

Phoenix Harmonic Exciter

Part Value	Reference	8-13-16	Description
470-Ω	R15		
100K	R3, R5, R10, R14, R17		
22K	R11		
1Meg	R2		
10K	R8, R9		
2K2	R1, R7		
4K7	R6		
1K	R4, R12, R13, R16		
470 pf	EQ	Special Effect	Quiets the higher pitch tones, only if wanted
.01	C16		Filters off any remaining RF in audio path
.1uf	C15		
1uf	C10		
10uf	C1, C2, C3, C4, C5, C6,		
10uf	C8, C11, C12, C13, C14,C18		
1000 uf	C1a to C1b		This capacitor mounts on bottom side of PCB for support
10uf *	C17	Tantalum	Observe polarity
10K	To VCA	Potentiometer	Controls level back into the EWS, board mounted
10K	Gain	External Pot	Drive second OP gain for best wave shape
10K	Waveform	External Pot	Control of main wave shape
600 Ω 1:1	T1	Transformer	This adds the skew to wave form for the even harmonics
Q3	2N3904	NPN Transistor	This drives the 555 pin 2 trigger
LM358	U1		OP amplifies audio level for shaping
TLC555	U2		Drives LED, adds some effects to sound
V0618A	U3	Opto-Isolator	Adds a nice effect to the sound
1N4007	D1		Prevents 15 volt reverse power supply damage
1N4007	D4		Prevents ribbon cable reverse power supply damage
TP-1	TP-1		Signal from mixer diode
TP-2	TP-2		Sine wave from second OP before transformer
TP-4	TP-4		555 square wave output
Regulator	78L05		Powers Harmonic Exciter with 5 volts
Regulator	78L09		Powers Pitch Preview LM386
3-Pin strip	S-3	Switch	Select +9v or +5v for Pitch Preview LM 386
2-Pin strip	S-1	Switch	This move audio signal closer to bottom rail of OP LM358
2-Pin strip	S2		Switch between pure Sine Wave to Clara sound
4-pin strip	+V In O gnd	Terminal	Attach jumper ribbon from Breakout board
4-pin strip	+V gnd A M	Terminal	Attach jumper ribbon to Pitch Preview
Term 3.5mm	TRM	x3	Terminal for LED, EQ, FV
+15v			Connect wire to plus side of EWS C19 electrolytic Capacitor.

Extras:	Not at Mouser		
PCB's		x2	2-Layer Breakout and 4-Layer Harmonic Exciter
CdS Cell		x1	Mounts at FV for a single finger volume control - experiment
20 cm ribbon cable		x2	Breakout to Exciter and Exciter to Pitch Preview board
10k	external Pot	x2	Potentiometer with ribbon cable for Gain & Waveform
Wood Screws		x2	Hold Exciter board on shoulder at volume side
Pin Strip		x1	cut to proper size
.1" Jumper clips		x4	plus a couple of extra as they get lost
PP Amplifier		x1	LM 386 finished board for Pitch Preview
Power Socket			Female midi socket to drop power cord out the bottom of EWS
8-pin dip sockets		x2	Sockets are best when experimenting