

SUNN SPL 6000

POWER AMPLIFIER

SERVICE MANUAL

APRIL 1993

0716000000 (120V)

0716000060 (230V)

0716000070 (100V)

NOTICE:

The information contained herein is CONFIDENTIAL and PROPRIETARY to Fender Musical Instruments. 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 express permission of Fender Musical Instruments. All specifications subject to change without notice.

A coded naming convention is used in the description of certain parts. The codes and what they mean follow:

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

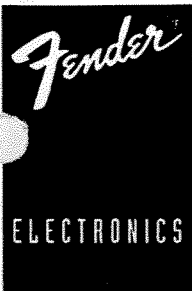
HARDWARE CODES

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 Plating

NOTICE:

Reference designators 1XX correspond to Channel 1. Reference designators 2XX correspond to Channel 2.

Parts marked with an asterick (*) indicate the required use of that specific part. This is necessary for RELIABILITY and SAFETY requirements. **DO NOT USE A SUBSTITUTE!**



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SPECIFICATIONS

OUTPUT POWER

Stereo Continuous sine wave output power, both channels driven +/- 1dB, 20 Hz to 20kHz with 120 VAC line voltage:

8 ohms 150 watts each channel.
4 ohms 300 watts each channel.

Mono Bridge

16 ohms 300 watts.
8 ohms 600 watts.

Single channel Driven @ 1 kHz, 1% THD:

8 ohms 179 watts.
4 ohms 312 watts.
2 ohms 250 watts.

POWER BANDWIDTH

10 Hz to 68 kHz.
(3 dB down points from rated power at less than 0.1% THD).

FREQUENCY RESPONSE

+0 -3 dB; 5 Hz to 68 kHz (at rated power, 8 ohms).

RISE TIME

Less than 5.2 μ Sec.

SLEW RATE

Greater than 13.5V/ μ Sec.

TOTAL HARMONIC DISTORTION (THD)

20 Hz to 20 kHz at rated power.
4 ohms Less than 0.03%.

HUM AND NOISE

Below rated output, 4 ohms. 20 Hz to 20 kHz broad band 95dB.
IEC A Weight 102 dB.

DAMPING FACTOR

Ref., 8 ohms. 5 Hz to 20 kHz Greater than 30.
1 kHz Greater than 175.

INPUT IMPEDANCE

Differential 33k ohms.

CHANNEL SEPARATION

Below rated power, single channel operating 1 kHz Greater than 65 dB.

SENSITIVITY

Reference 1 kHz, +/- 0.25 dB. Stereo Mode +1.8 dBv (1.23v)
Bridged Mode 1.8 dBv

STATUS INDICATORS

Each channel
Peak LED (red)
Power LED (red)

THERMAL PROTECTION

COOLING

Two speed fan.

GAIN CONTROLS

Continuously variable attenuator. One per channel.

MODE SWITCHING

Stereo-Mono Bridge, Dual Mono, Two push button switches.

POWER REQUIREMENTS

120v, 50 to 60 Hz, 10 amps (Domestic only).

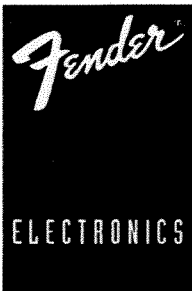
WEIGHT

25 lbs.

DIMENSIONS

Width
Height
Depth

19 inches
3 1/2 inches
14 7/8 inches (13 3/8 inches behind the front panel not including connectors).

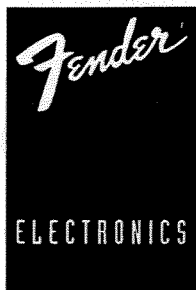


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PART LIST

PRINTED CIRCUIT BOARD ASSEMBLY

QTY	PART #	DESCRIPTION	REFERENCE	DESIGNATION
1	038871	PCB ASSY SPL6000/2300 ALL VOLTAGES	(STUFFED)	
2	028101	BUTTON PUSH SWITCH RED	S101,102	
22	028459	CAP AE RDL 2.2μF 50V 20%	C100-104,108-112,116,200-204,208-212,216	
2	028460	CAP AE RDL 4.7μF 50V 20%	C106,206	
4	028471	CAP AE RDL 47μF 50V 20%	C123,124,223,224	
2	028474	CAP AE RDL 100μF 25V 20%	C7,8	
2	038898	CAP AE RDL 10,000μF 80V	C5,6	
2	025970	CAP CD 5pF 1000V 10%	C118,218	
2	004026	CAP CD 22pF 1000V 10%	C127,227	
4	020909	CAP CD 47pF 1000V 10%	C119,120,219,220	
2	024854	CAP MP .1μF 400V 10%	C125,225	
8	025787	CAP MINI ELCTLT 100μF 16V NP	C117,121,122,126,217,221,222,226	
6	027257	CAP MPF .0022μF 100V	C105,205,1,2,3,4	
2	027269	CAP MPF .033μF 63V	C107,207	
6	027278	CAP MPF .1μF 63V 10%	C113-115,213-215	
1	031639	CONN HEADER .156 RA 15 PIN	P100	
1	031642	CONN .156 BTM ENT PCB 15 PIN	P101	
2	038656	CONTROL 10KB	R107,207	
46	006260	DIODE 1N4448 75PRV	CR100,102-106,109-117,119-122,129-132,200,202-206,209-217,219-222,229-232	
8	028776001	DIODE BIAS BYV26D LL	CR125-128,225-228	
4	020534	DIODE RECTIFIER 1N5402 200PRV	CR137,138,237,238	
8	025821	DIODE HV FDH400 SWITCHING	CR123,124,135,136,223,224,235,236	
4	027327	DIODE ZENER 1N5234B 6.2V .5W 5%	CR133,134,233,234	
2	027329	DIODE ZENER 1N5228B 3.9V .5W 5%	CR101,201	
4	031635	DIODE ZENER 1N5240B 10V .5W 5%	CR107,108,207,208	
2	031019	DIODE ZENER 1N5245B 15V .5W 5%	CR118,218	
2	009165	DIODE ZENER 1N4744 15V 1W C&F	CR1,2	
22	025802	FASTON TAB MALE .250X.032 PCB MT	CP1-18,100,101,200,201,	
8	020775	FUSEHOLDER CLIP PCB 5MM	XF100,101,200,201	
4	020801	FUSE QA 20mmX5mm 8 AMP 250V	F100,101,200,201	
1	038837	HEATSINK SPL6000/2300		
4	016795	IC DUAL OP AMP TL072C	U100,102,200,202	
2	027404	IC CA3080AE OTA	U101,201	
2	027387	INDUCTOR AIR CORE RDL 2.5UH	L100,200	
12	038815	INSULATOR SILICONE TO-3P	(@ Q115-120,215-220)	
2	030987	JACK 1/4" PCB 3/CD DOC	J102,202	
2	037248	JACK XLR FEMALE PCB	J100,200	
2	037249	JACK XLR MALE PCB	J101,201	
41	020888	JUMPER WIRE 22GA .5X.175	W1-43	
2	028841	KNOB PUSH BUTTON MX/PX	S100,200	
2	028039	LED 5X5mm RED SLB-55VR3	LD100,200	
1	028098	LED 5X5mm GREEN SLB-55MG3	LD101	
1	038870	PCB SPL6000/2300	(RAW BOARD)	

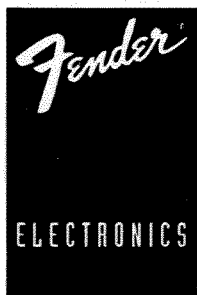


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PART LIST

PRINTED CIRCUIT BOARD ASSEMBLY CONTINUED

QTY	PART #	DESCRIPTION	REFERENCE	DESIGNATION
4	024947	RES CF 1/4W 47Ω 5%	R136,137,236,237	
8	024952	RES CF 1/4W 100Ω 5%	R1,2,3,4,106,111,112,206	
4	024961	RES CF 1/4W 470Ω 5%	R153,154,253,254	
16	024965	RES CF 1/4W 1K 5%	R113,128,132,140,152,183,184,185, 213,228,232,240,252,283,284,285	
3	024969	RES CF 1/4W 1.5K 5%	R7,131,231	
8	024971	RES CF 1/4W 2.2K 5%	R134,135,142,143,234,235,242,243	
12	024972	RES CF 1/4W 2.7K 5%	R160,161,166,169,171,174,260,261, 266,269,271,274	
2	024975	RES CF 1/4W 3.9K 5%	R120,220	
2	024977	RES CF 1/4W 4.7K 5%	R115,215	
2	025942	RES CF 1/4W 7.5K 5%	R138,238	
6	024981	RES CF 1/4W 10K 5%	R105,110,114,205,210,214	
2	024985	RES CF 1/4W 15K 5%	R129,229	
2	024987	RES CF 1/4W 22K 5%	R182,282	
9	024988	RES CF 1/4W 27K 5%	R133,141,155,156,181,233,241,255, 256	
12	024989	RES CF 1/4W 33K 5%	R100-104,122,200-204,222	
8	028990	RES CF 1/4W 51K 5%	R116-119,216-219	
2	024995	RES CF 1/4W 68K 5%	R124,224	
10	024997	RES CF 1/4W 100K 5%	R123,125-127,130,223,225-227,230	
2	024998	RES CF 1/4W 120K 5%	R112,212	
2	025059	RES CF 1/4W 220K 5%	R121,221	
4	025069	RES CF 1/4W 1M 5%	R108,109,208,209	
4	036926	RES CF 1/2W 4.7K 5%	R147,148,247,248	
2	031900	RES CF 1/2W 15K 5%	R139,239	
4	037354	RES CF 1W 4.7K 5%	R146,149,246,249	
12	031693*	RES MF FUSE 1/4W 4.7Ω 5%	R157,159,162,165,170,175,257,259, 262,265,270,275	
4	033205*	RES MF FUSE 1/4W 15Ω 5%	R150,151,250,251	
2	027749*	RES MF FUSE 1/4W 22Ω 5%	R158,258	
2	036960*	RES MF FUSE 1/4W 47Ω 5%	R6,10	
4	038814*	RES MF FUSE 1/4W 220Ω 5%	R144,145,244,245	
2	015582	RES MF 1/4W 10K 1%	R179,279	
2	016968	RES MF 1/4W 21.5K 1%	R180,280	
2	027627	RES MF 1W 10Ω 5%	R178,278	
4	027628	RES MF 2W 47Ω 5%	R176,177,276,277	
2	026485	RES WW BT 3W 1.2K 10%	R8,9	
12	9901503300	RES WW 5W .33Ω 5%	R163,164,167,168,172,173,263, 264,267,268,272,273	
1	037034	RES WW BT 10W 1K 10%	R5	
4	027638	SCREW 4-40x3/8" HWH ZI	(THERMAL SWITCH MOUNT)	
18	032934	SCREW TF 4-40x1/2" HIHS ZI	(@ Q113-120,213-220)	
8	038784	SLEEVING TEFLON 18GA. 5/8"	(@ CR125-128,225-228)	
3	9904701440	SPACER LED .7X.125 BLUE	(@ LD100,101,200)	
2	028091	SWITCH PUSH SLFLK SHORT STROKE	S100,200	



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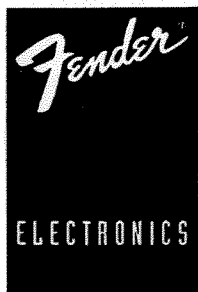
PART LIST

PRINTED CIRCUIT BOARD ASSEMBLY CONTINUED

QTY	PART #	DESCRIPTION	REFERENCE	DESIGNATION
1	028866	SWITCH 4PDT SGL STA LATCH	S101	
1	029904	SWITCH PB PC MT	S102	
2	031522	SWITCH BIDIRECT MBS4993 TO-92	TR100,200	
1	037037*	SWITCH THERMAL 194°F	TS2	(HI/LOW SPEED FAN)
1	038533*	SWITCH THERMAL SENSOR 248°F	TS1	
2	025794	THYRISTOR TRIAC MAC15-4	TR101,202	
1	026411	THERMISTOR 2.5Ω 8 AMP	TH1	
16	032937	WSHR CONE	(@ Q113-120,213-220)	
2	014408	XSTR PNP DARLNGTN MPSA63 TO-92	Q101,201	
2	014689	XSTR N-CH JFET J111 TO-92	Q100,200	
2	014866	XSTR PNP MPS-U60 TO-202	Q109,209	
2	014867	XSTR NPN MPS-U10 TO-202	Q110,210	
2	016739	XSTR NPN 2N4401 TO-92	Q111,211	
2	016742	XSTR PNP 2N4403 TO-92	Q112,212	
8	025751	XSTR NPN 2SC2362K/2SC2389	Q102-104,108,202,203,204,208	
6	025752	XSTR PNP 2SA1016K TO-92	Q105-107,205-207	
2	028759	XSTR PNP 2SA1306A TOP-220	Q114,214	
2	028760	XSTR NPN 2SC3298A TOP-220	Q113,213	
6	028762*	XSTR PNP 2SA1302 TOP-3L	Q116,118,120,216,218,220	
6	028763*	XSTR NPN 2SC3281 TOP-3L	Q115,117,119,215,217,219	

CHASSIS ASSEMBLY

QTY	PART #	DESCRIPTION	REFERENCE	DESIGNATION
1	038865	BAFFLE SPL6000/2300	(AIR DEFLECTOR)	
2	040722	BRACKET CHASSIS CORNER SPL6000		
2	040661	BRACKET RACK MOUNTING 2 SPACE		
2	040662	BRACKET CORD WRAP 2 SPACE		
1	007565	BUSHING SR .625X.125X37/64 BLK 100V/120V	(@ POWER CABLE)	
1	010401	BUSHING SR .625x.125x37/64 WHT 230V/240V	(@ POWER CABLE)	
2	9904814100	BUSHING 23-1410/1411	(@ CONTROL SHAFTS)	
1	026541	CABLE ASSY PWR W/.250 TAB 120V	(100V, 120V ONLY)	
1	033331	CABLE ASSY PWR 220V/240V	(220V/230V/240V)	
1	040994	CABLE ASSY PWR 10A U.K. W/.250 TABS	(240V UNITED KINGDOM ONLY)	
1	038602	CABLE ASSY PWR AUST .250 TAB	(AUSTRALIA ONLY)	
1	038857	CHASSIS ASSY SPL6000 120V		
1	028502	CHANNEL NYLON	(OVER EDGE OF SHIELD)	
1	038864	CHASSIS BOTTOM SPL6000/2300		
1	040723	CHASSIS FRONT SPL6000		
1	040724	CHASSIS WRAP SPL6000		
1	040725	COVER TOP SPL6000		
1	031180	FAN GUARD 3-1/8"		
1	036229	FAN 3-1/8" 120V		



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PART LIST

CHASSIS ASSEMBLY CONTINUED

QTY	PART #	DESCRIPTION	REFERENCE	DESIGNATION
1	028330	FUSE QA 1-1/4X1/4" 250V 10AMP	F1	(100V/120V ONLY)
1	013681	FUSE TD 20mmX5mm 250V 5AMP	F1	(220V/230V/240V ONLY)
1	030795	FUSEHOLDER 1/4X1-1/4 W/NUT	FH1	(100V/120V ONLY)
1	031196	FUSEHOLDER 20mmX5mm W/NUT	FH1	(220V/230V/240V ONLY)
2	039094	HANDLE SPL6000/2300		(RACK MOUNT)
2	032900	JACK PHONE 1/4" HI CURRENT		(SPEAKER OUTPUT JACKS)
2	036718	KNOB LT GRAY SR		
4	025819	NUT HEX KEP 10-32 ZINC		(TRANSFORMER MOUNT)
6	069393	NUT HEX 6-32 EXT LOCK		(FAN/RECTIFIER/GND LUG MOUNT)
6	097360	NUT HEX 4-40 EX LOCK		(2 SHIELD MOUNTS)
4	020912	PAD STANDOFF RUBBER		
2	015688	POST BINDING DUAL - BAND A		(SPEAKER OUTPUTS)
1	032925	RECTIFIER BRIDGE DIODE		
5	015627	SCRW M 6-32X3/4" PHP BLX		(FAN/RECTIFIER MOUNT)
5	017433	SCRW M 6-32X3/8" PHP BLX		(AC BOARD/GND LUG MOUNT)
4	025743	SCRW M 10-32X1/2" PHP BLX		(TRANSFORMER MOUNT)
4	029656	SCRW M 8-32X3/8" PHP BLX SEM/LW		(HANDLE MOUNT)
7	031184	SCRW M 6-32X1/4" PHPS BLX		(PCB TO STANDOFF MOUNT)
6	031189	SCRW M 4-40X1/4" UFHP BLX		
2	031632	SCRW M 6-32X7/16" PHPS BLX		(HEATSINK TO STANDOFF MOUNT)
41	032806	SCRW TF 6-32X1/4" PHP BLX		(TOP/BOTTOM COVER MOUNT)
4	037239	SCRW TF 8-32X3/8" PHP BLX		(BRACKET MOUNT)
8	037990	SCRW PLASTITE 6X3/8" PHP BLX		(XLR JACK MOUNT)
1	039093	SHIELD TRANS SPL6000/2300		
4	027673	STANDOFF NYL 1/2"		(AC BOARD MOUNT)
9	031073	STANDOFF 6-32X3/8 RND AL		(MAIN PCB MOUNT)
1	026479	SWITCH ROCKER DPST		(POWER SWITCH)
2	026401	WSHR SHOULDER FIBER 3/8X5/8		(@ 1/4" OUTPUT JACKS)
2	027520	WSHR FLAT FIBER.380X.630		(@ 1/4" OUTPUT JACKS)
2	029894	WSHR LCK INTL 3/8X.500X.022 NI		(@ 1/4" INPUT JACKS)
1	038834	XFMR PWR 120V SPL6000/2300		(120V DOMESTIC ONLY)
1	038835	XFMR PWR 100V/230V EXP		(100V/220V/230/240V ONLY)

MISCELLANEOUS

QTY	PART #	DESCRIPTION	REFERENCE	DESIGNATION
1	038866	MANUAL OWNERS SPL6000/2300		
1	038868	SCHEMATIC REDUCED SPL6000/2300 W/SERVICE DIAGRAM		