Whiteboard Lecture Recording Manual

1 Release Notes

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Notes:

1. You should be able to find a `.pdf` of this document here: `http://www.personal.reading.ac.uk/~pt904209/remote_teaching/main.html`
2. Most information regarding the software is relevant for MAC;
3. Missing from both kits are the batteries (if needed).
4. Probably useful to purchase bluetooth dongle for Blue kits and USB version of Yellow kit.
5. The Logitech web cam is my personal one and needs to be replaced with a departmental cam.

2 Introduction

The department has purchased some equipment in order to enable us recording classical whiteboard or blackboard lectures. In this document, I will explain the equipment, provide some instructions how to shoot a video with it, and give some hints as to how to edit the video. The equipment might also be combined with your private equipment, of course, such as DSL cameras. At this point, the document is somewhat incomplete as I have not tested all possible configurations of the equipment. Moreover, I have limited access to Windows and Linux solutions at the moment and thus was not able to conduct extensive tests on these platforms.

I also expect that based on the experience gained with the equipment, we might buy additional (potentially different) kits. The instructions might also be useful for people who use other means of delivery. So please:

Provide feedback and share your experience!

The relevant channels on Teams are a good place to leave your comments.

3 Video recording kits

We currently have two kits, a *blue* and a *yellow* one, stored in boxes with blue and yellow trim, respectively. Both kits contain camera and microphone equipment.

The two kits differ mainly in the way the audio is connected to the computer. Blue kits use a bluetooth headset. These are basically small headsets without any wiring which connect to the computer via bluetooth. Yellow kits use a UHF wireless microphone. The mic is wired to a beltpack transmitter which establishes a wireless connection to a receiver which in turn is plugged into the analog microphone jack at the computer. Both packs can be used with some DSL cameras instead of the cameras provided in the kit (some restrictions apply, see below).

Yellow kit Advantages: Longer Range; less obvious mic. Disadvantage: Only allowed on campus due to OFCOM licence, requires analog audio jack on computer (not available on some mobile devices) or alternatively on the DSL camera (if used with a DSL camera).

Blue kit Advantages: Can be used anywhere, not only on campus. Disadvantage: Slightly bigger headset, requires bluetooth which is not available on some PC's. (We might be able to solve that problem by purchasing a bluetooth dongle.)

3.1 Yellow kit (yellow boxes)

Box contents Logitech videoconferencing camera, Logitech base station, cable connecting camera to base station (blue plugs), USB caple connecting base station to computer, USB extension lead, AA and AAA batteries, white FIFINE wireless mic box. The FIFINE wireless mix box contains a lapel mic, a headset mic, beltpack transmitter, receiver, two 1/4"(female)–1/8"(male) audio jack adapters.

Setup Set up the camera in front of the board and connect to the grey base station using the cable with the blue plugs. Connect the grey base station to the mains and to the computer with USB cable and USB extension lead if needed. Chose a mic and plug the mic into the beltpack transmitter. The transmitter can be worn somewhere on the body but make sure not to bend the antenna. Using the 1/4"–1/8" audio jack adapters, plug the receiver into the analog microphone socket on the computer (often this is the pink socket). There is a small metallic button on the receiver; that's actually an extendable antenna. Pull it out (without breaking your fingernails). See Figure 1 for a schematic setup.

Switch on transmitter, then receiver. The receiver will show a *red* light if a connection is established and the battery status is ok. (Somewhat confusingly, red light means all ok while green means something is wrong). Open the video caputre software and switch to the appropriate audio and video channels. Whether audio/video is working you might also check using Skype "test audio/video" functionality.

Important: The wireless mic requires a licence which we have for the campus, only! This means that unless you have a licence for the relevant UHF channels at home, you cannot use the yellow kit for recording at home.

DSL camera setup To use your DSL camera instead of the camera provided, you need to connect it to the computer. This is easy if your DSL camera has a HDMI socket and you have a HDMI cable and a way to connect it to your computer (this is likely because projectors etc also use HDMI nowadays). On a laptop, I've

successfully used a HDMI to USB dongle. If your DSL also has an analog audio jack, you may connect the transmitter to the camera directly rather than the computer. In that case, you can record for instance with a laptop that does not have an analog audio jack.

3.2 Blue kit (blue boxes)

Box contents Logitech web cam, Manfrotto tripod, USB extension lead, AIKELA wireless headset box. The AIKELA wireless headset box contains the headset, a loading station and a USB connector for the loading station.

Setup Figure 2 shows how to set the Blue kit up. Set up the camera in front of the board, using the tripod if needed. Connect to computer with USB extension lead if needed. Follow the instructions for connecting the headset to your computer with bluetooth. Open the video caputre software and switch to the appropriate audio and video channels. Whether audio/video is working you might also check using Skype "test audio/video" functionality.

DSL camera setup This is the same as for the Yellow kit except that you don't have a way to connect audio to the DSL camera directly. The audio and video will reach the computer as separate streams.

4 Preparation

"Expert educators" advise that videos should not exceed 15 mins. I personally think that 45 minute lectures are a much better sized unit of delivery, but I'd nonetheless recommend taking videos in chunks (or "takes") of no more than 10 mins for several (technical rather than paedagogical) reasons. File sizes will amount to about 3Mb per minute. The sheer logistics of handling very large files becomes tedious. Uploading files beyond 30Mb to Blackboard via a fluky internet connection is only one of the potential sources of trouble (remember that for most domestic broadband contracts, upload speeds are much lower than download speeds). Another reason is that the probability of making a mistake you'd rather edit out converges to one pretty quickly, and there are numerous potential problems associated with editing large videos. Finally, if you are working with a single standard whiteboard, you won't have space for much more than about 10 mins worth of lectures.

Clearly, the 10 min takes should be logical units. Use your lecture notes as a film script and divide it up into takes using a red pen for instance (you'll start to see why film teams work the way they do). Give meaningful filenames to the individual takes and put those names in the script. You might even write the name of the take on the board when you start shooting.

5 Delivery

Here are a few more hints to observe while you are filming: Regarding lighting and the camera:

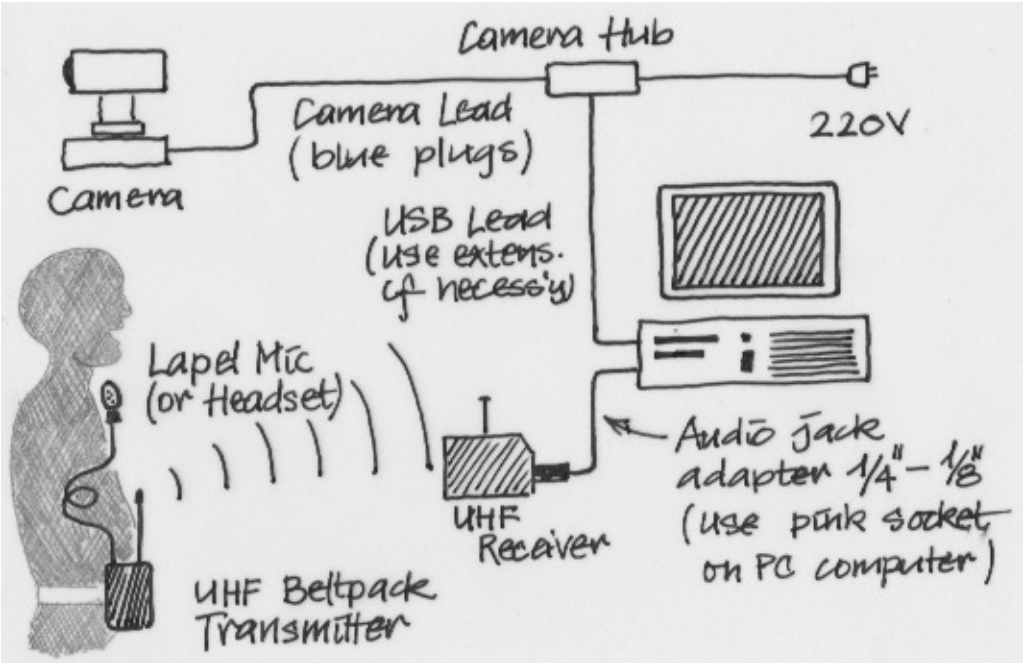

Figure 1: Setup of the yellow kit. In case a DSL camera is used, the microphone can be used as shown, or alternatively the audio jack can be plugged into the camera, provided it has an 1/8" analog audio input.

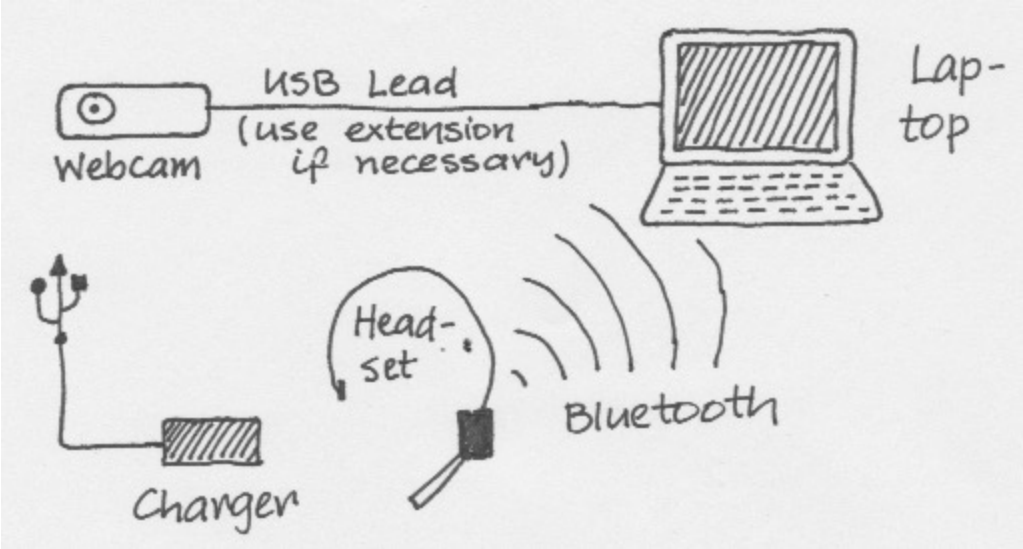

Figure 2: Setup of the Blue kit. In case a DSL camera is used, the headset should be used as shown. In case the computer does not have Bluetooth, the headset can be connected to a Bluetooth dongle which is plugged into a USB port (this still needs to be procured).

1. Try to remove all reflections from the board by positioning the lighting and camera accordingly. This can be quite difficult but the higher the vantage point of the camera the fewer problems you will have with reflections.

2. Try to position the camera in a vertical plane which intersects the board in the middle, and with the optical axis in that plane. If possible, put the camera at the height of your eyes or slightly above, facing down a bit (as said, this also often helps with reflections).

3. Use a camera control software tool (see Sec. 6) to

   (a) focus on the board and switch off the autofocus

   (b) zoom onto the board as appropriate but leave a bit of space either to the right or left where you may stand without blocking the board.

   (c) increase the contrast and reduce brightness and colour a little bit.

   This should be a lot easier with a DSL camera so that's a reason for using one.

Regarding yourself:

1. Try to look and speak at the camera as often as you can.

2. Try not to block the board; rather, keep to one side of the board when not writing.

3. Don't stop and retake just because you made a small mistake. You'll never finish that video. You can later correct the mistake with a subtitle.

4. Don't hold the pages of your notes too close to the mic.

5. Because you wear a headset, your voice will come across clearly even when you face the board; remember however that seeing your mouth while speaking does help the audience (in particular foreign language students).

6. Use fresh board markers or chalk markers when using the whiteboard.

6 Taking and editing the video on MAC

Here's the software I use to take videos on MAC:

1. Quicktime Player (bundled with MAC OS)

2. OpenShot Video Editor (free software)

3. Logitech Camera Tool (freely available from Logitech)

To get going, open the Logitech Camera Tool and adjust camera settings. Next, open Quicktime Player and click on `File -> New Movie Recording`. To the right of the record button in Quicktime Player is a little chevron; click on it to get a pull down menu. Now you should be able to select the relevant camera and audio

input channels. Once you have chosen those you are ready to go. After starting the recording, wait a second before starting to talk.

After finishing the recording, export the file as 720p and close all applications. You can now edit the video in OpenShot. It is advisable to generate an appropriate setup file (called *profile* in OpenShot) for your teaching videos. Don't worry, you can download mine here:
`http://www.personal.reading.ac.uk/~pt904209/remote_teaching/main.html`

Save this file in `~/.openshot_qt/profiles`. When you fire up OpenShot, choose this profile before doing anything else. In terms of editing, don't overdo it. It should be sufficient to walk through the video *just once more*. The only thing I'd edit are small mistakes using subtitles. Maybe you want to add a title for archiving purposes.

7 Taking and editing the video on Linux

This section needs writing after experimenting on Linux.

1. The command line camera tool `v4l-crtl` allows you to control virtually any parameter of the camera.

8 Taking and editing the video on Windows

This section needs writing after experimenting on Linux.