



## Freedom 3000 Plus Rework Station

### System Overview

The Conceptronic Freedom 3000+ printed circuit board repair station is designed for component rework, low volume prototype reflow soldering and process development. The Freedom 3000+ machine structure is accurate, rigid, and stable in order to repeatedly place and solder SMT components. A central plate provides integrated mounting features for permanent and precise alignment of all critical sub-assemblies. Circulating, linear ball bearings are used for the placement/heater head, optics train, and XY table.

Top and bottom forced hot gas heaters are standard. The heaters are PID computer controlled, and feature independent “variable” set-point temperatures and airflows. The top heater head is motorized for automatic component placement and removal. The software has built-in support for an optional 4 Zone “Honeycomb” Infrared Preheater for efficient preheating of large PCB assemblies.

The Freedom 3000+ control system features user-friendly Microsoft Windows™ software for processing development and general operation. The software runs on an integrated Pentium™ computer. The computer communicates with an internal, industrial PLC for reliable I/O control. The entire system is designed for maximum flexibility and ease of use with fast, accurately controlled heating and precise, repeatable placement.



### Semi- Automated Rework Station

- Vision System
- Placement & Removal

### Powerful Rework Station

- 1200W Convection Nozzle
- 1200W Underboard Heater
- 5000W Honeycomb preheater

- PB-Free Certified
- Accurate
- Rapid / Repeatable
- Robust / Reliable

#### Contact Information

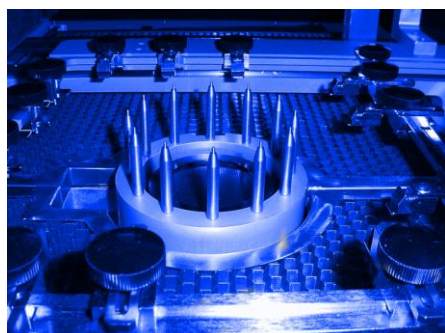
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## Freedom 3000 Plus Rework Station

### Standard Features

- Factory calibrated optics
- Fixed mirror (recommended for viewing and aligning components less than 60 x 60 mm)
- Thermocouple input ports (6) for real-time process monitoring and development
- Precision bearings for optics, Z-Axis, and X-Y Table
- PCB positioning table with X-Axis and Y-Axis fine adjust
- Breakaway heater head with built-in Theta adjustment
- Rigid station base made of high-stability, CNC machined aluminum for accuracy and durability
- High, Medium and Low gas flow settings for top and bottom process heaters
- Air or nitrogen heater operation with separate air and nitrogen inputs standard.
- Vacuum pump, & vacuum wand attachment for component handling.
- Universal Board holding fixture.
- Vacuum Part Pick Up Sensing switch, tells PLC found part and picks up
- Color Vision System, camera, lens, frame grabber card
- Manual Optics Train Control for most rapid cycle times is standard
- Wide-Array adjustable under board support for minimal stress and guaranteed repeatable z-axis positioning.



*Wide Array Under Board Support with Vertical Z-Axis Adjustment.*

### Control System

- Intel Pentium™ based PC
- Hard Disc Drive, Front Panel USB Port, CD ROM drive
- Industrial-duty programmable logic controller (PLC) for reliability and I/O control
- Real-time PID control for forced convection hot gas heaters
- Keyboard/Trackball
- 15" LCD Monitor

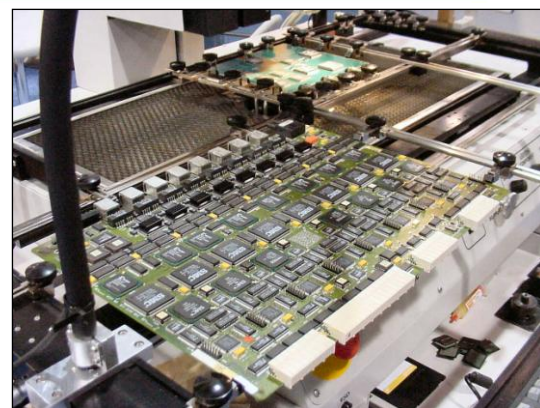
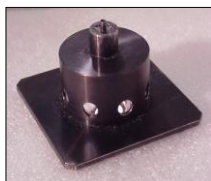
### Software

- MICROSOFT WINDOWS XP™
- Conceptronic WINDOWS™ based custom operating software
- Pre-programmed process recipes for rapid set-up and process development.
- Password protected engineering access
- Learn-and-repeat interactive profiling
- Data-logging with report generation
- Process graphing
- Virtually unlimited profile flexibility (multiple flow rates, temp set points, etc.)
- Virtually unlimited profile storage



### Component Handling Capacity

- 1 x 2 mm minimum recommended component size
- 80mm square maximum recommended component size
- Handles both grid array and leaded type components. (BGA, CGA, QFP, LCC, TSOP, FLIP-CHIP, and many others)
- Placement Accuracy to better than 0.001 inches
- Able to repair boards with up to 2.4 inch tall components

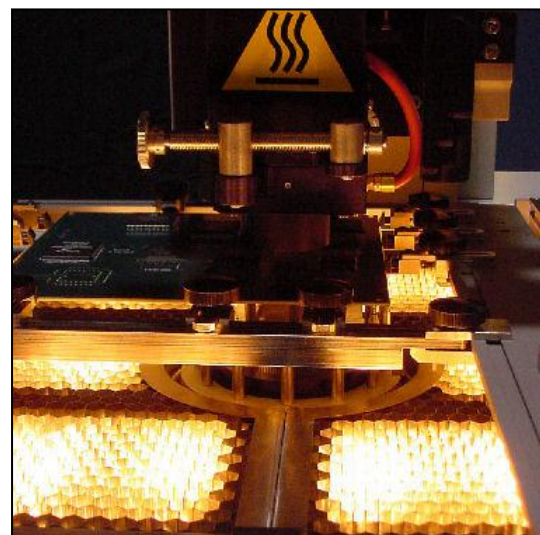


### Board Handling Capacity

- 14 x 14 compact size
- 20 x 20 standard size
- 24 x 36 large board
- 2 inch x 2 inch (5 cm x 5 cm) minimum recommended board size
- 20 inch x 20 inch (50.8 cm x 50.8 cm) maximum recommended board size
- PCB Thickness' up to 0.25 inch (6.4 mm)

### Options

- Split mirror (wider field of view recommended for parts larger than 60 x 60 mm), bigger part)
- Auto shuttle with calibrated positioning for component pickup.
- Closed loop Pressure Sensing Z-axis control.
- 360 degree rotating nozzle.
- Under board Preheater



*4 Zone Under Board Preheater*



# Freedom 3000 Plus Rework Station

## Mechanical Specifications

Width: 50 inch (127 cm)  
 Depth: 32 inch (81 cm)  
 Height: 68 inch (173 cm)  
 Weight: 400 lbs (182 kg)

Supply – air-----  
 100 PSI, 10 CFM [DRY, FILTERED, REGULATED] -1/4 inch NPT female inlet- 3/8 inch (10 mm) minimum supply line

Supply – nitrogen-----  
 60 PSI, 7 CFM [REGULATED] - 1/4 inch NPT female inlet - 3/8 inch (10 mm) minimum supply line

## Electrical Specifications

The standard Freedom 3000+ uses a 5KVA transformer. The customer must choose the primary voltage. HERTZ: 50/60

Primary Voltage (VAC)	Rating (AMPS)	Main Disconnect CB (AMPS)
190	27	30
200	25	30
208	24	30
220	23	30
230	22	25
240	21	25
380	13	16
400	13	16
416	12	16
440	12	16
460	11	13
480	11	13

## Control System & Software

- Industrial-duty programmable logic controller (PLC) for reliability and I/O control
- Intel Pentium™ based PC Interface.
- Thermocouple input ports (6) for real-time process monitoring and development
- Hard Disc Drive, CD ROM drive, Front Panel USB Port
- Keyboard/Trackball for "point and click" operator control
- Real-time PID control for forced convection hot gas heaters
- 17" LCD Monitor

-----**Contact Information**-----  
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## Heating & Atmosphere Control

- 1200W Convection heater heats Air or Nitrogen to 450C at low, medium, and high flow settings. Heat is accurately directed at reworked component through precision nozzle.
- 1200W under board Heater capable of heating Air or Nitrogen to 450C at low, medium, and high flow settings.
- 5000W Honeycomb IR preheater rapidly applies heat to the underside of the PCB. After process is complete, low mass honeycomb shield protects operator.
- Air or Nitrogen Operation

## Board Handling Capacity

- 2 inch x 2 inch (5 cm x 5 cm) minimum recommended board size
- 20 inch x 20 inch (50.8 cm x 50.8 cm) maximum recommended board size
- Able to repair boards with up to 2.4 inch tall components
- PCB Thickness' up to 0.25 in (6.4 mm)

## Component Handling Capacity

- 1 x 2 mm min to 80mm square max recommended component size
- Handles both grid array and leaded type components. (BGA, CGA, QFP, LCC, TSOP, FLIP-CHIP, and many others)
- Placement Accuracy to better than 0.001 inches
- Unmatched placement repeatability.

## Standard Tooling and Features

- Conceptronic Application Department will help choose four nozzles, included with machine.
- Universal Board holding fixture standard.
- Calibration kit to verify vision alignment.
- Vacuum wand attachment for component handling
- Vacuum Part Pick Up Sensing
- High Resolution Color Vision System
- Fixed mirror
- Stainless Steel Precision Bearings for Optics, Z-Axis, and X-Y Table with high temperature nitrile wipes.
- PCB positioning with 2 axis course and fine adjust.
- Breakaway heater head with built-in Theta adjustment
- Rigid station base made of high-stability, CNC machined aluminum for accuracy and durability
- Precision Micro-stepped drive motors.

## Options

- 14 x 14 compact board table.
- 24 x 36 ultra large board table.
- Automated Optics Train Control
- Custom tooling for specialized or difficult applications
- Split mirror (wider field of view recommended for parts larger than 60 x 60 mm), bigger part)
- Auto shuttle with calibrated positioning for component pickup.
- Closed loop Pressure Sensing Z-axis control.
- 360 degree rotating nozzle.
- Under board Preheater

