

**NTF**

Nordic Test Forum

*invites to*

# TestForum 2005

A Nordic forum for exchange of experience and know-how  
within the field of production test of electronics.

Meet colleges and experts, gain knowledge about trends  
and best practices in the area of test of electronics.

Tuesday and Wednesday, November 29<sup>th</sup> and 30<sup>th</sup>, 2005

**Buskerud University College, Kongsberg, Norway**



## The Program for TestForum 2005

We are proud to present Ben Bennetts as this years TestForum keynote speaker. Ben Bennetts is renowned for his involvement in electronics test and design for test issues for many years.

This years TestForum will cover Boundary-Scan test, Optical and X-Ray inspection, Functional Test, Test Strategies and Test Economics.

The keynote session and Boundary Scan sessions will give us information on the new standardisation activities; I-JTAG and S-JTAG. We will also learn about advances and novel uses of the boundary scan technology.

The Optical and X-Ray inspection session will concentrate on X-Ray including lead-free inspection issues.

In the Test Strategies and Test Economics session we will get interesting user presentations on managing global test and test efficiency analysis.

The Functional Test sessions will give us information on advances on instrument platforms as well as interesting user presentations.

This year we have set aside one hour for the exhibitors to present their products. We hope this will give you better advantage from the exhibition.

Yours sincerely



Knut Båstoløkken  
Chairman of *Nordic Test Forum*

## Local Organizer

The local organizer is:

Knut Båstoløkken  
Tel.: +47-37 07 16 07  
Email: [knut.baatstoloekken@kitron.com](mailto:knut.baatstoloekken@kitron.com)

## In Association with

The TestForum 2005 event is in association with the following Nordic organizations:



## Invited Speaker

### *Ben Bennetts*

Bennetts Associates

Dr. R. G. “Ben” Bennetts is an independent consultant in Design-For-Test (DFT), consulting in product life-cycle DFT strategies, and delivering on-site and open educational courses in DFT technologies.



In a career spanning over thirty years, he has worked:

- In the Electronic Design Automation industry with LogicVision (96 - 97) and Synopsys (93 - 95) where he assisted with the specification of DFT synthesis products and development of the DFT market.
- As an independent DFT consultant (86 - 93) advising on technical and marketing activities in test technology, test strategies and DFT techniques for ASICs, boards and systems and lecturing extensively on these topics. During this time, he was a member of JTAG, the organisation that created the IEEE 1149.1 Boundary-Scan Standard.
- In the Automatic Test Equipment industry with GenRad (83 - 86) and Cirrus Computers (79 - 83), writing test programs and developing test methodologies and tools.
- As a researcher and lecturer at Southampton University, UK (68 - 78) where he obtained his Ph. D. in test-pattern generation, followed by extensive research into test-related topics.

Ben was Program Chair for the first three European Test Conferences and he has published over 100 papers plus three books on test and DFT subjects. He was the Invited Plenary-Session Speaker at the 1992 IEEE International Test Conference (ITC) and was Program Chair for the 1997 ITC. He was a member of ITC's Steering Committee between 1996 - 2000. He is currently an Advisor to the Board of Directors of ASSET InterTech, advising the company on future directions of boundary-scan technology, and a Founder Member of the Technical Advisory Board of Teseda, a producer of low-cost PC-based chip DFT testers.

**Program**  
*Tuesday, November 29<sup>th</sup>, 2005*

Time	Titles	Speakers or additional info
07:45	Transport from hotel	For Annual General Assembly participants
8:30-10:00	NTF Annual General Assembly	For members and other interested.
09:15	Transport from hotel via train station	
10:00-10:30	Registration	
<b>10:30-10:40</b>	<b>Welcome/Introduction</b>	Knut Båtstøløkken
<b>10:40-11:45</b>	<b>Key Note Session</b>	<i>Chairman: Knut Båtstøløkken</i>
10:40-11:45	Has boundary scan gone crazy, or has boundary scan gone crazy?	Ben Bennetts, Bennetts Associates
11:45-12:15	Exhibition	
12:15-13:15	Lunch	
<b>13:15-14:15</b>	<b>Boundary Scan 1</b>	<i>Chairman: Jukka Antila</i>
13:15-13:45	A Transparent Solution for the Remote Wired or Wireless Communication to Board and System Level Boundary-Scan Architectures	Pete Collins, JTAG Technologies
13:45-14:15	Analog component measurements with IEEE 1149.1 test system SW upgrade	Pekka Kaukko, Elektrobit Testing OY
14:15-15:15	Exhibitor presentations	<i>Chairman: Bjørn B. Larsen</i>
15:15-15:45	Coffee Break	
<b>15:15-16:45</b>	<b>Functional Test</b>	<i>Chairman: Stig Gunnar Jensen</i>
15:45-16:15	PCI Express - Expanding the world of virtual Instrumentation	Vidar Grønås and Leif Johansson, National Instruments
16:15-16:45	Synthetic Instruments / LXI	Jonny Langmyren, 4Test
16:45-17:15	Fruit & Refreshments / Exhibition	
17:15-17:45	News from Conferences	Birger Schneider, Jukka Antila, Pete Collins, Ben Bennetts...
17:45-19:00	Panel debate: "Influence of Outsourcing on Electronics Test in the Nordic Countries"	<i>Panel moderator: Birger Schneider</i>
19:00	Transport to hotel	
20:00	Dinner	
21:30	Social get-together	

**Nordic Test Forum (NTF) Annual Assembly, November 29<sup>th</sup> 2005**

NTF was established at TestForum 2001. We hold our annual assembly for NTF at 08:30 November 29<sup>th</sup>, 2005. The agenda and motions will be dispatched to the members in a separate mailing.

If you do not intend to participate in the Annual Assembly, the TestForum 2005 starts with Registration from 10:00 to 10:30.

**Program, cont'd**  
**Wednesday November 30<sup>th</sup>, 2005**

Time	Titles	Speakers or additional info
07:45	Transport from hotel	
<b>08:30-11:00</b>	<b>Test Strategies, Test Economics</b>	<i>Chairman: Mick Austin</i>
08:30-09:15	Global control of the outsourcing with Eltek Global Test System	Mads Dahl, Eltek Energy AS
09:15-09:30	WATS – Test data management	Tom Andres Lomsdalen, Virinco
09:30-10:00	Coffe Break	
10:00-10:30	Using Quality Estimate of a New Product to Analyze Efficiency of Testing	Jukka Antila, Nokia Networks and Markku Moilanen, University of Oulu
10:30-11:00	Improving Productivity in Functional Test by Structured Re-Use of Test	Birger Schneider, microLEX
11:00-11:30	Exhibition	
11:30-12:30	Lunch	
<b>12:30-14:00</b>	<b>Optical and X-Ray inspection</b>	<i>Chairman: Jürgen Sedlacek</i>
12:30-13:00	3-D tomosynthetic reconstruction techniques for X-Ray inspection of circuit boards	Michael J. Smith, Teradyne
13:00-13:30	Advanced 3D X-Ray Computed Tomography of Electronic Devices	André Egbert and Stefan Becker, phoenix x-ray Systems + Services GmbH
13:30-14:00	Update on Lead Free Inspection and Failure Mechanisms	Michael J. Smith, Teradyne
14:00-14:30	Coffe Break	
<b>14:30-16:00</b>	<b>Boundary Scan 2</b>	<i>Chairman: Bengt Magnhagen</i>
14:30-15:00	extended Boundary Scan	Gerhard Vieweg, Goepel electronic
15:00-15:30	Fault Insertion Using IEEE 1149.1: Silicon Implementation and Tool Support	Pete Collins, JTAG Technologies
15:30-16:00	Boundary Scan training software	Artur Jutman, Tallinn University of Technology
16:00-16:15	Test Forum Close	Knut Båststøløkken
16:30	Transport to Kongsberg (hotel, train station)	

### Practical information

The **Seminar Fee** adds to EUR 390 for NTF members and EUR 425 for others. The fee includes participation, food and refreshments from Tuesday morning to Wednesday afternoon, transport between the hotel and HiBu as well as documentation. Exhibitors pay EUR 750, which also includes the participation of a single person.

The seminar fee will be invoiced directly to the organisation, from which the participant comes. In the event of cancellation after the final registration date, or in the event of failure to appear, the entire fee is still due. On request, another person from the same organisation can participate instead.

The hotel rooms are booked through the seminar registration, but the room rate is paid directly by each participant to the hotel (i.e. not included in the seminar fee). **The room rate** is NOK 805 (approximately EUR 105) per night, including breakfast.

Booking of rooms at the conference hotel is **not** mandatory for participation at the seminar.

The **Final Registration is Friday, November 18<sup>th</sup>, 2005**, in order **to guarantee hotel room. Registration after this date is also possible.** However, we cannot guarantee that hotel rooms are available at the conference hotel.

## Exhibition

As in previous years, there will be a mini show related to the tools and methodologies relevant to the NTF Forum event. Suppliers can make arrangements with NTF about exhibition space. If nothing special has been agreed, a table of about 70x140 cm<sup>2</sup>, as well as space for posters or similar material will be made available.

## Registration

Please send your advance registration to the TestForum 2005 secretariat at:

microLEX Systems A/S  
Dr. Neergaards Vej 5C  
DK-2970 Hoersholm  
Danmark  
  
Att.: Suzanne Holte  
  
Tel.: +45-45 76 21 00  
Fax: +45-45 76 22 00  
Email: [sho@microlexsys.com](mailto:sho@microlexsys.com)  
Web: [www.microlexsys.com](http://www.microlexsys.com)

Registration: microLEX Systems **no later than Friday November 18<sup>th</sup>, 2005.**

Please indicate, whether you register as:

- NTF member EUR 390
- A non-member EUR 425
- An exhibitor, i.e. wants to participate in the small exhibition: EUR 750

Please indicate whether you need a room at the conference hotel:

- Date of arrival
- Date of departure
- Single or double room

## Become Member of Nordic Test Forum

If you are involved in production test, validation test, and inspection of electronics, and your professional work is related to activities in the Nordic countries as a test professional, design engineer, manufacturer, supplier of solutions, consultant, or similar, you may register as member of Nordic Test Forum, NTF e.g. of the following reasons:

- Exchange of know-how in testing.
- Increased contact network in the Nordic countries.
- Surveillance and information of International activities in the area of test and inspection.
- Discounts at NTF seminars and TestForum events.
- Membership list

You can register for NTF membership on the WEB page: <http://nordictestforum.org>

## Nordic Test Forum in Short

*TestForum* is an annual event that *Nordic Test Forum (NTF)* runs every fall/early winter. NTF also runs 2-3 thematic events during a year, but these are focused events addressing basically only one topic area, each in the area of test and inspection of electronics, whereas TestForum typically has 3-thematic areas and cover the broader balance of test and inspection as well.

*TestForum* has its roots back the late eighties, where it originated as an event for the Norwegian electronics industry. However, from the late part of 2001 a group of people from Sweden, Norway and Denmark established the network, *Nordic Test Forum*. Later on, this activity (including the *TestForum* event) was extended to include all the Nordic countries. The language of the official presentations is English. Content and focus of the TestForum varies over time, but always within topic areas in focus at a given point in time.

*TestForum* has its main emphasis on issues relevant to production managers, engineers and technicians working in the fields of production, test, inspection and validation of electronics. At TestForum events we offer technically relevant presentations on methodology, tools, modules/instruments and available technology. The interaction between users and suppliers within the focus areas is an important asset of TestForum, and this balance and interaction is pursued in presentations, panel discussions, and in the planning of the events.

### TestForum Aims at:

- Creating and sustaining a relevant, balanced and coherent interaction between users as well as between users and suppliers of solutions for test, inspection, validation and production of electronics.
- Providing an up-to-date view on new methodologies and tools for relevant test, inspection, validation and production of electronics.
- Establishing a relevant and balanced view on equipment, systems, tools and software from tool vendors in the domain.

### Target Group of TestForum

Engineers and technicians, managers and planners within the fields of electronics production and test, inspection and validation. Includes also decision makers in organizations that procure equipment, tools and systems for production and test, inspection and validation of electronics.

### Executive Committee of TestForum and NTF

Knut Båststøløkken	Kitron AS (Chairman)
Birger Schneider	microLEX AS (Economics)
Bjørn B Larsen	NTNU Department of Electronics and Telecommunications (Secretary)
Stig-Gunnar Jensen	Flextronics International Norge AS
Bengt Magnhagen	Högskolan i Jönköping
Mick Austin	JTAG Technologies Finland
Gunnar Carlsson	Ericsson AB
Jürgen Sedlacek	Teleinstrument KonTest AB
Jukka Antila	Nokia Networks
Artur Jutman	Tallinn University of Technology

## Welcome to Kongsberg

Kongsberg was founded as a silver mining town in 1624, and the historical roots of the town are still very visible. Today, the town has a lively cultural scene, including an annual jazz festival with a large number of international performers and visitors.

As well as being a vibrant cultural city, Kongsberg is also the headquarter of an international technology corporation. The two main business areas are within Maritime and Defence and Aerospace and the group of industries operate worldwide with employees in over 20 countries and add an international dimension to the workforce in Kongsberg.

Buskerud University College is proud to have close relations with the industry and has guest lecturers and experts in our courses at regular intervals. Situated close to the mountains, the city is ideal for outdoors activities. Ski lifts and cross - country trails are widely used by locals and by tourists.

## Buskerud University College (HiBu) information



Kongsberg campus has over 800 students and 75 staff members. The following institutes are located at Kongsberg campus:

- Institute of Technology
- Institute of Optometry and Visual Sciences
- Institute of Business Administration and Political Science

The institutes take great pride in being updated in their course offerings and curriculum and also strive to serve

the local and regional community by offering courses in particular areas of current interest for the local and regional trade and industry.

### From Oslo to HiBu

- Follow E18 to Drammen
- Turn left on E134
- Follow E134 to Kongsberg
- Right after Kongsberg Hospital (Kongsberg Sykehus), take the first exit in the first roundabout after passing under the railroad.
- Turn left after passing the railroad and follow Baneveien for approximately 1.2km.
- Follow Frogs vei until arriving at HiBu.

### From Quality Grand Hotel to HiBu

- From Christian Augusts gate
- Turn left on Storgata
- Turn right on Bekkedokk
- Turn left after passing the railroad and follow Baneveien for approximately 1.2km.
- Follow Frogs vei until arriving at HiBu.

Høgskolen i Buskerud  
Frogs vei 41, 3611 Kongsberg  
<http://www.hibu.no/kongsberg/>

## Hotel information

Quality Hotel Grand  
Christian Augusts gate 2  
NO-3611 Kongsberg  
Tel.: (+47) 32772800  
Fax: (+47) 32734129  
<http://www.choicehotels.no/html/en-gb251940.jsp>

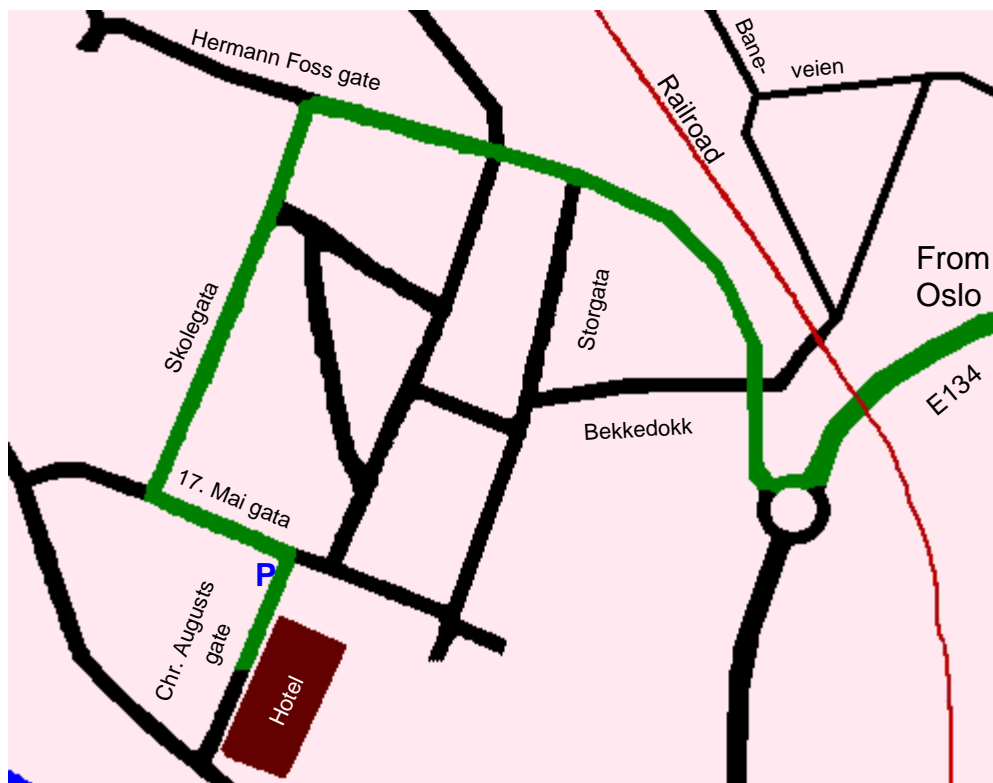
### Directions

From Oslo follow E18 to Drammen and turn left on E134 after the motorway bridge. Follow E134 to Kongsberg.

Right after Kongsberg Hospital (Kongsberg Sykehus), take the first exit in the first roundabout after passing under the railroad.

Turn left onto Skolegata and left onto 17. Mai gata.

There are parking facilities at the corner of 17. Mai gata and Christian Augusts gate.



## Transport information

We will provide transport between the hotel and HiBu. There will be transport from the hotel Tuesday 07:45 and 09:15. The 09:15 transport will also make a stop at the railway station. The transport back to the hotel will be at 19:00. Wednesday morning, the transport will be at 07:45 with return at 16:30 via the train station.

### To Kongsberg by car

From Oslo follow E18 to Drammen and turn left on E134. Follow E134 to Kongsberg.

### To Kongsberg by train

There are trains from Oslo to Kongsberg more than every hour. The travelling time from Oslo Central Station (Oslo S) is approximately 1 hour 25 minutes on the local trains and a little more than one hour on the regional trains.

The travelling time from Oslo Airport is a little more than 2 hours.

This table shows some selected departures.

Oslo Airport - Kongsberg				
Date	Departure	Arrival	Travelling time	Comment
Nov. 28 <sup>th</sup>	16:38	18:42	02:04	
Nov. 28 <sup>th</sup>	17:38	19:41	02:03	
Nov. 28 <sup>th</sup>	18:38	20:42	02:04	
Nov. 28 <sup>th</sup>	19:38	21:41	02:03	
Nov. 28 <sup>th</sup>	21:38	23:44	02:06	
Nov. 29 <sup>th</sup>	05:38	07:40	02:02	
Nov. 29 <sup>th</sup>	05:46	08:19	02:33	Change at Oslo S
Nov. 29 <sup>th</sup>	06:38	08:41	02:03	Pick up 09:20
Nov. 29 <sup>th</sup>	07:38	09:42	02:04	

Kongsberg - Oslo Airport				
Date	Departure	Arrival	Travelling time	Comment
Nov. 30 <sup>th</sup>	16:53	18:59	02:06	Drop off
Nov. 30 <sup>th</sup>	17:51	19:59	02:08	

See [www.nsb.no](http://www.nsb.no) for more details.

The train station at Oslo Airport is inside the terminal to the right as you exit the customs area.

### To Kongsberg by bus

There are busses from Oslo to Kongsberg every hour. Travelling time from Oslo bus station is approximately 1 hour 25 minutes.

The busses are operated by Nettbuss: [www.nettbuss.no](http://www.nettbuss.no)

The schedule is found here: [www.reiseinfo.no/nettbuss/ruter/t/23-231.htm](http://www.reiseinfo.no/nettbuss/ruter/t/23-231.htm)