Advance Program and Registration On-Line at www.imaps.org/flipchip

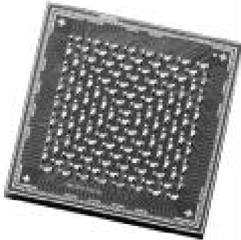
IMAPS Topical Workshop and Exhibition on

FLIP CHIP TECHNOLOGIES

June 20 - 23, 2005

Austin Marriott at the Capitol

Austin, Texas



Courtesy ST Assembly Test Services Inc.

General Chair:

Andrew J.G. Strandjord
FlipChip International LLC
Phone: 602-431-4728
andrew.strandjord@flipchip.com

Technical Co-Chairs:

Jon G. Aday
Amkor Technology Inc.
Phone: 480-821-2408, ext. 5082
jaday@amkor.com

Theodore G. Tessier
STATS ChipPAC, Inc.
Phone: 480-222-1735
ted.tessier@statschippac.com

Sponsored by:

International Microelectronics And Packaging Society (IMAPS)

Everything in electronics between the chip and the system!

PROFESSIONAL DEVELOPMENT COURSES - (1/2 DAY)

MONDAY, JUNE 20 1 PM - 5 PM

FLIP CHIP AND CSP TECHNOLOGIES

INSTRUCTOR: R. WAYNE JOHNSON, AUBURN UNIVERSITY

INTRODUCTION TO MICROELECTRONICS PACKAGING TECHNOLOGY

INSTRUCTOR: PHIL CRETER, CRETER & ASSOCIATES

EXHIBITION HOURS

TUESDAY, JUNE 21* 10 AM - 6:30 PM

*LUNCH, BREAKS AND RECEPTION IN THE EXHIBITS HALL

WELCOME RECEPTION IN THE EXHIBIT HALL

TUESDAY, JUNE 21 5 PM - 6:30 PM

TECHNICAL PROGRAM

JUNE 21 - 23, 2005

SESSION 1: PLENARY - MARKETING

Chair: Andrew J.G. Strandjord, FlipChip International LLC

SESSION 2: FABRICATION PROCESSES AND SYSTEMS INTEGRATION

Chairs: Thorsten Teutsch, PacTech USA - Packaging Technologies, Inc.; Haluk Balkan, FlipChip International LLC

SESSION 3: GOLD BUMPING TECHNOLOGIES

Chairs: Daniel D. Evans, Jr., Palomar Technologies Inc.; Jamin Ling, Kulicke & Soffa Industries Inc.

SESSION 4: NEW DEVELOPMENTS IN LEAD FREE SOLDERS

Chairs: Glenn A. Rinne, Unitive Electronics, Inc.; Robert Darveaux, Amkor Technology

SESSION 5: RELIABILITY (DESIGN, TESTING, AND MODELING)

Chairs: Daniel F. Baldwin, Engent Inc.; Theodore G. Tessier, STATS ChipPAC, Inc.

SESSION 6: UNDERFILL MATERIALS AND PROCESSES

Chairs: Guy Burgess, FlipChip International LLC; R. Wayne Johnson, Auburn University

Early Registration and Hotel Deadline: May 27, 2005.

Message from the General Chair:

The International Microelectronics And Packaging Society (IMAPS) is once again excited about sponsoring the upcoming Topical Workshop on Flip Chip Technologies. This event is being held June 20th through 23rd, at the Marriott Hotel in Austin, Texas. This annual event has been one of the Society's best attended workshops and has attracted industry leaders from around the world. This workshop has been specifically organized to allow for the presentation and debate of some of the latest and hottest technologies out there related to Flip Chip Bumping.

In addition to the technical sessions, the program this year includes two Professional Development Courses. These educational opportunities are not only there to serve people who are new to the industry, but also allow for the continuous education of those who have been working directly in the flip chip area for some time. I encourage all to take a close look at these courses and consider attending. The instructors have been involved in IMAPS for many years and are excellent resources for information.

The technical meeting begins this year with a Plenary Session which takes a look at both the business and technology trends in the industry. These speakers are well recognized in the industry and offer us a unique opportunity to hear the latest trends and information on flip chip bumping. These talks will set the tone for the rest of the workshop and serve to motivate discussion and debate on flip chip activities. This overview session is followed by five focused sessions on the various aspects of Flip Chip technologies, ranging from materials and processes to manufacturing and system integration.

Each year the workshop holds a focused exhibition for both suppliers and service organizations which support the Wafer Bumping and Flip Chip Technology industry. The exhibition allows attendees to see some of the latest equipment, materials offerings, and supplies offered by industry vendors.

The "workshop" atmosphere of this conference allows for a more personal interaction with one another. Attendees in the past have found that the Flip Chip Workshop is a great opportunity to meet old colleagues and also to form new relationships with people in the industry. If you are working in any area of electronics packaging or microelectronics, the Workshop on Flip Chip Technologies would be well worth attending.

Andrew Strandjord, FlipChip International, LLC

Flip Chip Tabletop Exhibition

"An opportunity to talk to industry leaders"

Exhibit Hours

Tuesday - June 21 10 am - 6:30 pm

Lunch, Breaks and Reception will be held in the Exhibit Hall.

Tabletop Registration Fees

IMAPS Corporate Member	Pre 5/12 - $450	After 5/12 - $550
Non-Corporate Member	Pre 5/12 - $550	After 5/12 - $650

Included with your registration: 1-six foot draped table, 2 chairs, carpeting and an Exhibit Hall admission for 2 booth personnel. A CD-ROM of Presentations and 1 list of attendees will be sent to you after the event. Full Technical Workshop registrations are available at an extra cost, fees are above.

Only tabletop exhibits will be accepted. Free standing exhibits will not be allowed at this event.

For more information visit www.imaps.org/flipchip or contact IMAPS at 202-548-4001

Marketing Feature Available for Exhibitors

IMAPS will provide all exhibitors an opportunity to provide an unlimited amount of promotional information on company products, services and contact information to be included on the post-event Technical Presentations CD-ROM. These CD-ROMs are provided to all technical conference attendees and are for sale through IMAPS to all industry professionals.

This new and unique feature will promote the Exhibitor's products and abilities much longer than just the Conference. There is a charge of $50 for this optional feature. This equates to an unlimited amount of advertising for just $50.

These submissions must be sent electronically, in Word or PDF format, to abell@imaps.org no later than June 10, 2005.

Sole responsibility for materials being sent on time and arriving at IMAPS in the proper format is the exhibiting company's. Refunds will only be given if CD ROM participation is cancelled in writing by June 1, 2005.

Professional Development Courses - Monday, June 20

Flip Chip and CSP Technologies – Constructions, Materials, Assembly and Reliability (PDC1)

1 pm - 5 pm

Instructor: R. Wayne Johnson, Auburn University

Description:

Flip chip use is growing in both flip chip-in-package and flip chip-on-laminate applications. This course will provide insight into the design and assembly of electronics using flip chip devices. The practical issues of implementing flip chip technology from wafer bumping to reliability characterization are covered. This course will begin with an examination of bumping options and corresponding design rules. Redistribution will also be discussed. Substrate requirements for flip chip will then be presented including a discussion of high density interconnect options and substrate design. Assembly of flip chip devices adds materials and processes to the standard SMT assembly process and the integration of these into the SMT process flow is examined. Materials and processes to be discussed include lead free alloys, fluxes, underfills (capillary flow, fluxing no-flow, and wafer applied), substrate dehydration, flux and underfill application, underfill curing, inspection, and underfill characterization techniques. The presentation will conclude with a discussion of flip chip assembly reliability testing, test vehicle design and failure analysis.

Lecture Syllabus:

1. Introduction to Flip Chip
2. Flip Chip Bumping
3. Substrates and Substrate Design
4. Assembly
   a. Flux Application
   b. Placement
   c. Reflow
5. Underfill
   a. Capillary
   b. Fluxing
      i. Placement Optimization
   c. Wafer Applied
   d. Transfer Molded
6. Reliability and Failure Analysis

Who Should Attend?

This course is intended for those individuals soon to be responsible for implementing flip chip assembly, suppliers of materials and equipment for flip chip assembly and others interested in flip chip implementation.

The Instructor:

Dr. Wayne Johnson is a Professor of Electrical Engineering at Auburn University and Director of the Laboratory for Electronics Assembly and Packaging (LEAP). At Auburn, he has established teaching and research laboratories for advanced packaging and electronics assembly. Research efforts are focused on materials, processing, and reliability for advanced SMT, wire bond and flip chip assembly. He has published and presented numerous papers at workshops and conferences and in technical journals on flip chip assembly. He received the 1997 Auburn Alumni Engineering Council Senior Faculty Research Award for his work in electronics packaging and assembly.

Dr. Johnson is currently the Technical Vice President of the International Microelectronics And Packaging Society. He was the 1991 President of the International Society for Hybrid Microelectronics (ISHM). He received the 1993 John A. Wagnon, Jr. Technical Achievement Award from ISHM, was named a Fellow of the Society in 1994 and received the Daniel C. Hughes Memorial Award in 1997. He is also a member SMTA and IPC and a Fellow of IEEE.

Dr. Johnson received the B.E. and M.Sc. degrees in 1979 and 1982 from Vanderbilt University, Nashville, TN, and the Ph.D. degree in 1987 from Auburn University, Auburn, AL, all in electrical engineering. He has worked in the microelectronics industry for DuPont, Eaton, and Amperex.

Introduction to Microelectronics Packaging Technology (PDC2)

1 pm – 5 pm

Instructor: Phil Creter, Creter & Associates

Description:

This course will provide an introduction to microelectronics packaging technology for engineers, technicians and others involved in manufacturing, processing, development, quality, sales and marketing. Emphasis will be on visual aids including actual samples and a variety of photos and figures to provide the attendee with not only a solid base in how microcircuits are made by various materials, processes and equipment but also what they look like. The attendee will learn classic hybrid definitions as well as current state of the art terminology of materials, processes and equipment, including: thick film technology, thin film technology and monolithic semiconductor technology; substrates (ceramic, conductors, dielectrics, co-fired, LTCC); components (passives, actives, chips vs. discrete, SMT components and flip chip); assembly including details of die attach, wire bonding and micro soldering, rework & repair; final assembly including details of visual inspection techniques, test, and failure analysis. Also covered: design, documentation standards, acronyms, list of symbols, clean rooms and handling techniques. Video clips highlight various microcircuit assembly processes. Included in the course handout is an updated glossary and list of references the attendee will find invaluable.

Who Should Attend?

This course is designed for the attendee who has little initial familiarity with Microelectronics Packaging engineering terminology but would like to relate it to real life, everyday applications. Ideal for entry level technicians and engineers but also for people in quality assurance, sales, marketing, purchasing, safety, administration and program management. Emphasis will be on visual aids.

The Instructor:

Phil Creter is a long-time member of IMAPS, having joined the New England Chapter of ISHM in 1974. He is a Fellow of the Society, and has been elected National Treasurer and President of the New England Chapter (twice). He received a BS in Chemistry from Suffolk University and has published numerous papers, holds a U.S. patent, has made many technical presentations (received Best Paper of Session award IMAPS 1998) and has chaired several technical sessions. Phil has over 30 years of microelectronics packaging experience at Polymer Flip Chip Corporation, Mini-Systems, GTE and Itek Corporation. His past positions include GTE Microelectronics Center Manager, Process Engineering Manager, Process Development Manager, Materials Engineering Manager and Manufacturing Engineer. He currently teaches professional development courses at microelectronics events and is a certified instructor for the Department of Homeland Security.

Tuesday, June 21

Registration Hours: 8 am – 6:30 pm

Exhibit Hours: 10 am – 6:30 pm

Welcome Reception in the Exhibit Hall: 5 pm – 6:30 pm

Session 1: Plenary Marketing

8:30 am – 11:30 am

Chair: Andrew J.G. Strandjord, FlipChip International

Market Expectations for Flip Chip and Wafer Level Packages: High Growth Prospects
E. Jan Vardaman, TechSearch International, Inc.

Emerging Wafer Level Technologies, Looking Beyond WLCSPs
Ted Tessier, STATSChipPAC Inc.

Alpha Particle Concerns in Wafer Level Packages
Glenn A. Rinne, P. Chilikuri, Unitive Electronics, Inc.

Break in Exhibit Hall: 10 am – 10:30 am

The Worldwide IC Packaging Market
Sandra Winkler, Electronic Trend Publications

Tensile Deformation of WLCSP and Flip Chip Solder Joints
Robert Darveaux, Amkor Technology / Arizona State University - East

Lunch in Exhibit Hall: Noon – 1 pm

Session 2: Fabrication Processes and Systems Integration

1 pm – 4:30 pm

Chairs: Thorsten Teutsch, PacTech USA - Packaging Technologies, Inc.; Haluk Balkan, FlipChip International, LLC

Design Guidelines for Fine Pitch Flip Chip Production
Haluk Balkan, Jacinta Aman Lim, Dan Berry, Guy Burgess, FlipChip International, LLC

Lead Free SiP Wireless Modules Fabricated with Flip Chips on Silicon Integrated Passive Device Substrates
Yinon Degani, SyChip Inc.

Chemical Resistance of Polyimide Passivations in Wafer-Level Photoresist Stripping Processes
Raymond Chan, Diane Scheele, Dynaloy, LLC; Thomas Goodman, E&G Technical Partners

Break in Exhibit Hall: 2:30 – 3 pm

Fine Pitch Solder Stencil Printing using Low Cost Electroless Ni/Au UBM for Memory Devices
Thorsten Teutsch, Axel Scheffler, Elke Zakel, PacTech USA - Packaging Technologies, Inc.; Carlo Gamboa, Bo Chang, Cypress Semiconductor

Standards for the Procurement and use of Die Devices
Mike Roughton, Donald Radley, Ken Ball, Alun Jones, MGR Consultants/ENCAST

C4NP: New Solder Bumping Technology - Low Cost & Lead Free
Klaus Ruhmer, SUSS MicroTec, Inc.; Dietrich Toennies, SUSS MicroTec – Germany; Emmett Hughlett, Peter Gruber, IBM TJ Watson Research Center; Patrick O'Leary, IBM Microelectronics Division

Wednesday, June 22

Registration Hours: 7:30 am – 4 pm

Session 3: Gold Bumping Technologies

8 am – 11:30 am

Chairs: Daniel D. Evans, Jr., Palomar Technologies Inc.; Jamin Ling, Kulicke & Soffa Industries Inc.

Flip Chip Type Camera Module Package for Mobile Phones with Low Cost Electro-Less Nickel/Gold Bump
J. K. Lyu, J.-D. Kim, Samsung Techwin Co., Ltd.

An Innovative Approach to Low Cost, High Performance, Lead-Free DCA
Elwyn Wakefield, Micro-Design; George A. Riley, FlipChips Dot Com

Low Profile Flat Top Ball Bumps for Next Generation 1st Level Interconnect
Daniel D. Evans, Jr., Palomar Technologies, Inc.

Break: 9:30 am – 10 am

Gold Bump Formation by High Speed Noncyanide Gold Electroplating
Bill Wu, Zhen Liu, Arthur Keigler, NEXX Systems

The Theken Disc - A Medical Marvel Description of the Theken Disc as Manufactured by Valtronic USA, Inc.
Donald Styblo, Valtronic USA; Rich Remer, Theken Disc

Stud Bumping – An Alternative Bumping Strategy
Jamin Ling, Matt Meyer, Matt Osborne, Vincent McTaggart, Kulicke & Soffa Industries Inc.

Lunch: 11:30 am – 12:30 pm

Session 4: New Developments in Lead Free Solders

1 pm – 4 pm

Chairs: Glenn A. Rinne, Unitive Electronics, Inc.; Robert Darveaux, Amkor Technology

Electroplating Tin-Silver Solder Bumps for Wafer Level Packaging
Jim (Zhongqin) Zhang, Zhen Liu, Arthur Keigler, NEXX Systems

Development of Lead-Free Flip Chip Packages with Sn-Cu Bumps
Don Son Jiang, L. J. Chen, Y. P. Wang, C. S. Hsiao, Siliconware Precision Industries Co., Ltd.

Total Packaging Solution for Low K Device/Pb Free Bump
Mitsuo Sugino, Sumitomo Bakelite Co., Ltd.

Break: 2:30 pm – 3 pm

Electrodeposition of Eutectic Gold-Tin Alloy for Microelectronic Applications
George Hradil, Edward Hradil, Hana Hradil, Technic Inc.

Tin Pest in Pb-Free Solders
Glenn A. Rinne, Unitive Electronics, Inc.

Technical Workshop Registration

Your registration fee includes all meals listed, Welcome Reception and an Abstract Book. A CD of the Workshop Presentations will be sent to each attendee after the event.

Professional Development Course offered for additional fee.

Technical Workshop Presentations

If you are unable to attend the Workshop and would like a CD of the Presentations, you may purchase a copy by using the registration form. Your copy will be mailed to you after the event.

The cost is $150 for members; $275 for nonmembers*, plus shipping and handling. Reserve your CD on-line at www.imaps.org/flipchip or call 202-548-4001.

*includes 1 year individual IMAPS membership

Thursday, June 23

Registration Hours: 7:30 am – 3:30 pm

Session 5: Reliability (Design, Testing, and Modeling)

8 am – 11:30 am

Chairs: Daniel F. Baldwin, Engent Inc.; Theodore G. Tessier, STATS ChipPAC, Inc.

Thermal Design for Power CSP Packages
Dennis Lang, Fairchild Semiconductor

Land Grid Array (LGA) as a Pb-Free Approach for Ceramic Ball Grid Array Packages
Joachim Rayos, Linda Bal, Thomas Koschmieder, Terry Burnette, Freescale Semiconductor, Inc.

Intermetallic Compound Formation in Flip Chip Solder Bump and Its Impact to Product Reliability
Hong Yang, Joe Patterson, Francois Guindon, Applied Micro Circuits Corporation

Break: 9:30 am – 10 am

Thermo-Mechanical Modeling for DOE Analysis of Over-Molded Flip-Chip Packages
Yu Gu, Mohsen Haji-Rahim, Daniel Jin, RF Micro Devices

FlipChip BGA Bump & Board Level Reliability: Power & Thermal Cycling Compared
Abu Eghan, Hoa Do, Leilei Zheng, Lan Hoang, Stephen Pan, Xilinx Inc.

In Situ Stress Analysis and Reliability Assessment of Flip Chip on Organic Board using Power Cycling Techniques
Daniel F. Baldwin, Engent, Inc.; Jian Zhang, GE Global Research

Lunch: 11:30 am – 12:30 pm

Session 6: Underfill Materials and Processes

1 pm – 3:30 pm

Chairs: Guy Burgess, Flip Chip International, LLC; R. Wayne Johnson, Auburn University

Plasma Treatment of Pre-Underfill Flip Chip Devices
James D. Getty, March Plasma Systems

Near Void Free Hybrid No-Flow Underfill Flip Chip Process Technology
Daniel F. Baldwin, Engent, Inc.; Michael Colella, Intel Corp.

Assembly and Reliability of Lead-free Flip Chip Devices with a Nanofilled No-flow Underfill Material
Ananth Prabhakumar, Donald Buckley, Arun Chaudhuri, Frank Stepniak, Paul Gillespie, Ryan Mills, Slawomir Rubinsztajn, Sandeep Tonapi, General Electric Global Research Center

Low Void Solder Paste for Flip Chip Applications
Guy Burgess, Joan K. Vrtis, FlipChip International, LLC

Flux Compatibility Study on Flip Chip Underfills
Renzhe Zhao, Qing Ji, George Carson, Michael Todd, Gary Shi, Henkel Corporation

Concluding Remarks: 3:30 pm

Advanced Technology Workshop and Tabletop Exhibition on

Military, Aerospace, Space and Homeland Security:

Packaging Issues and Applications (MASH)

Sacramento Marriott Rancho Cordova

Rancho Cordova, CA

May 3 - 5, 2005

Visit www.imaps.org/mash for more information

Advanced Technology Workshop on

Thermal Management

Dinah's Garden Hotel

Palo Alto, CA

October 24 - 26, 2005

Visit www.imaps.org/thermal for more information

Advanced Technology Workshop on

LED Packaging

Dinah's Garden Hotel

Palo Alto, CA

October 26 - 28, 2005

Information available soon at www.imaps.org

IMAPS 2005

38th International Symposium on Microelectronics

Pennsylvania Convention Center

Philadelphia, PA

September 25 - 29, 2005

Visit www.imaps2005.org for more information

Travel

FLY UNITED AND SAVE $$$

Take 5% off any United, United Express or Shuttle by United published fares, including First Class, in effect when tickets are purchased, subject to all applicable restrictions, or take 10% off applicable BUA, or like fares, in effect when tickets are purchased 7 days in advance. Reservations and schedule information may be obtained by calling the United Meetings desk at 1-800-521-4041 and referencing Meeting ID #583IW.

The Hotel

AUSTIN MARRIOTT AT THE CAPITOL
701 EAST 11TH STREET
AUSTIN, TEXAS 78701

RESERVATIONS: 512-478-1111 OR 800-648-4462

PLEASE REFERENCE IMAPS WHEN MAKING RESERVATION.

SINGLE/DOUBLE........................$159

Registration Form

Register On-Line at www.imaps.org/flipchip

Flip Chip Technologies Topical Workshop: June 20 - 23, 2005

❑ Dr. ❑ Mr. ❑ Ms. Member ID# ________________

First Name________________________________M.I.____________Last Name______________________________

Company/Affiliation____Job Position___________________________

Address____

City___________________________ State______ Zip____________ Country___________________________________

Phone________________________ Fax________________________ Email______________________________________

Registration Fees: Early Registration Ends 5/27/05

Workshop Fees

	(On or before 5/27)	(After 5/27)
❑ Member (IMAPS)	$550	$650
❑ Non-member*	$650	$750
❑ Speaker/Chair/Student	$500	$600
❑ Exhibit Only *(meals included)*	$25	$25

*Includes one-year individual IMAPS membership.

Workshop Fees include Abstract Book; all meals listed and a CD of Presentations. CD of Presentations will be mailed 10 business days after the event.

Professional Development Courses (1/2 Day*)

❑ Flip Chip Assembly	$300	$350
❑ Intro to Microelectronics Packaging	$300	$350

***Courses will run from 1 pm - 5 pm; Monday, June 20th**

Additional Purchases

❑ Spouse/Guest *(meals only)*	$160	$160
❑ CD of Presentations *(Member Rate)*	$150	$150
❑ CD of Presentations *(Non-Member Rate)*	$275	$275
❑ Add to Ship in the US	$7	$7
❑ Add to Ship Overseas	$25	$25

How did you hear about this event?

❑ Direct Mail ❑ Website ❑ E-Mail
❑ Advancing Microelectronics ❑ Colleague
❑ IMAPS Weekly E-mail Bulletin ❑ Personal Phone Call
❑ Industry/Trade Magazine ❑ Other ____________

Tabletop Exhibit - June 21st

	(On or before 5/12)	(After 5/12)
❑ IMAPS Corporate Member	$450	$550
❑ Non-IMAPS Corporate Members	$550	$650
❑ Yes, we will participate in the CD-ROM	$50	

Tabletop registration fee includes, 1-six foot draped table, 2 chairs, carpeting and an Exhibit Hall admission for 2 booth personnel. A CD-ROM of Presentations and 1 list of attendees will be sent to you after the event. Full Technical Workshop registrations are available at an extra cost, fees are above.

Housing (*Hotel Cut-off is May 27, 2005*)

Housing Accommodations **must** be made directly to:

Austin Marriott at the Capitol
701 East 11th Street
Austin, TX 78701
P: 512-478-1111 or 800-648-4462

Single/Double: $159

Please reference IMAPS when making reservation.

Austin Marriott requires a deposit for the first night's room and tax to hold your room. Deposit refunded if reservation is cancelled fourteen (14) days prior to arrival.

Payment

FC05PROG

Workshop Fees: $______________________________

Professional Courses: $______________________________

Additional Purchases: $______________________________

Tabletop Exhibit: $______________________________

Total Payment Due: $______________________________

A $25 fee must be added to all Wire Transfers.

❑ Enclosed is a check payable in US funds to IMAPS

❑ Charge my fees to:

❑ Visa ❑ MasterCard ❑ Discover ❑ Amex ❑ Diners Club

Card#________________________________Exp.__________

Signature_______________________________________

Card billing address, if different from above: (required)

____

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Mail this form with payment to: IMAPS * 611 2nd Street, NE * Washington, DC 20002-4909. For credit card transactions, register on-line: www.imaps.org; or register by phone with your credit card by calling 202-548-4001; Fax: 202-548-6115. Additional information? E-mail: IMAPS@imaps.org, or visit our web site: http://www.imaps.org. Cancellations will be refunded (less a $50 processing fee) only if written notice is postmarked on or before **Friday, June 3, 2005**. No refunds will be issued after that date.

IMAPS Registration
611 2nd Street, NE
Washington, DC 20002-4909

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