

BXR 200

BASS EXTENDED RANGE
COMBO & HEAD

SERVICE MANUAL



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BXR 200

(This is the model name for warranty claims)

SERVICE MANUAL

MARCH 1996

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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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: 4 Ω

Sensitivity: 1.03V RMS

Input Impedance: 22k Ω

DELTA COMP Range: 20db

PREAMP SECTION:

Input Impedance: Input 1 – Greater than 420k Ω (typically
greater than 1M ohm in the passband)
Input 2 – 136k Ω

**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: | <u><i>BXR 200 Combo</i></u> | <u><i>BXR 200 Head</i></u> |
|--------------------|-----------------------------|----------------------------|
| | 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

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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 asymmetrically to provide non-symmetrical 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 capacitively (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.

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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 $+15\text{Vdc}$ 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 $R60 \times (C6+17+18+19)$ or $2.2\text{k} \times 8.8 \mu\text{F} = 19.4 \text{mSec}$. 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 of 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 $+15\text{vdc}$. 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. $R_{fb} + R_{pd} \div R_{pd} = A_v$. Therefore $27\text{k} + 1\text{k} \div 1\text{k} = 28\text{k} \div 1\text{k} = 28A_v$.

Q9 & Q10 make up a voltage amplification stage. Again, to operate properly, the same amount of current must flow through 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.

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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 |

BXR 200 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 |

BXR 200 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 SWITCHING 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 SUPPRESSION |
| 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 | GROUND 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)

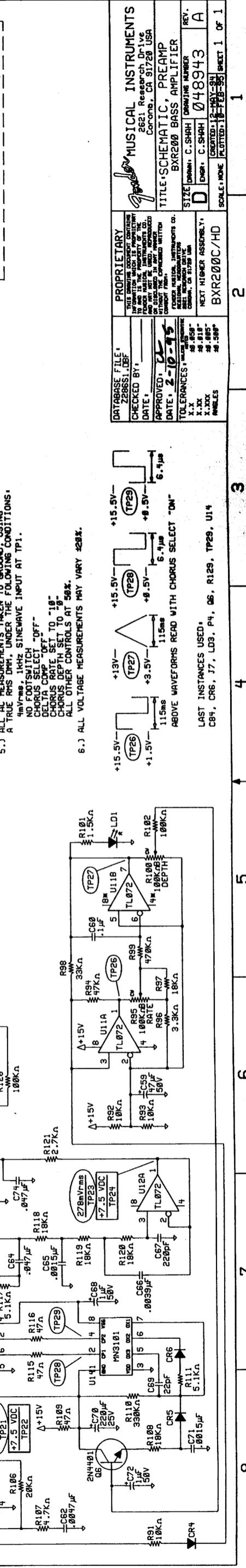
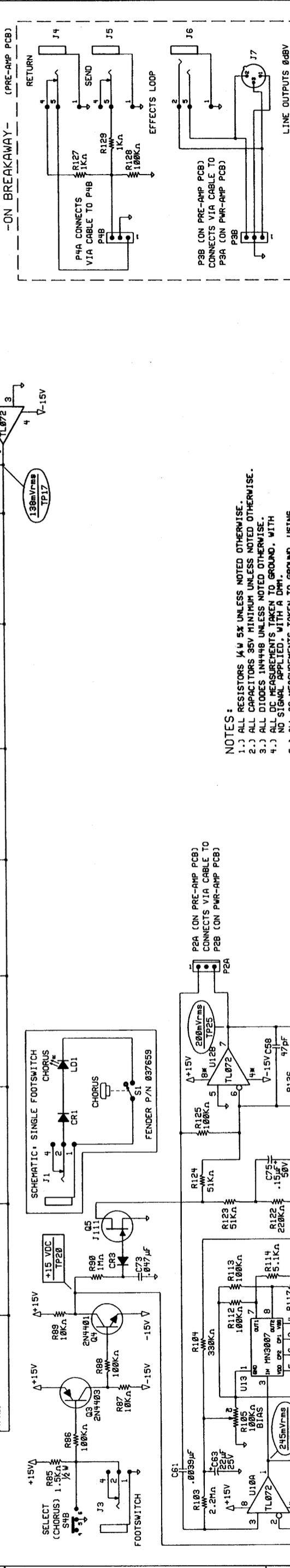
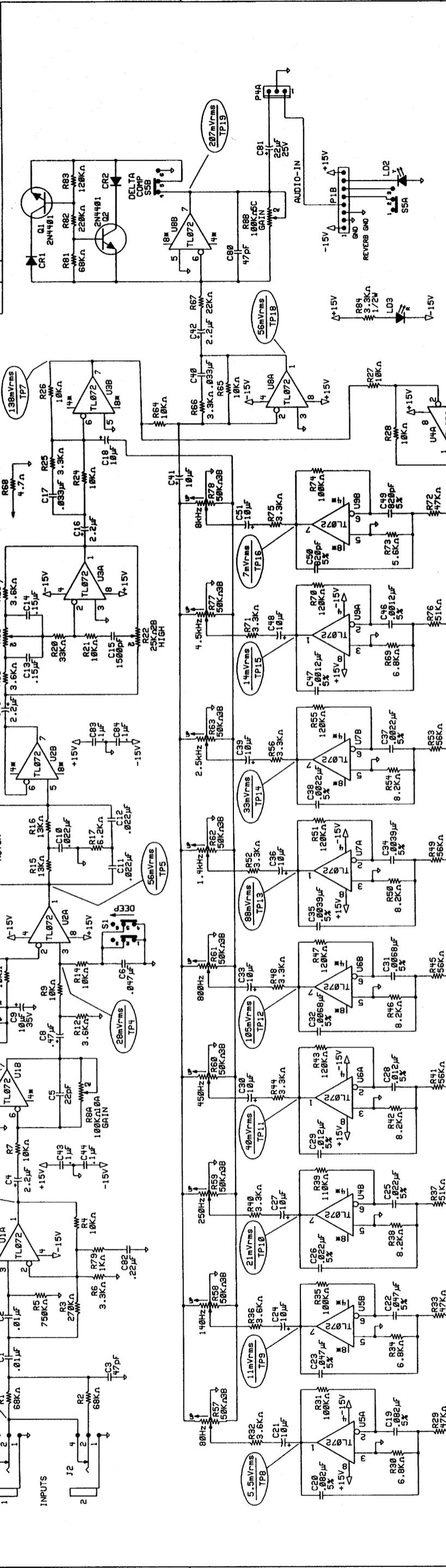
| QTY | PART # | DESCRIPTION | REFERENCE DESIGNATION |
|------------|---------------|--------------------------------|------------------------------|
| 1 | 025883 | HANDLE SHORT NO LOGO | RUBBER ONLY, NO INSERT |
| 1 | 025884 | HANDLE INSERT 7.78" | SPRING STEEL |
| 4 | 021972 | NUT T 10-32X3/4 STR 3 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

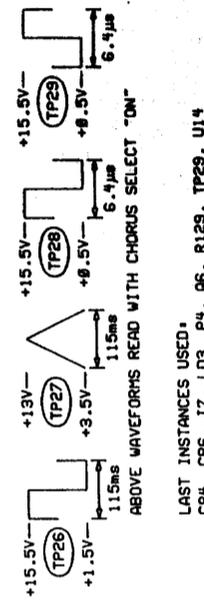
| QTY | PART # | DESCRIPTION | REFERENCE DESIGNATION |
|------------|---------------|--------------------------------|------------------------------|
| 1 | 048951 | MANUAL OWNERS BXR 200 | |
| 1 | 048944 | SCHEM REDUCED BXR 200 PREAMP | PREAMP |
| 1 | 048840 | SCHEM REDU W/SVC PA BXR/KXR200 | POWER AMP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

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

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
|---|---|---|---|---|---|---|---|



NOTES:
 1.) ALL RESISTORS 1/4W 5% UNLESS NOTED OTHERWISE.
 2.) ALL CAPACITORS 35V MINIMUM UNLESS NOTED OTHERWISE.
 3.) ALL DIODES 1N4148 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 4mVrms, 1KHz SINEWAVE INPUT AT TP1.
 CHORUS SELECT "OFF"
 NO FOOTSWITCH
 DELTA COMP "OFF"
 CHORUS RATE SET TO "10"
 CHORUS DEPTH SET TO "10"
 ALL OTHER CONTROLS AT 50%.



ABOVE WAVEFORMS READ WITH CHORUS SELECT "ON"
 LAST INSTANCES USED:
 C81, CR6, J7, LD3, P4, Q6, R129, TP29, U14

PROPRIETARY
 INFORMATION WHICH IS UNLAWFULLY
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 WRITTEN PERMISSION OF MUSICAL INSTRUMENTS
 CORPORATION, CA 91720 USA

DATABASE FILE:
 Z286S1.DBF
 CHECKED BY:
 DATE:
 APPROVED: **2-10-95**
 DATE: 2-10-95

MUSICAL INSTRUMENTS
 2621 Research Drive
 Corona, CA 91720 USA

TOLERANCES UNLESS OTHERWISE SPECIFIED:
 X.XX .50%
 X.X .50%
 X .50%

SIZE: D
 DRAWN: C. SHAH
 ENGINEER: C. SHAH
 CHECKED: J. SHAH
 DATE: 12-MAY-94
 CREATED: 10-FEB-95

TITLE: SCHEMATIC, PREAMP
 BXR200 BASS AMPLIFIER

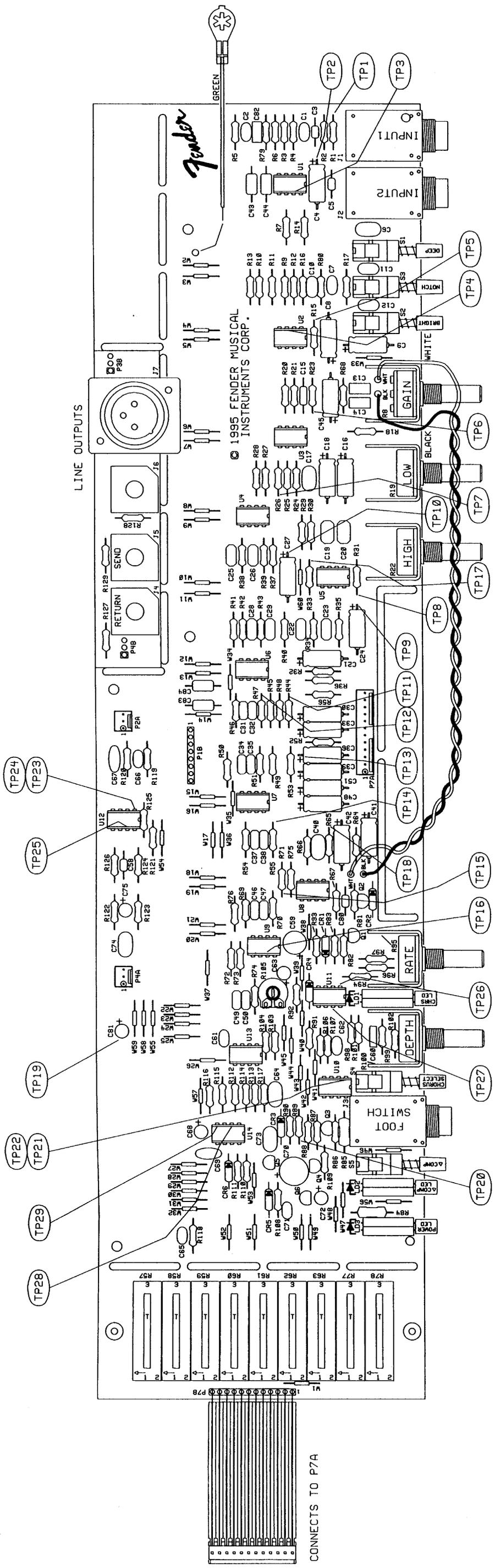
REV. A

SCALE: NONE PLATTED: 10-FEB-95 SHEET 1 OF 1

BXR200C/HD

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 10
 18 19

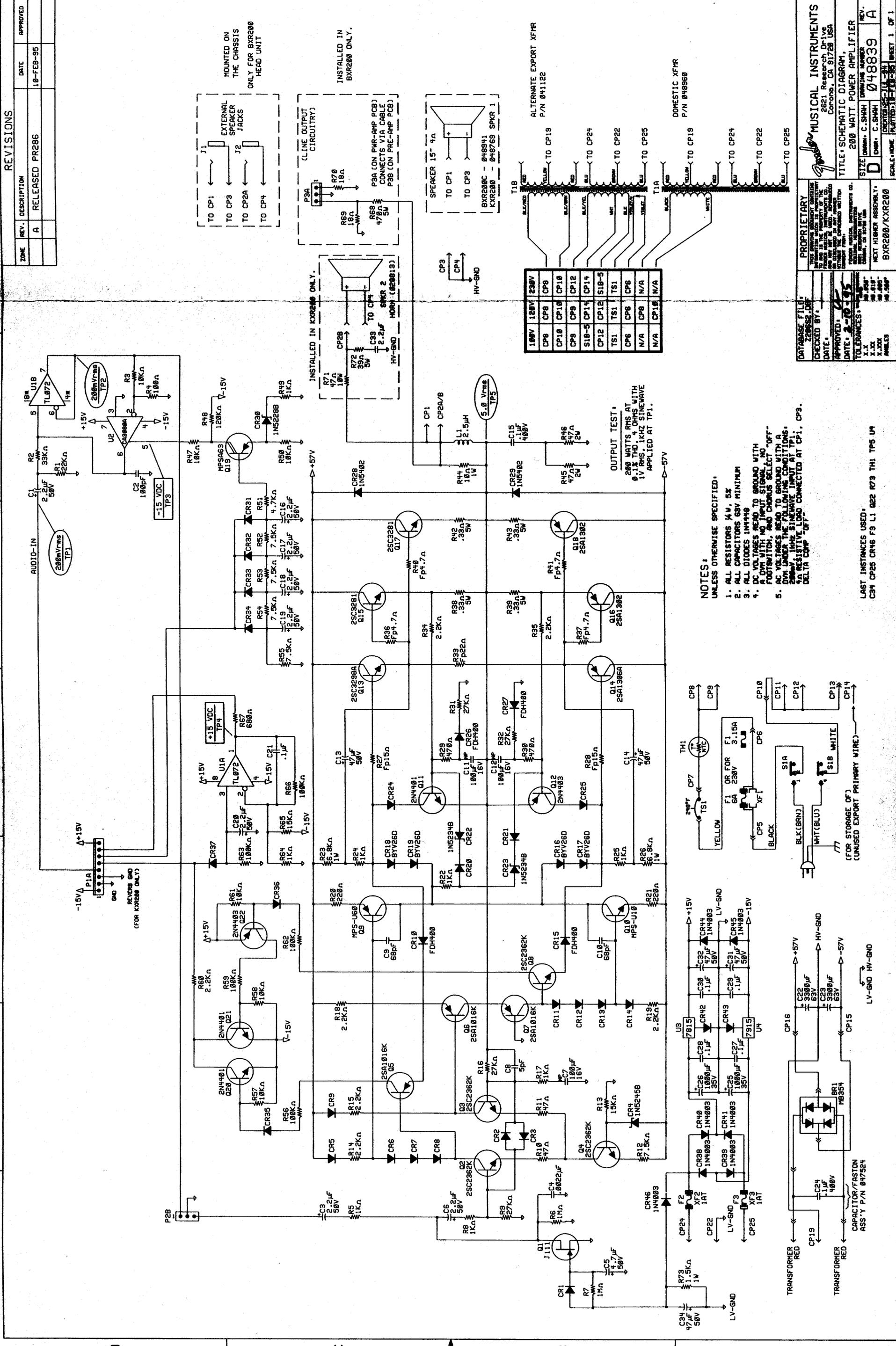
CHORUS BIAS ADJUSTMENT:
 WITH CHORUS SELECT ON, SET CHORUS RATE AND DEPTH CONTROLS FULLY CLOCKWISE.
 CONNECT A 1KHZ SINEWAVE AT ABOUT 1.8 VOLTS RMS TO THE EFFECTS LOOP RETURN JACK (J4). ADJUST TRIMPOT R105 FOR SYMMETRICAL CLIPPING AT U12 PIN 1 (TP23).

| | | |
|--|---|--|
| DATABASE FILE: Z286P1SE.DBF CHECKED BY: DATE: APPROVED: 4 DATE: 2-10-95 TOLERANCES: UNLESS OTHERWISE NOTED X.X ±0.050" X.XX ±0.010" X.XXX ±0.005" ANGLES | PROPRIETARY THIS DRAWING DOCUMENT CONTAINS INFORMATION PROPRIETARY TO AND IS THE PROPERTY OF FENDER MUSICAL INSTRUMENTS CO. AND MAY NOT BE USED, REPRODUCED OR DISCLOSED IN ANY MANNER WITHOUT THE EXPRESSED WRITTEN CONSENT FROM: FENDER MUSICAL INSTRUMENTS CO. 2821 Research Drive Corona, CA 91720 USA | TITLE: SERVICE DIAGRAM, BXR200 PRE-AMP. SIZE: B DRAWN: C. SHAH ENGR: C. SHAH DRAWING NUMBER: 048945 REV. A SCALE: NONE PLOTTED: 10-FEB-95 SHEET 1 OF 1 |
|--|---|--|

REVISIONS

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

1 2 3 4 5 6 7 8



MOUNTED ON THE CHASSIS ONLY FOR BXR200 HEAD UNIT

INSTALLED IN BXR200 ONLY.

ALTERNATE EXPORT XPMR P/N 041122

DOMESTIC XPMR P/N 048960

| 100V | 120V | 250V |
|-------|------|-------|
| CP8 | CP8 | CP8 |
| CP10 | CP10 | CP10 |
| CP9 | CP9 | CP9 |
| S1B-5 | CP14 | CP14 |
| CP12 | CP12 | S1B-5 |
| TS1 | TS1 | TS1 |
| CP6 | CP6 | CP6 |
| N/A | CP8 | N/A |
| N/A | CP10 | N/A |

- NOTES:
UNLESS OTHERWISE SPECIFIED:
1. ALL RESISTORS 1/4 W, 5%.
 2. ALL CAPACITORS 63V MINIMUM.
 3. ALL DIODES 1N4949.
 4. DC VOLTAGES MEAS TO GROUND WITH AC VOLTAGES MEAS TO GROUND WITH 50% RESISTIVE LOAD CONNECTED AT TP1, CP3, DELTA COMP OFF.
 5. AC VOLTAGES MEAS TO GROUND WITH 50% RESISTIVE LOAD CONNECTED AT TP1, CP3, DELTA COMP OFF.

MUSICAL INSTRUMENTS
2621 Research Drive
Corona, CA 92726 USA

TITLE: SCHEMATIC DIAGRAM
200 WATT POWER AMPLIFIER

DATE: 10-10-95
APPROVED BY: [Signature]
DRAWN BY: C. SHAH

SIZE: D
DRAWING NUMBER: 048839
REV: A

PROPRIETARY
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DATE: 10-10-95
APPROVED BY: [Signature]
DRAWN BY: C. SHAH

SCALE: 1:1
NEXT NUMBER ASSEMBLY: BXR200/KXR200

LAST INSTANCES USED:
CS4 CP25 CR46 F3 L1 Q22 R73 TH1 TP5 U4

1 2 3 4 5 6 7 8

