# RASPBERRY PI EQUIPMENT FOR LIVE STREAMING - FEB 2016

There are different setups available for different situations.

All require a Class 10 Micro SD card of 8GB which acts as the Pi's hard drive. The SD Card needs to be duplicated ('flashed' - different from file transfer) using an application such as ApplePi-Baker.

Resources: soundCamp     Locus Sonus
Support and questions: grant@soundtent.org

## WITH CIRRUS LOGIC AUDIO CARD

For details see the separate Cirrus Notes.

• **If you have audio equipment already**, you can use the soundcard from Cirrus Logic, which attaches directly to the Pi B+ OR A+. The Cirrus has a line-in jack which allows  you to connect from the output (eg the headphone jack) of a portable recorder. The recorder interfaces with the microphones and works as a preamp, making high quality stereo streams possible. Limitations are the need to commit the audio equipment for long periods, and security. May be most appropriate for a temporary installation. Needs power and internet connection via ethernet or WiFi. The Cirrus is not fully compatible with the Pi 2.

• The Cirrus also supplies bias voltage to the Line In, making it possible to plug in electret condenser (eg binaural) microphones directly with no external preamplification. The gain is reduced, slightly increasing the noise floor, but the quality can be very  good. Not all ECMs work with the Cirrus. The best quality for cost is obtained using the Primo EM-172-Zs, available for self assembly or ready assembled, which sound excellent. Cables are unbalanced so length of cable runs is limited.

• The Cirrus has 2 onboard digital (MEMS) microphones. These produce crisp sound with limited depth, similar to using the microphones on a mobile phone. Stereo image is also limited. Maybe most useful for relatively loud, bold sound sources, perhaps especially for higher frequencies. A very cheap setup. A simple GUI is available on the soundCamp disk image to activate the microphones and adjust gain.

• The cheapest and most energy efficient setup uses the Pi A+ and the Cirrus with ECMs (Primo EM-172) or even the on-board microphones. Limitations: the Pi A+ has no ethernet connector. Advantages: low power usage for solar applications.

**Typical equipment list and setup**

Pi B+
Cirrus Logic Audio Card (NOT the earlier Wolfson card)
2 Amp 5V power supply
WiFi adaptor (eg Edimax) OR ethernet cable
8GB Class 10 Micro SD Card

SoundCamp disk image for the Cirrus
ApplePi-Baker for flashing ('Previous version' recommended)

2 x Primo EM-172Z1 as stereo pair assembled or for self-assembly
OR
Microphones and portable recorder separate

**WITH USB SOUND CARD**

For long term installations, it is likely you will want a standalone system that does not rely on leaving other audio equipment on site. For this, you can use the Pi B+ or Pi 2 and a USB soundcard.

• **Mono setup**: Pi B+ or 2 with Icicle soundcard and Superlux ECM999 XLR microphone. The Icicle provides phantom power and allows long cable runs if necessary, so the Pi can be out of the weather. Microphone can be installed under eaves or in a custom made housing, typically with mesh and gauze windscreen. Temporary windscreens can be made with a piece of synthetic fur. SoundCamp have a disk image field tested in Tanzania under demanding conditions, designed to cope with power and internet outages. A recent and more refined disk image from Locus Sonus provides a web interface but has not been as fully field tested.

**Typical equipment list and setup**

Pi  B+ or Pi 2
2 Amp 5V power supply
WiFi adaptor (eg Edimax)
8GB Class 10 Micro SD Card [the Locusonus image works with 4GB]
Ethernet cable for initial configuration

Icicle soundcard from Blue Microphones
Superlux XLR measurement microphone ECM999
XLR microphone cable as needed

SoundCamp disk image for the Pi B+
OR
Locus Sonus disk image for Pi B+ OR Pi 2

ApplePi-Baker for flashing ('Previous version' recommended)


• **Stereo setup**: exactly as Mono setup above, except using a stereo soundcard such as the ART Dual Pre or the Guitarface. Not all USB soundcards work with the Pi, so check if unsure. We have used the ART extensively: it has been reliable and sounds good for the price, with acceptable noise levels. Sound is quite direct and 'punchy' with the flat response ECM999s, if not as clean as with the Icicle. Locus Sonus have experimented with the guitarface, which they say is good if a little low on gain. Recent tests corroborate that.


**Typical equipment list and setup**

Pi  B+ or Pi 2
2 Amp power supply
WiFi adaptor OR ethernet cable
8GB Class 10 Micro SD Card [Locusonus image works with 4GB]
ethernet cable for initial configuration

ART Dual Pre USB soundcard OR Guitarface

2 x Superlux XLR measurement microphone ECM999
2 x XLR microphone cable as needed for ART
OR
2 x balanced XLR (female) to 1/4" jack microphone cable for Guitarface

SoundCamp disk image for the Pi B+
OR
Locus Sonus disk image for Pi B+ OR Pi 2
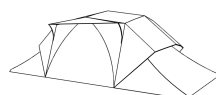
ApplePi-Baker for flashing ('Previous version' recommended)

XLR Cable (XLR to XLR for ART Dual Pre; XLR to 1/4" for Guitarface)
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**Models with links and guide prices based on UK online prices inclusive of VAT (JUN 2015) in UK £**

| | | |
|---|---|---|
| Pi A+ | 16.84 | |
| Pi B+ | 20.50 | |
| Pi 2 | 23.93 | |
| Cirrus Logic Audio card | 25.10 | |
| Power adaptor | 05.57 | |
| Power cable | 01.38 | |
| Combined power supply | 07.99 | |
| WiFi adaptor | 09.54 | |
| 8GB Class 10 SD Card | 04.57 | |
| | | |
| Icicle soundcard | 57.45 | |
| ART Dual Pre | 61.82 | |
| Guitarface | 33.29 | |
| Superlux ECM999 | 27.64 | |
| Stereo mics (Primo EM172) | 26.90 | (self assembly) |
| Stereo mics (Primo EM172) | 44.00 | (assembled, matching) |
| XLR Mic Cable 10m | 06.91 | |
| Mic Cable XLR to 1/4" jack | 06.88 | |