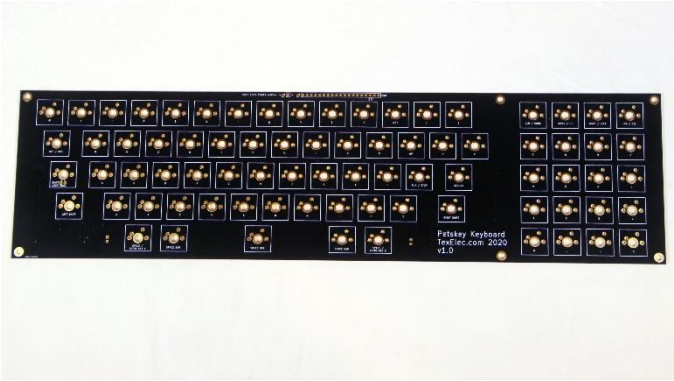
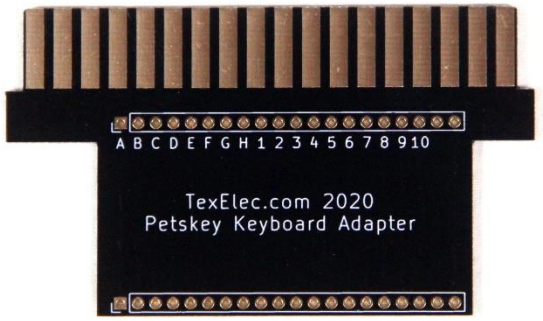
Petskey Keyboard Documentation and Assembly Guidance 0.1v – https://TexElec.com

The Petskey Keyboard consists of two separate circuit boards. The main board is all needed to use the Petskey with a Mini Pet. It was designed to use the same right-angle connector used by the Mini Pet but some standoffs, or preferably, rubber feet should be used on the bottom of the PCB to help level and stabilize it. A ribbon cable could be used to extend the connection between the keyboard and Mini Pet.



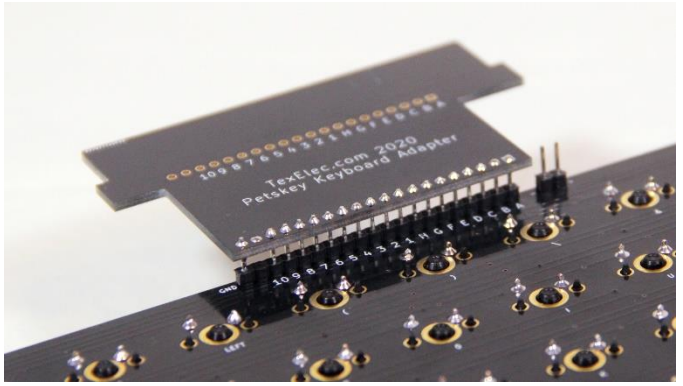
Main Petskey PCB



Petskey Edge Connector / Adapter

The second board adds the needed edge connector to work as a replacement keyboard for the Commodore Pet. The original keyboard is much different than the Petskey PCB. The keys are mounted in a large plastic housing with the PCB mounted on the bottom and a large metal shield is screwed into the Pet case around the whole assembly. This secures the keyboard into place and leaves the PCB connector for the keyboard low enough to clear the top of the case and easily allow the edge connector to attach. The Petskey PCB is flush against the top of the case, which is part of the reason the edge connector is on a separate board. The idea is to use a vertical pin header to 'drop' the edge connector below the main PCB and allow enough clearance for the keyboard connector to attach.

Original Commodore Pet Keyboard



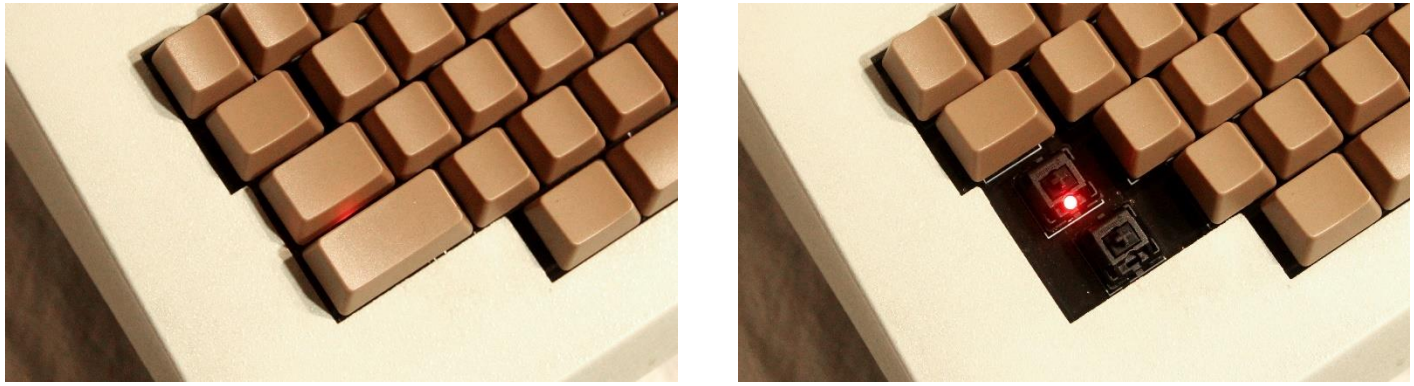
Petskey Keyboard with adapter installed

The parts needed to complete the assembly of the PCB are available from Mouser Electronics. The most important parts are the Cherry MX key switches. Cherry MX switches come in many varieties, but there are only three available from Mouser which are suitable for this PCB. The top option below are the cheapest standard keys with no tactile feel. The lower two are both tactile type keys and differ only in stem color. The key item to look for if buying the keys from other sources is a switch with NW in the part number. This designation is for PCB mounting which is necessary for the Petskey PCB. The keyboard is designed to use as few as 74 keys or as many as 78. The spacebar has three switches under it and only one is necessary. However, a spacebar 'spring' assembly will be needed with one. All three switches may be installed or just the outer two with no need for a spring. The spacebar will be very stiff with all three switches and feel a little unbalanced with two, so it is up to the end user to decide the best approach. There are also two extra keys on either side of the spacebar used to fill in the dead space leftover from the smaller spacebar. They are also optional, so could be omitted.

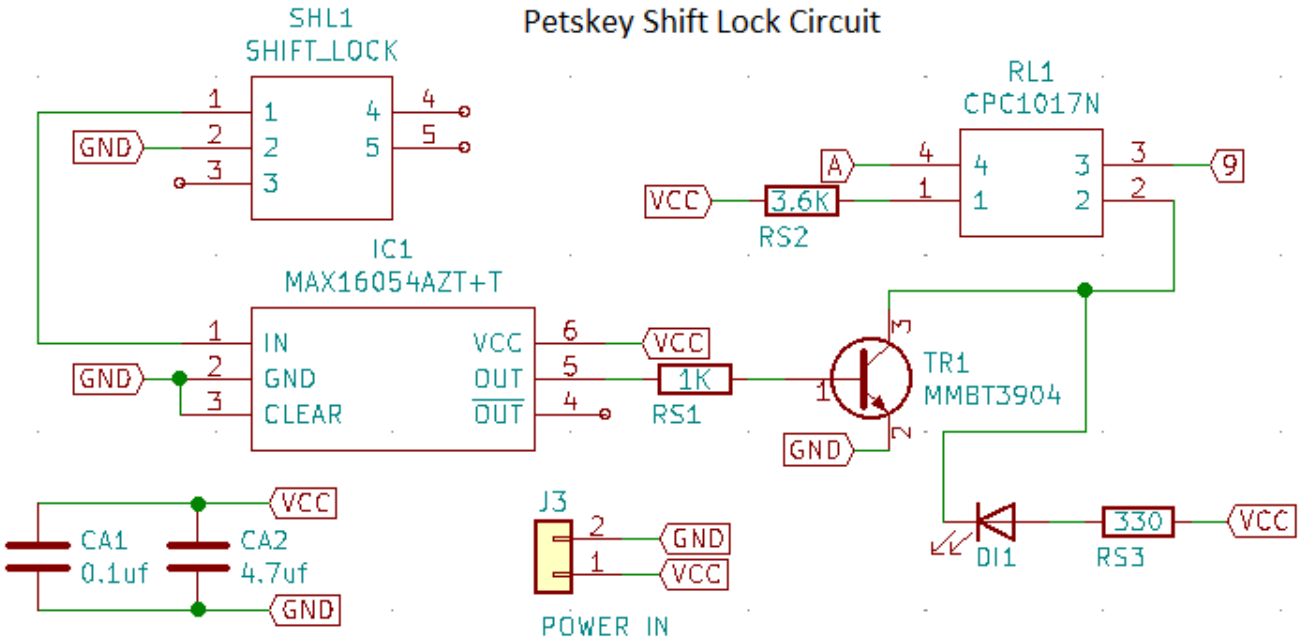
Part List for Cherry MX Key Switches (Mouser.com part numbers and prices in 50+ qty as of 8/19/2020):

Qty	Mouser #	Manu	Description	Price (USD)	Ext.: (USD)
74-78	540-MX1A-11NW	CHERRY	Pushbutton Switches Black Stem Linear Feel Fixation Pins for PCB Mounting	$0.665	$51.87
74-78	540-MX1A-C1NW	CHERRY	Pushbutton Switches Tactile Feel Clear Stem Fixation Pins for PCB Mounting	$0.76	$59.28
74-78	540-MX1A-E1NW	CHERRY	Pushbutton Switches Tactile Feel Blue Stem Fixation Pins for PCB Mounting	$0.76	$59.28

The original Commodore Pet Keyboard used a shift lock key which would physically lock down to engage and stand flush when disengaged. Cherry does not make a key with a locking feature like this, so a small circuit was designed to 'toggle' the shift lock key. It will also engage a LED which can be installed under the shift lock key or remotely by wiring the LED pads to the desired location.



LED Installed under Keycap

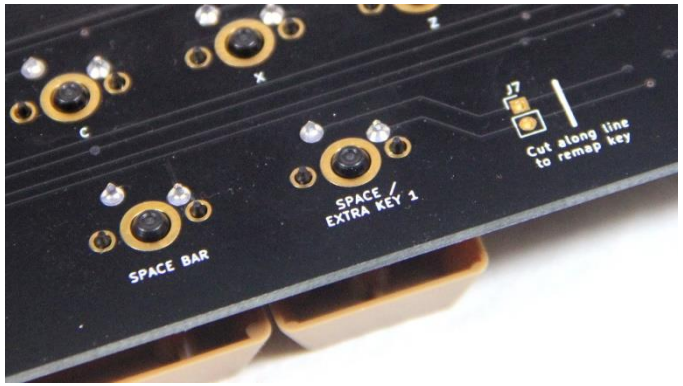


Above is the schematic for the shift lock circuit, part values and designations. This circuit is optional and can be omitted if the shift lock feature is not desired. The switch for the shift lock may be installed, but it will have no function without the optional circuit.

Part list for shift lock circuit (Mouser.com Part numbers and prices as of 8/19/2020):

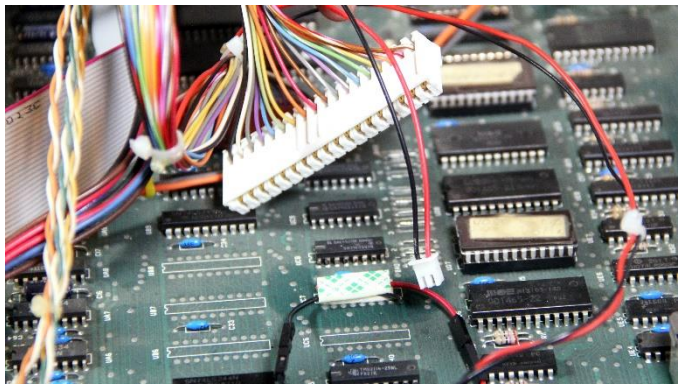
Qty	Mouser #	Manu	Description	Part	Price (USD)	Ext.: (USD)
1	700-MAX16054AZTT	Maxim	Supervisory Circuits On/Off Controller with Debounce and +/-15kV ESD Protection	IC1	$2.22	$2.22
1	604-WP710A10ID	Kingbright	Standard LEDs - Through Hole 3MM RED SS LAMP THRU HOLE	DI1	$0.23	$0.23
1	849-CPC1017N	IXYS	Solid State Relays - PCB Mount SPNO RELAY	RL1	$0.69	$0.69
1	791-0805X475K100CT	Walsin	Multilayer Ceramic Capacitors MLCC - SMD/SMT 4.7uF +-10% 10V	CA2	$0.13	$0.13
1	771-MMBT3904T/R	Nexperia	Bipolar Transistors - BJT TRANS SW TAPE-7	TR1	$0.10	$0.10
1	603-RC0805JR-073K6L	Yageo	Thick Film Resistors - SMD 3.6K OHM 5%	RS2	$0.11	$0.11
1	71-CRCW0805330RJNEAC	Vishay	Thick Film Resistors - SMD 1/8Watt 330ohms 5% Commercial Use	RS3	$0.10	$0.10
1	754-RR1220P-102D	Susumu	Thin Film Resistors - SMD 1/10W 1Kohm 0.5% 25ppm	RS1	$0.10	$0.10
1	80-C0805C104M5R	KEMET	Multilayer Ceramic Capacitors MLCC - SMD/SMT 50V 0.1uF X7R 0805 20%	CA1	$0.10	$0.10

The two extra keys located on either side of the spacebar are setup to be a space by default. However, they can be remapped if desired by cutting the traces to the switch along the line on the bottom of the PCB. There are two pads adjacent to the line which can be wired to any desired key. The keyboard matrix works by simply connecting the correct two wires together for a given key combination and it is possible for multiple switches to be connected to the same points. Each key is labeled on the bottom of the keyboard which allows easy location of the key you wish to connect.

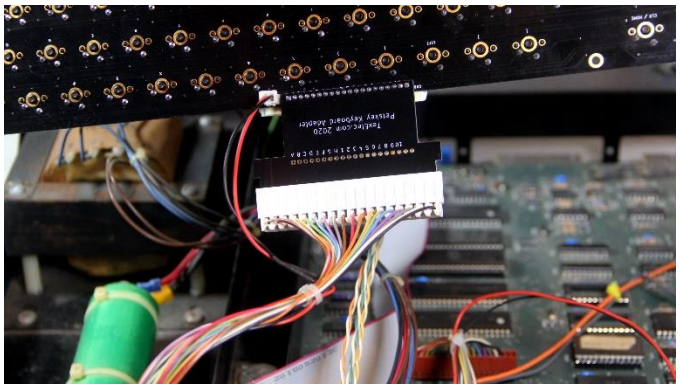


Extra Key 1 & 2 Locations and Trace Cut Lines

The power for the shift circuit may be taken from any +5 volt DC location on the Pet motherboard. We used power from an unused IC in our example. We then used a pair of wires secured with double-sided tape and zip-tied them to the existing keyboard wire harness. Leave some slack as pictured below to make sure the wire is long enough to reach the PCB.

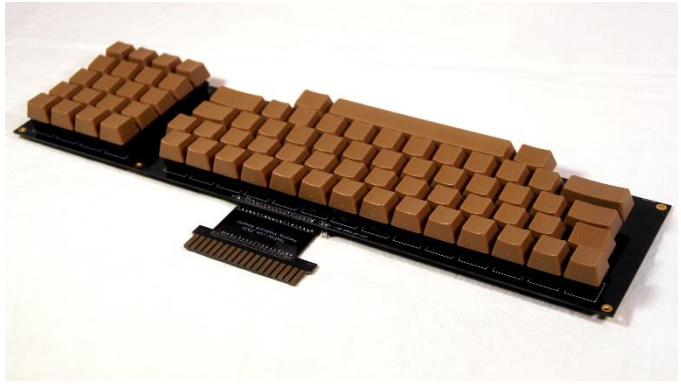


5 Volts DC Taken from Unused IC Socket



Power and Edge Connector Installed

It is necessary to use some form of protective tape on the top contacts of the Petskey PCB once Assembly of the keyboard is complete. The case of the Commodore Pet is plastic, but coated with a metalized coating inside which is used for shielding. Keys may not work, or trigger continuously without some form of protection over the contacts. We used a small piece of double-sided form tape and left the top peel away-layer in place. This has worked out well in testing, but any number of methods may be used to achieve the same result.



Keyboard Assembly Complete for Pet

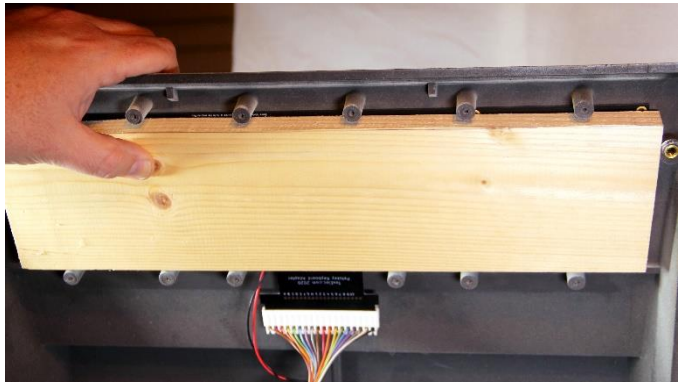
Thick foam Tape used as Insulation

One way to install the keyboard into the Commodore Pet is by using a piece of ¾" (19mm) lumber cut to approximately 15" (380mm) x 3 ¾" (95mm) as a spacer. The actual dimensions are not too critical. The idea is to fit the piece of wood under the keyboard and inside of the metal housing used to install the original PCB assembly. The height however is a little more critical and the ¾" or 19mm lumber may be a little too short. We also used two pieces of cardboard under the lumber (not pictured) to 'wedge' the PCB between a little more tightly between the top of the case, and the bottom of the metal housing.

Lumber in Metal Housing from Pet

PCB assembly on Top of Housing

Connect the shift power and keyboard cable before installing the metal housing. Install the screws but leave each a turn or two from full installation. It is best to make sure the PCB centered exactly where desired before tightening all the way. If it is tight enough, the keyboard assembly will be difficult to move around when installed. It is too loose; it will move around by hand easily and will need a bit more height.



Ready to Install Metal Shield

Installing Shield Screws

Petskey Keyboard Assembled and Installed in The Commodore Pet Model 4032

But Wait! What about the Keycaps?

Cherry MX keycaps are quite easy to obtain in many shapes and sizes from eBay, AliBaba, Max Keyboard and many other sources online. The original spacebar is much wider than the keys readily available today. Max Keyboard has a good key spacing guide we used to derive the best keyset to use. A standard key such as a 'Q' or '2' is called a 1x1 in Cherry's nomenclature. The space bars are typically defined as 1x6, 1x6.25 or 1x6.5. This means they are normal height, but 6 times wider, etc. The original Pet spacebar is closer to a 1x9 which is simply not available off the shelf. Therefore, we decided it best to have the option for another key on either side of the spacebar to fill in the space.

The 104 key ANSI keycap sets have almost everything needed for the Petskey Keyboard, and can be made to work if a wrong key or two is not a concern.

The Petskey keyboard uses:

- 3 - 1x1.5 - Return, Shift Lock, RVS/OFF
- 2 - 1x2 - Left & Right Shift Keys
- 1 - 1x6.25 - Spacebar
- 2 - 1x1.25 - Optional keys to the left & right of Spacebar
- 68 – 1x1 - All Other Keys

The 104 keycap set is short one 1.5x key unfortunately, but there are several 1.25x keys remaining which could be used instead. The completed assembly photo above shows a 1.25x key installed instead of a 1.5x on the RVS/OFF key. It is easy to see the extra space around this key, but it is still functional. Max Keyboard also sells individual keys & custom sets if you want to get the correct ones. It is also tricky to get the correct key angles correct with a standard set. Suffice it to say, that the Pet Keyboard does not have an easy off the shelf replacement set of keycaps, but with some trial and error, a standard set may be made to work.

Some keycap sets are blank as pictured, and others are pre-labeled. The labeled sets will work out for most of the standard keys, but the original pet has many keys with no directly available replacements. Labels could be made, and custom engraved or laser-etched sets are available online from many sources as well. There are many options available to explore depending on the desired outcome.