

POWER STAGE EXPANDER

p/n 071-0101-000 (120V)

SERVICE MANUAL

POWER STAGE EXPANDER

(This is the model name for warranty claims)

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

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



CONTENTS:

- Notices
- Specifications
- Parts lists:
 - PCB assembly
 - Cabinet assembly
 - Miscellaneous
- Schematics
- Service diagram

PARTS LIST

SPECIFICATIONS

Product Release No.:	PR 306 <i>(This is not a model number)</i>	
Part Number:	120V Version:	71-0101-000
	240V Aust:	71-0101-030
	230V UK:	71-0101-040
	230V Euro:	71-0101-060
Power Specification:	120V Version:	120 V AC, 60 Hz W
	230V Version:	230 V AC, 50 Hz W
	240V Version:	240 V AC, 50 Hz W
Nominal Power:	THD + noise	<0.05% @ 1 kHz, 100 W into 8 Ω
	Output impedance	0.2 Ω @ 1 kHz, 0.02 Ω @ 100 Hz
	Input sensitivity	1 V RMS, 0 dBV
Dimensions:	Height:	18" (45.7 cm)
	Width:	23-1/2" (59.7 cm)
	Depth:	12" (30.5 cm)
Weight:		41 lbs. (18.6 kg)

Product specifications are subject to change without notice

NOTE: SHADED ITEMS ARE FOR REFERENCE ONLY

PRINTED CIRCUIT BOARD

QTY	PART#	DESCRIPTION	REFERENCE	DESIGNATION
	051337003	PCB ASSY PWR AMP, PWR STG XPANDER		
2	028494	CAPAE RDL 35V 1000uF	C203 C204	
6	028459	CAPAE RDL 50V 2.2uF	C24 C27 C37 - 40	
2	028467	CAPAE RDL 50V 22uF	C25 C28	
4	028471	CAPAE RDL 50V 47uF	C33 C34 C205 C206	
2	028031	CAPAE RDL 63V 3300uF HT	C201 C202	
1	031040	CAPAE RDL 100V 100uF	C30	
2	020909	CAPCD 1KV 47pF 10%	C31 C32	
2	024832	CAP MPF RDL .022uF 250V 10%	C211 C212	
2	034788	CAPCR 50V .1uF 20%	C213 C214	
1	027269	CAPMPF 63V .033 5%	C36	
1	027278	CAPMPF 63V .1uF	C35	
1	030939	CAPPFF 50V .0039 5%	C26	
12	025802	FASTON TAB, .250	CP1 - 12	
19	006260	DIODE, 75PRV SIGNA IN4448	CR3 - 7 CR13 CR14 CR16 - 19 CR25-28 CR209 - 212	
2	025821	DIODE, 200PRV SIGNA FDH400	CR8 CR9	
2	028776	DIODE, BIAS REF BYV26D	CR10 CR11	
6	064089	DIODE, 200PRV, 1AMP 1N4003	CR20 CR21 CR205 - 208	
4	020534	DIODE, 200PRV, 3AMP 1N5402	CR201 - 204	
1	027329	ZENER 3.9V, .5W, 5% 1N5228B	CR29	
2	027327	ZENER 6.2V, .5W, 5% 1N5234B	CR12 CR15	
2	031635	ZENER 10V, .5W 5% 1N5240B	CR23 CR24	
1	031019	ZENER 15V, .5W, 5% 1N5245B	CR22	
1	013737	FUSE, 4A, SLOW 4AT	F1 (DOMESTIC)	
1	013115	FUSE, 2A, 5mm, SLOW 2AT	F2 (EXPORT)	
1	030987	JACK,PHONE,STEREO	J8	
1	028039	LED RED, 5x5mm	LD1	
1	014689	XISTOR JFET N-CHAN J111	Q1	

PARTS LIST

PRINTED CIRCUIT BOARD CONTINUED

QTY	PART#	DESCRIPTION	REFERENCE	DESIGNATION
4	025751	XISTOR NPN 2SC2362K	Q2 Q3 Q4 Q7	
2	025752	XISTOR PNP 2SA1016K	Q5 Q6	
1	014866	XISTOR PNP MPSW92	Q8	
1	014867	XISTOR NPN MPSW10	Q9	
1	016739	XISTOR NPN 2N4401	Q10	
1	041477	XISTOR PNP PWR MJE21193	Q14	
1	051091	XISTOR NPN 2SC4793	Q12	
1	041476	XISTOR NPN PWR MJE21194	Q15	
1	051092	XISTOR PNP 2SA1837	Q13	
2	016742	XISTOR PNP 2N4403	Q11 Q20	
2	024947	RESCF 1/4W 47 ohm 5%	R53 R55	
3	024952	RESCF 1/4W 100 ohm 5%	R44 R45 R92	
2	038814	RESMF 1/4W 220 ohm 5%	R61 R62 FUSIBLE	
6	024965	RESCF 1/4W 1K 5%	R48 R58 R67 R72 R73 R106	
5	024969	RESCF 1/4W 1.5K 5%	R64 R65 R68 R69 R200	
3	024972	RESCF 1/4W 2.7K 5%	R52 R54 R60	
1	024975	RESCF 1/4W 3.9K 5%	R99	
1	024977	RESCF 1/4W 4.7K 5%	R104	
1	025942	RESCF 1/4W 7.5K 5%	R56	
4	024981	RESCF 1/4W 10K 5%	R82 R91 R93 R105	
1	024986	RESCF 1/4W 18K 5%	R74	
1	024987	RESCF 1/4W 22K 5%	R46	
2	024988	RESCF 1/4W 27K 5%	R51 R57	
2	024989	RESCF 1/4W 33K 5%	R47 R97	
4	028990	RESCF 1/4W 51K 5%	R100 - 103	
1	024995	RESCF 1/4W 68K 5%	R98	
2	024997	RESCF 1/4W 100K 5%	R43 R95	
1	024998	RESCF 1/4W 120K 5%	R94	
1	025059	RESCF 1/4W 220K 5%	R96	
2	025069	RESCF 1/4W 1M 5%	R49 R50	
2	041272	RESCF 1/2W 5.6K 5%	R63 R66	
2	027628	RESCF 2W 47ohm 5%	R79 R80	
1	041258	RESCF 2W 2.2K 5%	R90	
2	051039	RESFP 1/4W 22 ohm 5%	R70 R71	

PARTS LIST

PRINTED CIRCUIT BOARD CONTINUED

QTY	PART#	DESCRIPTION	REFERENCE	DESIGNATION
2	051040	RESFP 1/4W 47 ohm 5%	R75 R76	
1	051041	RESFP 1/4W 2.2K 5%	R59	
2	032958	RESWW 5W .33ohm 10	R77 R78	
1	037845	RESWW 5W 47ohm	R81	
1	031611	IC OP-AMP DUAL 4560	U5	
1	027404	IC OP TRANS AMP CA3080	U6	
1	013562	IC REGULATOR, +15V 7815	U7	
1	013564	IC REGULATOR, -15V 7915	U8	
2	051095	FUSE CLIP, PCB 1/4"	XF1 XF3 (DOMESTIC)	
2	051094	FUSE CLIP, PCB 5MM	XF2 XF3 (EXPORT)	
2	025796	HEATSINK TO-220	at U7 U8	
2	050849	HEATSINK PCB LEVEL	at Q12 Q13	
2	031077	SCREW 4-40 x 1/4" TF HX W/SLT	at U7 U8	
2	039420	SCREW SEMS 4-40 x 3/8" PHP SS	at Q12 Q13	
2	027638	SCREW 4-40 X 3/8" TF HX S/SLT	at SPREADER	
1	050563	SPREADER BAR PWR STG 100	at Q14 Q15	
4	069385	SCREW 6-32 X 5/8 PHP ZI	at Q14 Q15	
4	051042	WASHER SPLIT #6 EXTRA DUTY	at Q14 Q15	
4	051158	NUT #6 HEX SMALL PATTERN	at Q14 Q15	
2	074211	MICA INSULATOR TO-3	at Q14 Q15	
2	097360	HEX NUT EX LOCK 4-40	at Q12 Q13	
1	041527	SPACER, RND .680 x .250 x .147	at LD1	
1	050569	PCB FAB PWR STG 100 PWR AMP	PCB	
13	020888	JUMPER .400"	W4-8 W15-18 W20 W28 W48 W59	
23	020888	JUMPER .500"	W1-3 W9-14 W19 W21-24 W27 W29 W50	
			W56 W61 W63-64 W68 W69	
14	020888	JUMPER .725"	W30 W32-38 W42-47	

PARTS LIST

CAB ASSEMBLY

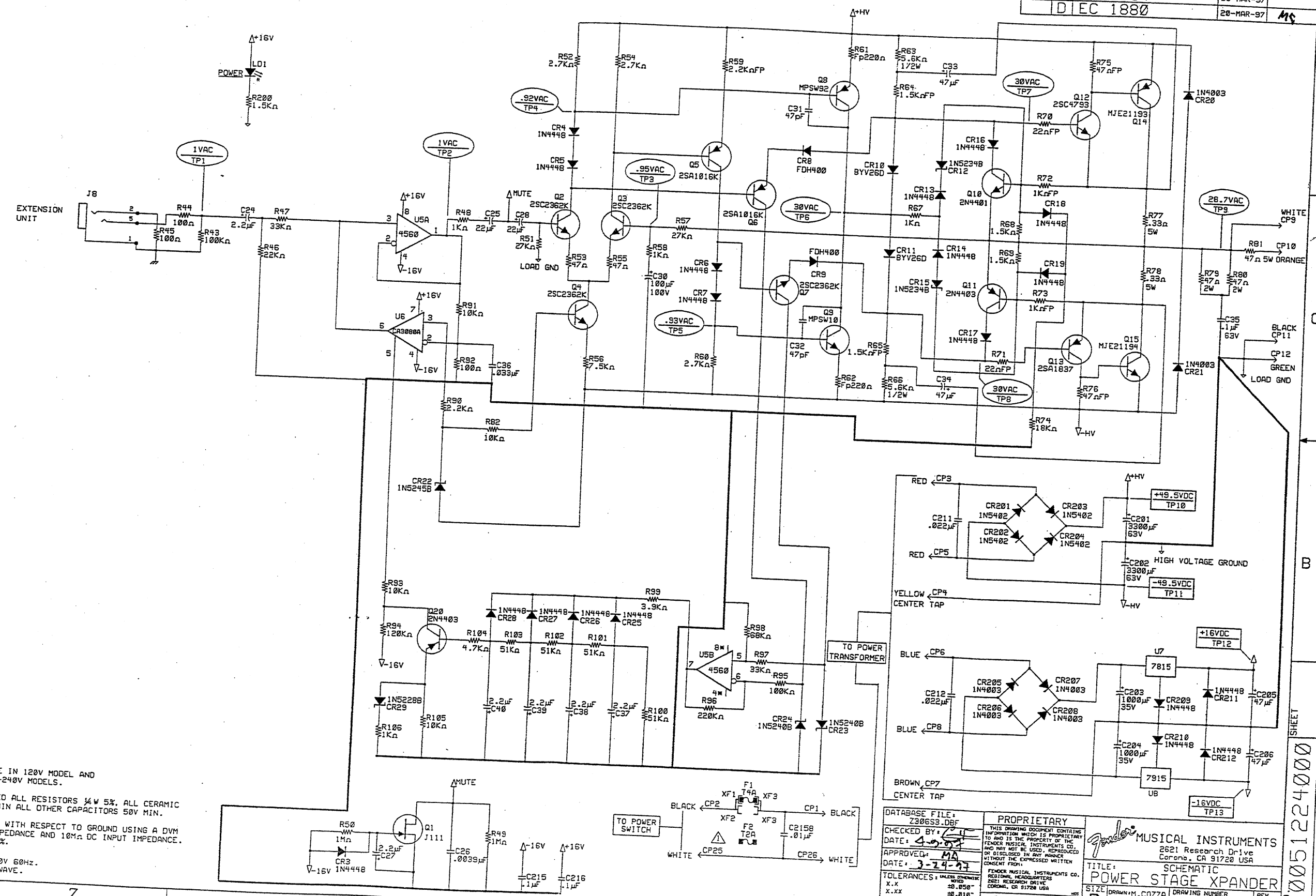
QTY	PART #	DESCRIPTION	REFERENCE	DESIGNATION
1	051060	CAB ASSY PWR STG EXPANDER		
8	017393	SCRW M 10-32x1-1/8 OHP BLX		
12	017942	SCRW WOOD 8x1 FHP BLK		
12	019275	INSERT GLIDE CUSHION 1.27 DIA		
19	021972	NUT T 10-32x3/4 STR 3 PRNG BLX		
2.02	027500	BIRCH/MAPLE 3/4" THICKNESS		
10.32	027502	PARTICLEBOARD 3/4" THICKNESS		
1				
.01	027579	PINE #3 COMMON 1X10X96 MAX		
3	027682	INSULATION 1-1/2"		
12	027849	GLIDE CAB 1.24x.335 BLX WAX		
1.3	027882	PLYWOOD LUAUN 1/4" THICKNESS		
3	029505	SCRW M 10-32x1-1/4 PHP BLX		
4	031845	HANDLE CAP 2 HOLE BLK PWDRD		
2	032524	INSERT HANDLE		
1	033349	ADAPTER SPEAKER STAND		
2	037790	HANDLE 9.25" BLACK RIBBED		
1.326	040046	CARPET BLACK		
1.43	050009	ASH 1-1/2x1/2		

MISCELLANEOUS

QTY	PART #	DESCRIPTION	REFERENCE	DESIGNATION
1	047248	CORD PWR W/IEC CONN	DOMESTIC VERSION	
1	047213	CONNECTOR AC LINE MALE IEC		
1	049808	PIEZO DRIVER, SCREW IN		
1	050555	SPEAKER 12" COAX		
1	050556	XFMR, PWR, PWR STG 100, 120 V	DOMESTIC VERSION ONLY	
1	051037	XFMR, PWR, PWR STG 100, 230 V	EXPORT VERSION ONLY	

UNIT	TRANSFORMER	POWER CORD	POWER SWITCH
DOM 120V 071-0101-000	050556	047248	039236
UK 230V 071-0101-040	051037	047249	040582
AUS 240V 071-0101-030	051037	047250	040582
EUR 230V 071-0101-060	051037	047251	040582

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
B	EC	1832	30-JAN-97	
C	EC	1864	03-MAR-97	
D	EC	1880	26-MAR-97	MS



- NOTES:
- FUSE IS T4A 250V TYPE IN 120V MODEL AND T2A 250V TYPE IN 220-240V MODELS.
 - UNLESS OTHERWISE NOTED ALL RESISTORS 1/4W 5%. ALL CERAMIC DISK CAPACITORS 1KV MIN ALL OTHER CAPACITORS 50V MIN.
 - ALL VOLTAGES MEASURED WITH RESPECT TO GROUND USING A DVM OF AT LEAST 1MΩ AC IMPEDANCE AND 10MΩ DC INPUT IMPEDANCE. VOLTAGES MAY VARY ±20%. TEST CONDITIONS:
A. LINE VOLTAGE 120V 60Hz.
B. INPUT 1KHz SINE WAVE.

DATABASE FILE: Z306S3.DBF
 CHECKED BY: [Signature]
 DATE: 4-9-97
 APPROVED: [Signature]
 DATE: 3-24-97

PROPRIETARY
 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.
 2621 RESEARCH DRIVE
 CORONA, CA 91726 USA

MUSICAL INSTRUMENTS
 2621 Research Drive
 Corona, CA 91726 USA

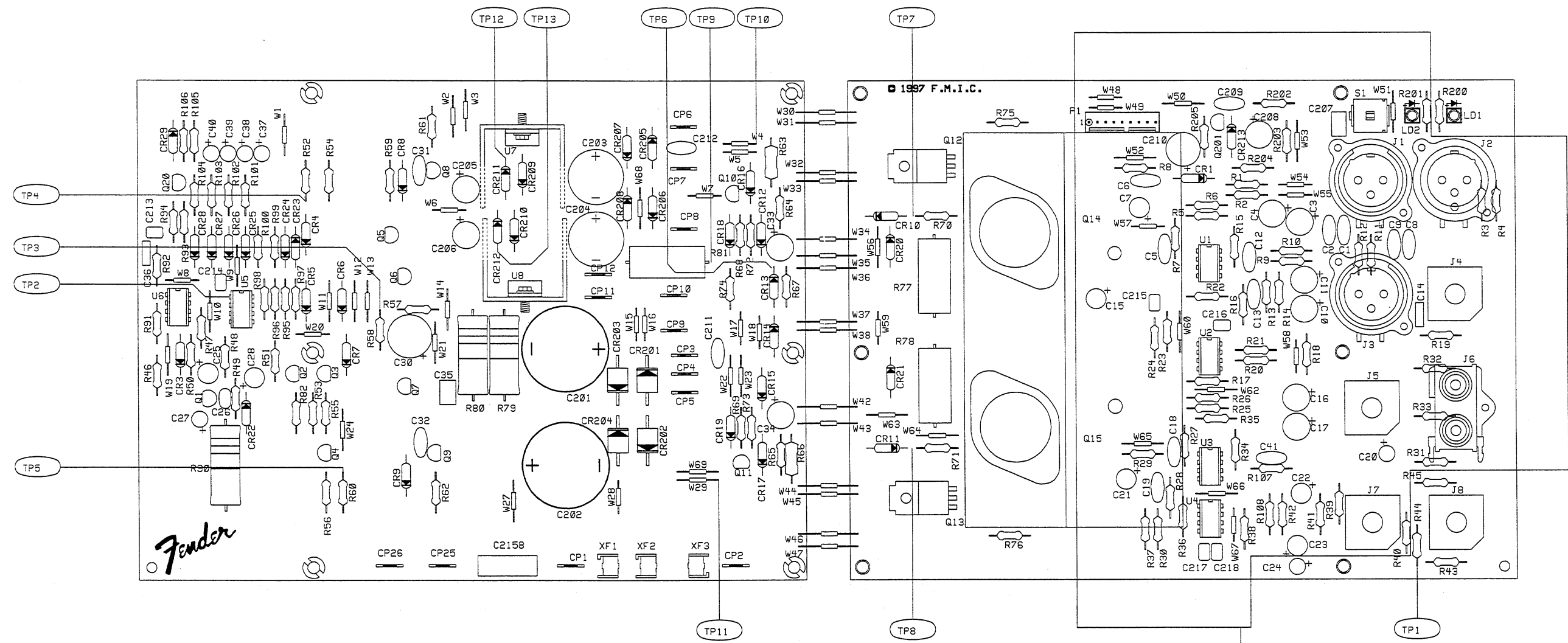
TITLE: POWER STAGE XPANDER
 SIZE: DRAWN: M. COZZA DRAWING NUMBER: REV.
 D ENGR: M. COZZA 051335 D

TOLERANCES: UNLESS OTHERWISE NOTED
 X.X .050"
 X.XX .010"
 X.XXX .005"
 ANGLES .500°

SCALE: CREATED: 04-OCT-96 PLOTTED: 21-MAR-97 SHEET 1 OF 1

PART NO 0051224000 SHEET

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	PR 306	07-OCT-96	
	B	EC 1832	13-JAN-97	MQ



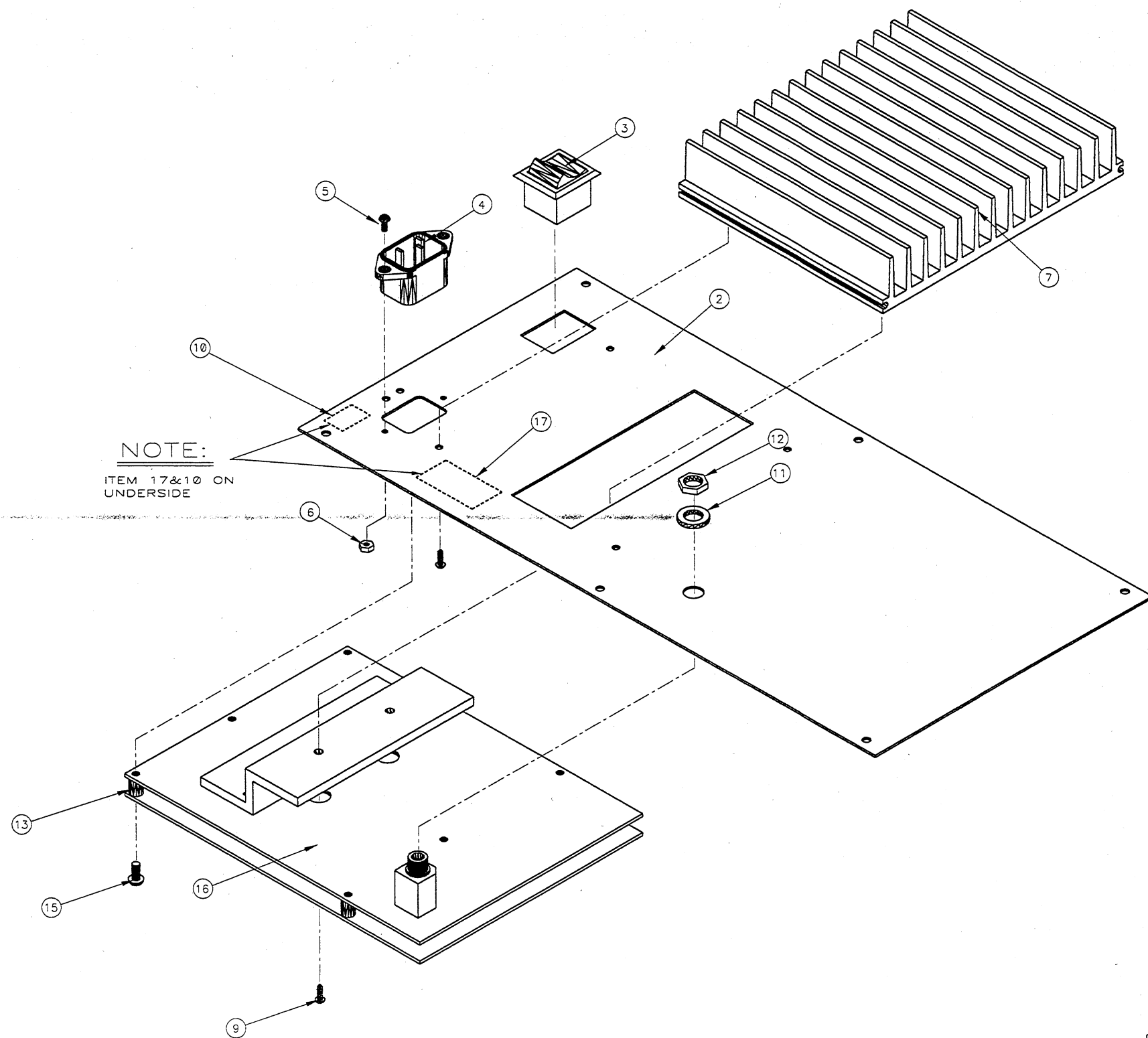
NOTE: PCB COMPONENTS NOT STUFFED BUT SILKSCREEN OUTLINE STILL ON BOARD

FILM/DWG: SERVICE DIAGRAM	
DATABASE: Z306P3.DBF	DATE: 03-FEB-97
LAYERS PLOTTED: 1 2 3 4	10
	18

DATABASE FILE: Z306P3.DBF CHECKED BY: [Signature] DATE: 1.30.97 APPROVED: MQ DATE: 1.30.97 TOLERANCES: UNLESS OTHERWISE NOTED X.X ±0.050" X.XX ±0.010" X.XXX ±0.005" ANGLES ±0.500°	PROPRIETARY 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 2621 RESEARCH DRIVE CORONA, CA 91720 USA NEXT HIGHER ASSEMBLY:	MUSICAL INSTRUMENTS 2621 Research Drive Corona, CA 91720 USA TITLE: SERVICE DIAGRAM POWER STAGE XPANDER SIZE: B DRAWN: M.COZZA DRAWING NUMBER: 051225 REV. B ENGR: M.COZZA SCALE: 1:1 CREATED: 03-OCT-96 PLOTTED: 03-FEB-97 SHEET 1 OF 1
--	---	--

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 CORP.

REV	EC NUMBER	BY	DATE/CHK
A	PR363	TG	10-07-96
B	EC 1832	HB	01-15-97
C	MEC 057	HB	04-16-97
D	EC CR134	KD	10-01-97



NOTE:
ITEM 17&10 ON
UNDERSIDE

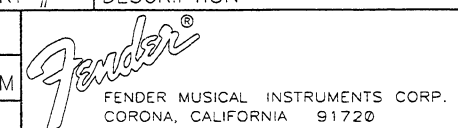
- 4. COPYRIGHT - 1997 - FENDER MUSICAL INSTRUMENTS CORP.
 - 3. - 3 - SAMPLES OF FIRST PARTS MUST BE APPROVED BY FENDER R&D BEFORE STARTING PRODUCTION.
 - 2. ALL DIMENSIONS ARE IN INCHES.
 - 1. DO NOT SCALE DRAWING.
- NOTES: UNLESS OTHERWISE NOTED

POWER SWITCH CHART		
VERSION	DOM. 120V 005120000	EXPORT 0051223000
SWITCH	039236	040582

MATERIAL	n/a
FINISH	n/a
TOL. UNLESS NOTED FRACT. ----- +- 1/32 .X ----- +- 0.050 .XX ----- +- 0.010 .XXX ----- +- 0.005 ANGLES ----- +- 0.5 DEGREES HOLE DIA ----- +0.005 - 0.001 UNMARKED ANGLES ARE 90 DEGREES.	

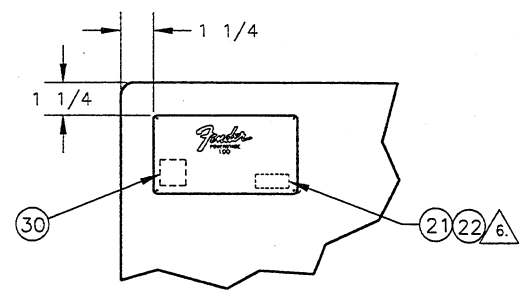
17	1	0037139000	FUSE CAUTION STICKER
16	1	0051337000	PCB ASSY
15	6	0015627000	SCREW, 6-32x3/4 PHP BLX
14			
13	6	0025936000	STANDOFF NYL PCB SNAP 3/8" NAT
12	1	0038537000	NUT, HEX 3/8-32 BLK NYL
11	1	0038538000	WASHER, 3/8x5/8x3/32 BLK NYL
10	1	0013020000	LABEL GROUNDING SEMKO
9	6	0027636000	SCREW, 8-32x5/8 BLX
8			
7	1	0053490000	HEAT SINK
6	2	0097360000	NUT, HEX 4-40 EX LOCK
5	2	0014172000	SCREW, 4-40x1/4 PHP BLX
4	1	0047213000	IEC LINE CORD JACK
3	1	SEE CHART	SWITCH, ROCKER DPST PSEUDO-IEC
2	1	0053492000	INPUT PANEL
1			

ITEM	QTY	PART #	DESCRIPTION
ENGINEER COZZA			
DRAWN T.GROENENBOOM			
DATE 09-18-96			
DFT. ENG. ENG. DATE DATE DATE			
APPROVED DATE 10-1-97			
TITLE CHASSIS ASSY, XPANDER			
SHEET 1/1	SIZE D	DRAWING NUMBER 0051200000	REV. D
SCALE N/A			

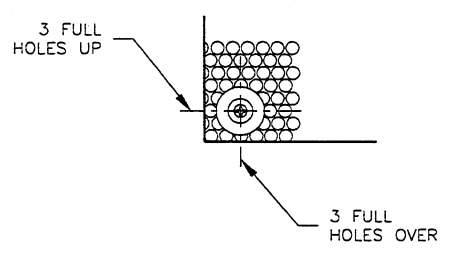


THIS DOCUMENT CONTAINS INFORMATION OF A PROPRIETARY NATURE TO FENDER MUSICAL INSTRUMENTS AND IS SUBMITTED TO YOU IN CONFIDENCE AND SHALL NOT BE DISCLOSED OR TRANSMITTED TO OTHERS WITHOUT AUTHORIZATION FROM FENDER MUSICAL INSTRUMENTS CORP. JAM'N

REV	EC NUMBER	BY	DATE/REV
B	EC 1832	HB	01-16-9
C	MEC 056	HB	04-01-9
D	EC CR102A	KD	06-25-9



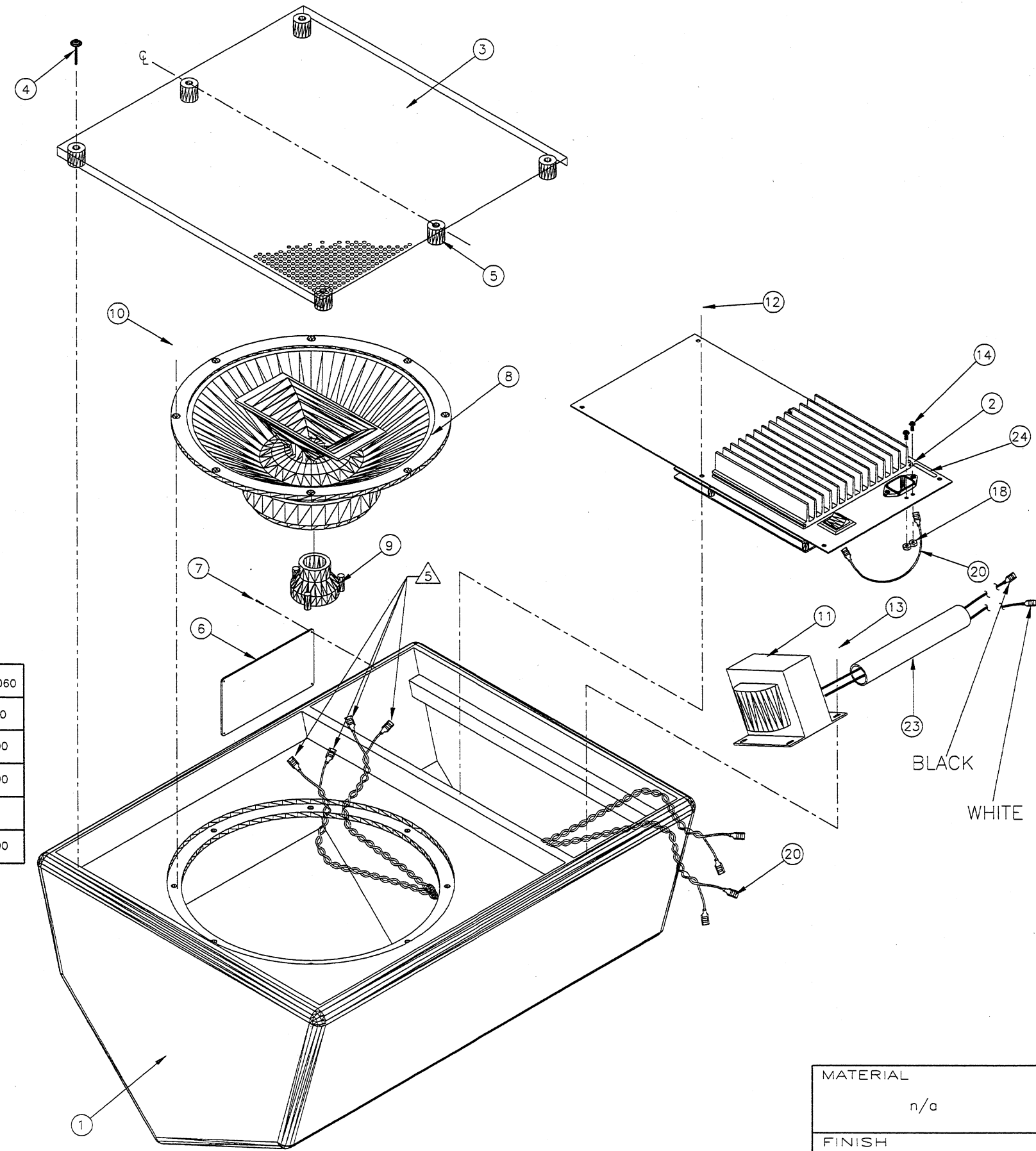
SAFTEY PANEL PLACEMENT DETAIL



SCREW W/STANDOFF PLACEMENT DETAIL TYP ALL CORNERS

VERSION	DOM 120V 071-0101-000	U.K. 230V 071-0101-040	AUST 240V 071-0101-030	EUR 230V 071-0101-060
POWER CORD	0047248000	0047249000	0047250000	0047251000
TRANSFORMER	0050556000	0051037000	0051037000	0051037000
VOLTAGE LABEL	NONE	0050505000	0050506000	0050505000
TAG, WARRANTY	(1) 0031893000	NONE	NONE	NONE
CHASSIS ASSY.	0051200000	0051223000	0051223000	0051223000

- 6. PLACE QUALITY ASSURANCE & HI-POT STICKERS IN OPEN AREA OF SAFETY PANEL
 - 5. ORANGE WIRE TO "+" TERMINAL ON HORN (ALAMBRE NARANJA A LA TERMINAL POSITIVA (+) DE LA CORNETA)
GREEN WIRE TO "-" TERMINAL ON HORN (ALAMBRE VERDE A LA TERMINAL NEGATIVA (-) DE LA CORNETA)
BLACK WIRE TO "-" TERMINAL ON SPEAKER (ALAMBRE NEGRO A LA TERMINAL NEGATIVA (-) DE LA BOCINA)
WHITE WIRE TO "+" TERMINAL ON SPEAKER (ALAMBRE BLANCO A LA TERMINAL POSITIVA (+) DE LA BOCINA)
 - 4. COPYRIGHT - 1996 -. FENDER MUSICAL INSTRUMENTS CORP.
 - 3. - 3 - SAMPLES OF FIRST PARTS MUST BE APPROVED BY FENDER R & D BEFORE STARTING PRODUCTION.
 - 2. ALL DIMENSIONS ARE IN INCHES.
 - 1. DO NOT SCALE DRAWING.
- NOTES: UNLESS NOTED OTHERWISE.



30	1	0050712000	LABEL CSA NRTL/C
29	1	0051225000	SERVICE DIAGRAM PWR STG EXPANDEF
28	1	0051224000	SCHEM W/SVC PWR STG EXPANDER
27	1	.9903311400	BAG JIFFY #1 7-1/4x12
26	1	0049118000	ORDER FORM MAKING THE CONNECT
25	SEE	CHART	TAG WARRANTY 5 YR FENDER
24	1	SEE CHART	VOLTAGE LABEL
23	1	0049940000	TUBING PVC 1/2X6" 105DEG CSA
22	1	EXP. ITEM	HI-POT STICKER
21	1	EXP. ITEM	QUALITY ASSURANCE STICKER
20	1	0051181000	WIRE SET PWR STG 100/XPANDER
19	1	0029757000	BAG POLY 35x22x52 .0015 (N. S.)
18	2	0069393000	NUT 6-32 HEX EXT LOCK
17	2	0051384000	END CAP,PWR STG 100/EXPANDER
16	1	0051208000	CARTON, PWR STG/EXPANDER (N. S.)
15	1	SEE CHART	CORD PWR W/IEC CONN (N. S.)
14	2	0031632000	SCRW M 6-32x7/16 PHPS BLX ITLW
13	4	0047821000	SCRW M 10-32 3/4 THP STL BLX
12	6	9904101110	SCRW PB 8x5/8 PHP BLX
11	1	SEE CHART	XFMR PWR STAGE
10	4	0026577000	SCRW 10-32x1 BLX
9	1	0049808000	PIEZO DRIVER, SCREW IN
8	1	0050555000	SPEAKER, 12" COAX
7	4	0036650000	PIN ESCUTCHEON #18x3/8 NI
6	1	0050744000	REAR NAMEPLATE PWR STGE/EXP
5	6	0050317000	STANDOFF RUBBER .75DIA X .77
4	6	0036112000	SCRW SMAB 6x1-1/4 OHP BLX w/W
3	1	0050565000	GRILLE PERF METAL PWR STAGE
2	1	0051200000	CHS ASSY PS XPANDER-DOM
1	1	0051060000	CAB ASSY PWR STG EXPANDER

MATERIAL	n/a	ENGINEER	COZZA	 FENDER MUSICAL INSTRUMENTS CORP. CORONA, CALIFORNIA 91720	
FINISH	n/a	DRAWN	T.GROENENBOOM		
		DATE	09-23-96	TITLE	END ITEM POWER STAGE XPANDER
		CHECK	<i>GF</i>	SHEET	1/1
		DATE	6-26-97	SCALE	N/A
		APPROVED	<i>MZ</i>	DRAWING NUMBER	0710101000
		DATE	6-26-97	REV.	D
		TOL UNLESS NOTED OTHERWISE		MASTER	