ELECTRONICS

KXR 200

SERVICE MANUAL

CONTENTS:

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

KXR 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

KXR 200

SPECIFICATIONS

Product Release No.:	PR 286 *(This is not a model number)*
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
Input impedance:	22K Ohms
Sensitivity:	1.03V RMS
DELTACOMP Range:	20dB
PREAMP SECTION:	
Input Impedance:	XLR – 1.82K Ω Phone – 18.2k Ω
Senitivity for 200 watts: **Channel and master** **Volume at maximum, all** **Tone controls at "0"**	XLR – 2.9mV RMS Phone – 29mV RMS
Equalizer:	For 3-band-EQ sections: +/- 12dB at 130,540 and 4200 Hz
Sensitivity for channel **Inserts, Master volume** **At maximum setting**	500mV RMS (-6dBV)
Sensitivity for Master **Volume and FX return** **Control at maximum**	130mV RMS (-18dBV)
Dimensions:	
	Height: 29 3/4" (75.6 cm) (w/o casters) Width: 21 11/16" (55.1 cm) Depth: 12" (30.5 cm)
Weight:	88 lbs. (40.0 kg)

Product specifications are subject to change without notice

KXR 200
CIRCUIT DESCRIPTION

PREAMPLIFIER

Input channels 1 thru 3 will accept a balanced or unbalanced signal via a ¼" phone jack. Resistors R1 & R2 are precision 1% parts which maximize the Common Mode Rejection of the first opamp stage U1A.U1A provides a gain of 1, and rolls off high frequencies above 87kHz. The signal then couples to the 3 band equalizer circuit. Gyrator U2A is tuned to 130 Hz (LOW), and Gyrator U2B to 540Hz (MID). The HIGH control uses C10 and R14 to provide a 6dB per octave shelving filter above 4.2kHz. The boost/cut function is handled by U3A. The signal couples to the Volume control stage U1B. The Volume control (R17) varies the gain from less than 1 to about 23. The signal is then routed through a ribbon cable to the Channel Insert Jack J2. This 3 conductor Phone jack sends the signal out on the "Tip" contact, and accepts the return signal on the "Ring" contact. The signal then couples through C14 to the FX SEND bus, REVERB SEND bus, and MAIN bus.

Although similar to channels 1 thru 3, Input channel 4 features the addition of an XLR jack which will accept a balanced low impedance microphone input. Channel 4 also features a 4-band equalizer circuit. Gyrator U11A is tuned to 125Hz (LOW), gyrator U11B is tuned to 320 Hz (LOW MID), and gyrator U12A to 1kHz (HIGH MID). The HIGH control uses C56 and R92 to provide a 6dB per octave shelving filter above 3.2 kHz.

The signals from the FX SEND controls are summed at U13A, which provides a gain of 2 and drives the FX SEND jack (J10). To minimize noise, the FX RETURN jack (J11) contains a switch contact that grounds the signal line when the return jack is not being used. U13B provides a gain of less than 1 to a maximum gain of 5. The FX return signal sums with the main signal at U14A.

The signals from the REVERB SEND controls are summed at U6A, which provides a gain of 2 and feeds the reverb pan drive circuit at U6B. U15A makes up the reverb recovery circuit. U15b provides variable gain and drive U14A. U14A is the summing amplifier for the Main, Effects Return, and Reverb return signals. It provides a maximum gain of about 2, feeds U14B, and drives the Line Output jacks. The Line Ouputs provide a pseudo-balanced signal. U14B feeds signal to the power amplifier.

The signal form 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.

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 (c16+17+18+19) or 2.2k x 8.8Uf=19.4mSec. As they charge, Q19 turns on and provides current to pin 5 of the QTA (U2). The

DELTACOMP (CONT)

current controls the output amplitude of U2. The inverted signal from U2 mixes with the input to 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 +15dvc. 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 white 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 of the Diff amp legs. 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. Therefore 27K + 1K ÷ 1K = 25K ÷ 1K = 28Av.

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-CR19 (BYV26D) make up the Fixed Bias circuit for the output transistors. The body of the Diodes is 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 condition occur, the voltage drop 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. This 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 will remain latched up until the input signal is removed.

Q12 & 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. This indicates a Flame Proof/Fuse-

POWER AMPLIFIER (CONT)

Type resistor. They won't burn and they won't 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

PREAMP

PRINTED CIRCUIT BOARD ASSEMBLY

QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
1	048497001	PCB ASSY KXR 200 PREAMP	STUFFED
1	048914000	CABLE RIBBON 8 CKT 7 IN	
1	048836000	CABLE RIBBON 12 CKT 23 IN	
1	037943000	CAP AE RDL .33uF 50V	C69
3	03869001	CAP AE AX 1.0uF 100V	C6,20,34
4	026517001	CAP AE AX 2.2uF 50V	C14,28,42,60
3	028459000	CAP AE RDL 2.2uF 50V 20%	C61,66,72
2	038691001	CAP AE AX 4.7uF 50V	C64,70
4	028463000	CAP AE RDL 10uF 50V 20%	C12,26,40,58
10	025960001	CAP AE AX 22uF 16V	C1,2,15,16,29,30,43,44,45,46
5	036954000	CAP AE RDL 22uF 63V 20%	C13,27,41,59,78
1	028471000	CAP AE RDL 47uF 50V 20%	C63
5	020909000	CAP CD 47PF 1000V 10%	C62,65,67,71,73
8	025979000	CAP CD 50PF 1000V 10%	C5,11,19,25,.33,39,49,57
8	038699001	CAP CA 100PF 100V	C3,4,17,18,31,32,47,48
1	039262001	CAP CA 680PF 50V	C76
1	039270001	CAP CA 10000PF 50V 5% LL	C51
4	027256000	CAP MPF .0015uF 100V	C9,23,37,55
1	027259000	CAP MPF .0033uF 100V	C68
1	027261000	CAP MPF .0047uF 100V	C53
3	027263000	CAP MPF .0082uF 100V	C7,21,35
1	027265000	CAP MPF .015uF 100V	C74
1	027267000	CAP MPF .022uF 100V	C75
4	027275000	CAP MPF .068uF 100V	C10,24,38,56
9	027278000	CAP MPF .1uF 63V 10%	C54, 79-86
4	027281000	CAP MPF .22uF 63V	C8,22,36,52
1	033477000	CAP MPF .68uF 63V 10%	C50
11	031266000	CONTROL RTRY 50K B TAPER	R20,22,44,46,68,70,98,99,110,116,118 (FX SENDS, REVERB SEND, RETURNS, MASTER VOLUME)
4	0249287000	CONTROL RTRY 50K 15A TAPER	R17,41,65,95 (VOLUME CONTROLS)
13	033002000	CONTROL RTRY 50K CNTR DET B	R7,10,13,31,34,37,55,58,61,82,85,88,91 (TONE CONTROLS)
15	016795000	IC DUAL OP AMP TL072	U1-15
2	030771000	JACK ¼ PCB 2/CD SCC	J10,11 (FX SEND AND RETURN)
4	016917	JACK ¼ PCB 3/CD DCC	J2,4,6,9 (CHANNEL INSERTS)
5	030987000	JACK ¼ PCB 3/CD DOC	J1,3,5,8,12 (CHANNEL INPUTS, LINE OUT)
2	048466000	JACK RCA SINGLE PCB MOUNT	J14,15
1	030762	JACK XLR FM PC VERT MT (A/D)	J7 (CHANNEL 4 IC INPUT)
1	037249	JACK XLR MALE PC VERT MT	J13 (LINE OUT)
73	020888001	JUMPER WIRE 22GA	W1-73
1	028841	KNOB PUSH BUTTON MX/PX	@S1
1	028097000	LED 5X5MM YLLOW SLB-55YY3	LD1
1	028039	LED RED 5X5 MM SLB-55VR3	LD2
1	048495	PCB FAB KXR 200	RAW PCB
3	024937	RES CF 1/4W 5% 10OHM LL	R130,131,132
1	024942001	RES CF 1/4W 5% 22OHM LL	R104
2	024947001	RES CF 1/4W 5% 47OHM	R128,129
6	024965001	RES CF 1/4W 5% 1K LL	R19,43,67,97,107,114
1	024967001	RES CF 1/4W 5% 1.2K LL	R126

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PREAMP

PRINTED CIRCUIT BOARD ASSEMBLY (CONT)

QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
1	024969001	RES CF 1/4W 5% 1.5K LL	R92
3	02497001	RES CF 1/4W 5% 1.8K LL	R14,38,62
2	031819001	RES MF 1/4W 5% 1.82K LL	R73,74
1	029005001	RES CF 1/4W 5% 2K LL	R105
8	024971001	RES CF 1/4W 5% 2.2K LL	R8,16,32,40,56,64,94,124
3	029455001	RES CF 1/4W 5% 2.4K LL	R83,86,89
3	024972001	RES CF 1/4W 5% 2.7K LL	R11,35,59
1	024973001	RES CF 1/4W 5% 3.3K LL	R120
1	024978000	RES CF 1/4W 5% 5.5K LL	R108
4	024981001	RES CF 1/4W 5% 10K LL	R109,115,133,134
3	024983001	RES CF 1/4W 5% 12K LL	R119,121,122
8	024986001	RES CF 1/4W 5% 18K LL	R6,15,30,39,54,63,81,93
16	031818001	RES MF 1/4W 1% 18.2K LL	R1,2,4,5,25,26,28,29,49,50,52,53,76,77,79,80
15	024987001	RES CF 1/4W 5% 22K LL	R21,23,24,45,47,48,69,71,72,100-102,111,117,125
3	024993001	RES CF 1/4W 5% 47K LL	R103,106,112
6	024996001	RES CF 1/4W 5% 82K LL	R9,12,33,36,57,60
9	024997001	RES CF 1/4W 5% 100K LL	R18,42,66,84,87,90,96,113,123
1	028861001	RES CF 1/2W 5% 3.3K LL	R127
2	036375	SPACER RND NYL .147X.250X.720	@LD1-2
1	022904	SWITCH PB PC MT	S1

POWER AMPLIFIER

PRINTED CIRCUIT BOARD ASSEMBLY

QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
1	029779*	BREAKER THERMAL NC OPEN 248	TS1
8	028459	CAP AE RDL 2.2UF 50V 20%	C1,3,6,16-20
1	028460	CAP AE RDL 4.7uF 50V 20%	C5
5	028471	CAP AE RDL 47uF 50V 20%	C13,14,31,32,34
3	025787	CAP AE RDL MINI 100uF 16V NP	C7,11-12
2	028494000	CAP AE RDL 100uF 35V 20%	C25-26
2	028031	CAP AE RDL 3300uF 63V	C22-23
1	033580000	CAP PFF RDL .0022uF 100V 10%	C8
5	027278000	CAP MPF .1uF 63V 10%	C9-10
1	024854000	CAP MPF RDL .1uF 400V 10%	C15
1	041501	CAP MPF AX 2.2uF 100V 10%	C33
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 1N5228B 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 PCT MT	CP1,2A,2B,3-16
2	025996000	FUSE CLIP PCB .250 & 5MM FUSE	XF1
4	020775000	FUSE CLIP PCB 5VV	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 8CKT SQ PIN	P1A
1	048939000	HEATSINK BAR BXR/KXR 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 MC7915CT	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

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POWER AMPLIFIER

PRINTED CIRCUIT BOARD ASSEMBLY (CONT)

QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
27	020888001	JUMPER WIRE 22GA	W1-27
1	048843001	PCB ASSY PWR AMP BXR 200	STUFFED
1	04884200	PCB FAB PWR AMP BXR 200	RAW PCB
4*	031693001	RES MF FUSE 1/4W 5% 4.7 OHM LL	R36,37,40,41
2*	033205001	RES MF FUSE 1/4W 5% 15 OHM LL	R27,28
1*	027749001	RES MF FUSE 1/4W 5% 22OHM LL	R33
2	024947001	RES CF 1/4W 5% 47 OHM LL	R10,11
1	024952001	RES CF 1/4W 5% 100OHM LL	R4
2	024956001	RES CF 1/4W 5% 220OHM LL	R20,21
2	024961001	RES CF 1/4W 5% 470OHM LL	R29-30
1	024963001	RES CF 1/4W 5% 680OHM LL	R67
8	024965001	RES CF 1/4W 5% 1K LL	R5,8,17,22,24,25,49,64
7	024917001	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 LL	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% 10OHM LL	R44
2	036621001	RES CF 1W 5% 6.8K LL	R23,26
2	027628000	RES FILM 2W 5% 47OHM	R45,46
4	032958000	RES WW BT 5W 10% .33OHM	R38-39,42-43
1	048467	RES WW BT 5W 10% 39OHM	R72
1	048468	RES WW BT 10W 10% 47OHM	R71
2	041595000	SCRW 6-32X3/16 PHP STL ZI SEMS	@TS1
5	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 2.5 OHM 8A C30-19	TH1
1	014689000	XSTR N-CH JFET J111 TO-92	Q1
3	016739000	XSTR NPN 2N4401 TO-92	Q11,20,21
4	02575100	XSTR NP 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	Q5-7
2	028762000	XSTR PNP 2SA1302 TOP-3L	Q16,18
1	028759000	XSTR PNP 2SA1306A0 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	048505000	CHS ASSY KXR 200 120V	
1	00756500	BUSHING SR .625X.125X37/64 BLK	@ PWR CABLE 100/120V ONLY
1	010401	BUSHING SR .625X.125X37/64 WHT	@ PWR CABLE 230/240V ONLY
1	026541000	CABLE ASSY PRW 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 230V ONLY
1	038602	CABLE ASSY PWR AUST .250 TAB	PWR CABLE AUSTRALIA 240V
1	040993	CABLE ASSY PWR 5A U.K. .250 TAB	P CABLE UNITED KINGDOM 240V
1	047524000	CAP ASSY .1UF 400V Q/RECP/TAB	@BRIDGE RECTIFIER EMI SUPPRESSION
1	024854000	CAP MPF RDL .1UF 400V 10%	RAW CAP FOR ABOVE ASSEMBLY
1	048499000	CHS KXR 200	
1	032925000	DIODE BRIDGE RECTIFIER	

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CHASSIS ASSEMBLY (CONT)

QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
1	048971000	HEAT SINK EXTRUDED BXR 200	
28	048835000	KNOB CTL SUCTOM DBL BLK/OFFWHT	
2	069393000	NUT 6-32 HEX EXT LOCK	GROUND LUG MOUNT
1	022004000	NUT KEPS #8-32 ZINC	BRIDGE RECTIFIER MOUNT
1	048500000	PANEL FRONT KXR 200	
1	048501000	PANEL REAR KXR 200	
2	047523000	RECEPTACLE W/TAB .250 18-14 GA	
6	017716000	SCREW M 8-32X1/2 PHP BLX	HATSINK TO CHASSIS MOUNT
4	037568000	SCREW M 6-32X3/4 PHP ZI LW	PWR AMP PCB MNT
2	039367000	SCREW M 6-32X3/8 PHPS SS ITLW	PREAMP PCB MOUNT
4	031184000	SCREW M 6-32X1/4 PHPS BLX ITLW	SHIELD MOUNT
2	031868000	SCREW PLASTITE 4X1/4 PHP BLX	FEMALE XLR MOUNT (FRONT)
2	037990000	SCREW PLASTITE 6X3/5 PHP BLX	MALE XLR MOUNT (REAR)
4	037997000	SCREW TF 10-32X5/8 HWHS BLX	TRANSFORMER MOUNT
5	027636000	SCREW TF 8-32X5/8 HWH BLX	HEATSINK TO TRANSISTOR BAR
1	049524000	SHIELD KXR 200	@ PREAMP
4	031241000	STANDOFF HX M/F AL 6-32X3/8	SHIELD MOUNT
1	040582000	SWITCH DPST .250 TAB GLOBAL	POWER SWITCH
1	048960000	XFMR DOMESTIC BXR 200	T1 (120V DOMESTIC ONLY)
1	041122	XFMR PWR EXPORT	T1 (100/120/230V)

CABINET ASSEMBLY

QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
1	048498000	CAB ASSY KXR 200	ENTIRE CABINET
1	047120000	CABLE REVERB 1450MM	
4	023513000	CASTER SWIVEL	
0.48	026317000	CLOTH GRILLE BLACK PVC	
6	031867000	CORNER 2 HOLE W/ NOTCH BLK PWDR	FRONT AND TOP/REAR
2	03184000	CORNER 3 HOLE BLK PWDRD	BOTTOM/REAR
4	029821000	EYELET RFLNGD .215ODX.315L	REVER PAN MOUNT
2	049564000	GASKET HANDLE	
1	02888500	GASKET HORN DUAL PIEZO	
4	02784900	GLIDE CAB 1.24X.335 BLX WAX	STEEL ONLY
1	048498001	GRILLE ASSY KXR 200	COMPLETE GRILLE
2	048958000	HANDLE RECESSED KXR/BXR	
1	028813000	HORN DUAL PIEZO (ADD 028885)	COMPLETE HORN)
4	019275000	INSERT GLIDE CUSHION 1.27 DIA	RUBBER ONLY
4	023505000	MTG PLATE – SWIVEL CASTER	CASTER SOCKET
1	011298000	NAMEPLATE FENDER SMALL	LOGO
8	021972000	NUT T 10-32X3/4 STR 3 PRNG BLX	SPEAKER MOUNT
1	028055000	REVERB UNIT 800 OHM 8EB2C1B DN	REVERB PAN
REF	026570000	TOLEX BLACK LT WEIGHT	
6	029527000	WSHR FNSH 8-5/8 FLNGD BLX WX	CHASSIS MOUNT

MISCELLANEOUS

QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
	048502000	MANUAL OWNER KXR 200	
	048493	SCHEM REDU W/SVC KXR200 PRE	PREAMP
	048840	SCHEM REDU W/SVC PA BXR/KXR 200	POWER AMPLIFIER

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	PR 287	JUN-19-95	
	B	EC 1546	AUG-15-95	

NOTE: UNLESS OTHERWISE SPECIFIED
1/ ALL CAPACITORS 35V MINIMUM.
2/ ALL RESISTORS ARE 1/4W, 5%.
2/ TPx,n DENOTES TEST POINT x, CHANNEL n
3/ FLn,x DENOTES FLEXCABLE # n, PIN # x.

PRE-TEST PREPARATIONS:
1/ SHORT FX SEND TO FX RETURN WITH EXTERNAL JACKS.
2/ CONNECT REVERB PAN.

TESTING CONDITIONS:
A/ TEST MUST BE PERFORMED ON ONE CHANNEL AT A TIME.
B/ INPUT: 5mVRMS AT 1KHZ SINEWAVE.
C/ ALL EQ. KNOBS SET AT 0 (I.E. FLAT).
D/ MASTER VOLUME SET AT MAX.
E/ CHANNEL VOLUME SET AT 5.
F/ ALL EFFECT AND REVERB CONTROLS SET AT 5.
G/ ALL VOLTAGES MEASURED WITH A DVM TO GROUND.
H/ ALL MEASUREMENTS ARE ±10%.
I/ TEST POINTS 1 THROUGH 4 ARE LOCAL TO EACH CHANNEL.

DATABASE FILE:	22875.PCB
CHECKED BY:	MH
DATE:	8-17-95
APPROVED:	LE
DATE:	8/16/95
TOLERANCES:	UNLESS OTHERWISE NOTED
X.X	±0.050"
X.XX	±0.010"
X.XXX	±0.005"
ANGLES	±0.500°

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FENDER MUSICAL INSTRUMENTS CO.
NATIONAL HEADQUARTERS
2821 RESEARCH DRIVE
CORONA, CA 91720 USA

NEXT HIGHER ASSEMBLY:

FENDER MUSICAL INSTRUMENTS
2821 Research Drive
Corona, CA 91720 USA

TITLE: KXR 200 PRE-AMP SCHEMATIC

SIZE	DRAWN: LAMTHANH	DRAWING NUMBER	REV.
D	ENGR: LAMTHANH	048492	B
SCALE:	CREATED: 18-APR-94	PLOTTED: 16-AUG-95	SHEET 1 OF 1

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

AUDIO-IN
200mVrms TP1
C1 2.2µF 50V
R2 33Kn
R1 22Kn
U1B TL072
200mVrms TP2
U2 CA3080A
C2 100pF
R3 10Kn
R4 100n
-15 VDC TP3
-15V P1A +15V
GND
REVERB GND (FOR KXR200 ONLY)
P2B
R47 10Kn
R48 120Kn
MPSA63 Q19
CR30 1N5228B
R49 1Kn
R50 10Kn
CR34 CR33 CR32 CR31
R54 7.5Kn R53 7.5Kn R52 7.5Kn R51 4.7Kn
C19 C18 C17 C16 2.2µF 50V
R55 7.5Kn
R60 2.2Kn
2N4401 Q20
2N4401 Q21
2N4403 Q22
R59 100Kn
R57 10Kn
R58 10Kn
R61 10Kn
CR35
CR36
R56 100Kn
R62 100Kn
CR37
U1A TL072
C20 2.2µF 50V
R63 100Kn
R64 1Kn
R65 15Kn
R66 100Kn
C21 .1µF
R67 680n
+15 VDC TP4
+57V
C3 2.2µF 50V
R5 1Kn
CR5 CR9
R14 2.2Kn R15 2.2Kn
CR6
CR7
CR8
2SA1016K Q5
R18 2.2Kn
R20 220n
MPS-U60 Q9
C9 68pF
CR10 FDH400
R23 6.8Kn 1W
R24 1Kn
C13 47µF 50V
CR18 BYV26D
CR19 BYV26D
CR24
2N4401 Q11
R27 Fp15n
R22 1Kn
1N5234B
CR20
CR22
R29 470n
R31 27Kn
CR26 FDH400
C11 NP 100µF 16V
2SC3298A Q13
2SC3281 Q15
R36 Fp4.7n
R40 Fp4.7n
2SC3281 Q17
R34 2.2Kn
R33 Fp22n
R38 .33n 5W
R42 .33n 5W
CR28 1N5402
R44 10n 1W
L1 2.5µH
5.0 Vrms TP5
CP1
CP2A/B
CP3
CP4
HV-GND
C6 2.2µF 50V
R8 1Kn
R9 27Kn
Q2 2SC2362K
Q3 2SC2362K
R16 27Kn
C8 5pF
CR2
CR3
Q6 2SA1016K
Q7 2SA1016K
2SC2362K Q8
CR11
CR12
CR13
CR14
R19 2.2Kn
CR15 FDH400
C10 68pF
Q10 MPS-U10
R21 220n
CR23 CR21
1N5234B
CR16 BYV26D
CR17 BYV26D
CR25
R28 Fp15n
C14 47µF 50V
R25 1Kn
R26 6.8Kn 1W
C12 NP 100µF 16V
R32 27Kn
CR27 FDH400
R30 470n
Q12 2N4403
R35 2.2Kn
R41 Fp4.7n
Q18 2SA1302
R37 Fp4.7n
Q16 2SA1302
Q14 2SA1306A
R39 .33n 5W
R43 .33n 5W
CR29 1N5402
C15 .1µF 400V
R45 47n 2W
R46 47n 2W
Q1 J111
CR1
R7 1Mn
C5 4.7µF 50V
R6 1Mn
C4 .0022µF
R10 47n
R11 47n
R17 1Kn
C7 NP 100µF 16V
Q4 2SC2362K
R13 15Kn
CR4 1N5245B
R12 7.5Kn
CR46 1N4003
C34 47µF 50V
R73 1.5Kn 1W
LV-GND
CP24
CP22
CP25
F2 XF2 1AT
F3 XF3 1AT
CR38 CR40 CR39 CR41 1N4003
U3 7815
U4 7915
C26 C25 1000µF 35V
C28 C27 C30 C29 .1µF
C32 C31 47µF 50V
CR42 CR43
CR44 CR45 1N4003
+15V
-15V
LV-GND
TRANSFORMER RED
CP19
TRANSFORMER RED
CAPACITOR/FASTON ASS'Y P/N 047524
CP16
CP15
C24 .1µF 400V
C22 3300µF 63V
C23 3300µF 63V
BR1 MB354
+57V
HV-GND
-57V
LV-GND HV-GND
TH1 T° NTC
TS1 240°F
CP7
CP8
CP9
YELLOW
F1 6A 230V OR FOR F1 3.15A
XF1
CP5
CP6
BLACK
S1A
BLK(BRN)
WHT(BLU)
S1B WHITE
CP10
CP11
CP12
CP13
CP14
(FOR STORAGE OF) (UNUSED EXPORT PRIMARY WIRE)

INSTALLED IN KXR200 ONLY.
R71 47n 10W
R72 39n 5W
C33 2.2µF
CP2B
TO CP4
SPKR 2 HORN (029813)
HV-GND

(LINE OUTPUT CIRCUITRY)
P3A
R70 18n
R69 18n
R68 470n 5W
P3A (ON PWR-AMP PCB) CONNECTS VIA CABLE P3B (ON PRE-AMP PCB)

INSTALLED IN BXR200 ONLY.

J1
TO CP1
TO CP3
J2
TO CP2A
TO CP4
EXTERNAL SPEAKER JACKS

MOUNTED ON THE CHASSIS
ONLY FOR BXR200 HEAD UNIT

SPEAKER 15" 4n
TO CP1
TO CP3
BXR200C - 048941
KXR200 - 048769 SPKR 1

100V	120V	230V
CP8	CP8	CP8
CP10	CP10	CP10
CP9	CP9	CP12
S1B-5	CP14	CP14
CP12	CP12	S1B-5
TS1	TS1	TS1
CP6	CP6	CP6
N/A	CP8	N/A
N/A	CP10	N/A

T1B
BLK/RED
YELLOW
BLK/GRN
BLK/YEL
WHT
BLK
VIOLET/W
VIOLET
RED
BLU
BROWN
TO CP19
TO CP24
TO CP22
TO CP25
ALTERNATE EXPORT XFMR P/N 041122

T1A
BLACK
WHITE
RED
YELLOW
BLU
BROWN
TO CP19
TO CP24
TO CP22
TO CP25
DOMESTIC XFMR P/N 048960

OUTPUT TEST:
200 WATTS RMS AT 0.1% THD, 4 OHMS WITH 1V RMS, 1KHZ SINEWAVE APPLIED AT TP1.

NOTES:
UNLESS OTHERWISE SPECIFIED:
1. ALL RESISTORS ¼ W, 5%
2. ALL CAPACITORS 63V MINIMUM
3. ALL DIODES 1N4448
4. DC VOLTAGES READ TO GROUND WITH A DVM WITH NO INPUT SIGNAL, NO FOOTSWITCH, AND CHORUS SELECT "OFF"
5. AC VOLTAGES READ TO GROUND WITH A DVM UNDER THE FOLLOWING CONDITIONS: 200mV, 1kHz SINEWAVE INPUT AT TP1. 4n RESISTIVE LOAD CONNECTED AT CP1, CP3. DELTA COMP "OFF"

LAST INSTANCES USED:
C34 CP25 CR46 F3 L1 Q22 R73 TH1 TP5 U4

DATABASE FILE: Z286S2.DBF
CHECKED BY:
DATE:
APPROVED: CA
DATE: 2-10-95
TOLERANCES: UNLESS OTHERWISE NOTED
X.X ±0.050"
X.XX ±0.010"
X.XXX ±0.005"
ANGLES ±0.500°

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REGIONAL HEADQUARTERS
2821 RESEARCH DRIVE
CORONA, CA 91720 USA

NEXT HIGHER ASSEMBLY: BXR200/KXR200

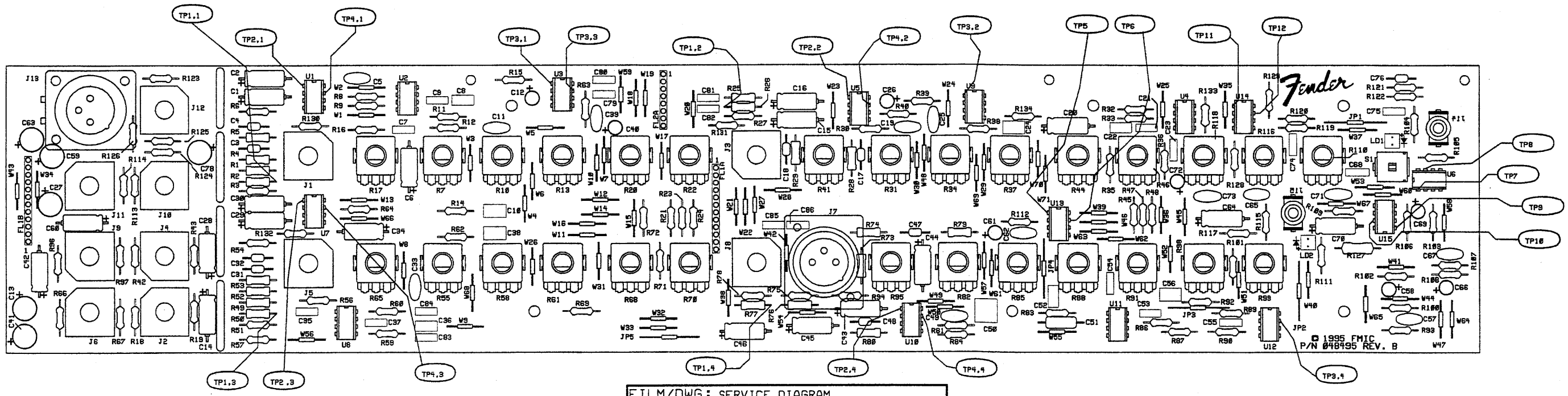
Fender MUSICAL INSTRUMENTS
2821 Research Drive
Corona, CA 91720 USA

TITLE: SCHEMATIC DIAGRAM, 200 WATT POWER AMPLIFIER

SIZE D | DRAWN: C.SHAH | DRAWING NUMBER 048839 | REV. A
ENGR: C.SHAH
SCALE: NONE | CREATED: 25-JUL-94 | PLOTTED: 10-FEB-95 | SHEET 1 OF 1

0048840000

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	PR 287	MAR-16-95	
	B	EC1546	AUG-15-95	

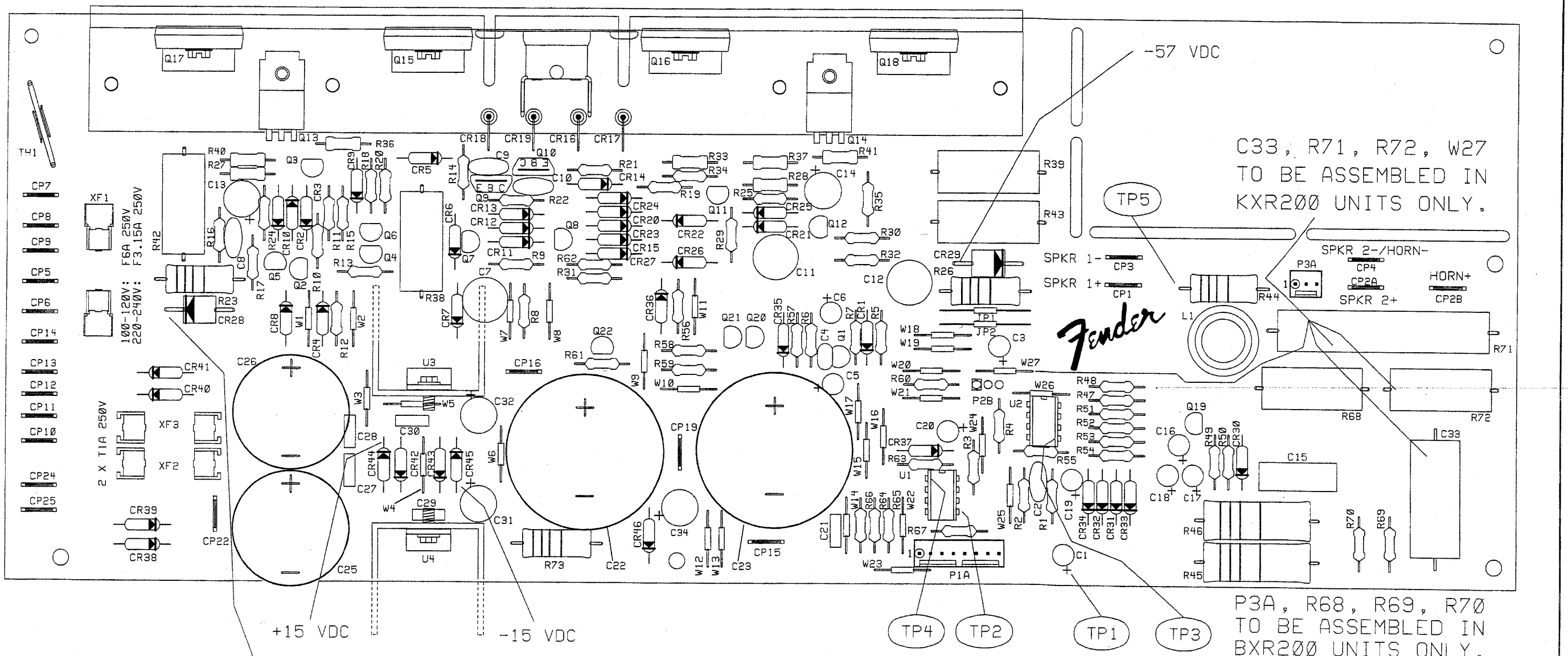


FILM/DWG: SERVICE DIAGRAM	
DATABASE:	DATE: 18-JUN-99
LAYERS PLOTTED: 1 2 3 4 18	10

DATABASE FILE: Z287P.DBF	PROPRIETARY	Fender MUSICAL INSTRUMENTS	
CHECKED BY: KEPLOT	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: FENDER MUSICAL INSTRUMENTS CO. REGIONAL HEADQUARTERS 2821 RESEARCH DRIVE CORONA, CA 91720 USA	2621 Research Drive Corona, CA 91720 USA	
DATE: 6/18/99		TITLE: KXR200 PRE-AMP SERVICE DIAGRAM	
APPROVED: M. Lamthanh		SIZE D	DRAWN: LAMTHANH / ENGR: LAMTHANH
DATE: 6/18/99		DRAWING NUMBER 048494	REV. B
TOLERANCES: UNLESS OTHERWISE NOTED X.X ±0.050" X.XX ±0.010" X.XXX ±0.005" ANGLES ±0.500°	NEXT HIGHER ASSEMBLY:	SCALE: N/A	CREATED: 06-MAY-94 PLOTTED: 18-JUN-99 SHEET 1 OF 1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	RELEASED PR286	10-FEB-95	S.SHAH
	B	ECCR#31	20-SEP-96	FM



FILM/DWG:	SERVICE DIAGRAM
DATABASE:	Z286P2.DBF DATE: 24-SEP-96
LAYERS PLOTTED:	1 2 3 4 10 18

DATABASE FILE:	Z286P2.DBF
CHECKED BY:	MC
DATE:	10-1-96
APPROVED:	FM
DATE:	9-24-96

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	DRAWING NUMBER	REV.
B	C.SHAH	048841	B
	ENGR: C.SHAH		

SCALE: NONE	CREATED: 25-AUG-94	
	PLOTTED: 24-SEP-96	SHEET 1 OF 1