

Panasonic

SEPTEMBER 2004

H D S P E C I A L



EUROPE NEEDS HIGH DEFINITION TV

Good for jobs, good for skills, good for industry, good for Europe

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TIME FOR EUROPE TO WORK TOGETHER

Joachim Reinhart, President and Chief Operating Officer of Matsushita Electric Europe says that Europe must start planning for the introduction of HD services.



Joachim Reinhart,
President and Chief Operating Officer
of Matsushita Electric Europe

We have just witnessed a magnificent Olympic Games in Athens, right at the heart of Europe. A great sporting spectacle watched by billions worldwide. Panasonic is proud of its 20 years of partnership with the Olympic movement – helping bring stunning images into the home through the power of digital media and technology.

By the time of the next Summer Games in Beijing in 2008, high definition coverage will be as prominent as standard definition coverage by the host broadcaster. The same development will be observed at the Soccer World Cup in Germany in 2006.

The next four years are a great opportunity and challenge for Europe. The USA, Japan and Australia have already started HD services. In Japan and the USA these services are now growing rapidly. The People's Republic of China is planning to start HD broadcasting in 2008 for the Olympics. Other parts of the world such as South East Asia are also bringing forward plans for HD.

Twelve months ago Europe had only a few plans for HD. Today, that picture is starting to change. Broadcasters, production companies, governments, the EBU and the European Commission are starting to be aware that Europe must not get left behind.

Broadcasters, manufacturers, the IT sector and programme makers must get together and develop a plan of action on how to implement HD services for terrestrial, cable, satellite and broadband. The plan should be relevant for the medium and long term.

There is also a great need to build a constituency of support among national and European politicians, legislators and the general public. What is so striking currently is that there is no Europe-wide public debate going on about HD. All of us must work together to change that.

Europe is extremely strong in the content creation industries, employing well over a million people in highly skilled jobs. Consultants PwC estimate that digital content will be a 600 billion Euro global industry by 2006 and a sector undergoing rapid growth. It is vital that Europe invests in the infrastructure to support a strong, growing sector that sells products throughout the world, and which is providing new jobs.



Broadcasting represents a key part of the cultural and political diversity which is a strength of European culture. If broadcasting fails to upgrade to HD, then over time it would lose customers, influence and market share to other media. That would be to the detriment of European culture.

Finally, Europe is the world's largest single market. Europe's position in the global economy means that Europe must have a modern IT infrastructure to compete in the global economy. HD should form part of the services available to European consumers.

Key to consumer take-up of HD is the new generation of flat panel displays, both plasma and LCD. These are capable of cinema quality pictures in the home with a quality and resolution way beyond current standard definition (SD) pictures – and at an increasingly affordable price.

Europe needs to act and plan for HD. As a company, Panasonic is investing heavily in high definition solutions in flat screen displays, in solid state cameras, in Digital TV sets and STBs, in Blu-ray optical disk recorders and players and in system LSIs which lie at the heart of all electronic devices. We can reassure all our European customers, both broadcasters and consumers, that we are investing heavily for the major opportunities that we see emerging over the next few years, as Europe goes HD.

Let us all work together to seize the moment.

B E N E F I T S

HD for Europe

- Good for jobs in broadcasting, production, manufacturing and retail
- Keeps Europe at forefront of major markets with modern IT infrastructure
- Broadcasting plays an important role in cultural diversity of Europe
- Gives greater choice to European consumers

HIGH DEFINITION BROADCASTING AND PRODUCTION IN EUROPE

Panasonic supports key HD production standards



HD production with Panasonic's variable frame rate camera system Varicam

Common standards and a clear long-term agenda are important for HD in Europe.

Both interlace and progressive HD standards are popular in HD production. Early HD adopters in the USA and Japan have chosen 1080i. Forthcoming major sporting events such as the 2006 Olympics in Turin and World Cup in Germany also in 2006 are both using 1080/50i. Panasonic has a growing range of HD equipment for 1080/50i production and is launching new products at IBC for this standard.

However progressive production is also gaining support. Film production, dramas, and documentary makers like the "look and feel" of progressive pictures. Panasonic progressive cameras both in SD and HD are proving very popular. Now European broadcasters are proposing a progressive standard for production and distribution. The proposed EBU broadcast HD standard of 720/50p provides a good solution for European broadcasters and consumers. For European consumers, recent research by the BBC shows that 720p pictures in the home on large screen displays are the best solution for the typical domestic configuration (2.8 m from the screen).

Panasonic's underlying HD broadcast strategy is to work closely with European broadcasters through the EBU and other industry bodies.

For the broadcaster the introduction of HD must be cost effective. Key to this is going to be a smooth transition, building on current technology with a clear pathway to HD services as Panasonic DVCPROHD series offer both 1080i and 720p. Equally HD equipment must be highly cost effective. Driven by the upcoming events of international interest 1080i will ensure a quick return of investment.

Panasonic's DV and DVCPRO family of products demonstrates this philosophy of long term commitment and support combined with a clear path to HD services. Customers using DV and DVCPRO have been provided with a clear production pathway from 25 Mbps to 50 Mbps and now to HD at 100 Mbps. The latest DVCPROHD VTRs (AJ-HD1700 and AJ-HD1200A) can play back cassettes from DV at 25 Mbps right the way through to DVCPROHD at 100 Mbps.



Alfacam OB trucks with Panasonic VTRs and plasmas were at the heart of HD production at Euro 2004 in Portugal and the Olympic Games 2004 in Athens

The DVCPRO family also demonstrates Panasonic's focus on working with other companies to deliver the best solutions to broadcast customers. The DVCPRO Partnership programme, which Panasonic started in the mid-1990s, played an important role in ensuring that customers had a choice of DVCPRO solutions from a range of suppliers.

Supporting a cost effective approach to HD production is Panasonic's partnership with several NLE manufacturers to exploit the IEEE1394 interface in the HD environment. IEEE1394 enables digital transfer without generation loss and dramatically lowers the cost of HD post-production and content distribution.

Panasonic's solid state SD memory system, at the heart of next generation P2 tapeless system, involves an extensive partnership programme. This ensures that customers have choice, security of supply and a competitive environment for purchasing equipment and making strategic business decisions.

B E N E F I T S

Key HD standards for European broadcasters

- 720p/1080i is effective solution for broadcasters in terms of production
- Growing range and demand for 720p/1080i production
- Integrates well with IT environment
- Enables European broadcasters to compete with pre-recorded HD material

HD SPECIAL

High definition broadcasting and production in Europe

(continued)



HD production will serve broadcast and film markets in Europe

Panasonic has been one of the pioneers of 720p production with cameras such as Varicam attracting wide support from programme makers

Panasonic, earlier this year, outlined its global HD technology roadmap. There are three broad themes:

HIGH-END PRODUCTION

A growing amount of high-end film production in Hollywood and other centres is moving to HD. The arrival of electronic cinema over the next 10 years will further encourage this process, meaning that the route from acquisition through to the cinema screen will become entirely digital. This sector of the market demands high-end specialist equipment.

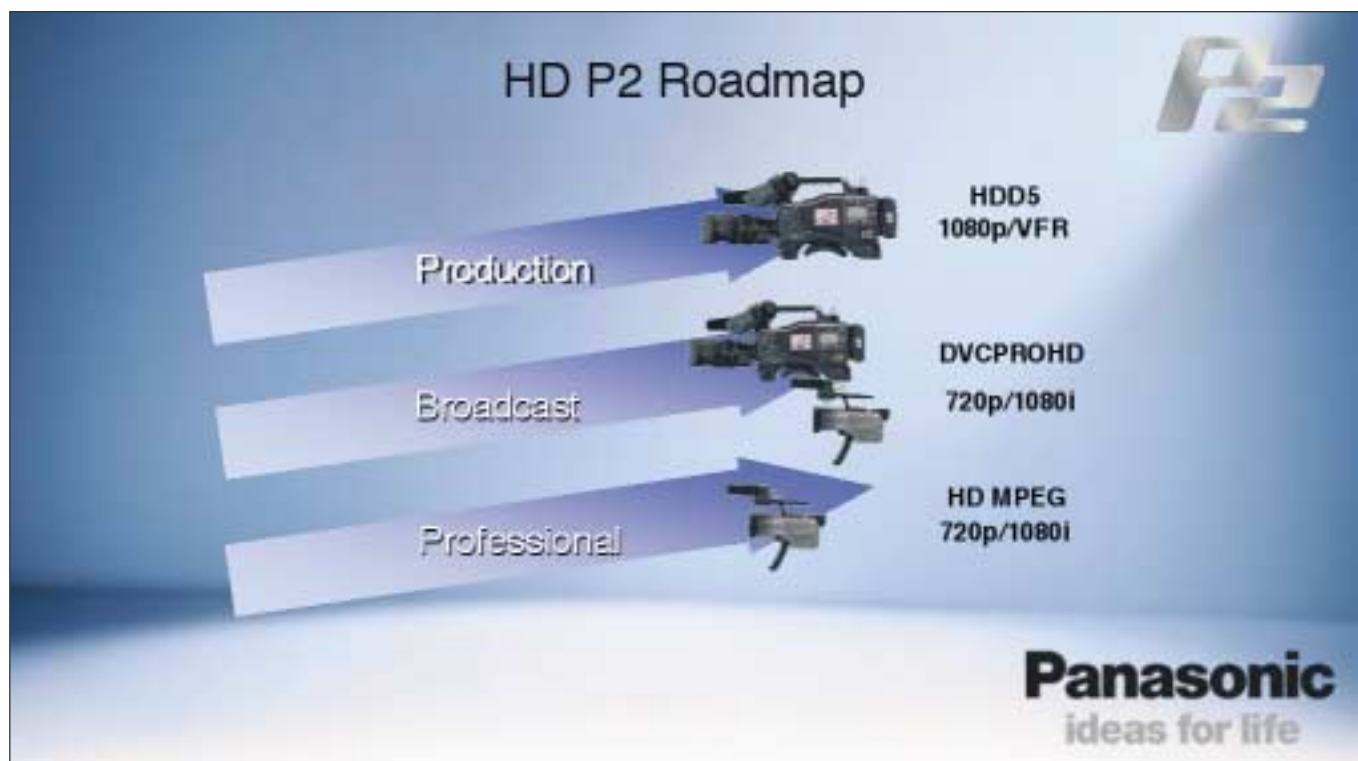
Panasonic will develop an HD-D5 P2 camcorder for global production markets. This will have 1080/50p and later 720/50p capability and be targeted at high end film style production applications. Panasonic's HD-D5 VTR is an industry standard, widely used in Hollywood and other HD production centres for mastering and as a programme bridge to the SD world. Building on HDD5's technology will ensure support for current investment by the high-end production community.

BROADCAST PRODUCTION

The requirements and cost structure of Hollywood are not applicable to the main requirements of broadcasters. News, sports, documentaries and soaps need powerful but cost effective HD production solutions. That is why Panasonic supports the cost effective development of HD broadcast equipment based on the current widely used 1080 interlaced and progressive production standard. In order to fulfil the required market needs Panasonic will support the 720/50p standard. Panasonic has been one of the pioneers of 720p CCD technology with cameras such as Varicam attracting wide support from programme makers. Equipment such as the the DVCPROHD VTR, supporting the IEEE1394 interface in the HD environment, further supports this production environment.

PROFESSIONAL PRODUCTION

There will be a large professional market seeking entry level HD solutions. Just as the DV market is used by schools, universities and businesses as well as broadcasters, so there will be a similar overlapping segment in the HD environment.



Panasonic has announced that it is developing HDV codec products based on its P2 tapeless open architecture. In 2005, Panasonic will offer an MPEG-based HD resolution palm-style mini-camcorder using P2 with a high quality recording (up to 50 Mbit). This will be targeted at the 720p/1080i professional production market.

Panasonic recognises that 1080 interlace and progressive are currently widely used for HD production in Europe and the markets in Japan, USA, Australia and Japan. Panasonic will continue to develop and support 1080 based products. However Panasonic supports the EBU and broadcasters wanting to move to the progressive HD standard, based on 720/50p.

HD SPECIAL

HIGH DEFINITION CONTENT FOR EUROPEAN CONSUMERS

Proposed HD standard promises major benefits



Large screen displays are the key to the take-up of HD services

European consumers will be accessing HD content in the home by 2006 via broadcasters

European consumers will be in a position to benefit from a range of developments which are going to make watching HD content in the home an increasingly attractive and powerful experience. Many of these technologies will be reaching mass market pricing levels in the next few years. This will make market take-up much more rapid than with early HD markets such as Japan and the USA.

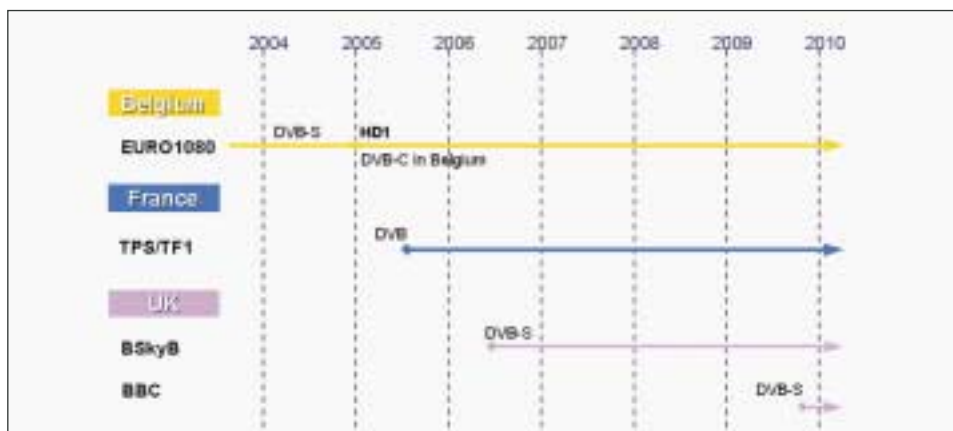
As one of the world's leading manufacturers of consumer digital video products, Panasonic continues to invest heavily in System LSI development and manufacturing facilities to support the growth of HD consumer markets in Europe and worldwide.

Delivering progressive signals to display systems in the home will provide an outstanding viewing experience for the European consumer. Progressive scan brings the world of IT and digital video together and allows consumers to benefit from developments across much larger markets.

However, developments in consumer and distribution technology over the next few years mean that European consumers will have a range of opportunities to access HD services. For example, European consumers will be accessing HD films in the home by 2006, via broadcaster such as HD1 (formerly Euro1080). TF1 in France (2005/2006) and Sky TV in the UK (2006) are also planning to start HD services. And such situation will stimulate the possibility of the Blu-ray disk equipments in European market.

The message from the consumer market is that European consumers will increasingly be accessing HD content from 2006 onwards. This is a challenge for European broadcasters and is a key factor for developing a timetable for the introduction of HD services.

COMMITMENT OF HD IN EUROPE



The following technologies are key to the delivery of HD pictures to the home:

FLAT PANEL DISPLAYS

Vital to the development of HD services in the home are flat display panels, both LCD and plasma. Their slim depth enable much wider screens to be deployed in the home and in a more stylish way than other solutions. This makes HD an attractive and exciting viewing experience for consumers.

With larger screens, consumers see clearly the difference between HD and SD content. Market research by the industry suggests that over 75% of the future flat panel market will be from size 32"-50" (81.3-127 cm). Recent research by the BBC has highlighted that for this range of sizes, 720/50p represents the best viewing solution compared to other proposed formats. Panasonic estimates that by 2010 there will be over 40 million flat panel displays in the European market and over 70% of these will be capable of receiving HD services.

For this rapidly growing market, Panasonic is providing LCD and plasma solutions from 22" (55.9 cm) upwards. From Spring 2005 all its new panels from 14"-50" (3.6-127 cm) will be capable of showing the proposed European HD standard of 720/50p as well as the current 1080/50i.

Displaying content on plasmas and LCDs requires extensive pre-processing of the signal to obtain the best results. Panasonic is investing heavily in pre-processing technology and Panasonic flat panel displays have an outstanding reputation for picture quality.

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BENEFITS

Progressive scan for European consumers

- Progressive scan distribution produces best pictures for flat panel displays
- Research shows 720 line resolution is best display solution for large screen flat panels in standard home configuration (2.8 m viewing distance from display)
- Best format for exploiting future IT home electronics infrastructure and IC development

High definition for European consumers

(continued)

Developments in coding mean that many in the industry, including Panasonic, are focusing development for HD distribution on MPEG-4 AVC



DIGITAL RECEIVERS (INCLUDING SET TOP BOXES, INTEGRATED DTV)

Receiver technology will become a key area of development in distributing HD signals to the home, whether by satellite, cable TV or terrestrial TV. MPEG-2 technology is the basis for TV distribution currently including HD services.

Developments in coding mean that many in the industry including Panasonic are focusing development for HD distribution on MPEG-4 AVC, also known as H.264. MPEG-4 AVC codecs with 720/50p capability are expected from 2006/7 onwards. MPEG-4 AVC will enable 720/50p HD pictures to be delivered to the home at around 10 Mbps data rate compared with 18 Mbps using MPEG-2, yet with the same level of quality. Especially, the state-of-art FExt technology, known as MPEG-4 AVC high profile, is quite effective in realization of high quality picture for HD, based on Panasonic's contribution.

Panasonic will continue to support development in MPEG-2 in set tops as it will continue to be the main transmission format for HD services in Europe until around 2008, when MPEG-4 AVC starts to be more widely adopted.

RECORDING DEVICES

Panasonic is a leading manufacturer of DVD recorders and players and has already introduced a next generation Blu-ray optical disk recorder for the HD market.

Blu-ray, also known as Blu-ray Disc (BD) is the name of a next-generation optical disc format jointly developed by thirteen leading consumer electronics and PC companies (Dell, Hitachi, HP, LG, Mitsubishi, Panasonic, Pioneer, Philips, Samsung, Sharp, Sony, TDK and Thomson). The format was developed to enable recording, rewriting and playback of high definition television.

Blu-ray is set to provide a powerful HD source and recording system for the consumer market. Blu-ray is also expected as a solution for European consumers to access HD content from major content owners.

Blu-ray makes it possible to record over four hours of HDTV in a dual layer format disk. Panasonic manufactures both recorders and disks. The Panasonic Blu-ray recorder is also compatible with DVD-RAM and DVD-R disks.

CONSUMER INTERFACES

Displaying HD material in the home is demanding on the interfaces that link the set top box or Blu-ray optical disk recorder to the display device. Traditional connectors do not have the bandwidth or capability to show 720p or 1080i material correctly.

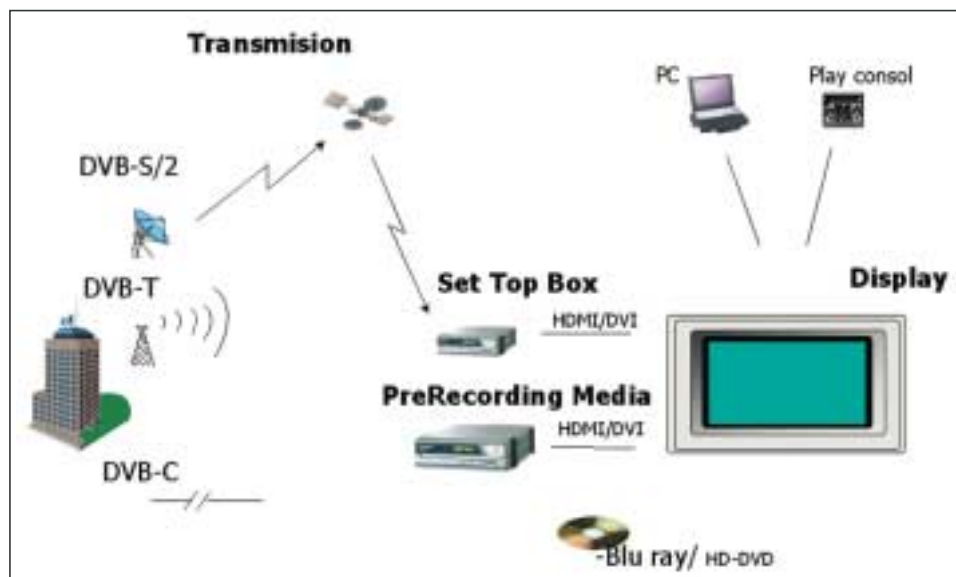
The high definition multimedia interface (HDMI) is rapidly emerging as the connection standard for HD. Developed by Sony, Hitachi, Thomson (RCA), Philips, Matsushita (Panasonic), Toshiba and Silicon Image, HDMI combines high definition video and multi-channel audio in a single digital interface to provide digital quality over a single cable.

HDMI systems will be able to automatically configure to display content in the most effective format, and automatically configure the home theatre system on demand.

HDMI has the capacity to support 5 Gbps and can support TV standards from standard definition through to 720p, 1080i and even 1080p. It also incorporates HDCP (high bandwidth digital content protection) of the HD signal.

Panasonic is introducing HDMI from 2005 onwards in European market.

DELIVERING HD TO THE CONSUMER



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Austria

Panasonic Austria Handelsges.m.b.H.
Professional AV Media
Laxenburgerstrasse 252
1230 Wien
Phone +43 (0) 1 610 80 773
Fax +43 (0) 1 610 80 777
www.panasonic-broadcast.at

Belgium

Panasonic Belgium n.v.
Stationstraat 26
1702 Groot-Bijgaarden
Phone +32 (0) 2 481 04 57
Fax +32 (0) 2 481 04 53

Bulgaria*

Techno Bulgaria Ltd.
No. 104 "Vassil Levski" Blvd.
1000 Sofia
No.12b "Ivan Assen II" Str.
1504 Sofia
Phone +359 (2) 946 0786
Fax +359 (2) 946 0220
www.techno.bg

Czech Republic

Panasonic Czech Republic, s.r.o.
Krizikova 237/36A
186 00 Prague 8
Phone +420 236 032 552 / 511
Fax +420 236 032 450
www.panasonic.cz

Croatia*

Euro-V.A.L.d.o.o.
Mirna 11
10040 Zagreb
Phone +385 1 2850 238
Fax +385 1 2850 238
www.euroval.hr

Exportdrrvo dd
Marulicev trg 18
10000 Zagreb
Phone +385 1 45 60 326
Fax +385 1 48 29 945

Denmark

Panasonic Danmark A/S
Branch of Panasonic Nordic AB
Ejby Industrivej 1
2600 Glostrup
Phone +45 43 20 08 57
Fax +45 43 20 08 68

Finland, Latvia, Lithuania, Estonia*

Kaukomarkkinat Oy
Kutojantie 4
02630 Espoo
Phone +358 (9) 521 52 53
Fax +358 (9) 521 28 10
www.panasonic.fi

France

Panasonic France S.A.
270 avenue du Président Wilson
93218 La Plaine Saint-Denis
Phone +33 (0) 1 49 46 43 59
Fax +33 (0) 1 49 46 45 26
www.panasonic.fr/video-pro

Germany

Panasonic Deutschland
Professional AV Media
Hagenauer Str. 43
65203 Wiesbaden
Phone +49 (0) 611 235 401
Fax +49 (0) 611 235 411
www.panasonic-broadcast.de

Greece*

Intertech S.A.
24, Afroditi St.
16777 Helliniko
Phone +30 210 96 92 300
Fax +30 210 96 48 588

Hungary

Panasonic Hungary Ltd.
Neumann János u.1
1117 Budapest
Phone +36 (1) 382 60 85
Fax +36 (1) 382 60 80

Italy

Panasonic Italia S.p.A.
Via Lucini 19
20125 Milan
Phone +39 02 67 88 449
Fax +39 02 67 88 495

Kazakhstan

Panasonic (CIS) Oy
Almaty Rep. Office for Central Asia
Seifullin Ave., 516
Almaty 480091
Phone/Fax +7-3272-504 777;
-502 414; 502 124

Montenegro, Serbia*

Hitex SA
16 Fin de la Croix
1762 Givisiez
Switzerland
Phone +41 (0) 26 466 25 20
Fax +41 (0) 26 466 50 40
www.hitexsa.com

Netherlands*

Haagtechno bv
Europalaan 30
5232 BC 's-Hertogenbosch
Phone +31 73 64 02 577
Fax +31 73 64 15 200
www.panasonic.nl

Norway

Panasonic Norge
Branch of Panasonic Nordic AB
Skaresletta 50
1471 Loerenskog
Phone +47 67 91 78 00
Fax +47 67 91 78 96

Poland

Panasonic Polska Sp.z.o.o.
Al. Krakowska 4/6
02-284 Warszawa
Phone +48 (22) 338 1100
Fax +48 (22) 338 1200

Portugal*

Prosonic - Produtos de Imagem e
Comunicação, S.A.
Rua Teles Palhinha, N° 3
Leião - Tagus Park
2744-015 Porto Salvo
Phone +351 21 425 77 04
Fax +351 21 425 7705
www.prosonic.pt

Romania*

PBR Ltd.
No. 22 "Tudor Arghezi" Str.
020946 Bucharest
Phone +40 21 211 4855
Fax +40 21 210 3061

Russia & CIS

Panasonic CIS Oy
Professional AV systems dept.
Profsojuznaya str., 56, 7th floor
117393 Moscow
Phone +7 095 258 42 06
Fax +7 095 258 42 24
www.panasonic.ru

Slovak Republic

Panasonic Slovakia, spol. s.r.o.
Stúrova 11
811 02 Bratislava
Phone +421 (0) 2 52 92 14 23
Fax +421 (0) 2 52 92 14 11

Slovenia, Croatia, Bosnia, Macedonia*

ON-AIR Systems Ltd.
The Media Centre
131-151 Great Titchfield St.
London W1W 5BB

TSE.d.o.o.
Audio Video Inzeniring
Trzaska 126
1000 Ljubljana
Phone +386 24 25 422
Fax +386 1 423 71 90
www.tse.si

Spain

Panasonic España, S.A.
Dept. AVC Profesional -
Josep Tarradellas, 20-30, 5pl.
08029 Barcelona
Phone +34 (93) 425 93 00
Fax +34 (93) 425 94 35
www.panasonic.es

Sweden

Panasonic Nordic AB
Ellipsvägen 12
141 75 Kungens Kurva
Phone +46 (8) 680 26 41
Fax +46 (8) 680 27 70

Switzerland*

John Lay Electronics
Professional Audio Video Systems
Littauerboden 1
6014 Littau
Phone +41 (0) 41 259 96 32
Fax +41 (0) 41 252 03 12
www.panasonic.ch

Turkey*

Basari TV Yayincilik Sistemleri A.S.,
Yesil Vadi Sk. 6,
Icerenkoy, 34752,
Istanbul
Phone +90 216 578 3700 Ext.: 2525
Fax +90 216 578 3744
www.basari.tv

Ukraine

Panasonic (CIS) Oy Kiev office:
Ukraine, 01001, Kiev,
Mikhailovskaya str. 11
Phone +380-44-4903437 /
+380-44-4903438 (ext. 112)
Fax +380-44-4903439

United Kingdom and Ireland

Panasonic Broadcast
Willoughby Road
Bracknell, Berkshire, RG12 8FP
Phone +44 (0) 1344 70 69 20
Fax +44 (0) 1344 70 69 19
www.panasonic.co.uk

* Authorised distributor

Panasonic Broadcast
a division of Panasonic Marketing Europe GmbH
Hagenauer Strasse 43
65203 Wiesbaden/Germany
Phone +49 (0) 611 235 481
Fax +49 (0) 611 235 479
info@panasonic-broadcast.com
www.panasonic-broadcast.com
www.panasonic-europe.com