



Cheops (Malta) Ltd

Who are we?

- ◆ Contract Electronic manufacturer using a mixture of technologies, such as Surface Mount Technology (SMD), Through Hole Technology (THT) and manual assembly.

Our Strength

- ◆ Within the SMD and THT sections Cheops has mixed technologies both semi automated and fully automated lines capable of placing over 50,000 components per hour.

Our Weakness

- ◆ Operational costs are on the increase hence making us less competitive.

Our Threat

- ◆ Cheops main area of activity is subcontracting. During the past five years this field has become increasingly competitive especially from Eastern European countries.

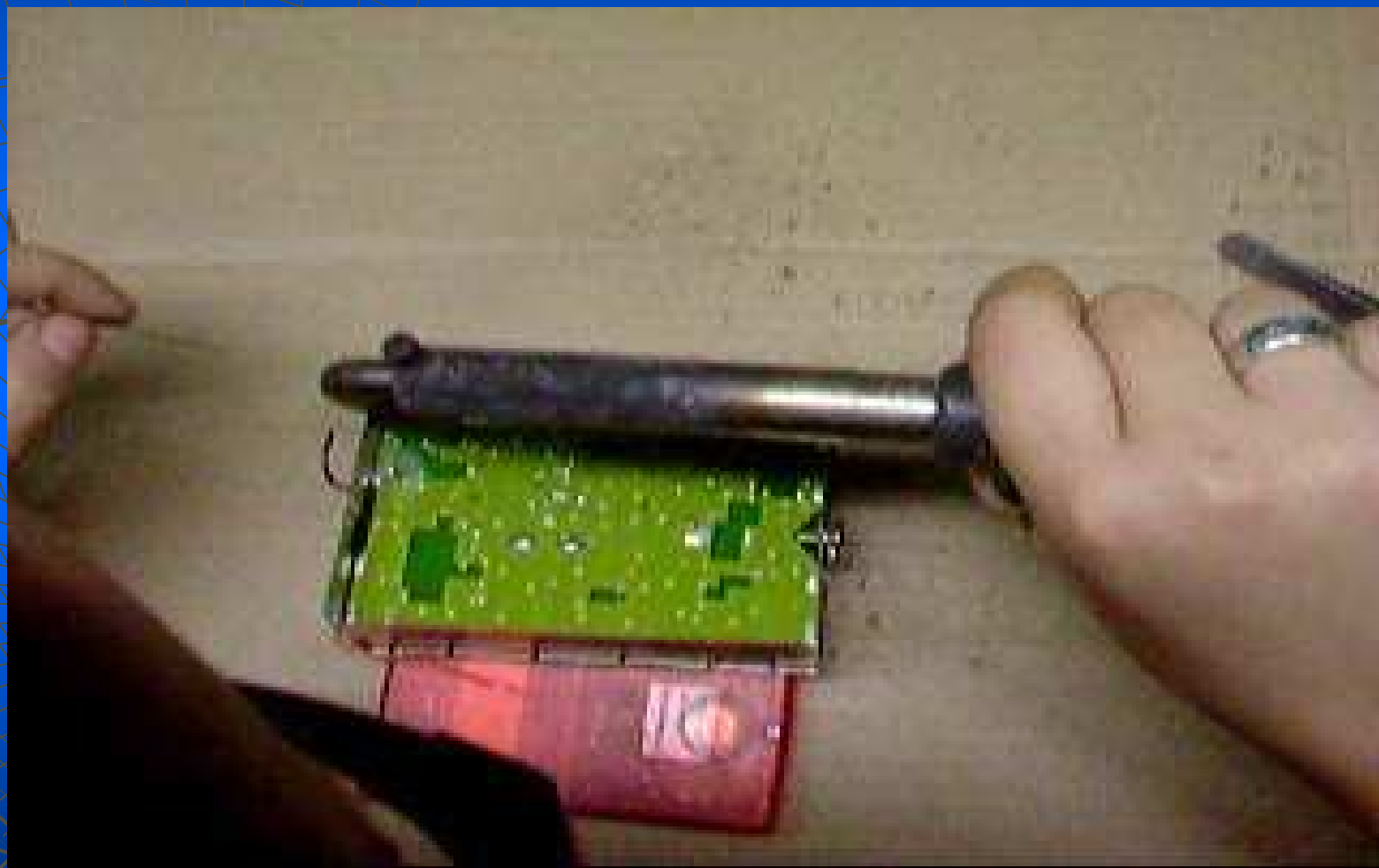
Our Opportunity

- ◆ To sustain our labour cost by optimizing our efficiency and automating our manual production processes.

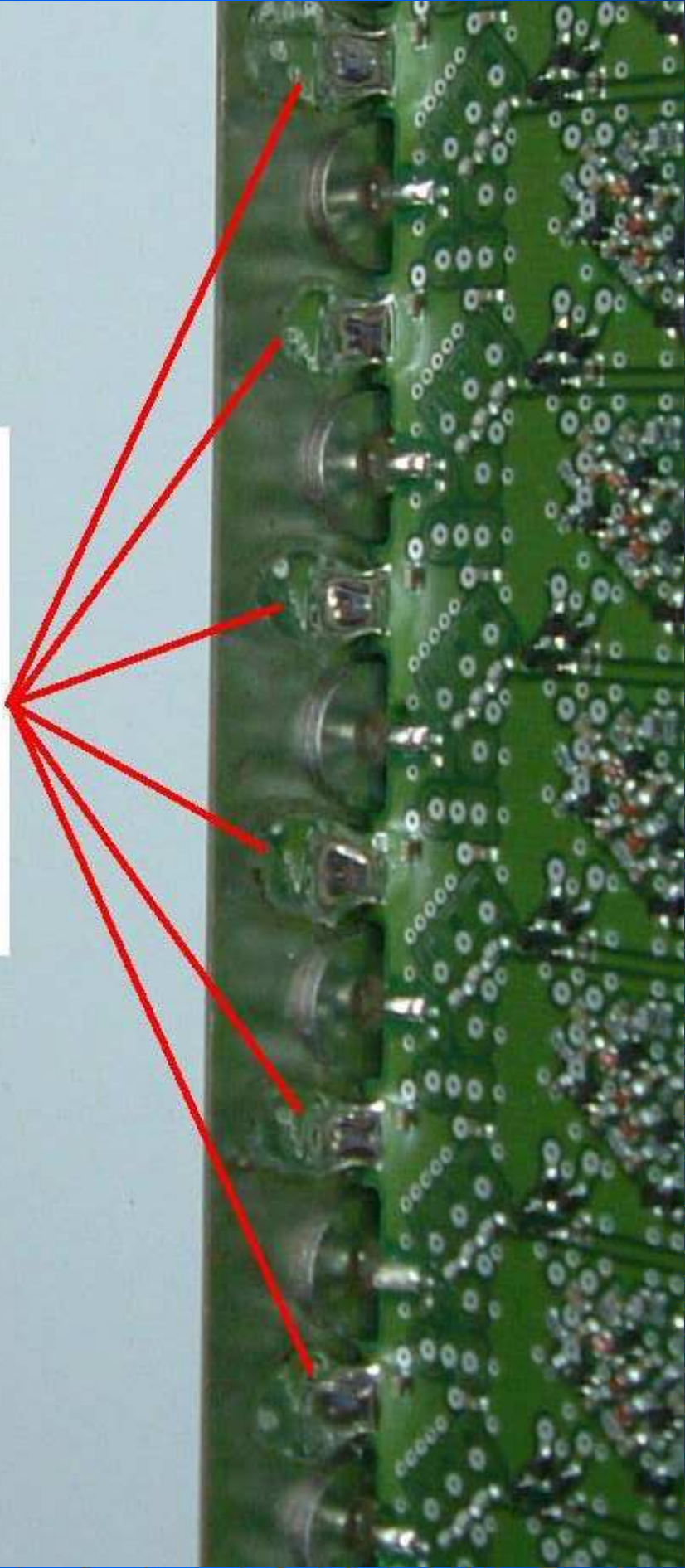
Our proposal

- ◆ Automating one of the most labour intensive processes within Cheops, this is where PCB's are manually soldered to a metal housing.
- ◆ Over 500,000 joints are soldered per year.
- ◆ 12% of Cheops resources are currently utilized to perform this task.

Hand Soldering Process



SOLDER JOINTS



Soldering of PCB to metal housing

Current Process: Manual Hand Soldering using a minimum 150 Watts soldering iron with a 6 mm chisel bit.

Soldering temperature: Constant flow of a minimum 300 degrees Centigrade on soldering joint.

Product size: Units from 30 by 50mm to units from 115 by 280mm

Metal thickness: From 0.5 to 1.2mm

Type of Solder: Lead free

Metal Plating: Nickel or Tin plated

Soldering method

- ◆ First the metal housing is heated to reach the temperature of 270 C, when this is reached, the PCB is then heated simultaneously with the housing. When both PCB and housing reach the required temperature, lead free solder is applied. During this process the soldering iron is held at 30 degrees angle from the housing to let the solder flow both on the housing and on to the PCB. This process takes from 10 to 15 seconds depending on the size of the joint.

Restrictions

- ◆ It is very important that the solder is not applied directly to the soldering iron as this will vaporize the flux rendering it inactive. This will result in poor mechanical and electrical joint.
- ◆ It is also very important that the correct heat is applied as too much heat will damage both the PCB and the plating on the metal. If heat is not sufficient, solder joints will suffer both mechanically and electrically.

Accurate and Flexible

- ◆ The soldering tool must be accurate and flexible to cater for different types of housings.
- ◆ Solder joints vary in size and in thickness therefore both solder feeding and heat must be varied accordingly.
- ◆ The solder tool must be able to move in X, Y, Z direction and its angle has to be variable from 5 degrees to 40 degrees angle during soldering. The movement must be very accurate as other components could be damaged if touched by the soldering bit