Global
Communications
Newsletter
August 2010

From Analog to Digital Terrestrial TV and Beyond in Spain

By R. Asorey-Cacheda, F.J. González Castaño and F.J. Gil-Castiñeira, Vigo University, Spain

Spanish television history started in October 1956. By then, there was only one public channel, TVE, which could only be watched in Madrid and nearby towns, with a population of approximately 300 TV sets. Broadcast time was only three hours a day. Just three years later television broadcasts began in Barcelona, and in the early 1960s started their outreach to the province capitals. In 1964 there were 1,000,000 TV sets. This figure was multiplied by four in 1970. In January 1965 a second public channel was launched, and in the following decade color television was introduced.

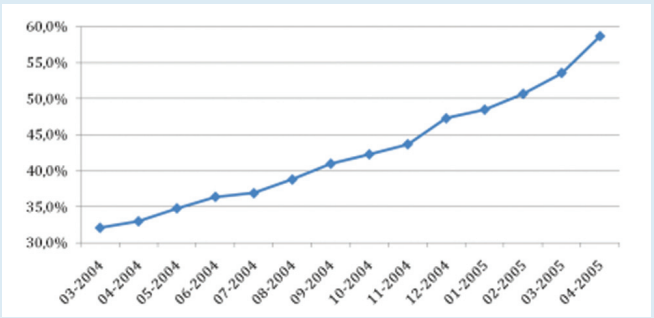
In 1983 a major change happened. The government issued a law on the third television channel. The aim of this law was to create a third Spanish TV channel in the regions. Regional governments took advantage of this movement by launching their own channels, breaking the TVE monopoly. Thus, under this law, the first generation of autonomic channels was created.

In 1988 the government issued the Law on Private Television, regulating the indirect provision of public television, whose ownership corresponds to the Spanish state, as an essential service. This law considered coverage, emission caps, and advertising, as well as its limitations. The three selected contractors were Antena 3, Telecinco and a pay-per-view channel, Canal +.

In 2000 digital terrestrial television (DTT) became operational, when the government granted a broadcasting license to the broadcasters at that time — public and private — and, in addition, it granted three multiplex channels and the means for launching a new pay-per-view platform called Quiero TV. Moreover, the government foresaw two more grants for Veo TV and Net TV. However, in June 2002 Quiero TV, which failed to achieve the expected profitability, ceased its broadcasts, leaving several empty channel slots.

By early 2005, the government began to develop a new National Technical Plan for Digital Terrestrial Television in an attempt to promote this technology in a television market where a single digital TV satellite broadcaster and a few cable networks monopolized the digital TV market. The installed base of digital terrestrial television receivers was estimated as tens of thousands. The most remarkable measures in the new plan were the advancement of the analog switch-off from 2012 to April 2010 (when all terrestrial TV broadcasts were digital), an increased number of DTT stations (by reusing the free Quiero TV frequencies), and the introduction of digital video broadcasting — handheld (DVB-H) broadcasts for mobile devices.

DTT raised the issue of regional channels that broadcast in analog in close geographical locations. For this scenario, the government announced its intention to grant a third multiplex to those regions that wanted to distribute signals from neighbor communities. Some pending problems will be difficult to address. In 2008 the Galician government (northwest Spain) claimed a third multiplex for broadcasting TV channels from Portuguese stations, arguing that there are linguistic and cultural similarities with their country. Since this case involves two countries, it is not clear how a solution might be implemented. So far, the Spanish government has not granted any extra frequency for this third multiplex.



Evolution of the digital terrestrial television penetration in Spain, April 2008 through May 2009.

In April 2009 the Spanish government announced a call for domestic private operators to offer pay-per-view services. However, some interest groups contested this measure. Finally, after several delays in the scheduled date, in August 2009 pay-per-view terrestrial digital television was approved, reserving an encrypted channel for every operator. Currently, there is only one channel of this kind, Gol TV. However, pay-per-view brought an important problem to light: the lack of devices that support encrypted signals in the market. Since pay-per-view was not allowed in the original law, most equipment was not prepared to support this kind of service; thus, many customers must replace their digital receivers with new ones if they wish to watch encrypted broadcasts.

Another interesting topic is high-definition (HD) television. Spanish DTT does not use the HD standard, apart from some testbeds. Since the regulation does not impose an upper quality limit, it can be expected that a few years after the analog switch, HD may gain market quota and become a de facto transmission format.

Regarding the digital terrestrial television penetration, by the end of May 2009, 95.09 percent of the Spanish population had access to it, 2.1 points over the expected value. And by then, 58.7 percent of households accessed digital signals instead of analog ones. Figure 1 represents the evolution of the penetration from April 2008 through May 2009. As can be

Croatian Electronic Communications? Ready to Join the EU

By Drazen Lucic, Executive Director, Croatian Post and Electronic Communications Agency, Croatia

Electronic Communications Market

Since the issue of the first licence for public voice telephony in 2004, 20 new entrants have been awarded licenses, and nine of them have entered the market and begun operating. In terms of market share, the largest operators are HT — Croatian Telecom (incumbent with market share of 73 percent), OT — Optima Telekom, H1 Telekom, Iskon Internet, Metronet, VIPnet, Amis Telekom, Vodatel, Primatel, Voljatel telekomunikacije, and B.net Croatia.

At the end of 2009, the total number of subscribers to public voice services using wireline networks was 1,859,190, which makes the market penetration 41.92 percent. The new wireline operators currently have 500,330 subscribers, representing a market share of 26.73 percent (during four and a half years of commercial work).

By the end of 2009, there were 357,140 ported numbers in wireline networks. At the same time, there were 478 realized collocations and 123,054 unbundled local loops in Croatia, which represents 7.25 percent of the total number of lines in operation. Installed capacity of cable distribution networks is 482,060 connections, and the number of subscribers to cable distribution services is currently 141,230.

There are three mobile operators acting in Croatia: Croatia Telecom (Deutsche Telekom/T-Mobil), VIPnet (Mobilcom Austria), and Tele2, who started operation in 2005, six to eight years after the first two operators. The market share of the operators is 50, 40, and 10 percent, respectively. At the end of 2009, the total number of SIMs connected in mobile networks reached 6,082,910, which equals market penetration 137.16 percent. The ARPU was €15, which is a decrease of 16 percent from 2008.

Since October 2006, when HAKOM launched number portability, there are 110,210 ported numbers in mobile networks.

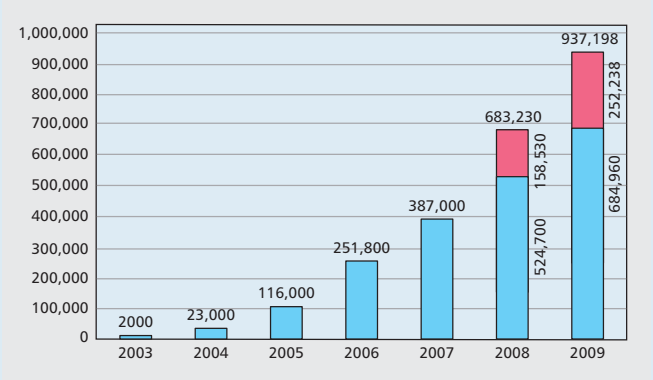
In the course of 2009 there was a significant increase in the number of broadband access users in Croatia. At the end of 2009, the number of broadband users in the fixed network reached 684,960, which is a penetration to 15.44 percent of the population, and the number of broadband users in the mobile network reached 252,238, a penetration of 5.69 percent of the population. Thus, the overall penetration of broadband users at the end of 2009 reached 21.13 percent.

At the end of 2009, the total number of Internet users in Croatia reached 2,495,450, a market penetration of approximately 56.3 percent.

Croatian National Broadband Strategy

As a result of implementation of the Broadband Development Strategy in the Republic of Croatia by 2008, adopted by the government of the Republic of Croatia in October 2006, which aimed at penetration of broadband connections of at least 12 percent in terms of population by the end of 2008 (i.e., to reach at least 500,000 broadband connections), the total number of broadband access users in the fixed network at the end of 2009 reached 684,960, which makes the penetration 15.44 percentn. Compared to the same period the previous year, this accounts for a growth of 30.54 percent. The total number of broadband users in the mobile network reached 252,238, which makes the penetration 5.69 percent of the population. Thus, the overall penetration of broadband at the end of 2009 was 21.13 percent (Fig. 1).

It is important to emphasize that the market share of new fixed line operators in the total number of broadband users is continuously increasing and currently is 25.56 percent. At the end of 2009, the total number of Internet users in Croatia reached 2,495,450, which represents market penetration of 56.3 percent.



Total number of broadband end-users.

In order to increase the availability of broadband Internet access in areas of special concern, as well as across hilly and mountainous areas, and to counter the regionally uneven distribution of broadband connections, by decision of the Croatian government, a program of granting incentives for the development of broadband Internet infrastructure was implemented in areas with insufficient commercial interest in developing and investing in such infrastructure.

All three existing mobile operators in Croatia are given technology- and service-neutral licences to use allocated radio frequency spectrum for different technologies (GSM and broadband — Universal Mobile Telecommunications System, UMTS). In addition to the development of UMTS networks in traditional higher-frequency bands, this has allowed mobile operators to use lower spectrum (900 MHz band) for UMTS technology with less investment, which has resulted in additional broadband coverage, especially in remote rural areas.

In order to encourage further development of broadband services, HAKOM, the national regulatory body, has issued technology- and service-neutral licences to WiMAX operators as well. Thus, they are able to use radio frequency spectrum for broadband wireless access (i.e., mobile use of new technologies is possible).

HAKOM, the Croatian Post and Electronic Communications Agency

HAKOM, the national Croatian post and telecommunications regulatory body, was established on 1 July2008 by merging the former Croatian Agency for Telecommunicatios with the Council for Postal Services. At HAKOM there are currently 165 employees (44.5 percent women and 55.5 percent men), 80 percent of whom have a university degree or higher school education; 20 percent have a high school education. HAKOM also initiated a multidisciplinary study of regulatory affairs as a joint venture of the faculties of law, economics, and electrical engineering and computing at the University of Zagreb.

Regulatory Framework in Line with the EU Requirements

Upon entering into the new Electronic Communications Act (OG 73/08) on 1 July 2008, the whole set of secondary legislation (ordinances) aligned with the EU 2002 regulatory framework, within the competence of the Ministry of the Sea, Transport and Infrastructure (MSTI) and the Croatian Post and Electronic Communications Agency (HAKOM), were adopted, after public consultations were conducted. Thus, all work on legislative alignment with the EU 2002 regulatory framework in electronic communications was completed, and Croatian telecommunications was ready to join the European Union.

Activity in the Texas Chapters

By T. Scott Atkinson, ComSoc NA Region Board, USA

In Texas we have five (5) Chapters in which ComSoc is at least one of the member societies. In San Antonio and Austin, there are joint ComSoc/Signaling Processing chapters, in Dallas a joint ComSoc/Vehicular Technology Chapter, and just ComSoc chapters in Ft. Worth, Galveston Bay, and Houston.

Each has their own way of structuring their programs. For example, Houston and Dallas hold most of their meetings over lunch, whereas Austin and San Antonio generally hold evening meetings.

All chapters, except San Antonio since it is the newest chapter, have had distinguished lectures over the years.

Each chapter's alignment is different, for example:

Chapter	Total	Life Members	Fellows	Senior Members	Members	Affiliate Members
Combined Austin and San Antonio	313	18	9	64	180	3
Dallas	531	26	8	99	357	7
Ft. Worth	116	6	0	13	73	2
Galveston Bay	18	6	1	4	12	0
Houston	237	11	6	25	136	1
Total for Chapters	1,215	679	24	205	758	13

•Dallas holds their meetings in the heart of the Telecom Corridor (an area populated with many different telecom companies). Their meetings also include a speaker on soft subjects, which have included talks on Resume Writing, Getting Your Dream Job, and Career Planning. Over the years they have been very successful in obtaining sponsors for their meetings. The current Chapter Chair is Bobby Chang. In past years they have sponsored their own telecom conference for North Texas. Meetings are currently held at the University of Texas at Dallas in their Science and Technology Building.

•Austin holds their meetings at their Austin AT&T Labs. They are also connected to the University of Texas Student Branch Communications Chapter. Many chapter meetings have reached 50 to 70 attendees. The current chair is Hanan Potash. They have held two successive Wireless HIVE conferences.

•San Antonio is firmly planted at the University of Texas at San Antonio since Dr. Brian Kelly, associate professor of communications technology, organized the chapter in 2009 and is the current Chapter Chair. Both the Austin and San Antonio ComSoc chapters are part of the Central Texas Section.

•The Galveston Bay Chapter holds their meeting close to the NASA Johnson Manned Spacecraft Center in Houston. The current Chair is Zafer Taqui.

•The Houston Section of ComSoc currently strives to meet every second month for lunch at the Shell facility near the Texas Medical Center. Most recently meetings have been held with the IEEE Houston Section. Joint IEEE Section meetings are held in the evenings at the Houston Engineering Scientific Society (HESS) facility just west of the Galleria area in Hous-

(Continued on Newsletter page 4)

2010 IEEE Maine COM Chapter Activities

Ron Brown (Chair), Ali Abedi (Vice-Chair), Maine Chapter, USA

The IEEE Maine ComSoc/CS Joint chapter was founded in 2005 and has hosted 26 distinguished speakers since then. These activities were supported by various fund raising efforts by Chapter Chairs and, of course, ComSoc Chapter support, which totaled $25,000 over five years with an expenditure of around $24,000, making this Chapter a financially healthy non-profit organization according to IEEE guidelines. In 2007 the Maine Chapter received the Best North American Chapter Award from ComSoc. To recognize and reward the outstanding achievements of its best Chapters from among more than 170 chapters worldwide, ComSoc established the Chapter Achievements Award Program. Regional Directors and the Membership Programs Development Director select Chapters that provide their members with the highest quality of service in areas of technical activities, public relations, educational services, membership development, job placement support, and services geared toward student members. The award includes a plaque and $1000 honoraria that were presented to the Chapter Chairs during an award luncheon on November 27, 2007 at IEEE GLOBECOM in Washington, DC.

The Maine Chapter took advantage of one of the most famous programs at ComSoc, the Distinguished Lecturer Tour (DLT). In collaboration with the New Hampshire and Boston Chapters in the United States and the New Brunswick Chapter in Canada, it has hosted three DLTs in the past three years.

Members of the Maine Chapter accept their award.

The most exciting event for theMaine ComSoc Chapter is happening in August 2010, when the CANEUS International Fly By Wireless Conference comes to Maine for the first time. CANEUS International is a non-profit member directed organization serving the needs of the aeronautics, space, and defense communities by fostering collaborations among technology developers, aerospace end users, governmental policy makers, and investors from across the world. CANEUS leads and coordinates the efforts of entities in Canada, the United States, Europe, and other countries, such as Japan and Brazil. This year's workshop will be hosted at the University of Maine, Orono, on 24–27 August, 2010. For more information visit www.caneus.org/fbw10

The Maine Chapter is also involved in organizing 2010 Northeast Industry Day in collaboration with the New Hampshire and Boston sections. This event is designed to enhance

TEXAS CHAPTERS/*continued from page 3*

ton on Westheimer Road. The current chair is Lee Gaspard.

Over the years many activities have taken place at these chapters; even in lean years with few meetings, the chapters have all survived. Some recent activity at these chapters include a joint meeting of the San Antonio Chapter; and the Life Members Group heard Dr. Brian Kelly and Madhy Saedy, Ph.D. candidate, both from the University of Texas at San Antonio, make presentations on the current status of LTE. Overall there were 15 attendees.

The Austin Chapter's recent meetings included, in April, the topic "Massively Broadband Wireless Communications and RFIC Design Research at the University of Austin" by Dr. Ted Rappaport. Their May 2010 talk was by Dr. Ian C. Wong on "A Unified Platform for Communication Systems Design and Prototyping: An LTE MIMO Case Study."

Recent Houston meetings included such topics as Troposcatter Communications for Offshore Applications, Successful Deployment of IPTV at the University of Houston, and Smart Grid Communications systems. It's anticipated that the next meeting will have a review of recent advancements in fiber optic systems.

In other activities, the Chapter chairs from Austin, Houston, Ft. Worth, Galveston Bay, and Dallas have participated in the North American Region Chapter Chairs Congress from San Francisco to Las Vegas to New York.

All in all, there are 1271 Communications Society members in Texas, of which 67 are Life Members, 24 are Fellows, 205 are Senior Members, 758 are members, and 13 are associate members. 2010 ComSoc Chapter membership, as of the end of May 2010, are shown in the accompanying table. There are 56 ComSoc members who are not associated with any chapter.

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www.comsoc.org/pubs/gcn

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The Texas Chapters face the same issues as pretty much all IEEE Chapters in that it is difficult to find good speakers and then get reasonable attendance at those meetings.

It has been my privilege to have been an active member, and officer in two different chapters, Houston and Central Texas.

BIOGRAPHY

T. Scott Atkinson (LSM) is a member (with Membership Development responsibilities) of the ComSoc North American Region Board, a former member and Vice Chair — Strategy of the ComSoc GLOBECOM/ICC Conference Selection Committee, a former Director, North American Region, and former member, ComSoc Board of Governors. Additionally he was Vice Chair and COO for GLOBECOM 2001 held in San Antonio. He currently resides in San Antonio and is now the Executive Chair of the Austin GLOBECOM 2014 Organizing Committee.

MAINE CHAPTER/*continued from page 3*

IEEE and industry relations, and will be held in Portsmouth, New Hampshire on 24 September, 2010. A summary of other Chapter activities in 2009-10 are:

- September 9, 2009, University of Maine, Orono. Wireless System-on-Chip and System-on Package Sensor Design for Radiotherapy, Dr. Muhamad Arsalan, Carleton University, Ottawa.
- September 16, 2009, Fairchild Semiconductor, South Portland, Maine. Wireless Services Infrastructure — Designing for the future, Mirela Marku, Director of Wireless Engineering, General Dynamics.
- October 7, 2009, University of Maine, Orono. Multihop Mobile Wireless Communication, Dr. Uday Desai, Indian Institute of Technology — Bombay.
- Oct 20, 2009, University of Maine, Orono. Career Success, Bill Stoy, National Security Agency.
- March 26, 2010, University of Maine, Orono. Phase Mode Analysis of Directional Elements in a Circular Array, Dr. Herbert Aumann, MIT Lincoln Labs, Lexington, Massachusetts.
- April 6–7, 2010, University of Maine, Orono. Wireless Coverage Analysis Software —- Parts I and II (two days), Greg Dale, ASCOM, Reston, Virginia.
- July 2, 2010, University of Maine, Orono. Advanced CMOS Process Integration: Looking Beyond Conventional Scaling, Dr. Ravi Todi, IBM R&D Center, Hopewell Junction, New York.

The key to maintaining a successful Chapter lies in collaboration with neighboring Chapters in order to efficiently use available resources and share the burden. For more information and access to video of some Maine Chapter talks, please visit our website: http://ewh.ieee.org/r1/maine/com_c

DIGITAL TV IN SPAIN/*continued from page 1*

observed, DTT has been growing at a reasonably good rate.

To conclude, Spanish DTT is healthy, although there remain some issues that must be addressed. These issues include the third regional multiplex and pay-per-view TV, which will probably require further regulation to satisfy all market players. Regarding HDTV, Spanish regulations do not cover it. It can be expected that some stations will switch to HD at some point in the near future, which in turn will motivate others to follow their decision. If this does not happen, the Spanish government will probably introduce new regulations to promote that transmission format.