Checking missed frames in digital imaging devices

1. Introduction

In the 'good old days' video systems used (in the UK) the CCIR 25 frame/second interlaced system. Modern systems use some form of digital progressive scan capture and recording and in many instances frame rates of 25/second are claimed. Of course this does not always actually happen and there are plenty of reasons why not. Slow memory, or a slow data transfer bus or an inadequate computer are often to blame. When developing such systems, we got tired of waving hands in front of the camera to check missed frames. A clock with a second hand can be petty useful, but after breaking a number of wall clocks (!), we decided to put together a simple system to check for this type of problem.

The circuit of the system is shown in Figure 1. We use eight gated LEDs driven by a Johnson counter (http://en.wikipedia.org/wiki/Ring_counter) clocked by the 50Hz mains, by an external input or by outputs from a sync separator. This last feature is useful whrn combining traditional video equipment with a frame grabber or a video-USB converter or similar image acquisition devices. The clock inputs can be selected using internal jumpers.

The circuit is simple and flexible allowing us to set the point at which LEDs come on and turn off during the clock period. There are no critical components used ansd although the EL4581sysnc separator is no longer available, National Instruments' LM1881 is a pin compatible chip.

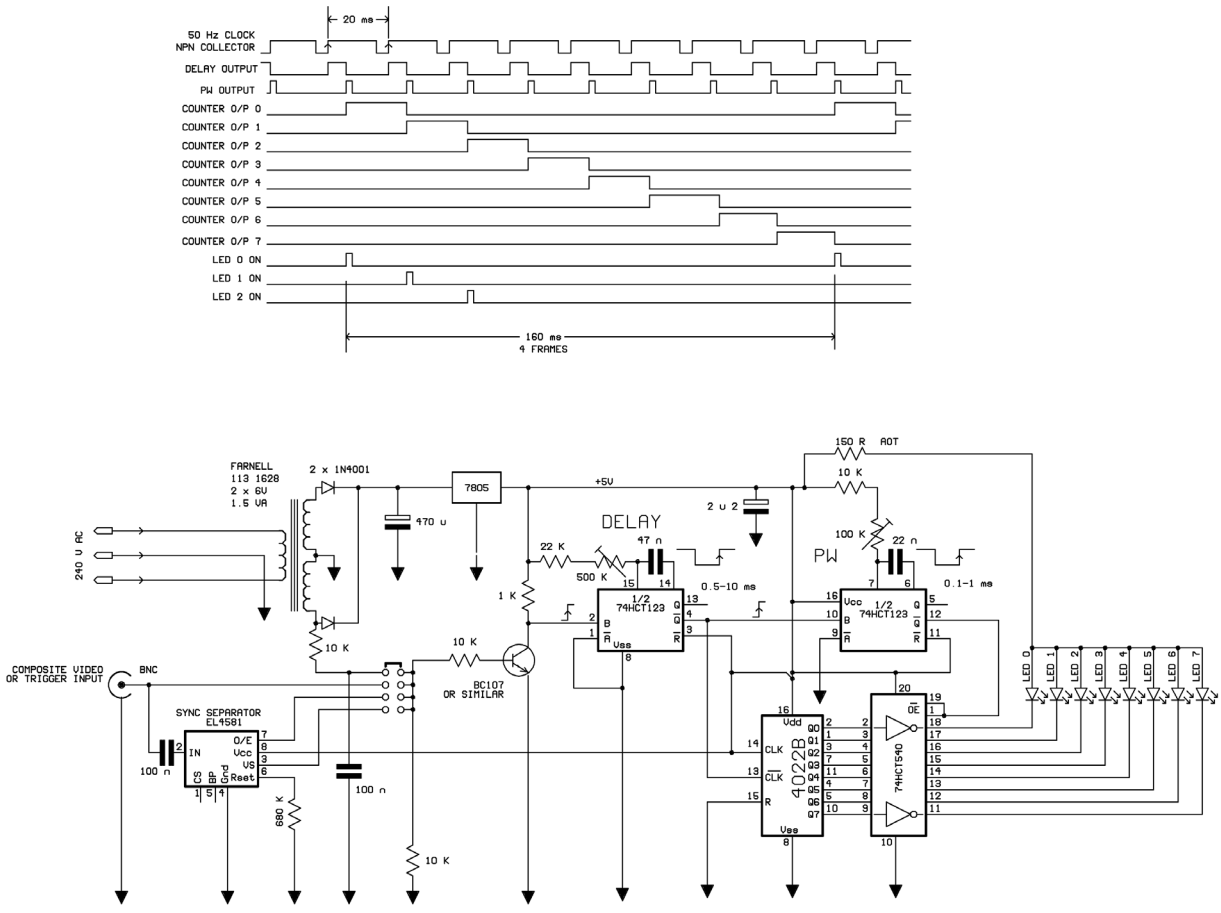

Figure 1: The circuit diagram of the LED counter system used for checking missing frames

The circuit was constructed in an oversize '13A plug' case and is shown in Figure 2. Provided that the camera of the system under test can be pointed at the device, the ring-like sequence of LEDs can be imaged and missing frames can be identified, either during live imaging or when replaying a recorded sequence. We cannot do much about the boredom associated with this test, but at least it is

ever so slightly more convenient than watching a clock face and seeing precious time flow by. A minor disadvantage is that it is no longer obvious when it is time to go for lunch or to go home!

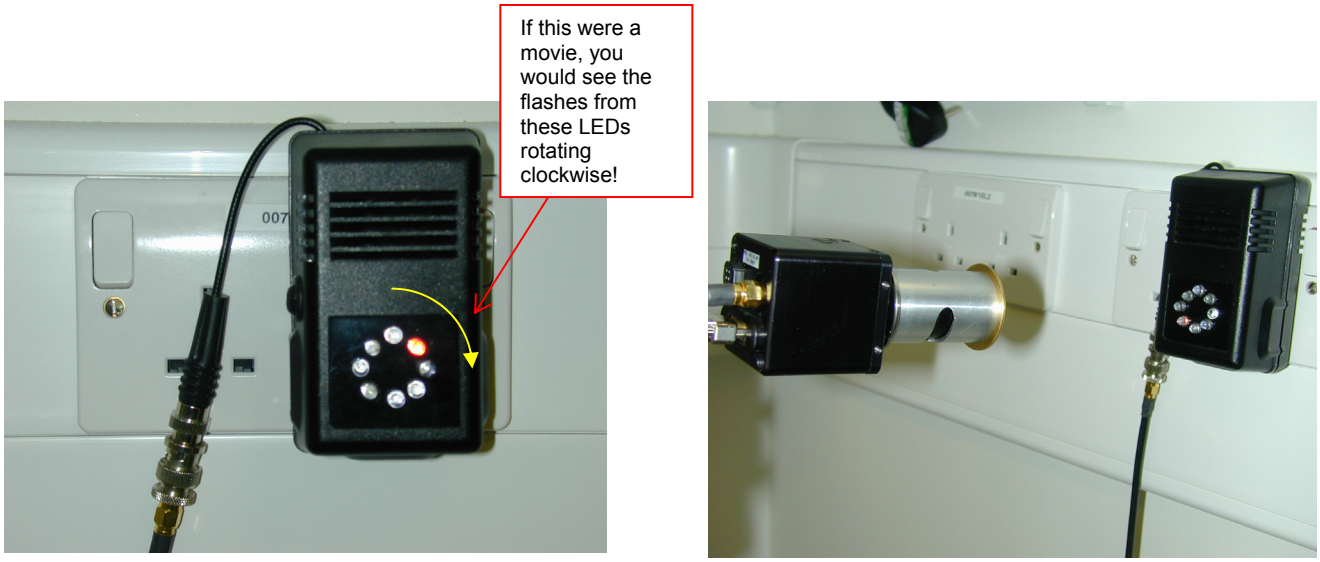

Figure 2. The LED counter system in practice

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