

---

# FOUNDATION TECHNOLOGY LTD.

## ASSEMBLY AND TEST PLANT LIST

---

### CONTENTS

1.	SUMMARSED ASSEMBLY AND TEST EQUIPMENT LIST.....	3
2.	GERBER AND DATA PROCESSORS.....	4
2.1	GraphiCode GC-Place.....	4
2.2	Assembly Expert (aka FabMaster).....	4
3.	COMPONENT STORAGE .....	5
3.1	Dry stores.....	5
3.2	Baking ovens .....	5
4.	INVICTA SABRE MAX 757 – STENCIL CLEANER.....	6
5.	SOLDER PASTE SCREEN PRINTERS .....	6
5.1	DEK Horizon 03iX.....	6
6.	THREE DIMENSION SOLDER PASTE INSPECTION.....	7
6.1	Koh Young KY8030 .....	7
7.	PICK AND PLACE EQUIPMENT.....	8
7.1	Siemens 80S/F .....	8
7.2	Siemens D1 .....	9
7.3	Siemens D2 .....	10
8.	REFLOW SYSTEMS.....	11
8.1	Three off Convection – JT Ltd – 10 zones.....	11
8.2	Vapour Phase- IBL VAC665.....	11
9.	CLEANING SYSTEMS.....	12
9.1	Electrovert Aquastorm 100 In-line Aqueous.....	12
9.2	CCH Sensotronic ABD500SA – Co-solvent .....	12
9.3	Ionic Contamination Tester .....	13
10.	INSPECTION SYSTEMS .....	14
10.1	Ersascope – BGA/Low Profile device inspection.....	14
10.2	X-ray - X-Tek CPXS 160kV .....	14
10.3	Cadread – Inspection system.....	14

10.4	Goepel OptiCon X-Line 3D Automatic X-Ray Inspection System .....	15
10.5	Agilent SJ50 - Automatic Optical Inspection Systems .....	16
10.6	DCB Automation UltraVision – Automatic Optical Inspection system .....	16
11.	THROUGH HOLE SOLDERING SYSTEMS .....	17
11.1	Blundell CMS400D Wave Soldering System.....	17
11.2	Vitronics Soltec 6745 Selective Soldering System .....	17
11.3	Vitronics Soltec 6746 Selective Soldering System .....	17
12.	ENVIRONMENTAL TEST .....	18
12.1	Design Environmental Ltd.....	18
13.	IN-CIRCUIT TESTER.....	19
13.1	Teradyne Z1884.....	19
14.	FLYING PROBE TESTERS.....	20
14.1	SPEA 4040 .....	20
15.	BOUNDARY SCAN (JTAG) – TEST EQUIPMENT .....	20
15.1	JTAG Technologies .....	20
15.2	XJTAG .....	20
16.	GENERAL PRUPOSE TEST EQUIPMENT .....	21
17.	SPECIALISED REWORK .....	21
17.1	SRT 1100HR+ - BGA Rework.....	21
18.	PRESS-FIT TOOLING.....	21

## 1. SUMMARSED ASSEMBLY AND TEST EQUIPMENT LIST

- Gerber data processing.
- CAD data processing.
- Component storage.
- Stencil cleaning.
- Printing.
- Paste Inspection.
- Placement.
- Reflow.
- Vapour Phase.
- Cleaning.
- AOI
- Wave solder.
- Selective Solder.
- Press fits.
- Inspection.
- X-Ray.
- ESS
- In-Circuit Test
- Flying Probe Test.
- JTAG.
- Press Fit Equipment

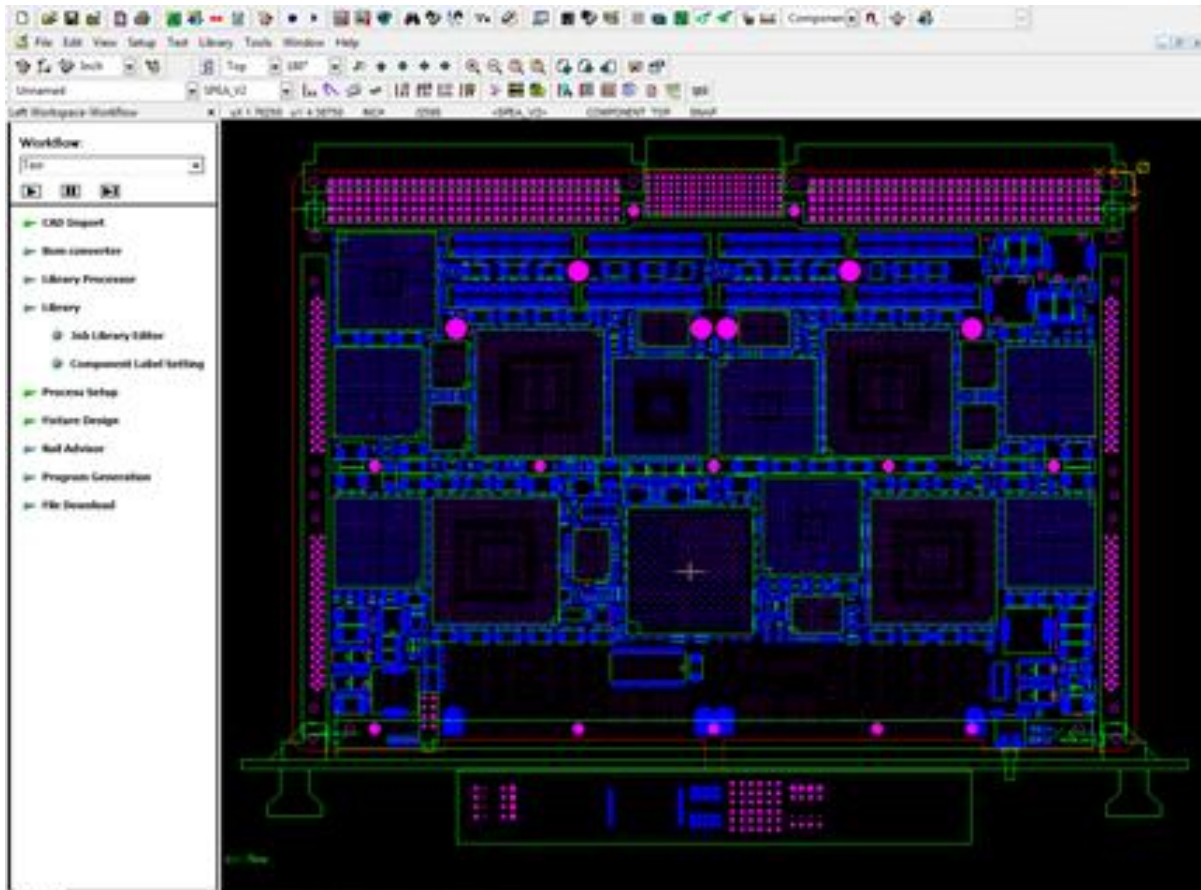
## 2. GERBER AND DATA PROCESSORS

### 2.1 GraphiCode GC-Place

- For solder paste stencil design

### 2.2 Assembly Expert (aka FabMaster)

- Input processors: most CAD systems inc. ODB++
- Output processors: SPEA, Gencad, Teradyne



### 3. COMPONENT STORAGE

#### 3.1 Dry stores

Temperature and humidity controlled – XTC510 (Blundell)

Photograph showing a few of the shop floor dry stores:



#### 3.2 Baking ovens



#### 4. INVICTA SABRE MAX 757 – STENCIL CLEANER

- Cleans: Stencils, Misprints
- Optional: Ultrasonics (for stencils only)

Photograph showing the Sabre stencil cleaner:



#### 5. SOLDER PASTE SCREEN PRINTERS

##### 5.1 DEK Horizon 03iX

- Maximum size: 510 x 508mm
- Registration: Vision alignment to fiducial marks
- Accuracy: +/-25 microns at fiducial positions (6 sigma dry, 3 sigma wet)

Photograph shows Line Loader and DEK Horizon printer:



## 6. THREE DIMENSION SOLDER PASTE INSPECTION

### 6.1 Koh Young KY8030

- Real time, 15um 4MPix camera.
- Detects solder paste defects such as slump, missing or low volume.
- Maximum board size: 510mm

Photograph shows Koh Young 3D SPI between shuttle conveyor and DEK Horizon printer



## 7. PICK AND PLACE EQUIPMENT

### 7.1 Siemens 80S/F

- Off-line programming system – SiPlace PRO
- Maximum board size: 508mm x 460mm
- Vision systems: board and component
- Placement rates:
  - S20 20,000 cph
  - F4 12,000 cph
- Revolving head system:
  - 12 vacuum nozzles - collect & place heads
  - Placement accuracy +/-90um, 4 sigma
  - Components: Sizes: 0402 to 14mm x 18mm
- IC Head:
  - Maximum placement rate: 2000 components/hour
  - Accuracy: +/-50um, 4 sigma
  - Components: Sizes: up to 55mm x 55mm

Photograph shows one of the Siplace S20 machines with an F4 in the background:





## 7.2 Siemens D1

- Board formats: 508mm x 460mm maximum
- Vision systems: board and component
- Maximum placement rate: 20,500 components/hour
- Placement heads: 1 off Revolving + 1 off IC Head
- Revolving head system:
  - 12 vacuum nozzles - collect & place heads
  - Placement accuracy: +/-67um, 4 sigma
  - Components: Sizes: 0201 to 18mm x 18mm
- IC Head:
  - Placement accuracy: +/-50um, 4 sigma
  - Components: Sizes: up to 200 x 125mm, Height: upto 19mm

Photograph shows a D1 with an F4 in the background:



### 7.3 Siemens D2

- Board formats: 508mm x 460mm maximum
- Vision systems: board and component
- Maximum placement rate: 40,000 components/hour
- Placement heads: 2 off Revolving
- Revolving head system:
  - 12 vacuum nozzles - collect & place heads
  - Placement accuracy: upto 50um, 3sigma
  - Components: Sizes: 01005 to 18mm x 18mm



## 8. REFLOW SYSTEMS

### 8.1 Three off Convection – JT Ltd – 10 zones

Photograph showing a JT 10 zone reflow oven with a FIFO in the foreground:



### 8.2 Vapour Phase- IBL VAC665

- Maximum size: 640 x 650mm
- Automatic soldering
- Separate IR unit
- Maximum temperature – 240°C

Photograph of one of the two Vapour Phase systems:



## 9. CLEANING SYSTEMS

### 9.1 Electrovert Aquastorm 100 In-line Aqueous

- Stages: Pre, Wash, Rinse, Dry



### 9.2 CCH Sensotronic ABD500SA – Co-solvent

- 2 stage (clean, rinse)
- Maximum board size: 360x310 (as a single pass)

Photograph showing the CCH Co-solvent cleaner:



### 9.3 Ionic Contamination Tester

- System: Alpha Metals Ionograph 500M



## 10. INSPECTION SYSTEMS

### 10.1 Ersascope – BGA/Low Profile device inspection

- 2<sup>nd</sup> generation Ersascope
- 350 x magnification

### 10.2 X-ray - X-Tek CPXS 160kV

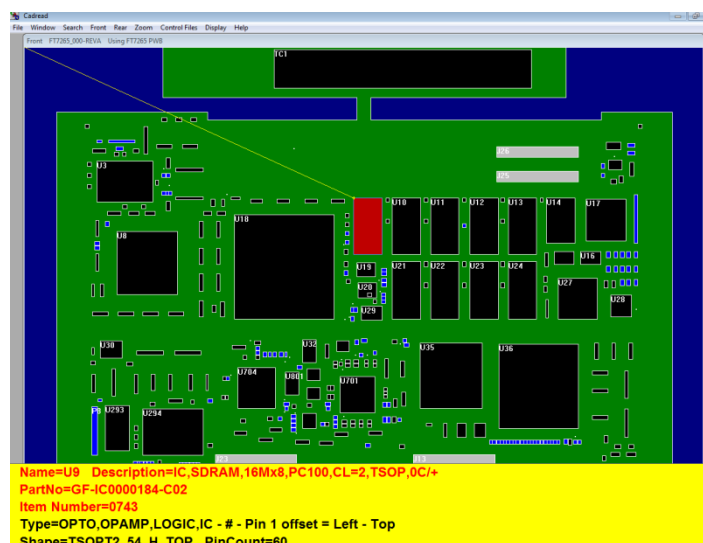
- Magnification: upto 1500x
- Maximum board size: 350mm by 530mm
- Axes: 5 axes, tilt +/- 60 degrees, rotation 360 degrees

Photograph showing the X-ray system:



### 10.3 Cadread – Inspection system

- Shows: Location, Orientation, Part number



**10.4 Goepel OptiCon X-Line 3D Automatic X-Ray Inspection System**

- Maximum size: 400 x 450mm
- Fiducials: 2 off minimum
- 3D inspection: Digital Tomosynthese
- Power: 130kV, 300uA
- Off-line programming system
- Voiding, bridging and shape for BGAs etc

Photograph shows the AXOI system:



### 10.5 Agilent SJ50 - Automatic Optical Inspection Systems

- Maximum size: 400x500mm
- Fiducials: 2 off minimum (ideally 3), camera, opposing corners
- Presence/absence, Bill boarding/flipped, Polarity, OCV, bridging

Photograph shows 2 Agilent SJ50 AOI systems:



### 10.6 DCB Automation UltraVision – Automatic Optical Inspection system

- Maximum size: 380x400mm
- Fiducials: 2 off minimum (ideally 3), camera, opposing corners
- Camera: 4M colour
- Test techniques: presence/absence, bill boarding/flipped, polarity, OCV, bridging, Laser height

Photograph of the DCB Automation UltraVision AOI system:





## 11. THROUGH HOLE SOLDERING SYSTEMS

### 11.1 Blundell CMS400D Wave Soldering System

- Waves: Dual, chip, lambda, spray fluxer
- Maximum board size: 406mm wide

Photograph of the Blundell wave solder system:



### 11.2 Vitronics Soltec 6745 Selective Soldering System

- Inert (Nitrogen) atmosphere.
- Interchangeable RoHS and non-RoHS solder pots.
- Maximum board size: 410 by 410 mm

Photograph of the Vitronics Selective soldering system:



### 11.3 Vitronics Soltec 6746 Selective Soldering System

- Inert (Nitrogen) atmosphere.
- Interchangeable RoHS and non-RoHS solder pots.
- Maximum board size: 410 by 410 mm

Photograph of the Vitronics Selective soldering system:



## 12. ENVIRONMENTAL TEST

### 12.1 Design Environmental Ltd

- FS220-40S
- FS209-70S
- FS335-70S
- Temperature ranges: -70°C to +130°C
- Rate of change: up to 20°C/min rate of change (-25°C to +85°C)
- Compressor and LN02 systems

Photograph showing one of the ESS chambers:



## 13. IN-CIRCUIT TESTER

### 13.1 Teradyne Z1884

- AC and DC stimulus and measurement systems.
- Digital Hardware: 3520 'pure-pins'
- Deltascan, Wavescan and Framescan Plus- vectorless techniques

Photograph shows the Z1884:



## 14. FLYING PROBE TESTERS

### 14.1 SPEA 4040

- Maximum size: 400x500mm
- Vision system: for fiducial alignment
- 4 off Flying Probes no fixtures required
- AC and DC stimulus and measurement systems.

Photograph shows one of the two SPEA 4040 systems



## 15. BOUNDARY SCAN (JTAG) – TEST EQUIPMENT

### 15.1 JTAG Technologies

- Development and runtime systems

### 15.2 XJTAG

- Development and runtime systems

## 16. GENERAL PRUPOSE TEST EQUIPMENT

- Power supplies
- Oscilloscopes
- Logic Analysers
- Frequency counters
- Function generators
- Toneohm 950 (Multilayer shorts locator)

## 17. SPECIALISED REWORK

### 17.1 SRT 1100HR+ - BGA Rework

- Maximum board size: 457 by 559mm
- Auto-profile, real time on screen profiling
- High resolution Video, Leica 40X zoom
- Heating: Top:1.6kW, Bottom: 4.0 kW

Photograph showing an SRT1100 rework system:



## 18. PRESS-FIT TOOLING

- Presses from: BalTec, Berg, Erni