2002 TAGA
TECHNOLOGY PATRONS
Membership Level Criteria: Contributions with total value of $5,000 or more in goods/services/cash to TAGA in 2001
PRESDT STD
U. S. Postage
PAID
Rochester, NY
Permit No. 426

2002 TAGA
CORPORATE SPONSORS
Membership Level Criteria: Annual member dues of $1,000

2002 TAGA
TECHNOLOGY PATRONS
Membership Level Criteria: Contributions with total value of $5,000 or more in goods/services/cash to TAGA in 2001

INX International Ink Co., Inc.
Baldwin Technology Co., Inc.
Kodak Polychrome Graphics
Printable Technologies, Inc.

American Color Graphics
Heidelberg
Ontario Beach Systems
Agfa Corp.

Appleton Coated, LLC
Kodak Polychrome Graphics
INX International Ink Co.
Sun Chemical Corp.

Beloitt Packard
Ink Systems, Inc.
Mahaek Paper Mills, Inc.
Ontario Beach Systems

DPC Inks, Inc.
Magna Graphics

Graphic Communications World
Group InfoTech, Inc.

Hewlett Packard
Sun Chemical Corp.

Group InfoTech

INX International Ink Co., Inc.

Kodak Polychrome Graphics

Group InfoTech, Inc.

Rochester Web Systems

INX International Ink Co., Inc.

Kodak Polychrome Graphics

Sun Chemical Corp.

Yamatoya & Co., Ltd.

2002 TAGA
TECHNOLOGY PATRONS
Membership Level Criteria: Contributions with total value of $5,000 or more in goods/services/cash to TAGA in 2001

INX International Ink Co., Inc.
Baldwin Technology Co., Inc.
Kodak Polychrome Graphics
Printable Technologies, Inc.

American Color Graphics
Heidelberg
Ontario Beach Systems
Agfa Corp.

Appleton Coated, LLC
Kodak Polychrome Graphics
INX International Ink Co.
Sun Chemical Corp.

Beloitt Packard
Ink Systems, Inc.
Mahaek Paper Mills, Inc.
Ontario Beach Systems

DPC Inks, Inc.
Magna Graphics

Graphic Communications World
Group InfoTech, Inc.

Hewlett Packard
Sun Chemical Corp.

Group InfoTech

INX International Ink Co., Inc.

Kodak Polychrome Graphics

Group InfoTech, Inc.

INX International Ink Co., Inc.

Kodak Polychrome Graphics

Sun Chemical Corp.

Yamatoya & Co., Ltd.

2002 TAGA
CORPORATE SPONSORS
Membership Level Criteria: Annual member dues of $1,000

2002 TAGA
TECHNOLOGY PATRONS
Membership Level Criteria: Contributions with total value of $5,000 or more in goods/services/cash to TAGA in 2001

INX International Ink Co., Inc.
Baldwin Technology Co., Inc.
Kodak Polychrome Graphics
Printable Technologies, Inc.

American Color Graphics
Heidelberg
Ontario Beach Systems
Agfa Corp.

Appleton Coated, LLC
Kodak Polychrome Graphics
INX International Ink Co.
Sun Chemical Corp.

Beloitt Packard
Ink Systems, Inc.
Mahaek Paper Mills, Inc.
Ontario Beach Systems

DPC Inks, Inc.
Magna Graphics

Graphic Communications World
Group InfoTech, Inc.

Hewlett Packard
Sun Chemical Corp.

Group InfoTech

INX International Ink Co., Inc.

Kodak Polychrome Graphics

Group InfoTech, Inc.

INX International Ink Co., Inc.

Kodak Polychrome Graphics

Sun Chemical Corp.

Yamatoya & Co., Ltd.

2002 TAGA
CORPORATE SPONSORS
Membership Level Criteria: Annual member dues of $1,000

2002 TAGA
TECHNOLOGY PATRONS
Membership Level Criteria: Contributions with total value of $5,000 or more in goods/services/cash to TAGA in 2001

INX International Ink Co., Inc.
Baldwin Technology Co., Inc.
Kodak Polychrome Graphics
Printable Technologies, Inc.

American Color Graphics
Heidelberg
Ontario Beach Systems
Agfa Corp.

Appleton Coated, LLC
Kodak Polychrome Graphics
INX International Ink Co.
Sun Chemical Corp.

Beloitt Packard
Ink Systems, Inc.
Mahaek Paper Mills, Inc.
Ontario Beach Systems

DPC Inks, Inc.
Magna Graphics

Graphic Communications World
Group InfoTech, Inc.

Hewlett Packard
Sun Chemical Corp.

Group InfoTech

INX International Ink Co., Inc.

Kodak Polychrome Graphics

Group InfoTech, Inc.

INX International Ink Co., Inc.

Kodak Polychrome Graphics

Sun Chemical Corp.

Yamatoya & Co., Ltd.

2002 TAGA
TECHNOLOGY PATRONS
Membership Level Criteria: Contributions with total value of $5,000 or more in goods/services/cash to TAGA in 2001

INX International Ink Co., Inc.
Baldwin Technology Co., Inc.
Kodak Polychrome Graphics
Printable Technologies, Inc.

American Color Graphics
Heidelberg
Ontario Beach Systems
Agfa Corp.

Appleton Coated, LLC
Kodak Polychrome Graphics
INX International Ink Co.
Sun Chemical Corp.

Beloitt Packard
Ink Systems, Inc.
Mahaek Paper Mills, Inc.
Ontario Beach Systems

DPC Inks, Inc.
Magna Graphics

Graphic Communications World
Group InfoTech, Inc.

Hewlett Packard
Sun Chemical Corp.

Group InfoTech

INX International Ink Co., Inc.

Kodak Polychrome Graphics

Group InfoTech, Inc.

INX International Ink Co., Inc.

Kodak Polychrome Graphics

Sun Chemical Corp.

Yamatoya & Co., Ltd.
Improvements in ovens, folders, and faster makereads

Using online color control systems

More pages on press (moving from 32 page signatures to current improvement include:

- Makeready to the first plate altogether?
- Time is another issue at a newswEEK.
- Newsweek looks toward for improvements in the future.

Prepress continues to work together with our suppliers to find further efficiencies.

- “paper has never run through a press better than it does today.”
- “Paper waste is now 5% to 6% waste. Nallen runs on a 28-30-lb. paper, which is lightweight, and paper manufacturers have responded with improvements in quality. Other areas of current improvement include:
  - More pages on press (moving from 32 page signatures to 48 pages signatures)
  - 50% faster press speeds
  - Quality improvements (while maintaining faster presses)
  - Improvements in material handling and special handling in postpress operations
  - Using online color control systems
  - Using presses that are “stacked” four units over four units for better performance
  - Improvements in ovens, folders, and faster make-ready

“These improvements must continue,” said Nallen, “and we are interested in particular in new binding operations that improve the pace of postpress operations and provide better selectivity options for selective binding and operations such as ink jetting.”

Automation in postpress, as well as in prepress operations, is an area Newsweek looks toward for improvements in the future.

There are distribution problems as well. “Right now,” said Nallen, “we are using thousands of trucks annually to move magazines, and we have to explore ways to combine distribution with other tactics to minimize the cost of distribution, especially given the ongoing escalation of postal rate increases.”

In the paper market, paper has already improved greatly, and “paper has never run through a press better than it does today.”

John realizes that Newsweek and all of its partners and suppliers must work together; they cannot do all this alone. Newsweek, and all publishers in general, must help their suppliers with study and research, (including a commitment in terms of sales volume), to allow their suppliers to make the investment on Newsweek’s behalf.

“We are competing with other media,” said Nallen. “It’s tough to compete with satellite, cable, and all other forms of media when you come out weekly. We provide a product you can wrap your hands around . . . in depth coverage and detail, but we have to get to the market quickly. CTP was the biggest thing to happen in the last few years, but what’s next? Direct to press, eliminate the plate altogether?”

“But 2001 was a very difficult year for publishers,” said Nallen, “and 2002 is not much better at this time. Advertising is down and efficiencies are needed. For example, in circulation, you may see online subscriptions and renewals taking the place of print subscriptions and renewals, and in general, you may see a decline in advertising revenue.”

“John Yule’s contributions to the color and imaging sciences have received widespread recognition. The University of London conferred upon him one of its highest distinctions, the degree of Doctor of Science in 1968. A Japanese language edition was published in 1980.

John’s retirement years were spent with his wife June in Prescott, Arizona. He continued to follow developments in the color imaging field, but his many hobbies, which included international folk dancing, hiking and music, were his preferred activities. John was a reserved but friendly man whose lively mind and physically active life produced an acclaimed career and a vital retirement that provided an inspiring example to those of us who seek to follow his path.

John was a TAGA member for 53 years.

Report by: Dave Mainwaring, Manager, Paper & Graphics Education at TAGA Member PrintPlanet, Inc.
John Yule, who was born in Bradfield, Berkshire, received a Bachelor of Science degree from the Royal College of Science (part of the University of London). He received a Master of Science degree from the Royal College of Science (part of the University of London) in 1937. The petroleum company he subsequently worked for in the south of England transferred him to their United States operations in 1932. John was about to return to England in 1936 when an offer of employment arrived from Alexander Murray of the Kodak Research Laboratory. He accepted the offer and began his long association with the imaging science community.

Dr. Yule joined the Rochester Institute of Technology in 1968 as a Research Scientist. His seven years at RIT included a series of pioneering studies conducted with Alton Pearson and Irving Poborovsky on the optimum reproduction of color and, in 1971, collaborative work with Nathaniel Korman at Time Inc.’s Springdale Laboratories in Connecticut. The subsequent Boulder series of scanners was produced until the 1980s. His early research is still cited regularly, particularly that concerning the Yule-Nielsen equation, a method for converting density measurements into dot areas.

The Journal of Graphic Technology is a quarterly peer-review journal dedicated to bridging the communications gap between printers, press suppliers, publishers, print buyers and the technologists that develop software, systems, equipment and materials for them. The journal will be published quarterly, and the first edition is imminent. For more information on the Journal of Graphic Technology or on paper submission guidelines, please see www.taga.org.

TAGA has announced the first panel of esteemed reviewers for the printing industry’s first peer-reviewed journal, TAGA’s Journal of Graphic Technology. The panel of 44 reviewers began with nominations from TAGA’s membership. The initial list of nominees was culled by the Journal of Graphic Technology’s Editorial Advisory Board and only then were individual reviewers confirmed to participate in the panel of reviewers. This is a lifetime appointment and thought leadership, industry recognition, and experience in publishing significant research were among the selection considerations.

This inaugural panel includes:
- Phil Age of Eastern Illinois University
- Joseph Agster of PAPI/Canadian
- Bob Bassemir of Sun Chemical
- Anne Blayo of E.F.P.G.
- Mark Bohan of the University of Wales/Swansea
- Robert Chung of the Rochester Institute of Technology
- Tim Clappole of the University of Wales/Swansea
- Patrice Dunn of DunnHill Studio
- Richard Durand, Jr. or Sun Chemical Corp.
- Peter Engelund of Imcotek
- Nils Enlund of The Royal Institute of Technology
- Craig Revie of Fuji Film Electronic Imaging Ltd.
- David Romano of Agfa Corporation
- Frank Romano of the Rochester Institute of Technology
- Thomas Schilden of University of Arizona
- John Seymour of Quad Tech International
- Frederic Simon of Clemson University
- David Smith of Dove Chemical
- Caj Södergård of VTT Information Technology
- Joseph Aspler of PAPRICAN
- Dr. Tony Stanton of the London School of Printing
- Tony Stallard of the National Taiwan University of Arts
- Per-Ake Johansson of STFI AB
- Tony Johnson of the London School of Printing
- Helmut Kohpman of Heidelberg
- Druckmaschinen AG
- Björn Kruse of Linkoping University
- John Lind of Graphic Arts Technical Foundation
- John MacPhee of Baldwin Technology
- Andy Masia of Iris Graphics
- Stig Nordqvist of The Swedish Newspaper Publisher’s Association (Tidningsutgivarna)
- Bernard Pineaux of E.F.P.G.
- William J. Ray of Group InfoTech
- Erwin Wohler of System Brunner AG
- Yang Xiang of the University of Maine
- Walt Zawacki of Flint Ink
- Mark Snyder of Clemson University
- Dr. Stig Nordqvist of Tidningsutgivarna (The Swedish newspaper association) and David Romano of Agfa Corporation were both re-elected to second terms as TAGA Board directors.

Stanton’s election to a TAGA Board officer’s position created a vacancy on TAGA’s board of directors, and Helene J. uhola of VTT Information Technology was appointed to fill that vacancy by TAGA’s president, Bruce Blom of MeadWestvaco.

Three board members will be leaving, including Miles Southworth of Graphic Arts Publishing (RIT professor emeritus), Dr. Juanita Parriss of Sun Chemical, and Walt Zawacki of Flint Ink.
NEW TAGA PROGRAMS:
OFET, MEMS, and Micro & Nanotechnologies

At the TAGA Conference the attendees and the participants in the Printers’ Evaluation and Challenge Panel expressed a high degree of interest in fabricating organic electronics, micro-electromechanical (MEMS) systems, and micro & nanotechnology architectures using graphic arts printing technologies. For instance, Dan Gamota of Motorola discussed Organic Field Effect Transistors (OFETs) which are a key element in the printed organic electronic technology being developed by a NIST ATP-sponsored Motorola-Xerox-Dow Chemical team. The team has demonstrated that printed OFET microtechnology is compatible with web-based printing technologies. They have deposited conductor, dielectric, and semiconductor materials on low-cost, flexible substrates to form OFETs, hence, creating an extremely inexpensive method of fabricating electronic circuitry, as opposed to traditional expensive silicon transistor manufacturing technology.

Organic semiconducting materials development over the last 20 years shows a consistent pattern for improvement in which new materials systems are discovered and enhanced periodically. Electrically active oligomers, polymers, and small molecules in solution and as suspensions are the dominant low-cost semiconductor “inks” used today. Moreover, the ability to use low cost solution processes for these materials systems in conjunction with demonstrated adequate electrical performance of the fabricated OFETs has increased the activity within the OFET space. In addition, these materials and processes are compatible with many substrates (polyester, paper, etc.). Preliminary studies have shown that provided adequate environmental barriers are implemented, these devices may be used even in packaging that is exposed to extreme temperatures, dampness, salinity and other adverse environmental factors.

TO TAGA CONFERENCE ATTENDEES

TAGAOfc@aol.com

At the TAGA conference the attendees and the participants in the Printers’ Evaluation and Challenge Panel expressed a high degree of interest in fabricating organic electronics, micro-electromechanical (MEMS) systems, and micro & nanotechnology architectures using graphic arts printing technologies. For instance, Dan Gamota of Motorola discussed Organic Field Effect Transistors (OFETs) which are a key element in the printed organic electronic technology being developed by a NIST ATP-sponsored Motorola-Xerox-Dow Chemical team. The team has demonstrated that printed OFET microtechnology is compatible with web-based printing technologies. They have deposited conductor, dielectric, and semiconductor materials on low-cost, flexible substrates to form OFETs, hence, creating an extremely inexpensive method of fabricating electronic circuitry, as opposed to traditional expensive silicon transistor manufacturing technology.

Organic semiconducting materials development over the last 20 years shows a consistent pattern for improvement in which new materials systems are discovered and enhanced periodically. Electrically active oligomers, polymers, and small molecules in solution and as suspensions are the dominant low-cost semiconductor “inks” used today. Moreover, the ability to use low cost solution processes for these materials systems in conjunction with demonstrated adequate electrical performance of the fabricated OFETs has increased the activity within the OFET space. In addition, these materials and processes are compatible with many substrates (polyester, paper, etc.). Preliminary studies have shown that provided adequate environmental barriers are implemented, these devices may be used even in packaging that is exposed to extreme temperatures, dampness, salinity and other adverse environmental factors.

GOT MAIL?
More and more of the TAGA communications are being sent to you via e-mail. If you have not received e-mail from TAGA this year, please send your current e-mail address to TAGAOfc@aol.com in order to be included in future e-mail communications. Thank you.

Organic electronic printing techniques used by Motorola in the OFET space include jetting, screen-printing, dispensing, spin coating, and pad printing. Motorola has shown that these printing techniques can be used in a sequential four-step process to fabricate OFETs. Presently, studies are underway to investigate several reliability and quality issues as well as high volume manufacturing related issues that must be fully characterized to bring OFET applications to market and to enable widespread acceptance and diffusion. These include repeatability, registration, electrical testing, air-to-air temperature cycling, flexure, humidity exposure, creasing, and so forth. The prototype manufacturing platform is much smaller than a web press, but it has features very similar to a conventional press. Utilizing a printing press offers several cost related benefits over traditional semiconductor manufacturing techniques. At 200 feet per minute, the process requires fewer operators, has a higher throughput than traditional electronics production, requires less room (footprint), and costs much less to install and operate ($40M versus traditional semiconductor fabs costing $4B).

Some of the companies that have already expressed an interest to participate in the creation of this revolutionary technology include Agfa, Apecia/Covion, Corning, Dow, Dupont, HD Microsystems, Flint Ink, IBM, Heidelberg, International Paper, Philips, Spectra, Sun Chemical, 3M, and Xerox. The potential markets are large and include (Reported estimates at IMAPS 2002 Conference):

- $1.3 billion in digital paper and signage
- $4 billion in inventory control
- $24 billion in displays
- $80 billion in novelty and marketing

There are however gaps to be bridged of which the two most pressing at this time being 1) the creation and qualification of an infrastructure and 2) the adoption of standards. Many of the aforementioned companies have shown interest to participate in the creation of the infrastructure (supply chain). Addressing the standards need, Motorola is working with the IEEE Standards body on circuit design and characterization standards.

Most of the organizations involved in the development of this revolutionary technology are not traditional printing technology companies. Motorola and its partners have turned to TAGA to help create the bridge between the semiconductor/microelectronics industry and the graphic arts/printing industry. TAGA is contemplating adding a full session to the 2003 ATC on this subject, publishing a special edition of the Journal of Graphic Technology on printed electronic micro & nanotechnologies with a special focus on OFET devices and circuitry, and so forth. The first step is to identify the community of interested developers from both industries and to facilitate communications. We will initially develop a private discussion group for both graphic arts and semiconductor/microelectronics developers, and possibly arrange for a small get-together.

If you are interested in participating in these discussions, please send an email message to TheHarvey3@aol.com. If you have any questions, please feel free to call Jim Harvey at (410) 451 5040.

IMAGE FORMATION

The structure of most photographic emulsion based color separation images is essentially that of the film’s grain. Over the years, however, some emulsion-based color separation systems also have relied upon a mosaic-type of filter structure to produce the appropriate images. The earliest commercial use of such systems was the Autochrome process of 1907. This process utilized a random distribution of red, green and blue filter elements (about 4 million sq. in.) over a black and white emulsion. After exposure, the emulsion was reversal processed to create a trans- parent positive image that derived its color appearance from the still intact filter elements. The popular Dufaycolor process of 1935, which worked on a similar principle, used a more regularly structured red, green and blue filter pattern with about 1 million elements sq. in.

Electronic scanner or camera systems impose their own kind of structure upon color separations. Both PMT and CCD scanning spots tend to normalize variations in adjacent tones that are perpendicular to the scanning direction. The main conversion of the tone scale into discrete steps, however, occurs after the recorded electrical signals are processed through an analog to digital (A/D) converter.

Interestingly, the initial image record from a mosaic filter type of CCD camera is not too dissimilar from those captured on such early mosaic filter color transparency emulsions as Dufaycolor. Similarly, modern “one shot” camera separations mimic those of 100 years ago, except for their smaller format.

This brings us to the most recent electronic version of color separation photography: the CMOS (complementary metal oxide semiconductor) stacked array. The structure of this sensor mimics the integral tripack type of color film (e.g. Kodachrome) that revolutionized color photography in the 1930s. The Foveon X3 imaging chip has three photodetector arrays located at different levels within a silicon layer. The top records the blue, the middle records the green and the bottom records the red light components of the image. This technology combines the compact-camera advantage of the single mosaic filter array sensor with the high resolution advantage of the three-sensor one shot camera.

IMAGE QUALITY CHOICES

Electronic camera performance range is considerably greater than that available from today’s film-based systems. Small CCD sensors, cheap lenses and filter mosaic structures restrict image resolution. On the other hand, linear array tandem CCD camera backs produce image detail that rivals the best film emulsions. It is important, therefore, to carefully choose electronic cameras that match the intended applications.

CHOOSE A COLOR SEPARATION METHOD

Camera or scanner separations? The question is becoming increas- ingly irrelevant because each method is simply a means to the end of providing analog signals to the A/D converter—the gateway to the image processing system. Direct (from the original scene) or indirect image capture? Image quality issues are important, but broader production concerns play an important role in the decision. Newspaper photography, for example, is well suited to electronic photography because of the fast turnarounds and relatively coarse halftone screens used for printing. Ultra fine screens or high magnification reproductions, on the other hand, are more likely to require conventional high resolution color transparencies and drum scanner/PMT methods of image capture.

In conclusion, however, it appears certain that electronic cameras will continue to displace electronic scanners as a preferred means of making color separations. In so doing, the color separation process (the image capture portion, at least) will pass from the photomechanical specialist to the creative photographer.

FOR FURTHER INFORMATION


THE AUTHOR

Gary G. Field is an Imaging Scientist and Professor at the California Polytechnic State University.

THE HARVEY3@aol.com
THE OLD IS NEW AGAIN

Increasingly, the printing industry’s color separations are once again being made via cameras rather than scanners. This transition has reopened some of yesteryear’s discussions about camera configurations, mosaic filter structures, optical resolution and other factors related to color separation quality and efficiency.

Despite some major differences, today’s electronic camera-based color separation systems share a number of features with the color photography methods of the early 20th century. An examination of these shared features may provide useful insights into today’s common color quality concerns.

CAMERA CONFIGURATIONS

The first color separations of the late 19th century were made by photographing the same scene three times through, respectively, red, green and blue filters. This sequential exposure strategy restricted the subject matter to still life scenes. Before long, the “one shot” camera was developed that allowed the photographer to expose three color separation negatives simultaneously from virtually any live scene. The feat was accomplished via a system of beam splitters and filters.

The printing industry initially used sequential load-and-expose camera techniques for producing color separations. These images were, in turn, subjected to tone and color correction procedures and a conversion from continuous tone to half-tone.

Simultaneous exposure of color separations came to the printing industry with the first color scanners of the early 1950s. Beam splitters were used to produce separations on these rotary drum PMT (photomultiplier tube) types of scanners.

The greater magnifications required from today’s small (24 x 36 mm, or less) CCD image sensors means that electronic cameras need much higher performance lenses than those used in the larger format film cameras of the early 1900s. Similarly, the larger field of view places higher demands upon lenses used in CCD scanners than on those microscope-type lenses used in PMT scanners.

LENS REQUIREMENTS

The greater magnifications required from today’s small (24 x 36 mm, or less) CCD image sensors means that electronic cameras need much higher performance lenses than those used in the larger format film cameras of the early 1900s. Similarly, the larger field of view places higher demands upon lenses used in CCD scanners than on those microscope-type lenses used in PMT scanners.

COLOR FILTER CHOICES

Narrow or wide band color separation filters? Narrow band separations require less color correction, but tend to lose detail in certain colors. Wide band separations require more color correction—a serious drawback in the days when photographic masking or hand retouching methods were used to make corrections. One advantage of wide bad filters, especially when they approximate the human visual or colorimetric response, is that the color separation system “sees” colors the same as a human observer does.

The color correction disadvantages of colorimetric-type filters have been greatly reduced since the digital computer based lookup table (LUT) approach to color image processing became available. The 1982 Eikonix Designmaster was the first commercial scanner to utilize a near colorimetric approach to color separation (Masia, 1984).

Despite some major differences, today’s electronic camera-based color separation systems share a number of features with the color photography methods of the early 20th century. An examination of these shared features may provide useful insights into today’s common color quality concerns.

CAMERA CONFIGURATIONS

The first color separations of the late 19th century were made by photographing the same scene three times through, respectively, red, green and blue filters. This sequential exposure strategy restricted the subject matter to still life scenes. Before long, the “one shot” camera was developed that allowed the photographer to expose three color separation negatives simultaneously from virtually any live scene. The feat was accomplished via a system of beam splitters and filters.

The printing industry initially used sequential load-and-expose camera techniques for producing color separations. These images were, in turn, subjected to tone and color correction procedures and a conversion from continuous tone to half-tone.

Simultaneous exposure of color separations came to the printing industry with the first color scanners of the early 1950s. Beam splitters were used to produce separations on these rotary drum PMT (photomultiplier tube) types of scanners.

The greater magnifications required from today’s small (24 x 36 mm, or less) CCD image sensors means that electronic cameras need much higher performance lenses than those used in the larger format film cameras of the early 1900s. Similarly, the larger field of view places higher demands upon lenses used in CCD scanners than on those microscope-type lenses used in PMT scanners.

COLOR FILTER CHOICES

Narrow or wide band color separation filters? Narrow band separations require less color correction, but tend to lose detail in certain colors. Wide band separations require more color correction—a serious drawback in the days when photographic masking or hand retouching methods were used to make corrections. One advantage of wide bad filters, especially when they approximate the human visual or colorimetric response, is that the color separation system “sees” colors the same as a human observer does.

The color correction disadvantages of colorimetric-type filters have been greatly reduced since the digital computer based lookup table (LUT) approach to color image processing became available. The 1982 Eikonix Designmaster was the first commercial scanner to utilize a near colorimetric approach to color separation (Masia, 1984).
2002 TAGA STUDENT COMPETITION WINNERS

On Tuesday, April 16th at TAGA 2002 Asheville, the winners of the 2002 TAGA Student Competitions were announced:

GRADUATE PAPER
1st: Hrishikesh Bhide, Western Michigan — $1,500
2nd: Radovan Sporka, Western Michigan — $1,000

UNDERGRADUATE PAPER
Kathleen Edwards and Kris Finnen, Cal Poly — $1,000

POSTER PAPER
Hélène Pelletier, Marie Effler, and Laurie Chastanet, EPFG — $300

PUBLICATION COMPETITION
Overall 1st: RIT — $1,000; 2nd: Cal Poly — $750
Technical Writing 1st: EPFG — $500
Non-Print publication 1st: Cal Poly — $500
Honorable Mention 1st: Clemson — $250

Congratulations, TAGA Students!
COLOR CONCEPTS by Gary G. Field

Color Separation Transitions

THE OLD IS NEW AGAIN

Increasingly, the printing industry’s color separations are once again being made via cameras rather than scanners. This transition has reopened some of yesteryear’s discussions about camera configurations, mosaic filter structures, optical resolution and other factors related to color separation quality and efficiency.

Despite some major differences, today’s electronic camera-based color separation systems share a number of features with the color photography methods of the early 20th century. An examination of these shared features may provide useful insights into today’s common color quality concerns.

CAMERA CONFIGURATIONS

The first color separations of the late 19th century were made by photographing the same scene three times through, respectively, red, green and blue filters. This sequential exposure strategy restricted the subject matter to still life scenes.

Before long, the “one shot” camera was developed that allowed the photographer to expose three color separation negatives simultaneously from virtually any live scene. The feat was accomplished via a system of beam splitters and filters.

The printing industry initially used sequential load-and-expose camera techniques for producing color separations. These images were, in turn, subjected to tone and color correction procedures and a conversion from continuous tone to halftone.

Simultaneous exposure of color separations came to the printing industry with the first color scanners of the early 1950s. Beam splitters were used to produce separations on these rotary drum PMT (photomultiplier tube) types of scanners.

LENS REQUIREMENTS

The greater magnifications required from today’s small (24 x 36 mm, or less) CCD image sensors means that electronic cameras need much higher performance lenses than those used in the larger format film cameras of the early 1900s. Similarly, the larger field of view places higher demands upon lenses used in CCD scanners than on those microscope-type lenses used in PMT scanners.

COLOR FILTER CHOICES

Narrow or wide band color separation filters? Narrow band separations require less color correction, but tend to lose detail in certain areas. Wide band separations require more color correction—a serious drawback in the days when photographic masking or hand retouching methods were used to make corrections. One advantage of wide band filters, especially when they approximate the human visual or colorimetric response, is that the color separation system “sees” colors the same as a human observer does.

The color correction disadvantages of colorimetric-type filters have been greatly reduced since the digital computer based lookup table (LUT) approach to color image processing became available. The 1982 Eikonix Designmaster was the first commercial scanner to utilize a near colorimetric approach to color separation (Masia, 1984).

Direct-from-still-life color separations became popular again when studio cameras were equipped with scanning-type linear array CCD sensors. The separations were made by making either three separate scans with one CCD, or one scan with three CCDs in tandem. Similarly, direct color separations from any live scene became common again when the two dimensional area array CCD cameras were introduced. The single CCD camera system uses a filter mosaic over the sensor network to produce the color separation signals.

Three separate elements on the CCD are required to capture the red, green and blue information for a single point. Image resolution was restricted on early models of this type of camera. Today’s CCDs, however, have such a high resolution (up to 6 million elements) that mosaic filter type electronic cameras are being used routinely for many printing industry image capture tasks.

The “one shot” type of camera has been reintroduced for those circumstances that require even higher levels of image capture resolution. The new electronic versions of these cameras provide, via the usual beam splitters (or prisms) and filters, high resolution red, green and blue color separations on separate CCDs.

TAGA ANNOUNCES 2002 HONORS AWARD RECIPIENT

TAGA Honors Mr. Takashi Numakura

The Technical Association of the Graphic Arts announced the award of the coveted TAGA Honors award to Mr. Takashi Numakura, Chairman of the Board of Yamatoya & Co., Ltd. in Tokyo, Japan—a company engaged in the development and sale of prepress systems and materials.

The Board of Directors of TAGA hereby singled out Mr. Numakura to receive the 2002 TAGA Honors Award as appreciation from his peers for his dedicated services and contributions to the advancement of graphic arts. In April 1954 when Mr. Numakura joined Yamatoya Corp., it was called then, he became Managing Director. He held this position until October 1967 when he was named Vice President, a position he held until January 1977 when Yamatoya Corp. became Yamatoya & Co., Ltd. Mr. Numakura was then named President & CEO and he served in this capacity until December 1999, when he became Chairman of the Board. Yamatoya’s main product is its Golden Imaging Software.

Mr. Numakura is the author of several technical papers and he has been an active member and supporter of numerous industry associations, including TAGA. He has been widely recognized by the Japanese and is the recipient of many national awards. In February 2000 he received the Award of Outstanding Service from the Japanese Society of Printing Science and Technology.

Mr. Numakura was presented with the symbol of the TAGA Honors Award, designed in 1976 by R. E. Maurer, then president of TAPA. It consists of a trihedron with three transparent side panels in the subtractive primary colors, yellow, magenta, and cyan, which are the colors of the three dye layers in transparencies and the colorants used in the printing inks for process-color reproduction. The overlap colors of red, green, and blue (violet) are generated by the colored panes. The black base represents the black printer and the white base of the pyramid the printing paper. Only 63 TAGA Honors Awards have been awarded since its inception in 1976. Last year, Helmut Kipphan, William J. Ray, and Irving Poborsky were awarded the TAGA Honors Award. This year, Mr. Numakura is the sole recipient of the award.

Mr. Takashi Numakura and Miles Southworth, TAGA Sec.-Treas. (Prof. Emeritus RIT)
Organic electronic printing techniques used by Motorola in the OFET space include jetting, screen-printing, dispensing, spin coating, and pad printing. Motorola has shown that these printing techniques can be used in a sequential four-step process to fabricate OFETs. Presently, studies are underway to investigate several reliability and quality issues as well as high volume manufacturing related issues that must be fully characterized to bring OFET applications to market and to enable widespread acceptance and diffusion. These include repeatability, registration, electrical testing, air-to-air temperature cycling, flexure, humidity exposure, crumpling, and so forth. The prototype manufacturing platform is much smaller than a web press, but it has features very similar to a conventional press. Utilizing a printing press offers several cost related benefits over traditional semiconductor manufacturing techniques. At 200 feet per minute, the process requires fewer operators, has a higher throughput than traditional electronic production, requires less room (footprint), and costs much less to install and operate ($40M versus traditional semiconductor fabs costing $4B).

Some of the companies that have already expressed an interest to participate in the creation of this revolutionary technology include Agfa, Avesta/Covion, Corning, Dow, Dupont, HD Microsystems, Flint Ink, IBM, Heidelberg, International Paper, Philips, Spectra, Sun Chemical, 3M, and Xerox. The potential markets are large and include (Reported estimates at IMAPS 2002 Conference): $13.3 billion in digital paper and signage; $4.2 billion in inventory control; $24 billion in displays; $80 billion in novelty and marketing.

There are however gaps to be bridged of which the two most pressing at this time being 1) the creation and qualification of an infrastructure and 2) the adoption of standards. Many of the aforementioned companies have shown interest to participate in the creation of the infrastructure (supply chain). Addressing the standards need, Motorola is working with the IEEE Standards body on circuit design and characterization standards.

Most of the organizations involved in the development of this revolutionary technology are not traditional printing technology companies. Motorola and its partners have turned to TAgA to help create the bridge between the semiconductor/microelectronics industry and the graphic arts/printing industry. TAgA is contemplating adding a full session to the 2003 ACT on this subject, publishing a special edition of the Journal of Graphic Technology on printed electronic micro & nanotechnologies with a special focus on OFET devices and circuitry, and so forth. The first step is to identify the community of interested developers from both industries and to facilitate communications. We will initially develop a private discussion group for both graphic arts and semiconductor/microelectronics developers, and possibly arrange for a small get-together.

If you are interested in participating in these discussions, please send an email message to TheHarvey3@aol.com. If you have any questions, please feel free to call Jim Harvey at (410) 451-5040.
TAGA has announced the first panel of esteemed reviewers for the printing industry’s first peer-reviewed journal, *Journal of Graphic Technology*. The panel of 44 reviewers began with nominations from TAGA’s membership. The initial list of nominees was culled by the TAGA Board, and only then were individual reviewers confirmed to participate in the panel of reviewers. This is a lifetime appointment, and the panel’s industry recognition, and experience in publishing significant research were among the selection considerations.

This inaugural panel includes:
- Phil Age of Eastern Illinois University
- Joseph Aspler of PAPRICAN
- Bob Bassemir of Sun Chemical
- Anne Blayo of E.F.F.P.
- Mark Bohan of the University of Wales/Swansea
- Robert Chung of the Rochester Institute of Technology
- Tim Clappole of the University of Wales/Swansea
- Patrick Dunn of DuPont Ink
- Richard Durand, Jr. or Sun Chemical Corp.
- Peter Engelhard of Icotech
- Nils Erland of The Royal Institute of Technology
- Dick Fisch of Dominant Wavelength
- Cynthia Gillispie-Johnson of NC A&T State University
- EG Granger of Ontario Beach Systems
- Richard Holub of IMAGICOLOR
- Yung-Ching Hsieh of the National Taiwan University of Arts
- Per-Ake Johannson of STFI AB
- Tony Johnson of the London School of Printing
- Helmut Kipphan of Heidelberg
- Bjorn Kruse of Linkoping University
- John Lind of Graphic Arts Technical Foundation
- John MacPhee of Baldwin Technology
- Andy Malina of Iris Graphics
- Stig Nordqvist of The Swedish Newspaper Publishers Association (Tidningsutgivarna)
- Bernard Pineaux of E.F.F.P.
- William J. Ray of Group InfoTech
- Craig Revie of Fujifilm Electronic Imaging Ltd.
- David Romano of Agfa Corporation
- Frank Romano of the Rochester Institute of Technology
- Thomas Schlenen of University of Arizona
- John Seymour of Quad Tech International
- Frederick Simon of Clemson University
- Dave Smith of Duve Chemical
- Cai Sodergard of VIT Information Technology
- John Yule
- Claude Zhu

The inaugural panel included scientists and photomechanical researchers, John A.C. Yule, died on April 10, 2002. The late John A.C. Yule, a founding TAGA member, one of the world’s leading color reproduction scientists and photomechanical researchers, John A.C. Yule, died on February 17, 2002. 

Yule was born in Bradfield, Berkshire, received a Bachelor of Science degree from the Royal College of Science (part of the University of London) in 1927. The petroleum company he subsequently worked for in the south of England transferred him to their United States operations in 1932. Yule was about to return to England in 1936 when an offer of employment arrived from Alexander Murray of the Kodak Research Laboratory. He accepted the offer and began his long association with the imaging science community of Rochester, New York.

At Kodak, he invented graphic arts products, was awarded some of the first early 1940s patents on color scanner technology, and authored numerous scientific and technical papers on color reproduction, film development and photomechanical processes. His 32 years at Kodak included service as an advisor to the United States Army Map Service during World War Two and, in 1951, four months of development work on the first successful color scanners at Time Inc.’s Springdale Laboratories in Connecticut. The subsequent OSI series of scanners was produced until the 1980s. His early research is still cited regularly, particularly that concerning the Yule-Nielsen equation, a method for converting density measurements into dot areas. Dr. Yule joined the Rochester Institute of Technology in 1968 as a Research Associate. His seven years at RIT included a series of pioneering studies conducted with Milton Pearson and Irving Poborborsky on the optimum reproduction of color and, in 1971, collaborative work with Natural Koman of the Ventures Research and Development Group on the first lookup table-based color scanner.

TAGA has announced the first panel of esteemed reviewers for the printing industry’s first peer-reviewed journal, *Journal of Graphic Technology*. The panel of 44 reviewers began with nominations from TAGA’s membership. The initial list of nominees was culled by the TAGA Board, and only then were individual reviewers confirmed to participate in the panel of reviewers. This is a lifetime appointment, and the panel’s industry recognition, and experience in publishing significant research were among the selection considerations.

This inaugural panel includes:
- Phil Age of Eastern Illinois University
- Joseph Aspler of PAPRICAN
- Bob Bassemir of Sun Chemical
- Anne Blayo of E.F.F.P.
- Mark Bohan of the University of Wales/Swansea
- Robert Chung of the Rochester Institute of Technology
- Tim Clappole of the University of Wales/Swansea
- Patrick Dunn of DuPont Ink
- Richard Durand, Jr. or Sun Chemical Corp.
- Peter Engelhard of Icotech
- Nils Erland of The Royal Institute of Technology
- Dick Fisch of Dominant Wavelength
- Cynthia Gillispie-Johnson of NC A&T State University
- EG Granger of Ontario Beach Systems
- Richard Holub of IMAGICOLOR
- Yung-Ching Hsieh of the National Taiwan University of Arts
- Per-Ake Johannson of STFI AB
- Tony Johnson of the London School of Printing
- Helmut Kipphan of Heidelberg
- Bjorn Kruse of Linkoping University
- John Lind of Graphic Arts Technical Foundation
- John MacPhee of Baldwin Technology
- Andy Malina of Iris Graphics
- Stig Nordqvist of The Swedish Newspaper Publishers Association (Tidningsutgivarna)
- Bernard Pineaux of E.F.F.P.
- William J. Ray of Group InfoTech
- Craig Revie of Fujifilm Electronic Imaging Ltd.
- David Romano of Agfa Corporation
- Frank Romano of the Rochester Institute of Technology
- Thomas Schlenen of University of Arizona
- John Seymour of Quad Tech International
- Frederick Simon of Clemson University
- Dave Smith of Duve Chemical
- Cai Sodergard of VIT Information Technology
- John Yule
- Claude Zhu

The inaugural panel included scientists and photomechanical researchers, John A.C. Yule, died on April 10, 2002. The late John A.C. Yule, a founding TAGA member, one of the world’s leading color reproduction scientists and photomechanical researchers, John A.C. Yule, died on February 17, 2002. 

Yule was born in Bradfield, Berkshire, received a Bachelor of Science degree from the Royal College of Science (part of the University of London) in 1927. The petroleum company he subsequently worked for in the south of England transferred him to their United States operations in 1932. Yule was about to return to England in 1936 when an offer of employment arrived from Alexander Murray of the Kodak Research Laboratory. He accepted the offer and began his long association with the imaging science community of Rochester, New York.

At Kodak, he invented graphic arts products, was awarded some of the first early 1940s patents on color scanner technology, and authored numerous scientific and technical papers on color reproduction, film development and photomechanical processes. His 32 years at Kodak included service as an advisor to the United States Army Map Service during World War Two and, in 1951, four months of development work on the first successful color scanners at Time Inc.‘s Springdale Laboratories in Connecticut. The subsequent OSI series of scanners was produced until the 1980s. His early research is still cited regularly, particularly that concerning the Yule-Nielsen equation, a method for converting density measurements into dot areas. Dr. Yule joined the Rochester Institute of Technology in 1968 as a Research Associate. His seven years at RIT included a series of pioneering studies conducted with Milton Pearson and Irving Poborborsky on the optimum reproduction of color and, in 1971, collaborative work with Natural Koman of the Ventures Research and Development Group on the first lookup table-based color scanner.
“Improvements in material handling and special handling to 30-lb. paper, which is lightweight, and paper manufacturers not print with proofs for their editorial products, they print to the printers and on the editorial side of operations, This balancing of advertising edit logic is one of their current for preferable placement by the advertisers often leads to conflicts very difficult to provide upfront positions to everyone. This demand require premium upfront placement in the magazine, but it becomes offer advertisers segmentation, which they demand. Advertisers

Continued from page 1

R&D Goal and Objectives

This includes additional measures such as make-ready to the first 100,000 bound books, plate preparation time, and other printing research, (including a commitment in terms of sales volume), to all publishers in general, must help their suppliers with study and (including a commitment in terms of sales volume), to allow their suppliers to make the investment on Newsweek's behalf. “We are competing with other media,” said Nallen. “It’s tough to compete with the revenue that radio, and all other forms of media when you come out weekly. We provide a product you can wrap your hands around. . . in depth coverage and detail, but we have to get to the market quickly. CTP was the biggest thing to happen in the last few years, but what’s next? Direct to press, eliminate the plate altogether.”

“2001 was a very difficult year for publishers,” said Nallen, “and 2002 is not much better at this time. Advertising is down and efficiencies are needed. For example, in circulation, you may see online subscriptions becoming more popular and renewals taking the place of new sales. This digital data is mailed to subscribers. The digital process has helped improve the whole workflow and for the most part the advertising files that are now coming in are in good shape and ready to go, so we have to look harder for efficiencies.”

Regarding the current advertising recession, Nallen said, “We’ve survived recessions before and we’ll survive this one, but we need to work together with our suppliers to find further efficiencies that will help us all survive the downturn and to compete effectively with other forms of media.”

TAGA PARTNERS WITH PRINTABLE TO LAUNCH PRINTPLANET’S TAGAPRESSOPS FORUM

Open Technical Email and Web Forum Connects Commercial and Academic Communities

Printable Technologies (www.printable.com), the leading online software provider for the graphical arts industry, and the Technical Association of the Graphic Arts (TAGA) today announced the launch of PrintPlanet’s TAGAPressOps Forum (TAGAPressOps @printplanet.com), a new technical forum connecting both press owners and operators with researchers and developers from both the commercial and academic communities. While the TAGAPressOps Forum was initiated on behalf of TAGA members, the organization is opening the forum to all qualified industry professionals. Dave Mainen, general manager of PrintPlanet and Jim Harvey, Director of Program Development for TAGA, will be co-moders of the Forum. "TAGA President Bruce Blom, who also is Manager, Paper & Graphics Education at MeadWestvaco Corporation, noted, "TAGA has been working to bring new services to its membership, and our launch of the TAGAPressOps Forum in partnership with PrintPlanet is the result of our survey of TAGA members regarding prospective online forum topics. Without question, press operations/ink and paper interactions emerged as their number one topic of interest, and the TAGA forum gives them a virtual new platform for the interchange of technical information, ideas and operational expertise."

The TAGAPressOps Forum may explore a wide range of technical topics including:

- Press characterization and operations studies
- Press design and innovation
- Pressroom automation and CIM
- Press optimization and troubleshooting
- Press operation and quality control

To assure its value as an independent and open forum for all members, the introduction of any sales and marketing efforts will be closely monitored and strongly discouraged. In addition to the launch of the PrintPlanet TAGAPressOps Forum, other major new TAGA membership services include the recent introduction of the Journal of Graphic Technology, the industry’s first peer-reviewed scientific journal, and the TAGA online International Student Resume Service. Chuck Gehman, executive vice president and CTO of Printable, observes, “We are very excited to have this opportunity to partner with TAGA to launch this important new technical forum for the industry. Together, we have carefully structured the TAGA-PressOps Forum to enable industry professionals to access an extraordinary resource to tap into the spectrum of knowledge and insights of peers worldwide for solutions and opportunities. With this new web and email discussion forum, TAGA continues to provide the leadership that has been its hallmark in the industry.”

Qualified industry professionals and academics are invited to register for membership in the PrintPlanet TAGA-PressOps Forum at: www.printplanet.com, click on e-communities and then select TAGAPressOps.
In the Members Only Section of the TAGA Web Site (www.taga.org)

R&D Goal and Objectives

The Publisher’s Perspective

R&D Goal and Objectives

By James E. Harvey, TAGA Director of New Program Development

At this year’s Annual Technical Conference, John Nallen, Director of Manufacturing at Newsweek Magazine, provided the keynote address. While Nallen does not purport to be a technologist, he has spent 27 years at Hill with responsibility for seven magazines including Business Week. 3.7 million copies of Newsweek reached his customers are Newsweek’s editors, advertisers, and readers. He said that Newsweek could no longer publish a “national” magazine; they must offer advertisers regional and demographic editions. Selective binding allows Newsweek to develop business plans for new technical conferences—six ideas were identified, and the Board members have accepted their challenges to come back in 90 days with detailed proposals. At that time we’ll review the proposals and determine which one(s) we should pursue. Stay tuned!

Continued on page 2

You can access many of the presentations from TAGA 2002 Asheville in the Members Only Section of the TAGA Web Site (www.taga.org)