

# FRONTMAN 15B

p/n 022-1503-000 (120 V)

## SERVICE MANUAL

FRONTMAN 15B  
(This is the model name for warranty claims)

## SERVICE MANUAL

FEBRUARY 1997

### 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

#### 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

#### RESISTOR CODES

RES CC	=	Carbon Comp
RES CF	=	Carbon Film
RES FP	=	Flame Proof
RES MF	=	Metal Film
RES WW	=	Wire Wound



### CONTENTS:

- Notices
- Specifications
- Parts lists:
  - Theory of Operation
  - PCB assembly
  - Chassis Assembly
  - Cabinet assembly
  - Miscellaneous
- Schematics
- Service diagram

**SPECIFICATIONS****Product Release No.:**PR 359 *(This is not a model number)***PART NUMBER:**

22-1503	120 V
22-1533	240 V Aus
22-1543	230 V UK
22-1563	230 V
22-1573	100 V
22-1583	230 V Nord

**POWER AMPLIFIER SECTION:**

Power output:	15 Watts
Rated load impedance:	8 $\Omega$
Distortion at rated power:	5%
Power bandwidth:	40 Hz to 20 kHz
Compression range:	19dB

**PREAMP SECTION:**

Input impedance:	202k Ohms
Sensitivity (@ 1kHz):	4mV at onset of compression

Equalization range:	HIGH	+/- 15 dB at 8 kHz
	MID	+/- 15 dB at 800 Hz
	LOW	+/- 15 dB at 40 Hz

**PHYSICAL SPECIFICATIONS:**

Width:	13-1/4 inches (34.3 cm)
Height:	15 inches (38.1 cm)
Depth:	9-3/4 inches (24.8 cm)
Weight:	21 lbs. (9.5 kg)

**THEORY OF OPERATION**

The input circuitry is a low pass filter with the -3 dB down point at 22 kHz. This sets up the initial response of the amplifier and provides RF suppression. U1B is an "Auto Pad". It provides excellent headroom and low noise. At upper volume control settings, it also rolls off low frequencies at 219 Hz. U1A makes up the tone controls. They provide 15 dB of boost or cut at 40 Hz (Low), 800 Hz (Mid), and 8 kHz (High). U2B is a special tone shaping circuit used for sonic enhancement.

U2A is a unity gain amplifier which drives the power amp stage. In conjunction with U4, it acts as the gain reduction circuit for the Deltacomp™. The output of the power amplifier is sensed through R23 by the Comparator U5A. As the amplifier output approaches clipping, the output of U5A goes negative. This charges Capacitors C20-C23 through the time constant made up with R41 (3.9K x 8.8 $\mu$ F = 34.3mSec). This single-pole charge is the attack time for the Deltacomp™. As the capacitors charge, the voltage at the base of transistor Q1 goes negative, turning on this Darlington device. Current from Q1 controls the output voltage of U4 (Operational Transconductance Amplifier). The output of U2A also drives the inverting input of U4. The inverted output from U4 mixes with the non-inverted input to U2A causing a cancellation effect. This attenuates the signal to the power amp, thus eliminating clipping. When the power amp output is reduced, the output U5A goes positive. Blocking Diodes CR8-CR11 force the Capacitors to discharge through R40. This 4-pole discharge is the Release for the Deltacomp™.

The power amplifier is contained within U3. CR1 and CR2 keep the output centered during clipping. CR3 and CR4 provide flyback protection for the output of U3.

**PARTS LIST**

NOTE: SHADED ITEMS ARE FOR REFERENCE ONLY

**PRINTED CIRCUIT BOARD ASSEMBLY**

QTY	PART #	DESCRIPTION	REFERENCE	DESIGNATION
	047499	PCB ASSY BXR 15/ FRONTMAN 15B		
9	026517	CAP AE AX 2.2μF 50V	C2,4,5,13,18,20,21,22,23	
1	038693	CAP AE AX 47μF 16V	C15	
2	028471	CAP AE RDL 47μF 50V 20%	C26,27	
2	033607	CAP AE RDL 2200μF 35V 20%	C24,25	
1	038703	CAP CA .1μF 50V	C12	
1	038873	CAP CA 22PF 100V	C14	
1	038699	CAP CA 100PF 100V	C3	
1	039259	CAP CA 220PF 100V	C1	
1	039260	CAP CA 270PF 100V	C10	
1	038700	CAP CA 390PF 50V	C6	
1	039267	CAP CA 3900PF 100V	C32	
1	038702	CAP CA 6800PF 50V	C7	
1	027286	CAP MPF .47μF 63V	C8	
1	033588	CAP PFF RDL .01μF 100V 10%	C16	
1	033591	CAP PFF RDL .033μF 100V 10%	C19	
4	033592	CAP PFF RDL .047μF 100V 10%	C28,29,30,31	
1	038656	CONTROL 10KB SNAP IN	R7	
3	038655	CONTROL 50KB W/CD SNAP IN	R8,9,10	
6	064089	DIODE 1N4003	CR3,4,15,16,17,18	
9	006260	DIODE 1N4448/1N914B SIGNAL	CR1,2,5,6,8,9,10,11,12	
2	047140	DIODE ZEN 1N5349B 12V 5W	CR13,14	
2	025996	FUSE CLIP PCB .250 & 5MM FUSE	XF1	
1	068411	FUSE QA 1-1/4X1/4 250V 0.5A	F1 (100/120V ONLY)	
1	020781	FUSE QA 20mm x 5mm 250V .25A	F1 (230V EXPORT ONLY)	
1	041952	HEATSINK BRONCO		
1	027404	IC CA3080AE OTA	U4	
3	016795	IC DUAL OP AMP TL072	U1,2,5	
1	029912	IC POWER AMP PC1188H 20W	U3	
1	041988	INSULATOR MICA 10 PIN SIP	AT HEATSINK	
2	037036	JACK PHONE PCB MONO CA PREMIUM	J1,3	
1	031570	JACK PHONE PCB STEREO PREMIUM	J2	
9	020888	JUMPER WIRE 22GA. .5X.175	W1,2,3,4,5,6,7,8,9	
1	028039	LED RED 5X5MM SLB-55VR3	LD1	
1	047499	PCB ASSY BXR 15	(STUFFED)	
1	047498	PCB FAB BXR 15	(RAW BOARD)	
1	024952	RES CF 1/4W 5% 100Ω	R31	
2	024959	RES CF 1/4W 5% 330Ω	R5,45	
2	024965	RES CF 1/4W 5% 1K	R19,48	
2	024971	RES CF 1/4W 5% 2.2K	R11,14	
2	024972	RES CF 1/4W 5% 2.7K	R6,34	
1	024975	RES CF 1/4W 5% 3.9K	R41	

**PARTS LIST****PRINTED CIRCUIT BOARD ASSEMBLY  
CONTINUED**

QTY	PART #	DESCRIPTION	REFERENCE	DESIGNATION
1	024977	RES CF 1/4W 5% 4.7K	R36	
1	028948	RES CF 1/4W 5% 6.2K	R32	
1	024980	RES CF 1/4W 5% 8.2K	R23	
5	024981	RES CF 1/4W 5% 10K	R15,25,26,28,30	
5	024989	RES CF 1/4W 5% 33K	R1,4,24,27,29	
2	024993	RES CF 1/4W 5% 47K	R18,21	
4	028990	RES CF 1/4W 5% 51K	R37,38,39,40	
1	024996	RES CF 1/4W 5% 82K	R12	
1	024997	RES CF 1/4W 5% 100K	R20	
1	024998	RES CF 1/4W 5% 120K	R33	
1	024999	RES CF 1/4W 5% 150K	R13	
2	025059	RES CF 1/4W 5% 220K	R3,17	
1	025061	RES CF 1/4W 5% 330K	R16	
1	025069	RES CF 1/4W 5% 1M	R2	
1	029083	RES CF 1/2W 5% 10Ω	R22	
1	026549	RES CF 1/2W 5% 1.5K	R42	
4	028045	RES FILM 1W 5% 220Ω	R43,44,46,47	
2	027638	SCRW TF 4-40X3/8 HWHS ZI .1HD	AT HEATSINK	
2	032908	SCRW TF 6-32X3/8 PHP ZI	AT HEATSINK	
1	9904701440	SPACER LED .7X.125 BLUE	AT LD1	
1	014408	XSTR PNP MPSA63 TO-92	Q1	

**CHASSIS ASSEMBLY**

QTY	PART #	DESCRIPTION	REFERENCE	DESIGNATION
	051212	CHASSIS ASSY FRNTMAN 15B		
4	033206	BUSHING KNOB SPACER	(@ CONTROLS)	
1	007565	BUSHING SR.625X.125X37/64 BLK	(@ POWER CABLE)	
1	026527	CABLE ASSY PWR 120V.187 TABS		
1	022491	CLAMP CABLE NYL SCRW MNT 5/16		
4	026402	KNOB POINTER BLACK		
1	047502	PANEL FRONT BXR 15		
1	048440	PLATE REAR BXR 15		
1	038900	SCRW TF 6-32X1/4 PHP ZI	(@ GROUND LUG)	
2	037353	SCRW TF 6-32X3/4 PHP ZI	(PCB MOUNT)	
1	051100	PANEL FRONT FRONTMAN 15B		
1	051330	CABLE ASSY 120V 6 FT		

## FRONTMAN 15B

**PARTS LIST****CHASSIS ASSEMBLY  
CONTINUED**

<b>QTY</b>	<b>PART #</b>	<b>DESCRIPTION</b>	<b>REFERENCE DESIGNATION</b>
5	032908	SCRW TF 6-32X3/8 PHP ZI	(XFMR/HEATSINK MOUNT)
2	047040	STANDOFF NYLON PCB SNAPIN 1/2"	
1	025935	SWITCH DPST .187 TAB (DOM)	(POWER SWITCH)
5	026459	WSHR FLAT 6X3/8 ZI	
1	025413	XFMR POWER F1158UC SQ15 FOJ	(120V DOMESTIC)
1	041775	XFMR POWER EXPORT 100V	(100V JAPAN)
1	031634	XFMR POWER FD15 230V	(230V EXPORT)

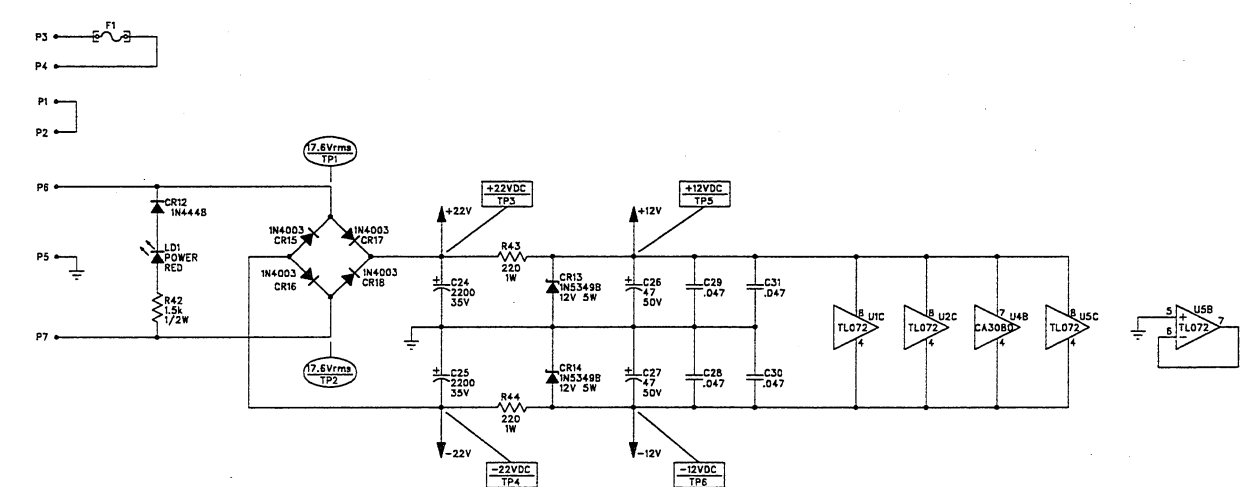
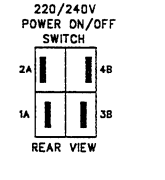
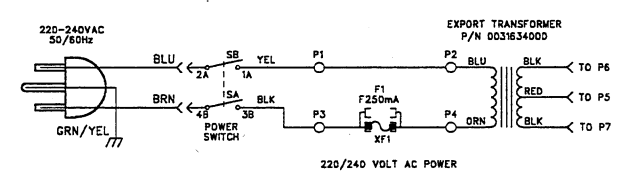
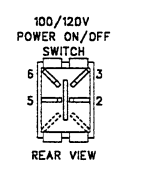
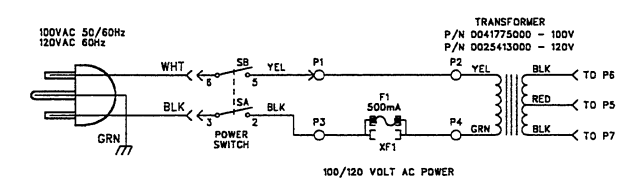
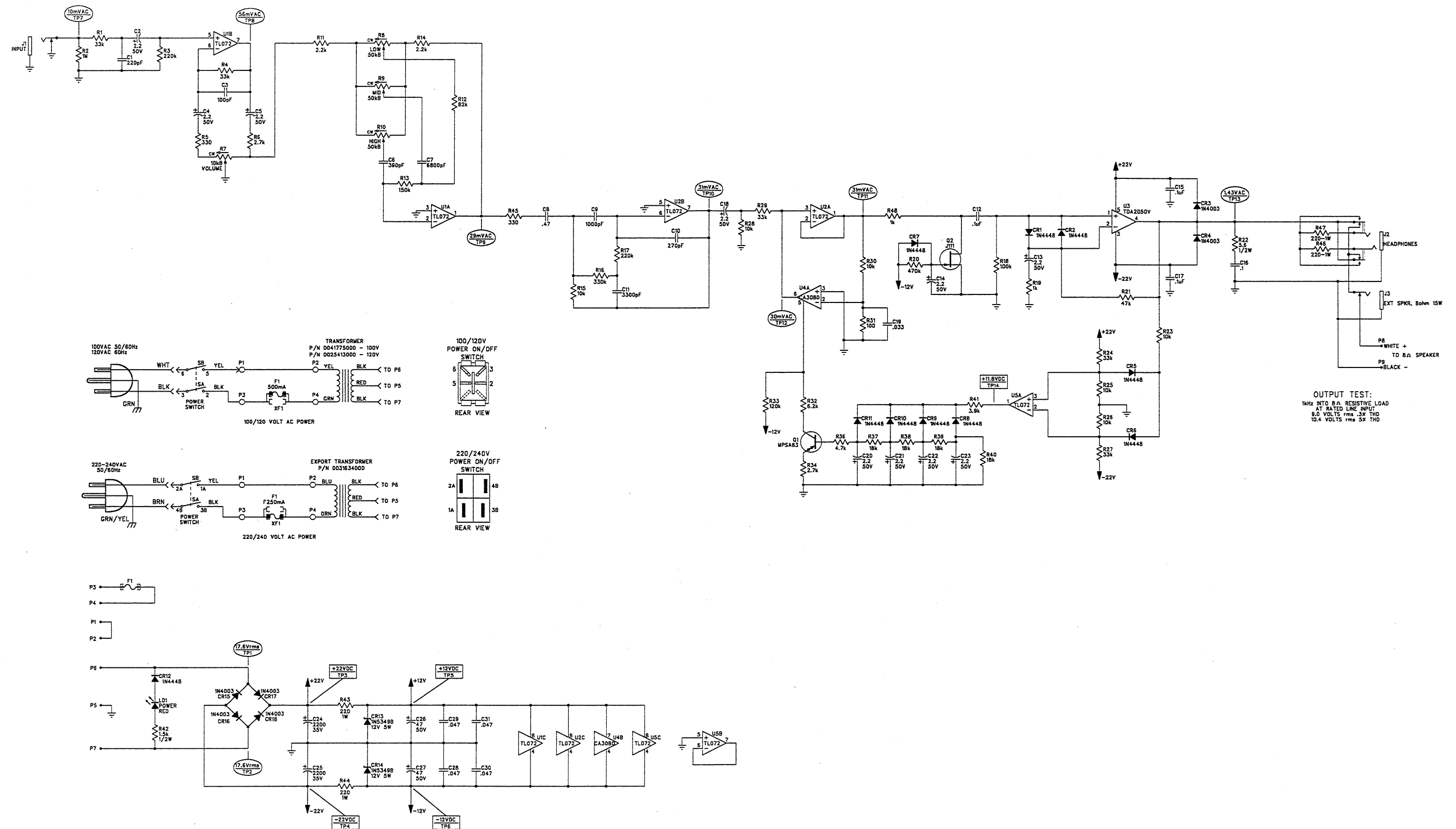
**CABINET ASSEMBLY**

<b>QTY</b>	<b>PART #</b>	<b>DESCRIPTION</b>	<b>REFERENCE DESIGNATION</b>
1	051168	CAB ASSY FRNTMAN 15B	
4	026566	CORNER 2 HOLE W/TAB NI	
4	029071	CORNER NOTCHED NICKEL (FD)	
4	041549	GLIDE PRESS-IN .75 DIA	
2	036199	SCRW M 8-32X1-3/16 OHP BLX CP	(CHASSIS SIDE MOUNT)
4	029828	SCRW PB 8X3/4 PHP ZI	
2	018113	SCRW SMA 4X1/2 OHP BLX	(LOGO MOUNT)
4	016627	SCRW SMA 8 x 3/4 OHP BLX	
16	026571	SCRW SMAB 8X5/8 THP NI	(CORNER MOUNT)
4	029527	WSHR FNSH 8-5/8 FLNGD BLX WX	(CHASSIS MOUNT)

**MISCELLANEOUS**

<b>QTY</b>	<b>PART #</b>	<b>DESCRIPTION</b>	<b>REFERENCE DESIGNATION</b>
1	051153	MANUAL OWNERS FRNTMAN 15B	
1	047496	SCHEMATIC REDUCED BXR 15	
.95	051204	FOAM TAPE 1/4" x 1/16" 3m4516	@ TOP & BOTTOM OF GRILLE
1	051169	GRILLE METAL BLK FRNTMAN 15B	
2	025395	HANDLE CAP 1 HOLE NI	
1	029906	NAMEPLATE GENERIC SMALL	
1	025883	HANDLE SHORT NO LOGO	
2	022277	SCRW M 10-32X1-1/2 OHP NI	(HANDLE/CHASSIS MOUNT)
4	026800	SCRW SMAB 8X1-3/4 OHP BLX	(GRILLE/BAFFLE MOUNT)
1	025421	SPEAKER 8 INCH PF8643	

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	EC 2333	04-AUG-99	MCU



6. LAST REFERENCE DESIGNATORS: C31, CR18, F1, J3, PS, Q2, R48, TP14, US, W11.
  5. ALL VOLTAGES MAY VARY +/-20%.
  4. AC VOLTAGE READINGS TAKEN WITH A DVM TO GROUND UNDER THE FOLLOWING CONDITIONS:  
14Hz INPUT APPLIED THROUGH 1/4" PLUG TO J1  
8.0 RESISTIVE LOAD CONNECTED AT P8, P9  
ALL CONTROLS SET TO 12 O'CLOCK
  3. DC VOLTAGES READ TO GROUND WITH A DVM, NO INPUT SIGNAL.
  2. ALL CAPACITORS IN uF; 50V MINIMUM.
  1. ALL RESISTORS IN OHMS; 1/4W, 5%.
- NOTES: (UNLESS OTHERWISE NOTED)

THIS DOCUMENT CONTAINS INFORMATION OF A PROPRIETARY NATURE TO FENDER MUSICAL INSTRUMENTS AND IS SUBMITTED TO YOU IN CONFIDENCE AND SHALL NOT BE DISCLOSED OR TRANSMITTED TO OTHERS WITHOUT AUTHORIZATION FROM FENDER MUSICAL INSTRUMENTS.

**Fender** MUSICAL INSTRUMENTS  
2621 Research Drive  
Corona, CA 91720 USA

CHECKED BY: *[Signature]*  
DATE: 25-AUG-99  
APPROVED BY: MULRICH  
DATE: 21-SEP-99  
DRAWN: MULRICH ENGR:SAMS/ULRICH  
DATABASE FILE: Z3595.SCH

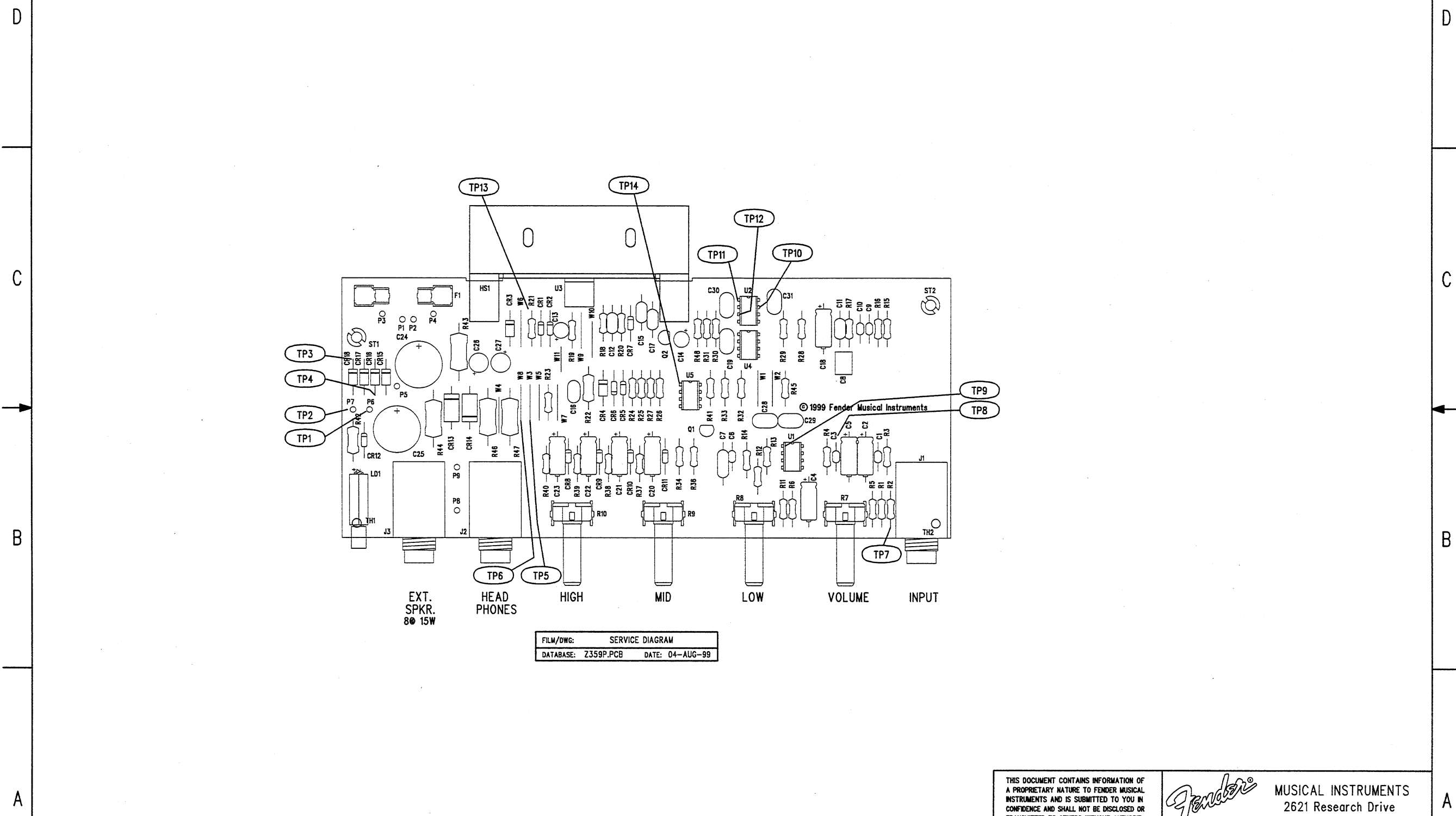
TITLE: SERVICE DIAGRAM, COMBINED (schematic)  
FRONTMAN 15B BASS AMPLIFIER

SIZE: D  
DRAWING NUMBER: 0054408000  
REV: A

RELEASE DATE: 04-AUG-99 SHEET: 1 OF 2


8 7 6 5 4 3 2 1

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	EC 2333	04-AUG-99	MCU



FILM/DWG: SERVICE DIAGRAM  
 DATABASE: Z359P.PCB DATE: 04-AUG-99

1. SEE SHEET 1 FOR PRIMARY WIRING, TEST CONDITIONS AND TEST POINT VALUES.  
 NOTES: (UNLESS OTHERWISE NOTED)

THIS DOCUMENT CONTAINS INFORMATION OF A PROPRIETARY NATURE TO FENDER MUSICAL INSTRUMENTS AND IS SUBMITTED TO YOU IN CONFIDENCE AND SHALL NOT BE DISCLOSED OR TRANSMITTED TO OTHERS WITHOUT AUTHORIZATION FROM FENDER MUSICAL INSTRUMENTS.		 MUSICAL INSTRUMENTS 2621 Research Drive Corona, CA 91720 USA	
CHECKED BY: <u>Beleni</u>	DATE: <u>29-AUG-99</u>	TITLE: SERVICE DIAGRAM, COMBINED (PCB assy) FRONTMAN 15B BASS AMPLIFIER	
APPROVED BY: <u>MULRICH</u>	DATE: <u>21-SEP-99</u>	SIZE: <b>C</b>	DRAWING NUMBER: <b>0054408000</b>
DRAWN: MULRICH	ENGR: SAMS/MULRICH	REV: <b>A</b>	
DATABASE FILE: Z359P.PCB	RELEASE DATE: 04-AUG-99	SHEET 2 OF 2	

8 7 6 5 4 3 2 1