

# FAST 4 & 5

## SPECIFICATIONS

Keyboard: C to C  
Manual Bass: C1 to B1  
Extended Bass: C2 to B2

Voice Stops (violet tabs):

Bass 16'  
Bass Clarinet 16'  
Flute 8'  
Oboe 8'  
Trumpet 8'  
Strings 8'  
Flute 4'  
Piccolo 4'

Mixture Stops (violet tabs):

Mixture (mixed frequencies of 5-1/3' and 2-2/3')  
Mixture: Brilliant

Vibrato Stops (blue tabs):

Vibrato On/Off  
Slow / Fast  
Light / Heavy

Percussion Stops (orange tabs):

Manual Bass On/Off  
Treble On/Off  
Long / Short  
Mixture On/Off  
Mixture Soft / Sharp

Sustain Stops (yellow tabs) Fast 5 Only:

Celest 8'  
Clavicord 8'  
Kinura 8'

Manual Bass Selector (dark-grey tab):

Bass / Treble

Pedal and Manual Bass Sound (black tab):

Soft / Sharp

Rotating General Volume Control

Swell Pedal Volume Control

Mains Switch and Pilot Light

Mains Voltage: 117 Volt AC

Dimensions: 37" x 17" x 36"

Weight: 62 lbs.

Metal cabinet covered with washable vinyl—plastic edges—chromed folding legs—retractable carrying handle—removable music rack—socket for head-phone—socket for the connection of an optional 13-note pedalboard—carrying bag supplied with the instrument.

## ADJUSTMENTS FAST 4 & 5

### VR1 VIBRATO SPEED

Vibrato speed may be adjusted using a small regular screwdriver. Proper speed is between 6-7 Hertz with the Vibrato speed tabswitch set in the Fast position.

### VR2 VOLTAGE

This adjustment is carefully set at the factory! Re-adjustment should not be necessary unless Power Supply components are replaced. To adjust, connect a D.C. voltmeter to supply voltage "A", then set the adjustment so that the meter reads +12 volts. Improper voltage adjustment will result in unstable tone generator operation. Always check the "A" supply voltage before servicing tone generators.

### VR3 STABILITY

The stability adjustment is carefully set at the factory! Readjustment should not be necessary unless Power Supply components are replaced. This adjustment has a wide range of normal operation. Only extreme settings on this adjustment will result in unstable Power Supply operation.

### VR5-VR9, VR12 & VR13 FILTERS

These adjustments are carefully set at the factory! Readjustment should not be necessary unless Filter components are replaced. To adjust a filter: First, connect an A.C. voltmeter across the speakers in the amplifier to which the organ is connected. Then, with a clip lead, ground the transistor collector lead of the filter requiring adjustment. While the filter is grounded—and using one flute tabswitch at a time—locate a group of dead keys on the keyboard and hold down one key at or near the center of this group. Next, while holding the note, remove the clip lead from the filter transistor. Now with the note playing, adjust the A.C. meter range so that the meter needle reads near center scale. (Use any meter range and organ volume combination that is convenient.) With the note still playing, set the filter adjustment to a point that gives the maximum increase in A.C. voltage.

### VR10, VR11 PERCUSSION LENGTH & ATTACK

These two adjustments affect each other. Adjustment of either one changes the other. Proper adjustment is achieved when the percussion functions with the least key pop and with a distinct difference in percussion length between short and long percussion tabswitch settings. Extreme adjustment of either length or attack will result in **no percussion**. Always try adjusting percussion before servicing the percussion circuits.

### L1 TUNING

The 12 Tone Generator Master Oscillator circuits determine the pitch of the entire organ. Adjusting any one of the Master Oscillator tuning adjustments will tune all the notes of that tone generator. Tuning any group of 12 notes automatically tunes the entire organ.

Tuning may be accomplished by using a small non-conductive screwdriver and one of the following methods:

1. Set of 12 Tuning Forks: Zero beat the note of the organ to be tuned to the sound of the corresponding tuning fork. This is a highly accurate method for tuning.
2. Strobe Conn or Strobe Tuner: This is done by visual observation of a strob pattern. Simply follow directions supplied with the Strobotuner. This is a highly accurate tuning method.
3. Another instrument: Zero beat the note of the organ to be tuned to the sound of a corresponding note on an "in tune" instrument (piano, organ, accordion, etc.) Accuracy is dependent upon the tuning of the other instruments. This method is especially desirable when the other instrument is to be played with the organ.
4. One Tuning Fork: One tuning fork is used to set the "temperment" (one note). The other 11 notes are set by ear using the number of beats between "4ths" and "5ths". This requires a trained ear. Accuracy is dependent upon the tuner.

# FAST 4 & 5

## TRANSISTOR VOLTAGES

Q No.	Circuit	Collector	Emitter	Base
Q1	Master Oscillator	+ 2.2	+12	+12
Q2	1st Divider	+ 5.5	+1	+1.2
Q3	1st Divider	+ 5.5	+1	+1.2
Q4	2nd Divider	+ 5.5	+1	+1.2
Q5	2nd Divider	+ 5.5	+1	+1.2
Q6	3rd Divider	+ 5.5	+1	+1.2
Q7	3rd Divider	+ 5.5	+1	+1.2
Q8	4th Divider	+ 5.5	+1	+1.2
Q9	4th Divider	+ 5.5	+1	+1.2
Q10	5th Divider	+ 5.5	+1	+1.2
Q11	5th Divider	+ 5.5	+1	+1.2
Q12	Vibrato Oscillator	+ 5.2*	+2.6	+2.8
Q13	Emitter Follower	+12	+4.5*	+1.8*
Q14	Voltage Sensor	-12	+5.6	+5
Q15	Voltage Regulator	φ	-12	-12
Q16	Voltage Regulator	φ	-12	-12
Q17	16' Solo Divider	+10/+5.5	+1	+1.8/+1.3
Q18	16' Solo Divider	+1.2/+5.5	+1	+ .9/+1.3
Q19	Pedal Solo Divider	+1/+5.5	+1	+1.8/+1.3
Q20	Pedal Solo Divider	+10/+5.5	+1	+ .9/+1.3
Q21	Bass Preamp	+5.5	+ .8	+1
Q22	3320 Cycles Flute Filter	+5.5	+ .8	+1
Q23	1660 Cycles Flute Filter	+5.5	+ .8	+1
Q24	830 Cycles Flute Filter	+5.5	+ .8	+1
Q25	415 Cycles Flute Filter	+5.5	+ .8	+1
Q26	207 Cycles Flute Filter	+5.5	+ .8	+1
Q27	String Preamp	+3.6	+1.1	+1.2
Q27	String Preamp	+5.8	+ .6	+1
Q28	Trumpet Filter	+6	+ .6	+1
Q29	Oboe Filter	+5.8	+ .6	+1
Q30	Treble Preamp	+5.6	+ .6	+1
Q31	Percussion Pulse Detector	+ .8	+ .5	+1.2
Q32	1 Shot Multivibrator	+ .1	φ	+ .3
Q33	1 Shot Multivibrator	+11.2	φ	+ .1
Q34	Percussion Driver	φ	+9.5	+10
Q35	Percussion Keyer	+11.5	+11.5	φ
Q36	Percussion Preamp	+6	+ .7	+1.2
Q37	Output Preamp	+9	+3	+3.3
Q38	Celest Filter #1	+5.8	+ .6	+1
Q39	Celest Filter #2	+5.8	+ .6	+1
Q40	Sustain Voice Preamp #1	+5.8	+ .6	+1
Q41	Sustain Preamp #2	+6	+ .6	+1
Q42	16' Solo Preamp	+12/+5.5	φ	φ/+ .6
Q43	Muter Preamp #1	+5.6	+ .6	+1
Q44	Muter Preamp #2	+9	+6.2	+5.6
Q45	Muter Driver	+6.5	φ	φ
Q46	Muter	φ	φ	+ .5

\*Pulse Voltage

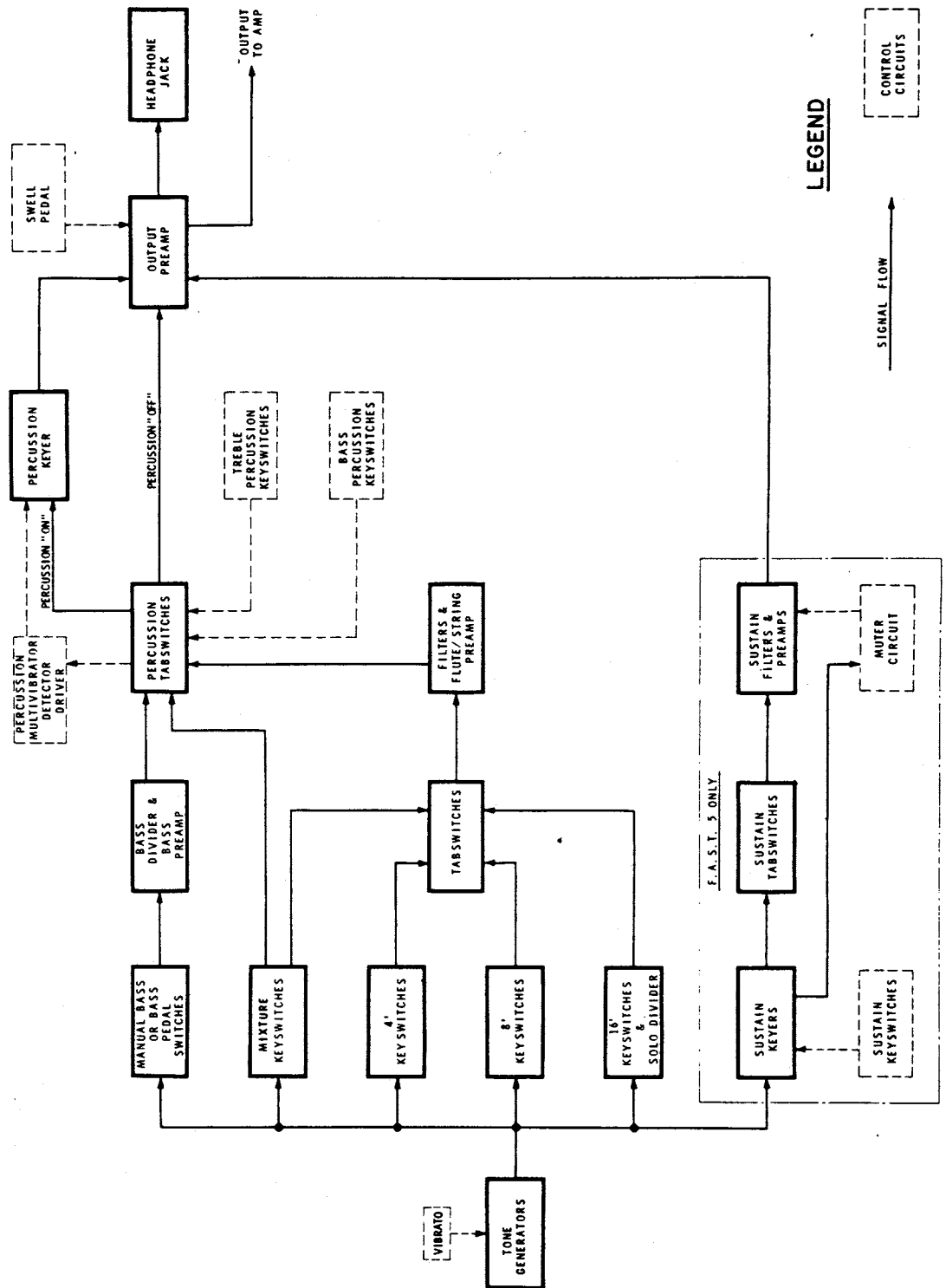
### IMPORTANT

The above voltage readings were measured to ground with a Simpson Model 260 V.O.M. Voltage readings shown are intended only as a guide in troubleshooting. Voltages will vary from organ to organ due to normal manufacturing tolerances.

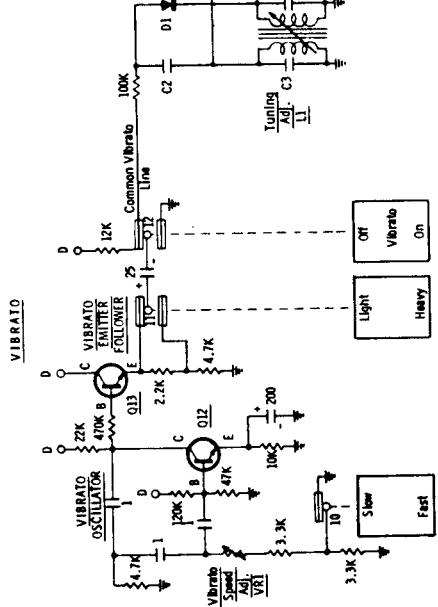
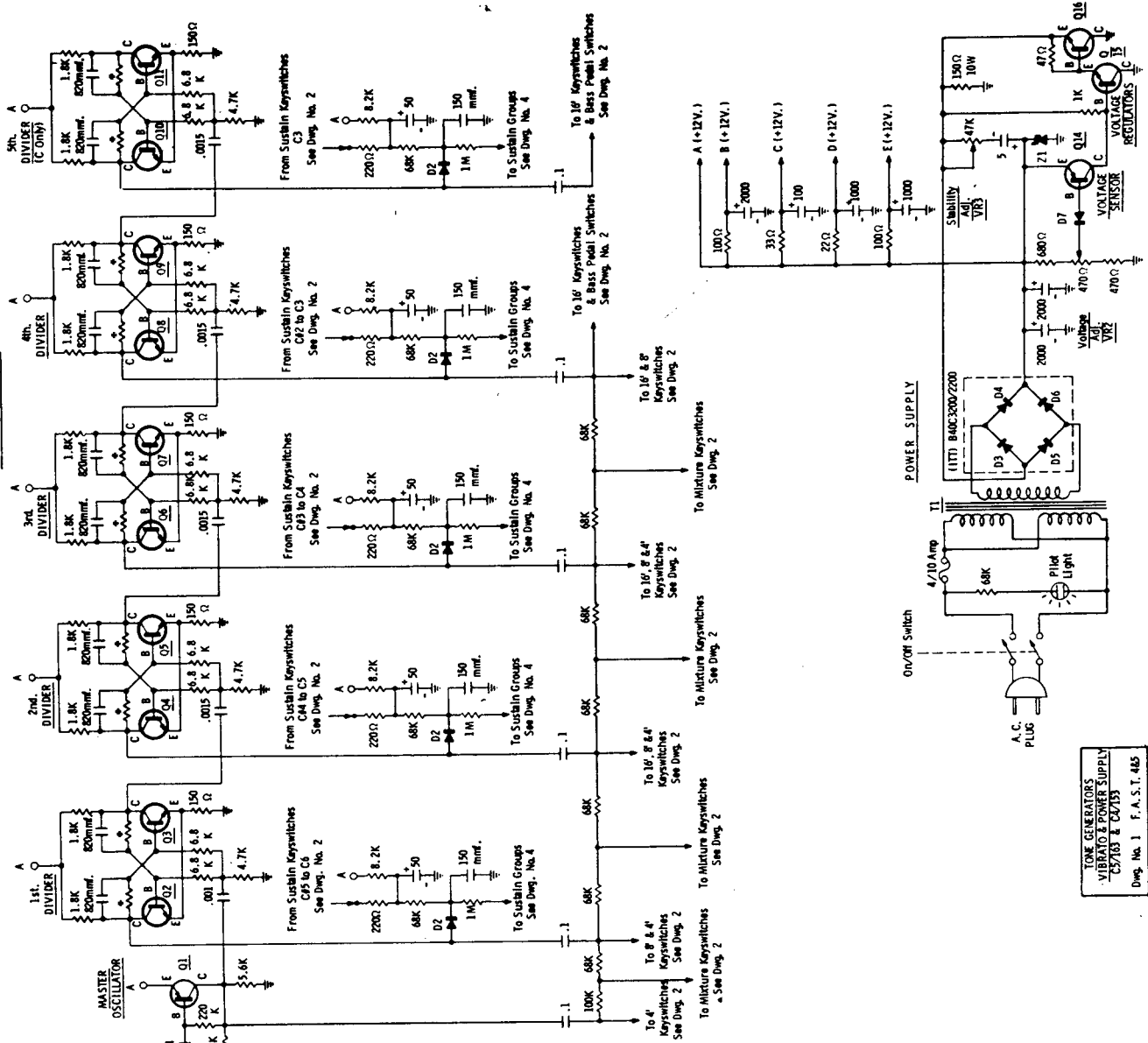
### CAUTION

Exercise extreme care when making voltage measurements. Accidental shorting of transistor leads may damage the transistor.

**BLOCK DIAGRAM**  
F.A.S.T. 4B5



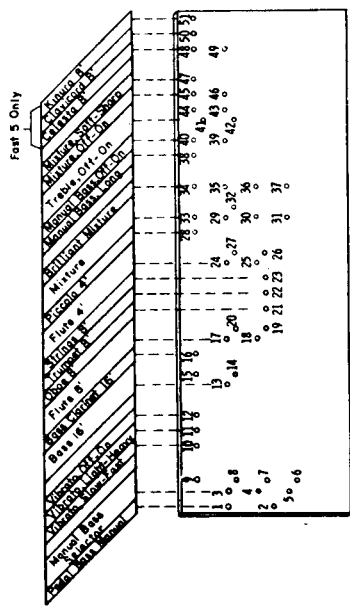
## TONE GENERATORS



GEN.	C1-C3	C2	C4
A	.012	.0022	.0068
B	.027	.0047	.0062
C	.022	.0039	.017
D	.022	.0039	.0062
E	.018	.0039	.01
F	.018	.0039	.01
G	.018	.0039	.01
H	.015	.0027	.0062
I	.012	.0022	.017
J	.012	.0022	.0068

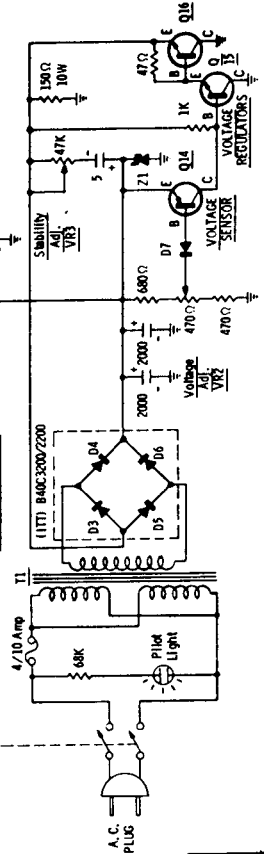
P.T.S.	Pin	Volts	Information
1	1	0	Ground
2	2	0	Ground
3	3	0	Ground
4	4	0	Ground
5	5	0	Ground
6	6	0	Ground
7	7	0	Ground
8	8	0	Ground
9	9	0	Ground
10	10	0	Ground
11	11	0	Ground
12	12	0	Ground
13	13	0	Ground
14	14	0	Ground
15	15	0	Ground
16	16	0	Ground

- NOTES**
1. All resistors 1/2 watt 10% and less unless otherwise specified.
  2. All capacitors are in microfarads unless otherwise specified.
  3. All values measured to ground with a Simpson V. O. M.
  4. See Parts List for component part numbers.
  5.  $\sigma$  denotes factory tolerance component.
  6. All transistors shown in the on position.
  7. You can't build a reputation on what you are going to do.



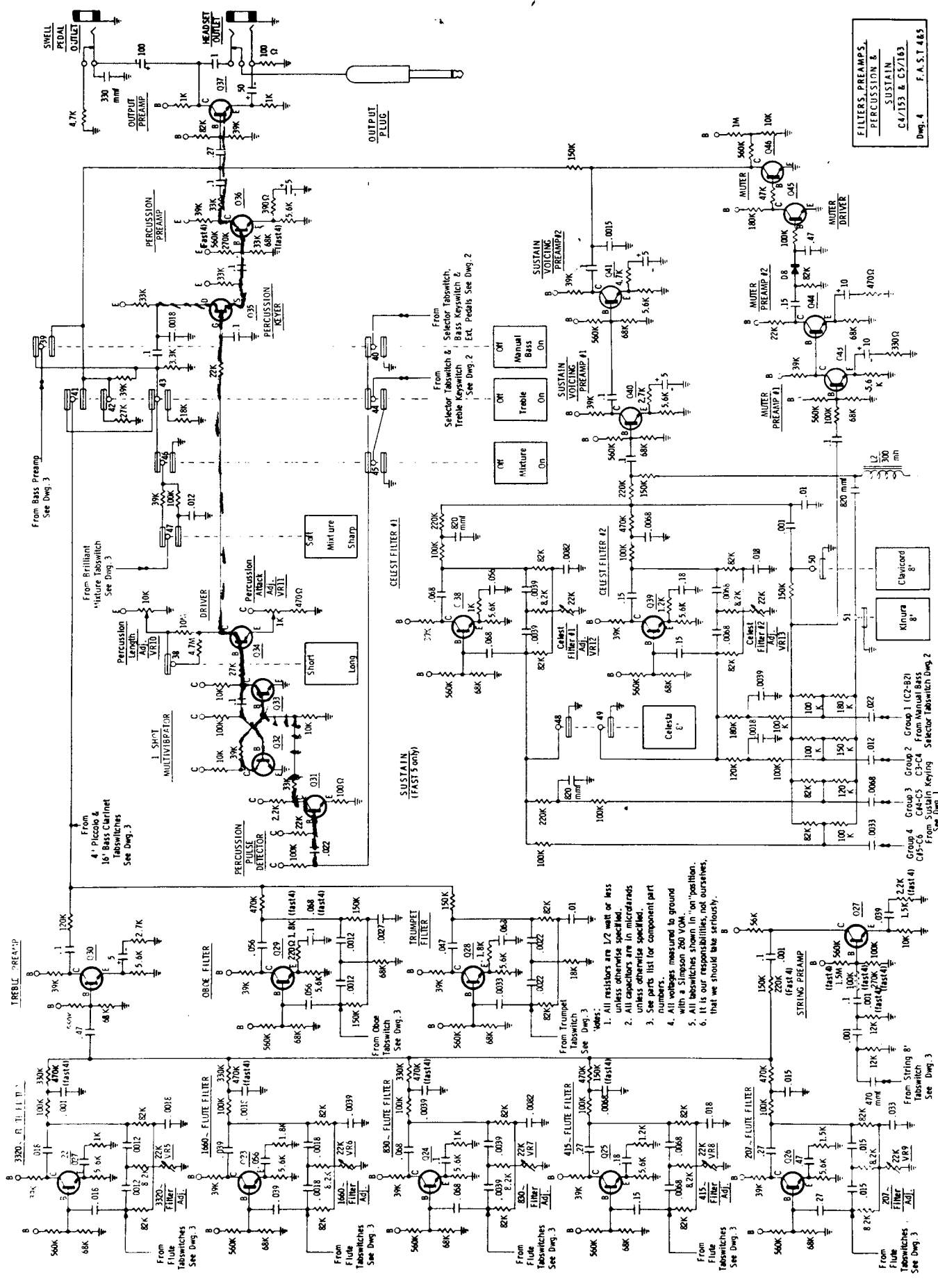
TAB SWITCH BOARD  
(Bottom View)

## POWER SUPPLY



TONE GENERATORS  
VIBRATO & POWER SUPPLY  
C5708 & C2135  
Dwg. No. 1 F.A.S.T. 4&5

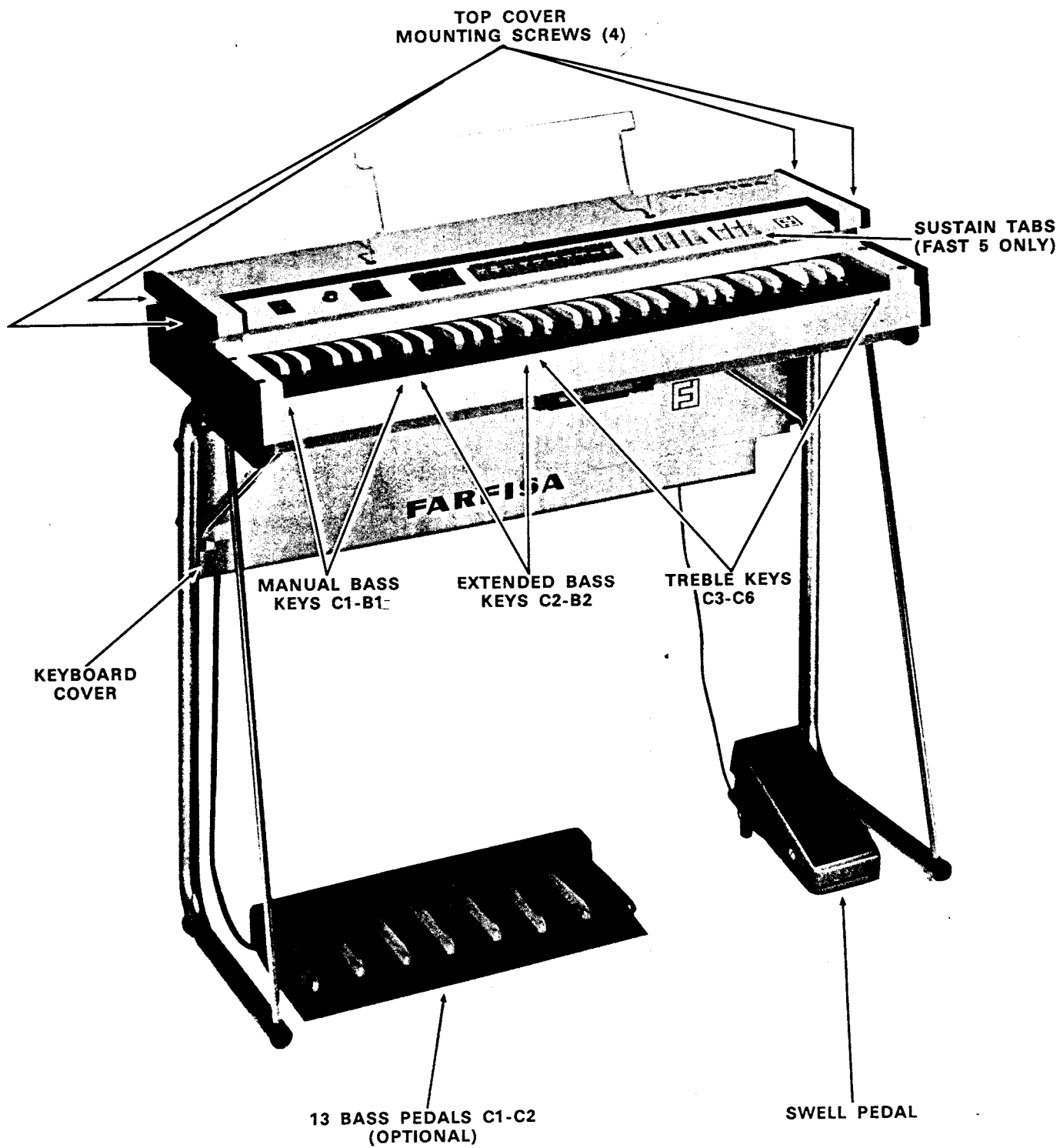




FILTERS, PREAMPS, PERCUSSION & SUSTAIN C4/153 & C5/163 DWG. 4 F.A.S.T. 4&5

1. All resistors are 1/2 watt or less unless otherwise specified.
2. All capacitors are in microfarads unless otherwise specified.
3. See parts list for component part numbers.
4. All voltages measured to ground with a Simpson 260 VOM.
5. All tabswitches shown in "on" position.
6. It is our responsibility, not ours, that we should take seriously.

**FRONT VIEW**  
**FAST 4 & 5**





# FAST 4 & 5

PART	DESCRIPTION	SCHEMATIC REFERENCE	PART NUMBER
<b>CELEST FILTER BOARD (FAST 5 ONLY)</b>			
Assembly	Celest Filter Board (PA-105).....	.....	996-013043
Potentiometer	22K Celest Filter Adj.....	VR12, 13 .....	925-011329
Transistor	Celest Filter (BC 114).....	Q38, 39 .....	991-013044
<b>CONSOLE ASSEMBLY</b>			
Cord	A.C. Power .....	.....	989-011268
Handle	Cabinet (Fast 4).....	.....	930-013024-2
Handle	Cabinet (Fast 5).....	.....	930-013024-3
Jack	Headphone .....	.....	906-013038
Jack	Swell Pedal .....	.....	906-013039
Knob	Bass Volume (Gray/Silver Cap).....	.....	915-011324
Light	Pilot .....	.....	939-013040
Socket	Bass Pedals .....	.....	906-013041
Switch	Off/On Power .....	.....	960-013042
<b>FLUTE FILTER BOARD</b>			
Assembly	Flute Filter Board (PA-97).....	.....	996-013046
Potentiometer	22K Flute Filter Adj.....	VR7-9 .....	925-011329
Transistor	Filter (BC 114).....	Q24-26 .....	991-013044
<b>KEYSWITCH ASSEMBLY</b>			
Actuator	Keyswitch (White Plastic).....	.....	964-013049
Key	C Natural Black (Bass).....	.....	964-013038-C
Key	D Natural Black (Bass).....	.....	964-013038-D
Key	E Natural Black (Bass).....	.....	964-013038-E
Key	F Natural Black (Bass).....	.....	964-013038-F
Key	G Natural Black (Bass).....	.....	964-013038-G
Key	A Natural Black (Bass).....	.....	964-013038-A
Key	B Natural Black (Bass).....	.....	964-013038-B
Key	C Natural Dark Gray (Bass/Treble) .....	.....	964-013027-C
Key	D Natural Dark Gray (Bass/Treble) .....	.....	964-013027-D
Key	E Natural Dark Gray (Bass/Treble) .....	.....	964-013027-E
Key	F Natural Dark Gray (Bass/Treble) .....	.....	964-013027-F
Key	G Natural Dark Gray (Bass/Treble) .....	.....	964-013027-G
Key	A Natural Dark Gray (Bass/Treble) .....	.....	964-013027-A
Key	B Natural Dark Gray (Bass/Treble) .....	.....	964-013027-B
Key	C Natural Gray (Treble) .....	.....	964-013028-C
Key	D Natural Gray (Treble) .....	.....	964-013028-D
Key	E Natural Gray (Treble) .....	.....	964-013028-E
Key	F Natural Gray (Treble) .....	.....	964-013028-F
Key	G Natural Gray (Treble) .....	.....	964-013028-G
Key	A Natural Gray (Treble) .....	.....	964-013028-A
Key	B Natural Gray (Treble) .....	.....	964-013028-B
Key	All Sharps (White).....	.....	964-013029
Spring	Actuator Pull Down.....	.....	975-013050
Spring	Key Contact .....	.....	975-013051

# FAST 4 & 5

PART	DESCRIPTION	SCHEMATIC REFERENCE	PART NUMBER
<b>MUTE BOARD (FAST 5 ONLY)</b>			
Assembly	Muter Board (PA-113).....	.....	996-013052
Capacitor	Electrolytic 10 UF 12V.....	.....	996-011203-29
Capacitor	Electrolytic 1000 UF 15V.....	.....	945-011203-30
Capacitor	Electrolytic 2000 UF 20V.....	.....	945-011203-31
Diode	Keying (X981).....	.....	919-013053
Transistor	Preamps, #1, #2, Driver & Muter (BC 113)...	Q43-46.....	991-011219
<b>OBOE &amp; TRUMPET FILTER BOARD</b>			
Assembly	Oboe & Trumpet Filter Board (PA-99).....	.....	996-013048
Capacitor	Electrolytic 1 UF 250V.....	.....	945-011203-28
Capacitor	Electrolytic 50 UF 12V.....	.....	945-011203-8
Capacitor	Electrolytic 100 UF 12V.....	.....	945-011203-10
Transistor	Filter & Output (BC 114).....	Q28, 29, 37.....	991-013044
<b>PERCUSSION BOARD</b>			
Assembly	Percussion Board (PA-100).....	.....	996-013054
Capacitor	Electrolytic 5 UF 12V.....	.....	945-011203-27
Capacitor	Electrolytic 100 UF 15V.....	.....	945-011203-33
Capacitor	Electrolytic 1000 UF 25V.....	.....	945-011203-18
Potentiometer	10K Percussion Length Adj.....	VR10.....	925-011231
Potentiometer	1K Percussion Attack Adj.....	VR11.....	925-011232
Transistor	Multi & Pulse Detector (1W9787).....	Q31-33.....	991-011318
Transistor	Driver (1W9810/1).....	Q34.....	991-011319
Transistor	Keyer (PAC 26).....	Q35.....	991-013055
Transistor	Percussion Preamp (BC 114).....	Q36.....	991-013044
<b>POWER SUPPLY</b>			
Assembly	Rectifier Board (PA-102).....	.....	996-013056
Assembly	Regulator Board (PA-103).....	.....	996-013057
Capacitor	Electrolytic 5 UF 35V.....	.....	945-011203-34
Capacitor	Electrolytic 2000 UF 15V.....	.....	945-011203-35
Capacitor	Electrolytic 2000 UF 45V.....	.....	945-011203-13
Diode	Keying.....	D7.....	919-011215
Diode	Zener (ZF5, 6).....	Z1.....	919-013058
Diode	Rectifier (Semikron B40 C2200/3500).....	D3-6.....	919-013061
Fuse	4/10 Amp.....	.....	939-013065
Holder	Fuse.....	.....	906-006303
Potentiometer	470 Ohm Voltage Adj.....	VR2.....	925-013059
Potentiometer	47K Stability Adj.....	VR3.....	925-013060
Resistor	150 Ohm 10W (Neohm 737).....	.....	924-013062
Transistor	Voltage Sensor (1W9640).....	Q14.....	991-011225
Transistor	Voltage Regulator (BC 113).....	Q15.....	991-011219
Transistor	Voltage Regulator (RCA 2N5036).....	Q16.....	991-013063
Transformer	Power (T-1045).....	T1.....	954-013064
<b>PREAMP &amp; FILTER BOARD</b>			
Assembly	Preamp & Filter Board (PA-98).....	.....	996-013047
Capacitor	Electrolytic 5 UF 12V.....	.....	945-011203-27
Potentiometer	22K Flute Filter Adj.....	VR5, 6.....	925-011329
Transistor	Filter (BC 114).....	Q22, 23, 27, 30.....	991-013044

# FAST 4 & 5

PART	DESCRIPTION	SCHEMATIC REFERENCE	PART NUMBER
Potentiometer	Vibrato Speed Adj (22K) .....	VR1 .....	925-011329
Transistor	Vib. Osc., 16' & Pedal Solo Divider (1W9787) .....	Q12, 17-20 .....	991-011318
Transistor	Vibrato Emitter Follower (BC 113) .....	Q13 .....	991-011219
Transistor	Bass Preamp (BC 114) .....	Q21 .....	991-013044
Transistor	Driver (1W9787) Fast 5 Only .....	Q42 .....	991-011318

## VOLTAGE FILTER BOARD (FAST 4 ONLY)

Assembly	D. C. Voltage Filter Board (PA-101) .....	.....	996-013045
Capacitor	Electrolytic 1000 UF 25V .....	.....	945-011203-18
Capacitor	Electrolytic 2000 UF 15V .....	.....	945-011203-26

## PROFESSIONAL

### AMPLIFIER & PERCUSSION BOARD

Assembly	Amplifier & Percussion Board (PA-110) .....	.....	996-013069
Diode	Keying (1818) .....	D9, 10 .....	919-013059
Diode	Keying (1728) .....	D12, 13 .....	919-013060
Diode	Keying (9803) .....	D7, 8, 11 .....	919-013082
Capacitor	Electrolytic 10 UF 12V .....	.....	945-011203-29
Capacitor	Electrolytic 25 UF 12V .....	.....	945-011203-39
Capacitor	Electrolytic 25 UF 25V .....	.....	945-011203-25
Capacitor	Electrolytic 50 UF 25V .....	.....	945-011203-9
Capacitor	Electrolytic 100 UF 12V .....	.....	945-011203-10
Capacitor	Electrolytic 500 UF 6V .....	.....	945-011203-40
Capacitor	Electrolytic 1000 UF 12V .....	.....	945-011203-21
Capacitor	Electrolytic 2000 UF 15V .....	.....	945-011203-26
Potentiometer	500 Ohm Percussion Pulse Adj .....	VR14 .....	925-013083
Potentiometer	10K Percussion Length Adj .....	VR15 .....	925-011232
Potentiometer	470 Ohm Squelch Adj .....	VR16 .....	925-013059
Transistor	16' Solo Divider (1W1632) .....	Q14, 15 .....	991-013056
Transistor	Percussion Multi, Preamp & Driver (1W9787) ..	Q31, 32, 36, 44 .....	991-011318
Transistor	Percussion Driver & Output (1W9810) .....	Q33, 45 .....	991-011319
Transistor	Percussion Modulator & Squelch Keyer (E103)	Q34, 41 .....	991-013055
Transistor	Percussion Preamp & Output (BC114) .....	Q35, 46 .....	991-013044
Transistor	Amplifier Input Preamp (BC109B) .....	Q42 .....	991-013057
Transistor	Squelch Gate (1W9640) .....	Q43 .....	991-013058

### CONSOLE ASSEMBLY

Cord	Output (with plug) .....	.....	989-013092
Cord	A. C. Power .....	.....	989-011268
Cover	Organ Top .....	.....	930-013089
Fuse	4/10 Amp (Slo-Blo) .....	.....	939-013065
Handle	Cabinet .....	.....	930-013024-4
Holder	Fuse .....	.....	906-006303
Jack	Headphone .....	.....	906-013038
Jack	Swell Pedal .....	.....	906-013039
Light	Pilot .....	.....	939-013062
Potentiometer	Level Adjustment .....	VR17 .....	925-013063
Switch	Off/On Power .....	.....	960-013064