

Curriculum Vitae of **JOHN HORROCKS**

Full Name **(Reginald) John Horrocks**

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Date of Birth 1951, UK, British Nationality

Qualifications **Fellow, Institution of Electrical Engineers (FIEE, CEng)**
BSc, First Class Honours in Electronic Engineering,
Southampton University 1972

Major Publications

Mobile Number Portability (Ovum, 2000)
Implementing Number Portability (Ovum, 1998)
European Guide to Telecommunications Liberalisation
(Horrocks Technology, 1995).
European Guide to Telecommunications Standards
(Horrocks Technology, 1992/3/5/6).
Co-author with Robin Scarr of:

- **The Technology Guide to Telecommunications**
(Commed, 1990, and Horrocks Technology 1994)
- **Future Trends in Telecommunications** (Wiley, 1993)

CAREER

1990 - Founder of **Horrocks Technology Ltd**, a consultancy in telecommunications, radio and electronics, specialising in technical and regulatory issues, and standards.

Clients include:

Governments and Regulators	Operators	Banks and Law firms	Others
DTI/BERR (UK)	France Telecom	Clifford Chance	CMA
MCA (Malta)	Jersey Telecom	Coudert Bros	ETSI
ComReg (Ireland)	INMARSAT	Credit Suisse	Glenayre
European Commission	KPN etc Netherlands	Olswang	Reuters
ICASA (South Africa)	Millicom	Squire, Saunders and Dempsey	Adam Smith Institute
OFTA (Hong Kong)	Eircom		Ovum
OFTEL/Ofcom (UK)	Neustar		IBM Consulting
PTS (Sweden)	NTT		PwC
Malaysia	I-CO		Mott MacDonald
HDTP (NI)	Tele2		Plum Consulting

Specific Experience

VoIP, Internet and Next Generation Networks

- Running a course on NGN and interconnection for the regulator in UAE (2013)
- Developing a cost reporting system and regulations for fixed and mobile operators in South Africa to support call termination regulations in the NGN era (2012)
- Undertaking a study on IP interconnection for NGN for the regulator (IDA) in Singapore including research on IP-interconnection in France, Germany, Hong Kong, Japan, Korea, Netherlands, USA, UK (2011)
- Advising Frontier Economics on the development of a cost model of the NGN in Israel and the DOCSIS 3 cable network for the calculation of the costs of wholesale interconnection services (2011)
- Running a 4-day tutorial ITU-organised workshop for the incumbent (TCI) in Iran on strategies for NGN migration (2010)
- Running a 3-day workshop for the Association of South Eastern Nations organised by the regulator of Thailand on NGN and IP interconnection and their effects on telecommunications and regulations (2010)
- Advising the European Commission on the underlying issues of using Bill and Keep instead of pure LRIC for call termination, taking account of NGN developments (2010)
- Advised BIS in UK on cost issues for proposed measures to prevent P2P file sharing on the Internet (2009-10)
- Advising the Mongolian Government on the development of next generation networks and broadband Internet access, including how to maximise the benefits of its investments in transmission infrastructure (2009)
- Giving a presentation on NGN and future trends to the regulator in Gibraltar (2009)
- Evaluating proposals to the European Commission for research funding under FP7 (2009)
- Preparing a consultation and draft regulations for the Oman regulator on VoIP and NGN (2008)
- Running a four day training course on VoIP and NGN for the regulator and operators in Montenegro (2008)
- Running a workshop for staff in the European Commission on next generation networks (2007)
- Assisting TERA Consultants in developing bottom up cost models of NGN for the French, Irish, Maltese and Gibraltar regulators (2007,8,9)
- Providing input to the UK operator group on numbering and routing for IP-based interconnection of NGNs (2006/7)
- Rapporteur for ETSI specification on interconnection of NGNs (2005/6/7)
- Rapporteur for ECC Report on a New Model for Interconnection designed for IP-based networks (2005)

- Advising a major European incumbent on strategies for VoIP (2005)
- Running in-house courses for Eircom on VoIP (2005)
- Advising the Spanish Government on a possible trial for ENUM, reviewing results of trials in other countries (2005)
- Advising XConnect on commercial and regulatory strategy (2004/5)
- Undertook a study for the UK Home Office on the development of NGNs and the effect of competition with the Internet and the growth of VoIP (2004)
- Rapporteur for ECC Reports on Firewalls/NATs and quality over IP (2003/4)
- Undertook a study for the UK Home Office on the expected development of VoIP in the period 2001-2007 (2001)
- Vice Chairman of the ETSI TISPAN WG on Numbering, naming and addressing for VoIP (2003-2007), and chairman from 1999-2003 (2003-2007)
- Researched ENUM and advised European regulators on its likely development
- Represented Neustar in ICANN (2000)

Numbering and Number Portability

- Advising the Regulatory Authority of Bermuda on number portability, drafting the Determination, running workshops for operators, preparing the specifications, developing a cloud-based equivalent of a number portability database (2013-14)
- Advising the cable operator in the Bahamas on number portability issues and costs (2013)
- Undertaking a cost benefit analysis of mobile portability for Botswana, especially taking account of the use of multiple SIMs (2012-13)
- Conducting a numbering audit for ICASA in South Africa (2012)
- Reviewing the numbering plan of Albania for the regulator and advising on relaxing the geographical constraints in the plan (2012)
- Undertaking a cost benefit analysis and developing number portability regulations for Jamaica (2010)
- Developing number portability regulations for Moldova (2010)
- Independent chairman of the UK mobile operators mobile number portability steering group (2008-2009)
- Researching the structure of procurement arrangements and contracts for central databases for the regulator in Chile (2009)
- Advising Jersey Telecom on policy and the costs and benefits of mobile number portability and details of their planned implementation, and drafting the Channel Islands mobile porting process, routing and charging specifications (2006/7/8/9)
- Advising the European Commission on the reasons for the failure of the European Telecommunications Numbering System (ETNS) and how it might be improved for the future (2009)
- Advising the regulator in Bahrain on its policy on mobile and fixed number portability and the necessary implementation (2008/9)

- Reviewing number portability processes in Ireland and Germany for Vodafone (2008)
- Running a workshop on mobile porting processes for UKPorting (2008)
- Running a training workshop on number portability for the regulator and operators in Montenegro (2008)
- Giving four key presentations at the ITU-T Asia Pacific Centre of Excellence workshop in Pakistan on mobile portability (2007)
- Writing a checklist of issues to be addressed in the porting specifications for mobile number portability in Malaysia and advising the database supplier on funding arrangements (2007)
- Reviewing the internal processes developed by Saudi Telecom for implementing mobile number portability and advising on subscriber retention strategies (2006)
- Rapporteur for ECC Report on the Future of Numbering taking account of VoIP and NGNs (2005/6)
- Revising the numbering plan for Malta (2005/6)
- Preparing a regime for premium rate services in Malta (2005/6/7)
- Writing the specifications for fixed and mobile number portability in Malta. Chairing working group of operators (2005)
- Advising the Malta Communications Authority on the implementation of mobile number portability and cost effective solutions for a small country. (2004/5).
- Advising Mobily (Etisalat), new entrant mobile operator in Saudi Arabia, on the implementation of mobile number portability (2004/5)
- Advising South African regulator on number portability and writing regulations and functional specification (2004/5/6)
- Studying implementations of mobile number portability in different countries for Vodafone to see lessons to be learned (2004)
- Led a study for ECC on the effects of convergence on numbering and naming (2002/3)
- Prepared numbering and naming strategy for the Malaysian Government (2002)
- Developed proposals for a fast and low cost porting procedure for mobile number portability for Ireland (2001)
- Advised the Irish regulator on the choice of number portability solutions for both fixed and mobile numbers (1999-2001)
- Lead author of UMTS Forum report 12 on numbering, naming and addressing for GPRS/UMTS (2000)
- Lead author of the Ovum Reports on Mobile Number Portability (Ovum, 2000) and Implementing Number Portability (Ovum, 1998)
- Estimated the costs of changes to the UK's freephone numbering and evaluated a cost benefit analysis of individual number allocation (1999)
- Reviewed future policy on numbering, naming and addressing for Netherlands government (1999)

- Researched details of interconnection and number portability in the UK for a major foreign operator (1998)
- Designed and wrote the functional specification for a transactional database for the support of number portability for the operators in the Netherlands. (1996)
- Designed architecture and migration paths for number portability in the Netherlands (1996)
- Advised the Hong Kong Post Office on the development of the Hong Kong numbering plan in order to facilitate the development of competition with special reference to number portability. (1992)
- Undertook the technical parts of studies on number portability for the Swedish, Dutch and Hong Kong Governments (1994-6)
- Studied the numbering and naming and addressing requirements for data services (X.121) and message handling services (X.400) within Europe, and prepared a 40 page report on behalf of OVUM for the European Commission. (1992)

Interconnection, Local Loop Unbundling and Internet Access

- Analysing the provision of wholesale services in South Africa and developing a value chain model (2013)
- Reviewing the wholesale services and practical interconnection arrangements of Jersey Telecom for the Jersey regulator (2012)
- Running a workshop on cost modelling with TERA for the Jamaican regulator and drafting a consultation document on the modelling of call termination costs (2012)
- Preparing LLU and bitstream regulations and providing training for Moldova (2010)
- Preparing a LLU and bitstream inter-operator process specification for Moldova (2010)
- Reviewing carrier selection regulations in Moldova (2010)
- Preparing an interconnection manual and providing training for ICASA South Africa (2010)
- Revising the Operations and Maintenance Manual of the Jersey Telecom Reference Interconnection Offer (2009)
- Preparing a report for the UK Government on the introduction of IPv6 (2009)
- Preparing a consultation and draft regulations for the South African regulator on LLU (2008)
- Preparing a consultation and draft regulations for the Oman regulator on LLU (2008)
- Reviewing migration issues including bitstream and LLU in Ireland and Germany for Vodafone (2008)
- Author of a paper on the future of termination rates as an input to the review of the European Telecommunications Framework (2006)

- Advised and assisted TERA Consultants in assessing and comparing mobile call termination cost models for the arbitration panel in Trinidad & Tobago (2006)
- Rapporteur for ETSI specification on interconnection of NGNs (2005/6)
- Advised the Maltese regulator on the Local loop unbundling reference offer of Maltacom (2005)
- Rapporteur for ECC Report on a New Model for Interconnection designed for IP-based networks (2005)
- Advising Etisalat (mobile operator) on how to establish interconnect as a new entrant in Saudi Arabia, commented on incumbent's RIO (2004)
- Modelling interconnection and charging for C&W to support proposals to Ofcom for regulatory changes (2004)
- Helped to prepare a cost model for operators in Indonesia and analysed an existing cost model to identify the dominant effects (2004)
- Advising South African regulator on carrier selection and pre-selection, and interconnection procedures and termination rates, including writing regulations and functional specifications (2004, and updates in 2008)
- Ran technical and operational part of workshops on Interconnection for Asia Pacific (2002 & 2003)
- Advised TSTT of Trinidad on its Reference Interconnection Offer (2001)
- Designed an interconnection forecasting and ordering system for Hong Kong (2000)
- Reviewed Internet access charges and arrangements in several European countries to help develop a strategy for an ISP (1999)
- Advised the Irish regulator on local loop unbundling (1999)
- Researched details of interconnection and its procedures in the UK for a major foreign operator (1998)
- Undertook the technical part of a study with Eutelis on the practical aspects of infrastructure sharing and collocation for the Commission (1998)
- Prepared for the National Interfaces Coordination Committee a review of European standards work relevant to interconnection. (1996)
- Undertook a study on carrier selection for ETO (1995)

Quality of Service

- Selecting and formulating QoS metrics for Qatar (2013)
- Developing QoS regulations on an ITU project for Maldives and Afghanistan (2010)
- Advised ComReg on the definition of QoS parameters for reporting by operators (2008)
- Developed a reporting system on speech quality for the Ministry in Spain to apply to the operators. The system uses a computer model based on the E-Model to calculate a figure of merit for an operator's network design (2006/7)

- Chairman of the ETSI Technical Committee on Speech, Transmission and Quality (1996-2004)
- Rapporteur of ETSI report on speech quality over IP (2004/5)
- Rapporteur for ECC Report on quality over IP (2003/4)
- Investigated congestion problems and traffic management in Hong Kong (2002)
- Rapporteur of standards on QoS parameters for interconnection and local loop unbundling (2000/1)
- Prepared a standard on quality of service parameters for use under ONP (1999)
- Undertook case studies and the technical part of a study with Eutelis and Idate on Quality of Service policy for the Commission

Radio

- Worked in team with Indepen and Aegis for Ofcom on analysis of benefits of harmonisation and standardisation in the management of the radio spectrum (2003/4)

Consumer Issues and Tariff Transparency

- Rapporteur for an ECC Report on Consumer Abuses and Fraud Issues relating to High Tariff Services (2005-6)
- Analysed costs of alternative methods of improving tariff transparency when Danish numbers become portable between fixed and mobile services (2000)
- Analysed solutions for improving tariff transparency for the Commission (1999)

Investment and Due Diligence

- Advising the Bureau of Public Enterprises in Nigeria on the sale of NITEL (2011)
- Carried out technical due diligence on an innovative solution for international mobile services (2001)
- Carried out technical due diligence on a mobile data service provider (2000)
- Carried out technical due diligence of start-up fixed operators in France and Italy for a large US investment bank (1999)
- In mid 1980s reviewed 140 business plans of hi-tech companies for Barclays Bank

Mobile and Paging

- Advising an SMS response company on obtaining short codes in UK and on adding SMS capabilities to existing numbers (2007)
- Advising Maltese regulator on a framework for MVNOs (2007)
- Adapted radio layer GPRS standards for use in TETRA bands (2001).
- Advised a commercial operator on the development of global radio-paging services and the allocation of frequencies within Europe. (1994-1999)

- Represented an operator in an ETSI study on the future development of mobile communications. (1998)

Approvals and market access

- Designed an “approvals” system for Oman based on lessons from approvals in Europe (2003)
- Provided long term consultancy to DTI Telecommunications Division on approvals, Open Network Provision and standards, including representing their interests in ETSI and TRAC, and managing the production of national technical regulations. (1991-1999)
- Played a leading role in defining the operation of the approval regime for terminal equipment under the RTTE Directive and its predecessors. (1995-1999)
- Prepared for DTI an independent review of the UK approvals system and recommended a strategy for the future. (1994)
- Prepared a study on various issues affecting S-PCN and contributed to the drafting of the TBRs (1994)
- Managed, and contributed substantially to the drafting of, the preparation within ETSI of the ONP leased line standards, their associated TBRs, and the ISDN access TBRs. (1991-1995)
- Participated in CEN BC-IT-226:A/2 on the Convergence of the Voluntary and Regulatory Sectors for testing and certification (1992)
- Prepared a proposal for the Cable Television Association to put to OFTEL to remove anti-competitive problems concerning extension wiring in residential premises. (1992)

Standards

- Chaired ETSI Technical Bodies on Speech, Transmission and Quality and its predecessor body on Business Telecommunications from 1991-2004
- Chaired ETSI working group on numbering for VoIP from 1999 – 2003, now vice chairman
- Participated in many ETSI Special Task Forces writing standards and reports on a wide range of subjects
- Rapporteur for many ETSI deliverables
- Managed the programme to develop the UK approvals standards

Regulatory Systems

- Compared and contrasted the different regulatory regimes in UK, France, Germany and Italy for a European PTT. (1998)
- Advised the Swedish government of the method of procuring telecommunications services (1993)
- Prepared a paper for Tele2 to present to the Swedish Government on the need for clear regulation on telecommunications and interconnection within Sweden. (1992)

- Prepared the TMA's submission to the UK DTI for the Duopoly Review. (1991)

Expert Witness work

- Advised the High Court in Hong Kong as an expert witness in a major judicial review on video-on-demand. (1996)
- Appeared as an expert witness in two malicious call cases (1993)

Law enforcement

- Advised the Home Office on lawful interception for VoIP (2002)
- Prepared a summary of data retention practices for the UK Home Office (2001)

Other

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- Advised Daitan labs in Brazil on technical and regulatory requirements in the UK (2007)

1986 - 90 OFTEL, London Deputy Technical Director

Duties included:

- Advising the Director General and the policy branches on the technical aspects of OFTEL's work.
- Recruiting permanent technical staff and part time consultants.
- Managing the Technical Directorate, planning work, allocating responsibilities, and controlling the budget.
- Undertaking a series of studies on future developments in telecommunications and their effect on regulation.
- Reviewing and reforming approval standards and conditions of approval, particularly for PBXs, multiplexers and wiring.
- Representing OFTEL and coordinating UK inputs to the Business Telecommunications Technical Committees of ETSI.

Issues with significant personal involvement:

- BT/MCL interconnection determinations for telephony and international Telex
- Network Code of Practice for private networks
- Assessment of licence applications for
 - Satellite uplinks
 - Telepoint
 - Personal Communications Networks
- Allocation of DNICs
- Development of the UK numbering plan
- Numbering arrangements for VADS including X.400
- Arrangements with Japan for international data services
- Regulatory framework for Centrex and VPNs

- Approval requirements for fixed parts of PMR and other radio networks
- European Network Code of Practice
- PBX standards OTR:001, BS6450
- European type approval arrangements for PBXs

1984 - 86 Secondment to High Technology Unit, Barclays Bank Head Office.

Working as a technical consultant advising Branch Managers on lendings to small high technology companies. Assessing the business plans of approximately 140 such companies. Assisting in the start up of Defence Technology Enterprises Ltd (a small company established to license for commercial purposes the results of R&D in MOD establishments) and representing Barclays at some Board meetings.

**1978 - 84 Space Branch (now BNSC), DTI, London
Principal Scientific Officer**

- Advising and preparing policy on technical, economic and legislative aspects of satellite communications.
- Managing and coordinating the development of spacecraft and communications payload technology for the European Space Agency programme and the RAE/RSRE programme.
- Chairman of European Space Agency SPINE Steering Committee (Experiment on small dish satellite communications)
- Representing the UK at the Joint Communications Board of the European Space Agency, assessing new programme proposals, negotiating UK participation, and co-ordinating interests of Government and industry.

1974 - 78 MOD(PE): Royal Aircraft Establishment, Farnborough.

Systems analysis and mathematical modelling of short range Naval guided weapon systems, including special study of the effects of multipath on radars operating at low elevation angles.

1972 - 74 Marconi Space & Defence Systems, Frimley

Analysing the performance of the Skylark sounding rocket, mathematical modelling of attitude control system, design of software for demultiplexing telemetry.