

This article was downloaded by:

On: 16 January 2011

Access details: *Access Details: Free Access*

Publisher *Taylor & Francis*

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Liquid Crystals Today

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title~content=t713681230>

Commercial Comment: High-Information Content Liquid Crystal Displays

Joseph A. Castellano^a

^a Stanford Resources Inc, San José, CA

To cite this Article Castellano, Joseph A.(1992) '*Commercial Comment: High-Information Content Liquid Crystal Displays*', *Liquid Crystals Today*, 2: 3, 1 – 2

To link to this Article: DOI: 10.1080/13583149208628603

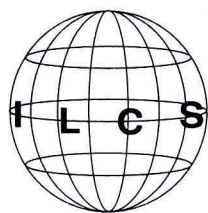
URL: <http://dx.doi.org/10.1080/13583149208628603>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.informaworld.com/terms-and-conditions-of-access.pdf>

This article may be used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.



LIQUID CRYSTALS Today

Vol. 2, No. 3 November 1992

A NEW PRESIDENT FOR ILCS

Results of the first elections held by the ILCS were announced by former President S Chandrasekhar at the 14th ILCC at Pisa, Italy. Nominations were received for two candidates for the position of President and four candidates for Vice-President, and in a close ballot the successful candidates were — President: Geoffrey Luckhurst (UK) and Vice-President: Shunsuke Kobayashi (Japan).

Geoffrey Luckhurst is well-known to the community of liquid crystal scientists for his theoretical and experimental research on molecular aspects of liquid crystal phases. His work at the University of Southampton has covered areas of molecular field theory, magnetic resonance and computer simulation, and he was the founding editor of "Liquid Crystals", one of the key journals in our field.

The new Vice-President, Shunsuke Kobayashi is a regional editor for another of our key journals, "Molecular Crystals & Liquid Crystals", and is also involved with a number of other journals. His research is in the area of optoelectronics and liquid crystal displays, and he is based at the Tokyo University of Agriculture & Technology.

The Society welcomes our new President and Vice-President, and looks forward to a successful future under their leadership. We must also record our gratitude to the retiring President Prof S Chandrasekhar, who was in large measure responsible for the establishment of the ILCS, and who has been an inspiration to many in the area of liquid crystals. Martin Schadt has retired as Vice-President, and his wise advice and guidance in the first years of the Society's existence has been immensely valuable. Both Prof Chandrasekhar and Martin Schadt continue as members of the Board of the ILCS.

Comments & Contributions to:

Dr D A Dunmur, Secretary to ILCS,
Dept of Chemistry, University of
Sheffield, Sheffield S3 7HF, UK.
Fax: (742) 750182
E-mail: CH1DAD@UK.AC.
SHEFFIELD.PRIMEA

Commercial Comment:

High-Information Content Liquid Crystal Displays

by Joseph A Castellano, Stanford Resources Inc,
POBox 20324, San José, CA 95160

Electronic information displays have become strategic components in global equipment markets. These displays provide a means of interacting with the controlling microprocessor found on an ever-increasing percentage of industrial, consumer and office products. High information content displays in colour, i.e. dot matrix displays which can present more than a predefined set of characters, are the best form of interaction with complex systems.

In recent years, liquid crystal displays (LCDs) have been developed in sizes up to 15-inches in diagonal with nearly one million pixels and thousands of colours; this has made them suitable for small television sets and portable computers. However, the largest screen sizes available for sale today are in the 10- to 11-inch diagonal size. Replacement of the cathode ray tube by LCDs in the huge TV market will have to wait until the larger screen LCDs (14-inches and up) become available at low prices. Meanwhile, the portable computer is an ideal application because of the LCD's low power, thin format, and light weight.

Liquid crystal displays will show a very strong growth in this application segment due to the large numbers of all types of portables including notebook, pen-based, palmtop and various other portable

definitions. The 'notebook' computer category, consisting of computers weighing about 7 lbs or less, will expand in number tremendously in the years to come, and LCD usage will move with it. The worldwide market for LCDs used in portable computers alone will grow at a compound annual rate of 20%, from 4.4 million units valued at \$1.11 billion in 1992, to 12.9 million units valued at \$3.12 billion in 1998.

The major commercially important LCD technologies today are: twisted-nematic Field Effect (TN-FE); SuperTwisted-Nematic (STN); Film SuperTwisted Nematic (F-STN); and Active Matrix, mainly using TFTs (thin film transistors), but also including MIM (metal-insulator-metal) and thin film diodes¹. Hitachi, Sharp, Toshiba, Epson, Seiko Instruments, Optrex, Kyocera, and Sanyo are the major suppliers of F-STN LCDs, the major technology used in portable computers today. Colour F-STN (256 colours) is becoming available but prices remain in the \$750 range. The main barrier to a 4,096, F-STN panel is the expense of additional drivers, which are currently unavailable. (Cont. on backpage)

[1] Details of the characteristics of the various techniques can be found in "Handbook of Display Technology", J A Castellano, Academic Press, San Diego, California, 1992.

In This Issue:

	Page
Society News	2-3
Scientific Notes	3
Just Thin Nematic Films . . . O Lavrentovich	4-5
New Books	6
Meeting Reports	6
Recent Advances in Understanding Smectics: P E Cladis	7
Forthcoming Meetings	8

COPY DATE FOR NEXT ISSUE : 15 January 1993

FORTHCOMING MEETINGS

DATE:	CONFERENCE:	VENUE:	CONTACT:
1993 7 — 12 March	European Liquid Crystal Conference	Flims, Switzerland	Dr M Schadt, F Hoffmann La Roche, ZFE/RLC 64/1227, CH 4002 BASEL, SWITZERLAND Fax: 41-61-688-1466
29 — 31 March	British Liquid Crystal Society Annual Conference	Manchester, UK	Prof H Coles, Dept of Physics, Univ of Manchester, MANCHESTER, M13 9PL, UK Fax: 44-61-273-2925
20 — 22 May	Hauptversammlung der Deutschen Bunsen-Gesellschaft: Flüssigkristalle	Leipzig, Germany	Prof H Stegemeyer, Dept of Chemistry, Univ of Paderborn, POB 1621, D-4790 PADERBORN, GERMANY Fax: 49-5251-602519
3 — 5 June	Third International Symposium on Metallo-Mesogens	Castellon, Spain	Dr Mercedes Marcos, Quimica Organica, Facultad de Ciencias- IMCA, Universidad de Zaragoza-CSIC, 50009- ZARAGOZA, SPAIN Fax: 34-76-567920
21 — 25 June	Gordon Conference on Liquid Crystals	Wolfeboro, Mass, USA	Prof J W Doane, Liquid Crystal Institute, Kent State University, KENT, OHIO 44242-0001, USA Fax: 1-216-672-2796
18 — 21 July	First International Conference on Materials Chemistry	Aberdeen, Scotland UK	Prof A West, Dept of Chemistry, Univ of Aberdeen, ABERDEEN AB9 2UE, Scotland, UK Fax: 44-224-272938
27 Sept — 1 Oct	Europhysics Conference on Macromolecular Physics 1993: Transitions in Oligomer & Polymer Systems	Ulm, Germany	Prof Dr H G Kilian, Universität Ulm, Experimentelle Physik, Albert-Einstein Allee 11, D-7900 ULM, GERMANY FAX: 49-731-502-3036
28 Sept — 1 Oct	FLC '93, Tokyo: Fourth International Conference on Ferroelectric Liquid Crystals	Tokyo, Japan	Prof Atsuo Fukuda, Tokyo Institute of Technology, Faculty of Engineering, Dept of Org. & Polymeric Materials, O-okayama, Meguro-ku, TOKYO 152, JAPAN Fax: 81-3-3748-5369
4 — 8 October [NOTE: Changed date]	V International Meeting on Optics of Liquid Crystals	Lake Balaton, Hungary	Dr I Janossy, Central Research Inst. for Physics, H-1525 BUDAPEST 114, POBox 49, HUNGARY Fax: 36-1-1695-380

Commercial Comment: *(continued from front page)*

'Fast' F-STN LCDs were introduced in 1991. The current price for a 10.6 inch, 640 x 480 pixel, monochrome model in quantities of 100,000 is approximately \$215. They have a response time of 220 milliseconds and can display 16 grey levels. Prototypes with even faster operation (120 to 150 milliseconds) have been shown but production of 16 grey level panels with this speed is difficult. The latter types are not expected to be

on the market until 1993.

Prices for 10.4-inch, 640 x 480 pixel, TFT LCDs are high because yields are lower than originally hoped for; however prices are expected to drop to approximately \$1,500 by the end of 1992. Larger screen TFT-LCDs (14 to 15 inches) are still unlikely to appear until 1994 or 1995. The 10.4 inch, 1,024 x 768 pixel, TFT LCD is in the prototype stage, but the price for a 256-colour model is expected to be

approximately \$3,000, although 100,000 unit quantities are several years away.

During the next five years, liquid crystal displays will dominate in portable/transportable computers as well as portable/table model colour TV in the 5-9 inch screen size range. Cost will still be the major problem facing the high information content LCD industry and the one major factor which will limit market penetration.