



Nordic HF Conference

12 – 14 August 2019
Fårö Kursgård, Fårö
Sweden

Programme



THE NATIONAL COMMITTEE
FOR RADIO SCIENCE
THE ROYAL SWEDISH ACADEMY OF SCIENCES



HF, LF and VLF systems – always fields of increasing importance

The first Nordic Shortwave Symposium HF 86 was sponsored by FMV, the Swedish Defence Materiel Administration, and initiated by Carl-Henrik Walde, chief engineer and manager of its Radio Division. The event was later taken over by NRS, the Nordic Radio Society, a foundation co-operating with SNRV, the Swedish National Committee of URSI (Union Radio-Scientifique Internationale). NRS promotes exchange of knowledge between different technical disciplines and between universities and the radio industry, its board representing SNRV, the radio industry, defence organisations, telecom operators and universities. As before, these URSI-sponsored HF conferences with the attached longwave symposia will focus on HF, LF and VLF communication, location and navigation systems "beyond the horizon".

HF communications have advanced significantly towards a high degree of automation and signal processing that can be cost-effectively implemented even in small systems. High capacity multimedia networks carry not only analogue voice and data messages in a store-and-forward manner, but also digitised high quality voice, streaming data and streaming video. Wideband HF and staring receivers will be used. Automatic networking and information transparency play an increasing role to achieve full subscriber connectivity, area coverage and highly reliable communications

We are happy to have two invited speakers: Michael Puls, Germany and Jonas von Mentzer, Sweden that will talk about user experiences, lessons identified and need for interoperability of HF Communications in the military maritime domain.

Conferences are important venues where users, scientists, engineers and manufacturers meet and have the opportunity to discuss both needs and solutions. Since the first conference in 1986, each Nordic HF conference has gathered over 100 participants, who have enjoyed the relaxed atmosphere and stimulating company of colleagues in the informal setting provided by the unique nature of Fårö and the camp. Plenty of time has been set aside outside the conference theatre to enable you to keep in touch in informal discussions and mutual exchanges of views. Please, make good use of these opportunities – the exhibition area is suitable. We hope you will get good value in spite of the somewhat primitive lodging. Companions are welcome to all activities after 15:00 hours.

I extend thanks to the Fårö Camp and to the HF 19 team, in particular the chairman of the Organising Committee Olov Carlsson, chairman of the Programme Committee Rickard Berg, secretary of the Programme Committee Håkan Bergzén and the Chief Hostess Marie Lindersjö. Many more have been involved in the committees and performed excellent work.

Thanks are also due to the Union Radio-Scientifique Internationale (URSI), Swedish National Committee of URSI (SNRV), Nordic Radio Society foundation (NRS), Swedish Defence Materiel Administration (FMV), Swedish Defence Research Agency (FOI), ÅF Technology AB, Combitech AB, WRAP International and others that have provided valuable assistance in the HF 19 organisation.

Finally, we are also deeply indebted to all authors and presenters who have provided the core substance of the conference.

As chairman of NRS, I wish you very welcome to the 12th Nordic HF conference on Fårö.

Mats Nilson
SNRV, NRS



RECEPTION DESK

The HF 19 reception is open 15:00 – 22:00 on Sunday and 07:30 – 17:00 on Monday to Wednesday.

MEALS

All meals are served in the restaurant building.

Morning and afternoon coffee/tea are served in the exhibition area (for family members in the pub). For excursions, family members may make a lunch package at breakfast.

Breakfast 07:00 – 09:30

Coffee/te 09:45 – 10:15

Lunch 11:30 – 13:00

Coffee/te 15:00 – 15:30

Dinner 17:00 – 18:30 On Tuesday the conference dinner will begin at 19:00.
 “Dricka” (Gotland drinks) will be served from 18:00.

Food preferences have been sent to the restaurant manager. Vegetarian food will be available; the Bavarian buffet will have beef, pork and lamb sausages. As a safety measure, you may approach the reception or a hostess to check that issue.

INTERNET ACCESS

E-mail and browsing facilities are available over the free wireless network. No password is required.

DOCUMENTATION

Proceedings of HF 19/LW 19 is provided as a paperback volume and on CD. Proceedings on CD from earlier conferences is available for purchase. A few weeks after the conference a CD with all conference proceedings will be available for purchase on the web site. There will be “print on demand” facilities at the venue. Our website will list titles and authors of all papers for Internet search and access to the topics.

AMATEUR RADIO STATION

SL1HF is situated behind Lambgiftet lodge. Station managers are Karl-Arne Markström, SM0AOM and Olov Carlsson, SM7EXE. Please log all QSOs accurately and write the SL1HF QSL card for every QSO. Cards are provided in the radio shack.

EXTENDED STAY AND FAMILY ACCOMMODATION

The camp office is ready to receive your payment for extra accommodation; please pay not later than Monday afternoon.

TIMINGS

General timings including social activities are on the next page with the conference programme on subsequent pages.

SUNDAY

17:00 – 22:00 Bavarian buffet, sponsored by Rohde & Schwarz.

19:00 – 24:00 The pub is open.

MONDAY

07:30 Morning music (Täby Spa Octet)

07:45 Please gather on the parade grounds for the flag ceremony and official conference opening.

15:30 – 17:00 Sightseeing tour on Fårö; buses leave from the garage yard.

19:00 HF 19 concert in Fårö Church (short walk from the camp)

20:00 Exhibitors' party in the exhibitions grounds

19:00 – 24:00 The pub is open.

TUESDAY

After breakfast All-day sightseeing tour (free) by bus of Fårö and Gotland main island for companions. Register your participation during Monday. Lunch packages will be prepared by the kitchen for the participants to bring.

15:30 – 18:00 Foxhunt (Amateur Radio Direction Finding); please assemble in the auditorium.

18:00 “Dricka” (Gotland drinks) served just outside the restaurant and pub area.

19:00 Conference dinner. In a convenient break we will have the prize award for the foxhunt.

19:00 – 24:00 The pub is open.

N.B. Swedish alcohol rules state that the “Dricka” must not enter the restaurant and pub area including the terraces. And wines etc must not exit that area.

WEDNESDAY

13:45 Bus shuttle leaves for Visby airport (ETA 15:00) and ferry terminal (ETA 15:30). Other transportation can be arranged by your own initiatives – plenty of private cars will leave after lunch.

EXHIBITORS (at printing deadline)

Amtele/Rockwell

Comrod A/S

Combitech AB

W5 Solutions AB

Promarine OY

KNL Networks

SESSION PROGRAMME AND CONTENTS
Monday morning, 12 August

PROPAGATION AND MODELLING **Page**
(Vivianne Jodalen) Monday 12 August 08:00 – 09:45

Sebastian Rauh, Robert Koch, Ewald Hedrich, Joerg Robert and Albert Heuberger	Joint time-frequency spectrum usage analysis and modelling for the shortwave	1.1
Filip Enander	On the realisability of HF communications from a very small flying platform	1.2
Chris Deacon, Ben Witvliet and Cathryn Mitchell	Investigation of the polarisation of 50 MHz signals via sporadic-E reflection	1.3
William N. Furman, John W. Nieto and William M. Batts	Evaluating the propagation characteristics of contiguous wideband channels	1.4

PROPAGATION AND SPECTRUM MANAGEMENT **Page**
(Olov Carlsson) Monday 12 August 10:15 – 11:30

E.M. Warrington, A.J. Stocker, D.R. Siddle, H.A.H. Al-Behadili, N.Y. Zaalov, F. Honary, N.C. Rogers, D.H. Boteler and D.W. Danskin	HF radio propagation at high latitudes: Observations and predictions	2.1
Vivianne Jodalen and Terje Mikal Mjelde	An investigation of space diversity at HF to obtain better linking probability under the disturbed high latitude ionosphere	2.2
Rickard Berg	HF communications during a grand solar minimum	2.3

SESSION PROGRAMME AND CONTENTS
Monday afternoon, 12 August

SIGNAL PROCESSING AND RADIO PROTOCOLS		Page
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(Stefan Bayer) Monday 12 August 13:00 – 15:00		
Steve Kille	Protocol architectures to efficiently deliver IP services over HF radio	3.1
Richard Hedlund	Signal processing in an airborne avalanche victim localisation system operating on 457 kHz	3.2
Jean-Yves Bernier, Philippe Crambert, Catherine Lamy-Bergot and Jean-Luc Rogier	Integration of IP services over high data rate HF capabilities	3.3
John W. Nieto and Daniel S. Metzger	On-air test results of a wideband HF hybrid ARQ	3.4

SESSION PROGRAMME AND CONTENTS

Tuesday morning, 13 August

SYSTEMS AND TECHNIQUES I **Page**

(Rolf Gustavsson) Tuesday 13 August 08:00 – 09:45

Rolf Folkesson and Karl-Arne Markström	Performance limitations in HF communication systems composed of practical realisable hardware	4.1
Josep M. Maso, Joaquim Porte, Joan Lluís Pijoan and David Badia	Internet of things communications for remote sensors in Antarctica using NVIS	4.2
Alfons Sailer and Jürgen Escher	Next generation HF radio: Systems aspects enabling network centric C4I integration	4.3
Mark Jorgenson	Building resiliency with HF networks	4.4

SYSTEMS AND TECHNIQUES II **Page**

(Jonas von Mentzer) Tuesday 13 August 10:15 – 11:30

William M. Batts, John W. Nieto and William N. Furman	A comparison of automated link establishment techniques for wideband HF	5.1
Louis Higgs	Pushing the boundaries: Achieving higher efficiency using low bandwidth links	5.2
Behrouz Farhang- Boroujeny, David B. Haab, Thomas V. Holschuh, Stephen A. Laraway, Hussein Moradi, Thomas Cameron Sego, and Taylor Sibbett	Robust communications through HF skywave channels using a filter bank spread spectrum technique	5.3

SESSION PROGRAMME AND CONTENTS
Tuesday afternoon, 13 August

ANTENNA SYSTEMS AND COGNITIVE RADIO SYSTEMS		Page
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(William Batts) Tuesday 13 August 13:00 – 15:00		
Harald Wickenhäuser	A sufficiently accurate verification attempt of an active antenna's K-factor using affordable measurement equipment	6.1
Adam Alenius and Lucas Wennerholm	Realisation of antenna pattern measurement systems using unmanned aerial vehicles	6.2
Andrew Robb	Near-field transition and ground plane effects on HF direction finding	6.3
Yehuda Eder	Dual path direct sampling architecture	6.4

SESSION PROGRAMME AND CONTENTS
Wednesday morning, 14 August

USER SCENARIOS I **Page**
(Peter Stenumgaard) Wednesday 14 August 08:00 – 09:45

Michael Puls and Jonas von Mentzer	User experiences concerning military requirements and need of interoperability for military message handling in the range of HF communications	7.1
Arnie Johansen	HF in the smart-phone age: Operational considerations of HF systems	7.2
Torbjörn Carlsson	Deployment of HF radio for the European Union capacity building mission in the Republic of Niger	7.3

USER SCENARIOS II AND EMC **Page**
(Susan Trinder) Wednesday 14 August 10:15 – 11:30

Karl-Arne Markström	Overview of the renewed interest in intercontinental point-to-point HF circuits aimed at reducing latency in “high-frequency trading” stock market applications	8.1
Lars Weberg	Wireless power transfer and the interference situation in the LF-HF bands	8.2
Peter Stenumgaard, Sara Linder and Henrik Olsson	Interference impact from solar-panel systems on HF communications	8.3

SPONSORS (at printing deadline)

The HF 19 organisers are very grateful for the valuable sponsorships provided by the following organisations (note – there may be more, but due to printing deadline they may not have made it in time for this list):



www.rohde-schwarz.com

Welcome dinner



www.elbitsystems.com

Banquet and conference gift



www.combitech.se

Umbrellas, Proceedings CD



www.amtelecommunication.se

Banquet drinks



www.wrap.se

Conference pens



www.saab.com

Church concert



www.collinsaerospace.com

Best paper award



www.l3harris.com

Musical entertainment by Täby Spa Octet

ORGANISING COMMITTEE

Olov Carlsson	WRAP International AB	(HF 19 chairman)
Rickard Berg	FMV	
Mats Nilson	SNRV, NRS, Wireless@KTH and VNL Europe AB	
Karl-Arne Markström	ÅF Digital Solutions AB	
Marie Lindersjö	Head conference hostess	

PROGRAMME COMMITTEE

Rickard Berg	FMV	(chairman)
Håkan Bergzén	Combitech AB	(secretary)
Karl-Arne Markström	ÅF Digital Solutions AB	
Kjell Brethack	FMV	
Emelie Agnedal	FMV	
Rolf Gustavsson	FOI	
Peter Johansson	FOI	
Dag Stranneby	Örebro University	

CONFERENCE HOSTESSES

Marie Lindersjö
Eva Carlsson
Jasmin Ansar
Monica Carlsson Blomster

CAMP HOSTS

Jan-Erik Engström	Camp chairman and pub manager
Johan Aronsson	Camp manager
Therese Sköldin	Restaurant manager

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