GREY DIE

PCB V2.0 BUILDER'S MANUAL



TABLE OF CONTENTS

- 1. Title Page
- 2. General Build Notes
- 3. 16mm Pot Adapter Board Info
- 4. 3PDT Daughterboard Info
- 5. Circuit Info
- 6. Bill of Materials
- 7. Onboard Wiring / Component Layout
- 8. Offboard Wiring (3PDT PCB)
- 9. Offboard Wiring (No 3PDT PCB)
- 10. Schematic
- 11. Drill Template



Cloned circuits with original functionality



PCB boards designed to allow direct mount 90 degree potentiometers

Dimensions (W=50.80mm x H=30.23mm) Recommended enlcosure 1590B

For a downloadable PDF copy of this manual, visit www.hammondtoneworks.com/support



DISCLAIMER:

All board layouts have been tested and verified. While we do offer support on our boards, there is an understood assumption that the end user (you) have the knowledge and skill needed to assemble the product and accept any risk involved with assembling the provided boards or parts. This understood skill level includes knowing how to properly solder, etc. If you have any issues with our boards or have any questions concerning any of our products, please contact us at **support@hammondtoneworks.com** Thank you for supporting us, we geniunely appreciate it! Now, get to bulding!

COMMERCIAL USE:

You may use our boards in personal or commercial projects if desired, as long as the branding on the board remains visible and unaltered.

Hammond Toneworks PCB boards are manufactured to accomodate the following recommended components

Resistor:	1/4w metal film or carbon film resistors (7.62mm lead spacing on all resistor connections)
Film Cap (B)	: Film box type capacitor (5mm lead spacing unless otherwise noted)
Cer Cap (M)	Monolithic ceramic capacitor (5.08mm lead spacing, ceramic disc capacitor can be used as a substitution)
Cer Cap (D):	Ceramic disc capacitor (2.54mm lead spacing)
Elec Cap:	25V Electrolytic Capacitor recommended, unless otherwise noted (50V caps recommended if using over 9V power) (2.54mm lead spacing)
Transistor:	All transistor holes are spaced to 2.54mm for easier soldering (2.54mm lead spacing)
Diode:	6.32mm lead spacing and 0.9mm hole diameter on PCB
Pots:	Potentiometers are to be connected to the effect board directly. Common 16mm right angle pots are recommended. (5mm lead spacing)
Wires:	Wiring connection holes are drilled to 1mm diameter and are spaced 2.54mm apart. Use of 24G wire is recommended for easy assembly

RECCOMENDED ASSEMBLY ORDER

1. EFFECT BOARD ASSEMBLY

- Solder small components first (resistors, diodes, etc) then work your way up to soldering the tallest components , then potentiometers, and finally the connection wires to the 3PDT daughter board (if used)

2. OFFBOARD WIRING

- Refer to the recommended offboard wiring methods on pages 8 or 9 (depending on your preference)



16mm PCB PIN POTENTIOMETER ADAPTER BOARD

Optional potentiometer adapter boards are available for purchase directly or via our Reverb store. These allow a secure connection with potentiometers that have a straight pcb pin type connection and to help organize offboard wiring. **These adapters are optional, and only recommended if the potentiometers in use do not have solder lugs or are unable to be connected directly to the pcb.**

NOTE:

It is easier to attach the wires to the adapter boards first, then solder the potentiometer to the adapter board **LAST**. Attach the wires to the front side of the PCB with the Hammond Toneworks logo, and attach the potentiometer to the rear side of the PCB that is marked with "POT THIS SIDE".





ASSEMBLED

(SHOWN WITHOUT WIRING)





3PDT DAUGHTERBOARD PCB

Included with your board is an optional 3PDT daughterboard PCB (compatible with enclosure sizes 1590B and larger) to help organize offboard wiring and simplify connections to the main circuit. Follow the wiring diagrams on pages 7 & 8 if using the 3PDT PCB daughterboard.

NOTE:

oneworks

Attach all PCB connections and components first, then solder the 3PDT switch to the 3PDT PCB board **LAST**. This is necessary due to the fact that the switch itself blocks access to some of the onboard soldering points located on the daughterboard to save space. Assemble the components and wires to the front side of the PCB with the Hammond Toneworks logo, and attach the 3PDT switch to the reverse side of the PCB that is marked with "3PDT THIS SIDE" wiring points are labeled on both sides of the PCB for ease of assembly.





REAR



4

CIRCUIT INFO



Classic late 70's op-amp distortion. Are you ready to get down and dirty? Because this will get you there. With it's two-knob simplicity and a great recognizable sound, this pedal circuit is a favorite of builders and players alike. The Grey One is capable of being built to the 1977, 1978, and 1980 versions of the vintage grey box *DOD 250 Overdrive / Preamp** as well as the first iteration of the 1982 yellow version.

CONTROLS

GAIN:

The GAIN control adjusts the amount of signal coming into the circuit, turn the potentiometer clockwise to increase the gain and increase clipping.

VOLUME:

The VOLUME control adjusts the overall output volume of the circuit. Turn clockwise to increase the output level of the circuit.

* Hammond Toneworks is in no way affiliated with Harman International Industries, Inc.



VERSION INFO AND B.O.M. PAGE INDEX

The Grey One V2 board is capable of being built to several version specs, a summary of the values are listed in the chart to the right.

For full bill of materials and component tables, please refer to the pages listed below according to which version of the circuit you would like to build.

1977 Grey Spec - 6a

1978 Grey Spec - 6b

1980 Grey Spec - 6c

1982 yllw Spec - 6d

HT GREY ONE - COMPONENT VALUE CHART											
COMP.	1977 GRY	1978 GRY	1980 GRY	1982 YLW							
U1	741	741	741	741							
		RESISTOR	S								
R1	10K	10K	10K	10K							
R2	510K	470K	470K	470K							
R3	20K	22K	22K	22K							
R4	20K	22K	22K	22K							
R5	1M	1M	1M	1M							
R6	4.7K	4.7K	4.7K	4.7K							
R7	10K	10K	10K	10K							
R8	JUMPER	JUMPER	100R	100R							
FILM CAPS											
C1	2.2n 1.5M RESISTOR										
C2	10n	10n	10n	10n							
C5	47n	47n	47n	47n							
C7	1n	1n	1n	1n							
	C	ERAMIC CA	APS .								
C4	OMIT	OMIT	OMIT	25p							
	ELE	CTROLYTIC	CAPS								
C3	OMIT	10u	10u	10u							
C6	4.7u	4.7u	4.7u	4.7u							
		DIODES									
D2	1N4001	1N4148	1N4148	1N4148							
D3	1N4001	1N4148	1N4148	1N4148							
		POTS									
GAIN	C500K	C500K	C500K	C500K							
VOLUME	B100K	B100K	B100K	B100K							



RESISTOR		FILM CAP (B)		ELEC CAP		DIODE		IC		POTS	
QTY	VALUE	QTY	VALUE	QTY	VALUE	QTY	VALUE	QTY	VALUE	QTY	VALUE
1	4.7K	1	1n	1	4.7u	2	1N4001	1	LM741	1	B100K
2	10K	1	2.2n							1	C500K
2	20K	1	10n								
1	510K	1	47n								
1	1M										

NOTE: Off board components are not listed (indicator LED, input/output jacks, power input jack, footswitch)

SMALL COMPONENT TABLE (Small components may be taped down here)



jumper in place of R8

RESISTOR		FILM CAP (B)		ELEC CAP		DIODE		IC		POTS	
QTY	VALUE	QTY	VALUE	QTY	VALUE	QTY	VALUE	QTY	VALUE	QTY	VALUE
1	4.7K	1	1n	1	4.7u	2	1N4148	1	LM741	1	B100K
2	10K	1	10n	1	10u					1	C500K
2	22K	1	47n								
1	470K										
1	1M										
1	1.5M										

NOTE: Off board components are not listed (indicator LED, input/output jacks, power input jack, footswitch)

SMALL COMPONENT TABLE (Small components may be taped down here)



POPULATED for the circuit to work. A leftover resistor leg works perfectly as a jumper. Simply solder the jumper in place of R8



RESISTOR		FILM CAP (B)		ELEC CAP		DIODE		IC		POTS	
QTY	VALUE	QTY	VALUE	QTY	VALUE	QTY	VALUE	QTY	VALUE	QTY	VALUE
1	100R	1	1n	1	4.7u	2	1N4148	1	LM741	1	B100K
1	4.7K	1	10n	1	10u					1	C500K
2	10K	1	47n								
2	22K										
1	470K										
1	1M										
1	1.5M										

NOTE: Off board components are not listed (indicator LED, input/output jacks, power input jack, footswitch)

SMALL COMPONENT TABLE (Small components may be taped down here)



RESISTOR		FILM CAP (B)		CER CAP (M)		ELEC CAP		DIODE		IC		POTS	
QTY	VALUE	QTY	VALUE	QTY	VALUE	QTY	VALUE	QTY	VALUE	QTY	VALUE	QTY	VALUE
1	100R	1	1n	1	25p	1	4.7u	2	1N4148	1	LM741	1	B100K
1	4.7K	1	10n			1	10u					1	C500K
2	10K	1	47n										
2	22K												
1	470K												
1	1M												
1	1.5M												

NOTE: Off board components are not listed (indicator LED, input/output jacks, power input jack, footswitch)

SMALL COMPONENT TABLE (Small components may be taped down here)





3PDT V2.2

Board mounted

ONBOARD WIRING



(wire length, boards, and pots are not shown to scale. They have been sized to fit this page for illustration purposes)





POTS

ONBOARD WIRING



EXAMPLE VIEW





OFFBOARD WIRING

You may use your own method of offboard wiring if preferred. The following wiring is recommended as it is the method used in testing our PCBs. As long as the effect PCB receives the correct 9V, Ground, In, and Out connections, it will work properly. A 3PDT PCB board is included with your effect board to simplify the offboard wiring process. All effect PCBs are designed to use a positive 9V input (18V where specified) unless otherwise noted. The offboard wiring method below allows the pedal to be powered using a common standard modern 9V positive sleeve/negative center power supply.



Solder point

* LED can be any value of your choice.

Typical recommendation is 4.7k for normal red LEDs, but may require up to 56k depending on LED brightness and color.



The following wiring is recommended if no 3PDT board is available, as it is the method used in testing our PCBs. As long as the effect PCB receives the correct 9V, Ground, In, and Out connections, it will work properly. A 3PDT PCB board is included with your effect board to simplify the offboard wiring process, if you would like to use the included board, see page 8. This wiring method uses a positive 9V input (18V where specified) unless otherwise noted. The offboard wiring method below allows the pedal to be powered using a common standard modern 9V positive sleeve/negative center power supply.



• = Solder point

* LED can be any value of your choice.

Typical recommendation is 4.7k for normal red LEDs, but may require up to 56k depending on LED brightness and color.



HAMMOND[®] Toneworks

SCHEMATIC



PRINT THIS PAGE ACTUAL SIZE

DIRECTIONS:

1. Cut along dotted lines, and fold along the solid outline to preshape the paper template.

2. Carefully align template to the empty enclosure (without bottom lid) and tape in place to the enclosure. You can also tape the corners of the template together once it is attached, to have a "cast" paper template ready if drilling more than one enclosure.

3. Using a steel punch, mark the drilling holes in the center of each cross. (mind the number of knobs) The punch should mark the enclosure even through the paper.

4. Remove template and check spacing on punched drill markers to ensure that everything will fit nicely. It's better to find out now than later. A common issue is the jacks being too high or low, hold a jack centered on the punch mark to see the clearance and make sure the lid will close (requires 2mm clearance from the open end of enclosure) and that the jack is not touching the bottom of the enclosure. Re-punch the drill markers if needed

5. Drill away!

Take your time. It's more rewarding to be patient and have a properly drilled enclosure than to rush and be out of alignment. 1590**B**

DRILL TEMPLATE

1590B 2 Knob Drill Template

Including drill size



* This template and its measurements were calculated using manufacturer's specs and physically tested on Hammond Manufacturing branded size 1590B enclosures.

Hammond Toneworks is in no way affiliated with Hammond Manufacturing Co. Ltd. or its subsidiaries.

