International
Color Consortium

International Color Consortium

Progress Report

2005

Creating, Promoting and Encouraging the Standardization and Evolution of an Open, Vendor-Neutral, Cross-Platform Color Management System Architecture and Components.

International Color Consortium

Members toured Lyon, France, during a 2004 meeting there. Shown from left to right are Elie Khoury, Craig Revie, Lars Borg, Kip Smythe, Max Derhack and Tony Johnson.

The ICC at work in London

Technical Secretary Tony Johnson at his retirement party

2005 Progress Report

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Purpose:

The International Color consortium is an organization established for the purpose of creating, promoting and encouraging the standardization and evolution of an open, vendor-neutral, cross-platform color management system architecture and components. The work of the ICC shall be made available to the public and encouraged for adoption by all relevant suppliers of the "color" industry. Where appropriate, ICC documents will be forwarded to national and international standards organizations.

ICC Officers 2005

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Vice Chair:	William Li	Creo, Inc., a Subsidiary of Kodak
Technical Secretary:	Dr. Phil Green	London College of Communication
Secretary:	William K. "Kip" Smythe	NPES The Association for Suppliers of Printing, Publishing and Converting Technologies

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Chairman's Message

Craig Revie, The Fujifilm Group

ICC has announced plans to hold its first Developers Conference in Scottsdale, Arizona on November 7, 2005. This conference is designed to provide practical guidance to users and product developers investigating how they can integrate ICC based color management in their own systems.

The program content will include a "from the trenches" expert panel discussing actual case examples and inviting audience participation. In addition, conference tutorials will address a variety of practical topics, from designing application color controls to understanding the specific content of profiles.

After extensive effort and industry-wide involvement, the ICC Specification, Version 4, is fully ready for wide distribution and use. ICC's task now is to encourage the widest possible adoption of the Specification, and this inaugural Developers Conference will be a key step in that direction.

The maturity of the ICC Specification is also reflected in its adoption as a full-fledged standard of the International Organization for Standardization (ISO). As of April 2005, ISO 15076-1 passed its final ballot and was ready for publication. This standard is based on the content of ICC's Specification V.4, and the formats of the ICC and ISO documents have been fully harmonized.

The emergence of the ICC Specification into the global standards environment means that effective color management, based on a framework recognized worldwide, is now practical for virtually the entire printing, publishing and converting industry.

Moreover, ICC took important steps in the last year to expand the value of its work into several new fields, including digital cinema and digital photography. We continue to nurture and expand a network of liaison relationships embracing a remarkably broad range of specialties. Similarly, ICC continues to invite and encourage participation in its activities.

The past year has seen important outreach activities by ICC, including publication of feature articles in prominent magazines and a striking enhancement of our website.

All of this effort is part of what we believe is ICC's new mandate: Having created a powerful tool with broad value across multiple industries, we now have the task of getting this tool into as many hands as possible. This task will continue to challenge us in the years ahead.

Highlights of the Past Year

After many years in which technical matters occupied center stage for ICC, our energy has been shifted recently. Such concerns as public education, promotion, and outreach to new fields have become paramount, and these priorities shaped much of ICC's activity in the last year.

ICC's promotion program achieved significant successes during 2004. Major feature articles on color management were developed by ICC and published in such magazines as *Printing Impressions, Print Media, Photo Marketing, and Graphic Design:usa.*

As a further aid in spreading knowledge and awareness of ICC Color Management, we began developing a series of white papers for publication through the ICC website. These white papers address a variety of issues and are designated "fundamental," "intermediate," or "advanced."

As of mid-2005, more than a dozen white papers have been posted on the site. The site has also been expanded in several other ways, and now provides an extensive information resource for anyone interested in color management or its implementation.

Much of 2004 was devoted to preparing the ICC Specification for adaptation into an ISO standard, including harmonizing its format with that required by ISO and developing a series of draft standards for preliminary reviews and ballots. This work culminated when a final proposed standard went out for ballot early in 2005, and was approved in April.

ISO 15076-1 now provides a recognized framework in which color management can be implemented by developers and users worldwide.

ICC stepped up its efforts this year to expand its activities beyond its traditional "home turf" in printing, publishing and converting. Chief among these efforts were initiatives in digital photography and digital cinema. Both of these fields can benefit significantly from ICC color management — yet, there is also much we need to learn about these specialties in order to make ICC's work fully relevant and valuable.

The Consortium also continued to work, as we have for several years now, to identify and address specific implementation problems being encountered by users. One by one, these problems have given way, and in some cases, the solutions have been incorporated into white papers now available through the ICC website.

We created a new working group on proof certification to tackle one particularly important and difficult set of challenges, relating to the need for a proofing standard in the graphic arts.

Similarly, we created specialized discussion groups to address the needs of users who wish to adopt RGB workflows, and to coordinate ICC's input into the latest revision of PDF/X.

All of these activities reflect ICC's desire to be proactive and highly visible in spreading knowledge about color management and promoting its adoption by users across a wide range of specialties.

2005 Progress Report

Technical Secretary's Report

Dr. Phil Green, London College of Communications

ICC's long-time Technical Secretary, and one of the Consortium's true founding leaders, Tony Johnson, retired this year after giving extraordinary service to the Consortium and the industry.

Tony has set a high standard for his successor, but one which I will strive to meet.

The past year saw a number of important milestones for ICC, including the final approval of the ICC specification as ISO standard 15076.

We have also launched and expanded a major outreach program in which we have developed a series of white papers on a range of color management issues, which have been published on the ICC web site. The web site has been thoroughly re-designed, and its "new look" made its debut in mid-2005.

ICC has also participated in discussions with other expert groups concerning proof -to-print matching, and procedures for process control for printing, and conducted a profile interoperability session at which developers and users had an opportunity to test V4 profiles and applications.

ICC White Papers

ICC White Papers provide useful information on colour management. Each White Paper is prepared by ICC members, and either expands on the information provided in the specification, or provides more general information.

Fundamentals

ICC profiles in a colour reproduction system introduces some of the issues in colour reproduction and discusses how ICC profiles may be used in achieving successful reproductions.

Recommendations for colour measurement summarizes the issues users should consider when making colour measurements for the purpose of constructing ICC profiles, and describes recommended practices.

Glossary contains definitions of terminology commonly used in colour imaging (including digital photography and printing), colour reproduction and management, and colour and density measurement.

Reasons to use ICC version 4 in PDF/X explains some of the reasons to move to version 4, and discusses the need for a change to the PDF/X specification to allow (and recommend) the use of ICC version 4 profiles.

Digital photography colour management basics describes the steps that an image undergoes from raw camera capture to rendered output and data encoding, and explains some important terms such as terms scene-referred and output-referred colorimetry.

Using ICC profiles with digital camera images describes some of the details in the "colour rendering" process and discusses the options for profiling digital cameras.

Intermediate

Colour management overview provides a conceptual overview of colour management and its evolution, and a summary of colour rendering options.

Black point compensation describes the Black Point Compensation method used in select products from Adobe Systems.

Differences between v2 and v4 display profiles explains the requirement for display tristimulus values to be chromatically adapted to the PCS white point and the use of the chromatic adaptation matrix to undo the chromatic adaptation and obtain the actual display tristimulus values.

Common colour management workflows & rendering intent usage documents some common workflows, and provide advice about rendering intent usage.

Advanced

Perceptual rendering fundamentals describes how ICC Version 4 differentiates clearly between perceptual rendering and colorimetric rendering so that the applications appropriate for each of these rendering intents are clarified and improved workflows can be achieved by exploiting these clarified rendering intent definitions.

Perceptual rendering intent use case issues discusses ways of using the features of the Version 4 specification to achieve a range of different colour reproduction objectives.

Implementation Notes for the IccLib CMM in SampleICC complements the IccLib class documentation by describing how the objects interact when applying profiles.

Secretary's Report

William K. "Kip" Smythe, NPES

ICC held major meetings during 2004-2005, in Scottsdale, Arizona, Orlando, Florida, Lyon, France and London, England. In addition, a variety of working group and other subsidiary meetings took place during the year.

Consortium membership remains high, with 84 organizations and companies now active in ICC. Attendance at our meetings was strong throughout 2004 and into 2005 with attendance well over 60 individuals in November in Scottsdale-a strong indication of the commitment of members and non-members alike to the goals of the ICC.

In many ways, the ICC has continued its original mission through strong member involvement of the many dedicated color and computer scientists who work actively both at and between meetings to further the mission of the ICC. Although the core activity of making color management work for the high-end graphic arts industry has remained a key goal, 2004-2005 has seen new initiatives to ensure that ICC based color management is the solution of choice for other vertical markets.

I had the privilege in 2005 to take the lead in organizing the ICC effort to embrace the digital photography and high-end photo-finishing markets. Early in 2004, I met with Chad Munce, Director of Technology for the Photo Marketing

Association International, to better understand the needs of the digital photography/photo-finishing industry as it relates to color management. Upon reporting my discussions with Chad Munce to the ICC, it was agreed that a formal Digital Photography Working Group should be formed. Jack Holm of Hewlett Packard and Eric Walowit of Color Savvy agreed to chair this activity. This was followed by numerous conference calls and two sessions at ICC meetings in 2004 on the best practices and problems faced by these industries in using ICC based color management. This effort culminated February 2005 in a session at the Digital Imaging Management Association's conference at the Photo Marketing Show in Orlando where over 70 photography professionals attended and learned about the strengths and weaknesses of ICC based color management.

We have also made a concerted effort to actively promote the activities of the ICC to the worldwide imaging press. Through regular news releases, an improved ICC web site, development and placement of feature articles and the publication of this report, we are getting our message to the industries that we serve.

The ICC is financially healthy and manned with dedicated professionals with the singular goal to make ICC based color management a reality in all relevant markets.

I would be remiss if I didn't take a minute to acknowledge the efforts of Tony Johnson who retired as ICC Technical Secretary at the end of 2004. Tony made major contributions to the worldwide recognition of the ICC specification during his 4 years of service to the ICC. Clearly his intellectual contributions will be missed but also his keen wit and love of the graphic arts industry. I wish Tony and his wife, Irene, all the best in their future endeavors.

Kip Smythe in the ICC stand at drupa 04.

2005 Progress Report

Chairman's Report
Architecture Working Group

Max Derhak, Onyx Graphics Corporation

Supported by the Architecture Working Group, ICC has created a new SampleICC profile library, which provides support for users in reading, manipulating and writing profiles. The sample library can be accessed through the ICC website or directly at http://www.sampleicc.sourceforge.net.

A white paper entitled "Implementation Notes for the ICCLib CMM in SampleICC" can also be found on the website.

The working group also extensively discussed the ICC reference gamut, which provides a clearer understanding of the Perceptual PCS. Architecture issues related to the efforts of other working groups also comprised a large part of this group's agenda during the year.

Charter: The Architecture Working Group will address issues relating to ICC architecture by:

1. Documenting the current architecture, including its functionality for the purpose of defining the baseline for further work and internal usage

2. Investigating and proposing improvements and alternatives to the current architecture to address identified issues

Chair:

Onyx Graphics Corp.
Max Derhak

Members:

Adobe Systems Inc.
Lars Borg
Peter MacLeod

Agfa-Gevaert N.V.
Marc Mahy

Apple Computer, Inc.
Luke Wallis

Canon Development Americas, Inc.
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Kodak Polychrome Graphics
Dr. Chris Edge

Lexmark International, Inc., CPD
Ann McCarthy

London College of Communication
Dr. Phil Green

Quebecor World
Bob Hallam

Xerox Corp.
Rob Buckley

The SampleICC Profile Project

The SampleICC project provides an example of ICC profile parsing, manipulation, and application including support for version 4 ICC profiles. Source code is provided. The IccLib subproject library is the heart of the implementation.

The included code and projects (See SampleICC/Tools/Winnt/BuildAll.dsw) can be built using Visual Studio C++ 6.0. These projects can be converted and built using Visual Studio .NET as well. Other makefiles for the text based command line tools (in SampleICC/Tools/CmdLine) will need to be created.

For more information, visit http://sourceforge.net/projects/sampleicc/.

Chairman's Report
Communications Working Group

Elie Khoury, ALWAN COLOR Expertise

Communications has come to the fore as an ICC priority in the last two years, and the level of activity for this working group reflects this.

We have contributed to the high level of adoption of Version 4 of the ICC Specification by major software developers and vendors. We have also supported the work of new groups formed to expand ICC coverage to digital photography and cinema.

Media relations were a large part of our activity in the last year, and we succeeded in placing prominent feature articles in key industry publications, including *Printing Impressions, Print Media, Photo Marketing, and Graphic Design:usa.* We are exploring opportunities to continue similar placements in other magazines.

ICC issues regular news releases and promoted use of its new logo by companies marketing ICC-compliant products. We have used the website to disseminate news and other information about ICC, and have expanded the site considerably. A portion of the website has been translated into French, and we are considering translations into other languages in the future.

The website continues to attract strong traffic, with an average of more than 25,000 visits and 50,000 page views per month. This activity is generated by an average of 15,000 unique visitors each month, which clearly reflects the growing interest in ICC color management and workflows.

Charter: The Communications Working Group executes the communications needs identified by the Steering Committee by:

1. Communicating what color management is and isn't from the ICC perspective (Develop and promote a consistent message of what the ICC is and does)

2. Producing regular press releases on ICC developments

3. Reviewing and expanding ICC information on the web site

4. Conducting regular surveys (or collecting information) of current and potential users to identify their needs and perceptions

5. Helping identify obstacles to ICC implementation

6. Identifying and promoting success stories on ICC implementations in the articles and the ICC website

7. Regularly producing articles for placement in publications

8. Developing and maintaining a current activities list and including it in the WG report

Chair:

ALWAN COLOR Expertise
Elie Khoury

Members:

Adobe Systems Inc.
Lars Borg

Apple Computer, Inc.
John Zimmer

Creo, Inc., a Subsidiary of Kodak
William Li
Joris Verbouwe

Eastman Kodak Co.
David Q. McDowell

The Fujifilm Group
Lawrence C. Warter

Heidelbergerer Druckmaschinen AG
Detlef Freyer

London College of Communication
Dr. Phil Green

Quark
David Allen

Quebecor World
Klaus Fischer

Chairman's Report
Digital Motion Picture Working Group

Lars Borg, Adobe Systems, Inc.

Shortly after its founding in early 2004, this new group held a meeting in Miami, Florida at which we received interesting presentations by a series of invited experts from the motion picture industry. The replacement of film by digital processes has been proceeding in this industry for several years and the need for reliable color management has become clear.

In addition to the presentations, a group of ICC members visited industry sites in Los Angeles, and industry experts were invited to attend our meetings in Scottsdale and Orlando as guests. We also presented a "Birds of a Feather" meeting during the Siggraph 2004 trade show that drew about 50 non-ICC members as attendees and strengthened our connections to the cinema industry as well as our understanding of its issues.

We believe this steadily expanding network of links and resources will help us develop new ways to apply ICC color management in an exciting and fast growing field.

Charter: The Digital Motion Picture Working Group will codify an open, vendor-neutral, cross-platform, color management system architecture for digital motion picture production that will enable utilization of ICC color management by:

1. Identifying a small number of significant color-critical digital motion picture production workflows

2. Identifying factors that make an open, vendor-neutral solution important

3. Identifying any liaison relationships that need to be established, and establishing these

4. Recommending effective ways for applications to use the ICC specifications to satisfy those workflows

5. Identifying where predictability and consistency are required in the workflows and insure that the recommendations enable them to be achieved

6. Identifying areas where the existing ICC Profile format is unable to provide the functionality required by these workflows

7. Proposing improvements or additions to the ICC specifications or implied architecture that would make the workflows more efficient

8. Promoting the use of ICC Profiles in digital motion picture production workflows

Chair:

Adobe Systems Inc.
Lars Borg

Vice Chair:

Lilliputian Pictures
Joseph Goldstone

Members:

Adobe Systems Inc.
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Manish Kulkarni

Apple Computer, Inc.
Luke Wallis

Color Savvy Systems Inc.
Eric Walowit

Electronics & Telecommunications Research Institute
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Maeng-Sub Cho

The Fujifilm Group
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Dr. Phil Green

NPES
Kip Smythe

R.R. Donnelley
Dr. Michael Rodriguez

Technicolor
Joshua Pines

Xerox Corp.
Rob Buckley

X-Rite, Inc.
James Vogh

Zoran Corp.
Tom Schuneman

Chairman's Report
Digital Photography Working Group

Jack Holm, Hewlett Packard

This is a new working group founded early in 2004 to enable and promote effective use of ICC color management among digital photography users.

Shortly after its organization, the working group identified some common misunderstandings about the role of color management in digital photography. The result was a pair of white papers addressing color management basics and the use of ICC Profiles with digital camera images.

In 2005, the working group has identified clear needs for:

- Unambiguous communication of scene colorimetry and capture conditions.
- Easy use of different media & ICC color management by photographers.
- Communication of scene enhancements and media-independent artistic considerations.
- Baseline scene-to-picture color rendering
- Information gaps between advanced users, camera manufacturers and color management experts.

These and other issues provide the Digital Photography Working Group with a full and meaningful agenda for the next several years.

Charter: The Digital Photography Working Group will enable and promote correct and effective use of ICC color management among digital photography users by:

1. Identifying digital photography user problems and needs regarding color management.

2. Preparing white papers and other educational materials, and promoting activities to guide developers and users in the appropriate application of ICC color management to digital photography.

3. Identifying limitations of ICC color management with respect to digital photography use cases, and developing recommendations to the digital photography community to address these limitations.

4. When necessary, proposing changes to the ICC profile format to address digital photography issues.

Chair:

Hewlett Packard
Jack Holm

Vice Chair:

Color Savvy Systems
Eric Walowit

Members:

Apple Computer, Inc.
Luke Wallis

Agfa-Gevaert N.V.
Marc Mahy

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Dr. Mikhael Rodriguez

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Matty Litvak

Sun Chemical Corp.
Danny Rich

Vertis, Inc.
Steve Smiley

X-Rite, Inc.
Ray Cheydleur

Zoran
Tom Schuneman

Chairman's Report
Graphic Arts Special Interest Working Group

Craig Revie, The Fujifilm Group

The graphic arts industry remains a very special focus for ICC, the industry that gave the Consortium its original mission and whose color management concerns have driven the largest part of ICC efforts over the last 12 years.

In the past year, GASIG was particularly active in continuing to whittle down the list of implementation issues raised by end users of ICC based color workflows. One by one, these issues have been addressed and solved. Sometimes the solutions to individual difficulties proved to be of broad interest and applicability. In these cases, we have developed white papers for publication through the website.

One area of particular concern throughout the printing, publishing and converting industries is, of course, consistent proofing. A separate working group was created to investigate this topic in the detail, and with the sustained attention that it requires.

The working group helped to shape the next revision of the PDF/X standard by coordinating ICC's input into the discussions leading to this revision. We have also maintained an ongoing forum throughout the year for discussion of issues in RGB workflow, recognizing that a growing number of graphic arts specialists are indeed becoming more interested in RGB as the basis for their entire workflow.

Charter: The primary focus of this working group is to address issues raised when using ICC Profiles for printing presses or related printing systems, such as digital proofers, by:

1. Promoting the use of ICC Profiles in "high end" graphic arts applications.

2. Identifying areas where the existing ICC Profile format is unable to provide the functionality required by these printing systems.

3. Proposing changes in working practice and if necessary in the ICC Profile format to address current limitations.

Chair:

The Fujifilm Group
Craig Revie

Members:

Adobe Systems Inc.
Lars Borg
Dr. James King

Agfa-Gevaert N.V.
Marc Mahy

Apple Computer, Inc.
Steve Swen
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Heijo Reinl

Corbis Corp.
William T. Radcliffe

Creo, Inc., a Subsidiary of Kodak
William Li
Joris Verbouwe

Dainippon Screen
Setsuo Ohara

DuPont Ink Jet
Bob Strum

Eastman Kodak Co.
David Q. McDowell

Electronics and Telecommunications Research Institute
Dr. Kim Jin-Seo

The Fujifilm Group
Lawrence C. Warter

Fuji Xerox Co., Ltd..
Hiroaki Ikegami

Global Graphics Inc.
Kenneth Elsman

GretagMacbeth
Dr. Stefan Brües

Heidelberger Druckmaschinen AG
Detlef Freyer
Uwe-Jens Krabbenhoeft

Hewlett Packard
Jack Holm
Dr. Johan Lammens
Mary Nielsen
Dr. Ingeborg Tastl

Integrated Color Solutions, Inc.
Jo Kirkenaer

Kodak Polychrome Graphics
Dr. Chris Edge

Konica Corp.
Dr. Po-Chieh Hung

Lexmark International, Inc., CPD
Ann McCarthy

London College of Communication
Dr. Phil Green

Onyx Graphics Corp.
Max Derhak

Quark, Inc.
David Allen

Quebecor World
Bob Hallam

R.R. Donnelley
Dr. Michael Rodriguez

Vertis, Inc.
Steve Smiley

Xerox Corp.
Rob Buckley

Zoran Corp.
Tom Schuneman

Chairman's Report
ICC Profile Assessment Working Group (PAWG)

Dr. Abhay Sharma, Western Michigan University

As I review the issues facing the group over the last year, it is clear that the assessment and measurement of profile quality continues to be one of the foremost challenges to the ICC. The ICC's main document, the ICC Specification, describes in detail the format and data structure of an ICC profile. The specification, however, does not discuss the quality of the contents of an ICC profile. The task of the Profile Assessment Working Group is to address the issue of ICC profile quality.

The work of the group falls into three main areas - (i) compliance to the specification, (ii) colorimetric and quantitative metrics, and (iii) perceptual attributes and quality of color transformations. Testing tools, analysis and results continue to be made in all three core areas.

As the first step of profile assessment, the group continues to develop a reliable method of validating profile conformance. The group is developing tools that test conformance to all elements of the specification (as well as future additions to the specification). The two projects developed this year are the Genoa validation tool originally produced by Genoa Technology in early 1999 and now being updated by HP. The other test tool is based on Max Derhak's SampleICC C++ library.

The group has developed (and posted for download) a "probe" profile that can be used to verify various aspects of profile concatenation including the rendering intent. The probe profile has some systematic adjustments of hue angle and L° lightness in the different rendering intents, making it possible to determine which lookup table has been used in a given transform. Initially a v2 profile was developed, within the last year the profile has been updated and now a v4 profile is also available. Users continue to download and use this very useful diagnostic tool.

In terms of perceptual attributes the group continues to support the Standard Color Image Data (SCID LAB) images as part of ISO 12640-3. The development of a standard set of images, encoded in CIELAB, is very useful in profile assessment. The images are used to evaluate the quality of profiles in terms of visual characteristics such as flesh tones, smoothness of vignettes, and reproduction of neutrals. The tests using these real world images will complement other well established colorimetric "quantitative" tests. The SCID LAB images are encoded in LAB which allows for isolation and testing of a single profile - "PCS to device". This ability to investigate a

single profile can be described as modular debugging and is the process favored in the work of this group.

The group continues to search for tools to test visual attributes and in meetings over the last year has reviewed exciting ideas including ColorThink Pro from Chromix and a digital test form for evaluation of profiles and visualization of gamut differences from University of Dalarna, Sweden.

The issue of profile smoothness continues to be addressed by this group. Many members feel that profile smoothness is important to avoid artifacts in color reproduction, but that there is no clear or obvious way of assessing the smoothness of a color transform. In the last year the group has carried out a literature review of smoothness metrics and has looked at 2D and 3D metrics and methods of visual assessment. The Profile Assessment Working Group has initiated a collaboration between a number of university teams to collectively study the issue of profile smoothness.

One of the most beneficial exercises in the last year has been the "profile interoperability sessions" initiated by Ingeborg Tastl of HP. These sessions, which have now become an ongoing feature of ICC meetings involve the live and simultaneous testing of profiles and applications.

Tom Collins, Color Manager, Quad/Graphics was elected unopposed as vice-chair of the Working Group, at the meeting in London, February, 2005.

Charter: The mission of this group is to seek methods for assessing quality of ICC profiles by:

1. Defining a set of quality attributes for ICC profiles

2. Identifying analytical methods for defining and investigating performance capabilities of valid ICC profiles. (A valid profile is one that conforms to the ICC specification.)

3. Investigating metrics that might quantify or qualify said performance characteristics

4. Recommending promising solutions to the ICC body for their consideration

5. Setting a short term goal of developing evaluation methods for use within the ICC

6. Setting a longer term goal of offering suggestions to users for evaluation

Chair:

Western Michigan University
Dr. Abhay Sharma

Vice-Chair:

Quad/Graphics
Tom Collins

Members:

Agfa-Gevaert N.V.
Marc Mahy

ALWAN COLOR Expertise
Elie Khoury
Luc Regnault

Apple Computer, Inc.
Luke Wallis

CGS Publishing Technologies International GmbH
Heijo Reinl

Creo, Inc., a Subsidiary of Kodak
Harold Boll
William Li

DuPont Ink Jet
Robert Strum

Proof Certification Working Group

The absence of a uniform proofing standard has been a persistent challenge to the graphic arts industry. In fact, most proofing hardware and software vendors provide their systems with proofing presets that provide strikingly different output results.

A variety of efforts have been directed to solving this problem, but these have also resulted in different sets of proofing conditions and validation procedures, not only leaving the original problem unsolved but contributing to the confusion surrounding the issue.

ICC has taken on this challenge and intends to be extremely proactive and collaborative in working to define a new standard for proofing. We have established collaboration with ISO to promulgate such a standard in the near future. We are inviting manufacturers of instruments, lighting and other devices to join in this effort along with vendors of software and proofing systems.

This is a complex problem and will not be quickly solved. But it is also the type of problem that lends itself most clearly to the broad, consensus-based strategy with which ICC will address it.

Members:

Color Savvy Systems
Eric Walowit

Creo, Inc., a Subsidiary of Kodak
Yoav Bresler

Digital Dog
Andrew Rodney

The Fujifilm Group
Dale Mutza

Hewlett Packard
Jack Holm

London College of Communication
Dr. Phil Green

Photo Marketing Association International
Chad Munce

Photography
Mr. Eddie Tapp

The Probe Profile

The 'probe profile' (Probev1_ICCv2.icc) is syntactically a v2ICC output device ('prtr') profile. The color space of this profile is CMYK, and its PCS is Lab.

Colors processed via this profile are deliberately distorted in a systematic way, to enable visual determination of the rendering intent used when rendering ("BToA" or PCS to device transforms) and when proofing ("AToB" or device to PCS transforms). This is useful, in cases when color-management-aware software does not document the behavior.

Through its use, one can visually determine the rendering transform used in a workflow by processing an image with the profile and observing the dominant hue of the rendered result.

For more information, visit http://www.color. org/memberson-ly/probeprofile.html

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ICC Profile Assessment Working Group (PAWG)

Eastman Kodak Co.
David Q. McDowell

Electronics and Telecommunications Research Institute
Dr. Kim Jin-Seo

The Fujifilm Group
Craig Revie
Lawrence C. Warter

Hewlett Packard
Dr. Johan Lammens
Dr. Ingeborg Tastl

Integrated Color Solutions, Inc.
Jo Kirkenaer

Kodak Polychrome Graphics
Dr. Chris Edge
Dr. Arkady Ten

London College of Communication
Dr. Phil Green

Quebecor World
Bob Hallam

R. R. Donnelley
Dr. Michael Rodriguez

Sharp Laboratories of America, Inc.
John "J.D." Dalrymple

Chairman's Report
Specification Editing Working Group

William Li, Creo, Inc., a Subsidiary of Kodak

Adapting the ICC Specification into an ISO international standard has commanded most of the group's attention over the past year. The new standard is now ready for distribution and we believe it represents a major advance for the industry.

Other areas in which we have been active include assuring the ICC developer community of more frequent updates on the Specification. We have devoted a portion of the website to a listing of approved revisions that are not yet included in the released version of the Specification. Our intent is that the profile specification will always be current with, or ahead of, what is available through the ISO standard, and that as time goes on, new changes will originate in the ICC process and later be transferred to the ISO version.

Charter: The Specification Editing Working Group is responsible for dealing with issues related to published ICC specifications by:

1. Ensuring that balloted changes to published ICC specifications, including both ICC-published and directly-derived versions are published in minor or major revisions in a timely fashion, including performing the mechanics of ensuring that the specifications are published.

2. Discussing reviewing and making recommendations on non-material changes to the specifications which help clarify the intent of the specification, as well as ensuring that these changes are made to the appropriate published specifications.

3. Being responsible for the publication and maintenance of new ICC specification documents as they are developed by the body of the ICC.

Chair:

Creo, Inc., a Subsidiary of Kodak
William Li

Members:

Adobe Systems Inc.
Lars Borg
Manish Kulkarni

Agfa-Gevaert N.V.
Marc Mahy

Canon Development Americas, Inc.
John Haikin

CGS Publishing Technologies International GmbH
Heijo Reinl

Creo, Inc., a Subsidiary of Kodak
Dana Fokos

DuPont Ink Jet
Robert Strum

Eastman Kodak Co.
David Q. McDowell

The Fujifilm Group
Mr. Martin Gouch

Hewlett Packard
Dr. Johan Lammens

London College of Communication
Dr. Phil Green

Chairman's Report
Workflow Working Group

Ann McCarthy, Lexmark International Inc. CPD

The ICC Workflow WG serves as the bridge between ICC color management technologies and use of those technologies in real world color reproduction applications. ICC color management is applicable to and is used in a wide range of color systems, from highly specialized digital cinema color effects to high volume publications printing to home use photography applications. The ICC Workflow WG works to align ICC technologies so that the color management needs of these diverse use case systems are addressed in an open, platform independent, manner.

In previous years the Workflow WG recognized and defined a common set of workflow primitives - fundamental color system behaviors - that occur and reoccur across these various workflows. The reference materials describing the workflow primitives and their attributes are available on the ICC website in the *Color Imaging Workflow Primitives* slide sets. These workflow primitives occur in various specific forms across the range of color managed workflows.

Initially the ICC Workflow WG focused on graphic arts workflows. In 2004, the ICC Workflow WG led ICC investigations into digital photography and digital cinema workflows. These two focus areas have now transitioned into the recently formed Digital Motion Picture WG and Digital Photography WG. Along with the Graphic Arts Special Interest WG, these four working groups balance the needs of specific user groups with the broad requirements for a generally applicable color management systems infrastructure.

As a next step in understanding color management systems interactions in various workflows, the Workflow WG has initiated a color management systems requirements analysis effort. Rather than focusing exclusively on ICC color management, this work is investigating the general system requirements that derive from real world needs to adapt color behaviors using a variety of digital color technologies. The current *Color Management Systems Requirements* draft is available on the ICC website on the Workflow WG 'work in progress' page.

In conjunction with the color management requirements analysis work, and in an effort to further understand real world workflow needs, the ICC Workflow WG most recently has developed an analysis of Workflow Patterns and Dimensions, along with new proposals for conveying designer and artist intentions from the early creative stages of color content creation through to the various color reproduction venues. *The Workflow Patterns and Dimensions* work was discussed in detail at the Spring '05 ICC meeting. The related presentation is posted on the ICC website on the Workflow WG 'work in progress' page. Comments and contributions to this investigative approach are welcome. If you are interested in becoming involved in this work, please consider joining the ICC Workflow Working Group.

Along with the above activities, several members of the ICC Workflow WG have contributed to the growing collection of ICC White Papers. The papers titled, '*ICC profiles in a colour reproduction system*', '*Common color management workflows & rendering intent usage*', and '*Perceptual rendering intent use case issues*' are of particular note from a workflow perspective. These and other White Papers are now available on the ICC web site.

Charter: The Workflow Working Group will:

1. Identify a small number of the most commonly used workflows

2. Recommend effective ways for application to use the ICC specification to satisfy those workflows and recommend improvements to the specification, or implied architecture, in order to make the workflow procedure more efficient

3. Identify where predictability and consistency are required in the workflow and insure that the recommendation enable them to be achieved

4. Recommend what procedures are required to ensure ease of use with the recommendations made

5. Identify any liaison relationships that need to be established

Chair:

Lexmark International, Inc., CPD
Ann McCarthy

Members:

Adobe Systems Inc.
Lars Borg

Agfa-Gevaert N.V.
Marc Mahy

ALWAN COLOR Expertise
Elie Khoury

Apple Computer, Inc.
Steve Swen
Luke Wallis

Color Savvy Systems Inc.
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GretagMacbeth
Dr. Stefan Brües

Heidelberger Druckmaschinen AG
Uwe-Jens Krabbenhoeft

Hewlett Packard
Jack Holm

Integrated Color Solutions, Inc.
Jo Kirkenaer

KiKUZE Solutions Pte Ltd..
Allan Zhang

London College of Communication
Dr. Phil Green

Quark, Inc.
David Allen

Quebecor World
Bob Hallam

R.R. Donnelley
Dr. Michael Rodriguez

Vertis, Inc.
Steve Smiley

Liaisons

Communication and collaborative relationships with other color-oriented organizations has remained a key priority for ICC. The roster of organizations with which ICC maintains liaisons has evolved and expanded over the years. In 2005, we have a formal liaison structure with the following groups:

CIE Division 8 is the section of the International Commission on Illumination that deals with image technology. The division's work in color appearance modeling, determination of color difference for complex images, gamut mapping and RGB color spaces is important to the work of ICC and is closely monitored. ICC is considering a proposal to recommend the chromatic adaptation model proposed by CIE (based on the work of TC8-01 as soon as it is formally approved), for Annex E of the ICC specification in its V4 version. (www.cie.org)

CIE Technical Committee 1-57 (Standards in Colorimetry) was established in 2000 to prepare a series of CIE/ISO/IEC Standards that describe (1) the method of calculating CIE tristimulus values and chromaticity coordinates; (2) a uniform color space and its associated metrics; and (3) a formula for industrial color difference evaluation.

CIP4 is an international worldwide operating standards body formed to encourage computer based integration of all processes that have to be considered in the graphic arts industry, in particular the specification of standards. (www.cip4.org)

European Color Initiative (ECI), A Who's Who of the European graphic arts community, was founded in 1996 to support ICC based color management technologies. The group, which includes advertising agencies, publishing houses, prepress trade shops, printers, research labs and associations, has established a new working group for digital photography. (www.eci.org)

GATF (The Graphic Arts Technical Foundation) is a technical research and education for the graphic communications industry. GATF presents an annual conference and seminars on color management and maintains an ICC Registry.

Ghent PDF Workgroup, founded in 2002, is an international assembly of industry associations whose goal is to establish and disseminate process specifications for best practices in graphic arts workflows. The initiative for the workgroup came from Enfocus Software, whose founder Peter Camps chaired the project for the first year. The idea for the workgroup originated with the complex process of seeking consensus on PDF creation and preflight settings, when it because clear that a coordinated approach was needed. Founding members agreed to collaborate on a process with the outcome of one set of specifications, but with each member retaining independent authority to adopt and promote the specifications. Interested industry organizations, including ICC, send representatives to the workgroup meetings as observesr to learn from the process.

ISO Technical Committee 42 is responsible for the development of standards in the field of photography. ICC monitors and contributes to the work of this group in areas which may impact its work, such as camera characterization, image quality, measurement and extended RGB color spaces. (www.iso.org)

ISO Technical Committee 130 (Graphic Technology) is responsible for the standardization of test methods and specifications in the field of printing and graphic terminology, including composition, reproduction, printing processes, finishing and the suitability of materials. ICC is working with this group in the preparation of the ICC specification for publication as an ISO standard, and many of the members of ICC are also represented on this committee. In the United States, the ANSI-accredited Committee for Graphic Arts Technologies Standards (CGATS) is responsible for the development of standards for graphic technology, and interfaces with ISO TC 130 on work of mutual interest. As with TC 42, ICC monitors and contributes to many of the activities of TC 130 which are relevant to its work, such as file formats for data exchange, standard test images, process control and color standards for graphic technology. (www.iso.org)

2005 Progress Report

International Color Consortium Announces First ICC Developers Conference

The International Color Consortium will present ICC DevCon '05, the first ICC Developers Conference, an intensive, practical tutorial day for application developers and others considering implementing ICC color management in their products, software and workflows.

The conference will take place November 7, 2005, from 8 a.m. to 7:30 p.m. at the Chaparral Suites Resort in Scottsdale, Arizona. ICC DevCon '05 will be co-located with the IS&T Color Imaging Conference, which will be held November 7-11 at the adjacent Sunburst Resort.

The heart of the ICC DevCon '05 program is a sequence of 13 half-hour tutorial sessions addressing such topics as:

• How should applications present user interface color controls?

• When and how in a workflow should a print job be encoded for print?

• How should device drivers use ICC profiles?

• What are the trade-offs in DeviceLink profile construction?

• Under the hood: V4 CMM, V4 ICC profiles, and the new ICC Perceptual PCS

Each tutorial will be presented by a principal expert on the selected topic. The tutorial sequence will provide implementation details on how to build, use and get maximum benefits from color management using Version 4 of the ICC Specification. The tutorial materials will be targeted to application and system developers and professional users.

In addition, a panel of experts will host an interactive "From the Trenches" panel discussion during lunch, and color management product vendors will offer a "Show and Tell" of displays and technical demonstrations during an evening networking reception.

"DevCon '05 will deliver an intensive day through which users and developers of all types can get both the strategic view of ICC based color management and practical help in making ICC profiles work for their business," said ICC Chair Craig Revie of Fuji Film Electronic Imaging.

"ICC based color management in all its forms is here to stay, and is creating both challenges and opportunities for our industries. ICC DevCon '05 will help developers navigate this environment by combining best practices, knowledge-able speakers, and vendor resources to deliver a world-class learning opportunity," Revie added.

The conference will conclude with a Wine & Cheese Networking Event and ICC Color Management Technology Demonstrations by ICC DevCon'05 sponsors and ICC members. Sponsors include Adobe Systems, BARBIERI Electronic, Creo, Inc., a Subsidiary of Kodak, Hewlett Parkard, The MathWorks, Inc., Graphic Arts Monthly and Printing Impressions.

Conference registration fees are $400 each for the first and second registration and $300 each for additional registrations for ICC members companies and $500 each for the first and second registration and $375 each for additional registrations for non-member companies. Fulltime students and educators and IS&T and SID members will be offered the member registration prices. Registrations received by October 3 qualify for a $50 "early bird" discount.

Complete conference information, online registration forms and details about becoming a conference sponsor are available at www.color.org/iccdevcon05.html, or by contacting the ICC Secretary at 703/264-7200, e-mail ksmythe@npes.org.