M13 Stompbox Modeler

Service Manual

Line6, Inc. Customer Service and Repair
3850-A Royal Ave. Simi Valley, CA 93063 P. 818-575-3600; F. 818-575-3961; E. service@line6.com

ECOs INCLUDED ON THIS SCHEMATIC/PCB REVISION		
ECO NO:	DATE:	DESCRIPTION:
0806003	02.29.08	Released as rev.A – added R120, R172 to relay nets.
0812606	05.05.08	Released as rev.B – refer to ECO for changes.

* DO NOT INSTALL

Install R126 when using DSP emulator and MCU flash is unprogrammed.

Set "BOOT_ME" low during reset to activate on chip bootloader.

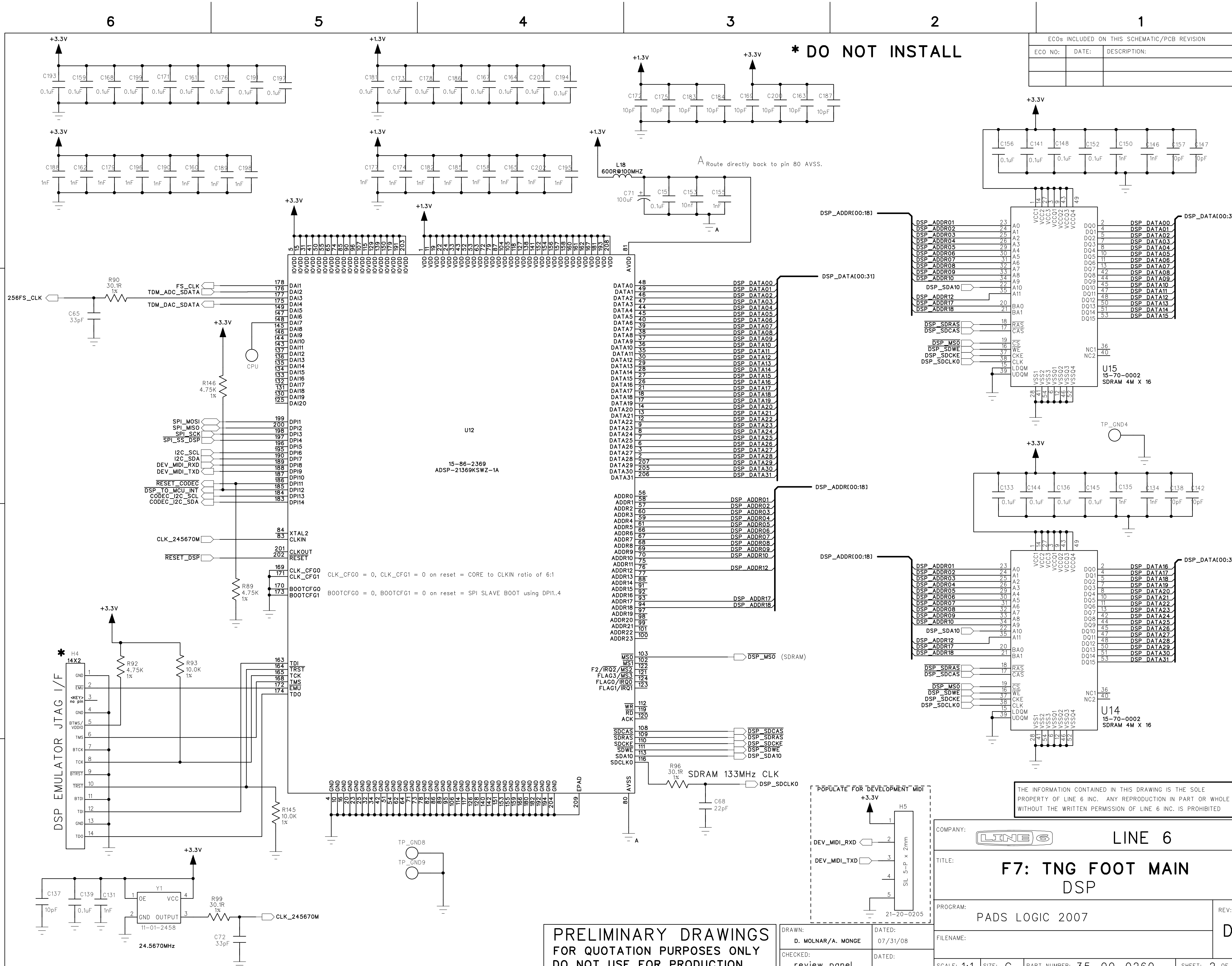
MCU JTAG EMULATOR I/F
conforms to ARM 14 pin I/F spec.

FLASH 4M X 16

PRELIMINARY DRAWINGS
FOR QUOTATION PURPOSES ONLY
DO NOT USE FOR PRODUCTION

This board: All resistors are 1% Tolerance

COMPANY:	LINE 6
TITLE:	F7: TNG FOOT MAIN MCU
PROGRAM:	PADS LOGIC 2007
REV:	D
FILENAME:	
DRAWN:	D. MOLNAR/A. MONGE
DATED:	07/31/08
CHECKED:	review panel
DATED:	
SCALE:	1:1
SIZE:	C
PART NUMBER:	35-00-0260
SHEET:	1 OF 10


* DO NOT INSTALL
ECOs INCLUDED ON THIS SCHEMATIC/PCB REVISION
ECO NO: DATE: DESCRIPTION:
A Route directly back to pin 80 AVSS.
U12
15-86-2369
ADSP-21369KSWZ-1A
CLK_CFG0 = 0, CLK_CFG1 = 0 on reset = CORE to CLKIN ratio of 6:1
BOOTCFG0 = 0, BOOTCFG1 = 0 on reset = SPI SLAVE BOOT using DPI1..4
DSP EMULATOR JTAG I/F
U15
15-70-0002
SDRAM 4M X 16
U14
15-70-0002
SDRAM 4M X 16
SDRAM 133MHz CLK
POPULATE FOR DEVELOPMENT MIDI
24.5670MHz
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF LINE 6 INC. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF LINE 6 INC. IS PROHIBITED
COMPANY: LINE 6
TITLE: F7: TNG FOOT MAIN
DSP
PROGRAM: PADS LOGIC 2007
REV: D
FILENAME:
DRAWN: D. MOLNAR/A. MONGE
DATED: 07/31/08
CHECKED: review panel
DATED:
SCALE: 1:1
SIZE: C
PART NUMBER: 35-00-0260
SHEET: 2 OF 10
PRELIMINARY DRAWINGS
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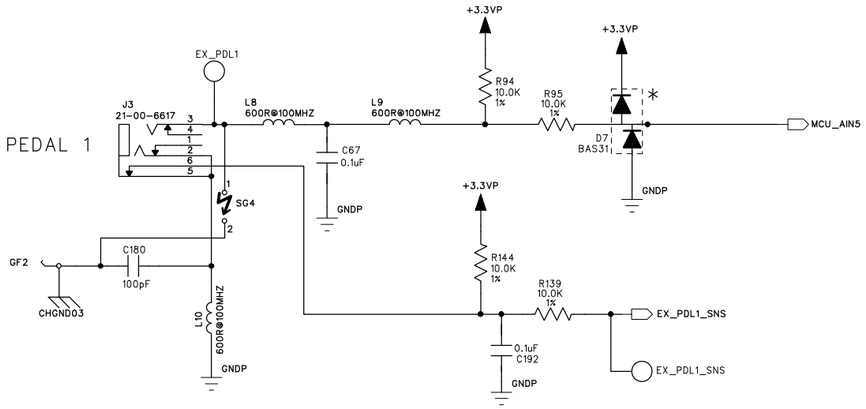
ECOs INCLUDED ON THIS SCHEMATIC/PCB REVISION		
ECO NO:	DATE:	DESCRIPTION:

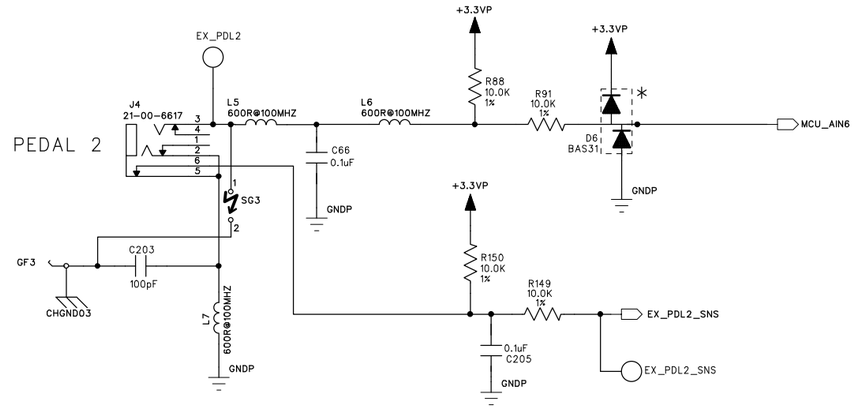
EXP. PEDAL INPUTS

* DO NOT INSTALL

EXPRESSION PEDAL 1



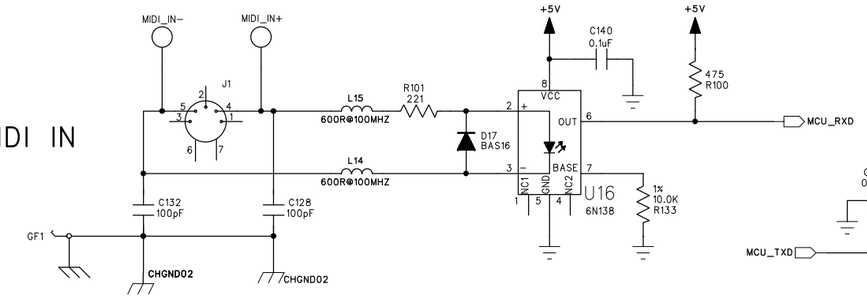
EXPRESSION PEDAL 2



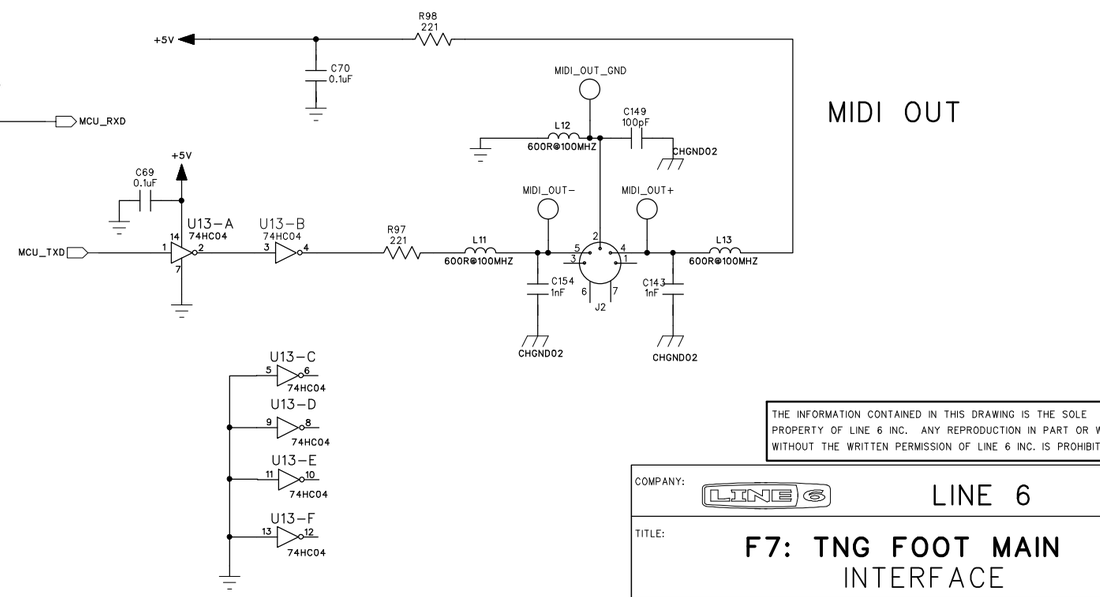
R161
0
1%
CHGND03
CHGND02

MIDI INTERFACE

MIDI IN



MIDI OUT



PRELIMINARY DRAWINGS
FOR QUOTATION PURPOSES ONLY
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DRAWN:	D. MOLNAR/A. MONGE	DATED:	07/31/08
CHECKED:	review panel	DATED:	

COMPANY: LINE 6

TITLE: **F7: TNG FOOT MAIN INTERFACE**

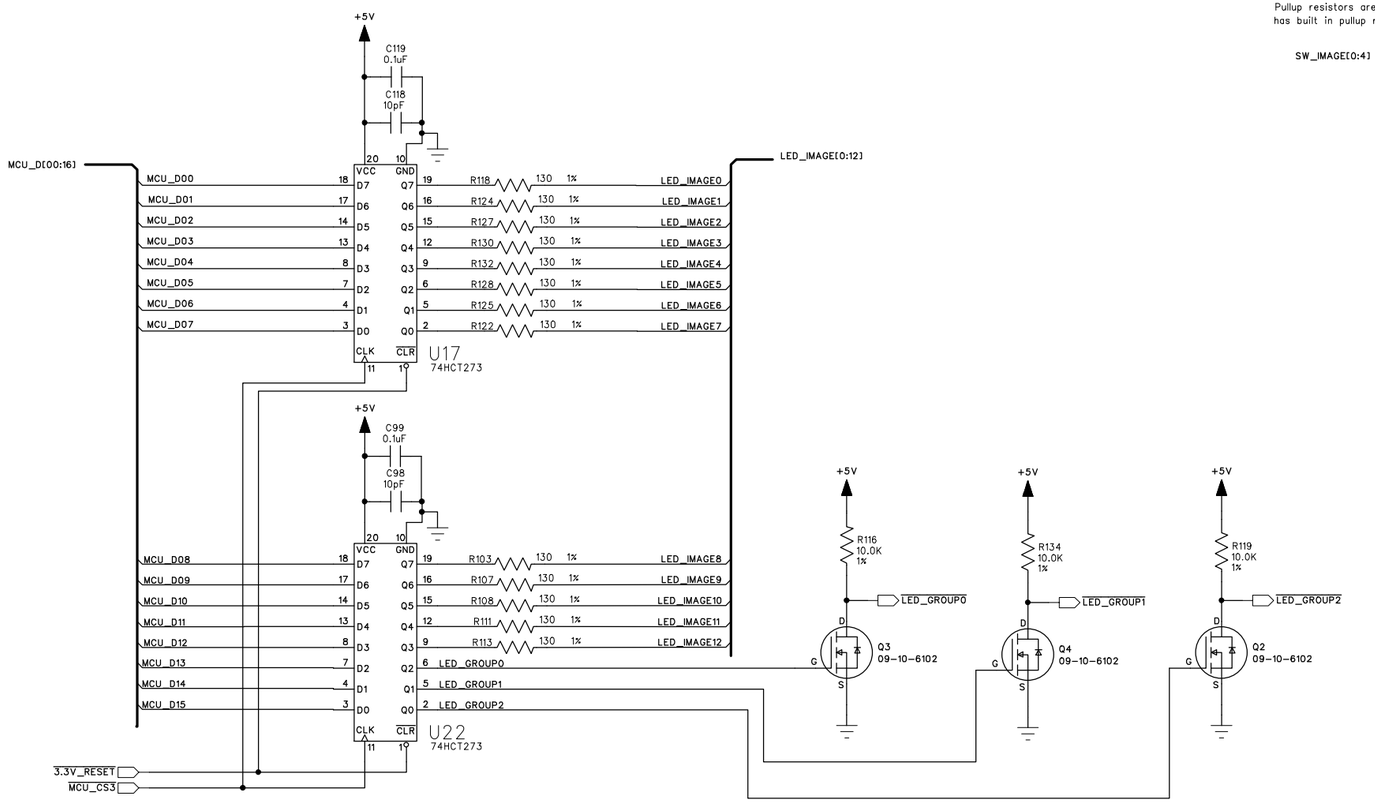
PROGRAM: PADS LOGIC 2007

REV: D

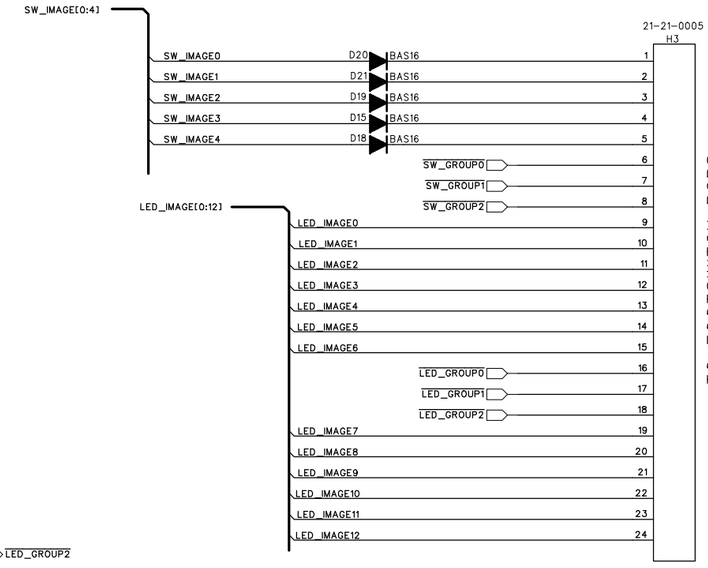
FILENAME:

SCALE: 1:1 | SIZE: C | PART NUMBER: 35-00-0260 | SHEET: 3 OF 10

ECOs INCLUDED ON THIS SCHEMATIC/PCB REVISION		
ECO NO:	DATE:	DESCRIPTION:



Pullup resistors are not needed because the LPC2220 has built in pullup resistors in its I/O pins



ALL LEDS AND SWITCHES ARE LOCATED ON THE FOOTSWITCH PCBs

LED MATRIX 13 X 3

	LOWER LED_GROUP0	MIDDLE LED_GROUP1	UPPER LED_GROUP2
LED_IMAGE0	1A-RED	1B-RED	1C-RED
LED_IMAGE1	1A-GREEN	1B-GREEN	1C-GREEN
LED_IMAGE2	1A-BLUE	1B-BLUE	1C-BLUE
LED_IMAGE3	2A-RED	2B-RED	2C-RED
LED_IMAGE4	2A-GREEN	2B-GREEN	2C-GREEN
LED_IMAGE5	2A-BLUE	2B-BLUE	2C-BLUE
LED_IMAGE6	3A-RED	3B-RED	3C-RED
LED_IMAGE7	3A-GREEN	3B-GREEN	3C-GREEN
LED_IMAGE8	3A-BLUE	3B-BLUE	3C-BLUE
LED_IMAGE9	4A-RED	4B-RED	4C-RED
LED_IMAGE10	4A-GREEN	4B-GREEN	4C-GREEN
LED_IMAGE11	4A-BLUE	4B-BLUE	4C-BLUE
LED_IMAGE12	TAP	Looper Ctrl.	SCENES

SWITCH MATRIX 5 X 3

	LOWER SW_GROUP0	MIDDLE SW_GROUP1	UPPER SW_GROUP2
SW_IMAGE0	1A	1B	1C
SW_IMAGE1	2A	2B	2C
SW_IMAGE2	3A	3B	3C
SW_IMAGE3	4A	4B	4C
SW_IMAGE4	TAP	Looper Ctrl.	SCENES

PRELIMINARY DRAWINGS
FOR QUOTATION PURPOSES ONLY
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DRAWN:	DATED:
D. MOLNAR/A. MONGE	07/31/08
CHECKED:	DATED:
review panel	00/00/01

COMPANY: LINE 6

TITLE: **F7: TNG FOOT MAIN**
USER INTERFACE1

PROGRAM: PADS LOGIC 2007

REV: D

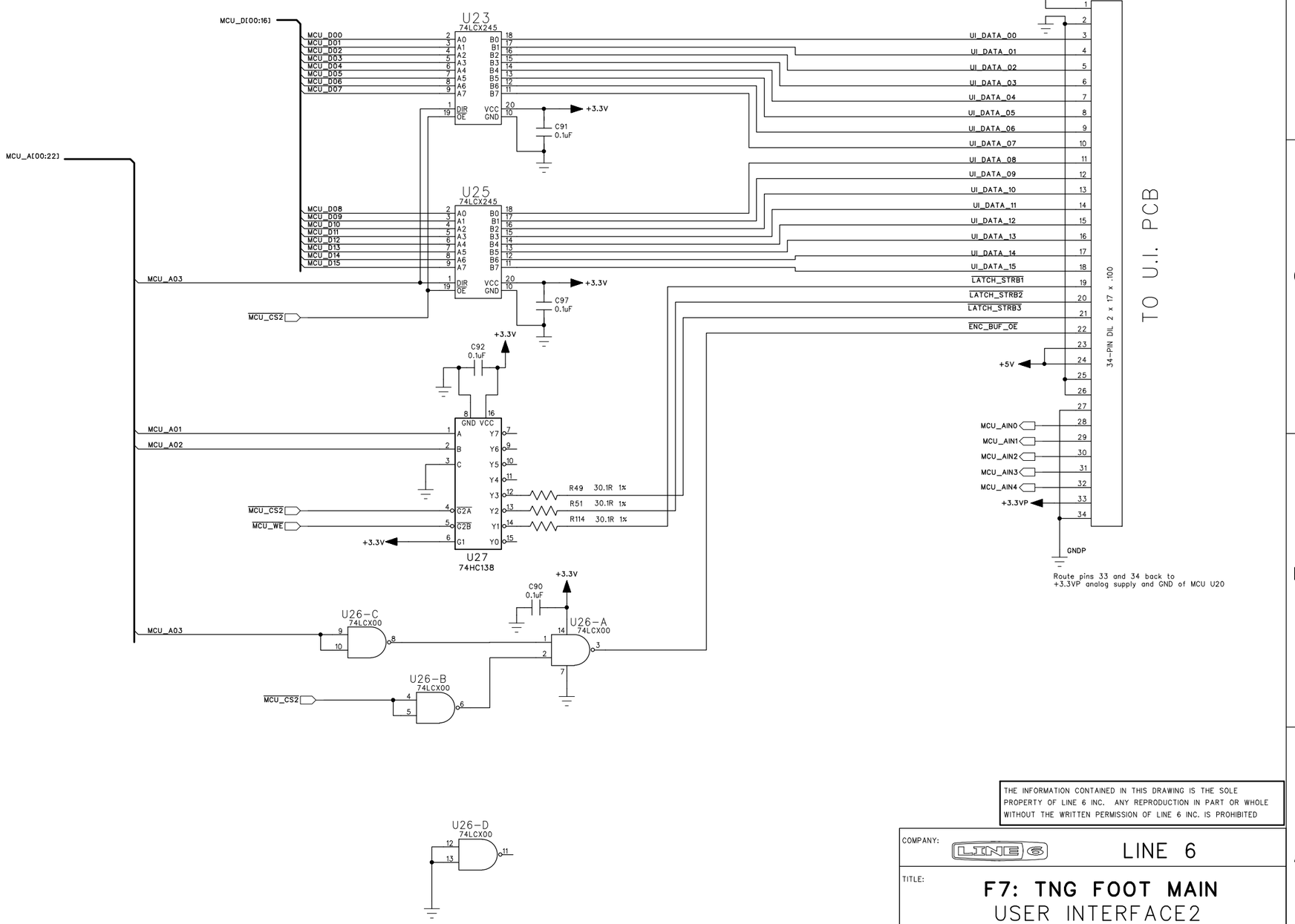
FILENAME:

SCALE: 1:1 | SIZE: C | PART NUMBER: 35-00-0260 | SHEET: 4 OF 10

ECOs INCLUDED ON THIS SCHEMATIC/PCB REVISION		
ECO NO:	DATE:	DESCRIPTION:

USER INTERFACE TRUTH TABLE

MCU LINES					I/O BUFFER		UI LATCH & BUFFER LINES				
MCU_CS2	A22..A4	A3	A2	A1	DIR	OE	LATCH_STRB1	LATCH_STRB2	LATCH_STRB3	ENC_BUF_OE
H	X	X	X	X	H A->B	H	H	H	H	H
L	X	H	L	L	H A->B	L	H	H	H	H
L	X	H	L	H	H A->B	L	L	H	H	H
L	X	H	H	L	H A->B	L	H	L	H	H
L	X	H	H	H	H A->B	L	H	H	L	H
L	X	L	X	X	L B->A	L	H	H	H	L



PRELIMINARY DRAWINGS
FOR QUOTATION PURPOSES ONLY
DO NOT USE FOR PRODUCTION

DRAWN: D. MOLNAR/A. MONGE	DATED: 07/31/08
CHECKED: review panel	DATED:

COMPANY: LINE 6

TITLE: **F7: TNG FOOT MAIN**
USER INTERFACE2

PROGRAM: PADS LOGIC 2007

REV: D

FILENAME:

SCALE: 1:1 | SIZE: C | PART NUMBER: 35-00-0260 | SHEET: 5 OF 10

6 5 4 3 2 1

*DO NOT INSTALL

ECOs INCLUDED ON THIS SCHEMATIC/PCB REVISION		
ECO NO:	DATE:	DESCRIPTION:

GUITAR INPUT LEFT 5Vpp MAX

J5 21-00-6617
L20 15R@1GHz 1A
24-15-0001 RY2-B RELAY
C47 47nF Film
C28 100pF
R63 1.00K 1%
R64 1.00M 1%
C214 0.1uF
C211 0.1uF
U9-A TL074
SG1 SG2
C216 3.3pF *
L21 600R@100MHZ
GF4
0R R160
CHGND01
BYPASS_LEFT
GIN_L_GND
GIN_L
BYP_L
+12V_IN
-12V_IN
GIN_L_LGAIN+
C52 100pF
R71 10.0K 1%
R75 10.0K 1%
U9-B TL074
GIN_L_LGAIN-
U9-C TL074
R66 15.0K 1%
R67 1.00K 1%
GIN_L_HGAIN+
C55 100pF
R77 10.0K 1%
R70 10.0K 1%
U9-D TL074
GIN_L_HGAIN-
+3.3V
R140 10.0K 1%
R135 10.0K 1%
C208 0.1uF
GIN_L_SNS
TP_GND1

GUITAR INPUT RIGHT 5Vpp MAX

J6 21-00-6617
L23 15R@1GHz 1A
24-15-0001 RY2-C RELAY
C38 47nF Film
C234 100pF
R53 1.00K 1%
R54 1.00M 1%
C223 0.1uF
C222 0.1uF
U6-A TL074
SG3 SG4
C221 3.3pF *
L25 600R@100MHZ
GF5
0R R173
CHGND04
BYPASS_RIGHT
GIN_R_GND
GIN_R
BYP_R
+12V_IN
-12V_IN
GIN_R_LGAIN+
C32 100pF
R47 10.0K 1%
R48 10.0K 1%
U6-B TL074
GIN_R_LGAIN-
U6-C TL074
R44 15.0K 1%
R45 1.00K 1%
GIN_R_HGAIN+
C35 100pF
R50 10.0K 1%
R46 10.0K 1%
U6-D TL074
GIN_R_HGAIN-
+3.3V
R141 10.0K 1%
R136 10.0K 1%
C224 0.1uF
GIN_R_SNS

INPUT RELAY CONTROL

POWER SUPPLY FOR INPUT & OUTPUT RELAY DRIVERS

+3.3V
D14 B340LA
+3.3V_RD
C76 1000uF 6.3V
C105 0.1uF
R167 1.00K 1%
R162 121 1%
R164 121 1%
R166 121 1%
INPUT_RELAY+
Q9 PMBT4401
Q7 PMBT4403
Q5 09-06-7002
GND
RY2-A 24-15-0001 RELAY
Q6 09-06-7002
R163 121 1%
R165 121 1%
INPUT_RELAY-
Q8 PMBT4403
R120 10.0K 1%

PRELIMINARY DRAWINGS
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DO NOT USE FOR PRODUCTION

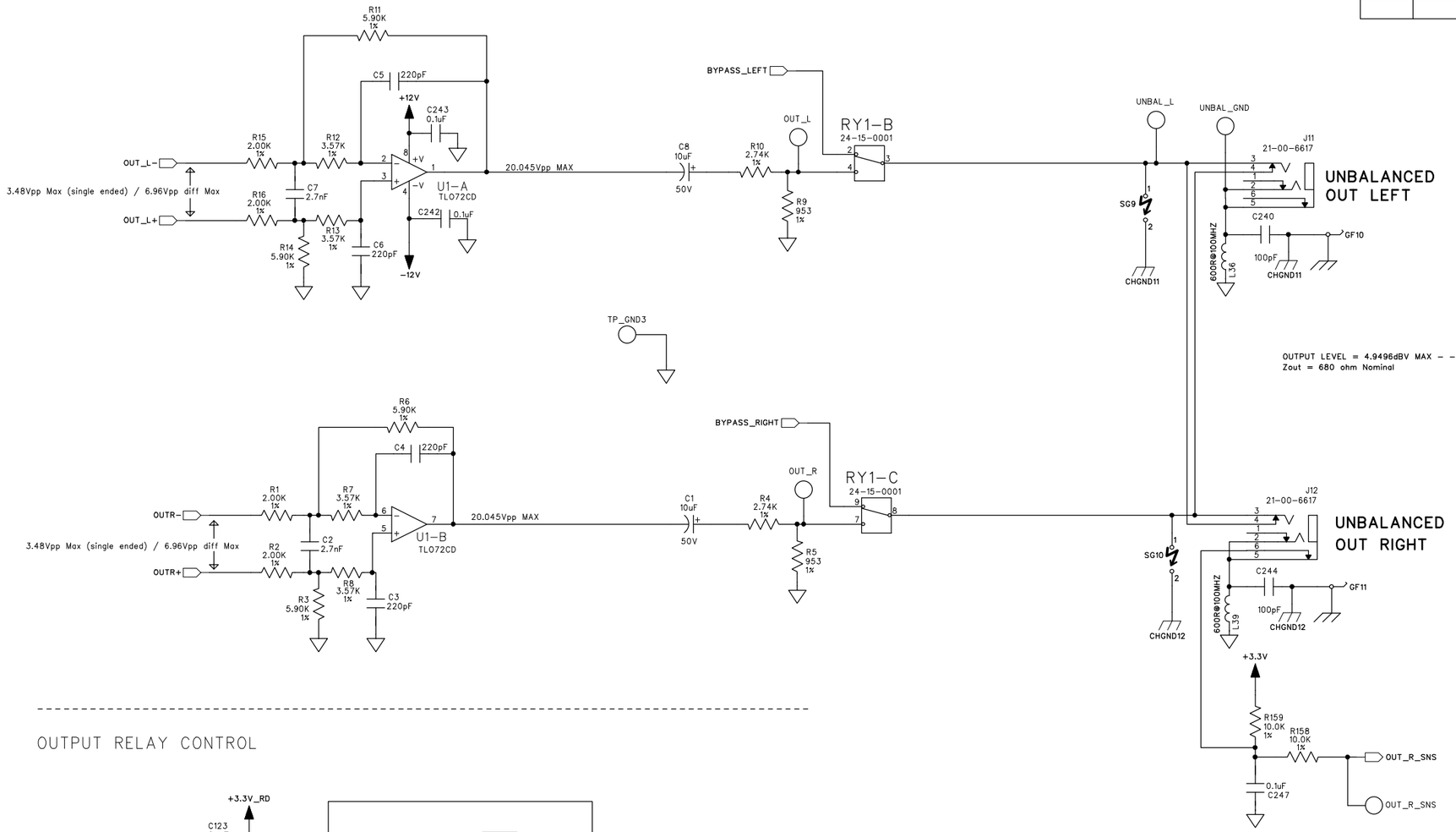
DRAWN:	DATED:
D. MOLNAR/A. MONGE/gk	07/31/08
CHECKED:	DATED:
review panel	

COMPANY: LINE 6

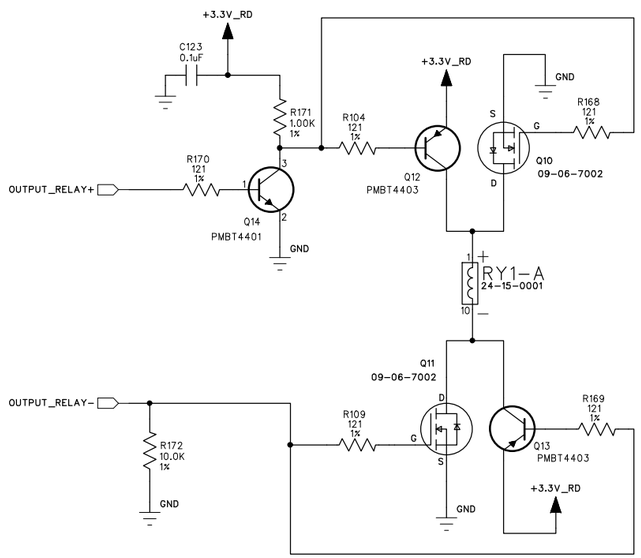
TITLE: F7: TNG FOOT MAIN
ANALOG INPUT

PROGRAM: PADS LOGIC 2007
REV: D
FILENAME:
SCALE: 1:1 SIZE: C PART NUMBER: 35-00-0260 SHEET: 6 OF 10

ECOs INCLUDED ON THIS SCHEMATIC/PCB REVISION		
ECO NO:	DATE:	DESCRIPTION:



OUTPUT RELAY CONTROL



PRELIMINARY DRAWINGS
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DO NOT USE FOR PRODUCTION

DRAWN: D. MOLNAR/A. MONGE/gk	DATED: 07/31/08
CHECKED: review panel	DATED:

COMPANY: LINE 6

TITLE: F7: TNG FOOT MAIN
ANALOG OUTPUT

PROGRAM: PADS LOGIC 2007

REV: D

FILENAME:

SCALE: 1:1 | SIZE: C | PART NUMBER: 35-00-0260 | SHEET: 7 OF 10

*DO NOT INSTALL

ECOs INCLUDED ON THIS SCHEMATIC/PCB REVISION		
ECO NO:	DATE:	DESCRIPTION:

CODEC Performance Specs
Fs: 48KHz, 96KHz
ADC S/N:
105dB Differential
102dB Single-ended
DAC S/N:
108dB Differential
105dB Single-ended
ADC/DAC THD+N:
-98dB Differential
-95dB Single-ended

CODEC inputs are 2.8Vpp typ full scale single ended
5.6V typ full scale diff

Codec outputs are 6.96Vpp MAX Differential
3.48Vpp MAX Single Ended

U10
12-64-4243
CS42436

ANALOG TO DIGITAL GROUND CONNECTION AT CODEC

PRELIMINARY DRAWINGS
FOR QUOTATION PURPOSES ONLY
DO NOT USE FOR PRODUCTION

DRAWN: D. MOLNAR/A. MONGE	DATED: 07/31/08	COMPANY: LINE 6	
CHECKED: review panel	DATED:	TITLE: F7: TNG FOOT MAIN CODEC	
		PROGRAM: PADS LOGIC 2004	REV: D
		FILENAME:	
SCALE: 1:1	SIZE: C	PART NUMBER: 35-00-0260	SHEET: 8 OF 10

STEREO FX LOOP RETURN

5Vpp = 7.168dBu MAX INPUT (single ended)

ECOs INCLUDED ON THIS SCHEMATIC/PCB REVISION		
ECO NO:	DATE:	DESCRIPTION:

LEFT

J7 21-00-6617
L26 600R@100MHZ
L27 600R@100MHZ
C226 100pF
C27 0.1uF
R43 10.0K 1%
R41 1.00M 1%
D4 BAS31
U5-A TL074
C228 0.1uF
C230 0.1uF
R40 10.0K 1%
R42 10.0K 1%
U5-B TL074
SG6
GF6
C227 100pF
L28 600R@100MHZ
CHGND07
FX_IN_L
FX_IN_GND
+12V
-12V
FX_RET_L+
FX_RET_L-

RIGHT

J8 21-00-6617
L29 600R@100MHZ
L30 600R@100MHZ
C231 100pF
C26 0.1uF
R36 10.0K 1%
R37 1.00M 1%
D3 BAS31
U5-D TL074
R38 10.0K 1%
R39 10.0K 1%
U5-C TL074
SG5
GF7
C232 100pF
L31 600R@100MHZ
CHGND08
FX_IN_R
FX_RET_R+
FX_RET_R-

R142 10.0K 1%
R137 10.0K 1%
C229
FX_RETL_SNS
R143 10.0K 1%
R138 10.0K 1%
C233 0.1uF
FX_RETR_SNS
+3.3V
TP_GND2

FX SEND LEFT

FX_SEND_L-
FX_SEND_L+
3.48Vpp Max (single ended) / 6.96Vpp diff Max
R32 2.00K 1%
R33 2.00K 1%
R29 3.57K 1%
R30 3.57K 1%
R28 5.90K 1%
R31 5.90K 1%
C19 220pF
C23 2.7nF
C22 220pF
C18 0.1uF
C237 0.1uF
U3-A TL072CD
20.045Vpp
C24 10uF 50V
R34 2.74K 1%
R35 953 1%
L4 600R@100MHZ
L3 600R@100MHZ
C25 1nF
SG7
CHGND09
FX_SNDL
FX_SNDL_GND
J9 21-00-6617
C236 100pF
L32 600R@100MHZ
GF8

OUTPUT LEVEL = 4.9496dBV MAX - - 5.00Vpp MAX
Zout = 689 ohm NOMINAL

FX SEND RIGHT

FX_SEND_R-
FX_SEND_R+
3.48Vpp Max (single ended) / 6.96Vpp diff Max
R17 2.00K 1%
R18 2.00K 1%
R23 3.57K 1%
R20 3.57K 1%
R22 5.90K 1%
R19 5.90K 1%
C17 220pF
C12 2.7nF
C14 220pF
U3-B TL072CD
C13 10uF 50V
R25 2.74K 1%
R26 953 1%
L2 600R@100MHZ
L1 600R@100MHZ
C16 1nF
SG8
CHGND10
FX_SNDR
FX_SNDR_GND
J10 21-00-6617
C238 100pF
L33 600R@100MHZ
GF9
R157 10.0K 1%
R156 10.0K 1%
C246 0.1uF
FX_SNDR_SNS

PRELIMINARY DRAWINGS
FOR QUOTATION PURPOSES ONLY
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DRAWN: D. MOLNAR/A. MONGE	DATED: 04/10/08
CHECKED: review panel	DATED:

COMPANY: LINE 6

TITLE: F7: TNG FOOT MAIN FX LOOP

PROGRAM: PADS LOGIC 2004

REV: D

FILENAME:

SCALE: 1:1 | SIZE: C | PART NUMBER: 35-00-0260 | SHEET: 9 OF 10

*DO NOT INSTALL

ECOs INCLUDED ON THIS SCHEMATIC/PCB REVISION		
ECO NO:	DATE:	DESCRIPTION:

POWER SWITCH MOUNTED ON CHASSIS

BLK WIRE 21-34-0061

WHT WIRE 21-34-0062

+AC

9VAC

J13 21-00-0014

L17 3 turns

L16 3 turns

PGND

C79 0.22uF

C88 10nF

C83 10nF

C87 10nF

BR1

CHGND0

C82 1000uF 16V

D11 MRA4006

D10 MRA4006

C81 1000uF 35V

R24 0

Circuit guarantees that +12V Trails -12V

Q1 TIP32 09-03-0032

R27 475 1%

R21 4.7K 5/2W 5%

U2 MC7812CTC

C10 47nF

C9 10uF 50V

D1 BAS31

+12V

C11 0.1uF

C85 1000uF 16V

D8 MRA4006

D9 MRA4006

C84 1000uF 35V

U4 MC7912CTC

C21 47nF

C15 10uF 50V

ID2 BAS31

-12V

C20 0.1uF

ANALOG TO DIGITAL GROUND CONNECTION AT CODEC

D12 S3DB-13 3A@200V

C96 47nF

C80 4700uF 16V

C225 0.1uF

C29 10uF 50V

U7 NJM 2374A 15-68-2374

PWM

L24 150uH 04-01-0004

+3_3V

+3.3V

R55 1.78K 1%

C220 0.1uF

C44 6800uF 6.3V

C39 390pF

D5 B130/B

R52 1.07K 1%

Power supply filter for guitar inputs

R154 22.1 1%

+12V_IN

C45 100uF 16V

Ground run separately back to +-12V filter caps

AGND

C40 100uF 16V

R155 22.1 1%

-12V_IN

D16 BAS16

U29 LM1117-1.8

+1_8V

+1.8V

C74 0.1uF

12-52-1118

C130 0.1uF

C73 10uF 16V

D25 BAS16

LAY U14 flat with standoff Heat sink

U11 LM317T 12-00-0317

+1_3V

+1.3V

C204 0.1uF

R152 240 1%

D24 BAS16

C62 0.1uF

C63 470uF 6.3V

R151 10.0

C206 10uF 50V

D13 BAS16

U19 12-02-7805

+5V

C104 0.1uF

C77 100uF 10V

C115 0.1uF

D28 BAS16

U8 12-02-7805

+5VA

C218 0.1uF

C46 3300uF 6.3V

C219 0.1uF

TOP SIDE FIDUCALS

FID1 FID3 FID5 FID7

FID9 Located under DSP U12

FID10 Located under MCU U20

BOTTOM SIDE FIDUCALS

FID2 FID4 FID6 FID8

BOARD MOUNTING HOLES

MTH1 MTH4 MTH5 MTH6 MTH7 MTH8 MTH3 MTH2

C89 0.1uF

C86 0.1uF

C170 0.1uF

C239 0.1uF

C166 0.1uF

PRELIMINARY DRAWINGS
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DRAWN: D. MOLNAR/A. MONGE	DATED: 04/10/08
CHECKED: review panel	DATED:

COMPANY: LINE 6

TITLE: F7: TNG FOOT MAIN POWER SUPPLY

PROGRAM: PADS LOGIC 2004

REV: D

FILENAME:

SCALE: 1:1 | SIZE: C | PART NUMBER: 35-00-0260 | SHEET: 10 OF 10

ECOs INCLUDED ON THIS SCHEMATIC/PCB REVISION		
ECO NO:	DATE:	DESCRIPTION:
0806003	02.29.08	Released as rev.A
0810203	04.10.08	Changed LCD PCBA p/n. Released as rev.A

TO MAIN PCB

21-30-0047
H500

+3.3V

UI_DATA[00:15]

UI_DATA00
UI_DATA01
UI_DATA02
UI_DATA03
UI_DATA04
UI_DATA05
UI_DATA06
UI_DATA07
UI_DATA08
UI_DATA09
UI_DATA10
UI_DATA11
UI_DATA12
UI_DATA13
UI_DATA14
UI_DATA15

LATCH_STRB1
LATCH_STRB2
LATCH_STRB3
ENC_BUF_OE

+5V
C579 10uF 16V

MCU_AD0
MCU_AD1
MCU_AD2
MCU_AD3
MCU_AD4

+3.3VP
C580 10uF 16V
C576 10uF 16V
GNDP

MH502 CHGND1 C569 0.1uF GND
MH503 CHGND2 C566 0.1uF GNDP
MH508 CHGND3 C549 0.1uF GND
MH509 CHGND4 C545 0.1uF GNDP
MH514 CHGND5 C529 0.1uF GND
MH515 CHGND6 C526 0.1uF GNDP
MH520 CHGND7 C511 0.1uF GND
MH521 CHGND8 C507 0.1uF GNDP

MH500 MH504
MH505 MH507
MH506 MH510
MH511 MH513
MH512 MH516
MH517 MH519
MH518 MH522
MH523 MH501

ENCODERS

24-12-0008 E500
R535 4.75K 1%
R530 4.75K 1%
R534 4.75K 1%
C570 0.1uF
C572 0.1uF

24-12-0008 E501
R526 4.75K 1%
R521 4.75K 1%
R525 4.75K 1%
C550 0.1uF
C552 0.1uF

24-12-0008 E502
R517 4.75K 1%
R512 4.75K 1%
R516 4.75K 1%
C530 0.1uF
C532 0.1uF

24-12-0008 E503
R506 4.75K 1%
R500 4.75K 1%
R505 4.75K 1%
C512 0.1uF
C515 0.1uF

+3.3V
C501 0.1uF
GND
ENC_BUF_OE
U503 74LVC244
1OE 2OE VCC GND
1A0 1A1 1A2 1A3 2A0 2A1 2A2 2A3
1Y0 1Y1 1Y2 1Y3 2Y0 2Y1 2Y2 2Y3
UI_DATA00 UI_DATA01 UI_DATA02 UI_DATA03 UI_DATA04 UI_DATA05

+3.3V
C503 0.1uF
ENC_BUF_OE
U502 74LVC244
UI_DATA09 UI_DATA10 UI_DATA11 UI_DATA06 UI_DATA07 UI_DATA08

PRELIMINARY DRAWINGS
FOR QUOTATION PURPOSES ONLY
DO NOT USE FOR PRODUCTION

DRAWN: D. MOLNAR/A. MONGE	DATED: 10.09.2007
CHECKED: Review Panel	DATED:

COMPANY: LINE 6

TITLE: **F7: TNG FOOT UI INTERFACE**

PROGRAM: PADS LOGIC 2004

REV: A1

FILENAME:

SCALE: 1:1 | SIZE: C | PART NUMBER: 35-00-0261 | SHEET: 1 OF 4

ECOs INCLUDED ON THIS SCHEMATIC/PCB REVISION		
ECO NO:	DATE:	DESCRIPTION:

UI_DATA[00:15]

+3.3V C500 0.1uF

U500 74LVC574A — LATCH_STRB1 — C508 0.1uF
U505 74LVC574A — LATCH_STRB1
U506 74LVC574A — LATCH_STRB2
U504 74LVC574A — LATCH_STRB2 — C514 0.1uF
U501 74LVC574A — LATCH_STRB3
C506 0.1uF
C502 0.1uF

UI_DATA	LCD_DATA
UI_DATA07	LCD_DATA07
UI_DATA06	LCD_DATA06
UI_DATA05	LCD_DATA05
UI_DATA04	LCD_DATA04
UI_DATA03	LCD_DATA03
UI_DATA02	LCD_DATA02
UI_DATA01	LCD_DATA01
UI_DATA00	LCD_DATA00

LCD_DATA[00:07]

UI_DATA	
UI_DATA15	LCD4_E2
UI_DATA14	LCD4_E1
UI_DATA13	LCD3_E2
UI_DATA12	LCD3_E1
UI_DATA11	LCD2_E2
UI_DATA10	LCD2_E1
UI_DATA09	LCD1_E2
UI_DATA08	LCD1_E1

UI_DATA	
UI_DATA07	LCD2_CONTRAST_PULSE
UI_DATA06	LCD2_CTRL_BLUE
UI_DATA05	LCD2_CTRL_GREEN
UI_DATA04	LCD2_CTRL_RED
UI_DATA03	LCD1_CONTRAST_PULSE
UI_DATA02	LCD1_CTRL_BLUE
UI_DATA01	LCD1_CTRL_GREEN
UI_DATA00	LCD1_CTRL_RED

UI_DATA	
UI_DATA15	LCD4_CONTRAST_PULSE
UI_DATA14	LCD4_CTRL_BLUE
UI_DATA13	LCD4_CTRL_GREEN
UI_DATA12	LCD4_CTRL_RED
UI_DATA11	LCD3_CONTRAST_PULSE
UI_DATA10	LCD3_CTRL_BLUE
UI_DATA09	LCD3_CTRL_GREEN
UI_DATA08	LCD3_CTRL_RED

UI_DATA	
UI_DATA07	ADMUX_B (To POT Muxes)
UI_DATA06	ADMUX_A
UI_DATA01	LCD_RESET
UI_DATA00	LCD_A0

LCD1_CONTRAST_PULSE — R533 1.00K — R532 4.32K — C574 10uF 16V — R531 7.50K — -5VOUT_LCD1

C573 0.1uF

C563 0.1uF — U513-A 74HCT14 — U513-B 74HCT14 — LCD1_CTRL_RED — R529 57.6 1%
U513-C 74HCT14 — U513-D 74HCT14 — LCD1_CTRL_GREEN — R527 57.6 1%
U513-E 74HCT14 — U513-F 74HCT14 — LCD1_CTRL_BLUE — R528 57.6 1%

LCD500
LCD MODULE - RGB BKLIGHT

1	VSS
2	VDD
3	VO
4	VOUT
5	A0
6	E1
7	E2
8	DB0
9	DB1
10	R
11	G
12	DB2
13	DB3
14	DB4
15	DB5
16	DB6
17	DB7
18	RST
19	B
20	K

LCD_A0, LCD1_E1, LCD1_E2, LCD_DATA[00:07], LCD_RESET
route back to U1 GND
50-02-0081
122 X 32

LCD 1

LCD2_CONTRAST_PULSE — R524 1.00K — R523 4.32K — C575 10uF 16V — R522 7.50K — -5VOUT_LCD2

C553 0.1uF

C548 0.1uF — U511-A 74HCT14 — U511-B 74HCT14 — LCD2_CTRL_RED — R520 57.6 1%
U511-C 74HCT14 — U511-D 74HCT14 — LCD2_CTRL_GREEN — R519 57.6 1%
U511-E 74HCT14 — U511-F 74HCT14 — LCD2_CTRL_BLUE — R518 57.6 1%

LCD501
50-02-0081
LCD MODULE - RGB BKLIGHT

1	VSS
2	VDD
3	VO
4	VOUT
5	A0
6	E1
7	E2
8	DB0
9	DB1
10	R
11	G
12	DB2
13	DB3
14	DB4
15	DB5
16	DB6
17	DB7
18	RST
19	B
20	K

LCD_A0, LCD2_E1, LCD2_E2, LCD_DATA[00:07], LCD_RESET
route back to U2 GND
122 X 32

LCD 2

PRELIMINARY DRAWINGS
FOR QUOTATION PURPOSES ONLY
DO NOT USE FOR PRODUCTION

DRAWN: D. MOLNAR/A. MONGE	DATED: 10.09.2007
CHECKED: review panel	DATED:

COMPANY: LINE 6

TITLE: F7: TNG FOOT UI
LCD1-2

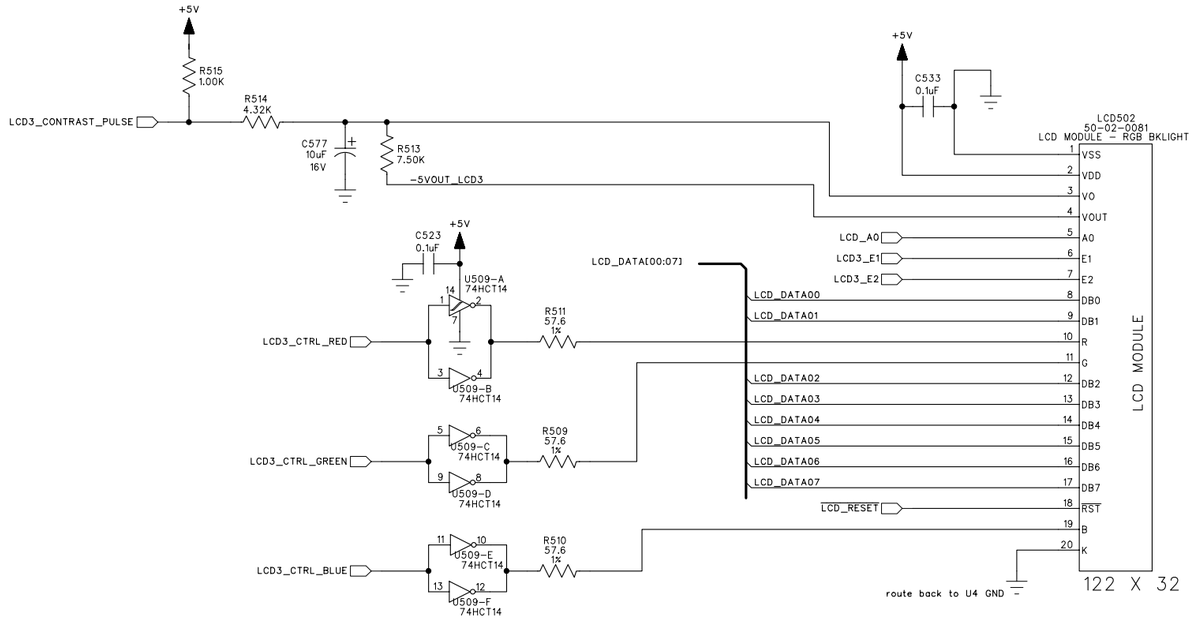
PROGRAM: PADS LOGIC 2004

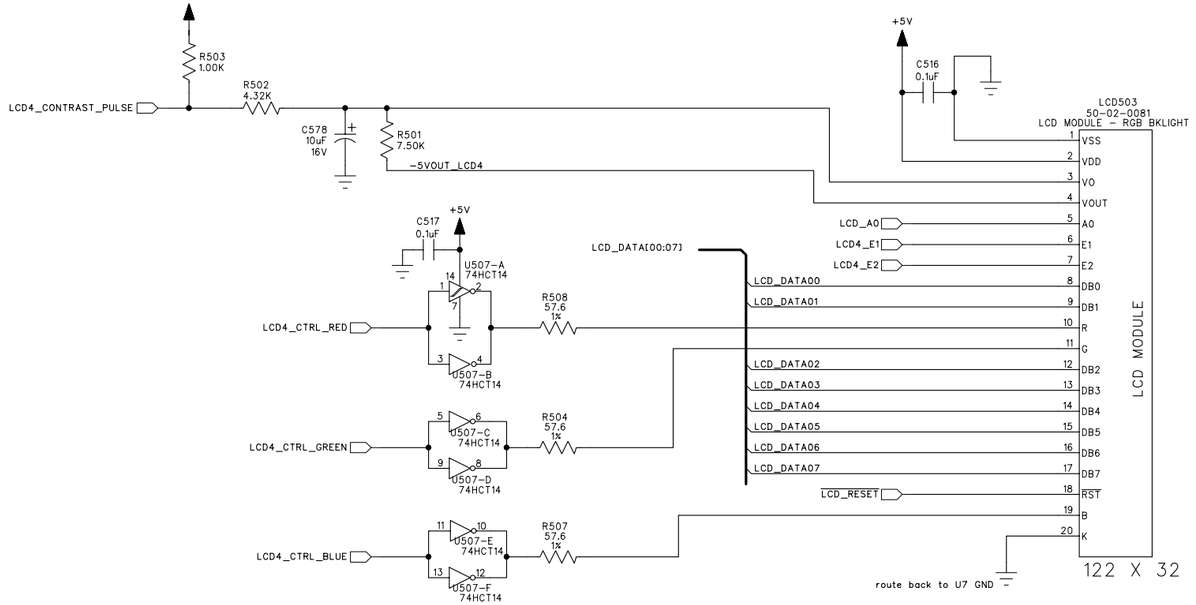
REV: A1

FILENAME:

SCALE: 1:1 | SIZE: C | PART NUMBER: 35-00-0261 | SHEET: 2 OF 4

ECOs INCLUDED ON THIS SCHEMATIC/PCB REVISION		
ECO NO:	DATE:	DESCRIPTION:





PRELIMINARY DRAWINGS
FOR QUOTATION PURPOSES ONLY
DO NOT USE FOR PRODUCTION

DRAWN: D. MOLNAR/A. MONGE	DATED: 10.09.2007
CHECKED: review panel	DATED:

COMPANY: LINE 6

TITLE: **F7: TNG FOOT UI**
LCD3-4

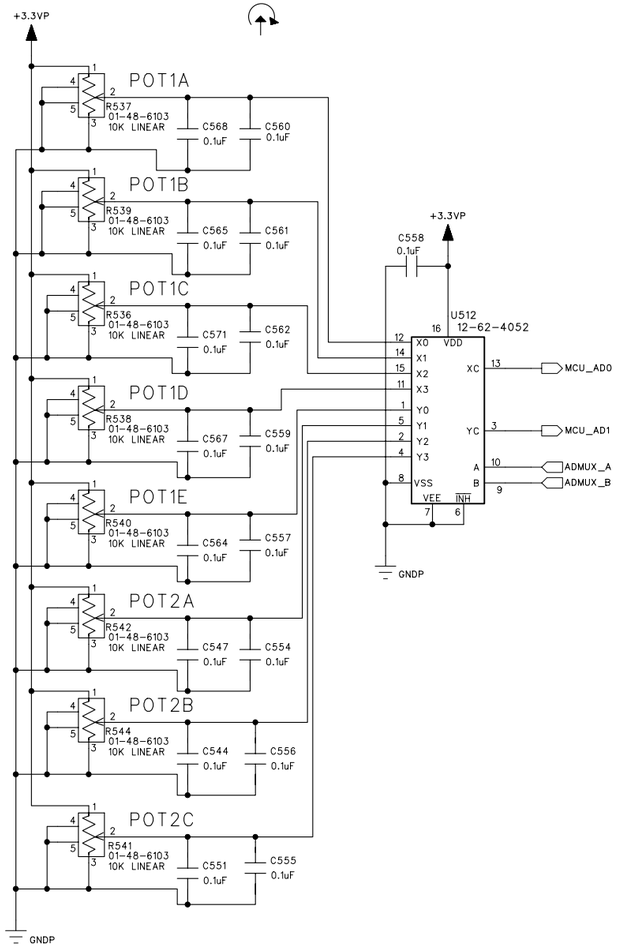
PROGRAM: PADS LOGIC 2004

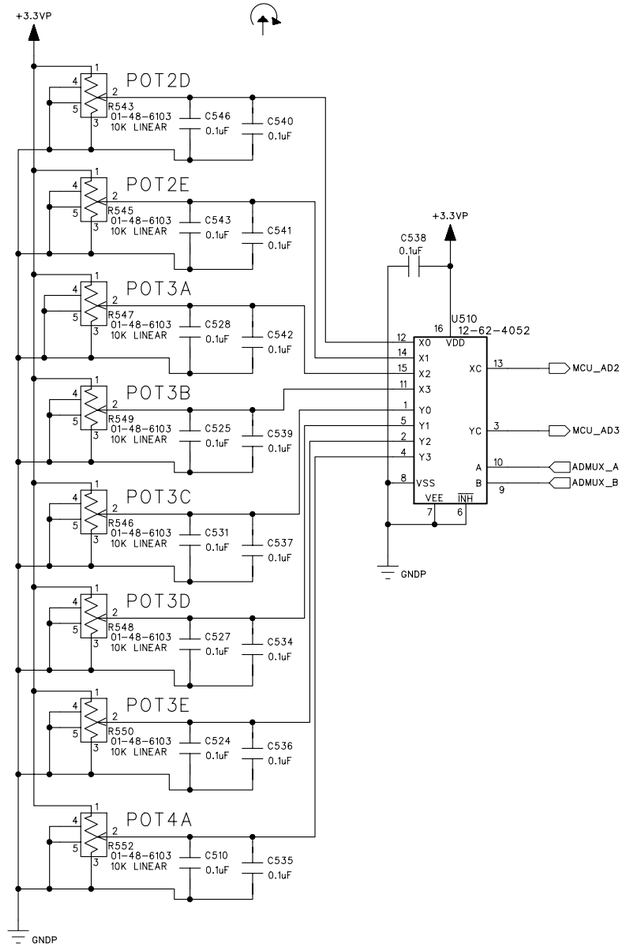
REV: A1

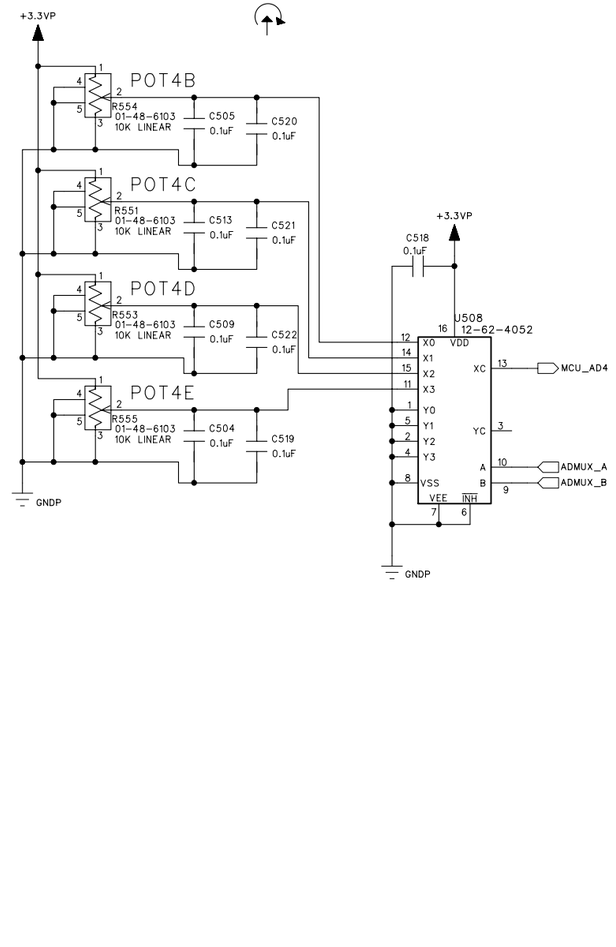
FILENAME:

SCALE: 1:1 | SIZE: C | PART NUMBER: 35-00-0261 | SHEET: 3 OF 4

ECOs INCLUDED ON THIS SCHEMATIC/PCB REVISION		
ECO NO:	DATE:	DESCRIPTION:





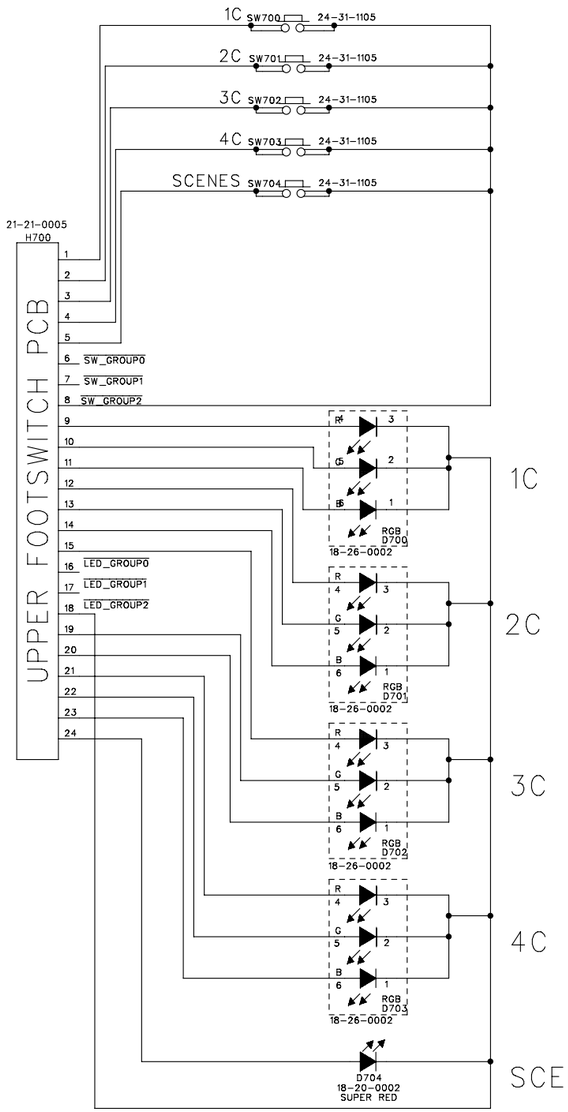


PRELIMINARY DRAWINGS
FOR QUOTATION PURPOSES ONLY
DO NOT USE FOR PRODUCTION

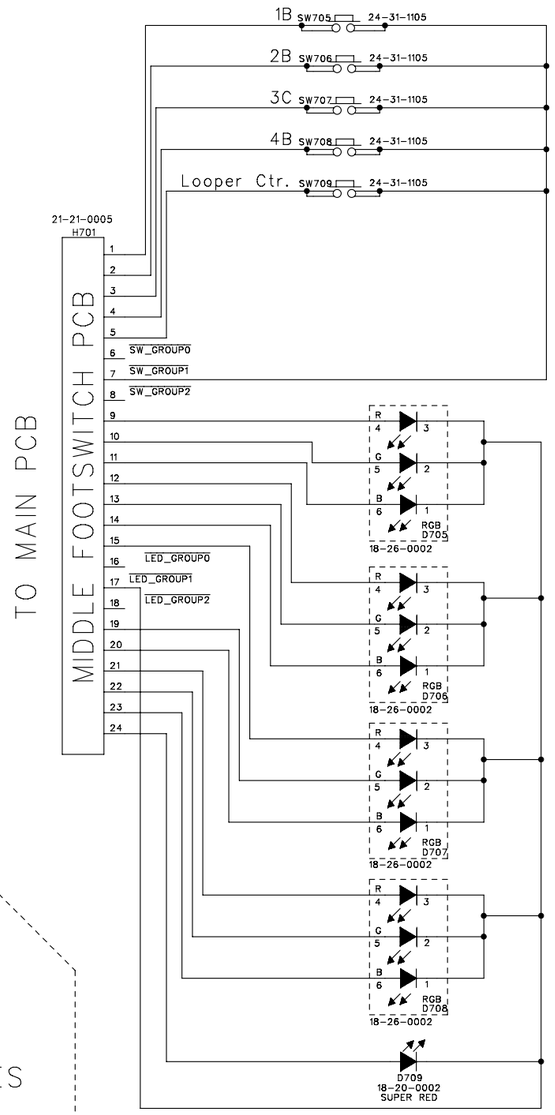
DRAWN: D. MOLNAR/A. MONGE	DATED: 10.09.2007		
CHECKED: review panel	DATED:		
COMPANY: LINE 6			
TITLE: F7: TNG FOOT UI POTS			
PROGRAM: PADS LOGIC 2004			REV: A1
FILENAME:			
SCALE: 1:1	SIZE: C	PART NUMBER: 35-00-0261	SHEET: 4 OF 4

ECOs INCLUDED ON THIS SCHEMATIC/PCB REVISION		
ECO NO:	DATE:	DESCRIPTION:
0806003	02.29.08	Released as rev.A

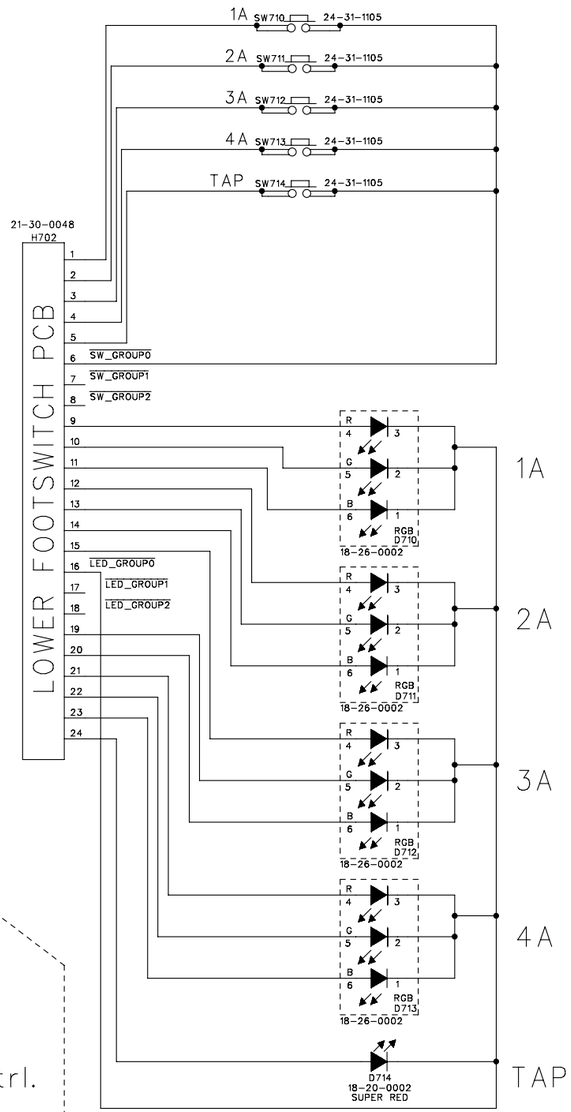
UPPER FOOTSWITCH PCB
35-00-0262



MIDDLE FOOTSWITCH PCB
35-00-0262-1



LOWER FOOTSWITCH PCB
35-00-0262-2



LED MATRIX 13 X 3

	LOWER LED_GROUP0	MIDDLE LED_GROUP1	UPPER LED_GROUP2
LED_IMAGE0	1A-RED	1B-RED	1C-RED
LED_IMAGE1	1A-GREEN	1B-GREEN	1C-GREEN
LED_IMAGE2	1A-BLUE	1B-BLUE	1C-BLUE
LED_IMAGE3	2A-RED	2B-RED	2C-RED
LED_IMAGE4	2A-GREEN	2B-GREEN	2C-GREEN
LED_IMAGE5	2A-BLUE	2B-BLUE	2C-BLUE
LED_IMAGE6	3A-RED	3B-RED	3C-RED
LED_IMAGE7	3A-GREEN	3B-GREEN	3C-GREEN
LED_IMAGE8	3A-BLUE	3B-BLUE	3C-BLUE
LED_IMAGE9	4A-RED	4B-RED	4C-RED
LED_IMAGE10	4A-GREEN	4B-GREEN	4C-GREEN
LED_IMAGE11	4A-BLUE	4B-BLUE	4C-BLUE
LED_IMAGE12	TAP	Looper Ctrl.	SCENES

SWITCH MATRIX 5 X 3

	LOWER SW_GROUP0	MIDDLE SW_GROUP1	UPPER SW_GROUP2
SW_IMAGE0	1A	1B	1C
SW_IMAGE1	2A	2B	2C
SW_IMAGE2	3A	3B	3C
SW_IMAGE3	4A	4B	4C
SW_IMAGE4	TAP	Looper Ctrl.	SCENES

PRELIMINARY DRAWINGS
FOR QUOTATION PURPOSES ONLY
DO NOT USE FOR PRODUCTION

DRAWN:	DATED:
D. MOLNAR/J.FORBES	10.10.2007
CHECKED:	DATED:
review panel	

COMPANY: LINE 6

TITLE: F7: TNG FOOT
FOOTSWITCH PCBS

PROGRAM: PADS LOGIC 2004

REV: A

FILENAME:

SCALE: 1:1 | SIZE: C | 35-00-0262 (-1, -2) | SHEET: 1 OF 1

M13 Stompbox Modeler Parts List

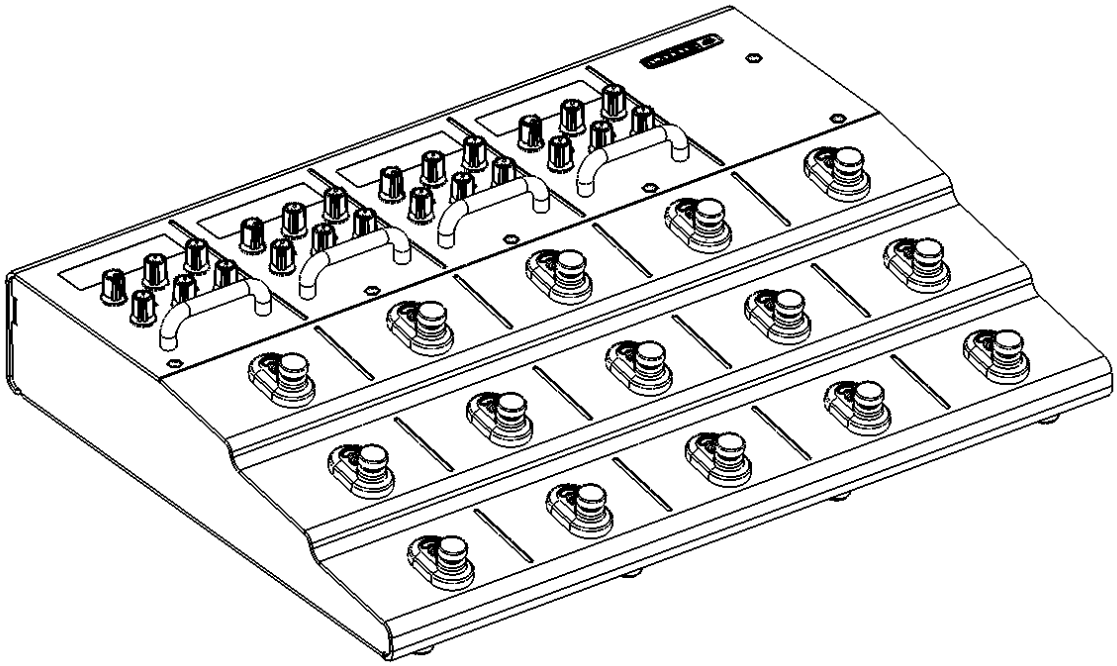
99-040-3005	M13 Stompbox Modeler US		
Part Number	Description	Qty Per	Reference Designator(s)
11-32-0000	XFMR PX2 120VAC/60Hz 9VAC/2A UL 2464 VW-1 6FT BLACK US	1	PACKOUT
40-00-0167	MANUAL USER TNG FOOT F7-1	1	
40-00-1000	CARD WARRANTY LINE 6	1	
40-01-0016	CARD LICENSE-AGREEMNT END-USERALL-PRODUCTS	1	
40-03-0031	CARD REGISTRATION UK	1	
40-03-2000	CARD REGISTRATION US	1	
40-03-2000-1	CARD REGISTRATION EUROPE	1	
40-10-0222	CARTON GIFT TNG FOOT F7-1	1	
40-20-0011	BAG PLASTIC 10 x 16 2 mil	1	
40-20-0022	BAG PLASTIC 2 MIL 36"x14"	1	
40-25-0024	STICKER ART SEAL EULA REV.B	1	
59-00-0043	ASSY UNIT COMPLETE TNG FOOT F7-1	1	

59-00-0043	ASSY UNIT COMPLETE TNG FOOT		
Part Number	Description	Qty Per	Reference Designator(s)
24-24-0606	SWITCH POWER ROCKER 6A/250V 10A/120V PNL MNT BLACK	1	
30-00-0043	SCREW 6-32 x 5/16 w/LK WASH PPZ STL	14	
30-00-0063	SCREW THRD-FRM 6-20 x 1/2-IN PPB	2	
30-00-0125	SCREW 8-32 x 5/16 W/LK WASH PPH BLK STL	8	
30-00-0375	SCREW 6-32 x .375 PPB	11	
30-00-0405	SCREW 6-32 x .50" SHCS NICKEL PL P11-1	15	
30-06-0623	NUT HEX 6-32 w/CAPTIVE STAR-WASHER	15	
30-12-0010	STANDOFF HEX .250 6-32 M-F 0.375-IN AL	2	
30-27-0095	KNOB 0.54-H x 0.44 D PLASTIC ABS BLACK	24	
30-27-0260	FOOTSWITCH PUSH PIN .15 DIA x .15 LONG ABS BLACK P11-1	15	
30-27-0261	LIGHT PIPE FOOTSWITCH 1.1 x .8x .6 PC CLEAR P11-1	15	
30-27-0293	SUPPORT CHASSIS 3.0 x 2.2 x .9 ABS F7-1	1	
30-27-0294	BEZEL F7-1 2.9 x 1.2 x .1 CLEAR POLYCARBONATE	4	
30-27-0295	PUSH SPACER TEARDROP 3/16 NYLON 3/8"	7	
30-27-0304	CABLE STRAIN RELIEF 1.1" x .5 " x .5" ABS BLACK	1	
30-48-0010	FOOT RUBBER w/ADHESIVE 3M BUMPON SJ-5012 (OR EQUIV)	2	
30-48-5012	BUMPER RUBBER .465" OD BLACK	10	
30-51-0290	FOOTSWITCH BASE 1.3 x .5 x .5 ADC P11-1	15	
30-51-0291	FOOTSWITCH PLUNGER 0.5 DIA x 0.76 LG SST P11-1	15	
30-51-0293	SPRING 9 COIL .30 DIA x .82 x .024 STEEL ZINC PLATE P11-1	15	
30-51-0294	SPRING 8 COIL .14 x .35 x .020STEEL ZINC PLATE P11-1	15	
30-51-0295	CLIP E STYLE FOR 7/32" DIA SHAFT STEEL BLACK PHOS P11-1	15	
30-51-0321	CHASSIS TOP 15.0 x 11.0 x 2.4 STEEL F7-1	1	
30-51-0322	CHASSIS BOTTOM 15.1 x 10.7 x 2.4 STEEL F7-1	1	
30-51-0323	GUARD KNOB 2.0 x .75 x 0.25 ROUND STEEL BAR CHROME	4	
30-60-0006	LOGO LINE 6 SML 38.35 x 7.98MM w/ADHSV BRUSHED/BLK FINISH AL	1	
30-63-0034	FOAM w/ADHSV 2 SIDES BEZEL 2.4" x 0.27" F7-1	8	
40-25-0020	LABEL INSPECTION QUALITY	1	
40-25-0101	LABEL BAR CODE S/N 2-PNL LTX 16 1125502	1	
50-02-0260	PCBA MAIN TNG FOOT F7-1	1	
50-02-0261	PCBA UI TNG FOOT F7-1	1	
50-02-0262	PCBA FOOTSWITCH UPPER TNG FOOTF7-1	1	
50-02-0262-1	PCBA FOOTSWITCH MIDDLE TNG FOOT F7-1	1	
50-02-0262-2	PCBA FOOTSWITCH LOWER TNG FOOTF7-1	1	

50-02-0260	PCBA MAIN TNG FOOT F7-1		
Part Number	Description	Qty Per	Reference Designator(s)
01-04-0000	RES 0R 5% 1206	1	R24
01-24-0000	RES 0R 1% 0805	4	R65,R68,R85,R86
01-24-1001	RES 1.00K 1% 0805	2	R167,R171
01-24-1002	RES 10.0K 1% 0805	7	R88,R91,R94,R95,R116,R119,R134
01-24-1071	RES 1.07K 1% 0805	1	R52
01-24-10R0	RES 10.0R 1% 0805	2	R123,R131
01-24-1210	RES 121R 1% 0805	10	R104,R109,R162,R163,R164,R165,R166,R167,R168,R169,R170
01-24-1300	RES 130R 1% 0805	13	R103,R107,R108,R111,R113,R118,R122,R124,R125,R127,R128
			R130,R132
01-24-1502	RES 15.0K 1% 0805	2	R44,R66
01-24-1781	RES 1.78K 1% 0805	1	R55
01-24-1871	RES 1.87K 1% 0805	12	R56,R57,R59606162,R73,R74,R78,R80,R84,R87
01-24-2001	RES 2.00K 1% 0805	2	R147,R148
01-24-2002	RES 20.0K 1% 0805	16	R135,R136,R137,R138,R139,R140,R141,R142,R143,R144,R149,R150,R156,R157,R158,R159
01-24-2210	RES 221R 1% 0805	3	R97,R98,R101
01-24-22R1	RES 22.1R 1% 0805	2	R154,R155
01-24-2400	RES 240R 1% 0805	1	R152
01-24-30R1	RES 30.1R 1% 0805	3	R90,R96,R99
01-24-4750	RES 475R 1% 0805	1	R100
01-24-4751	RES 4.75K 1% 0805	2	R82,R83
01-24-5R11	RES 5.11R 1% 0805	1	R153
01-25-1001	RES 1.00K 1% 0603	4	R45,R53,R63,R67
01-25-1002	RES 10.0K 1% 0603	19	R36,R38,R39,R40,R42,R43,R46,R47,R48,R50,R70,R71,R75 R77,R93,R120,
			R133,R145,R172
01-25-1004	RES 1.00M 1% 0603	4	R37,R41,R54,R64
01-25-2001	RES 2.00K 1% 0603	8	R1,R2,R15,R16,R17,R18,R32,R33
01-25-2741	RES 2.74K 1% 0603	4	R4,R10,R25,R34
01-25-30R1	RES 30.1R 1% 0603	3	R49,R51,R114
01-25-3571	RES 3.57K 1% 0603	8	R7,R8,R12,R13,R20,R23,R29,R30
01-25-4751	RES 4.75K 1% 0603	12	R89,R92,R102,R105,R106,R110,R112,R115,R117,R121,R129,R146
01-25-5491	RES 5.49K 1% 0603	6	R58,R69,R72,R76,R79,R81
01-25-5901	RES 5.90K 1% 0603	8	R3,R6,R11,R14,R19,R22,R28,R31
01-25-9530	RES 953R 1% 0603	4	R5,R9,R26,R35
01-28-10R0	RES 10.0R 1% 1206	1	R151
03-10-0338	CAP ELEC 3300uF 6.3V 20% RADIAL 10/20/5	1	C46
03-10-0477	CAP ELEC 470uF 6.3V 20% RADIAL6.3/11/5	1	C63
03-10-1107	CAP ELEC 100uF 6.3V 20% RADIAL5/11/5	2	C71,C75
03-10-6108	CAP ELEC 1000uF 6.3V 20% RADIAL 8/11.5/5	1	C76
03-11-0688	CAP ELEC 6800uF 6.3V 20% 105C LOW Z 0.022R RADIAL 16/25/7.5	1	C44
03-12-0107	CAP ELEC 100uF 16V 20% RADIAL 6.3/11/5	2	C40,C45
03-12-0108	CAP ELEC 1000uF 16V 20% RADIAL10/16/5	2	C82,C85
03-12-0478	CAP ELEC 4700uF 16V 20% RADIAL	1	C80
03-16-2108	CAP ELEC 1000uF 35V 20% 105C LOW Z RADIAL 12.5/25/5	2	C81,C84
03-18-0106	CAP ELEC 10uF 50V 20% RADIAL 5/11/5	20	C1,C8,C9,C13,C15,C24,C29,R30,R31,C33,C34,C36,C37,C41,C42,C53,C57
			C61,C64,C206
03-36-0224	CAP ESTR 0.22uF 50V 5% TH 11/6/11.5/7.5	1	C79
03-45-0473	CAP FILM 47nF 16V 20% 1206	2	C38,C47
03-50-0221	CAP NPO 220pF 50V 5% 0805	8	C3,C4,C5,C6,C14,C17,C19,C22
03-50-0272	CAP NPO 2.7nF 50V 5% 0805	10	C2,C7,C12,C23,C43,C48,C50,C54,C56,C58
03-50-0330	CAP NPO 33pF 50V 5% 0805	2	C65,C72
03-50-0391	CAP NPO 390pF 50V 5% 0805	1	C39
03-52-0101	CAP X7R 100pF 50V 10% 0805	2	C226,C231
03-52-0103	CAP X7R 10nF 50V 10% 0805	3	C83,C87,C88
03-52-0220	CAP X7R 22pF 50V 10% 0805	1	C68

50-02-0260	PCBA MAIN TNG FOOT Continued...		
Part Number	Description	Qty Per	Reference Designator(s)
03-52-0473	CAP X7R 47nF 50V 10% 0805	3	C10,C21,C96
03-56-0100	CAP NPO 10pF 50V 5% 0603	21	C95,C98,C106,C110,C111,C116,C118,C127,C137,C138,C142,
			C147,C157,C163,C169,C172,C175,C183,C184,C187,C200
03-56-0101	CAP NPO 100pF 50V 5% 0603	17	C32,C35,C52,C55,C78,C132,C149,C180,C203,C227,
			C232,C236,C238,C240,C244,C248,C249
03-56-0102	CAP NPO 1nF 50V 5% 0603	4	C16,C25,C143,C154
03-56-0470	CAP NPO 47pF 50V 5% 0603	4	C28,C216,C221,C234
03-58-0102	CAP X7R 1nF 50V 10% 0603	29	C94,C107,C109,C117,C120,C125,C126,C131,C134,C135,C146,
			C150,C155,C158,C160,C162,C165,C174,C177,C179,C182,
			C185,C188,C189,C190,C195,C196,C198,C202
03-58-0103	CAP X7R 10nF 50V 10% 0603	1	C153
03-58-0104	CAP X7R 0.1uF 25V 10% 0603	97	C11,C18,C20,C26,C27,C51,C59,C60,C62,C66,C67,C69,C70,C74,C86,
			C89,C90,C91,C92,C93,C97,C99,C100,C101,C102,C103,C104,C105,C108,C112,C113,C114,C115,C119,C121,C122,C123,C124,C129,C130,
			C133,C136,C139,C140,C141,C144,C145,C148,C151,C152,C156,C159,C161,
			C164,C166,C167,C168,C170,C171,C173,C176,C178,C181,C186,C191,C192,C193,C194,
			C197,C199,C201,C204,C205,C208,C209,C210,C211,C213,C214,C215,C218,C219,C220,
			C222,C223,C224,C225,C228,C229,C230,C233,C237,C239,C242,C243,C246,C247
03-80-0107	CAP ELEC 100uF 10V 20% SM 6.3/5.4/7.8	4	C77,C207,C212,C217
03-82-0106	CAP ELEC 10uF 16V 20% SM 4/5.4/5.5	2	C49,C73
04-01-0004	INDUCTOR CHOKE 150uH 0.4R 1A SM SHIELDED	1	L24
04-04-0001	FERRITE BEAD 3 TURN 600R @ 100MHz MATERIAL 61 RADIAL TH	2	L16,L17
04-05-0010	FERRITE BEAD 15R @ 1GHz 1A 1206 SM	2	L20,L23
06-20-0099	DIODE GEN PUR DUAL 70V 215mA 6nS SOT-23 SM	4	D1,D2,D3,D4
06-23-0054	DIODE SCHOTTKY DUAL 30V 200mA 5nS SOT-23 SM	4	D22,D23,D26,D27
06-23-0340	DIODE SCHOTTKY 3A 40V SMA SM	1	D14
06-32-0130	DIODE SCHOTTKY 1A 30V SMB SM	1	D5
06-32-0313	DIODE RECTIFIER 200V 3A SMB SM	1	D12
06-32-4006	DIODE RECTIFIER 800V 1A SMA SM	4	D8,D9,D10,D11
06-34-0016	DIODE SWITCHING 75V 200mA 6nS SOT-23 SM	10	D13,D15,D16,D17,D18,D19,D20,D21,D25,D28
09-06-7002	TRANS MOSFET N-CHAN 60V 7R5 SOT-23 SM	4	Q5,Q6,Q10,Q11
09-10-4401	TRANS NPN SMALL SIGNAL SOT-23 SM	2	Q9,Q14
09-10-4403	TRANS PNP SMALL SIGNAL SOT-23 SM	4	Q7,Q8,Q12,Q13
09-10-6102	TRANS N-CHANNEL MOSFET SOT-23 SM	3	Q2,Q3,Q4
11-01-2458	OSCILLATOR 24.576MHz 3.3V W/3-S HCMOS OUT 4 PIN HS-DIP8	1	Y1
11-10-2012	FERRITE BEAD 600R @ 100MHz 300mA 0805 SM	32	L1,L2,L3,L4,L5,L6,L7,L8,L9,L10,L11,L12,L13,L14,L15,L18,L21,L25,L26,L27,L28,L29,L30,L31,L32,L33,L34,L35,L36,L37,L38,L39
12-00-0317	IC VREG ADJ 1.2V-37V 1.5 AMP TO-220 LM317 TH	1	U11
12-02-7805	IC REG +5V 1.5 AMP TH	2	U8,U19
12-02-7812	IC REG +12V 1.0AMP TO -220 TH	1	U2
12-02-7912	IC REG -12V 1.0AMP TO-220 TH	1	U4
12-52-1118	IC REG 1.8V LDO LINEAR 800mA SOT-223 SM	1	U29
12-54-0072	IC OP AMP DUAL TL072 SM	2	U1,U3
12-54-0074	IC OP AMP TL074 SM	3	U5,U6,U9
12-64-4243	IC CODEC TDM 108dB 192KHz 6- IN 6-OUT CS42436 SM	1	U10
15-40-6138	IC OPTO ISOLATOR 6N138 DIP 8 PIN TH	1	U16
15-62-0004	IC 74HC04 HEX INVERTER SO-14 SM	1	U13
15-62-0138	IC 74HC138 DECODER/DEMUX 3-8 LINE SO-16 SM	1	U27
15-64-0273	IC 74HCT273 OCTAL D-TYPE FLIP FLOP 8 BIT SO-20 SM	2	U17,U22
15-65-0000	IC 74LCX00 LOW VOLTAGE QUAD 2 INPUT NAND GATE 5V SO-14 SM	1	U26
15-65-8245	IC 74LCX245 LOW VOLTAGE CMOS BIDIRECTIONAL TRANSCEIVE SO-20	2	U23,U25
15-68-2374	IC PWM DC/DC CONVERTER DMP8 SM	1	U7
15-70-0002	IC SDRAM 3.3V 64MB 1M x 16 x 4 TSOP-54 SM	2	U14,U15
15-84-2220	IC MCU 16/32 BIT ARM W/64K ADC LPC2220 LQFP144 SM	1	U20
15-86-1369	IC DSP SHARC PROCESSOR ADSP-21369 MQFP208 SM	1	U12
15-92-5809	IC RESET 3 PIN 3.3V ACTIVE LOWOUTPUT SOT-23 SM	1	U28
21-00-0014	JACK BARREL PCB MT 2.5MM DC POWER 3 PIN TH	1	J13
21-00-6617	JACK 1/4" TRS PCB MOUNT 6 PIN HORIZONTAL W/CHROME HRDWARE TH	10	J3,J4,J5,J6,J7,J8,J9,J10,J11,J12

50-02-0260	PCBA MAIN TNG FOOT Continued...		
Part Number	Description	Qty Per	Reference Designator(s)
21-04-5075	JACK DIN FEMALE MIDI 5 PIN PCB MOUNT RT ANGLE	2	J1,J2
21-18-0002	TERMINAL SCREW PCB MOUNT RIGHTANGLE SNAP-IN 6-32 THREAD	1	BR1
21-20-0205	HDR SIL PCB-MT 5 PIN x 2MM MALE SHRD VERT MT TH	1	H5 (Do not install)
21-20-1033	HDR DIL PCB-MT 34 PIN 2 x 17 x .100 MALE SHRD VERT MT TH	1	H2
21-21-0014	HDR DIL PCB-MT 14 PIN 2 x 7 x .100 MALE SHRD VERT MNT TH	2	H1,H4
21-34-0061-1	CBL 1 COND 18AWG 3.0" FM-QUICK DISCONNECT/S-T BLACK	1	BLK
21-34-0061-2	CBL 1 COND 18AWG 3.0" FM-QUICK DISCONNECT/S-T WHITE	1	WHT
24-15-0001	RELAY DPDT SINGLE WINDING LATCHING TYPE DIP 10 TH	2	RY1,RY2
30-00-0607	SCREW 6-32 x 7/16IN w/LK WASH PPZ STL	3	(U8,U11,U19)
30-12-0632	STANDOFF HEX .250 6-32 F-F 1IN F-F AL	1	(U19)
30-12-2210	STANDOFF HEX .250 6-32 F-F .500 LG AL	2	(U8,U11)
30-15-0043	SPACER .085 THICK x .63 OD NYLON	10	
30-18-3030	CLIP GROUND PCB .30 x .30 x .07	11	
35-00-0260	PCB MAIN TNG FOOT F7-1 REV.B	1	
45-02-0046	IC PROGRAMMED FLASH/MCU v1.02 TNG FOOT F7-1	1	
50-02-0261	**PCBA UI TNG FOOT F7-1**		
Part Number	Description	Qty Per	Reference Designator(s)
01-24-1001	RES 1.00K 1% 0805	4	R503,R515,R524,R533
01-24-4321	RES 4.32K 1% 0805	4	R502,R514,R523,R532
01-24-4751	RES 4.75K 1% 0805	12	R500,R505,R506,R512,R516,R517,R521,R525,R526,R530,R534,R535
01-24-57R6	RES 57.6R 1% 0805	12	R504,R507,R508,R509,R510,R511,R518,R519,R520,R527,R528,R529
01-24-7501	RES 7.50K 1% 0805	4	R501,R513,R522,R531
01-48-6103	POT MONO 10KB LINEAR TAPER 25MM W/9MM NUT D-SHAFT	20	R536,R537,R538,R539,R540,R541,R542,R543,R544,R545,R546,R547,R548,R549,R550,R551,R552,R553,R554,R555
03-58-0104	CAP X7R 0.1uF 25V 10% 0603	74	C500,C501,C502,C503,C504,C503,C507,C508,C509,C510,C511,C512,C513,C514,C515,C516,C517,C518,C519,C520,C521,C522,C523,C524,C525,C526,C527,C528,C529,C530,C531,C532,C533,C534,C535,C536,C537,C538,C539,C540,C541,C542,C543,C544,C545,C546,C547,C548,C549,C550,C551,C552,C553,C554,C555,C556,C557,C558,C559,C560,C561,C562,C563,C564,C565,C566,C567,C568,C569,C570,C571,C572,C573
03-82-0106	CAP ELEC 10uF 16V 20% SM 4/5.4/5.5	7	C574,C575,C576,C576,C577,C578,C579,C580
12-62-4054	IC SWITCH ANALOG CD74HC4052M SO-16 SM	3	U508,U510,U512
15-64-0014	IC 74HCT14 HEX INVERTER 6 SM	4	U507,U509,U511,U513
15-65-0574	IC 74LVC574A OCTAL D-TYPE FLIP FLOP 5V EDGE TRIGGER SO20 SM	5	U500-501,U504,U505,U506
15-65-1244	IC 74LVC244 LOW VOLTAGE CMOS OCTAL BUFFER/LINE DRVR TSSOP20	2	U502,U503
21-30-0047	CBL RIBBON DIL 34 PIN .100 PI TCH 5.25" STAKED TO FEMALE	1	H500
24-12-0009	ENCODER 20 STEP w/SWITCH 18MM D-SHAFT METAL V-MNT PCB	4	E500,E501,E502,E503
30-27-0220	PUSH SPACER TEARDROP 3/16" NYLON NATURAL	16	MH500,MH501,MH504,MH505,MH506,MH507,MH510,MH513,MH516,MH517,MH518,MH519,MH522,MH523
35-00-0261	PCB UI TNG FOOT F7-1 REV.A	1	
50-02-0081	PCBA DISPLAY LCD 122x32 POS GRAPHIC RGB BACKLIGHT F7-1	4	
50-02-0262	**PCBA FOOTSWITCH UPPER TNG FOOT**		
Part Number	Description	Qty Per	Reference Designator(s)
18-20-0002	LED RED SUPER 2MM x 1.25MM 660nM 0805 SM	1	D704
18-26-0002	LED BLUE/GREEN HYPER RED 3.2MM x 1.6MM SM	4	D700,D701,D702,D703
21-21-0005	HDR DIL PCB-MT 24 PIN 2 x 12 x .100 MALE SHRD VERT TH	1	H700
24-31-1105	SWITCH TACT 6MM SQ 4 PIN TH	5	SW700,SW701,SW702,SW703,SW704
35-00-0262	PCB FOOTSWITCH UPPER TNG FOOT F7-1 REV.A	1	
50-02-0262-1	**PCBA FOOTSWITCH MIDDLE TNG FOOT**		
Part Number	Description	Qty Per	Reference Designator(s)
18-20-0002	LED RED SUPER 2MM x 1.25MM 660nM 0805 SM	1	D709
18-26-0002	LED BLUE/GREEN HYPER RED 3.2MM x 1.6MM SM	4	D705,D706,D707,D708
21-21-0005	HDR DIL PCB-MT 24 PIN 2 x 12 x .100 MALE SHRD VERT TH	1	H701
24-31-1105	SWITCH TACT 6MM SQ 4 PIN TH	5	SW705,SW706,SW707,SW708,SW709
35-00-0262-1	PCB FOOTSWITCH MIDDLE TNG FOOTF7-1 REV.A	1	
50-02-0262-2	**PCBA FOOTSWITCH LOWER TNG FOOT**		
Part Number	Description	Qty Per	Reference Designator(s)
18-20-0002	LED RED SUPER 2MM x 1.25MM 660nM 0805 SM	1	D714
18-26-0002	LED BLUE/GREEN HYPER RED 3.2MM x 1.6MM SM	4	D710,D711,D712,D713
21-30-0048	CBL RIBBON DIL 24 PIN 28AWG .100 PITCH 8.5" 4-CONN	1	H702
24-31-1105	SWITCH TACT 6MM SQ 4 PIN TH	5	SW710,SW711,SW712,SW713,SW714
35-00-0262-2	PCB FOOTSWITCH LOWER TNG FOOT F7-1 REV.A	1	



Forward and Notes

The information in this booklet applies to the F7-1 Complete Unit. It is suggested that the steps for assembly follow the order presented in these instructions.

These instructions deal with the assembling of the major subassemblies, the final product, and quality/inspection considerations. See also the Related Electrical assembly documentation for major considerations in assembling the electrical components of the PCBs (through the soldering process and preparation of the board for addition of custom components).

A note on the text: the illustrations in this book are for reference only. In some cases, color and geometry of illustrations may not accurately reflect the color or exact geometry of actual parts.

- Unless otherwise noted, all dimensions are in inches.
- Drawings are not to scale.
- Torque value tolerance +/- .5 in.-lbs. Do not over tighten any components.
- For clarity, not all component details are shown. This is especially true with respect to cable assemblies. They are often omitted from views to provide a clearer picture of the material discussed. Do not be confused by the absence (or unexpected presence) of any component in the illustrations in this book.

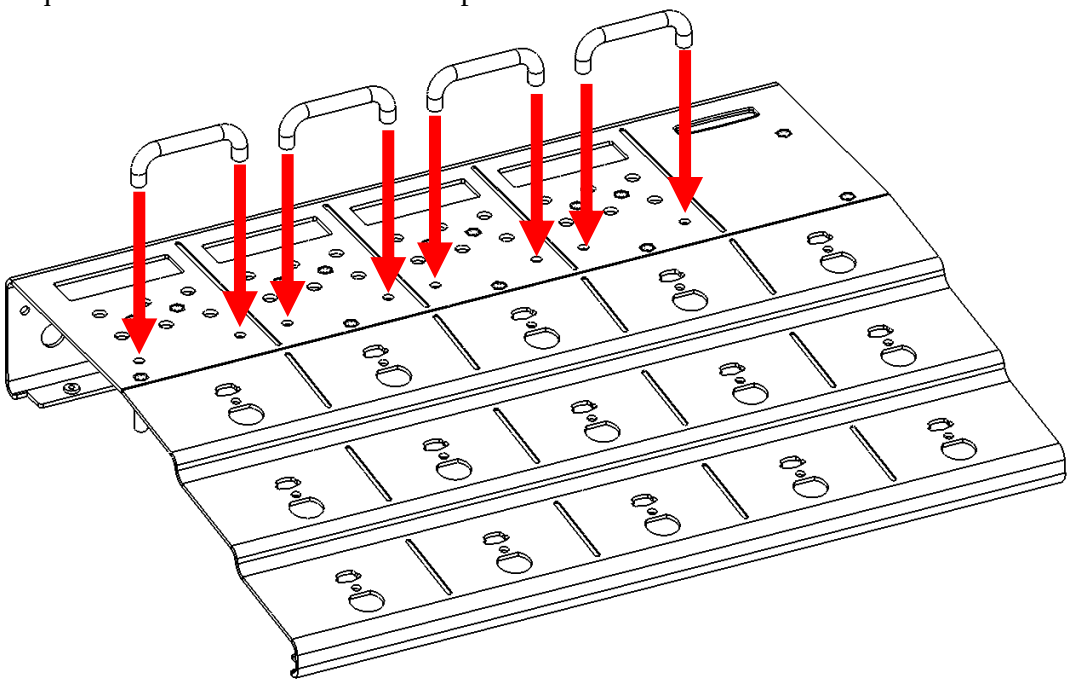
Revision Comment Sheet

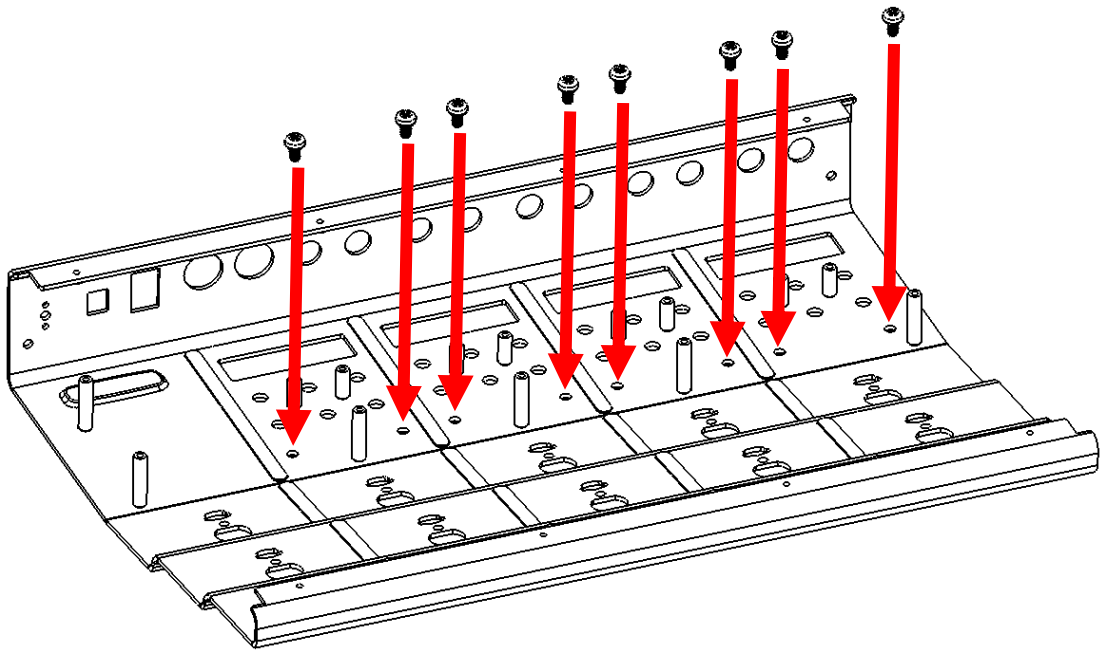
Revision	Changes
A	Initial release. See ECO 0807003.
B	ECO 0809206. Revised Step 14. Added a step after Step 21.
C	ECO 0809206. Revised Step 10.
D	ECO 0813302. Revised Step 16.
E	ECO 0814001. Revised Step 23.

STEP 1

P/N required:
1 each **30-51-0321** CHASSIS TOP F7-1
4 each **30-51-0323** KNOB GUARD SMALL
8 each **30-00-0125** SCREW 8-32 x 5/16" WITH STAR WASHER

Torque each SCREW to 8 – 10 inch-pounds.

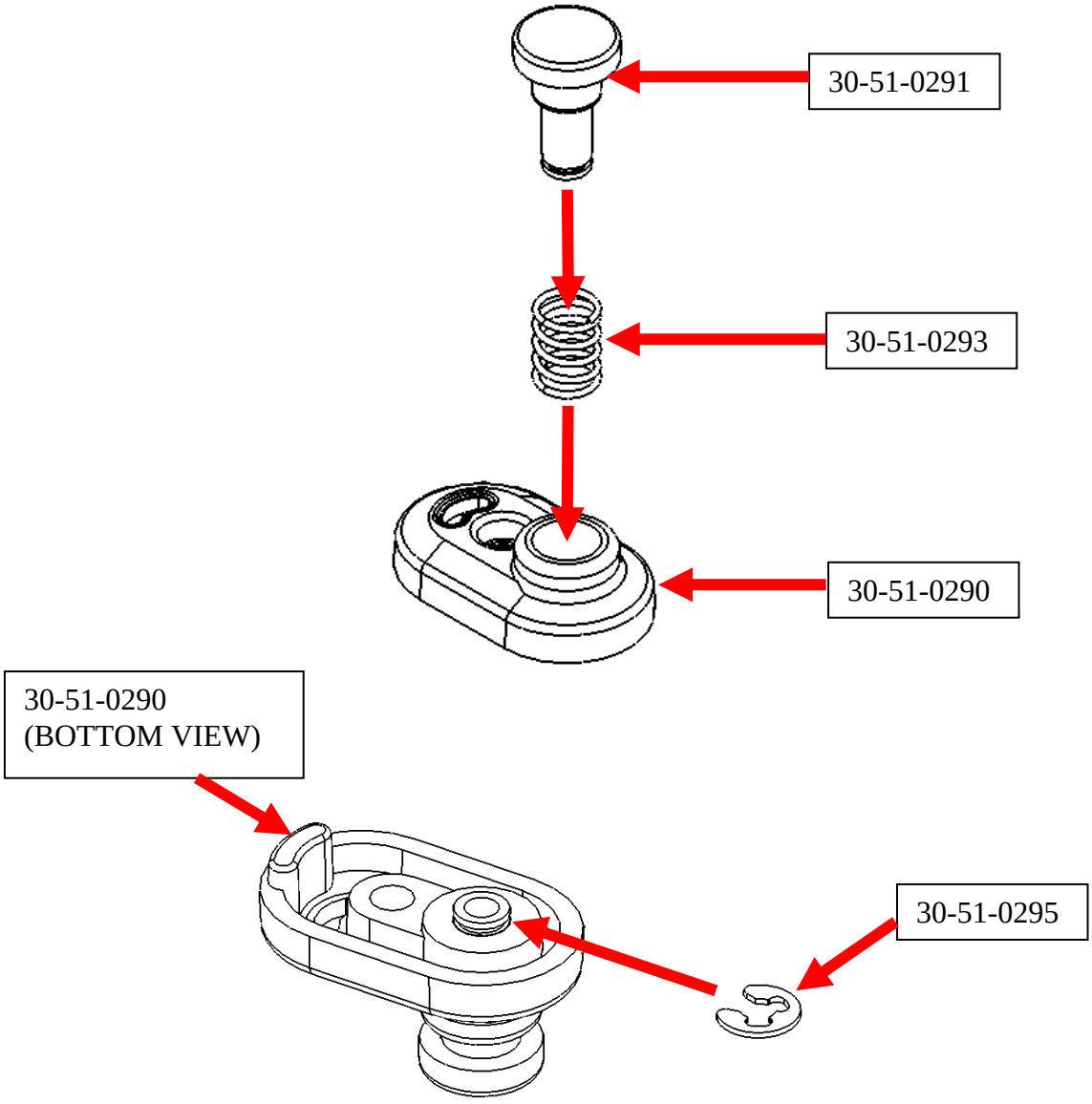




STEP 2

P/N required:
1 each **30-51-0290** FOOTSWITCH BASE
1 each **30-51-0291** FOOTSWITCH PLUNGER
1 each **30-51-0293** FOOTSWICH SPRING, LARGE
1 each **30-51-0295** E-CLIP

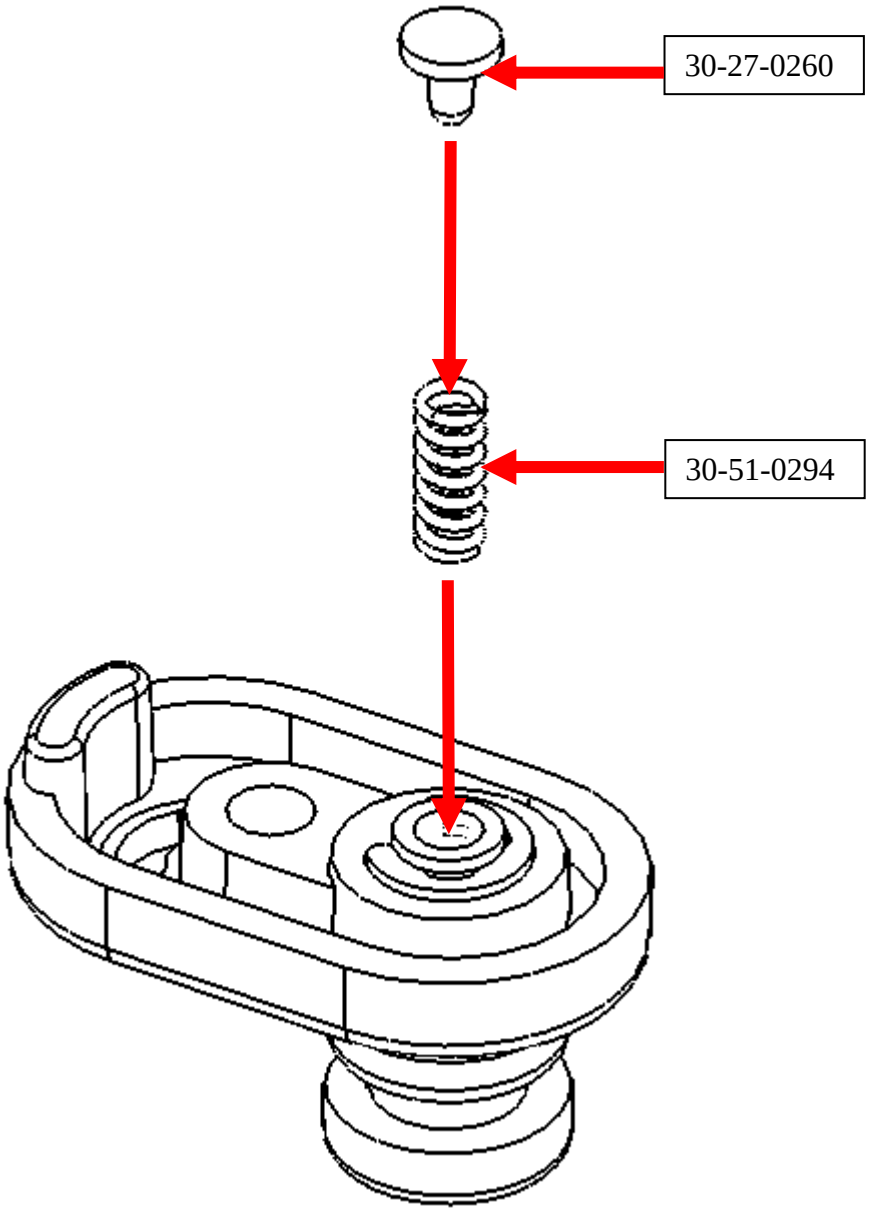
Insert the FOOTSWITCH PLUNGER and the FOOTSWICH SPRING, LARGE into the large hole in the FOOTSWITCH BASE. Push the FOOTSWITCH PLUNGER all the way through the FOOTSWITCH BASE and secure it with the E-CLIP.



STEP 3

P/N required:
1 each **30-27-0260** FOOTSWITCH PUSH PIN
1 each **30-51-0294** FOOTSWITCH SPRING, SMALL

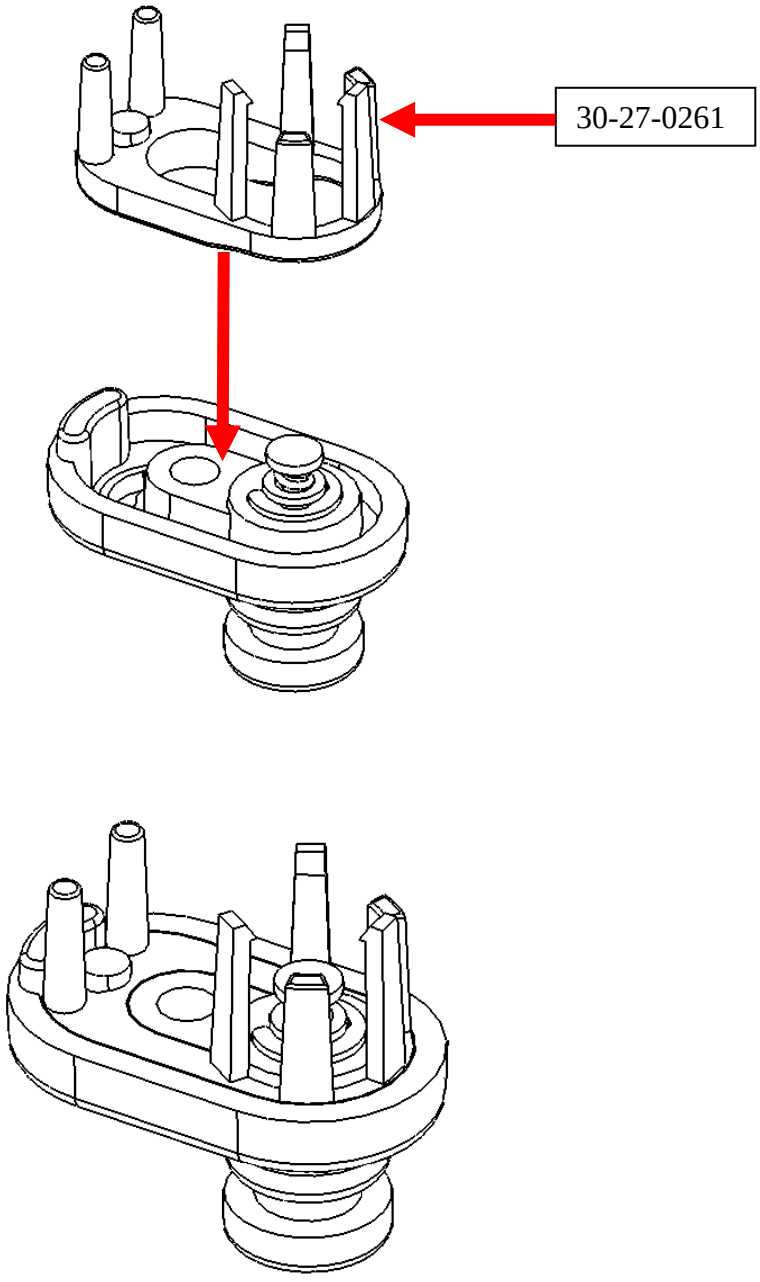
Insert the FOOTSWITCH PUSH PIN and the FOOTSWITCH SPRING, SMALL into the FOOTSWITCH PLUNGER.



STEP 4

P/N required:
1 each **30-27-0261** FOOTSWITCH LIGHT PIPE

Insert the FOOTSWITCH LIGHT PIPE into the FOOTSWITCH BASE.



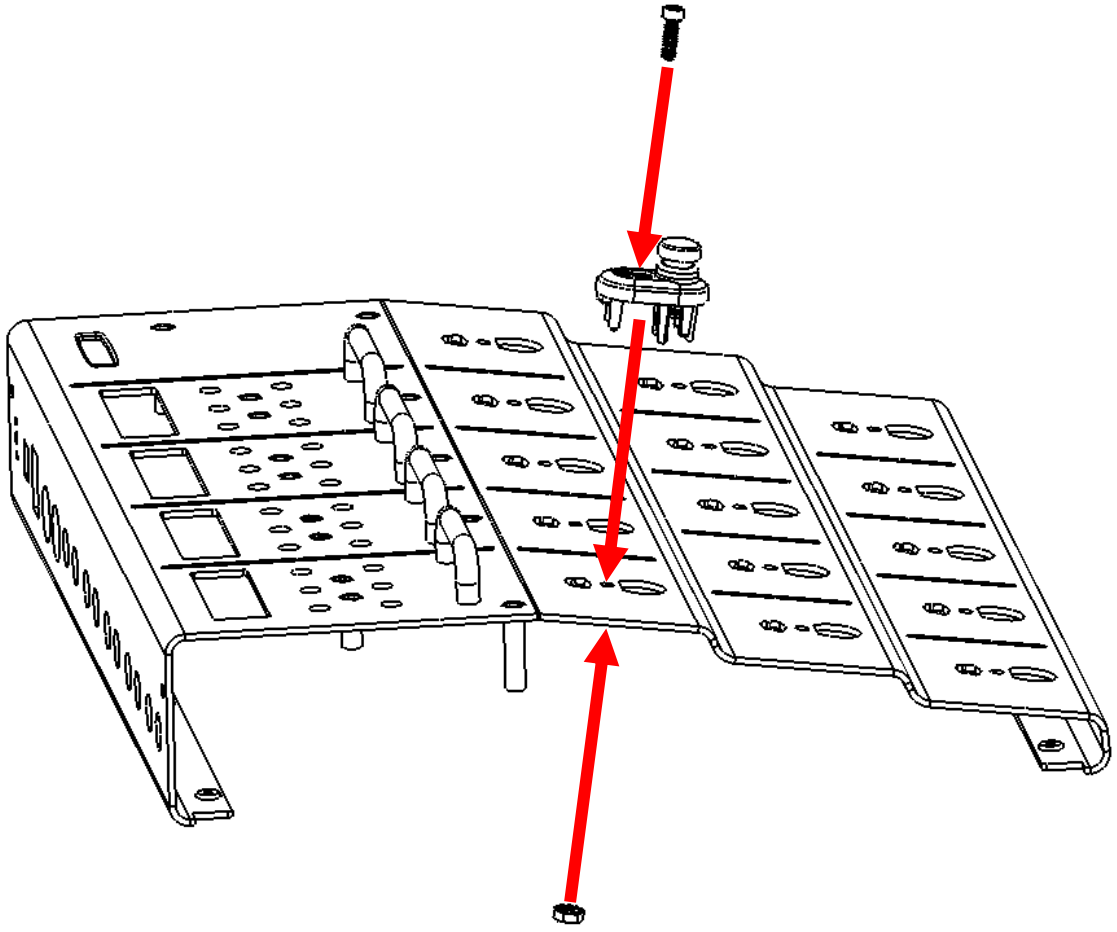
REPEAT THE PREVIOUS 3 STEPS TO CREATE 15 SUBASSEMBLIES.

STEP 5

P/N required:
15 each **30-06-0623** NUT 6-32 WITH STAR WASHER
15 each **30-00-0405** SCREW 6-32 x ½" NICKEL PLATED

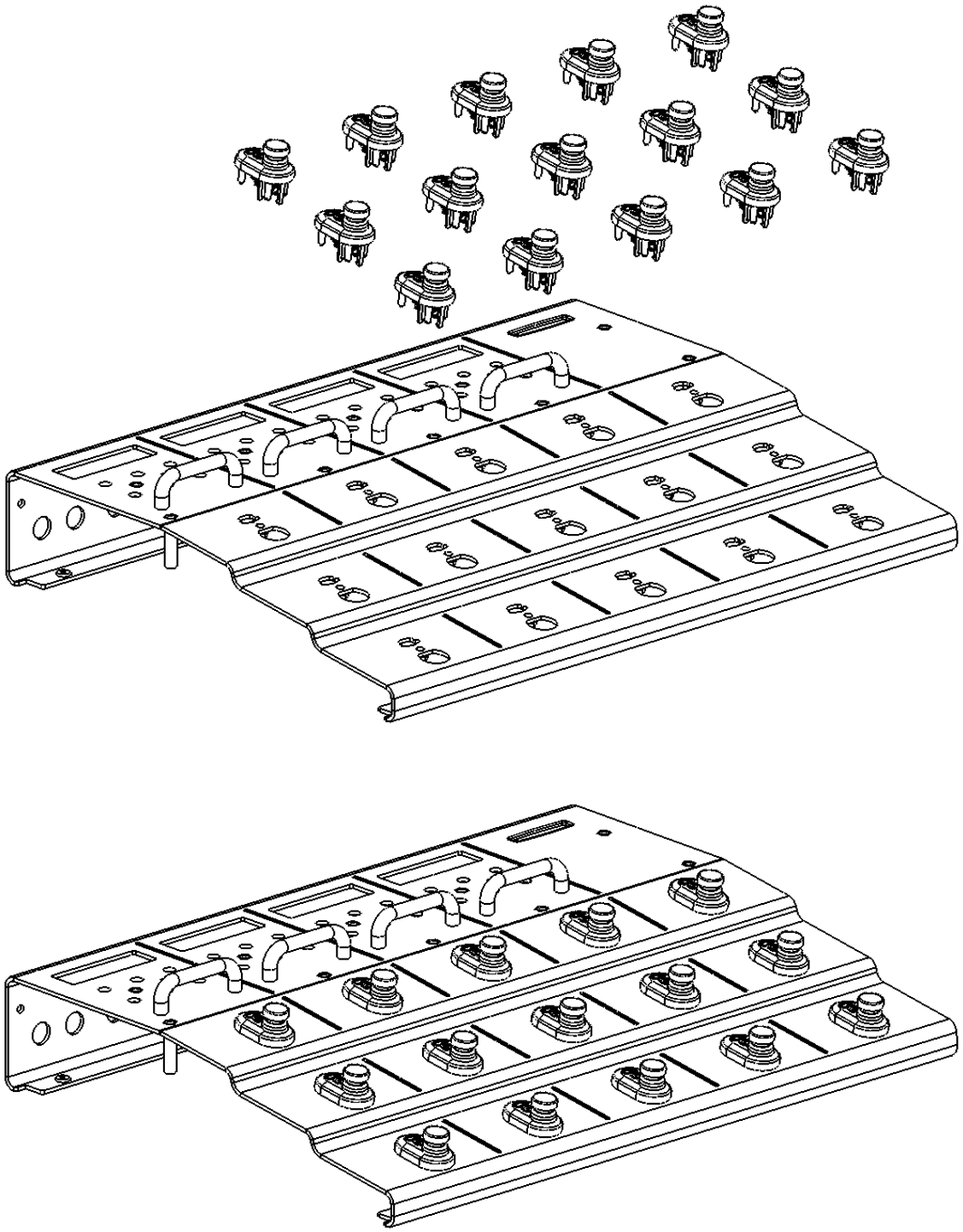
Install one footswitch subassembly into each of the 15 locations on the CHASSIS TOP. Secure with one SCREW 6-32 x ½" NICKEL PLATED and NUT 6-32 WITH STAR WASHER.

Torque the NUT 6-32 WITH STAR WASHER to 8 – 10 inch-pounds.



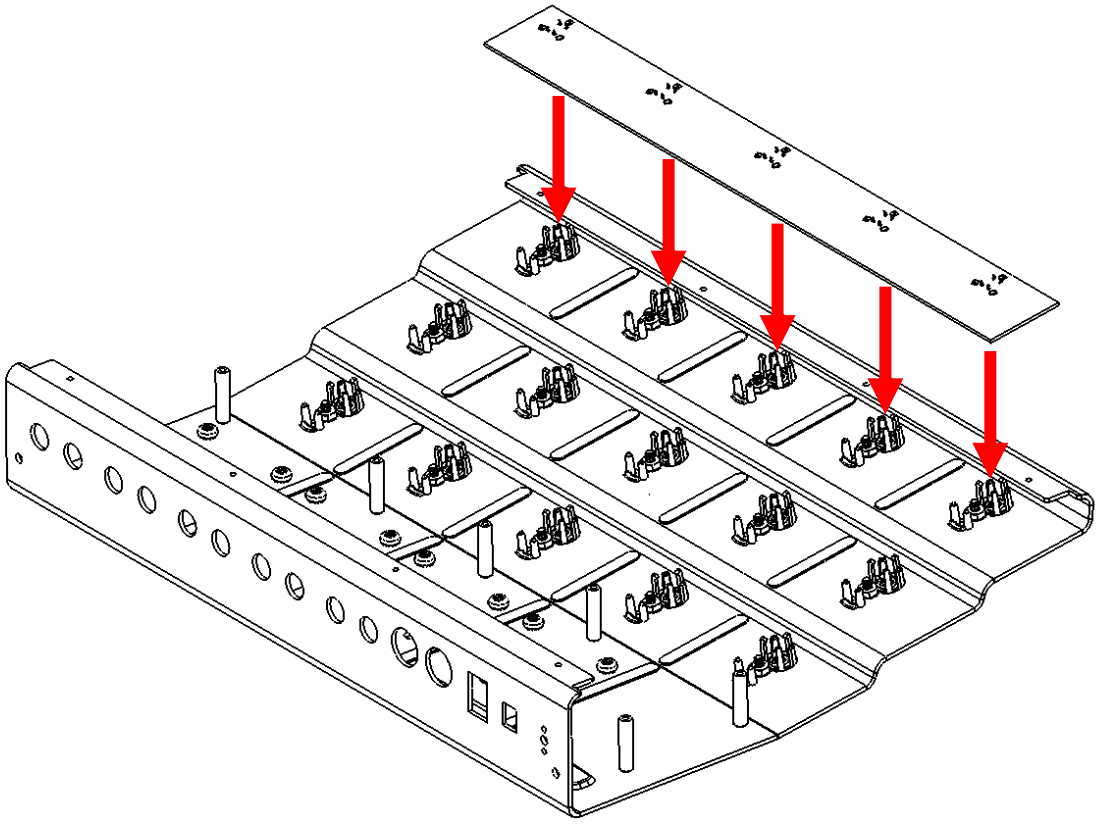
(Step 5 is continued on the next page.)

STEP 5 (continued)



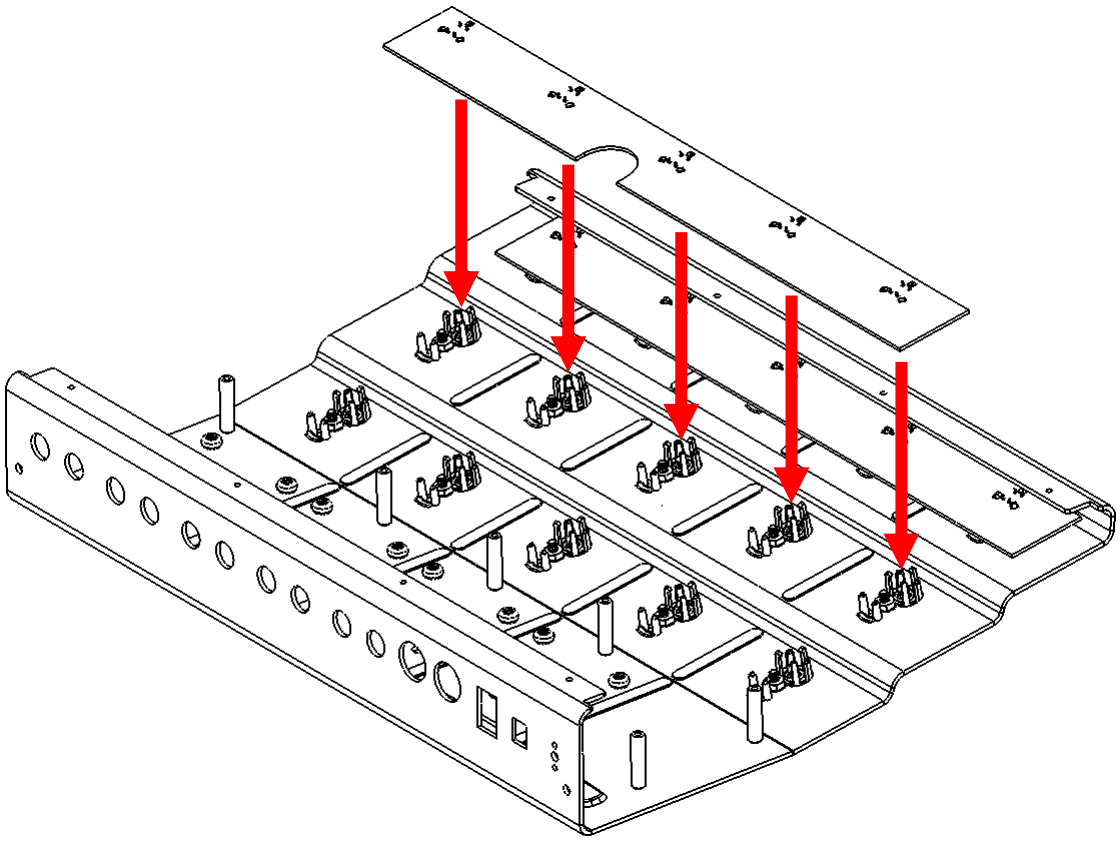
STEP 6

P/N required:
1 each **50-02-0262-2** PCBA FOOTSWITCH LOWER



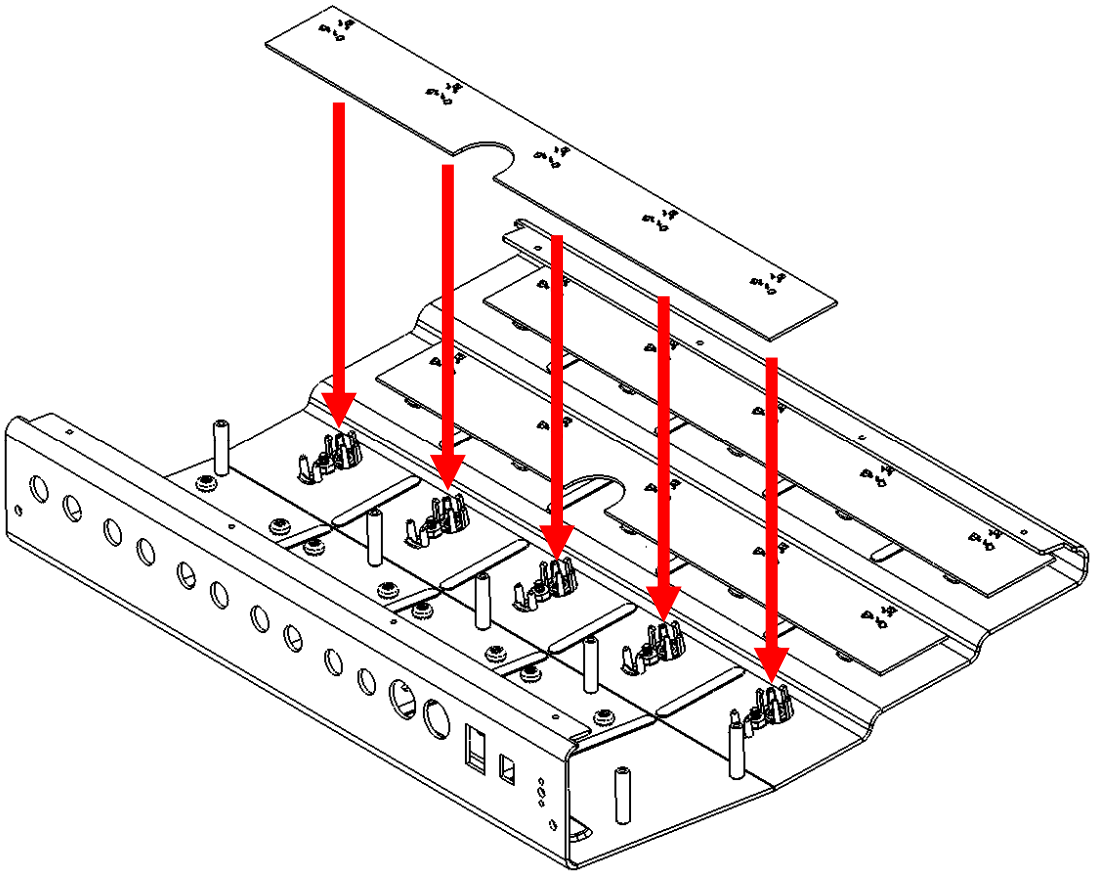
STEP 7

P/N required:
1 each **50-02-0262-1** PCBA FOOTSWITCH MIDDLE



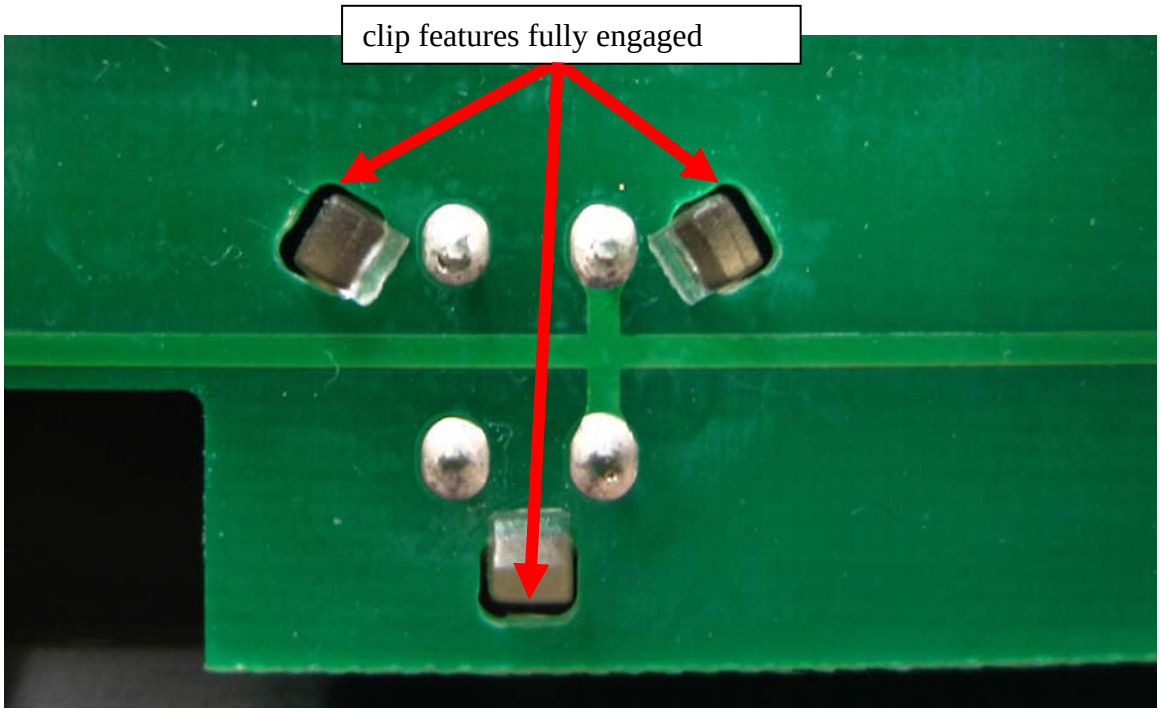
STEP 8

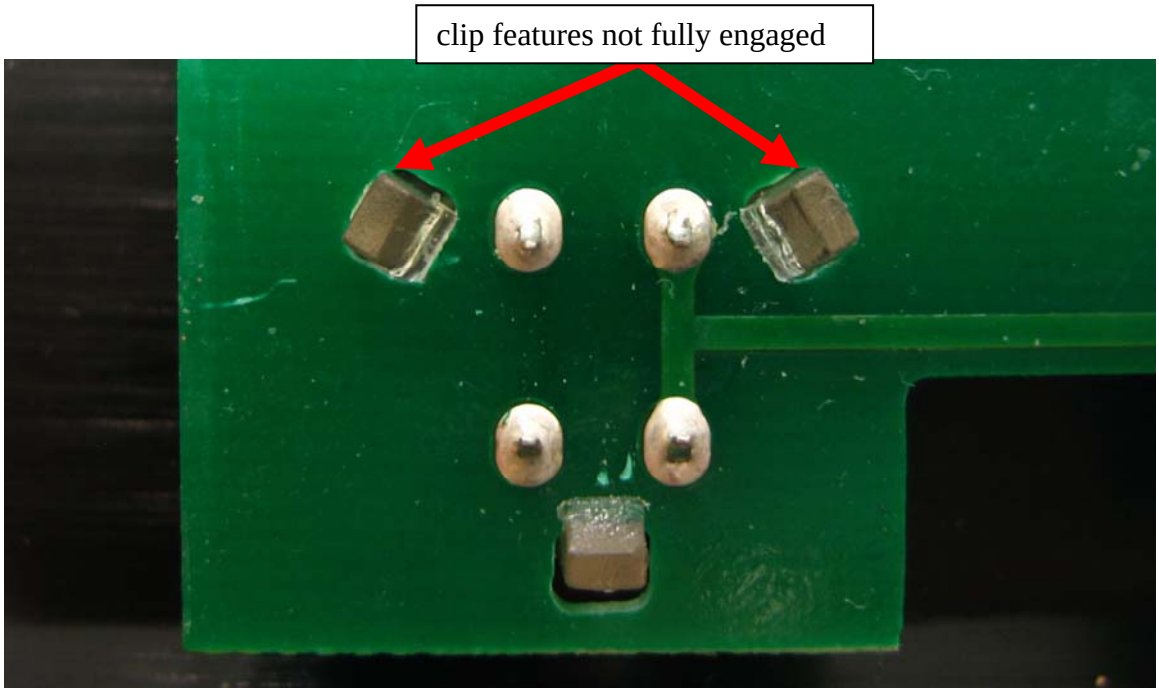
P/N required:
1 each **50-02-0262** PCBA FOOTSWITCH UPPER



STEP 9

Verify that the clip features on the FOOTSWITCH LIGHTPIPES are fully engaged.

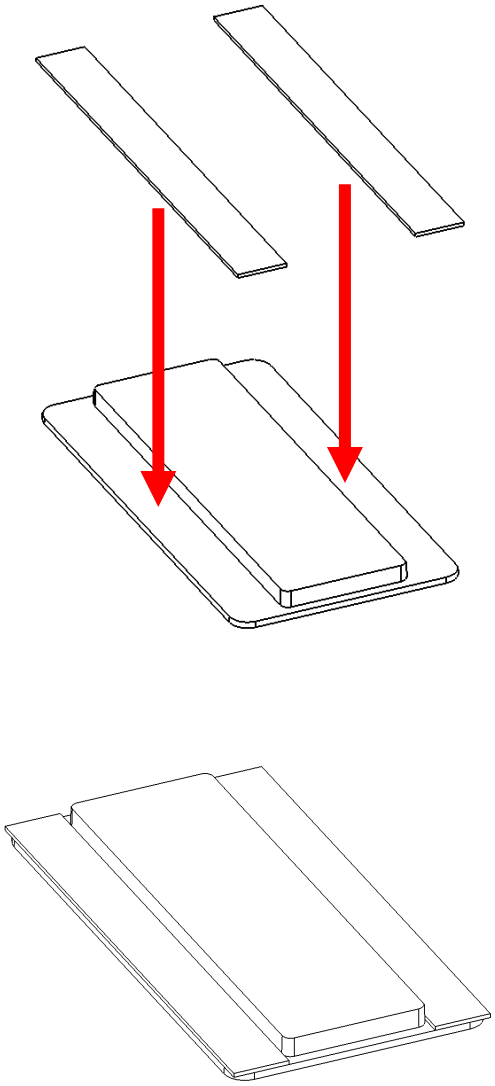




STEP 10

P/N required:
4 each **30-27-0294** LCD BEZEL
8 each **30-65-0024** LCD BEZEL ADHESIVE

Remove the protective backing from one side of the LCD BEZEL ADHESIVE, and apply two pieces of LCD BEZEL ADHESIVE to the LCD BEZEL as shown.

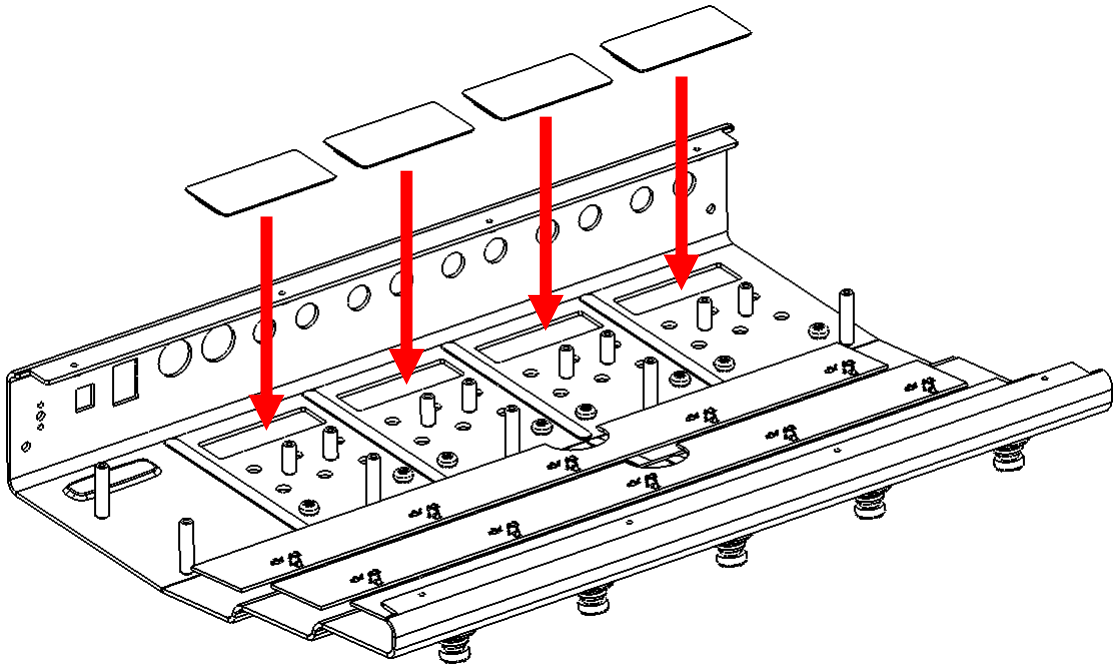


REPEAT THIS STEP TO CREATE 4 SUBASSEMBLIES.

STEP 11

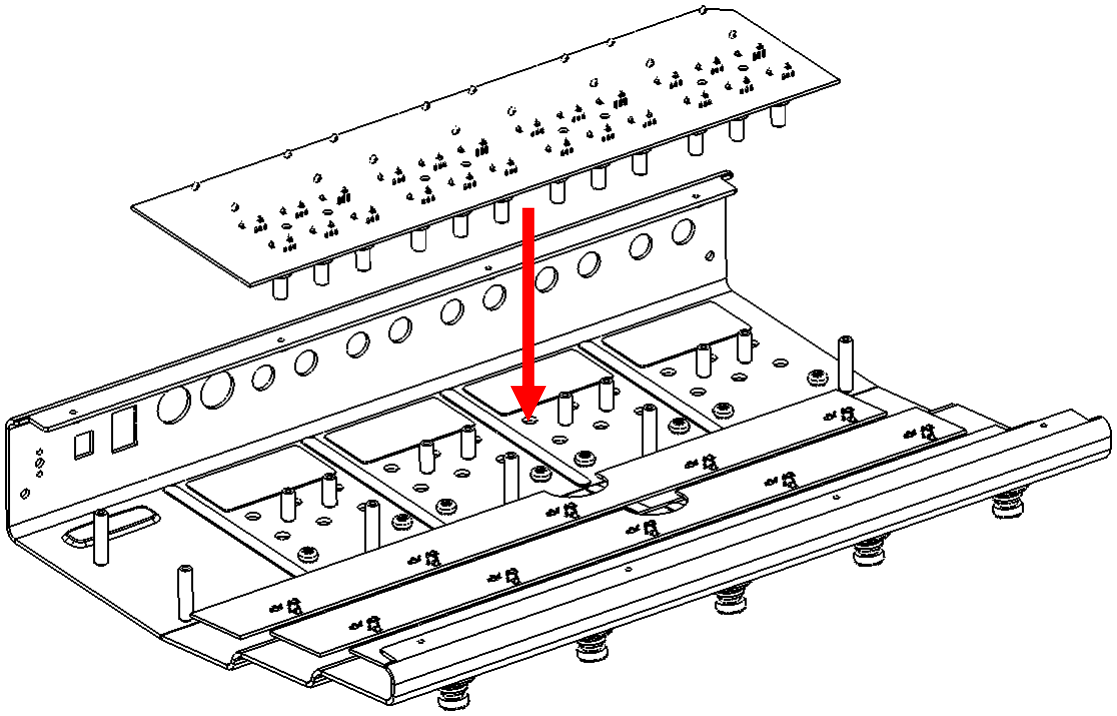
P/N required:
4 each **30-27-0294** LCB BEZEL (from previous step)

Remove the protective backing from the other side of each LCD BEZEL ADHESIVE, and install the LCD BEZELS in the CHASSIS TOP as shown.



STEP 12

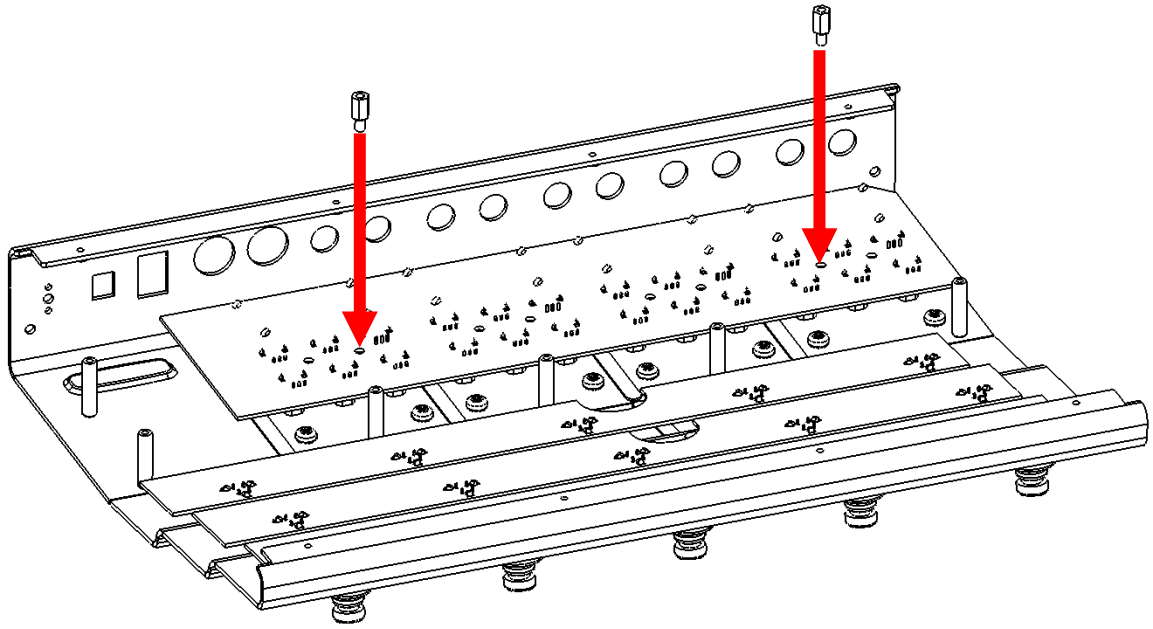
P/N required:
1 each **50-02-0261** PCBA UI F7-1



STEP 13

P/N required:
2 each **30-12-0010** HEX STANDOFF 6-32 x 3/8” M-F

Torque the HEX STANDOFF to 7 - 8 inch-pounds.

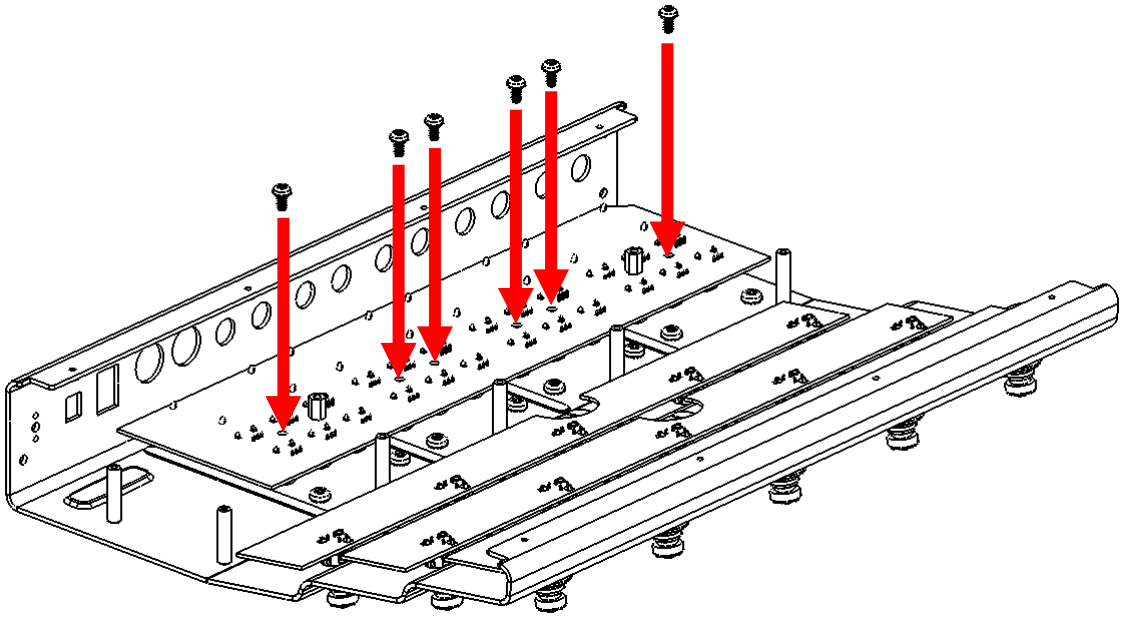


STEP 14

P/N required:
6 each **30-00-0043** SCREW 6-32 x 5/16” WITH STAR WASHER

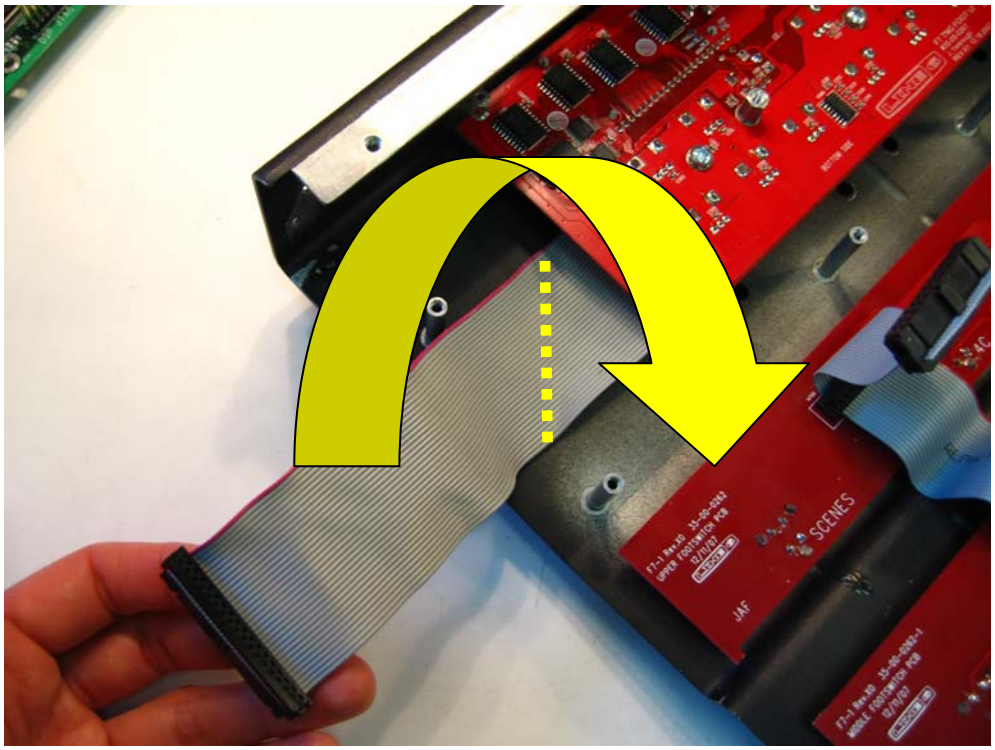
Torque the SCREWS to 8 – 10 inch-pounds.

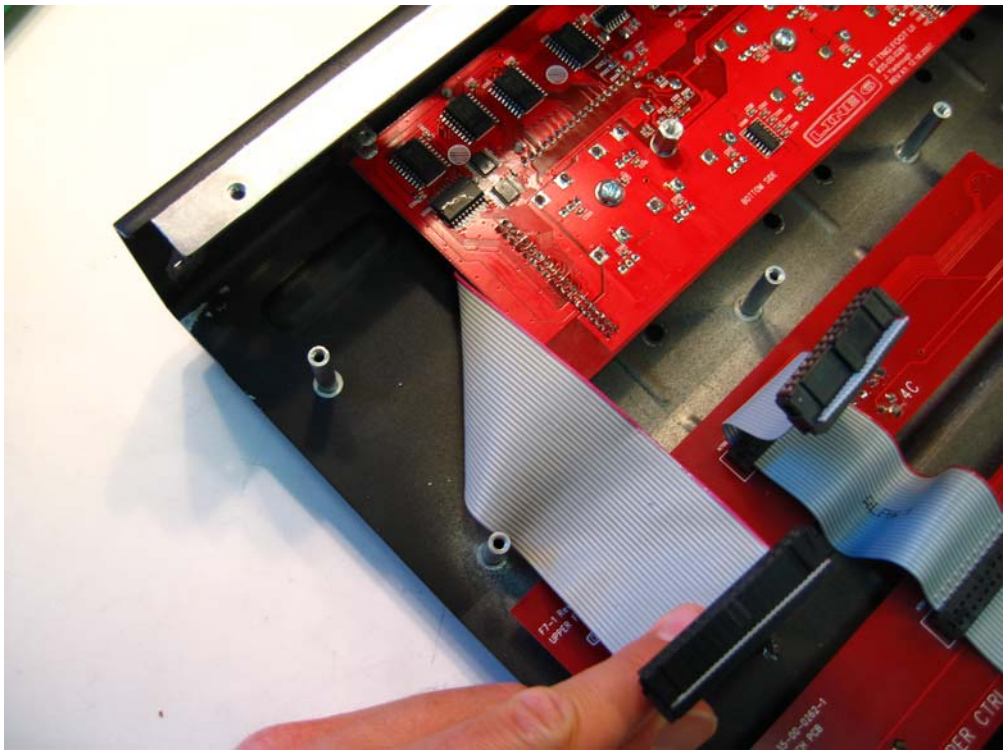
Fold the ribbon cable as shown.



(Step 14 is continued on the next page.)

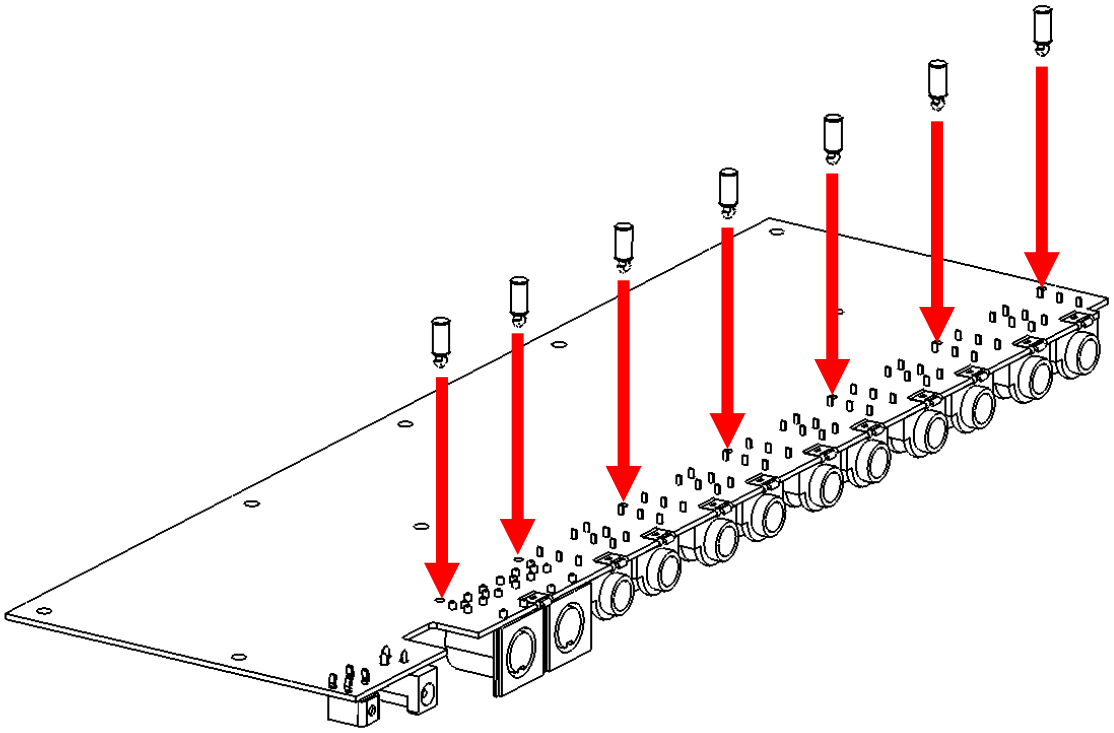
STEP 14 (continued)





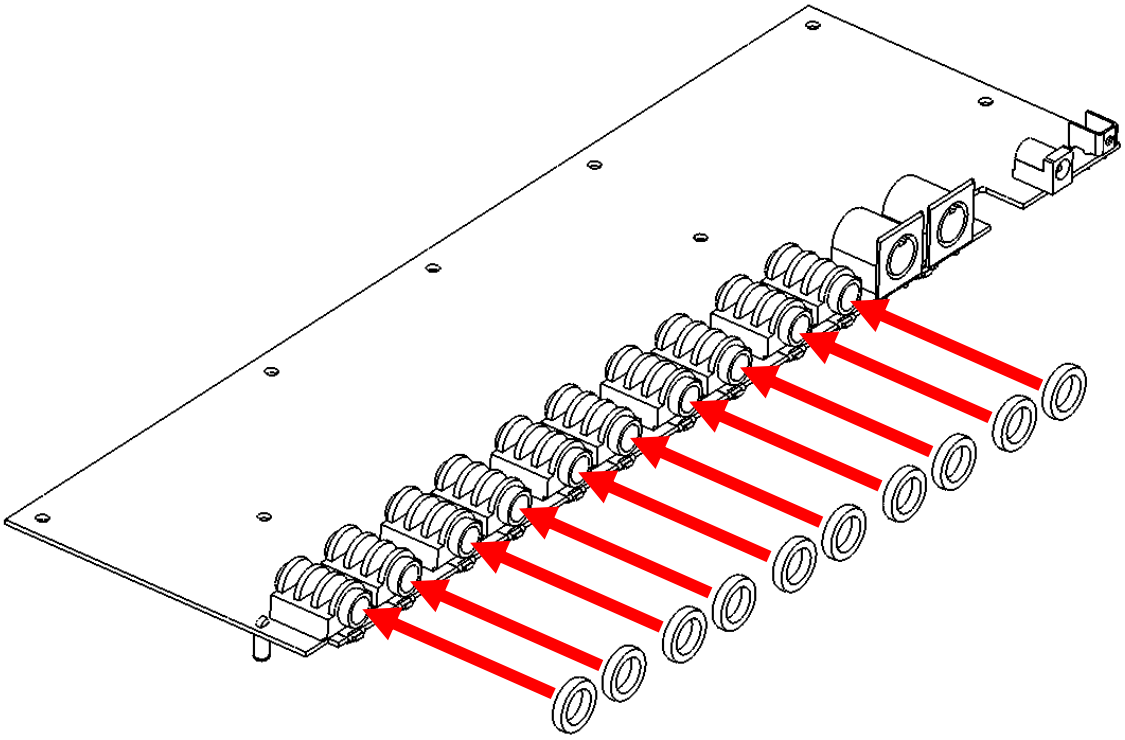
STEP 15

P/N required:
7 each **30-27-0295** PUSH SPACER PCBA
1 each **50-02-0260** PCBA MAIN F7-1

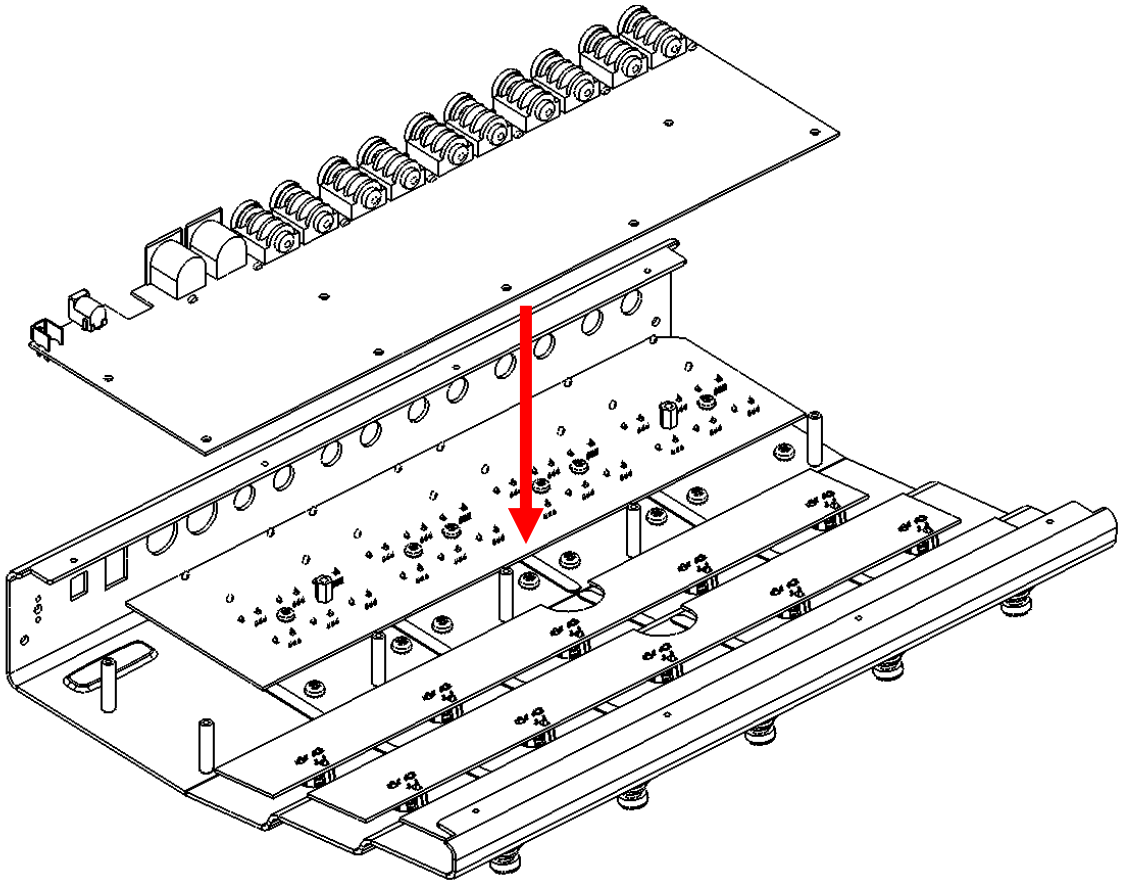


STEP 16

P/N required:
10 each **30-15-0043** 1/4” JACK SPACER



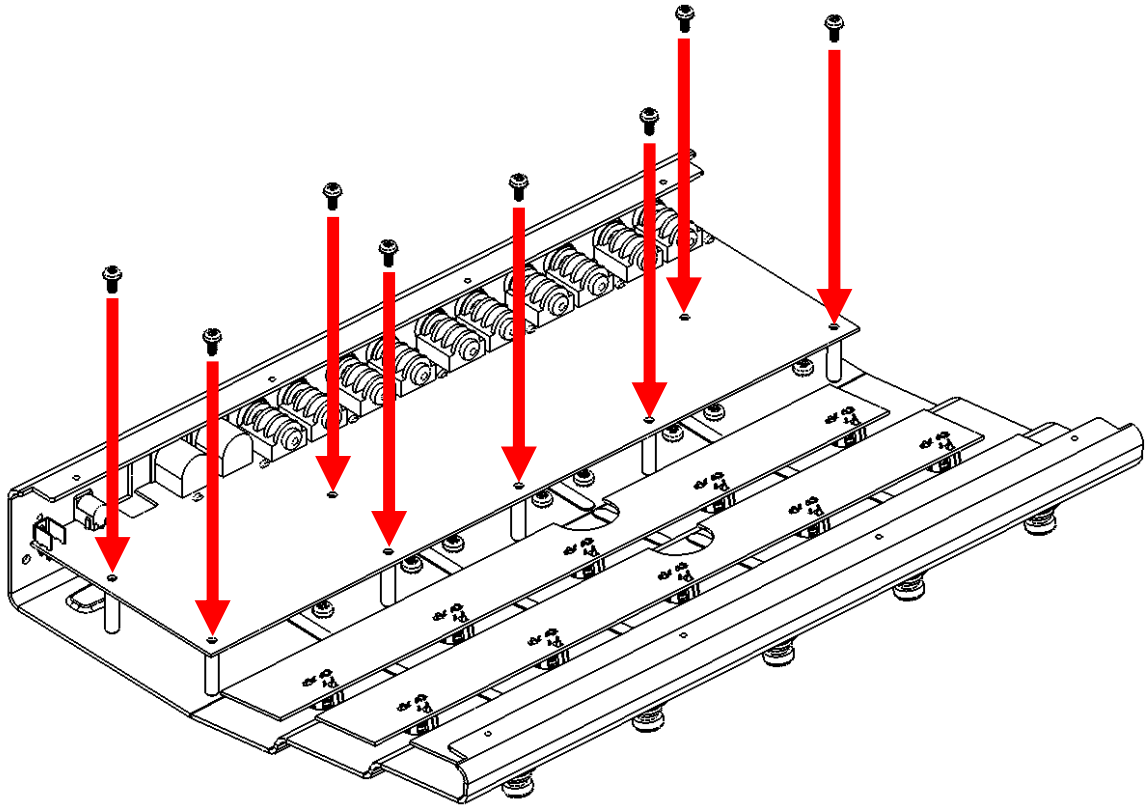
STEP 17



STEP 18

P/N required:
8 each **30-00-0043** SCREW 6-32 x 5/16” WITH STAR WASHER

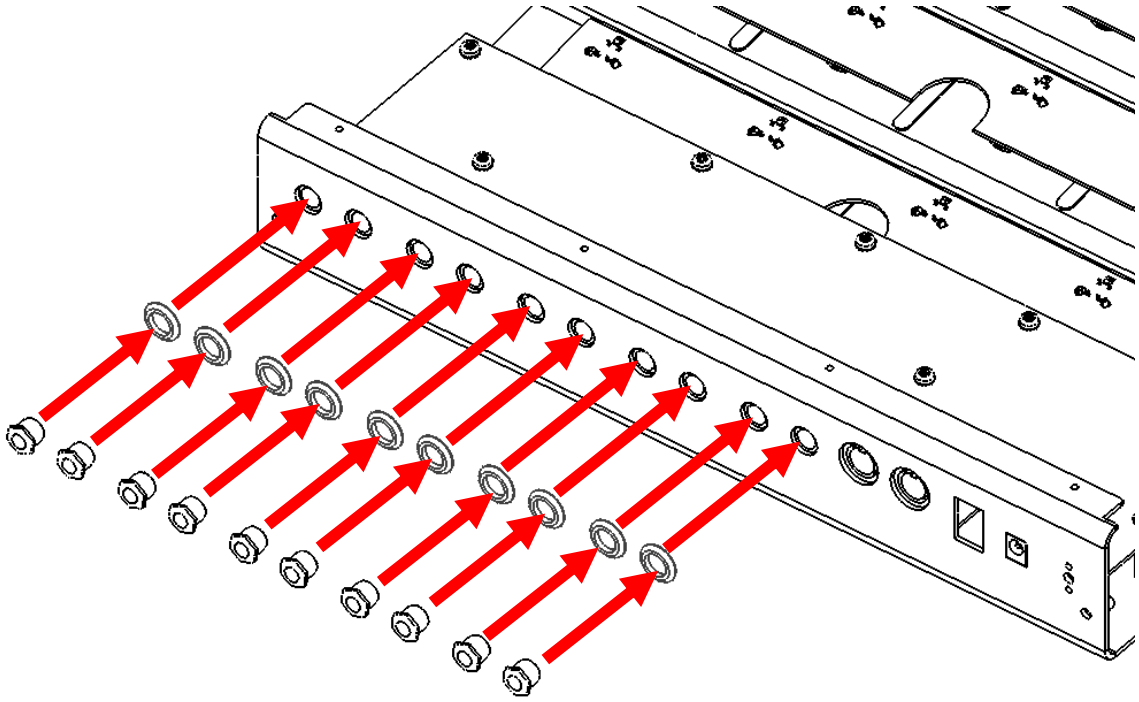
Torque the SCREWS to 8 – 10 inch-pounds.



STEP 19

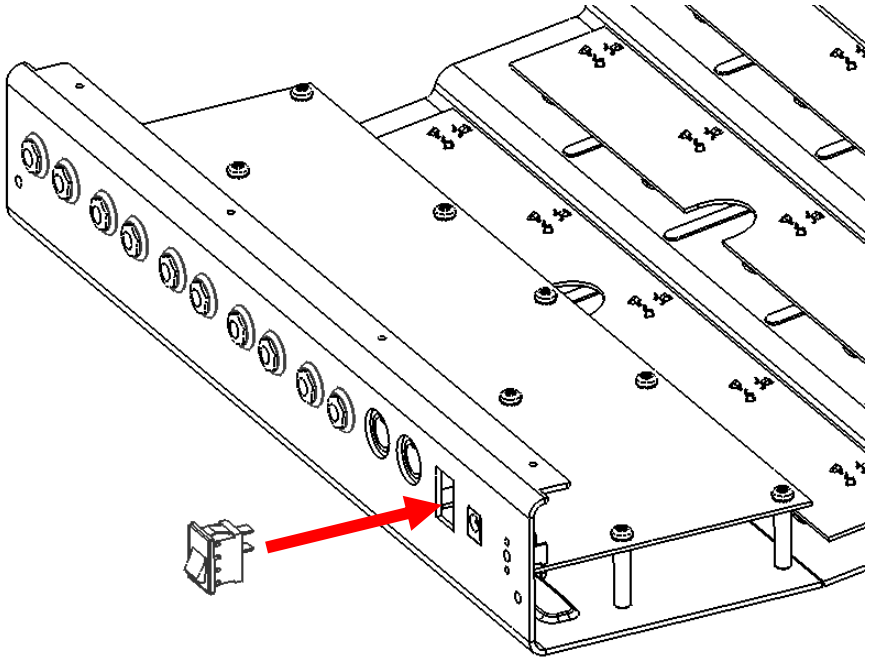
Torque the ¼" jack nuts to 5 - 6 inch-pounds.

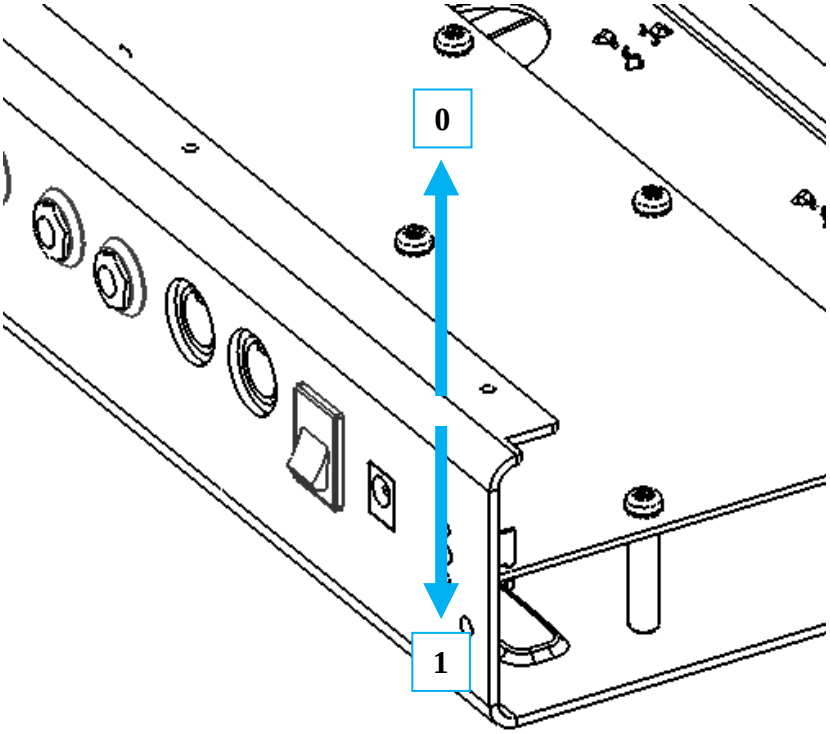
The ¼" jack nuts and washers are included with the ¼" jacks installed on **50-02-0260** PCBA MAIN F7-1.



STEP 20

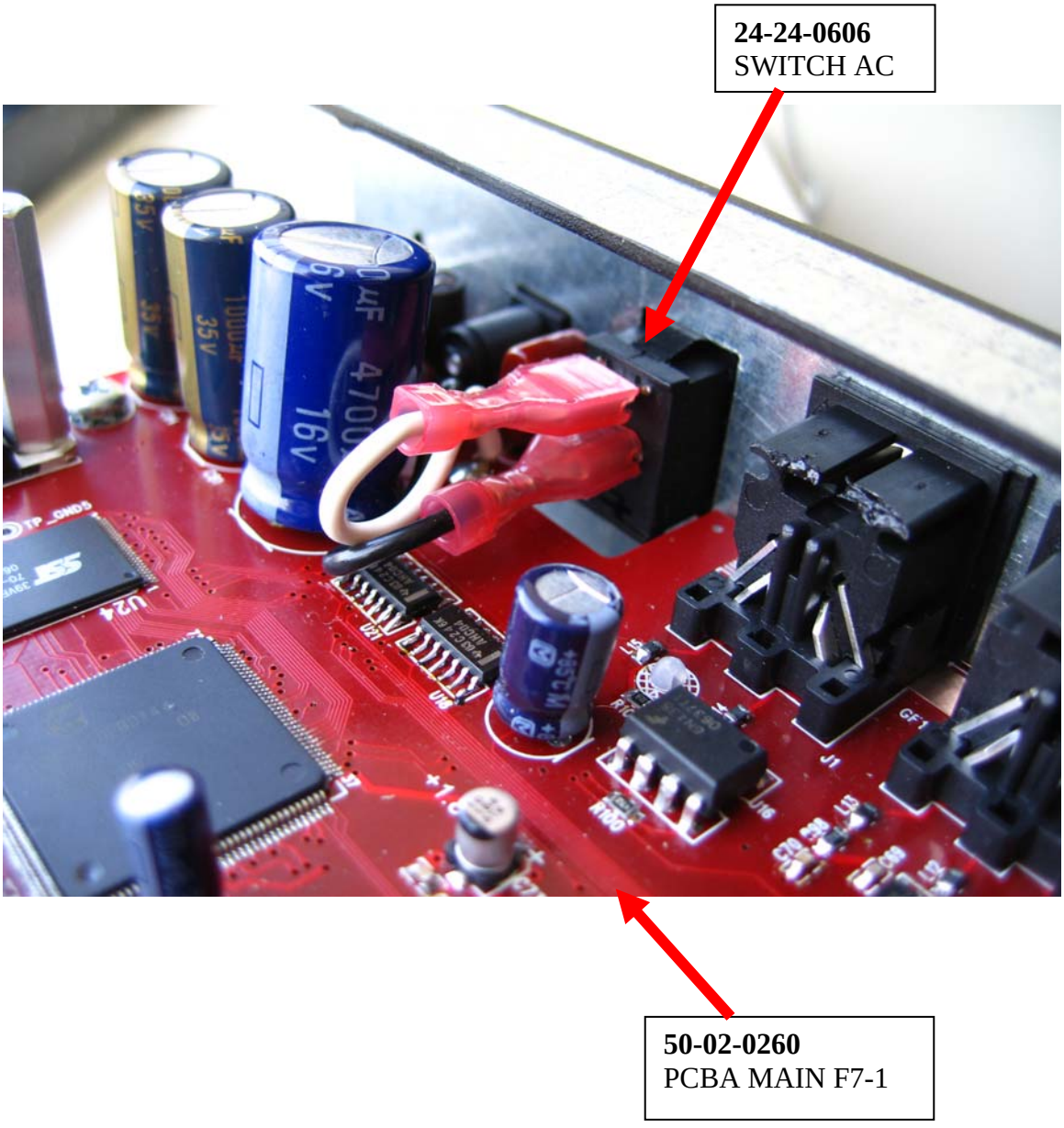
P/N required:
1 each **24-24-0606** SWITCH AC





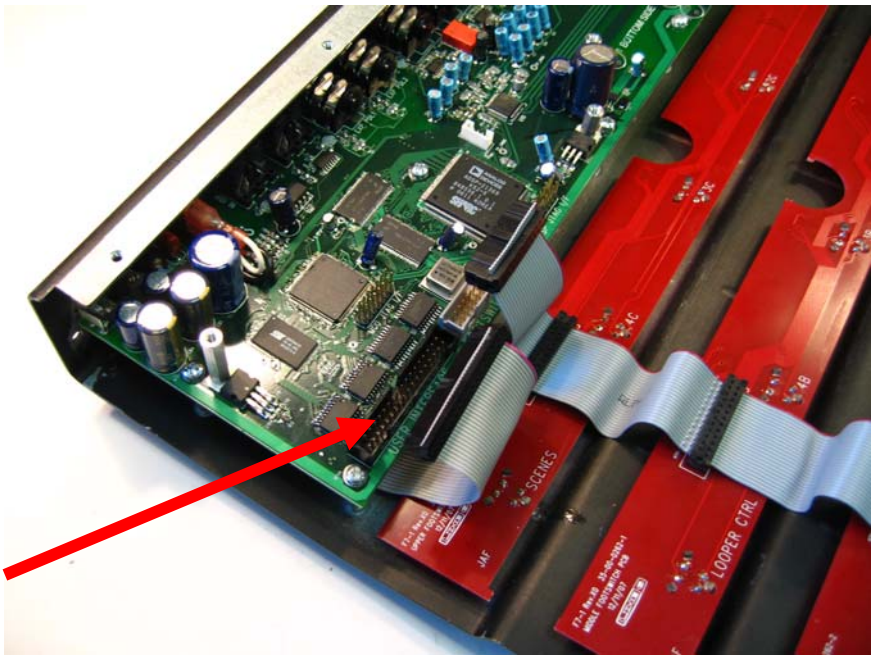
STEP 21

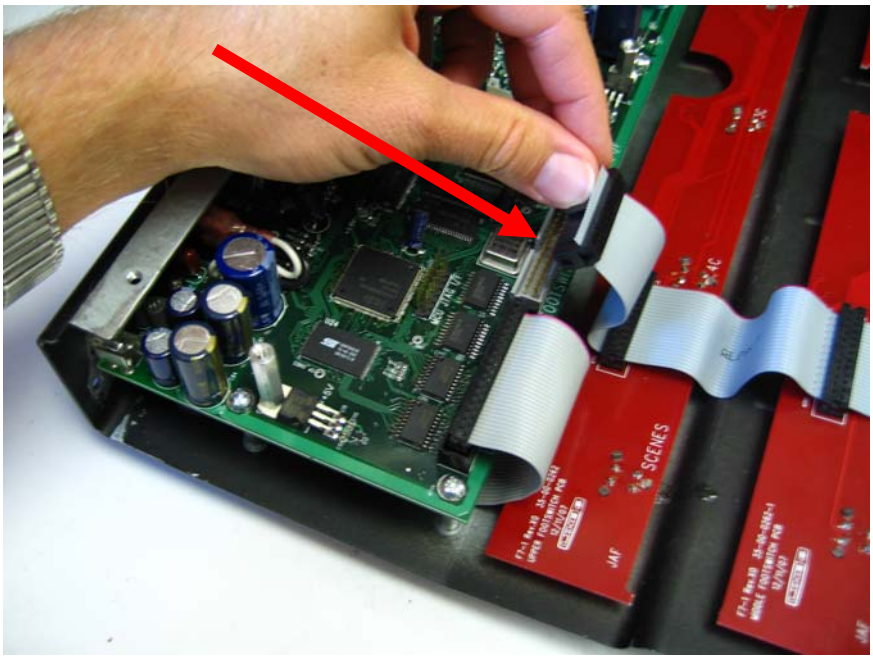
Connect the cables from **50-02-0260** PCBA MAIN F7-1 to **24-24-0606** SWITCH AC as shown.



STEP 22

Connect the ribbon cables from the PCBA UI F7-1 and the PCBA FOOTSWITCH UPPER to the headers on the PCBA MAIN F7-1.

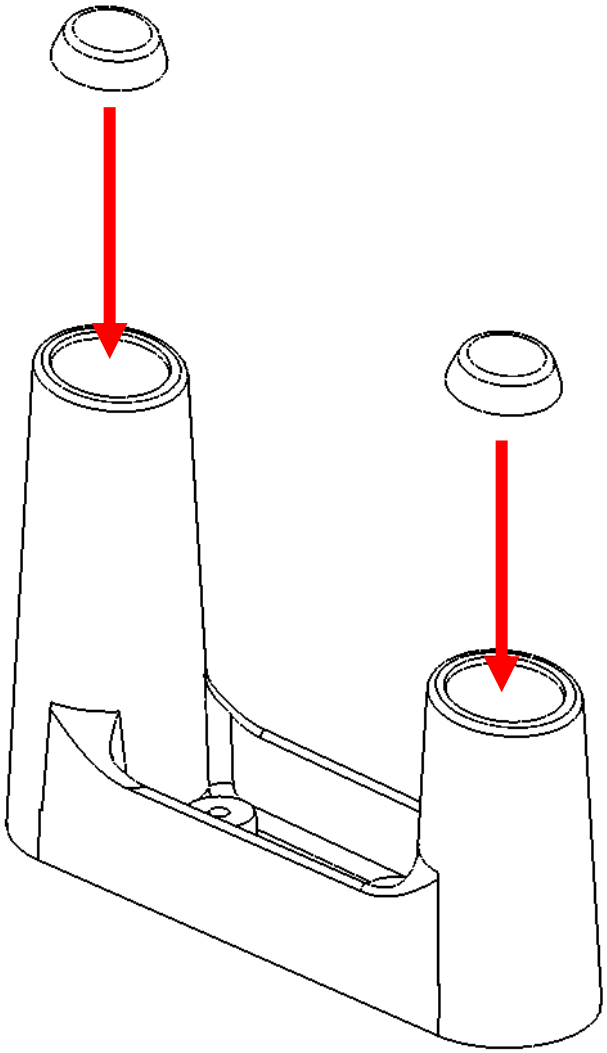




STEP 23

P/N required:
2 each **30-75-0024** RUBBER BUMPER WITH ADHESIVE
1 each **30-27-0293** CHASSIS SUPPORT

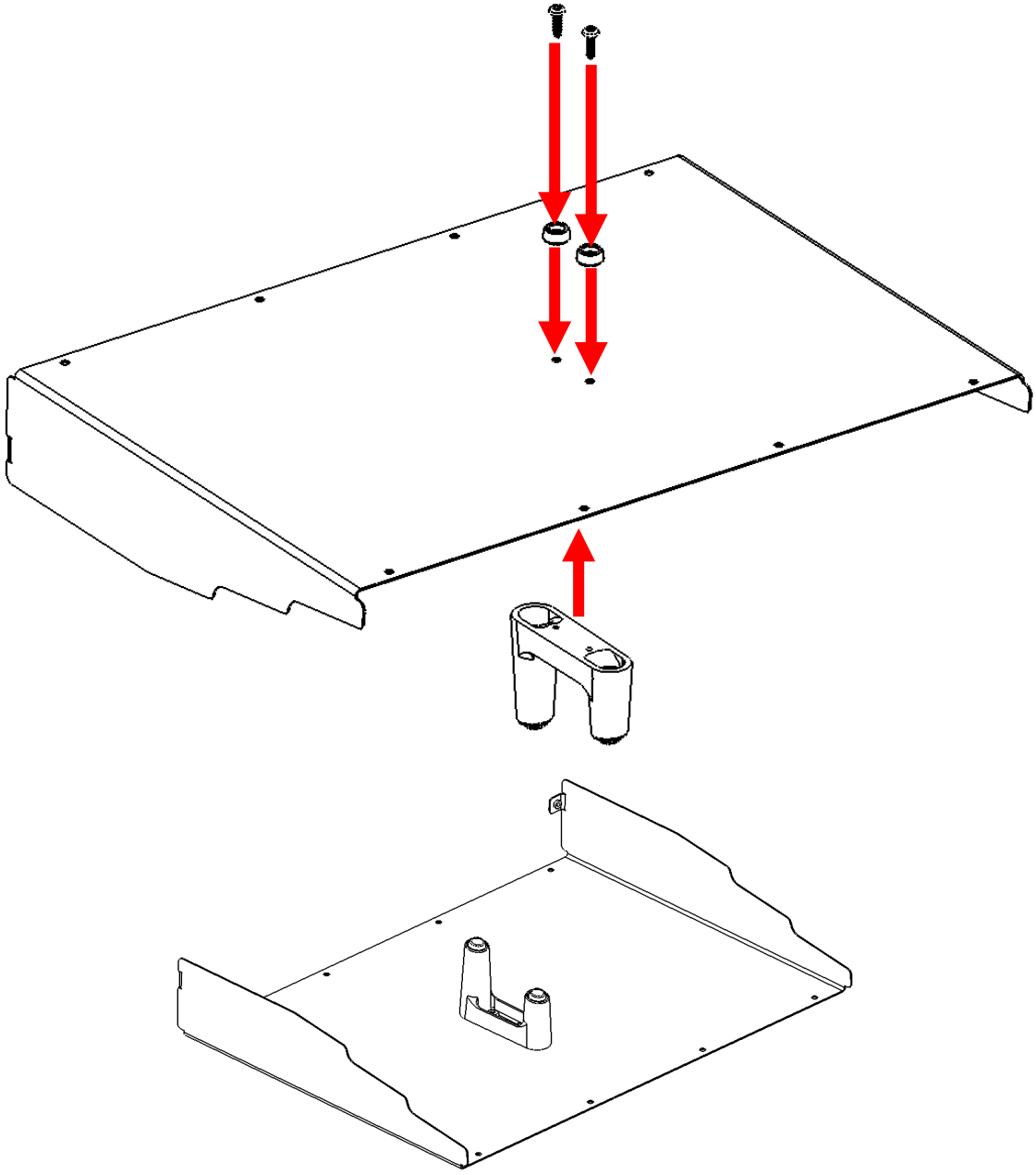
Remove the backing from two RUBBER BUMPERS WITH ADHESIVE, and apply the RUBBER BUMPERS WITH ADHESIVE in the circular recesses on the CHASSIS SUPPORT.



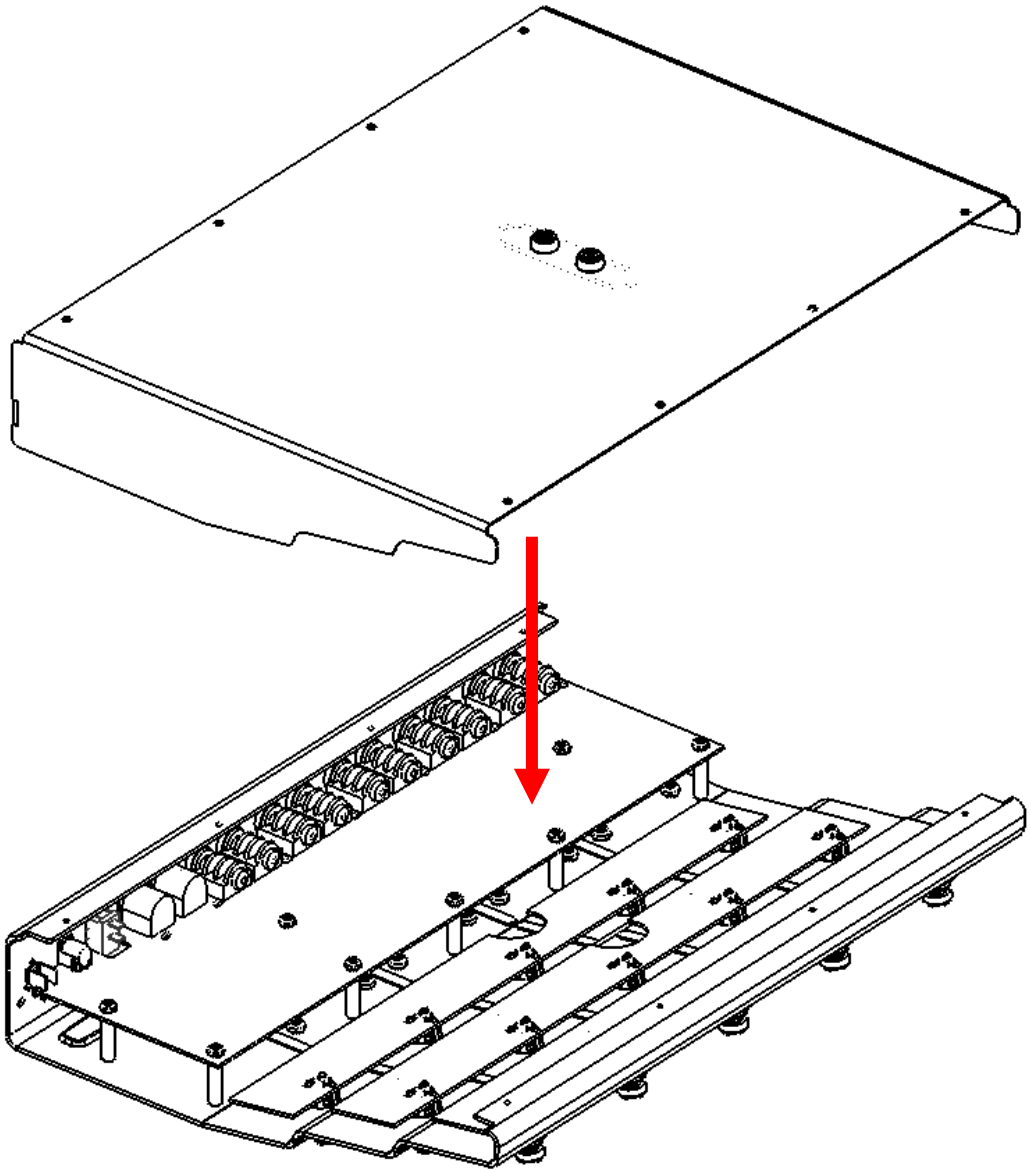
STEP 24

P/N required:
2 each **30-00-0063** SCREW 6-20 x ½”
2 each **30-48-5012** RUBBER BUMPER WITH WASHER
1 each **30-51-0322** CHASSIS BOTTOM

Tighten the SCREWS until they are fully seated on the RUBBER BUMPERS.



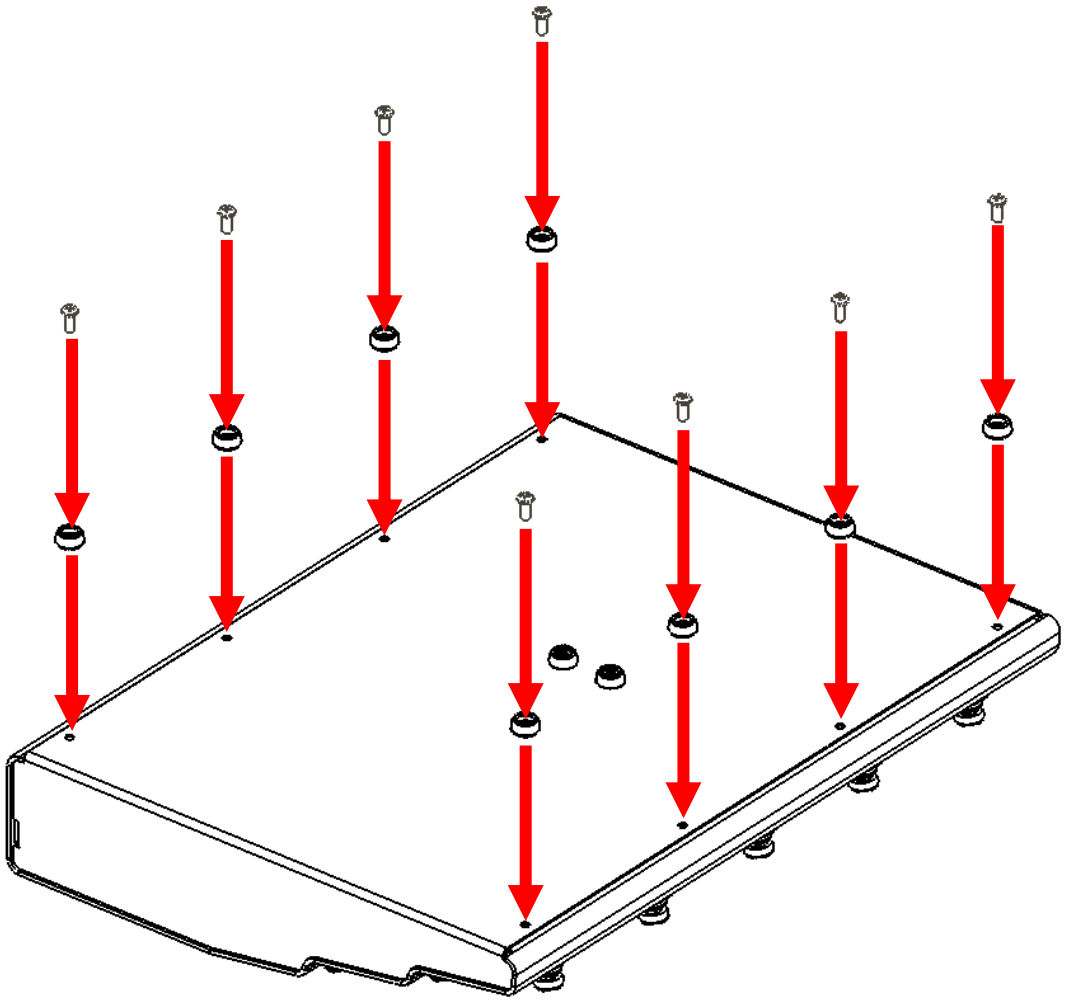
STEP 25



STEP 26

P/N required:
8 each **30-00-0375** SCREW 6-32 x .375”
8 each **30-48-5012** RUBBER BUMPER WITH WASHER

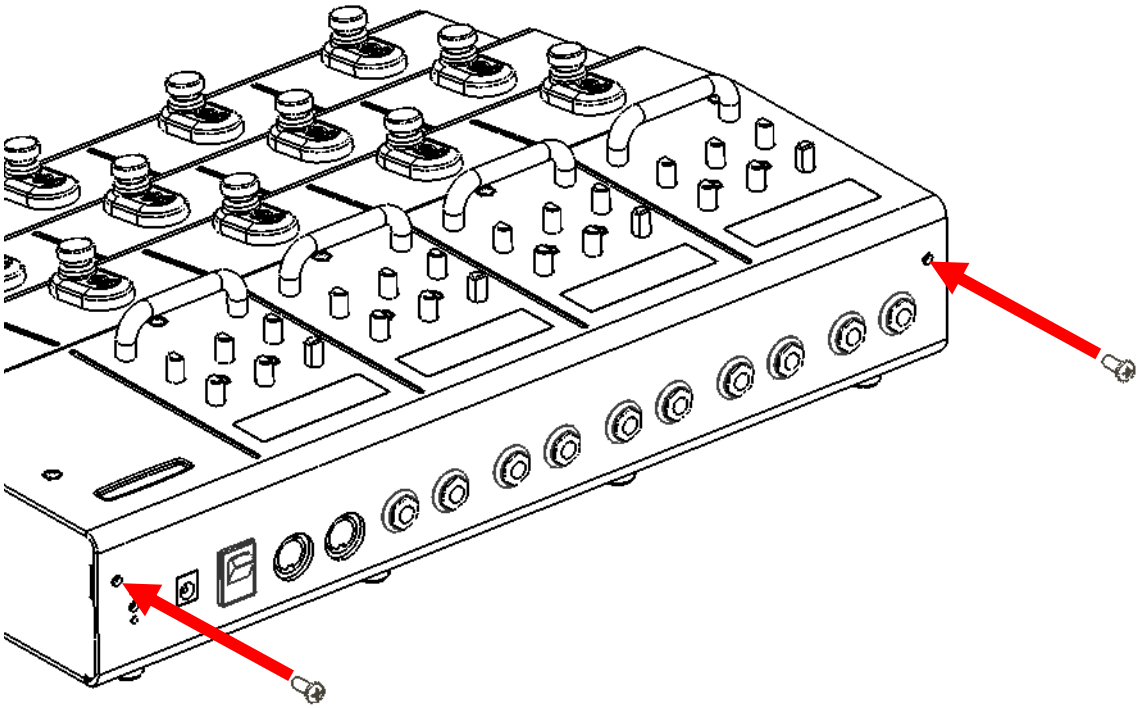
Torque the SCREWS to 2 - 3 inch-pounds.



STEP 27

P/N required:
2 each **30-00-0375** SCREW 6-32 x .375”

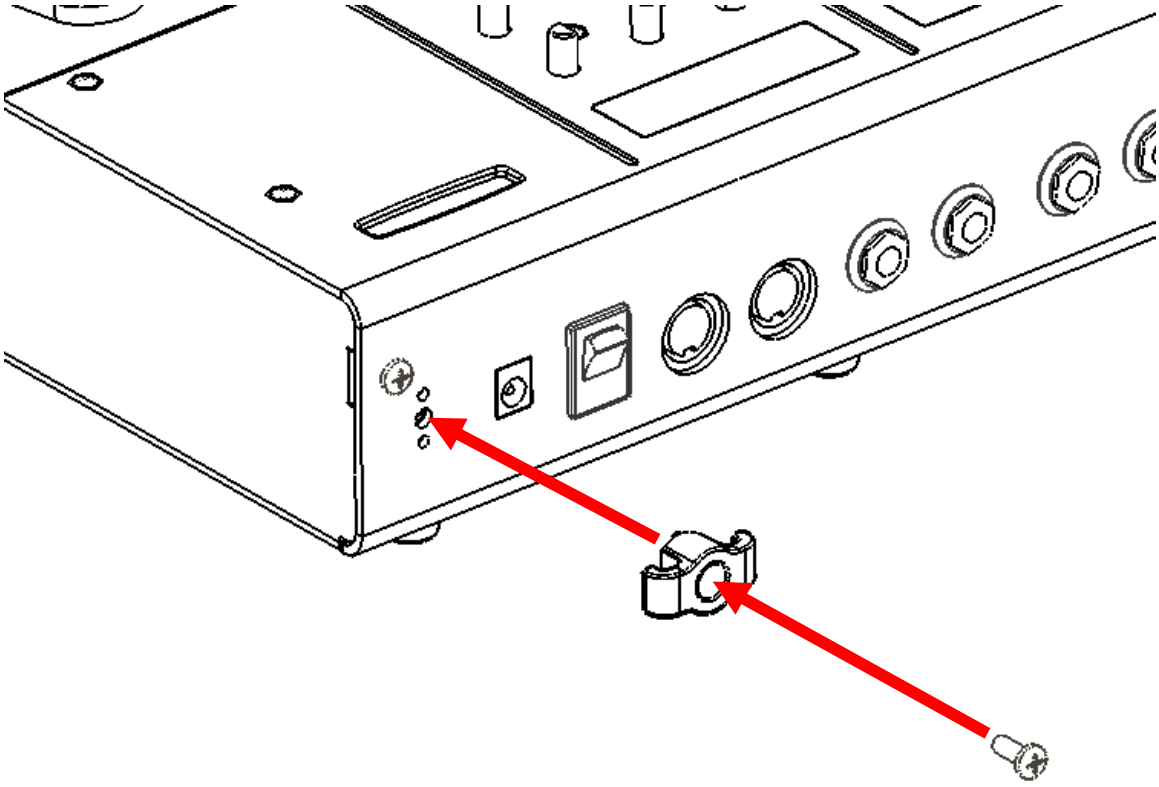
Torque the SCREWS to 8 – 10 inch-pounds.



STEP 28

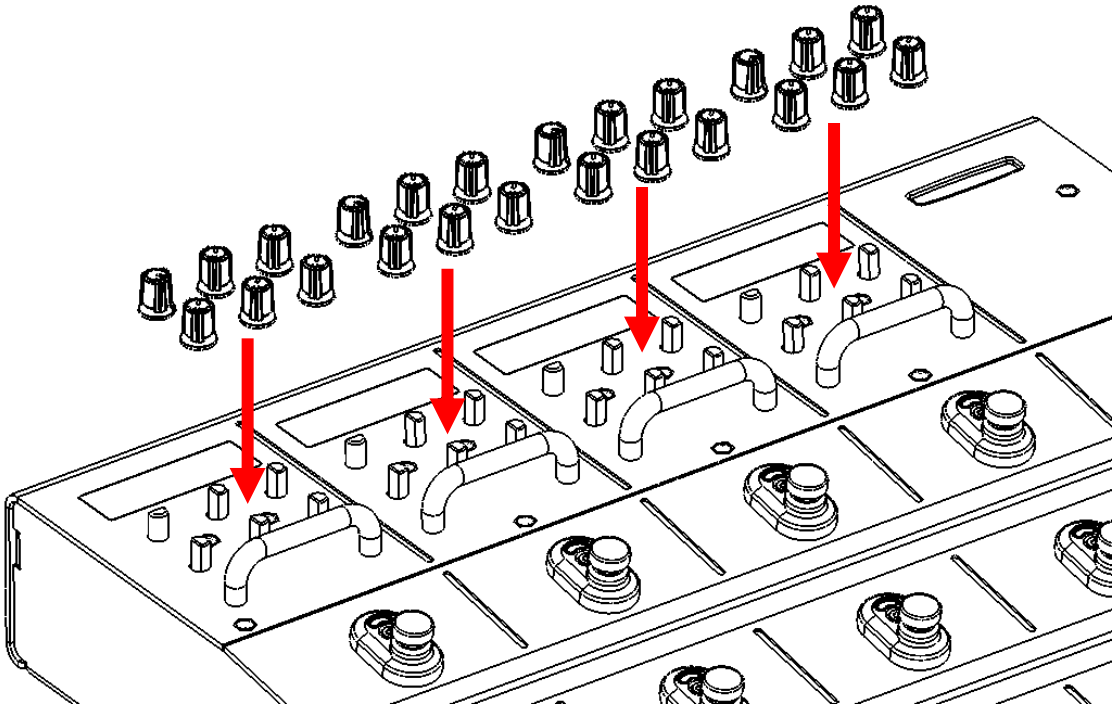
P/N required:
1 each **30-27-0304** CABLE STRAIN RELIEF
1 each **30-00-0375** SCREW 6-32 x .375”

Torque the SCREW to 8 – 10 inch-pounds.



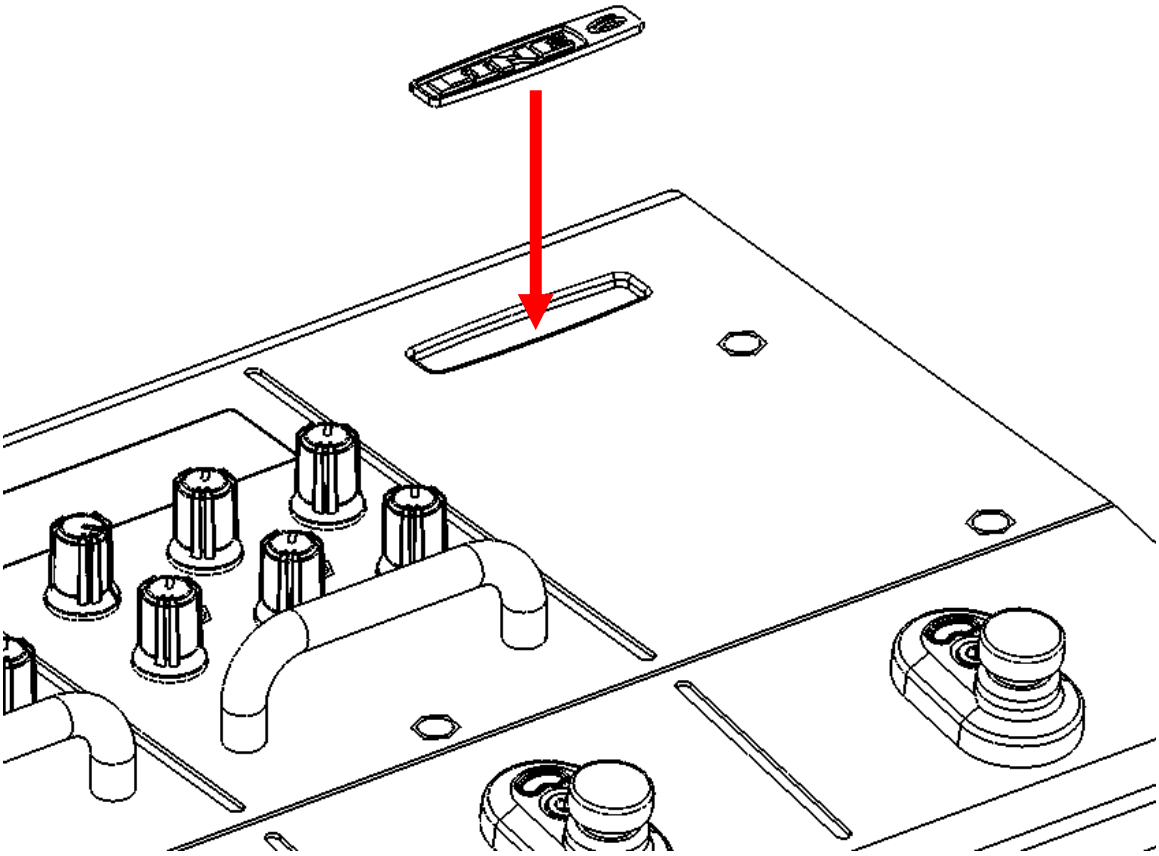
STEP 29

P/N required:
24 each **30-27-0095** KNOB SMALL



STEP 30

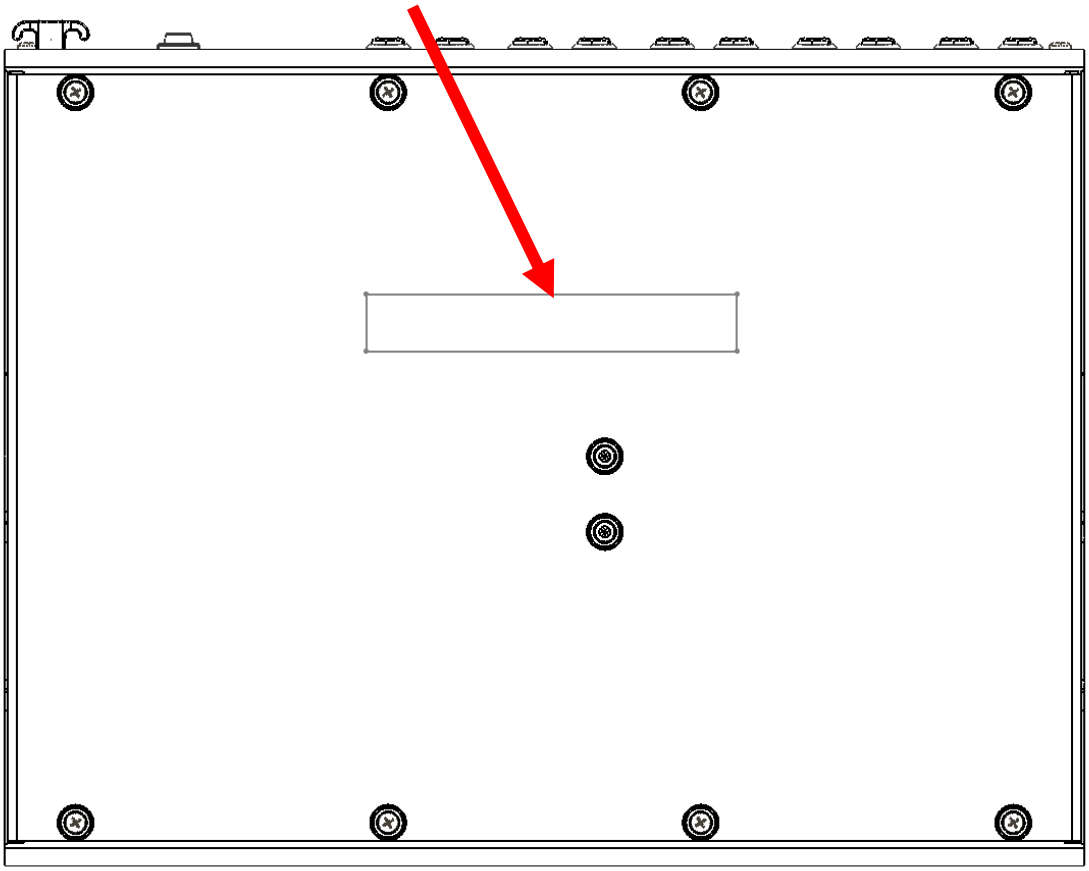
P/N required:
1 each **30-60-0006** LINE 6 LOGO WITH ADHESIVE



STEP 31

P/N required:
1 each **40-25-0101** LABEL BAR CODE SERIAL NUMBER

Apply the LABEL BAR CODE SERIAL NUMBER in the rectangle silkscreened on the CHASSIS BOTTOM. The text shall be readable in the orientation shown.



Text shall be readable in the orientation shown.

Assembly of the F7-1 Complete Unit is now complete.

Note: The "Final Unit Test Instructions" were designed for final Manufacturing tests. The following equipment is not required to perform the outboard test procedures.

M13 TNG FOOT F7-1
Final Unit Test Instructions

Rev B

DATE: 04.15.2008

UI Tests To Perform: Flash, SDRAM, Pots, Encoder, LCD, Backlights, Buttons, and LEDs.

Optional Tests To Perform: Jacks, and Pedals "Additional Equipment Required"

SUMMARY: The M13 TNG FOOT F7-1 Final Unit Test will perform User Interface and Audio tests using a test computer, LabVIEW, Delta1010 Audio Interface and a Final Test Fixture.

EQUIPMENT REQUIRED:

1 – TNG FOOT F7-1 COMPLETE UNIT
1 – (PX2) POWER SUPPLY (9VAC – 2000mA min) **w/right angle connector ONLY**
1 – Delta1010 Audio Interface
1 – Dedicated computer with LabVIEW Run-Time 8.0 or later installed
1 – Final Unit test fixture with attached cable harness
2 – Expression pedals

SET UP:

1. Connect **9VAC POWER** to TNG LIVE P11-1.

2. The display will indicate, **"Flash"** and list other tests underneath.

Figure 2

Figure 3a

Figure 3b

NOTE: Rotate the **Encoder** to move between the different tests. Press the **Encoder** to begin a test. If you need to rerun a test, scroll to the desired test and press the Encoder to rerun it.

Flash Test

3. If "**Flash**" is not highlighted on the menu screen, rotate the **Encoder** until the Flash test is highlighted. (See Figure 4)

Figure 4

4. **Press** the **Encoder** to begin the Flash test. (See Figure 5) For a moment the Menu screen will be gone and only "Flash" will appear on the screen until the test has completed. Next the menu will return, but the display will now have a "P" for pass or "F" for Fail on the screen next to the Flash test instead of a dash.

Figure 5

5. Flash test is complete. Reject the Unit if there is a failure 'F'.

SDRAM Test

6. **Rotate** the **Encoder** until the SDRAM test is highlighted. (See Figure 6)

Figure 6

7. **Press** the **Encoder** to begin the SDRAM test. For a moment the Menu screen will be gone and only "SDRAM" will appear on the screen until the test has completed. Next the menu will return, but the display will now have a "P" for pass or "F" for Fail on the screen next to the SDRAM test instead of a dash. (See Figure 7)

Figure 7

8. SDRAM test is complete. Reject the Unit if there is a failure 'F'.

Pots Test

9. **Rotate** the **Encoder** until the **Pots** test is highlighted.
10. **Press** the **Encoder** to begin the **Pots** test. The display on the left (1st) will look like Figure 8.

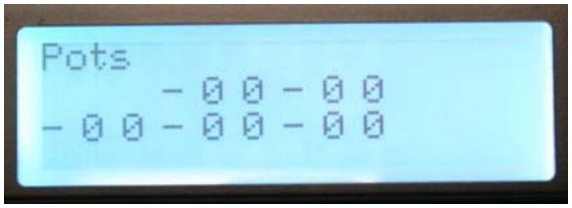


Figure 8

11. Under each display, **turn** each of the **5 Pots CCW** (Counter Clockwise) until rotation stops, (At this point a '**1**' should register on the display corresponding to the Pot being turned.) and then **CW** (Clockwise) until rotation stops. Now the "- 0 0's" should be changed to "1 1's" for each Pot. (See Figure 9) The display above each group of **Pots** after testing will display all '11's.

Figure 9

12. The display will go back to the main page and "**Pots P**" will be displayed, once all 4 groups of Pots are tested and Pass. (See Figure 10)

Figure 10

13. If the tests fail, 'F', or you wish to run the test again, for any reason, you can press the Encoder and the test will repeat.
14. **Pots** test is complete. Reject the Unit if there is a failure 'F'.

Encoders Test

15. Rotate the **Encoder** until the **Encoders** test is highlighted.

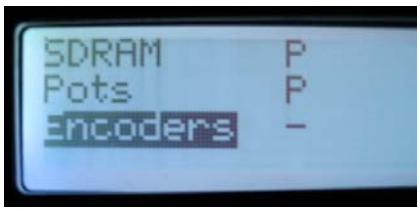


Figure 11

16. **Press** the left most **Encoder** to begin the **Encoders** test. The 1st (Left) display will look like Figure 12. **This is where the status of reading the 4 Encoders is displayed.**

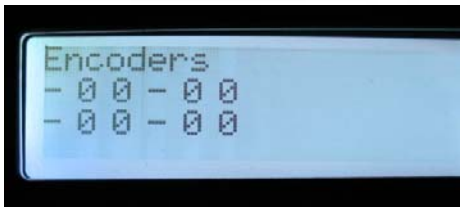


Figure 12

17. **Rotate** each of the **Encoders** from **LEFT** to **RIGHT** and back again **(there is one under each of the 4 LCDs)**. (See Figure 13)

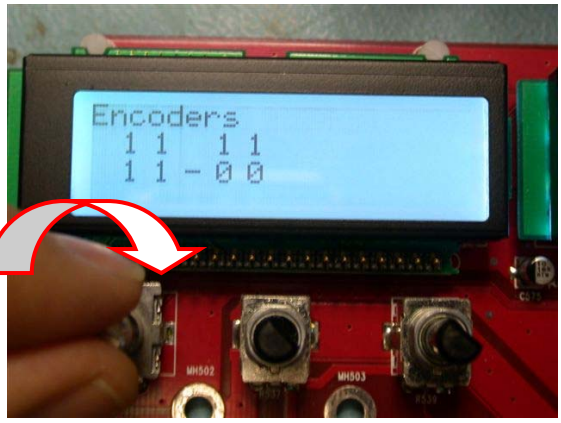


Figure 13

18. The display will change back to the main page and have "**Encoders P**" once all 4 Encoders are tested and Pass.

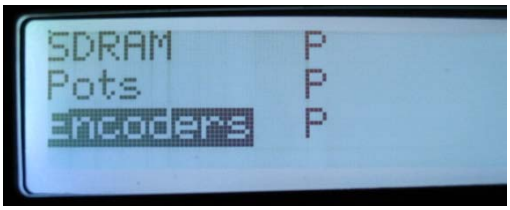


Figure 14

19. If tests fail, 'F', or you wish to run the test again, you can press the **Encoder** and the test will repeat.
20. **Encoders** test is complete. Reject the Unit if there is a failure 'F'.

LCD Test

21. **Rotate** the **Encoder** until the **LCD** test is highlighted.

Figure 15

22. **Press** the **Encoder** to begin the **LCD** test. The display will look like Figure 16 on the 4 LCD displays. All pixels will go off (black) for a few seconds and then on (white).

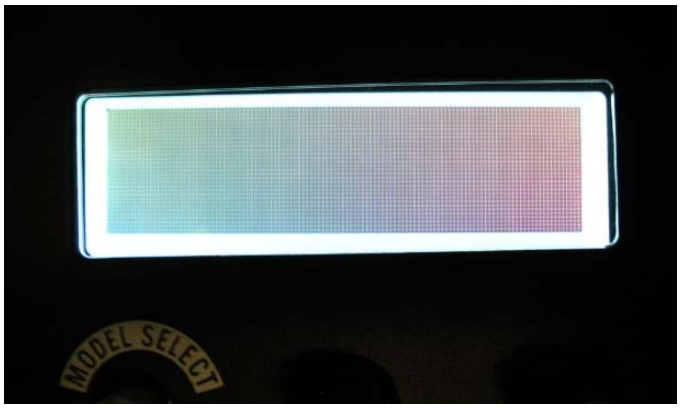


Figure 16

23. Check all 4 displays for missing pixels (pixels that do not turn black 'off') and also for pixels that do not turn 'on' (white). Also check to make sure the LCD display is framed up squre within it's window. The display will change back to the main page and will display "**LCD** **P**" for PASS.
24. **Figure 16 shows a misaligned LCD display, which is an example of what should be a FAILED even though the self-test will bring back a PASS.**
25. Even though the display indicates P for Pass, reject the PCBA if pixels do not turn off or on as expected.

Figure 17

26. If tests fail, 'F', or you wish to run the test again, you can press the **Encoder** and the test will repeat.
27. **LCD** test is complete. Reject the Unit if there is a failure 'F'.

Backlights Test

28. Rotate the **Encoder** until the **Backlights** test is highlighted.

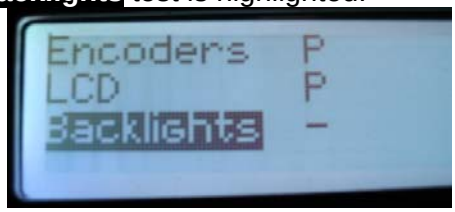


Figure 18

29. **Press** the **Encoder** to begin the **Backlights** test.

Figure 19

30. All 4 LCD Displays will transition thru Red, Green and Blue.
31. Verify seeing a change to each color on each display.
32. The display will change back to the main page menu displaying "**Backlights** **P**" for PASS.

33. Even though the display indicates P for Pass, reject the test if the back lighting of the display does not change as expected.

Figure 20

34. If tests fail, 'F', or you wish to run the test again, you can press the **Encoder** and the test will repeat.
35. **Backlights** test is complete. Reject the Unit if there is a failure 'F'.

Buttons Test

36. **Rotate** the **Encoder** until the **Buttons** test is highlighted.

Figure 21

37. **Press** the **Encoder** to begin the **Buttons** test. The leftmost LCD will appear as Figure 22.

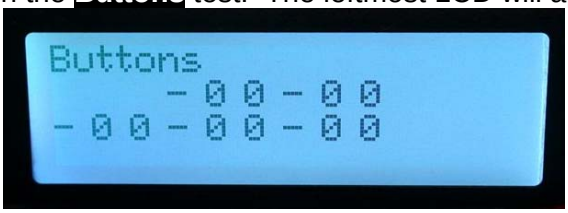


Figure 22

38. Press each of the 15 **Foot Switch Buttons** (As shown in Figure 23a and 23b) and verify that all of the displays except the far right one has all of the "- 0 0"s changed to "1 1"s.

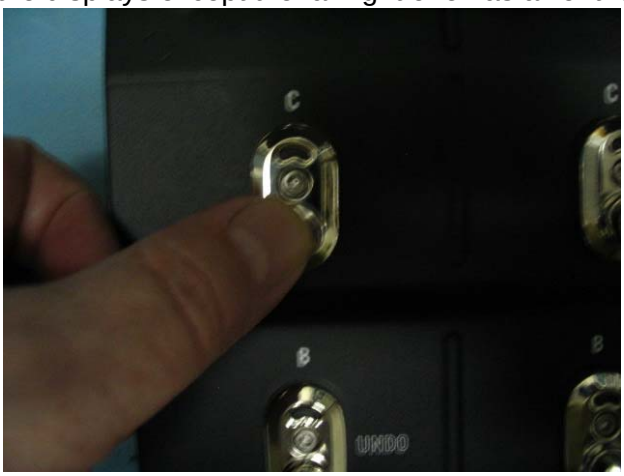


Figure 23a

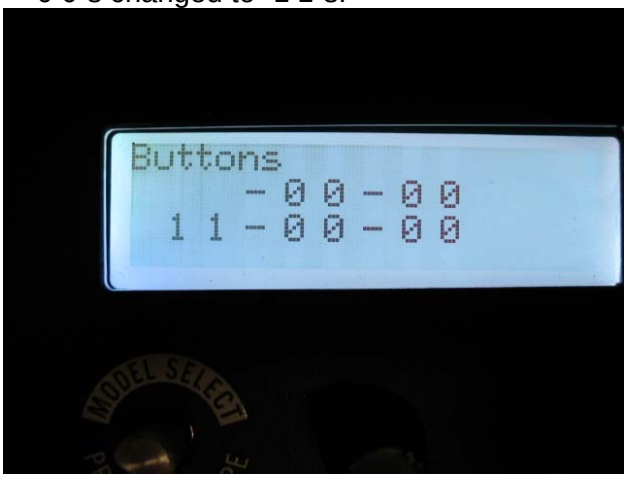


Figure 23b

39. The LCD right-most group will display the results of **Encoder Buttons** test.

40. Press each of the 4 Encoder Buttons as shown in Figure 24a. Encoder #1 has passed as indicated by the '11' in Figure 24b. Press the other 3 encoders and the display in the 4th group will indicate the results.

Figure 24a

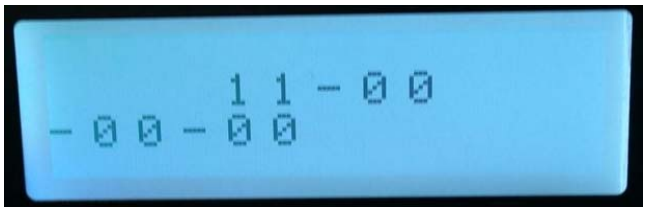


Figure 24b

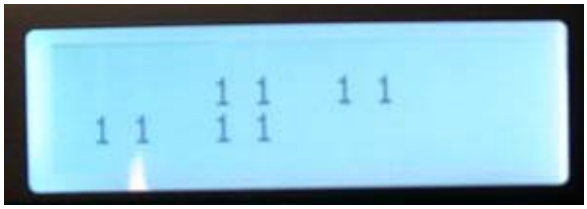


Figure 24c

41. The display will change back to the main page menu displaying "**Buttons** **P**" for PASS.
42. If tests fail, 'F', or you wish to run the test again, you can press the **Encoder** and the test will repeat.
43. **Buttons** test is complete. Reject the Unit if there is a failure 'F'.

LEDs Test

44. **Rotate** the **Encoder** until the **LEDs** test is highlighted.

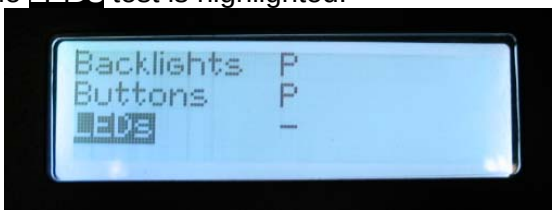


Figure 25

45. **Press** the **Encoder** to begin the **LEDs** test. All of the LEDs of the Foot Switches (See Figure 26a and 26b) will light up.

Figure 26a

Figure 26b

46. Watch to see that all of the LEDs on each of the 15 **Foot Switch Buttons** light up. The 12 buttons on the A, B, and C row's will light up to the "**WHITE**" like color, while the 3 to the for right will light up **RED,** because they are single color LEDs. After all the LEDs light each will cycle through RED GREEN and BLUE if they are a RGB LED or just flash RED again if it is a single color LED. Verify that all of the light correctly.
47. Even though the display indicates P for Pass, reject the test if the LEDs do not light as expected.
48. The display will change back to the main page menu displaying "**LEDs P**" for PASS.

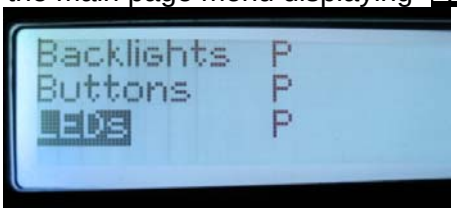


Figure 27

49. If tests fail, 'F', or you wish to run the test again, you can press the **Encoder** and the test will repeat.
50. **LEDs** test is complete. Reject the Unit if there is a failure 'F'.

Jacks Test

51. **Rotate** the **Encoder** until the **Jacks** test is highlighted.

Figure 28

52. Without turning off the Power place the Unit into the TNG Foot's Test Fixture. (See Figure 29a). The two ¼' Cables coming from the fixture closest to the MIDI connectors should be connected to **Expression Pedals** on the ends of the cables outside of the fixture. (See Figure 29b)

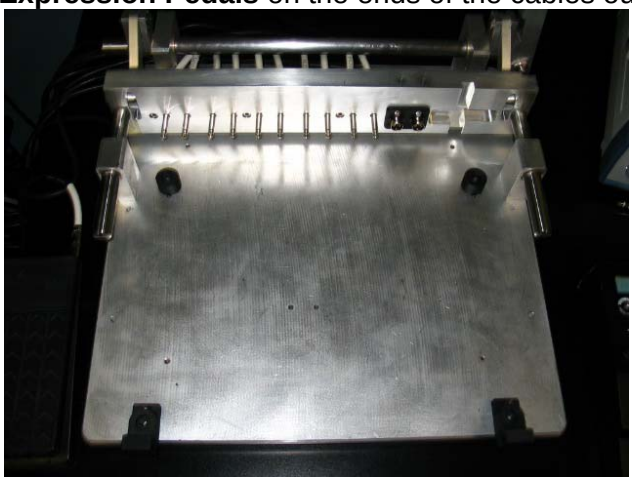


Figure 29a


Figure 29b

53. The fixture will insert and remove all the jacks at one time and then indicate P(Pass). At this point all the UI testing should be done (if you do the Jack Test in the fixture)

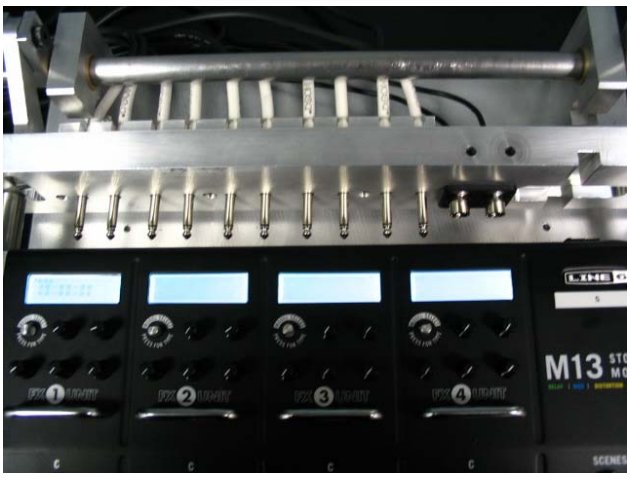


Figure 30

54. **Press** the **Encoder** to begin the **Jacks** test. The leftmost LCD will appear as Figure 31.

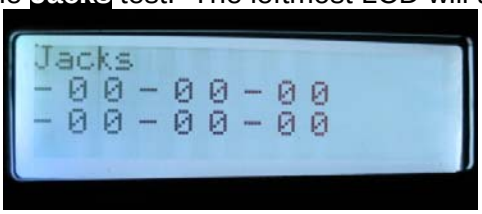


Figure 31

55. Close the clamp on the fixture inserting all the jacks & plugs. **(Make sure Allof the Plugs match up to the Jacks before pulling down with force on the lever.)** The displayed 00's will all change to 01's. (See Figures 32a-c)

Figure 32a

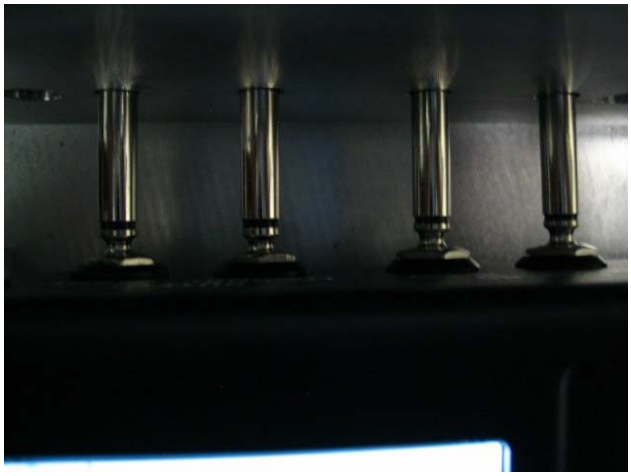


Figure 32b

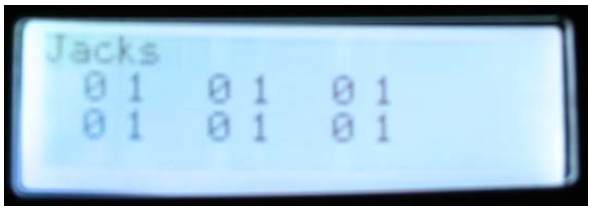


Figure 32c

56. Open the clamp and then close again (move handle towards you, away from you and then back towards you),

57. The display will change back to the main page once you have opened the clamp and will display "**Jacks** **P**" for PASS. (See Figure 33) Closing the clamp puts the UUT into the correct condition to go on with the testing.

Figure 33

58. If tests fail, 'F', or you wish to run the test again, you can press the **Encoder** and the test will repeat.
59. **Jacks** test is complete. Reject the Unit if there is a failure 'F'.

Pedals Test

60. **Rotate** the **Encoder** until the **Pedals** test is highlighted.
NOTE: It is important to have the Pedals already connected to the Test Cables, because transient of connecting and disconnecting the pedals during the test can cause the test to pass inaccurately.

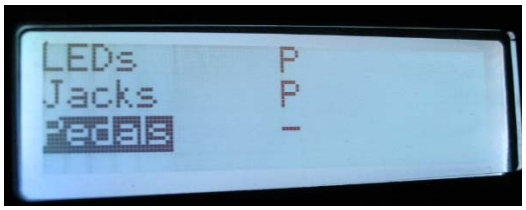


Figure 34

61. **Press** the **Encoder** to begin the **Pedals** test. The leftmost LCD will appear as Figure 35.

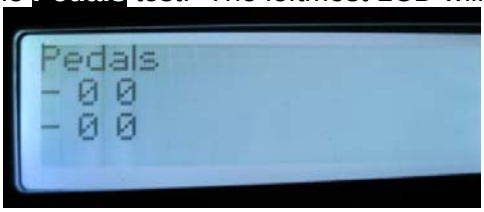


Figure 35

62. Press each of the **Expression Pedals** to the **Toe** position then the **Heel** position as in Figures 36a and 36b.