

## Post office on fire

When we first built the Uppen Doon exhibition layout, we had intentions to eventually have fire effects in a building.

The sequence would include:

- A flame effect inside the building
- The sound of a fire engine approaching
- Flashing lights in the emergence vehicles
- Elevation of the fire engine's ladder

Since the layout would appear at exhibitions, we could not have the sequence running continually; the sound of the siren would drive everyone mad.

We thought of using a timer but that presented other problems. Too frequent and it would still be annoying. and would run even during quiet periods. Too infrequent and it would be missed by many attendees.

We decided to have the sequence initiated by a key fob. That way, it would only run when there was a demand and nobody would miss out on it.

We used the one shown, which is available quite cheaply on eBay.



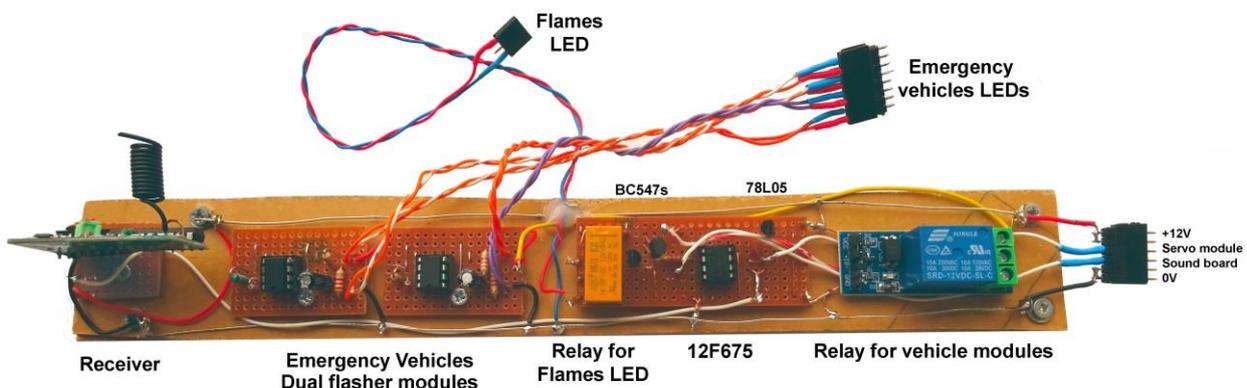
## The hardware

Apart from the fob transmitter and receiver, the effect required:

- Two dual-flasher kits for the vehicles
- A flame effect LED like the one shown here (removed from its case and rolled flat).
- A relay to switch the flames effect LED
- An EzyPoints kit and servo, to operate the fire engine ladder.
- A Sound Player to reproduce the siren effect.
- A programmed chip to control all the operations



All the parts were mounted on a board before fitting under the baseboard. All connections are pluggable, to allow the board to be easily removed for any repairs or modifications.



The Sound Player is mounted in another part of the baseboard, as it also handles other sound effects such as station announcements school sounds, dog barking, steam whistle.

## The software

All the control is handled by a PIC12F675, which is an 8-pin PIC chip. Two of the pins connect to the 5V supply and one connects to the receiver module. Four of the pins connect to the lights, the servo controller and the sound module. One pin is unconnected.

The sequence programmed into the PIC is quite simple.

- fire effect on
- siren sound on
- flashing lights on
- siren off
- ladder up
- wait for 16s
- fire effect off
- ladder down
- flashing lights off

## The audio

I looked around for the sound of a fire engine siren and found a video clip of a fire engine leaving a fire station.

Unfortunately, that meant the volume decreased as the engine sped away.

First, I stripped the audio from the clip.

I tried using Audacity to change the volume levels but that resulted in the introduction of too much noise when the low levels were boosted.

Then I reversed the sample so that the volume increased with time. Turns out that “*new-naw-nee-naw*” sounds the same backwards!



Click on image to view video

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