B 9318 E

TELE satellite

#215 GLOBAL DIGITAL TV MAGAZINE 02-03/2010

Made in 中文

Incredible Mass Production at CHANGHONG

The Quality Control Experts at SKYWORTH

Presenting DTT from JIUZHOU

SVEC - Your Choice of Dishes From Sichuan

Witnessing the Birth of a New STB Manufacturer KAIFA

TELE satellite AWARD 02-03/2010

Test Report

Trimax SM-3500

Brandnew: Satellite Meter with TV and Spectrum Analyzer

TOPFIELD®
LEADER OF MULTIMEDIA HOME

www.i-topfield.com

Multimedia HDTV Twin Tuner PVR with DivX playback

SRP-2100 TMS

PVR

Playing recorded programmes at up to 64 times speed at maximum.

YouTube

Playing media contents of YouTube.

MULTIMEDIA

Playing video files of DivX, MPG, MP4, VOB, MKV and FLV.

SHOUTcast

Playing SHOUTcast Internet radio

Twitter

Blogging with Twitter

Game

Featuring on-line game BATTLE TANK

- Able to transfer media files among network users.
- Providing Yahoo Flickr and Google Weather.

HD High Definition | DivX | DOLBY DIGITAL | DVB Digital Video Broadcasting

* Specifications, functions or design of this product shall be subject to chage for improvement without any futher notice.

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TELE-satellite was established in 1981 and today is the oldest, largest and most-read digital tv trade magazine in the world. TELE-satellite is seen by more than 250,000 digital tv professionals around the world and is available both in printed form and online. TELE-satellite is published worldwide in 22 language editions.

www.TELE-satellite.com

Dear Readers,

The focus in this issue of TELE-satellite is on China. We started out with asking ourselves where all the receivers actually come from. Up until a few years ago the answer would have been not so clear with manufacturers based in many different countries, but today most receivers originate from China. And even if that's not the case for a particular model or brand, some of the built-in components will almost certainly have been made in China.

A cluster of satellite-related companies has established itself in China. This means that transport routes are reduced to a minimum and all parts and services required for receiver production are readily available. It goes without saying that such a company cluster serves as a magnet for new manufacturers as well so that in the end a collection of highly-skilled companies is created, all of which are able to offer top quality at hugely competitive prices. After all, there's not a single anchor company setting the tone but a variety of competing manufacturers.

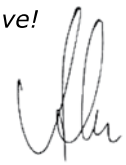
Let's stick to the topic of prices for a moment: Many Chinese manufacturers work on an OEM (original equipment manufacturer) basis, which means they produce receivers on behalf and in the name of an established brand, trade company or content provider. This seems to make a lot of sense from the manufacturer's point of view, as they are only dealing with a small number of large clients and their respective specifications. However, what sounds like a perfect arrangement can easily turn into a millstone around the neck as soon as the economy begins to slow down. If a manufacturer has to rely on a small number of clients these are in a position of trying to beat down prices, reducing orders or withdrawing capacity at all.

You can only avoid this dilemma if you're able to establish your own brand and become independent of established clients. Because you need your own brand on a global scale to be able to decide about strategies, products and markets. Many Chinese manufactures find themselves in this transition period from dependent OEM manufacturer to independent brand at this very moment. While some have almost reached this goal, others are only embarking on the journey.

That is why we have paid a visit to some of the largest manufacturers in China. Increasing self-confidence on the world market also implies that manufacturers stand face-to-face with buyers of their products. It's no longer a third-party brand name that is printed on the front panels, but the manufacturer's own name. Responsibility lies with the manufacturer exclusively and there's no excuse for less-than-perfect quality.

Let there be no doubt about it: The Chinese manufacturers we visited set great store by quality assurance. See for yourself when you read through the company reports on the following pages. Quality and price are two of the attributes that open doors for these manufacturers to become recognised brands in their own right. This development will also boost trading transactions because a manufacturer competing on the market with its own brand also has a feeling of what the market expects or demands. In return, such a manufacturer is in a much better position to offer large clients perfectly tailored products.

Little-known OEMs are entering centre stage – what a smart move!



Alexander Wiese

P.S.: My favourite radio station this month is 'Petőfi Radio' (HOTBIRD 13E, 12.149/V/27500) from Hungary. Tune in for surprisingly international pop music variety with only few commercial breaks and little spoken content.

Technomate

The First Triple Tuner High-Definition PVR

TM-7100 HD TRIPLE TUNER PVR

2x Satellite HD Tuners & 1x Terrestrial Tuner

- Triple Tuner High-Definition PVR
- Supports up to 1TB S-ATA 3.5" & 2.5" HDD
- Easily remove HDD via HDD Bay on side of TM-7100 HD
- 2x USB 2.0 Ports: PVR function, MP3 & JPEG Playback & Software Transfer
- Record:
  - 1 Channel from each Tuner & Playback a Recorded File at the same time
  - 3 HD Satellite Channels at the same time (2 have to be on same TP)
- 2x Smart Card Readers & 2x Common Interface (CI)
- Ethernet Communication Port, RF Modulator & Blind Search

HDD Bay on Side of PVR:

TM-6800 Super+

Satellite HD

TM-6900 HD COMBO Super+

Satellite HD & Terrestrial

- Record 2 Channels at the same time (on same tp) & playback a recorded file at the same time
- Record 1 Satellite & 1 Terrestrial Channel & Playback a Recorded File at the same time (TM-6900)
- 2x USB 2.0 Ports (Front + Rear)
- RF Modulator
- eSATA & Blind Search
- Ethernet Communication Port

Linux Open Source Running Enigma

TM-500 / TM-600

- Unlimited Channel Memory
- Ethernet Communication Port
- 2x Scart Outputs
- RF Modulator
- Smart Card Reader
- Super Sensitive Tuner
- Internal Power Supply

TM-500

TM-600 Extras

- 3x USB 2.0 PVR (Front, Internal & Rear)
- Record/Playback Scrambled & Free-To-Air (FTA) Channels by USB
- USB 2.0 for Software Download & MP3 Playback
- Component Output (YPbPr)

TM-600

Linux Inside

Technomate

Future Electronics Ltd
8A Nicou Pattichi Street, 3071, Limassol, Cyprus
Tel: +357 2533 3652

FROM A DIFFERENT PERSPECTIVE

OPENSAT

OPENSAT 9700/9900 HDPVR

- 1xSmartcard reader • 2xCI slot • Fully compliant with MPEG-4 HD/H.264 (DVB-S/SVB-S2)
- Video resolution 576i,p/720p/1080i • Various video output (HDMI/YPbPr/Scart/CVBS)
- Multimedia functions (MP3/JPG/DivX play support) • VFD display
- PVR ready through USB 2.0 interface • RJ-45 Ethernet interface (9900HDPVR model)
- Blind Scan/Fast Scan/Unicable support • Background recording&playback while recording function

ABC BIZNIS

ABC BIZNIS s.r.o. Krušovská 4646, 955 01 Topoľčany, Slovakia, Tel.: +421 38 5313508
Fax: +421 38 5313508, E-mail: info@abcbiznis.sk, Web: www.abcbiznis.sk

more info: www.opensat.sk

CONTENT

TRIMAX SM-3500
Satellite Meter with
TV and Spectrum 18

NETUP DUAL DVB-S2-CI
Two Tuner HDTV
Satellite PC Card 24

TECHNOMATE LNB
Multiple Output LNB 30

SPAUN SVN 231 F
Satellite and Terrestrial
Amplifier 36

JIUZHOU DVE-4Q
Professional Satellite Encoder..... 40

Company Report:
DTT at JIUZHOU, China 10

Company Overview:
Best Satellite Companies
of the World.....46

Company Report:
Receiver and TV Manufacturer
CHANGHONG, China 50

Company Report:
Satellite Receiver Manufacturer
KAIFA, China 62

Company Report:
Professional Dish Manufacturer
SVEC, China 74

Company Report:
Receiver Manufacturer
SKYWORTH, China 84

Company Report:
Satellite Dealer COWMIX
in Arizona/USA.....96

DXer Report:
Satellite Reception Station India 100

Satelliten Information:
New Satellites..... 106

News: Satellites Transmissions 108

News: IPTV & Cable 110

News: Digital Terrestrial Television .. 114

News: HDTV Programmes 118

World DTT Chart 122

Global Satellite Coverages 138

History: 10 Years Ago 176

ADVERTISERS

ABCBIZNIS..... 5
ABCOM 16
ALUOSAT 115
ANGA-2010.....55
AZBOX..... 179
AZURE SHINE..... 117
BOIINGSAT 45
BYA ELECTRONIC 113
CABSAT-2010 103
CCBN-2010.....65
CES-2010 77
CHANGHONG.....13
COMMUNICASIA-2010.....69
CONVERGENCEINDIA-2010 83
DISHPOINTER..... 107
DOEBIS 8-9
DVBWORLD 117
HORIZON 53
INFOSAT.....89
GLOBAL INVACOM 27
JIUZHOU 180
MFC.....93
MOTECK 111
NAB.....87
NANOXX.....43
NETUP.....93
OPENBOX 71
PENTHOUSE 21
PROMAX.....59
PULSTAR 107
SAB 73
SATCATCHER 95
SATCOM AFRICA-2010.....97
SATCOM RUSSIA-2010 109
SEATEL.....39
SKYWORTH 7
SMARTWI.....15
SPAUN.....33
SVEC 29
TECHNOMATE 4
TEHNICB 95
TEKNIKSAT.....67
TOPFIELD..... 2
TRIMAX.....35
TRUSAT 81

Skyworth

OUTSTANDING **STB HARDWARE** MANUFACTURER FROM CHINA

HS11

DVB-S2 HD with ALI chipset (HOT-SELLING)

- Based on ALi single chip processor
- SD/HD 1080i(HDCP) MPEG-2/4(H.264 AVC), AAC & fully DVB-S/S2 compliant
- Conax 7 CA embedded / Common Interface
- 8 Timer Reservations for turning on/off and channel switching
- Picture browering from USB disk
- 8 Digit/Char 14 Segment VFD Display

T18

DVB-T SD MPEG4

- Based on ALi single chip processor
- SD MPEG-2/4 H.264, AAC & fully
- DVB-T compliant
- FTA / Conax 7 CAS Embedded
- PVR and Timeshift supported
- Picture Browser embedded
- Software upgrades through RS232 port and USB

S1K

DVB-S SD with USB PVR and LAN

- Built in Ali 3329E Single Chip processor
- Mpeg-2 digital@fully DVB-S compliant
- Dual scart+RCA+SPDIF+USB+LAN
- Single Turner PVR with time shifting function
- Real standby<1w(OPTIONAL)

S1B

DVB-S Low-cost

- Built in Ali3329C single chip processor
- MPEG-2 digital &fully DVB-S compliant
- Single scart +RCA+SPDIF
- Real standby<1 w(optional)
- 4000 channels TV and Radio Programmable

T26

DVB-T SD with USB PVR

- Based on Cheertek single chip processor
- MPEG-2 digital & fully DVB-T compliant
- Double scart+USB+SPDIF
- 256 colors on screen display
- Fully support to 7 days electronic program
- Software upgrades through RS232 port and USB,receiver to reveiver

T28

SCART STICKER with USB PVR

- Based on Cheertek single chip processor
- MPEG-2 digital & fully DVB-T compliant
- 256 colors on screen display
- Single cart +USB+PVR
- Fully support to 7 days electronic program
- Software upgrades through RS232 port and USB,receiver to reveiver

SHENZHEN SKYWORTH DIGITAL TECHNOLOGY CO., LTD.
www.skyworthdigital.com

ADD: UNIT A13-16/F, SKYWORTH BLDG., GAOXIN AVE.1.S., NANSHAN DISTRICT, SHENZHEN, CHINA
TEL: +86-755-26743854
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Kompetenz in Satellitentechnik

WE ARE DISTRIBUTOR OF

TOPFIELD · STRONG DIGITAL TV · VANTAGE · JAEGER · HUMAX · emme esse ANTENNA SYSTEM · SMW SWEDISH MICROWAVE AB · emitor · MICROELECTRONICS TECHNOLOGY INC. · ALPS · GIBERTINI · ALLVISION · Inverto digital-labs · SPAUN · Stab

TOPFIELD

Topfield Media Solution

Features available at launch

- Fully compliant with DVB-S2.
  - * High profile level 4.1 H.264/AVC streams @ 30fps
  - * High or main profile level 3.1 H.264/AVC streams @ 60fps
  - * HD MPEG2 4:2:0 streams @ 30fps
  - * SD MPEG2 4:2:0 streams @ 60fps
- Supports DiSEqC 1.0, 1.1, 1.2 and USALS protocols for dish control.

Experience the future of digital receiver

- Stores up to 7,000 TV services and 3,000 radio services.
- Displays picture-in-picture with two HD services.
- Supports time-shift up to 5 hours at maximum.
- Records two services simultaneously while displaying another service.
- Able to record directly to both an external hard drive and a built-in hard drive (USB/eSATA).
- Playing recorded programmes at up to 64 times speed at maximum.
- Enables you to sort out any undesirable parts such as commercials during the programme.
- Supporting video files of DivX 3.11, 4.1 and 5.x.
- Displays JPEG image files.
- Featuring a double-player game 'BATTLE TANK'.
- Plays media contents of YouTube.
- Firmware updates available : over-the-air, with a USB memory stick, and from the Topfield's firmware server via Internet.

Features will be available by firmware updates

- Enables you to record the video from an external device such as a digital camera.
- Enables you to chat with other users via Internet.
- Enables you to enjoy the double-player game with other users via Internet.
- Enables you to transfer media files between the PVR and your computer with embeded web & FTP servers.
- Supports MediaHighway EPG
- Supports Sony tvtv EPG

PVR
Playing recorded programesat up to 64 times speed at maximum

GAME
Featuring a double-player game „Battle Tank"

UCC
Playing media contents of YouTube

DivX
Supporting video files of DivX 3.11, 4.1 and 5.x

TOPFIELD

TF 5050CI HDMI

- Fully DVB-S compliant
- 2 Common Interface
- 5000 TV & radio services programmable
- 256 colors On-Screen Display (OSD)
- Service & Favorite service list editable
- Electronic Program Guide (EPG) supported
- Exciting games embedded
- Firmware upgrade by Over-The-Air
- HDMI output

Measuring Instruments

emitor MEGALOOK

MEGALOOK helps professional users to do exact adjustments and maintenance of satellite dishes and of cable TV and terrestrial networks.

- Input frequency: 2-900 MHz and 920-2150 MHz
- 4.5" B/W Monitor for PAL/NTSC
- Lots of memory positions for spectrum pictures
- RS232 for PC-connection
- Built in, rechargeable battery.
- Only 7.5kg complete with carrying case

ALSO AVAILABLE:
Combolook, Digital Satlook NIT
Satlook Micro +, Satlook Mark IV

DIGIAIR pro

The meter to use for easy Digital terrestrial installations. Very sensitive, easy to maximize weak and strong signals.

- Handy spectrum-analyzer for frequency 45-862MHz
- Presents full range and expanded spectrum
- Ready for Mpeg2 and Mpeg4 signals
- Signal level readout in dBuV, BER
- Digital-signals present BER and S/N-ratio
- High resolution back-lighted LCD display
- Very high accuracy, ±1dB at 20°C

DIGISAT PRO ACCU

Measuring instrument for dish-properties. Check two LNBs at the same time. With DiSEqC tester.

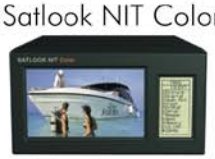
AISO AVAILABLE:
- Digisat
- Digisat+
- Digisat Pro
- Digisat Multi

Satlook Micro HD

Now with DVB-S2 support!

- Measure DVB-S and DVB-S2 signals
- Spectrum-analyzer with zoom function
- EasyFind satellite identification for faster installations
- Super bright 3" LCD display
- Very sensitive, easy to maximize weak and strong signals
- Digital BER, QPSK (DVB-S), 8PSK (DVB-S2) and S/N-ratio
- Readout NIT -gives Satellite ID and TV/Radio-channel info
- X-pol. function for optimize LNB skew
- DiSEqC according to level 1.0, 1.1 and 1.2
- LNB voltage 13/18V, 22KHz tone switch
- Stores up to 99 memory positions
- RS232 for PC-connection (up/download)
- Built in, rechargeable battery

Satlook NIT Color



- DVB satellite-receiver 920-2150MHz
- Spectrum-analyzer with expanded spectrum
- 5" 16:9 LCD color display
- DVB-S (Free to Air) and Analog TV-picture
- Digital BER, QPSK and S/N-ratio
- DiSEqC according to level 1.0, 1.1 and 1.2
- KU- and C-band (normal/inverted video)

TOPFIELD

TF 6500T HDMI

DVB-T Receiver

- HDMI outputport, 576p, 720p, 1080i
- Fully DVB-T compliant
- 2000 service TV & Radio programmable

TF 6000 FE

Digital satellite Receiver

- MPEG-2 Digital and fully DVB compliant
- DiSEqC 1.0, 1.1, 1.2 and USALS (DiSEqC 1.3)
- 5000 services (TV and Radio) programmable

PCMCIA-Modules

- CONAX
- IRDETO
- VIACCESS
- ASTON / SECA
- CRYPTOWORKS
- CRYPTOWORKS (Arena)

- ALPHACRYPT Light
- ALPHACRYPT Classic
- ALPHACRYPT TC
- VIACCESS MPEG 2+4
- CONAX MPEG 2+4

STRONG DIGITAL TV

NEW

SRT 6205 - PVR Ready

USB recording capability

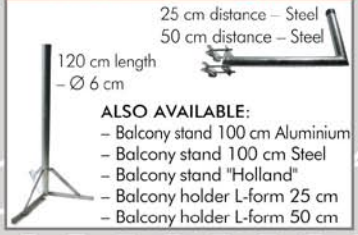
- Digital Satellite Receiver
- UHF Modulator to connect the receiver to TV
- Display showing channel number
- 2 Common Interface slots
- USB port: for playing music files and viewing photos, play back of TV programmes recorded by the receiver

SRT 5246 Hybrid

Satellite + Terrestrial FTA

- For all digital Free-To-Air TV and Radio programmes via terrestrial antenna and satellite
- Audio- and Video in DVD quality
- Mosaic function: 4 or 9 TV channels in overview

Balcony mounting parts



ALSO AVAILABLE:
- Balcony stand 100 cm Aluminium
- Balcony stand 100 cm Steel
- Balcony stand "Holland"
- Balcony holder L-form 25 cm
- Balcony holder L-form 50 cm

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Dr.-Günter-Henle-Str.4
D-56271 Mündersbach

Fon: +49-(0)26 80 98 79-0
Fax: +49-(0)26 80 98 79-19

Email: info@doebis.de
Web: www.doebis.de

DOEBIS

expertise in satellite technology

Your competent partner for over 22 years

HDTV Receiver Selection

VANTAGE HD 8000 S — NEW

DVB-S HDTV Twin PVR
- Equipped with two DVB-S2 tuner
- Ethernet Port(Just HD7100 Series)
- Fully DVB-S / DVB-S2 (H.264) HD compliant
- USB 2.0 supported
- HDMI
- 2 CI and 2 Smart card Reader

TOPFIELD TF-7700 HD PVR

HDTV digital satellite Receiver with personal video recorder
- Fully DVB-S / DVB-S2 (H.264) HD compliant
- With 2 tuners
- Time shift supported
- USB memory supported

TOPFIELD TF-7700 HSCI / TF-7700 HCCI

HDTV for satellite and cable reception
- Supports MPEG-2, MPEG-4, H.264 and fully DVB compliant
- 2 Common Interfaces
- USB 2.0 supported for fast PC interface
- VFD Display for service information

Multiswitches/ DiSEqC-Switches

- SPAUN
- DTRON
- JAEGER
- JOHANSSON
- MAXIMUM
- BEST

From 2 in/1 out
up to 17 in/36 out

S2 SPAUN™ Full range

Multifocus Dish

emme esse ANTENNA SYSTEM — Clarkalign

Professional multisattelite system

- Suitable for M-ML dishes ø 85/100/115cm
- Mount with Skew adjustment of the dish for a perfect alignment of the received satellites
- Multi-feed-holder designed for an easy pointing

An innovate system to reiceive the signal from various satellites at the same time, using one fixed mount, high gain, offset dish. When there is a big difference between longitude of the receiving dish and that of the transmitting satellite, the pointing of the dish leads to another "disalignment" between the antenna axis and the Clarke belt. This system, by the rotation of the parallel dish, allows axis realignment, assuring a stronger signal.

Optical fibre LNB

INVACOM — Innovation in Communications

Fibre LNB

with optical fiber connection

The Fibre Optic LNB can feed the whole Ku-band to up to 32 end-points.

AVAILABLE ACCESSORIES:

Optical 2, 4 or 8 way MDU can imitate a twin, quad or quattro LNB, and you can have up to 32 MDUs from one Fibre Optic LNB

1x2, 1x4 or 1x8 optical fibre coupler

Optical cable from 1,0 meter up to 200 meters

Full LNB range INVACOM available as:
SNH-031, TWH-031, QTH-031, QDH-031, SNF-031, TWF-031, QTF-031 and QDF-031

LNBs

- MTI
- BEST
- INVACOM
- ALPS
- INVERTO
- MAXIMUM
- TITANIUM, etc.

- **Single Universal**
- **Twin Universal**
- **Quattro Universal**
- **Quad Universal**
- **Octo LNB**
- **Monoblock Single Universal**
- **Monoblock Twin Universal**
- **Monoblock Quad**
- **C Band**
- **Circular**

and many more

Inverto

- **Red Extended - 40mm, 0,3dB**
- **Black Premium - 40mm, 0,2dB**
- **Black Ultra - 40mm, 0,2dB**
- **Black Multiconnect - 23mm, 0,2dB**

All available as:
- Single Universal
- Twin Universal
- Quattro Universal
- Quad Universal

Full LNB range INVERTO available from stock

Parts

Multifeedholder for 2, 3, or 4 LNB

Wallmounts
15 cm distance – Aluminium
25 cm distance – Aluminium
35 cm distance – Aluminium
45 cm distance – Aluminium
55 cm distance – Aluminium
35 cm distance – Steel
45 cm distance – Steel
50 cm distance – Steel
70 cm distance – Steel

F-Connector – 7 mm
F-Connector – 7 mm waterresistant
F-Connector – 4 mm and more

Remotesystems
AV-Linker – Videosender for remote control
Remote Blaster
Zapline 2 and more

BIGLink

Koaxialcable
High Qualitiy coax cable
Minicable Coax
Mini-Twincable Coax
> 100 dB / > 110 dB

Motors

Aktuatoren/ Actuators

Mini Actuators – 6", 8", 10", 12"
Regular Actuators – 12", 18", 24"
Heavy Actuators – 24", 36"

H-H Mounts

SG 99 / SG 99 II	– up to 1,00 m
SG 107	– up to 1,10 m
SG 2100 A DiSEqC 1.2	– up to 1,00 m
Stab HH100 DiSEqC 1.2	– up to 1,00 m
Stab HH120 DiSEqC 1.2	– up to 1,20 m

Dishes

GIBERTINI — TRIAX — emme esse MULTIMEDIA SYSTEM

40 cm	– White
70 cm	– White, Black, Red
90 cm	– White, Black, Red
100 cm	– White, Black, Red
120 cm	– White
130 cm	– White, Black
160 cm	– White

Big Dishes directly from our warehouse!

IRTE

SDI	1,50 m
SDI	1,80 m
Irte	2,00 m
Irte	2,40 m

Flat-Dishes

SELFSAT H10D / H10D2

- Works on all Ku-band Satellites
- Cross polarization improved
- Ideal for High Definition (HD) reception

MAXIMUM Flat-1

- Receives alle programs broadcasted by european satellites
- 2 LNB (twin) output for 2 set-top-boxes plugged
- 60/70 cm equivalency

Unicable solution

Inverto digital-labs

IDLP UST110-CUO10-8PP

Unicable-Standard one cable solution.
Cascadable multiswitch for up to 16 users.

UNICABLE TECHNOLOGY

Türkçe konusan personele sahibiz ! Мы говорим и даём консультации на русском языке!

More products and informations you`ll find on our website www.doebis.de

Terrestrial Receivers at Jiuzhou

Our readers are very familiar with Jiuzhou - have a look at TELE-satellite issue 02-03/2007. In 2008 Jiuzhou celebrated their 50th birthday and moved into their new Jiuzhou Electric Building (see TELE-satellite issue 02-03/2008). In September 2009, when the Shenzhen Metro Line 1 was extended, Jiuzhou became close to a Metro station. It's a five minute walk to the station which has a nice and fitting name: "Hi Tech Park".

The Jiuzhou Electric Building in Nanshan's High Tech Park, a part of Shenzhen in southern China directly across from Hong Kong. There is a restaurant, the "Raindrops Café", in which managers and high-ranking guests sit down and have a bite to eat.

JIUZHOU

TELE-satellite World

www.TELE-satellite.com/...

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Turkish	Türkçe	www.TELE-satellite.com/TELE-satellite-1003/**tur**/jiuzhou.pdf

Available online starting from 29 January 2010

We've already reported several times on Jiuzhou's satellite receivers, but now that terrestrial reception is taking on more meaning, we wanted to know what the current situation at Jiuzhou is. Who better to tell us what's going on than the Manager of the R&D team.

Zhang Enyong explains to us what's new: "A few years ago Jiuzhou began producing terrestrial receivers and just recently also ISDB-T receivers for the Latin American market." Since early 2008 Jiuzhou has entered the local DMB-TH market. R&D team leader Zhang Enyong tells us: "Our R&D team is focussing right now on a combo box for DVB-T and DVB-C, which will be ready in early 2010."

Roughly 50% of their terrestrial receiver production is for the DVB-T standard, 35% is for the American ATSC standard and the remaining 15% for the Latin America ISDB-T standard.

Huang Wei, Sales Team Manager, expands on this: "For 2010 and 2011 we are expecting an increase in DVB-T sales of 20% each year." At the moment standard resolution boxes (SD) make up the majority of sales, namely 60%, "but for 2011 we see that changing: HD will then make up 60% of receiver sales whereas SD boxes will drop to about 40%."

Of course we're nosy about anything new coming from Jiuzhou. "We're just now starting with a DVB-T2 PVR receiver", reveals R&D team leader Zhang Enyong, "and we're also working on developing a twin tuner model that should become available in mid 2010."

He then walked into his laboratory

■ **Zhang Enyong is the R&D team Leader and is seen here showing us a brochure of one of Jiuzhou's brand new receivers.**

■ **Marketing Assistant Zoe Liu shows us a sample from the new DVB-T2 series.**

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■ Gina Yan from the Overseas Marketing Department is seen here showing us the developmental model of the mobile TV with DVB-T antenna.

and came back with a sample unit: "This is our newest product; a mobile TV with DVB-T."

This product will undoubtedly be a hit since such a small TV would be a lot of fun to play with. "This product should be ready in mid 2010", explains Zhang Enyong.

Zhang Enyong leads a team of 100 engineers. "Roughly 50 of them are involved exclusively with DTT", explains Zhang Enyong. We can't wait to see all the upcoming new and interesting products from Jiuzhou!

■ Huang Wei is in charge of the sales team (background). Anyone who orders with Jiuzhou ends up with one of the 40 employees that work here.

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Trimax SM-3500

A Lightweight Device Bursting with Great Features

If there is one trend we at TELE-satellite have been observing in recent months it's that small, handy and inexpensive digital satellite meters have sprung to prominence. We only need to look back a handful of years to bring back memories of bulky and heavy devices carrying price tags that were far too hefty for average private users. Think of the price of a small used car to give you some impression.

In recent issues we have already introduced some representatives of the new and lightweight generation of signal meters, and this time we'd like to draw your attention to the new Trimax SM-3500, complete with a fully-fledged review of its features.

Packed in a sturdy cloth bag this new arrival only has the size of small brick, but without the corresponding weight. With just half a kilo it must be one of the lightest meters on the market today, especially since that figure already includes the battery pack. On the meter's top an F socket is available for signal input, while all other connections to the outside world are positioned on the bottom side of the Trimax SM-3500. In detail, there is the power input, audio and video input and output and a USB interface for PC connectivity.

The high-resolution 3.5" display is protected by a robust flap and – thanks to its dimensions – is very easy to read. Slightly below the display a total of 29 buttons are available to access all functions and features of the SM-3500.

Four of them are designed as so-called function keys right below the display and another eight are placed on the lower right segment and also serve as function keys. A numeric pad as well as a cross-shaped cursor key with central OK button in the upper right corner complement the control layout.

We particularly appreciated the perfect pressure point of all buttons which provide just enough feedback without having to press them too hard. Even when using the carrying case with the transparent protective foil over the control panel the device is easy to operate while at the same time being protected from dirt, rain, splashing water or other potentially harmful elements. All buttons are cleverly arranged and clearly labelled.

Thanks to the 12 function keys – which access certain frequently used modes and features at the touch of a single button – the meter is not only easy but also very quick to use. The device even comes with a sun visor which can be velcroed to the meter so that you'll be able to read the display also in the middle of the day under direct sunlight.

Speaking of the display, we can commend Trimax for offering such a bright und crisp screen which truly proves its merits in everyday use. Trimax ships the SM-3500 in stylish carton packaging which includes the meter itself as well as all special equipment secured in precisely shaped foam padding.

The package comes with a charging cable for wall outlets and a 12 V car charger together with the power pack, connecting cable for hooking up the meter with a PC, A/V cable, carrying strap, CD with an English-language manual and F adaptor for connecting the signal line to the device.

Overall, the workmanship of the SM-3500 leaves nothing to be desired and the manual turns out to be very well designed and provides answers to any questions that may arise when working with this new Trimax signal meter.

Everyday use

When the device is switched on for the first time the display shows the main menu right away. In addition, all five coloured LEDs initially light up during booting.

These LEDs are located between the upper and lower function keys and indicate whether the integrated battery pack is being charged, whether a transponder is actively read and locked, whether 13V or 18V supply voltage is provided and whether a 22 kHz signal for the high band is being generated.

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Available online starting from 29 January 2010

This way you always know the operating mode of the meter at a single glance, which is a feature we have badly missed in so many competing products.

Even though we could hardly wait for re-adjusting our 120 cm antenna on our editorial office's roof with the help of the SM-3500, we still started out with changing the settings to meet our local requirement first. To do this, we entered the settings menu and discovered that the number of available OSD languages beats the usual range for signal meters by far.

Apart from standard options such as English, French, German and Spanish we were also offered Russian, Turkish, Czech, Portuguese, Slovenian, Polish, Italian and Greek. With the help of a timer mode it is possible to define a set period of time after which the meter turns off to save battery live of the lithium-ion pack, which comes with a capacity of 1950mA and thus should provide enough power to completely adjust a satellite antenna.

In case previously found channels are already stored in the SM-3500's internal memory, these entries can be conveniently deleted, moved or sorted by either alphabet or satellite using a dedicated menu item.

The unit also displays the currently installed software release so that it's easy to find out if an upgrade is available for download from the manufacturer's website at www.trimaxtec.com.

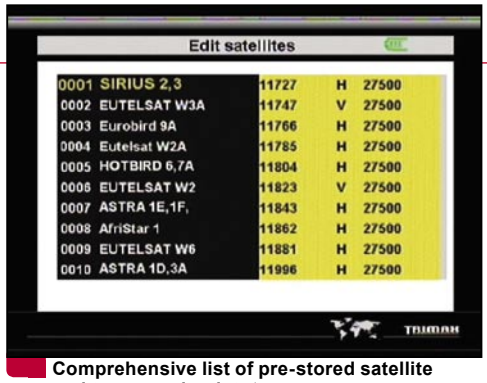
The SM-3500 comes with a comprehensive database of pre-stored satellite and transponder entries. A total of 55 European, Asian and American orbital positions complete with transponder data can be retrieved and offer great help for exactly aligning an antenna.

It turned out, however, that this database is not fully up-to-date, for example regarding the two most popular European positions ASTRA 19.2° East and HOTBIRD 13° East. We should add at this stage that all entries can easily be edited manually, so that any wrong satellite or transponder data can be corrected at any time, if need be.

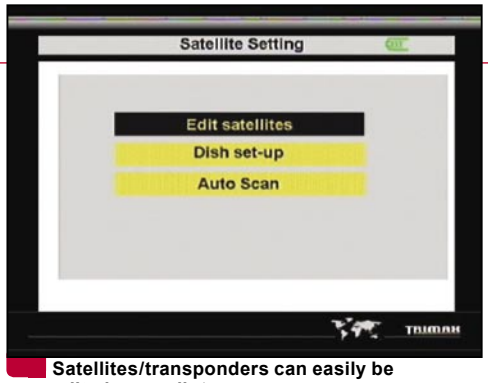
On a brighter note, we loved the fact that this meter cannot only be used for the Ku band, but a number of alternative LOF values (for the C band, among others) can be selected or any required LOF can even be entered manually. This makes the SM-3500 a perfect match even for out-of-the-ordinary LNBs.

TELE satellite AWARD 02-03/2010

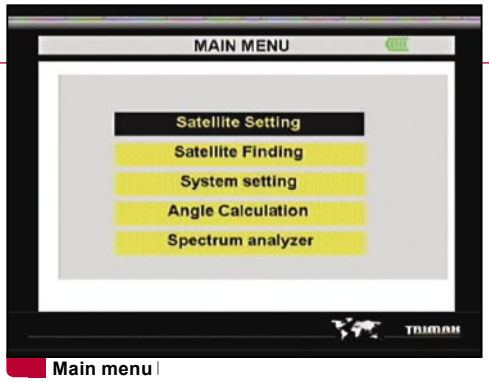
Trimax SM-3500
A well-balanced digital meter with spectrum display and TV mode.



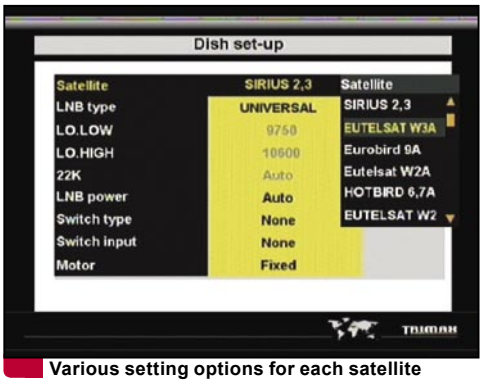
Comprehensive list of pre-stored satellite and transponder data



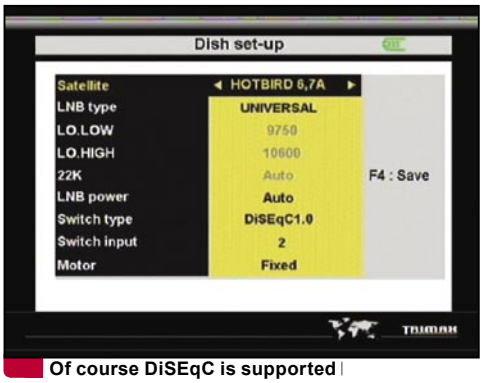
Satellites/transponders can easily be edited manually



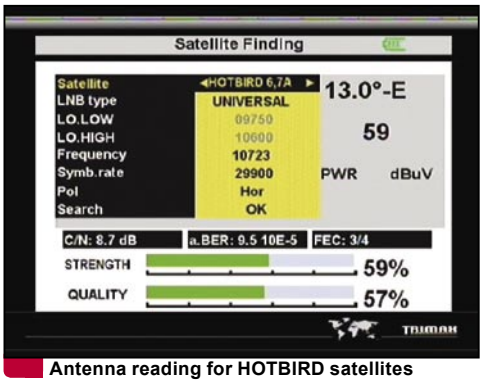
Main menu



Various setting options for each satellite entry



Of course DiSEqC is supported



Antenna reading for HOTBIRD satellites at 13° East

More often than not multi-switches are used and with its DiSEqC 1.0 and 1.1 compatibility this meter is nicely equipped for these jobs as well. Even DiSEqC 1.2 and 1.3 (USALS) for motorised antennas are supported.

The user-friendliness of this neat little device is further enhanced by the fact that all parameters (such as LOF or DiSEqC) for all required satellites can be set beforehand and can later be retrieved with the single touch of a button. This saves valuable time and lets you focus on your actual task of antenna alignment when up on the roof.

Now that all basic settings were completed we climbed up to the antenna and loosened its alignment screws. In general, the SM-3500 provides two ways of adjusting an antenna. One is based on a satellite search mode while the other relies on a spectrum display.

If you intend to use the satellite search mode all you have to do is select the desired satellite and the meter will immediately activate the first transponder that is pre-stored for that particular position. Of course you're free to switch to another transponder on the same satellite but this turned out to be of no special use as the SM-3500 uses the pre-stored transponder to identify the satellite position with the help of transmitted NIT data.

A general problem is that a number of satellite transponders (for example on TURKSAT 42° East) transmit incorrect NIT information which naturally also results in incorrect readings of the signal meter. That is why Trimax has gone to great lengths in checking the accuracy of the first transponder of each satellite so that with the pre-stored default settings a correct reading is always guaranteed.

Needless to say that we started out with great expectations and we were extremely curious as to how precisely the meter's search mode actually worked. The moment we selected HOTBIRD 13° East in the menu the low threshold tuner started to measure and check all incoming signals.

It felt like no time at all until we had moved the antenna to a position that made the signal bars jump forward. Still, the meter could not yet lock a signal, which meant that we had not quite arrived at HOTBIRD. We kept moving the antenna very carefully towards the East until the SM-3500 confirmed we had found HOTBIRD at 13° East.

We liked the fact that this new Trimax meter does not only indicate the percentage of signal quality and signal strength, but also C/N (carrier-to-noise), BER (bit error rate) and signal level in dBµV, all of which make finding the perfect antenna alignment so much easier. When using a professional Promax meter for checking our results later we were able to verify that the SM-3500's job was nothing short of brilliant!

Let's look at option 2 now, which is using the integrated spectrum analyzer. Here you first adjust the antenna until the spectrum level starts to peak. Then you use satellite search to further fine-tune your antenna alignment.

In professional use spectrum display can be extremely helpful whenever installers are already familiar with spectrum patterns of specific satellites so that they can determine the required satellite by simply looking at the spectrum display.

With all our enthusiasm regarding the SM-3500's capabilities we almost forgot that for any of the two modes to actually deliver results

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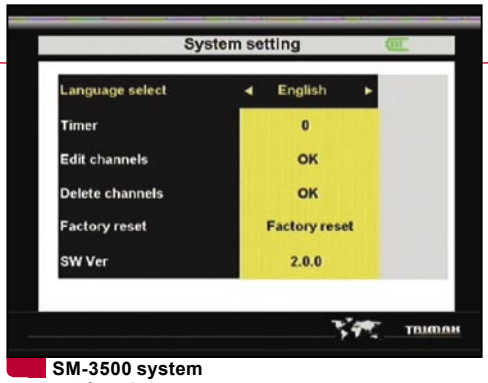
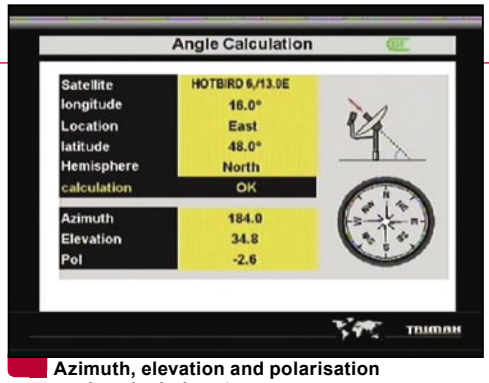
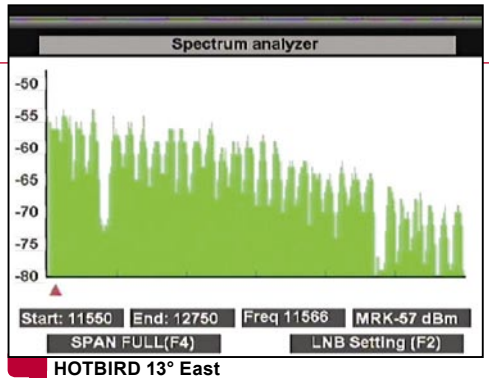


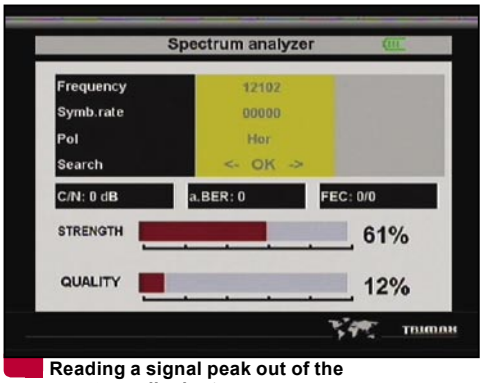
SM-3500 system settings



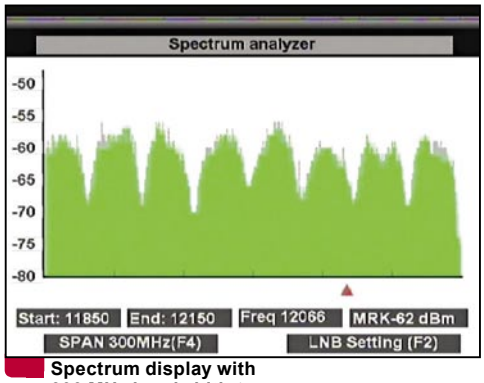
Azimuth, elevation and polarisation angle calculations



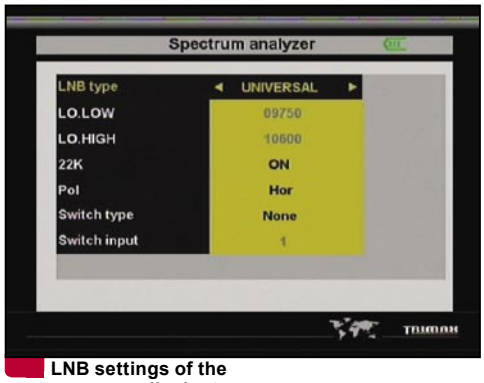
HOTBIRD 13° East spectrum display



Reading a signal peak out of the spectrum display



Spectrum display with 300 MHz bandwidth



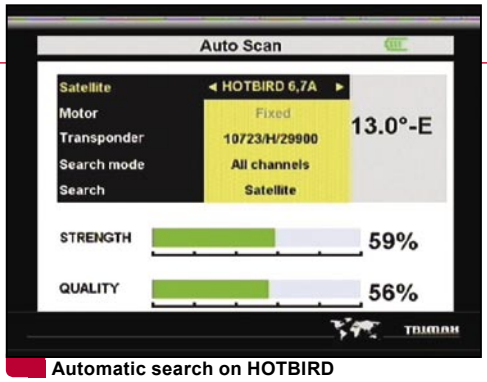
LNB settings of the spectrum display

some homework needs to be done first. Basically, this consists of getting the azimuth and elevation of the antenna right, or at least close. This is where the Trimax meter has another ace up its sleeve: Thanks to built-in calculation routines you only need to enter your exact geographical position and the desired satellite position for the SM-3500 to come up with the right azimuth, elevation and polarisation angle values. Could you even ask for more?

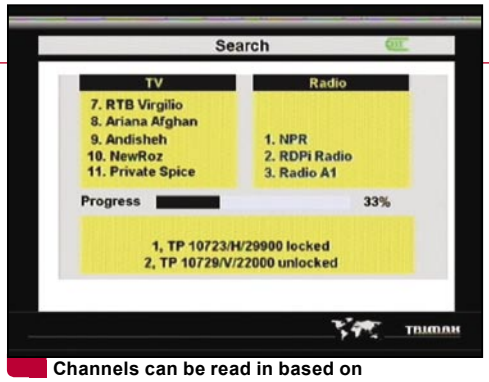
Actually, there still is more. The meter comes with a fully featured tuner and is therefore capable of performing an automatic channel search thanks to pre-stored satellite and transponder data. All channels that are found are stored in a dedicated channel list and can be watched on the meter's display – provided they are transmitted free-to-air. So if you're still not quite sure you've hit the right satellite you can always tune into the channels to see for yourself whether or not you're spot on.

And for the DXers amongst you we are happy to confirm that in TV mode the SM-3500 is able to read and display data such as the PIDs of a specific channel as well as the currently received transponder and satellite, which is an extremely valuable additional bonus feature. And while we're at it, feed hunters and DXers will show particular interest in the spectrum display. Apart from being able to show the spectrum for different bandwidths each signal peak can be marked with the cursor so that the Trimax meter can read the actual signal strength.

With the help of all the function keys it is also child's play to change the polarisation or band, which means a complete satellite can be scanned for feeds in a matter of seconds. In addition, LNB settings such as DiSEqC position can be accessed with dedicated func-

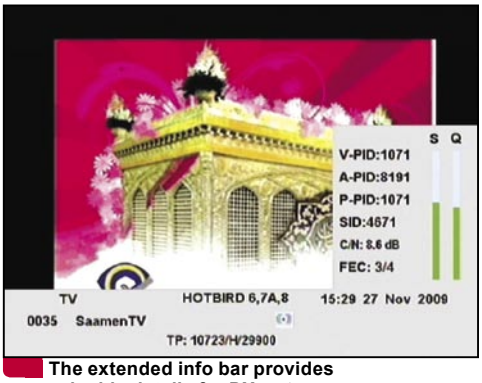


Automatic search on HOTBIRD 13° East

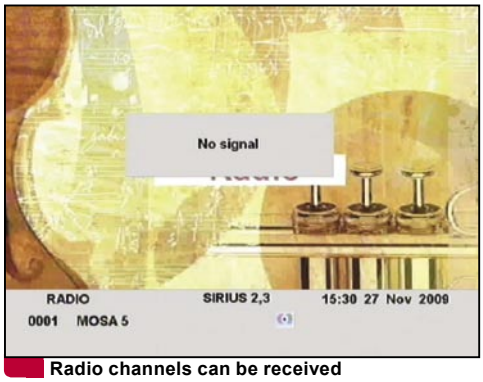


Channels can be read in based on pre-stored transponder data

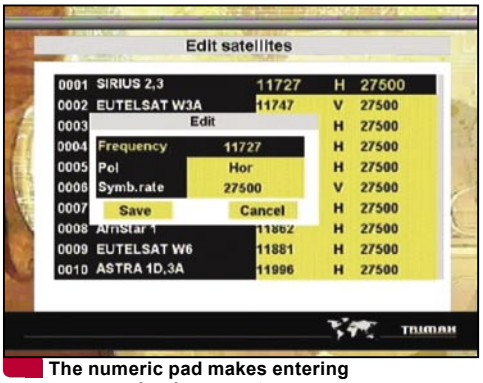
The SM-3500 is able to display free-to-air DVB channels



The extended info bar provides valuable details for DXers



Radio channels can be received as well



The numeric pad makes entering transponder data easy

tion keys as well as right from the spectrum display mode.

As you would expect from a smart meter the search menu pops up by simply pressing the OK button, which means the identified signal peak is analysed and read in with the touch of a button. We tested this on EUTELSAT W2A at 10° East and were impressed. With the help of the spectrum display we were able to access all active feed transmissions in the meter's display in next to no time, and even transponders that had been newly activated or deactivated were shown using this procedure.

The SM-3500 also worked reliably on SCPC transponders and delivered reasonable results too.

The A/V input and output round off the balanced and positive overall impression of the new Trimax digital meter.

This not only allows displaying the OSD signal on a larger monitor, but also lets you display external sources on the SM-3500's monitor, which is particularly helpful if an external positioner is used, for example, or if a receiver needs to be connected to the antenna for test reasons. The fact that only composite signals can be processed does not really restrict the usefulness of this feature.

Conclusion

In summary, we were truly impressed with the Trimax SM-3500. This new meter boasts excellent workmanship, a low-threshold tuner capable of also dealing with weaker signals, and great ease-of-use.

Thanks to its lateral blinds the 3.5'' TFT display is easy to read even in direct sunlight and the battery pack lasts long enough to align one or even more antennas without having to rush.

Since Trimax is always working on further enhancing its products the SM-3500 comes equipped with a PC interface. Using an MS Windows application new software can be installed in a breeze so that the manufacturer is in a position to add even more features to its latest digital meter.

If you're after a small meter with all features you are likely to ever require, you need not look further.

Expert opinion

Thomas Haring
TELE-satellite
Test Center
Austria

\+

Very easy to read display
Low-threshold tuner
Well-designed OSD
Easy to use
Realtime spectrum display
Battery pack with sufficient power

\-

none

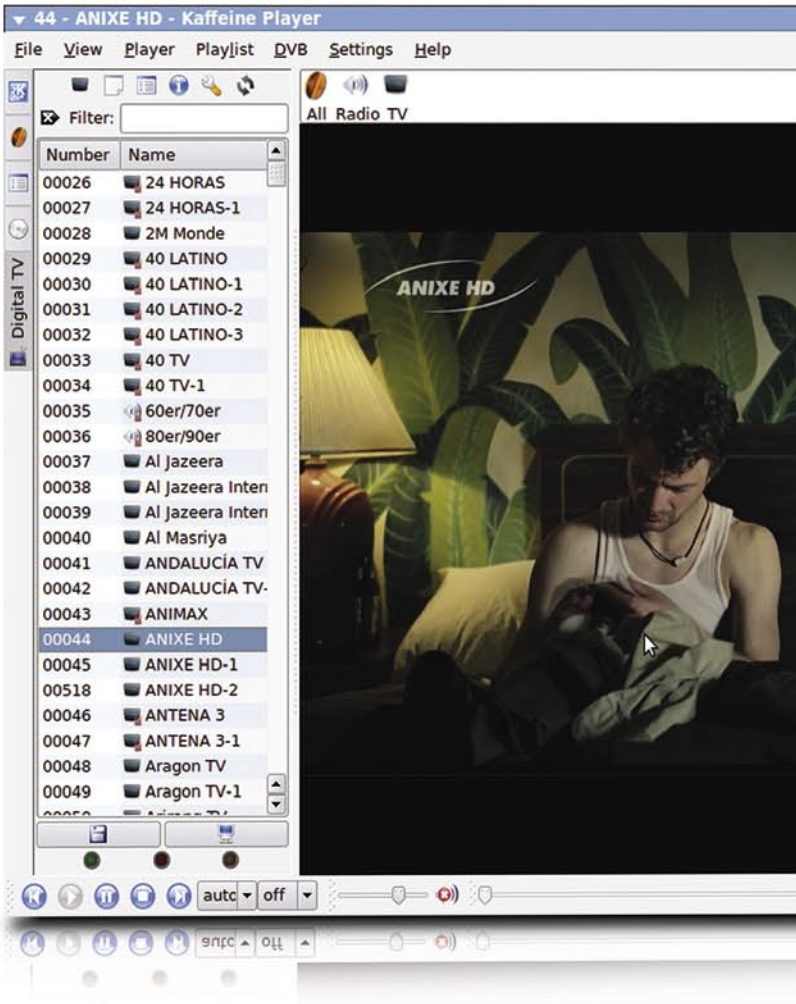
TECHNICAL DATA

Manufacturer	Trimax Technology Limited 9/F, Jiuzhou Electric Building, Hi-tech Industrial Park, #12 Keji Road South, Nanshan District, Shenzhen, China
Tel	+86-755-26715445
Fax	+86-755-26002191
Email	sales@trimaxtec.com
Model	SM-3500
Frequency range	930~2150 MHz
Level range	-65 dBm ~ -25 dBm
LNB power supply	13/18V, max. 400 mA
Symbol rate	1.5~45 Ms/s
DiSEqC	Yes
Spectral Inversion	Auto conversion
Video format	720x576 (PAL), 720x480 (NTSC)
Supply voltage	12.6V
Supply voltage charger	90-265V, 50/60 Hz
Li-oN battery	1950 mA
Supplied items	Protective case, user guide, mains charging unit, car charger, PC connection cable, A/V cable
Dimension	9.5x15.5x4.5mm
Net weight	0.5kg
Working temperature	0°C to +40°C
Storage temperatur	-40°C to +65°C
Display	3.5" LCD color display

NetUP Dual DVB-S2-CI

Two Tuners in HDTV in one PC Card

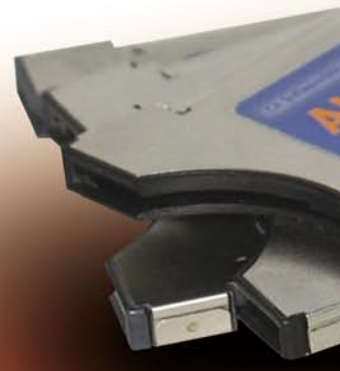
A specialist company in the area of IPTV is NetUP from Moscow, Russia. They offer all kinds of products for the distribution of IPTV signals including DVB Gateways, Conditional Access Systems and even Billing Systems for IPTV networks. Their latest development is a professional high-density satellite reception card, which is mainly targeted at the professional market in DVB-IP gateways, home theaters and satellite Internet systems. Their card not only comes equipped with two DVB-S2 tuners, but also with two Common Interface slots, and all this packed into one single card fitting in a PCIe slot. Since it's a card aimed at the professional market it's running on Linux. Mainly this card will be used in rack mounts. Usually, these can house two cards. With a regular PC Card this would mean handling 2 channels. But using this new two-tuner card a single rack can manage 4 channels in one rack.



Even though this is a professional card, it is as well very attractive for the satellite watcher, who would like to watch his local football team grabbing the European cup in full-screen HD while at same time keeping an eye on what happens in the latest episode of his favorite show. The satellite enthusiast hunting satellite feeds might even have more fun with this card, now that he can track two different DVB-S2 feeds at same time. There are many ways how this card can be of good use for the real enthusiast as well as for the real professional. To be really happy with the card, I recommend using a high-end PC, because the card does not include a dedicated H.264/MPEG2 hardware decoder.

Installation

The card comes without any software or installation instructions. On NetUP's support page (http://www.netup.tv/en-EN/dual_dvb-s2-ci_card.php) it's stated that this card has "drivers for Linux OS". My next step was to check the chipset used on board: it is a Conexant CX23885. Armed with this piece of information I checked if the card is supported by video4linux (v4l for short). To do this, I went to



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Swedish	Svenska	www.TELE-satellite.com/TELE-satellite-1003/**sve**/netup.pdf
Turkish	Türkçe	www.TELE-satellite.com/TELE-satellite-1003/**tur**/netup.pdf

Available online starting from 29 January 2010

the main source for DVB-S(2) cards, which is the LinuxTV Wiki at http://www.linuxtv.org. After two mouse clicks I found what I searched for: the card is indeed supported! http://www.linuxtv.org/wiki/index.php/NetUP_Dual_DVB_S2_CI

Having finished these preliminaries, I switched on my spare PC, which runs on Ubuntu 9.04. After power on and logging in, I would have expected the card to be automatically detected. But dmesg said: No (Pic.1). So it seems that the default version of v4l bundled with Ubuntu 9.04 is not able to use the card. Luckily, in the card's page on LinuxTV Wiki there's a hint on how to make it work: you need to check the latest source from v4l repository. The repository is based on mercurial source control system. Naturally, in order to be able to check out the source you need to install it. Under my Ubuntu installation only one command was needed:

$ sudo apt-get install mercurial meld (Pic.2).

After this I entered the commands suggested in LinuxTV Wiki, which resulted in the required kernel modules and programs to be built:

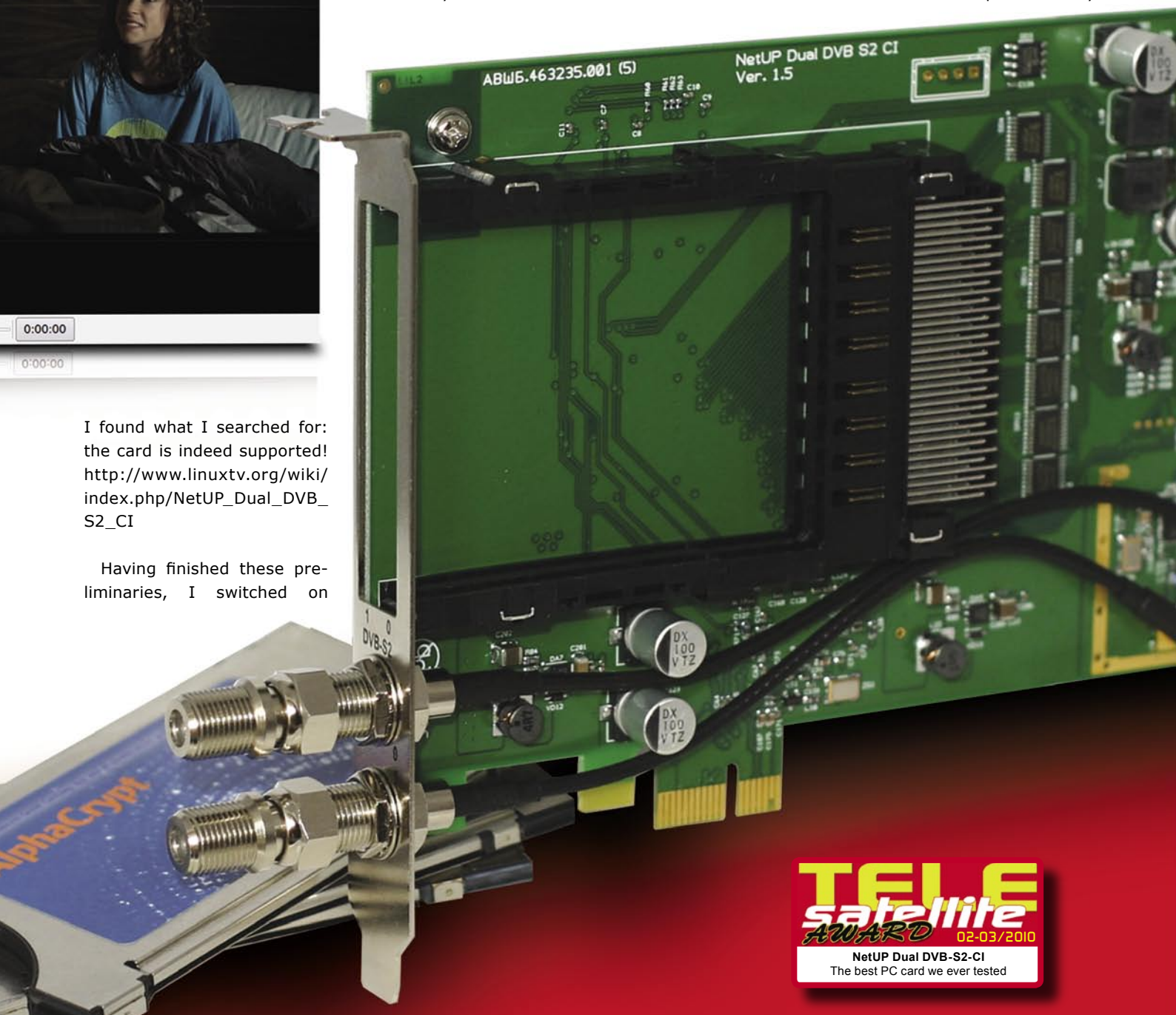
```
$ hg clone http://linuxtv.org/hg/v4l-dvb/
$ cd v4l-dvb
$ make > /dev/null 2>&1
$ sudo make install > /dev/null 2>&1
```

Time to check if everything is in order. I rebooted the computer and checked again the status of the card detection by using dmesg. Bingo! The card was detected this time with both of its tuners, as can be seen in (Pic.3).

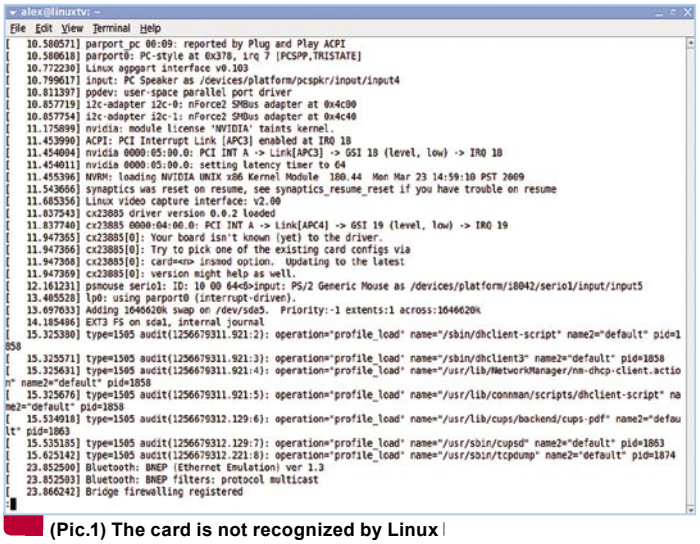
Now, after the card was detected, all that was left to do is to install a player that's able to open a DVB device and play the corresponding stream. The easiest software to use is Kaffeine, which can be fastly installed by using this command:

$ sudo apt-get install kaffeine

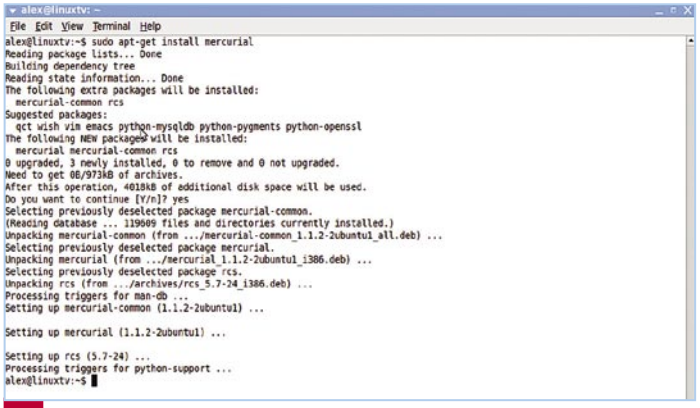
Kaffeine depends heavily on



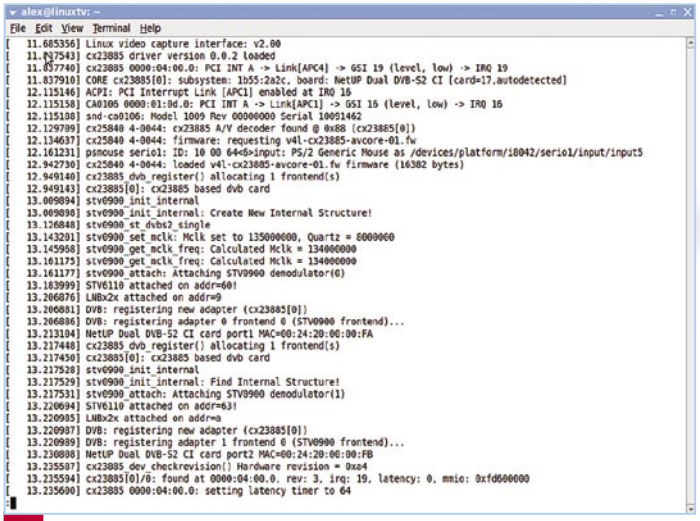
TELE satellite AWARD 02-03/2010
NetUP Dual DVB-S2-CI
The best PC card we ever tested



(Pic.1) The card is not recognized by Linux



(Pic.2) Mercurial gets installed



(Pic.3) The NetUP card is successfully detected

some KDE libraries and it will install more packages than expected. But one is missing, which I selected manually: libxine1-ffmpeg This is needed for software decoding of H.264. After the installation is done (which takes a couple of minutes) I went to the "Application" menu and to "Sound and Video". I clicked on "Kaffeine" and was greeted with the welcome screen in (Pic.4).

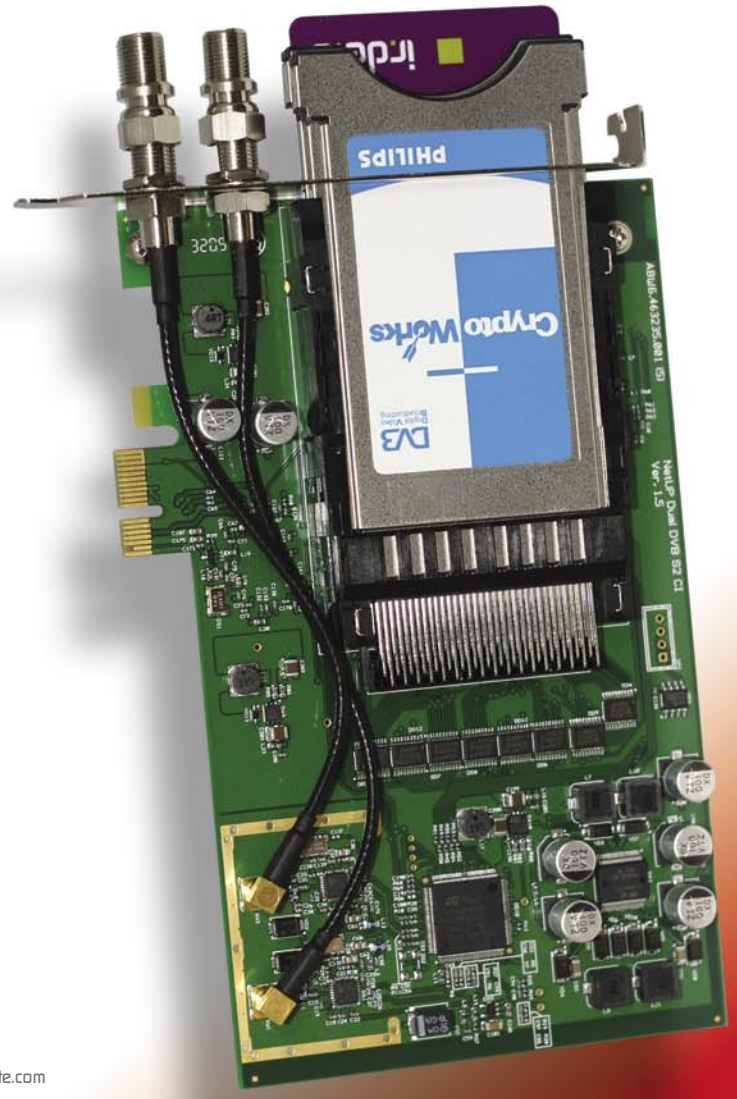
Watching TV

In the Kaffeine menue I clicked on "Digital TV" which resulted in an interface resembling ProgDVB under Windows (albeit with less features). The next step is to scan for all the receivable channels. This can be done by pressing "C" or going to the "DVB" menu and then to "Channels". The interface for channel scanning is pretty intuitive and Kaffeine is able to scan a whole satellite by using the NIT information contained on some transponders. Doing this, after a couple of minutes the complete list of channels is displayed (Pic.5).

However, Kaffeine can not display two tuners and is therefore of not much use with this sophisticated card. The solution is to use a more advanced piece of software, like for instance MythTV, VLC or MPlayer. But before to switch to another DVB viewer I checked the quality/signal strength indicator in Kaffeine. Though it is not really accurate (it reports either 3% or 98%) I managed to correlate these two figures by using a satellite signal meter and was able to determine that the SNR for Anixe HD is 6 dB. To put this into persepctive: it means that the power of the useful signal is twice the power of the noise, thus making the tuner in the NetUP card one of the most sensitive available.

In practice

The lock time for the card is pretty good, averaging 4minutes and 47 seconds for a full scan of HOTBIRD at 13E. This card even offers a hidden highlight: it can receive 16APSK DVB-S2 channels! This modulation is used by some channels to hide themselves away from regular viewers. Unfortunately, my 90cm dish is too small to get a decent signal at my location for HOTBIRD but I was still able to get at least some macroblocks from these transponders. If you are closer to main beam of HOTBIRD try 11.334H, 11.373H and 11.432V for such transmissions, which trade off error correction for quality (Pic.6).



OptiScan

The *first* cost effective solution combining 'Optical Power' and Satellite 'IF' measurements

If you need to precisely align the new GIFibre**MDU** Optical LNB, recently launched by Global Invacom, you need the new Opti**Scan**. It supplies power to the LNB whilst providing a real-time visual spectrum for satellite identification.

Zoom in on a given transponder and all the information you require for positive alignment is clearly displayed 'Optical Power – BER – MER – Satellite Ident'.

Packed with functionality at an affordable price, the new Opti**Scan** not only out performs its rivals on every level in day to day dish alignment and signal measurement, it can also do it optically!

There are cheaper meters on the market, but when you drill right down into it, that's just what they are - ***cheap!***

- Can it Measure BER in either Pre or Post Viterbi on a fibre output?
- Can it give you a calibrated Optical Power measurement on a fibre output?
- Can it provide you with a detailed MER readout on a fibre output?
- Can it do this and much more, optically, as well as being the ultimate day to day satellite IF meter?

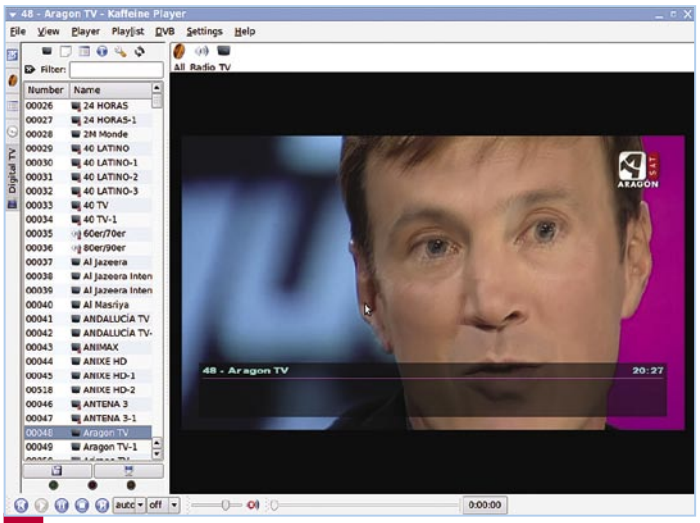
The Opti**Scan** can

global invacom
completing the picture

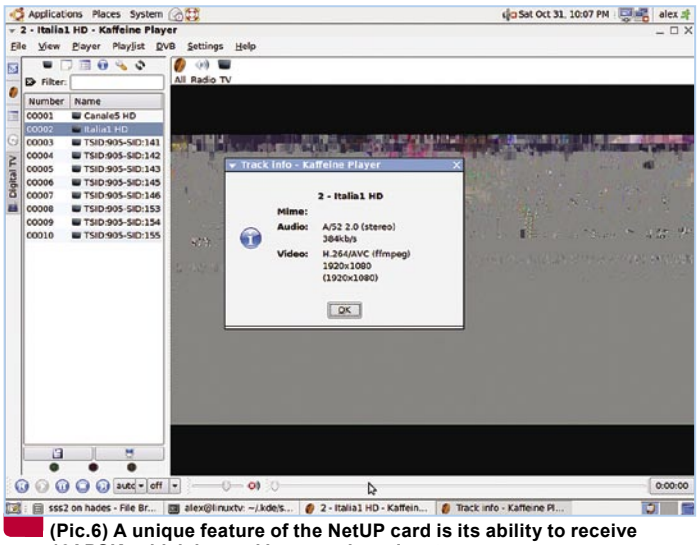
globalinvacom.com

The NetUP two tuner card is highly interesting for the serious satellite enthusiast and is a must for the professional user of satellite signals in DVB-S2. It's tuner sensitivy is exceptional. It requires Linux and needs some software background for the one who installs it, but after this hurdle is overcome performance of the NetUP card is as perfect as a satellite PC card can be.

(Pic.4) Welcome screen of Kaffeine, a DVB viewer program



(Pic.5) After a couple of minutes the menu shows all channels received



(Pic.6) A unique feature of the NetUP card is its ability to receive 16APSK, which is used by some broadcasters, like Italia 1 HD from Italy on HOTBIRD 13E

Expert Opinion

Alexandru Porosanu
TELE-satellite
Test Center
Romania

\+

Two independent tuners on same board.
Very stable performance due to Linux.
Exceptional good tuner sensitivity.
Dual standard DVB-S and DVB-S2.

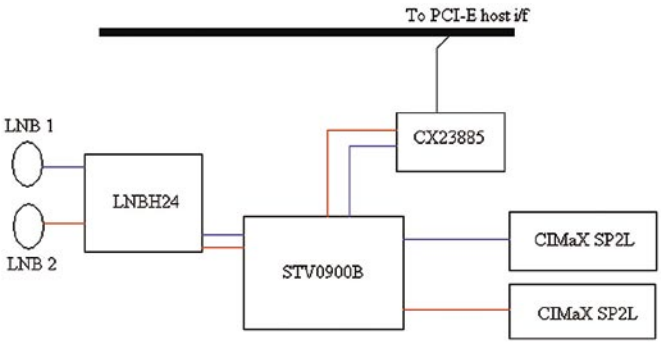
\-

Card comes with no software support from manufacturer.
No hardware acceleration for MPEG2 or H.264.

TECHNICAL DATA

Manufacturer	NetUP, Olof Palme Str. 1, Sect. 7, Moscow, Russia
Phone	+7 495 510 1025 (ext 0) - general questions +7 495 510 1025 (ext 1) - technical support
Fax	+7 499 143 5521
Email	info@netup.tv
Website	www.netup.tv
Model	NetUP Dual DVB-S2-CI
Function	Two Tuners DVB-S2 PCIe card
Frequency Range	950 - 2150 MHz
Systems	DVB-S, DVB-S2
Transmission Modes	MPEG-2, MPEG-4 (software)
Demodulator DVB-S	QPSK
Demodulator DVB-S2	QPSK, 8PSK, 16APSK, 32APSK
DiSEqC	up to 2.0
CI Slots	2 for any professional CA modules (PowerCAM Pro, Aston Pro Solutions, etc.)
Connectors	2 x F
Software	Linux

Technical Information



General Overview

*** 4 Layer PCB**
*** 2 x CI slots**
*** Long PCI-E board**

Components Overview

*** 1 x STM STV 0900B – Dual demodulator that can handle DVB-S QPSK, DVB-S2 QPSK, 8PSK, 16APSK (all the standards currently used for broadcast in Digital Television, both in Europe and USA); also employs a lower voltage requirement (3.3V)**

*** 1 x STM LNBH24 – Dual LNB supply and control; compatible with DiSEqC 2.0 feedback signal specification by employing a 22 KHz tone detection; supports unfiltered DiSEqC signal output**

*** 2 x SCM Microsystems' CIMaX SP2L – CI interface driver**

*** 1 x Conexant - PCI Express Broadcast Audio/Video Decoder, supporting two MPEG transport streams**

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Technomate multiple output models

Ku-Band LNB's for more complex installations

Technomate's single LNBs were presented in the previous issue of TELE-satellite. We were very pleased to conclude that their performance was really extraordinary.
But Technomate have also multiple output LNB's in their offer. Are they also that good? We took their twin, quad, quattro and octo models for evaluation.

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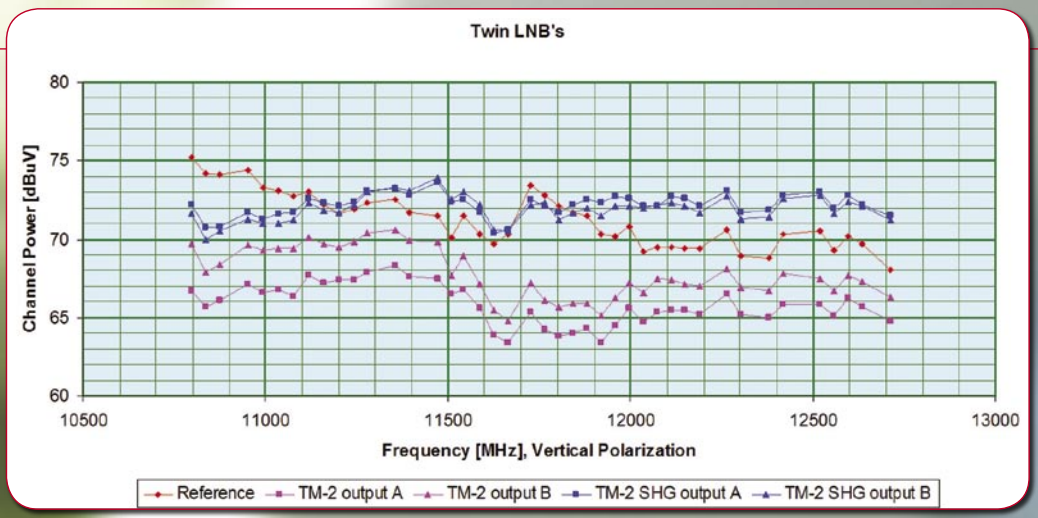
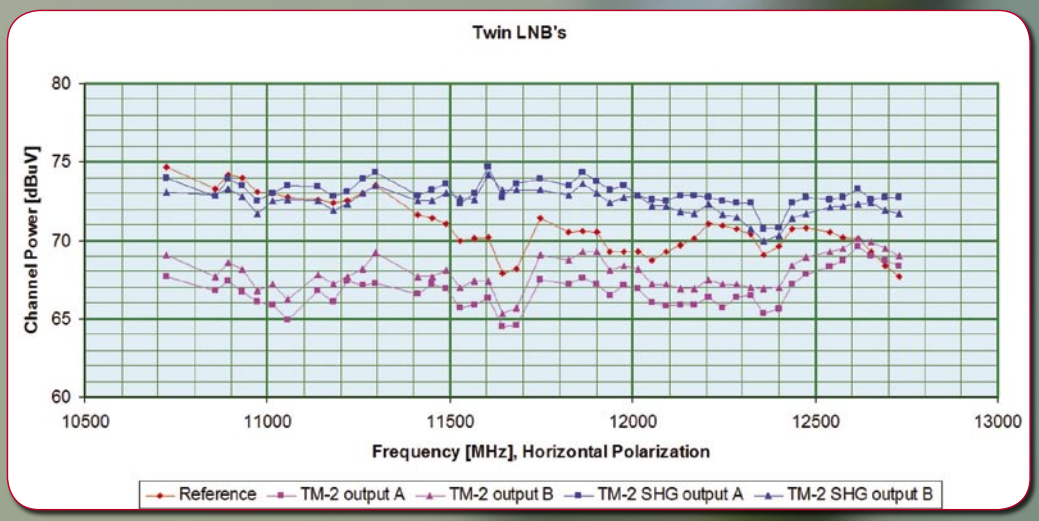
TECHNOMATE
MULTIPLE OUTPUT LNBs
Excellent quality even topping our reference LNB

Technomate


Twin LNB's
Channel Power [dBuV]
80
75
70
65
60
10500
11000
11500
12000
12500
13000
Frequency [MHz], Vertical Polarization
Reference
TM-2 output A
TM-2 output B
TM-2 SHG output A
TM-2 SHG output B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12000
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Reference
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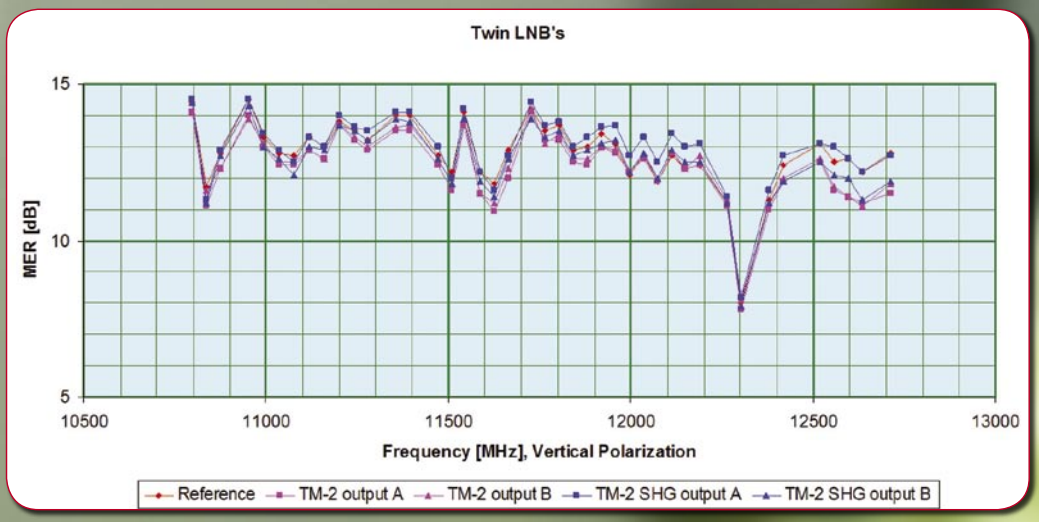
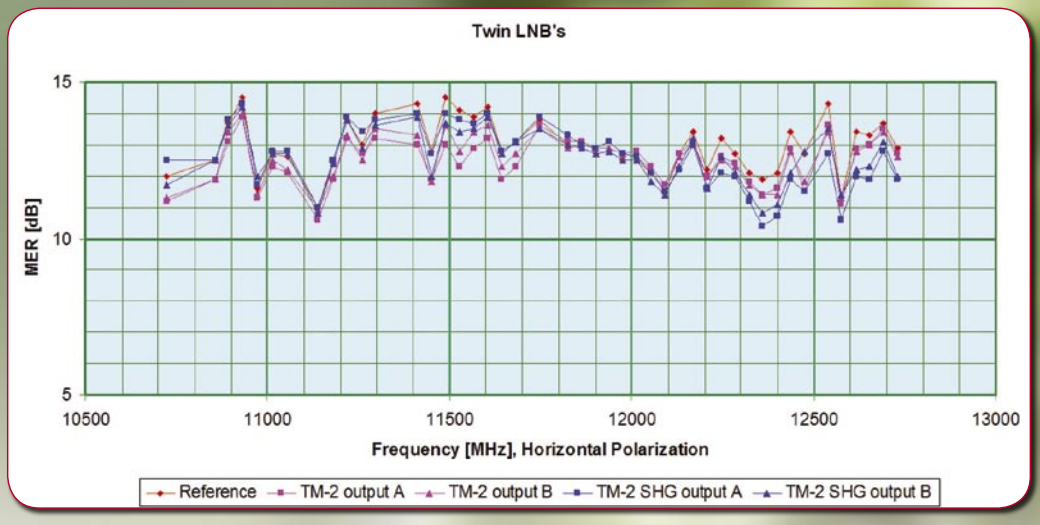
TM-2 output B
TM-2 SHG output A
TM-2 SHG output B


Twin LNB's
MER [dB]
15
10
5
10500
11000
11500
12000
12500
13000
Frequency [MHz], Vertical Polarization
Reference
TM-2 output A
TM-2 output B
TM-2 SHG output A
TM-2 SHG output B


Twin LNB's
MER [dB]
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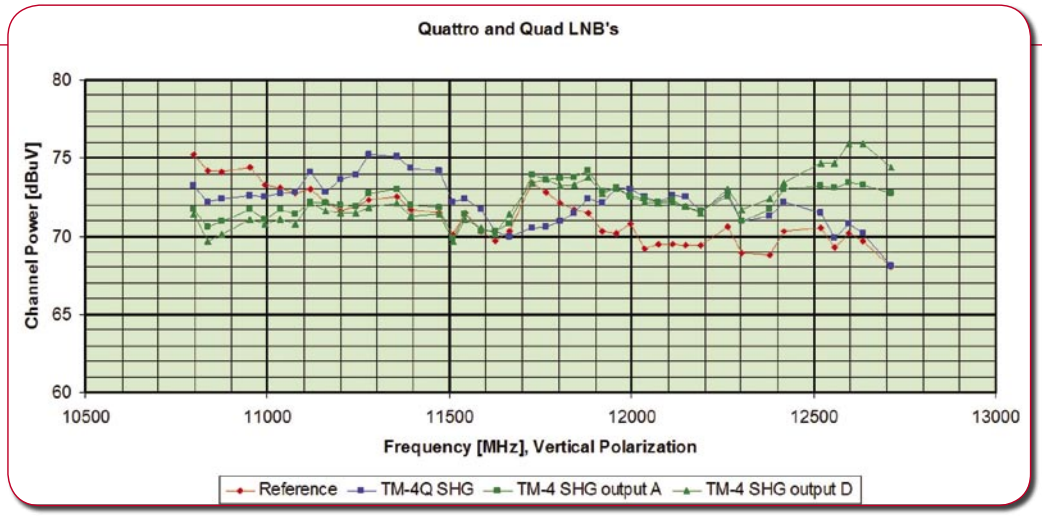
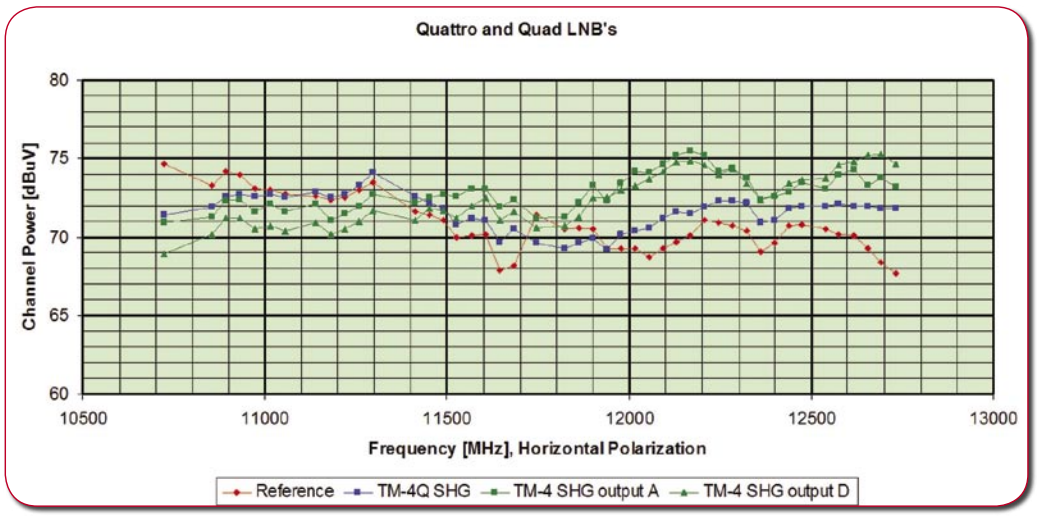
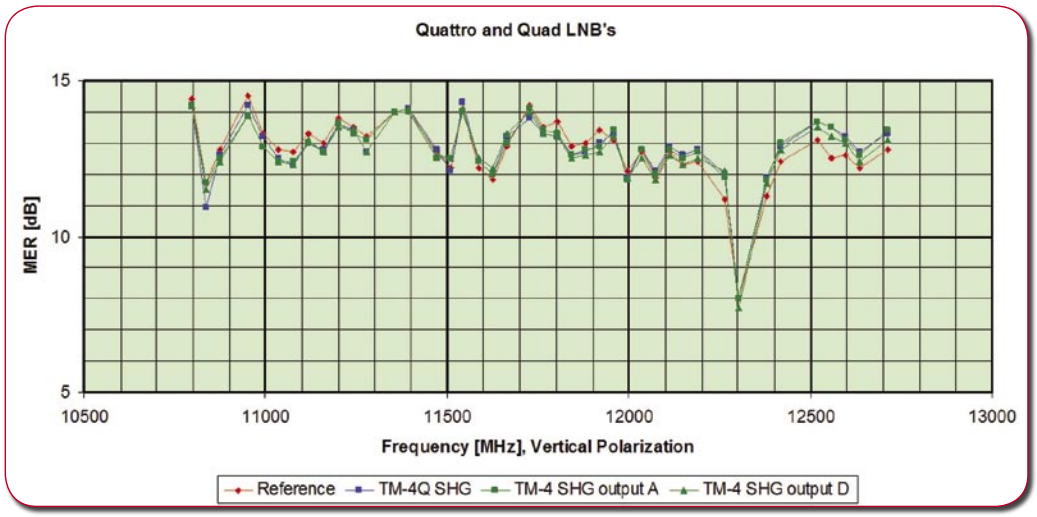
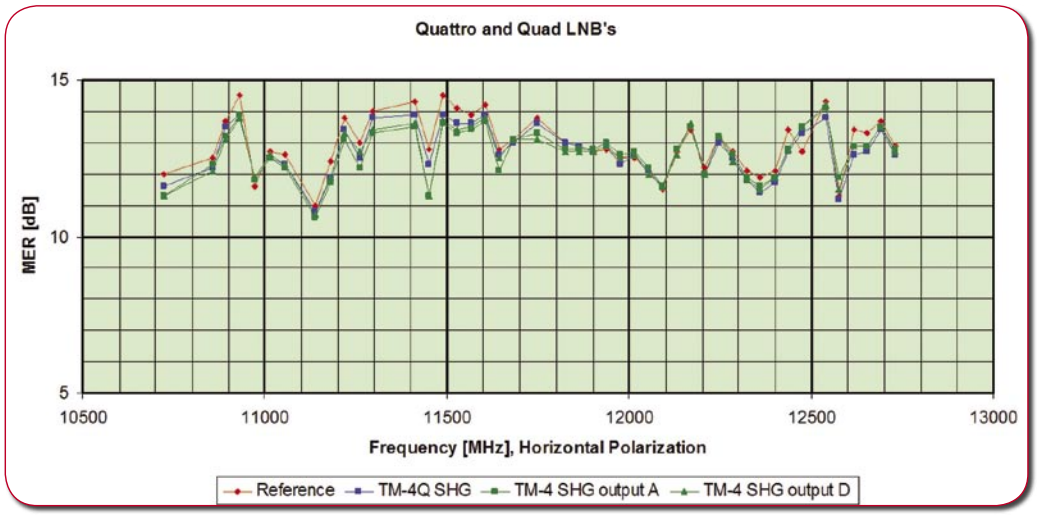
Frequency [MHz], Horizontal Polarization
Reference
TM-2 output A
TM-2 output B
TM-2 SHG output A
TM-2 SHG output B









We knew that they can not be as good as their single output models (TM-1's). Nevertheless, we kept as a reference the same very good universal single LNB that we used for testing previously. Not too many contemporary product can be a match for it.

The twins were the first to go. TM-2 was the standard twin model (0.2dB) and TM-2 Super High Gain was the model with increased output level and lower noise figure (0.1dB). And indeed, as you can see in the graphs, the SHG model had the gain greater than our reference by about 2 dB while the standard model was ca. 3 dB below our reference. The SHG dB model was also superior in noise performance but not for all transponders. In the higher sub-band, horizontal polarization, the standard TM-2 was slightly better. Anyway, both models were very close to our reference what is a very good result for the twin LNB. Also the difference between the 2 outputs of every twin device was small.

After finishing the twins, we moved on to quad and quattro models. We took the same measurements as for the twins: channel power which was directly related to LNB gain and MER which was a measure of signal quality at the output of LNB. This time we had only the Super High Gain versions of TM4 (quad)

SPAUN Mini System

NEW

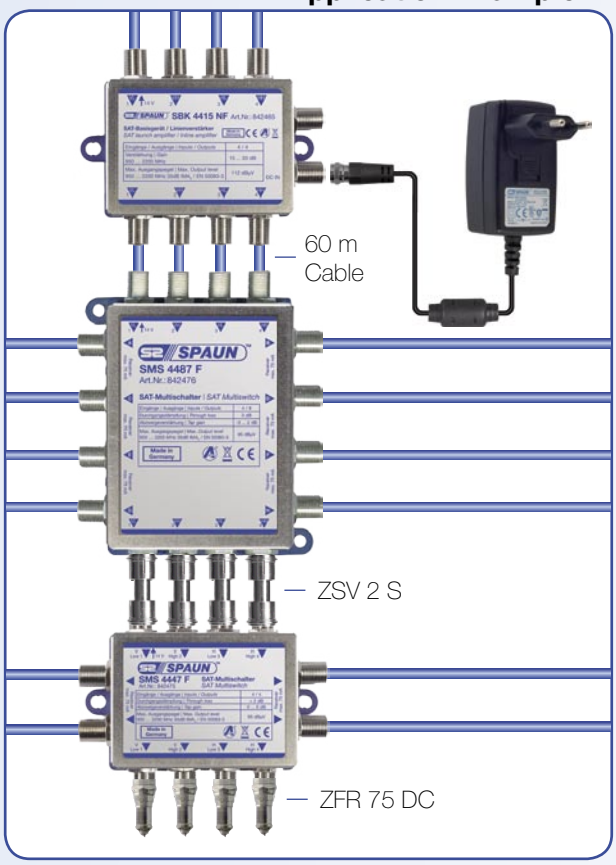
4 SAT-IF-Cascade in
cigarette pack format
· remote-fed
· flexibly applicable

SBK 4415 NF

SMS 4447 F

SMS 4487 F

Application Example



SAT Launch Amplifier for 4 SAT-IF Signals

SBK 4415 NF

· to use with Quattro LNB
· to use if required as Inline Amplifier

Cascadable Multiswitches (also stand-alone) including wall fastening

SMS 4447 F

· for 4 subscribers

SMS 4447 / 8 F

· for 4 subscribers
· with 8 dB tap loss

SMS 4487 F

· for 8 subscribers

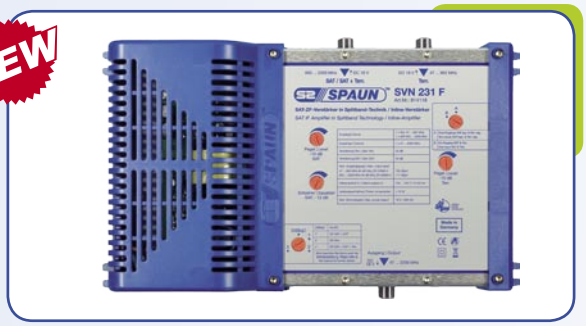
SMS 4487 / 8 F

· for 8 subscribers
· with 8 dB tap loss

SVN 231 F

SAT-IF Amplifier (mains-operated)

NEW



The SVN 231 F can be used either as SAT-IF Amplifier or as Inline Amplifier.

· for single cable systems
· Splitband technology
· Gain SAT = 30 dB
  Gain Terr. = 20 dB
· Level adjustment for SAT & Terr.
· Slope correction for SAT

SPAUN electronic GmbH & Co. KG
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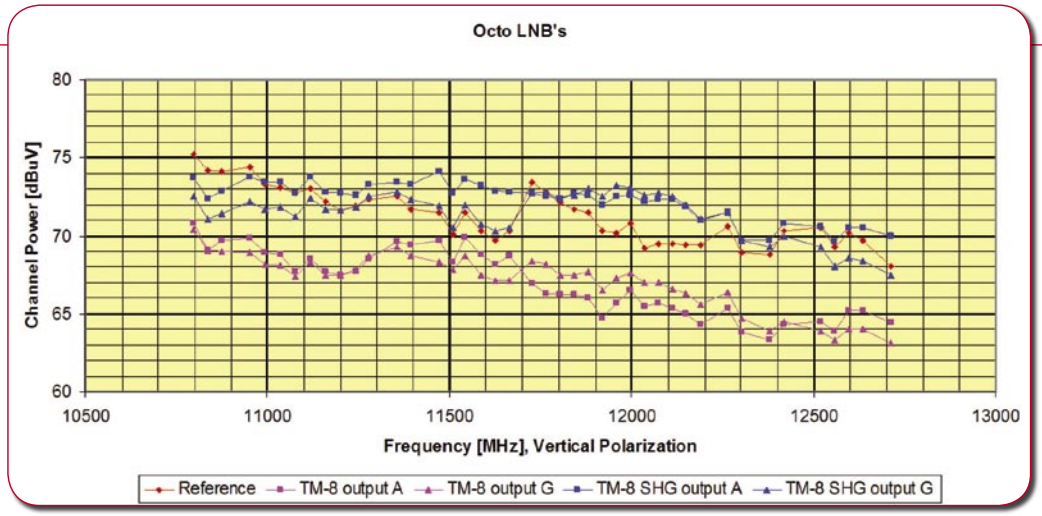
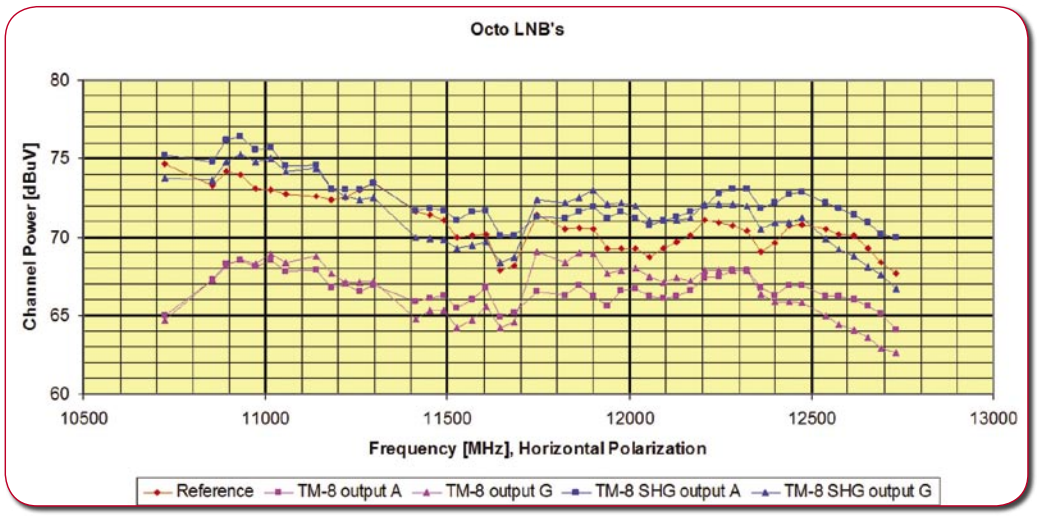
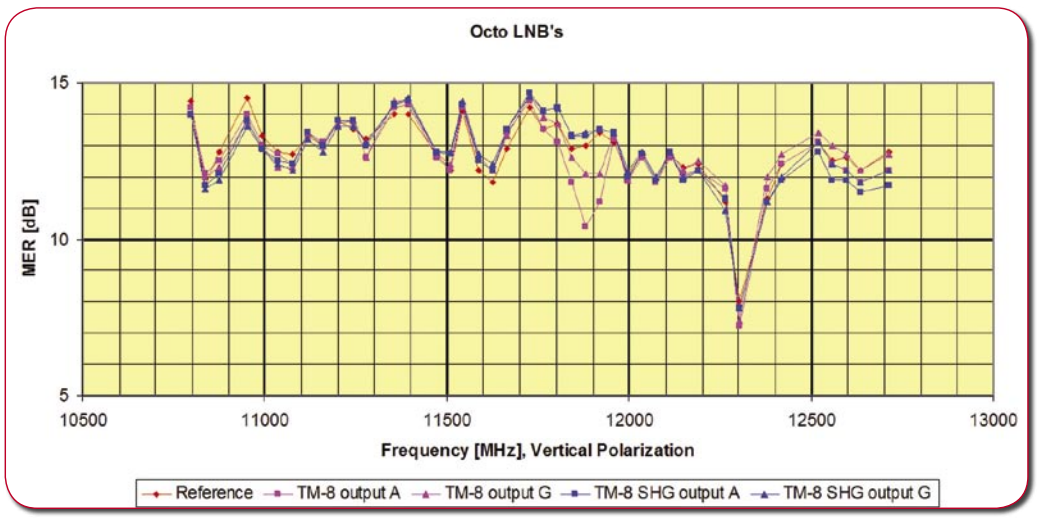
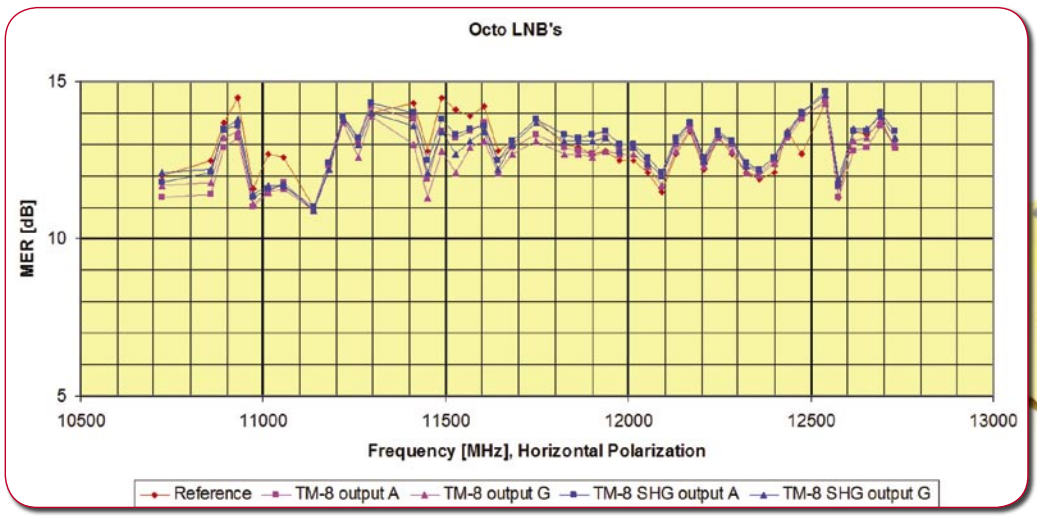
Email: contact@spaun.com · www.spaun.com









and TM4Q (quattro). We measured the first and the forth output of the quad to check the difference between the outputs. Both LNB models beat our reference in terms of output power and were practically equal in noise performance (Modulation Error Ratio). Again: a very good result!

Finally, the time came for "octos". We got the standard TM-8 and TM-8 Super High Gain. As could be expected the Super High Gain model delivered stronger signal at its outputs than its brother. It was even slightly stronger than our reference. Also the SHG was better in signal quality, but again – the difference between both tested models and the reference was really small.

We can conclude that Technomate's LNBs are the best we have ever been able to check in our lab. The Super High Gain models do indeed provide ample of signal power and are the best choice for connecting multiple receivers.

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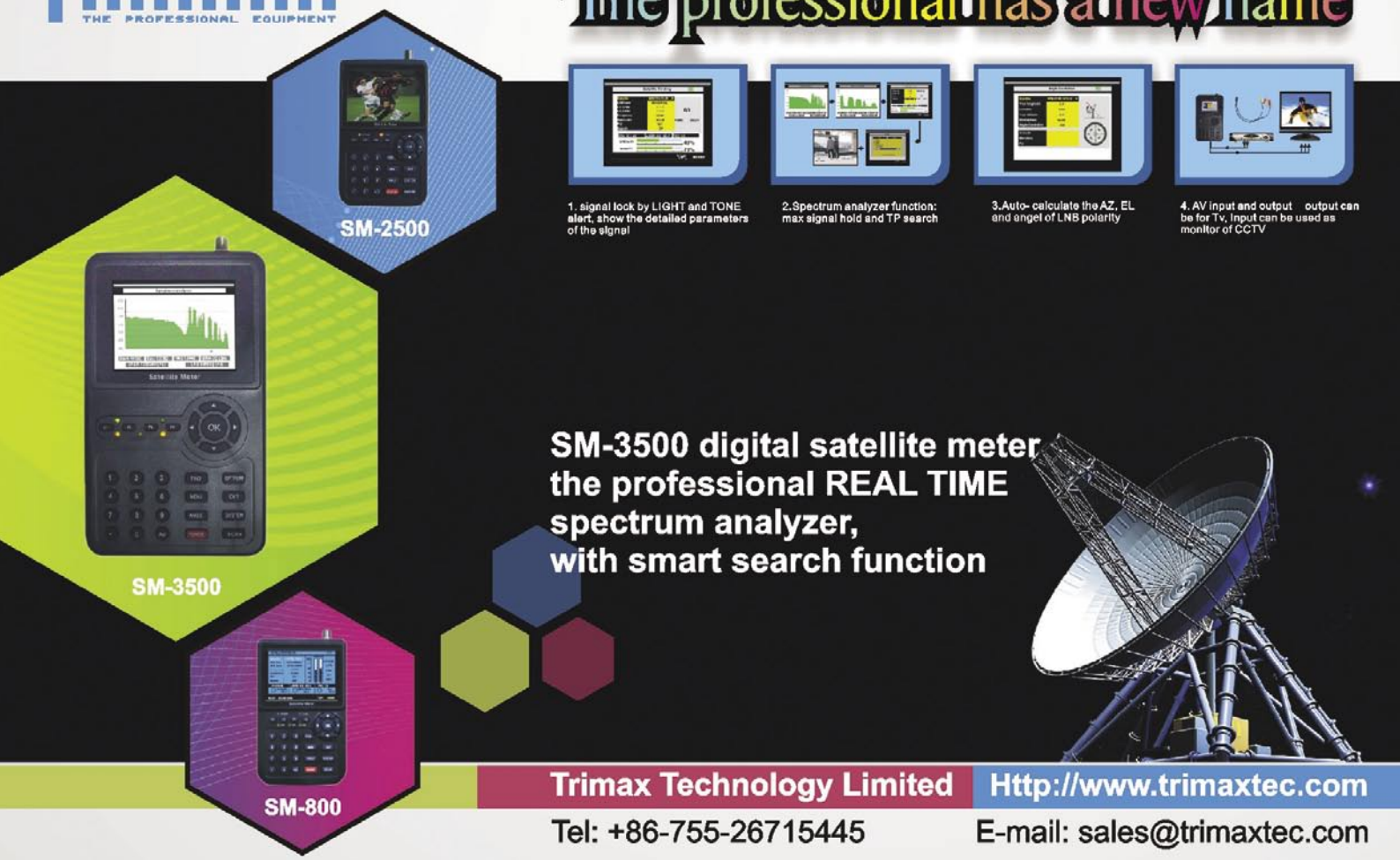

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Http://www.trimaxtec.com
Tel: +86-755-26715445
E-mail: sales@trimaxtec.com

Expert Opinion

Jacek Pawlowski
TELE-satellite
Test Center
Poland

+

Very good multiple output LNB's comparable to single LNB in terms of signal quality (noise performance). Super High Gain models offer higher output than the standard version (about 5 dB more). You should choose them if long cables are in place. For smaller installation with reasonably short cables (10-20m) the standard units should be equally good. All models have covers to protect F connectors. The difference in performance among the outputs is small. The workmanship is very good indeed.

-

Noise figure 0.1 dB seems to be somewhat overclaimed.

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Available online starting from 29 January 2010

TECHNICAL DATA

Manufacturer	Technomate
E-mail	info@technomate.com
Website	www.technomate.com
Function	Universal multiple LNB's for Ku-Band
Models	Twins: TM-2 and TM-2 Super High Gain Quad: TM-4 Super High Gain Quattro: TM-4Q Super High Gain Octo: TM-8 and TM-8 Super High Gain
Input frequency	10.7~12.75 GHz
Output frequency	0.95~2.15 GHz
LOF's	9.75 and 10.6 GHz
LO temperature drift	±2 MHz (-40~+60° C)
LO Phase Noise	-60 dBc/Hz @ 1kHz offset -80 dBc/Hz @ 10 kHz offset -100 dBc/Hz @ 100 kHz offset
Noise figure	0.2 dB (standard models), 0.1 dB (Super High Gain models)
Conversion Gain	50-56 dB (standard models) 55-62 dB (Super High Gain models)
Gain flatness characteristics	5 dB over entire band
1 dB output compression	0 dBm min.
LO spurious	-60 dBm max.
Intermodulation (1.7 GHz)	-60 dBm max.
Image rejection	40 dB min.
Cross polarization isolation	20 dB min.
Port-to-port isolation	20 dB min.
Reflector type	Offset
F/D ratio	0.6
Operating temperature	-40~+60° C

SPAUN SVN 231 F Amplifier

Universal building block for antenna installations

In many reception systems for individual use a combination of satellite and terrestrial antennas are used. Theoretically, it is possible to use separate cables for satellite and terrestrial TV but it is not very practical. Usually, a signal combiner is used up there beneath the roof. We connect the LNB output and the terrestrial antenna output to it. The combiner has only one output to which we hook up one cable. Now we have both signals: satellite and terrestrial in one cable. The signals do not interfere with each other because they occupy different frequency bands:
47-862 MHz (terrestrial TV) and
950-2150 MHz (satellite IF).

TELE satellite AWARD 02-03/2010
SPAUN SVN 231 F
Excellent amplifier/combiner with excellent specifications

A simple passive combiner would add unnecessary and unwanted signal attenuation. Therefore, it is much wiser to use an active device – SAT IF/ Terrestrial TV amplifier. The well known German manufacturer of distribution equipment SPAUN Electronic offers a very interesting product of this kind. We decided to check the performance of SVN 231 F Amplifier.

Features

The device is contained in typical SPAUN enclosure with nice looking blue plastic part and perfectly finished aluminum covers. The workmanship, as always with SPAUN distribution equipment, is excellent.

You can mount SVN 231 F on the wall with 4 screws but remember that this device must be placed indoor rather than in the open air. In most cases, it will be right below the roof where the cables from the satellite and terrestrial antennas enter the building. Of course, you will need the mains supply (100~240V 47~63Hz) to power the amplifier. Power consumption is less than 18 W.

As a SAT-IF amplifier with active terrestrial feed, SVN 231 F has 2 inputs: one to connect an LNB, and the other to connect a terrestrial signal. Speaking of LNB, this can be Ku-Band or C-Band LNB – it does not matter. Both kinds of LNB's deliver the output signal in the frequency range: 950-2150 MHz. As to the terrestrial signal, it can be the output of a single antenna or the output of several terrestrial antennas connected together with branching filters.

SVN 231 F provides separate gain adjustment for satellite and terrestrial signals. Satellite signal can be amplified by 20~30 dB and terrestrial by 10~20 dB. So, in both cases, the gain adjustment range is 10 dB. An interesting feature is the adjustable equalizer embedded in the satellite path. Thanks to it, you can reduce the gain for lower frequencies of the IF band. In this way, you compensate for the cable losses which are less for lower frequencies than for higher frequencies. According to the specifications, the adjustment range is from 0 to -12 dB at the lower end of IF frequency range (at 950 MHz).

Additionally, SVN 231 F allows you to power the devices installed in the terrestrial input (like antenna amplifier or active antenna), satellite input, and even insert the DC voltage to its output cable. Using the switch "DiSEqC-1-2-3" you can select the option you need in your installation. In our test circuit we used DC power generated by SVN 231 F to supply active terrestrial antenna and it worked perfectly. The switch was set to position 2. In this position, 18 V DC (up to 400 mA) was provided on the terrestrial input and the satellite input repeated the voltage and 22 kHz signal present at the SVN 231 F output and generated by our satellite receiver.

You can use SVN 231 F to amplify and combine satellite and terrestrial signals and insert them into one cable but it can be also used as an in-line amplifier amplifying the already combined satellite/ terrestrial signal. In such case you use the satellite input of SVN 231 F and set the switch A-B to position B.

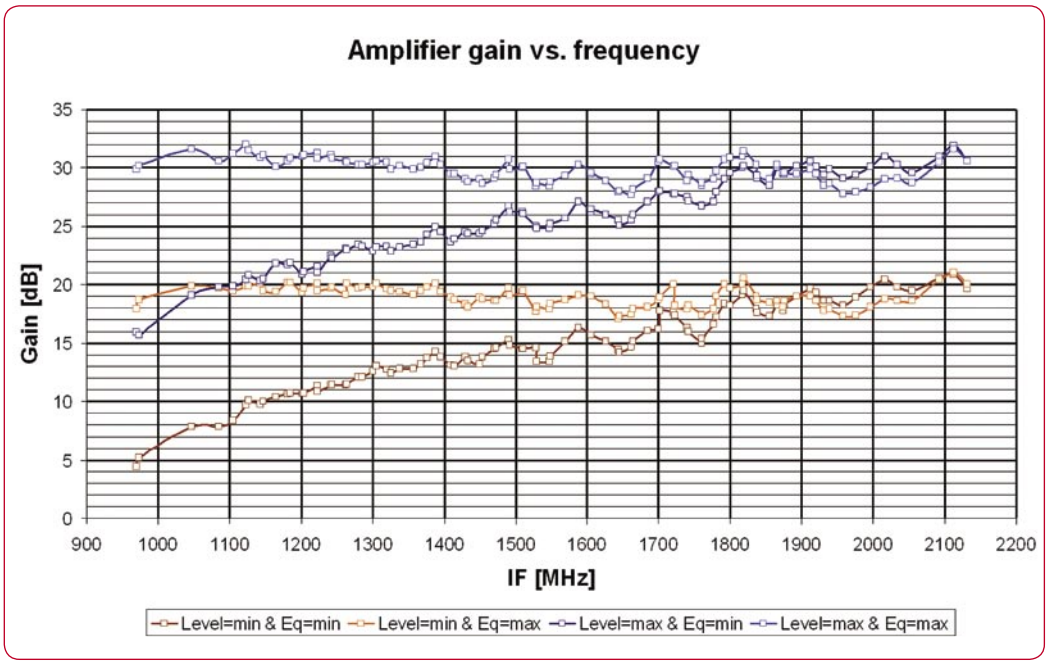
Performance

Satellite amplifier performance was the first to be tested. We used the real world signal from HOTBIRD satellite on 13° East and measured its level at the input of SVN 231 F and at its output for minimum and maximum settings of the gain (level) and slope (equalizer) controls. We used practically every satellite transponder, so the number of the test frequencies was really impressive. You can see the results in the "Amplifier gain vs. frequency" graph.

The actual gain matches perfectly the specs: 20 dB at the level control set to minimum and 30 dB when the level control is set to maximum. The gain is pretty flat over the entire IF range.

The IF is the signal at the output of Ku-Band or C-band LNB. It starts at 950 MHz and ends at 2150 MHz.

As mentioned before, the equalizer control allows you to compensate for the losses of the cable. According to the spec it should adjust the gain at the lowest frequency from 0 to -12 dB. Our measurements revealed that the adjustment range is even higher, from 0 to -14 dB.



We are happy to inform you that practically there was no change in the signal quality between the output and the input. The differences of MER parameters were for example: 13.0 dB vs. 13.2 dB. This means that the internal noise of the SVN 231 F is so low that it does not spoil carrier-to-noise ratio at all.

After measuring the satellite signal, we also tried the terrestrial input. Again we used the real signal of analog terrestrial TV. The results are shown in the "Terrestrial signal gain" graph. Pretty like with the satellite signal, also here the actual gain was almost exactly equal to the specification: 20 dB for maximum settings and 10 dB for minimum settings of the terrestrial level control.

Finally, we decided to measure the DVB-T multiplex available in our location. The difference of the results versus the specification was mere 0.2 dB. It is a big pleasure to measure a device whose actual performance matches that closely its specifications!

SVN 231 F is an excellent building block for antenna installations. It offers high and adjustable gain both for satellite and terrestrial signals.

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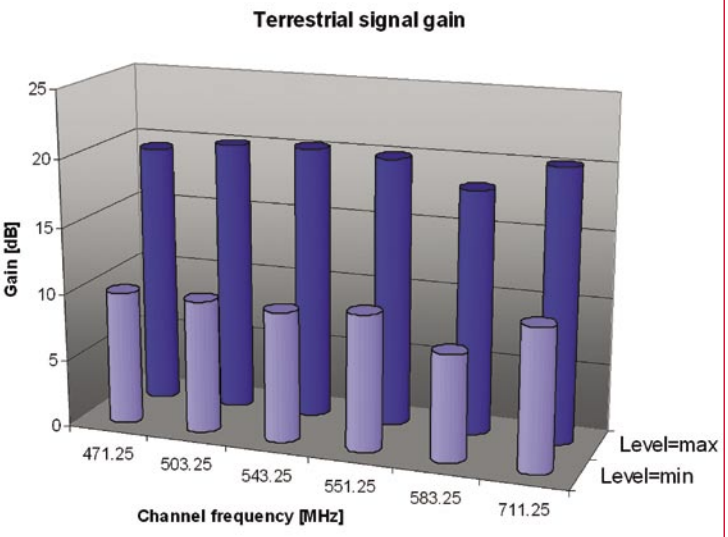

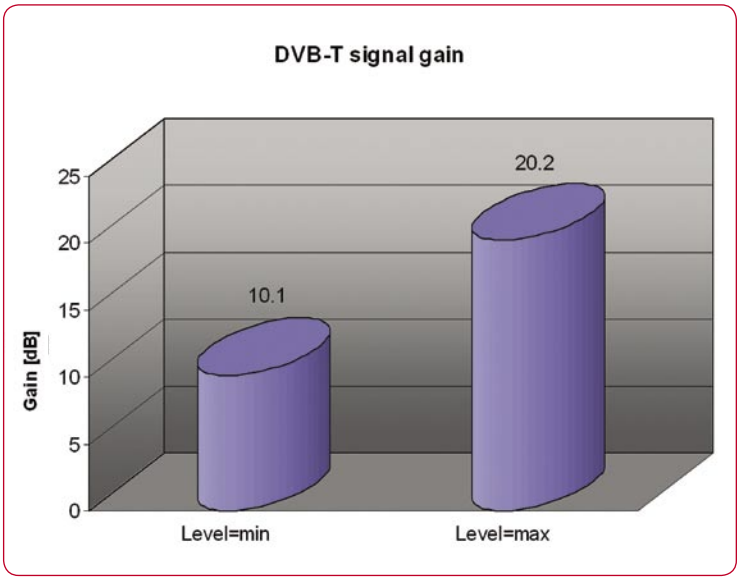

Expert Opinion

Jacek Pawlowski
TELE-satellite
Test Center
Poland

\+

Very flat gain over the entire band
Adjustable gain for satellite and terrestrial signals
Adjustable equalizer for cable losses compensation
Very low internal noise
Actual performance matches or exceeds the specification
Low power consumption
Very good workmanship
Can be used as an amplifier / signal combiner (SAT + Terr.) as well as an in-line amplifier

\-

None

TECHNICAL DATA

Manufacturer	SPAUN Electronic, Byk-Gulden-Str. 22, D-78224 Singen, Germany
Internet	www.spaun.com
E-mail	contact@spaun.com
Phone	+49 - 7731 - 8673-0
Fax	+49 - 7731 - 8673-17
Model	SVN 231 F
Function	SAT-IF/Terrestrial TV amplifier
Inputs	Sat: 1 (950…2200 MHz) Terr.: 1 (47…862 MHz)
Outputs	1 (47… 2200 MHz)
Gain SAT-IF	30 dB
Gain Terr.	20 dB
Level adjustment range	0…-10 dB
Slope correction range	0…-12 dB
Mains power supply	100…240V / 47…63Hz
Power consumption	<18W
Ambient temperature range	-20…+50 °C
Dimensions	250 x 190 x 77 mm

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Jiuzhou DVE-4Q

4-Channel MPEG-2 Encoder for Digital TV Headends

When we enjoy watching digital tv, we rarely think about how the signal is created. More advanced viewers know that the very initial input signal is quite often in analog form. Such analog signal has to be converted to digital format. DVB standard precisely describes it. This format is called MPEG-2 transport stream. Actually, one transport stream can carry a number of digitized analog channels. A transport stream is then fed to the modulator of suitable type: QPSK for DVB-S transmission, QAM for DVB-C or COFDM for DVB-T. The same transport stream can be used for digital satellite, cable or terrestrial tv. But how to create a transport stream?

That's where MPEG-2 encoders come into play. Those are the boxes with one or more analog inputs and one digital output carrying a transport stream. Converting analog to digital signal is not that simple as it might sound. Digital signal processors somewhat similar to the microprocessors we have in our PC must be used in order to do that correctly and in real time. If it is not done correctly, we may get a lip sync problem (a time shift between video and audio detectable by human senses) or some digital distortion in video (like macroblocks popping up here and there on the screen, especially in dynamic scenes).

Jiuzhou DVE-4Q is designed for installation in 19' equipment racks what is typical for the professional equipment. The front panel looks unpretentious – no unnecessary blows and whistles. LCD display, power and status LED's, and six buttons. But after all, MPEG-2 encoder is not a device you place in your A/V cabinet to impress your guests. It is supposed to be installed in the headend station, programmed and left unattended.

The rear panel reveals what DVE-4Q can actually do. It has four A/V inputs and although they use BNC connectors, it is the same type of signal we have in the satellite receivers but with RCA sockets - analog video and analog stereo audio.

JIUZHOU

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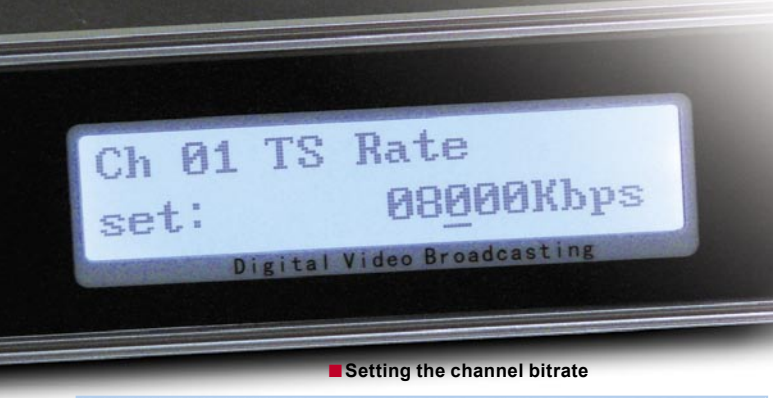
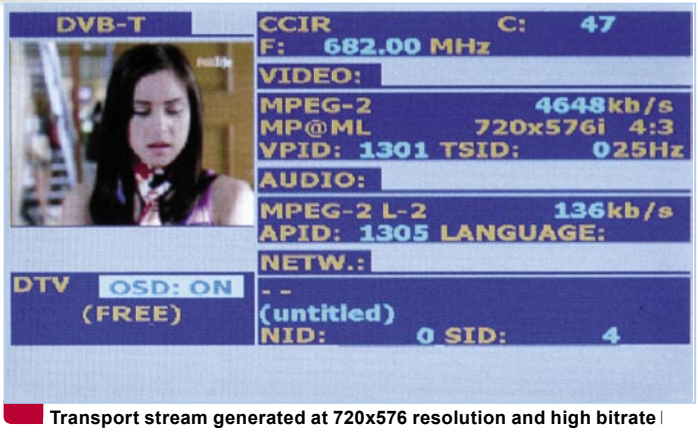
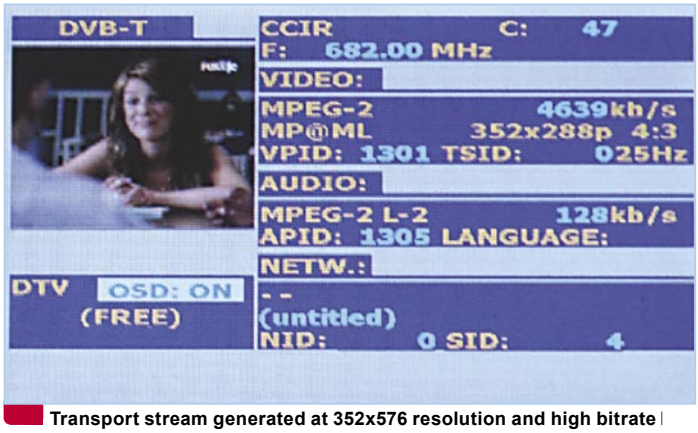


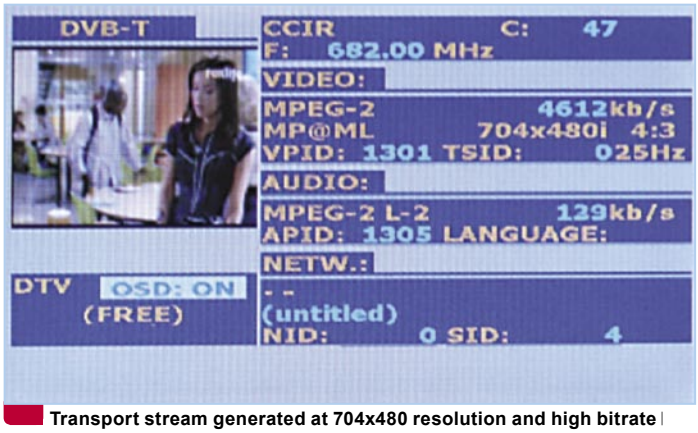
Setting the channel bitrate



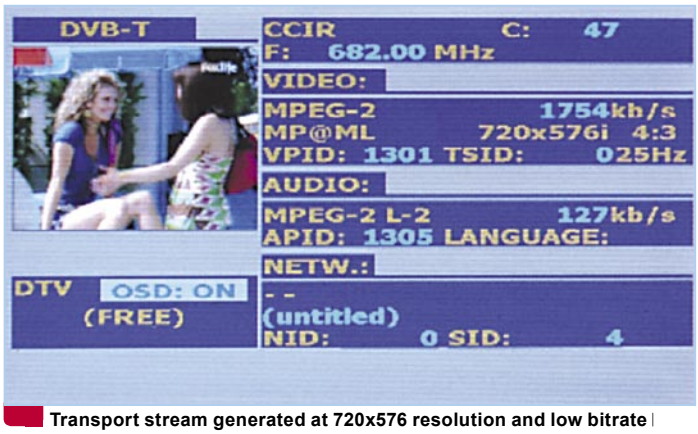
Transport stream generated at 720x576 resolution and high bitrate



Transport stream generated at 352x576 resolution and high bitrate



Transport stream generated at 704x480 resolution and high bitrate



Transport stream generated at 720x576 resolution and low bitrate

Instrument specification reveals that the input can be either in PAL or NTSC system – the encoder will adjust to it automatically. There are two output BNC connectors but with exactly the same signal. This is where the transport stream is output. So, if necessary, you can connect two modulators to the encoder or a modulator and transport stream analyzer.

Except for the inputs and outputs, there are RS-232 and Ethernet interfaces as well as power socket and switch on the rear panel. Interesting that there is no cooling fan. Quick check in the user manual revealed that the device consumed only 30W so the same amount as a regular satellite tv receiver. No wonder a cooling fan was not embedded. The encoder we received for test was dedicated for 220 V ±10% mains voltage and ambient temperature 5...40° C. The manufacturer recommends assuring good ventilation for the unit and considering air conditioning of the entire room. Indeed, the headend stations are usually chock full of different stuff and taking care of good ventilation is a must.

Installation

After power up, the instrument initialize itself what lasts about 40 seconds, then it shows software and hardware version. You can press now OK button to enter the main menu. The menu consists of four items: channel settings, multiplex settings, system settings and check the warning information. Arrows up/down are used to switch between menu items, OK enters the item.

Channel settings menu is used to set proper parameters for each A/V input. You can choose between: Auto, PAL or NTSC. Next item allows you to set the sequence of I, B and P frames in the GOP (Group of Pictures): IP, IBP or IBBP. Then, you can adjust luminance, contrast, saturation and hue for the input in the next 4 submenus. In this way, you can compensate for imperfections of the incoming analog signal. Those values are set either in the range of 0 to 255 or from 0 to 128 (for hue).

Although it may look difficult at the very beginning, changing the numerical values is in fact quite simple and fast. Left/right arrows are used o change the digit, while up/down to increase/decrease the digit. However, if the input signal is good and does not require corrections, the best idea is to leave the factory defaults.

The further submenus in the channel settings are more "digital" in nature. These are: picture resolution, audio sampling rate, audio output bitrate. The available video resolutions are: 720x576, 704x576, 640x576, 544x576, 480x576, 384x576, 352x576 for PAL and 720x480, 704x480, 640x480, 544x480, 480x480, 384x480, 352x480 for NTSC. Audio sampling rates can be set to: 32 kHz, 44.1 kHz or 48 kHz and audio output rates: 128, 256 or 384 kbps.

Audio options are the next menu item. Here you can set it to stereo, joint stereo, dual or mono. The last menu items in the channel settings are the channel output bitrate (video+audio together) with the setting range from 1 Mbps to 15 Mbps and PID settings. PID settings allow you to set the PID values for video, audio, PCR and PMT of a channel.

When you are finished with the channel settings, you

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+ Videostreaming Server-Client integrated. Watch a recorded movie stored at the USB harddisk via ethernet using a second NanoXX HD-Receiver connected to the network.
+ Integrated Mediaplayer: Playback AVI (XVID), JPG and MP3 files from the connected USB2.0 device
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+ HDMI Ver. 1.2, S-VHS, YPbPr RGB Outputs, S/PDIF optical&coaxial, Audio-Video-Cinch, 9800HD: eSATA

DIGITAL fernsehen – 04.2009 – excellent – NANOXX 9800 HD – www.digitalfernsehen.de

TELE SATELLITE AWARD & BROADBAND 04-05/2008 – NANOXX 9500HD – Small enclosure, superbly crisp picture, extremly fast channel search, and connection for HDD

TELE satellite AWARD 12-01 /20 10 – NANOXX 9800HD – An outstandingly equipped universal HD receiver with an unprecedented number of features

NanoXX 9500HD-C

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+ Same specifications as the NanoXX 9500HD for satellite reception but DVB-C Tuner

TELE SATELLITE AWARD & BROADBAND 12-01/2008 – NanoXX 9400 – Very fast low-threshold blind scan receiver – ideal for DXers

NanoXX Product Range

SDTV
NanoXX 9300C (Cable Receiver)
NanoXX 9400 (Satellite Receiver)

HDTV
NanoXX Alpha HD (2 Cardreader, USB-Ready)
NanoXX 9500HD (HDTV USB-PVR Sat.-Receiver)
NanoXX 9500HD-C (HDTV USB-PVR Cable-Rec.)
NanoXX 9800HD (Twin-HDTV USB-PVR Sat.-Rec.)

HDTV with CI+ (the new Common Interface standard)
NanoXX Omega HD+ (Twin-Tuner-PVR Satellite Receiver)

Software und FAQ

Firmware Upgrades & Tools:
http://www.nanoxx.info/download
Frequently Asked Questions (FAQ):
http://www.nanoxx.info/faq

Product Informations @ YouTube

http://www.nanoxx.info
http://www.youtube.com/Nanoxxdotinfo

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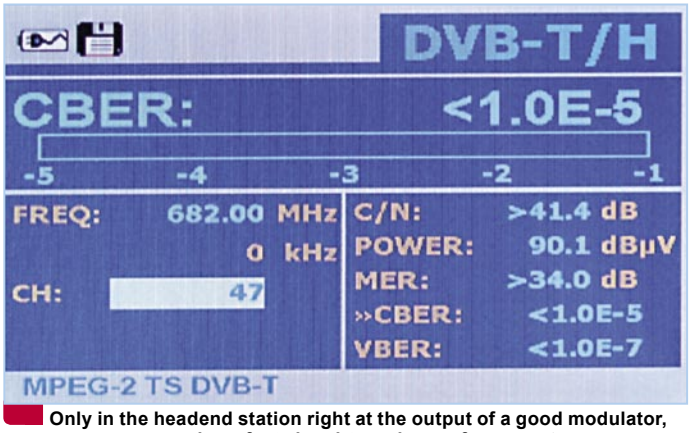
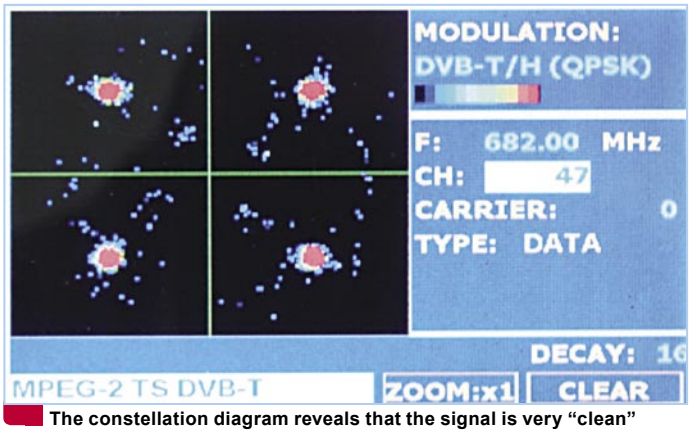


Only in the headend station right at the output of a good modulator, one can see such perfect signal-to-noise performance



The constellation diagram reveals that the signal is very "clean" (noiseless)

Expert Opinion

Jacek Pawlowski
TELE-satellite
Test Center
Poland

\+

DVE-4Q is simple, very flexible and good quality MPEG-2 encoder which can be successfully used in digital tv head ends - especially local cable or terrestrial networks. It is suitable for both PAL and NTSC standard definition signals. Every resolution, sampling rate or audio output bitrate specified in DVB standard are supported and the channel and multiplex bitrates can be set freely.

\-

Transport streams used for satellite transmissions usually need to have more options set that DVE-4Q can do, for example: channel name or event name. So if this encoder is to be used in a full featured satellite headend, its output would have to be still processed digitally before being fed to the QPSK modulator.

can move on to the multiplex settings. They are not that extended as the channel settings. In this menu, you can select which channels are to be included in the multiplex (transport stream). The next setting of the multiplex is the total output bitrate of the transport stream. Its setting range is from 1 Mbps to 54Mbps. Of course, you should set the total bitrate larger than the sum of the channel bitrates.

The following menu item allows you to choose if the SDT table is included in the stream or not and the last item in the multiplex setting is the transport stream ID number.

The next menu – system settings – is used to set local area network parameters: IP address, submask and gateway. The last item in this menu is the reset to factory defaults.

Finally the last menu "Warning Information" is used only if the red status LED lights up. In this way we can check what the reason of an error was.

Performance

To check the performance of the DVE-4Q encoder, we connected it to a DVB-T modulator. As the input, we used DVD player and the outputs of satellite receivers. The encoder started to operate without any problem.

With the default settings the quality of output signal was extraordinary good what you can see in the attached pictures. CBER better than 1x10-5 is something you can not see too often. The encoder created signal in various resolutions in accordance to our setting.

Except for video resolution, also the channel bitrate has enormous impact of the picture quality we see on the tv-set. When we decreased it below about 1.5 Mbps heavy picture distortion were visible especially during the change of a scene. Normally, the lower the bitrate the cheaper the transmission is. However you should not decrease it too much because the viewers will notice the distortions. Having an encoder as flexible as DVE-4Q, one can easily set the proper settings for himself.

During the whole test, DVE-4Q worked flawlessly. It created transport stream with very good quality digital video and audio unless our settings were deliberately low.

TECHNICAL DATA

Manufacturer	SICHUAN JIUZHOU ELECTRONIC TECHNOLOGY CO., Ltd. No. 16, Yuejin Road, Mianyang, Sichuan Province, China
Web	www.jiuzhoutech.com/
Phone	+86-816-2469 300
Fax	+86-816-2469 411
Model	DVE-4Q
Function	4-Channel MPEG-2 Encoder
Video input (CVBS)	Level 1.0Vp-p, 75ohm, BNC connector
Audio input	Level 2.0Vp-p, 600ohm, BNC connector
Output standard	ASI
Output level	800mV±10%
Output bitrate	1~100Mbps tunable (each channel 1~15Mbps tunable)
Video coding	Complying to ISO11172 and ISO13818 (MPEG-2), 4:2:0 MP@ML
Audio coding	MPEG-1 Lay II, CD audio quality
Dimensions	44mmx480mmx320mm
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FORTEC STAR

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DIGITAL SATELLITE SYSTEMS

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Satellite Receiver Manufacturer, Portugal

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INFOSAT

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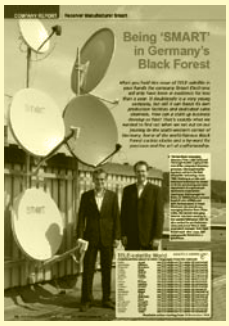

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Large-scale Quality and Innovation Made by CHANGHONG

CHANGHONG is one of the largest volume manufacturers of receivers with headquarters in Mianyang in the Sichuan province of south-western China, some 130 km from the provincial capital of Chengdu. Not only do millions of satellite and terrestrial receivers leave the production premises every year but also an equal number of flat-screen TVs, so that the company ranks among the most important digital corporations in the world.

Digital TV manufacturer CHANGHONG is headquartered in Mianyang, a city of 600.000 inhabitants. The administrative building can be seen in the centre, with the development centre to the left and any many satellite antennas on its roof. In the background and extending to the left the CHANGHONG manufacturing plants stretch out over 2 square km.

Looking at their business today it is hard to imagine the humble beginnings of the project. CHANGHONG was founded in 1958 and started out with producing military radar systems. But today the company has evolved into a super-huge, pluralistic, international group of 13 different industries, producing everything from digital tv panel displays to IT systems, air conditioner systems, digital audiovisual products, set top boxes, eco-friendly battery and power supplies up to whole systems of technical equipment, electronic engineering and chemical materials.

One of the 13 industries of the CHANGHONG GROUP is the SICHUAN CHANGHONG NETWORK TECHNOLOGIES Co., Ltd. It is an independent subsidiary of the CHANGHONG GROUP and specializes in research & development, marketing and manufacturing of digital set top boxes in all standards like DVB-S, DVB-C, DVB-T, ISDB, DMB-TH and of course HDTV including value-added systems for digital tv.

Their production capacity reaches up to 12 million, making them the largest STB manufacturer in China. The company has heavily invested in their quality control and has built up a digital TV laboratory, a digital HFC experimental net, EMC laboratory and most importantly a high accuracy SMT production line. CHANGHONG's aim is to become one of the strongest suppliers for digital tv solutions worldwide.

"In 1978 CHANGHONG started its TV production," Richard Cheng Li remembers. "At the time we imported a complete production line from Panasonic in Japan and we also implemented every single production guideline right down to the very last detail." Richard continues to explain that "this is how things go in the first phase of

■ At Chengdu airport: His role as Overseas Sales Director leads Richard Cheng Li to many destinations around the globe.

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Available online starting from 29 January 2010

■ **Janet Zhang is in charge of technical communication with customers. With a recent issue of TELE-satellite in her hand she can be seen in front of some satellite antennas that are installed on the roof of the development department. The opposite side of the building houses many more dishes**

industrialisation: You simply take everything over because you lack the self-confidence required to come up with something of your own."

In the second phase products are modified and adapted to local markets, which leads to increasing independence as soon as the production process is understood from A to Z.

Finally, phase 3 includes setting up one's one brand name, knowing that a new local or even global player is in the making. "CHANGHONG is currently in phase 2, but eagerly eying phase 3 already," Richard Cheng Li summarise the company's current standing. According to Richard, CHANGHONG's ambitions are high-flying: Phase 2 does not only imply that the production lines run at capacity, but also that the development department is working overtime.

Indeed, the premises include a dedicated building housing several teams of development and software engineers. Right next to its entrance hall a huge library makes available all major electronics magazines from China and abroad as well as a large section of specialised literature. Engineers are free to look at any piece of literature or information while they are at work.

CHANGHONG even operates joint laboratories with two major chipset manufacturers where engineers from CHANGHONG as well as from the two chipset companies together work on innovative receiver hardware and software. Some 20 engineers work in the NEC joint laboratory, with the ST joint laboratory being home to 30 engineers. 46 additional engineers deal with mechanical components such as housings or internal structural elements.

■ **A small section of the enormous CHANGHONG production site. The apartment blocks visible in the background are purpose-built for CHANGHONG employees.**

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Library head Chen Qiong files TELE-satellite magazine into the comprehensive magazines section of the in-house library. More than 300 publications are at hand for consultation by development engineers.

It goes without saying that a world-class manufacturer doesn't stop at production. State-of-the-art products must comply with a plethora of safety requirements and standards, all of which have to be routinely checked and verified at the end of the manufacturing process. These days testing requires even more technical expertise than mere production, so it is interesting to find out how CHANGHONG approaches this matter.

To find out, we walk down one floor and enter the realm of hardware test manager Wang Xiao Bo. He presides over a huge range of measuring equipment and proudly draws our attention to test transmitters: "We are able to generate DVB-S, DVB-S2, DVB-C and of course Chinese DMB-T and ABS-S signals. With the help of special software we can even create ISDB-T signals for test purposes." Units from current production are selected and sent to the test lab to be checked for compliance with all relevant specifications.

Speaking of specifications – does CHANGHONG really check and verify whether all safety requirements are met? We hop into a car and drive a few miles to the other end of the vast CHANGHONG production premises. Behind company-owned apartments for employees and next to the dispatch centre an EMC laboratory has been set up by CHANGHONG.

You Meng is the lab manager and shows us a framed certificate on the wall: "Our measuring laboratory was certified by the FCC in 2008." Incidentally, this is hardly surprising as the EMC lab boasts professional technology and state-of-the-art systems. Radiation tests are performed in a 9 x 6 metre hall which is fully encased with metal. Four smaller chambers are available for EMI tests and other checks. "This measuring lab represents an investment of more than one million USD," You Meng reveals. A total of six engineers work in the lab and check pre-production as well as production samples for compliance with safety requirements. Evidently, quality assurance and quality checks are well-established procedures at CHANGHONG. What we do not yet know, however, is what the sales figures look like.

Overseas Sales Manager Richard Cheng Li has the details: "We produce some ten million multimedia devices per year, mostly TV sets, as well as three to four million receivers. Some 70% of receivers and some 80% of multimedia devices stay in China, the rest goes into export."

And this is where we tap into a delicate situation: CHANGHONG's production site is not really ideally situated for export business, with the coast and any ports for shipping into all corners of the world rather far away. "We have found a solution, however, "Richard Cheng Li reveals. "Rather than trying to export finished products we decided to export production!"

Today, CHANGHONG operates manufacturing plants in the Czech Republic, Indonesia, Australia and the CIS countries. In Brazil, Dubai and India CHANGHONG runs assembly sites and sales offices. All this is impressive proof for the company's expansion plans.

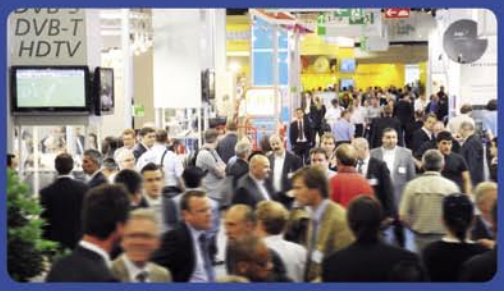
Which leads us to another cue for Richard Cheng Li: How does he evaluate the company's future? "The coming years will see a significant upswing in the terrestrial digital receiver segment, as virtually all countries are currently in a transition phase from analog to digital terrestrial broadcasting."

CHANGHONG is well placed to cover this government-driven market as it also manufactures TV sets next to their digital receivers and both products groups will experience a genuine boom in coming years.

Presently, CHANGHONG is working hard on boosting its market position. "We participate in all major specialised fairs and exhibitions," Richard Cheng Li states and lists the following examples: "IFA in Germany, IBC in Netherlands, CSTB in Russia, CABSAT in Dubai, Convergence in India, BroadcastAsia in Singapore and Broadcast & Cable in Brazil."

CHANGHONG has come a long way. Today the company boasts state-of-the-art production facilities using all the latest technical tools that are available. What's more, there is a spirit of trying to be best in everything it does, which further adds to the overall appeal of CHANGHONG.

Focusing on the receiver and TV segments the company is right on track to ride the digital and HDTV wave over the course of the coming years and finds itself in an enviable position for becoming a major global player.



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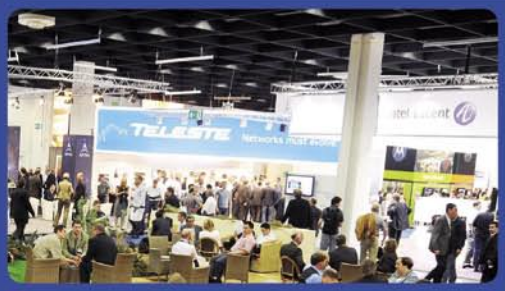

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Inside the Hardware Test Center

■ Wang Xiao Bo is the manager of CHANGHONG's Hardware Test Center and poses in front of a professional R&S measuring device. He proudly lists some of the equipment available to his staff: "We use the SFE by R&S, the DDS200 and VM700T systems as well as two DVT200 units made by Tektronix, various MPEG-2 generators, the VM6000 video measuring system and many other state-of-the-art systems."

■ Two staff members test sample models taken from current production.

Software Test Center

■ What is Software Test Center manager Shi Luobei doing here? "I'm writing down our goals for coming weeks on this board," she tells us. This way all employees have the company goals right on front of their eyes and can do their best to achieve them.

■ The Software Test Center evaluates receiver software and is hunting for any bugs. All receiver functions are thoroughly tested so that customers will be able buy a flawless product.

■ This member of staff is busy testing a pilot DVB-T receiver with integrated Nagravision for the Spanish market. "This particular model will be launched in Spain in three months," Wang Xiao Bo explains. "We are currently making sure all specifications are met before starting with serial production."

■ Wang Xiao Bo turns on the DVB-S2 generator. Right below generators for DVB-C, DMB-T, ABS-S and DVB-T can be seen.

CHANGHONG

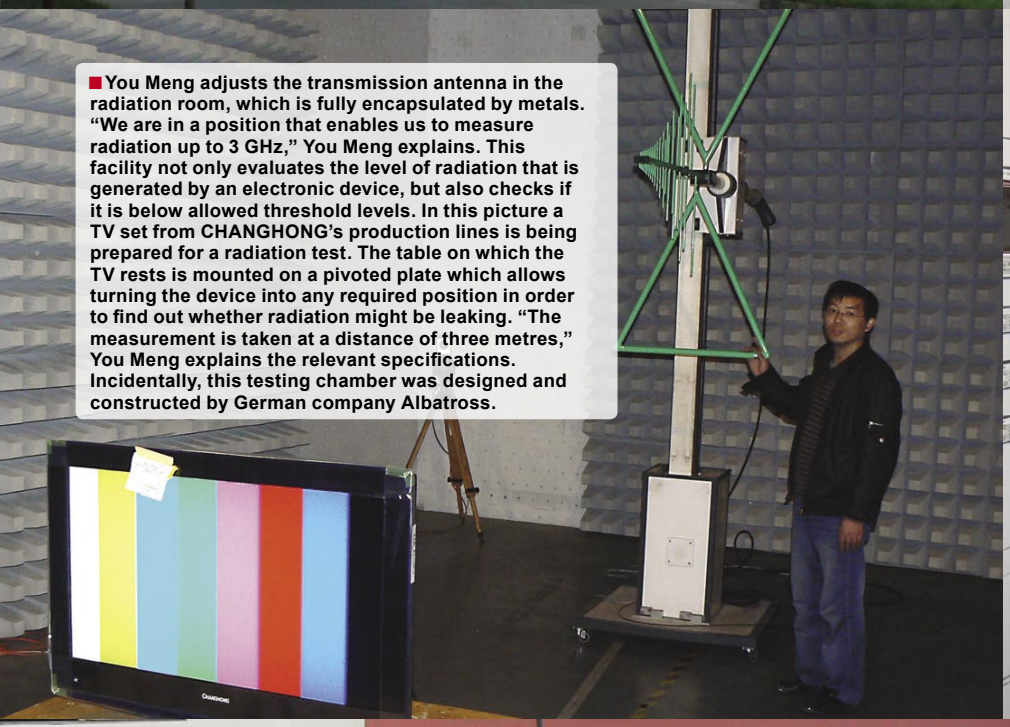
■ A Software Test Center member of staff wracks his head about a software bug. It definitely has to go before this model can go into despatch.

EMC Test Laboratory

CHANGHONG

■ The three buildings seen here house the EMC lab as well as video and audio testing chambers.

■ EMC Test Laboratory manager You Meng draws our attention to the certificate issued by the United States' FCC. This document authorises the CHANGHONG EMC Test Center to officially issue test certificates. The second document on the right was issued by the Chinese section of the international EMC laboratories group.



■ You Meng adjusts the transmission antenna in the radiation room, which is fully encapsulated by metals. "We are in a position that enables us to measure radiation up to 3 GHz," You Meng explains. This facility not only evaluates the level of radiation that is generated by an electronic device, but also checks if it is below allowed threshold levels. In this picture a TV set from CHANGHONG's production lines is being prepared for a radiation test. The table on which the TV rests is mounted on a pivoted plate which allows turning the device into any required position in order to find out whether radiation might be leaking. "The measurement is taken at a distance of three metres," You Meng explains the relevant specifications. Incidentally, this testing chamber was designed and constructed by German company Albatross.

■ EU standards are even stricter than most other national standards. This room is used for testing receivers according to EU standard EN55020.

SMT Production

CHANGHONG

■ Somewhere in the vast expanses of the production area Zhou Bo, Sales Manager Europe, leads us into this building.

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SMT Production

■ The sixth floor is supervised by SMT manager Yeng Fei who is not only in charge of a total of 29 SMT production lines, but also for 400 employees working around the clock in two shifts. "Our machines must be running all the time," Yeng Fei emphasise, "which is why we use a two-shift roster with a 12-hour shift followed by two days off."

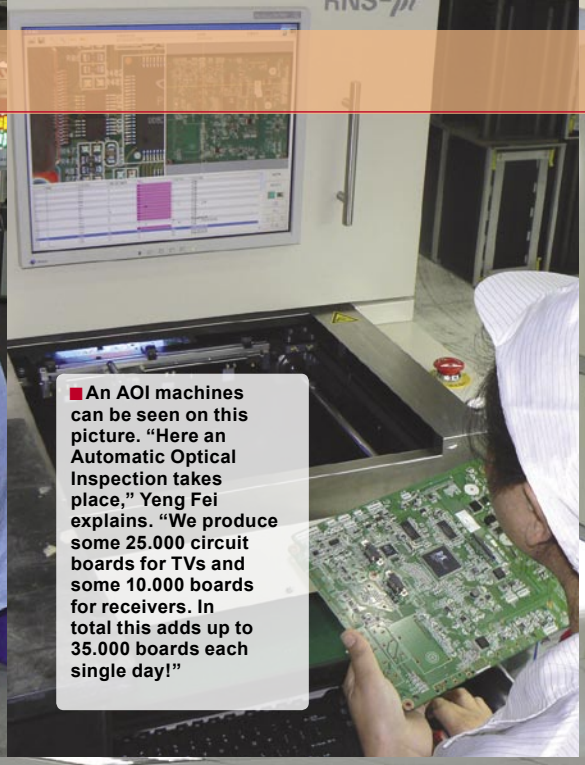
NEC Joint Laboratory

CHANGHONG

■ View of the laboratory that is operated jointly with NEC. 20 engineers are employed here.

■ Wang Yong Sheng heads the NEC Joint Laboratory. Here he is seen discussing a new task for the EMMA3 chip with an NEC engineer. This chip is used for HDTV.

■ A member of staff checks assembly to the SMT machine. “This is the most recent addition to our equipment,” Yeng Fei reveals and points to the Panasonic system. “We also work with SMT machines supplied by Siemens and Fuji.”



■ An AOI machines can be seen on this picture. “Here an Automatic Optical Inspection takes place,” Yeng Fei explains. “We produce some 25.000 circuit boards for TVs and some 10.000 boards for receivers. In total this adds up to 35.000 boards each single day!”

■ Random samples are also inspected using this X-ray machine.

ST Joint Laboratory

CHANGHONG

■ In total 30 CHANGHONG and ST engineers collaborate on the further development of the STI7101 chip and the development of the new STI7105 chip. They also work on Broadcom chips for HDTV.

■ Some of the 46 CHANGHONG hardware engineers can be seen in the background on this picture. Left in front is Zhang Lei Ming, manager of the Software Joint Laboratory, and to the right Zhou Jun who heads the Hardware Department.

The Birth of a New Receiver Manufacturer

Kaifa in China Starts Production

■ Kaifa's administration building in Shenzhen, China

By the time this issue of TELE-satellite will be published, Kaifa will have been manufacturing satellites receivers for just a few weeks. When we paid them a visit, they were just finishing the installation of their assembly line and an initial test run was soon to follow.
Who exactly is Kaifa and what makes this company think they're ready to step into the market as a satellite receiver manufacturer?

The first question we had was for Lidya Jin, Marketing Supervisor, and she explains to us how Kaifa came to be in existence: "Kaifa was founded in 1985 through an initiative by the then Minister of Chinese Ministry of Electronics Industry, Zemin Jiang who was the former President of China."

The first products manufactured back then were magnetic recording heads for hard drives. Production of electric meters started in 1995. A portion of these power meters are sent to India and totals roughly 5 million up to today. "We produce special electric meters for the Indian market, so-called Anti-Tamper meters", explains Lidya Jin. Kaifa also provides the Italian Electric Utility ENEL with power meters. These power meters have been exceptionally designed. Up to now, Kaifa has delivered approximately 17 million of these meters to Italy.

■ A look at the production building

■ This model in Kaifa's entrance lobby provides an overall view: the administration building with its production lines is to the left, a production building is to the right and in the back is employee housing. The employees come from almost every province in China and it helps them when the company can completely provide for them. When they marry, they move off of the premises. But Kaifa has also taken care of these employees by building apartment blocks outside of Kaifa's property. Jackie Yan is proud of the social measures that Kaifa has taken.

Kaifa also manufactures media substrates of hard disk drives, cash registers, multimedia players, projectors PCBA, DRAM modules, USB memory sticks and even cell phones. But most of these products carry the Kaifa name, instead they carry the names of the companies that purchased their products. Kaifa considers itself an Electronic Manufacturing Service provider, with customers that include world-renowned names such as Seagate and Samsung.

Kaifa employs 8000 people and expects sales of two billion dollars in 2008. The largest shareholder of Kaifa is the company Great Wall Industries listed in the Hong Kong stock exchange in 1999. Great Wall itself belongs in large part to China Electronics Corporation, one of China's top 100 companies and China's largest IT firm with an expected sales revenue of approximately 10 billion US dollars in 2008.

Kaifa operates in two different locations with its main operations located in Shenzhen with 6100 employees on 80,000 Sq-meters. Its other location is in Suzhou on the Yangtze River Delta with 2100 employees on 14,800 Sq-meters and manufactures the PCBA (Print Circuited Board Assembly), which Samsung uses in their notebooks as well as PCBA for Seagate hard drives.

Kaifa is ranked second in the world as a manufacturer of HSA (Head Stack Assembly) with a global market segment of 10%. 215 engineers work in the R&D department, 100 engineers are respon-

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sible for quality and system management with another 30 expatriats who are mostly responsible for Marketing and Management.

After this introduction to everything that Kaifa produces, it's easier to see why Kaifa wants to start manufacturing satellite receivers. Marketing Manager Jackie Yan explains it to us in words: "About a year ago one of our largest power meter customers in India came to us and asked us if we could also manufacture satellite receivers." This customer was so impressed with the overall quality and further development of Kaifa's products that it only seemed natural that Kaifa should also produce satellite receivers for this customer and its DTH project in India.

Naturally this is quite a fast start for a brand new satellite receiver producer. But of course there's more going on than just this one customer. Jackie Yan explains, "We are currently in negotiations with another large DTH operator who also happens to be from the Southeast Asia region and we are also waiting to start negotiations with a third customer."

And what about production capacity at Kaifa? GuangYun Zhu is their Satellite Receiver Production Manager. He says to us, "Right now we have production facilities which can produce 5 million satellite receivers per years."

While touring the fabrication facility we can clearly see why Kaifa holds such a high position in the EMS category: everything is exceptionally organized and the machines are state of the art.

But this is completely understandable: worldwide companies like Samsung demand nothing but the best quality. And it looks like it was a very good decision for Kaifa to step into the satellite receiver market.

Jackie Yan, Marketing Manager, is seen here showing us Kaifa's first satellite receiver model. It is being manufactured for a DTH provider in India. Jackie Yan is standing in front of a wall on which are calligraphies of the former President of China Zemin Jiang.

A portion of the products that Kaifa manufactures: to the left are power meters, in the middle are components for hard drives and to the far right are head stack assemblies for hard drives.

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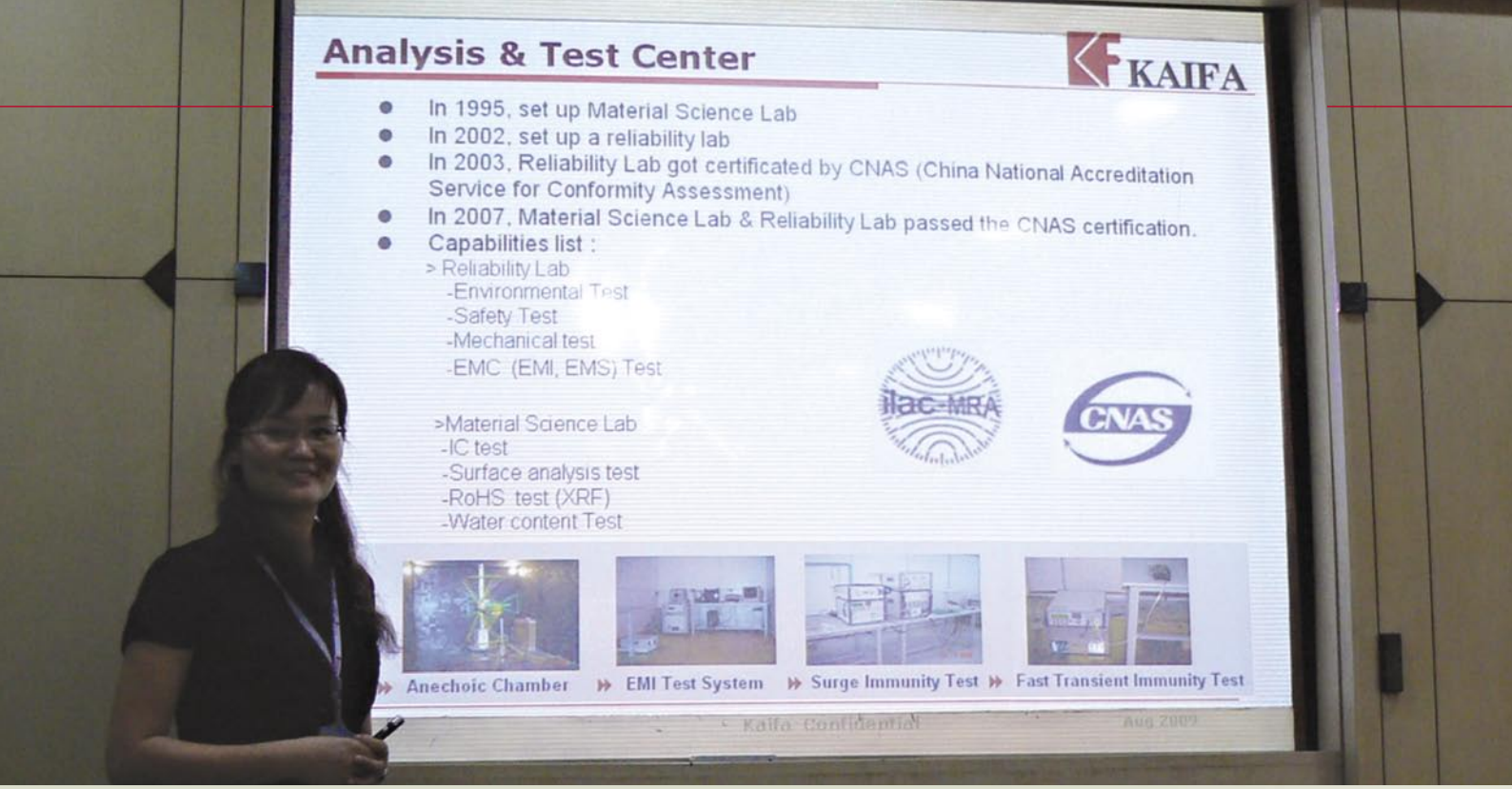

■ **Lidya Jin, Marketing Supervisor, is showing us here the certificates that Kaifa has received from various institutions for its Quality Assurance. Kaifa has been certified as public technology platform in China.**

In the Reliability Lab

KAIFA

■ **This machine conducts shaking and vibration tests; the machine behind it performs drop tests.**

■ **Zico is one of the most experienced engineers at Kaifa. Here he is showing us an Aging Chamber. He explains, "Products are kept in here for one week at 70° Celsius." Five of these chambers are in use in the Reliability Lab.**

■ **An engineer working on the Surge Immunity Test Machine**

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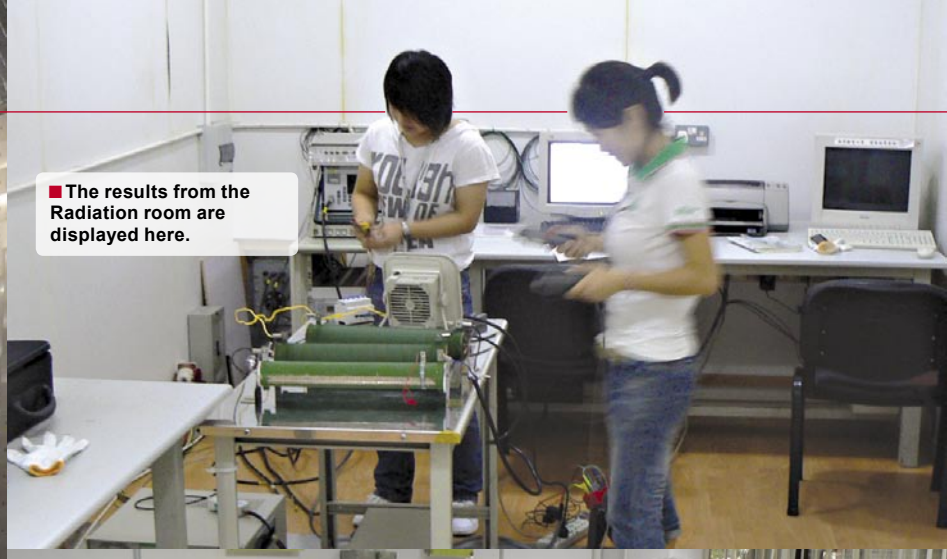
■ In the Radiation room: an employee is preparing a product for an electromagnetic radiation test



■ The results from the Radiation room are displayed here.

■ Immunity Tests are conducted here

The Birth of Satellite Receiver Production

KAIFA

■ This is Guang Yun Zhu, Satellite Receiver Production Manager. Everything is ready; production can begin in just a few days!

■ This test station is located right alongside the production line. An employee is practicing on the test station using a satellite receiver circuit board. They are still test circuit boards but it will soon be regular production line boards that pass through this station.

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Here we have to wear plastic shoe covers and a blue smock since. Here we see Engineer Deng. He is with Kaifa for five years and is one of the most experienced engineers with these machines. He explains to us: “We are using SMT automatic machines from Siemens and Fuji.”

The finished circuit boards are tested here.

What can no longer be recognized by the naked eye is made visible in this X-ray machine. Tong Qing Xu is the engineer for this machine and he explains to us: “Six employees are alone responsible for Failure Analyze Testing in Advanced SMT Lab.”

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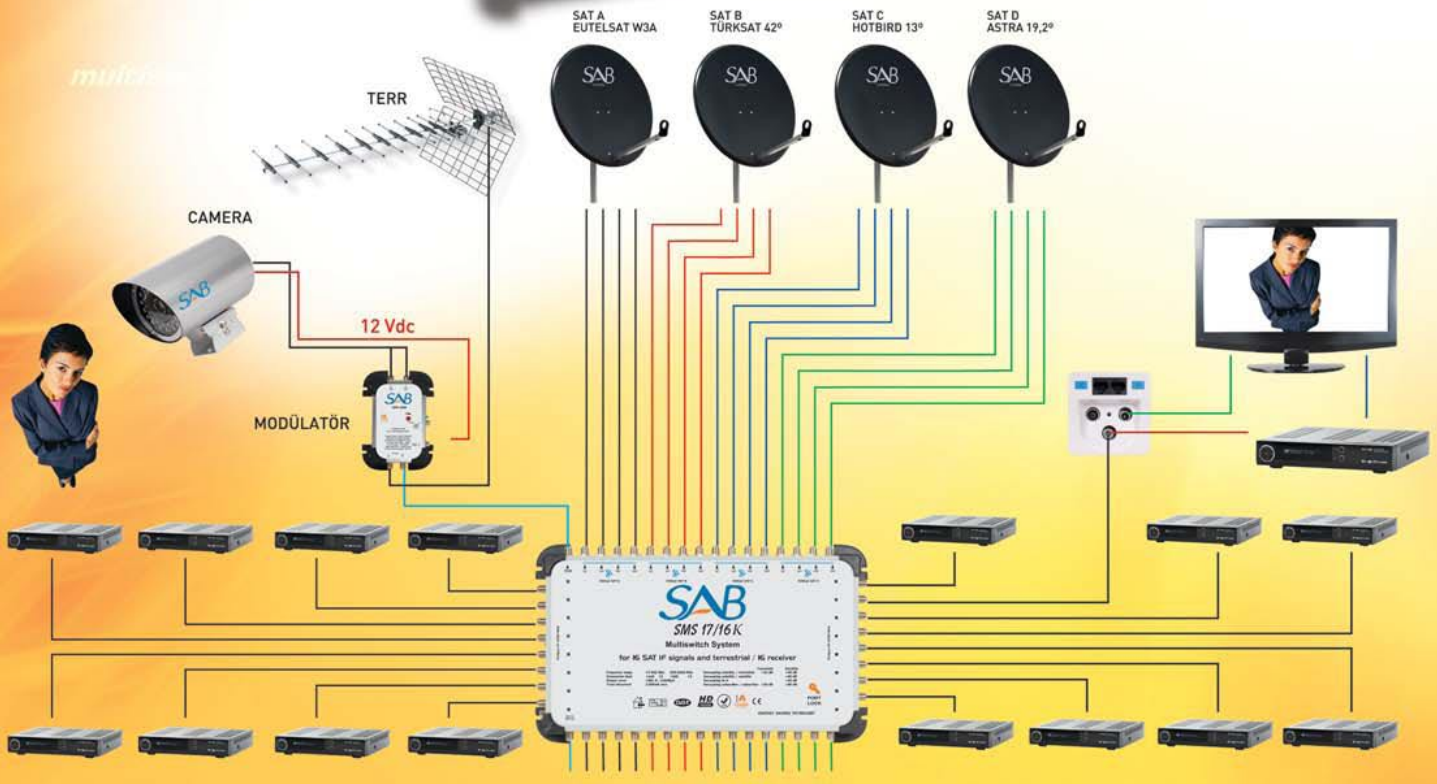

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SVEC Dishes from Chengdu/Sichuan

Alexander Wiese

The Sichuan province is well known outside of China for its spicy cuisine. A national favorite is the "Hot Pot": in one pot with two separated sections a very spicy soup and a mild soup are heated up into which chopsticks are used to dunk in different types of food for a few minutes. This could be thinly sliced pieces of meat or vegetables. Along with that you drink sweetened Wong Lo Kat herbal tea to offset the spiciness of the Hot Pot. The company SVEC in Sichuan's capital city of Chengdu, a city with eight million inhabitants in southwestern China, has its own spicy menu. SVEC is looking for new challenges adding to their production of satellite dishes: they want to play a much bigger role in the world market with high quality products.

An enormous satellite dish identifies SVEC's location in Chengdu from a distance. The administration building is in the foreground and in the back to the left is the satellite dish production facility.

The city of Chengdu itself has a long tradition for electronic communications in China. Its University of Electronic Science and Technology is very famous and has set up one of only two Antenna Science majors in all of China's universities. It is said that the best engineers in electronic communications can be found in Chengdu. About 30 factories are located in Chengdu.

In the High-Tech Development Park, West Zone, you will find SVEC's manufacturing facility. It's located well beyond Chengdu's third city ring but still within its city limits.

At the conference table in the bosses office, Wang Duo, SVEC's Board Director, explains to us the company's strategy and begins with its founding: "SVEC began in 1993 with the production of 1.5-meter aluminum antennas for the C-band", says Director Wang Duo, "in our first year our 50 employees produced 10,000 anten-

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■ Wang Duo is Board Director and Manager of the company SVEC

nas." 25 years later, those 50 employees grew to nearly 1000. Director Wang Duo explains: "They are divided into three different locations."

Becky is Manager of their Sales Teams and she tells us more about the three locations, "The fabrication plant here in Chengdu produces mostly for the domestic Chinese market. Our Suzhou location near Shanghai produces primarily for the export market, hence its location near the Pacific ocean. Our plant in Xinjiang in extreme northwestern China produces for the Russian export market." With all of these production facilities, it must be quite a large number of satellite dishes that are being manufactured. Director Wang duo gives us a number: "If we were to operate at full capacity it would be 180 million dishes a month." This enourmous amount has been created by the big demand on the local China DTH market.

In reality though they don't produce that many antennas but Becky gave us some food for thought: "For the Chinese DTH project we have a contract to deliver 7 million dishes." Even though the domestic market is being supplied with millions of dishes, Becky and her sales team now want to focus more on the export market. "Right now our sales numbers are very good for the Southeast Asian countries as well as for South America", explains Becky.

Becky continues: "Our key partners in the export market are the TV operators. 70% of our sales volume comes from TV operators. In 2009 we manufactured 3 million antennas. We are looking to increase deliveries to North America. The Middle East market is a FTA market, but there they don't care about quality, only about price, so sales volumes went down in 2009. Africa is yet a sleeping market for us." SVEC is actively taking part in all of the popular trade shows. "We are going to ANGA in Cologne, Cabsat in Dubai, IBC in Amsterdam, CSTB in Moscow, NAB in Las Vegas and of course CCBN in Beijing." You will find Becky or her colleagues at each of these trade shows.

But SVEC is not satisfied with just the production of satellite dishes. Their Master Chef, who is busy stirring up a new spicy antenna soup, is Wei Yun Han, head of the R&D team and at 73 years old is a real old timer who is loaded with new ideas. He has worked for military industrial enterprises for almost 60 years and has full experience in this industry. His team of 20 engineers are busy working on the completion of an automatic satellite system that is expected to be ready by the middle of 2010.

The designated driver of the company has the enviable task of driving around the company minivan in which is installed a prototype of this automatic system and testing the satellite reception while driving. As passengers in the minivan we were able to get a first hand look at how perfectly the prototype functioned and while our eyes were focused a little more on the chaotic traffic all around us than on the attached mini TV, with the driver it was the other

A look at the gigantic 9000 Sq-m production facility. A total of 15 press machines are installed here that are used to produce satellite dishes from as small as 35cm in diameter all the way up to large paneled 3-meter diameter antennas.

This is Li Peng. She is Production Manager and is seen here showing us a panel from an SVEC dish.

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way around. Applications for such an automatic tracking system naturally include TV reception in moving vehicles such as in a car, in a truck, in an RV or even in a train.

But the Internet is the future, and therefore interest in receiving Internet-via-satellite using a system like this could reach completely new dimensions.

The subject of Internet-via-Satellite is not too far removed from VSAT. It's actually a separate business unit for SVEC and they would also like to strengthen their market position here as well.

This is a challenging technology and SVEC with its many years of production experience can bring a lot of know-how to the table. This covers the Ku-band as well as the Ka-band; most of the Internet-via-Satellite signals can be found in the Ka-band. These are technical challenges that are far beyond those that would be found with the production of satellite dishes; they are challenges that SVEC is taking on enthusiastically.

SVEC has ambitions to become one of the leading suppliers of satellite reception systems in the world. As Director Wang Duo says: "We care very much about the high technology development. It's very important because it determines our life in future. Our goal is to play a much bigger role in the world market with high quality and technology products."

That spicy soup in Sichuan is boiling away at SVEC!

■ There are only two dish factories in China which have the ability to develop the mould in their own mould plant.

■ A look at the press machines in the production hall. The dishes as well as the dish panels are formed here out of sheet metal

■ Automatic welding robots are used in the production of the support rods.

■ Dish panels are waiting here for further transport.

■ Becky (left), Export Sales Manager, Alexander Wiese (center), TELE-satellite Editor-in-Chief, and Wang Duo (right) Board Director SVEC

■ In the SVEC showroom: Frank is in the Export Sales Team

■ The R&D center with the developmental engineers. In the background Development Manager Wei Yun Han is discussing their new automatic tracking system product.

■ A prototype of their new self-tracking satellite antenna is installed on the company van. The driver keeps an eye on the mini TV while driving to make sure that reception is interference-free.

■ A look at the Sales area: all customer inquiries are funneled here. Nine employees are responsible for export with another 25 responsible for domestic sales.

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TRU SAT

MODEL	TRUSAT400	TRUSAT600
Physical Size	43cm X 43cm	63cm X 63cm
Frequency range	10.7-12.75 Ghz	10.7-12.75 Ghz
Polarization	Dual Linear or Dual Circular	Dual Linear or Dual Circular
Gain	34 dBi(at 12.4 Ghz)	37 dBi(at 12.2 Ghz)
Cross Polarization	<-30dB	<-30dB
Beam width at -3dB	4.5 degree	2.7 degree
LNB LO Frequency	All LO	Same as left
LNB Noise Figure	0.5 dB(Max)	Same as left
LNB Conversion Gain	60~65 dB	Same as left
LNB Output	1 output(standard)/ 2/4 outputs(optional)	Same as left

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■ Becky is in charge of the Sales Team. She also travels quite extensively internationally and represents SVEC at the trade shows.

■ Belinda Zhou is Sales Manager for Middle East and European markets

■ Reina is Sales Manager for Africa and India

■ Green Li is the Sales Manager for Southeast Asia and Russia. She had read the article in TELE-satellite about the pink dishes from Thailand. She gestures to her monitor: “We also manufacture satellite dishes in pink for our customer TrueVisions.”

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Quality Control at Skyworth

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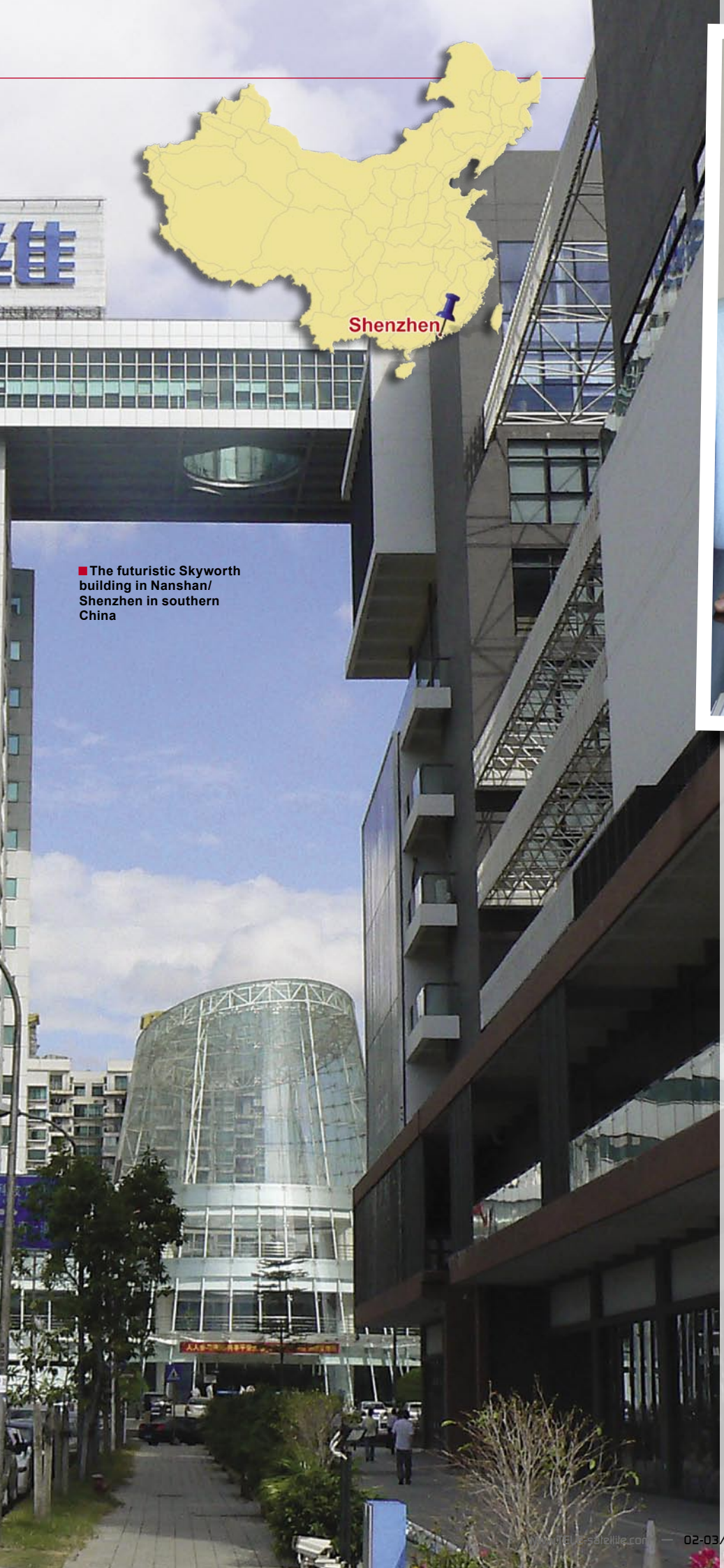


■ The futuristic Skyworth building in Nanshan/ Shenzhen in southern China

■ David Ken is Vice General Manager and explains Skyworth's background

One of the largest receiver manufacturers in the world is Skyworth. Skyworth Group Co. Ltd. is one of the leading manufacturers of TV sets in China. The company started into the satellite receiver research as early as 1997 and in 2002 a subsidiary was established under the name of Shenzhen Skyworth Digital Technology Co. Ltd. Those 13 years of experience in satellite technology made the company more and more professional and by now Skyworth claims to be the leading STB (set top box) manufacturer in China.

In the past TELE-satellite has had many reports on receivers from this manufacturer but always under a different brand name. Skyworth happens to be an OEM (Original Equipment Manufacturer). The success of an OEM is measured by the quality of their products. So what makes Skyworth so successfull in the OEM business? Why do more and more big and famous customers from all over the world start to cooperate with Skyworth? And why are these customers all so satisfied with Skyworth? It is exactly for these reasons that we decided to pay them a visit in Nanshan's Hi-Tech Park in the city of Shenzhen in southern China.

Skyworth can be found in a very impressive-looking futuristic building. This is where we met Vice General Manager David Ken. On the company's homepage we saw that Skyworth manufactures TV's and other products besides receivers. So naturally, our first question to David Ken is how is it all divided. He explains, "If you look at it from a sales figure point of view, then 70% of it is TV's, 20% is receivers and the remaining 10% falls on the other products." But as David Ken continues, it gets more interesting: "If you look at it from a profit aspect, then the receiver section is greater than 20%." These figures are all made possible by the 2000 employees in the receiver section; Skyworth has a total of 20,000 employees.

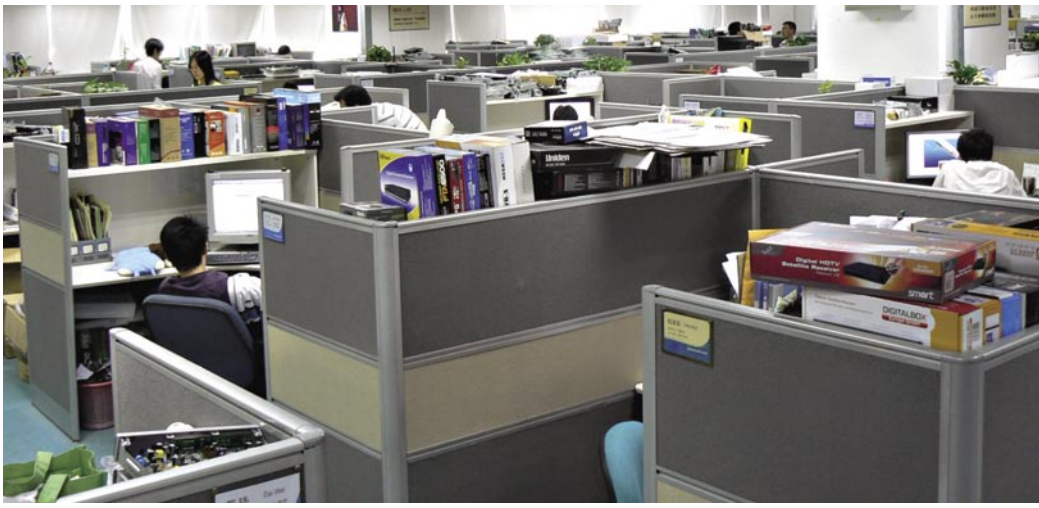
Skyworth is a publicly traded company listed on the Hong Kong exchange. "In the year 2010 we will also actively plan to be listed in the China stock exchange market with our set top box business", says David Ken.

What does this mean in numbers? David Ken jumps right into the millions: "In 2008 it was 5 million receivers, in 2009 it will be 8 million and for 2010 we are guessing total sales of 10 million receivers." Skyworth manufactures receivers for cable reception, satellite reception and terrestrial reception. David Ken tells us: "After 10 years of effort we have obtained an outstanding record in the field of national digital television. Since mass production of STB has started in 2001, Skyworth has provided products and services in over 100 cities in all of China owning to our excellent quality and thoughtful service. In recent years, Skyworth Digital kept its first rank in China and provided over 8 million cable STBs since 2004, occupying 20% of the domestic STB market."

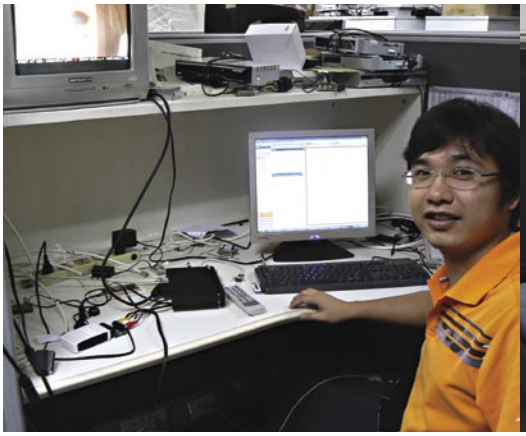
Where do all these receivers go? David Ken spells it all out for us, "90% of our cable boxes remain within China; the other 10% are exported." However for satellite boxes it's exactly the opposite: "Only 10% remain in China and of the

■ Jack Zhang is Chief Technical Officer, he manages the strong R&D team of 350 employees

■ A look at a portion of the R&D department in which a group of engineers just finished a meeting



■ Hardware engineers are seen at work here



■ Here we see Yuan Quibo, one of the Test Engineers, checking out a model T29 DVB-T receiver. This box will ultimately end up in Spain

■ This is Terry. He manages the technical Support team that consists of six engineers. They help OEM customers with any technical problems

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■ Sue Mao is Assistant of Sales here in the Skyworth showroom with one of their extraordinary receivers. As an OEM, Skyworth finds its customers mostly through taking part in trade shows. Sue Mao shows us a list of trade shows that Skyworth plans to visit in 2010. In addition to ANGA, CABSAT, CCBN, CSTB, IBC, SCAT and Convergence India, Skyworth will also take part in trade shows such as IFA, the Hong Kong Trade Fair, Andina Link in Columbia and shows in Brazil and San Salvador. All together, that's a total of 13 trade shows.

■ Skyworth's first products can be found in the company museum: this was the first remote control in 1990 with which everything started, and later, the first TV. Skyworth was originally founded in Hong Kong.

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■ Here is the first Skyworth receiver from 2002

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■ The parade of satellite dishes on the roof of 17th floor of the main Skyworth building. Sue Mao tells us: "The live satellite signal is sent to the Skyworth Research & Development center and used to further develop and test our products."

90% that are exported, 60% find their way to Europe, 20% to Latin America and 20% to the Middle East, North Africa and Turkey." The situation with terrestrial receivers is different yet again. David Ken explains, "90% go to Europe, mostly to Spain and Italy. The remaining 10% end up in countries like Vietnam and Australia as well as in South America." David Kens gives some more insight: "Aiming at the

■ On the way to the manufacturing site we met up with Zhou Yong in the company's shuttle bus. He is Skyworth's manufacturing Quality Control Manager

■ The entrance to Skyworth's expansive manufacturing site in the Shi Yan district. Every vehicle entering and leaving is checked out.

European and South American market, Skyworth Digital invests much on the different kinds of standards and technical skills, such as ROHS, REACH, CE and low power regulations, in order to meet the special requests from our customers, which is one of the main reasons to attract big and famous customers from all over the world." And what about SD and HD boxes? David Ken says, "In 2009 80% of our boxes were SD and the other 20% were HD. For 2010 we expect a distribution of 70% SD and 30% HD."

What about the technology behind Skyworth's products? Jack Zhang is CTO and Manager of the R&D team. "We use chipsets from all of the major chipset vendors", says Jack Zhang, "such as ST, Broadcom, NXP for the operator market and Cheerteck and Ali for the retail market, from high end to low end."

For 2010, Jack Zhang announced a line of new products utilizing the 7111 and 7105 chips from ST. "The ST 7105 is designed especially for high-speed data transmission and these receivers will come with an E-SATA interface for high-speed PVR operation." This chipset would also allow a memory chip to be built into a receiver. David Ken elaborates, "if one of our OEM customers asks for this, we can get right to work." Also new from Skyworth is a SCART Stick that for now is available for DVB-T and DVB-S. "The patent requests are in progress", comments David Ken. Skyworth is constantly coming up with innovative ideas. The R&D engineering team is impressive: it consists of 350 employees. The Export sales team on the other hand is small: it is made up of 20 employees while 40 employees handle sales for the Chinese domestic market. On top of that are another 40 employees for administration, human resources, purchasing and of course management. That leaves 1720 employees for production. All in all, a very streamlined company.

It gets interesting when David Ken starts speaking from experience: "After the start of FTA receiver mass production it takes about 10 years before the price ex-factory drops by 80%. With HD receivers this price reduction will presumably take only about three years." The pressure on manufacturers to keep costs down is enormous. In order to keep pace, redesigns are constantly necessary.

"Roughly 20% of our production volume is geared towards the high-end segment, another 30% for the middle segment." David Ken adds a comment: "We are constantly expanding our range and what really helps us is our experience in the low-end market. This helps us to get greater purchasing power and developing smarter and smarter technical designs. All the way this makes us stronger in this competitive market. We do not compete on price, but we provide cost-effective products."

Last but not least, the main reason why we even came here, we wanted to see Skyworth's quality assurance. We hopped in a company-owned shuttle bus to take us to Skyworth's manufacturing facility in the Shi Yan district 20km to the west. Quality Control Manager Zhou Yong was already on the bus so we got a chance to talk to him on the way there: "50 employees keep an eye out on the end product while another 50 employees watch over things during each individual production step", explains Zhou Yong.

The manufacturing site is actually a wide-spread area on which are a large number of fabrication buildings plus company-owned employee housing as well as a full-sized soccer field (football pitch) for them to use during their free time. In addition to the many quality control points (see pictures), there's even a room used as a safety check point for dangerous substances (ROHS): tests are made on every incoming shipment to check for dangerous substances. This includes the elements chromium, mercury, lead, bromine and cadmium. It guarantees that the finished product does not contain any dangerous substances.

Skyworth really does do everything necessary to maintain the highest level of quality. This reveals the reason why a growing number of heavyweight clients chose Skyworth to manufacture their STB. This approach guarantees Skyworth's success!

■ In the building to the right are the receiver assembly halls. In the back to the left is the production building for flat-screen TV's

Production Sequence of a Receiver

7 production lines have been set up on this floor of Skyworth's fabrication building with which a total of 20,000 receivers can be manufactured each day

1

2

3

4

5

6

7

8

9

10

11

1. This is how it starts: rubber feet are attached to the chassis' and the front panels are mounted

2. The power supply is installed

3. The main board is inserted

4. The cables are put in place

5. The first safety test: voltage stability is checked

6. All completed units are subjected to an aging test. Human Resource employee Yang Yongzhou shows us here how all products are put to a four-hour test.

7. Next is the card reader test: an employee slides a card in the slot to test its function

8. All OK! The cabinet can be screwed together

9. Now its time for all the individual components such as batteries for the remote control and the user manual

10. The unit is placed inside a plastic cover

11. All done, the unit is packaged

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Overview

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Components Used

- Conexant CX23885;
- dual demodulator STM STV0900;
- tuner STM STV6110A;
- dual LNB STM LNBH24;
- SMARDTV CIMaX Sp2.

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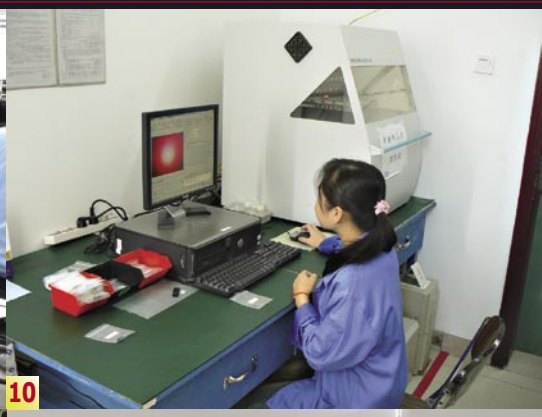

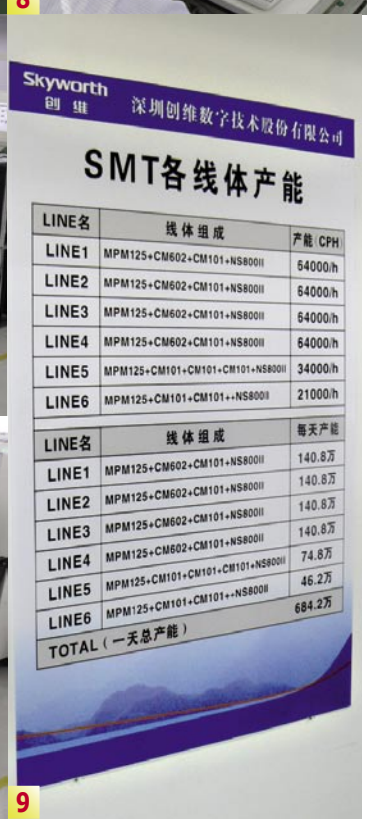

1. The components for the main board are installed here. Skyworth has over five of these assembly lines available

2. Before the circuit boards are sent through a soldering machine, an employee optically checks out the main boards

3. The tuner assemblies are assembled and tested here

4. Here we are in a clean room with the SMT machines. Insertion Manager Zhou Xin takes us around the room and explains: "We operate with four high-speed systems and two medium-speed systems"

5. This machine installs the smaller assemblies on the circuit board

6. This machine installs the chips

7. Here small electronic components get installed

8. Now it gets interesting: this machine is called AOI or Automatic Optical Inspector and is capable of finding the smallest faults that are invisible to the naked eye. It is an electronic microscope with automatic analysis

9. A panel on the wall displays production capacity information of the automatic insertion machines at Skyworth

10. An employee tests a sample of a freshly delivered component for dangerous substances

11. The production line boss is Chen Jin Mei, General Manager Assistant, in her office directly above the production line

12. A look at the production line. The slogan on the banner says "Safety First, No Accidents"

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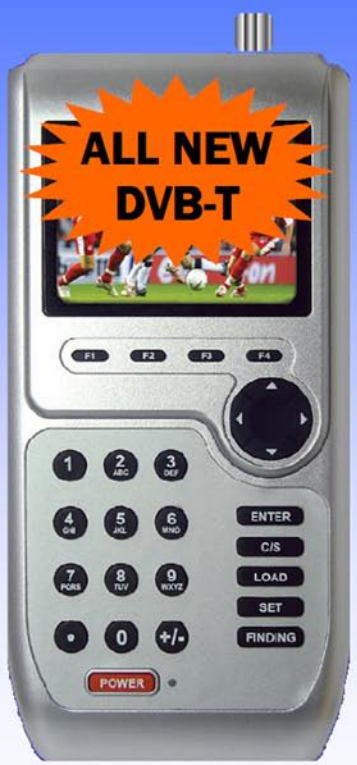

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JT is COWMIX

Satellite reception has been linked with PayTV for many years in the USA. But this has slowly been changing; free-to-air (FTA) reception is becoming more and more popular. The USA is a land of immigrants and since many providers from around the world send their programming to the USA for free, it makes sense that so many want to be able to watch TV in their mother-tongue or perhaps even their grandmother-tongue. Why should you pay a monthly fee to watch English-language programming when you can watch channels in their original language for free?

■ Who does this car belong to with this license plate? Right, JT stands for Jeremy Tieman and ORG is for his organization.

This trend here in the USA was recognized not only by TV viewers but also by many daring technology enthusiasts who started their own satellite dealer business and thereby promoted this trend. One of these freshly-baked satellite dealer newcomers is Jeremy Tiemann who can be found in Phoenix, the capital of the state of Arizona located in southwestern USA. His company COWMIX has been in existence since 2006 and it turns out that the start of his company did not exactly go according to plan: "I originally planned to sell MP3 players."

At the beginning it was only an idea to make himself independent in the Engineering field. "The deciding factor turned out to be a friend of the family, a doctor, who regularly traveled to Las Vegas for the CES consumer electronics show." Jeremy tells us. In 2005 this doctor asked Jeremy to simply come along to the CES. While walking through the trade show they both began to real-

■ The COWMIX showroom in Phoenix, Arizona.

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■ Jeremy Tieman (centre), President of satellite dealer COWMIX with Alexander Wiese (left), TELE-satellite's Editor-in-Chief

ize that they had the same desire to use their engineering interests commercially. No sooner said than done: an LLC (limited liability corporation) was formed. The doctor controlled a large portion of the finances but stayed out of the way of the company's day-to-day operations.

"The attempt to be successful in the MP3 market quickly failed", remembers Jeremy of those early days, "No sooner did we get a delivery than we found out that newer models were already available that had twice the memory." A small, newly-started company could not keep up with a pace like that. And then by sheer coincidence, a friend showed off his newly acquired FTA satellite system to Jeremy. "It was like getting struck by lightning", says Jeremy, "That's it!" Jeremy immediately sat himself in front of his laptop and began to familiarize himself with satellite technology. He bought different receiver models and

■ Ben Salazar adjusts a 75cm dish on the roof of COWMIX's offices in Phoenix, Arizona. It is pointed to 97° west.

■ Ben Salazar (left) runs sales with the help of Iris Cortez (right). An additional 11 freelancers are responsible for complete system installations.

thoroughly tested each of them. "I will stick with SonicView; those are the best receivers." he finally declared.

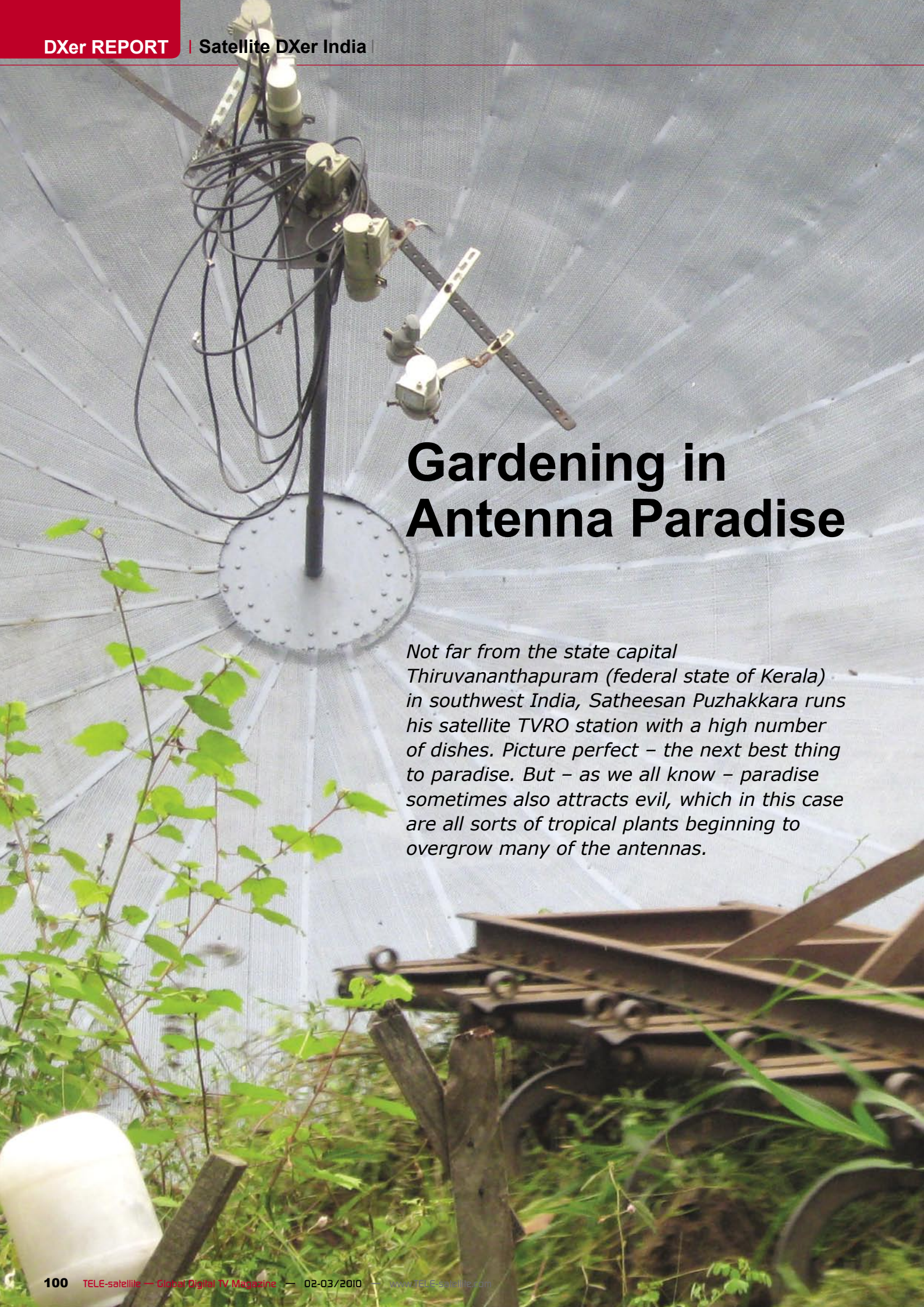
He met Tony Lively, SonicView's sales manager, at the CES show in 2007 and placed his first receiver order: 250 boxes! In February 2007 the delivery truck arrived: but where to put the palette? "COWMIX was founded in my garage", explains Jeremy, "that was the only place where I could store the receivers." But now the big question for his new business: how do you get rid of these 250 receivers and make a profit?

Jeremy is a Systems Administrator by trade and that means he knows his way around computers. And that also means that he is intimately familiar with the Internet too. That's where he began his selling offensive: "I started by putting my receivers for sale on E-bay and Craig's List." Craig's List, available in every city, is a place to put small ads. It happens to be very popular in the USA. It didn't take long for Jeremy to see the difference between E-bay and Craig's List: "On E-bay you hear from people from all over the country and beyond while on Craig's List it is mostly just the locals because I only placed the ads in Craig's List for Phoenix.

So, is Jeremy planning to stop offering receivers through E-bay? "I'm going to tell you a little secret", whispers Jeremy, "I will continue to offer the receivers on E-bay simply because it is the most cost-effective way to publicize my company." E-bay visitors often only look for experts in their vicinity and interested parties in Arizona will quickly find their way to COWMIX. Jeremy explains, "Actual receiver sales can be attributed more to Craig's List; from 20 receivers that are sold via Craig's List, only one is sold via E-bay." Jeremy has a suggestion to all the potential business opportunists among TELE-satellite's readers: "Offer your products via E-bay. In this way your address will quickly become known at a very cheap price!" That's a great inside tip.

Sure enough, the 250 receivers from that first delivery were gone in four months. Jeremy soon after took the next step and rented an office with a storeroom. He explains, "In the first year 2007 I sold 1500 receivers; the following year it was 4000 receivers." In 2009 the economic crisis hit home: "I definitely felt the pinch", says Jeremy, "by the end of the year it will only be around 2500 receivers." Despite this setback, Jeremy is once again optimistic for 2010: "Sales should substantially increase since the FTA market is the market of the future!"

We certainly agree with that.



Gardening in Antenna Paradise

Not far from the state capital Thiruvananthapuram (federal state of Kerala) in southwest India, Satheesan Puzhakkara runs his satellite TVRO station with a high number of dishes. Picture perfect – the next best thing to paradise. But – as we all know – paradise sometimes also attracts evil, which in this case are all sorts of tropical plants beginning to overgrow many of the antennas.

The World of Satellite DXers

Backlist: DXer reports in previous issues of TELE-satellite

Yahya, Saudi Arabia:	www.TELE-satellite.com/TELE-satellite-0911/eng/enigma-arabic.pdf
Roy Carman, London, UK:	www.TELE-satellite.com/TELE-satellite-0909/eng/londondxer.pdf
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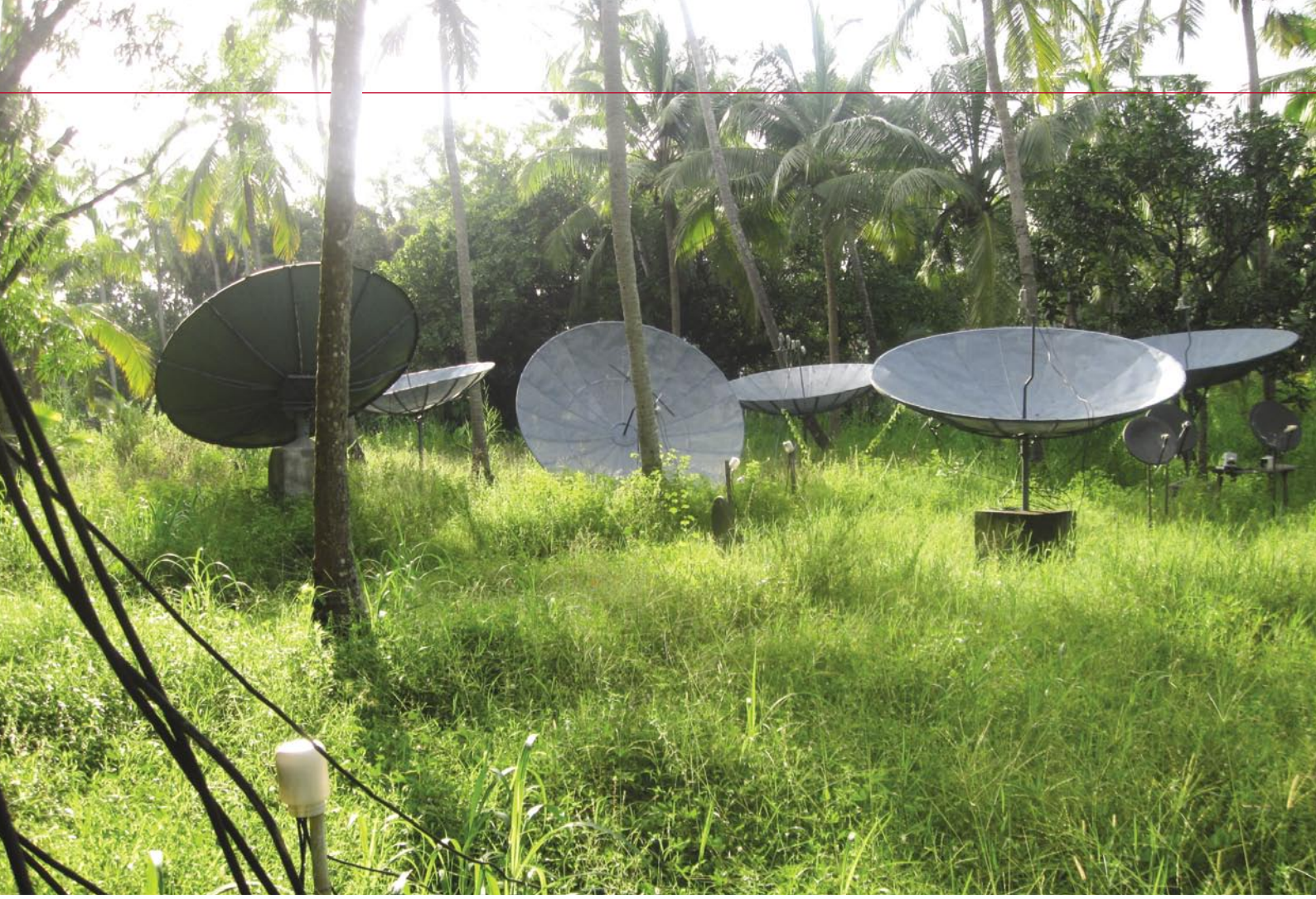

■ The antenna farm of Satheesan's scanning station in Thiruvananthapuram/Kerala in India.

■ All antennas stand proudly again after the radical clean-up and reception is unrestricted once again.

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■ This huge 3.1 meter dish is fully encircled by plants.

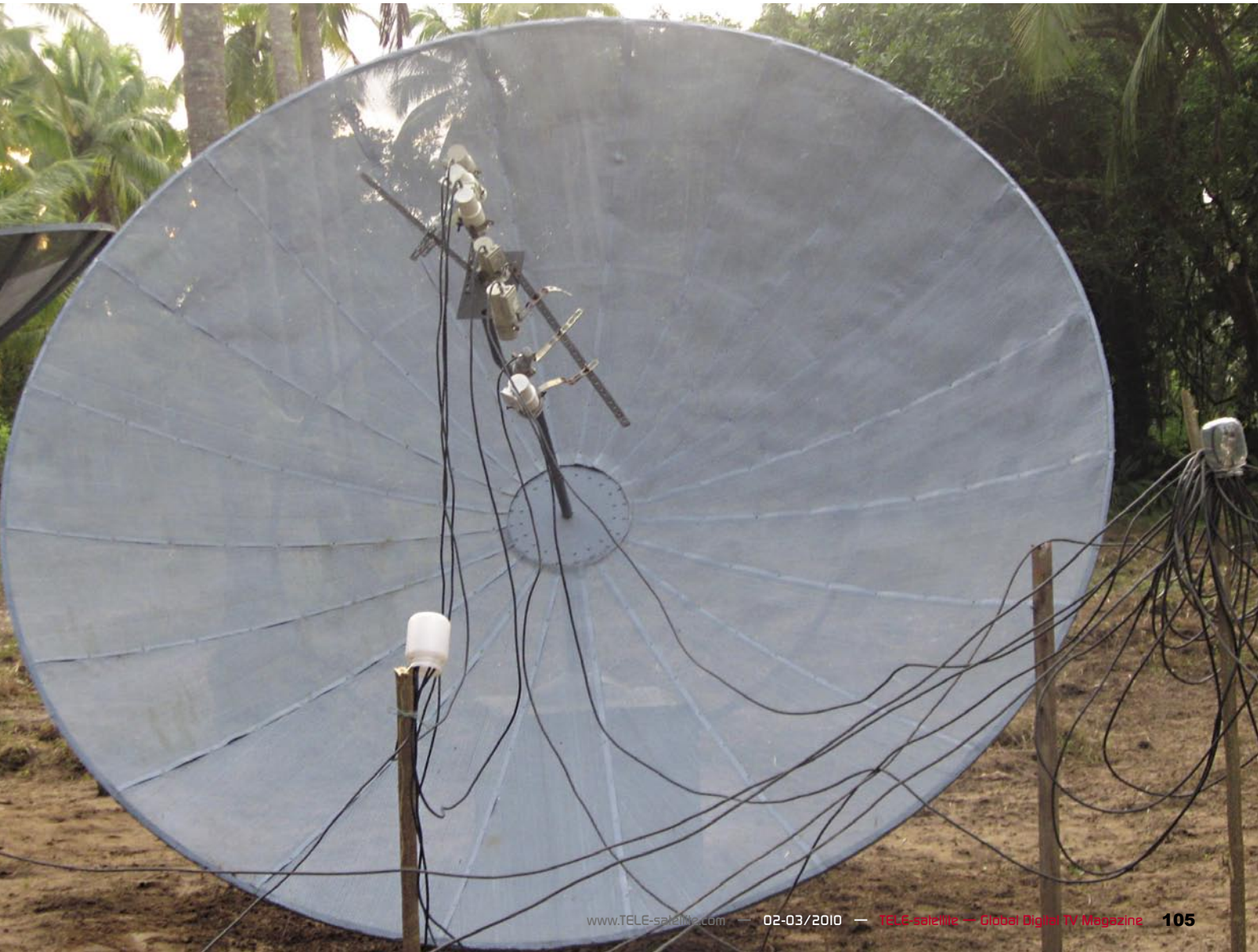
■ The plants are truly beautiful, but business is business and flawless reception is a top priority.

This calls for a radical solution: All coax cables had been disconnected so that the great clean-up could begin. Even a tractor was called in to get rid of all of the plants. In the end the whole area was cleaned and the antennas were hooked up to the system again one after the other. Now Satheesan can start hunting all those satellites up there once again.

■ One of the helping hands collects coax cables.

■ Then the tractor shows up and takes care of de-planting.

■ All is cleared and the LNBs are ready again for connecting to the receivers.

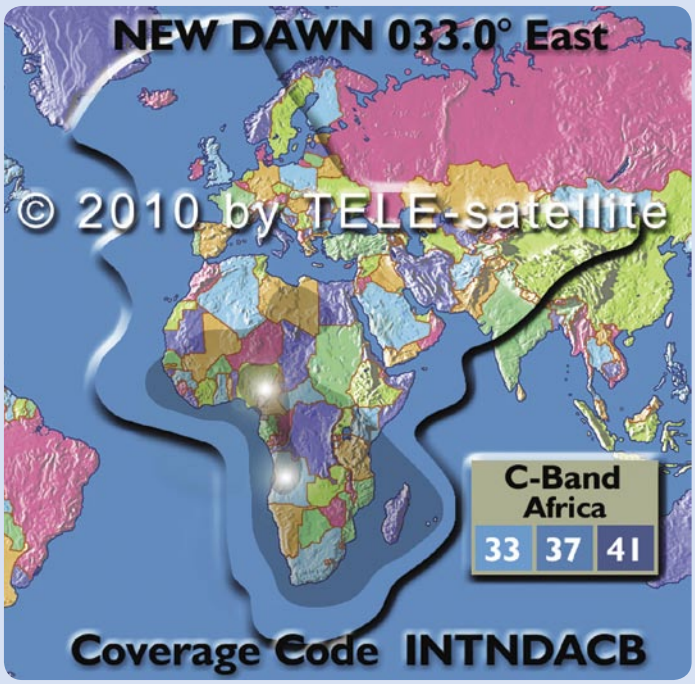


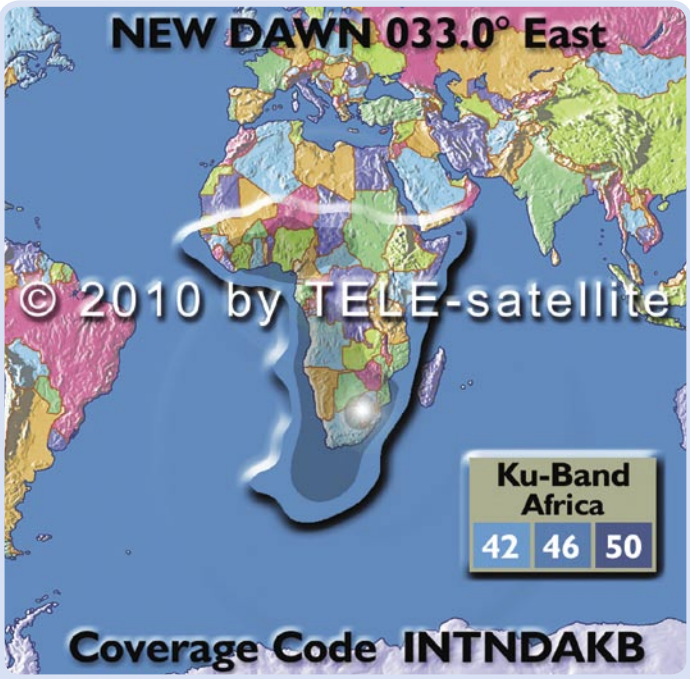
New Satellites *to be launched soon*

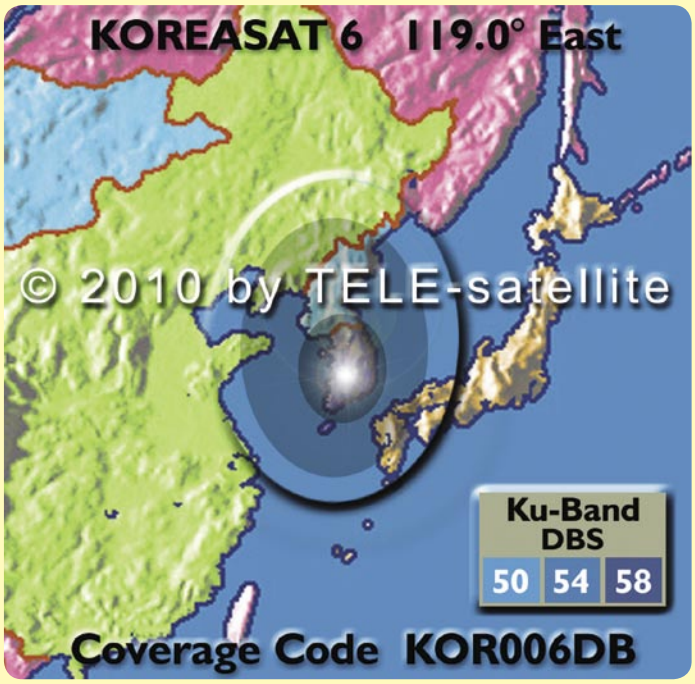
Edited by
Aleksandar Medic

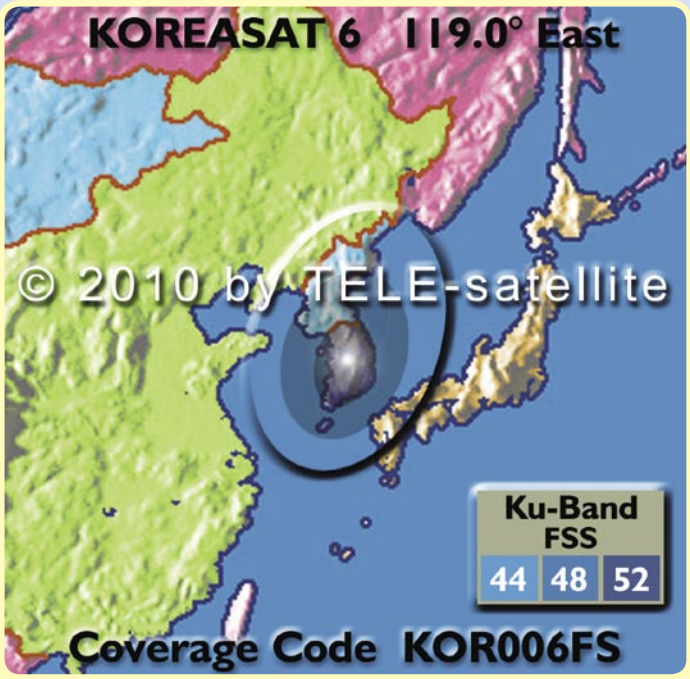
INTELSAT NEW DAWN

INTELSAT NEW DAWN, a satellite built and launched in a joint venture with Convergence Partners, a South African investment group, will utilize orbital location of 33° East which is ideally positioned to serve the growing needs of African continent with fixed satellite services such as voice communications, wireless backhaul, broadband connectivity and television programming. This USD 250 million satellite, built by Orbital Sciences Corporation will have two 4.8 kWh capacity Li-Ion batteries in order to support its hybrid payload consisting of 28 C- and 24 Ku-band 36 MHz transponders. After its launch as 50th Intelsat satellite put in orbit by Arianespace, using an Ariane 5 or Soyuz launcher, it will replace GALAXY 11 which is currently located at 33° East. INTELSAT NEW DAWN will use the Star-2 platform. This satellite with two deployable antennas will weigh about 3,000 kg at launch and have a design life exceeding 15 years.









KOREASAT 6

KOREASAT 6, a commercial communications satellite owned by KT Corporation (formerly Korea Telecom), will be boosted into geostationary transfer orbit by an Ariane 5 or Soyuz launcher from the Guiana Space Center, Europe's Spaceport, French Guiana. This satellite will be built by the French company Thales Alenia Space using a Star-2 platform from Orbital Sciences Corporation. Thales will supply the payload and US-based Orbital Sciences Corporation will carry out final spacecraft, payload and system integration and testing at its manufactoring facility in Dulles, Virginia. KOREASAT 6 will weigh 2622 kg at launch and generate 3.4 kilowatts of payload power for its 30 Ku-band transponders. From 116° East orbital position where it will replace Koreasat 3 satellite, this satellite will provide DTH, CATV distribution, TVRO, and VSAT services throughout the Republic of Korea.

DishPointer AR

See where to point your dish, live on the iPhone screen!

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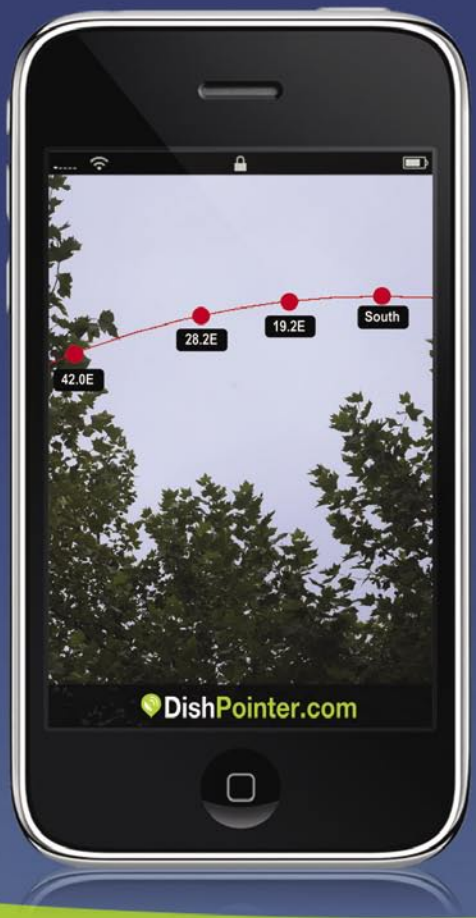
See DishPointer AR in action on YouTube!

This app uses the iPhones GPS, motion sensor and compass to calculate all the satellite positions and overlays them on the camera. At a glance you will see where to point the dish and any obstacles blocking the line of sight.



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EUROPE

EUROPE

EUTELSAT AND ABS REACH DEAL ON ORBITAL POSITION

Eutelsat Communications and Asia Broadcast Satellite (ABS) have signed a strategic agreement for commercial cooperation at the 75 degrees East orbital location. Eutelsat is collocating its Eurobird 4 satellite at 75 degrees East with the ABS-1 and ABS-1A satellites operated by ABS. This will add eight Ku-band transponders for the Middle East, central Asia and Russia. Renamed W75/ABS-1B, Eutelsat's satellite will also provide possible redundancy to customers until the arrival of ABS-2, which is expected in 2012.

SES ORDERS FOUR NEW SATELLITES

SES has ordered four satellites in a deal from Astrium worth €500 million. The new satellites - Astra 2E, Astra 2F, Astra 2G and Astra 5B - are intended to improve satellite television services in Europe and boost development in Eastern Europe and Africa. They will be located at two orbital positions (28.2 and 31.5 degrees East) and will carry Ku-and Ka-band payloads. The launch of the new satellites should take place between 2012 and 2014, and each is expected to last for 15 years.

EUTELSAT W7 LAUNCHED INTO ORBIT

The W7 satellite of Eutelsat Communications has been successfully launched into orbit on 24 November 2009 by a Proton Breeze M rocket supplied by ILS. The satellite will be located at 36 degrees East where it will support expansion of pay-TV platforms in Russia and across Africa. It will also provide Eutelsat with the possibility of expanding telecoms and data activity in a vast region embracing Europe, the Middle East, Africa and Central Asia. Collocated with W4, Eutelsat's new satellite will double resources at the 36 degrees East location from January 2010.

THOR 6 SUCCESSFULLY LAUNCHED

Telenor Satellite Broadcasting's new satellite, Thor 6, has been successfully launched into orbit by the Ariane 5 ECA launcher from the Guiana Spaceport in Kourou. It will replace the Thor III satellite at the 1° West orbital position, which is set to retire in 2010, as well as provide additional capacity for expansion. Thor 6 is equipped with 36 Ku-band transponders. 16 transponders will be reserved for the Nordic countries and 20 transponders for Central and Eastern Europe.

MDA RECEIVES CONTRACT FOR TWO EXPRESS SATELLITES

MacDonald, Dettwiler and Associates Ltd (MDA) has signed a CAD 200 million (CAD) with the Russian Radio Research and Development Institute (NIIR) to provide advanced technology solutions for the Express AM5 and Express AM6 satellites. Scheduled to launch in 2012, the Express satellites will provide digital TV, radio broadcasting, multimedia services and mobile communications. MDA will deliver the solutions by the first quarter of 2012.

NORTH AMERICA

BOEING SHIPS DIRECTV12 TO LAUNCH SITE

The DIRECTV 12 satellite has been shipped to the Baikonur Cosmodrome launch facility in Kazakhstan from where it will be launched in December 2009 aboard an International Launch Services Proton/Breeze M rocket. DIRECTV 12 is the 11th satellite Boeing has built for the DTH operator. It will increase DIRECTV's HD capacity by 50%, and when combined with the DIRECTV 10 and 11 satellites that launched in 2007 and 2008, will enable DIRECTV to deliver 200 national and 1,500 local HDTV channels to millions of U.S. households.

ASIA & PACIFIC

AZERSPACE TO BE LAUNCHED IN 2011

Orbital Sciences Corporation has presented the approved model of the national satellite Azerspace during the Azerbaijani international exhibition BakuTel-2009. Orbital Sciences Corporation won the tender to create the Azerspace satellite. The satellite, which will be used for TV, radio and internet services, will cover Europe and parts of Asia. According to the approved plan, the Azerspace satellite will be launched into orbit in 2011. Azerbaijan intends to use about 25% of the satellite capacity, and the rest will be offered to operators in other countries.

CHINA TO LAUNCH APSTAR-7 SATELLITE

The APTSTAR-7 satellite built by Thales Alenia Space will be sent into space by China's Long March 3B/E carrier rocket at the Xichang Satellite Launch Centre in south-western China in the first half of 2012. The satellite, with a designed life span of 15 years, will air live TV and communications for Asia, the Middle East, Australia Africa and parts of Europe.

SPACE COMMUNICATION RECEIVES LOAN FOR AMOS 5 SATELLITE

Space Communication has secured a loan of up to US$ 140 million from Migdal Insurance and Financial Holdings and the Amitim pension funds to partly cover purchase of the Amos 5 satellite. Space Com said in a statement it would pay back the loan and interest in instalments every six months over six years starting in 2012. Space Com agreed in 2008 to buy the communications satellite for US$ 170 million from Russia-based Reshetnev Information Satellite Systems but has so far paid only US$ 50 million, which will be put in orbit in 2011 for commercial operations.

PLDT SELLS SATELLITE BUSINESS

Philippine Long Distance Telephone Co. (PLDT) sold its subsidiary Mabuhay Satellite Corp. (MSC), the first Philippine entity to own and operate a communications satellite, to Asia Broadcast Holdings (ABS), a Bermuda company engaged in the satellite business. The MSC space centre is a satellite communications facility providing full satellite operations, payload and client monitoring, tracking, telemetry and control services for Aguila-2 satellite.

WORLD

NSS-12 SATELLITE SUCCESSFULLY LAUNCHED

The NSS-12 satellite was successfully launched into space by an Ariane 5 rocket from the European Spaceport in Kourou, French Guiana, on 29 October 2009. NSS-12 was manufactured by Space Systems/Loral and is poised to be the 41th satellite in SES` global fleet. The spacecraft replaces NSS-703 at 57 degrees East and covers virtually the entire Eastern Hemisphere. NSS-12 features 40 C-band transponders and 48 Ku-band transponders with DTH power levels, as well as elaborate beam interconnectivity and C-/Ku-band cross-strapping.

INTELSAT TO BUY PROTOSTAR 1 SATELLITE FOR US$ 210 MILLION

Intelsat was selected in October 2009 as the successful bidder at a bankruptcy auction for the ProtoStar 1 satellite with an all cash offer of US$ 210 million. Bermuda-based ProtoStar filed for bankruptcy protection along with its five affiliates in July and said it was looking to sell its satellites through a court-supervised auction. ProtoStar was formed in 2005 to launch and operate high-power geostationary satellites to lease capacity to Asian DTH satellite television and broadband service providers. Upon conclusion of the deal, ProtoStar 1 will be re-named Intelsat 25. Launched in July 2008, the satellite is expected to have a 16-year life span.

ATLAS V LAUNCHES INTELSAT 14

The Intelsat 14 telecommunications satellite was launched on 23 November 2009 on an Atlas V from Cape Canaveral Air Force Station, Florida. Built by Space Systems/Loral on a SS/L 1300 spacecraft bus, Intelsat 14 carries 40 C-band and 22 Ku-band transponders, broadcasting via four different beams. Set for deployment at 315 degrees East, where it will replace Intelsat's IS-1R satellite, Intelsat 14 has a 15-year design life.

INTELSAT 15 LAUNCHED BY SEA LAUNCH

Sea Launch has launched the Intelsat 15 satellite using a Land Launch vehicle at the Baikonour Cosmodrome in Kazakhstan on 30 November 2009. The Ku-band Intelsat 15 satellite, also known as IS-15, was built by Orbital Sciences Corp. It will provide video and data services from the 85 degrees East orbital position, replacing Intelsat's 709 satellite.

ATREXX OFFERS SATELLITE CAPACITY TRADING PLATFORM

German service provider atrexx is offering a solution to the problem of long-term capacity leases and scarcity of capacity in certain regions. The atrexx Trading Platform is a satellite marketplace, designed to bring buyers and sellers of satellite related resources and services together. The Platform offers free registration to both parties. Once registered, they are able to post their request or their available services onto the platform. All postings are publicly – yet anonymously - accessible worldwide, to everyone with access to the Internet. Updates are available by e-mail as well as through Twitter tweets and RSS feeds.

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Edited by
Branislav Pekic

EUROPE

BELGIUM

BELGACOM TOPS 663,000 IPTV SUBSCRIBERS

Belgacom added 75,000 customers for its IPTV service Belgacom TV in the third quarter of this year to reach 663,000 customers by the end of the period, with the company citing the launch of a multi-play pack as one of the reasons for this solid growth. TV ARPU per household went up slightly to €20.60 in the third quarter of 2009, while revenue from IPTV services rose 51.2% year-on-year to reach €94 million.

BOSNIA AND HERZEGOVINA

BH TELECOM OPTS FOR ENVIVIO IPTV SOLUTION

BH Telecom has selected Envivio IPTV Headend solution, integrated by Smart Com, for its new IPTV service. The Bosnian triple-play provider has already begun the rollout of its new Moja TV IPTV service. Envivio officials said that the deployment will help BH Telecom to offer a full suite of live and on-demand channels complete with EPG, PVR and other interactive features to its more than 2 million subscribers.

CROATIA

T-HT WITH 190,000 SUBSCRIBERS

Croatia's dominant fixed line provider T-Hrvatski Telekom (T-HT) has reported that its total ADSL broadband subscriber lines in service increased by 22.7% year-on-year to reach 527,000 at the end of September 2009, whilst its MAXtv IPTV service reached 190,000 subscribers at the same date, up from 92,000 a year earlier. IP-based revenue rose 30.1% year-on-year in the first nine months of 2009.

FRANCE

FRANCE TELECOM WITH 2.45 MILLION PAY-TV SUBSCRIBERS

France Telecom/Orange reached reached 2.547 million French subscribers to its pay-TV services (delivered via IPTV and DTH) by the end of September, up 59% year-on-year, with the Orange sport and cinema series channels having a total of 596,000 subscribers, compared to 130,000 at the end of 2008.

TF1 LAUNCHES CATCH-UP SERVICE ON BBOX

TF1 has launched its catch-up TV service MyTF1 on the IPTV service of Bouygues Telecom, with other IPTV providers expected to follow shortly. The service also gives access to the broadcaster's VOD platform TF1 Vision, as well as games, polls, voting and other interactive features. Around 3,000 programmes are being available on-demand and for free, with catch-up programmes available for seven days after broadcast. Bouygues Telcom is thought to currently have around 170,000 subscribers for its IPTV service.

GEORGIA

UNITED TELECOM LAUNCHES IPTV SERVICE

United Telecom of Georgia launched an IPTV service in the capital Tbilisi in October 2009 in partnership with Novus Group. United Telecom plans to invest a further USD 2-3 million in the development of the service, on top of an original investment of USD 1.5 million. The service is expected to be expanded nationwide in the first quarter of 2010. Packages are priced between USD 15 and USD 35, with customers able to subscribe to a triple-play United package.

GERMANY

SWISSCOM DEPLOYS IPTV AT HILTON FRANKFURT

Swisscom has installed its convergent IPTV and Internet solution at the Hilton Frankfurt. The solution delivers HD live-TV and VOD plus Internet access through the hotel's telephone system. Thanks to the pioneering use of VDSL technology for hotel IPTV solutions, hotel guests benefit from wired and wireless Internet access, digital TV with more than 70 channels from all over the world, an extensive library of new SD/HD blockbusters and a series of innovative short documentaries in HD quality. Swisscom IPTV has been deployed in nearly 5'000 guest rooms since its market launch in 2009.

GREECE

OTE CLOSE TO IPTV COVERAGE TARGET

'Conn-x TV', the IPTV service provided by OTE, now covers 53 cities after the operator recently expanded its footprint by nine additional areas: Arta, Zakynthos, Karditsa, Lamia, Lefkada, Messologgi, Mykonos, Naousa and Paros. OTE aims to offer Conn-x TV to all major cities and prefecture capitals in Greece by the end of 2009.

LATVIA

LATTELECOM TOP DIGITAL TV PROVIDER

Lattelecom has become the largest provider of digital TV services in the country with a customer base of over 40,000 subscribers for its IPTV service Interactive TV. The service includes HD content, VOD, archived programmes and PVR capabilities.

LITHUANIA

TEO WITH 50,000 IPTV SUBSCRIBERS

Teo reached 51,239 subscribers for its IPTV service Interactive Gala TV by the end of the third quarter of this year, adding 3,339 customers in the three-month period. During the twelve months to the end of September, the company doubled its TV customers to reach 91,700 subscribers.

THE NETHERLANDS

KPN LAUNCHES HD CHANNELS ON IPTV

KPN has boosted its IPTV Interactieve TV service with the introduction of HD channels. The IPTV service currently has 70,000 subscribers, compared with 854,000 for its digital TV platform, Digitenne. To support the expansion of its IPTV service, KPN is upgrading its copper network to VDSL2.

POLAND

FRANCE TELECOM/ORANGE IPTV SUBSCRIBERS UP 88%

France Telecom/Orange saw its pay-TV base (served by IPTV and DTH) more than double in the first nine months of this year to reach 283,000 subscribers, having sold 132,000 DTH subscriptions in the period, while its IPTV customer base was up 88% year-on-year by the end of September.

PORTUGAL

PORTUGAL TELECOM TOPS 500,000 PAY-TV CLIENTS

Portugal Telecom's Meo pay-TV service has surpassed the 500,000 clients mark, about double the client base it had last year and with 57,000 customers added since mid-2009. Meo offers triple-play services, including TV, broadband Internet and fixed-line phones.

ROMANIA

ROMTELECOM LAUNCHES IPTV IN 9 CITIES

Romtelecom has launched, in Bucharest, Cluj, Iasi and another 7 big cities, TV services through the same lines it provides fixed telephony and Internet services, opening a new front in its battle with RCS&RDS and UPC. The IPTV service costs RON 15 per month and clients will not pay until March 2010.

SCANDINAVIA

TELIASONERA ADDS 109,000 IPTV SUBSCRIBERS

TeliaSonera added 109,000 subscribers to its TV services across all markets in the third quarter of this year to bring the total to 739,000 customers, of which 561,000 were IPTV subscribers. Over 20% of its broadband customers (across all markets) were reported to subscribe to its IPTV services, available in Sweden, Norway, Denmark, Lithuania and Estonia. The total number of IPTV subscribers across all markets increased by 29,000 in the third quarter of this year, of which 17,000 were added in Sweden.

SPAIN

TELEFONICA ADDS GRASS VALLEY ENCODERS

Telefonica recently added the latest Grass Valley ViBE EM2000 MPEG SD encoders to its IPTV head end. The EM2000 based on the customer-designed Grass Valley Mustang compression engine, and uses unprecedented processing power to deliver MPEG-4 compression of standard definition television signals in smaller bandwidths with superior picture quality. Grass Valley provided the complete head end for Telefonica's IPTV service in a turnkey contract in 2006.

UKRAINE

VOLIA TO LAUNCH IPTV IN SECOND HALF OF 2010

Cable operator Volia has confirmed that it plans to launch IPTV services in the second half of 2010. The company added that it estimates 15% of its broadband customers and 7% of its existing television customers are interested in receiving IPTV.

UNITED KINGDOM

BT VISION TO MISS 2010 SUBSCRIBER TARGET

The chief executive of BT Vision has conceded that the service is unlikely to achieve previously announced subscriber targets. Marc Watson said that BT Vision will not meet the two to three million subscribers by end-2010 that BT Group chief executive Ian Livingstone set in April 2008. BT Vision ended the second quarter of 2009 with 436,000 subscribers. BT is expected to begin a marketing offensive at the beginning of 2010 that will place BT Vision at the centre of a triple-play TV, telephony and broadband internet offer.

CANVAS IPTV OPEN STANDARD TO COST £115.6 MILLION

The BBC's Project Canvas IPTV open standard will cost £115.6 million to run over a four-year period and considerably more to the broadcaster than previous estimates suggested should only four partners be involved. The BBC's original submission put the cost of Canvas to the BBC at £16.6 million, based on four partners being involved, but this projection has now been revised to £24.7 million. In total, in the time it has taken to develop the proposal and in the first four years of Canvas being in operation, the total cost to all parties would be £115.6 million.

BSKYB MAKES SKY PLAYER AVAILABLE ON HYBRID BOX

BSkyB has put its Sky Player online catch-up TV service on a hybrid DTT/IPTV set-top box alongside the BBC iPlayer. As part of a deal with IP Vision, the Sky Player is now available via its Fetch TV SmartBoxes, which became the first hybrid DTT/IPTV devices in the market to feature the iPlayer. The partnership means that channels including Sky Movies, Sky Sports and others, will feature via IPTV on the Fetch TV boxes by early 2010.

NORTH AMERICA

CANADA

MTS ALLSTREAM LAUNCHES PVR SERVICE

MTS Allstream launched what it claims is Canada's first whole-home PVR service. According to the company, the service, which is offered on its Microsoft Mediaroom-powered IPTV platform, MTS Ultimate TV (available in Portage, La Prairie, Brandon and Winnipeg) for CAN$ 5:00 a month, allows users to record up to three programs at the same time and play back programs from any connected TV in the home, as well as pause, replay and rewind live TV from their main set-top box.

TELUS EXPANDS IPTV COVERAGE

Telus has reportedly expanded coverage of its IPTV services in western Canada. The company's IPTV service is now available to the residents in Lethbridge and Medicine Hat in Alberta and Campbell River in British Columbia. Telus TV offers more than 390 channels (including 35 HDTV channels), VOD service and a PVR. The company's IPTV subscriber base exceeded 137,000 customers, representing an 83% year-over-year growth.

UNITED STATES

CONSOLIDATED SETS RECORD FOR IPTV ADDITIONS

Consolidated Communications, which has operations in Illinois, Texas and Pennsylvania, reported the company's highest-ever IPTV subscriber additions for a single quarter. Consolidated signed up 1,800 customers during the third quarter, and now has more than 21,500 total. The company's IPTV subscriber take has increased by almost 40% over the past year.

AT&T AND VERIZON SET FOR DOUBLE DIGITAL IPTV GROWTH

AT&T and Verizon are expected to post double-digit IPTV subscriber growth in their respective third quarter releases, according to analyst firm Strategy Analytics. The firm estimates that Verizon`s FiOS TV customer base will grow 12% in the quarter, exceeding 2.8 million total subscribers. Meanwhile, AT&T is expected to add over 250,000 new U-verse subs, implying a 17% sequential growth rate. A recent report published by Strategy Analytics shows US IPTV growing to 15.5 million subscribers by 2013.

THOMSON, LIVETV TO DEPLOY IPTV TECHNOLOGY

Thomson signed a long-term contract with LiveTV to develop of a live TV broadcast system for aircraft based on Thomson's IPTV-based satellite television distribution technology. The solution aims to enable networks to convert satellite content into video-over-IP content for distribution and viewing on individual seat back screens. Thomson's system will offer digital and live insertion channels as well as an electronic program guide service.

ECHOSTAR VIP-TV TO DELIVER SERVICE TO CT COMMUNICATIONS

EchoStar Satellite Services will deliver its ViP-TV video transport service to CT Communications. CT Communications will receive transport of up to 46 IP-encapsulated high definition TV channels to its IP headend. It supplies triple-play services to more than 8,000 customers in Western Ohio. EchoStar's ViP-TV transport service can offer a suite of services, including a secure, MPEG-4 encoded IP stream of approximately 300 popular, broadcast-quality TV and music channels from a satellite located at 85 degrees West.

TV2MORO LAUNCHES ARABIC TV SERVICE

TV2Moro has launched a subscription pay-TV service to serve Arabic communities in the US and Canada. The service is available in two packages, basic and premium, through a set-top box and includes channels such as Al-Jazeera English, Al Hayat 1 and 2, and Orbit Al Yawm. A further 10 channels will be added in the near future.

AT&T IPTV SERVICE TOPS 2 MILLION CUSTOMERS

AT&T announced in December that it has reached its 2 millionth AT&T U-verse TV customer. In 2009, the operator added more than 25 HD channels and

expanded U-verse availability in the Southeast region. AT&T U-verse High Speed Internet Max Turbo is available to residential customers for US$ 65 a month, along with AT&T U-verse TV.

USA TO HAVE 15.5 MILLION IPTV SUBSCRIBERS BY 2013

Strategy Analytics announced in its market research "United States IPTV Market Sizing: 2009-2013," that the U.S. IPTV market segment is expected to have 15.5 million subscribers and $15 billion in service revenues by 2013.

LATIN AMERICA

IPTV TO BECOME LEADING PAY-TV PLATFORM BY 2014

The Latin American pay-TV market will experience a compound annual growth rate (CAGR) of almost 11% between 2009 and 2014, according to a new series of reports from Signals Telecom Consulting, with IPTV predicted to become the region's premium pay-TV platform, focusing on high purchasing power customers and vertical market segments. This will result in operators such as UNE and Telmex migrating their CATV users to IPTV offered over HFC networks. IPTV growth in the region is predicted to accelerate from 2010.

UTSTARCOM EYES REGIONAL IPTV OPPORTUNITIES

IP networking solutions provider UTStarcom is expecting to see a boom in IPTV deployments in 2010, according to Diego Martinez, Americas VP and general manager for UTStarcom. Martinez said that Latin America still faces many challenges for IPTV to take off, such as the quality of last mile access as well as regulatory issues. However, that scenario would appear to be changing in some countries like Argentina.

BAHAMAS

IPSI TO LAUNCH IPTV DURING 2010

Nassau-based firm IP Solutions International (IPSI) has been granted the first triple-play licence in the Bahamas, with the company expected to launch its IPTV and broadband services in the first quarter of 2010. The company reportedly plans to offer IPTV (both live and VOD), gaming and VoIP services to customers.

CHILE

TELEFONICA DEL SUR OPTS FOR LATENS CONDITIONAL ACCESS

Latens announced in December 2009 that Telefónica del Sur (Telsur), Chile's pioneering telecommunications company now have over 25,000 IPTV subscribers. Launched in July 2007, Telsur's WiTV IPTV service is now in the second phase of deployment which sees the company heavily investing in upgrading and expanding their network and IPTV services and feature set. Telsur offers 120 channels of SD digital TV with EPG, parental control and VOD capabilities.

COSTA RICA

ICE TO LAUNCH IPTV IN 2010

The Contraloria General de la Republica has given the Instituto Costarricense de Electricidad (ICE) the green light to provide IPTV services, endorsing a USD 19.6 million contract between the state institution and ITS Servicios de Infocomunicacion for the purchase of the requisite equipment. Now it has received the green light, ICE says the service will be launched in June 2010.

VENEZUELA

CAN-TV PREPARES IPTV, DTH SERVICES IN 2010

CanTV aims to launch pay-TV services over both IPTV and satellite technology next year, the government said in a statement in December. CanTV has already deployed 1,666 satellite stations nationwide through which the company expects to provide new communications services to the national market and other countries across the region, via Venezuela's own Venesat-1 satellite.

ASIA & PACIFIC

IPTV SET FOR 45% GROWTH IN MIDDLE EAST

According to Dominic McGill, the organiser of the Middle East Television (METV) exhibition and conference, the Middle East is also showing signs of swift adoption of IPTV, with 45% year-on-year growth reported in 2008. The demand is being driven by the increasing availability of cutting-edge convergence technology across voice, data and multimedia solutions. Etisalat is reported to be in the finals stages of a FTTH network covering the city of Abu Dhabi. The project, dubbed eLite, would make Abu Dhabi the first 100% FTTH-connected capital city in the world.

ETISALAT, ENDAVO TEAM UP FOR ONLINE VIDEO PLATFORM

Endavo Media has signed a multi-year platform licensing deal with Etisalat to install Endavo`s platform to support the roll-out of an IP-based over-the-top (OTT) video delivery infrastructure over its own Internet and wireless networks. Etisalat will market its video services to broadcasters and content producers across 17 countries, including all of the Middle East and part of North Africa.

IPTV SUBSCRIBER BASE TO GROW 51% IN ASIA PACIFIC

The IPTV subscriber base in the Asia-Pacific region is expected to grow by 51% this year, according to research and consulting firm Frost & Sullivan, closing 2009 at 9.4 million users and accounting for 37.6% of the global subscribers. The IPTV subscriber base in the region will grow at a compound annual growth rate of 24.6% annually between 2009 and 2014, climbing to an estimated 23.5 million subscribers by the end of 2014. Frost & Sullivan believe that as much as 62% of the IPTV subscriber net additions from now until 2014 will come from emerging markets like China, Indonesia, Vietnam, India, Thailand and the Philippines.

ANEVIA AND BNS TEAM UP FOR IPTV DEPLOYMENT

Anevia and BNS have combined their expertise to provide Asian hospitality, broadcast and telecom service providers with high performance TV and video solutions. The Anevia-BNS partnership has already generated interest among IPTV service providers, leading to deployments in Singapore, Macau, the Philippines, Indonesia and Taiwan, where the companies' solutions are powering Taiwan's first ever HD-IPTV service for local operator Max Media. The first phase roll out to 1,500 homes was completed in early November.

AUSTRALIA

IINET TO OFFER IPTV FROM 2010

iiNet has boosted its metropolitan network capacity with new routers installed across the country, as the company moves forwards with its plans to start offering IPTV services from the first quarter of 2010. The operator has installed the new Juniper Networks' MX series routers in its metro network exchanges across the country's largest cities, with capacity rising in some areas from 1 Gbps to 10 Gbps.

TELSTRA SELECTS NETGEM BOXES FOR IPTV SERVICE

Telstra has selected Netgem to supply the set-top boxes and software for its upcoming IPTV service called T-Box, which will offer live and VOD content from its BigPond brand to its broadband subscribers. The operator will offer content from the BigPond brand along with Australia's free-to-air terrestrial channels (in both HD and SD). The new set-top box features twin tuners for watching one channel whilst recording another, as well as time-shifting and PVR features.

NBN TO BOOST IPTV LAUNCHES IN AUSTRALIA

Australia's proposed National Broadband Network (NBN) will help boost the number of IPTV launches in the country, according to Frost & Sullivan, with 235,000 IPTV subscribers predicted for the country by 2014, while New Zealand is also predicted to have 141,000 IPTV subscribers by 2014 as a result of its own new broadband network. Work on the new Australian broadband network has already initiated, with Tasmania to be the first state to initiate the rollout.

CHINA

SHANGAI TELECOM WITH 850,000 IPTV SUBSCRIBERS

Shanghai Telecom reached 850,000 IPTV subscribers as of the end of October, according to Beijing-based firm Marbridge Consulting. The number of IPTV subscribers across all of China stood at 2.1 million at end-2008, of which China Telecom accounted for 1.6mn and China Unicom (formerly China Netcom, which was merged with China Unicom in October 2008) accounted for 500,000.

INDIA

BSNL PLANS PAN-INDIAN IPTV SERVICES

BSNL has signed an agreement with the SmarTV Group for the launch of pan-India IPTV services, following a test launch of the service in a handful of major cities. No financial details of the deal have been disclosed. BSNL has said that it hopes to increase its IPTV subscriber base by as much as 100,000 by March 2010. The SmarTV Group has also entered a long-term contract with MTNL for the delivery of similar IPTV services. MTNL recently launched pre-paid IPTV services for all of its subscribers in Delhi and Mumbai.

INDONESIA

PT TO LAUNCH IPTV ON DEMAND SERVICE IN 2010

PT Telekomunikasi Indonesia (Telkom) is to launch of an Internet service that will allow users to watch their favorite programs whenever they want on their TV sets or computers. The new IPTV service will be operational in 2010, and after two to three years, we aim to have attracted around 40% of our 8.7 million fixed-line subscribers," said Rinaldi Firmansyah, Telkom's president director. He added that Telkom currently has around a million phone lines that can use the IPTV system. IPTV will initially be available only in Jakarta, but will be offered in five more locations, including Surabaya, Medan and Bali, by 2011.

NEW ZEALAND

TANDBERG POWERS NEW VOD SERVICE

Hybrid Television Services (ANZ) is deploying a complete suite of Tandberg Television software solutions to enable carrier class VOD to the televi-

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sion via broadband Internet. Hybrid TV is providing New Zealand customers access to a wide range of On-Demand movies and TV programming via their TiVo media device from November 2009. The service includes new release movies, hit TV shows for the whole family as well as free music videos, artist interviews and music concerts.

TELSTRACLEAR STARTS IPTV TESTS

TelstraClear has completed tests of IPTV services, and indicated that it plans to deliver the service over the country's yet-to-be-built ultra-fast broadband network. The tests took place in Wellington, using the fibre network of Whangarei-based firm Northpower to test the service. A new ultra-fast broadband network is planned to be built with investments of up to NZ$ 1.5 billion, covering three-quarters of Kiwi homes and businesses.

SOUTH KOREA

KOREAN IPTV SUBSCRIBERS TOP 1.5 MILLION

The number of South Korean subscribers to real-time IPTV topped the 1.5 million mark a year after the service started. According to the Korea Communications Commission, the country's three IPTV service providers - KT, SK Broadband and LG Dacom - have achieved the landmark a year after the IPTV officially launched in December 2008. South Korea is expected to hit 2 million IPTV subscribers in early 2010. In comparison, it took cable 4 years to hit 1 million subscribers, and satellite TV almost 2 years, to do what IPTV has accomplished in 9 months.

GOVERNMENT PUTTING PRESSURE ON IPTV OPERATORS

South Korean government officials are being accused of pressuring executives of three large telecom companies to commit 25 million won in support of IPTV. Criticisms against the presidential office are escalating over details surrounding the IPTV affair where an administrative officer forced three private telecommunications companies to provide large-scale funding to the Korea Digital Media Industry Association (KoDiMa) to manage IPTV.

TAIWAN

BNS COMPLETES FIRST PHASE OF IPTV DEPLOYMENT

Hong Kong-based firm BNS has completed the first phase of Max Media's community-based IPTV deployment in Taiwan. Over 1,500 homes have been connected to the service so far, and the project is reportedly on track to connect a further 3,000+ buildings across Taiwan within the next five years, representing 10% of Taiwan's population. The IPTV service delivers 45 broadcast channels in SD and HD.

UNITED ARAB EMIRATES

MOTOROLA SUPPLIES SET-TOP BOXES TO DU

Motorola's Home & Networks Mobility business has supplied du with its VIP1200E and VIP1216E set-top boxes for the latter's Microsoft Mediaroom-powered IPTV service.

VIETNAM

VTC SELECTS MINERVA MIDDLEWARE FOR IPTV

VTC Digital Communications, the telecoms arm of state-run Vietnam Multimedia Corporation (VTC), has chosen Minerva to supply its iTVManager middleware platform for the delivery of IPTV services in Vietnam. Under the first phase of the project, the operator will offer IPTV to over 100,000 subscribers across the country, with plans to expand the service in the near future. Minerva's solution enables the delivery and management of next generation video services over broadband networks, including HDTV and VOD.

WORLD

MRG REPORT IDENTIFIES IPTV MARKET LEADERS

The Global IPTV Market Leaders Report - October 2009 (MLR) indicates that global IPTV subscribers will grow from 28 million in 2009 to 83 million in 2013. The European region will continue to lead in IPTV deployments in 2013 with 48% share, followed by Asia, North America and "rest of world." In the IPTV Access sector, Alcatel-Lucent breaks the record by acquiring 51% share of the worldwide access market. In the Content Security sector, Verimatrix retains its #1 global market ranking, enjoying a 26% share of the global market. In Set-top Boxes, Motorola still dominates the global market, with 28% share globally. In Video Headend Encoders, Motorola also maintains its #1 global ranking with 38% share of market.

AMINO IPTV BOX POWERED BY INTEL ATOM

Amino Communications has announced it has demonstrated an IPTV set-top box that is powered by the new Intel Atom Processor CE4100. The new generation of Amino products will address consumer demand for TV-based entertainment from any source, including broadcast, on-demand and open Internet 'Over-the-Top' (OTT) services. The new CE4100 is expected to enable Amino to develop new types of hybrid/OTT devices that offer high flexibility and functionality.

Edited by
Branislav Pekic

EUROPE

EUROPE

OVER 90 MILLION DVB-T RECEIVERS SOLD

According to a Position Paper issued by DigiTAG, the sale of over 90 million DVB-T receivers in Europe testifies to the overwhelming success of the DTT platform. In many homes, including those that subscribe to cable, IPTV, or satellite services, the terrestrial television platform is used for the majority of secondary television sets. In the UK, more than 10 million households, out of a total of 25 million, rely exclusively on the DTT platform. At this stage, DVB-T is de-facto present in nearly all television sets sold in EU Member-States, and legislation in several countries reinforces this market reality.

PORTUGAL TOP EUROPEAN DIGITAL TV MARKET

Italy's e-Media Institute has published the ranking of the ten countries in Western Europe where digital TV is most successful, with Portugal firmly at the top with 48%. Second place went to Belgium (40%), followed by Greece (38%), while France and the Netherlands end the top 5 with respectively 37% and 35%. In one year, between June 2008 and June 2009 some 18.6 million families in ten countries, over 14% of the total, have been converted to digital.

BOSNIA AND HERZEGOVINA

BROADCASTERS REFUSE DTT FUNDING FROM SAUDI ARABIA

Bosnia's three public broadcasters – BHRT, RTRS, FTV – have rejected a donation from Saudi Arabia in the digital switchover process, arguing that the project is under the sole authority of the state. The issue was raised by Marija Putica, the chairperson of BHRT, who raised the issue after speculations emerged that some foreign companies are trying to get into the process worth around BAM 60 million. The HA Media said that the governments of Saudi Arabia and other Islamic countries are ready to make donations for this process, worth some EUR 35 million.

CROATIA

DTT RECEIVED BY 22% OF CROATIAN HOUSEHOLDS

Some 22% of Croatian households receive TV signals with digital receivers (17% with a stand-alone box and 5% through a digital receiver built-in TV), while 6% watch IPTV, according to the latest report by the Central Office for e-Croatia and conducted by analysts GfK. Total population coverage with a DTT signal is currently 90.8%, although so far only four of 10 households in Croatia receive DTT.

CYPRUS

CYPRUS TO INTRODUCE DTT IN 2010

Cyprus is planning to introduce DTT in 2010. According to a decision by the Cabinet in July 2008, two DTT licenses will be given, one to the Cyprus Broadcasting Corporation (CyBC) for public service broadcasting and a second one to a platform of private operators through auctioning.

DENMARK

NEC HELPS BROADCAST SERVICE DENMARK TO SWITCH TO DIGITAL

The NEC Corporation has completed the implementation of the DT in Denmark for the network operator, Broadcast Service Danmark (BSD). The switchover from analogue to digital took place on 31 October 2009. BSD operates the national terrestrial TV networks in Denmark and NEC helped to deploy the digital platform by means of its transmitter product series, DTU-52 and DTL-10, which are the latest generation digital TV transmitter from NEC, providing compact design and high energy efficiency.

FINLAND

YLE RESERVES CHANNEL FOR HDTV

The Finnish Broadcasting Company (YLE) has decided to reserve a new channel for broadcasts of HD television programming. The Finnish government is expected to make a decision on granting licences for up to eight HDTV channels in early 2010. As the national public broadcaster, YLE does not have to file a separate application for an HDTV channel licence. Eight companies have applied for terrestrial HDTV channels - Sanoma Television, MTV3, MTV Networks, Urhotv, Family Channel, Discovery Communications Europe, Viasat Finland and Turner Entertainment Networks International.

FRANCE

TF1 GRANTED EXTENSION FOR CHANNEL DEAL

TF1 received an extension from the French competition authorities in December to obtain approval for its acquisition of the digital terrestrial channels TMC and NT1. TF1 is seeking regulatory clearance to acquire 40 percent of TMC (bringing its stake to 80%) and all of NT1 from the AB Group for €192 million. The French competition authority will now deliver its ruling on January 26.

HUNGARY

ANTENNA HUNGARIA FINED FOR DTT ROLLOUT

The National Communications Authority (NHH) has fined Antenna Hungaria HUF 40 million for failing to meet conditions in its contract to roll out digital broadcasting in Hungary. The NHH board also gave Antenna Hungária deadlines to take the necessary steps to correct the situation. Antenna Hungária said it would contest the resolutions in court. The NHH is dissatisfied with the pace of the roll-out, but hoped the delay was only temporary and DTT would extend over the entire country by the end of 2011.

IRELAND

DTT DELAYS CAUSE CONCERN IN IRELAND

The development of DTT in Ireland is at a critical stage after the consortium that holds the DTT contract said it needed more financial leeway for the project. The OneVision consortium, which includes Eircom, TV3, Arqiva and Setanta, told the Broadcasting Authority of Ireland (BAI) that it needed some flexibility on the financing of DTT. OneVision is also seeking a commitment from the government that it will invest in the promotion of the switchover to DTT. The analogue switch-off is planned for the end of 2012.

ITALY

NEWS CORP TO LAUNCH FTA CHANNEL ON DTT

News Corp is set to launch a free DTT channel in January 2010, putting it in direct competition with RAI and Mediaset. Cielo, which will broadcast on a third-party multiplex, will reach some 12 million households. News Corp's Italian satellite unit, Sky Italia, has also launched a new USB key that will allow its HDTV customers to view free-to-air DTT TV channels, without adding a new set-top box.

MEDIASET PREMIUM WITH 2.9 MILLION ACTIVE CARDS

The number of active cards for the Mediaset Premium pay-TV service on DTT totaled 2.9 million on 30 September 2009 compared to around 2.5 million in the same period one year earlier. Mediaset considers the figure as more than positive, taking into account that on 30 June 2009 more than 2 million Premium cards had expired. The broadcaster reported that the revenues of Mediaset Premium totalled €379.9 million in the period January-September 2009, up 41% on the first nine months of 2008.

ITALY TO END 2009 WITH 62% OF DTT HOUSEHOLDS

On 31 December 2009, 62% of Italian households (36 million individuals) were in possession of a DTT receiver. An additional 10 million households or 38% of population will receive TV exclusively via DTT from 2010. According to estimates by industry organization DGTVi, the national transition from analogue to digital could be concluded before 2012.

MACEDONIA (FORMER YUGOSLAV REPUBLIC)

BOOMTV LAUNCHES PAY-TV SERVICE

BoomTV has launched a premium service on digital terrestrial, selecting Viaccess conditional access platform to secure its programming. Launched by On.Net, it is offering 50 TV channels, 50 radio stations and datacast, including a 7-day EPG, on four DVB-T national multiplexes. The operator is targeting more than 200.000 pay-TV subscribers by the end of 2010. Initially the service is being offered for a token MKD 1, but from 1 March 2010 the full price will be MKD 499 and will include a free TV set. Initially, the TV signal is available to 80 percent of households and by year's end will cover 95 percent.

NORWAY

DTT TRANSITION COMPLETED IN NORWAY

On 1 December 2009, the last analogue transmitters were closed down, completing the switchover to digital terrestrial which began in 2007. Initially, 24 TV channels and 16 radio channels will be available. The DTT network consists of approximately 430 masts on mountain tops and ridges.

RUSSIA

RUSSIA TO SWITCH TO DTT IN 2015

President Dmitry Medvedev said in December that Russia would switch to digital broadcasting by 2015. The president said it would be good to synchronize the process within the Commonwealth of Independent States. The first DTT package comprises of 8 TV channels and three radio stations. Work to activate a second package of digital channels reportedly would be finished in the near future.

SERBIA

TELEKOM SRBIJA AND FOX TELEVIZIJA TEST DVB-T2

Telekom Srbija and Fox Televizija have conducted the first public tests of the DVB-T2 broadcasting standard. The tests was realised through the two

networks for the processing and transmission of TV signals provided by Telekom Srbija, which are fully digital and based on IP/MPLS architecture. During the public trials, a total of 13 digital TV channels were transmitted simultaneously or one HDTV channel and eight SDTV channels.

SPAIN

BARCELONA AREA TO SWITCH TO DTT

Some 161 municipalities in the province of Barcelona are to end analogue TV broadcasts by January 2010. From then on, more than 600,000 citizens of the counties of Osona, Garraf, Anoia, Alt Penedès, Bages and Berguedà will only able to watch TV via DTT. According to the National Transition to DTT, 90% of Catalan households now have satellite adapted to receive digital signals, and 81.2% have access to DTT through a decoder.

GOL TELEVISION WITH 850.000 SUBSCRIBERS

The digital terrestrial pay-TV platform Gol TV has reached the figure of 850.000 subscribers to its service in November 2009, according to the director general of Spanish operator Mediapro. Jaume Roures said that the latest subscriber figure makes closer the achievement of the original goal of one million subscribers by the end of the season.

UNITED KINGDOM

BBC AND ARQIVA TO UPGRADE NETWORK TO DVB-T2

The BBC and Arqiva have agreed to upgrade the relevant parts of the DTT transmission network to DVB-T2. The new technology will deliver an increase in capacity of 67% to the BBC's Multiplex B, efficiently creating the space needed for UK public service broadcasters' HD transmissions. The BBC and Arqiva will be the first organisations in the world to deploy the DVB-T2 technology into full operational service across an entire transmission network. NEC Corporation will be supplying the transmitters.

FREEVIEW MAIN DIGITAL TV PROVIDER

Freeview is now the provider of digital TV on the main set in 10 million UK homes, with a growing numbers of viewers taking up the service as the switchover from analogue gathers pace around the country. The vast majority of viewers switching from the old five-channel analogue set-up were choosing Freeview's digital terrestrial TV service over BSkyB's satellite and Virgin Media's cable subscription services, the company claims. More than 18 million UK homes used Freeview on at least one of their TV sets, the company added.

BT VISION TO LAUNCH HYBRID DIGITAL BOX

BT has confirmed that the next set-top box to be issued for its hybrid DTT/IPTV service "BT Vision" will be capable of receiving Freeview HD terrestrial channels. Michael Barry, Head of Programming at BT, said that work is in progress but has not yet decided on a firm launch date. Freeview HD broadcasts started in the Granada region and London, with other regions to follow in 2010.

NORTH AMERICA

CANADA

CANADIAN BROADCASTERS TEST DIGITAL SFN

Rohde & Schwarz is collaborating with Moseley Broadcast and the Communications Research Centre Canada to create one of the first single-frequency network test beds for ATSC fixed and mobile digital television. The research and development agreement is being conducted under the auspices of the CRC. The mobile test area will cover about 250 square kilometres in the Ottawa, Ontario area.

UNITED STATES

ATSC RATIFIES MOBILE TV STANDARD

The Advanced Television Systems Committee in October 2009 approved a new mobile digital TV standard that will allow digital TV broadcasters to deliver content to a broad variety of mobile devices. Targeted devices include not only mobile phones, but also other handheld devices and in-vehicle entertainment systems. The A/153 ATSC Mobile DTV standard is the culmination of a development process that took about two and a half years.

AMERICANS WANT MOBILE TV

U.S. consumers want mobile TV, according to the Open Mobile Video Coalition. The study's optimistic findings are contrary to the state of the mobile television market in the United States, which has been hampered by slow uptake among consumers. The service, offered by Verizon Wireless, AT&T and FLO TV, has not made an impact due to limited content and market availability.

LATIN AMERICA

BRAZIL

ARIMA AWARDED ISDB-T MOBILE TV CONTRACT

Arima Communications has landed orders for ISDB-T enabled mobile TV handsets from Sony Ericsson, according to industry sources. The

mobile TV handsets, which will be built using chipset solutions from NewPort Media, will target the market in Brazil. Arima is expected to start shipping the ISDB-T mobile TV handsets to Sony Ericsson before the end of 2010.

DTT ARRIVES TO 26 BRAZILIAN CITIES

The digital terrestrial TV signal has already arrived to 26 Brazilian cities, 19 of which are state capitals. From January 2010, DTT will be the only way to receive terrestrial TV broadcasts in Sao Paulo, Belo Horizonte, Brasilia, Fortaleza, Rio de Janeiro and Salvador. According to the Brazilian Association of Radio and Television (ABERT), some 90 million Brazilians are now able to receive the digital signal. The last year for the transmission of the analogue signal will be 2016, according to the timetable of the ministry.

CHILE

MOVISTAR TO INTRODUCE MOBILE TV BROADCASTS

Movistar has announced the launch of mobile handsets that use the Japanese ISDB digital TV standard. Earlier in 2009, Chile announced it had chosen to adapt the ISDB-T standard with MPEG-4, as did Brazil in 2006, to create its own version of the Japanese standard called SBTVD. Peru and Argentina have also opted for the same path. The two phones available are the LG KB775 and the Samsung I6220. The digital TV signal available is still at a testing stage, with only limited coverage in capital Santiago.
ECUADOR

ECUADOR LIKELY TO OPT FOR ISDB-T

According to local media reports, Ecuador has decided to adopt the Japan-Brazilian ISDB-T digital TV system. The information is not yet official but it depends on the signing of protocols between the parties, but it's taken for granted by the negotiators on both sides. As a result, Ecuador joins Chile, Brazil, Peru and Argentina in the selection of the system. Venezuela also should adopt the standard.

TRINIDAD AND TOBAGO

GREEN DOT TV DEPLOYS HARMONIC TECHNOLOGY FOR DVB-T

Green Dot TV in St. James, Trinidad, has deployed Harmonic Electra 5400 SD AVC encoders as part of an IP-based headend system to deliver 80 channels via DVB-T transmission. The Green Dot service is sent to a mountaintop tower via IP microwave link and in turn transmitted throughout Trinidad and Tobago via DVB-T signal.

ASIA & PACIFIC

ASEAN COUNTRIES FOR PHASED ANALOGUE SWITCHOFF

During the Tenth Conference of the ASEAN Ministers Responsible for Information (AMRI) in November 2009, an agreement was reached for the adoption of a phased approach towards analogue switch-off over a period of time from 2015 to 2020, as the member states are at different stages of readiness for digital TV implementation.

AZERBAIJAN

AZERBAIJAN TO PRODUCE DIGITAL TV DECODERS

The Kur computer equipment production factory intends to begin production of decoders for digital TV. The production of these DVB-T compatible products is expected to start in 2010 and the cost of the product will not exceed US$ 50. The development of digital broadcasting in Azerbaijan is one of the priorities assigned to the Ministry of Communications and Information Technologies. Full transition to digital broadcasting is expected by 2012.

ISRAEL

END ANALOGUE BROADCASTS TO END IN 2010

Sometime in 2010, analogue broadcasts of Channels 1, 2 and 10 will be ending and Israeli viewers will have to equip themselves with a DTT decoder in order to continue reception. Experimental DTT broadcasts began in August 2009 and the decoders are available from NIS 300.

JAPAN

NEARLY 70% OF JAPANESE READY FOR DIGITAL TV

With less than two years to go before the planned switchover to digital TV, 69.5% Japanese households owned digital terrestrial TVs as of September 2009, according to a survey conducted by the Ministry of Internal Affairs and Communications. This is slightly behind the 72% diffusion target the ministry set in 2003, while representing a rise of 8.8 percentage points since the previous survey in March.

MEDIAFLO RECOGNISED AS MOBILE TV STANDARD

Japan's Ministry of Internal Affairs and Communications (MIC) has recognized Qualcomm's MediaFLO technology as one of two official technologies for nationwide mobile multimedia broadcasting services in Japan. This milestone signifies that MediaFLO-enabled mobile TV services may be deployed in Japan once spectrum is made available in 2011. The only other mobile broadcast technology recognized by the MIC for this purpose is ISDB-Tmm, an evolution of Japan's digital TV (DTV) standard, ISDB-T.

SOUTH KOREA

DMB REVENUES REACH RECORD HIGH

The monthly advertising revenues of terrestrial digital multimedia broadcasting or DMB companies rose to a record high in November. According to the Korea Broadcast Advertising Corp. the combined advertising revenues of the six terrestrial DMB firms came in at 1.53 billion won (US$ 1.3 million). At the current pace, terrestrial DMB firms' combined advertising revenue for this year is likely to come in at over 12 billion won.

TAIWAN

TAIWAN TO AWARD MOBILE TV LICENSES

Taiwan's Ministry of Transportation and Communications (MOTC) has released a draft proposal for the release of two nationwide mobile TV licences in 2010. The auction will be based on the principle of technical neutrality and has so far attracted a lot of interest from various industry players. It follows the trial of mobile TV by five players 2007–2008. The standards most likely to be chosen in Taiwan are DVB-H and MediaFLO (developed by Qualcomm).

VIETNAM

VIETNAM TV STARTS DMB SERVICE

Vietnam TV started commercially offering its DMB service in November 2009. DMBro and Broadtech SC are both going to cooperate with the three major telecoms firms in Vietnam starting from 2010. Hanoi and Ho Chi Minh City are the two major targets for expansion of the service. The major goal for the first three years is going to be 5 million subscribers between the two cities. Korea's Electronics and Telecommunications Research Institute (ETRI) has been working closely with Broadtech SC, an affiliate of Vietnam TV, since May of last year, when the DMB tests began.

AFRICA

KENYA

KENYA INITIATES DIGITAL TV MIGRATION

In December 2009, Kenya became the second African country to begin the migration from analogue to digital broadcasting after South Africa whose migration was accelerated by FIFA World Cup finals to be held in 2010. The Government had set a deadline for full migration by the year 2012 despite the one set by the International Telecommunications Union of 2015. The phase one of transition to digital television broadcasting covers Nairobi and its environs.

SOUTH AFRICA

SENTECH FALLING BEHIND IN DTT ROLLOUT

Sentech has also revealed that it is falling behind in its DTT rollout. After the initial digital TV switch-on on 1 November 2008, the company had planned to have a 40% DTT population coverage by 31 March 2009. According to Sentech the delays in the finalisation of a frequency plan and DTT migration regulations mean that only 33% was achieved from 30 October 2008. According to Beverley Ngwenya, COO at Sentech, problems were caused by underfunding and the delay threatened the November 2011 target for switching-off analogue transmissions. Sentech is currently in the fourth phase of its DTT rollout which commenced on 1 April 2009 and will continue until 31 March 2010. The objective is to achieve 63.3% population coverage by 31 March 2010.

GOVERNMENT TO SUBSIDISE SET-TOP BOXES

The South African Government has put aside R2.45 billion to subsidise set-top boxes for about five million households. The boxes, which are expected to cost about R700 each, are necessary to enable South Africans to watch TV when the country switches over to a digital signal in November 2011. The country is currently in the middle of a dual-illumination period.

MTN LAUNCHES DVB-H DEVICES

MTN South Africa has launched the country's first commercially available 3G/DVB-H capable mobile handset – the Samsung P910. The Multichoice and M-Net DVB-H trial network coverage areas restricted to select suburbs in Johannesburg, Soweto, Pretoria and Cape Town. Network roll-out is continuing at a rapid pace.

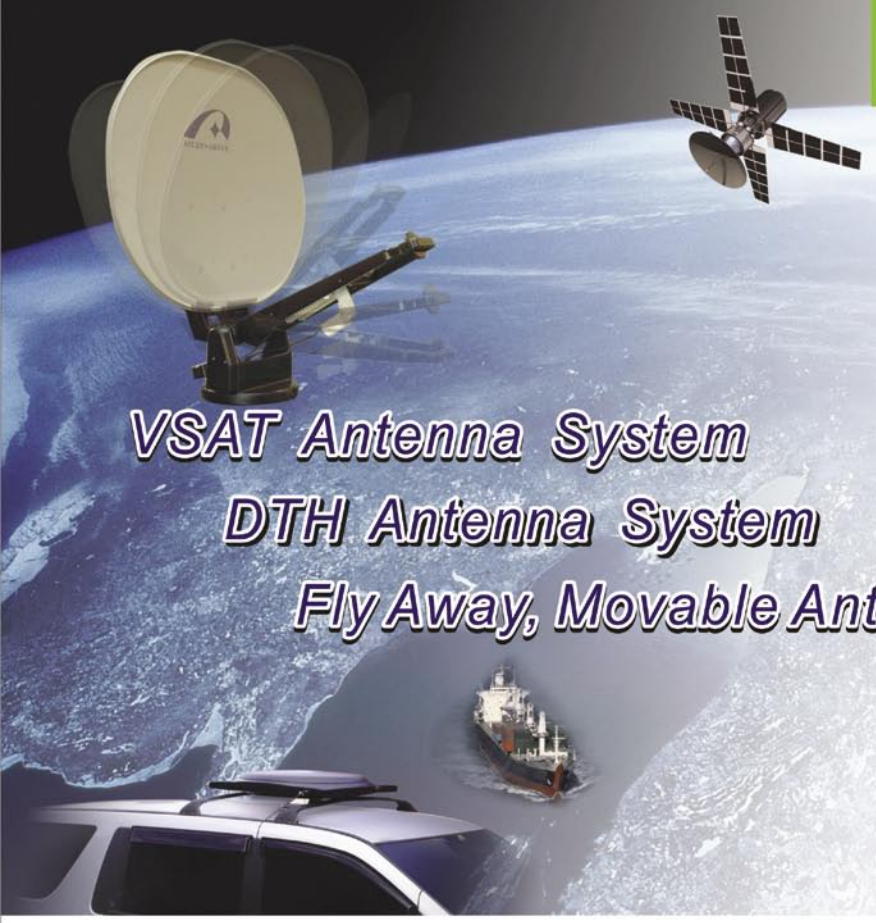
SOUTH AFRICA SELECTS MPEG-5 MIDDLEWARE

The International MHEG Promotion Alliance (IMPALA) has announced that South Africa has selected MHEG-5 as the interactive TV middleware for its digital switchover.

UGANDA

DTT PILOT UNDERWAY IN UGANDA

Two hundred viewers in Kampala, Uganda are currently receiving test DTT signals broadcast by five local TV stations. Uganda plans to switch its analogue signals by December 2012. The pilot transmissions are being carried out by Next Generation Broadcasting, a Swedish DTT company in partnership with national broadcaster Uganda Broadcasting Corporation (UBC) TV. The five TV stations taking part in the pilot include Nation Television (NTV), WBS, East Africa Television and Nile Broadcasting Service. The plan is to create both FTA and pay-for bouquets.



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EUROPE

EUROPE

EUTELSAT GROWTH DUE TO HD SERVICES

Eutelsat has released it figures for the first quarter of the year which showed that revenues grew by 11.6% to €226.7 million. The growth in demand for HD services is being heralded as one of the reasons. Currently Eutelsat carry around 3,329 channels and those being broadcast in HD have risen by a massive sixty per cent to over one hundred. Eutelsat now carry around 40% of all HD channels in Europe, the Middle East and Russia.

GERMANY

SKY GERMANY TO LAUNCH 4 HDTV CHANNELS IN 2010

Sky Deutschland is planning to launch 4 high-definition channels in mid-2010, after signing a capacity licensing deal with SES Astra. The German DTH operator already offers seven HD channels, namely Discovery HD, History HD, National Geographic HD, Sky Cinema HD, Disney Cinemagic HD, Sky Sport HD and Eurosport HD. A

PRIVATE BROADCASTERS LAUNCH HD+ SERVICE

HD Plus launched its HDTV service, HD+, in November 2009. The service includes HD programmes of broadcasters RTL, VOX, Sat.1, ProSieben and Kabel Eins. TV viewers can use HD+ for one year free of charge by purchasing a HD+ satellite receiver. After the first year, viewers can recharge the HD+ card for €50. Six models of HD+ receivers have been launched by Humax, Technisat, Technotrend Görler and Videoweb. In addition, HD Plus is supporting modules for receivers using the CI Plus standard.

SKY DEUTSCHLAND LAUNCHES HDTV PROMOTION

Sky Deutschland is offering consumers a HD TV Starter box for €199, which includes the HD set top box and a pre paid HD TV subscription. There are two different types of starter pack, the DTH satellite reception version and one that can be used in conjunction with a cable TV connection. The packages include a subscription to all twenty one channels from Sky Welt and Sky Welt Extra, with a further eighteen channels for satellite TV users. There are seven HD channels covering film and sport within the channels offered.

PORTUGAL

CLIX TV BOOSTS HD CONTENT

Clix has expanded its HD offering with live coverage of the Champions League in HD provided by RTP1 HD, the new public channel which broadcasts the games of most of major European clubs. This new option adds to the existing wide range of choices in high definition: Arte HD, Bebe TV HD, Disney Cinemagic HD, Luxe TV HD, National Geographic Channel HD, Sport TV HD.

UNITED KINGDOM

BSKYB WITH 1.6 MILLION HDTV SUBSCRIBERS

BSkyB gained 94,000 new customers in the first quarter of 2009 and now reaches 9.54 million households. It also signed up 287,000 customers to Sky+ HD – a three-fold increase on the previous year – to now reach a total of 1.6 million households.

TISCALI LAUNCHES HDTV

Tiscali customers with a Tiscali+ set-top box can receive HD movies from December 2009 on a pay-per-view basis. New HD releases will cost £4.95 (compared to £3.99 in SD) and older HD releases will cost £2.99 (compared to £1.99).

BBC CRITICISED OVER POOR HD PICTURE QUALITY

The BBC's HDTV service has lost its sharp pictures, after the broadcaster lowered the bitrate of its HD encoding technology from 16 to 9.7 MB. Protests began in August 2009 after the BBC changed its encoding system, leading to claims that its HD service, available on the Freesat platform, was little better than normal television. The BBC's main commercial rival Sky transmits HD programmes at a bitrate of between 1MB and 15MB.

FREEVIEW BEGINS HD TESTS

Freeview launched HD broadcasts in the UK although no HD set top boxes were available on the market on launch date. The reason being is that the broadcasts are in fact tests for the Freeview HD service taking place in London and Manchester but these transmitters already cover around 20% of the UK population. The HD switch-on makes the UK the only country in the world to operate to the DVB T2 standard.

NORTH AMERICA

CANADA

SHAW DIRECT OFFERS 58 HD CHANNELS

Following the launch of the History HD channel in November, Shaw Direct now offers a total of 58 High Definition (HD) channels. History Television HD is part of Shaw Direct's HD Extra package, featuring AMC HD, A&E HD, Discovery HD and more, for as little as CAD 4.99 per month.

ROGERS ADDS 13 HDTV CHANNELS

Rogers Communications in December added 13 new high definition channels to its HD content line-up, bringing the Rogers offering to more than 100 channels and hundreds of hours of HD content On Demand. The new HD channels are: Global BC HD, History Television HD, TCM - Turner Classic Movies HD, KTLA HD, WPIX HD, WSBK HD, MEXCESS HD, MFUN! HD, CBS COLLEGE SPORTS HD, WOW HD, TV5 HD, TFO HD and Fireplace HD.

BELL TV DROPPING SD SATELLITE RECEIVERS

Bell TV has informed its dealers that it will no longer sell or rent its 3150 and 5900 standard definition (SD) satellite receivers. Once the current inventory of the two models is gone, Bell will replace these models with high definition (HD) satellite receivers – 6131 and 9241 High HD PVR. Both will feature MPEG-4 capability, the ability to add an external hard disk drive and HDMI connectivity. The transition to MPEG-4 by ExpressVu has not been confirmed and is not expected for several years.

MATANUSKA SELECTS AMINO FOR HD ROLLOUT

Matanuska Telephone Association will buy HD set-top boxes from Amino Communications for its HDTV rollout. MTA, which serves the Palmer, Eagle River and Wasilla areas, is acquiring Amino's A130 set-top box, which handles a single MPEG-4 HD stream, and its A530 HD DVR box. MTA has about 8,000 IPTV subscribers and its HD channel line-up currently consists of about 24 broadcast-TV and basic-cable services.

UNITED STATES

BRIGHT HOUSE OFFERS 100 HD CHANNELS

Bright House Networks has reached the goal of having 100 high-definition channels by the end of 2009. The total of 103 HD channels does include HD Movies on Demand, a pay per view channel. In doing so it fulfils the ambitious goal it set in December 2008 when it only offered 37 channels in HD. It will also make Bright House more competitive with AT&T U-verse, and satellite providers DISH Network and DirecTV, which all offer more than 100 HD channels.

ASIA & PACIFIC

CHINA

COGO TO BENEFIT FROM CHINA'S HDTV PLANS

Cogo Group expects to benefit from China's plan to migrate to HDTV over the next three years. Cogo has already secured design wins to provide HD solutions to three top-tier set-top box manufacturers with scheduled shipments beginning in 2010. Additionally, Cogo is targeting an additional 20 STB vendors with its solution next year. At the end of September 2009, the Chinese government announced that nine channels would begin offering HD transmissions. Various industry sources have estimated that total HD STB sales will reach 30-50 million subscribers over the next three years, from a very limited number today. Currently, Beijing Gehua, Shanghai Cable, and Shenzhen CATV are key cable operators aggressively rolling out HDTV; however, over 100 cable operators will ultimately deliver HDTV in China over the next few years.

MALAYSIA

ASTRO LAUNCHES HDTV BROADCASTS

Astro All Asia Networks launched HDTV in Malaysia in December 2009. The DTH operator is available to some 2.875 million residential subscribers. The roll out of HDTV services is estimated to cost some 200 million Ringgits, including marketing and operating costs of approximately 150 million Ringgit, over the next financial year.

WORLD

AFN TO SWITCH TO HIGH DEFINITION

American Forces Network decoders will soon go high definition and follows the recent conversion from analogue TV to digital TV in the USA. Production of the older Cisco model D9835 satellite receiver/decoder was recently discontinued by the manufacturer to make way for the high-definition D9865 which will cost US$ 379. AFN has funding to switch over to high definition in fiscal 2012. The switch to digital and high definition is a lengthy and complicated process and involves replacing nearly 150,000 standard-definition-only receiver/decoders worldwide.

Exhibition Preview

- **2 - 4 March 2010: CABSAT 2010**
  The Leading International Digital Media Event for the Middle East, Africa and South Asia
  Dubai International Convention and Exhibition Center, UAE
  www.cabsat.com

- **8 - 10 March 2010: DVB World 2010**
  The essential annual conference and exhibition dedicated to DVB standards and their implementation
  Lisbon, Portugal
  www.dvbworld.org

- **23 - 25 March 2010: CCBN 2010**
  18th China Content Broadcasting Network Expo
  China International Exhibition Center (CIEC), Beijing, China
  www.ccbn.tv

- **12 - 15 April 2010: NABSHOW**
  The Must-Attend Global Event for Content Professionals
  Las Vegas Convention Center, Las Vegas, Nevada, USA
  www.nabshow.com

- **13 - 14 April 2010: SatCom 2010 Africa**
  Investment and Development for Operators, Government and Investors
  Sandton Convention Center, Johannesburg, South Africa
  www.satcomafrica.com

- **4 - 6 May 2010: ANGA Cable 2010**
  Trade Fair for Cable, Broadband and Satellite
  Koeln Messe, Cologne, Germany
  www.angacable.com

- **15 - 18 June 2010: CommunicAsia 2010**
  The 21st International Communications and Information Technology Exhibition & Conference
  Singapore Expo, Singapore
  www.communicasia.com

- **22 - 24 June 2010: SatCom 2010 Russia & CIS**
  Investment and development for operators, developers, government and investors
  Kiev, Ukraine
  www.terrapinn.com/2010/satcomrus/

- **20 - 22 October 2010: EEBC**
  Telecom & Broadcasting
  Exhibition centre "KyivExpoPlaza", Kiev, Ukraine
  www.eebc.net.ua

TELE-satellite Deadlines

Editorial Deadlines, Magazine Publishing Dates

Number	Issue	Deadline	Hardcopies	Available Online
#216	04-05/2010	5 February 2010	19 March 2010	2 April 2010
#217	06-07/2010	2 April 2010	14 May 2010	28 May 2010
#218	08-09/2010	4 June 2010	16 July 2010	30 July 2010
#219	10-11/2010	6 August 2010	17 September 2010	1 October 2010
#220	12-01/2011	3 December 2009	14 January 2011	28 January 2011

DVB-T MPEG-2

Algeria
Albania
Australia
Austria
Belgium
Croatia**
Denmark**
Finland**
France**
Germany*
Greece*
Indonesia
Ireland
Italy**
Luxembourg
Morocco
Namibia
Netherlands
Sweden*/**
Switzerland
Tunisia
UK**

* some DVB-T MPEG-4 transmissions

** some DVB-T2 transmissions

DVB-T MPEG-4

Azerbaijan
Belarus*
Bulgaria
Colombia
Czech**
Estonia**
Hungary**
Iceland
India
Iran
Israel
Kenya
Latvia
Lithuania
Macedonia
Malaysia
New Zealand
Norway
Poland
Portugal
Romania
Russia
Serbia**
Slovakia
Slovenia**
South Africa
Spain**
Ukraine*
Vietnam

* some DVB-T MPEG-2 transmissions

** some DVB-T2 transmissions

Digital Terrestrial Television of the World

Dominant System per Country

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SLOVAKIA
UKRAINE
AUSTRIA
MOLDOVA
HUNGARY
ROMANIA
SLOVENIA
CROATIA
YUGOSLAVIA
BULGARIA
MACEDONIA
ITALY
ALBANIA
GREECE
BOSNIA-HERZEGOVINA
TURKEY
GEORGIA
ARMENIA
AZERBAIJAN
TURKMENISTAN
KAZAKHSTAN
UZBEKISTAN
KYRGYZSTAN
TAJIKISTAN
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CYPRUS
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LEBANON
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IRAQ
IRAN
AFGHANISTAN
JORDAN
TUNISIA
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EQUATORIAL GUINEA
GABON
CONGO
ZAIRE
UGANDA
KENYA
SOMALIA
RWANDA
BURUNDI
TANZANIA
ANGOLA
ZAMBIA
MALAWI
MOZAMBIQUE
NAMIBIA
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MAURITIUS
RÉUNION
DVB-T2
Taiwan
ATSC
Canada
Guatemala
Honduras
Mexico
USA
ISDB-T
MPEG-2
Japan
ISDB-T
MPEG-4
Argentina
Brazil
Chile
Peru
Venezuela
DMB-TH
China
Hongkong

World DTT Chart

EUROPE

Western Europe

Austria — DVB-T

DTT Information provided by

Thomas Haring, Austria

National Programmes FTA 64QAM

Mux A	ORF-1	ORF-2	ATV
Mux B	ORF Sport	Puls 4	3sat

Regional Programmes FTA 64QAM

ORF-2 Wien	ORF-2 Niederöster.	ORF-2 Burgenland	ORF-2 Steiermark
ORF-2 Kärnten	ORF-2 Tirol	ORF-2 Oberösterreich	ORF-2 Salzburg
ORF-2 Vorarlberg			

Local Programmes FTA 8PSK

Mux C Wien	RT24	WienTV	BusinessTV
Mux C Linz	LT1		

Belgium — DVB-T

DTT Information provided by

Leo Stouten, Belgium

Regional Programmes FTA French

RTBF	La Une	La Deux	La Trois
	Euronews	TV5 Monde	Arte

Regional Programmes FTA Dutch

VRT	één	Ketnet/Canvas	Ketnet+/ Canvas+
	één+		

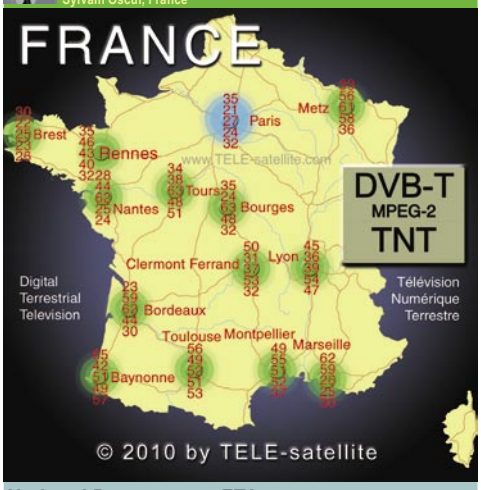
Regional Programmes Encrypted Dutch

Norkring Pakket 1	Norkring Pakket 2	Norkring Pakket 3	Norkring Pakket 4
Norkring Pakket 5	Norkring Pakket 6		

France — DVB-T

DTT Information provided by

Sylvain Oscul, France



National Programmes FTA

Mux R1	France 2	France 3	France 5
	ARTE	Chaine Parlamentaire	Regional Programmes
Mux R2	Direct 8	Gulli	Virgin 17
	iTELE	BFM TV	France 4
Mux R4	M6	W9	NT1
Mux R6	TF1	NRJ 12	TMC

Regional Programmes in all France FTA

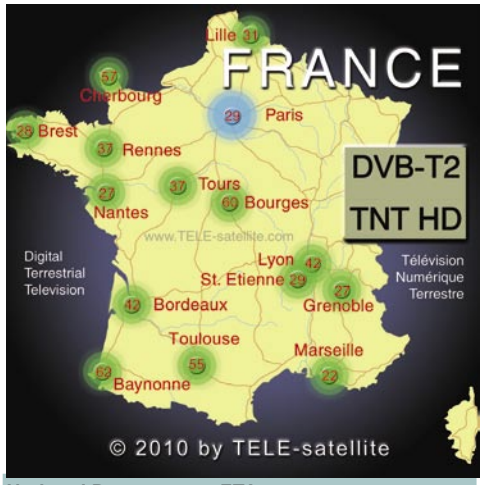
Angers 7	TV8 Mont Blanc	TVPI	TV7 Bordeaux
Canal 8	Citizen TV	Clermont Première	Bip TV
téléGrenoble	TV Vendée	LM TV	Télé 102
Wéo	TLM	Télé Locale Provence	La chaine Marseille
7L	Nantes 7	Télénantes	Télé Miroir
Orléans TV	TV Rennes 35	TLI	TV Tours
Canal 32			

Regional Programmes Ile de France FTA

France Ô	Demain TV	Cinaps TV	IDF 1
NRJ Paris	Cap 24		

National Programmes Encrypted

Mux R3	Canal+	Planète	Canal+ Sport
	Canal+ Cinéma	TPS Star	
Mux R4	Paris Première		
Mux R6	Eurosport	LCI	TF6



National Programmes FTA

Mux R5	TF1 HD	France 2 HD	M6 HD
Mux R4	Arte HD		

National Programmes Encrypted

Mux R3	Canal+ HD		

Germany — DVB-T

DTT Information provided by

Heinz Koppitz, Germany

National Programmes FTA 16QAM

Mux 1	Das Erste	Arte	Phoenix
	Eins Plus		
ZDF	ZDF	3sat	ZDF Infokanal
ProSiebenSat1	Sat 1	Pro7	Kabel Eins
	N24		
RTL Group	RTL	RTL 2	Super RTL
	Vox		

Regional Programmes FTA 64QAM Berlin

RBB 2	MDR	Arte	NDR
Berlin 1	WDR	SWR	HSE
Berlin 2	DSF	9Live	Eurosport
	TV.Berlin		
Berlin 3	ntv	Euronews	JayJay

Regional Programmes FTA 64QAM Frankfurt

HR 2	Phoenix	SWR	BR

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Rhein-Main	Eurosport	Tele 5	rheinmaintv
	Bibel TV		

Regional Programmes FTA 64QAM München

BR 2	BR	BR alpha	SWR
München	Tele 5	Eurosport	münchen.tv
	HSE 24		

Regional Programmes FTA 64QAM Hamburg

NDR 2	NDR	WDR	MDR
Hamburg	9Live	Eurosport	Hamburg 1
	Bibel TV		

Regional Programmes FTA 64QAM Köln

WDR 2	WDR	MDR	NDR
	SWR		
Nordrhein-Westfalen	CNN	Viva	Eurosport
	Tele 5		

Regional Programmes FTA 64QAM Stuttgart

SWR 2	SWR	HR	WDR
	BR		

Regional Programmes FTA 64QAM Leipzig

MDR 2	MDR	RBB	WDR
	BR		
Leipzig	Leipzig Fernsehen	Info TV Leipzig	BBC World
	Bibel TV		

Regional Programmes FTA 64QAM Hannover

NDR 2	NDR	WDR	MDR
	HR		
Niedersachsen	Tele 5	Comedy Central	Eurosport
	Mona TV		

Regional Programmes FTA 64QAM Erfurt

MDR 2	MDR	RBB	BR
	HR		

National Programmes Encrypted Conax

Mediengruppe RTL	RTL	Vox	RTL 2
	Super RTL	Crime	Passion

Greece DVB-T

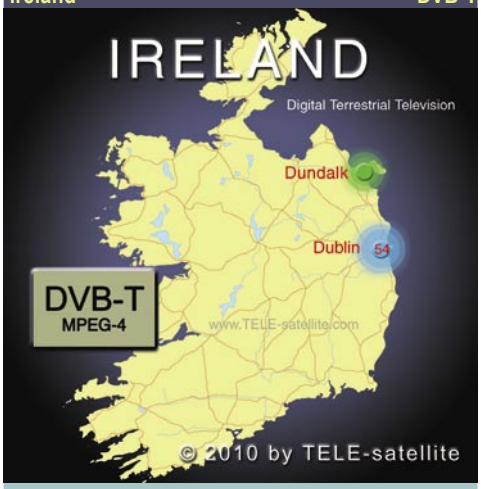
National Programmes FTA

ERT 1	ERT 2		

National Programmes FTA

ALPHA	ALTER	ANTENNA	ΜΑΚΕΔΟΝΙΑ TV
MEGA	ΣΚΑΪ	STAR	

Ireland DVB-T



Test Programmes FTA

RTÉ	TG4	TV3	

Italy DVB-T

DTT Information provided by

Alberto Boselli, Italy

National Programmes FTA

Mux A	RaiUno	RaiDue	RaiTre
	Rai 4		
Mux B	RaiNews24	Rai Gulp	Rai Sportpiù
	Rai Storia	Sat2000	
Rete A	All Music	Repubblica TV	France 24
	Second TV		
Mediaset 2	Italia 1	Rete 4	Canale 5
	Boing	Iris	Class News
	BBC World	Coming Soon	
TIMB 1	LA7	MTV Italia	Qoob
	Mediashopping	Sportialia	Sportitalia24

National Programmes Encrypted

Mediaset 1	Premium menu	Hiro	Cartoon Network
	Playhouse Disney	Disney Channel +1	Extra 1
	Extra 2	Premium Calcio 24	Premium Calcio 1
	Premium Calcio 2	Premium Calcio 3	Premium Calcio 4
	Premium Calcio 5	Premium Calcio 6	Premium Calcio attivazione
Dfree	Mediashopping	Disney Channel	Joi
	Mya	Steel	Joi + 1
	Mya + 1	Steel + 1	

Nationa Programme Encrypted

Premium Calcio HD			

Test Programmes FTA

RAI HD	La7		

Capital City Other City 8 34 VHF or UHF Transmitter

Multiplex Bouquet	Programme Name

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Maps by www.mapresources.com

Luxembourg — DVB-T

DTT Information provided by

Leo Stouten, Belgium

National Programmes FTA

Mux Ch 27	RTL Télé Lëtzebuerg 1	RTL Télé Lëtzebuerg 2	

French Belgium Programmes FTA

Mux Ch 24	RTL TVI	Club RTL	Plug TV
Mux Ch 7	M6		

Dutch Netherlands Programmes FTA

Mux Ch 24	RTL 4	RTL 5	RTL 7

Netherlands — DVB-T

DTT Information provided by

Ron Eberson, Netherlands

National Programmes FTA 64 QAM

Bouquet Publiek Omroep	Nederland 1	Nederland 2	Nederland 3

Regional Programmes FTA 64QAM

Bouquet Publiek Omroep	Omroep Brabant TV	TV Drenthe	TV Flevoland
	Omroep Fryslan	TV Gelderland	TV Noord
	L1TV	TV Noord Holland	TV Oost
	Regio TV Utrecht	Omroep Zeeland TV	TV West
	TV Rijnmond		

National Programmes Encrypted (Conax) 64QAM

Bouquet 2	RTL4	RTL5	RTL7
	SBS6	NET5	
Bouquet 3	Eredivisie Live	Cartoon Network	TMF
	MTV	Animal Planet	CNN
	BBC Prime	CNBC	
Bouquet 4	Veronica	RTL8	één
	Canvas	Nickelodeon	Discovery Channel
	Eurosport	Private Spice	

Portugal — DVB-T

DTT Information provided by

Luis Fernando Carvalho, Portugal

National Programmes FTA

RTP1	RTP2	SIC	TVI

Regional Programmes FTA

RTP Açores	RTP Madeira		

Spain — DVB-T

DTT Information provided by

Mariano Roch, Spain

National Programmes FTA 64QAM

TELEVISIÓN ESPAÑOLA	TVE 1	TVE 2	Clan TV
	Teledeporte	Canal 24 Horas	
ANTENA 3 TV	Antena 3	Antena Neox	Antena Nova
TELECINCO	Telecinco	La Siete	FDF Telecinco
	Cinco Shop		
SOGECABLE	Cuatro	CNN+	40 Latino
	Canal Promo		
LA SEXTA	La Sexta	Gol TV	
NET TV	Intereconomía	Disney Channel	
VEO	Veo TV	Set en Veo	Tienda en Veo

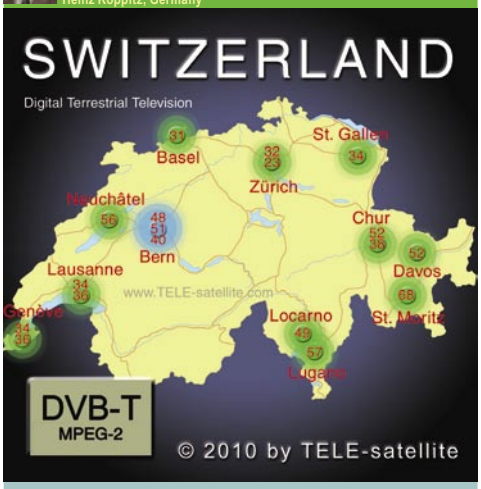
Local Programmes FTA 64QAM

Murcia Ch 29	7RM HD		
Valladolid Ch 32	TVE HD		
Barcelona Ch 43	3HD		
Tarragona Ch 62	3HD		
Valencia Ch 32	Canal 9 HD		
Zaragoza Ch 63 Teruel Ch 62 Huesca Ch 57	Aragón 2 HD		

Switzerland — DVB-T

DTT Information provided by

Heinz Koppitz, Germany



National Programmes FTA 64QAM

Mux D	SF 1	SF 2	TSR 1
	TSI 1		
Mux R	SF 1	SF 2	SF i
	TSR 1	TSI 1	
Mux F	TSR 1	TSR 2	SF 1
	TSI 1		
Mux I	TSI 1	TSI 2	SF 1
	TSR 1		

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UK — DVB-T

DTT Information provided by

Andy Middleton, UK

National Programmes FTA 16QAM

Mux 1	BBC 1	BBC 2	BBC 3
PSB1	CBBC	BBC News	

National Programmes FTA 64QAM

Mux 2	ITV1	ITV 2	Channel 4
PSB2	More4	E4	Five

National Programmes FTA 64QAM

Mux A	ITV3	QVC	Virgin 1
COM4	Bid TV	Fiver	Five USA
	Quest	CITV	CNN International

National Programmes FTA 64QAM

Mux B	BBC 4	CBeebies	BBC Parliament
PSB3	Community		

National Programmes FTA 16QAM

Mux C	Sky3	Dave	E4+1
COM5	price-drop tv	Sky News	Sky Sports News
	NHS Direct		

National Programmes FTA 16QAM

Mux D	Yesterday	Film4	4Music
COM6	TMF	Ideal World	ITV4
	Dave ja vu	Virgin 1 +1	TOPUP Anytime
	Gems TV	Lottery Xtra	Russia Today

National Programmes FTA

Mux B	BBC HD	ITV HD	

Northern Europe

Denmark — DVB-T

National Programmes FTA

DR 1	DR 2	TV 2 Danmark	

Regional Programmes FTA

TV-2 Regionerne	Lokalt	Regional TV	

Regional Programmes Faroer Islands Encrypted

Mux 1	3+	CNBC	Kanal 5
	BBC Prime	BBC World	Kanal 4
Mux 2	TV3	DR 1	Discovery DK
	Svf	DR 2	Visjon Norge
Mux 3	Canal+ First	Canal+ Drama	Canal+ Comedy
	TCM Cartoon	Hallmark	Canal+ Sport 1
Mux 4	TV2 Sport	Eurosport	Animal Planet
	NRK	VH1	Rás 1
	Kanal 6		

National Programmes FTA

DR Ramasjang	DR K	DR HD	DR Update
Folketings-TV			

Boxer Programmes FTA

TV2	DR1	DR2	DR Update
DR Ramasjang	DR K.	DR HD	

Boxer Programmes Encrypted

TV2 News	TV2 Charlie	TV2 Zulu	TV2 Film
Kanal 5	Kanal 4	6'eren	Canal 9
Discovery Channel	Disney Channel	MTV	CNN
TV2 Sport	Animal Planet	Cartoon Network	Nickelodeon
Disney XD	The Voice	VH1	Discovery Science
Travel & Living	History	Travel Channel	Star!
Body in Balance	Canal+ First	Canal+ Hits Sports	Canal+ Sport 1

TV4 Sverige	TV2 Norge	ARD	

Estonia — DVB-T

National Programmes FTA

Mux 1	ETV	ETV 2	TV6
	Kanal 2	Kanal 11	TV3

National Programmes Encrypted

Mux 2	Discovery Channel	Discovery Science	Discovery World
	Discovery Travel	Animal Planet	Cartoon Network
	Eurosport	Extreme Sports	Fashion TV
	PBK Estonia	TVC International	REN-TV Estonia
Mux 3	TV14	Fox Life	Fox Cinema
	MTV Eesti	Seitse	National Geographic
	Hallmark	Nickelodeon	ESPN America
	Euronews	CNN	Hustler TV

HDTV Test Programmes FTA

Mux 4	Rush HD	Test 1	Test 2
	Test 3		

Capital City

Other City

8 VHF or
34 UHF Transmitter

Multiplex Bouquet	Programme Name

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Finland DVB-T

National Programmes FTA

Mux A	YLE TV1	YLE TV2	YLE Teema
	YLE FST5		
Mux B	MTV3	Nelomen	Sub
	Jim	Liv	
Mux C	Urheilukanava	The Voice	Klubi.tv
	Iskelmä	Iskelmä TV Harju & Pöntinen	

National Programmes Encrypted

Mux A	SVT World		
Mux B	MTV 3 Max	Sub Juniori	Su Leffa
Mux C	Canal+ First	Canal+ Hits	Canal+ Sport1
	Canal+ Sport 2	Disney Programme	Urheilu+ kanava
	URHOtv		
Mux E	Discovery Channel	Eurosport	MTV3 Fakta
	Music Television MTV	Nickelodeon	KinoTV

Test Programme FTA

MTV 3 MAX HD			

Iceland DVB-T

National Programmes Encrypted

Vodafone	RÚV	Stöð 2	Stöð 2+,
	Stöð 2 Bíó	Stöð 2 Extra	Stöð 2 Sport
	Stöð 2 Sport 2	Skjár Einn	

Latvia DVB-T

National Programmes FTA

LTV1	LTV7	LNT	TV5

Lithuania DVB-T

National Programmes FTA

Balticum Auksinis	BTV	Info TV	LTV
LIUKS	LNK	LTV2	TV1
TV3	TV6		

Norway DVB-T

National Programmes FTA

Mux 1	nrk1	nrk2	nrk3
	nrk super		

National Programmes Encrypted

Mux 1	TV3	TV4	Disney Channel
Mux 2	TV2	Zebra2	2 Film
	2 Nyheter	2 Sport	Animal Planet
	The Voice	Discovery Channel	24
Mux 3	Canal+ Sport1	Canal+ Film1	Canal+ Film2
	FEM	Sport N	TV Norge
	National Geographic	BBC World	

Sweden DVB-T

National Programmes FTA 64QAM

Mux Nät 1	SVT1	SVT2	SVT24
	Barnkanalen	Kunskaps	
Mux Nät 5	Axess TV		

National Programmes Encrypted 64QAM

Mux Nät 2	CNN	TV4 Fakta	TV4 Film
	TV4 Plus	TV6	TV400
Mux Nät 3	Canal+ First	Canal+ Hits	Canal+ Sport1
	Disney Programme	Kanal 5	TV3
	TV8	VH1	
Mux Nät 4	Animal Planet	Comedy Central	Discovery Channel
	Eurosport	Kanal 9	MTV
	Nickelodeon	ztv.se	
Mux Nät 5	TV4 Sport	Canal 7	Silver
	TCM		

Regional Programmes FTA 64QAM

Mux Nät 1	SVT2 Regional	SVT24 Regional	

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Regional Programmes Encrypted 64QAM

Mux Nät 2	TV4 Regional		

National Programmes FTA 64QAM

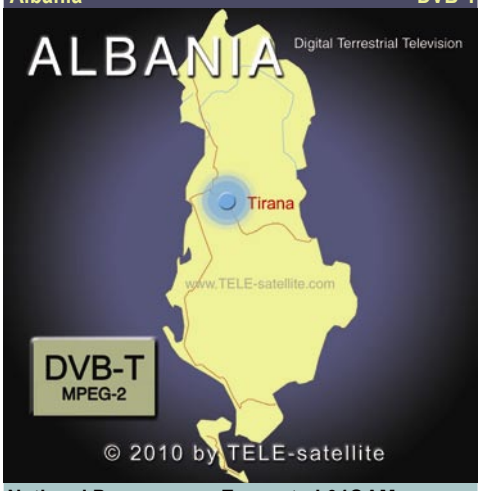
Mux Nät 6	7	BBC World News	Disney XD
	Star!	Showtime	

National Programmes FTA

Mux Nät M	SVT HD	TV Finland	

Central Europe

Albania — DVB-T



National Programmes Encrypted 64QAM

DigitalALB Mux 1	DigitalALB Mux 2	DigitalALB Mux 3	DigitalALB Mux 4

Bulgaria — DVB-T

DTT Information provided by
Ivan Penev, Bulgaria

Test Programmes FTA

Mux 1			

Croatia — DVB-T

DTT Information provided by
Aleksandar Medic

National Programmes FTA 64QAM

Mux A	HRT1	HRT2	RTL TV
	NOVA TV		

Test Programmes FTA 64QAM

HTV1			

Czech — DVB-T

DTT Information provided by
Miroslav Kodet, Czech

National Programmes FTA 64QAM

Mux 1	CT1	CT2	CT4
	CT24		
Mux 2	Nova TV	Prima TV	Nova Cinema
	Prima Cool	Barrandova TV	
Mux 3	Z1	Ocko	TV Noe
	Public TV		

National Programmes FTA

Mux 4	CT1 HD	Nova HD	O2 Info

Macedonia — DVB-T

DTT Information provided by
Branislav Pekic, Serbia

Capital City Other City 8 34 VHF or UHF Transmitter

Multiplex Bouquet	Programme Name

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Test Programmes FTA

On.net	Test		

Hungary DVB-T

DTT Information provided by

Attila Horvath-Militicsi, Hungary

National Programmes FTA 64QAM

Mux A1	MTV-1 HD Budapest	MTV-2 HD	
Mux A2	MTV-1 HD Sopron	MTV-2 HD	
Mux A3	MTV-1 HD Szeged	MTV-2 HD	
Mux C	RTL Klub	Duna TV HD	Duna II Autonómia SD
	Euronews	TV2.hu	

National Programmes Encrypted Conax

Mux A	ATV	Hír TV	

National Programmes FTA 64QAM

Mux 1	MTV-1 HD Budapest	MTV-2 HD	HD teszt

Poland DVB-T

DTT Information provided by

Jacek Pawlowski, Poland

National Programmes FTA

TVP1	TVP2	TVP Info	TVN
Polsat	TV4	PULS	
TVP HD			

Romania DVB-T

DTT Information provided by

Alexandru Porosanu, Romania

Test Programmes FTA

Mux Ch 31	ProTV HD		
Mux Ch 54	TVR1	TVR-HD	
Mux Ch 59	Antena 1	Antena 3	National TV
	TV3	TVR Cultural	Realitatea TV

Serbia DVB-T

DTT Information provided by

Branislav Pekic, Serbia

National Programmes FTA

RTS 1	RTS 2	RTS Digital	

National Programmes FTA

RTS HD			

Slovakia DVB-T

DTT Information provided by

Miroslav Kodet, Czech

National Programmes FTA

Mux 1	TV Jednotka	TV Dvojka	TV Markiza
	TV JOJ		

Regional Programme Bratislava FTA

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Mux 1	TA3		

Regional Programme Banská Bystrica FTA

Mux 1	AZTV		

Slovenia — DVB-T

DTT Information provided by

Branislav Pekic, Serbia

National Programmes FTA

Mux A	TV Slovenija 1	TV Slovenija 2	TV Slovenija 3

Regional Programmes FTA

Zahod (West)	TV Koper-Cpodistria		
Vzhod (East)	Tele M		

Test Programme FTA

TV Slovenija HD			

Eastern Europe

Belarus — DVB-T

DTT Information provided by — Информация представлена

Pavel Goroshko, Ukraine — Павлом Горошко, Украина

National Programmes FTA

1st Channel	Channel 8	OHT	Harmony
World	CTB	RTR Belarus	NTV Belarus

National Programmes FTA

1st Channel	Channel 8	OHT	Harmony
World	CTB	RTR Belarus	NTV Belarus

Russia — DVB-T

DTT Information provided by — Информация предоставлена

Nikolay Ovsyadovskiy, Russia — Николаем Овсядовским, Россия

National Programmes FTA

Первый канал Perviy Kanal	Телеканал Россия Telekanal Rossiya	Вести Vesti	Kultura
	НТВ NTV	5 канал 5 Kanal	Бибигон + Теленяня Bibigon + Telenyanya

Local Programmes Moscow Encrypted

Mux Ch 32	DVisionLive	DVisionNews	DVisionSpice

Test Programme Moscow

Mux Ch 34	VGTRK Test HD		

Regional Programmes Ekaterinburg

Mux Ch 22	Муз-ТВ Muz-TV	Время Vremya	7ТВ 7 TV
	Дом Кино Dom Kino	Орбита-4 Orbita-4	Россия Дубль 4 Russia Double-4
	Telecafe	Теленяня Telenyanya	TV Centr
Mux Ch 40	Kanal 1	Телеканал Россия Telekanal Rossiya	Вести Vesti
	Culture	Спорт Sports	Теленяня Telenyanya
	ОТВ OTV	НТВ NTV	
Mux Ch 60	Дом Кино Dom Kino	Муз-ТВ Muz-TV	Канал 4 Kanal 4
	МИР MIR	ТНТ TNT	ТВЦ TVC
	Luxe TV		

Regional Programmes Smolensk

Mux Ch 50	Телеканал Россия Telekanal Rossiya	Петербург 5 канал Petersburg 5 Kanal	Югра Ugra

Regional Programmes Kazan

Ren-TV	МИР MIR	Муз-ТВ Muz-TV	TNV
Sport Telenyanya	STS	Domashniy	ТНТ TNT
2x2	Дом Кино Dom Kino		

Regional Programmes Khanty-Mansiysk

Mux Ch 40	Канал 1 +2 Kanal 1 +2	Телеканал Россия +2 Telekanal Rossiya +2	Вести Vesti
	Culture	Спорт Sports	Югра Ugra
	Канал 5 +3 Kanal 5 +3	НТВ +2 NTV +2	
Mux Ch 50	ТВЦ TVC	МИР MIR	Дом Кино Dom Kino
	Время Vremya	Теленяня Telenyanya	Telecafe
	Муз-ТВ Muz-TV	ТНТ TNT	

Capital City — Other City

8 VHF or
34 UHF Transmitter

Multiplex Bouquet	Programme Name

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Ukraine — DVB-T

DTT Information provided by — Информация представлена
Pavel Goroshko, Ukraine — Павлом Горошко, Украина

National Programmes FTA

UDTVN	MEGASPORT	KULTURA	INTER
	FOOTBALL	M2	KDRTRK
	MUSICBOX	TBi	NTN
	GUMOR TV		

Regional Programmes FTA

ERA PRODUCTION	UT-1	K1	RADA
	TV KYIV		
KRRT	5 KANAL	MEGASPORT	TONIS
	OTV	ICTV	
GAMMA CONSULTING	GAMMA	M2	M1
	RUMUSIC	NEWS_ONE	TEST

AFRICA

Maghreb

Algeria — DVB-T

DTT Information provided by — معلومات متوفرة من السيد
Morsli Hallam, Algeria — حلام مرسلي, الجزائر

Test Programmes FTA

كنال ألجيري (Canal Algèrie)	قنات الثالثة (TV A3)	الجزائرية الخامسة (TV Amazigh)	الجزائرية الرابعة (TV Coran)
قنات الوطنية (National Programme)			

Morocco — DVB-T

DTT Information provided by — معلومات متوفرة من السيد
Morsli Hallam, Algeria — حلام مرسلي, الجزائر

National Programmes FTA

الأولى (Al Aoula)	الثانية (2M)	الرياضية (Arryadia)	الرابعة (Arrabia)
السادسة (Assadissa)	افلام tv (Aflam TV)		

Tunisia — DVB-T

DTT Information provided by — معلومات متوفرة من السيد
Morsli Hallam, Algeria — حلام مرسلي, الجزائر

Test Programme FTA

شوف tv (Chouf TV)			

Sub Sahara Africa

Kenya — DVB-T

South Africa — DVB-T

DTT Information provided by
Ingo Salomon, South Africa

Test National Programmes FTA

Mux 1	SABC 1	SABC 2	SABC 3
	Trinity		
Mux 2	E.tv		

Test National Programmes Encrypted

Mux 3	M'Net	DStv	

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Namibia — DVB-T

DTT Information provided by

Ingo Salomon, South Africa

National Programmes Encrypted 8PSK

M-Net	Super Sport 1	SABC Africa	Discovery
Programme O			

AMERICA

North America

Canada — ATSC

DTT Information provided by

Ron Roessel, USA

Local Programmes FTA Ottawa

Ch 6 CIII-TV6	Ch 9 CBOFT	Ch 13 CJOH-TV	Ch 17 CJMT-TV2
Ch 20 CITY-TV3	Ch 22 CHCH-TV1	Ch 24 CICO TV24	Ch 25 CBOT
Ch 27 CFMT-TV2	Ch 33 SUNTV	Ch 42 CITS-TV1	Ch 43 CHRO-TV43

Local Programmes FTA Quebec

Ch 12 CBVT	Ch 15 CIVQ-TV	Ch 20 CKMI-TV	Ch 25 CBVE-TV
Ch 39 CFAP-TV	Ch 49 CFCM-TV		

Local Programmes FTA Winnipeg

Ch 7 CKY-TV	Ch 9 CKND-TV	Ch 27 CBWT	Ch 35 CIIT-TV
Ch 51 CBWFT			

Local Programmes FTA Toronto

Ch 9 CFTO-TV	Ch 19 CICA-TV	Ch 20 CBLT	Ch 40 CKXT-TV
Ch 41 CIII-TV41	Ch 44 CJMT-TV	Ch 47 CFMT-TV	Ch 51 CITY-TV

Local Programmes FTA Edmonton

Ch 11 CBXT	Ch 13 CITV-TV	Ch 17 CHCA-TV2	Ch 23 CKES-TV
Ch 26 CJAL-TV	Ch 42 CBXFT	Ch 44 CJEO-TV	Ch 47 CFRN-TV
Ch 51 CKEM-TV			

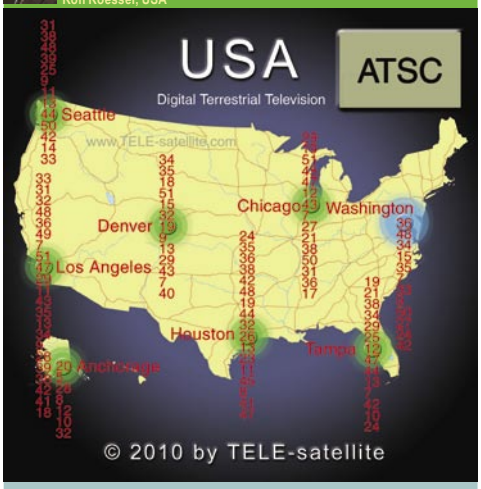
Local Programmes FTA Vancouver

Ch 8 CHAN-TV	Ch 10 CKVU-TV	Ch 17 CIVI-TV2	Ch 20 CHNM-TV
Ch 26 CBUFT	Ch 32 CIVT-TV	Ch 43 CBUT	

USA — ATSC

DTT Information provided by

Ron Roessel, USA



Regional Programmes FTA Washington

FOX	NBC	ION	UNIVISION
MYTV	ABC	PBS	CBS
CW	ETV		

Regional Programmes FTA Los Angeles

TBN	CW	INDEPENDENT	PBS
NBC	ABC	AZTECA	TELEFUTURA
FOX	CBS	MYTV	UNIVISION
ION			

Regional Programmes FTA Denver

CW	CBS	PBS	UNIVISION
TELEFUTURA	FOX	MYTV	NBC
TELEMUNDO	ION	ABC	INDEPENDENT

Regional Programmes FTA Houston

TBN	NBC	TELEFUTURA	CW
INDEPENDENT	TELEMUNDO	ION	FOX
ABC	CBS	UNIVISION	PBS
TUVISION			

Regional Programmes FTA Chicago

NBC	CW	MYTV	TELEMUNDO
PBS	CBS	ION	INDEPENDENT
UNIVISION	TELEFUTURA	FOX	

Regional Programmes FTA Tampa

INDEPENDENT	MYTV	PBS	ABC
UNIVISION	FOX	TELEFUTURA	CW
NBC	ION	CBS	

Regional Programmes FTA Anchorage

FOX	MYTV	CBS	PBS
ABC	NBC	INDEPENDENT	

Regional Programmes FTA Seattle

INDEPENDENT	ABC	NBC	CBS
MYTV	PBS	CW	FOX
AMR1/AZAM	UNIVISION	REL	TBN
ION			

Central America

Bermudas — DVB-T

International Programmes Encrypted

WOW	Bermuda Weather	Look TV	Bermuda Government
	WOW	WNYW	WNET
	BBC World	ZFB	ZBM
	3 Angels Network	VSB	TBN
	CNN	TruTV	TLC
	Bloomberg	CNN Headlines	CNBC
	Spike TV	TNT	TBS
	ABC Family	Lifetime	The Word
	Superstation WGN	WDTV	WPIX
	Weather Channel	USA	My9 WWOR
	RTP	Disney Channel	Fox News
	BET	Animal Planet	CMT
	E!	National Geographic	Discovery
	Nickelodeon	Sci-Fi	

Guatemala — ATSC

National Programmes FTA

RTG			

Capital City

Other City

8 VHF or
34 UHF Transmitter

Multiplex Bouquet	Programme Name

Disclaimer: This Chart is for educational overview only and is neither complete nor accurate. This Chart shall not be used commercially.
Maps by www.mapresources.com

Guatemala — ATSC

National Programmes FTA

Campus TV			

Mexico — ATSC

DTT Information provided by

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Local Programmes FTA Mexico City

Televisión Metropolitana	TV Azteca	Televisora del Valle de Mexico	Compañia Internacional de Radio y Televisión
Televimex			

Local Programmes FTA Guadalajara

Televimex	Televisora de Occidente	TV Azteca	

Local Programmes FTA Monterrey

Televimex	TV Azteca	Television Digital	

Local Programmes FTA Tijuana

Televimex	Radio Televisión	TV Azteca	Televisora de Calimex
Tele Nacional	XHBJ-TV		

Local Programmes FTA Ciudad Juarez

Canales de Televisión Populares	TV Azteca		

South America

Argentina — ISDB-T

DTT Information provided by

Juan Carlos Miranda Duarte, Chile

National Programme FTA

Canal 7			

Brazil — ISDB-T

DTT Information provided by

Juan Carlos Miranda Duarte, Chile

Regional Programmes FTA Amazonas

TV Amazonas (Globo)	Amazon Sat		

Regional Programmes FTA Bahia

TV Itapoan	TV Bahia	TV Aratu	Rede Globo
Band Bahía			

Regional Programmes FTA Ceará

TV União	TV Diário	TV Ceará	TV Assembleia CE
TV Verdes Mares (Globo)	Rede TV!	TV Jangadeiro	

Regional Programmes FTA Distrito Federal

Globo Brasília	Record Brasília	STB Brasília	Band Brasília
TV Senado	TV Justiça	RBI	TV Brasil

Regional Programmes FTA Espírito Santo

TV Capixaba	TV Gazeta	TV Vitória	TV Tribuna

Regional Programmes FTA Goiás

Record Goiânia	TV Serra Dourada	TV Goiânia	TV Brasil Central
TV Anhanguera			

Regional Programmes FTA Mato Grosso do Sul

TV Morena			

Regional Programmes FTA Minas Gerais

TV Integração (Globo)	Band MG	Rede TV!	Record MG
Globl Minas	TV Alterosa		

Regional Programmes FTA Pará

TV Liberal (Globo)	RBA		

Regional Programmes FTA Paraíba

TV Correio	TV Cabo Branco	TV Tambaú	

Regional Programmes FTA Pernambuco

Rede TV!	TV Tribuna	TV Jornal	Globo Nordeste (Rede Globo)
TV Clube			

Regional Programmes FTA Rio de Janeiro

Rede TV!	SBT RJ	Rede Globo	Band Rio
Record RJ	TV Brasil		

Regional Programmes FTA Rio Grande do Sul

RBS TV (Globo)			

Regional Programmes FTA HD São Paulo

Mega TV HD	Gazeta HD	Globo HD	Record HD
Canal 21 HD	Band HD	Cultura HD	SBT HD
Rede TV! HD	CNT HD	MTV Brasil HD	RedeVida HD
Record News HD	Mackenzie HD	TV Camara HD	TV Brasil HD

Regional Programmes FTA SD São Paulo

Mega	Gazeta	Canal 21	UNIVESP TV
TVMulticultura	RIT	Abril	NGT Digital
TV ALESP	TV Brasil 1	TV Brasil 2	

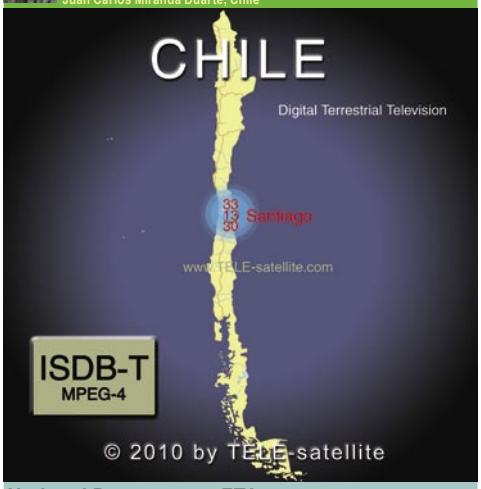
Regional Programmes FTA Sergipe

TV Atalaia (Rede Record)	TV Canção Nova		

Chile — ISDB-T

DTT Information provided by

Juan Carlos Miranda Duarte, Chile



National Programmes FTA

Mux Ch 33	TVN		
Mux Ch 13	Canal 24		
Mux Ch 30	Chilevision		

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Colombia — DVB-T

DTT Information provided by

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Regional Programmes FTA Medellín

Mux Ch 56	Teleantioquia		

Test Programmes FTA Bogotá

Señal Colombia	Señal Institucional		

Peru — ISDB-T

DTT Information provided by

Juan Carlos Miranda Duarte, Chile

Test Programmes FTA

Venezuela — ISDB-T

DTT Information provided by

Juan Carlos Miranda Duarte, Chile

Test Programmes FTA

ASIA

Middle East

Israel — DVB-T

DTT Information provided by

המידע נמסר על ידי

Benjamin Ganor, Israel

בנימין גנור - ישראל

National Programmes FTA

IDAN Plus	ערוץ 1 IBA 1	ערוץ 33 IBA 33	ערוץ 2 Programme 2
	ערוץ 10 Programme 10	ערוץ הכנסת Knesset Programme	

Central Asia

Azerbaijan — DVB-T

National Programmes FTA

Mux 1	AzTV	ITV	

Regional Programmes FTA

Mux 2	Baku TV	Ganja TV	Nakchivan TV

South West Asia

Iran — DVB-T

DTT Information provided by

Masood Baziar, Iran

National Programmes FTA

شبکه 1 Channel 1	شبکه 2 Channel 2	شبکه 3 Channel 3	شبکه 4 Channel 4
شبکه تهران Tehran Channel	شبکه قرآن Qoran Channel	العالم Al Alam Arabic	پرس تی وی Press TV English
شبکه خبر Iran News Network	شبکه استانی آذربایجان شرقی East Azerbaijan Channel Farsi and Turkish		

Capital City

Other City

8 VHF or
34 UHF Transmitter

Multiplex Bouquet	Programme Name

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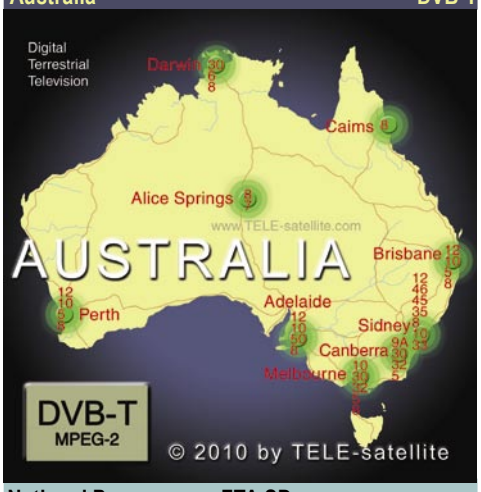
South East Asia

Australia — DVB-T



National Programmes FTA SD

ABC 1	ABC 2	Go!	Network Ten
Nine	One	Prima	SBS One
SBS Two	Southern Cross	Southern Cross Ten	Win

Regional Programmes FTA SD Sidney

Australian Christian Channel	Channel NSW	Digital Forty Four	NBN

National Programmes FTA HD

ABC HD	Nine HD	Prime HD	Seven HD
7 HD	Southern Cross HD	Southern Cross Ten HD	Win HD

Regional Programmes FTA HD Sidney

NBN HD	One HD	SBS One	

China — DMB-TH

DTT Information provided by

Luo Shigang, China 地面数字电视信息由中国的罗世刚先生提供

Local Programmes FTA Beijing 北京

Mux Ch 22 HD	BTV-HD 北京高清台		
Mux Ch 46 HD	CCTV-HD 央视综合高清		
Mux Ch 45 SD	CCTV-1 央视1套	CCTV-2 央视2套	CCTV-Music CCTV-音乐
	CCTV-Child CCTV-少儿	BTV-1 北京1频道	CETV-3 华娱卫视-3

Local Programmes FTA Shanghai 上海

Mux Ch 27 HD	CCTV-HD 央视综合高清		
Mux Ch 66 SD	CCTV-1 央视1套	Smg-STW 上海新闻综合	Smg-Channel Young 上海生活时尚
	Smg-Entertainment 上海东方娱乐		

Local Programmes Encrypted Shanghai 上海

Mux Ch 66 SD	CCTV-3, 5, 6, 8, 10 央视3, 5, 6, 8, 10套	Smg-Sports 上海体育	Smg-CBN 第一财经
	Smg-TVPlay 上海电视剧	Smg-East Movie 上海东方电影	Smg-Toonmax 上海炫动卡通
	Smg-Folk 上海东方戏		

Local Programmes FTA Shenzhen 深圳

Mux Ch 32 HD	CCTV-HD 央视综合高清		
Mux Ch 32 SD	SZTV 深圳卫视	SZTV-7 公共频道	
Mux Ch 50 SD	SZTV-1 都市频道	SZTV-1 电视剧频道	CCTV-1 中央1台
	CCTV-4 中央四台	GDTV 广东卫视	GD 珠江频道
Mux Ch 60 HD	SZTV-HD 深视高清	CCTV1-HD 央视1高清	

Local Programmes FTA Guangzhou 广州

Mux Ch 35 HD	HDJade 高清翡翠台		
Mux Ch 35 SD	J2 翡翠2台	iNews 互动新闻台	
Mux Ch 44 SD	CCTV-8 电视剧频道		
Mux Ch 45 SD	CCTV-1 央视1套	CCTV-2 央视2套	CCTV-News CCTV-新闻
	GDTV-1 广东省1套	GZTV-1 广州1套	GZTV-2 广州2
	GZTV 广州电视台	CITY-1 城市电视1台	CITY-2 城市电视2台

Local Programmes FTA Qingdao 青岛

Mux Ch 59 HD	CCTV-HD 央视高清综合频道		
Mux Ch 52 SD	Taxi-TV 的士频道		
Mux Ch 55 SD	Mobile-TV 移动公交频道		

Local Programmes FTA Shenyang 沈阳

Mux Ch 59+60 SD	LNTV-Mobile 辽宁移动频道	LNTV-Economy 财经频道	Home Theater 家庭影院
	LNTV 辽宁卫视		
Mux Ch 61 HD	CCTV-HD 央视高清综合频道		

Local Programmes FTA Dalian 大连

Mux Ch 53 SD	CCTV-5 央视5套	DLTV-1 大连1套	Mobile-TV 移动公交频道

Local Programmes FTA Chengdu 成都

Mux Ch 60 SD	Mobile-TV 移动电视	Mobile TV-Sports 移动体育	

Local Programmes FTA Chongqing 重庆

Mux Ch 43 SD	CCTV1 央视1套	CCTV-2 央视2套	CCTV-7 央视7套
	SCTV 四川卫视	CQTV 重庆卫视	CQTV-Mobile 重庆移动
	CQTV-News 重庆新闻等		

Local Programmes FTA Wuhan 武汉

Mux Ch 54 SD	HBMTV 湖北华视移动数字电视		
Mux Ch 56 SD	CITY 城市电视		

Local Programmes FTA Harbin 哈尔滨

Mux Ch 45 SD	HLJTV 黑龙江卫视	HLJTV-Mobile 黑龙江移动	HLJTV-City 黑龙江都市
Mux Ch 42 SD	DTV1 哈尔滨移动	DTV2 哈尔滨新闻综合	CCTV5 央视体育
Mux Ch 50 SD	CCTV-News CCTV新闻		

Local Programmes Encrypted Harbin 哈尔滨

Mux Ch 52 HD	HLJTV-HD 黑龙江高清		
Mux Ch 52 SD	Home Theater 家庭影院	Action Film 动作电影	
Mux Ch 50 SD	HLJTV 黑龙江卫视	CCTV-News CCTV新闻	CCTV-5 央视体育
	HLJTV-Play 黑龙江影视	HLJTV-Arts 黑龙江文艺	HLJTV-Law 黑龙江法制频道
	HLJTV-Documentary 纪录片频道 等		
Mux Ch 56 SD	CCTV 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 央视1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11		
Mux Ch 58 SD	CCTV-Football 足球频道	HLJTV-Public 黑龙江公共频道	HLJTV-Kids 黑龙江少儿频道
	SETV 东南卫视	AHTV 安徽卫视	SDTV 山东卫视
	ZJTV 浙江卫视	GXTV 广西卫	
Mux Ch 60 SD	JLTV 吉林卫视	LNTV 辽宁卫视	TJTV 天津卫视
	BTV 北京卫视	HBTV 湖北卫视	YNTV 云南卫视
	TCTV 旅游卫视	JSTV 江苏卫视	SXTV 陕西卫视
	SCTV 四川卫视		

Local Programmes FTA Hongkong 香港

Mux Ch 30 SD	Jade 翡翠台	Pearl 明珠台	Home 本港台
	World 国际台		
Mux Ch 35 HD	HDJade 高清翡翠台		
Mux Ch 35 SD	J2 翡翠2台	iNews 互动新闻台	
Mux Ch 37 HD	HD aTV 亚洲卫视高清		
Mux Ch 37 SD	TVS 南方卫视	CTI-Asia 中天亚洲台	CCTV-4 央视4台

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Indonesia — DVB-T

DTT Information provided by
Vincent Witjhun, Indonesia

Test Programme FTA

Test			

International Programmes Encrypted

m2v	BBC World	CNBC Asia	MTV Asia
	Programme V	Nickelodeon	Spacetoon
	Kidsco	Discovery Travel	National Geographic
	Star World	ANTV	Indostar
	Trans TV	SCTV	SCTV
	Metro TV	TV One	ESPN
	Star Sports	STar Movies	Celestial Movies
	Discovery Channel	Discovery Turbo	Fashion TV

Japan — ISDB-T

Regional Programmes FTA

青森	NHK青森	青森放送 (RAB)	青森朝日放送 (ABA)
	青森テレビ (ATV)		
宮城	NHK仙台	東北放送 (TBC)	宮城テレビ放送(MMT)
	東日本放送 (KHB)	仙台放送(OX)	
関東	日本放送協会 (NHK)	日本テレビ (NTV)	テレビ朝日 (EX)
	TBSテレビ (TBS)	テレビ東京 (TX)	フジテレビ (CX)
石川	NHK金沢	テレビ金沢 (KTK)	北陸朝日放送 (HAB)
	北陸放送 (MRO)	石川テレビ (ITC)	
静岡	NHK静岡	だいいちテレビ (SDT)	静岡朝日テレビ (SATV)
	静岡放送 (SBS)	テレビ静岡 (SUT)	
近畿	NHK大阪	毎日放送 (MBS)	朝日放送 (ABC)
	関西テレビ (KTV)	読売テレビ (YTV)	
長崎	NHK長崎	長崎放送 (NBC)	長崎国際テレビ (NIB)
	長崎文化放送 (NCC)	テレビ長崎 (KTN)	

Malaysia — DVB-T

Test Programmes FTA 64QAM

TV1	TV2	RTMi	

New Zealand — DVB-T

National Programmes FTA

ONE	TV 2	TV 3	C4
Maori Television	TVNZ 6	TVNZ 7	TV3 Plus 1
Prime	Stratos	Parliament TV	Chinese TV 8
tvCentral	CUE	Te Reo	

DTT Information provided by
Jim Edstein, Taiwan

Taiwan — DVB-T2

Test Programmes FTA 64QAM

PTS	HiHD		

Vietnam — DVB-T

Capital City Other City 8 34 VHF or UHF Transmitter

Multiplex Bouquet	Programme Name

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Maps by www.mapresources.com

Satellites of the World

N
W
E
S

INTELSAT 10-02 - Europe, Middle East, North India ◄ 359.2 East (000.8 West)
C-Band: INTELSAT 10-02 - Europe, Africa, South East Asia ◄ 359.2 East (000.8 West)
THOR 3, 5 - Europe ◄ 359.2 East (000.8 West)
AMOS 2, 3 - Europe, Middle East ◄ 356.0 East (004.0 West)
ATLANTIC BIRD 3 - Europe ◄ 355.0 East (005.0 West)
C-Band: ATLANTIC BIRD 3 - Africa, Europe, Middle America ◄ 355.0 East (005.0 West)
NILESAT 101, 102, ATLANTIC BIRD 4A - Middle East ◄ 353.0 East (007.0 West)
TELECOM 2D - France ◄ 352.0 East (008.0 West)
ATLANTIC BIRD 2 - Europe, America, Middle East ◄ 352.0 East (008.0 West)
EXPRESS AM44 - Middle East ◄ 349.0 East (011.0 West)
C-Band: EXPRESS AM44 - Europe, North Africa, Middle East ◄ 349.0 East (011.0 West)
ATLANTIC BIRD 1 - Europe, America ◄ 347.5 East (012.5 West)
TELSTAR 12 - Europe, South Africa, Am. ◄ 345.0 East (015.0 West)
INTELSAT 901 - Europe, Middle East ◄ 342.0 East (018.0 West)
C-Band: INTELSAT 901 - Europe, Africa, Atlantic Ocean Region ◄ 342.0 East (018.0 West)
NSS 7 - Europe, Middle East, Africa, America ◄ 338.0 East (022.0 West)
C-Band: NSS 7 - Europe, Africa, America ◄ 338.0 East (022.0 West)
INTELSAT 905 - Europe ◄ 335.5 East (024.5 West)
C-Band: INTELSAT 905 - Europe, Africa, America ◄ 335.5 East (024.5 West)
INTELSAT 907 - Europe ◄ 332.5 East (027.5 West)
C-Band: INTELSAT 907 - Europe, Africa, America ◄ 332.5 East (027.5 West)
HISPASAT 1C, 1D - Europe, America ◄ 330.0 East (030.0 West)
INTELSAT 801 - Europe ◄ 328.5 East (031.5 West)
C-Band: INTELSAT 801 - Europe, Africa, America ◄ 328.5 East (031.5 West)
INTELSAT 903 - Europe ◄ 325.5 East (034.5 West)
C-Band: INTELSAT 903 - Europe ◄ 325.5 East (034.5 West)
TELSTAR 11N - Europe, Africa ◄ 322.5 East (037.5 West)
C-Band: NSS 10 - Europe, Africa, America ◄ 322.5 East (037.5 West)
NSS 806 - Europe ◄ 319.5 East (040.5 West)
C-Band: NSS 806 - America, Europe ◄ 319.5 East (040.5 West)
C-Band: INTELSAT 3R - Europe, North America ◄ 317.0 East (043.0 West)
INTELSAT 11 - Brazil ◄ 317.0 East (043.0 West)
INTELSAT 1R - Europe, North Africa, South America ◄ 315.0 East (045.0 West)
C-Band: INTELSAT 1R - America ◄ 315.0 East (045.0 West)
C-Band: INTELSAT 705 - North America ◄ 310.0 East (050.0 West)
C-Band: INTELSAT 705 - America, Atlantic Ocean Region ◄ 310.0 East (050.0 West)
INTELSAT 707 - America ◄ 307.0 East (053.0 West)
C-Band: INTELSAT 707 - America, Africa ◄ 307.0 East (053.0 West)
C-Band: INTELSAT 805 - America ◄ 304.5 East (055.5 West)
INTELSAT 9 - Mexico, Brazil, Europe ◄ 302.0 East (058.0 West)
C-Band: INTELSAT 9 - America ◄ 302.0 East (058.0 West)
AMAZONAS 1 - Brazil, South America ◄ 299.0 East (061.0 West)
C-Band: AMAZONAS 1 - America ◄ 299.0 East (061.0 West)
ECHOSTAR 3, 12 - Conus ◄ 298.5 East (061.5 West)
TELSTAR 14 - Brazil, Mercosul ◄ 297.0 East (063.0 West)
STARONE C1 - Brazil ◄ 295.0 East (065.0 West)
C-Band: STARONE C1 - South America ◄ 295.0 East (065.0 West)
STARONE C2 - Brazil ◄ 290.0 East (070.0 West)
C-Band: STARONE C2 - South America ◄ 290.0 East (070.0 West)
NAHUEL 1 - America ◄ 288.0 East (072.0 West)
AMC 6 - North America ◄ 288.0 East (072.0 West)
C-Band: AMC 6 - North America ◄ 288.0 East (072.0 West)
DIRECTV 1R, NIMIQ 5 - Conus ◄ 287.5 East (072.5 West)
HORIZONS 2 - North America ◄ 286.0 East (074.0 West)
C-Band: BRASILSAT B3 - Brazil ◄ 285.0 East (075.0 West)
ECHOSTAR 4, 8 - America, Mexico ◄ 283.0 East (077.0 West)
SIMON BOLIVAR - South America ◄ 282.0 East (078.0 West)
C-Band: SIMON BOLIVAR - South America ◄ 282.0 East (078.0 West)
AMC 5 - North America ◄ 281.0 East (079.0 West)
NIMIQ 4 - Canada ◄ 278.0 East (082.0 West)
AMC 9 - North America ◄ 277.0 East (083.0 West)
C-Band: BRASILSAT B4 - Brazil ◄ 276.0 East (084.0 West)
AMC 16 - North America ◄ 275.0 East (085.0 West)
AMC 3 - North America ◄ 273.0 East (087.0 West)
C-Band: AMC 3 - North America ◄ 273.0 East (087.0 West)
GALAXY 28 - America ◄ 271.0 East (089.0 West)
C-Band: GALAXY 28 - America ◄ 271.0 East (089.0 West)
NIMIQ 1 - Canada ◄ 269.0 East (091.0 West)
GALAXY 17 - North America ◄ 269.0 East (091.0 West)
C-Band: GALAXY 17 - North America ◄ 269.0 East (091.0 West)
GALAXY 25 - North America ◄ 266.9 East (093.1 West)
GALAXY 3C - North America ◄ 265.0 East (095.0 West)
C-Band: GALAXY 3C - North America ◄ 265.0 East (095.0 West)
GALAXY 19 - North America ◄ 263.0 East (097.0 West)
C-Band: GALAXY 19 - North America ◄ 263.0 East (097.0 West)
GALAXY 16 - North America ◄ 261.0 East (099.0 West)
C-Band: GALAXY 16 - North America ◄ 261.0 East (099.0 West)
DIRECTV 11 - America ◄ 260.8 East (99.2 West)
AMC 4 - North And Central America ◄ 259.0 East (101.0 West)
C-Band: AMC 4 - North America ◄ 259.0 East (101.0 West)
DIRECTV 4S, 8 - America ◄ 259.0 East (101.0 West)
AMC 1 - North America ◄ 257.0 East (103.0 West)
C-Band: AMC 1 - North America ◄ 257.0 East (103.0 West)
AMC 15 - North America ◄ 255.0 East (105.0 West)
C-Band: AMC 18 - North America ◄ 255.0 East (105.0 West)
ANIK F1R - North America ◄ 252.7 East (107.3 West)
C-Band: ANIK F1R - North America ◄ 252.7 East (107.3 West)
C-Band: ANIK F1 - South America ◄ 252.7 East (107.3 West)
ECHOSTAR 10, 11 - America ◄ 250.0 East (110.0 West)
ANIK F2 - North America ◄ 248.9 East (111.1 West)
C-Band: ANIK F2 - North America ◄ 248.9 East (111.1 West)
SATMEX 6 - America ◄ 247.0 East (113.0 West)
C-Band: SATMEX 6 - America ◄ 247.0 East (113.0 West)
SATMEX 5 - America ◄ 243.2 East (116.8 West)
C-Band: SATMEX 5 - America ◄ 243.2 East (116.8 West)
ECHOSTAR 7 - Conus ◄ 241.0 East (119.0 West)
ECHOSTAR 9, GALAXY 23 - North America ◄ 239.0 East (121.0 West)
C-Band: ECHOSTAR 9, GALAXY 23 - North America ◄ 239.0 East (121.0 West)
GALAXY 18 - North America ◄ 237.0 East (123.0 West)
C-Band: GALAXY 18 - North America ◄ 237.0 East (123.0 West)
C-Band: GALAXY 14 - North America ◄ 235.0 East (125.0 West)
AMC 21 - North America ◄ 235.0 East (125.0 West)
GALAXY 13, HORIZONS 1 - North America ◄ 233.0 East (127.0 West)
C-Band: GALAXY 13, HORIZONS 1 - North America ◄ 233.0 East (127.0 West)
CIEL 2 - America ◄ 231.0 East (129.0 West)
GALAXY 27 - North America ◄ 231.0 East (129.0 West)
C-Band: AMC 11 - North America ◄ 229.0 East (131.0 West)
C-Band: GALAXY 15 - North America ◄ 227.0 East (133.0 West)
C-Band: AMC 10 - North America ◄ 225.0 East (135.0 West)
C-Band: AMC 7 - North America ◄ 223.0 East (137.0 West)
C-Band: AMC 8 - North America ◄ 221.0 East (139.0 West)

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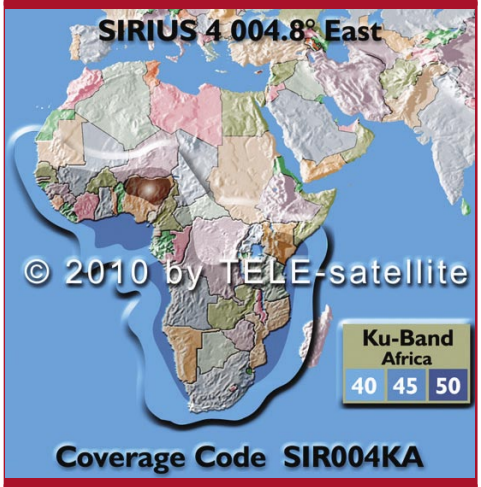
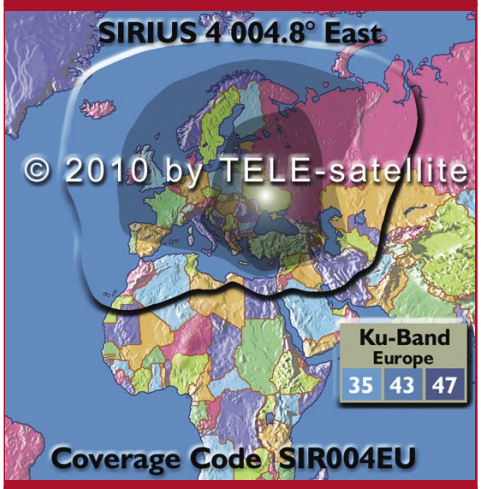
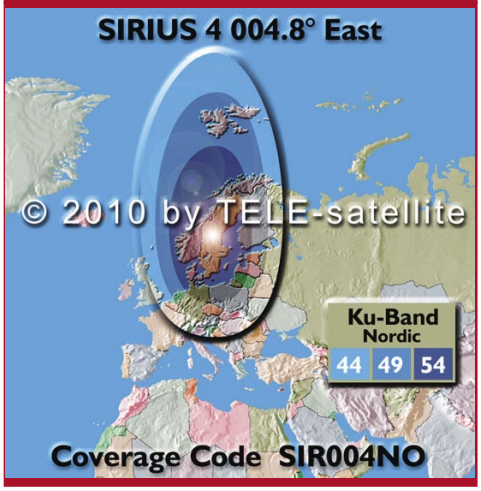
Global Satellite Coverages

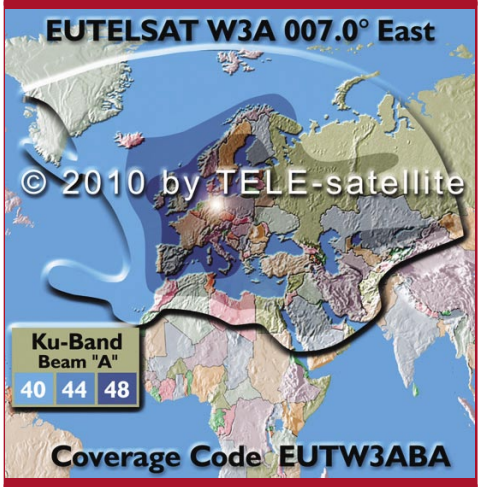
SIRIUS 4
4.8 East

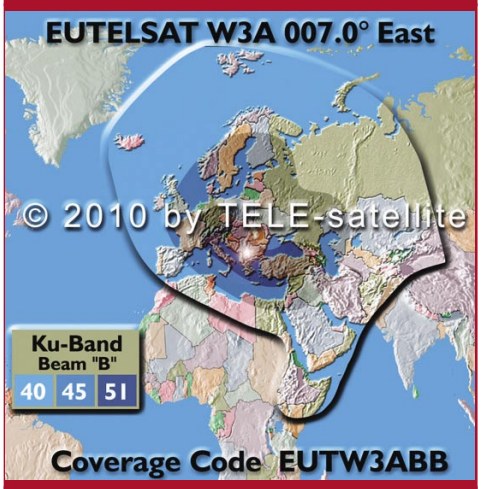


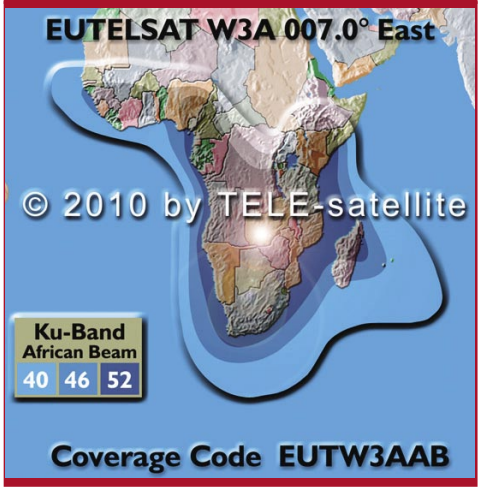




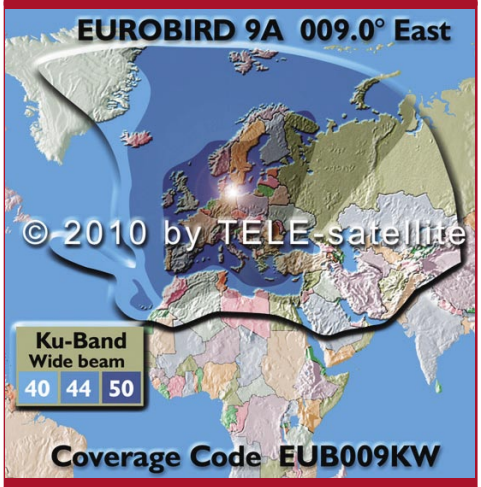
EUTELSAT W3A
7.0 East



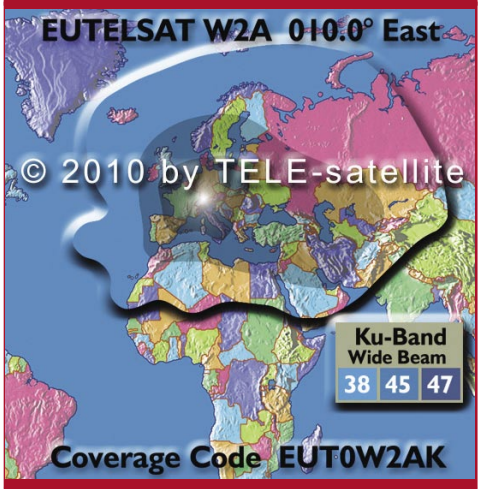




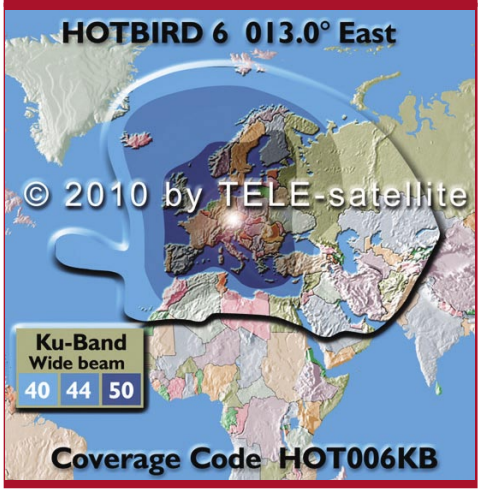
EUROBIRD 9A
9.0 East

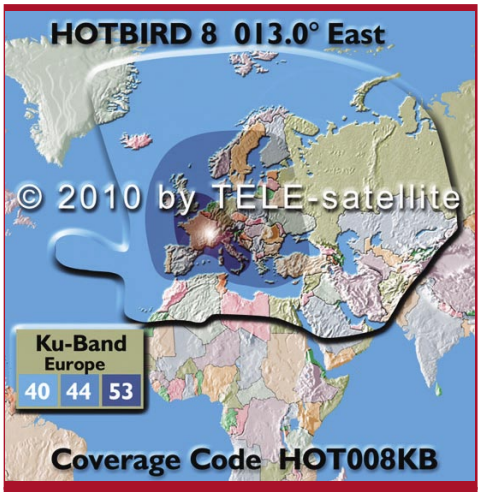


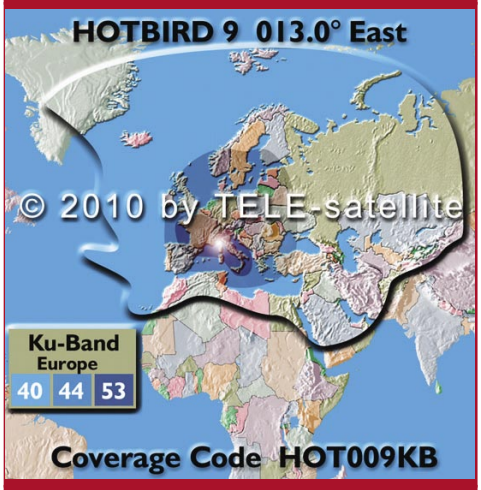
EUTELSAT W2A
10.0 East

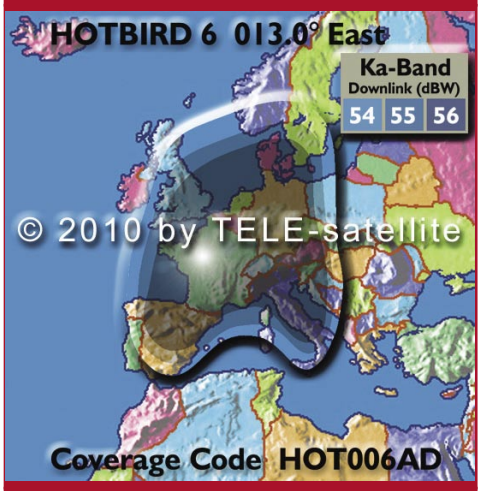


HOTBIRD 6, 8, 9
13.0 East

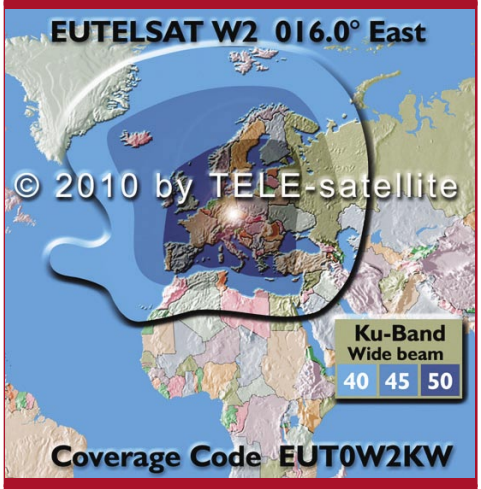


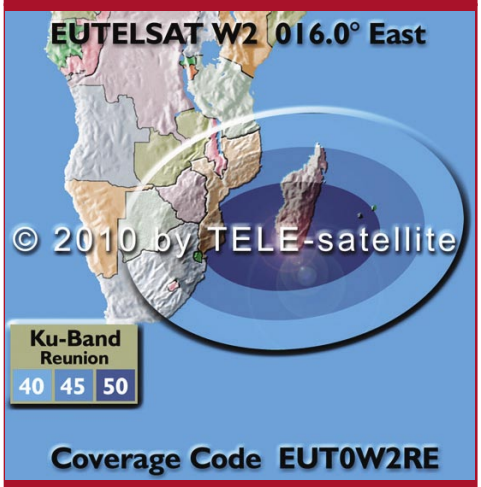




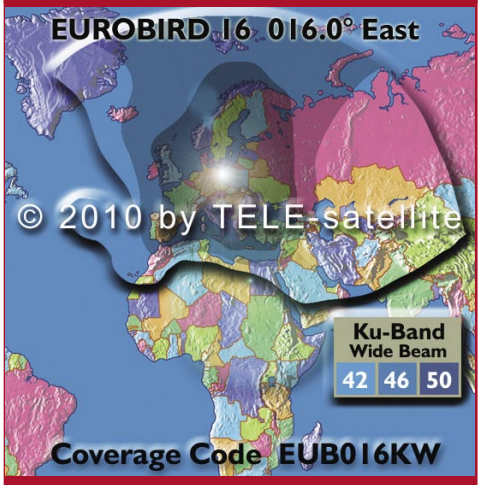


EUTELSAT W2
16.0 East

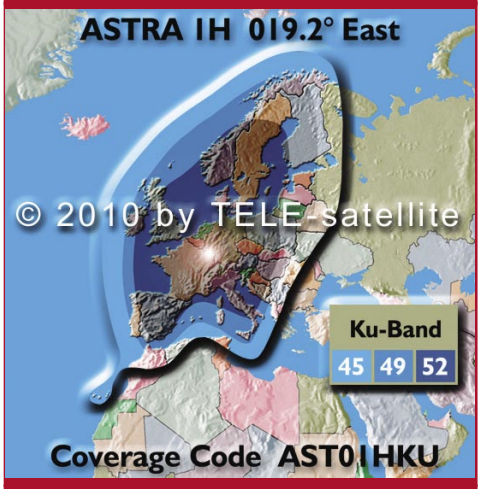


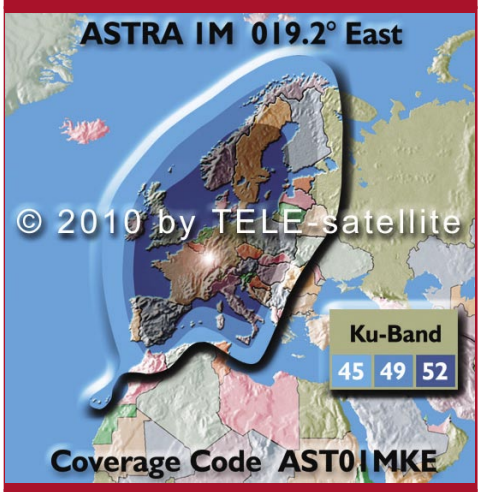


EUROBIRD 16
16.0 East

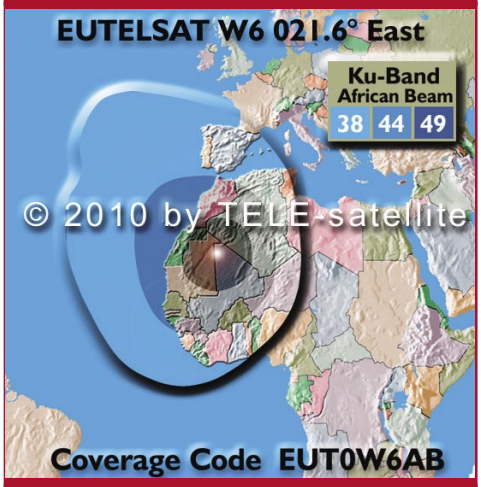


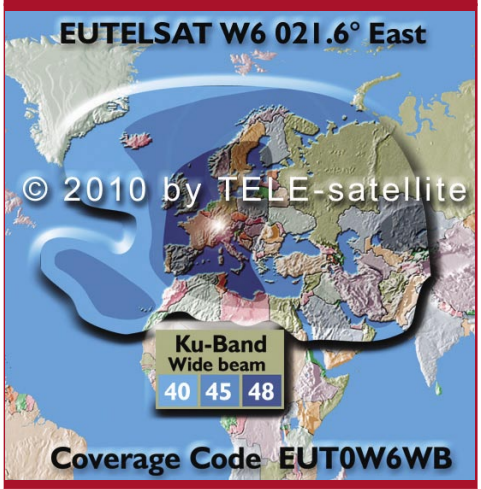
ASTRA 1H, 1KR, 1L, 1M
19.2 East



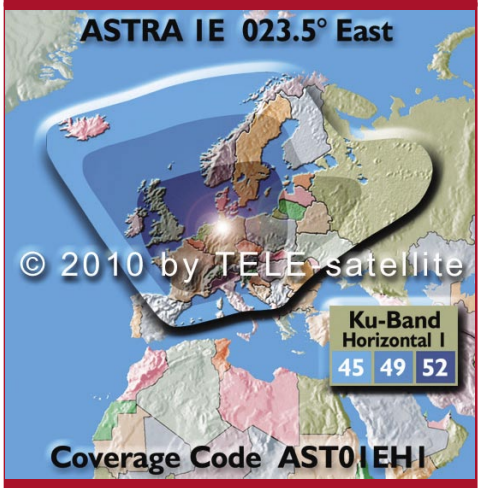


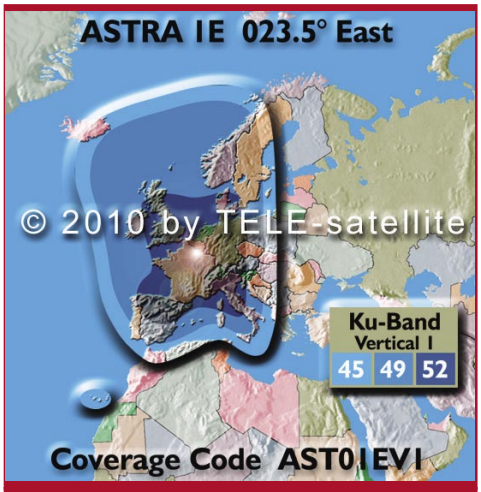
EUTELSAT W6
21.6 East

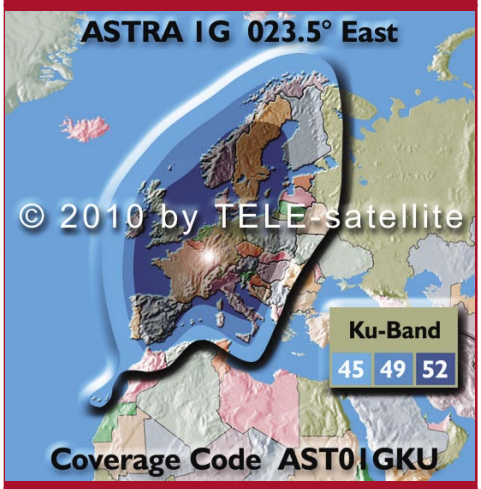


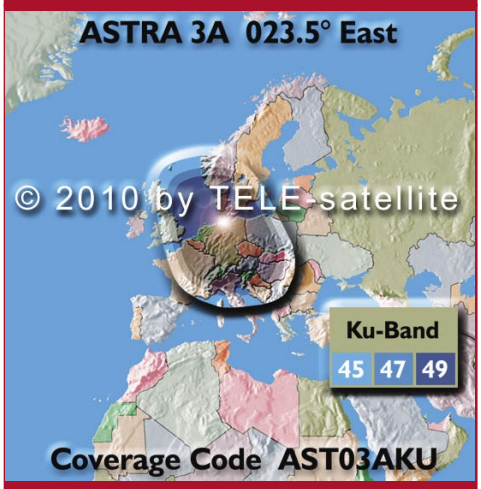


ASTRA 1E, 1G, 3A
23.5 East



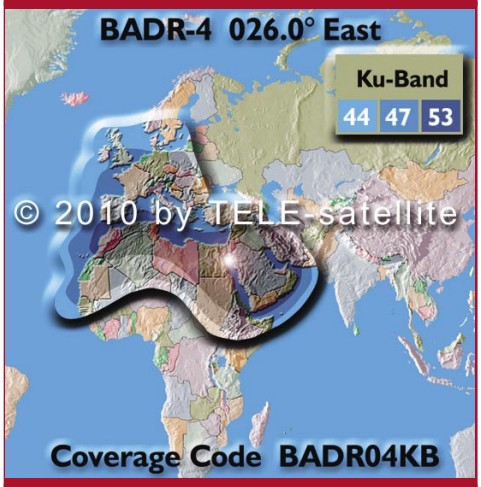




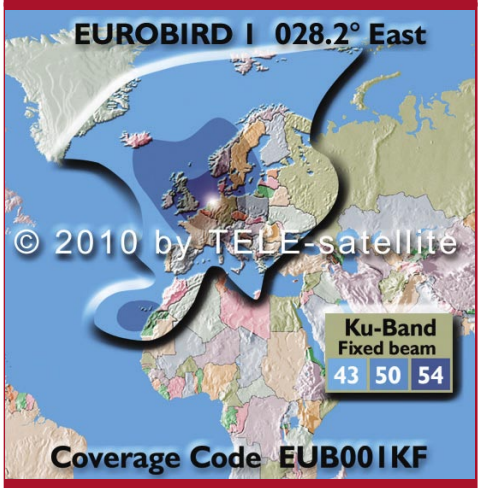


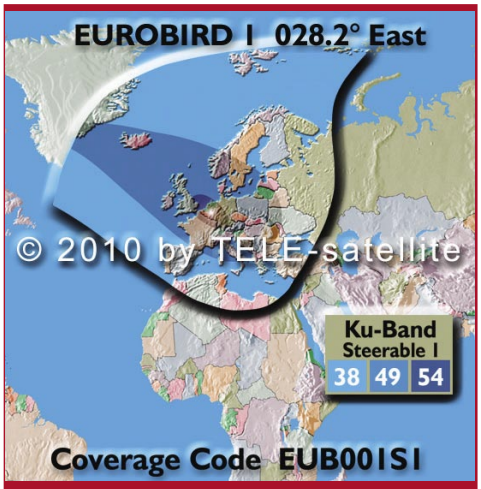
EUROBIRD 2
25.5 East

BADR 4, 6
26.0 East

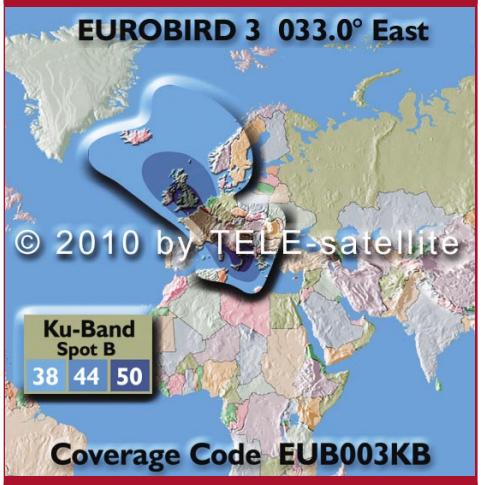


EUROBIRD 1
28.2 East





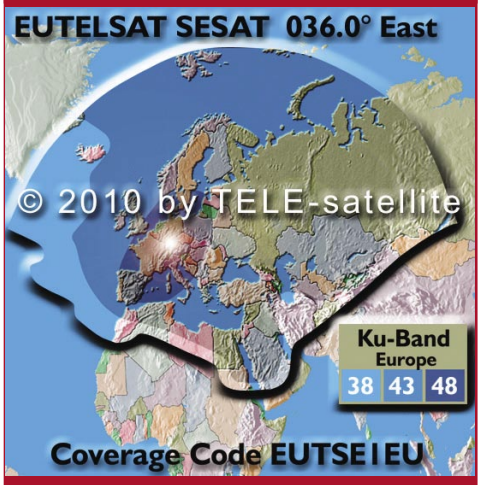
EUROBIRD 3
33.0 East

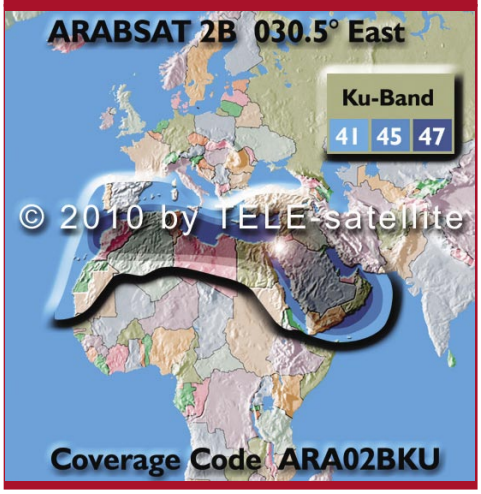


ASTRA 2A, 2B, 2D
28.2 East

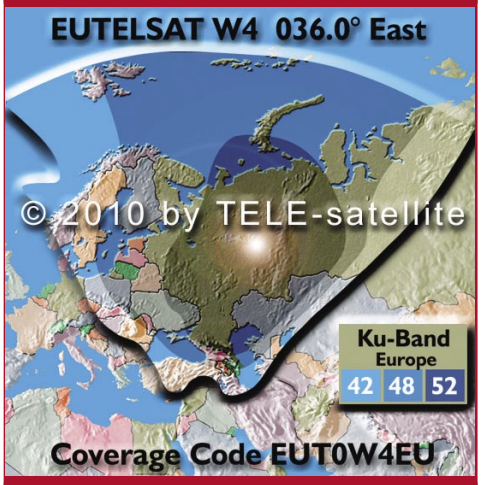
ARABSAT 2B
30.5 East

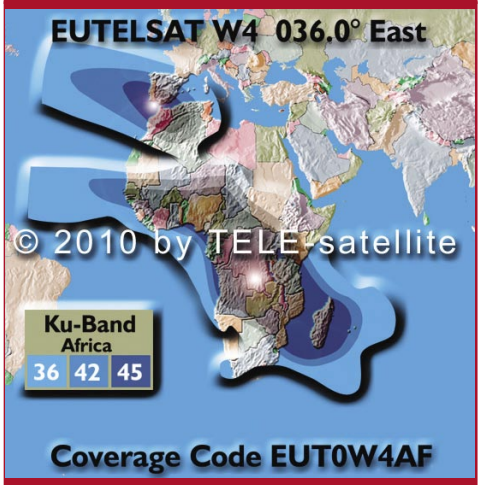
EUTELSAT SESAT
36.0 East



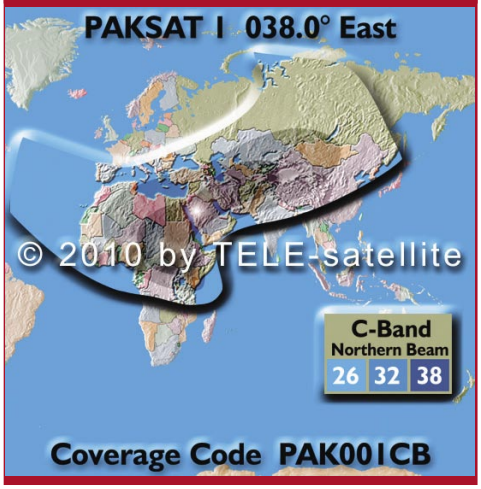


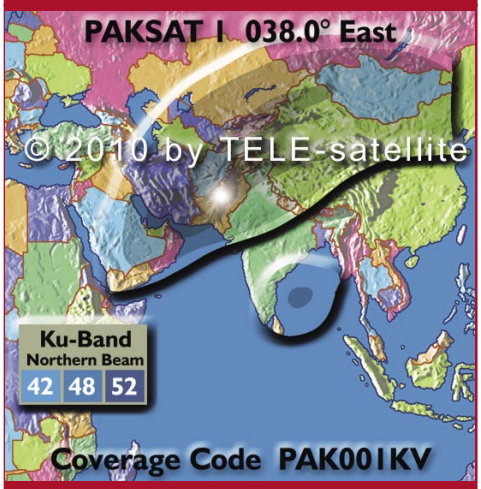
EUTELSAT W4
36.0 East



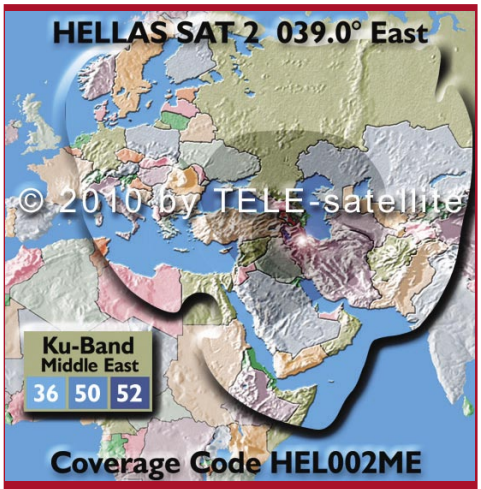


PAKSAT 1
38.0 East

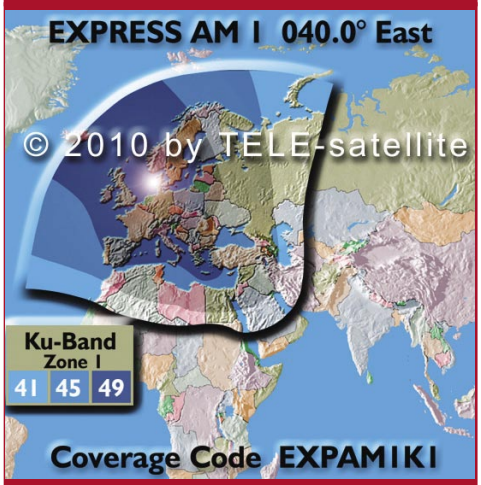


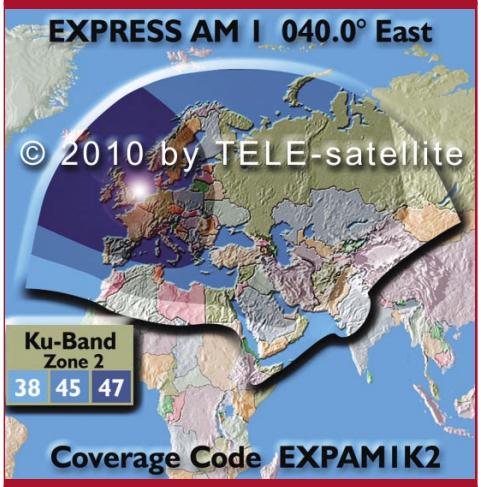


HELLAS SAT 2
39.0 East

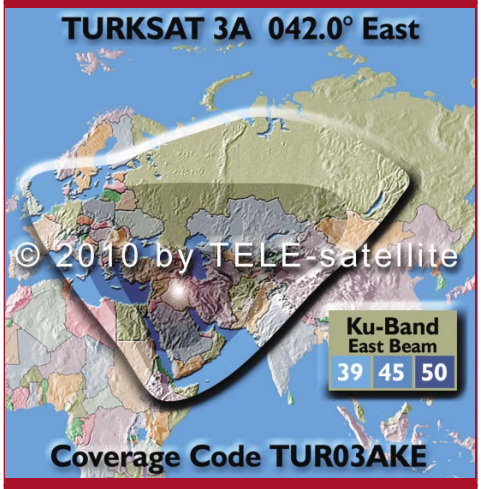


EXPRESS AM1
40.0 East

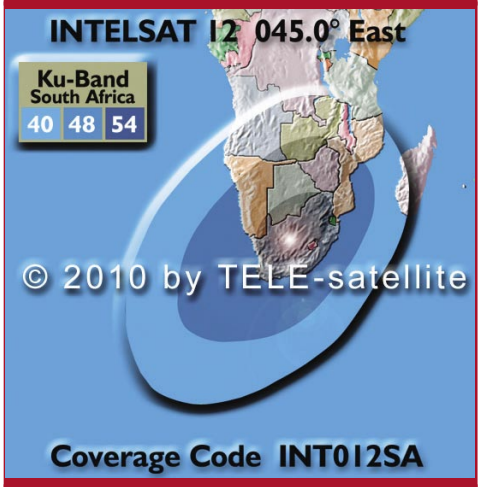


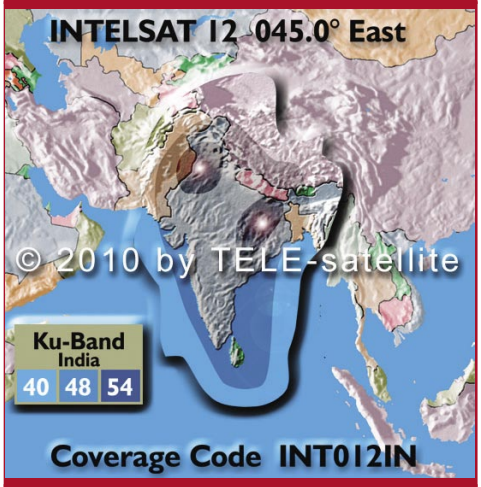


TURKSAT 2A, 3A
42.0 East

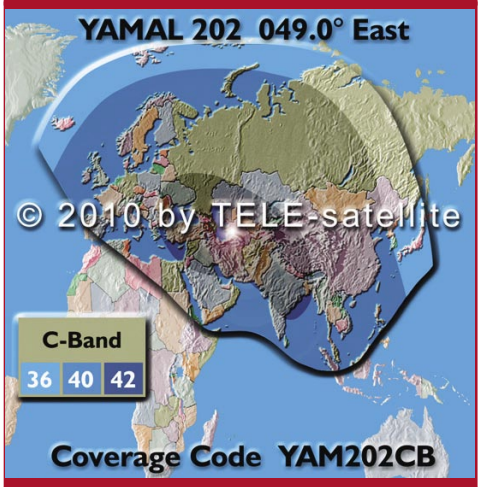


INTELSAT 12
45.0 East

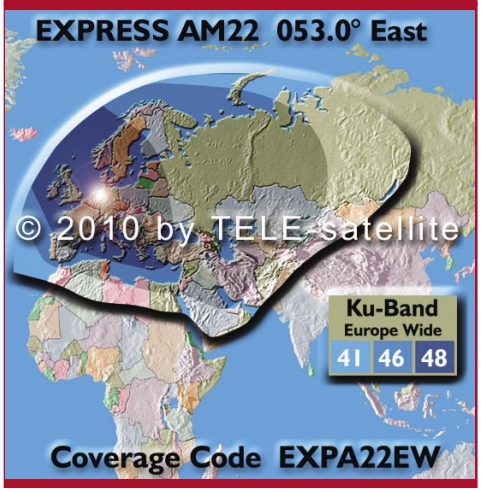




YAMAL 202
49.0 East

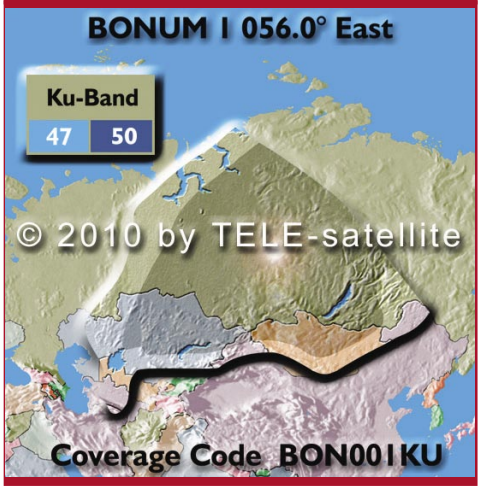


EXPRESS AM22
53.0 East

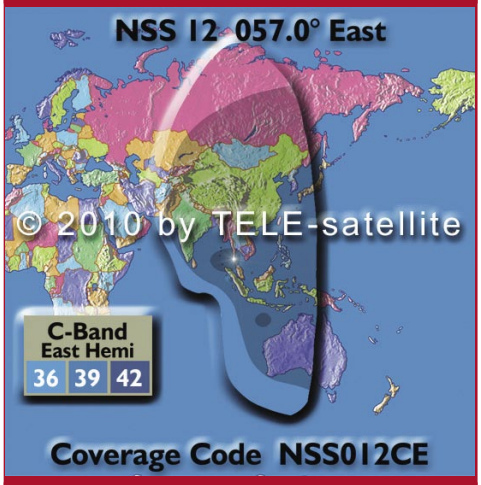


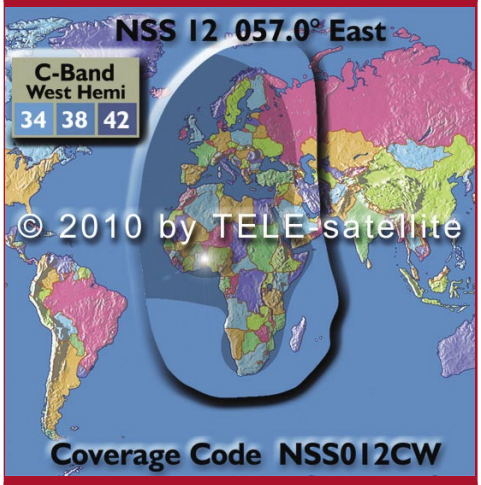
INSAT 3E
55.0 East

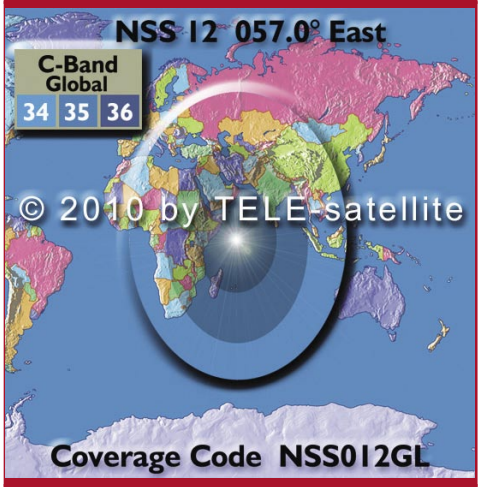
BONUM 1
56.0 East

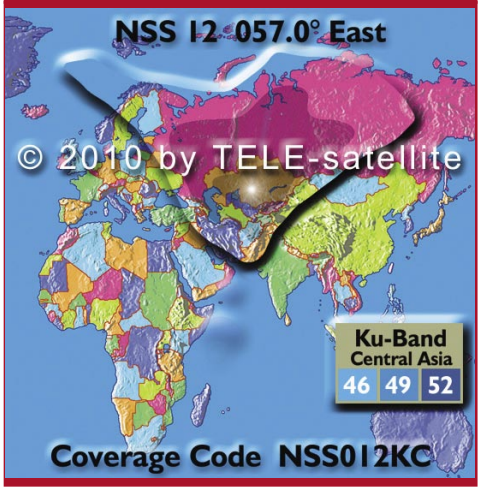


NSS 12
57.0 East

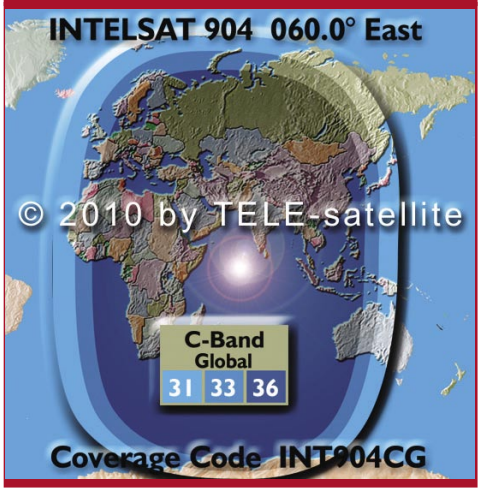


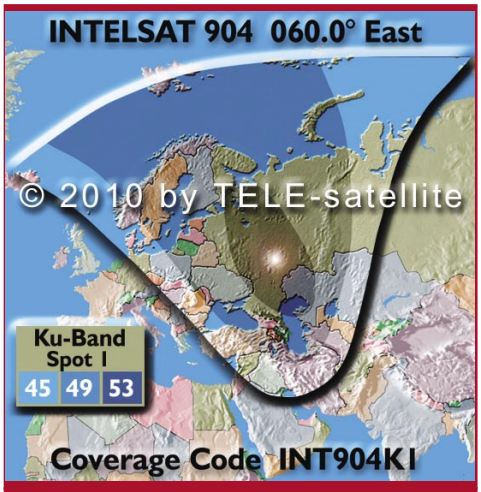


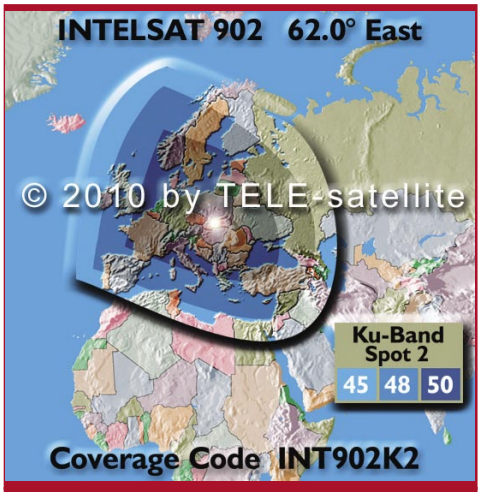


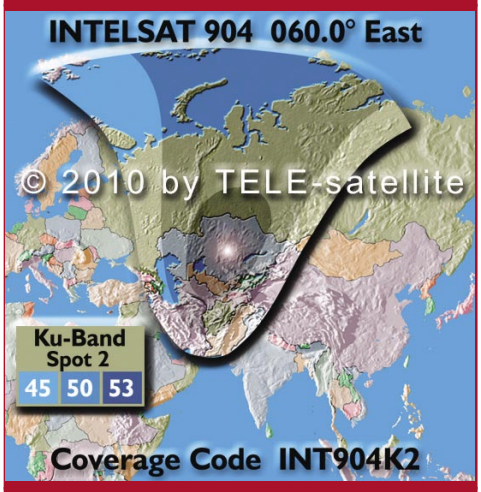


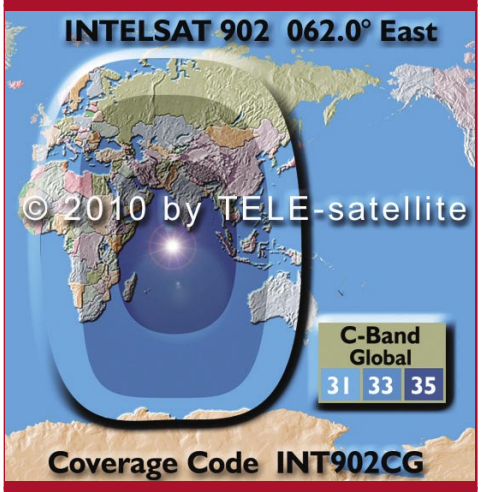
INTELSAT 904
60.0 East

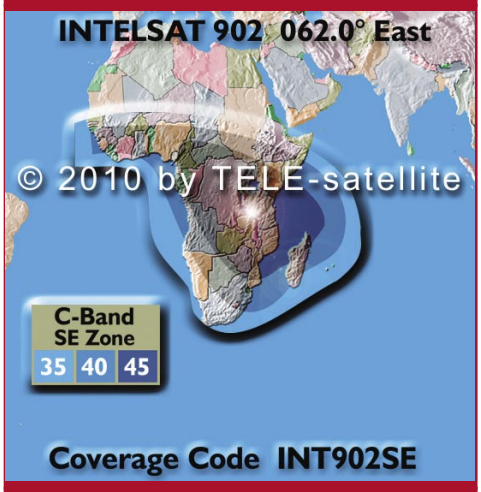


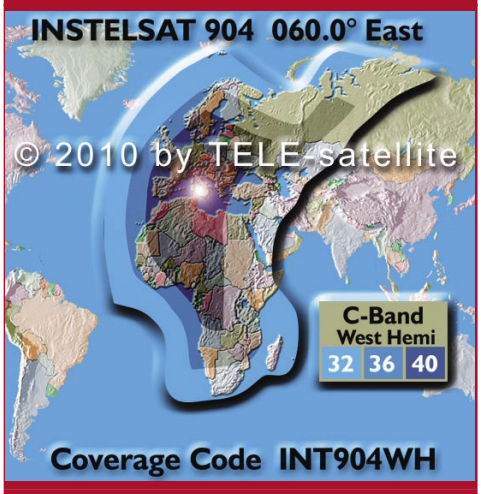


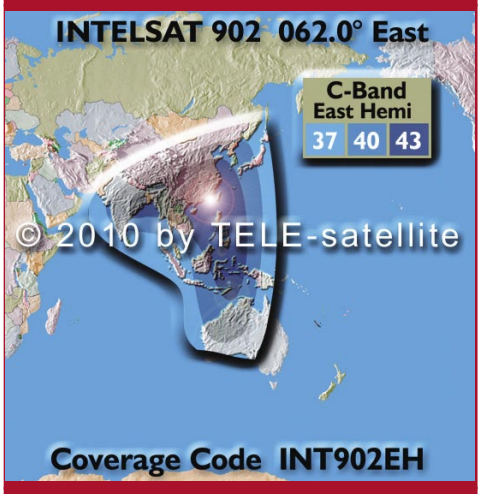




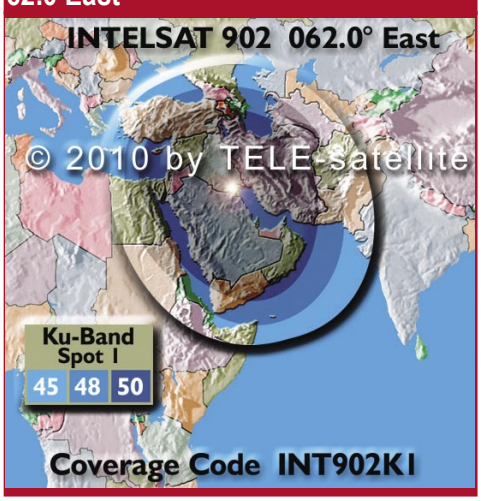


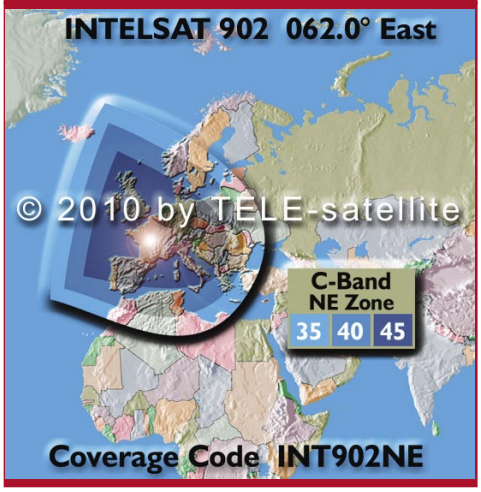


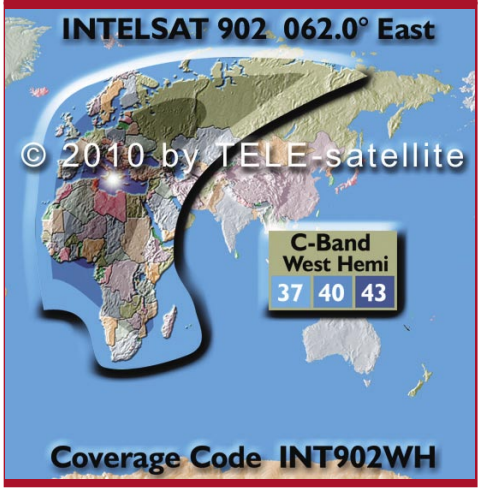




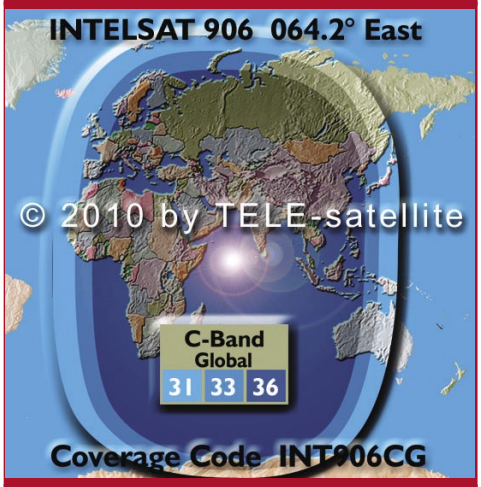
INTELSAT 902
62.0 East

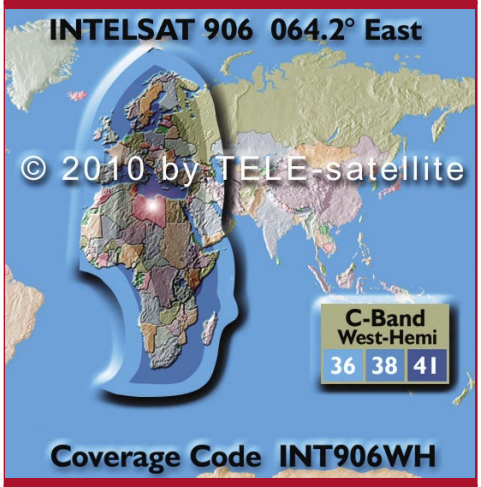


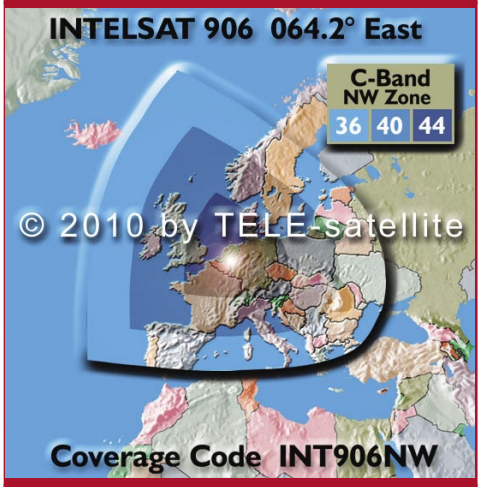


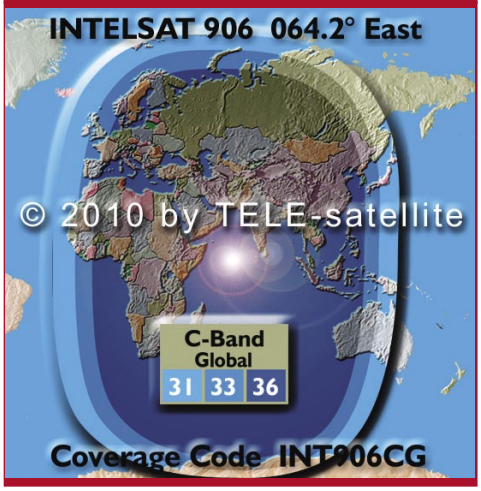


INTELSAT 906
64.2 East

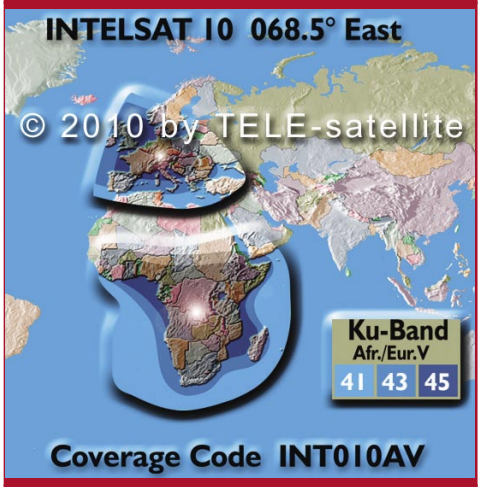


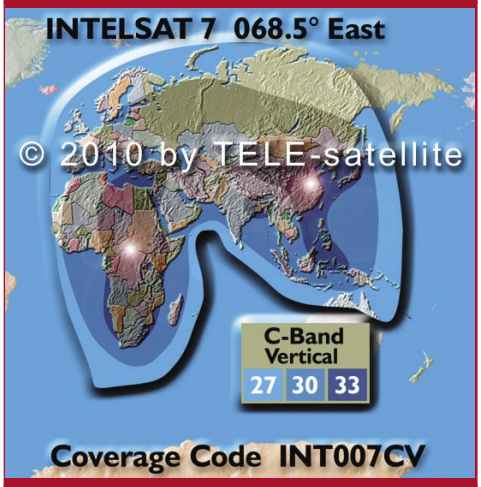


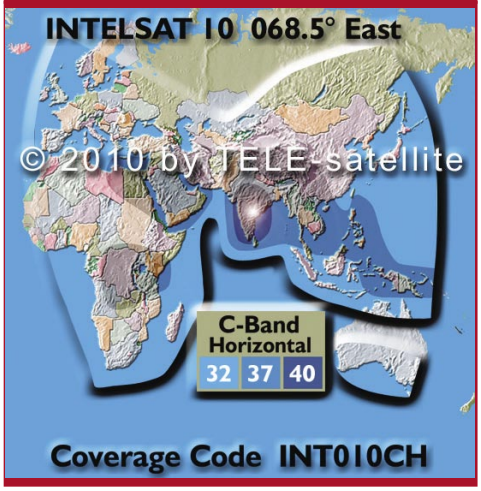




INTELSAT 7, 10
68.5 East

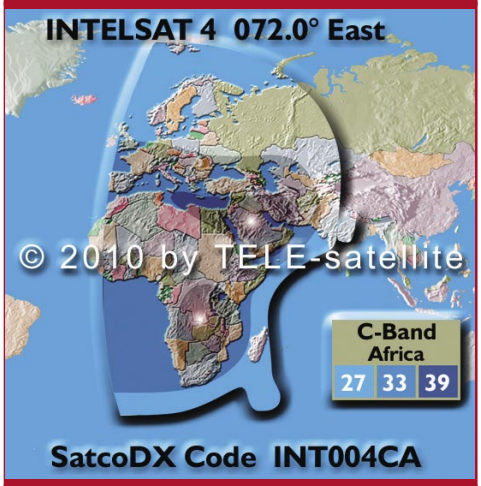


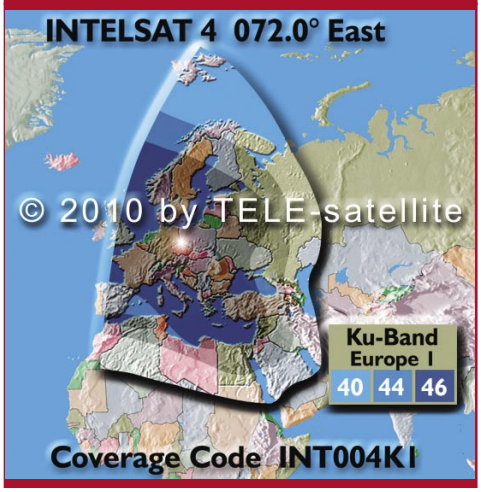


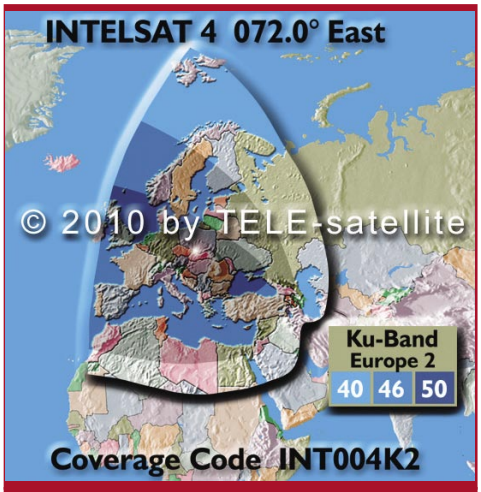


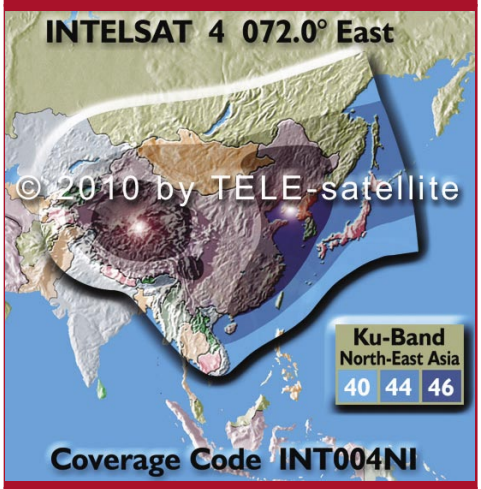
EUTELSAT W5
70.5 East

INTELSAT 4
72.0 East

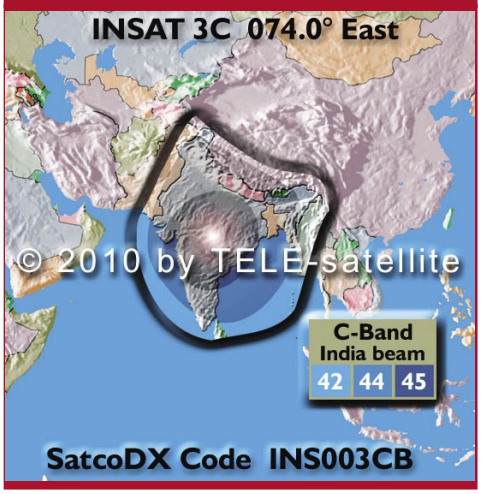




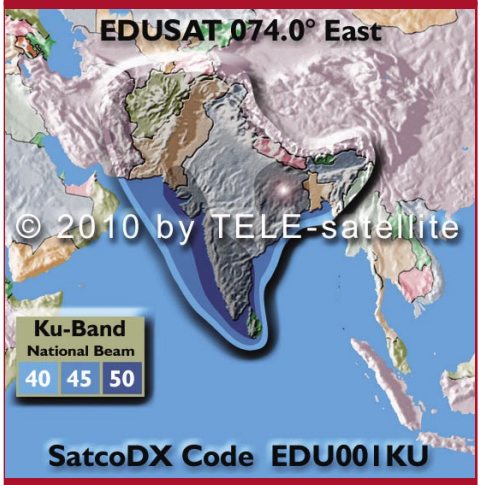




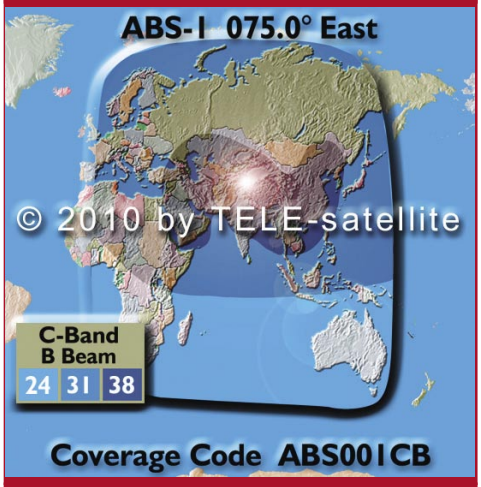
INSAT 3C
74.0 East

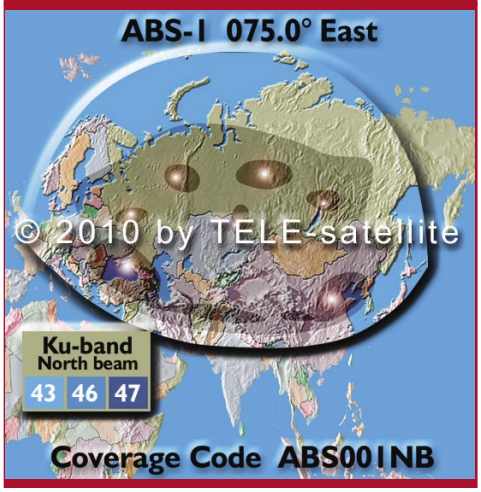


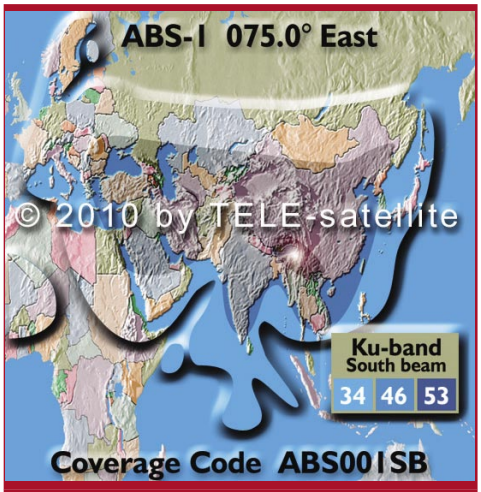
EDUSAT
74.0 East



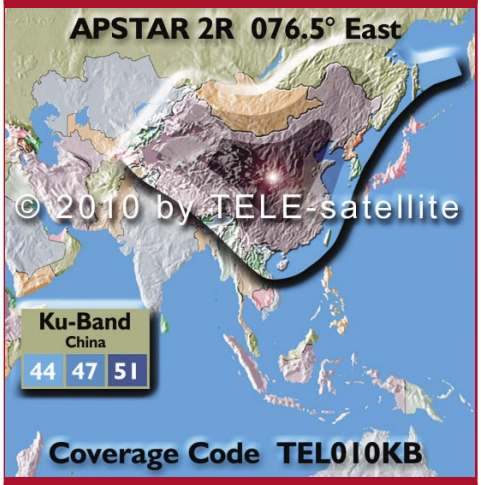
ABS 1
75.0 East

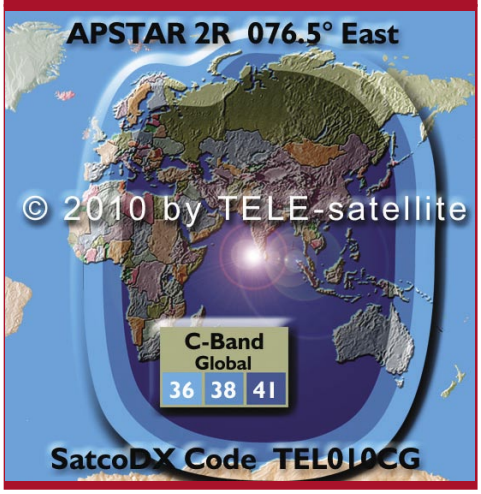




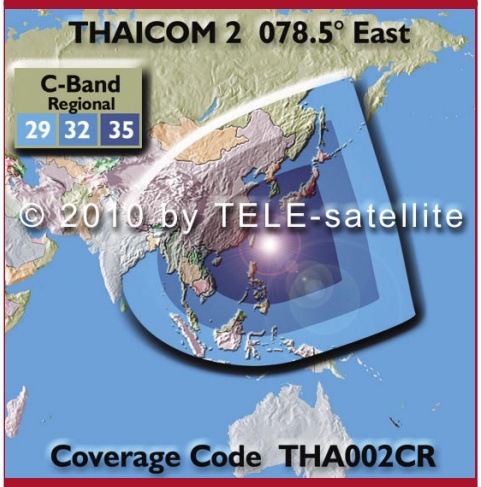


APSTAR 2R
76.5 East

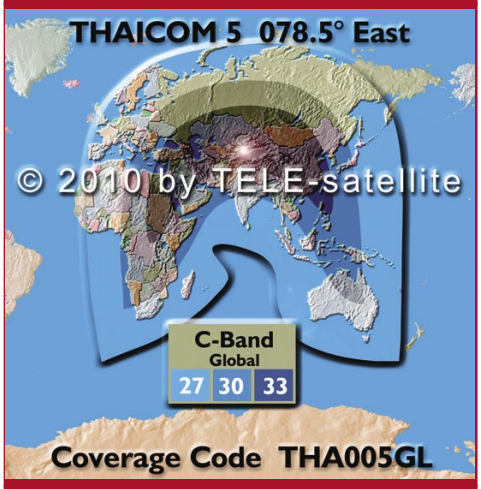


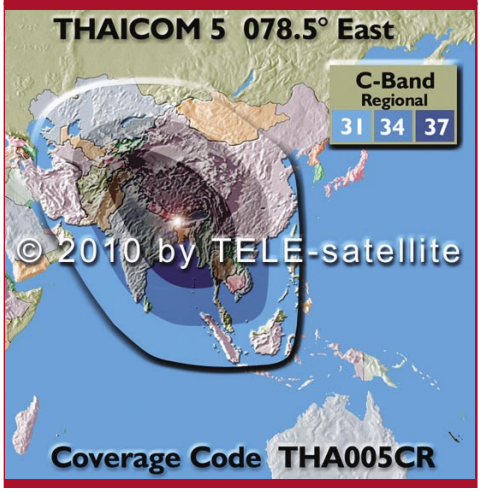


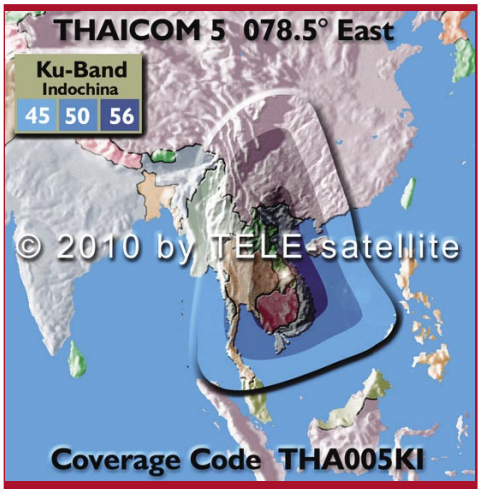
THAICOM 2
78.5 East



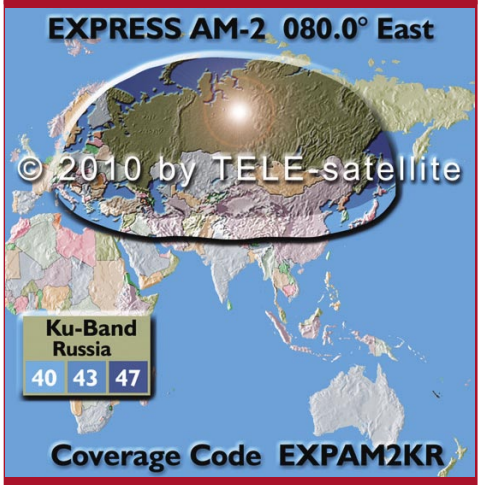
THAICOM 5
78.5 East



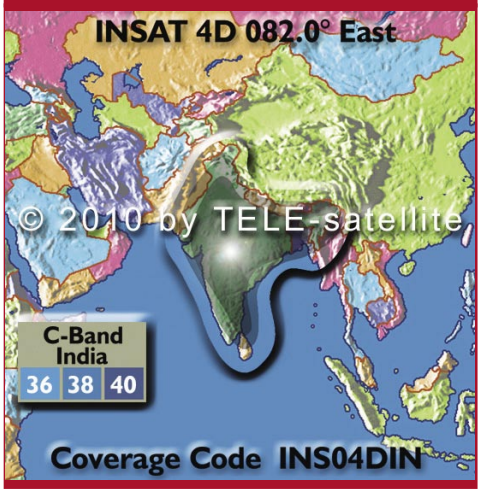


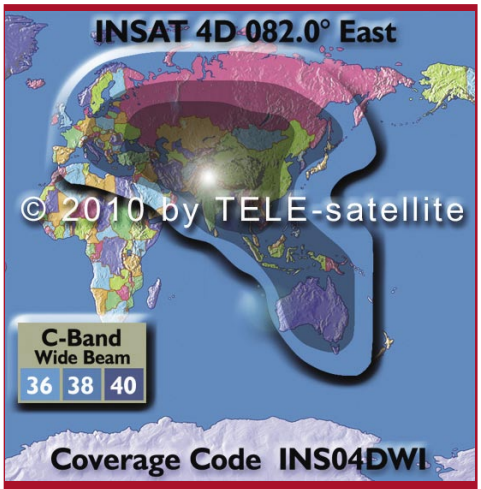


EXPRESS AM2
80.0 East

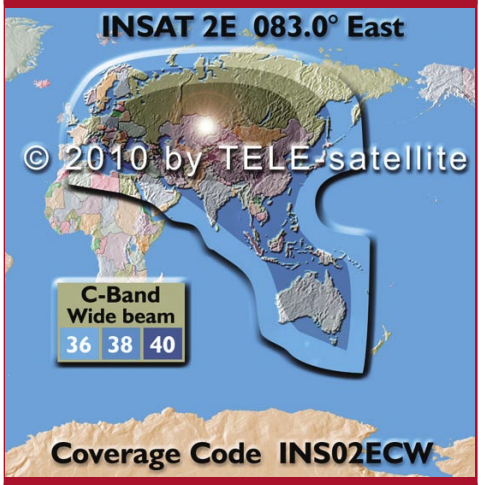


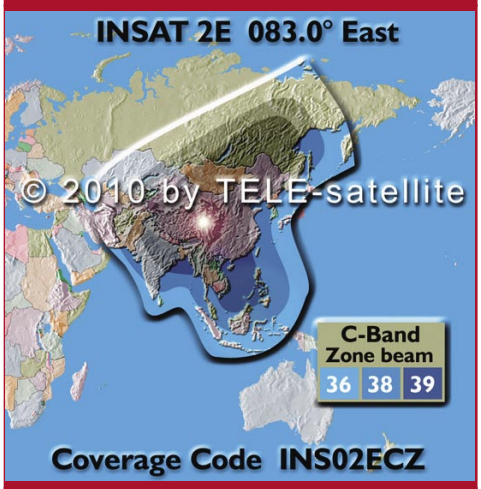
INSAT 4D
82.0 East

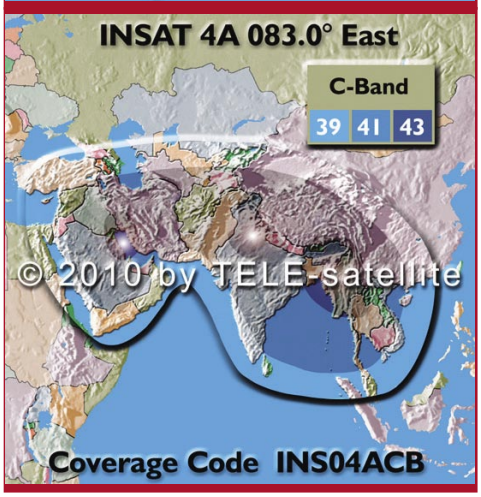


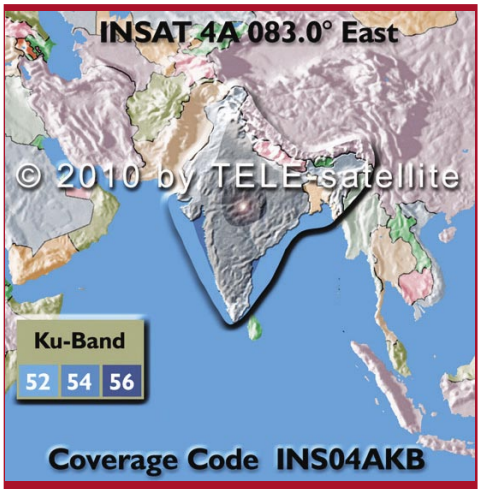


INSAT 2E, 4A
83.0 East

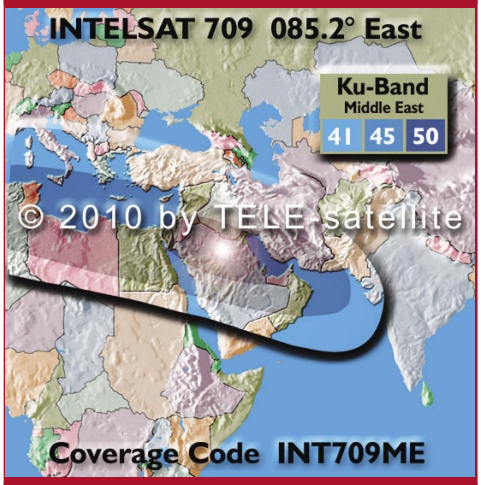


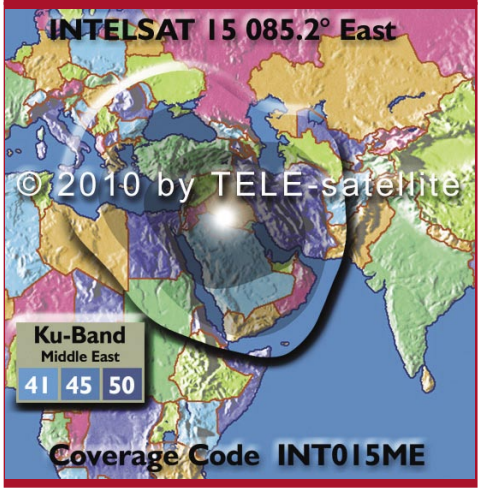




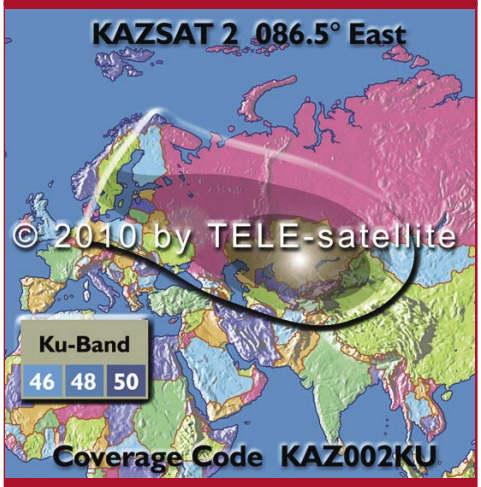


INTELSAT 709, 15
85.2 East

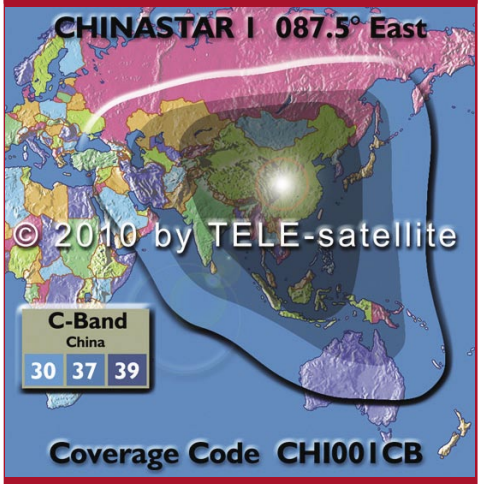




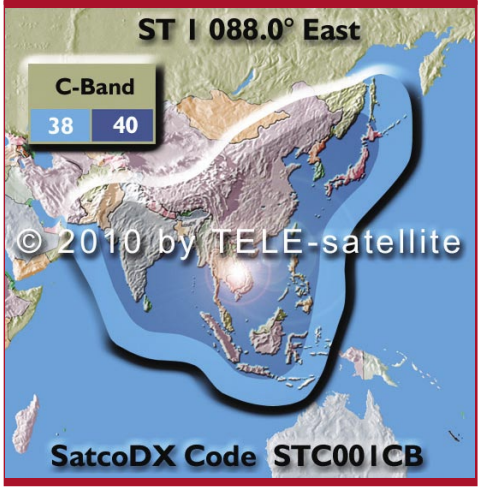
KAZSAT 2
86.5 East

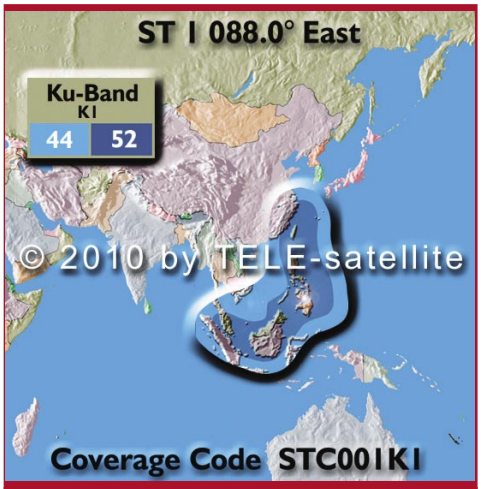


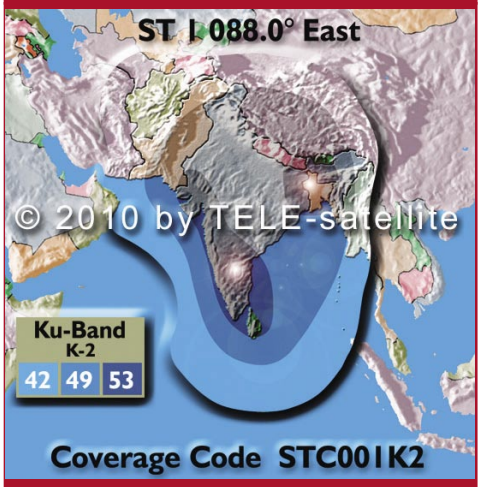
CHINASTAR 1
87.5 East



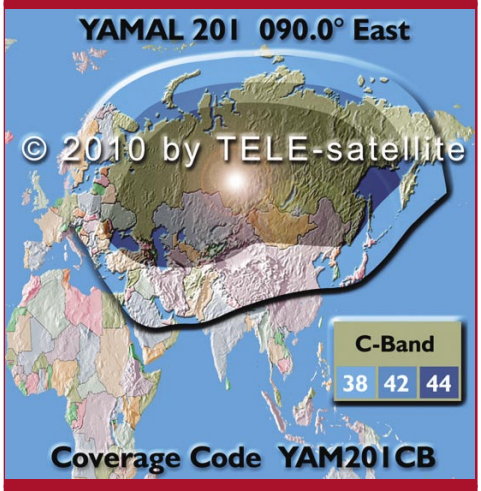
ST 1
88.0 East

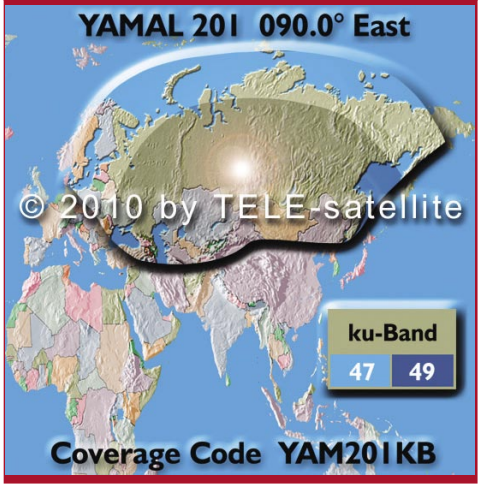




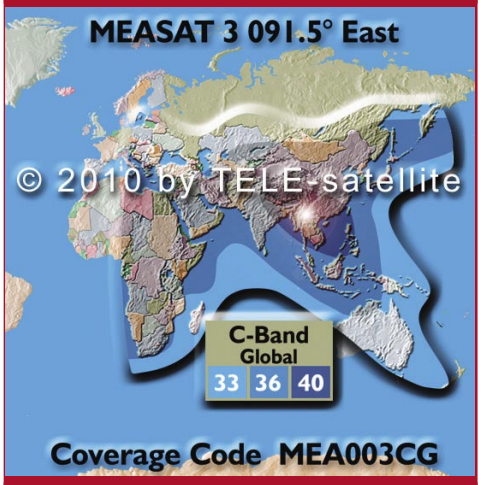


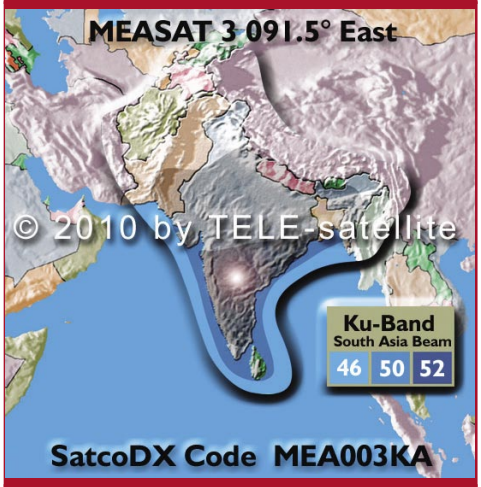
YAMAL 201
90.0 East

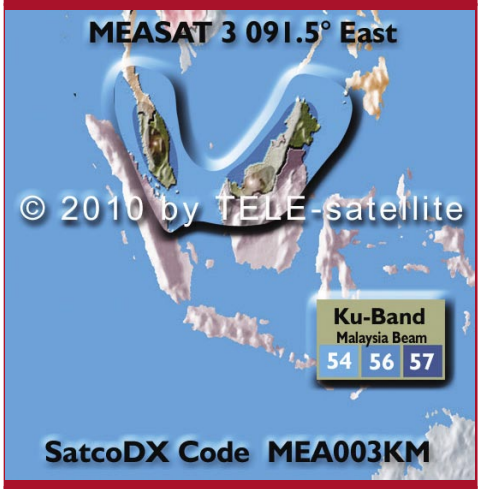


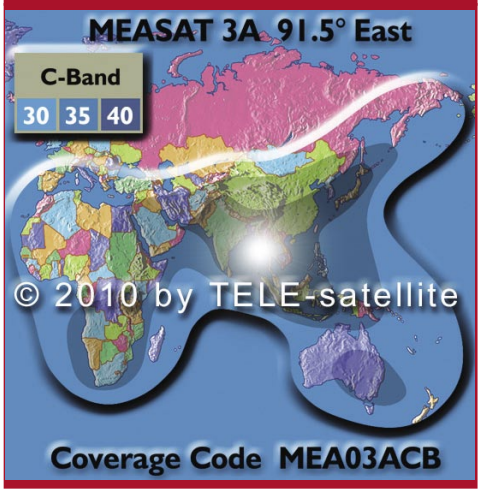


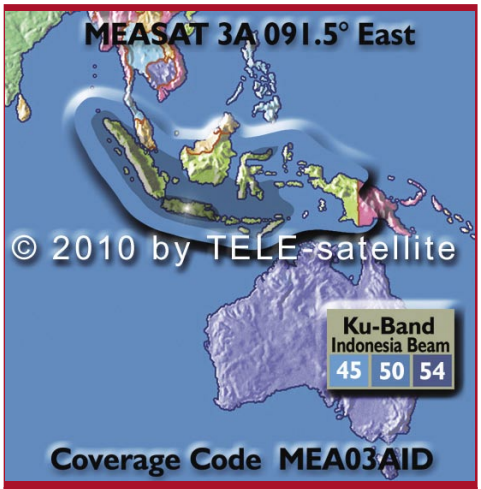
MEASAT 3, 3A
91.5 East

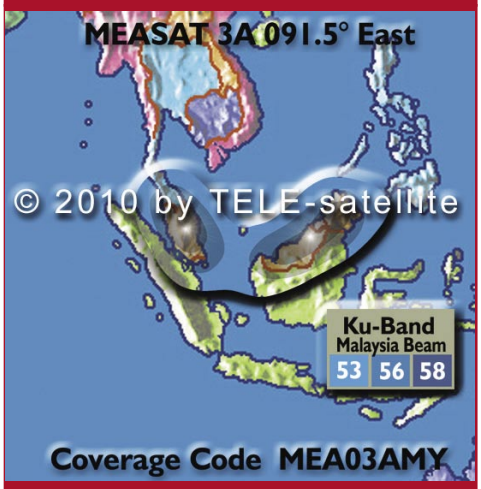




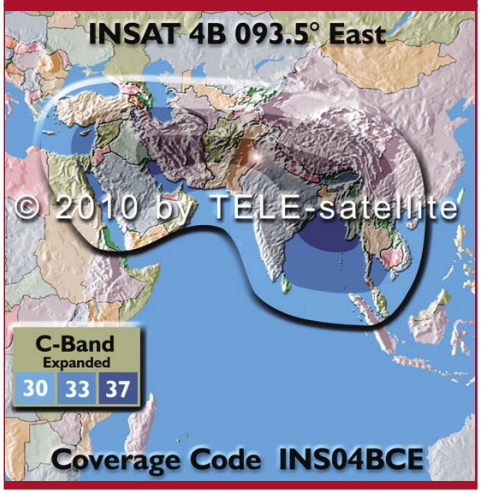


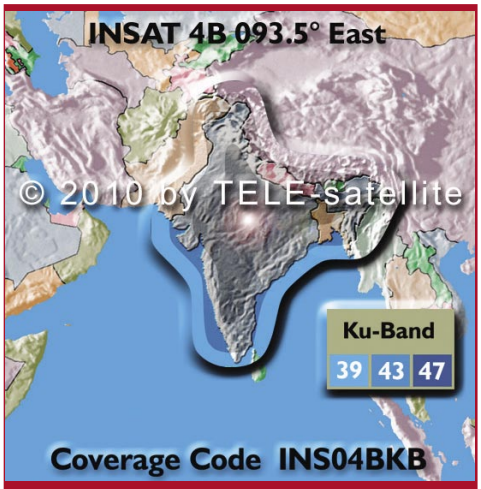




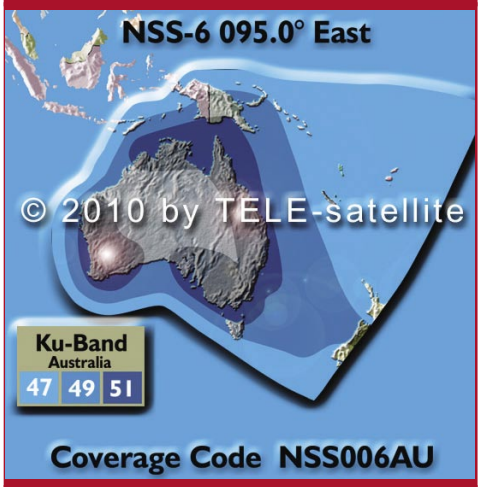


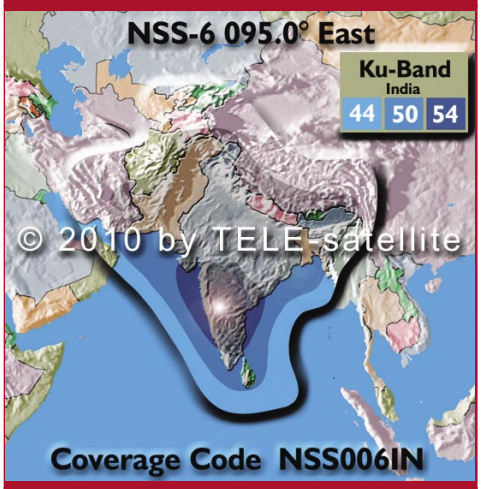
INSAT 3A, 4B
93.5 East

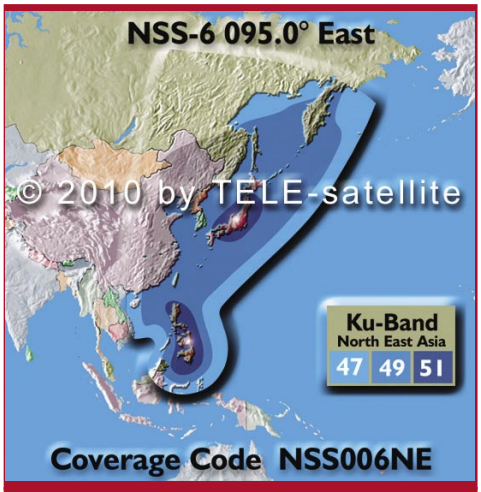




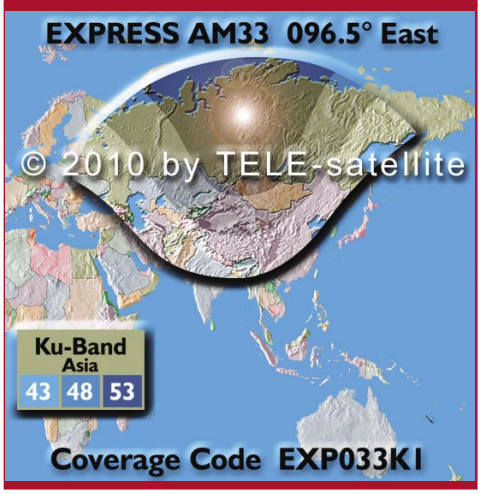
NSS 6
95.0 East



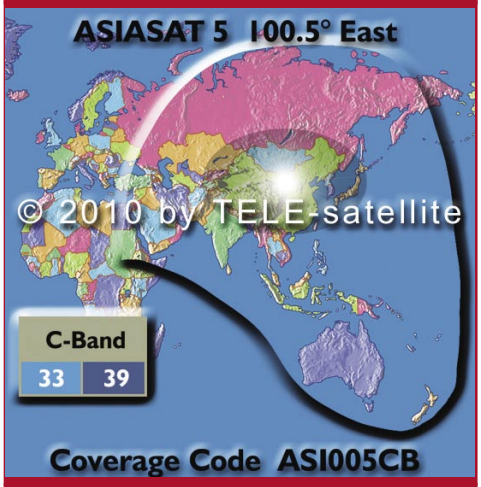


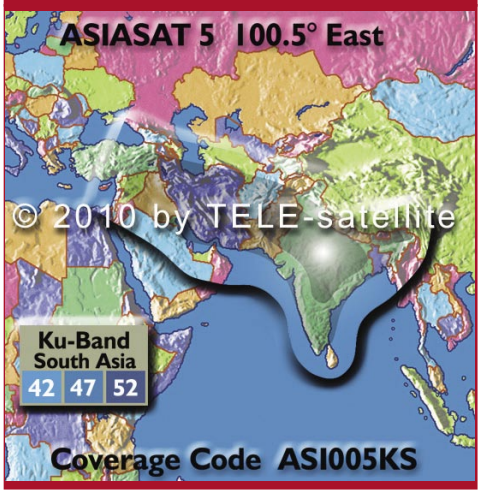


EXPRESS AM 33
96.5 East



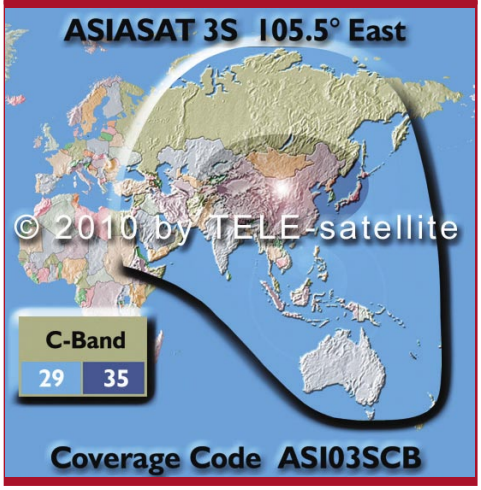
ASIASAT 5
100.5 East

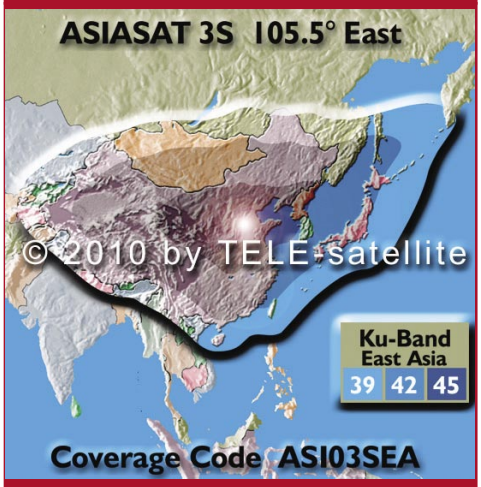




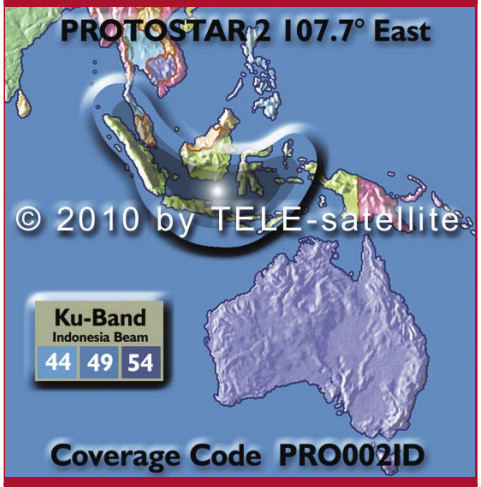
EXPRESS A2
103.0 East

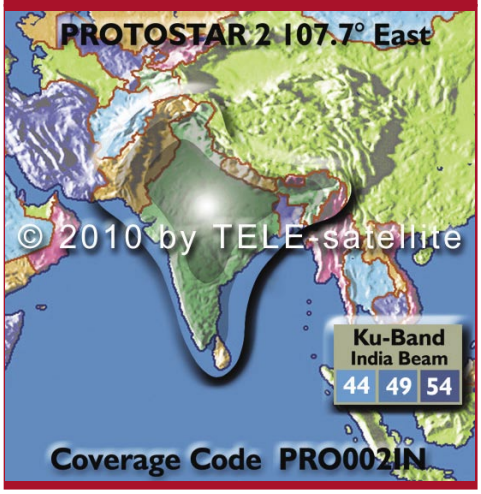
ASIASAT 3
105.5 East

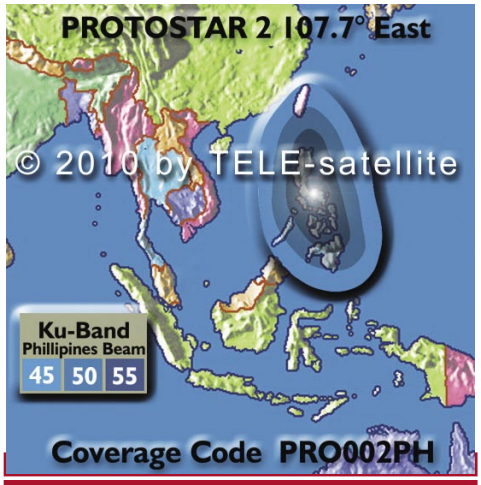


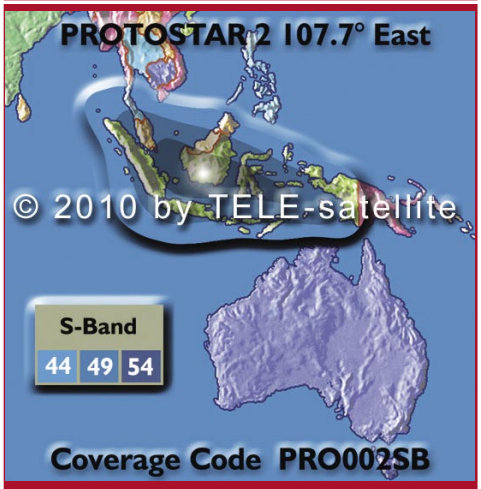


PROTOSTAR 2
107.7 East

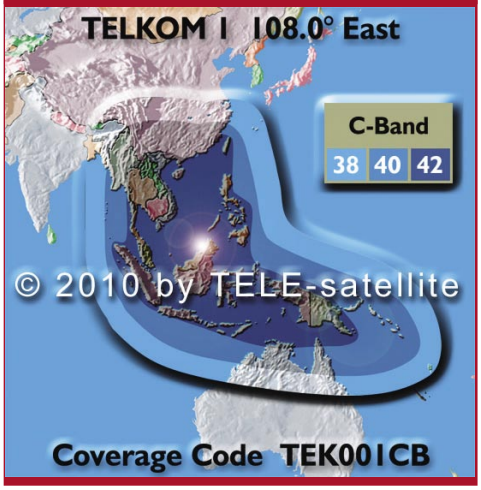




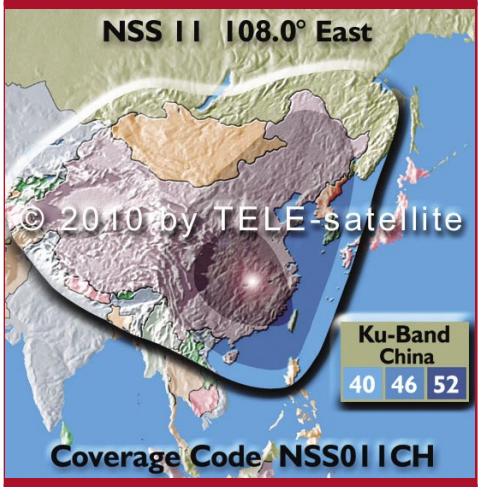


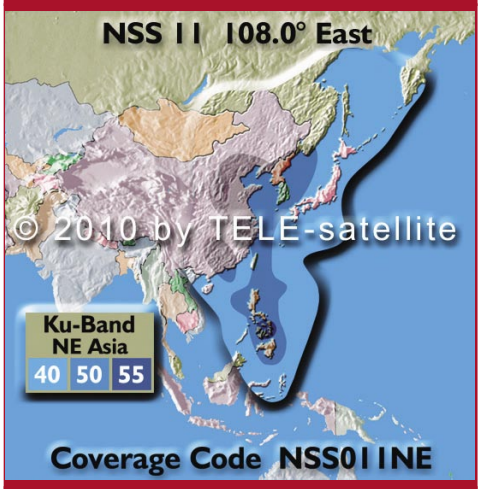


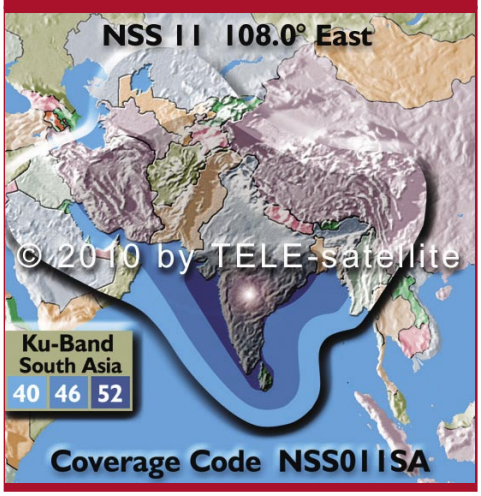
TELKOM 1
108.0 East



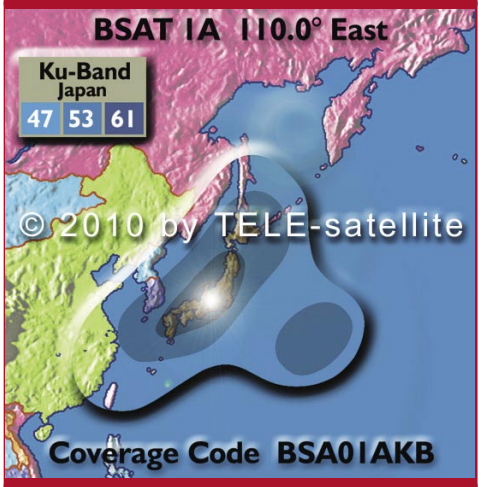
NSS 11
108.0 East

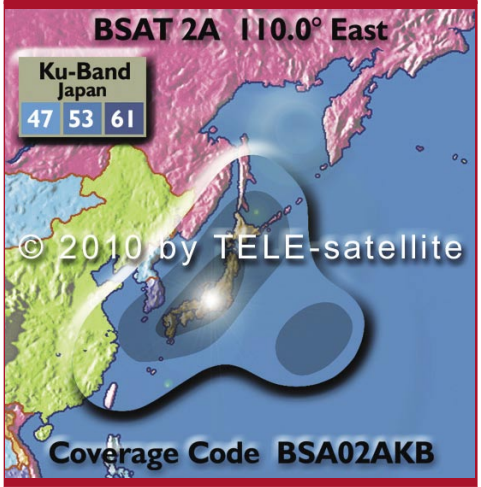




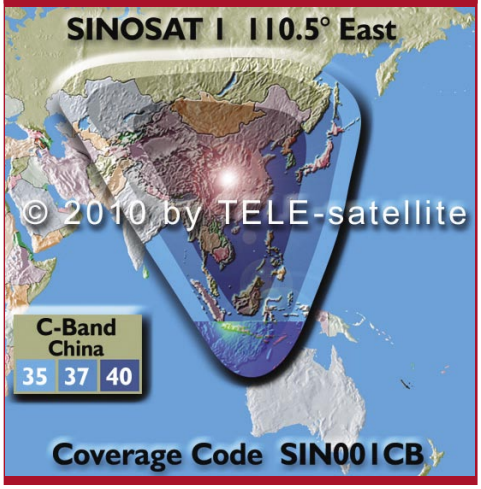


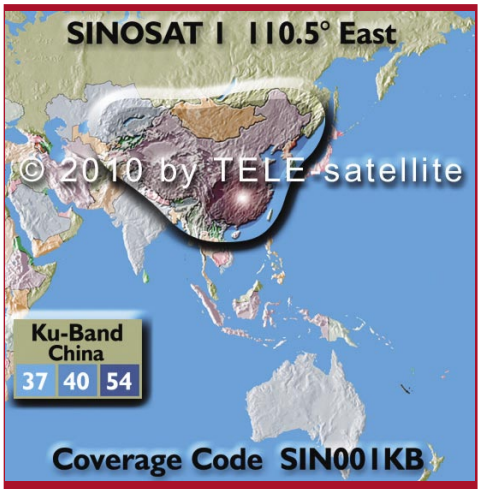
BSAT 1A, 2A
110.0 Esat



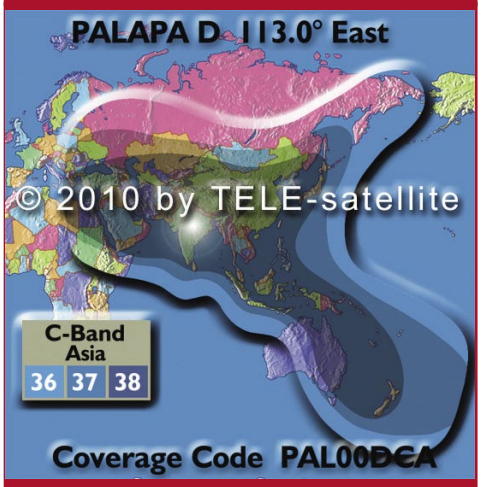


SINOSAT 1
110.5 East

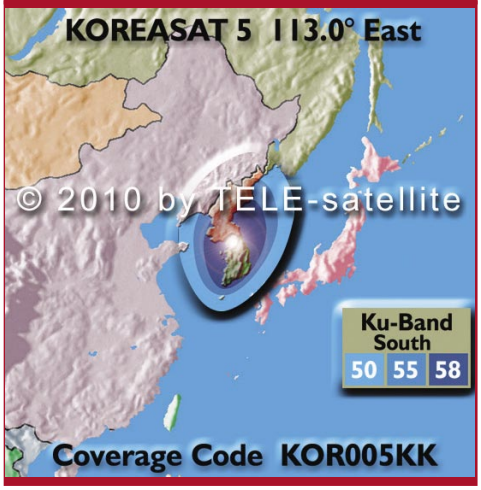


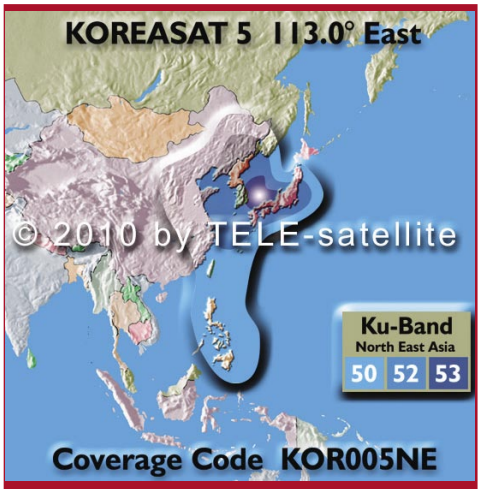


PALAPA D
113.0 East

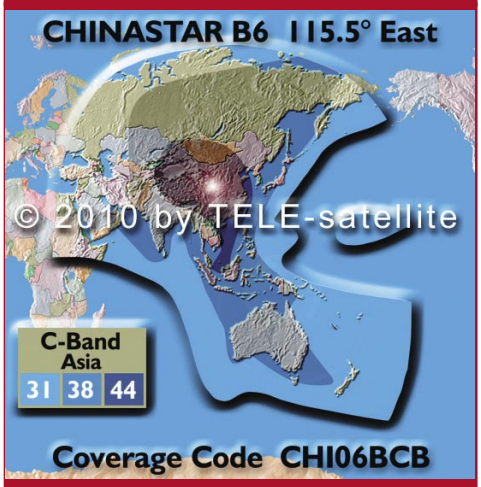


KOREASAT 5
113.0 East





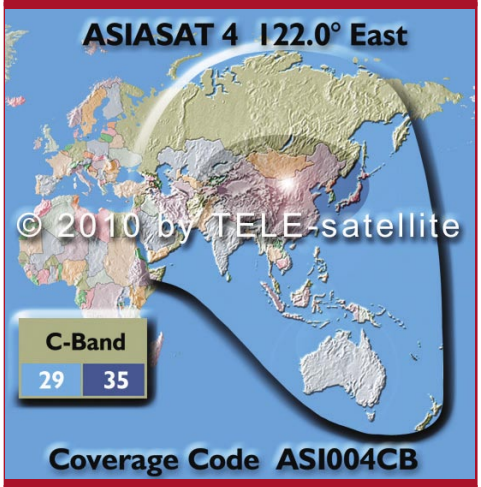
CHINASAT 6B
115.5 East

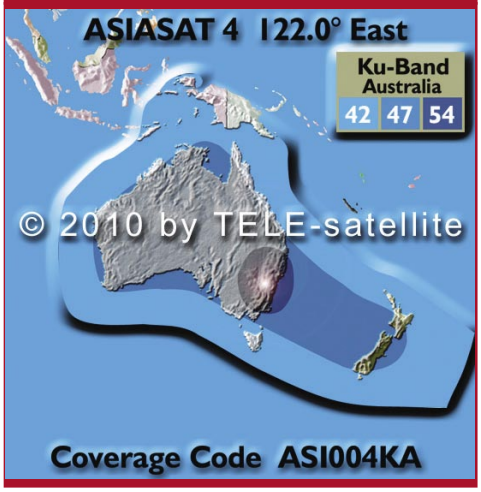


KOREASAT 3
116.0 East

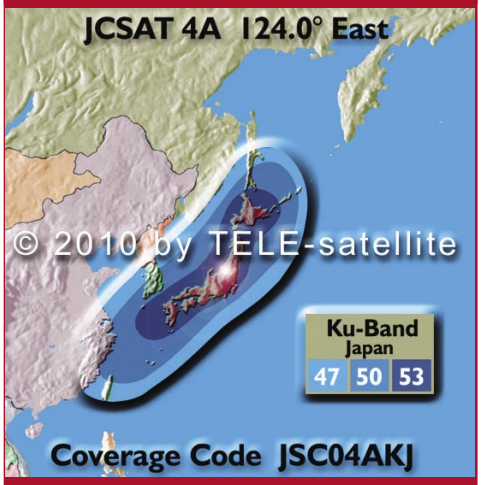
THAICOM 1A

ASIASAT 4
122.2 East

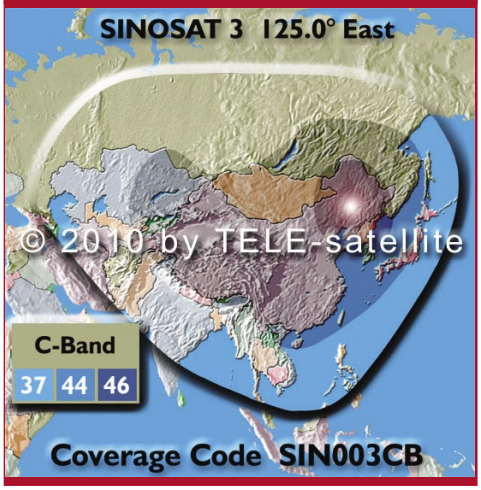




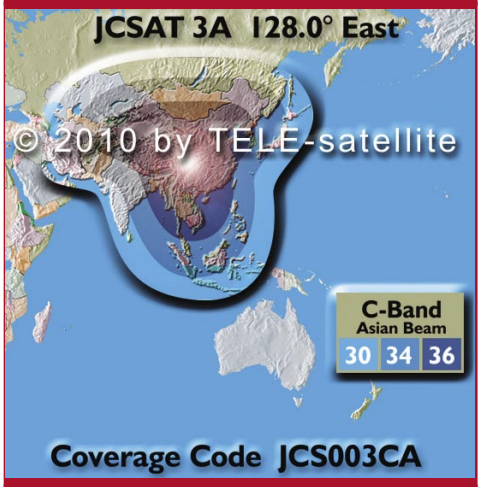
JCSAT 4A
124.0 East

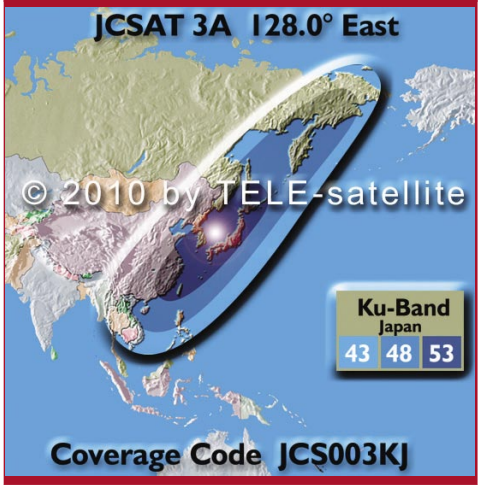


SINOSAT 3
125.0 East

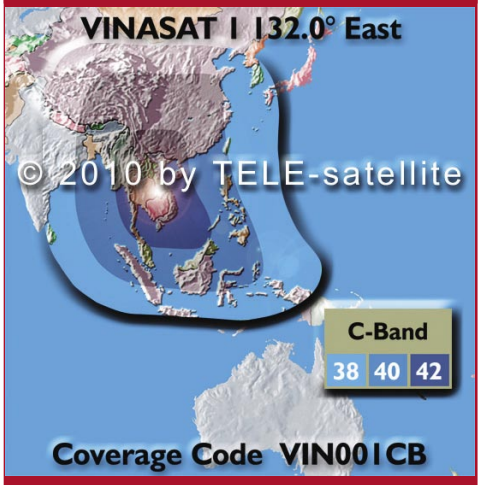


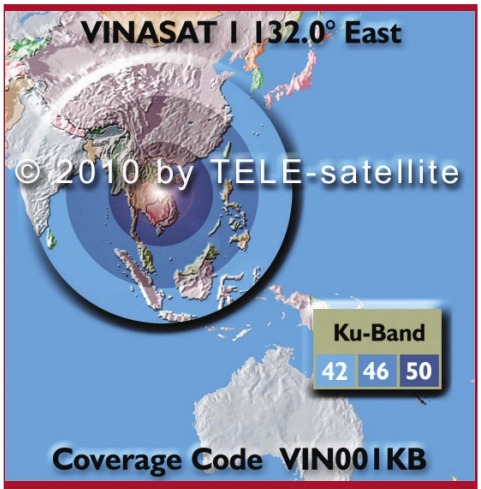
JCSAT 3A
128.0 East



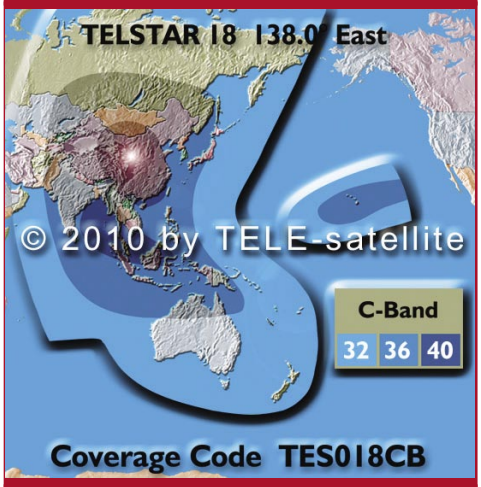


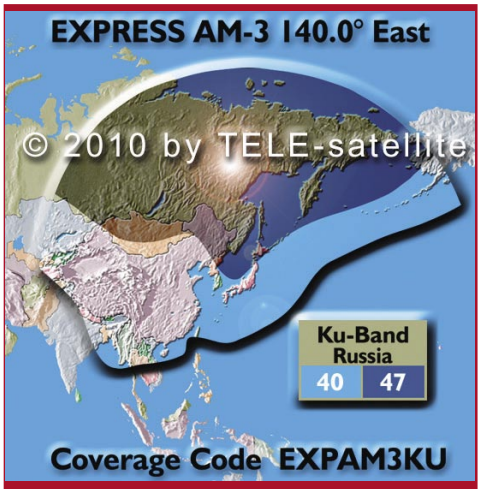
VINASAT 1
132.0 East



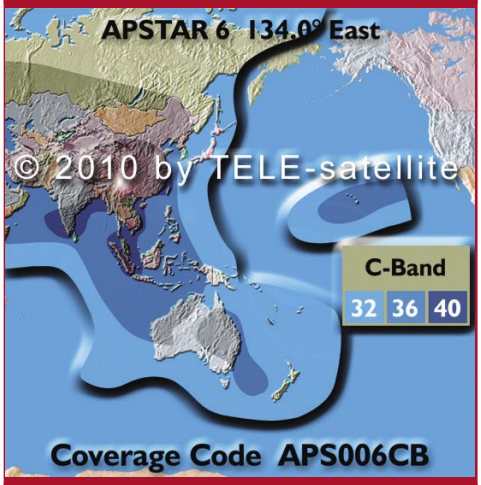


TELSTAR 18
138.0 East

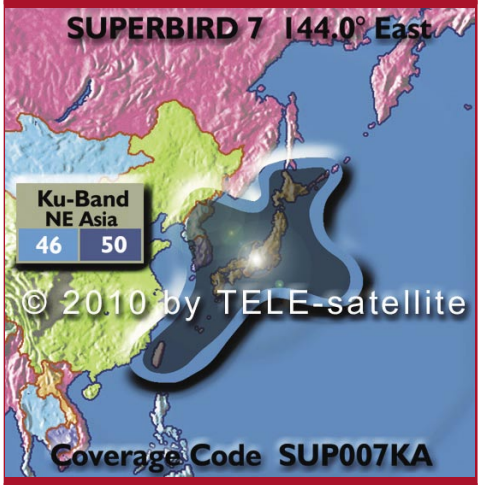


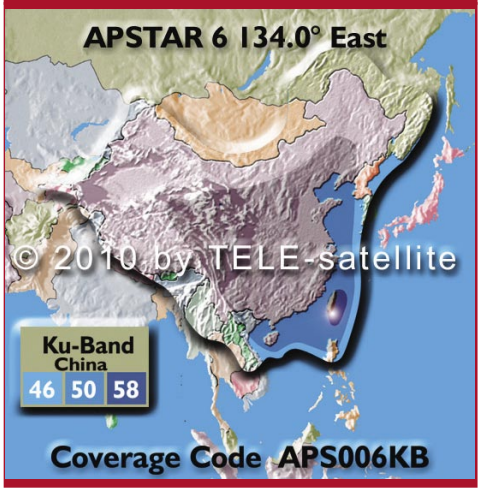


APSTAR 6
134.0 East

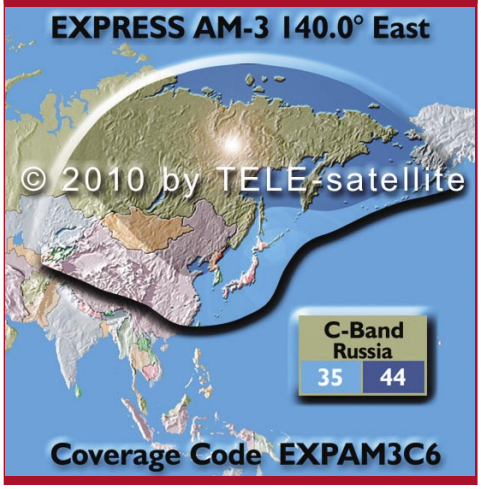


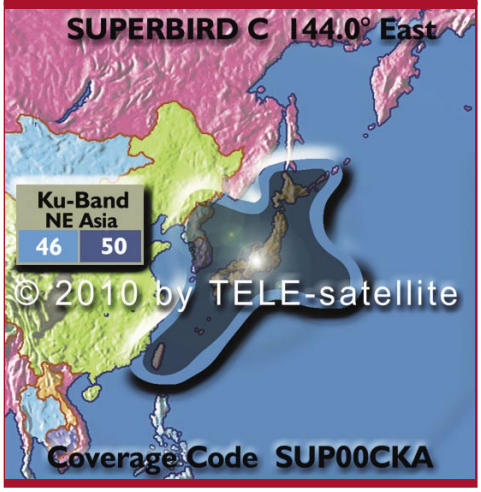
SUPERBIRD C2
144.0 East



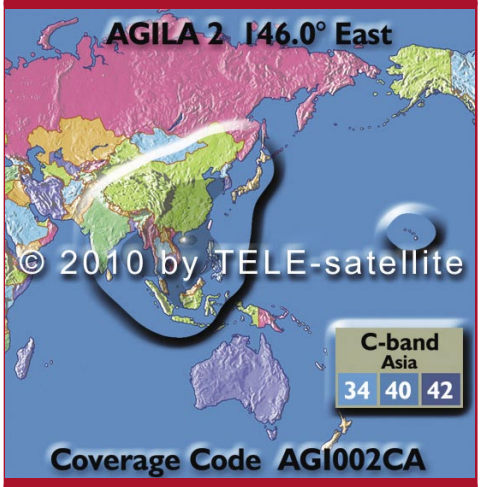


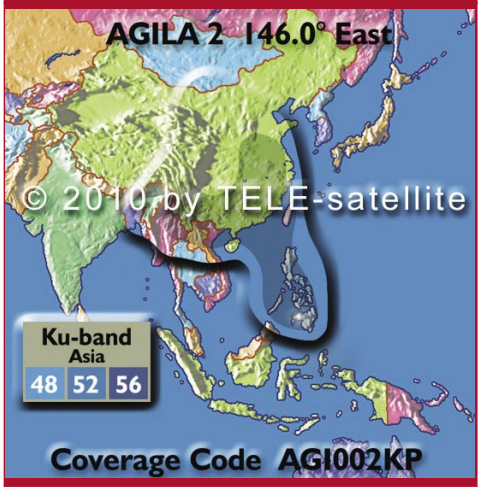
EXPRESS AM3
140.0 East



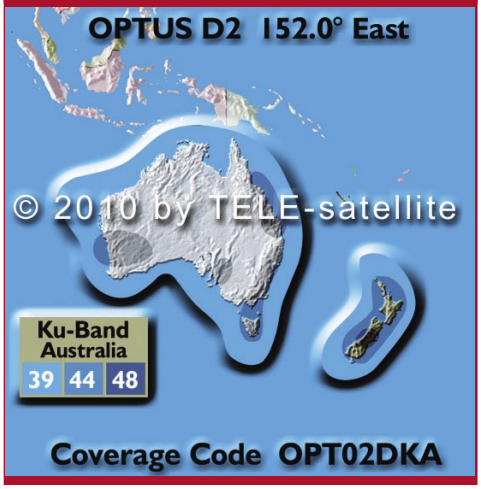


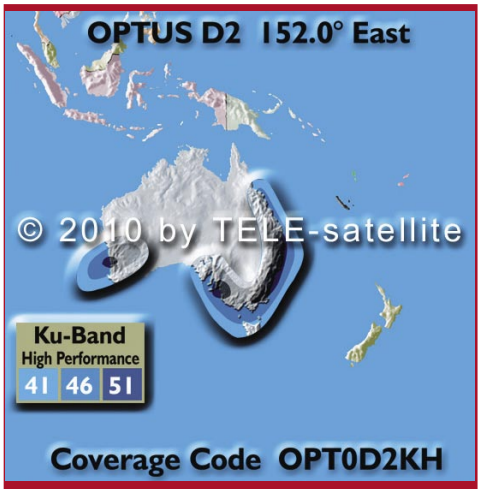
AGILA 2
146.0 East



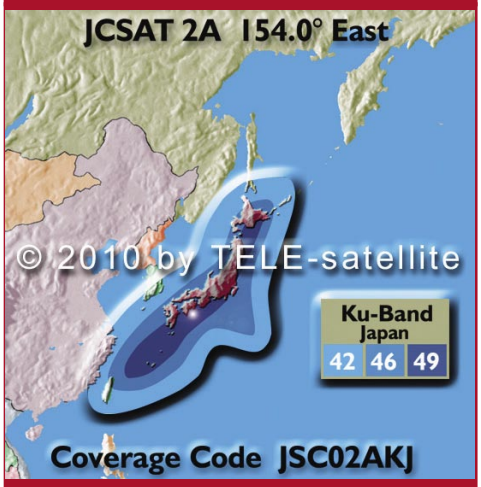


OPTUS D2
152.0 East

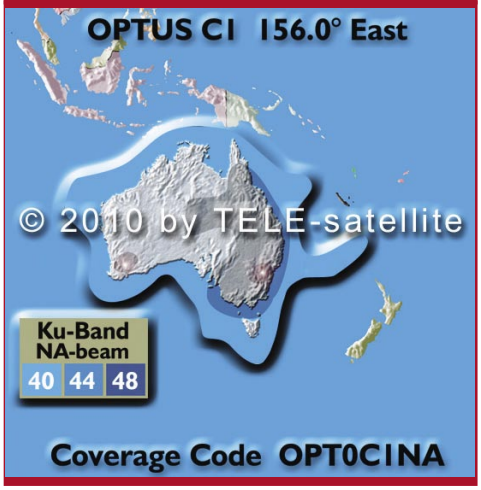


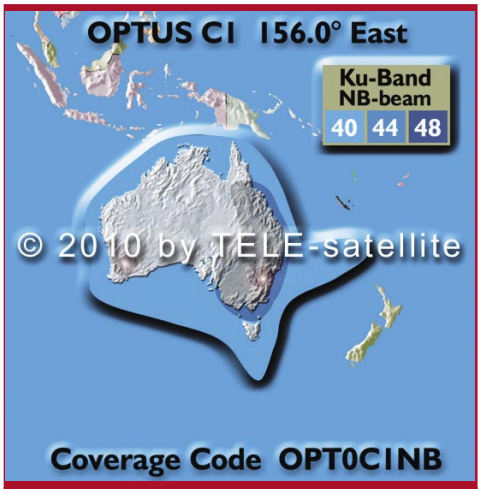


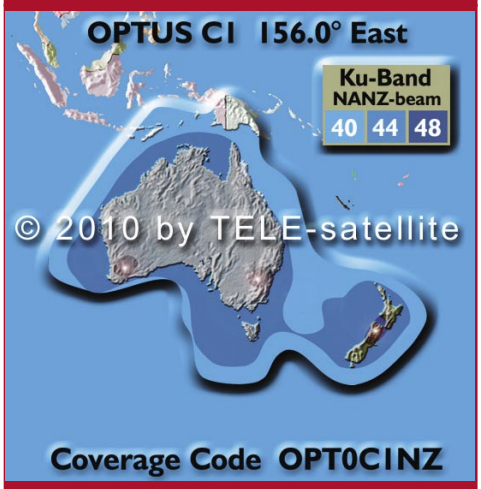
JCSAT 2A
154.0 East



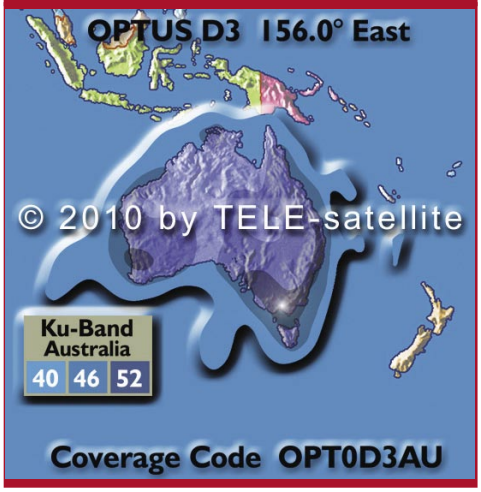
OPTUS C1
156.0 East



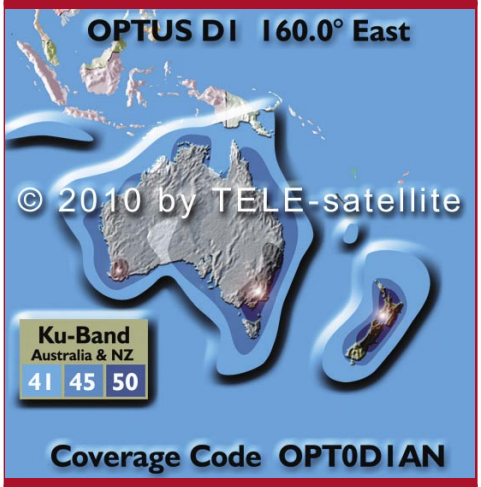


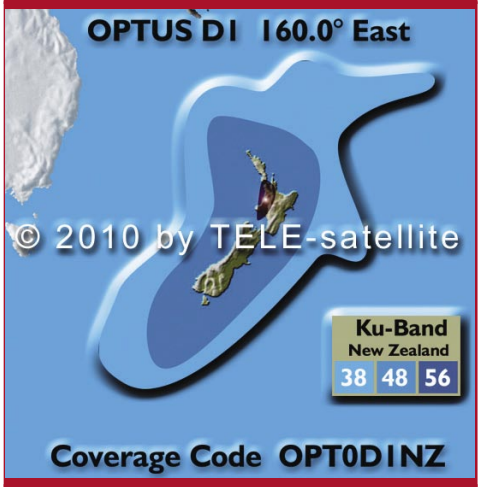


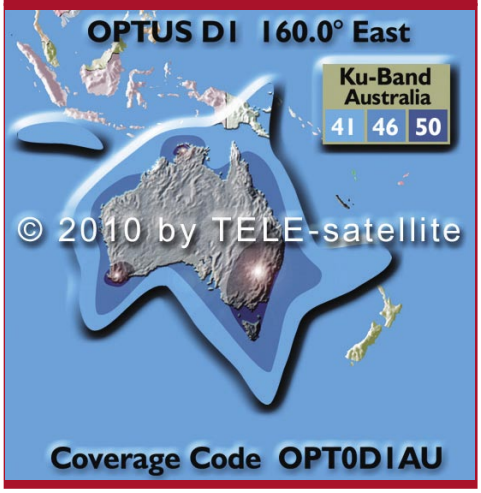
OPTUS D3
156.0 East



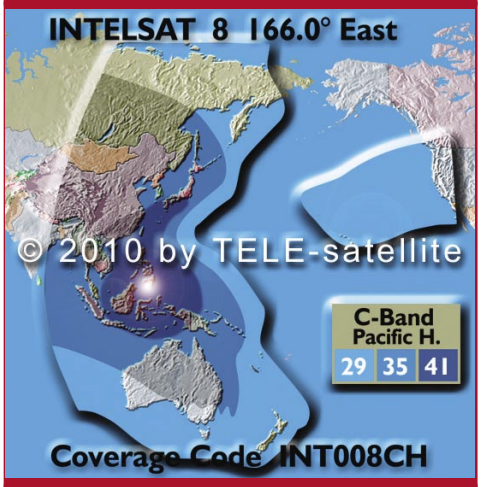
OPTUS D1
160.0 East

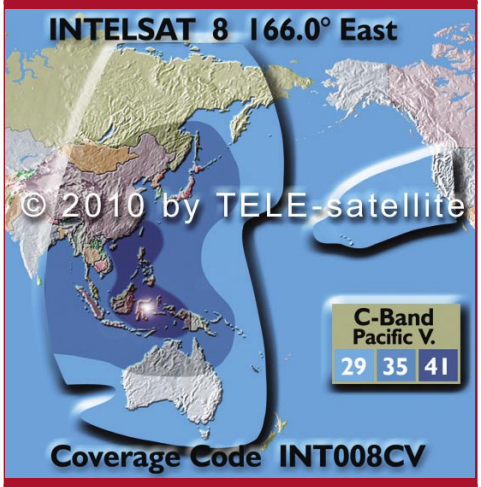


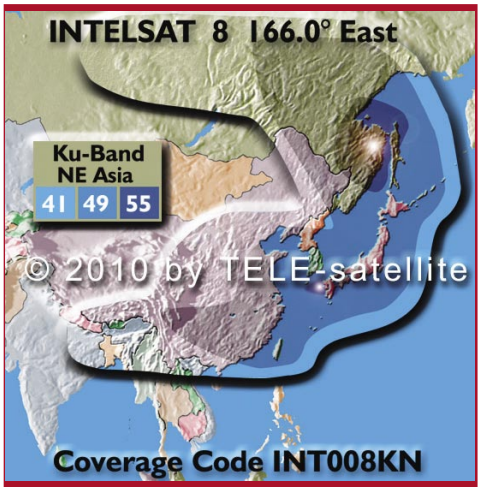




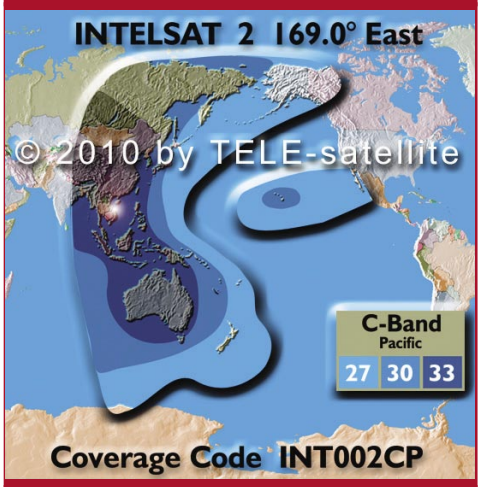
INTELSAT 8
166.0 East

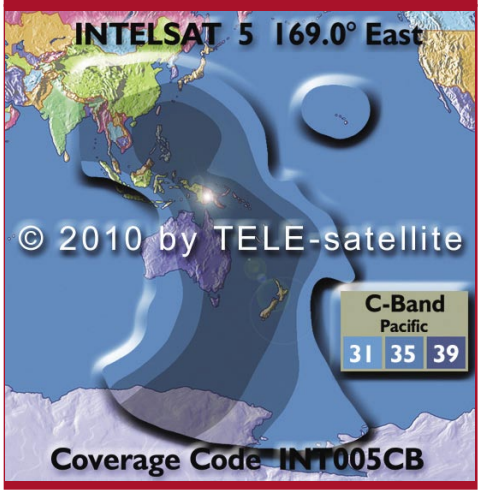






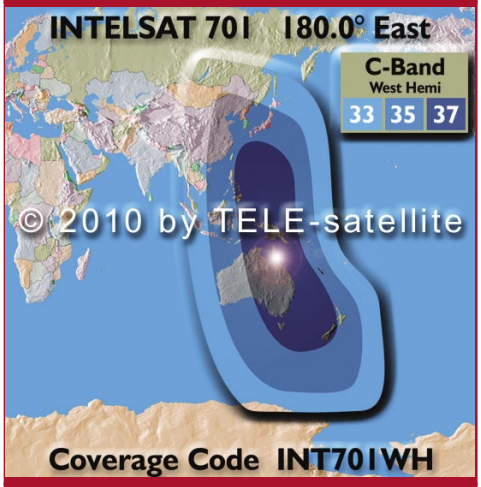
INTELSAT 2, 5
169.0 East

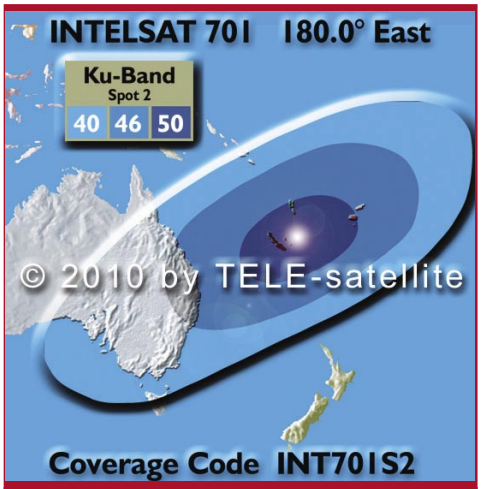


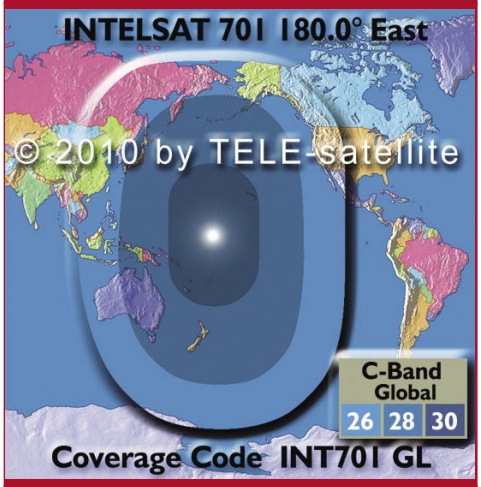


GE 23
172.0 East

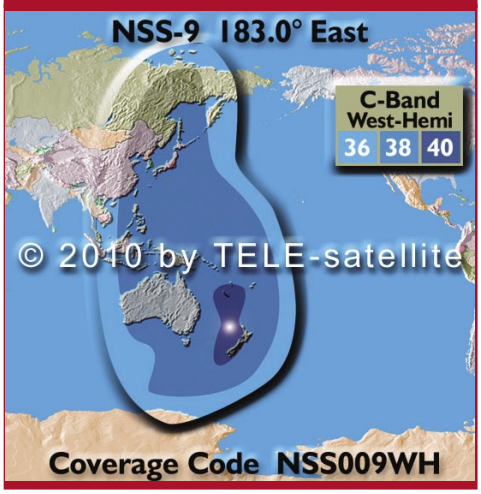
INTELSAT 701
180.0 East





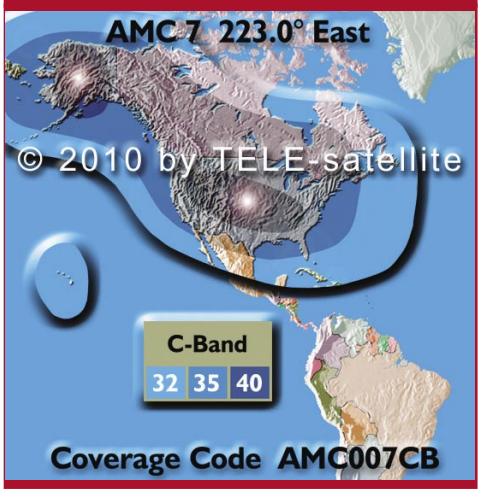


NSS 9
183.0 East — 177.0 West

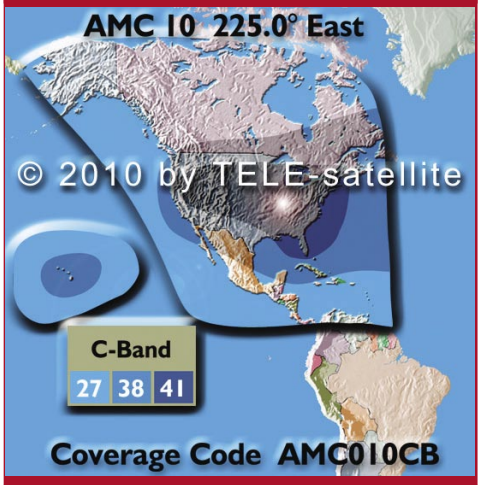


AMC 8
221.0 East — 139.0 West

AMC 7
223.0 East — 137.0 West



AMC 10
225.0 East — 135.0 West



GALAXY 13
233.0 East — 127.0 West

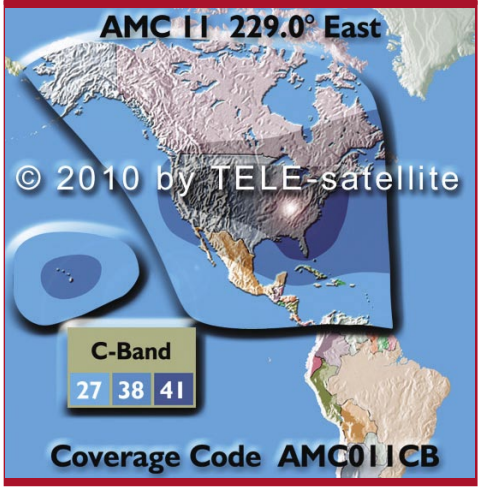
GALAXY 14
235.0 East — 125.0 West

GALAXY 15
227.0 East — 133.0 West

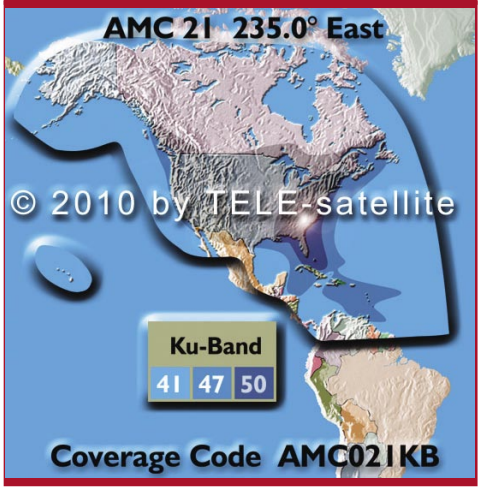
HORIZONS 1
233.0 East — 127.0 West

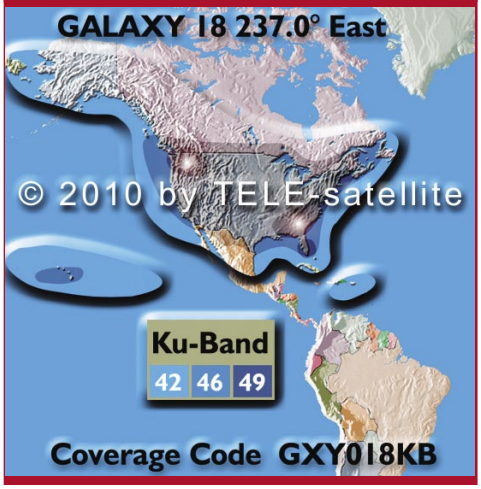
GALAXY 18
237.0 East — 123.0 West

AMC 11
229.0 East — 131.0 West



AMC 21
235.0 East — 125.0 West

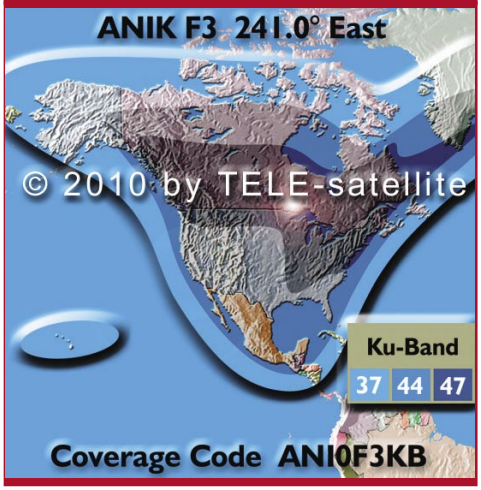


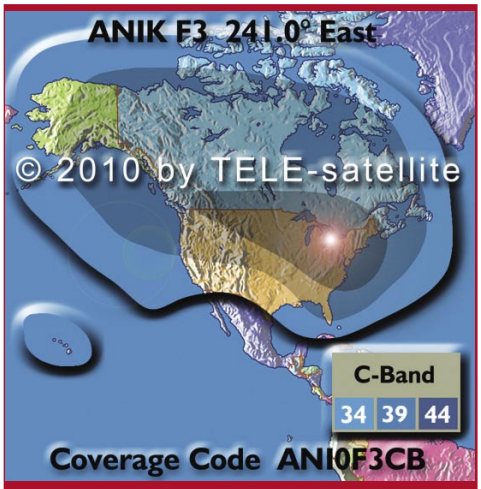


ECHOSTAR 9
239.0 East — 121.0 West

GALAXY 23
239.0 East — 121.0 West

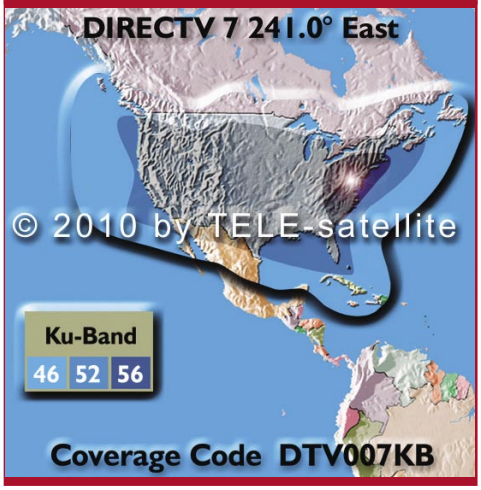
ANIK F3
241.0 East — 119.0 West



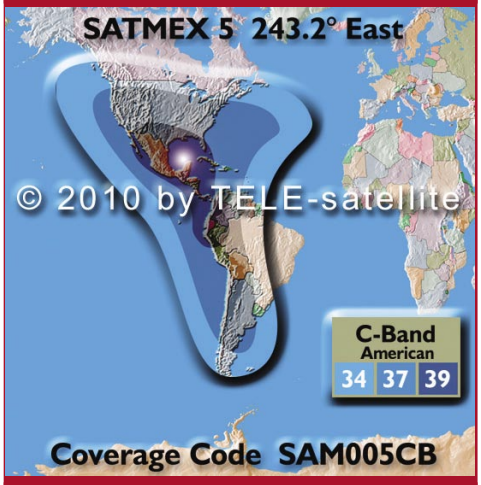


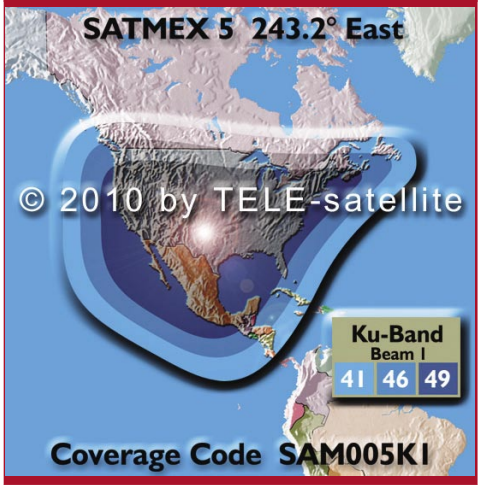
ECHOSTAR 7
241.0 East — 119.0 West

DIREC TV7S
241.0 East — 119.0 West

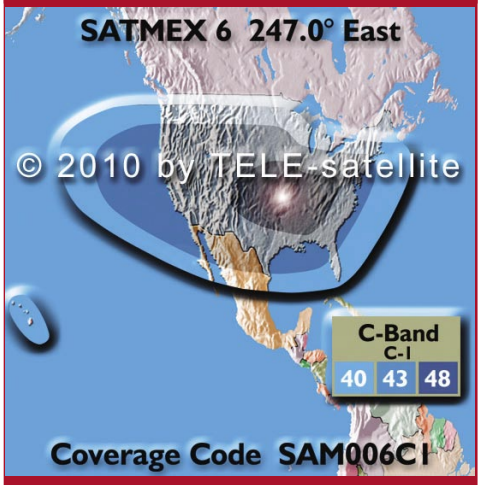


SATMEX 5
244.0 East — 116.8 West



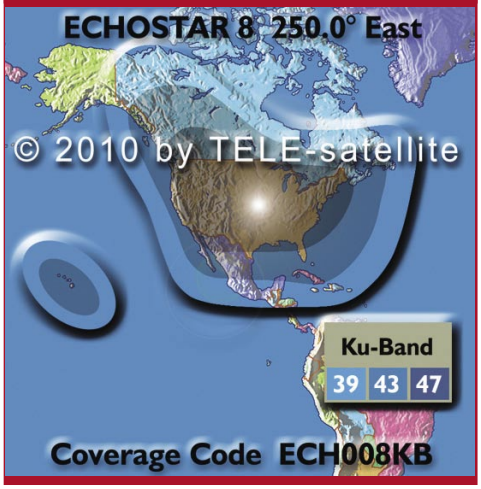


SATMEX 6
247.0 East — 113.0 West

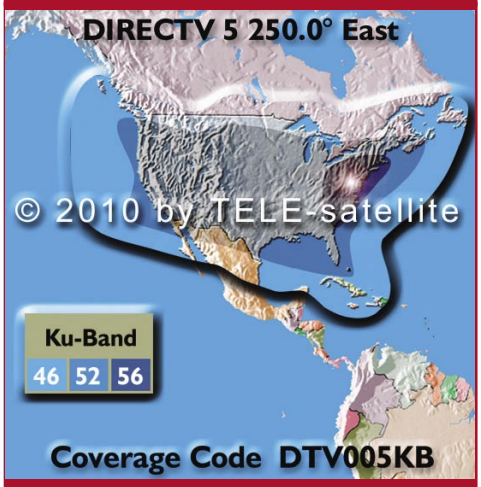


ANIK F2
249.0 East — 111.1 West

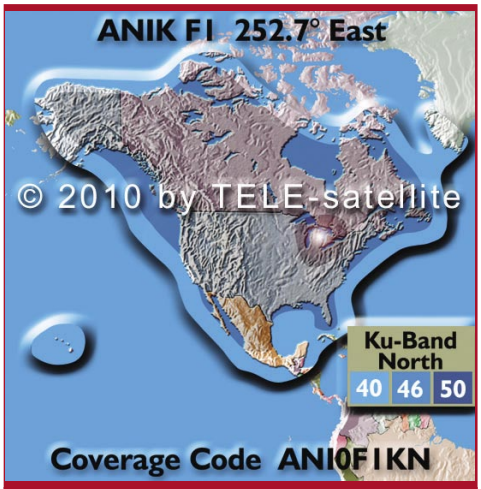
ECHOSTAR 10, 11
250.0 East — 110.0 West



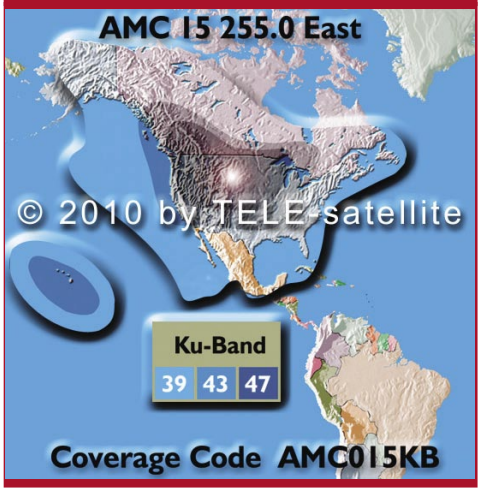
DIREC TV5
250.0 East — 110.0 West



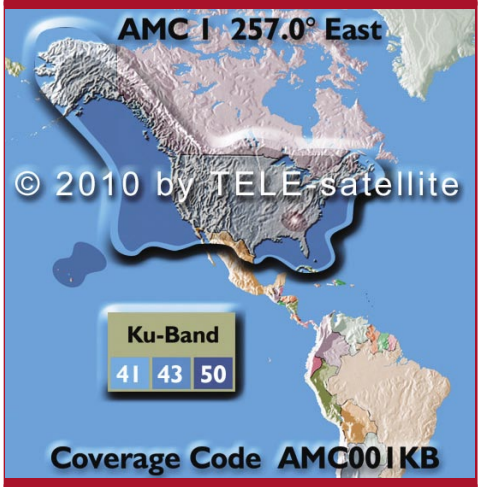
ANIK F1, F1R
252.0 East — 107.3 West

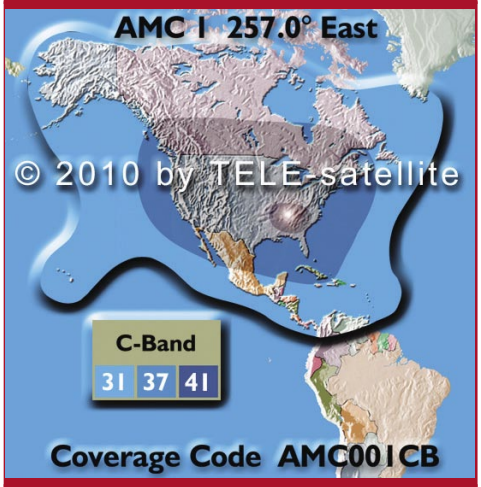


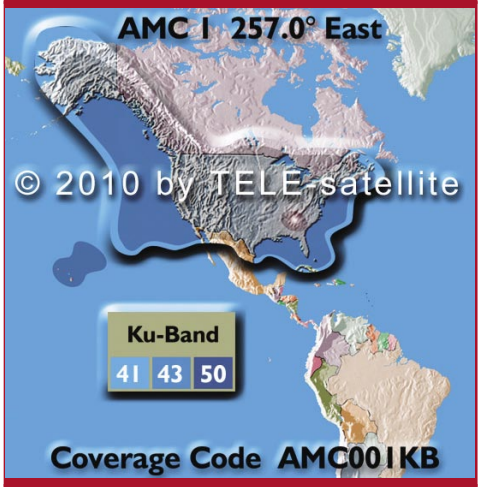
AMC 15, 18
255.0 East — 105.0 West

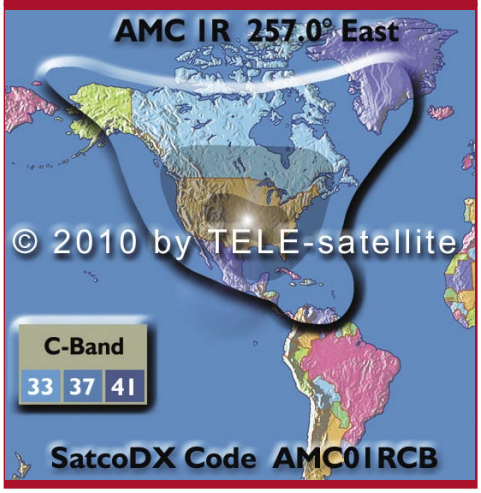


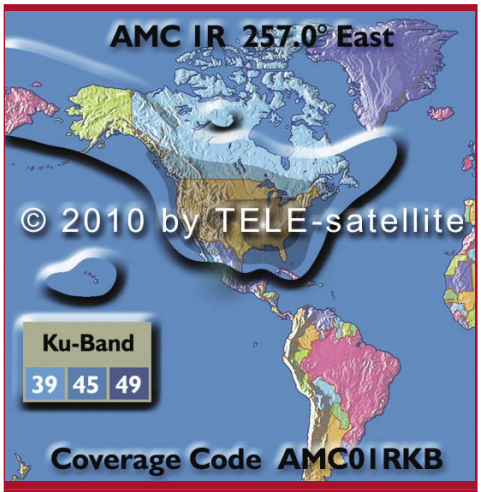
AMC 1
257.0 East — 103.0 West



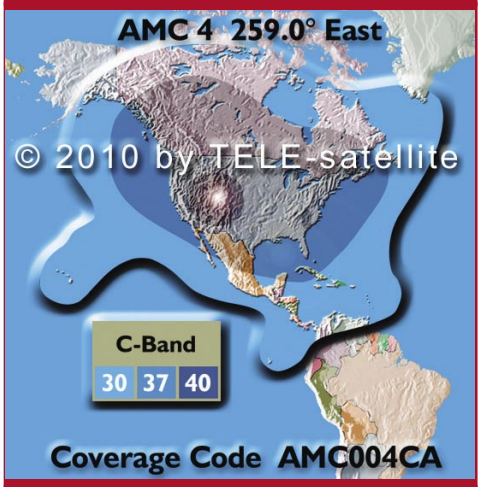


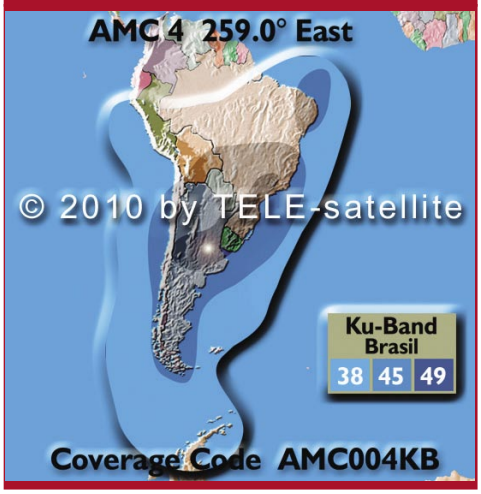


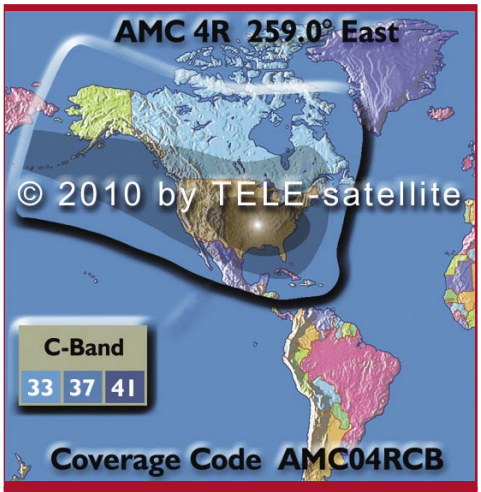


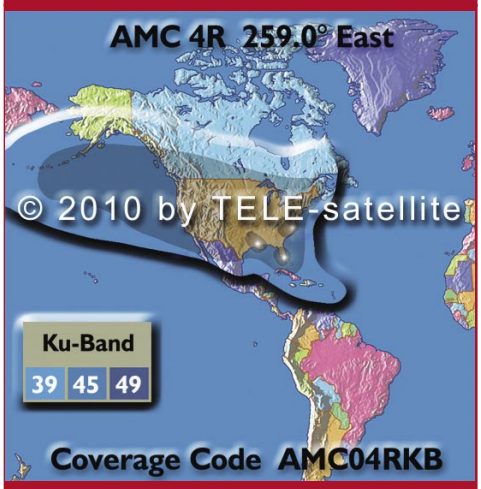


AMC 2, 4
259.0 East — 101.0 West

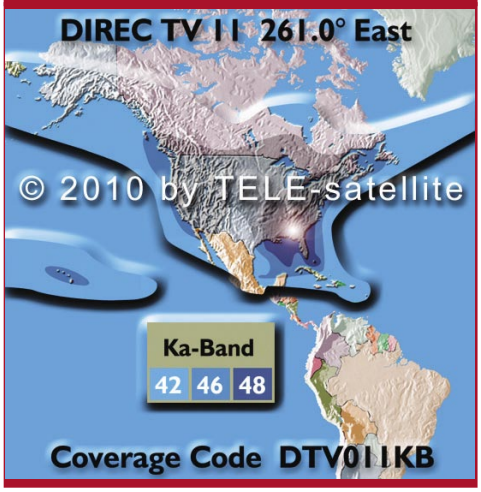




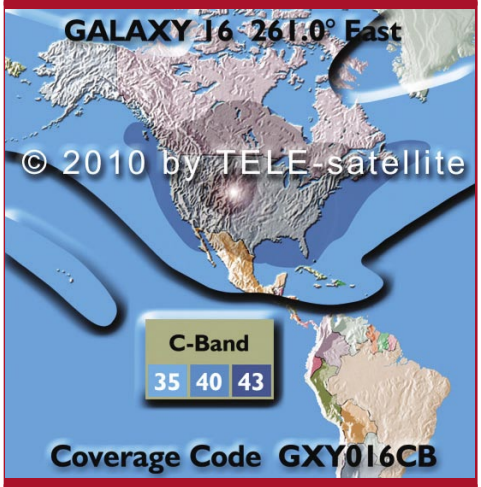


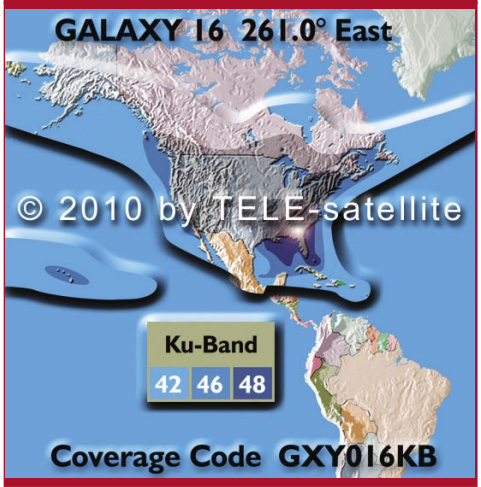


DIREC TV11
261.0 East — 99.2 West

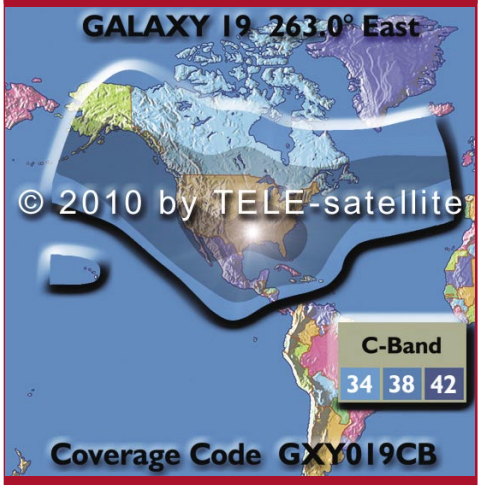


GALAXY 16
261.0 East — 99.0 West

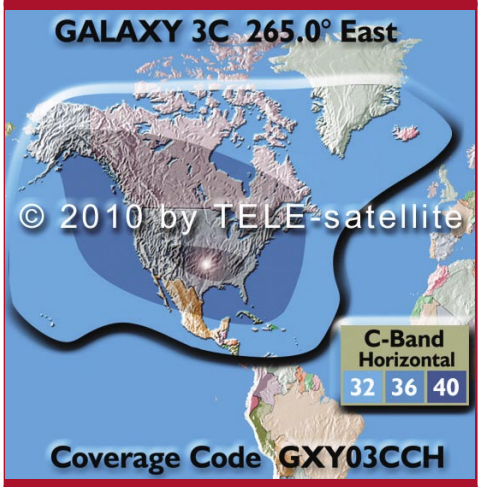


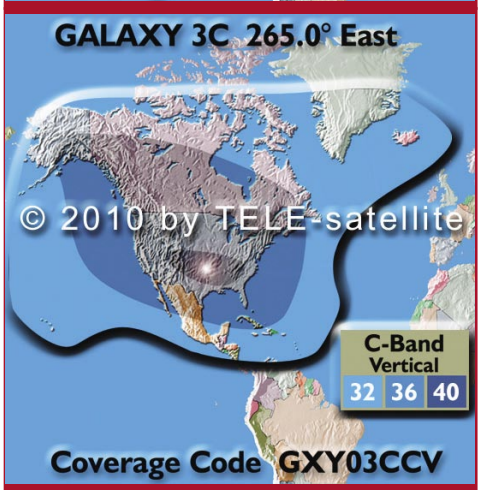


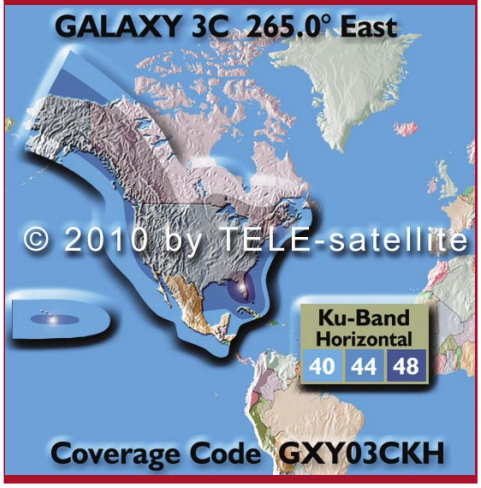
GALAXY 19
263.0 East — 97.0 West

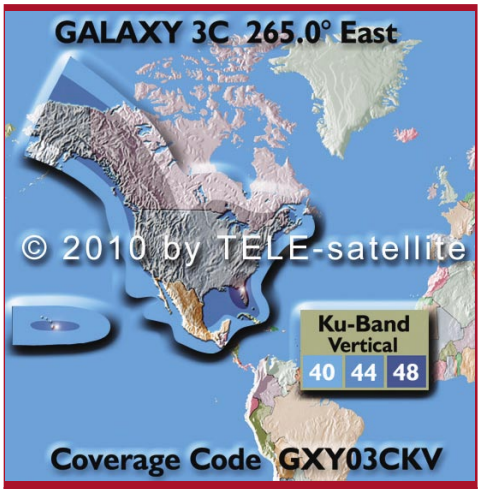


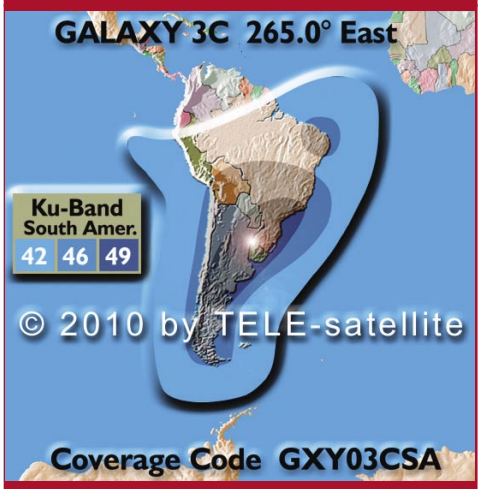
GALAXY 3C
265.0 East — 95.0 West



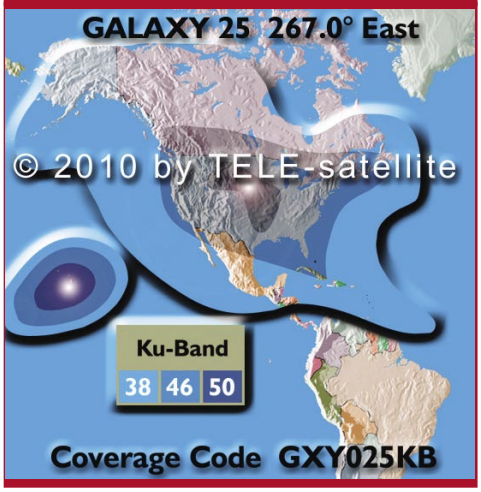




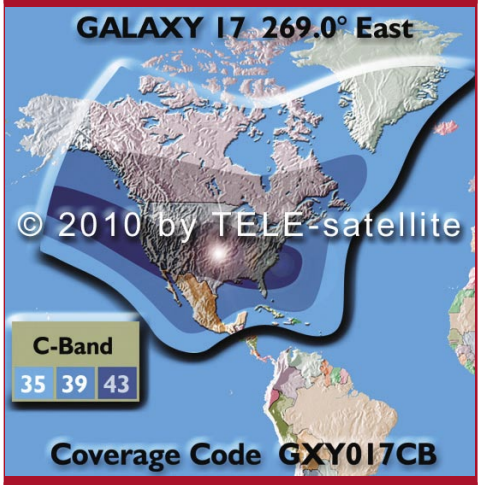


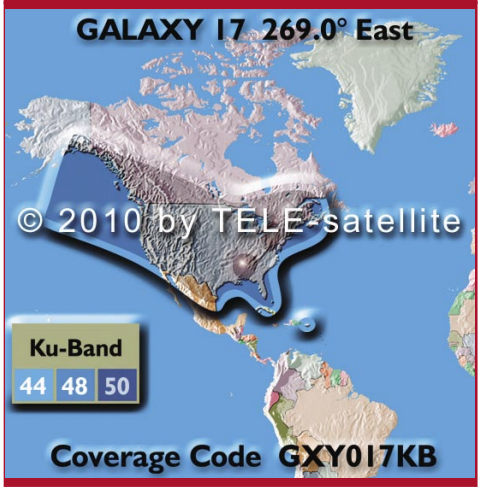


GALAXY 25
267.0 East — 93.1 West

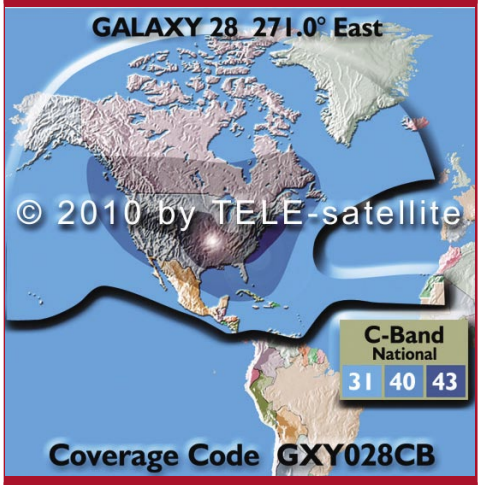


GALAXY 17
269.0 East — 91.0 West

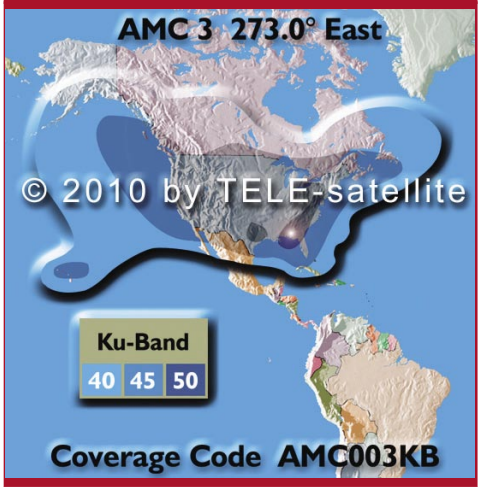




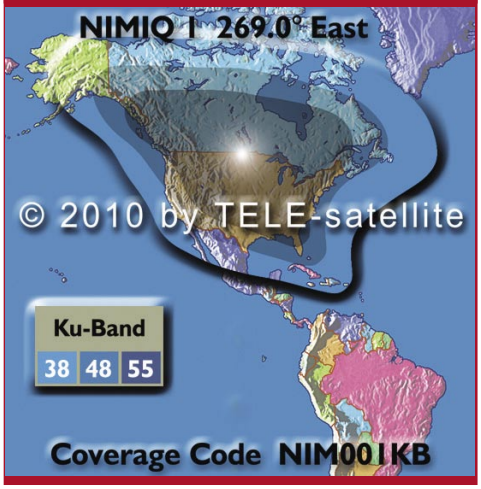
GALAXY 28
271.0 East — 89.0 West



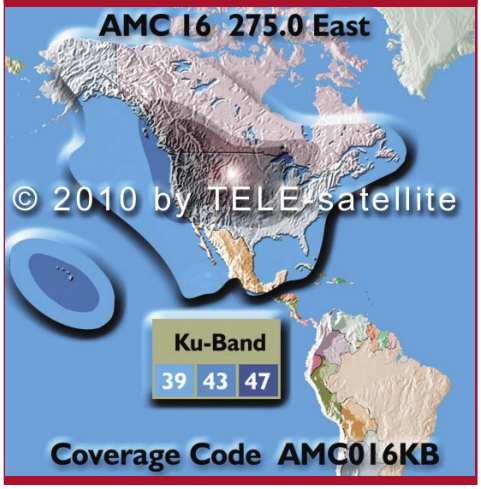
AMC 3
273.0 East — 87.0 West



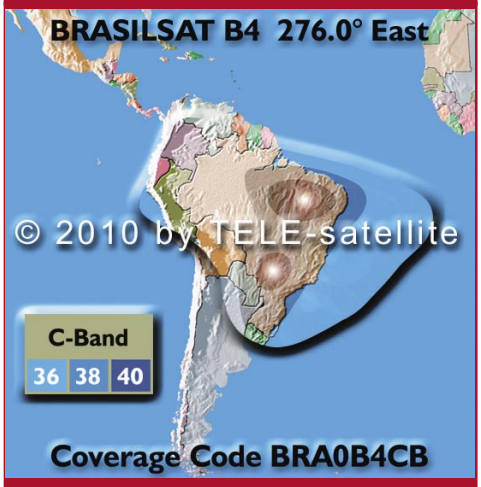
NIMIQ 1
269.0 East — 91.0 West



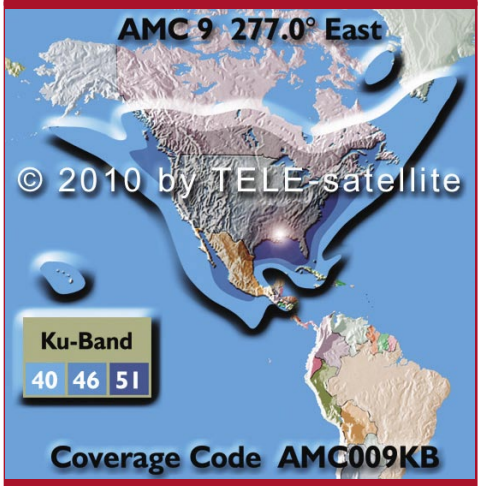
AMC 16
275.0 East — 85.0 West



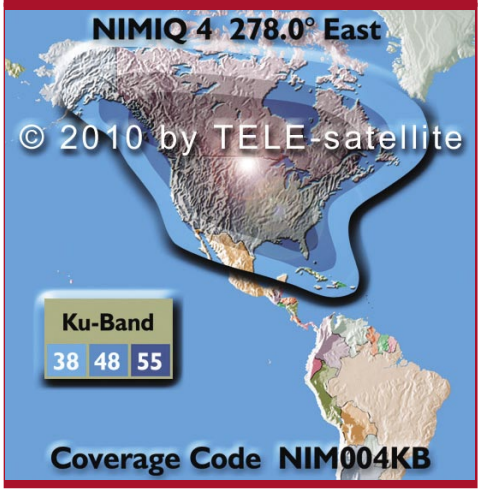
BRASILSAT B4
276.0 East — 84.0 West



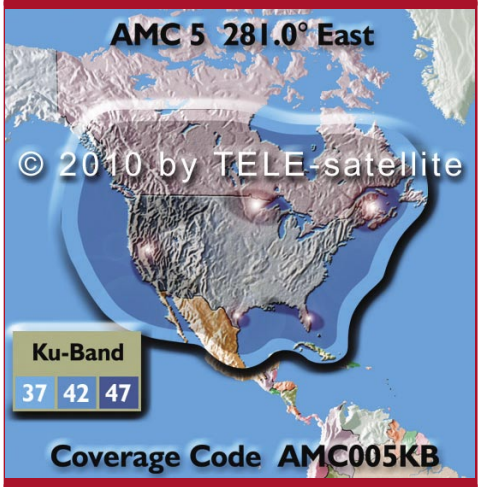
AMC 9
277.0 East — 83.0 West

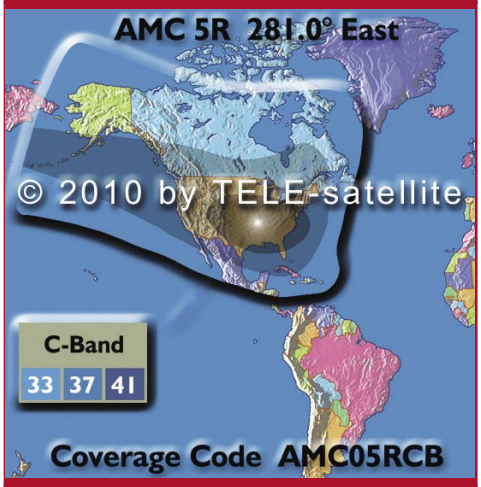


NIMIQ 4
278.0 East — 82.0 West

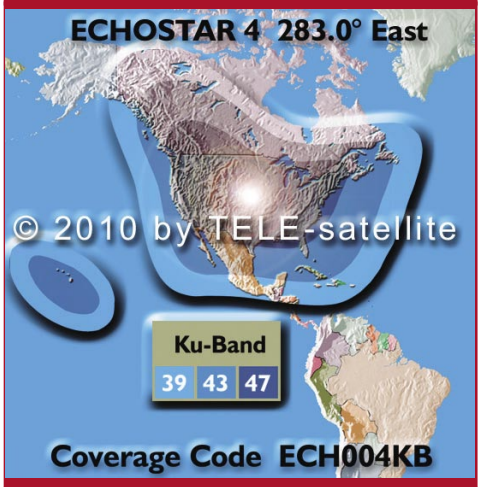


AMC 5
281.0 East — 79.0 West

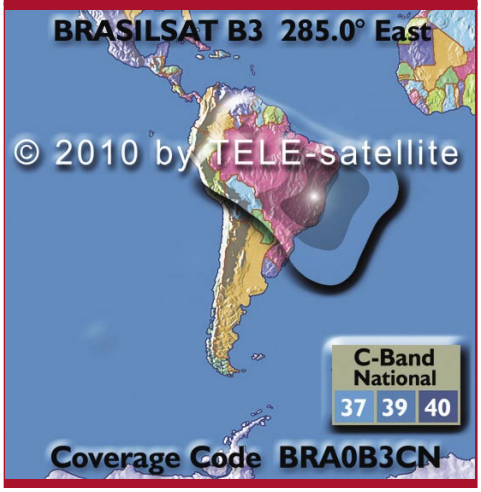




ECHOSTAR 4, 8
283.0 East — 77.0 West

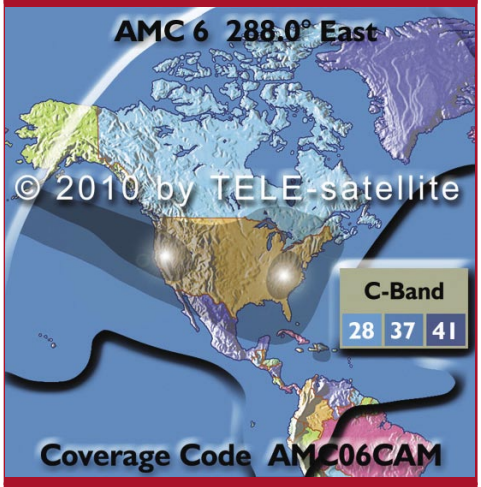


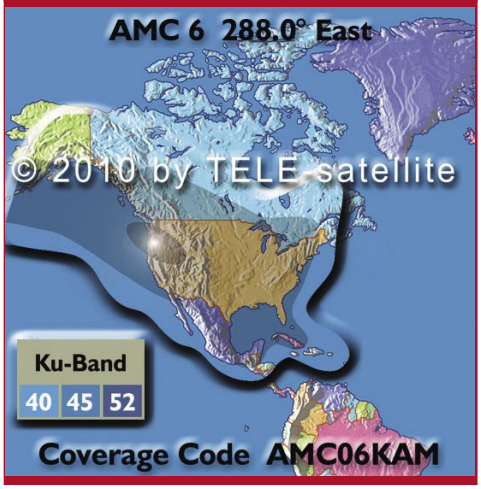
BRASILSAT B3
285.0 East — 75.0 West



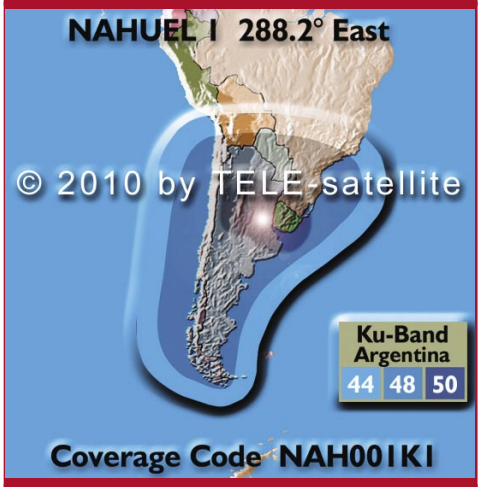
DIRECTV 1R
287.5 East — 72.5 West

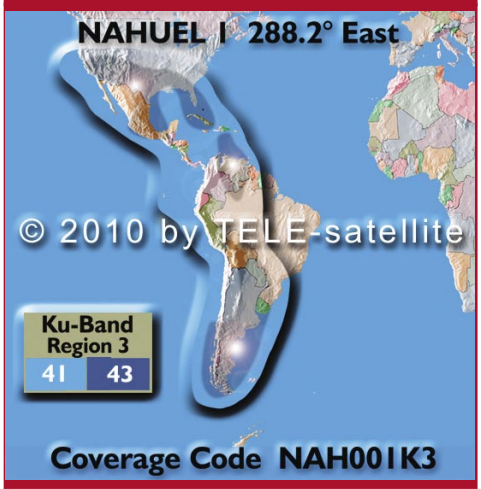
AMC 6
288.0 East — 72.0 West



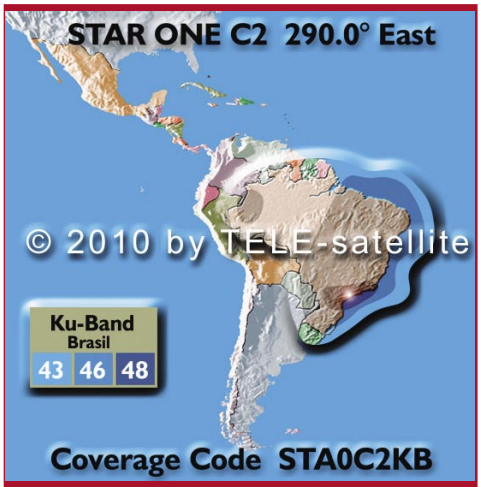


NAHUEL 1
288.0 East — 71.8 West



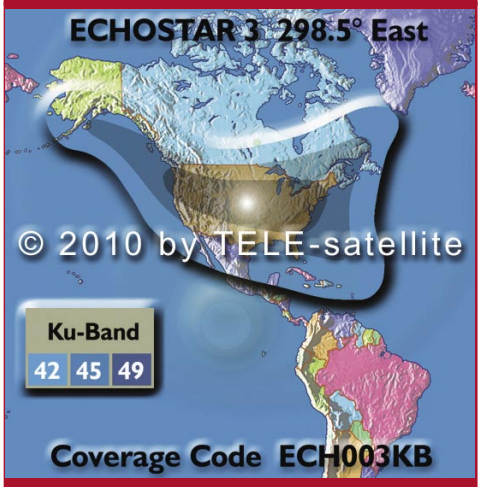


STARONE C2
290.0 East — 70.0 West

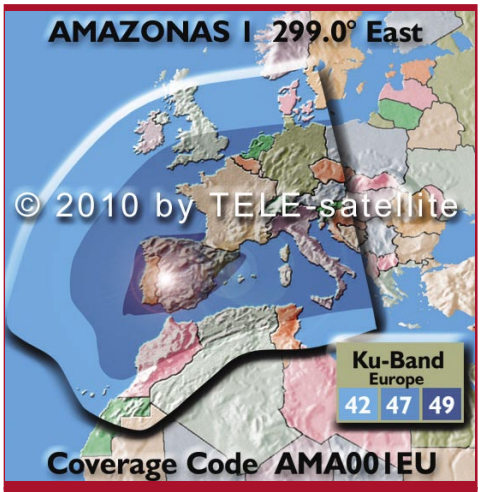


STARONE C1
295.0 East — 65.0 West

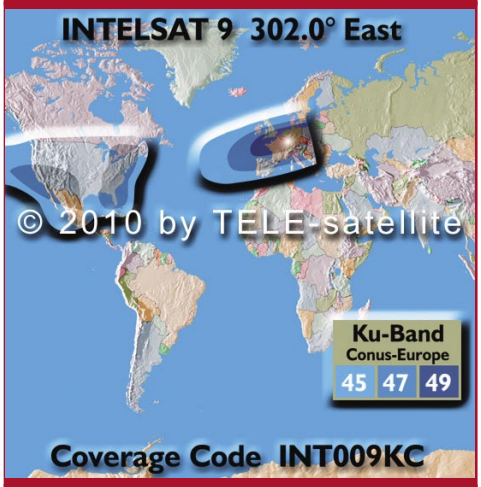
ECHOSTAR 3, 12
298.5 East — 61.5 West

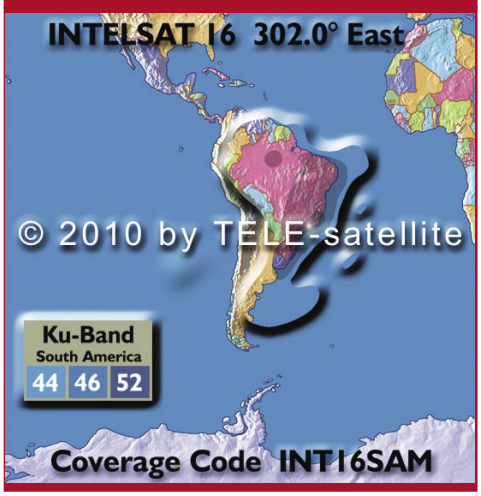


AMAZONAS 1
299.0 East — 61.0 West



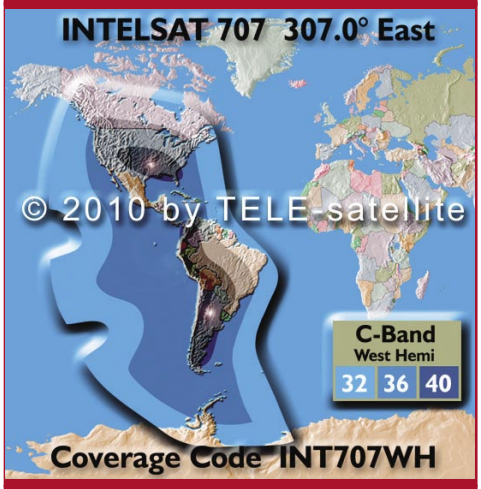
INTELSAT 9
302.0 East — 58.0 West

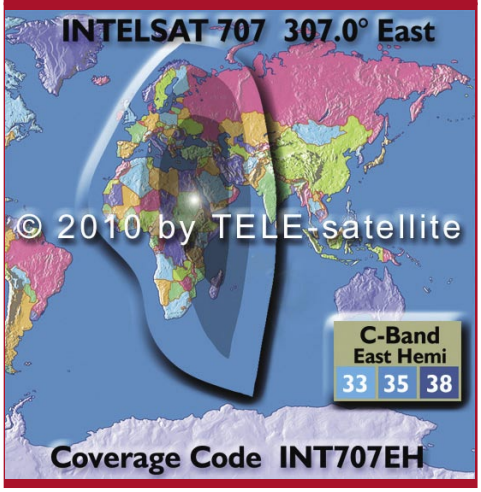


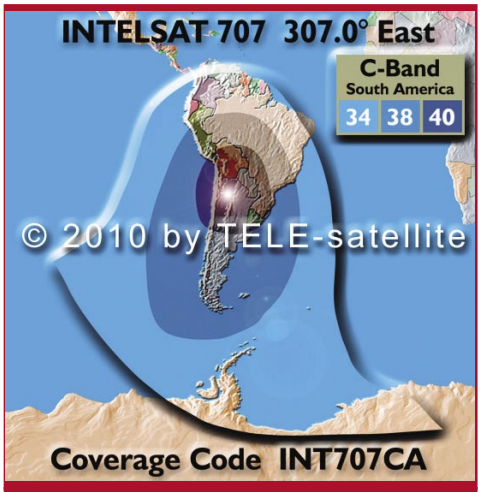


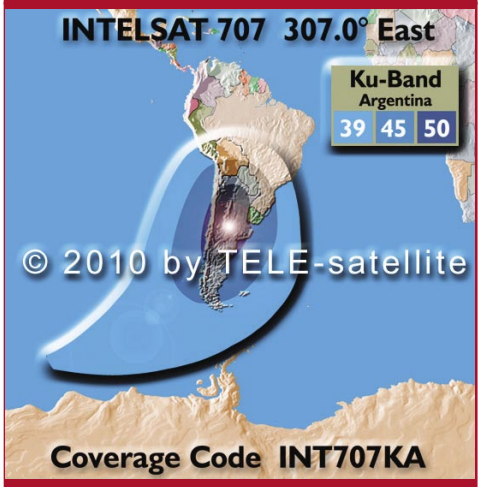
INTELSAT 805
304.5 East — 55.5 West

INTELSAT 707
307.0 East — 53.0 West

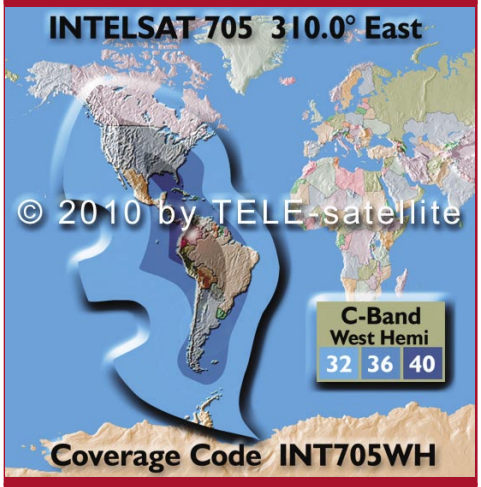




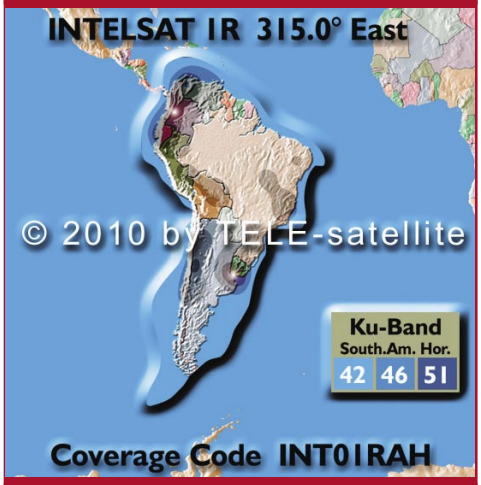


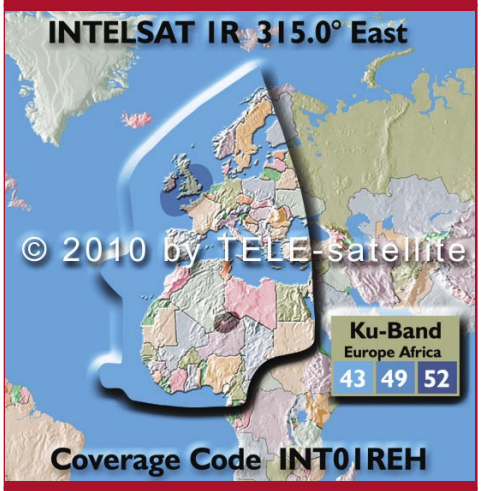


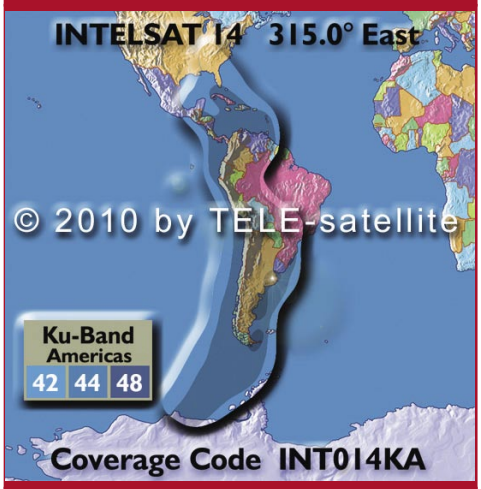
INTELSAT 705
310.0 East — 50.0 West

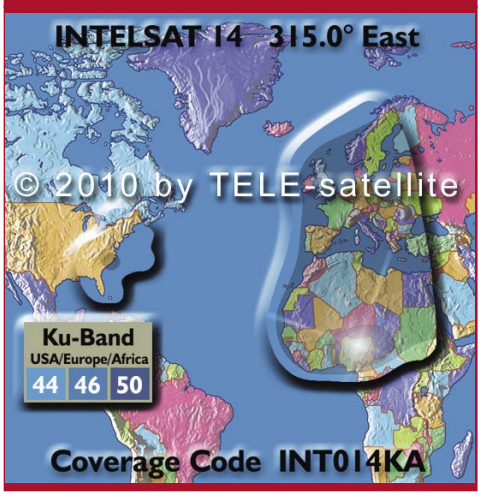


INTELSAT 1R
315.0 East — 45.0 West

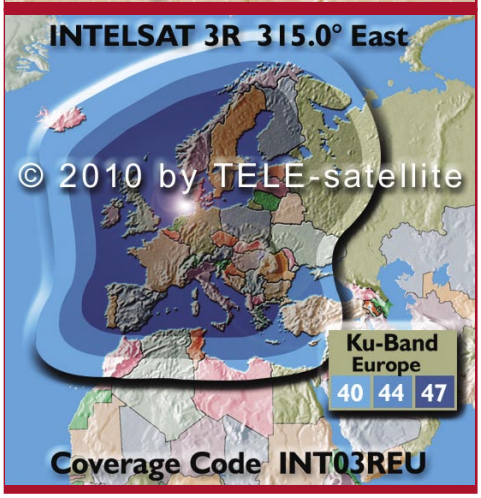




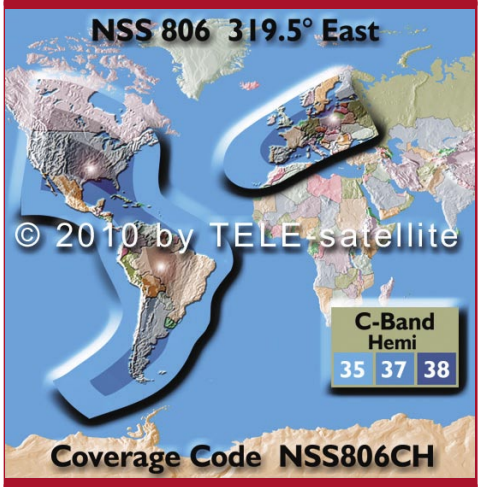


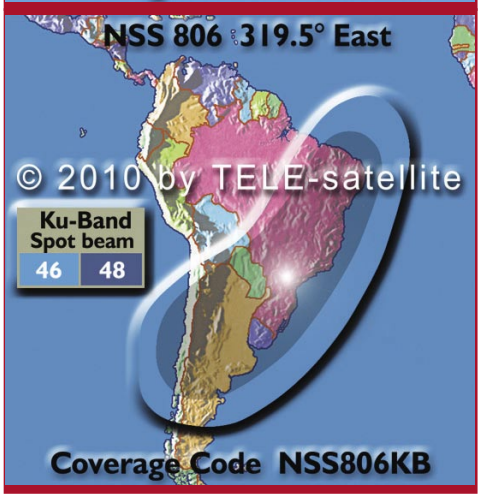


INTELSAT 11, 3R
317.0 East — 43.0 West

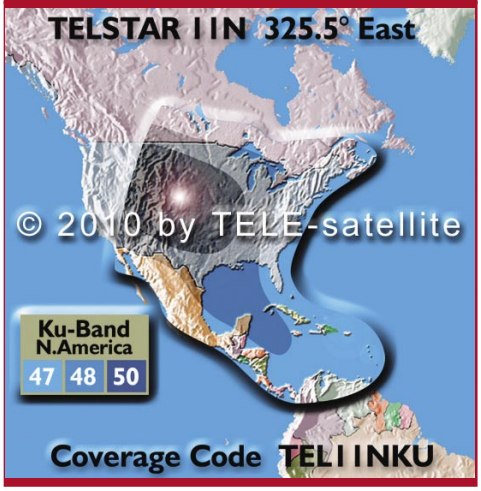


NSS 806
319.5 East — 40.5 West

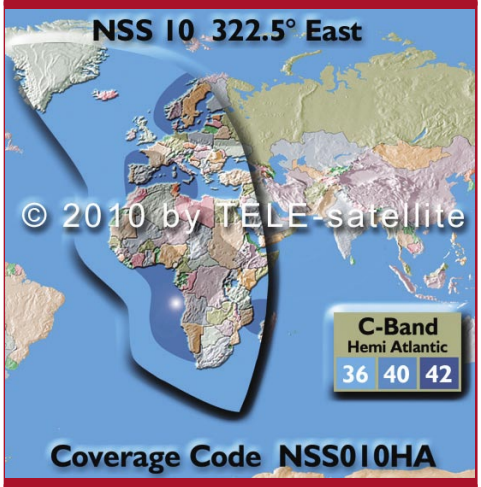




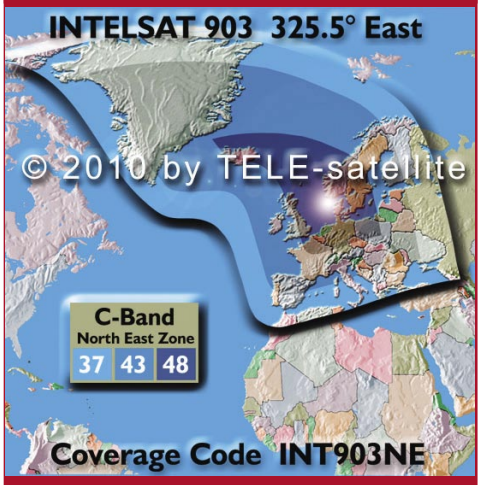
TELSTAR 11N
322.5 East — 37.5 West



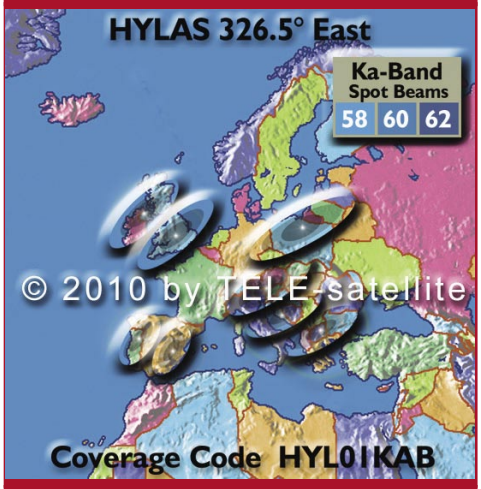
NSS 10
322.5 East — 37.5 West

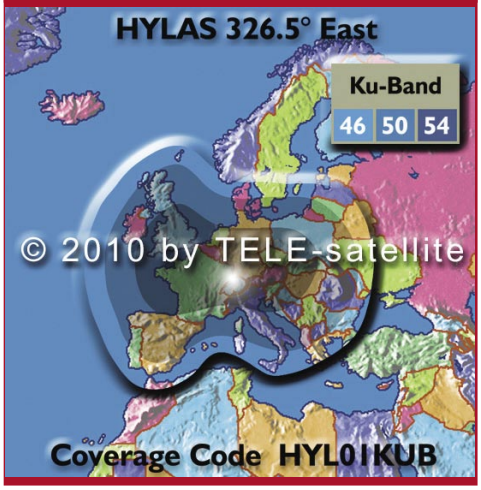


INTELSAT 903
325.5 East — 34.5 West

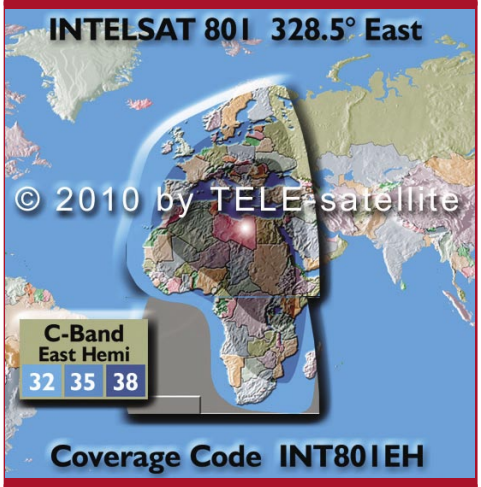


HYLAS
326.5 East — 33.5 West

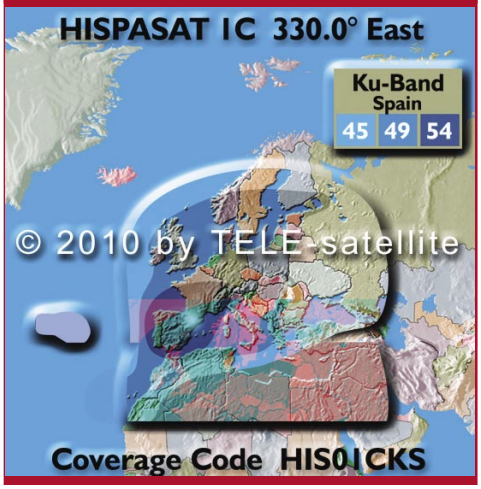


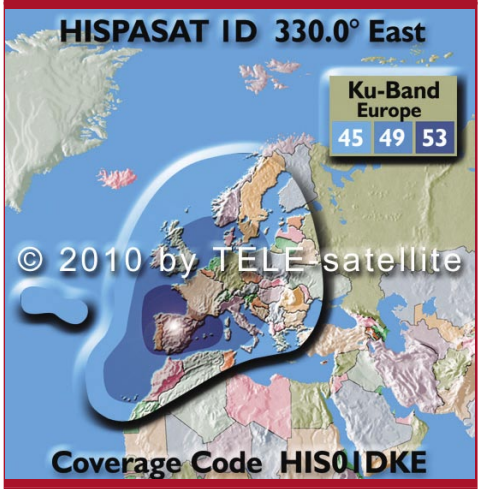


INTELSAT 801
328.5 East — 31.5 west

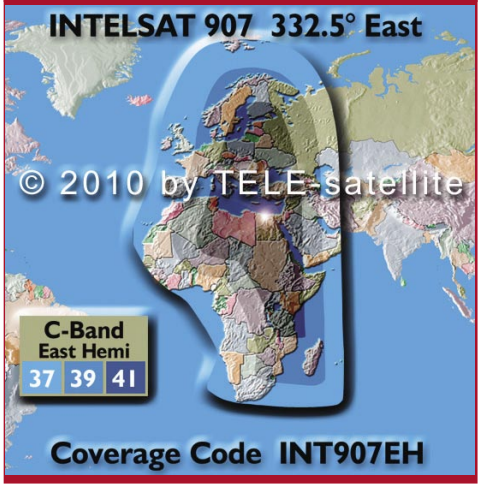


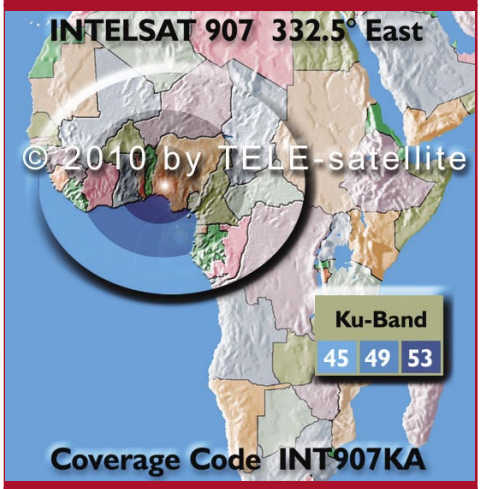
HISPASAT 1C, 1D
330 East — 30.0 West

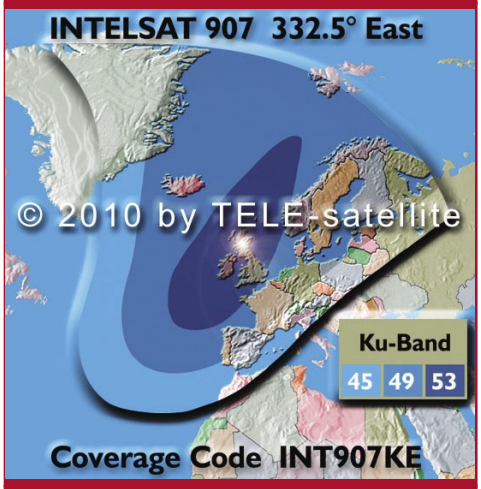


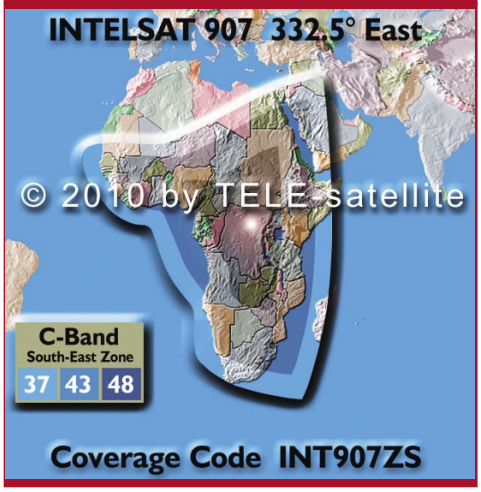


INTELSAT 907
332.5 East — 27.5 West

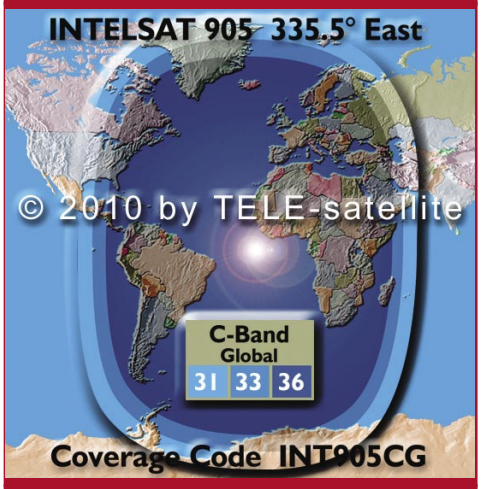


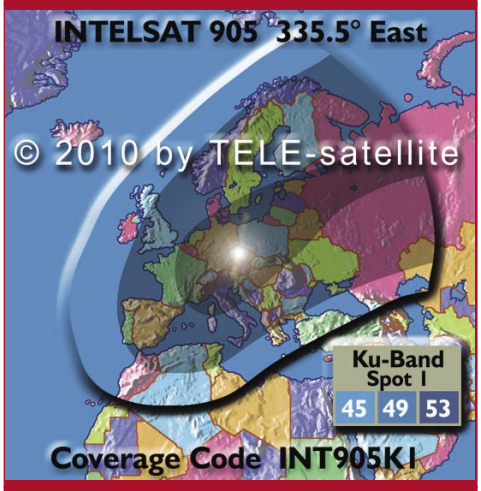


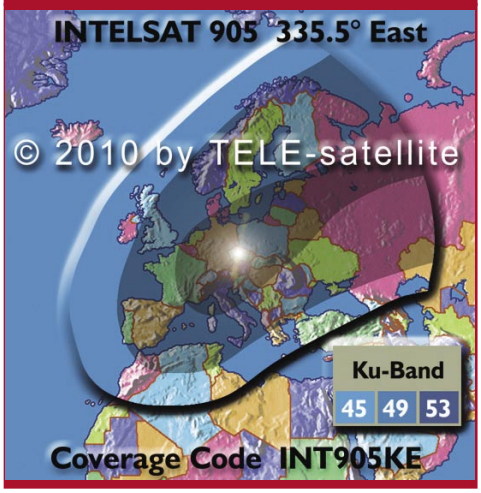




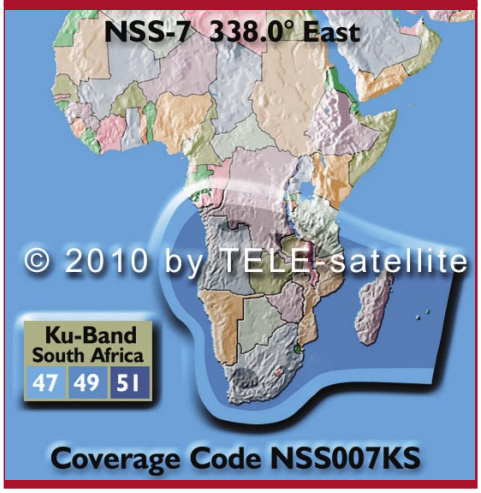
INTELSAT 905
335.5 East — 24.5 West

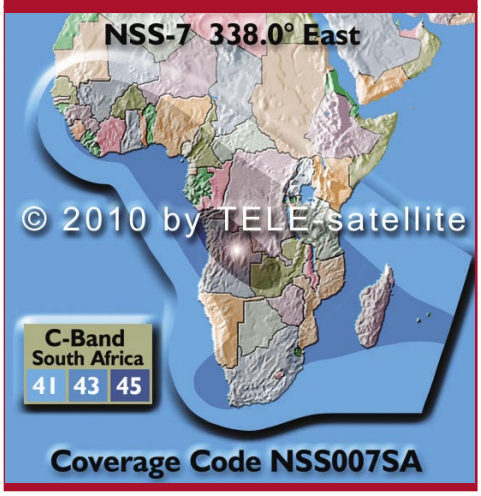




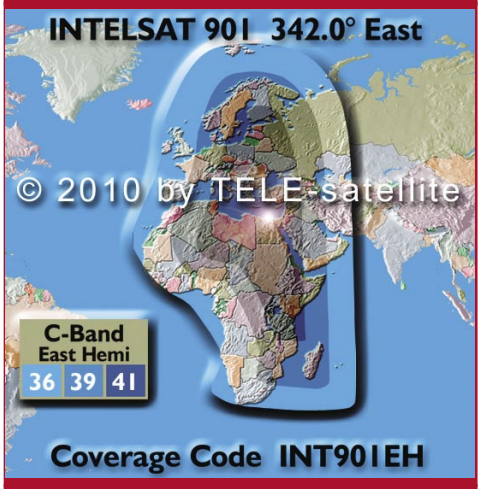


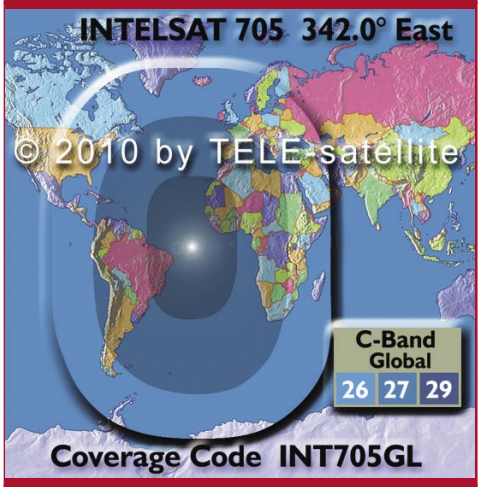
NSS 7
338.0 East — 22.0 West

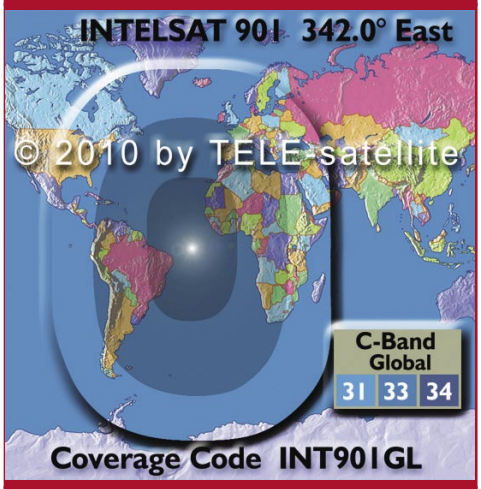


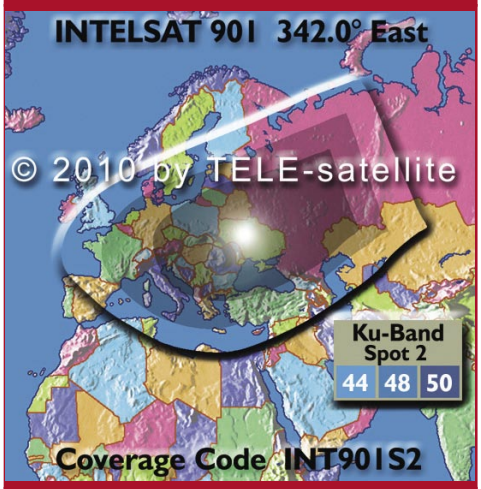


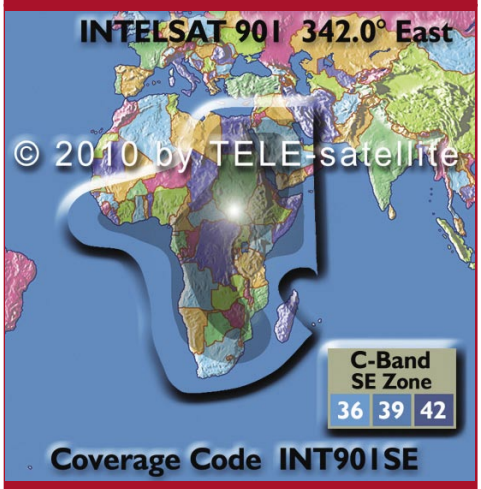
INTELSAT 901
342.0 East — 18.0 West





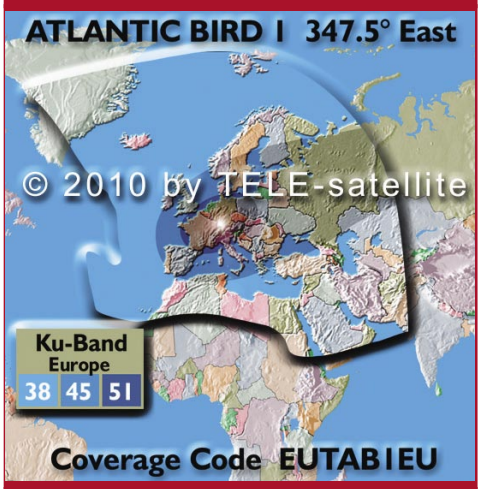


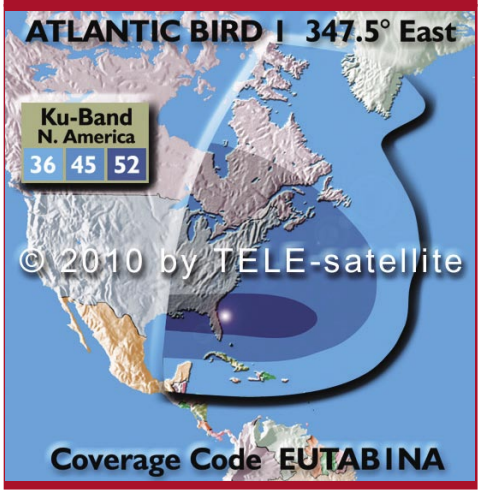


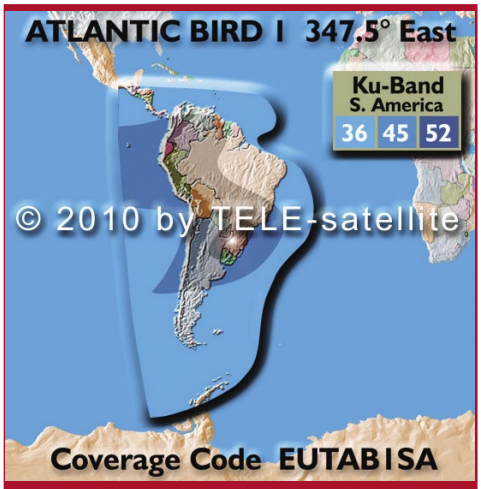


TELSTAR 12
345.0 East — 15.0 West

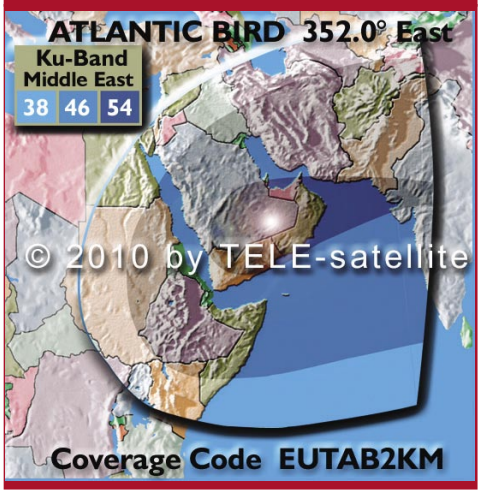
ATLANTIC BIRD 1
347.5 East — 12.5 West





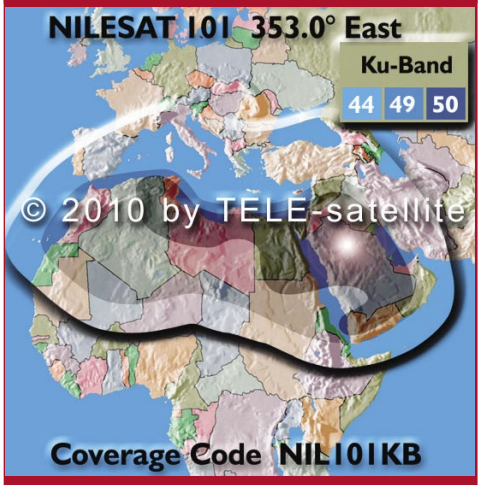


ATLANTIC BIRD 2
352.0 East — 8.0 West

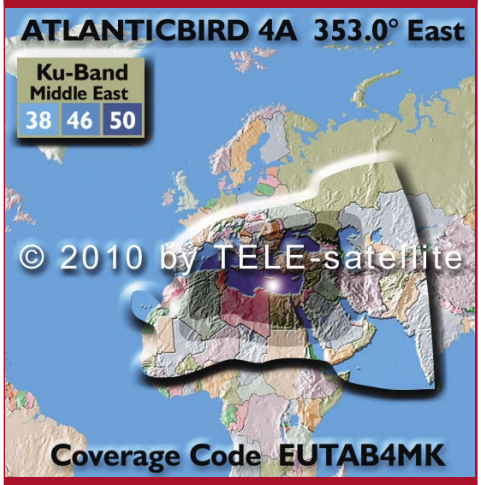


TELECOM 2D
352.0 East — 7.8 West

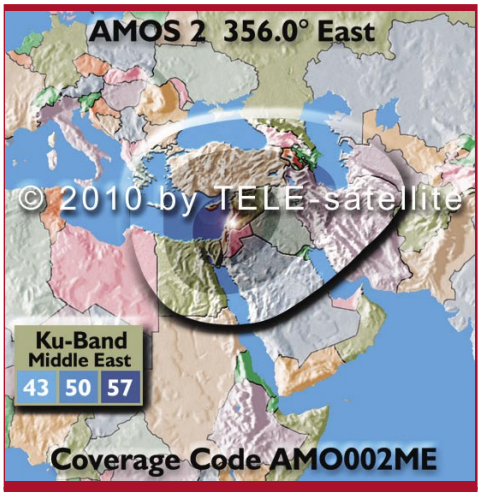
NILESAT 101, 102
353.0 East — 7.0 West

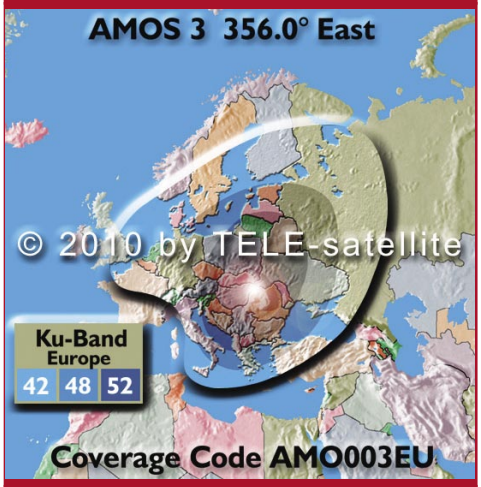


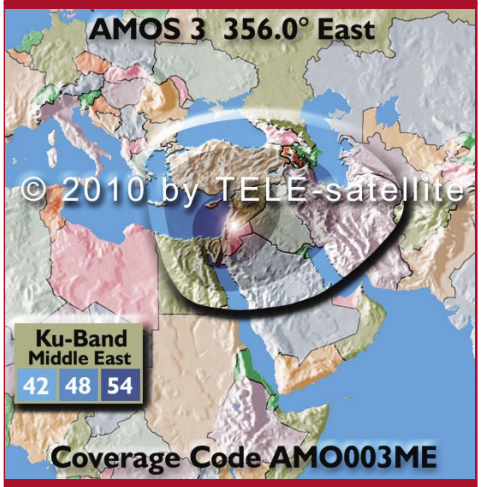
ATLANTIC BIRD 4A
353.0 East — 7.0 West

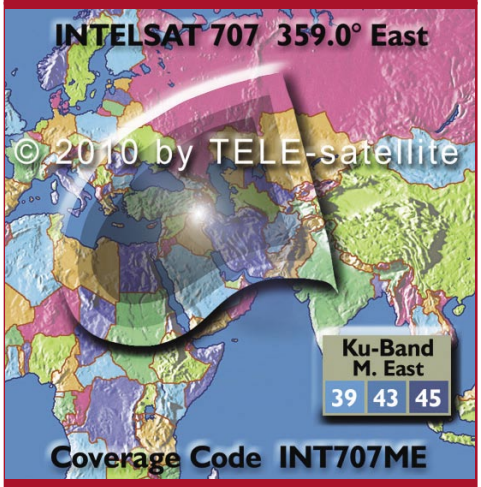


ATLANTIC BIRD 3
355.0 East — 5.0 West

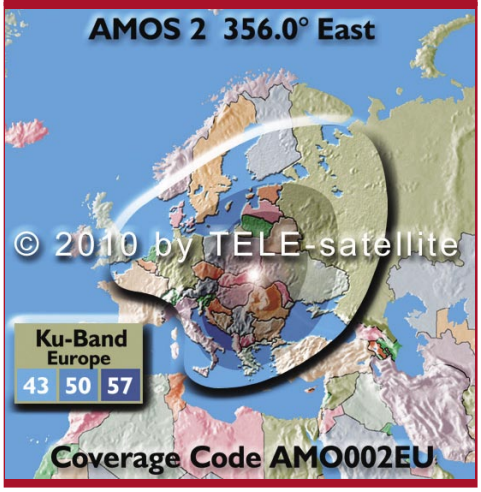




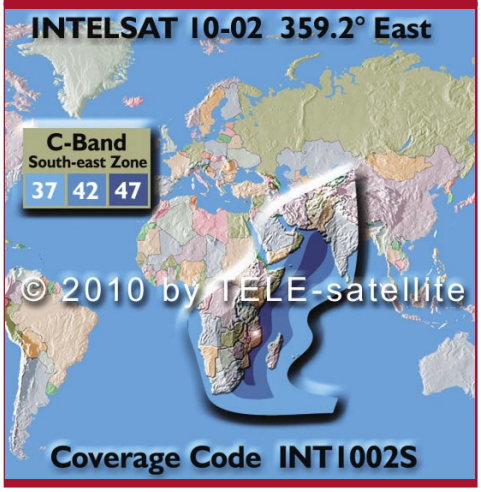




AMOS 2, 3
356.0 East — 4.0 West



INTELSAT 10-02
359.2 East — 0.8 West

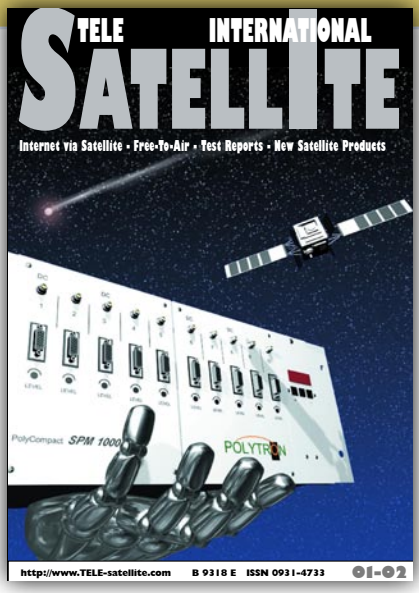


THOR 3, 5
359.2 East — 0.8 West

Edited by
Alexander Wiese

10 Years Ago

Travel into the Past
TELE-satellite Magazine
Issue 01-02/2000



Attisat FL 500

For many years, Greece was one of the countries in which satellite reception with smaller dishes was not really possible. Even with larger dishes the local geographical situation was of the greatest influence on the reception in many cases.
In practice, many Greeks just had to do trial and error for many years. The Greeks have always participated in our discussions about satellite reception, being prepared to try any construction to find a solution.
So it was just a matter of time before a company would come along and offer some real innovative products on this field. Attisat Satellite Systems is one of these very young companies, now introducing their first product.
The number of direct reception satellites throughout the world has grown over the last decade.
In almost every region there is at least one satellite to be found which has been built for direct reception. In the Mediterranean area these are the Astra, Arabsat, Nilesat, Hotbird and Türksat.

Attisat investigated the situation and developed a flat dish of 53cm x 53cm. A flat dish not only looks better, but in some cases it also performs better compared to normal parabolic antennas. In fact, a flat dish consists of many smaller dishes that are all catching the signal and supply it to one LNB. The efficiency of these dishes is around 85%.
The aperture angle is around 25% smaller compared to parabolic antennas. Also the side lobes are about 10dB lower, preventing the interference of nearby positioned satellites. Polarisation separation was measured lower than -30dB, which is absolutely better than average.

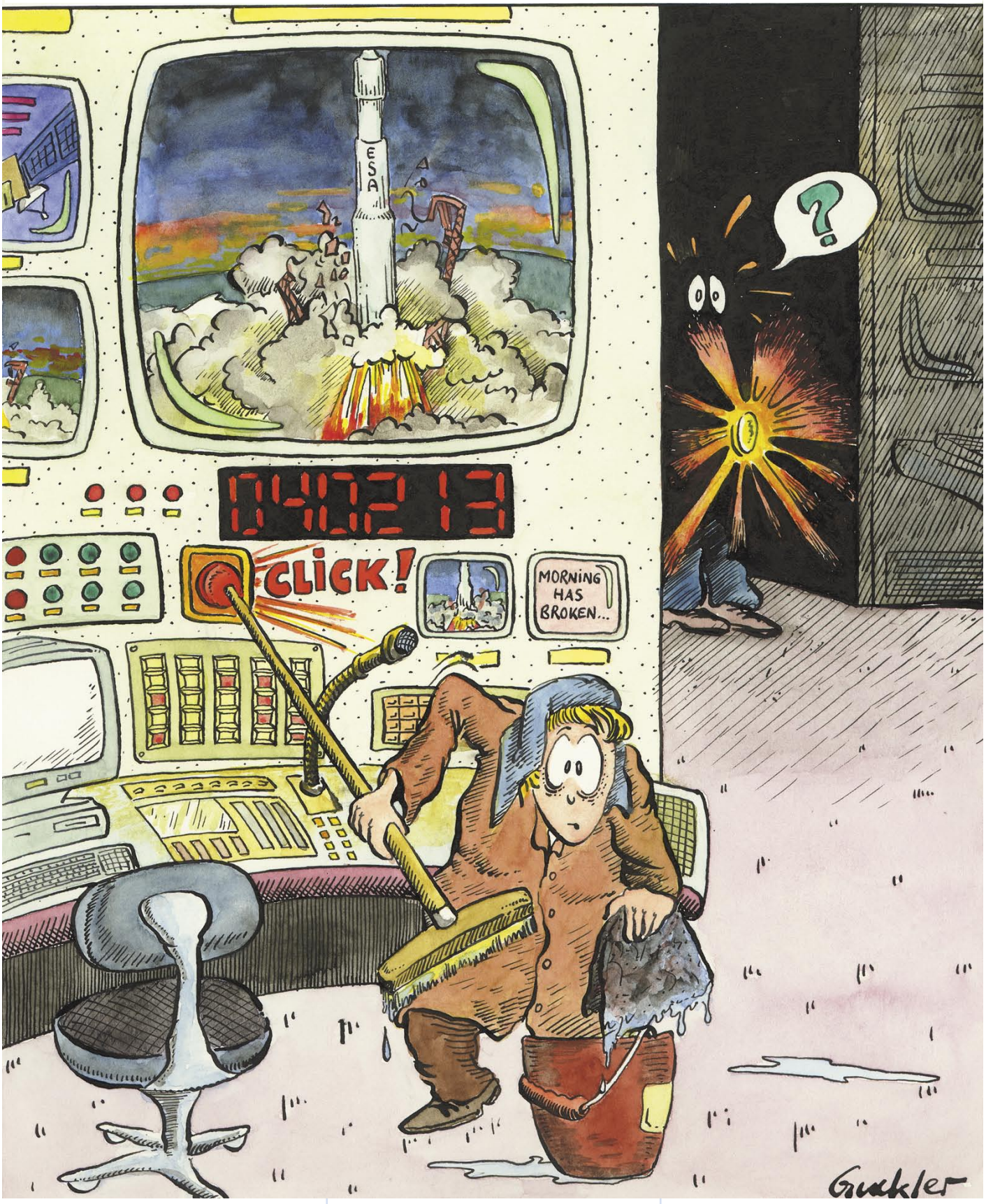
Star Sat SR-X40CI

Although analogue reception is still going strong, more channels are also becoming available on digital platforms every day. Where, for example, one year ago you needed a very large dish to catch some exotic channels (Thai-TV in Europe for instance,) a digital platform now brings these channels to your home with only a very small dish and a digital receiver. For every European it has now become possible to get the latest news directly from Chile or Argentina. Italians or Arabs living in the U.S. can now keep up with the news from home, thanks to digital technology. This requires a world-wide applicable receiver, offering not only Ku-band reception but C-band as well. And for those wanting to combine both C-band and Ku-Band into one LNB a dual polariser with servo motor comes in. This meant some extra requirements for the receiver, which has to be able to control the dual polariser as well.
First of all, FTA reception is important, but the possibility to choose a pay-TV package later on must be there. Therefore, a Common Interface is necessary. This can be used in Europe, Africa, Middle East and Asia. In the U.S., other access systems are in use.All these requirements mentioned above are met by the new receiver from Star Sat from Dubai. Since they are still searching for a European distributor we had to get our test version directly from Dubai.
The number of channels is really large: 2,900 in total (2,000 for TV / 900 for Radio.) And it supports up to 50 satellites. On the front, a green display indicates the channel ID, the programme mode and when in standby mode, it shows the time. Also located on the front is the standby button, and hidden behind a lid there are more buttons, enabling complete operation of the box.
Two CA-slots for encoding, Irdeto, Viaccess, Cryprworks, Conax and Nagravision are present. At the back, terminals make it possible to connect a servo polariser. The SR-X40CI would be the ideal receiver for motorised installations if a positioner was built-in as well. However it isn't, you will need a separate one.
Three scart connectors (European version) are present to connect a television set, VCR and external decoder (like for the RAI.) Additionally, the box features output in phono for both video and audio. The 0/12-Volt control signal can be used to operate external switches. A serial interface is present (RS-232, 9 pin) enabling a transfer rate of up to 38,400 baud. New firmware can be downloaded from the Internet or will be available on diskette. Even channel settings (including satellite settings) can be updated using the serial interface.
A built-in modulator integrates a present terrestrial signal to the receiver's RF output. It is software adjustable and can be set to any channel on the UHF band (for the European version in PAL D/K, B/G, I and SECAM L.) Another nice feature is the presence of a mains switch.

Nera World Communicator

With the bus to a crisis region? Well, the Greyhound won't take you there, but an ISDN bus from a Norwegian manufacturer of satellite telephones just might.
The Nera "WorldPhone" gave reporters, businesspeople and the military a means for voice communications from most places on earth, but there was still a need for transmitting higher bit rates with a small portable unit. So the idea for the new WorldCommunicator was born, and Nera is now introducing the result of this idea: it looks like a small flap-open laptop PC which provides an ISDN hook-up in all corners of the earth. This is possible thanks to the new strong spot beams of the latest generation of Inmarsat satellites. Four operative and eight back-up satellites delivering these strong beams are currently in orbit.

Now we know why the last rocket start happened at 4 in the morning...



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