Smart Home Hacks

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Let’s Get Smart

- Building Blocks
- The Zen of Home Automation
- Five Fun Hacks

Your Power Line Network

- X10 is a “power line carrier” protocol
- Ubiquitous, but not perfect
- Easy to add to an existing home
- Variety of inexpensive devices

X10 Details

- Serialized commands sent over the AC power line
- X10 modules are connected to power line and listen for commands
- All modules are always listening for commands
- Modules respond when they see a command with their X10 address
  - House codes: A-P
  - Unit codes: 1-16
  - Example X10 address: B5

Lamp & Appliance Modules

- Modules let you control:
  - Lamps
  - Fans
  - Coffee Pots
  - Radios

Motion Detectors

- Passive Infrared Detection
- Battery-operated
- Sends wireless signal to a nearby transceiver
- Transceiver relays signal to the power line
- Not exactly instantaneous

Sending X10 Commands

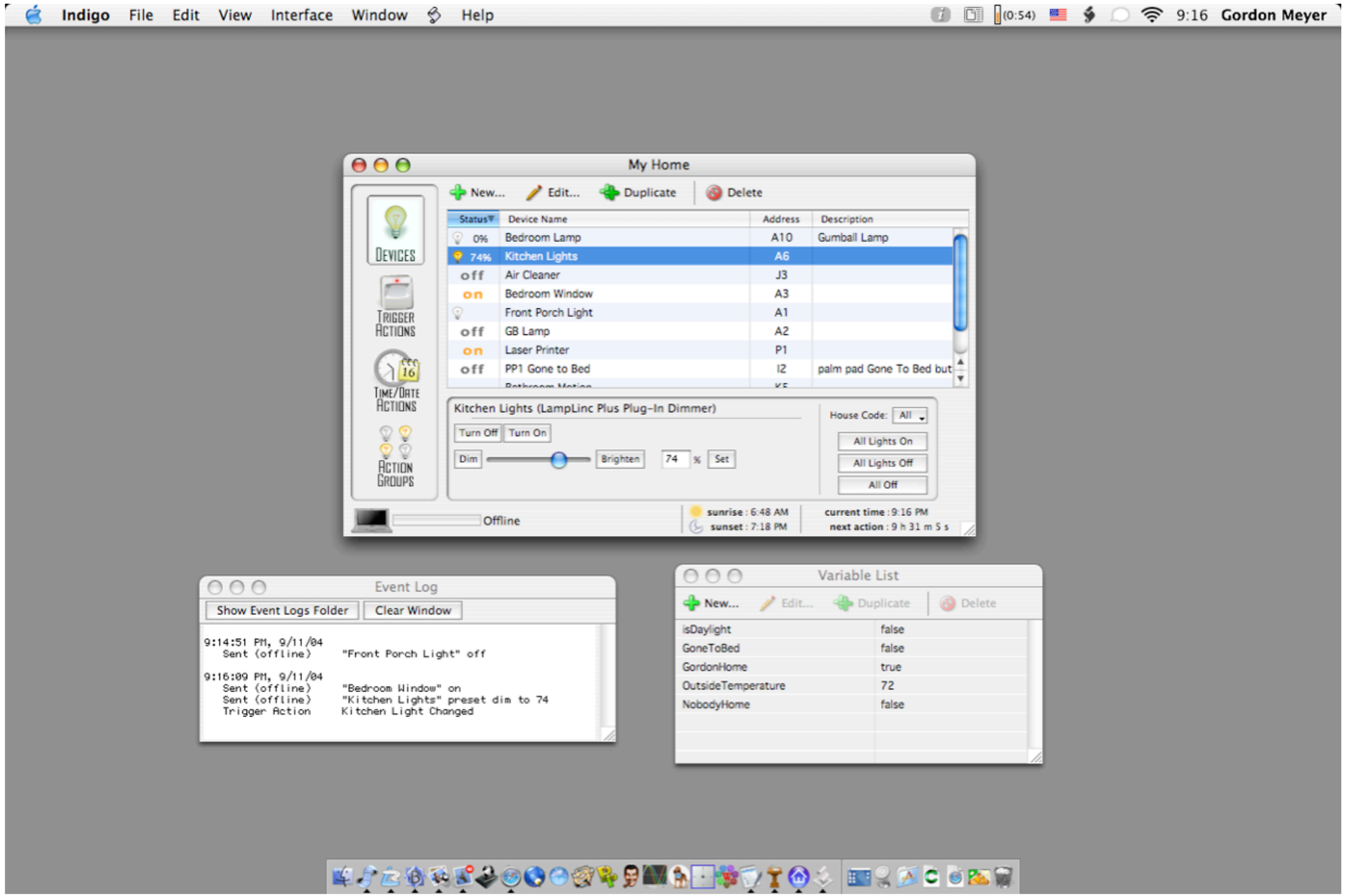
- Mini-controllers let you manually send X10 commands
- Turn lights on or off
- Dim lights
- Trigger a macro in your home automation software

Add a Brain to Your Smart Home

Move Beyond Remote Control

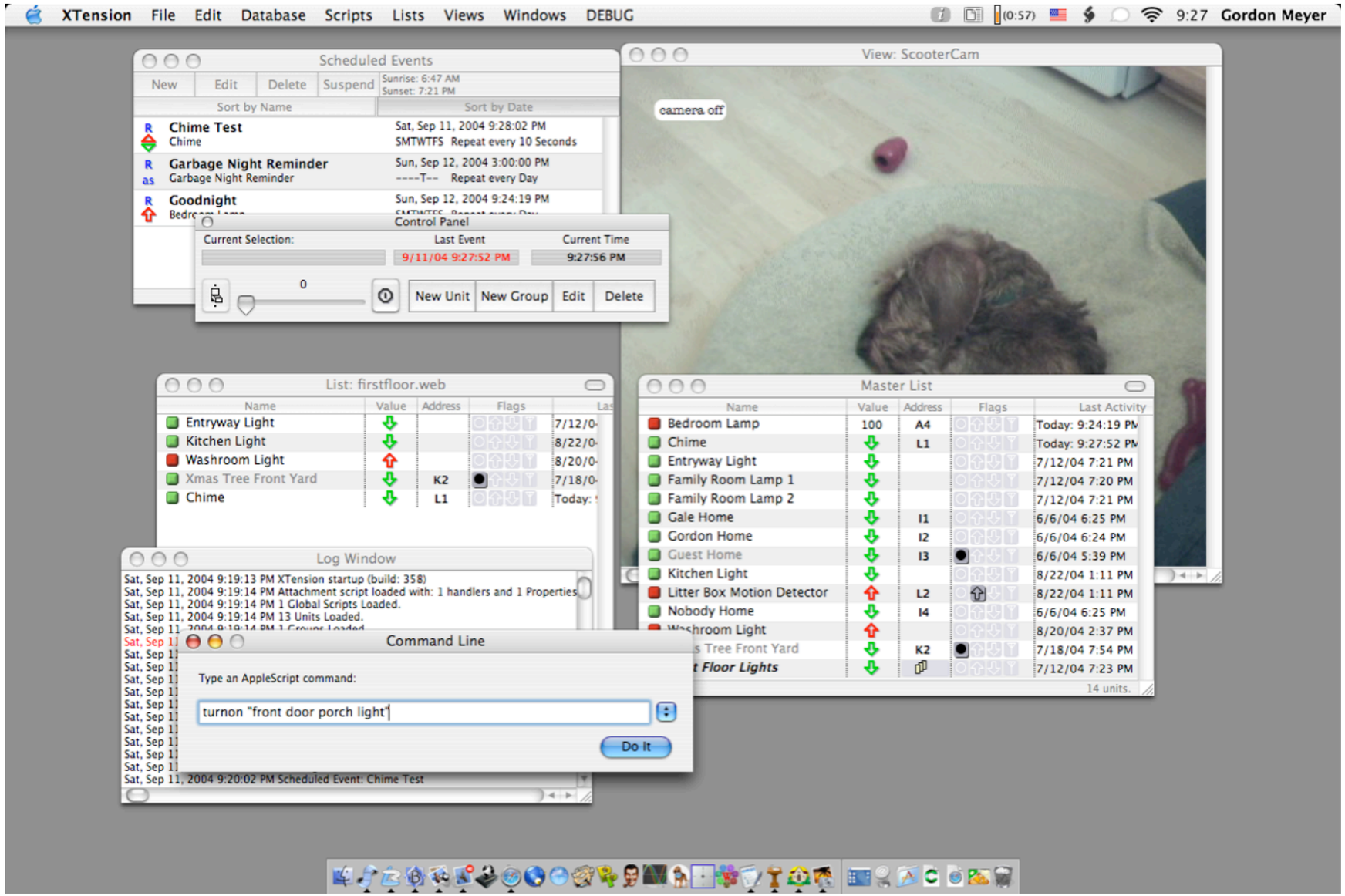
Indigo

www.perceptiveautomation.com



XTension

www.shed.com



MUSCLE

www.shotton.com/muscle

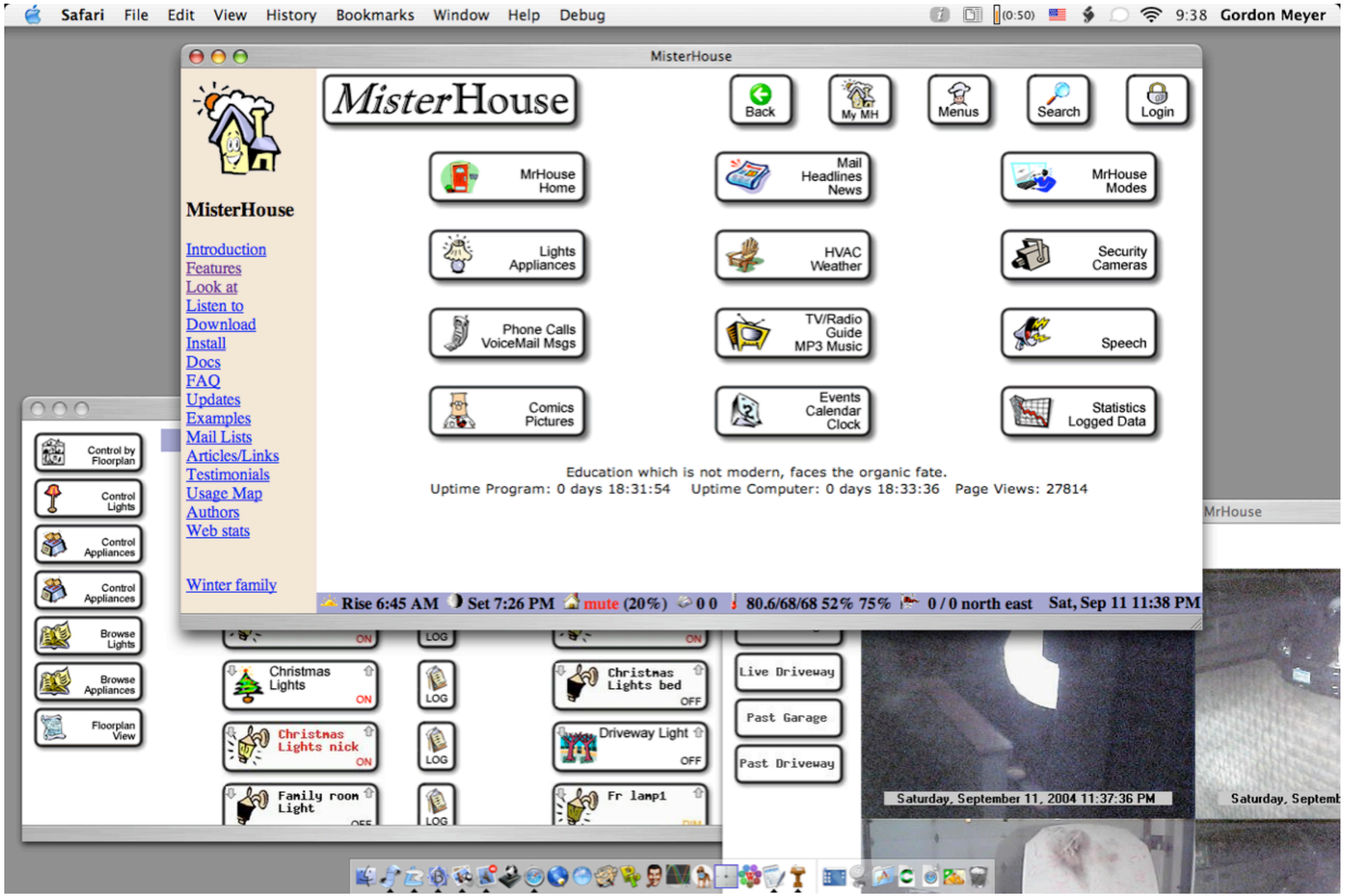
A port of Unix's heyu & xtend

/* If it's after 10PM and Unit B2 is off, then dim A7 by 20%, wait five minutes, then turn A7 off. /*

```
% [ `date +%H` -ge 20 ] && [ $(($X10_B2)) -lt 128 ] && heyu turn
        a7 bright 5; sleep 300 ; heyu turn a7 off
```

Misterhouse

www.misterhouse.com



Ante Up

If you have a USB-to-Serial Adapter handy:

- $70 ActiveHome Starter Kit
  - www.x10.com/products/ck11a_sp_8pc_39c70.html
- XTension or Indigo (Try both demos)

Ante Up

If you don’t want to buy a USB-to-Serial Adapter:

- Indigo and Smarthome.com Bundle Deal
  - $90 for Indigo
  - $35 for SmartLinc USB and one lamp module

Ante Up

Bottom Line:

- Spend $100 - $135 to decide if you like it
- Less if you use free software
- More if you get hooked (You have been warned.)

The Zen of X10

X10 is less than perfect

- Transmission timing means it takes 1.5 seconds to send commands.
  - Longer if you’re using wireless devices, like motion detectors
- Electrical noise can block commands
  - Power supplies, electric toothbrushes, fluorescent lights
- Normalize your electrical environment
  - Filters & signal boosters
  - www.smarthome.com/x10troubleshoot.html
- Relax, take a deep breath
  - Do you drop AirPort because the microwave knocks you offline?

Five Fun Hacks

Detect a Beer Thief

What it does

Keep an eye on the babysitter, or your teenagers, while you're away from home.

Courtesy of Michael Ferguson

Motion detector

- Mounted on inside of the door
- Opening door sends two signals:
  - motion
  - dusk-to-light
- Silently write message to log
- Say “You’re busted!”
- Sound an alarm

In the liquor cabinet

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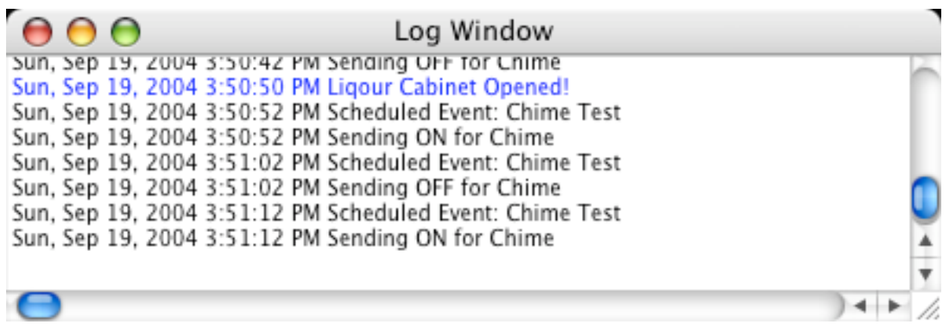

In the liquor cabinet

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  - motion
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- Sound an alarm

Hacking the hack

- Use this technique to monitor:
  - The fridge, for dieters.
  - The gun cabinet.
  - Your car, parked in the garage.
  - The furnace closet, to log when you last changed the air filter.

Track Events with iCal

What it does

Adds events to iCal so you can keep track of activity around your home.

Courtesy of Greg Smith

Attachment script

```
on LogIniCal(theCalName, theSummary, theNote, theLocation, eventdate, EventKind)
  tell application "iCal"
    set CalList to (title of every calendar)
    if theCalName is not in the CalList then create calendar with name theCalName
    set TargetCal to (first calendar whose title is theCalName)

    if EventKind is true then
      make event at end of events of TargetCal with properties {start date:eventdate,
         summary:theSummary, description:theNote, location:theLocation, status:
         tentative}
    else if EventKind is false then
      try
        set EventList to (every event whose summary is theSummary) of TargetCal
        set TargetEvent to (last item of EventList whose status is tentative)

        if status of TargetEvent is tentative then
          set (end date) of TargetEvent to eventdate
          set status of TargetEvent to confirmed
        end if
      on error
        make event at end of events of TargetCal with properties {start date:eventdate,
           summary:theSummary, description:(theNote & " (no starting event found)"),
           location:theLocation, status:cancelled}
      end try
    end if
  end tell
end LogIniCal
```

Attachment script

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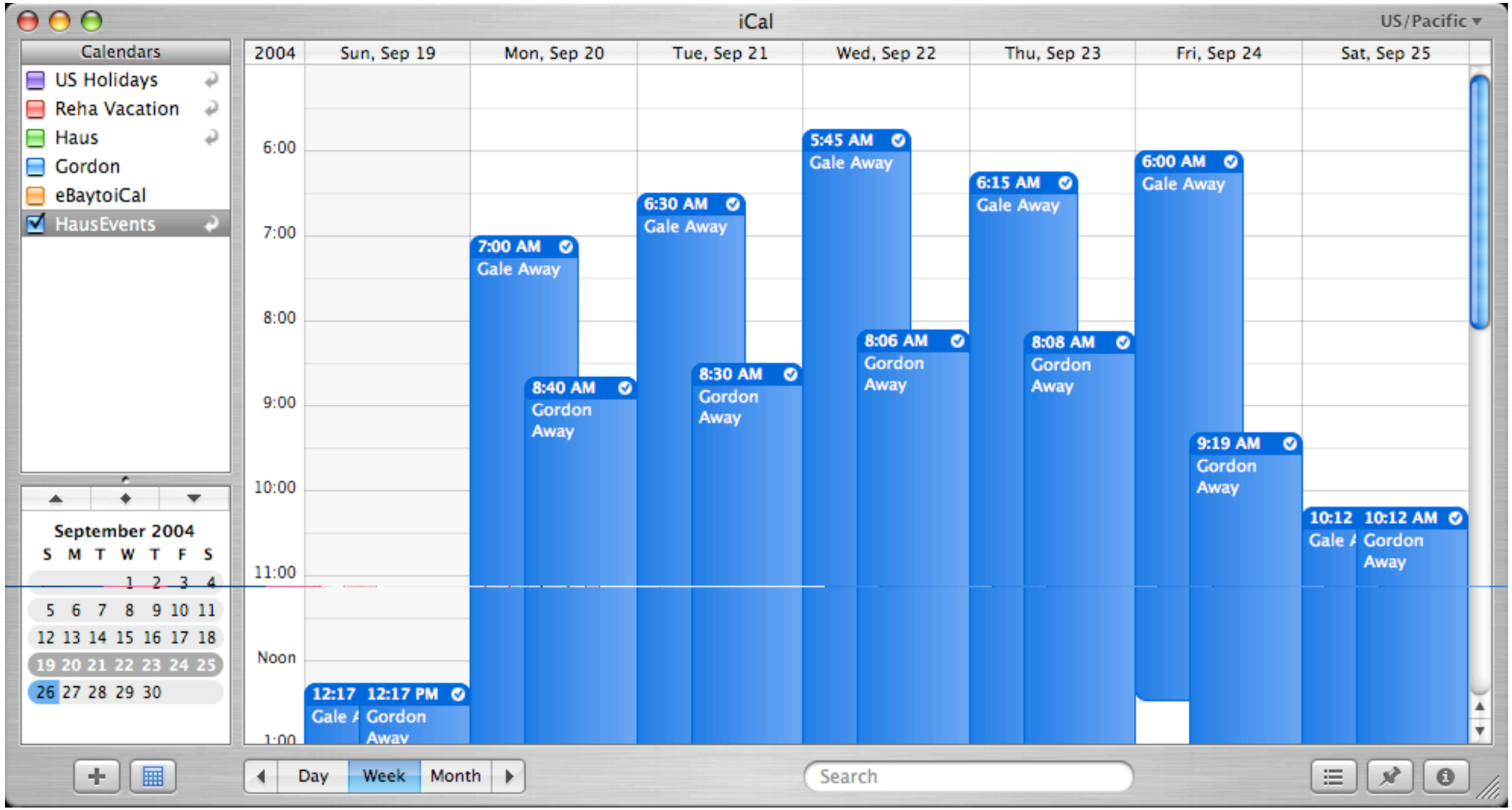
      end try
    end if
  end tell
end LogIniCal
```

Calling the attachment

- Log the starting time
  - `LogIniCal("HausEvents", "Gordon Home", "no notes", "Santa Clara", eventdate, true)`
  - Parameters
    - Calendar Name, Event Name, Notes, Location, Date, Start/Stop
- Log the ending time
  - `LogIniCal("HausEvents", "Gordon Home", "no notes", "Santa Clara", eventdate, false)`

The result

A workday log



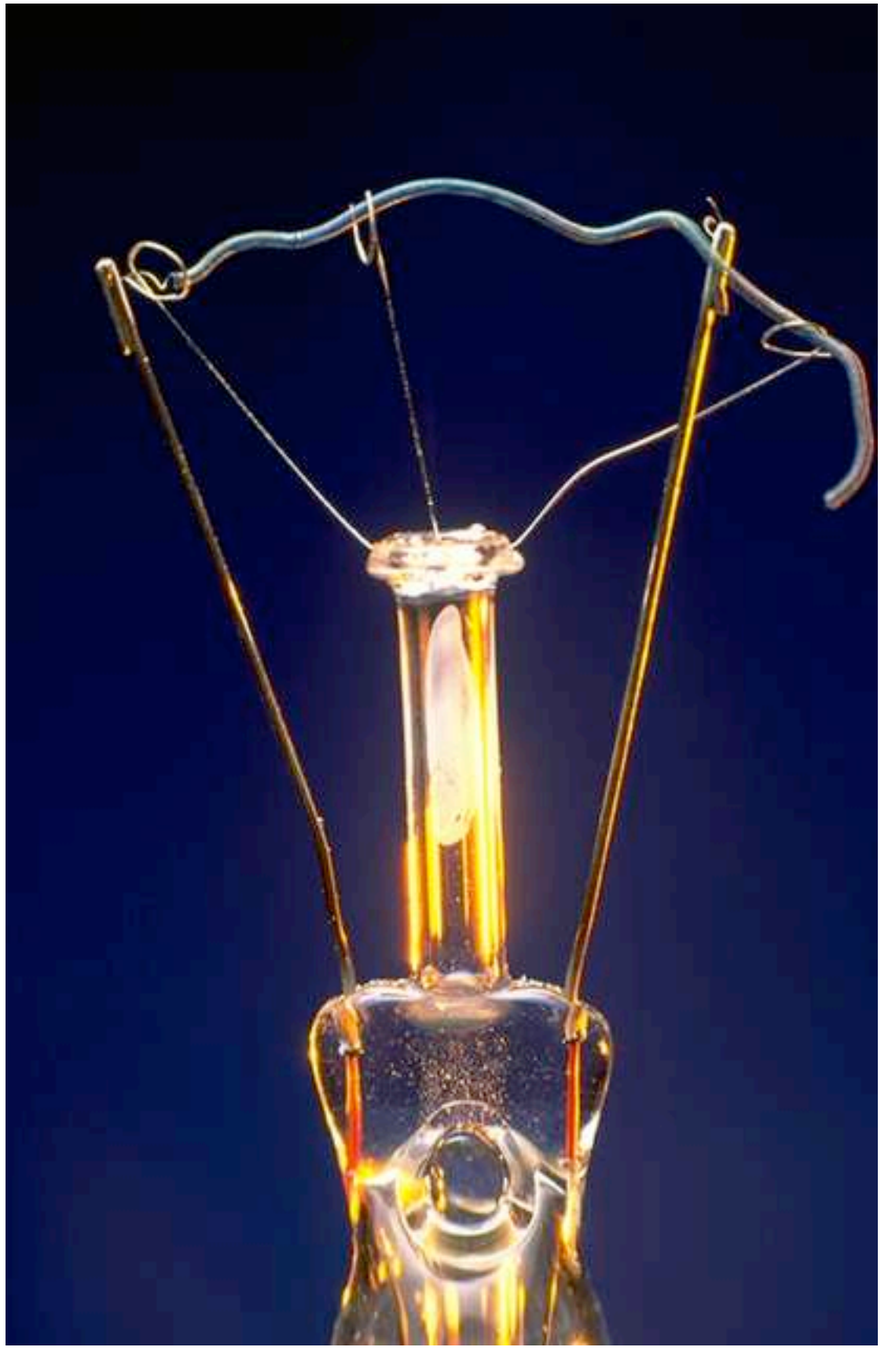
Hacking the hack

- Publish the calendar on .Mac so you can check in on your home while you're on the road.
- Use separate calendars for different types of events.
- Download Greg Smith's original script
  - http://homepage.mac.com/gregjsmith/

Spousal Approval Factor

SAF

Simulate a Sunrise



What it does

Gently brightens the bedroom lights so you wake up naturally.

Starting 15 minutes before the time that you want to wake up, raise the light level in the room.

SunRise clock

http://www.dreamessentials.com/a_clocks_sunrise.aspx

$110.

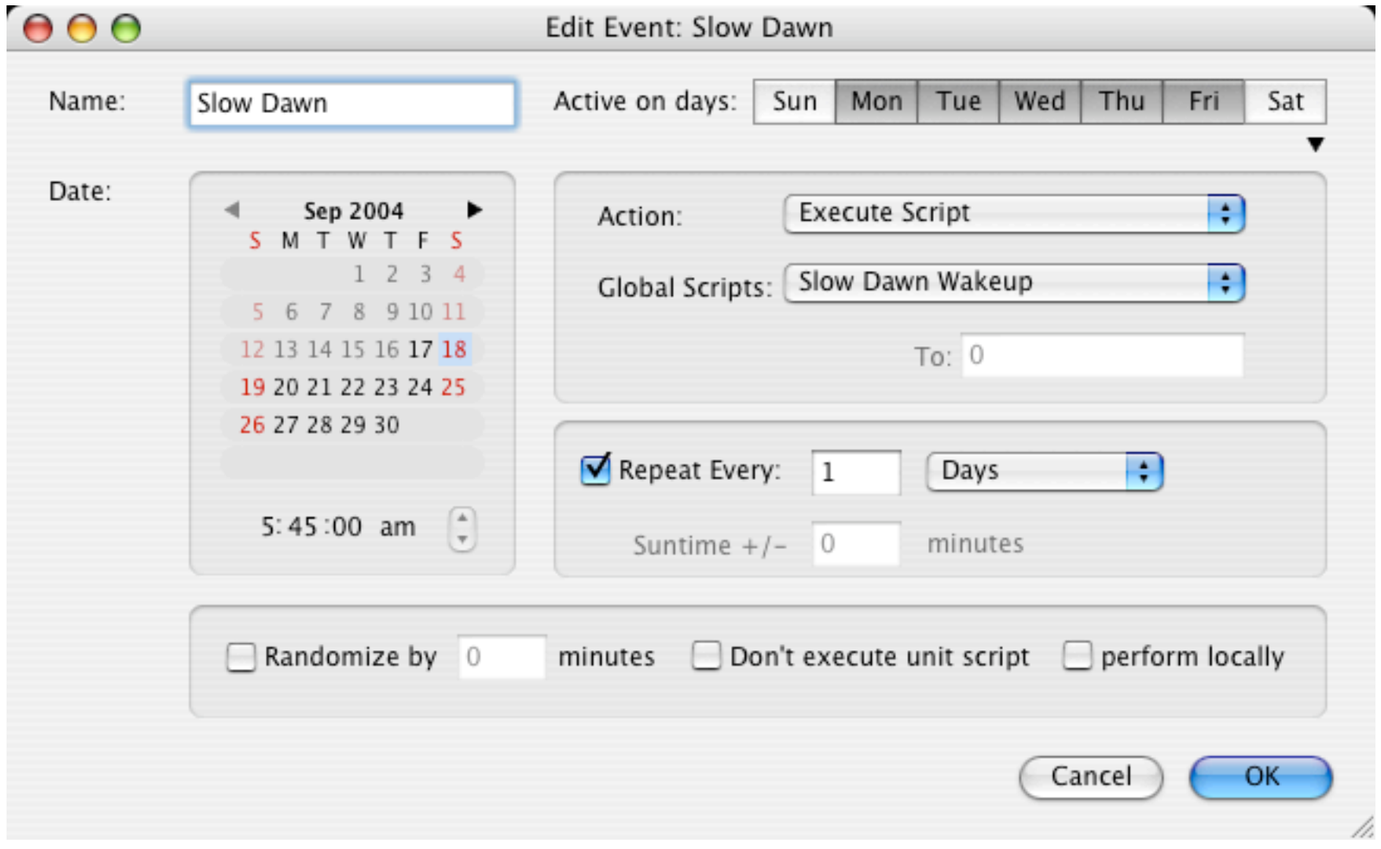
XTension script

Scheduled to begin 15 minutes before your wake-up time

```
dim "Bedroom Lamp" to 10
dim "Bedroom Lamp" to 20 in 3 * minutes
dim "Bedroom Lamp" to 30 in 5 * minutes
dim "Bedroom Lamp" to 50 in 7 * minutes
dim "Bedroom Lamp" to 75 in 9 * minutes
dim "Bedroom Lamp" to 80 in 11 * minutes
dim "Bedroom Lamp" to 100 in 14 * minutes
```

XTension repeating event

Monday—Friday, 15 minutes Early



Hacking the hack

Make it smarter

- If you’re not at home, because you’ve left earlier or are on vacation, skip the whole process.

```
if (status of "Gordon Home”) is true then
  dim "Bedroom Lamp" to 10
  dim "Bedroom Lamp" to 20 in 3 * minutes
  [...]
end if
```

- Reverse the technique to dim the lights when you go to bed.

Outdo Big Ben

What it does

A high-fidelity grandfather clock that doesn't chime while you're sleeping or watching a movie.

Courtesy of David Kindred

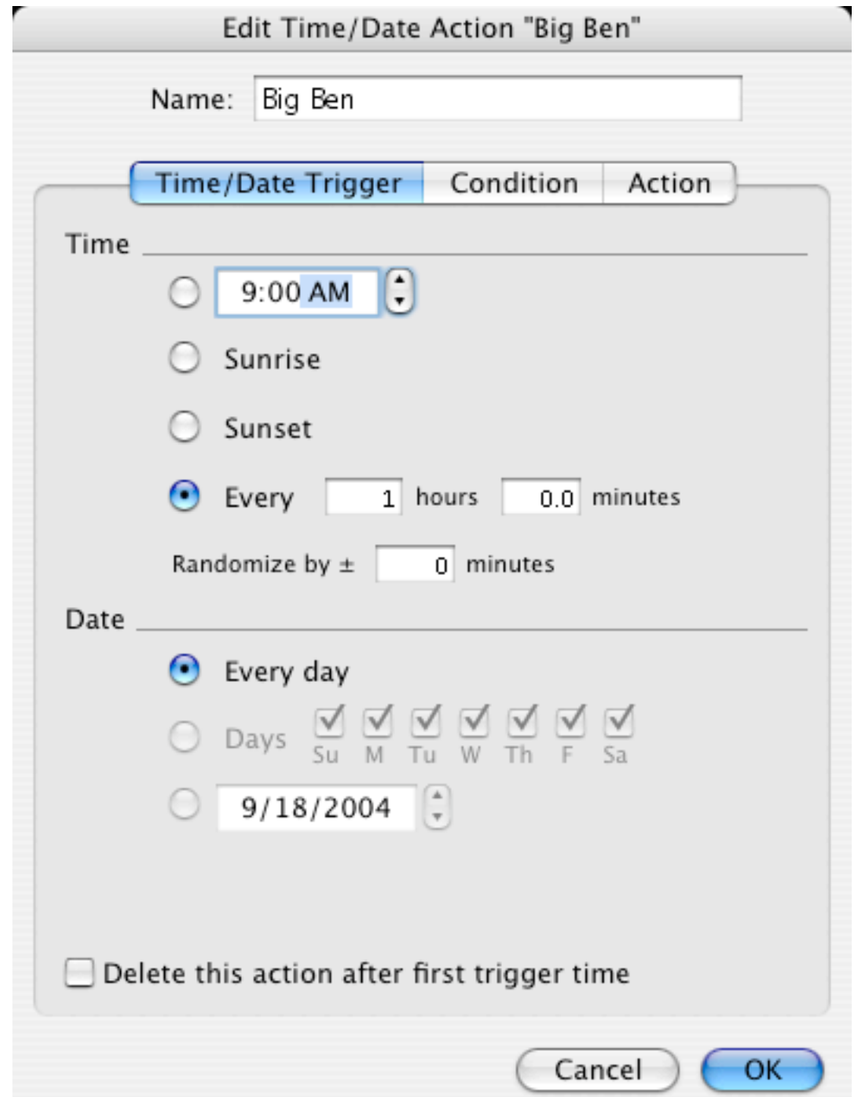
The script

```
set theTime to (current date) as string
set theHour to word 5 of theTime
set theName to theHour & ".wav"
set thePath to (path to documents folder) & "BigBen:" & theName
  as string
set theFile to thePath as alias

tell application "QuickTime Player"
  set theMovie to open file thePath
  set close when done of theMovie to true
  play theMovie
end tell
```

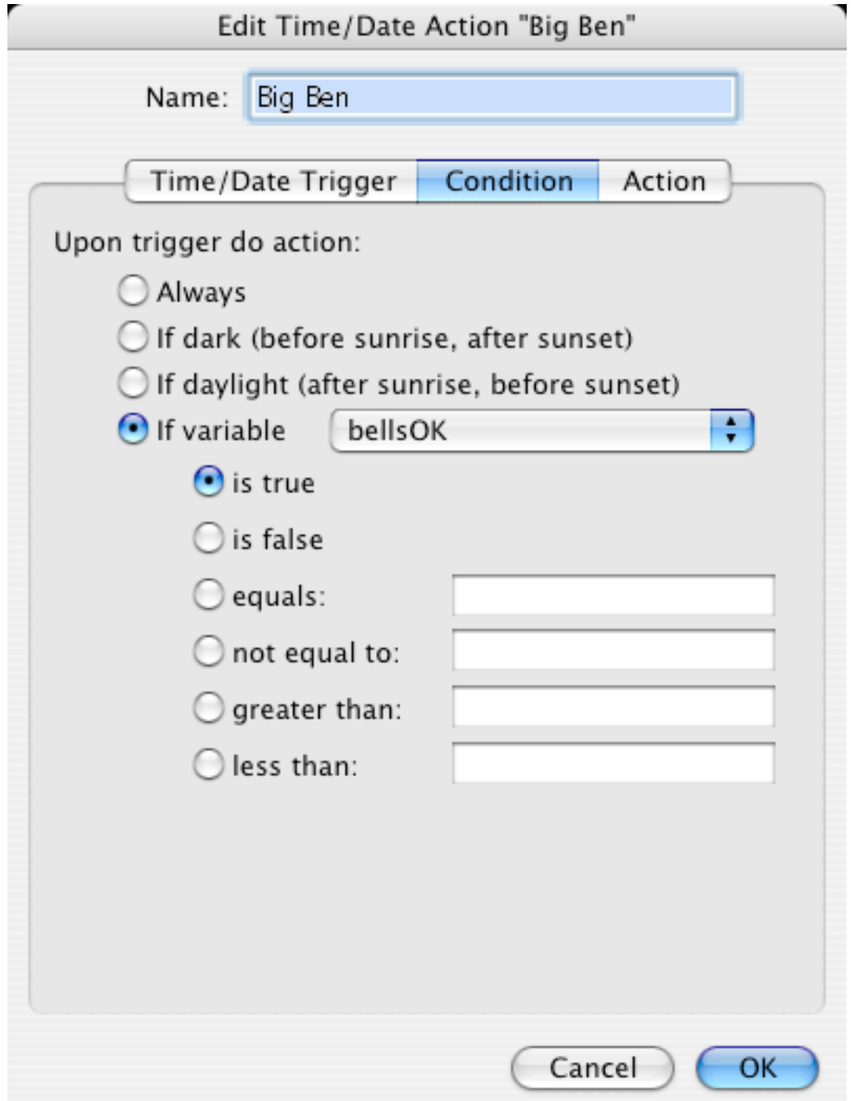
Indigo Repeating Event

Every day, every hour



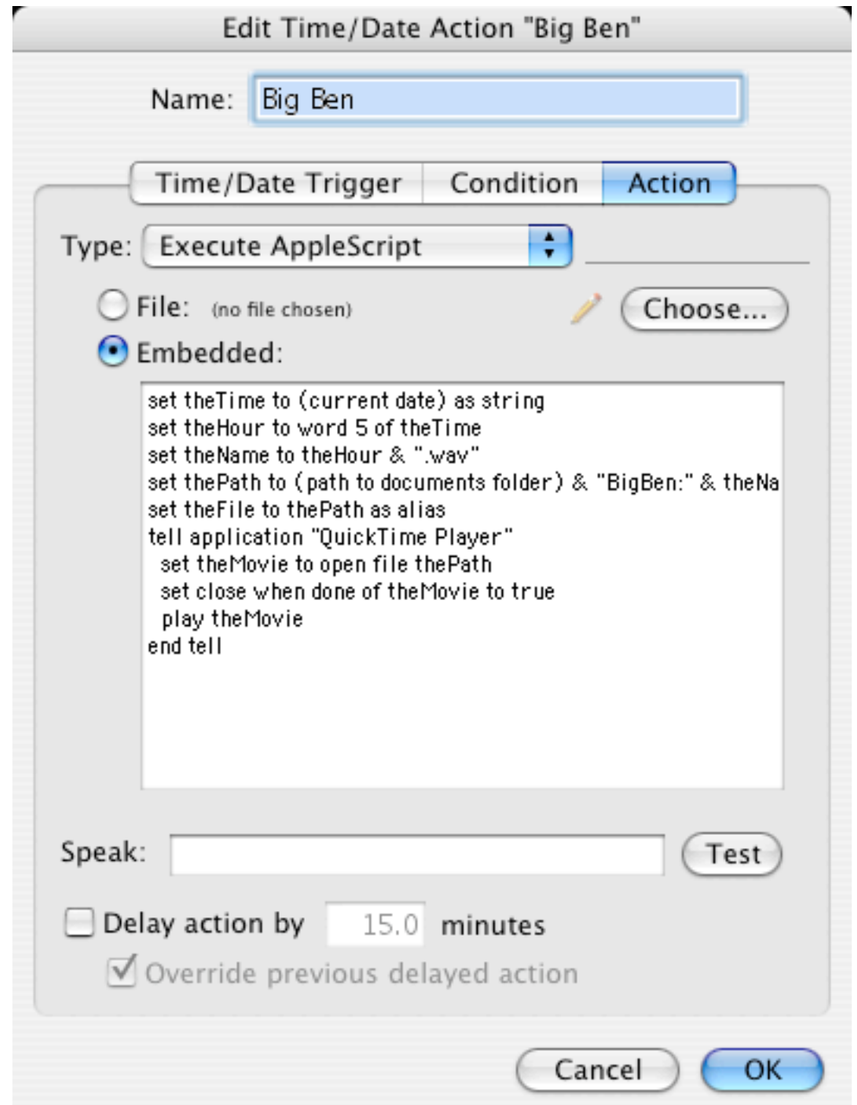
Indigo Repeating Event

When “bellsOK” is true



Indigo Repeating Event

Run the script



Hacking the hack

Make it smarter

- Set up a scheduled event that silences the bells (”bellsOK”= false) at bedtime, while you’re gone, or other appropriate moments.
- Use the half-hour and quarter-hour chimes, too.
- Set the system’s volume before and after playing the sound files.
- If you don’t have a home automation system (yet) use cron or iCal to schedule the script.

Hamster-Powered Night Light

What it does

Harness your hamster's nocturnal running to power a night light.

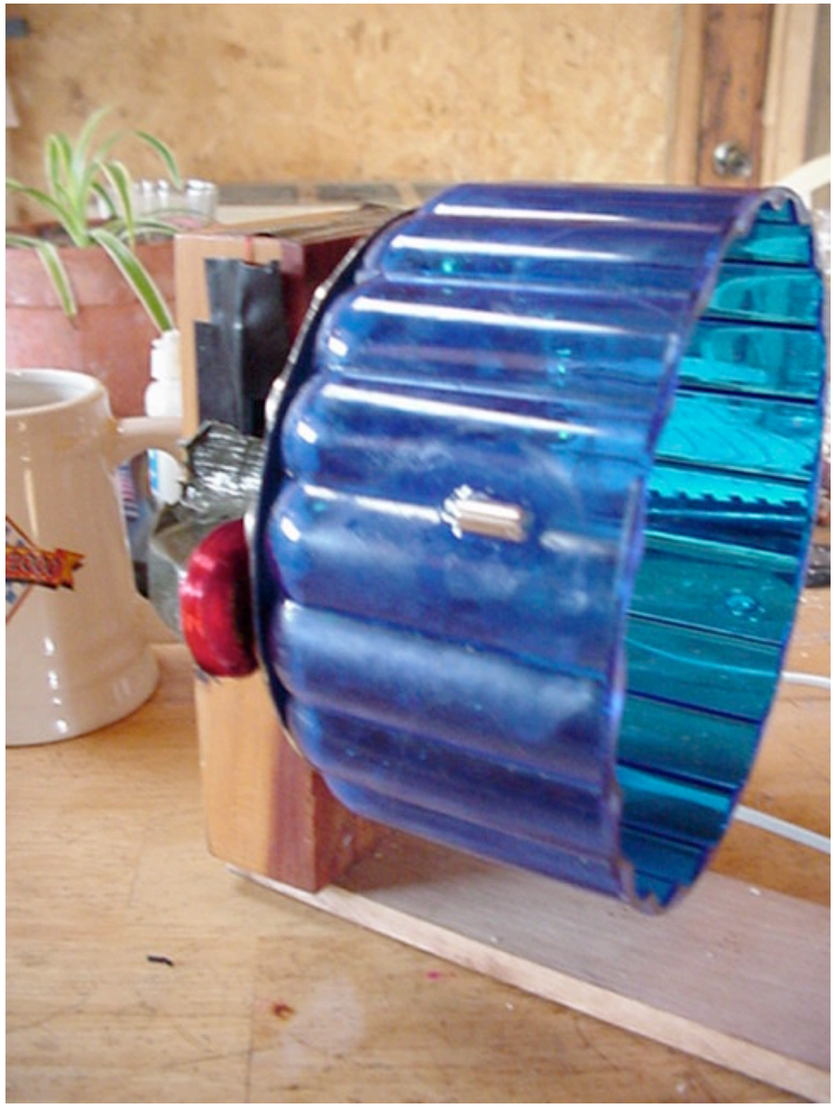
Courtesy of Dan Fink

The specifications

- A visit to the pet store showed that most rodents achieve between 40 and 60 RPM on their exercise wheels.
- Cheap exercise wheels are noisy, which means they're wasting energy. Use a ball-bearing mount instead. (Scavenged from a skateboard.)

The specifications

- Build an alternator into the exercise wheel
  - mount the wheel on stand
  - add a circle of magnets around the outside perimeter
  - wind two coils of enamled magnet wire (connected in series)



The light

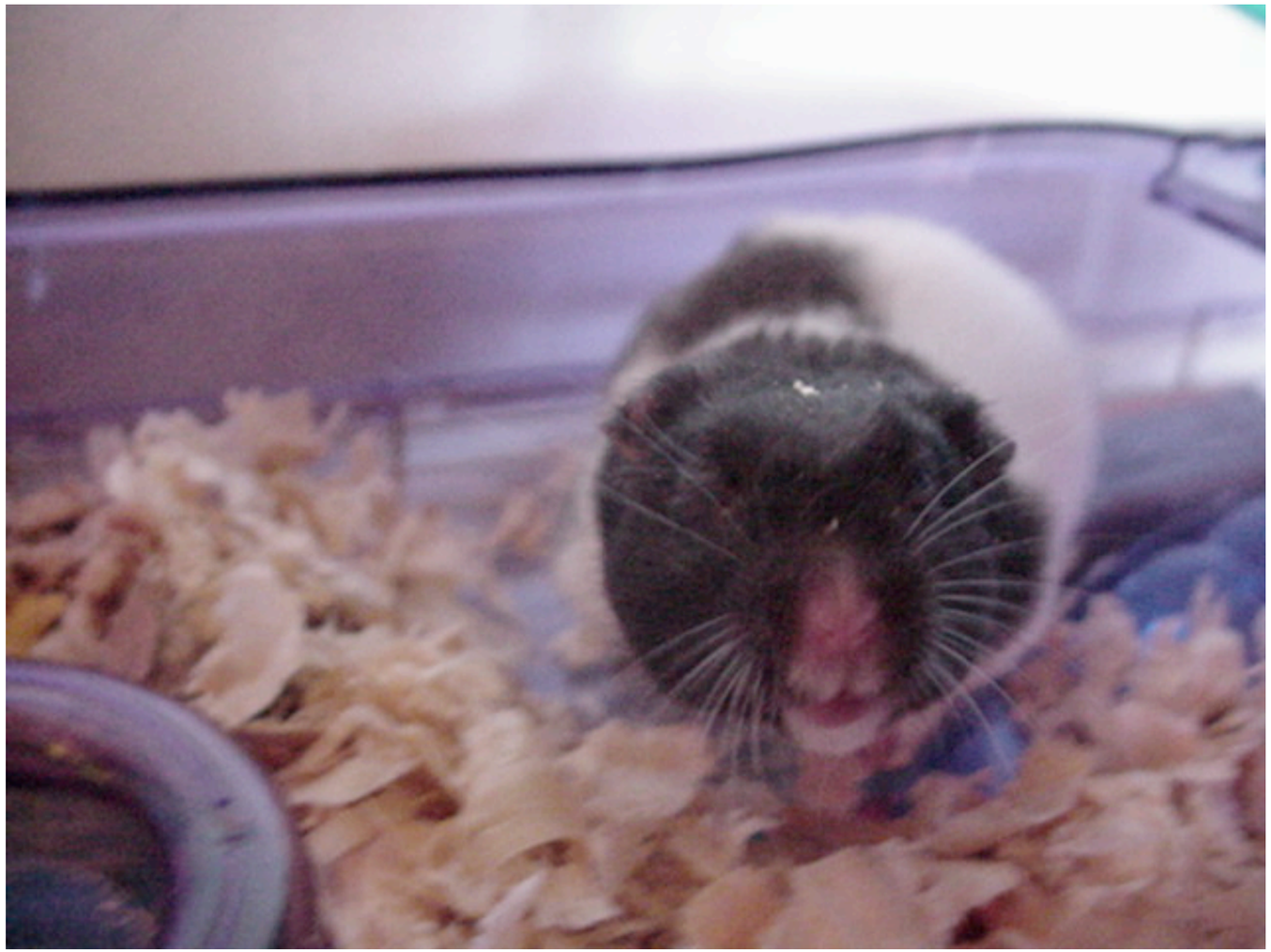
- Two bright red LEDs.
- Wired backwards to each other, so one is lit, depending on which direction the wheel is spinning.
- Plenty bright for lighting the way to the bathroom during the night.

Why stop there?

- Calibrate the bicycle computer to the circumference of the exercise wheel.
- Skippy regularly achieved 2 to 3 MPH.
- The computer keeps track of peak speeds, elapsed time, and how many Hamster-Miles (hM) are run each night.

Skippy the Hamster

In memoriam



Thank you.

www.gordonmeyer.com