

JANUARY 2013

PO Box 3561 El Paso, TX 79923-3561 www.kint98.com



MAKING THE \$35 RASPBERRY PI MINI COMPUTER: QUICKLY AND CAREFULLY DOES IT

It's a safe bet that a fair few children of geeky moms and dads will be finding a rectangularshaped parcel under their holiday tree tomorrow. And when they rip off the shiny wrapping those lucky kids will find an oh-so-tasty Raspberry Pi inside: a \$35 mini computer that can play Blueray-quality video and has more graphical power than a Nintendo Wii — although none of that will be immediately obvious. The Pi is a <u>learning tool</u> not a plug-and-play toy.

The first thing the kids are likely to notice after they winkle their Pi out of its antistatic packet is that it looks a bit weird. If they've grown up surrounded by slick, shiny consumer gadgets like iPhones and iPads they may never have handled an uncovered circuit board before. Reclaiming electronics from the sealed box approach is all part of the <u>Raspberry Pi Foun-</u><u>dation's plan to get kids learning to code</u> – curiosity being an essential component of learning and creativity.

So in the spirit of stripping away a few more layers, I've been asking the Foundation what the secret is to making a \$35 mini computer. The basic recipe is this: having extremely skilful cooks who can craft batch after batch of Raspberry Pis as quickly as possible, and with as few duds as possible.

Many Raspberry Pis are made in the UK, in <u>Sony's Pencoed factory</u> in Wales which <u>landed</u> <u>a multi-million pound contract to manufacture Pis</u> for one of the Foundation's Pi licensees, Premier Farnell, back in the fall. Premier Farnell also has two locations in China which produce Pi but the majority of its production (70 percent) is in Pencoed, and in January the factory will account for its entire Pi output. (The Foundation can't disclose exactly how much of the Pi pie each of its licensees accounts for.)

Sony's Pencoed factory makes an average of 4,000 <u>Model B Pi</u>'s every day — or one every 7.5 seconds. Which is hard to imagine when you consider the intricacies involved in churning out thousands of double sided PCBs (printed component boards) with surface mount components on both sides and plated through hole components on the top — with blobs of molten solder being laid down in just the right spots, and the correct components stamped on them at a rate of 5.5 parts per second. And doing it all on a very tight budget.

Boards are made in panels of six Pis which go through four "key processes": mounting the bottom surface components, mounting the top surface components, mounting the plated through hole components; and then testing and packing.

	OUR SUSTAINING
	MEMBERS:
	KTSM-TV
	KVIA-TV
ar-	KRWG-TV
g n	KBNA-AM/FM & KAMA-AM
ו	KHEY-AM/FM, KPRR-FM & KTSM-AM/FM
ket ets	KLAQ-FM, KISS-FM & KROD-AM
_ n_	KPAS-FM- ALGTE A. FELDER CSRE
	INTERNET RADIO NETWORK
t kil- b	BURST COMMUNICATIONS INC THOM JOHNSON
	GIESLER BROADCASTING
<u>ed</u>	DAN GEISLER
s, 0-	ENTRAVISION
ac-	COMMUNICATIONS
01	PANASONIC-JIM McGowan
ery	SCMS, INC
n-	TNT BROADCAST AND
of	CONTRACTORS, INC
d	PAUL TERRY
	KSCE-TV
	RF Specialties of Texas Dan Sessler.
	KCOS-TV
	TIME WARNER CABLE











e-mail kvia@kvia.com

PI ON A BUDGET

Of course, making a Pi is nowhere near as complex as making a modern smartphone, but the balancing act here is keeping the price down without eroding the distributor's business model. The most costly components in the Pi are the Processor and Memory core silicon, closely followed by the connectors.

With a \$35 price tag (and just \$25 for the forthcoming <u>Model A Pi</u>) components have to be bought at the right price but also the right quality — since manufacturing defects also have to be minimised and squeezed out of the production process till they're barely ever there. It's no good slowing production either: demand for Pi is so high they have to be able to make thousands per day.

"To achieve the low price whilst still vielding a sustainable business model requires skillful manufacturing optimisation and parts procurement," says Pi hardware designer and Foundation trustee Pete Lomas (no relation!). "The production line has to run efficiently and deliver a very low failure rate. Component vendors must be selected for both quality and price and any potential changes passed through a detailed selection procedure. It is little use saving 40 cents on the components if the failure rate of finished Raspberry Pi rises. Equally every defect is aggressively pursued to understand it's root cause and eliminate it."

"Test failures" do still exist of course, but Lomas says that "to our knowledge" fewer than 100 boards have been returned by users as defective — meaning less than 0.1 percent of boards have slipped through the quality-control net. "Of these, some had physical (transit) damage and others had no fault found, so the actual figure is somewhat lower again," he adds..

CONTINUES IN PAGE 5

SBE CHAPTER 38 OFFICERS

<u>CHAIRMAN</u> Antonio Castro SBE member # 11456. KFOX/COX retired Chief Eng. 800 Arredondo dr. El Paso. TX 79912 915-584-1220 home 915-525-8507 cell farahjac@sbcglobal.net

VISE CHAIRMAN Carlos Sosa SBE member # 26533 801 N Oregon St. El Paso, TX 79902 915-496-4444 Office

<u>Treasurer</u> Walter Hanthorn SBE member # 18307 KSCE TV 4461 Gen. Maloney El Paso, TX. 79924 915-269-7583 home 915-532-8588 office <u>Certification Committee</u>: David Halperin.

Membership Committee: TBD TBD

<u>Frequency Coord. Committee</u>: Warren Reeves Owen Smith

<u>Scholarship Committee</u>: Rick Vilardell

Web Site Committee: Norbert Miles

Sustaining Membership: TBD

Program Chairman: Enrique Lopez

Newsletter: Antonio Castro

EAS Chairman: David Halpering

Executive Committee: Antonio Castro Carlos Sosa Walter Hanthorn



EL PASO,TX CHAPTER 38 MEETING MINUTE DATE 12/11/2012 LOCATION: CLEAR CHANNEL

MEETING CALLED TO ORDER: 18:17 PM, BY ANTONIO CASTRO, THERE WERE 11 MEMBERS.

REPORT OF THE SECRETARY: MINUTES ACCEPTED BY MARIO JIMENEZ, 2nd BY ENRIQUE LOPEZ

REPORT OF THE TREASURER: CURRENT BALANCE OF \$ 4,304.24. ACCEPTED BY DAVID HALPERING, 2nd BY NORBERT MILES

REPORT OF THE CERTIFICATION COMMITTEE: GABRIEL MEDRANO FROM KTSM PRESENTED THE EXAM FOR C.T.O.

REPORT OF THE MEMBERSHIP COMMITTEE: NORBERT MILES WILL SEARCH OUT IN AUSTIN PRESENTATION

REPORT OF THE FREQUENCY COORDINATOR COMMITTEE: NO REPORT.

REPORT OF THE SCHOLARSHIP COMMITTEE: NO REPORT

REPORT OF THE WEBSITE COMMITTEE 1275 HITS. (26 MORE FROM LAST MONTH)

REPORT OF THE EAS CHAIRMAN : NO REPORT.

REPORT OF THE PROGRAM COMMITTEE: FOR JANUARY, WE HAVE KEN DILLARD, FROM DIGITAL NIRVANA INC.

UNFINISHED BUSINESS: NO ANNUAL PICNIC FOR THIS YEAR

NEW BUSINESS OR ANY ITEMS FOR THE CHAPTER INTERES: GBS, NAUTEL AND RF TECH, OF TEXAS INVITED CHAPTER TO A HOLIDAY DINNER LAST DECEMBER 6th

NEXT MEETING DATE AND LOCATION: TUESDAY JANUARY 8, 2013 AT 6 PM IN CLEAR CHANNEL RADIO

MEETING ADJOURNED: AT 18:31 PM

<u>A NOTE FROM THE EDITOR :</u> NEW YEAR COMES WITH A LOT OF GOOD IDEAS ANS WISHES. LET'S TAKE THEM TO OUR NEXT MEETING AND SHARE WITH OTHERS. HAVE A GRAT ONE !!!



THANKS TO RICH GEBHART FOR THE DIALIGHT PRESENTATION ON DECEMBER 2012.

FOR JANUARY 2013 THE PRESENTER AND HOST IS:

KEN DILLARD

SENIOR ENTERPRISE ACCOUNT EXECUTIVE DIGITAL NIRVANA INC

Office: +1.513.898.1456 Mobile: +1.513.439.6901 701 Signal Hill Drive Milford, OH 45150

ken@digital-nirvana.com

http://www.digital-nirvana.com/

Digital Nirvana develops logging, broadcast monitoring (compliance and performance), content repurposing, and distribution solutions for broadcasters and content distributors and originators.

WHEN ? TIME ? WHERE ? TUESDAY JANUARY 8 6 PM CLEAR CHANNEL RADIO STUDIO, NORTH MESA.

SEE YOU GUYS THERE !!!











SELLING LIKE HOT CAKES

In terms of keeping up with demand, Lomas admits the Foundation was initially caught on the hop — having drastically underestimated people's appetite for Pi — which resulted in shipping delays in the early months. "We were caught out by a massive increase in interest in the Pi in the very early days," he says. "Whilst we were setting up for a modest production run of 20,000 units the expressions of interest overtook us by a factor of 10. At that point we decided to engage with our partners Premier Farnell and RS.

"Even with their significant resources, the logistics of getting components for a hundred thousands of Pis and getting them built was a challenge."

Unlike an electronics giant like Apple or Samsung, the not-for-profit Raspberry Pi Foundation and its suppliers were not in a position to stockpile components prior to launch to scale up for the unexpected surge in demand. (And let's face it, even Apple can't always keep up with demand.) Another delaying factor is long lead-times on some of the Pi components, says Lomas.

"[Our partners] didn't have the opportunity to stockpile before launch (unlike, say, Apple), so things were always going to be tricky. Scalability also depends on the components and the lead-time on some parts, especially the processors, is significant and still can present issues a year in to manufacture."

The Foundation is expecting to sell about a million Pis in its first year of operation — a far cry from the original 20,000 production run it budgeted for.

ANOTHER HELPING OF PI

Asked whether Sony's factory could scale up to greater production capacity in the future, Lomas says there is "significant extra capacity" that could be brought on stream. "Ultimately it is the licensee's decision where to place additional capacity, but overall the Sony experience has been excellent," he adds.

There has been no let up in demand for Pi, according to Lomas, but the Foundation believes its existing Pi factories have enough capacity to keep up with demand. "We hope that in the next few months we will reach equilibrium where manufacturing is balanced (as much as it ever can be) with demand. We have options to increase capacity with our existing manufacturers and so additional factories would in all probability not be required."

For more on Pi production, Lomas has written an excellent, blow by blow account of the various stages and processes of Sony's Pencoed Pi production line — such as the reels of surface mount components used to keep production ticking along, how Pi boards are baked (yes really) in giant ovens to make sure all the components are properly adhered, and the perils of "lava accidents."

The Foundation has also put together a video montage showing some of the Pi production stages:

http://www.youtube.com/watch?feature=player embedded&v=zj9bFgsaBd4

COPY THIS IN YOUR BRAWSER FOR VIEWING