

If you're tired of playing your favorite classic arcade games in MAME using your keyboard but aren't quite ready to dedicate a corner of your living room to a six-foot tall full-size arcade cabinet, a good solution (and one that's easier to get permission from your significant other to build than that full-size arcade cabinet) is to build your own MAME controller. Homemade MAME controllers are surprisingly simple and inexpensive to make, and can greatly improve your MAME gaming experience!

The most important step is also the first – PLANNING. Is your controller going to support one player, or two? Are you going to set it on your desk or on your lap? Is your favorite game Pac-Man (a game that uses a 4-way joystick and no buttons) or Mortal Kombat 3 (which requires an 8-way joystick and six buttons per player)? There's no reason why you can't design a controller that will work with both, but it'll never work out if you don't plan ahead! If you're a computer guy, pull up your favorite drawing program and keep moving circles around until you like what you see. If you're more of a hands-on guy, try cutting out some circles out of paper and moving them around until you like the way it feels. I've seen many controllers completely assembled out of cardboard before a single piece of wood was ever cut. Don't forget while laying out your buttons that for MAME, you may want to include player start buttons and coin-up buttons.

Once you have a general idea of the size and layout of your controller, it's time to get some wood and start cutting! The type of wood you choose depends on the look you want and how you plan on finishing the controller. I've used both 1/2 " and 3/4 " wood and had good results. If you want to save yourself a ton of frustration, pick up a couple of extra drill bits at your local hardware store. Arcade buttons need a 1 1/8" hole, while joysticks generally require a 1 1/4 " hole.

Now comes the less fun part. You've got to get all those buttons and joysticks talking to your computer. If you want quick and easy, pick up an encoder such as the I-PAC. All the controller's wires will hook directly to the encoder, which then connects to your PC. Most encoders ship pre-configured for MAME, so once your wiring is done you're ready to go. Most of the new encoders have USB connections, which will allow you to easily disconnect your controller when not in use. These encoders are generally available for under \$40.

If the ultimate goal of your controller is to keep prices down, you may want to make your own encoder by hacking a keyboard. This involves soldering a wire from each button on your new controller to a contact point on a disassembled computer keyboard. It's inexpensive, but it takes a lot of time, patience and frustration to get it just right. Additionally, many keyboard hacks experience what's known as "ghosting" and/or "blocking". The next time you're at your computer, open up a text editor and, using your entire hand, press down as many keys as you can at the same time. Chances are, you won't see more than three or four letters appear. Keyboards weren't designed to take in a lot of input all at once – and if that's the heart of your MAME controller, neither will it. Also keep in mind that if you use a PS/2 keyboard, that means you'll be unplugging your normal keyboard in order to use your controller. Keyboard hacks work, but they definitely have limitations.

If you plan on making a MAME controller for only one player, a better option would be to hack a joystick (Microsoft Sidewinders and Gravis Gamepads seem to be popular donors). The idea is the same as a keyboard hack; open the joystick and solder your wires directly to the contacts on the joystick's circuit board. Most of these controllers are USB, which again makes building a controller out of them convenient.

Once you've got your controller assembled, it's time to decorate it! The only limit here is your imagination. The simplest solutions involve simply painting your controller. I've also seen the tops of controllers wrapped in \$1 sheets of contact paper that turned out looking really nice. Slightly fancier controllers may end up covered in Formica. Even fancier ones may end up with graphics printed on top of them, covered by a layer of Plexiglas. Many MAME controllers end up with T-molding around their edges, just like their arcade dwelling big brothers. Like I said, the sky's the limit here.

Even starting from scratch, you can build a really nice looking MAME controller for \$50-\$100, depending on the number of controls and the finish you decide on. With just a little bit of elbow grease, you can build yourself a one of a kind controller and save yourself some money in the process.