

Issue 08  
September 2008

# FLO FOCUS

Mobile Television Business

FLO Forum

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# About FLO Forum

## About FLO Forum

The FLO Forum was established in June 2005 to join business leaders involved in developing FLO-based networks, products and services for the wireless industry. The group works collaboratively to generate technical specifications for submission to global standards and regulatory bodies, and to consider the factors that drive success in extending brand, services and products to mobile devices.

One of the FLO Forum's principal aims is to drive the standardization of FLO technology, which will yield lower price points and faster time to market for FLO-based products and services. The group is focused on making FLO technology a global standard – from setting guidelines for testing and certification of equipment using FLO technology, to serving as a resource for information about FLO technology and FLO compliant products. Taken together these efforts are helping to foster a thriving vendor community in support of FLO-based products.

We are also supporting efforts for acquisition and clearing of spectrum globally to support FLO deployments and promote the development and certification of FLO-based products and services. The membership, which currently stands at more than 90, benefits from working in partnership on future developments, accelerating efforts to make FLO technology a standard. Together, our efforts are increasing market acceptance, removing regulatory hurdles, and promoting industry adoption of FLO technology.

To receive information on membership, please complete the Prospective Membership Questionnaire form available at [www.floforum.org](http://www.floforum.org). E-mail the completed questionnaire to [membership@floforum.org](mailto:membership@floforum.org) and a Membership Committee representative will contact you shortly.

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## Members

The FLO Forum's membership currently stands at more than 90 companies, from Asia, Europe, the Middle East and North America.

<i>7 Layers, Inc.</i>	<i>IRT – Institut für Rundfunktechnik</i>	<i>onTimetek, Inc.</i>
<i>Agilent Technologies, Inc.</i>	<i>ITOCHU Techno-Solutions Corporation</i>	<i>PacketVideo Corporation</i>
<i>Anritsu Corporation</i>	<i>KDDI Corporation</i>	<i>Pantech &amp; Curitel, Curitel Communications, Inc.</i>
<i>Aplix Corporation</i>	<i>Korea Electronics Technology Institute</i>	<i>Qualcomm Inc.</i>
<i>Argiva</i>	<i>KT Corporation</i>	<i>Rohde &amp; Schwarz, Inc.</i>
<i>Atheros Communications Inc.</i>	<i>KT Freetel Co., Ltd.</i>	<i>Roundbox Inc.</i>
<i>Axcera LLC</i>	<i>Kyocera Telecommunications Research Corporation (KTRC)</i>	<i>RSG Media Systems, LLC Inc.</i>
<i>Bandai Channel Co., LTD.</i>	<i>LEADER Electronics Corp.</i>	<i>Samsung Electronics Co., Ltd.</i>
<i>Beijing BBEF Science &amp; Technology Co., Ltd.</i>	<i>LG Electronics</i>	<i>SHARP Corporation</i>
<i>CETECOM Inc.</i>	<i>LG Telecom</i>	<i>Siano Mobile Silicon LTD.</i>
<i>Chyron Corporation</i>	<i>Lumantek Co., Ltd.</i>	<i>SK Telecom</i>
<i>Coding Technologies AB</i>	<i>Maspro Denkoh Corp.</i>	<i>SOLiD Technologies, Inc.</i>
<i>conVISUAL AG</i>	<i>MaxLinear Inc.</i>	<i>SPINNER GmbH</i>
<i>Digital Fountain</i>	<i>M.B. International Telecom Labs</i>	<i>Spirent Communications, Inc.</i>
<i>Dielectric</i>	<i>Media Excel</i>	<i>Streamazzo</i>
<i>DTVinteractive Co., Ltd.</i>	<i>MegaChips Corporation</i>	<i>TeamCast</i>
<i>EBS</i>	<i>Mier Comunicaciones, S.A.</i>	<i>Telechips, Inc.</i>
<i>ENENSYS Technologies</i>	<i>MediaFLO USA, Inc.</i>	<i>Terayon Communication Systems, Inc.</i>
<i>Envivio Inc.</i>	<i>Mobidia, Inc.</i>	<i>Thomson</i>
<i>Expway</i>	<i>Mobile Media Planning CORP.</i>	<i>Toshiba</i>
<i>Frontier Silicon Ltd.</i>	<i>Mobix Interactive</i>	<i>Transpera, Inc.</i>
<i>GCT Semiconductor, Inc.</i>	<i>Motorola Inc.</i>	<i>Unique Broadband Systems Ltd.</i>
<i>GoTV Networks Inc.</i>	<i>MSYS Corp.</i>	<i>VectorMAX Corp.</i>
<i>Harris Corporation - Broadcast Division</i>	<i>Nagravision SA</i>	<i>Verimatrix, Inc.</i>
<i>Harmonic Inc.</i>	<i>NDS Limited</i>	<i>VisualOn</i>
<i>Hitachi Kokusai Electric Inc.</i>	<i>NEC Corporation</i>	<i>WideOrbit</i>
<i>Huawei Technologies Co., Ltd.</i>	<i>net&amp;tv Inc.</i>	<i>Widvine Technologies, Inc.</i>
<i>Imagination Technologies Limited</i>	<i>Newport Media, Inc.</i>	<i>Wireless Test Systems</i>
<i>Industrial Technology Research Institute</i>	<i>NVIDLA Corporation</i>	<i>WeComm Ltd.</i>
<i>Innovationszentrum fuer Telekommunikationstechnik GmbH IZT</i>	<i>NXP Semiconductors</i>	<i>WRG, Inc.</i>
<i>Innowireless</i>	<i>Oniontech Co., Ltd.</i>	<i>ZTE Corporation</i>
<i>Irdeto</i>		



## President's Comment

*Dr. Kamil Grajski,  
President, FLO Forum*

### Dear FLO Forum members and prospective FLO Forum members...

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**I hereby declare the mobile TV hype to be over. Aggressive projections have not come to fruition, such as by the opening ceremonies for the 2008 Summer Olympics, aided by a European Commission sponsored DVB-H technology mandate, the European Union would be well along the road to rapid adoption of mobile TV and mobile broadcast services.**

Worse comes news in recent days that due in part to the lack of mobile network operator engagement, the Mobile 3.0 consortium that had won a license in Germany with plans to use DVB-H for its mobile TV service may be on the verge of collapse. This is not to pick on DVB-H. Not at all. For MediaFLO, Qualcomm CEO Paul Jacobs publicly expressed a desire to see greater mobile network operator marketing and promotion of the MediaFLO-powered mobile TV service. The hype is over, merely to be replaced by the realities of establishing a new global, consumer mass-market medium. And importantly, underlying trends still register strong positives.

Mobile broadcast TV has launched commercially in closely followed markets around the world, including Japan, Korea, Europe (Italy) and the United States. What have we learned so far? For those operators that launched with a free-to-air model (and lots of devices), such as in Japan and T-DMB in Korea, consumer adoption is not a major issue. What remains unclear is revenue and profitability growth. For those operators that launched with a pay-TV model, adoption is the greater issue, and to be fair, revenue and profitability growth are yet to be fully tested. In response 3 Italy, which was first to market with a mobile DVB/H-powered pay TV service, recently announced the addition of a free-to-air service. Similarly, MediaFLO USA has added a free-to-air promotional channel aimed at giving consumers an easy way to sample and subscribe. Thus, in response to market realities, the launched mobile broadcast market is now implementing and testing the proposition that a hybrid free-to-air and pay-TV model may be optimal to drive adoption and fuel business growth.

But what about the yet-to-be-launched mobile broadcast scene? For these the medium- and long-term trends remain positive. In the medium-term, technology has come to the fore once again to confirm that capacity (spectral efficiency) matters. The FLO air interface supports ~1.5X-2X the number of video channels (25+ fps; QVGA) as any other mobile broadcast technology. Such capacity gives excellent flexibility in adjusting bandwidth between free-to-air and subscription-based programming. Similarly, in the medium term, we can expect action to result from recently concluded spectrum auctions, including those in the United States and the United Kingdom.

Two key long-term trends signal continued positive momentum. First, mobile broadcast regulatory consultations are recently concluded or in progress in India, Singapore, Taiwan, Ireland and the United Arab Emirates. In Europe there is progress relating to the Digital Dividend and spectrum harmonization. Second, 3G-based mobile TV continues to build momentum and in many markets powers spirited competition between operators. Ultimately, as 3G-based mobile TV and related services drive adoption and simultaneous use grows, the economics of mobile broadcast and capacity performance of MediaFLO will come to the fore.

Back to today. Who doesn't look upon the stunning success of the Apple 3G iPhone with a mixture of awe and envy? We in the mobile broadcast industry would love to have the "problems" that Apple experienced over that first weekend. But fear not, the underpinnings for a robust mobile broadcast industry are as strong as ever.

*Dr. Kamil Grajski*

# Tradeshaw Update

## FLO Forum enjoys success at NAB and CTIA – with still more to come in 2008

Earlier this year, the FLO Forum exhibited at two major U.S. industry events, CTIA Wireless and the National Association of Broadcasters (NAB) Show. Both of these well-attended shows took place in Las Vegas and provided the FLO Forum once again with the opportunity to highlight its presence within the mobile TV world, and to build on the momentum FLO technology has established in the United States and beyond.

### *NAB 2008*

At the NAB Show, now in its 80th year, FLO Forum members were invited to actively participate in a special media roundtable event hosted by the FLO Forum and moderated by Kamil Grajski. Created specifically to educate journalists and analysts about key issues surrounding mobile TV, the roundtable also offered a unique opportunity for the media to establish a dialogue with several FLO Forum members representing all aspects of the mobile TV value chain including:

- David Crawford – *Team Cast*
- Tom Munro – *Verimatrix*
- Eric Petajan – *Vectormax*
- Hubert Rechsteiner – *Nagravision*
- Thomas Seigman – *RSG Systems*
- Vinod Valloppillil – *Roundbox*
- Xavier Wartell – *EXPWAY*
- Jack Wilson – *Axcera*

During the roundtable discussion, several topics were discussed with members providing their thoughts on the future of mobile TV and its evolution, current industry trends, as well as the importance of the FLO Forum working together to address and resolve issues. As the subject of interactivity was brought to the forefront, participants argued that it is essential for the industry to think of mobile TV as something “a lot more than just a small screen.”

The compelling debate and a diverse panel of expert participants led to the roundtable event catching the attention of a number of key industry commentators, journalists and analysts, who covered the discussion for several major national and international trade publications including Telephony, Broadcasting & Cable, Communications Daily, and Broadcast magazine. The media attending the roundtable felt it was an informative and valuable session, paving the way for further discussions at upcoming events around the world.



### *CTIA 2008*

CTIA Wireless – Vegas’ answer to Barcelona’s Mobile World Congress – featured over 1,200 exhibiting companies and drew more than 40,000 technology and telecom industry professionals from 125 countries. The FLO Forum exhibited at the event and forum president Kamil Grajski met with a host of journalists and industry analysts to discuss the mobile television industry, and to share his thoughts on how FLO Forum members are working together in a variety of areas to ensure growth and reach common goals.

Looking ahead to Fall 2008, the FLO Forum will again have a presence at CTIA IT Wireless in San Francisco, California, from September 10-12. As a key US industry event, CTIA IT Wireless is expected to attract upwards of 40,000+ attendees including key industry influencers, top-level technology professionals and media from around the world.

## *FLO Forum exhibiting at CTIA Wireless and IBC*

The FLO Forum will be exhibiting throughout the show at our members booths.

The following week the FLO Forum will be out in force for the third year running at the International Broadcast Convention (IBC) in Amsterdam. IBC – Europe’s largest broadcasting tradeshow set to welcome 40,000 attendees – will play host to an exciting programme of speakers and events, with mobile TV designated an official “hot topic” for the show.

The FLO Forum again has a stand in the Mobile Zone, which can be found this year at booth number M283. Nearly half of the FLO Forum’s membership will be in attendance as exhibitors and even more as delegates. Beyond IBC and CTIA shows, the FLO Forum has a number of events in its sights across the globe for the closing months of 2008.

FLO Forum member Qualcomm showcase its MediaFLO™ mobile broadcast platform – operating on both UHF and L-Band frequencies – through an international line up of linear TV programs; datacasting of news, weather, sports and radio; Clipcasting™ media; and interactive applications that allow viewers to interact with mobile TV programming and one another.

In addition to FLO-enabled phones, personal media players and portable laptops, the company will demonstrate live mobile broadcast services via an automotive entertainment system, and for the first time, will unveil a MediaFLO prototype that allows third-party devices using Symbian and Windows Mobile operating systems to receive live MediaFLO signals. Qualcomm will be joined by a number of MediaFLO ecosystem partners throughout the IBC Mobile Zone showing their respective hardware and software solutions that support the MediaFLO platform.

Beyond IBC and CTIA shows, the FLO Forum has a number of events in its sights across the globe for the closing months of 2008.

### **Upcoming Events**

**CTIA Wireless**, September 10-12, San Francisco, CA

**IBC 2008**, September 12-16, Amsterdam

**Mobility World Congress & Exhibition**, October 13-16, Bangkok

**MIPCOM**, October 13-17, Cannes

**GSMA Mobile Asia Conference**, November 18-20, Macau

### **FLO Forum members exhibiting at IBC 2008**

<b>FLO Forum member</b>	<b>Booth Location</b>
Agilent Technologies	M291
Anritsu	1.F29
Axcera	8.E24
Chyron	7.H11
Digital Fountain, Inc.	IP341
Dielectric Communications	M384
DTVinteractive Co., Ltd	IP158
ENENSYS Technologies	12.PA21
Envivio, Inc.	5.A19
Expway	M386
Harris	7.G20
Harmonic Inc	1.C61
Hitachi Kokusai Electric Europe GmbH/ UK Ltd.	11.F40
Irdeto	1.D51
IRT Institut für Rundfunktechnik	10.F51
Leader Electronics Corporation	10.F38
LG	IP254
Lumantek	M281
Media Excel	2.C24
Mier Comunicaciones	8.B59
QUALCOMM – MediaFLO	M269
Motorola	1.D31
Nagravision	1.D69
Nagravision	M493
NDS	1.A71
NEC Corporation	8.B91
Newport Media, Inc.	M481
nxp Semiconductors	1.D10
Rohde & Schwarz	8.B47
Roundbox	1.E90
Samsung Electronics	1.B81
Siano Mobile Silicon	M592
Spinner GmbH	8.B27
TeamCast	2.C23/M383
Thomson	1.D11/7.F31/1.E02
Toshiba	IP254
Unique Broadband Systems Ltd	M597
Widvine Technologies	4.A59

## *STREAMEZZO*

FLO Forum member Streamezzo, has announced that Telstra has selected its software platform and professional services team to design, develop and deploy the first fully interactive mobile TV service in Australia. Streamezzo, creator of the Universal Software Platform™ which overcomes mobile industry fragmentation and powers the mobile internet, has developed and launched Telstra's Mobile FOXTEL™ TV offering in partnership with Alcatel-Lucent.

Telstra's new Mobile FOXTEL™ service was developed with Streamezzo's Universal Software Platform with the ultimate goal of creating the most unique, compelling and intuitive mobile TV experience for users. The new handset environment includes an easy-to-use on-screen application offering ready access to the most advanced mobile TV features available on the market today, including a video-on-demand catalogue and an interactive Electronic Program Guide (EPG). The cross-platform capabilities of the new offering allows FOXTEL customers with FOXTEL iQ to remotely record content on their home set top box via the EPG on their mobile handset.

[www.streamezzo.com](http://www.streamezzo.com)

## *Qualcomm*

Qualcomm has announced it has been elected to the governing board of the Broadcast Mobile Convergence Forum (bmcoforum), a leading worldwide industry association for mobile broadcasting services. Luigi Ardito, Technical Marketing lead for the Europe, Middle East and Africa (EMEA) region for Qualcomm MediaFLO Technologies was named Qualcomm's representative to the board at the Forum's Annual 2008 plenary meeting in Berlin.

Qualcomm joins a 14-strong board of representatives elected by the bmcoforum's 110 member organizations from the telecommunications, broadcast and content industries, will help guide the bmcoforum as it promotes an open market approach to mobile broadcast services. An aim of bmcoforum is to accelerate the commercial implementation of new user experiences for receiving broadcast services on mobile devices through activities including promoting technology standardization and lobbying for spectrum and suitable regulatory frameworks.

[www.qualcomm.com](http://www.qualcomm.com)

## *EDX Wireless*

EDX Wireless, a provider of carrier-class RF planning tools for the design and deployment of 4G wireless networks, has announced its support of the FLO global ecosystem and teamed with Qualcomm to provide specialized propagation studies to FLO service operators. The studies will be used in planning the placement of FLO network base stations transmitting real-time multicasting of video, audio and data streams to FLO-enabled mobile devices.

Under the agreement EDX will distribute and provide support for the specialized studies, which will be made available to MediaFLO service operators as additional features to EDX's carrier class wireless network planning tool, EDX® SignalPro®, for a fully integrated network planning tool solution. The joint solution is immediately available for approved MediaFLO service operators.

[www.edx.com](http://www.edx.com)

## *TeamCast*

TeamCast, one of the founding members of the FLO Forum, is continuing to develop its successful range of OEM modules, supplying key products to leading transmission equipment manufacturers, network infrastructure providers and R&D laboratories. The FLO product range supports all operating frequencies from VHF, through UHF, to L-Band, and presently provides the following functionality:

- FLO modulators, with optional on-board GPS circuitry for single frequency network applications
- a FLO repeater/gap-filler 'engine', with a powerful digital echo-cancellation algorithm incorporated for on-channel operation
- a FLO signal generator, providing full specification modulated FLO signals plus all options needed for advanced transmission channel emulation and performance tests (noise, fading, Doppler etc).

TeamCast also continues to help transmission equipment manufacturers to integrate added value features into their products. At IBC 2008, TeamCast is announcing a dual mode modulator able to perform either analogue TV or digital TV modulation in the same module; the perfect solution for extending transmitter operating lifetime.

[www.teamcast.com](http://www.teamcast.com)

## *conVISUAL*

FLO Forum member conVISUAL has announced it has acquired the media asset rights for valuable 3D content from KIZOO Technology Ventures, a development and investment company.

KIZOO's extensive library includes animations from internationally recognized licensors such as New Line Cinema, Paws, Warner, and United Media, resulting in high-quality 3D graphics of world famous characters such as SpongeBob, Garfield, Batman, Perry Rhodan, Looney Tunes, Lord of the Rings, and Peanuts. Additionally, KIZOO has created over 800 original high-value 3D animations. The characters have been animated in best quality and visualize emotions at the highest possible graphic level. The graphics can be used optimally for communication applications, such as Mobile Marketing or Instant Messaging services, to express feelings and moods.

The acquisition is a welcome addition to conVISUAL's extensive portfolio of high quality mobile content, building an optimal base for the acquisition of new customers world-wide. conVISUAL will offer immediately, worldwide, unrestricted utilization of characters created by KIZOO.

[www.convisual.com](http://www.convisual.com)

## *CETECOM*

CETECOM has announced that it has chosen FLO Forum member Spirent's FLO1-ATS automated test system for its MediaFLO™ /3G test labs in San Diego. CETECOM, also members of the FLO Forum are a leading independent wireless technology testing and certification organization.

With Spirent FLO1-ATS, a FLO receiver's compliance to the FLO Device Minimum Performance Specification (TIA-1102) can automatically be measured. Since the introduction of the Spirent FLO1-ATS in 2006, this fully automated system has been in use by major network operators and device manufacturers across the US.

[www.citecom.com](http://www.citecom.com)

[www.spirentcom.com](http://www.spirentcom.com)

## Verimatrix

Verimatrix has announced its Video Content Authority System (VCAS™) for mobile TV which enables pay-TV companies to respond to the growing consumer trend of watching television or video content when and where they want. Triple and quadruple-play service operators can deliver cost-effective mobile services that incorporate robust content security without requiring specialist security hardware in the handsets. The standards-based solution secures video within home media distribution, streaming or downloaded applications and supports emerging mobile broadcasting networks such as FLO, where Verimatrix contributed to the newly ratified OpenCA standard TIA-1146.

[www.verimatrix.com](http://www.verimatrix.com)

## Roundbox & Itochu Techno-Solutions

FLO Forum member, Itochu Techno-Solutions, announced a distributor agreement with Roundbox, also a member of the FLO Forum. Together, the two companies are launching a datacasting solution for MediaFLO and other broadcast networks targeting the Japanese market.

Roundbox's software makes the IP datacasting features found on networks such as MediaFLO and WiMAX accessible to third-party software developers using simple, standard mobile development tools. Itochu Techno-Solutions, providers of information technology solutions in Japan, has released this solution to both mobile broadcasters and carriers.

[www.ctc-g.co.jp/en](http://www.ctc-g.co.jp/en)

[www.roundbox.com](http://www.roundbox.com)

# Rohde & Schwarz and FLO: A Perfect Match

**As a long-standing member of the FLO Forum, Rohde & Schwarz represent just one of the success stories rising from the growth of the FLO ecosystem. Eddy Vanderkerken, director of sales; broadcast transmitters, takes a look at where that relationship started, and what is in store for the future.**

Ask many people what type of products Rohde & Schwarz (R&S) manufactures and the answer will usually be high-performance test equipment. True enough, but Rohde & Schwarz is also the world's largest manufacturer of television transmitters for both fixed and mobile applications. So it's not surprising that Rohde & Schwarz would take a lead in development of transmitters for FLO networks, as well as the measurement solutions required to test them and MediaFLO's user equipment.

As a major supplier of test equipment to Qualcomm, Rohde & Schwarz got started early in developing solutions for FLO technology. This next-generation high-capacity mobile, multicast, multimedia services technology requires solutions that "off-the-shelf" transmitters could not satisfy. To remedy this, Rohde & Schwarz first developed a transmitter exciter that could accept the input of a FLO transport stream, encode and modulate it, and output the desired modulated RF spectrum. Fortunately, the flexible architecture employed by Rohde & Schwarz broadcast systems simplifies this task, as standards-compliant signals can be implemented largely through software. The resulting R&S® Sx800 exciter today drives the company's broad family of low-power and high-power solid-state FLO-capable transmitters.

The company's first FLO transmitter went on the air in November 2004 in San Diego using Channel 55 for a mobile TV application for the first time. Today, Rohde & Schwarz is the leading supplier of liquid-cooled, solid-state transmitters for MediaFLO USA, and has deployed more than 200 units throughout North America in less than three years. Rohde & Schwarz has created an entire family of FLO-capable solid-state transmitters. Each one is extremely efficient, in keeping with the critical need to reduce broadcasters' annual operating costs. There are air-cooled, low-power and liquid-cooled high-power versions of the R&S Nx8600 transmitter series as well as the 900-Watt R&S NV8303VO, which is housed in a weather-resistant enclosure.

On a parallel path, Rohde & Schwarz has developed unique test solutions for FLO subsystems, systems, and user equipment. The R&S



SFU broadcast test system has been adapted to support the development of FLO receiver chips and receivers with an RF signal source that encodes and generates standards-based signals in real time. The instrument lets the operator change all transmit parameters "on the fly", and can generate interferer noise, phase noise, impulse noise, and multipath signals.

The new R&S SFE broadcast signal generator and compact R&S SFE100 test modulator designed for engineering and manufacturing environments will soon be offered with real-time FLO capabilities as well. Rohde & Schwarz also developed the R&S TU8980, the industry's first FLO Device Conformance Test System (FDCS), that enables manufacturers and test laboratories to evaluate receivers and handsets and to assess their products' compliance with the FLO minimum performance specifications embodied in published TIA standards TIA-1102, TIA-1103 and TIA-1104. The R&S TU8980 can also be configured to perform tests unique to individual mobile network and MediaFLO service providers. Together, this equipment provides all of the measurement solutions required for FLO equipment evaluation from the earliest stages of development through to compliance testing.

For companies like Rohde & Schwarz that have been closely involved with FLO technology from its earliest origins, it's exciting to see the promise of this technology begin to unfold. As it does, Rohde & Schwarz will continue to expand its broadcast and measurement solutions to support the FLO ecosystem as it expands in both coverage and capabilities.

# Membership Focus

## Making sure the price is right

**There is one digit that is having an impact on the adoption of mobile TV: zero. Consumers ultimately determine the success of a service business model, and in the case of mobile broadcast TV, free-to-air services appear to be driving consumer adoption in greater numbers than their subscription-based counterparts. This has brought about a shift in the strategies of some of the leading mobile broadcast TV protagonists. The emerging strategies seek to blend free-to-air with the opportunity to upsell pay-TV (premium channels) further down the line.**

Subscription services were favored in the early days of mobile TV (2005 – 2007) as the business model of choice. However, companies, such as those in South Korea, and especially Italy that launched with an exclusively pay-TV model have now added free-to-air service as well. Similarly, MediaFLO USA (which provides a wholesale mobile broadcast TV service through Verizon and AT&T) recently added a free-to-air promotional channel that gives consumers an immediate, hands-on experience with the service, and highlights the depth and breadth of the service content lineup.

“In retrospect, a mistake of the early mobile broadcast TV services was to charge a premium,” says Vinod Valloppillil, vice president of product marketing at Roundbox, who also is a member of the FLO Forum Board of Directors and is the Chair of the Services and Content committee. “I do not believe it has done irreparable damage. In terms of perceived value, the difference between £0.00 and £0.01 may be much bigger than the difference between £0.01 and £10.”

*“In retrospect, a mistake of the early mobile broadcast TV services was to charge a premium.”*

Valloppillil believes that the penetration of free-to-air-enabled devices will follow a similar consumption model to camera phones. While it's taken six-to-seven years to reach around 60 per cent penetration for camera phones in developed markets, he says that the adoption curve will be significantly faster for mobile broadcast TV.

South Korea is the ideal case in point. When the Satellite-DMB-based service launched in May 2005 as TU Media, it chose to pursue the subscription-based route. When in December the same year the service was challenged by the government and broadcaster-backed free-to-air service using terrestrial-DMB (T-DMB), the two business models went head-to-head at the mercy of (or to the benefit of) the consumer.

*“TU Media is now offering a broader selection of a-la-carte channels as a direct ploy to attract more subscribers.”*

At the start of 2008, T-DMB had amassed over 8 million subscribers compared to S-DMB's 1.2 million. TU Media's only period of strong growth came during the first six months of commercial operation when it was the market's only mobile broadcast TV solution and was therefore unchallenged by T-DMB. In any other market around the world, 1.2 million subscribers would be hailed as a phenomenal success, however, because this figure is dwarfed by its free-to-air rival it is coming under increasing scrutiny.

“Over the last year its subscriber base has stagnated,” said Brendon Woo, country manager for Korea, Irdeto. “TU Media has been desperately in need of a new solution to make its break-even point of 2 million subscribers by the end of 2008, and its longer-term goal of 6.5 million subscribers by 2010.”

Clearly, TU Media remains focused on reaching mass market adoption comparable with that of T-DMB. Since June 2008, the 22 million SK Telecom customers could access the S-DMB service for free.

“It means SKT has included the TU Media service as part of its mobile package which means SKT is basically paying for the TU media service on behalf of the viewers,” explained Woo. He added that TU Media is now offering a broader selection of a-la-carte channels as a direct ploy to attract more subscribers.

Woo says that not only is the notion of ‘free’ a key driver, but that there are also other elements critical for the ecosystem to successfully operate. “Consumers welcome free services,” he says. “But what's more critical for consumers to choose S-DMB service is still dependent on the choice of devices. If more devices are available for S-DMB, this free service will definitely help gain more subscribers for TU Media.”

In South Korea, S-DMB is facing something of a Catch 22 scenario. For S-DMB to even contemplate a free model funded through advertising, it must increase its subscriber base. Conversely, it will only realistically rapidly expand its subscriber base if the service introduces a free element. What's more, the widening availability of S-DMB-enabled handsets is also dependent on an increased user base.

But scale does not ensure satisfaction. S-DMB's rival free-to-air service, T-DMB has over 8 million subscribers that should appeal to the

advertising community. But Woo believes that advertisers remain unconvinced by mobile TV as an advertising medium. "Advertisers have been unimpressed by its effectiveness as an advertising vehicle," he claims, though he also adds that "there is tremendous upside still available as the T-DMB state-run advertising agency KOBACO, continues to gain expertise and the advertising value chain learns how to effectively use this new consumer mass market medium."

And it's not just in South Korea where companies are evaluating their mobile broadcast TV subscription model. 3 Italy, by far that country's most successful mobile broadcast TV service provider with over 700,000 subscribers (as of August 2007), became Europe's first mobile operator to offer a free to air bouquet when it launched La3 in June this year. La3 houses a number of channels including RAI 1, RAI 2, Sky Meteo 24, Current TV and Mediaset, as well as the operator's own in-house channel. The service is funded by interactive advertising. The operator is yet to comment on the success of the service, but it is fair to speculate that perhaps, as in the case of TU-Media, 3 Italy observed the opportunity to drive further consumer adoption through a more direct appeal to typical broadcast TV viewing habits.

Roundbox's Valloppillil attributes the situation on the assumed requirement to deliver premium TV experiences to consumers.

"This means that services like MediaFLO in the US explicitly models itself after premium cable and satellite television offerings and provide a bouquet of programming (typically five to 15 channels) delivered to consumers for a monthly subscription fee," he said. "The challenge, however, is that while premium, terrestrial, television is very successful (in the US, for example, cable / satellite house-hold penetration is close to 80 per cent), it's the product of over 50 years of service evolution that got its start with a very broad consumer experience with free-to-air, ad-supported television. And, as the massive penetration of cable and satellite coupled with the ubiquity of 30-second advertisements demonstrates, the two models are quite complementary."

*“ Korea and Japan provide significant proof points about the complementary nature of free-to-air and premium mobile broadcast services. ”*

The issue that remains is the order in which the services are introduced commercially. While the likes of TU Media and 3 Italy migrate towards a blend of free-to-air and subscription-based services, Valloppillil believes those free-to-air services that have demonstrated their capability to a mass audience can now look to evolve the service by introducing premium channels.

"Korea and Japan provide significant proof points about the complementary nature of free-to-air and premium mobile broadcast services," Valloppillil says. "Japan's ISDB-T service is now available on nearly 100 per cent of the retail-available handsets while Korea's T-DMB service is rapidly approaching the 25 per cent penetration mark. As a result of this success, operators in both countries are now eagerly trialling and planning for premium mobile broadcast services as an 'up sell' opportunity on top of this base."

Valloppillil anticipates a similar evolution path developing in the US where initiatives like the Open Mobile Video Coalition (OMVC) create the opportunity for an evolution of complementary free-to-air and premium services in synergy with MediaFLO USA. While in Europe, there are similar discussions regarding a free and premium service pairing between DVB-T and DVB-H. Finally, regulators have taken note of evolving business experience and at least in one country (the United Arab Emirates) a recent draft consultation includes a requirement for a mix of free-to-air and premium services.

Kamil A Grajski, President of the FLO Forum adds, "the growing realization for the need to blend free-to-air with premium services underscores the importance of capacity as a key differentiator of the FLO air interface." Ending on a note of caution, he continues, "to the degree that the free-to-air model depends upon mobile advertising there is enormous opportunity as well as risk as the per capita dollar spend for non-mobile advertising in countries such as the USA and Japan are 500-600X that for mobile."

In conclusion, market data shows that an important driver for mobile broadcast TV adoption is price, and that with free-to-air (of at least minimally appealing and quality content), consumers will adopt the service. The grand experiment underway is how to build a viable business around a blended advertiser-supported free-to-air service in combination with paid services. Neither alone seems capable of supporting required returns on investment.

# A look at the global FLO Ecosystem

The FLO Forum launched in June 2005 with an inaugural meeting in San Francisco where 15 pioneering founding member companies embarked upon a three-fold mission:

- To promote the global standardization of FLO technology
- To promote the acquisition and clearing of spectrum in support of FLO deployments
- To promote the certification and testing of FLO products and services

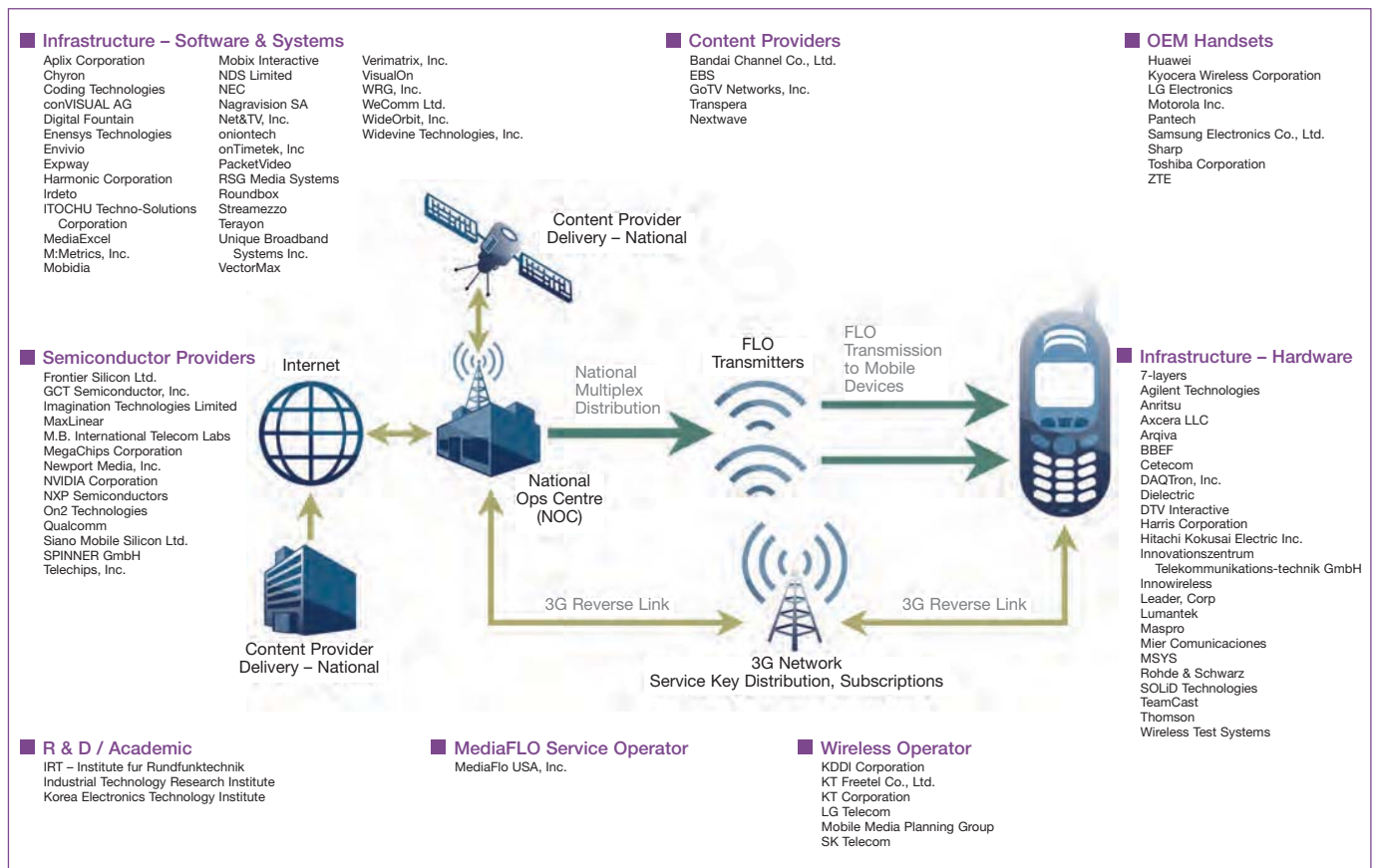
Fast forward three years and membership has grown exponentially. Member companies now represent all aspects of the mobile TV value chain from R&D to infrastructure to content providers. Members span the globe with roughly a third in the US, Europe and Asia respectively.

With mobile broadcast system requirements varying widely – dependant on market conditions, regulatory environment and business objectives – the FLO Forum remains committed to ensuring that FLO technology not only offers the best performance and cost, but also provides service and network operators with flexibility and choice in terms of solution design, approved suppliers and flexible, adaptive business models. To this end, the FLO Forum remains dedicated to addressing a requirement to enable multiple vendors and service

providers to independently develop and offer FLO products and services for the mobile TV market.

Eight FLO standards have now been published by the Telecommunications Industry Association (TIA). The most recent, TIA-1146 Forward Link Only Open Conditional Access Specification, was a member-driven project led by Irdeto, Nagravision, NDS, Verimatrix and Widevine. The success of the OpenCA project highlights the continuing achievements made by the FLO Forum. Looking ahead projects and partnerships driven by the FLO Forum will ensure that the FLO Ecosystem continues to deliver the best opportunities and business for mobile television deployments worldwide.

Perhaps more important than the publication of the standards themselves is the growing evidence of adoption. As of this writing, more than three-dozen companies have announced or demonstrated FLO-related products and services. These range from multi-mode mobile broadcast baseband chips, to broadcast network transmission equipment, test equipment, video encoders, and of course, FLO-enabled handsets and commercially launched services, among many other examples.



## *European Parliament calls for coordinated use of digital dividend spectrum*

Since its inception in 2005 the FLO Forum has always believed that among the key challenges in the commercial roll-out of mobile TV – particularly across Europe – is the lack of harmonized spectrum and clarity around its licensing. The issue of the Digital Dividend, UHF spectrum released after analog switch-off, was recently addressed in a Report by the European Parliament (EP) Industry Committee (ITRE). Members of the European Parliament (MEPs) called on Member States and the Commission to identify common spectrum sub-bands under a pan-EU coordinated approach to enable the successful introduction of additional and new digital services such as DTV, Mobile TV, and Mobile Broadband in an environment free-of-interference.

The Report calls for “a common and balanced approach to the use of the Digital Dividend,” allowing broadcasters to expand their services and electronic communications operators to deploy new services. Notably, in line with the FLO Forum’s stance on the fundamental importance of technology neutrality, MEPs stated that the Digital Dividend should be allocated in a technology-neutral fashion.

Members of the European Parliament urge EU Member States to develop and implement national strategies and release their digital dividends as quickly as possible by close of 2009, “to allow European citizens to benefit from the deployment of new, innovative and competitive services.”

The European Parliament also urges the Commission to propose measures to the European Parliament and the Council to better coordinate the use of the Digital Dividend at EU level. Member states, along with the Commission, should identify common spectrum sub-bands which could be harmonized at the EU level and on a technology-neutral basis. This coordinated approach, as recommended by the Members of the European Parliament, is “the most efficient way to avoid harmful interference.”

The FLO Forum welcomes the European Parliament Industry Committee recommendations and believes its adoption by the Commission and the Council would encourage the continued market competition across European and beyond and innovation in terms of technologies and services such as Mobile TV. Such an approach would foster sustainable economics and investments as well as compelling quality of services at affordable prices for the benefit of the European citizens and society.

## *Irish regulator addresses UHF spectrum allocation*

In June the Irish regulatory body, the Commission for Communications Regulation (ComReg), issued a public consultation on allocation of UHF spectrum. The consultation sought to address the allocation of a single 8 MHz multiplex within 470-862MHz in the urban regions of Ireland, namely Cork, Dublin, Galway, Limerick and Waterford.

The regulator is proposing two possible spectrum license award options; under a Mobile TV service license subject to specific obligations (coverage, business model, etc.), or under a flexible and

neutral service license approach only subject to technical spectrum requirements (interference protection, etc.).

Commissioner Mike Byrne comments, “ComReg is aware of the critical importance of managing the radio spectrum efficiently and providing access to spectrum so that consumers, industry and the economy can benefit from the convergence and digitalization of electronic communications services and networks.”

## *FLO Forum backs Singapore regulator’s plans for mobile broadcast services*

The FLO Forum has formally responded to an invitation from the MDA, the Singapore regulator, asking for comments regarding its proposed policy and regulatory framework for mobile broadcasting services in Singapore.

In a letter to the regulator, Kamil A. Grajski, President of the FLO Forum, said that “The FLO Forum overall agrees with MDA views especially with regards to technology neutrality and the availability of two UHF spectrum multiplexes. Both proposals will allow for a high level of competition and provide choices of multimedia services at reasonable costs for the consumers. This will help favour the rapid adoption of the Mobile TV market in Singapore.”

## *FLO Forum responds to Taiwanese regulator on its “Mobile TV Licensing Policy” proposals*

In its public consultation on “Mobile TV Licensing Policy”, the National Communications Commission (NCC), Taiwan’s National media and telecoms regulator, has proposed the allocation of three 6 MHz UHF licenses based on national single frequency network for new mobile services such as Mobile TV. The proposal follows the principle of technology neutrality. The FLO Forum responded to the regulator’s request for industry comments earlier in 2008, strongly encouraging the NCC in its due diligence to issue licenses for Mobile TV.

## *FLO Forum applauds the European Radiocommunications Office’s activities on spectrum matters*

In a letter to the FLO Forum, the European Radiocommunications Office (ERO) seek the industry’s input on the “Future Role of CEPT” parent body of ERO and the ECC where the FLO Forum participated in the technical activities of Task Group 4 in charge of assessing the technical feasibility and advantages of a UHF Digital Dividend harmonization in Europe for new multimedia and mobile services. In its response, the FLO Forum had the opportunity to re-iterate its strong support in the instrumental and successful technical activities of CEPT in such important matters as spectrum represents an essential part of Europe global leadership in information technology and innovations.



# Technology Update

*MaryBeth Selby,  
CFO and Chair of the Working Committee  
Advisory Board, FLO Forum*

## *Open standardization of FLO technology continues; OpenCA specification gets TIA approval*

As reported previously in this column the FLO Forum is driven by a commitment to build an open platform and encourage the emergence of an extensive catalogue of partner products and solutions. It has, since its beginnings, understood the need to apply itself not only to the development of technical specifications, but also to creating implementation and testing guidelines to facilitate the integration of components and services from different suppliers into a single unified system.

In mid-2006, with this in mind, the FLO Forum launched the Open FLO initiative with the aim of defining the architectures, interfaces and protocols required to address the needs of the expanding FLO ecosystem. In July this year, following months of detailed review, the FLO Conditional Access Standard (OpenCA) received approval from the Telecommunications Industry Association (TIA) and was published as TIA-1146.

The completion of the OpenCA Specification creates a standards-based environment which enables multiple vendors to implement content security systems within the FLO architecture. The specification provides a standard interface for conditional access (CA) systems to interoperate, ensuring that FLO network operators have the flexibility to use multiple CA solutions. Through this standard interface, they can replace an entire CA system seamlessly with another system, or run multiple systems concurrently in a "Simulcrypt" setting, providing operators with greater control to respond to changing security demands or business model requirements. The framework also enables content providers to offer a wider choice of premium mobile content while reducing the risk of piracy, thus helping to create a compelling mobile TV experience for the end user.

The OpenCA initiative originated within the FLO Forum and was driven by six member companies who are leaders in the global conditional access market. These companies who were key to the success of the program were; Irdeto, Nagravision, Newport Media, NDS, Verimatrix and Widevine. Each contributed via the FLO Forum's Services & Content and Technical Committees, applying their extensive experience of working with the DVB Open Security Framework (OSF) to devise an equivalent solution for FLO technology.

*“ The completion of the OpenCA Specification creates a standards-based environment. ”*

The publication of the OpenCA standard now takes the total of TIA approved FLO specifications to eight, following the publication of the Forward Link Only Repeater Minimum Performance Specification and the Media Adaptation Layer Specification, published as TIA-1132 and TIA-1130 respectively earlier this year.

Further to this the Minimum Performance Specification (MPS) for Forward Link Only Transmitters, published as TIA-1103 in 2006, is currently under review with a number of significant updates proposed. At the time this article went to print the TIA's TR-47.1 Engineering Committee subcommittee was working to ratify the revisions, proposed with a view to extending MPS test coverage for 7 and 8 MHz channels in the UHF band, which is due for publication as TIA 1103 Rev A. Further revisions are also in the pipeline for the TIA-1102 FLO Minimum Performance Specification for Terrestrial Mobile Multimedia Multicast Forward Link Only Devices and the TIA-1099 FLO Air Interface Specification.

## *FLO Forum to launch self verification programme for transmitters*

After several months of deliberation and consultation with forum members, the FLO Forum Test and Certification Committee is nearing ratification of the self verification process for FLO transmitters.

The highlights of self the verification for transmission system include:

- Transmission systems (TS) manufacturers will be responsible for compliance and equipment certifications to overall technical performance and safety standards required by the regulatory body for the geographic region where the system will be installed.
- TS manufacturers will be responsible for verifying conformance to FLO Minimum Performance Specifications (MPS) including TIA 1103 and TIA 1132 plus revisions.
- A combination of FLO recommended tests along with test/measurement equipment vendor application notes on making FLO measurements will be provided by the FLO Forum for manufacturers and system operators to correctly verify system performance.

The work done to date by the Committee has been a collaborative effort with TS vendors, MFSOs, and other interested FLO Forum members providing contributions to flesh out and complete the process. Significant work by the following member companies is noted: Harris Corporation, Thompson, Rhode & Schwarz, Mier Comunicaciones, MediaFLO USA Inc., and Qualcomm. The work has also spurred action by the T&CC resulting in an open call for tools to support Modulation Error Ratio (MER) and MPS testing in the field.