BXR 200

BASS EXTENDED RANGE
COMBO & HEAD

SERVICE MANUAL

CONTENTS:

Fender Musical Instruments Corp. 8860 E. Chaparral Road Suite 100 Scottsdale, AZ 85250

BXR 200

(This is the model name for warranty claims)

SERVICE MANUAL

MARCH 1996

IMPORTANT NOTICE:

The information contained herein is CONFIDENTIAL and PROPRIETARY to Fender Musical Instruments Corp. 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 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

BXR 200
SPECIFICATIONS

Product Release No.:	PR 286 *(This is not a model number)*
POWER AMPLIFIER SECTION:	
Power Output:	200 Watts RMS
Distortion at 200 watts:	Less than .1% @ 1kHz, below compression Less than 1% @ 1kHz, maximum compression
Rated Load Impedance:	4Ω
Sensitivity:	1.03V RMS
Input Impedance:	22kΩ
DELTACOMP Range:	20db
PREAMP SECTION:	
Input Impedance:	Input 1 – Greater than 420kΩ (typically greater than 1M ohm in the passband) Input 2 – 136kΩ
Sensitivity for 200 watts: GAIN at maximum, all tone controls at "0" detent, no enhancement activated.	Input 1 – 2.2mV Input 2 – 4.4mV
Shelving Tone Controls:	LOW +/- 12dB at 60Hz HIGH +/- 12dB at 10 kHz
Graphic Equalizer:	+/- 12dB at 80,140,250,450,800,1.4k,2.5k, 4.5k and 8kHz.

Dimensions:

	BXR 200 Combo		*BXR 200 Head*	
Height:	25-1/2"	(64.8 cm)	6-29/32 inches	(17.5cm)
Width:	21-1/2"	(54.6 cm)		
Depth:	13-1/2"	(34.3 cm)		
Weight:	72 lbs.	(32.7 kg)	27 lbs	(12.3 kg)

Product specifications are subject to change without notice

BXR 200
CIRCUIT DESCRIPTION

PREAMP

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

U1A is a "cheater" Sallen Key filter with gain. R79 and C82 create a gradual boost in the high frequencies. This sets up the initial response of the amplifier. C43 and C44 are used for local power supply decoupling for the first two op-amp stages. This minimizes noise and hum in the front end of the preamp.

U1B is a variable gain stage. The Gain Control is used as the feedback resistor. This allows a gain adjustment from less than 1 to about 10.

At the input of U2A, the DEEP enhancement switch boosts and extends the low-frequency response. Within the negative feedback loop, the BRIGHT enhancement switch adds high frequency "sparkle". The output of U2A drives the Notch Filter circuit. When engaged, this filter provides a narrow band notch of about –20db at 650 Hz. The signal then feeds a unity gain amp (U2B) and couples to the first tone control stage.

From the active tone controls the signal is routed to the second Gain stage (U8B). If the DeltaComp is off, switch S5B places Q1 & Q2 into the feedback loop, where they are biased asymetrically to provide non-symetrical soft clipping, which simulates a tube sound. The diode junctions Q1,Q2, CR1 and CR2 drop a constant knee-voltage independent of current. As the signal increases above a certain level, the constant voltage alters the feedback current to the op-amp in a non-linear fashion. This non-linear transfer characteristic is what rounds off the resulting signal into a tube-type, soft-clipping waveshape. With the DeltaComp engaged, the soft-clipping circuit is disabled.

CHORUS

The input signal to the Chorus circuit is capacitivly (C61) coupled to U10A, which drives the Bucket Brigade Device (BBD) U13. Trimpot R105 sets the DC bias for U10A and U12A. When properly adjusted, the output from U10A & U12A will display symmetrical clipping. (Refer to the adjustment procedure on the service diagram). The BBD is clocked by U14 at 180kHz. The 180kHz carrier clock is Frequency Modulated by the Low Frequency Oscillator U11, which deviates the carrier at maximum DEPTH from 60kHz to 300kHz. The RATE of deviation runs from about 0.3Hz to 8.7Hz. The FM deviation on top of the BBD delay results in a pleasing choral effect.

C62 and R107 (@U10A) provide pre-emphasis above 7kHz. At the output of U12A, R121 and C74 provide the de-emphasis. This helps to reduce noise. C64, C65 and C67 filter out clock noise. The Dry and Chorus signals are summed at U12B and then fed to the power amplifier. Via the Chorus select switch or the footswitch, the Chorus effect can be switched on or off. The collector of Q4 provides the control voltage which enables U11, and determines the state of JFET Q5. A –15Vdc from Q4 enables U11 to oscillate, and pinches off JFET Q5, which removes the ground from the node between R123 & R124.

DELTACOMP™

The signal from the preamp feeds from P1B pin 4, through a ribbon cable, to P1A on the power amplifier PCB. The signal couples (via C1) to the unity gain amplifier U1B. U1B contains a closed loop (gain of 1) negative feedback path, along with positive feedback through the inverting Operational Transconductance Amplifier (OTA) U2. U1B and U2 make up the gain reduction circuit for the DeltaComp clip protection feature.

DELTACOMP™ (Cont)

The attack and release circuit for the DeltaComp is made up by the Diode, Resistor, and Capacitor network which drives the Base of Q19. Comparator U1A senses the voltage from the Collectors of Q20 & Q21. When the power amplifier approaches clipping on a positive swing, the collector of Q5 pulls up R56, which turns on Q20, transferring –16Vdc to the collector, pulling down R60. This causes the output (pin 1) of U1A to switch from +15Vdc to –15Vdc, lighting the DeltaComp/Clip Led. *Note: when the DeltaComp is disabled, the Led indicates clipping of the output stage*. WIth the DeltaComp enabled, the Led indicates an active DeltaComp circuit. The negative control voltage from R60 also feeds through P1A to P1B on the preamp PCB. The voltage is routed to the DeltaComp switch (S5A), located on the front panel. With the switch engaged, the control voltage is sent back through the ribbon cable (via P1 pin 6) to the attack/release circuit.

The negative voltage drives through Diodes CR31-CR34, and charges Capacitors C16-C19 all at once in parallel as a one pole filter through a single time constant of R60 X (C6+17+18+19) or 2.2k X 8.8 uF = 19.4 mSec. As they charge, Q19 turns on and provides current to pin 5 of the OTA (U2). The current controls the output amplitude of U2. The inverted signal from U2 mixes with the input to U1B providing cancellation which reduces amplitude of U2. The inverted signal from U2 mixes with the input ot U1B providing cancellation which reduces the input to the power amplifier. This prevents the amplifier from clipping. When the output of the power amplifier is reduced, the output of U1A toggles back to +15vdc. Due to the blocking action of Diodes CR31-CR34, Capacitors C16-C19 are forced to discharge as a 4-pole filter with different time constants through R55. R51 prevents Parasitic oscillation while Zener CR30 provides 2 slopes which results in smoother limiting.

When the power amplifier approaches clipping on a negative swing, R62 is pulled low, turning on Q22 which pulls up the Base of Q21, transferring –16vdc to the collector.

POWER AMPLIFIER

JFET Q1 and associated components provide a 4-5 second turn-on delay for the audio input to the power amplifier. When the power is switched on, Capacitor C5 charges through Resistor R7. The negative Gate voltage pinches off the JFET, removing the ground from the input of the amplifier. When the power is switched off, C5 immediately discharges through Diode CR1, grounding the input of the amplifier. ***TROUBLESHOOTING TIP:*** Check for proper operation of this circuit when experiencing excessive turn-on or turn-off “Pops”, or no output when signal applied to the input. Many times the JFET itself can be the culprit. ***NOTE:*** Excessive turn-off “Pops” can also be caused by uneven discharge of the +/- power supplies. Usually a mismatch in the Filter Capacitors will cause this problem. Its easy to look at both supplies on an oscilloscope. Invert one scope input and check for even discharge to zero volts.

Q4 is the current source for the Differential Amplifier (Q2,Q3). For the Diff amp to work properly, one half of the current from the current source must flow through each leg of the Diff amp. If the same amount of current flows through each leg of the Diff amp, the voltage drop across resistors R14 &R15 must be the same. If not, there will be a DC offset at the output of the amplifier. The overall gain of the amplifier is set up around the Diff amp. R16 (27k) is the feedback resistor and R17 (1k) is the pull-down resistor. Rfb +Rpd ÷ Rpd = Av. Therfore 27k + 1k ÷ 1k = 28k ÷ 1k = 28Av.

Q9 & Q10 make up a voltage amplification stage. Again, to operate properly, the same amount of current must flow trhough these transistors. Thus the voltage drop across R20 & R21 must be the same. Diodes CR16-CR9 (BYV26D) make up the Fixed Bias circuit for the output transistors. The bodies of the Diodes are mounted through the heatsink to properly track the temperature of the transistors. These Diodes were selected because they exhibit a 2mV decrease in Knee Voltage for every 1 degree (Celsius) increase in temperature. The Collectors of Q9 & Q10 are at 0 volts. Therefore the Bias Diodes provide 2 voltage drops (1.2 volts) to the Base of Driver Transistors Q13 & Q14. One Diode drop (0.6 volts) Biases on the Driver Transistors. The remaining 0.6 volts drops across the output transistors (Q15-Q18) in parallel, Biasing them on.

Transistors Q11, Q12, and associated components comprise the Current Limiting or Short Proof protection circuit. There are usually two conditions which demand excessive output current from the amplifier. A shorted speaker cable, or a load impedance which is below the minimum rating of the amplifier. If these conditions occur, the voltage drops across the Emitter Resistors (.33Ω 5 Watt) will dramatically increase. On the positive side of the amplifier, C11 charges through R29 & R34. On the negative side C12 charges through R30 & R35. Htis will cause Q11 & Q12 to turn on. This limits the amount of signal which is available to the Base of the Driver Transistors (Q13 & Q14). CR20-CR23 make up a latching circuit that senses the signal through R22. This ensures that Q11 & Q12 turn on hard in conduction. When the fault condition is removed from the output, the current limiting circuit will remain latched up until the input signal is removed.

Q13 & Q14 are the Driver Transistors for the output section. Q15-Q18 are the output transistors. Notice on the schematic that the Base resistors carry the "Fp" designation. Htis indicates a Flame Proof/Fuse Type resistor. They won't burn and they act like a fuse when exposed to an over-current condition. This prevents catastrophic damage to the output section. If an output transistor shorts Base to Collector or Base to Emitter, the resistor will simply open. IN many cases the amplifier will continue to operate, but at a reduced power level. An increase in distortion may also become apparent. When replacing these resistors, ALWAYS use the Fuse Type OEM part.

PARTS LIST

NOTE: SHADED ITEMS ARE FOR REFERENCE ONLY

PREAMP PRINTED CIRCUIT BOARD ASSEMBLY

QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
5	048451000	BUTTON PUSH OFF WHITE	@S1-S5
1	033379000	CABLE RIBBON 3 CKT 10"	@P3B
1	049334000	CABLE RIBBON 3 CKT 20"	@P4B
1	048914000	CABLE RIBBON 8 CKT 7"	@P1B
1	048845000	CABLE RIBBON 12 CKT 3-3/4"	@P7B
1	033605000	CAP AE RDL .15uF 50V 20%	C75
1	038689001	CAP AE AX .47uF 100V	C8
2	028458000	CAP AE RDL 1uF 50V 20%	C68,72
4	026517001	CAP AE AX 2.2uF 50V	C4,16,42,45
12	038692001	CAP AE AX 10uF 35V	C9,18,21,24,27,30,33,36,39,41,48,51
2	028456000	CAP AE RDL 22uF 25V 20%	C63,81
1	028471000	CAP AE RDL 47uF 50V 20%	C59
1	028479000	CAP AE RDL 220uF 25V 20%	C70
1	038873001	CAP CA 22PF 100V LL	C5
1	004026000	CAP CD 22PF 1000V 10%	C69
3	038698001	CAP CA 47PF 100V 10%	C3,58,80
1	007029000	CAP CD 220PF 1000V 10%	C67
1	039264001	CAP CA 1500PF 100V LL	C15
4	038703001	CAP CA .1uF 50V LL	C43,44,83,84
1	027278000	CAP MPF .1uF 63V 10%	C60
2	027280000	CAP MPF .15uF 63V	C13,14
1	027281000	CAP MPF .22uF 63V	C82
2	030933000	CAP PFF .0012uF 50V 5%	C46,47
2	033579000	CAP PFF RDL .0015uF 100V 10%	C65,71
2	030936000	CAP PFF .0022uF 50V 5%	C37,38
2	030939000	CAP PFF .0039uF 50V 5%	C34,35
2	033582000	CAP PFF RDL .0039uF 100V 10%	C61,66
1	033583000	CAP PFF RDL .0047uF 100V 10%	C62

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PARTS LIST
PREAMP PRINTED CIRCUIT BOARD ASSEMBLY (CONT)

QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
2	030943000	CAP PFF .0068uF 50V 5%	C31,32
2	030929000	CAP PFF 820PF 50V 5%	C49,50
2	033588000	CAP PFF RDL .01uF 100V 10%	C1,2
2	030946000	CAP PFF .012uF 50V 5%	C28,29
1	036234000	CAP PFF RDL .015uF 100V 10%	C7
2	030950000	CAP PFF RDL .022uF 50V 10%	C25,26
3	033590000	CAP PFF RDL .022uF 100V 10%	C10,11,12
2	033591000	CAP PFF RDL .033uF 100V 10%	C17,40
2	030954000	CAP PFF .047uF 50V 5%	C22,23
4	033592000	CAP PFF RDL .047uF 100V 10%	C6,64,73,74
2	030959000	CAP PFF RDL .082uF 50V 5%	C19,20
2	031087000	CONTROL SNAPIN 25K 2B W/DETENT	R19,22 (LOW/HIGH TONE CONTROLS)
9	040673000	CONTROL SLIDE 20MM 50K CTRDET	R57-63,77,78 (EQUALIZER)
2	027945000	CONTROL SNAP IN 100K B TAPER	R95,100 (RATE, DEPTH)
1	031090000	CONTROL 100K 10A/100K 5C	R8 (GAIN)
1	019994000	CONTROL T-POT 100K 20% PC MTG	R105
6	006260001	DIODE 1N4448 SIGNAL LL	CR1-6
1	027421000	HDR .1 CTR 12 CKT SQ PIN	P7A
2	027410000	HDR .1CTR 3CKT AW PIN	P2A, P4A
12	016795000	IC DUAL OP AMP TL072	U1-12
1	029671000	IC MN3007 BUCKET BRIGADE	U13
1	029672000	IC MN3101 CLOCK GEN/DRIVER	U14
2	030771000	JACK ¼ PCB 2/CD SCC	J4,5 (SEND, RETURN)
1	030987000	JACK ¼ PCB 3/CD DOC	J6 (LINE OUT)
3	037036000	JACK PHONE PCB MONO CA PREMIUM	J1,2,3 (INPUTS, FOOTSWITCH)
1	04012000	JACK XLR MALE (A/D XLM-3PV)	J7 (LINE OUT)
60	020888001	JUMPER WIRE 22GA	W1-60
1	028097000	LED 5X5MM YELLOW SLB-55YY3	LD2
2	028039000	LED RED 5X5MM SLB-55VR3	LD1,3
1	048947001	PCB ASSY PREAMP BXR 200	STUFFED
1	048946000	PCB FAB PRE AMP BXR 200	RAW PCB
1	025818001	RES CF 1/4W 5% 4.7 OHM LL	R68
3	024974001	RES CF 1/4W 5% 47OHM LL	R109,115,116
3	024965001	RES CF 1/4W 5% 1K LL	R79,127,129
1	024969001	RES CF 1/4W 5% 1.5K LL	R101
1	024970001	RES CF 1/4W 5% 1.8K LL	R121
11	024973001	RES CF 1/4W 5% 3.3K LL	R6,25,40,44,48,52,56,66,71,75,96
5	026504001	RES CF 1/4W 5% 3.6K LL	R12,18,23,32,36
1	024977001	RES CF 1/4W 5% 4.7K LL	R107
3	028034001	RES CF 1/4W 5% 5.1K LL	R111,114,117
1	024978001	RES CF 1/4W 5% 5.6K LL	R73
1	028948001	RES CF 1/4W 5% 6.2K LL	R17
3	024979001	RES CF 1/4W 5% 6.8K LL	R30,34,69
5	024980001	RES CF 1/4W 5% 8.2K LL	R38,42,46,50,54
18	024981001	RES CF 1/4W 5% 10K LL	R4,7,9,10,13,14,21,24,26-28,64,65,87,89,91-93
2	029539001	RES CF 1/4W 5% 13K LL	R15,16
5	024986001	RES CF 1/4W 5% 18K LL	R97,108,118,119,120
1	029006001	RES CF 1/4W 5% 20K LL	R106
1	024987001	RES CF 1/4W 5% 22K LL	R67
2	024989001	RES CF 1/4W 5% 33K LL	R20,98
4	024993001	RES CF 1/4W 5% 47K LL	R29,33,72,94
4	028990001	RES CF 1/4W 5% 51K LL	R37,76,123,124
4	024994001	RES CF 1/4W 5% 56K LL	R41,45,49,53
3	024995001	RES CF 1/4W 5% 100K LL	R31,35,74,86,88,102,112,113,125,126,128
1	028549001	RES CF 1/4W 5% 110K LL	R39
6	024998001	RES CF 1/4W 5% 120K LL	R43,47,51,55,70,83
2	025059001	RES CF 1/4W 5% 220K LL	R82,122
1	025060001	RES CF 1/4W 5% 270K LL	R3

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PARTS LIST

PREAMP PRINTED CIRCUIT BOARD ASSEMBLY (CONT)

QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
2	025061001	RES CF 1/4W 5% 330K LL	R104,110
1	025065001	RES CF 1/4W 5% 470K LL	R99
1	029617001	RES CF 1/4W 5% 750K LL	R5
1	025069001	RES CF 1/4W 5% 1M LL	R90
1	025075001	RES CF 1/4W 5% 2.2M LL	R103
1	025084001	RES CF 1/4W 5% 10M LL	R80
1	026549001	RES CF 1/2W 5% 1.5K LL	R85
1	028861001	RES CF 1/2W 5% 3.3K LL	R84
2	031188000	SCRW M4-40X1/4 PHPS ZI W/WSHR	@EQ STANDOFFS
3	9904701440	SPACER LED .7X.125 BLUE	@LD1,2,3
2	016746000	STANDOFF RND AL 4-40X1/2X1/4	@EQ PCB
5	028091000	SWITCH PUSH SLFLK SHORT STROKE	S1-5
1	014689000	XSTR N-CH JFET J111 TO-92	Q5
4	016793000	XSTR NPN 2N4401 TO-92	Q1,2,4,6
1	016742000	XSTR PNP 2N4403 TO-92	Q3

POWER AMPLIFIER PRINTED CIRCUIT BOARD ASSEMBLY

QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
1	029779*	BREAKER THERMAL NC OPEN 248	TS1
8	02845900	CAP AE RDL 2.2uF 50V 20%	C1,3,6,16-20
1	028460000	CAP AE RDL 4.7uF 50V 20%	C5
5	028471000	CAP AE RDL 47uF 50V 20%	C13,14,31,32,34
3	025787000	CAP AE RDL MINI 100uF 16V NP	C7,11,12
2	028494000	CAP AE RDL 1000uF 35V 20%	C25,26
2	028031000	CAP AE RDL 3300uF 63V	C22,23
1	025970000	CAP CD 5PF 1000V 10%	C8
2	025982000	CAP CD 68PF 1000V 10%	C9,10
1	033580000	CAP PFF RDL .0022uF 100V 10%	C4
5	027278000	CAP MPR .1uF 63V 10%	C21,27-30
1	024854000	CAP MPF RDL .1uF 400V 10%	C15
7	064089001	DIODE 1N4003 LL	CR38-41,44-46
25	006260001	DIODE 1N4448 SIGNAL LL	CR1-3,5-9,11-14,20,21,24,25,31-37,42,43
2	020534000	DIODE 1N5402 RECTIFER 200V C&F	CR28,29
4	028776000	DIODE BIAS BYV26D LEAD FORMED	CR16-19
4	025821001	DIODE HV FDH-400 SWITCING LL	CR10,15,26,27
1	027329001	DIODE ZEN 1N5228V 3.9V 5% LL	CR30
2	027327001	DIODE ZEN 1N5234V 6.2V 5% LL	CR22,23
1	031019001	DIODE ZEN 1N5245V.5W 15V 5% LL	CR4
21	025802000	FSTN TAB MALE .250X.032 PCB MT	CP1,2A,2B,3-16
2	025996000	FUSE CLIP PCB .250 & 5MM FUSE	XF1
4	020775000	FUSE CLIP PCB 5MM	XF2,3
1	090738000	FUSE QA 1-1/4X1/4 250V 6A	F1 (100/120V ONLY)
1	020796	FUSE QA 20MMX5MM 250V 3.15A	F1 (EXPORT 220/230/240V ONLY)
2	013112000	FUSE TD 20MMX5MM 250V 1A	F2,3
1	027416000	HDR .1 CTR 8 CKT SQ PIN	P1A
1	048939000	HEATSINK BAR BXR/KCR 200	MAIN HEATSINK
2	025796000	HEATSINK TO-220	@U3,4
1	027404000	IC CA3080AE OTA	U2
1	016795000	IC DUAL OP AMP TL072	U1
1	013562000	IC REGULATOR +15V MC7815CT	U3
1	013564000	IC REGULATOR –15V MC 7915CT	U4
1	027387000	INDUCTOR AIR CORE RDL 2.5UH	L1
4	038815000	INSULATOR SILICONE TO-3P	@Q15-18
2	026043000	JUMPER WIRE 18GA .8X.175	JP1,2
27	020888001	JUMPER WIRE 22GA	W1-27
1	048843001	PCB ASSY PWR AMP BXR 200	STUFFED
1	048842000	PCB FAB PWR AMP BXR 200	RAW PCB

BXR 200
PARTS LIST

POWER AMPLIFIER PRINTED CIRCUIT BOARD ASSEMBLY (CONT)

QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
4*	031693001	RES MF FUSE 1/4W 5% 4.7 OHM LL	R39-37,40-41
2*	033205001	RES MF FUSE 1/4W 5% 15 OHM LL	R27,28
2	024940001	RES CF 1/4W 5% 18 OHM	R69-70
1*	027749001	RES MF FUSE 1/4W 5% 22 OHM LL	R33
2	024947001	RES CF 1/4W 5% 47 OHM LL	R10,11
1	024952001	RES CF 1/4W 5% 100 OHM LL	R4
2	024956001	RES CF 1/4W 5% 220 OHM LL	R20-21
2	024961001	RES CF 1/4W 5% 470 OHM LL	R29-30
1	024963001	RES CF 1/4W 5% 680 OHM LL	R67
8	024965001	RES CF 1/4W 5% 1K LL	R5,8,17,22,24,25,49,64
7	024971001	RES CF 1/4W 5% 2.2K LL	R14,15,18,19,34,35,60
1	024977001	RES CF 1/4W 5% 4.7K LL	R51
5	025942001	RES CF 1/4W 5% 7.5K LL	R12,52-55
6	024981001	RES CF 1/4W 5% 10K LL	R3,47,50,57,58,61
2	024985001	RES CF 1/4W 5% 15K LL	R13,65
1	024987001	RES CF 1/4W 5% 22K LL	R1
4	024988001	RES CF 1/4W 5% 27K LL	R9,16,31,32
1	024989001	RES CF 1/4W 5% 33K LL	R2
5	024997001	RES CF 1/4W 5% 100K LL	R56,59,62,63,66
1	024998001	RES CF 1/4W 5% 120K KK	R48
2	025069001	RES CF 1/4W 5% 1M LL	R6,7
1	028029001	RES FILM 1W 5% 1.5K LL	R73
1	027627001	RES FILM 1W 5% 10 OHM LL	R44
2	036621001	RES CF 1W 5% 6.8K LL	R23,26
2	027628000	RES FILM 2W 5% 47 OHM	R45,46
4	032958000	RES WW BT 5W 10% .33 OHM	R38,39,42,43
1	041256000	RES WW BT 5W 10% 470 OHM	R68 (IN BXR 200 ONLY)
2	041595000	SCRW 6-32X3/16 PHP STL ZI SEMS	@TS1
8	027638000	SCRW TF 4-40X3/8 HWHS ZI .1" HD	@Q13-18, U3,4
5	032908000	SCRW TF 6-32X3/8 PHP ZI	PCB TO HEATSINK MOUNT
1	026411000	THERMISTER 2.5OHM 8A C30-19	TH1
1	014689000	XSTR NPN 2N4401 TO-92	Q11,20,21
3	016739000	XSTR NPN 2SC2362K/2SC2389	Q2-4,8
2	028763000	XSTR NPN 2SC3281 TOP-3L	Q15,17
1	028760000	XSTR NPN 2SC3298A TOP-220	Q13
1	014867000	XSTR NPN MPSW10 TO-226AE	Q10
2	016742000	XSTR PNP 2N4403 TO-92	Q12,22
3	025752000	XSTR PNP 2SA1016K TO-92	Q5,6,7
2	028762000	XSTR PNP 2SA1302 TOP-3L	Q16,18
1	028759000	XSTR PNP 2SA1306A TOP-220	Q14
1	014408000	XSTR PNP DRLNGTN MPSA63 TO-92	Q19
1	014866000	XSTR PNP MPSW92 TO-226AE	Q9

CHASSIS ASSEMBLY

QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
1	048953000	CHS ASSY BXR 200 120V COMBP	COMPLETE CHASSIS
1	049531	CHS ASSY BXR 200 120V HEAD	
1	007565000	BUSHING SR .625X.125X37/64 BLK	@ PWR CABLE 100/120V ONLY
1	010401	BUSHING SR .625X.125X37/64 WHT	@ PWR CABLE 230/2440V ONLY
1	026541000	CABLE ASSY PWR W/.250 TAB 120V	POWER CABLE 120V ONLY
1	048463	CABLE ASSY PWR .250 TAB 100V	POWER CABLE 100V ONLY
1	033331	CABLE ASSY PWR 220/240V	POWER CABLE AUSTRALIA 240V
1	040993	CABLE ASSY PWR 5A UK .250 TAB	PCABLE UNITED KINGDOM 240V
1	047524000	CAP ASSY .1UF 400V W/RECP/TAB	@BRIDGE RECTIFIER EMI SUPRESSION
1	024854000	CAP MPF RDL .1UF 400V 10%	
1	048948000	CHS BXR 200 COMBO	RAW CHASSIS
1	048948000	CHS BXR 200 HEAD	RAW CHASSIS, PAINTED & SCREENED

BXR 200
PARTS LIST
CHASSIS ASSEMBLY (CONT)

QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
1	032925000	DIODE BRIDGE RECTIFIER	
1	048974000	HEATSINK EXTRUDED BXR 200	
2	021626	JACK PHONE 2/CD SOC L11 3/8" L	SPEAKER OUTPUT JACKS, COMBO ONLY
9	041109000	KNOB EQ BXR SERIES	
5	026403000	KNOB POINTER BLACK 180 DEG	
3	069393000	NUT 6-32 HEX EXT LOCK	GROUNG LUG MOUNT
1	022004000	NUT KEPS #8-32 ZINC	BRIDGE RECTIFIER MOUNT
1	048949000	PANEL FRONT BXR 200 COMBO	COMBO ONLY
1	048950000	PANEL REAR BXR 200 COMBO	COMBO ONLY
6	017716000	SCREW 8-32X1/2 PHP BLX	HEATSINK TO CHASSIS MOUNT
2	014172000	SCREW M 4-40X1/4 PHP BLX	GEQ MOUNT
4	015627000	SCREW M 6-32X3/4 PH BLX	PWR AMP PCB TO CHASSIS MOUNT
4	017433000	SCREW M 6-32X3/8 PHP BLX	PREAMP TO PCB TO CHASSIS MOUNT
5	027636000	SCREW TF 8-32X5/8 HWH BLX	HEATSINK TO TRANSISTOR BAR
4	037997000	SCREW TF 10-32X5/8 HWHS BLX	TRANSFORMER MOUNT
2	031868000	SCRW PLASTITE 4X1/4 PHP BLX	@XLR JACK
1	050008000	SHIELD BXR 200	@PREAMP
1	040582000	SWITCH DPST .250 TAB GLOBAL	POWER SWITCH
2	029894	WSHR LCK INTL 3/8X.500X.022 NI	@ SPEAKER OUTPUT JACKS
5	026401000	WSH SHLDR FIBER 3/8X5/8	EFFECTS LOOP, LINE OUT, OUTPUTS
5	027520000	WSHR FLAT .380X.630 FIBER	EFFECTS LOOP, LINE OUT, OUTPUTS
1	048960000	XFMR PWR 120V 200/300 WATT T1 (120V)	T1 (120V)
1	041122	XFMR PWR EXPORT	T1 (100V/120V/230V)

CABINET ASSEMBLY COMBO VERSION

QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
1	048740000	CAB ASSY BXR 200 COMBO	COMPLETE CABINET
REF	026317000	CLOTH GRILLE BLACK PVC	
6	031867000	CORNER 2 HOLE W/NOTCH BLX PWDR	
2	031840000	CORNER 3 HOLE BLX PWDRD	
2	049564000	GASKET HANDL	
4	027849000	GLIDE CAB 1.24X.335 BLX WAX	STEEL ONLY, NO INSERT
2	048958000	HANDLE RECESSED KXR/BXR	NO GASKET
4	019275000	INSERT GLIDE CUSHION 1.27 DIA	RUBBER ONLY
1	011298000	NAMEPLATE FENDER SAMLL	LOGO
12	021972000	NUT T 10-32X3/4 STR 3 PRNG BLX	SPEAKER MOUNT
6	036199000	SCREW M 8-32X1-3/16 OHP BLX CP	CHASSIS MOUNT
3	038796000	SCRW 8X1-1/2 PFH SM ZI	
8	026577000	SCRW M 10-32X1 PHP BLX	SPEAKER MOUNT
2	018113000	SCRW SMA 4X1/2 OHP BLX	LOGO MOUNT
8	016627000	SCRW SMA 8X3/4 OHP BLX	
14	026576000	SCRW SMA 8X5/8 THP BLACK	
4	017942000	SCRW WOOD 8X1 FHP BLX	
1	048941	SPEAKER 15" 4 OHM 150W BXR 200	
REF	026570000	TOLEX BLACK LT WEIGHT	
6	029527000	WSHR FNSH 8-5/8 FLNGD BLX WX	CHASSIS MOUNT

CABINET ASSEMBLY HEAD VERSION

QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
1	049059	CABINET ASSY BXR 200 HEAD	COMPLETE CABINET
8	048976	FOOT RUBBER 1-1/2"	
4	031838	CORNER 2 HOLE W/TAB BLK PWDRD	
4	031867	CORNER 2 HOLE W/NOTCH BLK PWDR	
2	031845	HANDLE CAP 2 HOLD BLK PWDRD	HANDLE MOUNT

BXR 200

PARTS LIST

CABINET ASSEMBLY HEAD VERSION (CONT)

QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
1	025883	HANDLE SHORT NO LOGO	RUBBER ONLY, NO INSERT
1	025884	HANDLE INSERT 7.78”	SPRING STEEL
4	021972	NUT T 10-32X3/4 STR 3 PRNG BLX	HANDLE MOUNT
4	017393	SCRW M 10-32X1-1/8 OHP BLX	HANDLE MOUNT
8	026576	SCRW SMA 8X5/8 THP BLACK	CORNER MOUNT
8	018988	SCRW SMA 8X1-1/8 PHP BLX	FOOT MOUNTING

MISCELLANEOUS

QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
1	048951	MANUAL OWNERS BXR 200	
1	048944	SCHEM REDUCED BXR 200 PREAMP	PREAMP
1	048840	SCHEM REDU W/SVC PA BXR/KXR200	POWER AMP

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	RELEASED PR286	10-FEB-95	

NOTES:
1.) ALL RESISTORS ¼ W 5% UNLESS NOTED OTHERWISE.
2.) ALL CAPACITORS 35V MINIMUM UNLESS NOTED OTHERWISE.
3.) ALL DIODES 1N4448 UNLESS NOTED OTHERWISE.
4.) ALL DC MEASUREMENTS TAKEN TO GROUND, WITH NO SIGNAL APPLIED, WITH A DMM.
5.) ALL AC MEASUREMENTS TAKEN TO GROUND, USING A TRUE RMS DMM, UNDER THE FOLOWING CONDITIONS:
4mVrms, 1kHz SINEWAVE INPUT AT TP1.
NO FOOTSWITCH
CHORUS SELECT "OFF"
DELTA COMP "OFF"
CHORUS RATE SET TO "10"
CHORUS DEPTH SET TO "0"
ALL OTHER CONTROLS AT 50%.
6.) ALL VOLTAGE MEASUREMENTS MAY VARY ±20%.

ABOVE WAVEFORMS READ WITH CHORUS SELECT "ON"

LAST INSTANCES USED:
C84, CR6, J7, LD3, P4, Q6, R129, TP29, U14

-ON BREAKAWAY- (PRE-AMP PCB)

P4A CONNECTS VIA CABLE TO P4B

P2A (ON PRE-AMP PCB) CONNECTS VIA CABLE TO P2B (ON PWR-AMP PCB)

P3B (ON PRE-AMP PCB) CONNECTS VIA CABLE TO P3A (ON PWR-AMP PCB)

FENDER P/N 037659

DATABASE FILE: Z2865I.DBF
CHECKED BY:
DATE:
APPROVED: CL
DATE: 2-10-95
TOLERANCES: X.X ±0.050" X.XX ±0.010" X.XXX ±0.005" ANGLES ±0.500"

PROPRIETARY

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FENDER MUSICAL INSTRUMENTS CO. REGIONAL HEADQUARTERS 8500 RESEARCH DRIVE CORONA, CA 91720 USA

NEXT HIGHER ASSEMBLY: BXR200C/HD

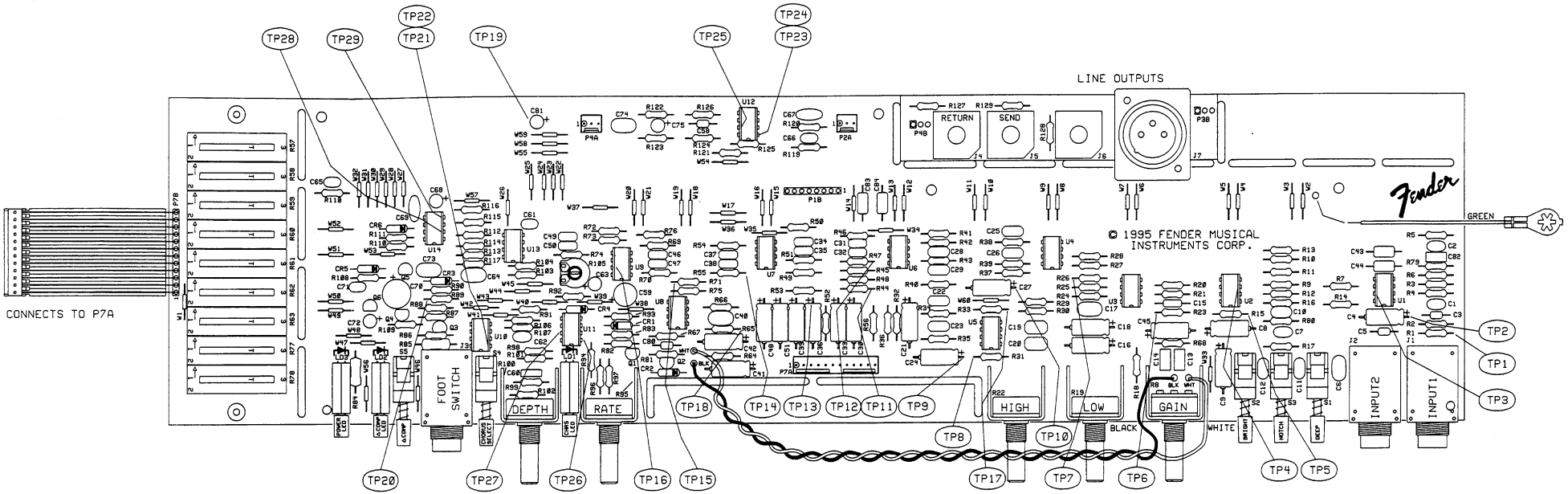
FENDER MUSICAL INSTRUMENTS
2621 Research Drive
Corona, CA 91720 USA

TITLE: SCHEMATIC, PREAMP
BXR200 BASS AMPLIFIER

SIZE: D | DRAWN: C.SHAH | DRAWING NUMBER: 048943 | REV: A
ENGR: C.SHAH
SCALE: NONE | CREATED: 12-MAY-94 | PLOTTED: 10-FEB-95 | SHEET 1 OF 1

0048944000

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	RELEASED PR286	10-FEB-95	



FILM/DWG: SERVICE DIAGRAM	
DATABASE: Z286P1SE.DBF	DATE: 10-FEB-95
LAYERS PLOTTED: 1 2 3 4 18 19	10

CHORUS BIAS ADJUSTMENT:

WITH CHORUS SELECT ON, SET CHORUS RATE AND DEPTH CONTROLS FULLY CLOCKWISE. CONNECT A 1kHz SINEWAVE AT ABOUT 1.8 VOLTS RMS TO THE EFFECTS LOOP RETURN JACK (J4). ADJUST TRIMPOT R105 FOR SYMMETRICAL CLIPPING AT U12 PIN 1 (TP23).

DATABASE FILE: Z286P1SE.DBF
CHECKED BY: _____
DATE: _____
APPROVED: [signature]
DATE: 2-10-95

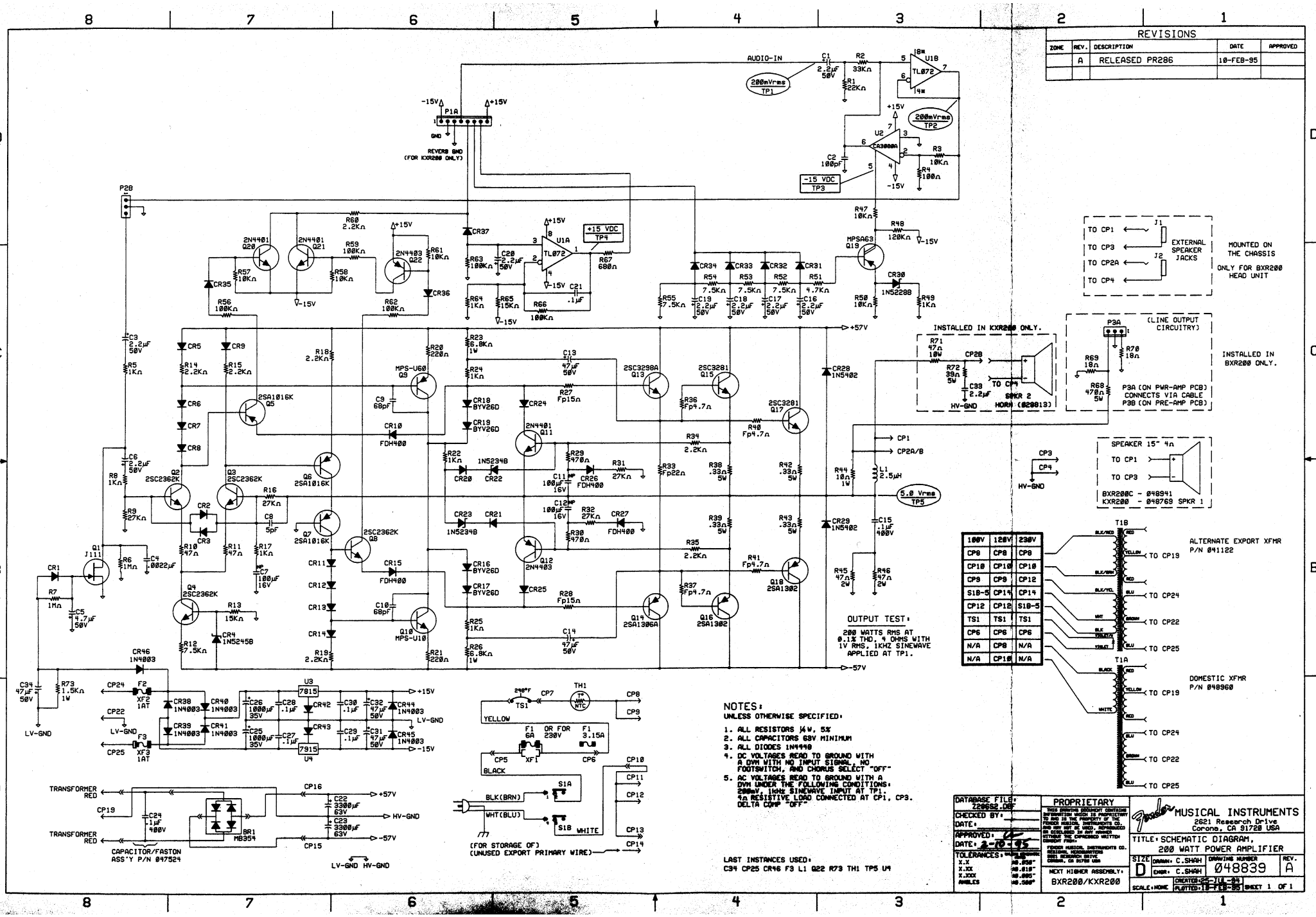
TOLERANCES: UNLESS OTHERWISE NOTED
X.X ±0.050"
X.XX ±0.010"
X.XXX ±0.005"
ANGLES ±0.500°

NEXT HIGHER ASSEMBLY: BXR200C/HD

Fender MUSICAL INSTRUMENTS
2621 Research Drive
Corona, CA 91720 USA

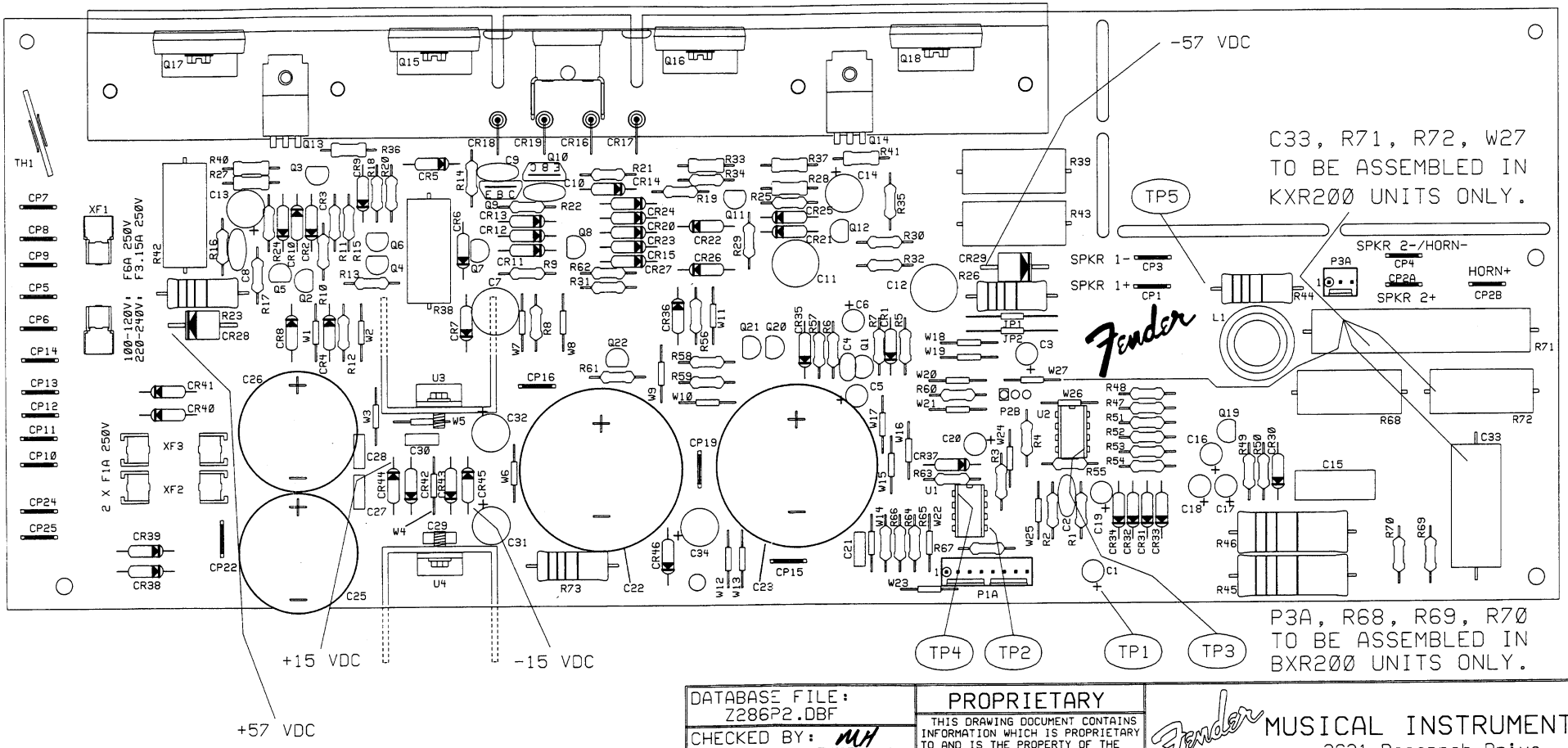
TITLE: SERVICE DIAGRAM, BXR200 PRE-AMP.

SIZE	DRAWN: C.SHAH	DRAWING NUMBER	REV.
B	ENGR: C.SHAH	048945	A
SCALE: NONE	CREATED: 21-JUN-94 PLOTTED: 10-FEB-95	SHEET 1 OF 1	



REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	RELEASED PR286	10-FEB-95	MH



FILM/DWG:	SERVICE DIAGRAM
DATABASE:	Z286P2.DBF DATE: 13-FEB-95
LAYERS PLOTTED:	1 2 3 4 10 18

DATABASE FILE:	Z286P2.DBF
CHECKED BY:	MH
DATE:	2-14-95
APPROVED:	CL
DATE:	2-14-95

TOLERANCES: UNLESS OTHERWISE NOTED

X.X	±0.050"
X.XX	±0.010"
X.XXX	±0.005"
ANGLES	±0.500°

NEXT HIGHER ASSEMBLY: BXR200/KXR200

Fender MUSICAL INSTRUMENTS
2621 Research Drive
Corona, CA 91720 USA

TITLE: SERVICE DIAGRAM
POWER AMPLIFIER 200 WATTS

SIZE	DRAWN: C.SHAH	DRAWING NUMBER	REV.
B	ENGR: C.SHAH	048841	A
SCALE: NONE	CREATED: 25-AUG-94 PLOTTED: 13-FEB-95	SHEET 1 OF 1	