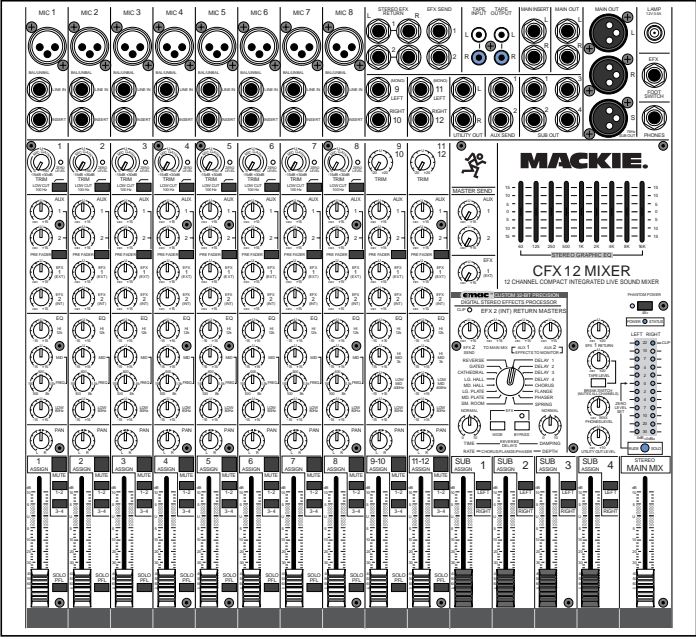


MACKIE®

CFX series

Compact Effects Mixers:
CFX•12, CFX•16 and CFX•20



SERVICE MANUAL

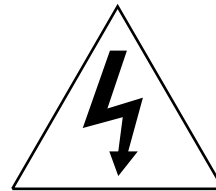


SERVICE ON THIS EQUIPMENT IS TO BE PERFORMED BY
EXPERIENCED REPAIR TECHNICIANS ONLY
CONFIER L'ENTRETIEN AU PERSONNEL QUALIFIE



CAUTION AVIS

RISK OF ELECTRIC SHOCK
DO NOT OPEN
*RISQUE DE CHOC ELECTRIQUE
NE PAS OUVRIR*



CAUTION: TO REDUCE THE RISK OF
ELECTRIC SHOCK DO NOT REMOVE
THE COVER (OR BACK)
NO USER SERVICEABLE PARTS INSIDE
REFER SERVICING TO QUALIFIED
PERSONNEL

WARNING: TO REDUCE THE RISK OF
FIRE OR ELECTRIC SHOCK, DO NOT
EXPOSE THIS PRODUCT TO RAIN OR
MOISTURE

TO PREVENT ELECTRIC SHOCK, DO
NOT USE THIS POLARIZED PLUG WITH
AN EXTENSION CORD, RECEPTACLE OR
OTHER OUTLET UNLESS THE BLADES
CAN BE FULLY INSERTED TO PREVENT
BLADE EXPOSURE.

*ATTENTION: POUR EVITER LES
RISQUES DE CHOC ELECTRIQUE, NE
PAS ENLEVER LE COUVERCLE. AUCUN
ENTRETIEN DE PIECES INTERIEURES
PAR L'USAGER. CONFIER L'ENTRETIEN
AU PERSONNEL QUALIFIE.*

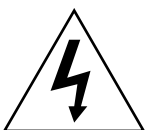
*AVIS: POUR EVITER LES RISQUES
D'INCENDIE OU D'ELECTROCUTION,
N'EXPOSEZ PAS CET ARTICLE A LA
PLUIE OU A L'HUMIDITE.*

*POUR PREVENIR LES CHOCS
ELECTRIQUES NE PAS UTILISER CETTE
FICHE POLARISEE AVEC UN
PROLONGATEUR, UN PRISE DE
COURANT OU UNE AUTRE SORTIE DE
COURANT, SAUF SI LES LAMES
PEUVENT ETRE INSEREES A FOND
SANS LAISSER AUCUNE PARTIE A
DECOUVERT.*

This apparatus does not exceed the Class A/Class B (whichever is applicable) limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of Communications.

ATTENTION :Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de class A/de class B (selon le cas) prescrites dans le règlement sur le brouillage radioélectrique édicté par les ministere des communications du Canada.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio energy and, if not installed properly and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.



The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure, that may be of sufficient magnitude to constitute a risk of electric shock to persons.

Le symbole éclair avec point de flèche à l'intérieur d'un triangle équilatéral est utilisé pour alerter l'utilisateur de la présence à l'intérieur du coffret de "voltage dangereux" non isolé d'ampleur suffisante pour constituer un risque d'électrocution.



The exclamation point within an equilateral triangle is intended to alert the user of the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Le point d'exclamation à l'intérieur d'un triangle équilatéral est employé pour alerter les utilisateurs de la présence d'instructions importantes pour le fonctionnement et l'entretien (service) dans le livret d'instruction accompagnant l'appareil.

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Overview	4
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AC power supply	260-1

INTRODUCTION



This manual contains basic service information. It is essential that you have a copy of the user's manual as this contains the complete operating instructions.

SERVICE TECHNICAL ASSISTANCE

Mackie Designs, Service Technical Assistance, is available 8AM - 5PM PST, Monday through Friday for Authorized Mackie Service Centers, at 1-800-258-6883. Feel free to call with any questions and speak with a carefully-calibrated technician. If one is not available, leave a detailed message and a qualified Mackoid will return your call asap.

DISCLAIMER

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Overview

The CFX mixer series consists of 3 models: the CFX•12, CFX•16 and CFX•20. Each consists of five circuit boards: Effects, Master, Slave, Power and AC Power.

The Master board is the main mixer circuit.

The Effects board is fitted on the back of the Master board. This is exactly the same as used in the PPM Professional Powered Mixer series.

The Slave board connects to the left of the Master board and adds four channels. The CFX•12 has one Slave board, the CFX•16 has two, and the CFX•20 has three. This is the main difference between the three models.

The power board regulates the AC power to +/- 15VDC, +5VDC and +48VDC (phantom power).

The AC power board holds the IEC connector, fuse holder, power switch and caps.

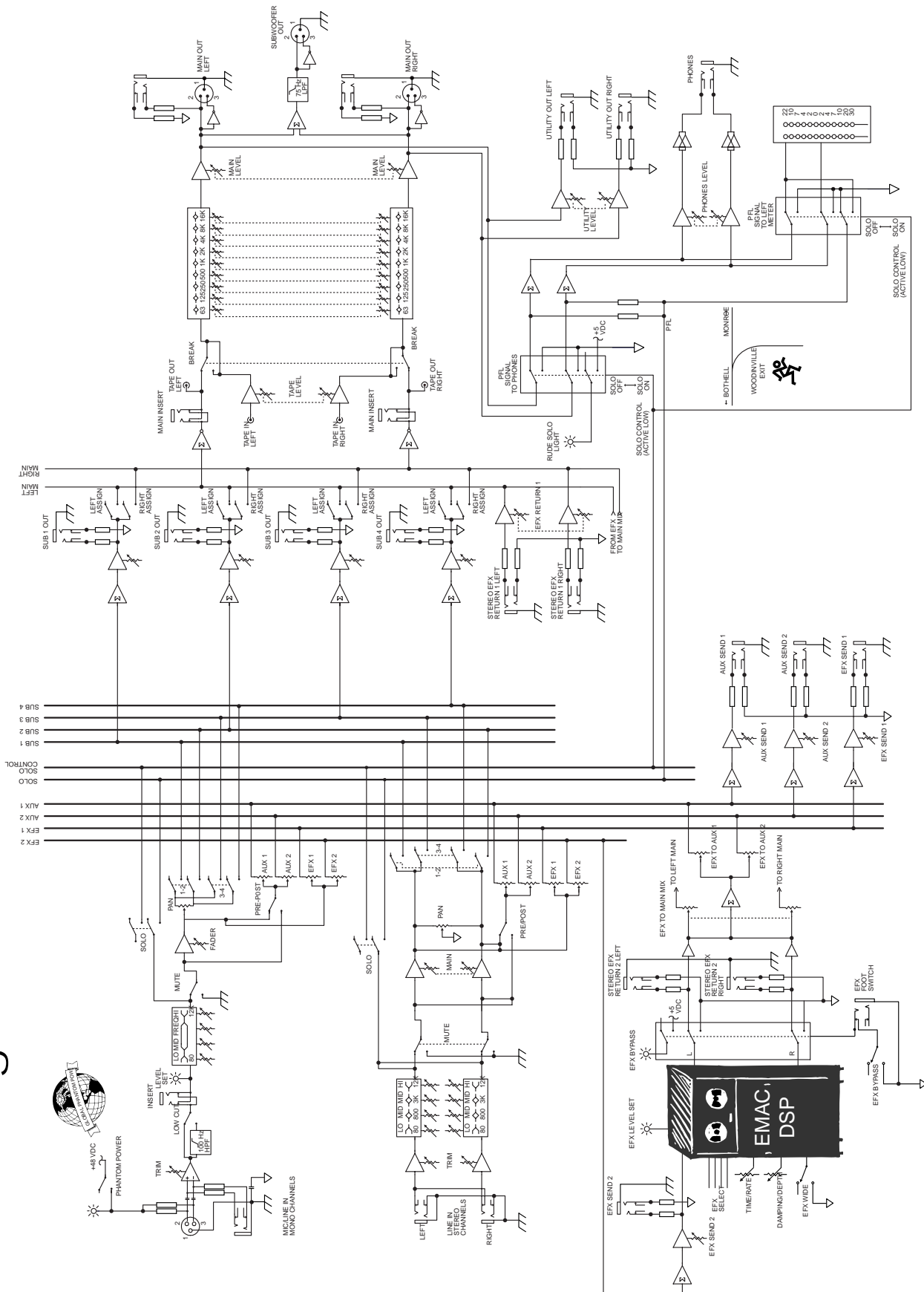
This table shows which boards are used in each mixer.

Note: Each schematic chapter is labeled with the number of the board it describes. For example, chapter 241 contains schematics and pcb layouts for circuit board number 550-241-00, chapter 192 is for circuit board 550-192-00.

MODEL	EFFECTS	MASTER	SLAVE	POWER	AC POWER
CFX•12	192	241	242 (QTY 1)	258	260
CFX•16	192	241	242 (QTY 2)	258	260
CFX•20	192	241	242 (QTY 3)	258	260



Block Diagram



Specifications

Frequency Response

Mic Input to any Output (Trim at 0 dB):
+0, -1 dB, 32Hz to 20kHz

Distortion THD and SMPTE IMD; 20Hz to 20kHz

Mic Input to Main Output:
< 0.05% @ +4 dBu output

Noise 20Hz to 20kHz BandWidth (150Ω source impedance)

Equivalent Input Noise (EIN):
-127 dBu

Residual Output Noise:
Main, Monitor, & Effects outputs
Channel & Master levels off
-95 dBu

Common Mode Rejection Ratio (CMRR)

60 dB @ 1kHz, Trim @ 0 dB

Crosstalk

Adjacent Inputs or Input to Output:
-90 dB @ 1kHz

Fader Off
-90 dB @ 1kHz

Mute Switch and Break Switch Mute
-80 dB @ 1kHz

Input Level Trim Control Range

+6 to -50 dB

Phantom Power

+48V DC

Equalization

Low Cut: 100Hz, -18 dB/octave
Mono Channel EQ:

High ±15 dB @ 12kHz
Mid ±15 dB @ 100Hz
Low ±15 dB @ 80Hz

Stereo Channel EQ:

High ±15 dB @ 12kHz
High Mid ±15 dB @ 3kHz
Low Mid ±15 dB @ 400Hz
Low ±15 dB @ 80Hz

Graphic EQ (9 bands):

Q = 1.414, ISO octave centers
±15 dB @ 63, 125, 250, 500, 1k, 2k, 4k, 8k, 16k Hz

Mixer Rated Output

Main, Sub, Aux, & Efx: +4 dBu
Max Rated Output: +20 dBu

Maximum Input Levels

Mic Input: -28 dBu, Trim @ +50 dB
+18 dBu, Trim @ +6 dB

Line Input: -8 dBu, Trim @ +30 dB
+38 dBu, Trim @ -15 dB

Insert Input, Stereo Line Input, Tape Input, and Effects Return: +20 dBu

Maximum Voltage Gain

Mic Input to

Insert Output: 50 dB
Tape Output: 66 dB
Sub Output: 66 dB
Main Output: 76 dB
Aux Send: 71 dB

Line Input to

Insert Output: 30 dB
Tape Output: 46 dB
Sub Output: 46 dB
Main Output: 56 dB
Aux Send: 51 dB

Stereo Line Input to

Tape Output: 40 dB
Sub Output: 40 dB
Main Output: 50 dB
Aux Send: 45 dB

Tape Input to

Main Output: 30 dB
Effects Return to Main Output: 30 dB

Input Impedance

Mic Input: 3kΩ, bal
Line Input: 40kΩ, bal
Insert Input, Stereo Line Input, Tape Input, and Effects Returns: 10kΩ, unbal

Output Impedance

Main Output, Insert Output, Tape Output, Sub Output, and Effects Sends: 150Ω

Digital Effects

Resolution: 16-bit, 2-channel
No. of Presets: 16

Channel Level Set LED (Sensitivity)

0 dBu (normal operating level)

VU Meters

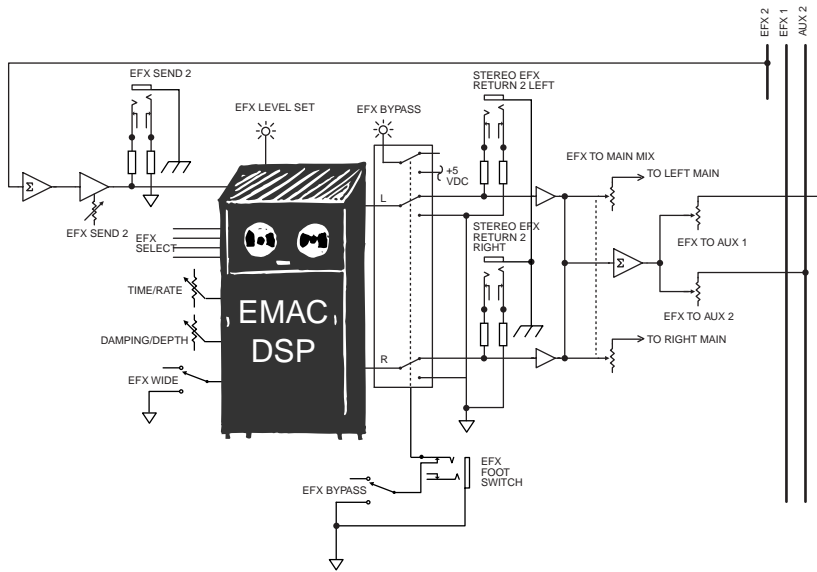
Main L/R
12 segments:
Clip, +10, +7, +4, +2, 0, -2, -4, -7, -10, -20, -30

Disclaimer

Since we are always striving to make our products better by incorporating new and improved materials, components, and manufacturing methods, we reserve the right to change these specifications at any time without notice.

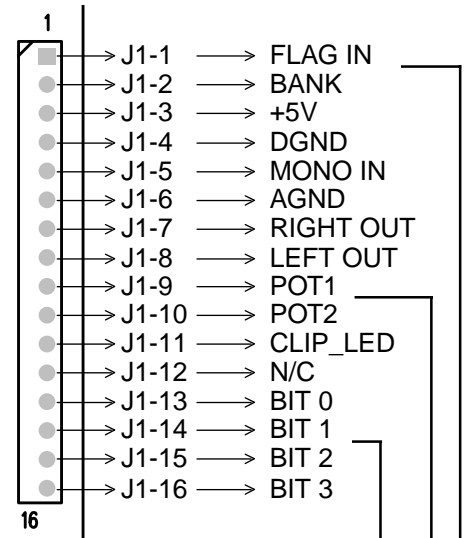
Effects board

BLOCK DIAGRAM

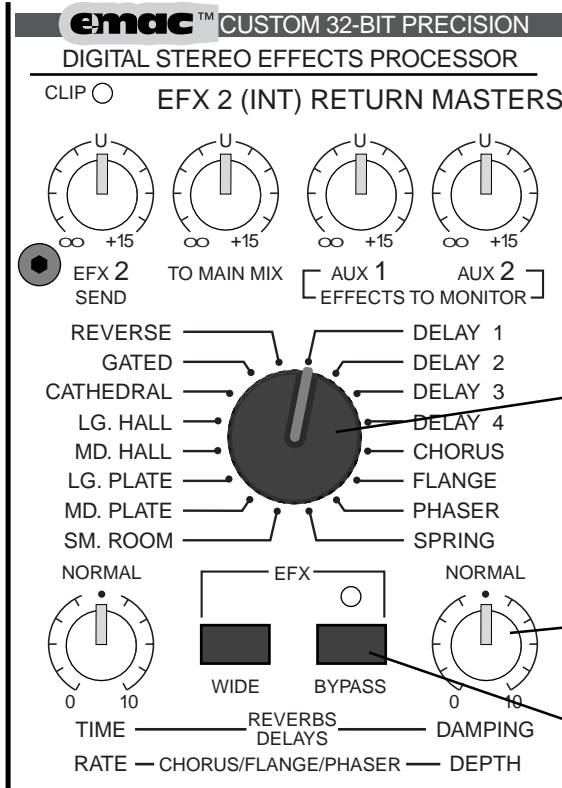


This shows the signals present on the EFX board connector J1.

J1



EFX CONTROLS



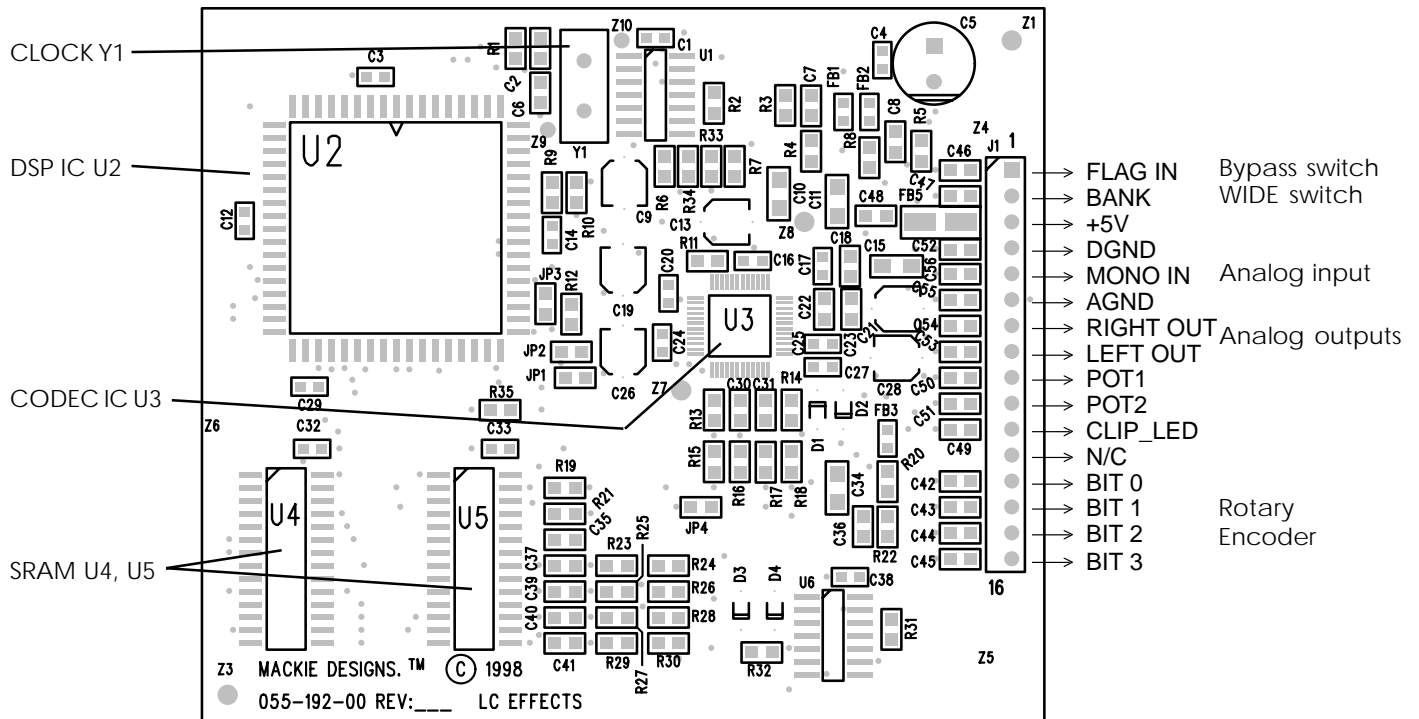
Adjustment of the rotary encoder S1 will vary the level of BIT 0 through to BIT 3. This will select which DSP algorithm is in effect on the EFX board's DSP IC U2.

The adjustment of these two pots directly affects the CODEC IC U3. The levels are named POT 1 and POT 2 at connector J1.

The state of the WIDE switch and the BYPASS switch directly affect the DSP IC. The WIDE status is named BANK. The BYPASS status is named FLAG.

The EFX board

The EFX circuit board schematics and pcb layouts are shown in chapter 192.
 The circuit is made from the following main elements: Clock, CODEC, DSP and SRAM



INTEGRATED CIRCUITS

PART NO.	DESCRIPTION	VALUE	REF
080-088-00	IC, ADSP-2163		U2
315-017-00	CRYSTAL, 24.576 MHZ	24.576	Y1
325-027-03	IC, SMD, DUAL D F/F	74HC74A	U6
325-071-03	IC, HEX, INV, SMD	74HCU04	U1
329-042-03	IC, AD1819 QFP	AD1819	U3
329-047-03	IC, 32KX8 SRAM 20nS	7C256-20	U4-5

EFX OVERVIEW

The CODEC receives a mono analog input from the mixer circuit board and converts it into a digital signal. The CODEC also receives analog control signals from the two Parameter pots, converts this to digital and sends a combined digital signal to the DSP.

The DSP and the two SRAM ICs, form a powerful DSP system. The DSP receives the digital data from the CODEC as well as the direct control signals from the rotary encoder and the EFX WIDE switch. The DSP programming selects and performs the appropriate DSP function on the data, and sends it back to the CODEC.

The CODEC converts the incoming digital signals to two analog outputs which are sent to the main left and right mix, and summed to the monitor mix. For Phaser and Delay effects, the two analog outputs from the CODEC are mono. For other effects, there is a difference between the signals.

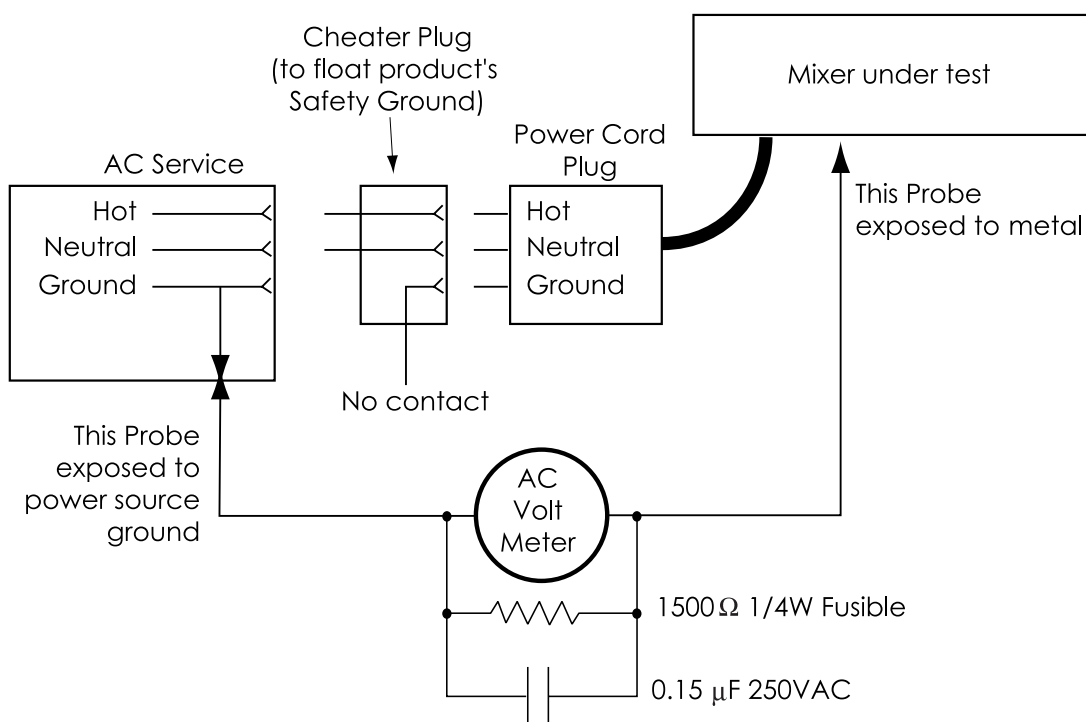
Safety test



You must perform the following leakage test before returning the mixer to your customer. Take every safety precaution to protect yourself while doing this test.



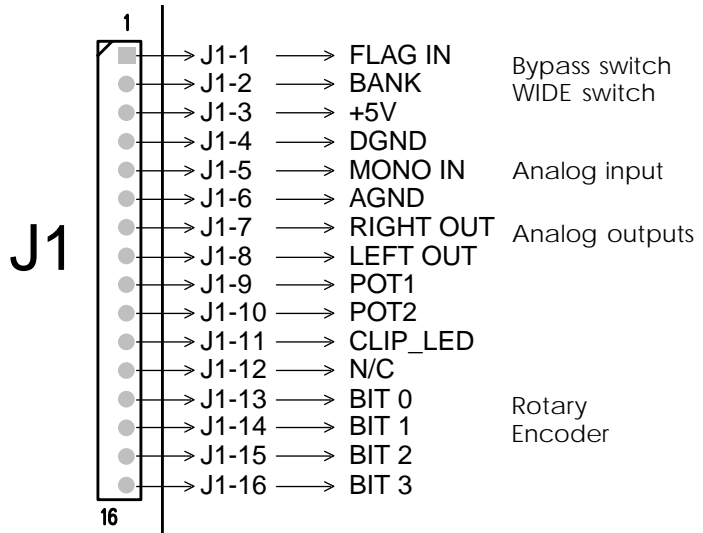
1. Make a small loading RC circuit as shown in the diagram below, and connect the AC volt meter between the AC power source ground and any exposed metal on the unit under test.
2. Connect the mixer under test to an AC power source using a ground-lift adaptor, leaving the mixer's safety ground floating. Turn the mixer on.
3. The meter reading should be less than 750mVAC (note: this is equivalent to 0.5mA of leakage current).
4. Flip the plug over in the receptical so the hot and neutral are swapped. Verify that the reading is still less then 750mVAC.
5. If either reading is greater than 750mVAC, then you must investigate and repair the mixer before returning it to your customer.



Connectors

MIXER TO EFX BOARD

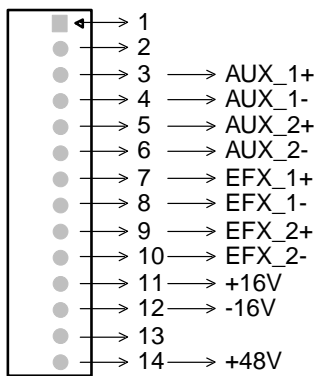
The details for the mixer to EFX board connector are shown on page 8, but here it is again.



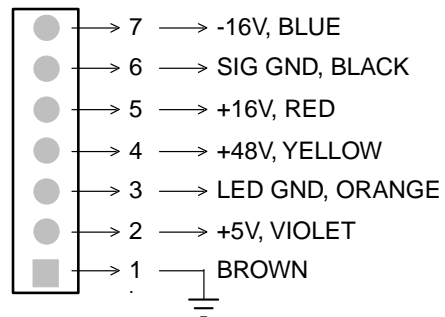
This shows the signals present on the EFX board connector J1.

MASTER CIRCUIT BOARD

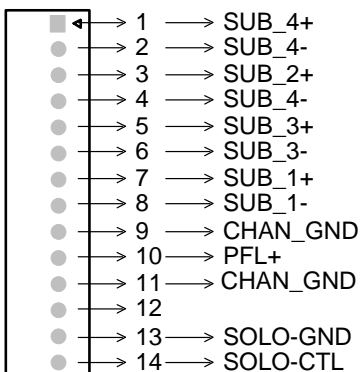
J4



J44

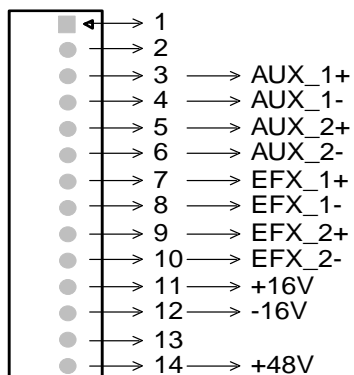


J5

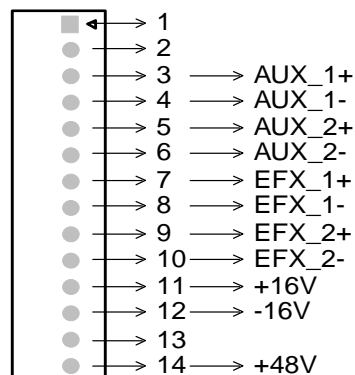


SLAVE CIRCUIT BOARD CONNECTIONS

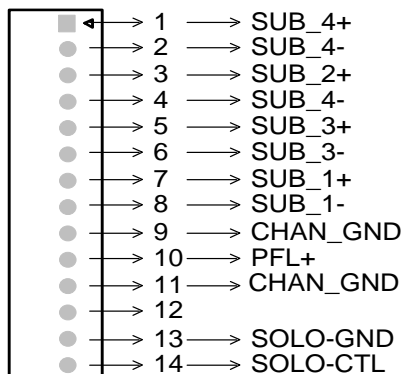
J4



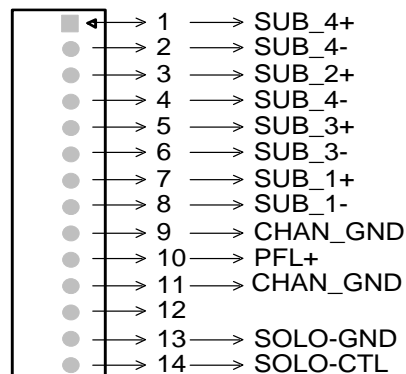
J15



J5



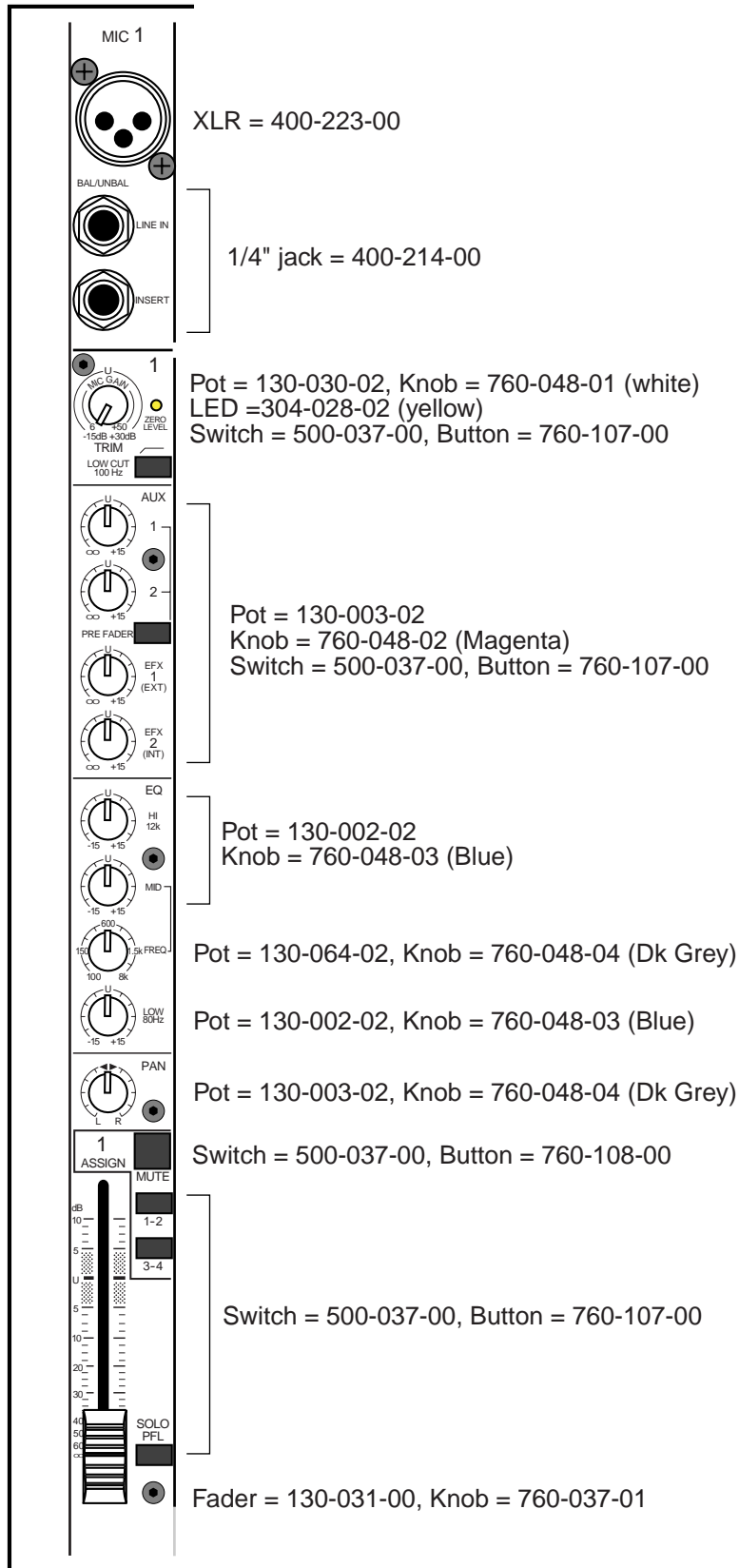
J16



This shows the signals between SLAVE boards.

This shows the signals into the SLAVE board from the MASTER. Actually, this is all rather sad, that past generations fought in the American Civil War to put a stop to this sort of thing. All circuit boards are created equal.

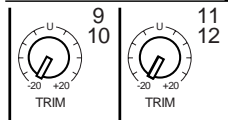
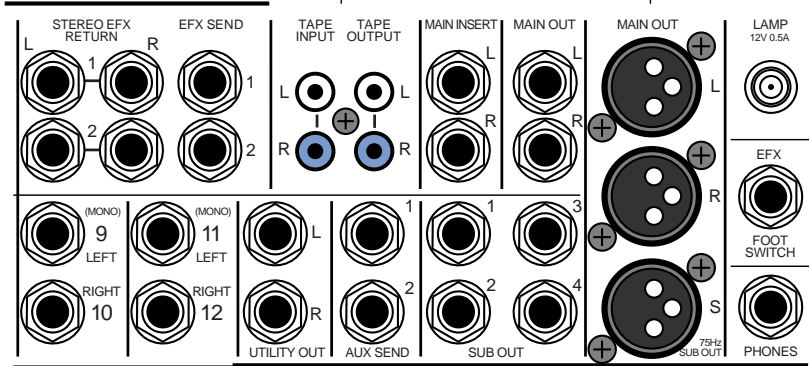
Quick Parts



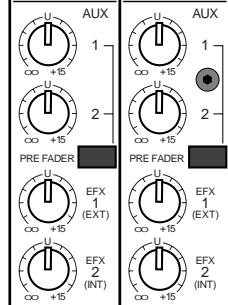
All 1/4" jacks = 400-214-00

Quad RCA jack = 400-022-00

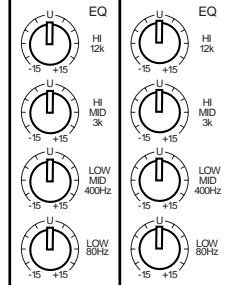
XLR = 400-041-00



Pot = 130-061-02, Knob = 760-048-01 (white)



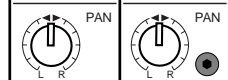
Pot = 130-003-02
Knob = 760-048-02 (magenta)
Switch = 500-037-00, Button = 760-107-00



Pot = 130-061-02, Knob = 760-048-03 (blue)

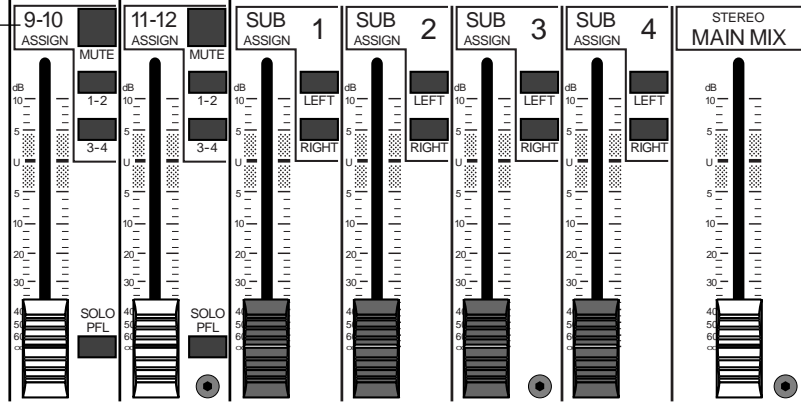
Pot = 130-061-02, Knob = 760-048-04 (dark grey)

Pot = 130-061-02, Knob = 760-048-03 (blue)



Pot = 130-003-02, Knob = 760-048-04 (dark grey)

Switch = 500-037-00
Button = 760-108-00



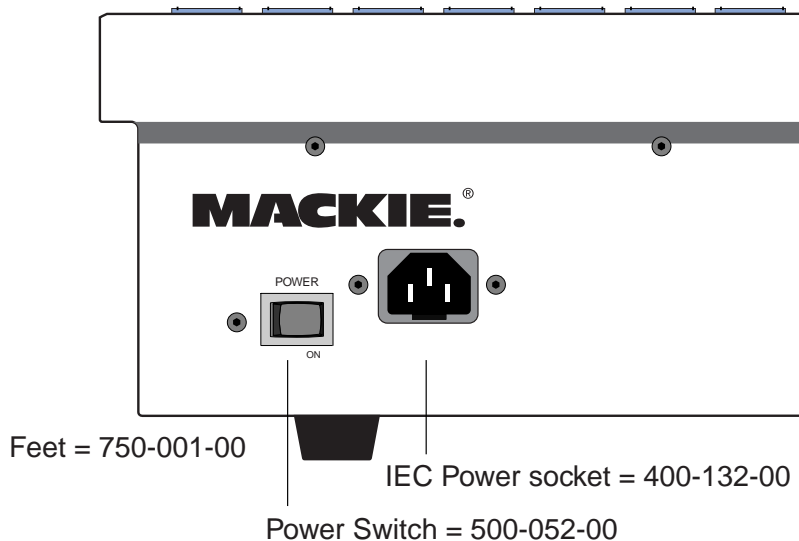
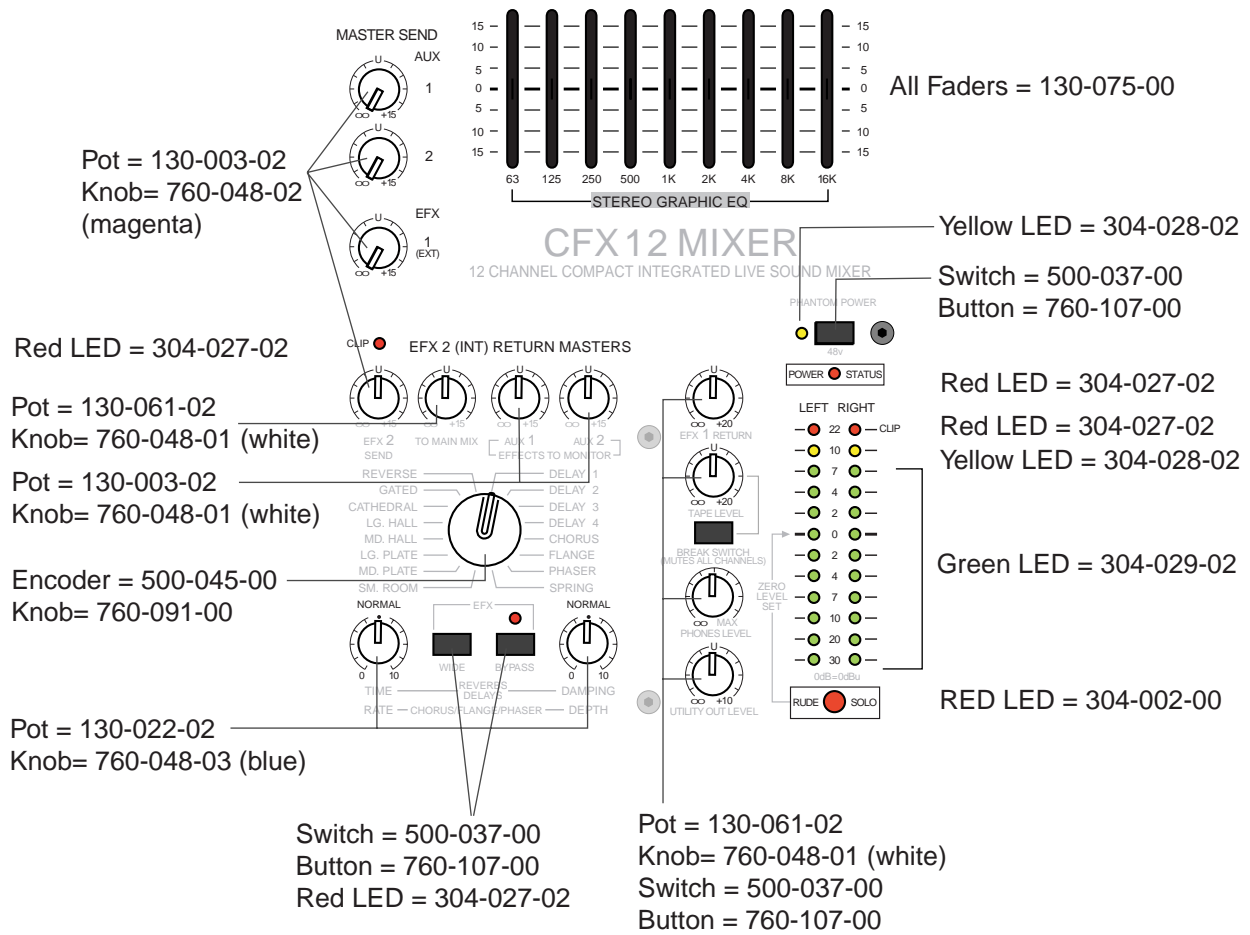
Switch = 500-037-00
Button = 760-107-00

Fader = 130-032-00 (dual)
Knob = 760-037-01

Fader = 130-031-00 (mono)
Knob = 760-037-03 (blue)

Fader = 130-032-00 (dual)
Knob = 760-037-01

MACKIE. CFX MIXER SERVICE MANUAL



PARTS LIST

Parts Numbering guide




040- Cables
 055- Finished PCB Assy
 100- Pots and resistors
 200- Capacitors
 300- Semiconductors
 400- Jacks/Connectors
 500- Switches
 510- Fuses
 550- Chassis Metalwork
 600- Transformers
 601- Inductors
 610- Wires and Cables
 640- AC line cords
 700- Hardware
 760- Knobs/Plastic
 770- Fans
 790- Misc./Packing
 800- Printed Material
 860- EPROM

PART#	DESCRIPTION	PAGES
090-063-00	MASTER PARTS	A-2
055-192-00	EFFECTS BOARD	A-4
055-241-00	MASTER BOARD	A-5
055-242-00	SLAVE 4 BOARD	A-10
055-258-00	POWER SUPPLY BOARD	A-12
055-260-00	AC INPUT BOARD	A-12



Components noted with this symbol shall be replaced only by the component specified.
 This is required to maintain product safety.

Master Parts List CFX Assembly

Item#	Part #	Description	Rev	Qty	Notes
	090-120-00	CFX12	A3-A2	1	CFX12 ASSEMBLY
	090-121-00	CFX16	A3-A2	1	CFX16 ASSEMBLY
	090-122-00	CFX20	A3-A2	1	CFX20 ASSEMBLY
1	040-358-00	CBL RIB 18G 7P .156 16IN	B	1	
4	055-192-00-01	PCB ASSY LC EFTS-PWR MIX	B1-A1	1	See Page A-4
	055-241-00-02	ASSY PCB CFX MASTER	A-A2	1	See Page A-5
6	055-242-00-01	ASSY PCB CFX SLAVE 4	1-A1	1	See Page A-10
7	055-258-00-01	PCB ASSY PWR SPLY CFX	A-A1	1	See Page A-12
8	055-260-00-01	PCB ASSY AC INPUT CFX	A-A1	1	See Page A-12
	9	080-142-00	SA XFMR -010 120V	A-A1	1 120V models (all CFX)
	9	080-142-01	SA XFMR -010 230V	A	1 230V models (all CFX)
	9	080-142-02	SA XFMR -010 100V	A	1 100V models (all CFX)
	2	080-144-00	SA BNC CFX 12/16/20	C1	A1 1
	44	400-365-00	QDISK TAB .250 M #6 MNT	A	1
	11	410-005-00	INSL SILPAD TO-220	A	4
	12	510-001-00	FUSE SB 1A 5X20MM 250V UL	B	1 120V models (all CFX)
	12	510-002-00	FUSE SB .5A 5X20 250V IEC	C	1 230V models (all CFX)
	12	510-025-00	FUSE SB 1.25A 5X20MM 250V	B	1 100V models (all CFX)
	13	550-442-00	CHASSIS TOP CXF 12		1 CFX12
	13	550-443-00	CHASSIS TOP CXF 16	A	1 CFX16
	13	550-444-00	CHASSIS TOP CXF 20	A	1 CFX20
	14	550-445-00	CHASSIS BOTTOM CXF 12	A	1 CFX12
	14	550-446-00	CHASSIS BOTTOM CXF 16	A	1 CFX16
	14	550-447-00	CHASSIS BOTTOM CXF 20	A	1 CFX20
	15	550-462-00	CLAMP TO-220 X 4	A	1
	43	550-491-00	FAB PLT HTSK CFX PWR SPLY	A	1
	16	550-551-10	PNT LEFT SIDE CFX	A	1
	17	550-551-20	PNT RIGHT SIDE CFX	A	1
	18	550-552-00	BACK CFX 12	B	1 CFX12
	18	550-553-00	BACK CFX-16	B	1 CFX16
	18	550-554-00	BACK CFX-20	B	1 CFX20
	20	620-045-00	CBL FLT 14C W/PINS 3.5IN	A	2, 4, 6 (2 for CFX•12, 4=•16, 6=•20)
		640-001-00	LC IEC SJT 10A/125V 6FT	D	1 120v Linecord
		640-002-02	LC JAPAN 12A 125VAC 8FT	C	1 100V Linecord
	22	700-010-00	TF 6-32X1/4 PHP BLKZC	A	26
	23	700-011-00	MCH 4-40X1/4 BTNSKT BLKOX	A	34, 44, 54
	24	700-028-01	SEMS 6-32X5/16 PHP BLKZC	B	6
	25	700-028-03	SEMS 6-32X1/2 PHP BLKZC	B	4
	26	701-016-00	5-20X5/16 PHPII TYP B BLK	A	23, 31, 39
	27	705-001-00	KEPNUT 6-32	A	4
	28	705-003-00	NUT HEX-SPLD W/400-214-00	A	AR
	29	705-008-00	NUT LOCK 8-32	A	2
	31	710-002-00	WASHER-SPLD W/400-214-00	A	AR
	33	750-001-00	BUMPON ROUND BLK .63X.31	A	4
	34	760-037-01	KNOB SLIDE 10X25MM MLDLIN	A	11, 15, 19
	35	760-037-03	KNOB SLIDE 11X24 BLUE	A	4
	36	760-048-01	KNOB 9MM LT GRY	B	17, 21, 25
		760-048-02	KNOB 9MM MAGENTA	B	44, 60, 76
		760-048-03	KNOB 9MM BLU/GRY	B	34, 46, 58
	39	760-048-04	KNOB 9MM DARK GRAY	B	18, 26, 34
	40	760-091-00	KNOB MASTER VOLUME	A	1
	41	780-050-00	LIPSEAL MASTER CFX	A	1
	42	780-051-00	LIPSEAL SLAVE 4 CFX	A	1, 2, 3

Note: The Item numbers in the first column refer to the circled numbers in the exploded views, chapters B, C and D.



Item#	Part #	Description	Rev	Qty	Notes
	790-002-00	BAG POLY 12 X 18 2MIL	A	1	
	790-027-00	BAG POLY 20X7X36 4MIL GUS	A	1	
	800-130-00	BOX CMPT CFX 12	B	1	CFX12
	800-131-00	BOX CMPT CFX 16	B	1	CFX16
	800-132-00	BOX CMPT CFX 20	B	1	CFX20
	810-086-00	FOAM SET CFX		1	
	820-104-00	OWNR MNL COMPACT CFX	A	1	COVERS ALL CFX

055-192-00 REV B, Effects board

PART NO.	DESCRIPTION	VALUE		REFERENCE DESIGNATORS
080-088-00	IC, ADSP-2163			U2
140-009-00	RESISTOR TF SMT	2.2	5%	R11
140-049-00	RES TF SM .1W 5% 100 OHM	100	5%	R33-34
140-053-00	RESISTOR TF SMT	150	5%	R13-14
140-073-00	RESISTOR TF SMT	1K0	5%	R4 R8-9 R20 R31
140-089-00	RESISTOR TF SMT	4K7	5%	R19 R21 R23-30
140-097-00	RESISTOR TF SMT	10K	5%	R7 R10 R32
140-097-00	RESISTOR TF SMT *DO NOT STUFF*	10K	5%	R16-18 R15
140-114-00	RESISTOR TF SMT	47K	5%	R3 R5-6 R22
140-123-00	RESISTOR TF SMT	100K	5%	R2 R12
140-123-00	RES TF SM .1W 5% 100K OHM	100K	5%	R35
140-139-00	RESISTOR TF SMT	470K	5%	R1
212-001-00	CAPACITOR CERAMIC SMT	0.01	10%	C30-31
212-003-00	CER 100PF 5% 50V NPO SM	100PF	5%	C46 C49
212-005-00	CAPACITOR CERAMIC SMT	20PF	5%	C2 C6
212-007-00	CAPACITOR CERAMIC SMT	0.047	5%	C18
212-016-00	CER 1000PF 5% 50V NPO SM	1000PF	5%	C42-45 C47-48 C50-56
212-023-00	CAPACITOR CERAMIC SMT	0.001	10%	C7-8 C36
212-024-00	CER 1UF 25V Y5V 1206	1UF	-400	C10-11 C15 C34
212-027-00	CAPACITOR CERAMIC SMT	.1UF	10%	C1 C3-4 C12 C14 C16-17 C20 C24-25 C27 C29 C32-33 C38
212-029-00	CAPACITOR CERAMIC SMT	270PF	5%	C22-23
212-032-00	CAPACITOR CERAMIC X7R SMT	2200PF	10%	C35 C37 C39-41
220-011-00	LYT 100UF 20% 25V RAD	100UF	10%	C5
223-003-00	LYT 22UF 20% 6.3V SM	22UF	20%	C9
223-004-00	LYT 10UF 20% 16V SM	10UF	20%	C13 C19 C21 C26 C28
300-003-00	DIODE SIGNAL SMD	DL4148		D1-4
315-017-00	CRYSTAL, 24.576 MHZ	24.576		Y1
325-027-03	IC, SMD, DUAL D F/F	74HC74A		U6
325-071-03	IC, HEX, INV, SMD	74HCU04		U1
329-042-03	IC, AD1819 QFP	AD1819		U3
329-047-03	IC, 32KX8 SRAM 20nS	7C256-20		U4-5
400-280-00	HDR, SKT, 16P, .1X1 STR	1.75		J1
450-192-00	PCB, LC EFFECTS			Z1
601-009-00	FERRITE BEAD, SMT	Z=1000		FB1-3
601-010-00	FERRITE SMT POWER	Z=73		FB5

055-241-00 REV A, Master board

PART NO.	DESCRIPTION	VALUE		REFERENCE DESIGNATORS
040-137-00	CBL ASSY, 18GA 1010 GRN/YEL 9" LUG/AMP IN			E2
130-002-02	POT RTY 50KB 9MM MNO H TN	50KB		R47 R55 R59 R126 R135 R139 R209 R220 R224 R285 R294 R298
130-003-02	POTRTY 50KG 9MM MN TN PAN	50KG		R32-33 R38-39 R63 R112-113 R118-119 R143 R195-196 R201-202 R228 R273-274 R279-280 R304 R332-333 R340-341 R387 R429-430 R438-439 R492 R525-526 R531 R535 R617 R621
130-022-02	RESISTOR POT 9MM HORIZ	10KB		R545 R629
130-030-02	RESISTOR POT 9MM HORIZ	5KZY		R15 R95 R180 R260
130-031-00	POT SLD 10KD 60MM MONO	10KD		R74 R154 R239 R316 R562 R569 R648 R713
130-032-00	POT SLD 50KD 60MM DUAL	50KD		R398 R503 R861
130-061-02	POT 50KG 12MM DUAL WO SLV	50KG		R320 R350 R360-361 R374 R417 R450 R464-465 R481 R539 R744 R748 R753 R759
130-064-02	POT 500KC 12MM DUL WO SLV	500KC		R56 R136 R221 R295
130-075-00	POT SLD 50KW 30MM PANA	50KW		R603 R605 R664-665 R669 R729 R732 R735 R825
140-032-00	RESISTOR CF	20	5%	R848
140-037-00	RESISTOR CF	33	5%	R847
140-049-00	RESISTOR TF SMT	100	5%	R624
140-051-00	RES TF SM .1W 5% 120 OHM	120	5%	R407 R409 R412 R415 R514 R516 R576 R578 R652 R654 R786 R790 R846
140-057-00	RESISTOR CF	220	5%	R852-853 R857-860
140-061-00	RESISTOR CF	330	5%	R842 R844
140-064-00	RES TF SM .1W 5% 430 OHM	430	5%	R765
140-065-00	RESISTOR CF	470	5%	R841 R843 R845
140-066-00	RES TF SM .1W 5% 510 OHM	510	5%	R35 R37 R40-41 R70-73 R115 R117 R121 R132 R150-153 R198 R200 R204 R215 R235-238 R276 R278 R282 R291 R312-315 R336-337 R347 R356 R394-397 R433-434 R445 R456 R499-502 R618 R675 R840 R850-851
140-068-00	RESISTOR CF	620	5%	R839
140-073-00	RES TF SM .1W 5% 1K0 OHM	1K0	5%	R10 R13 R53-54 R60 R62 R85 R88 R133-134 R140 R142 R170 R173 R216-217 R225 R227 R255 R258 R292-293 R299 R301 R351-354 R365-368 R370-372 R376 R378-381 R451-454 R461-462 R469-472 R474-476 R479-480 R483-487 R494 R534 R552 R623
140-074-00	RESISTOR CF	1K1	5%	R574-575
140-076-00	RESISTOR CF	1K3	5%	R838
140-077-00	RESISTOR TF SMT	1K5	5%	R548 R628
140-079-00	RES TF SM .1W 5% 1K8 OHM	1K8	5%	R568 R572 R647 R650
140-080-00	RES TF SM .1W 5% 2K0 OHM	2K	5%	R23 R103 R187 R265 R622 R747 R834 R837
140-083-00	RESISTOR TF SMT	2K7	5%	R547 R627
140-084-00	RESISTOR TF SMT	3K0	5%	R5-6 R9 R12 R80-81 R84 R87 R165-166 R169 R172 R250-251 R254 R257
140-085-00	RES TF SM .1W 5% 3K3 OHM	3K3	5%	R691-692
140-086-00	RES TF SM .1W 5% 3K6 OHM	3K6	5%	R327 R329 R421 R423
140-087-00	RESISTOR CF	3K9	5%	R51 R61 R131 R141 R214 R226 R290 R300 R303 R382-384 R386 R488 R490-491 R836
140-088-00	RES TF SM .1W 5% 4.3K	4K3	5%	R556-557 R636-637 R701-702 R766-767

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PART NO.	DESCRIPTION	VALUE		REFERENCE DESIGNATORS
140-089-00	RES TF SM .1W 5% 4K7 OHM	4K7	5%	R29 R64-69 R109 R144-149 R182-183 R229-234 R305-311 R388-393 R493 R495-498
140-090-00	RES TF SM .1W 5% 5K1 OHM	5K1	5%	R20 R34 R36 R42-43 R57-58 R100 R114 R116 R120 R122 R137-138 R156 R158 R184 R194 R197 R199 R203 R205 R222-223 R241 R245 R275 R277 R281 R283 R296-297 R334-335 R338-339 R342-346 R348-349 R355 R400 R404 R431-432 R435-436 R440-444 R446-447 R455 R505 R509 R522 R529 R533 R538 R553-554 R563 R642 R707 R770 R776-777
140-091-00	RESISTOR CF	5K6	5%	R835
140-094-00	RES TF SM .1W 5% 7K5 OHM	7K5	5%	R50 R130 R213 R289 R358-359 R459-460 R558 R638 R693 R698 R703 R768 R854 R868
140-097-00	RES TF SM .1W 5% 10K OHM	10K	5%	R44-45 R75 R123-124 R160 R206-207 R218-219 R244 R317 R448 R458 R540-541 R543-544 R549 R555 R559-561 R567 R580 R583-584 R586-588 R590-591 R597-599 R601 R609 R612-613 R615-616 R619-620 R625-626 R633-635 R639-641 R646 R657-658 R672-673 R676-677 R686-687 R694-696 R699-700 R704-706 R709 R711 R714 R718-719 R722 R739-740 R743 R754 R764 R769 R771-773 R782 R784 R789 R793-795 R797 R799 R812 R814 R817-823 R826 R828 R833 R849 R869 R872 R875 R877
140-098-00	RES TF SM .1W 5% 11K OHM	11K	5%	R155 R157 R240 R243 R399 R403 R504 R508 R565 R570 R644 R649
140-101-00	RES TF SM .1W 5% 15K OHM	15K	5%	R159 R161 R242 R246 R377 R463 R478 R489 R571 R573 R651 R716
140-104-00	RES TF SM .1W 5% 20K OHM	20K	5%	R30 R46 R91 R110 R125 R176 R208 R284 R542 R546 R874 R876
140-105-00	RESISTOR TF SMT	22K	5%	R537
140-108-00	RESISTOR TF SMT	27K	5%	R11 R86 R171 R256
140-109-00	RES TF SM .1W 5% 30K OHM	30K	5%	R262 R272 R323 R325 R328 R331 R405-406 R419 R422 R425 R427 R437 R449 R510-511 R518 R521 R527 R536 R680-681 R688-690 R697 R749-750 R755-756 R760-761
140-111-00	RES TF SM .1W 5% 36K OHM	36K	5%	R25 R105 R189 R267 R678-679 R682-683
140-112-00	RES TF SM .1W 5% 39K OHM	39K	5%	R870-871
140-114-00	RES TF SM .1W 5% 47K OHM	47K	5%	R48-49 R127-128 R210-211 R286-287 R302 R357 R364 R375 R385 R457 R468 R482
140-119-00	RES TF SM .1W 5% 75K	75K	5%	R362-363 R369 R373 R466-467 R473 R477
140-123-00	RES TF SM .1W 5% 100K OHM	100K	5%	R3-4 R17 R27 R31 R52 R78-79 R89 R94 R97 R107 R111 R129 R164 R174 R179 R191 R193 R212 R249 R269 R271 R288 R318-319 R321-322 R324 R326 R330 R411 R414 R418 R420 R424 R512-513 R519-520 R528 R532 R550-551 R564 R566 R630-632 R643 R645 R708 R710 R751-752 R757-758 R762 R774 R778 R785 R787 R791 R810-811 R855-856 R862-863
140-130-00	RES TF SM .1W 5% 200K OHM	200K	5%	R401-402 R506-507 R796 R798

PART NO.	DESCRIPTION	VALUE		REFERENCE DESIGNATORS
141-051-00	RES TF SM .25W 5% 120 OHM	120	5%	R28 R108 R192 R270 R408 R410 R413 R416 R515 R517 R577 R579 R653 R655 R763 R775 R779-781 R783 R788 R792 R800-809 R865-866
145-066-00	RES MF SM .1W 1% 4.75 OHM	4.75	1%	R16 R96 R181 R261
145-279-00	RES MF SM .1W 787 OHM	787	1%	R596 R608
145-288-00	RESISTOR MF SMT	976	1%	R723 R730
145-296-00	RESISTOR MF SMT	1K18	1%	R816 R831
145-307-00	RESISTOR MF SMT	1K54	1%	R593 R604
145-317-00	RESISTOR MF SMT	1K96	1%	R663 R670
145-330-00	RES MF SM .1W 1% 2K43 OHM	2K43	1%	R684-685 R745-746
145-330-00	RESISTOR MF SMT	2K43	1%	R727 R736
145-339-00	RESISTOR MF SMT	3K01	1%	R14 R90 R175 R259 R592 R602
145-341-00	RES MF SM .1W 1% 3K16 OHM	3K16	1%	R426
145-346-00	RES MF SM .1W 1% 3K57 OHM	3K57	1%	R19 R93 R99 R178
145-350-00	RESISTOR MF SMT	3K92	1%	R660 R666
145-352-00	RES MF SM .1W 1% 4K12 OHM	4K12	1%	R18 R92 R98 R177
145-356-00	RES MF SM .1W 1% 4K53 OHM	4K53	1%	R712 R715
145-358-00	RESISTOR MF SMT	4K75	1%	R726 R734
145-368-00	RESISTOR MF SMT	6K04	1%	R595 R607
145-373-00	RES MF SM .1W 1% 6K81 OHM	6K81	1%	R428
145-377-00	RESISTOR TF SMT	7K50	1%	R724 R731
145-388-00	RESISTOR MF SMT	9K76	1%	R815 R832 R864 R867 R873
145-389-00	RES MF SM .1W 1% 10K0 OHM	10K0	1%	R21-22 R24 R26 R101-102 R104 R106 R185-186 R188 R190 R263-264 R266 R268
145-397-00	RESISTOR MF SMT	12K1	1%	R585 R594 R606 R614
145-406-00	RESISTOR MF SMT	15K0	1%	R662 R668 R717 R738
145-416-00	RESISTOR MF SMT	19K1	1%	R728 R737
145-417-00	RESISTOR MF SMT	19K6	1%	R813 R830
145-418-00	RES MF SM .1W 1% 20K0 OHM	20K0	1%	R7-8 R82-83 R167-168 R252-253
145-426-00	RESISTOR MF SMT	24K3	1%	R582 R589 R600 R611
145-435-00	RESISTOR MF SMT	30K1	1%	R659 R661 R667 R674
145-445-00	RESISTOR MF SMT	38K3	1%	R721 R725 R733 R742
145-455-00	RESISTOR MF SMT	48K7	1%	R581 R610
145-456-00	RES MF SM .1W 1% 49K9 OHM	49K9	1%	R523-524 R530 R824 R827 R829
145-464-00	RESISTOR MF SMT	60K4	1%	R656 R671
145-474-00	RESISTOR MF SMT	76K8	1%	R720 R741
146-373-00	RES MF SM .25W 1% 6K81 OHM	6K81	1%	R1-2 R76-77 R162-163 R247-248
200-010-02	PLY .0018UF 10% 100V TR	0.0018	2.00%	C34 C75 C121 C163 C192-193 C234-235
200-011-02	CAPACITOR MYLART&R	0.0022	2.50%	C409-412 C420-423 C467-468 C480-481
200-013-02	PLY .0082UF 10% 100V TR	0.0082	2.00%	C195-198 C236-237 C241-242
200-014-02	PLY .0033UF 10% 100V TR	0.0033	2.50%	C35-36 C76-77 C123-124 C164-165
200-025-02	PLY/BX .56UF 5% 63V TR	0.56		C39 C80 C127 C168 C171 C203 C210 C249
200-029-02	CAPACITOR MYLART&R	0.22	10%	C316-319 C330-333 C354-355 C367-368 C500-501 C505
200-031-02	PLY .022UF 2% 50V TR	0.022	5%	C199-200 C204-205 C243-244 C250-251 C356-359 C369-372 C407-408 C418-419
212-001-00	CER .01UF 10% 50V X7R SM	0.01	10%	C14 C17-18 C20 C24 C29 C31 C54 C57 C59 C61 C65 C70 C72 C82 C85 C99 C102-103 C105-106 C110 C115-116 C118 C122 C130-131 C147 C150 C154 C160 C230 C238 C265 C272-273 C277-280 C291-292 C320 C322-325 C328-329 C360-366 C373 C376 C413-417 C471-474 C478-479 C482-483 C488 C509-510 C516-517

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PART NO.	DESCRIPTION	VALUE	REFERENCE DESIGNATORS
212-003-00	CER 100PF 5% 50V NPO SM	100PF 5%	C334 C338
212-004-00	CER 220PF 5% 50V NPO SM	220PF 5%	C5 C45 C90 C138
212-005-00	CER 20PF 5% 50V NPO SM	20PF 5%	C81 C83 C129 C132 C180 C184 C188 C212 C215 C224 C255 C258 C264 C266 C275 C282 C290 C303 C309 C313 C340 C342 C348 C351 C374-375 C378-380 C384-385 C391-393 C399 C402 C440
212-006-00	CAPACITOR CERAMIC SMT	470PF 5%	C2 C4 C6 C11 C42 C44 C46 C51 C87 C89 C91 C96 C135 C137 C139 C144
212-007-00	CER .047UF 20% 50V Z5U SM	0.047 20%	C513
212-009-00	CER 47PF 5% 50V NPO SM	47PF 5%	C12-13 C52-53 C97-98 C145-146 C228-229 C231-232 C308 C347 C398 C441 C444-445 C450 C454 C457 C460 C504 C506
212-010-00	CAPACITOR CERAMIC SMT	.1UF -400	C19 C58 C60 C104 C170 C182-183 C202 C207 C214 C217 C222-223 C239-240 C245-246 C248 C257 C260 C285 C287 C295 C297 C300-302 C304-305 C310 C314 C336-337 C339 C343-344 C349 C352 C377 C381-383 C386-389 C394-395 C400 C403 C442-443 C447-448 C452 C455 C458 C461 C463-464 C485 C489-493 C496-497 C507-508 C514-515
212-015-00	CAPACITOR CERAMIC SMT	33PF 5%	C288 C293
212-018-00	CER 10PF 5% 50V NPO SM	10PF 5%	C32 C73 C119 C161 C169 C201 C206 C247
212-019-00	CAPACITOR CERAMIC SMT	150PF 5%	C10 C15 C21 C23 C50 C55 C62 C64 C95 C100 C107 C109 C143 C148 C151 C153
212-021-00	CAPACITOR CERAMIC SMT	27pF	C270-271 C276 C321 C326-327 C469-470 C475-477 C484
212-023-00	CAPACITOR CERAMIC SMT	0.001 10%	C9 C49 C94 C142 C175 C220
220-002-02	LYT 47UF 20% 25V RAD TR	47UF 20%	C3 C8 C26 C28 C30 C33 C37-38 C40 C43 C48 C67 C69 C71 C74 C78-79 C84 C88 C93 C112 C114 C117 C120 C125-126 C128 C133 C136 C141 C156 C158-159 C162 C166-167 C172-174 C176-179 C181 C185-187 C189-191 C194 C208-209 C211 C213 C216 C218-219 C221 C225-227 C233 C252-254 C256 C259 C261-263 C267-269 C274 C281 C283-284 C286 C289 C294 C296 C306-307 C311-312 C315 C335 C341 C345-346 C350 C353 C390 C396-397 C401 C404-406 C424-439 C446 C449 C451 C453 C456 C459 C462 C465-466 C486-487 C494-495 C498-499 C502-503 C511-512
220-003-02	LYT 47UF 20% 50V RAD TR	47UF 10%	C1 C7 C41 C47 C86 C92 C134 C140
220-004-02	CAPACITOR LYTIC RADIAL T&R	470UF 10%	C16 C56 C101 C149
220-008-02	LYT 1UF 20% 50V RAD TR	1UF 10%	C298-299
220-013-02	LYT .22UF 20% 50V RAD TR	.22UF 10%	C22 C25 C27 C63 C66 C68 C108 C111 C113 C152 C155 C157

PART NO.	DESCRIPTION	VALUE	REFERENCE DESIGNATORS
300-003-00	DIODE SIGNAL SMD	DL4148	D24-25 D54-59
301-004-00	DIO PWR DL4002 SM	DL4002	D1-4 D6-9 D11-14 D16-19
302-010-03	DIO ZEN DL5232B 5.6V SM	DL5232	D22-23
304-002-00	LED RED T1-3/4 W FLASHER	RED	D53
304-027-02	LED RED W/.425 SPACER TR	RED	D21 D26 D28 D40-41
304-028-02	LED YEL W/.425 SPACER TR	YEL	D5 D10 D15 D20 D27 D29 D42
304-029-02	LED GRN W/.425 SPACER TR	GRN	D30-39 D43-52
310-002-02	XSTR PNP 2N4403 T/A	2N4403	Q12-13
311-001-00	XSTR NPN IMBT4401 SM	IMBT4401	Q9-11
311-002-00	X-SISTOR PNP SMD	IMBT4403	Q1-8
320-011-00	I.C. LINEAR	NJM 4560	U60-61
320-012-00	OPAMP NJM4560M	NJM4560M	U1 U3-5 U7-31 U33-34 U36-39 U41-59 U62-65 U72-77
323-002-00	I.C. QUAD COMPARATOR SMD	LM339	U2 U6 U66-71
325-086-03	IC, ANALOG MUX/DEMUX	74HC4053	U32 U35 U40
400-022-00	CONNECTOR JACK QUAD RCA HORIZ		J25
400-041-00	CONNECTOR XLR PC MTG VERT MALE		J39-41
400-048-00	HDR 7P .156X1 RTA		J44
400-214-00	JACK 1/4 V PCMNT 1MM WASH		J2-3 J7-8 J10-11 J13-24 J26-33 J35-38 J42-43
400-223-00	CONNECTOR XLR PC MTG VERT FML		J1 J6 J9 J12
400-349-00	HDR SKT BOT ENTRY 14P .100X1		J4-5
450-241-00	PCB, CFX: MAIN		Z2
500-037-00	SWITCH 2PDT PUSH V SNAPIN	2P2T	SW1-46
500-045-00	SW ROT ENCODER 15.5MM 4BIT		S1
601-010-00	FERRITE BEAD, SMT	Z=73	L1
620-042-00	CBL FLEX STRIP 16C .1X1 4IN		J34
660-002-00	JUMPER WIRE 24GA T&R		Z1 Z5-7 Z50 Z901
660-002-00	JUMPER WIRE 24GA T&R		JP1-76
706-009-00	SPACER, NYLON, LED .385		Z8
706-033-01	STDF SWAGE NO.4 X .542L F		H1-21
706-038-00	STDF NO.4 X .250L		H22-24
760-107-00	BTN 2 COLOR 9X5MM		B1-2 B4-8 B10-14 B16-20 B22-25 B27-30 B32-46
760-108-00	BTN 2 COLOR 9X9MM		B3 B9 B15 B21 B26 B31


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550-242-00 REV A, Slave 4 board





PART NO.	DESCRIPTION	VALUE	REFERENCE DESIGNATORS
130-002-02	POT RTY 50KB 9MM MNO H TN	50KB	R47 R55 R59 R126 R135 R139 R209 R220 R224 R285 R294 R298
130-003-02	POTRTY 50KG 9MM MN TN PAN	50KG	R32-33 R38-39 R63 R112-113 R118-119 R143 R195-196 R201-202 R228 R273-274 R279-280 R304
130-030-02	RESISTOR POT 9MM HORIZ	5KZY	R15 R95 R180 R260
130-031-00	POT SLD 10KD 60MM MONO	10KD	R74 R154 R239 R316
130-064-02	POT 500KC 12MM DUL WO SLV	500KC	R56 R136 R221 R295
140-066-00	RES TF SM .1W 5% 510 OHM	510	5% R35 R37 R40-41 R70-73 R115 R117 R121 R132 R150-153 R198 R200 R204 R215 R235-238 R276 R278 R282 R291 R312-315
140-073-00	RES TF SM .1W 5% 1K0 OHM	1K0	5% R10 R13 R53-54 R60 R62 R85 R88 R133-134 R140 R142 R170 R173 R216-217 R225 R227 R255 R258 R292-293 R299 R301
140-080-00	RES TF SM .1W 5% 2K0 OHM	2K	5% R23 R103 R187 R265
140-084-00	RESISTOR TF SMT	3K0	5% R5-6 R9 R12 R80-81 R84 R87 R165-166 R169 R172 R250-251 R254 R257
140-087-00	RESISTOR CF	3K9	5% R51 R61 R131 R141 R214 R226 R290 R300
140-089-00	RES TF SM .1W 5% 4K7 OHM	4K7	5% R29 R64-69 R109 R144-149 R182-183 R229-234 R305-306 R308-311
140-090-00	RES TF SM .1W 5% 5K1 OHM	5K1	5% R20 R34 R36 R42-43 R57-58 R100 R114 R116 R120 R122 R137-138 R156 R158 R184 R194 R197 R199 R203 R205 R222-223 R241 R245 R275 R277 R281 R283 R296-297
140-094-00	RES TF SM .1W 5% 7K5 OHM	7K5	5% R50 R130 R213 R289
140-097-00	RES TF SM .1W 5% 10K OHM	10K	5% R44-45 R75 R123-124 R160 R206-207 R218-219 R244 R317
140-098-00	RES TF SM .1W 5% 11K OHM	11K	5% R155 R157 R240 R243
140-101-00	RES TF SM .1W 5% 15K OHM	15K	5% R159 R161 R242 R246
140-104-00	RES TF SM .1W 5% 20K OHM	20K	5% R30 R46 R91 R110 R125 R176 R208 R284
140-108-00	RESISTOR TF SMT	27K	5% R11 R86 R171 R256
140-111-00	RES TF SM .1W 5% 36K OHM	36K	5% R25 R105 R189 R267
140-114-00	RES TF SM .1W 5% 47K OHM	47K	5% R48-49 R127-128 R210-211 R286-287
140-123-00	RES TF SM .1W 5% 100K OHM	100K	5% R3-4 R17 R27 R31 R52 R78-79 R89 R94 R97 R107 R111 R129 R164 R174 R179 R191 R193 R212 R249 R269 R271 R288
141-051-00	RES TF SM .25W 5% 120 OHM	120	5% R28 R108 R192 R270
145-066-00	RES MF SM .1W 1% 4.75 OHM	4.75	1% R16 R96 R181 R261
145-339-00	RESISTOR MF SMT	3K01	1% R14 R90 R175 R259
145-346-00	RES MF SM .1W 1% 3K57 OHM	3K57	1% R19 R93 R99 R178
145-352-00	RES MF SM .1W 1% 4K12 OHM	4K12	1% R18 R92 R98 R177
145-389-00	RES MF SM .1W 1% 10K0 OHM	10K0	1% R21-22 R24 R26 R101-102 R104 R106 R185-186 R188 R190 R263-264 R266 R268
145-418-00	RES MF SM .1W 1% 20K0 OHM	20K0	1% R7-8 R82-83 R167-168 R252-253
146-373-00	RES MF SM .25W 1% 6K81 OHM	6K81	1% R1-2 R76-77 R162-163 R247-248
200-010-02	PLY .0018UF 10% 100V TR	0.0018	2.00% C34 C75 C121 C163
200-014-02	PLY .0033UF 10% 100V TR	0.0033	2.50% C35-36 C76-77 C123-124 C164-165
200-025-02	PLY/BX .56UF 5% 63V TR	0.56	C39 C80 C127 C168
212-001-00	CER .01UF 10% 50V X7R SM	0.01	10% C14 C17-18 C20 C24 C29 C31 C54 C57 C59 C61 C65 C70 C72 C82 C85 C99 C102-103 C105-106 C110 C115-116 C118 C122 C130-131 C147 C150 C154 C160
212-004-00	CER 220PF 5% 50V NPO SM	220PF	5% C5 C45 C90 C138
212-005-00	CER 20PF 5% 50V NPO SM	20PF	5% C81 C83 C129 C132

PART NO.	DESCRIPTION	VALUE	REFERENCE DESIGNATORS
212-006-00	CAPACITOR CERAMIC SMT	470PF 5%	C2 C4 C6 C11 C42 C44 C46 C51 C87 C89 C91 C96 C135 C137 C139 C144
212-009-00	CER 47PF 5% 50V NPO SM	47PF 5%	C12-13 C52-53 C97-98 C145-146
212-010-00	CAPACITOR CERAMIC SMT	.1UF -400	C19 C58 C60 C104
212-018-00	CER 10PF 5% 50V NPO SM	10PF 5%	C32 C73 C119 C161
212-019-00	CAPACITOR CERAMIC SMT	150PF 5%	C10 C15 C21 C23 C50 C55 C62 C64 C95 C100 C107 C109 C143 C148 C151 C153
212-023-00	CAPACITOR CERAMIC SMT	0.001 10%	C9 C49 C94 C142
220-002-02	LYT 47UF 20% 25V RAD TR	47UF 20%	C3 C8 C26 C28 C30 C33 C37-38 C40 C43 C48 C67 C69 C71 C74 C78-79 C84 C88 C93 C112 C114 C117 C120 C125-126 C128 C133 C136 C141 C156 C158-159 C162 C166-167 C169-170
220-003-02	LYT 47UF 20% 50V RAD TR	47UF 10%	C1 C7 C41 C47 C86 C92 C134 C140
220-004-02	CAPACITOR LYTIC RADIAL T&R	470UF 10%	C16 C56 C101 C149
220-013-02	LYT .22UF 20% 50V RAD TR	.22UF 10%	C22 C25 C27 C63 C66 C68 C108 C111 C113 C152 C155 C157
301-004-00	DIO PWR DL4002 SM	DL4002	D1-4 D6-9 D11-14 D16-19
304-028-02	LED YEL W/.425 SPACER TR	YEL	D5 D10 D15 D20
311-002-00	X-SISTOR PNP SMD	IMBT4403	Q1-8
320-012-00	OPAMP NJM4560M	NJM4560M	U1 U3-5 U7-16
323-002-00	I.C. QUAD COMPARATOR SMD	LM339	U2 U6
400-214-00	JACK 1/4 V PCMNT 1MM WASH		J2-3 J7-8 J10-11 J13-14
400-223-00	CONNECTOR XLR PC MTG VERT FML		J1 J6 J9 J12
400-349-00	HDR SKT BOT ENTRY 14P .100X1		J4-5 J15-16
450-242-00	PCB, CFX: CHANNEL		Z1
500-037-00	SWITCH 2PDT PUSH V SNAPIN	2P2T	SW1-24
660-002-00	JUMPER WIRE 24GA T&R		JP1-31
706-033-01	STDF SWAGE NO.4 X .542L F		H1-10
760-107-00	BTN 2 COLOR 9X5MM		Z2-17 Z22-25
760-108-00	BTN 2 COLOR 9X9MM		Z18-21

550-258-00 REV B, Power Supply

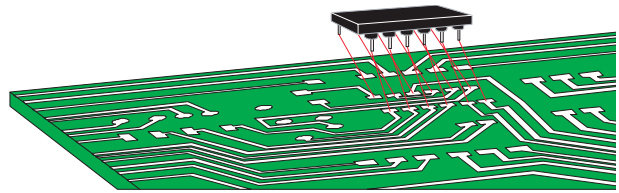
PART NO.	DESCRIPTION	VALUE	REFERENCE DESIGNATORS
100-028-00	RESISTOR CF	130 5%	R1 R4
100-031-00	RESISTOR CF	180 5%	R8
100-057-00	RESISTOR CF	2K2 5%	R2 R5
100-064-00	RESISTOR CF	4K3 5%	R3 R6
110-080-00	RESISTOR CF	20K 5%	R7
121-093-00	RESISTOR MF	6K8 5%	R9
211-001-00	CAPACITOR CERAMIC	0.01 -400	C5 C11 C15
211-010-00	CER .01UF +80/-20% 50V AX	0.01 -400	C16
220-002-02	CAPACITOR LYTIC RADIAL TAPE	47UF 10%	C14
220-007-00	CAPACITOR LYTIC RADIAL	100UF 10%	C18
220-011-02	LYT 100UF 20% 25V RAD	100UF 10%	C6 C13
220-012-02	CAPACITOR LYTIC RADIAL TAPE	4.7UF 10%	C19
220-023-00	CAPACITOR LYTIC RADIAL	6,800UF 10%	C8-9 C12
220-026-00	CAPACITOR LYTIC RADIAL	1,000UF 10%	C17
220-027-02	CAPACITOR LYTIC RADIAL TAPE	10UF 10%	C7 C10
301-001-00	DIO PWR 1N4002	1N4002	D1-7 D12-21
301-003-00	DIODE POWER	1N5401	D8-11
321-003-00	I.C. LINEAR POS 3 TERM VOLTAGE REGULATOR	LM 7805	U3
321-008-00	I.C. ADJ POS 3 TERM VOLTAGE REGULATOR	LM317T	U1 U4
321-009-00	I.C. ADJ NEG 3 TERM VOLTAGE REGULATOR	LM337T	U2
400-060-00	FUSE CLIP PC MT 5MM DIA	NULL	Z8-9
400-093-00	HDR 7P .156X1 LOCKING		J2
400-173-00	TERM .25 QKDS PCMT STABLE		J3
400-348-00	TERM QDISC .187 MALE PCMT		J4
400-350-00	HDR 9P .156X1 STR LOCK		J1
450-258-00	PCB, CFX POWER SUPPLY		Z18
 510-002-00	FUSE .5A SLO BLO 5 X 20MM	.5A	F1

550-260-00 REV A, AC Power Input

PART NO.	DESCRIPTION	VALUE	REFERENCE DESIGNATORS
040-135-00	CBL ASSY 18GA 1010 GRN/YEL 9"		P10
 200-023-00	PLY/BX .001UF 20% 250V Y2	.001uF 20%	C1-2
 200-024-00	PLY/BX .01UF 20% 250V Y2	.01uF 20%	C3
400-060-00	FUSE CLIP PCMT 5MM DIA		Z2-3
 400-132-00	IEC MALE RTA PCMT		J1
400-173-00	TERM .25 QKDS PCMT STABLE		P2 P9
 450-260-00	PCB, CFX AC POWER INPUT		Z1
500-052-00	SW SPST PWR ROCKER RTA BLK		SW1
712-020-00	BRKT ANG 6-32X.037THK STL		BKT1
712-021-01	RIVET, CL END .125"		Z6-7



MACKIE®



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EFX Board Modification Instructions:

Models affected:

All PPM series powered mixers: 406M, 408M, 408S, 808M and 808S

All CFX series compact effects mixers: CFX•12, CFX•16 and CFX•20

Verify the following symptom on any of these units in for repair:

Symptom:

While program material is playing, if the EFX BYPASS switch is depressed and a delay function is selected, as soon as the EFX BYPASS is unselected, the program material that was last recorded in the delay line is played at the outputs. In other words, the EFX BYPASS switch acts like a sample and hold when a delay function is selected.

Solution: Cut Pin 1 of the EFX board's ribbon cable.

Safety Warning:



Caution! These instructions are for use by qualified personnel only. To avoid electric shock, do not perform any servicing unless you are qualified to do so. Refer all service and modifying to qualified personnel.

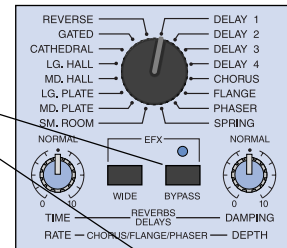
Tools Required:

Sharp pair of electrical cutters, Phillips screwdriver, safety glasses.

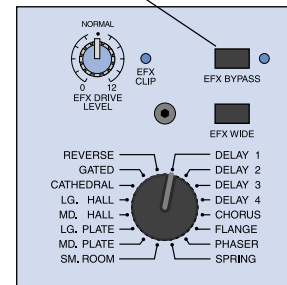
Powered Mixer repair

In order to perform this on the Powered Mixer series, the front panel must be removed.

- 1/ Remove all cords- including the power cable and speaker outputs- from the mixer.
- 2/ Place the mixer on a dry, non-marring surface with the heat sink facing down.
- 3/ Remove the six screws securing the front panel of the mixer to the plastic enclosure. These are located three per side on the far left and right edges of the front panel. Keep track of which screws go where.
- 4/ Carefully disconnect the white block connector located on the right side of the front panel of the mixer.
- 5/ Disconnect the green 16-gauge chassis ground wire located in the center of the bottom edge of the mixer's front panel.
- 6/ Remove the mixer front panel from the plastic chassis and place face down on a dry, non-marring surface.
- 7/ Pull the ribbon cable off the EFX board and cut pin 1 as shown in the diagram on page 2. The cut should be flush with the ribbon cable's insulation, so there is no chance of any electrical contact.
- 8/ Replace the ribbon cable onto the EFX board, making sure that all pins are inserted correctly, and there is no connection to pin 1.
- 9/ Reassemble the mixer and fully retest before returning it to your customer.



Front panel EFX controls for CFX mixers

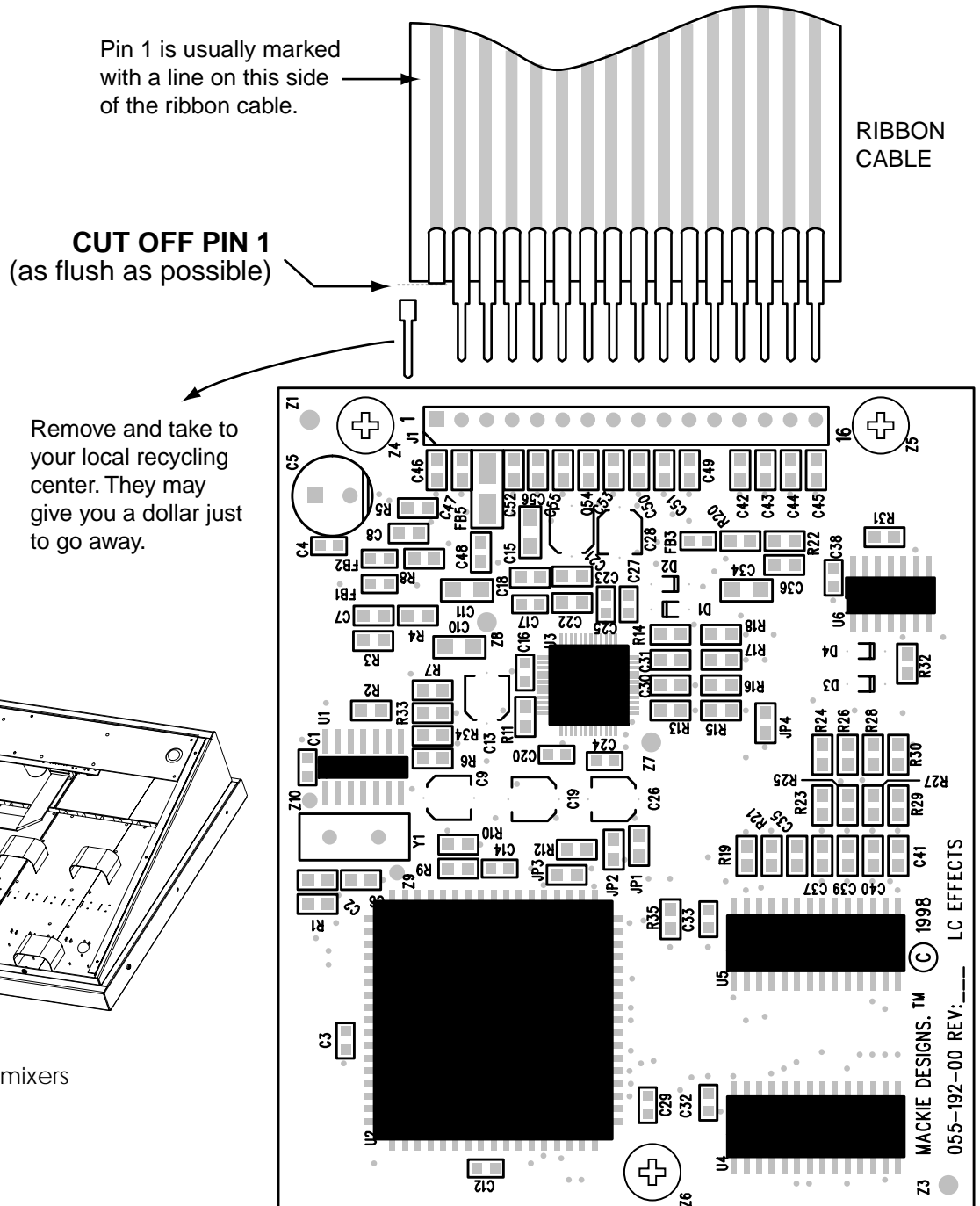


Front panel EFX controls for PPM mixers

CFX Mixer repair

In order to perform this on the CFX Compact Mixer series, the bottom panel must be removed.

- 1/ Remove all cords- including the power cable from the mixer.
- 2/ Place the mixer upside down on a dry, non-marring and donut-free surface.
- 3/ Remove the screws securing the bottom panel of the mixer.
- 4/ Pull the ribbon cable off the EFX board and carefully cut pin 1 of the cable as shown in the diagram below. The cut should be flush with the ribbon cable's insulation, so there is no chance of any electrical contact.
- 5/ Replace the ribbon cable onto the EFX board, making sure that all pins are inserted correctly, and there is no connection to pin 1.
- 6/ Reassemble the mixer and fully retest before returning it to your customer.



EFX BOARD, BOLTED TO THE REAR FACE OF THE MIXER BOARD.