

## Interactive Training CD-ROM & Electronics Photo CD-ROMs

We have a wide range of interactive CD-ROM's covering design, assembly, rework and inspection of conventional and lead-free products. CD-ROM are available to order from the Bob Willis web site at [www.bobwillis.co.uk/6/6.htm](http://www.bobwillis.co.uk/6/6.htm)

### WAVE SOLDERING PROCESS INTRODUCTION AND DEFECT GUIDE 2

This CD ROM provides a guide to all aspects of wave soldering with all the common process defects. Each stage of the process including fluxing, pre heat, solder wave and conveyors are explained. The defect guide also includes defects specifically on printed boards and components which can cause soldering problems.

At the first screen you can select the soldering process, equipment set-up, quality control, defect guide and CD ROM operation. Selecting the process you want to view takes you to each section. As an example in the fluxing section details of foam, spray, wave and dip fluxing systems are explained along with video clips and still photographs.

Also included on the CD ROM are procedures for Parts Per Million Monitoring, process control procedures and set-up methods. A spread sheet is provided which may be used for defect monitoring using the PPM procedure. The defect guide browser provides examples of defects rather than defect categories which makes it easy to compare process problems with the disk content. Clicking on the photograph provides a full screen view with an explanation of the possible causes.

### Hand Soldering & De-Soldering Lead-Free Interactive CD-ROM

This is the first in a series of interactive CD-ROMs developed by Soldertec Global to assist engineers with the practical introduction of lead-free materials and processes. Introduced by Kay Nimmo, Technical Director, Tin Technology, the CD provides a step-by-step guide to materials, soldering steps, inspection and common defects which may be seen in manufacture. The CD also features an interactive quiz on hand, reflow and wave soldering to help assess staff's knowledge on the use of lead-free materials. Two additional CD-ROMs will be released shortly covering the use of wave and reflow soldering with lead-free alloys and the changes necessary in manufacture.

### Soldertec Lead-Free Reflow Soldering Interactive CD-ROM

This is the second in a series of interactive CD-ROMs developed by Soldertec Global to assist engineers with the practical introduction of lead-free materials and processes. Introduced by Kay Nimmo, Technical Director, Tin Technology, the CD provides a step-by-step guide to solder paste materials, convection and vapour phase soldering steps, lead-free inspection and common reflow defects which may be seen in manufacture. The process stages and defects are illustrated with video clips. The CD also features an interactive quiz on hand, reflow and wave soldering to help assess staff's knowledge on the use of lead-free materials. Additional CD-ROMs will be released shortly covering other aspects of lead-free alloys and the changes necessary in manufacture.

## Soldertec Lead-Free Wave Soldering Interactive CD-ROM

Third in a series of interactive CD-ROMs developed by Soldertec Global to assist engineers with the practical introduction of lead-free materials and processes. Introduced by Kay Nimmo, Technical Director, Tin Technology, the CD provides a step-by-step guide to wave soldering, wetting, fluxing, process control, inspection. Process animations explain the wave soldering process options and video is used to further enhance the process stages. Inspection criteria for wave solder joints are illustrated for different alloys. Common wave soldering defects are included which may be seen in manufacture, reasons and possible corrective action is provided. The CD also features an interactive quiz on wave, reflow and hand soldering to help assess staff's knowledge on the use of lead-free materials.

## The Lead-Free Soldering "Cook Book 3" Interactive CD-ROM

The NPL interactive "Lead-Free Assembly and Soldering Cook Book 3" CD-ROM just got bigger, so much so its now on two CD-ROMs. To include even more international views on lead-free we have had to put the nine new interviews onto a second CD-ROM making a total of 21. The latest views on lead free come from the likes of Dieter Bergman-IPC, Jennie Hwang, Phil Zarrow-ITM and Bill Kenyon all from the USA giving their prospective on issues faced by the industry.

The World's First training and interactive resource on lead-free soldering technology has been produced jointly by The National Physical Laboratory and Electronic Presentation Services to address the following aspects of the technology:

Design Rules, PCB Solderable Finishes, Component Terminations, Impact on Process Conditions, Impact on Existing Equipment, Hand Soldering, Screen Printing, Reflow Soldering, Wave Soldering, Cleaning, Rework, Visual Inspection, Joint Reliability, In Circuit Test

Additional Features will include:

Lead-free Interactive Test Module

Reference Specification documents

Company Implementation Case Studies

A total of 21 video interviews

Interactive Defect Guide, including BGA, PIHR, CSP and through hole

Reference Bibliography

Whether a large OEM or a small CEM, a supplier or user, this project brings together all you ever wanted to know about Lead-Free assembly technology.

## Conventional and Surface Mount Process Introduction

If you are using PowerPoint for training or sales presentations and need to illustrate the conventional and surface mount assembly process stages SMART Group have a new C-ROM for you. The CD features two presentations one on conventional through hole assembly, the second features surface mount and mixed technology assembly process stages.

Stages included in Surface Mount include:

- Screen printing
- Component Placement
- Reflow Soldering
- Adhesive Application
- Wave Soldering
- Cleaning
- Rework

Conventional Assembly includes

- Through hole insertion
- Hand soldering
- Fluxing
- Preheat
- Wave soldering
- Cleaning
- Inspection
- Rework
- Test

Each stage of the process is illustrated with animations and commentary, each slide describes the basic process stages. The PowerPoint format makes it ideal to edit each presentation, leave out or add additional photographs, text depending on your requirement.

To complement these PowerPoint files SMART Group also have 8 Photo CD-ROMs with hundreds of pictures which can be used to enhance your training and sales presentations, these include surface mount, BGA, printed boards, flip chip, lead-free, wire termination and crimping and more.

The animations can also be used in other PowerPoint presentations royalty free provided they are not resold or used as a commercial product. The material in the Photo Albums can also be used royalty free provide the images are not resold.

## Guide to Simultaneous Double Sided Reflow Soldering CD-ROM

In any process there are always opportunities to improve the process, reduce the number of process stages or reduce the cost of manufacture. Engineering is always looking at alternative processes, Simultaneous Double Sided Reflow (SDSR) is a possible new candidate to provide cost savings and increased throughput. The process will be featured at Nepcon Electronic exhibition next week and is the latest Interactive CD-ROM available from the SMART Group. The process was first described in the SMART Group Charity Report SDSRS which has raised money for worthy projects in the UK and America.

In simple terms the process involves screen printing and placing components on both sides of the board with the option of using through hole components. Finally the whole assembly is run through a single reflow soldering process to solder both sides of the board and potentially the through components as well. It is currently being considered by two Japanese companies and reported being used by Philips in Europe and a couple of UK companies.

The interactive CD-ROM covers:

SDSRS Advantages  
SDSRS Disadvantages

Screen Printing  
Adhesive Dispense  
Adhesive Requirements  
Component Placement  
Reflow Soldering  
Final Inspection

Process Issues  
Process Results

Further information can be obtained from Tony Gordon or come and see the process at Nepcon Electronics.

#### Simultaneous Double Sided Reflow Soldering Photo Album CD-ROM

With the increasing interest in SDSRS, Simultaneous Double Sided Reflow Soldering a photo CD has been produced to aid engineers and training departments to educate staff. This CD-ROM provides the process or quality engineer with a source of photographs of process defects which may be used in company inspection document or presentations. They may be simply pasted into any document for in house company use. Each photograph is provided as a .Tiff file format.

The photographs cover project work over the last twelve months and material produced during the Nepcon Exhibition. Conventional photographs, x-rays and microsections are included.

#### SMT/CONVENTIONAL INSPECTION AND QUALITY CONTROL CD-ROM

The latest CD from SMART Group provides inspection criteria for surface mount and conventional assembly and soldering as well as providing a defect guide for common defects found during wave and reflow soldering.

Included on the CD is a complete guide to introducing yield monitoring based on Part Per Million PPM or Defects Per Million DPM with a spreadsheet for recording the defects. Video sequences show how to fill in the forms using screen printing as a reference. Animated process guides highlight other process stages for both conventional and SMT where in-process sample inspection should be conducted.

Also included are a range of in process quality control procedures for each stage of the process, which is considered critical as well as visual guidelines for acceptable criteria. These cover screen printing, stencil checks, placement, component loading, reflow, wave soldering, manual assembly and final inspection. These procedures are ideal for any company standard or as a guide to the minimum standards for contracting out assembly.

An interactive test is provided to assess your staff's understanding of inspection criteria and normal in process control. Twenty questions are included and the results are saved for each staff member taking the test.

## Rework and Repair of Conventional & SMT CD

The first screen introduces the user to the CD-ROM and the key topics covered in each section including conventional surface mount desoldering operations. Each section of the CD can be selected by using the interactive buttons next to the subject. The main screen also features an exit button to end the program. The CD features a complete introduction to surface mount and through hole assembly which may be followed with the on screen text or use of the audio tracks. This section shows the screen printing process for solder paste application.

The component removal section covers surface mount chip, SOIC, PLCC, BGA and conventional through hole component removal. Each section provides video clips illustrating the component removal and text sections which gives the step by step procedures. The component replacement section again covers chip, SOIC, PLCC, BGA and through hole parts and additional topics like screen printing, solder short removal and BGA reballing of reworked parts.

The European inspection standards cover all the surface mount placement and soldering standards and can be accessed from this page. More detailed text based standards are also available for reference.

The defect gallery provides photographs of defects seen during rework. Each photograph may be clicked to reveal a larger view of the defect. In the larger view of the defect section a text screen provides a description of the defect, possible causes and corrective actions for the process. There are a wide range of suppliers of surface mount and conventional through hole equipment and a selection of suppliers' details is provided on the CD-ROM for reference.

## REFLOW SOLDERING AND TEMPERATURE PROFILING

This CD ROM is fully interactive and covers the use of single sided and double sided reflow assembly. It includes animations and video clips showing the set-up of a reflow process and how to conduct a temperature profile. Two sections show how to attach thermocouples with a full written instructions. Interactive sections explain the temperature profile and what each stage must achieve and why.

The video clips feature process equipment from Electrovert, Seho, ECD and others. Examples of satisfactory solder standards are provided with a complete guide to possible process defects. The defect section may be viewed with small photographic examples to make searching easy and then each sample may be viewed at full screen. A description of each of the defect photographs is included with the possible causes. The CD also contains video clips of soldering BGA, Pin In Hole Reflow, Solder Beading and lots lots more.

A full animation of the surface mount assembly process is included on each of the CD-ROM which includes the BGA, double sided assembly and through hole/Intrusive reflow assembly. The CD is ideal for shop floor reference or training new engineers in the use of reflow soldering processes. Also included on the ROM is the latest issues of profiling software and user manuals.

#### PIN IN HOLE INTRUSIVE ASSEMBLY AND DEFECT GUIDE

This CD ROM is fully interactive and covers the use of through hole components, design and process requirement when implementing Pin in Hole/Intrusive assembly. Examples of satisfactory solder standards are provided with a complete guide to possible process defects with intrusive reflow. The defect section may be viewed with small examples to make searching easy and then each sample may be viewed at both half and full screen. A description of each of the defects is included with the examples.

A full animation of the surface mount assembly process is included on the disk which includes the BGA, double sided assembly and through hole/Intrusive reflow assembly. This section features a commentary by Bob Willis or can be viewed with just a text guide.

This CD-ROM complements the video tape, report and photo album already available in industry and are the first products available in the world to cover the use of this technology.

#### PRINTED BOARD CIRCUIT DESIGN AND DEFECT GUIDE

Printed board design and layout is the key to Zero Defect Manufacture and this CD ROM provides a basic introduction to Conventional, Surface Mount, Ball Grid Array and Pin In Hole/Intrusive Reflow Assembly.

The interactive CD ROM contains the following guidelines:

- Conventional and surface mount layout
- Surface mount and Conventional footprints
- Resist, via hole, tracking and panel layout
- Solder paste stencil rules
- Printed Board Specifications

A brief introduction to printed board manufacture is provided along with guidelines on the correct specification of printed boards for fine pitch surface mount applications. This is ideal for engineers who need a basic introduction to circuit fabrication.

The defect guide browser provides photographic examples of defects or poor design rather than defect categories which makes it easy to compare potential problems with the disk content. Clicking on the photograph provides a full screen view with an explanation of the possible causes.

Two full animations of the surface mount and conventional assembly processes are included on the disk which includes the BGA, double sided assembly and through hole/Intrusive reflow conventional assembly and wave soldering. This section features a commentary by Bob Willis one of the UK's leading process engineers or it can be viewed with just a text guide.

## INTERACTIVE BALL GRID ARRAY ASSEMBLY INSPECTION AND DEFECT GUIDE

This CD ROM is fully interactive and covers the different types of BGA component, design and process requirement with X-ray inspection of solder joints and a inspection standard for guidance. A Word document of the text is available on the CD ROM for use in a company standard and may be edited to suit the company documentation system. Examples of satisfactory standards are provided with a complete guide to possible process defects. The defect section may be viewed with small examples to make searching easy and then each sample may be viewed at both half and full screen. A description of each of the defects is included with the examples.

A full animation of the surface mount assembly process is included on the disk which includes the BGA, double sided assembly and through hole/Intrusive reflow assembly. This section features a commentary by Bob Willis or can be viewed with just a text guide.

The CD ROM also includes over 130 picture files which may be used freely in training material and standards in a manufacturing company provided that the resulting material is not resold.

## BOB WILLIS SURFACE MOUNT PROCESS DEFECT GUIDE Two

The first CD ROM provides a guide to common process defects found at each stage of the SMT process. It also includes defects specifically on printed boards and components. At the first screen you select the process you want to view which gives you an introduction to the processes listed below.

Printed Boards, Components inc; BGA, Screen Print, Adhesive Application, Placement, Reflow Solder, Wave Solder, Cleaning, Rework

In the case of printed board section it explains the most important issues with surface mount circuits. It then lists common process defects which can be selected to reveal a photographic example of the defect type and an explanation of the possible causes.

This disk will form part of the forthcoming Bob Willis Master Class Series

## SURFACE MOUNT INTERACTIVE KNOWLEDGE ASSESSMENT CD ROM

The disk provides sets of interactive question and answer tests for engineering, production and quality staff. It is designed to be used after any formal training courses to test a group or a single member of staff and their understanding of different surface mount topics. It may also be used to assist the selection of new staff members during company interviews where colour and component recognition is particularly important.

The CD ROM contains a series of questions on each of the following subjects:

Colour Coding, Printed Circuit Boards, Component Recognition, Solder Paste Printing, Component Placement, Reflow Soldering, Wave Soldering, Cleaning, Rework and Repair, Solder Joint Inspection

Each question has multiple choice answers which must be selected prior to moving onto the next question. Both correct and incorrect answers are acknowledged and the answers recorded to disk along with the student name. The test can be repeated with the number of attempts again recorded to disk for future reference. Selected subjects like joint inspection and component recognition have photographic examples for the student

to assess. After working through the multi choice question and answer session a report of the correctly answered questions is produced for the instructor on each student. A copy of the questions and answers are also included as a .txt and .doc files on the hard disk for manual testing and for possible modification of the test questions.

The following are photo CDs which provide you with hundreds of different tif .jpg images to help you produce your own inspection standards, training material or illustrate technical articles.

The following are New Photo CDs released now!!

0201 Chip Assembly and Soldering

- Contains over 120 images

Wire Preparation and Crimping

- Contains over 120 images

Flip Chip Assembly Photo Album

- Contains over 180 images

Lead-Free Assembly and Soldering Photo CD-ROM

This CD-ROM provides the process or quality engineer with a source of photographs of process examples which may be used in company inspection document or presentations. The photographs can also be used in marketing and advertising material or in technical articles. They may be simply pasted into any Word or PowerPoint document for in house company use. Photograph are provided in .Tiff or .jpg file format.

The photographs are either conventional photographs, x-rays and microsections for surface mount or conventional joints as well as solder paste print, components and solder joints. Both satisfactory and rejects are covered.

PIN IN HOLE REFLOW PHOTO ALBUM

This CD ROM provides the process or quality engineer with a source of PIHR photographs of the assembly process, components and process defects which may be used in company inspection document or training presentations. They may be simply pasted into any document for in house company use. Over 150 photograph is provided as a .Tiff file format.

The disk includes examples of the following:

Square paste print - Split paste deposit - Bleeding on split deposit- Incomplete paste reflow - Incomplete paste deposit - Body displaced paste - Deposit with PGA - Base of two headers - Base of pin header - Balling due to header - Solder balling on resist- Balling due to header - PGA solder fillets - Topside solder fillets - Poor wetting on hole wall - Lifting of header - PGA solder fillets - Dried paste displacement - Hole paste displacement - Microsection with small void - Pin with thick solder coating - Microsection of PGA pin - Microsection of joint - Through hole coils inserted - Edge connector reflow

## BALL GRID ARRAY PHOTO ALBUM

This CD ROM provides the process or quality engineer with a source of photographs of assembly process, components and process defects which may be used in company inspection document or training presentations. They may be simply pasted into any document for in house company use. Over 150 photograph is provided as a .Tiff file format.

The disk includes examples of the following:

BGA Component Types, Pad Types, Via Mounting, Resist Apertures, Pasted Boards, Solder Joints on Surface and Via Mounted, Location Marks, Poor PCB Wetting, Resist Damage, Component Cracking, Missing Balls, Ball Shear Tests. Microsections of Component Cracking, Satisfactory BGA Joints, Non Wetting, Coplanarity Problems, Cracked Joints, Delamination of Die. X-Ray Images of Voiding, Missing Balls, Short Circuits and Non Reflow.

## PRINTED CIRCUIT BOARD PHOTO ALBUM

This CD ROM provides the inspection or quality engineer with a source of printed circuit board photographs including many PCB cosmetic and process defects which may be used in company inspection documents, training presentations or operator awareness. They may be simply pasted into any document for in house company use. Over 300 photograph is provided as a .Tiff file format.

The disk includes examples of the following:

Plated through holes, conductors, solder mask, PCB legend, artwork, surface mount pads, test points and via holes. The process defects include thin PTH plating, plating cracks, plating voids, poor adhesion and copper nodules. Solderability defects are provided on through holes, surface mount pads, conductors and via holes. Solder balling defects are shown on solder resist, peelable masks and conductors. Measeling and delamination defects are provided for surface defects and with microsection. The disk provides over 100 common defects on plated through hole, multilayer and flexible circuits.

## SMT/Conventional Joint Illustrations CD ROM

A new CD-ROM features each of the illustrations used on the SMART inspection standards CD-ROMs and each of the conventional and surface mount wall chart sets available from EPS & the SMART Group. In addition there are also a set of colour illustrations for wire termination and soldering standards.

The CD is an ideal source for companies to make their own custom training material, standards, posters or training presentations. Text documents are included which may be modified to create a company inspection standard using the illustrations on the CD. Most of the illustrations are in .pcx format but can be converted in most painting packages.

Also included on the CD-ROM are two free animated tutorials which explain the complete assembly process. One covers conventional assembly using the wave soldering process illustrating each of the different fluxing options. The second shows the complete surface mount assembly process using reflow soldering. It is also possible to use the animated sections separately in Power Point or any presentation package able to run .avi files.

## SURFACE MOUNT PROCESS DEFECTS PHOTO ALBUM

This CD ROM provides the process or quality engineer with a source of photographs of process defects which may be used in company inspection document or presentations. They may be simply pasted into any document for in house company use. Each photograph is provided as a .Tiff file format.

The disk includes examples of the following:

Chip Leaching, Poor Solderability, Plastic Cracking, BGA Misplacement, BGA Cracking, BGA Cracking, Capacitor Cracking, Plastic Softening, QFP Cracking, Solder Beading, Crystallised Joints, Cracked Joint, Poor Pad Wetting, Component Lift, No Wetting, Joint Failure, Joint Voiding, Solder Wicking, Component Lifting, Solder Short, Non Reflow, PCB Measeling, Poor Penetration, Solder Skip, Bulbous Joint, Blow Hole, Solder Webbing, Adhesive Contamination, Adhesive Stringing, Excess Adhesive, Misplaced Lead, Misplaced Component, Dendrite Growth, Corrosion, Solder Spikes, Flux Residues, Joint Cracking, Pad Lifting etc

## CONVENTIONAL ASSEMBLY DEFECTS PHOTO ALBUM

This CD ROM provides the process or quality engineer with a source of photographs of process defects which may be used in company inspection documents, training material or presentations. They may be simply pasted into any document for in house company use. Each photograph is provided as a .Tiff file format.

The disk includes examples of the following:

Component lifting, Component damage, Contamination, Pin Holes, Blow Holes, PCB Microsections, Solder Spikes, Poor Solder Penetration, Poor Fluxing, Delamination, Sunken Joints, Cracked Joints, Lifted Pads, Poor Through Hole Plating, Resist Lifting, Legend Ink Contamination, Solder Balls, lead Damage, Corrosion, Voiding, Damaged Components, Non Wetting, De Wetting, Dendrite Growth, Microsections of good through plating and poor plating, Contamination in through holes, Resist in through holes etc.

## SURFACE MOUNT INSPECTION STANDARDS

The CD ROM provides a simple tutorial on inspection of surface mount assemblies. It covers adhesive application, placement and soldering. The four main termination's are covered, chip, gull wing, J Lead and castellated. The criteria is given with each example which is in line with the current European and IPC standards.

A test section is include which allows staff to asses there understanding of the standard against actual solder joints examples. This provides assessment against the basic criteria in the standard. After working through the test images it prints out a log of the answers to the questions for instructor records.

Also included on the CD ROM is an inspection standard which can be modified or printed out with illustrations for a company training document or inspection standard.

## CONVENTIONAL SOLDERING STANDARDS

The CD ROM provides a simple tutorial on inspection of conventional assemblies. It covers lead length, lead clench and soldering of components and wire termination's. Single sided, double sided boards are illustrated. The criteria is given for each example which is in line with the current European and IPC standards.

A test section is include which allows staff to asses there understanding of the standard against actual solder joints examples. This provides assessment against the basic criteria in the standard. After working through the test images it prints out a log of the answers to the questions for instructor records.

Also included on the CD ROM is a inspection standard which can be modified or printed out with illustrations for a company training document or inspection standard.

## SURFACE MOUNT AND CONVENTIONAL COMPONENT PHOTO ALBUM

This CD ROM provides the training instructor process or quality engineer with a source of photographs of surface mount and convention components which may be used in company inspection document, training classes and presentations. They may be simply pasted into any document for in house company use. Each photograph is provided as a .Tiff file format.

The disk includes examples of the following:

Chip resistor, MELF (Metal Electrode Face Bonded) resistor, Chip resistor network, Chip capacitors, Tantalum capacitor, Tantalum capacitor, Capacitor, SOT23 (Small Outline Transistor or Diode) package, Diode array, SOT143, SOT89, SOT223, DPAK (Diode Package), 1206 LED (Light Emitting Diode), MELF (Metal Electrode Face Bonded) diode, MELF , SOIC14 (Small Outline Integrated Circuit), VSOP (Very Small Outline), Ceramic SOJ, PLCC20 (Plastic Leaded Chip Carrier), BGA (Ball Grid Array), PLCC20 (Plastic Leaded Chip Carrier) , Diode package, Capacitor, Variable resistor, LCCC terminations, MELF fuse, Bare chip on board wire bonded, SMT connectors, SOT89 (Small Outline Transistor), Tantalum capacitor, TAB (Tape Automated Bonded) device, QFP gull wing terminations, SOIC20, Assorted surface mount components, PLCC terminations, Timmer, Chip capacitor, QFP44, Tantalum capacitor, Inductor, LCCC terminations , SOT23 devices in plastic tape , 1206 LED (Light Emitting Diodes), Tantalum capacitor, TGA (Tape Grid Array) terminations, Chip resistor, QFP gull wing terminations, Radial leaded crystal, Epoxy glass hybrid, Conventional pin header, Dual in line tube packaging, IDC Socket, Epoxy glass hybrid, Conventional odd form components, Radial components on tape, Trimmer, CCGA (Ceramic Column Grid Array)

The cost of each CD-ROM is £99 + VAT in Europe