http://www.phantasmechanics.com/fpilot.html

Gaslight on a Budget:

If you've already read about ALF, our 'upper-mid-tech' flicker emulator, and aren't willing to tackle that circuit, you now have two other options: The Flicker Pilot (my own idea) and the even-simpler-to-build Quick'n'Easy Flickerer, submitted by phantasmechanic Phil Tucker.

A WARNING FOR BEGINNERS
These projects involve working with 120 V. A.C. current. If you are not familiar and comfortable with basic wiring techniques, please do not attempt to build these projects! Always remove power when modifying or servicing these devices!

THE FLICKER PILOT

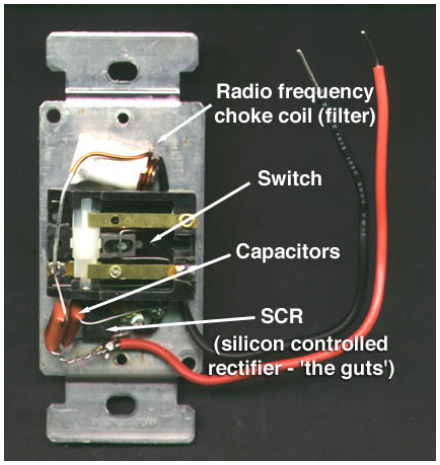
The inspiration for this device was the gas-mantle flicker observed in a very famous Orlando haunt owned by a very large and still growing entertainment conglomerate. The technique described below (invented in 1997) was my guess at one possible method that might have been used, and inside sources recently revealed that this guess was surprisingly accurate.

Although I cannot reveal the famous corporation's original invention - which is typically brilliant imagineering - I can show you how to achieve an almost identical effect without

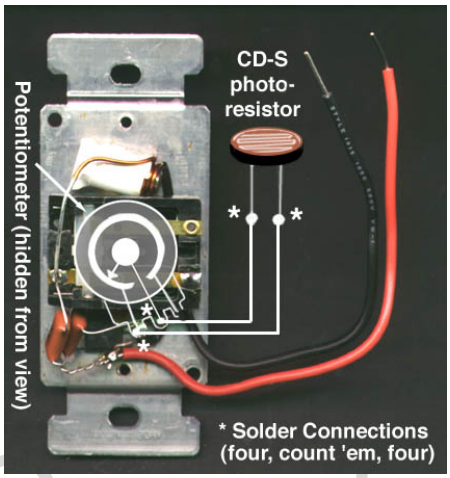
sweat, tears and more complex circuitry. The magic ingredient which makes our inexpensive version possible is the humble flicker-flame bulb, commonly available at Home Depot, as show at right. It is available in a C-7 candelabra base, and the standard light bulb base.

You don't have to wire any circuit boards or order exotic parts, but the Flicker Pilot will drive 600 watts* of incandescent lights - enough to fill anything from a few lanterns to the largest gaslight-era chandelier you can imagine. All you will need: a flicker bulb, socket, wire, a wall dimmer with a round knob, a cadmium sulfide (CdS) photoresistor (available at Radio Shack), a project box to mount it all in - and the will to tinker for a while. We recommend that you purchase a dimmer model with a front panel which mounts with **screws**, not rivets, as you must remove the panel to make the simple modification. An example of a good choice is shown at left.

(*Consult the rating of the dimmer you purchase for capacity.)



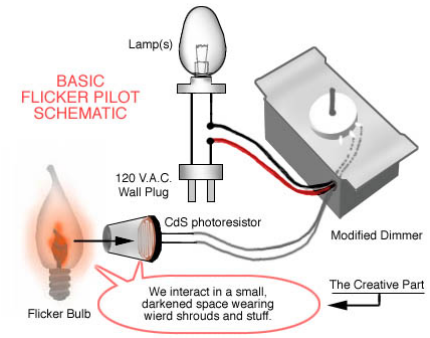
At right, you can see the insides of the dimmer. It works by rectifying A.C. current to pulsed D.C. in the form of square waves, by means of a little part called an SCR, or silicon controlled rectifier. The width of the pulses is varied by means of the knob, and as the pulse width narrows, the amount of energy output decreases (read about ALF for a more accurate discussion.) The SCR produces a good bit of heat in performing this task, and it is attached to the metal cover of the dimmer which functions as a heat sink, or radiator for cooling.



Beneath the push-on/push-off switch is another component known as a **potentiometer**. This is very similar to the rotary volume controls on audio devices, and is also known as a **variable resistor**. Your task, should you choose to accept it, is to connect the CdS photoresistor across the same leads used by the dimmer (there is a third connection, but it's not used in dimmers.)

Use small diameter insulated wire, and thread it through the same hole in the plastic cover through which the dimmer wires pass. You'll have to make sure all four wires will fit, and be sure to pass them through before connecting the CdS cell. Yes, this means soldering - our imagineering how-to covers the basics of soldering for novices. You will solder the leads for the photoresistor directly on top of the existing solder joins, using additional solder.

REMEMBER: If it isn't obvious, you should use electrical tape to insulate the solder joints on the external photoresistor. In no case should bare metal be exposed on any conductor of your finished product! WARNING: Unplug the device before repositioning the photocell! There is enough voltage on the leads to shock you. The finished FlickerPilot should be encased in a box, and **all** wire connections must be properly insulated.



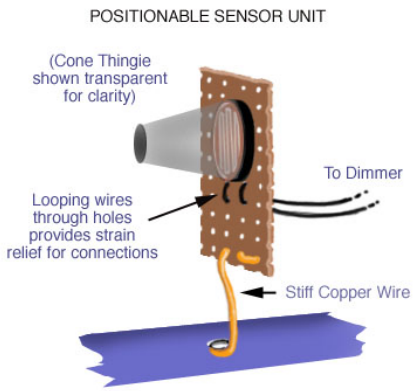
Once you have the modified dimmer completed, wire your test system up as shown at right. The CdS cell and flicker bulb should have a darkened space all to themselves. Since no two flicker bulbs behave the same way, every system will be unique, and will require experimentation to perfect.

Generally speaking, you should surround your photoresistor with a cylendrical or conical shroud to assure that the light it 'sees' comes only from the flicker bulb. The smaller the aperture at the bulb end - up to a point - the more pronounced the flicker effect will be. Small apertures require more precise positioning, however, and a too-small opening will not admit enough light. *This is where you must experiment and be patient.*

Observe the flicker bulb's activity - no two behave in exactly the same way. The idea is to point the cell assembly at the bulb where there is a lot of activity. What the cell sees is what activates your lights - it's doing the same thing that would be accomplished by twiddling the knob slightly and rapidly by hand. (In the finished unit, the knob serves to control the overall level of illumination, allowing you to fine tune your staging.) Obviously, you can't do your experiments with the parts shut away from all light, but at least keep a dark background behind the bulb, opposite the CdS sensor.

Flicker bulbs are fickle. As the bulb ages, the flicker pattern changes, and you can expect a maximum life of a month or two of constant use before it dies. For haunt purposes, this is generally quite acceptable. Occasionally, a flicker bulb may go dark, then without warning, start working again. Despite this compromise in reliability, you're

getting a lot of effect out to a relatively cheap component, so just keep a spare or two on hand.



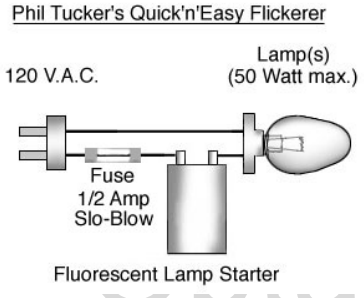
Since the necessity of occasional adjustments must be expected, mount the cell assembly so that it can be repositioned easily. One helpful suggestion is to mount the cell to a small piece of perforated circuit board at the time of wiring. You can then use an empty section of the board to accept a piece of stiff copper wire, as shown at left. The wire can then be screw-mounted to the box.

With the specter of experimentation before you, you might be wondering if this gadget has really been tested. It has indeed, and it performed perfectly for the entire operation of a major haunt during the 1999 season. It was instrumental in winning the organization's 'Best Prop' and 'Best Looking Room' awards, sharing credit with 5 FCG's which hovered around the large gaslight-effect chandelier it powered. The lights were C-9 outdoor Christmas bulbs in a stock set purchased from Wal-Mart.

The only failure I experienced was due to a missing part: A well-meaning individual purloined the flicker bulb for use in another room. I had left the Flicker Pilot box open, as it was stashed in a dark corner, and I wanted to be able access the sensor in case it needed adjusting. The person who took the bulb had no idea it was part of a system.

As I have said many times, an effect doesn't have to be expensive to be effective. A reviewer for a local paper even mistook the FCG's for optical projections (seriously!)

THE QUICK'N'EASY FLICKERER



Can it get any simpler than the FlickerPilot? You bet! Phil Tucker sent us his favorite method, and it's about as simple (and clever) as can be. The circuit at right tells the tale. Using a fluorescent starter module (Home Depot), this gadget can handle up to 50 Watts of lights. I can hardly do better than this diagram in explaining it. This requires no elaborate enclosure. All

you need to do is insulate your connections carefully, and *voila,* instant flicker!

IMPORTANT! *There is a possible risk of fire with this gadget if the wattage of the bulb is too high.* Add a 500ma (1/2 amp) fuse to the circuit for safety as illustrated.

Note that there is no adjustment for brightness, so choose low-wattage bulbs if you want a dimly lit scene. This is the only experimentation required in the construction of this device.

Another experienced starter-flicker user, my friend John J. wrote to us with the following advice: "...you want to use a starter anywhere from 4W up to 25W. Anything over 30W is a waste of time. I've had a good mimic with the 4, 6, 8W or 15-20W pushing a 45W bulb."

Want More Realism? Try...

MICKEY'S MANTLE

To achieve a truly realistic-looking gas lamp, you need to simulate the look of a mantle, the cloth element that glows white-hot when lit in a gas-air mixture environment. The bulb shown at right (Home Depot should have it) is the ideal base. A real mantle should be available from any sporting goods store that stocks parts for Coleman lanterns. Simply stretch the mantle over the bulb and secure it. When powered by the FlickerPilot or a Quick'n'Easy Flickerer, this gaff should do the job well! Each bulb is rated at 15 Watts; be sure to do the math (simple addition) for your load.

If the mantle does not cover the entire bulb, simply collar the exposed area of the bulb near the bottom so it doesn't show. I will leave the details up to you, but the idea is so simple it hardly needs further elaboration in print.