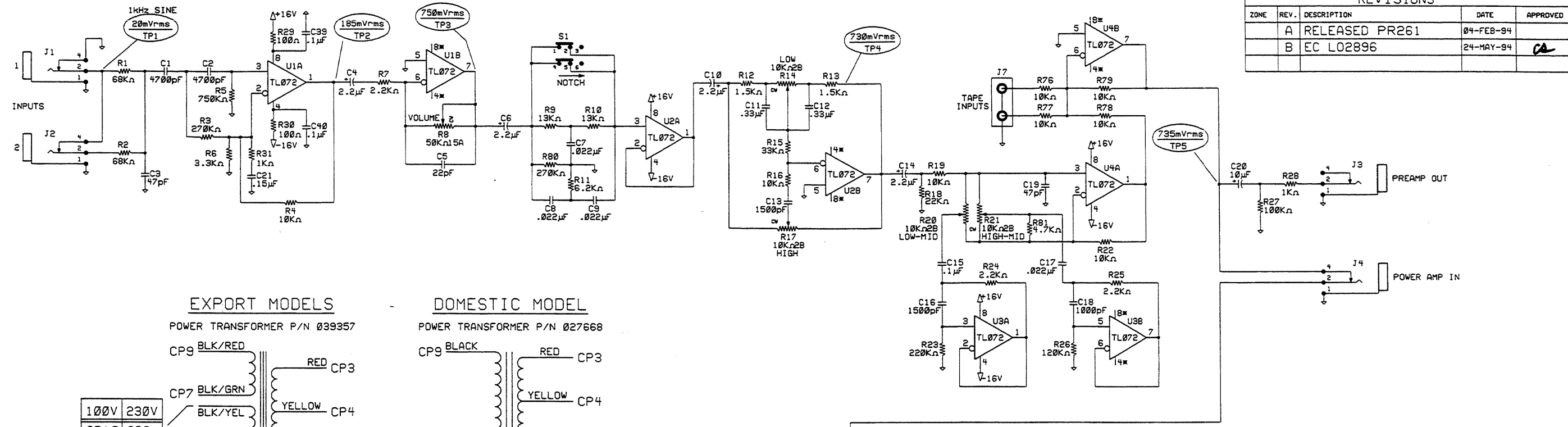
CABINET ASSEMBLY

QTY	PART #	DESCRIPTION	REFERENCE	DESIGNATION
1	047535	CAB ASSY BXR 60	(COMPLETE CABINET)	
1	047535010	GRILLE ASSY BXR 60	(COMPLETE GRILLE)	
4	026317	CLOTH GRILLE BLACK PVC		
6	031867	CORNER 2 HOLE W/NOTCH BLK PWDR		
2	031840	CORNER 3 HOLE BLK PWDRD		
4	027849	GLIDE CAB 1.24X.335 BLX WAX	(STEEL ONLY, NO INSERT)	
2	031845	HANDLE CAP 2 HOLE BLK PWDRD	(HANDLE MOUNT)	
1	025884	HANDLE INSERT 7.78"	(SPRING STEEL)	
1	025883	HANDLE SHORT NO LOGO	(RUBBER ONLY, NO INSERT)	
4	019275	INSERT GLIDE CUSHION 1.27 DIA	(RUBBER ONLY)	
1	011298	NAMEPLATE FENDER SMALL	(LOGO)	
4	021972	NUT T 10-32X3/4 STR 3 PRNG BLX	(HANDLE MOUNT)	
4	026577	SCRW M 10-32X1 PHP BLX	(HANDLE MOUNT)	
4	017441	SCRW M 10-32X1-1/2 OHP STL BLX	(CHASSIS MOUNT)	
4	036199	SCRW M 8-32X1-3/16 OHP BLX CP	(SPEAKER MOUNT)	
2	018113	SCRW SMA 4X1/2 OHP BLX	(LOGO MOUNT)	
14	026576	SCRW SMA 8X5/8 TH BLACK	(CORNER MOUNT)	
4	017942	SCRW WOOD 8X1 BLACK	(GLIDE MOUNT)	
1	047539	SPEAKER 12" 8 OHM 75 WATT BXR 60		
4	029527	WSHR FNSH 8-5/8 FLNGD BLX WX	(CHASSIS MOUNT)	

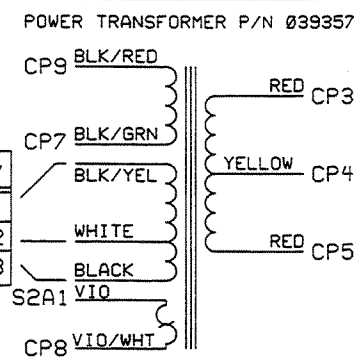
MISCELLANEOUS

QTY	PART #	DESCRIPTION	REFERENCE	DESIGNATION
1	047537	CARTON BXR 60		
8	038561	EPERAN FOAM CORNER 4-3/4X4-3/4		
1	047538	MANUAL OWNERS BXR 60		
1	047526	SCHEMATIC REDUCED BXR 60		

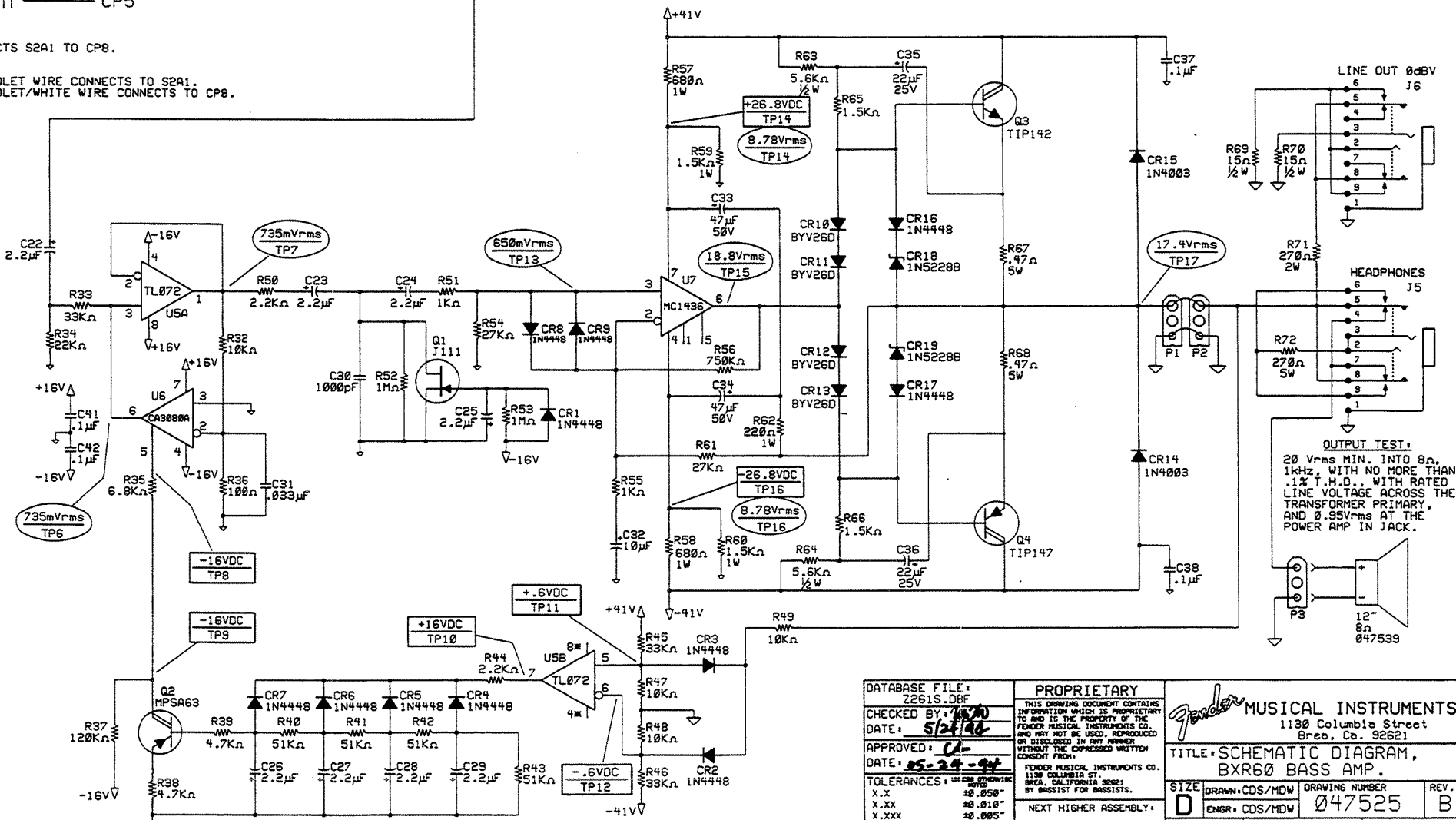
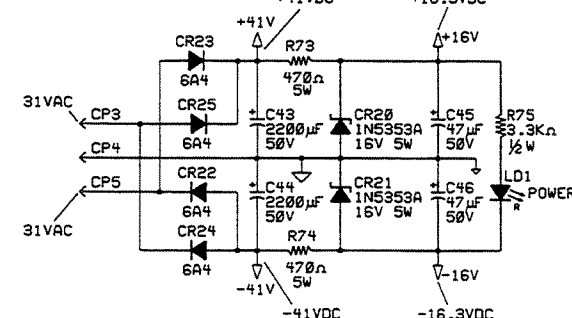
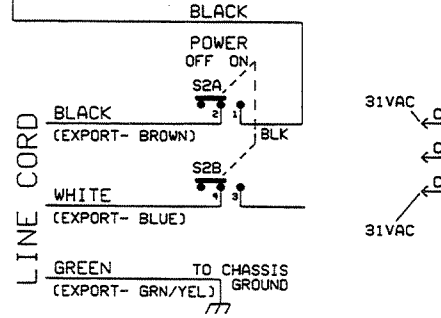
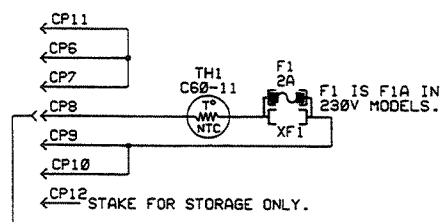
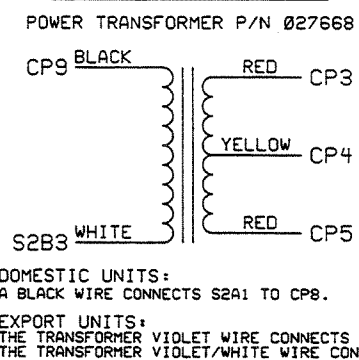
REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	RELEASED PR261	04-FEB-94	
	B	EC L02896	24-MAY-94	CA



EXPORT MODELS



DOMESTIC MODEL



- NOTES:
- 1.) ALL RESISTORS 1/4W 5% UNLESS NOTED OTHERWISE.
 - 2.) ALL CAPACITORS 35V MINIMUM UNLESS NOTED OTHERWISE.
 - 3.) ALL DC MEASUREMENTS TAKEN TO GROUND, WITH NO SIGNAL APPLIED, WITH A DMM.
 - 4.) ALL AC MEASUREMENTS TAKEN TO GROUND, USING A TRUE RMS DMM, UNDER THE FOLLOWING CONDITIONS: ALL CONTROLS AT 50%.
 - 5.) ALL VOLTAGE MEASUREMENTS ARE ±20%.
 - 6.) LAST INSTANCES: R81, C46, U7, Q4, CR25, P3, CP12, J7, S2, F1, XFI, TH1, LD1, TP17.
 - 7.) SIX-DIGIT NUMBERS ARE FENDER PART NUMBERS.

DATABASE FILE: 2261S.DBF

CHECKED BY: [Signature]

DATE: 5/27/94

APPROVED: [Signature]

DATE: 05-24-94

TOLERANCES: UNLESS OTHERWISE NOTED

PROPRIETARY

FENDER MUSICAL INSTRUMENTS CO. 1130 COLUMBIA STREET, BREA, CALIFORNIA 92621

FENDER MUSICAL INSTRUMENTS CO. 1130 COLUMBIA STREET, BREA, CALIFORNIA 92621

BY ASSISTANT FOR BASSISTS.

NEXT HIGHER ASSEMBLY:

TITLE: SCHEMATIC DIAGRAM, BXR60 BASS AMP.

SIZE: D

DRAWN: CDS/MOW

DRAWING NUMBER: 047525

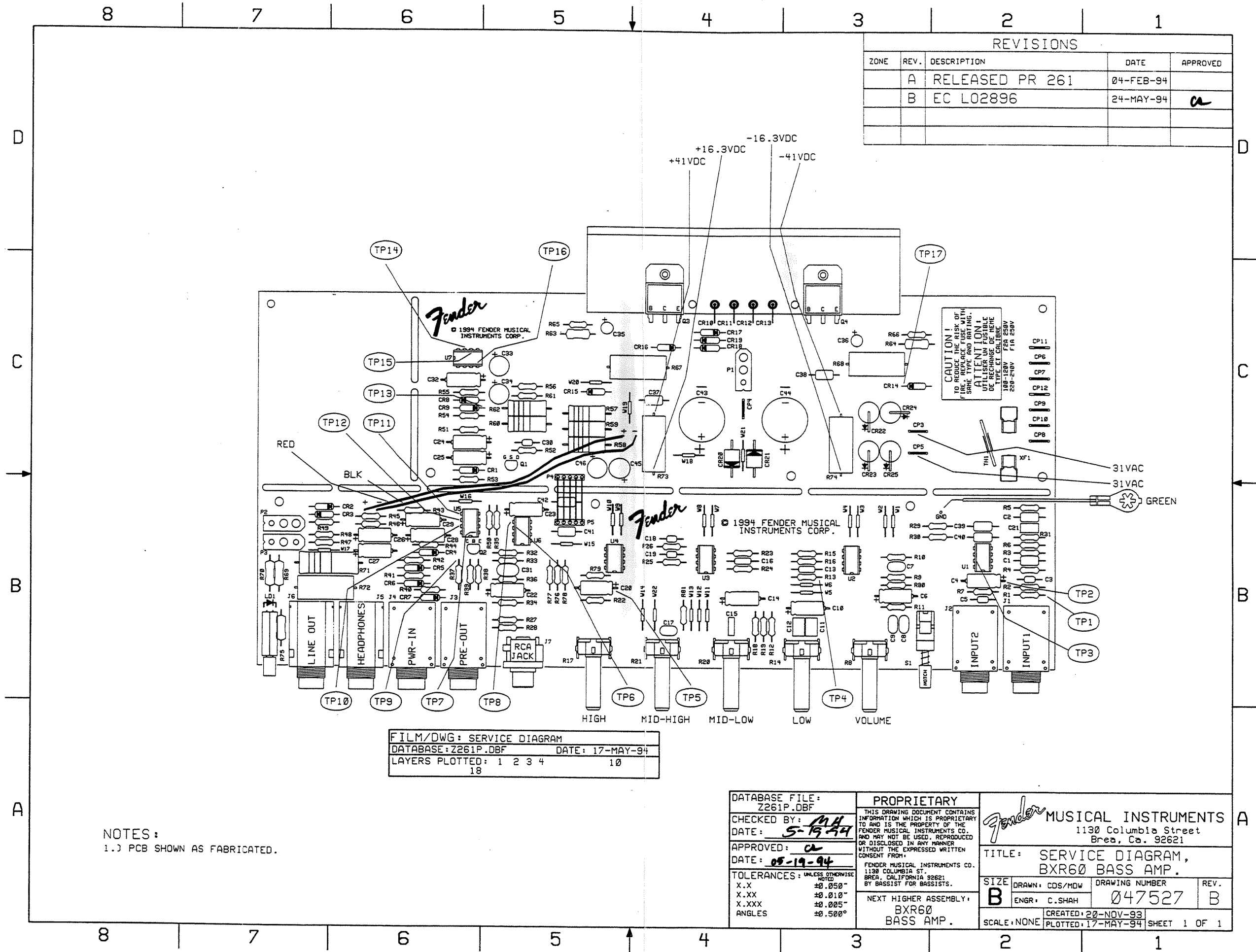
REV. B

CREATED: 08-OCT-93

PLOTTED: 19-MAY-94

SHEET 1 OF 1

PART NO. 0047526000 SHEET



REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	RELEASED PR 261	04-FEB-94	
	B	EC L02896	24-MAY-94	<i>ca</i>

FILM/DWG: SERVICE DIAGRAM
 DATABASE: Z261P.DBF DATE: 17-MAY-94
 LAYERS PLOTTED: 1 2 3 4 10 18

NOTES:
 1.) PCB SHOWN AS FABRICATED.

DATABASE FILE: Z261P.DBF		PROPRIETARY <small>THIS DRAWING DOCUMENT CONTAINS INFORMATION WHICH IS PROPRIETARY TO AND IS THE PROPERTY OF THE FENDER MUSICAL INSTRUMENTS CO. AND MAY NOT BE USED, REPRODUCED OR DISCLOSED IN ANY MANNER WITHOUT THE EXPRESSED WRITTEN CONSENT FROM:</small>		Fender MUSICAL INSTRUMENTS 1130 Columbia Street Brea, Ca. 92621	
CHECKED BY: <i>MA</i> DATE: <i>5-19-94</i>		APPROVED: <i>ca</i> DATE: <i>05-19-94</i>		TITLE: SERVICE DIAGRAM, BXR60 BASS AMP.	
TOLERANCES: UNLESS OTHERWISE NOTED X.X ±0.050" X.XX ±0.010" X.XXX ±0.005" ANGLES ±0.500°		FENDER MUSICAL INSTRUMENTS CO. 1130 COLUMBIA ST. BREA, CALIFORNIA 92621 BY BASSIST FOR BASSISTS.		SIZE: B DRAWN: CDS/MDW ENGR: C.SHAH DRAWING NUMBER: 047527 REV: B	
		NEXT HIGHER ASSEMBLY: BXR60 BASS AMP.		CREATED: 20-NOV-93 PLOTTED: 17-MAY-94 SCALE: NONE SHEET 1 OF 1	