

Speed of FlyJacket Grabber

W.Pasman, 21/12/02

Introduction

Grabbing a frame on the LiveView flyjacket on the iPaq is quite slow. So optimizing this is essential to get quick responses. We will start out pointing to some bugs to give additional reasons to grab lower than the resolution you would like to get.

Some bugs

A bug in either the FlyJacket or the drivers for it is that when you grab 480 lines you actually get a 240 line image with every line duplicated twice. It's clear that this doesn't really help improving image quality. We also tried the SVHS input, NTSC mode, 720x240 PAL mode and capturing YUV instead of RGB, but that does not make any difference. Furthermore it may be handy to know that the capture formats are slightly different from what is in the manual. The 'RGB' actually gives you BGR24 format (1 byte B, 1 byte G, 1 byte R), and the 'YUV' format gives UYVY.

System setup

We use an iPAQ 3800 pocketPC2002 with LiveView Flyjacket 3800 attached to a RTS Cheos EVI-D31 camera. Flyjacket has utility version 1.7 (FlyJacket.dll version 1.5; FlyJacket_AV.dll version 1.31 and FlyJacket_AV1.dl version 1.1). We also used the Liveview flycam for the NTSC modes, to check out the 240/480 line bug.

Grabber speed

Grabbing speeds were measured for several format settings. Table 1 shows the results. Note that we used the 'preview' mode to get the 320x240 resolutions and the capture mode for the other resolutions.

Table. Grab time and image size for various grab formats.

resolution	mode	time (ms)	imagesize (kb)
320x240	UYVY	77	150
320x240	BGR24	103	225
640x240	UYVY	154	300
720x240	UYVY	172	337.5
640x240	BGR24	210	450
640x480	UYVY	186	600
640x480	BGR24	297	900

Analysis

As can be seen, in all modes capturing 240 lines the time required is half of the image size in kb, or stated otherwise the bandwidth between grabber and memory seems to be only 2Mb/s. For the 480 line modes this is much faster, indeed it seems they are grabbing 240 lines and then doing some copying in software at a much higher speed. For instance in 640x480 YUV mode it seems they use 150ms to get a 640x240 image and then need an extra 36ms to copy every line twice. In 640x480 RGB mode they need 72ms extra. This last value is surprisingly slow, as this is twice as much as 640x480 YUV, while the image is only 50% larger. Maybe they are using YUV420 under water?

Conclusion

Concluding, avoid grabbing above 240 lines as we can all copy data where necessary. LiveView just doesn't deliver the promised 480 lines. The speed is quite low as well, way slower than copying bytes. In all this grabber is a bit disappointing.