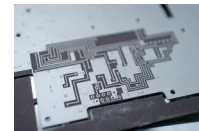
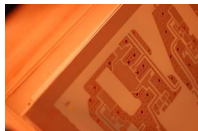
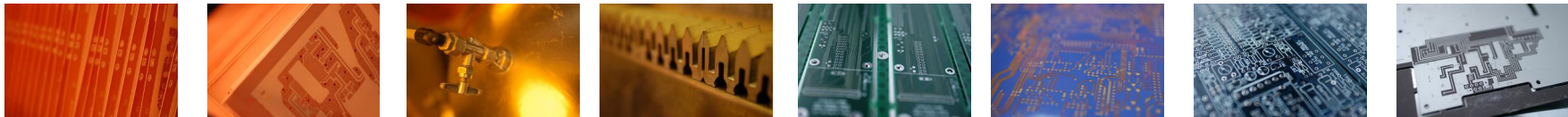


Steve Driver
Managing Director

Spirit Circuits Ltd

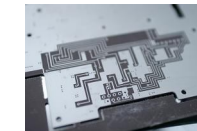
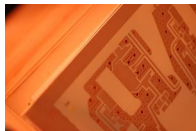


The Future of PCBs



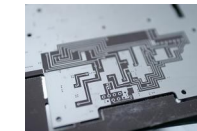
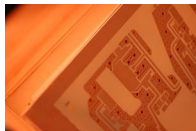


Who is this?



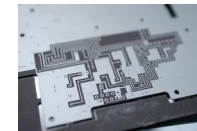
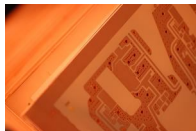


Paul Eisler
Inventor of the
Printed Circuit Board





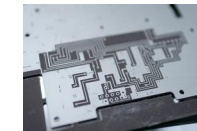
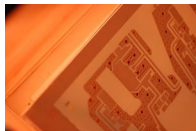
**Who took the
picture?**





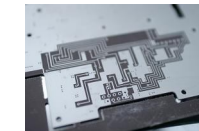
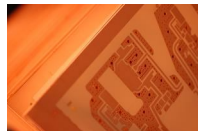
Who took the
picture?

Maurice Hubert



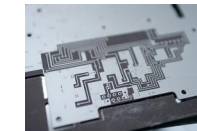
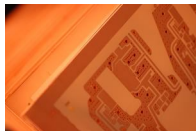


Who is this?

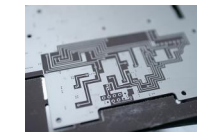
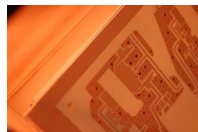




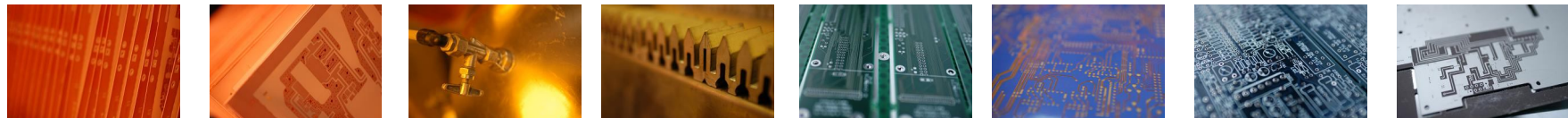
My Dad



You're here because of
something they did!



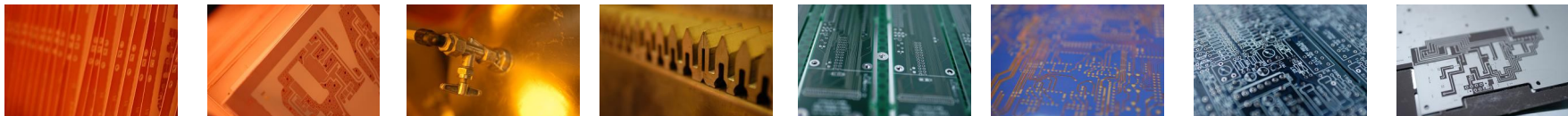
The First PCB Built by Paul Eisler 1942



What is a Printed Circuit Board?

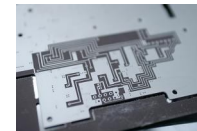
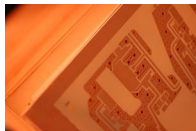
Printed circuit boards are an integral part of electronic devices, allowing for complicated assemblies of parts in small spaces. While costly in initial design, ***they are cheap to manufacture and extremely durable.*** The technique was used by the military in World War II in radios. After the war these boards were opened to commercial use and continue to evolve into more sophisticated types

David Kennedy eHow Contributor



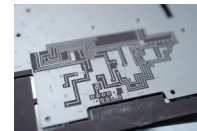
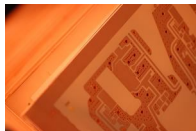
What does PCB
stand?

Printed
Circuit
Board



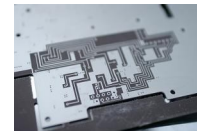
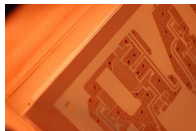
What does PCB stand?

**Problem
Come
Back**



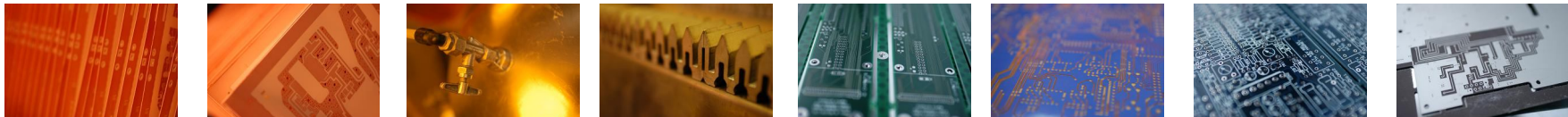
When did PCB production start?

- First generation 1950 -1970



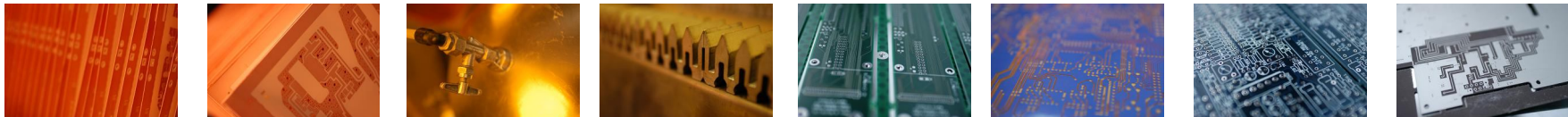
When did PCB production start?

- First generation 1950 -1970
- **The Pioneers**



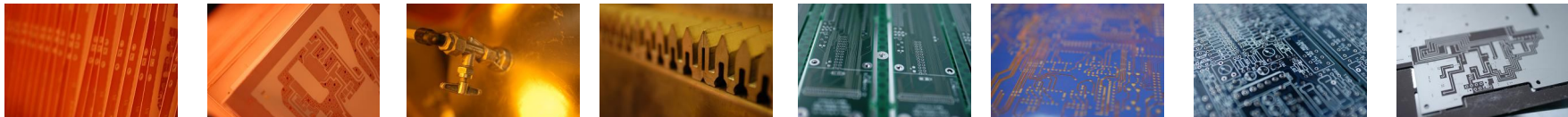
When did PCB production start?

- First generation 1950 -1970
- **The Pioneers**
- Second generation 1970 – 1990



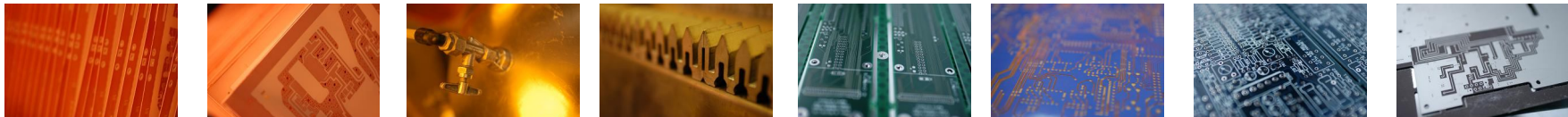
When did PCB production start?

- First generation 1950 -1970
- **The Pioneers**
- Second generation 1970 – 1990
- **The Engineers**



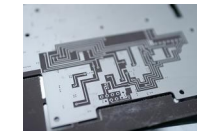
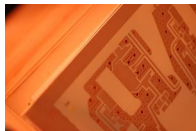
When did PCB production start?

- First generation 1950 -1970
- **The Pioneers**
- Second generation 1970 – 1990
- **The Engineers**
- Third generation 1990 -2010



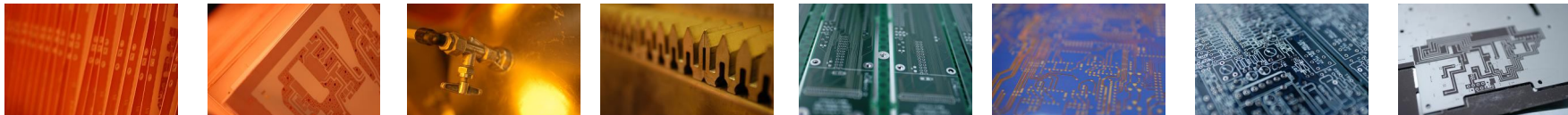
When did PCB production start?

- First generation 1950 -1970
- **The Pioneers**
- Second generation 1970 – 1990
- **The Engineers**
- Third generation 1990 -2010
- **The Mavericks**



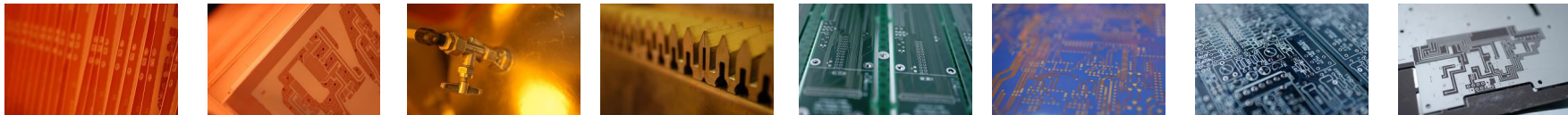
When did PCB production start?

- First generation 1950 -1970
- **The Pioneers**
- Second generation 1970 – 1990
- **The Engineers**
- Third generation 1990 -2010
- **The Mavericks**
- Fourth generation 2010 –

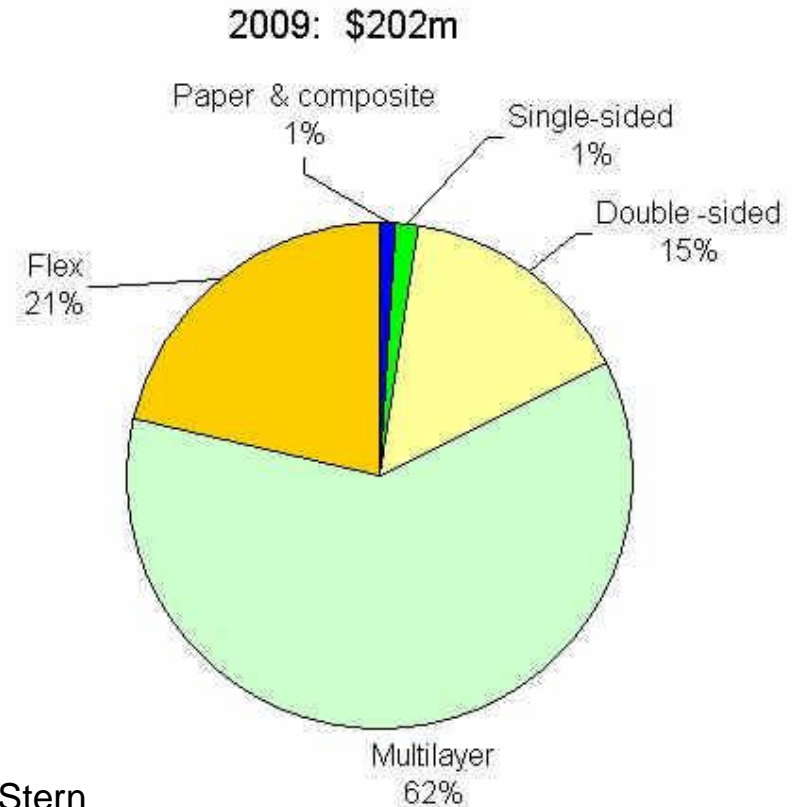
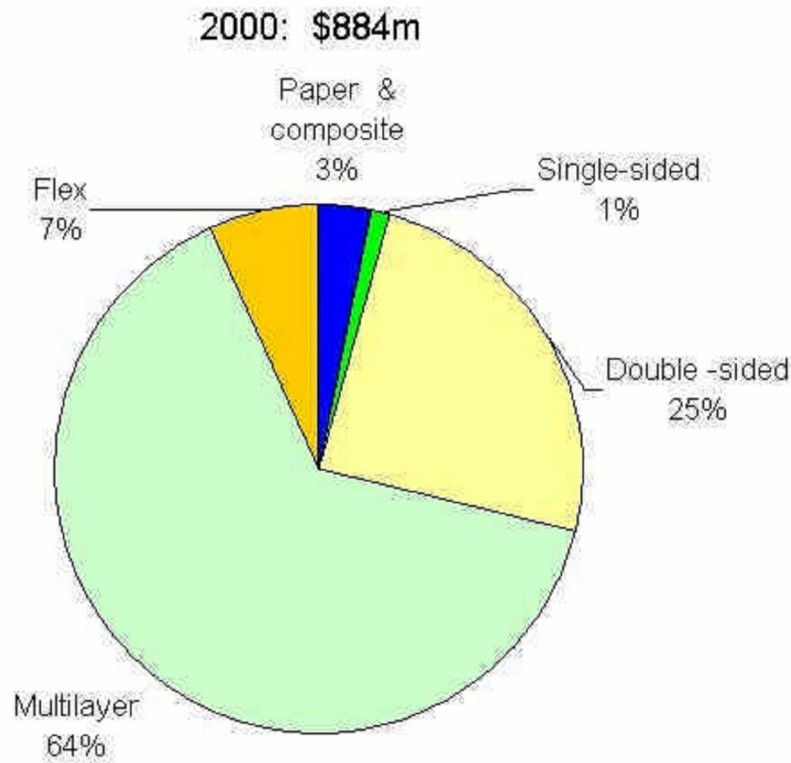


When did PCB production start?

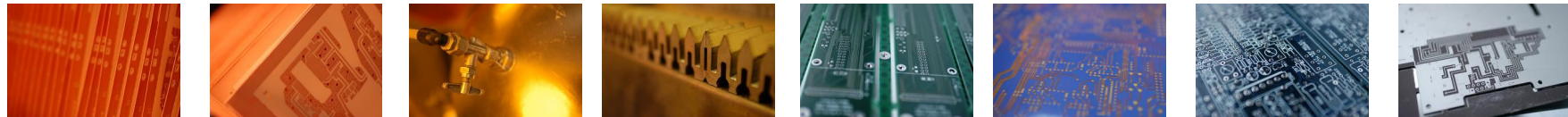
- First generation 1950 -1970
- **The Pioneers**
- Second generation 1970 – 1990
- **The Engineers**
- Third generation 1990 -2010
- **The Mavericks**
- Fourth generation 2010 –
- **The Thinkers**



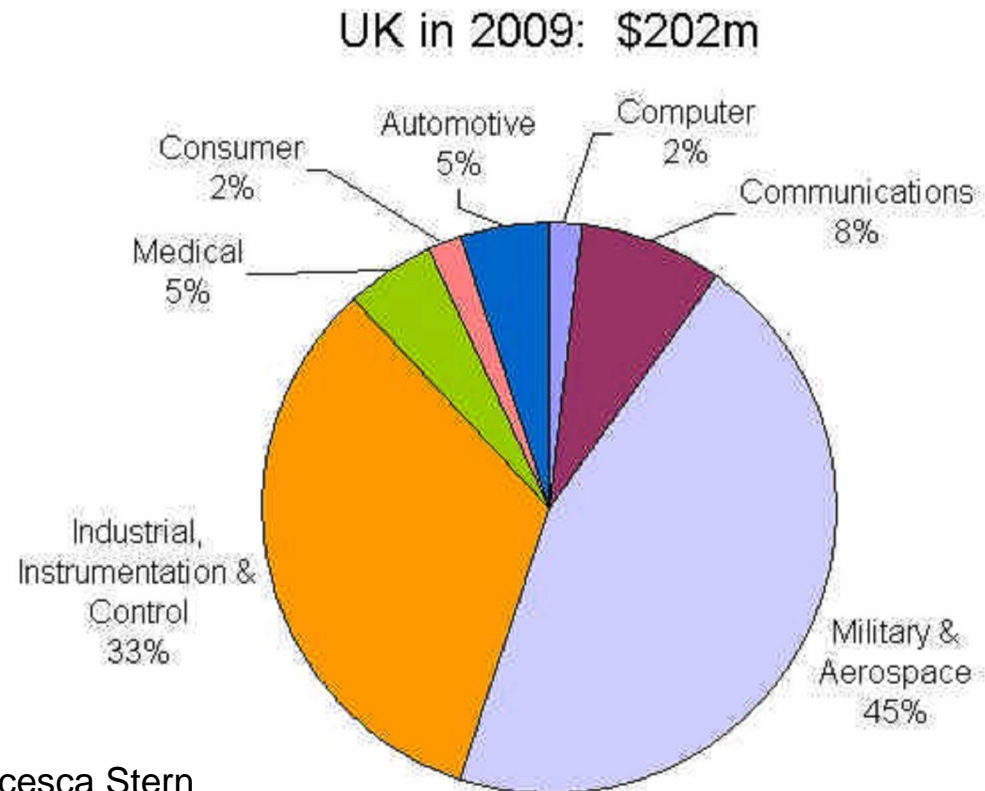
The UK PCB Market



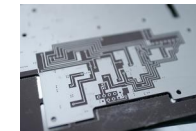
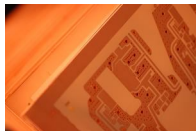
Charts by Francesca Stern
BPA Consulting.



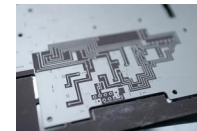
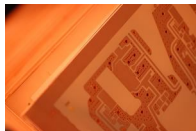
The UK PCB Market



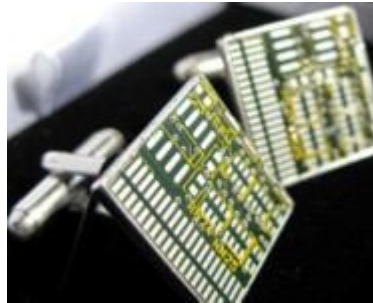
Charts by Francesca Stern
BPA Consulting.



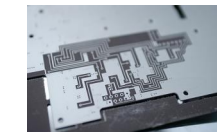
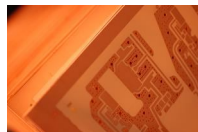
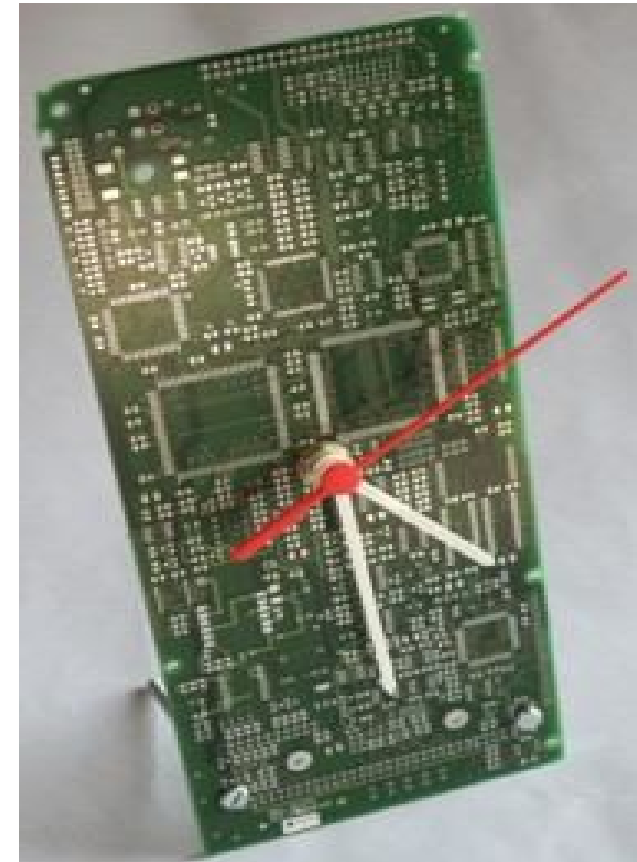
The Future 2010 -



Is this the future?



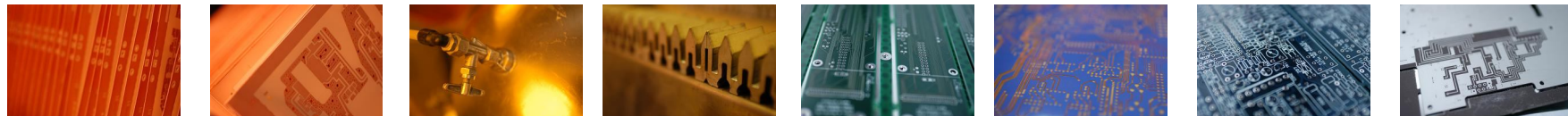
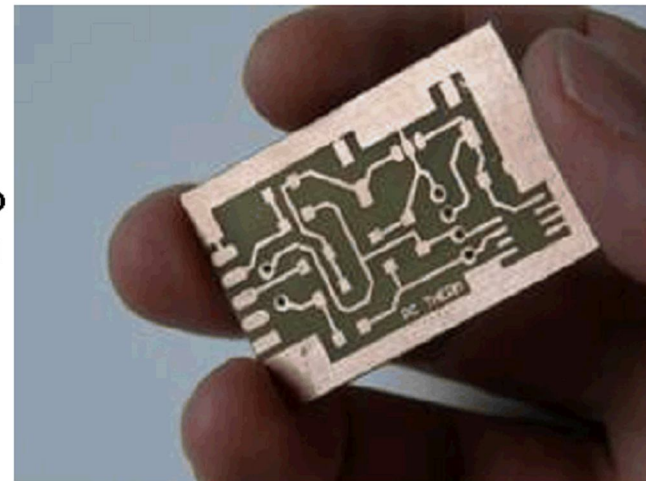
ELECTRICKERY
UNIT 3K1 COOPER HOUSE
2 MICHAEL ROAD
FULHAM
LONDON
SW6 2ER



Is this the Future?

How to make PCBs at home in 1 hour & **WITHOUT** special materials

If you take your electronics hobby seriously, I guess you already feel the need for a simple and fast technique for making your own printed-circuit boards (PCB). Here I'm going to show how to make simple single-sided PCBs in a snap, using widely available materials. This technique works reliably for thin tracks down to 10 mils, and is suitable for most surface-mount parts.



Is this the Future



The Occam Process



New Supply Chain Model



Lead-Free - Solderless Assembly



Test Vehicle Roadmap



Verdant ELECTRONICS

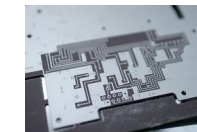
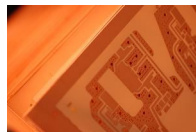
It is vanity to do with more that which can be done with less.
-William of Occam

Home About Us News Board of Advisors FAQs Contact Us

Learn all about Verdant's Occam Process™
Download the White (Green) Paper
Download Now

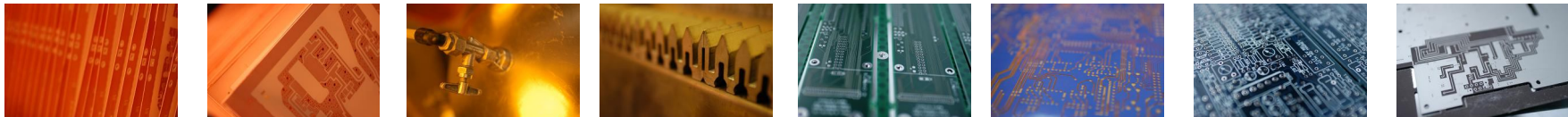
THE MISSION of Verdant Electronics is to work cooperatively with others to advance the technologies and techniques used in electronics manufacturing to reduce time in process and waste, thereby reducing costs and reducing the environmental impact of electronic products. Verdant Electronics will make its developments available to all electronic product developers to ensure wide-spread access and adoption of advanced or improved manufacturing technologies.

Discover Verdant's Technology

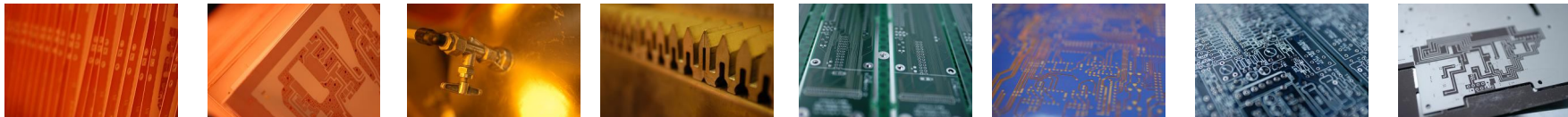


The Future 2010 –

What does our future look like?

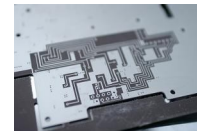
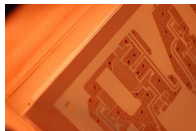


“The Futures Tight The Futures Merlin”



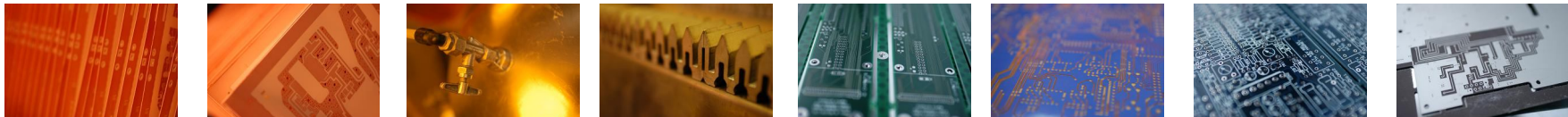
The Future 2010 - 2020

- When thinking about the future,
- I applied my Think10 rule and made a list of the things I believe we need to consider.
- The school and college leavers
- Technology
- Methodology
- Innovation
- Change
- Market conditions
- Make vs. Imports
- Training
- Re-cycling
- Culture



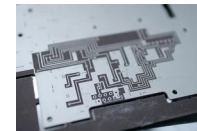
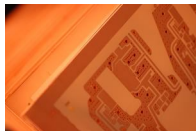
Training and Young people

- Work with the universities
- Train and offer a career path for school leavers
- Sponsor training courses
- Use and work with the institutes
- Prepare your company image and culture for the next generation



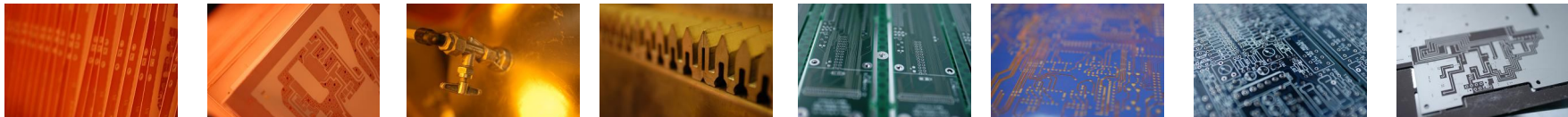
Innovate

- Work with suppliers and customers to develop and approve new energy efficient and greener solutions
- Pete Lyme is here tonight, He is the Dyson of the PCB industry.
- Find re-cycling solutions
- Work with the universities and research centres and find new substrates
- Use social media and other internet portals to reach new markets
- Improve yields and sustainability of your product
- Trade online
- Blog, Tweet, chat etc...



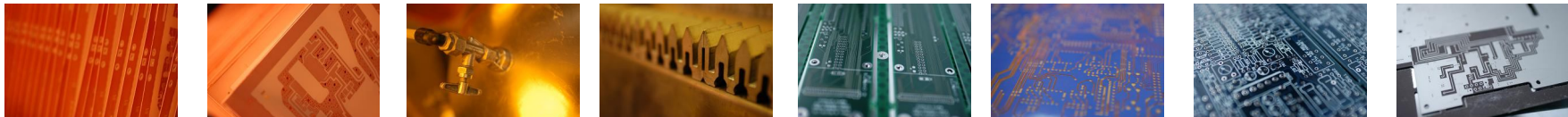
Technology

- What is Technology! You do not need to be a big company to offer technology. Very often R&D is carried out in the small companies where there is flexibility and speed.
- New technology could simply be a new ink a new plating process a new laminate or a combination of all these.
- When we refer to hi-technology the companies we think of are Graphic, Stevenage, Invotech and Exception. However, Trackwise, Tecnoflex and Labtech are also offering niche technology



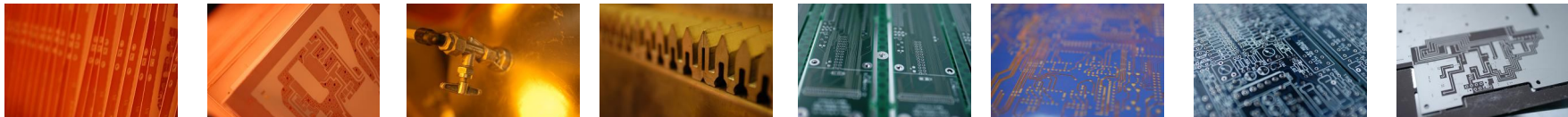
Methodology

- Challenge everything!
- In the office look at the way you quote, the way you sell, the way you load orders
- In the factory, challenge tradition, solder mask spraying, direct imaging and ink jets are the some of the areas where I think we will change
- At the drawing board understand the cost drivers and don't build unnecessary difficulties into the board.
- Look at material options.....why are we still defaulting to 1.6 materials?
- Why are we still putting idents on boards?



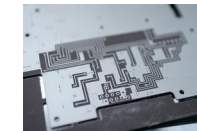
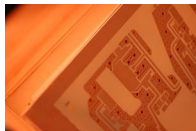
The Market

- We know that by volume the market is shrinking.
- By part number and number of jobs the market is growing and will continue to grow.
- The prototype market is buoyant.
- The niche markets are good too :- if you are willing take risks.
- In the standard PCB market (1 to 8 layers) there are still many players, to succeed here lead times must be under 7 days



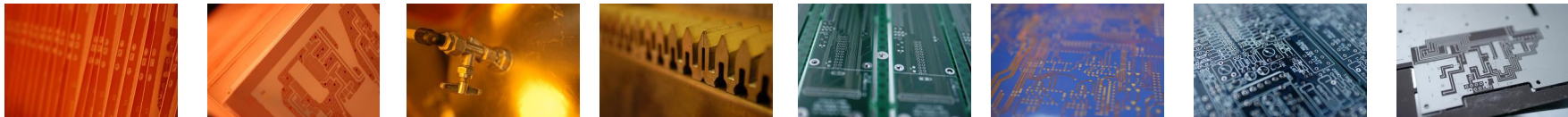
Make vs. Import

- Understand the real cost of an imported boards.
- What is stock costing or hiding?
- What did the currency shift cost?
- What did the ash cloud cost your business?
- Mis-aligned seasons cause delivery issues
- Port strikes, fuel surcharges what do they really cost?
- Tsunami, earthquakes, flooding what is the impact on your business?
- These you cannot plan for, they all effect your business

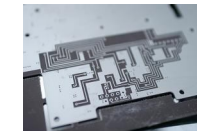
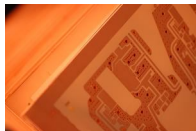


Circuit Board Waste

- “It is estimated that as much as 50,000 tonnes of PCB (printed circuit board) scrap is produced each year in the UK and of this only around 15% is currently subjected to any form of recycling. The remaining 85% is consigned to landfill.”
- Dr Martin Goosey and Dr Rod Kellner (A Scoping Study, End- of-Life Printed Circuit Boards)

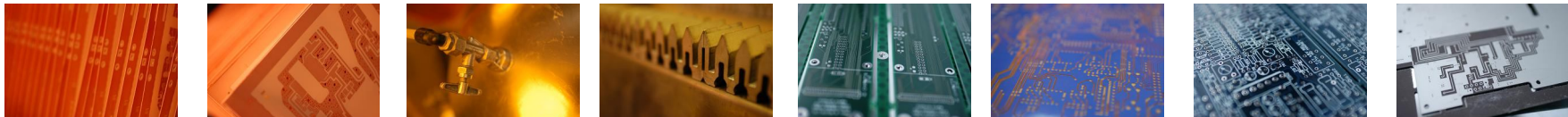


Don't waste it

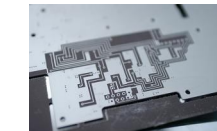
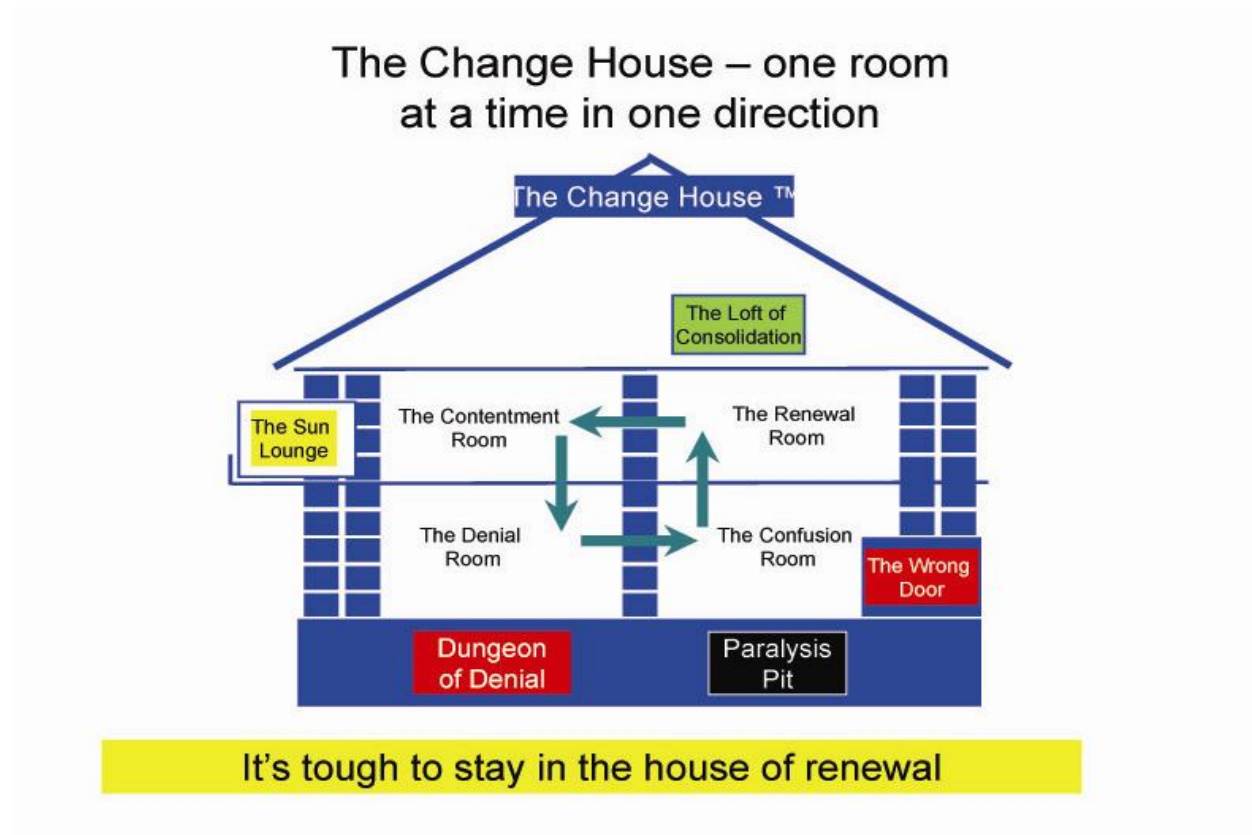


The future and Change

- I believe there is a good future for all of us
- There will be further consolidation and acquisitions, we have seen in the earlier charts how the UK market has shrunk
- There will be new technologies
- We will be changing our processes
- **Change will happen....its always does!**

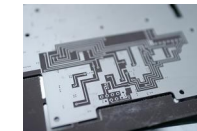
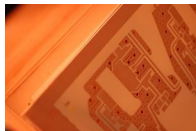


Look for changes in your business

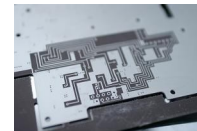
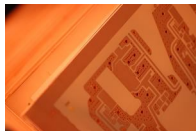


Challenge tradition

**“ Don't just do something
sit there”**



Think10



Thank you

