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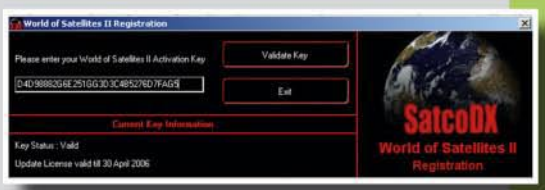

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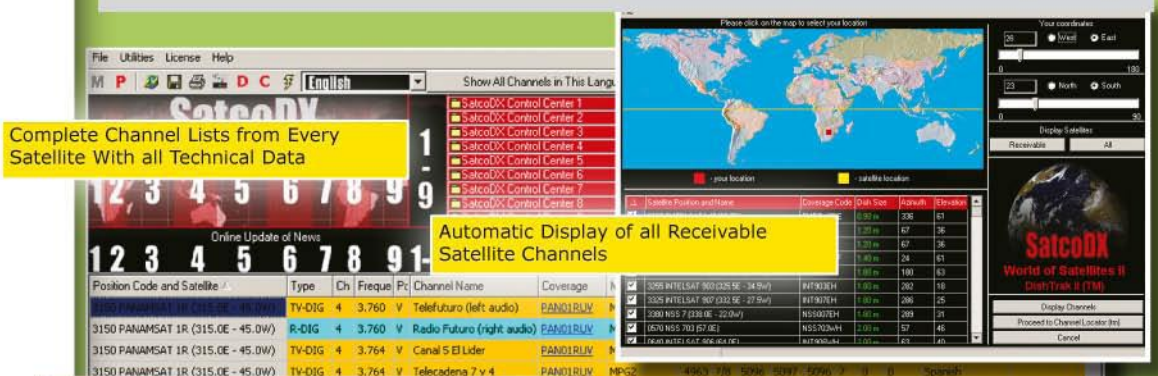

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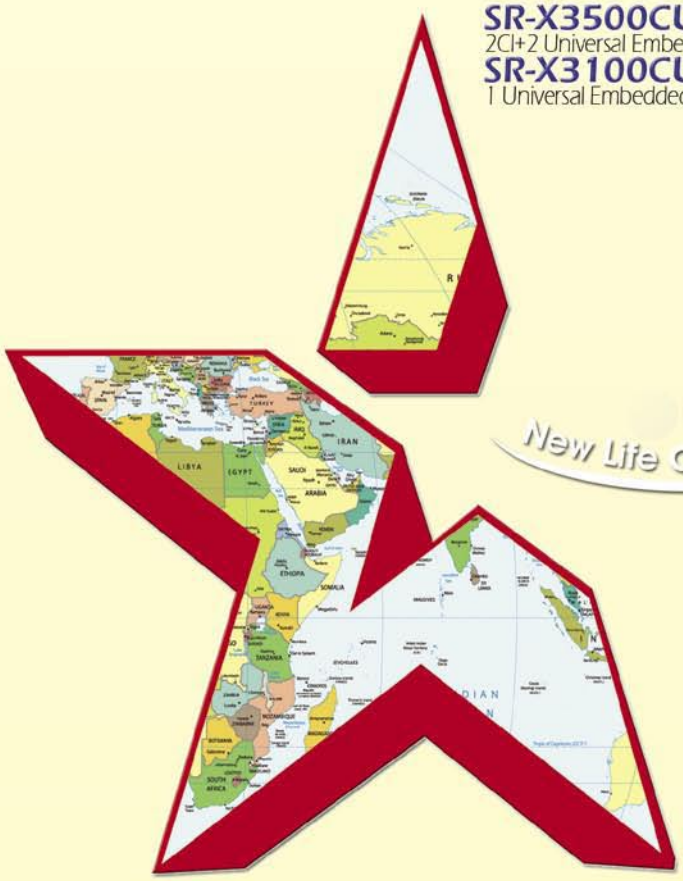

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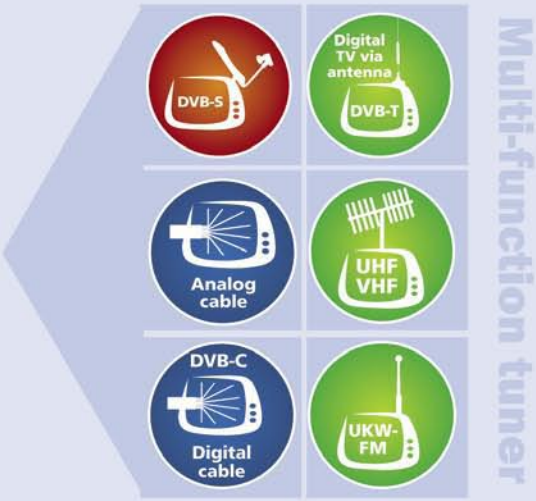

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Dear Readers

Yes, those were the days…in the analog age you could either receive something, or you couldn't. And when there was something to receive, then it was only one TV signal, or it was nothing. Either yes or no, black or white, 1 or 0. That was the analog age.

In today's digital age it is much more than just 1 and 0: there is an incredible variety. One TV signal is not necessarily the same as another; digital technology provides us with quite a few variants. As equipment users we may not notice this all that much, but as viewers it becomes much more evident, especially when the picture quality is something we may not have seen before.

In this issue of TELE-satellite, we will focus on picture resolution in the DVB-S standard. Instead of one defined norm like there was in the analog days, DVB-S offers a variety like that found in a supermarket. But as equipment users we really don't experience any of this. While most of the receivers on the market today can provide us the PIDs of a signal, there are (up until now) none that can display the picture resolution.

Picture resolution is what we as viewers actually see on the TV screen; the PIDs just make reception possible. Once the PIDs are entered, reception functions properly. But the picture that we would be looking at for years is not explained in any way. What the receiver does to present the picture to you is available in detail but what we see is kept a secret.

Programming providers are taking clear advantage of this. To save on transponder costs or to transmit more channels for the same amount of money, the picture resolution is simply reduced. The normal viewer has no idea that the providers can manipulate picture resolution. There is no hint of this given anywhere. The normal viewer just takes it as it comes and doesn't realize that it could be different.

In our report on page 46 of this issue we highlight the different variants. It is actually quite amazing: all satellite receivers can easily decode many of the different picture resolution variations. And in these same receivers there is no need to change a setting for this to work; they all produce a single video signal from these variants that every TV can correctly display. It doesn't matter if the pixels are doubled, or even quadrupled, everything is handled automatically. Yes, the developers of these DVB norms know all the tricks on hiding the important data. Picture resolution is certainly the most important when it comes to a TV signal.

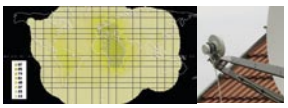
Recently, the SatcoDX channel lists have started including the picture resolution of a satellite channel. And as time goes by, more and more SatcoDX scanning stations will switch over so that eventually anyone who wants to know it will be able to find out what the picture resolution is of every channel.

This now gives you a new sorting capability: you can now search for programs that transmit in higher quality. You might then also be able to see that higher picture quality may go hand-in-hand with higher programming quality.

Enjoy your high-quality TV!

Alexander Wiese

P.S. My favorite radio station of the month is Love Radio (SIRIUS 5E, 11.766H, 27500, 6163), Ukrainian soft hit parade with a few news breaks and hardly any commercials.



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Thank You, ARION!

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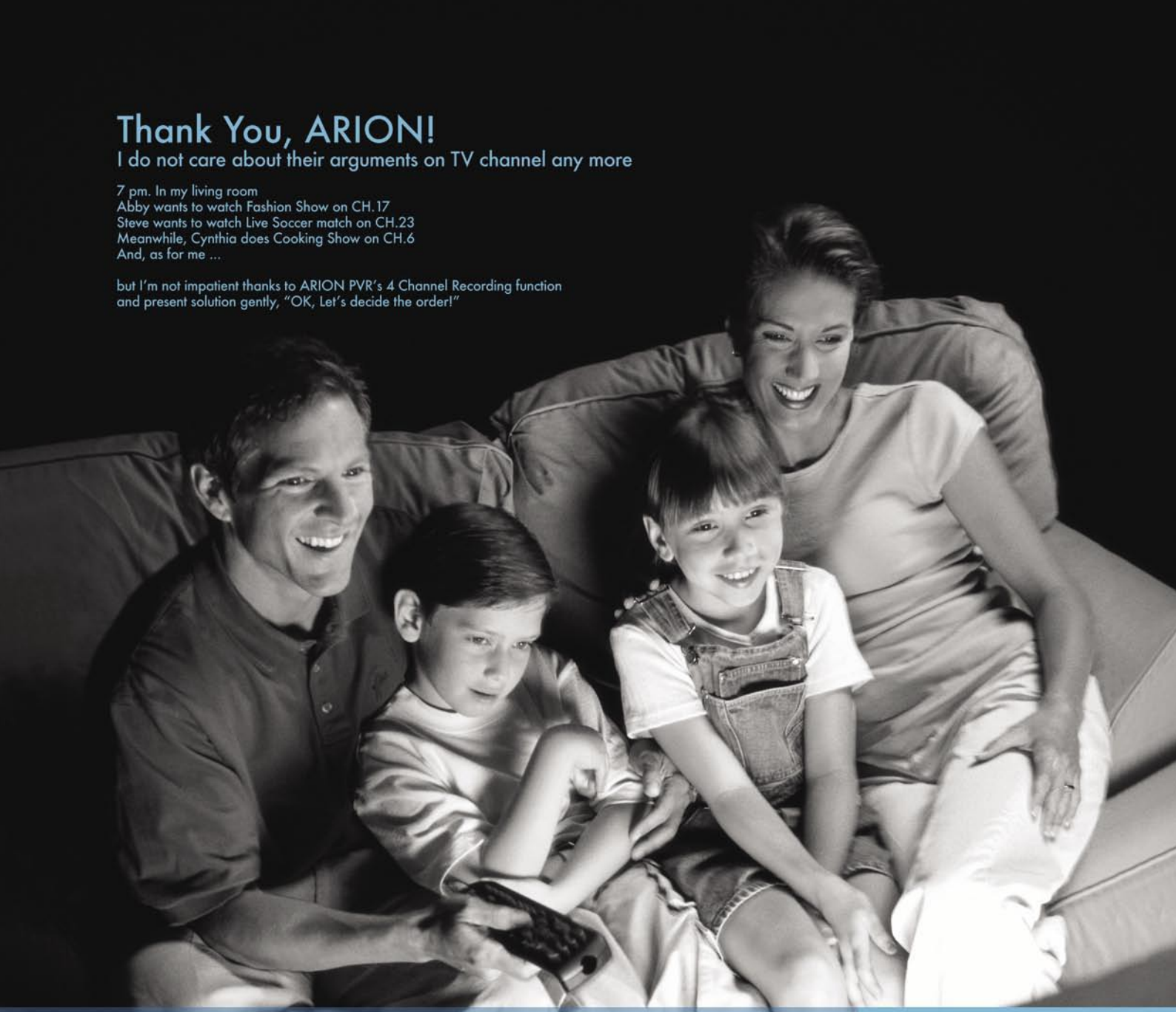

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Basic manual for satellite receivers

Heinz Koppitz

It happens very often that you buy a cheap receiver without a manual or that you simply loose the one that was attached and now you don't know how to operate your receiver. The dozens of emails we receive every day in our office speak a clear language and many users have problems to find out how to look for new programs, sort or delete them without the manual.

This article will try to help you finding and using the basic functions of your receiver. After that, you should be able to even use the more specific feature, by simple try and error.

Satellite receivers are designed for television signal reception, which means that they have to be connected to a TV set, which they can use as OSD (on screen display). As a matter of fact, the front sides are mainly very poorly equipped and just contain a few buttons and a segment display, only very few receivers can show channel names and other information via an alphanumeric display, sometimes a display is missing at all. So if you are a radio freak, you'll have to turn on your TV for most receivers to know which channel you are currently listening to.

The front sides are mainly very poorly equipped

Some receivers offer a few buttons to operate the unit without remote control, but these buttons are just duplicates of the ones available on the remote, with one exception: Some of them contain a manual power on/off button, which sometimes can also be found on the back side. The other buttons are normally just channel up/down and maybe sometimes volume up/down. If a special button to enter the main menu is available, it's in most cases not very useful, because there are no numeric keys available on the receiver's front and so you can't use most of the menu entries at all.

All available connectors are on the back side

Luckily there's one point, where all receivers are similar, they offer the available connectors (which are also standardized) on the back side. Normally, the receiver is even ready for use if there are just the signal input and the video output connected.

- The antenna cable has to be connected to the signal input, which is normally labelled IF Input or LNB-IN.
- Your TV gets connected via the Scart plug (in Europe)
- For all other regions, you can use the video output via the yellow RCA plug (e.g. USA)
- Some receivers also offer an RF output in the UHF range
- The audio signal e.g. for radio output can be taken from the white and red RCA plug (Stereo)
- Your PC can be connected via the 9 pin RS232 connector
- Sometimes a manual power switch is also available.

Connect your TV via the Scart output

As soon as the receiver is connected via the IF input with your antenna and via the Scart output with your TV, you can turn it on and you should immediately see some pictures.

If you use an older TV set which has no Scart or video input, you have to connect it via your receiver's RF output. In this case you have to setup the correct channel on your TV first (in Europe it's normally UHF channel 38). Sometimes it happens that the receiver's modulator and the TV use different modulaton types and the TV has to be setup first. In this case you'll need another TV to setup the receiver correctly, before you can connect it with the other one.

The Scart and video input should always offer a picture and if you are very lucky, your receiver was pre-programmed with a channel list and you can immediately start zapping. However, if there's just some strange message on the TV, don't panic, some receivers need a few seconds before they show the first channel.

In general we recommend that you perform a complete new system setup, this helps you to setup the receiver correctly and get all the new available channels, but please be aware that you need your original remote control to use all the special features of your device.

To open the main menu, try to find a button, labelled with Menu or Setup on your remote. Sometimes the main menu also pops up if you press the OK button.

The installation procedure is basically the same with all receivers, but the necessary menu entries are sometimes labelled in a different way.

1. Search (adjust satellites, select/entertransponders, channel search)
2. Edit (antenna, transponders, group/sort/delete programs)
3. Basic settings (language, video output, time setup, PIN)
4. Information (status, factory reset, software upgrade, games)

First of all you

A simple type remote control

Standard plugs for LNB and Audio

Can be found with many receivers: RS-232 plug for programming via PC

Common with European receivers: the two SCART plugs for connecting TV and VCR

UHF connectors (left) became a rarity nowadays, instead the S/PDIF plug is more common

should setup the OSD language to English. This helps you to find the correct buttons on the remote control, which are normally labelled in English. Furthermore you can prevent some confusion, because it happens very often that translated menu entries contain strange and misunderstanding text. Also the manuals contain sometimes lots of translation errors, which can make it quite difficult for the beginner to understand their meaning.

After setting up the OSD language, some other basic settings like time setup or video output have to be adjusted. Some receivers prompt you to enter a pin code to access these menus, which is normally 0000 or 1234.

In the next step, it's time for cleaning up. If you bought a used receiver, there might be hundreds of old channels, but even a new receiver might contain some over aged data. In this case it's very useful to perform a complete factory reset.

The important factory reset is normally available in every receiver

The factory reset can be found on nearly every receiver and normally it does only reset channel data and some user settings, the so very important transponder and satellite data will not be deleted, because the receiver would be useless without them. However, considering that the receiver was manufactured a few months or even a few years ago, these transponder data might not be very up to date and you will probably have to add new transponders, which can be found in the SatcoDX lists at www.satcodx.com .

Enable the „FTA only" option during channel search

If you own a FTA only receiver which has no CI slots or card readers, it's very useful to reduce the channel search to free programs only. Normally this can be done in the search menu by selecting the option „FTA only". This helps you to keep control of your channel list and if you scan a few different satellites, you might fill up the receivers channel memory with hundreds of unwanted and encrypted channels and loose space for other free to air programs, because most receivers channel memory is limited to 3000 TV and 1000 radio channels.

Right now, the most important functions are setup and you can start fine-tuning your receiver.

Update your receiver via PC and the Internet

It's much more comfortable to setup the receivers channel list on the PC than on the unit itself. Just connect your receiver and the PC via a RS232 cable (cross over cable) and use a PC program like SetEdit or some other program offered by the manufacturer to do the job. Sometimes these programs are capable of directly importing new channel lists from e.g. SatcoDX.

Nearly every manufacturer offers a homepage on the internet and normally they are really worth a click. If you can't find the one of your receiver's manufacturer, try some internet search engines and encyclopaedias like Google or Wikipedia, but normally you'll find the correct site by entering the manufacturers name with .com or with the local country extension.

Be careful when upgrading the receivers software

Finally I have a very important warning for you: Manufacturers offer from time to time new software updates to fix newly discovered bugs or to enhance the receiver's functionality. If you are lucky, your receiver can update its software automatically via satellite, but most of the older models don't offer that option. You have to visit the manufacturer's website, download the software there and install it to your receiver via the RS232 connector and your PC. In this case, please read all the information provided by the manufacturer on the website and check if you are really using the exactly fitting software for your receiver. If you install the wrong software, your receiver might get destroyed.

The stronger, the better – it that always true?

Probably all our readers are aware that in order to have a reliable satellite reception, we need to have strong enough signal at the receiver input. Generally, the stronger the signal, the better its quality. **Always?**

The quality of signal is related to the so-called signal-to-noise ratio S/N. For digital signals, we more often use the carrier-to-noise ratio C/N but its meaning is practically the same. Every satellite signal except for the useful data has some amount of noise. We would like to have as much useful signal and as little noise as possible. Probably you know that to improve the signal to noise ratio you may:

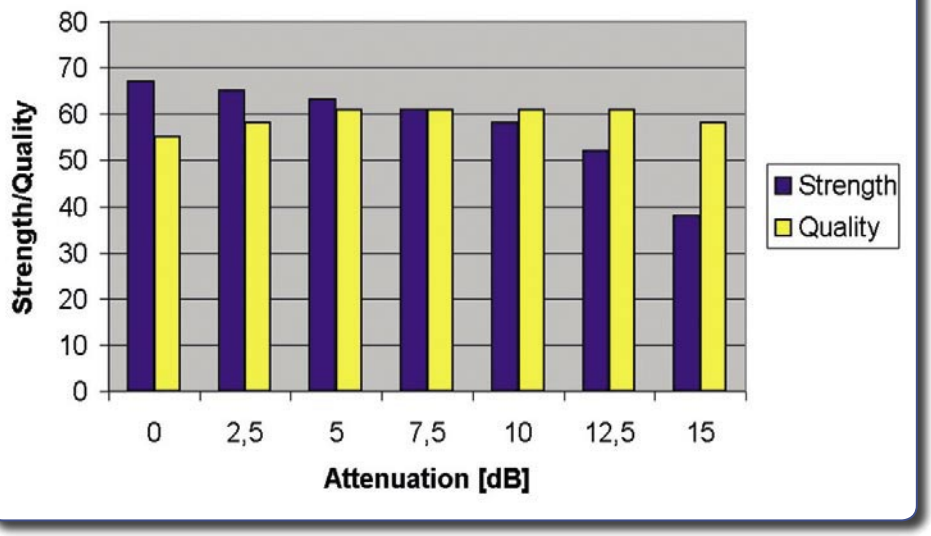
- increase the size of your dish
- replace your current LNB with a better one of lower noise figure.

However, there is yet another trick that may sometimes be used. It is relatively easy to try and we will not have to spend a fortune on that.

Those of our respected readers who have some experience with the amateur radio have probably already guessed what I aiming at. This is about reducing the sensitivity of a receiver. Ham radio receivers and transceivers quite often have buttons to either switch off their front-end RF amplifier or switch on the input signal attenuator. Sometimes, both functions are available. We are speaking here about reducing the input amplifier sensitivity by 10-20 dB.

How that can be? When a number of strong signals are present at the receiver input, they interfere with one another and produce extra noise. This phenomenon is called intermodulation. Some receivers are more immune to intermodulation, the others are less immune. There are no electronic circuits that are absolutely protected against this. Moreover, the more sensitive we make the receiver, the less protective against intermodulation it becomes. Now, if among the strong signals, there is a weak one, its quality is decreased by the noise generated by its stronger companions. What we can do? Optimally, we would like to attenuate the "strong bullies" and preserve the strength of the "weak guy". Unfortunately, this is very difficult to do. What we can do very easily, is to attenuate all signals by a few decibels in hope that this will reduce the intermodulation but not make the weak signal too weak for reception.

Strength	67	65	63	61	58	52	38
Quality	55	58	61	61	61	61	58



Does it work that way in satellite reception too? That's what we wanted to test for you. We added a manually adjustable 20 dB attenuator at the receiver input. We aimed the dish to Hotbird satellite which has a lot of strong transponders (when received in Europe). After traveling among transponders, we found the weakest one. In our case, it was 12303 V, SR=27500, FEC ¾. The table and the chart present the readings of our receiver strength and quality indicators taken when we were turning the knob of the attenuator. We used approximately ¾ of its full range, what means 0-15 dB.

As you can see, the signal quality actually improved when we added some attenuation. Even at -15 dB, the signal was still better than when fed directly. This confirms that the satellite TV receivers are also not free of the intermodulation problem.

However, we must emphasize here that it was the ONLY signal on Hotbird that behaved in this way. All others (which had initial quality reading >60%) were simply maintaining its initial quality reading and were getting worse for bigger attenuation setting.

So, adding an attenuator at the receiver input is not a universal solution. However, if you are (or want to be) a DX-er, you should have an attenuator in your drawer. If you want to pick a weak signal surrounded by the strong ones and its quality is not good enough to produce a stable video, before climbing to the roof to re-align your dish, insert an adjustable attenuator before your receiver input (LNB-IN). Turn its knob and observe the quality reading - you may be surprised!

Technisat Digit 4S

Small Jack-of-all-trades

It was always the main target of the German company Technisat, to provide their costumers with easy to use, but powerful receivers. A few days ago, parcel service delivered the new Digit 4S to our testcenter, and so we tried to verify, if this claim is really true.

At the first look you notice immediately the receiver's small size, it's just 205x130x35mm, which let it appear quite dainty, and so it will certainly find its place in every living room shelf.

Objectively the new Technisat receiver does not offer as much connectors as some rival products might do, but considering the small size, the manufacturer did his very best to offer as much connectors as possible and all important ones are available. Because the Digit 4S is a FTA receiver, there are no CI slots or card readers. The attached remote control is very handy, it's labelling is very clear and the buttons offer a comfortable pressure point. In general, workmanship of this receiver leaves a very good impression. The attached user manual is available in many different languages, always fitting for the country of delivery.

Everyday use

What is more annoying than a new device whose handling is so very complicated that you despair, and what's less funny than installing a new satellite receiver and having to read a huge manual? For years, Technisat is successfully trying to prevent their costumers from these experiences, and the new Digit 4S is no exception.

After turning on the receiver for first time, a nicely designed installation wizard appears and helps the user with small and easy to understand steps through the entire setup procedure. First of all, it shows all available OSD languages, which are English, Italian, Spanish, Greek, German, French, Turkish, Swedish, Portuguese, Persian, Polish, Czech, Hungarian and Dutch, so every user should find a suitable one.

The antenna configuration offers by default the in Europe very common ASTRA and HOTBIRD reception. If you want to receive additional satellites, or if you use special DiSEqC parameters, you can also set them up directly during installation. Finally, the receiver checks if there's a software update available via satellite, and he asks the user to perform a channel search, either for all available programs or just the free to air ones.

If you prefer, you can also use the ISIPRO system, which offers a predefined channel list with over 370 entries from ASTRA 19.2° east and HOTBIRD 13° east. The clue is that this channel list can be updated directly via satellite and you'll never again have to worry about not-active channels in your list any more.

Basically, the receiver is now ready for use, special options like the video output signal or special DiSEqC parameters can be setup via the main menu, which is splitted in 6 big categories. The Digit 4S supports CVBS, RBB and S-Video output and it handles PAL and NTSC signals.

The pre-programmed satellite list is not very up to date and contains just 20 European satellites, but the user can add 13 manual entries. The Digit 4S supports DiseqC 1.0, 1.2 and 1.3 (USALS). Pleasantly, it also supports the Technisat Multytenne, which we already introduced in an earlier issue of TELE-satellite magazine, and which enables you to receive ASTRA1 19.2° east, ASTRA3A 23.5° east, HOTBIRD 13° east and ASTRA2 28.2° east at the same time, as well as the DisiCon LNB series (unicable solution). Furthermore, the corresponding LOF values for C-band and for circular polarized LNBs are preprogrammed and if you want to connect your S-band antenna, you can enter the correct LOF values manually.

Technisat equipped this receiver with channel memory, capable of handling 5000 entries, which should suffice for an FTA receiver, even if it's connected to a motorized antenna.

When we started the auto-

matic channels scan, we felt a little bit disappointed, because it's working very accurately but also very slow, and it took the Digit 4S nearly 7 minutes to scan the ASTRA1 satellites and a channel scan on a 80 transponder satellite took nearly 8.5 minutes, which is certainly no new speed record. Anyway, the channel scan feature is not so

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very important, considering the fact that the ISIPRO system can be used, which offers an up to date channel list without having to scan for the programs first. For the advanced users, the receiver offers the possibility to enter the correct PID values manually.

Another highlight of the DIGIT 4S is the automatic EPG scan. It allows the receiver to load all available EPG data from selectable programs and store them locally, so if you zap to a channel and press the EPG button, the EPG data are available in the blink of an eye.

Also in every day use, the receiver leaves a very good impression. Pressing the OK button opens the channel list, which is very nicely designed and shows you the current EPG data (if they are transmitted by content provider) for every channel and a small preview window. Of course, you can reduce the channel list to your favourite channels or you can sort it by content providers.

A highlight of this receiver is also the channel change speed between two programs on different transponders, which is far below one second! After every channel change, the receiver shows an info bar, which is a little bit oversized, but it contains besides the EPG data a lot of important information on current channel (Teletext, AC3 sound, subtitles etc.).

In comparison to other receivers, the Technisat Digit 4S is one of the few FTA receivers, whose EPG functions are really working perfectly, while a lot of other receivers sometimes disappointed us with this feature.

The tuner used by the Digit 4S is very sensitive, and can handle signals with a C/N between 4 and 5 dB without any problems. Furthermore, SCPC signals with very low symbol rates are no problem at all, our test transponder on the PAS12 45° east with a symbol rate of 1320 Ks/s was handled successfully.

30 different timer entries and a built in Teletext decoder round up the perfect picture of this new receiver.

Expert conclusion

Thomas Haring
TELE-satellit
Test Center
Österreich

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The Technisat Digit 4S is a very easy to use but powerful receiver and even for absolute beginners it's no big deal to use it. Because of his solid function and thoughtful features it's the ideal receiver for every day use in your living room. Considering its small size, the Digit 4S can also be used for camping trips or for your weekend house.

\-

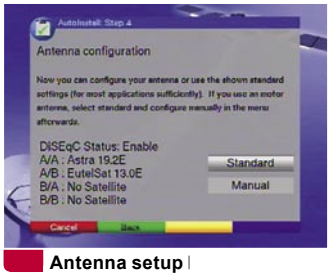
None

TECHNIC DATA

Manufacturer	TechniSat Digital GmbH Julius-Saxler-Straße 3 TechniPark D-54550 Daun / Germany
Homepage	www.technisat.com
Fax	+352-710-707959
Contact	international@technisat.com
Model	Digit 4S
Function	Digital FTA satellite receiver
Channel memory	5000
Satellites	33
Symbol rates	1-45 Ms/sec.
SCPC compatible	yes (tested with 1,327 Ms/s)
USALS	yes
DiSEqC	1.0 / 1.2 / 1.3
Scart connectors	2
Audio connectors	2 x RCA
UHF Modulator	no
0/12 Volt output	no
Digital audio output	yes (optical and coaxial)
EPG	yes
C/Ku-Band compatible	yes
Power supply	180-250 VAC, 50 Hz

Installation wizard

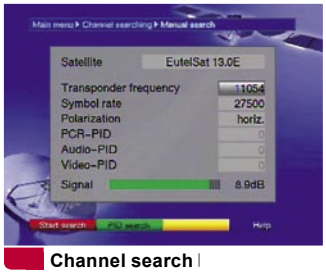
Info bar



Antenna setup

Main menu

EPG



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Matrix Java

A Slim Blind-Scan FTA Receiver

The company PT Stella Satindo, based in Jakarta/ Indonesia, offers a wide range of satellite equipment under the brand name of Matrix. The Indonesian office of TELE-satellite had the opportunity to test one of their digital satellite receivers, a model called Matrix Java.

The receiver has a very elegant design, with silver casing and black front panel. It offers a signal indicator LED next to its channel display. A mains switch is located at left side of front panel, and six small buttons on the right allow for full operation control: channel up/ down, volume up/down, Menu and OK. The receiver comes included with RF and AV RCA cables.

Only three different menu languages are available: English, Chinese, and Indonesian. The user manual that came with the test unit was written only in Indonesian language. It has many pictures and is quite useful for beginners, and explaining all the basics.

Everyday Use

Matrix Java comes preprogrammed with the TV/radio channels from 4 satellites, and is ready to be used with 4 LNBFs on a 1 dish system, as this is commonly used in Indonesia: controlled by a DiSEqC 1.0 switch the satellites are PalapaC2 (113.0E), Telkom1 (108.0E), Asiasat3S (105.5E) and Asiasat2 (100.5E).

We were happy to note the fast channel switching speed. It only needs 1 second to wait before the selected channel appears on the TV screen. Pressing the Info button will show all the technical parameters for the selected channel: including PID's for video, audio, PCR, and teletext, if available.

All typical LOF are supported, and less typical values can be entered manually, which allows for any signals in the Ku, C and S-bands. Universal LNBF, DiSEqC 1.2 and USALS are not supported.

A test on a S-band satellite (Cakrawarta at 107.7E) could be handled with no problem by the Matrix Java, as well as a Ku-band satellite (Measat1 at 91.5E). Despite that these two satellites contain encrypted pay-TV channels, and the Matrix Java is a FTA receiver only.

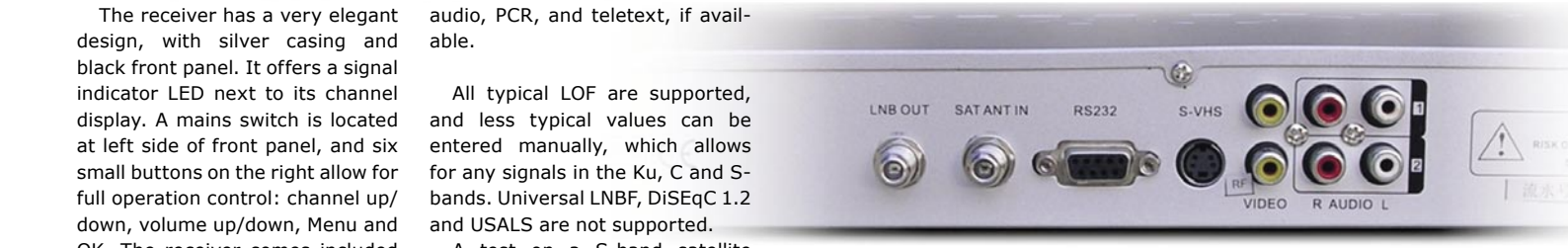
Blind Scan

Unfortunately, the Matrix Java has no transponders list, but this weakness is replaced by a blind-scan feature. This blind scan process has two steps. First is to scan the active transponders, and then to scan the channels.

In our test, the channel scan with blind-scan feature was quite fast. The values of the found symbol rates are somehow higher than expected (plus 7), accoridng to what is listed in SatcoDX Satellite Chart. We test the Matrix Java on PalapaC2 (113.0E), and found that it could not get all the active transponders, some weaker signals were passed.

Conclusion

With the ability to blind-scan, this receiver could very quickly update the channel lists, without having to manually add any channels. This Matrix Java is a cost effective choice for beginners, and a very good choice as a slave receiver for feed hunting DXer's.



TECHNIC DATA

Manufacturer	PT Stella Satindo, Komplek Daan Mogot Prima, Blok B3 No. 7 Jl. Daan Mogot Raya km 12,8 Jakarta 11740, Indonesia
Website	www.stella.co.id
Phone	+62-21-54373829
Fax	+62-21-54373833
Email	sales@stella.co.id
Model	Matrix Java
Function	Blind Scan FTA receiver
Channel Memory	1000
Satellites	no
Symbolrate	2 - 45 Mbps
DiSEqC	1.0
22 kHz switch	yes
USALS	no
Programmable 0/12v	no
Scart connectors	no
V/Audio Output	3 X RCA
Digital Audio Output	no
Color systems	PAL, NTSC
S-VHS Output	yes
RF Modulator	yes (fixed VHF: 210 MHz)
SCPC Compatible	yes
EPG	no
Teletext	no
Power Supply	80 - 270 VAC
Power Consumption	20 W (max.)

Expert conclusion

Vincent Witjhun
TELE-satellite
Test Center
Indonesia

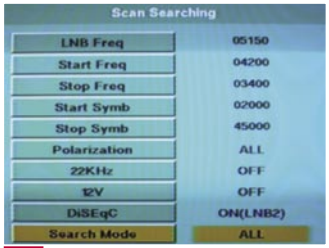
+

Fast channel scan with blind scan feature.

-

No support for Universal Ku-Band LNBF, DiSEqC 1.2 and USALS.

Main Menu in Indonesian |



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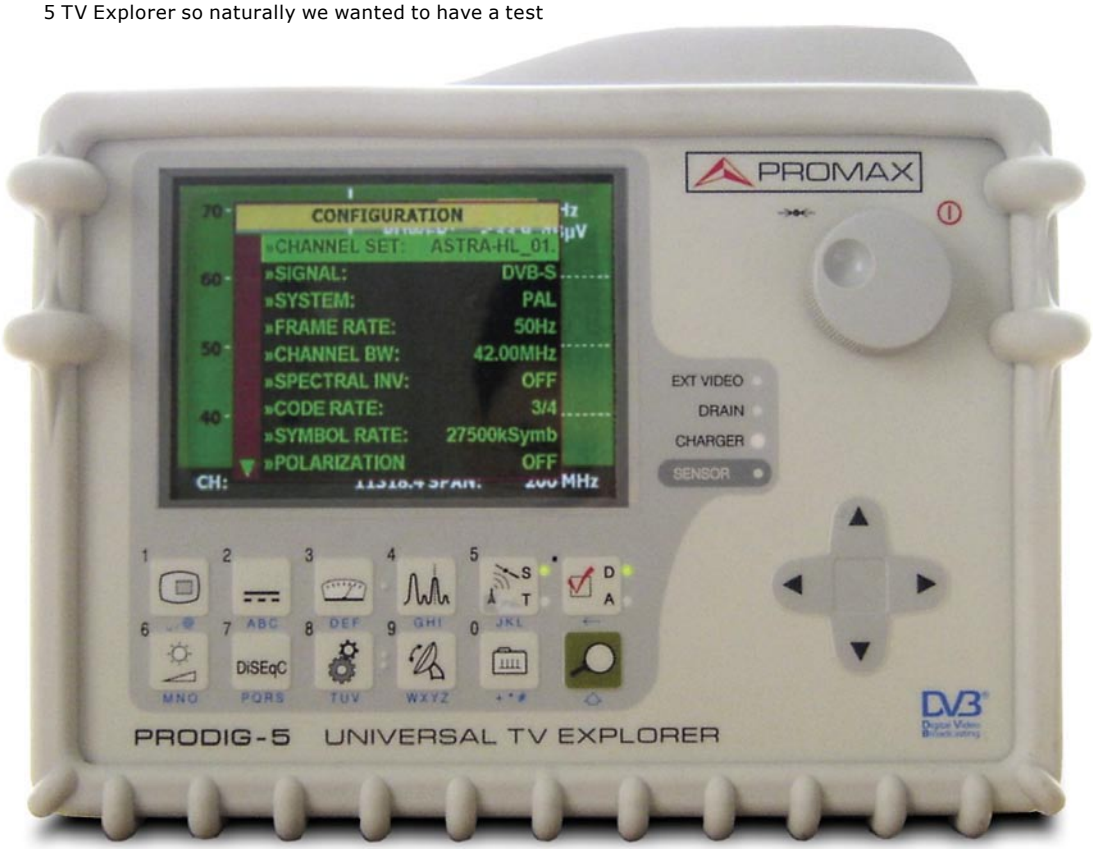
Promax TV Explorer

Small All-in-One Unit

Large, Heavy and Expensive: these are words that most of you have up until now used whenever the subject signal analyzer comes up. The fact that it doesn't always have to be this way was demonstrated by the Spanish company Promax. Not long ago we were told about their newest model Prodig 5 TV Explorer so naturally we wanted to have a test sample sent to us right away. The package we were waiting for arrived just a few days ago. We quickly unpacked everything and placed the 23x16x7.6 cm analyzer on the table. We were used to seeing analyzers that were twice the size and at a weight of only 1.9 kg, it was a true featherweight.



As expected from Promax, this unit's workmanship left us with a very good impression. The chassis is surrounded by rubber to help protect it from damage while at the same time allowing it to be easily stood up. Also included in the package was a plastic carrying case to help protect it from moisture and dirt, a power supply, a charger cable for a vehicle as well as a variety of adapter plugs and a user manual written in English, French and Spanish.

Despite its light weight, the built-in Li battery can power the Prodig-5 for up to 3.5 hours. This is an exceptionally long time compared to some of its larger brothers.

The front panel sports a 5-inch TFT color display, four status LED's, a set of up/down/left/right arrow buttons plus a set of 12 pushbuttons to control the analyzers various functions. Naturally, the buttons are designed so that moisture and dirt cannot get behind them. An adjustment knob is used for varying the frequency and is also used as the on/off switch. The antenna connector can be found on the top of the unit and can be used not only for satellite signals but also for terrestrial and cable signals. The manufacturer even thought to include a Scart connector on the left side of the box through which the output of the actual display signal is available and also external signals can be connected. An RS-232 port on the rear panel for sending measurement results to a PC and for uploading new software is also included. Unfortunately, the included user manual seemed somewhat lean and only gave a brief description of the unit's more important features.

Everyday Use

Promax wanted to take advantage of the increasing digitalization and thus paid very close attention to the receiver's digital DVB-S, DVB-C and DVB-T compatibility. An analog terrestrial tuner is also included that happens to support the PAL, NTSC and SECAM TV standards. The OSD (on-screen display) is available in English, German, Spanish, French and Italian while an integrated light sensor automatically controls the displays contrast and brightness for optimum readability.

After looking over the handbook for a short time, every user should become familiar with the elementary functions of the easy-to-read and self-explanatory buttons. If you want to take advantage of all of the TV Explorer's functions, you will have to do plenty of "learn-by-doing" since the user manual won't be able to answer too many detailed questions.

Of course the first step would be to select the type of signal you would like to measure. From there you go to the spectrum analyzer display. With analog terrestrial signals as well as with DVB-T and DVB-C signals, active channels would immediately be visible as peaks on the display. In satellite reception mode the correct switching voltage must first be selected as does the proper band and any DiSEqC parameters must also be chosen. The TV Explorer can supply 5V, 13V, 15V, 18V, 24V as well as 13V and 18V in combination with a 22 kHz signal. If necessary, the analyzer can switch to an external source of power.

The TV Explorer can display the actual power usage of the LNB or multiswitch; an especially interesting feature. The DiSEqC 1.0 protocol is included for multifeed systems as DiSEqC 1.2 for motorized antennas. DiSEqC 1.1 and 1.3 (USALS) are unfortunately not supported.

The spectrum display of the TV Explorer is available in two different modes. In the first mode the display acts at a reduced speed with an overall picture generated at a slower measurement speed that may not show every weak signal. In the Align Mode, the spectrum display is initially generated and then kept up to date at a much faster pace thereby making it ideal for precise adjustments. Additionally, in this mode the signal strength can also be presented audibly. The arrow buttons can be used to zoom in on individual frequency ranges or reposition the y-axis of the signal strength display.

Once the initial settings have been taken care of, the first frequency can be selected that can later be looked at much more closely. Frequency selection is handled either by the control knob or by direct entry using the integrated 10-button keypad. The frequency entered can be either the downlink frequency or the transponder IF. With terrestrial signals it can be as simple as entering in the correct channel number. In digital mode a push

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of the Scan button is enough for the TV Explorer to attempt to find more information on the selected transponder/frequency. If it's an analog signal, the unit will recognize this and indicate this by lighting the corresponding status LED.

Since there is no integrated analog satellite tuner, picture and sound can only be displayed in terrestrial mode. In satellite mode, only measurement data is displayed. If it's a digital transponder, the automatic scan function of the TV Explorer comes into play. In just a short time the symbolrate, FEC and other critical data of the transponder is identified. With a push of the TV button, the PMT's are read, the channel list is displayed and the first receivable channel is presented. The TV Explorer uses an easy-to-read Info bar to display not only information such as PID's and resolution but also the actual measured datarate, the service provider as well as any encryption used by the channel.

This makes it easy to identify what satellite you happened to land on while adjusting the antenna. Otherwise it would also help to have a quick look at a frequency list such as can be found at www.satcodx.com.

The TV Explorer supports the measurements of VBER, C/N, signal strength, MER and CBER to help with any fine tuning adjustments. The VBER measurement indicates the number of error bits after Viterbi error correction while the C/N (carrier-to-noise ratio) indicates the noise figure. MER is the modulation error rate and CBER is the number of error bits after error correction. All of this data can be displayed in an easy-to-read graphic while the other values are minimized and placed near the bottom of the display.

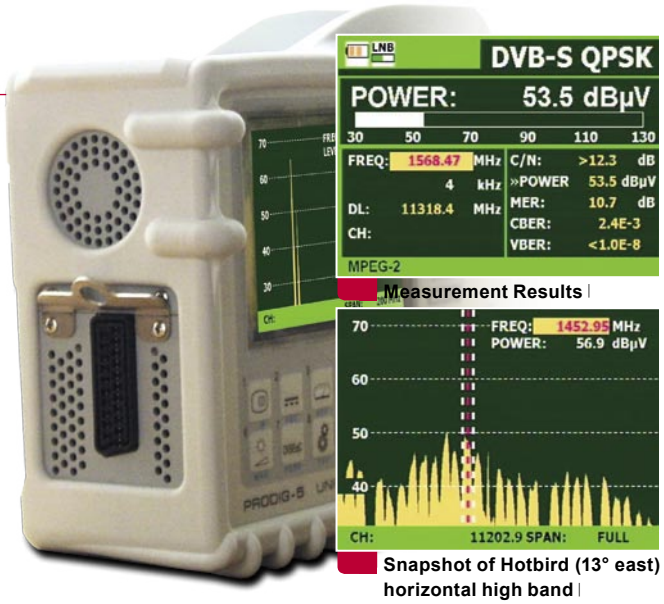
To help make things even easier, the user can set up a number of different satellite profiles (several are already preprogrammed into the unit). This takes some of the guesswork out of setting up a multifeed system on multiple connectors since the TV Explorer by using the stored profiles will automatically adjust for the correct DiSEqC, polarization and band settings.

In addition to this box being used as an analyzer, the TV Explorer would also make an interesting tool for the diehard feedhunter. Thanks to the spectrum display, new signals can be found as soon as they appear and with the help of the Autoscan function can be recognized and identified. Aside from picture and audio, all of the signal's critical data such as PID's, FEC, symbolrate, resolution, datarate, TV standard, etc., are displayed on the screen. Unfortunately, the display of MPEG 4:2:2 signals is not possible. The handling of DVB-T and DVB-C signals as well as analog terrestrial signals is just as simple and professionally done. The capabilities of the small TV Explorer seem to be unlimited here as well.

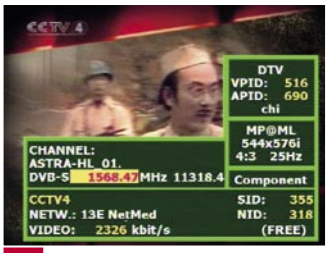
To properly test the TV Explorer we hooked it up to a USALS antenna and were very much amazed. Through its light weight and small size and also its handy carrying case, this unit (contrary to its larger cousins) is perfect for antenna alignment in hard to reach localities. Since the analyzer is not DiSEqC 1.3 compatible, we simply used an FTA receiver with integrated USALS and routed the video signal to the analyzer through the built-in Scart connector. With a push of a button we were able to switch back and forth between our measurement results and the FTA receiver. It doesn't get any easier than this.

We also have to give praise to the manufacturer's competent and quick-to-respond technical support team. After posing a technical question anonymously, we are happy to say that we got the desired and, above all, correct answer within 24 hours.

There's no doubt: the TV Explorer will be the tool of choice in the TELE-satellite test center in the future.



Measurement Results | Snapshot of Hotbird (13° east) horizontal high band |



Signal display in DVB-S modes |

Automatic recognition of symbolrate and FEC |

TECHNIC DATA

Manufacturer	Promax Electronica, S. A., Barcelona, Spain
E-mail	promax@promax.es
Tel	+34-93-260 20 02
Fax	+34-93-338 11 26
Model	Prodig-5 TV Explorer
Function	Professional Digital/Analog TV, Satellite, Cable Signal Analyzer
Frequency Range	Band 1: 45-865 MHz
	Band 2: 950-2150 MHz
Measurement Range	Terrestrial: 10-120 dBuV
	Satellite: 30-120 dBuV
Accuracy	Terrestrial: +/- 1.5 dB
	Satellite: +/- 2.5 dB
Monitor	5" TFT Color Screen
Color Systems	PAL, NTSC, SECAM
TV Standards	M, N, B, G, I, D, K and L
QPSK Symbolrates	2-45 Msps
Power Supply	Li-Ion 7.2V/11Ah
	3.5 hours Operation without Recharge
	3.0 hours Recharging Time
Operating Temperature	5-40°C

Expert conclusion

Thomas Haring
TELE-satellite
Test Center
Austria

+

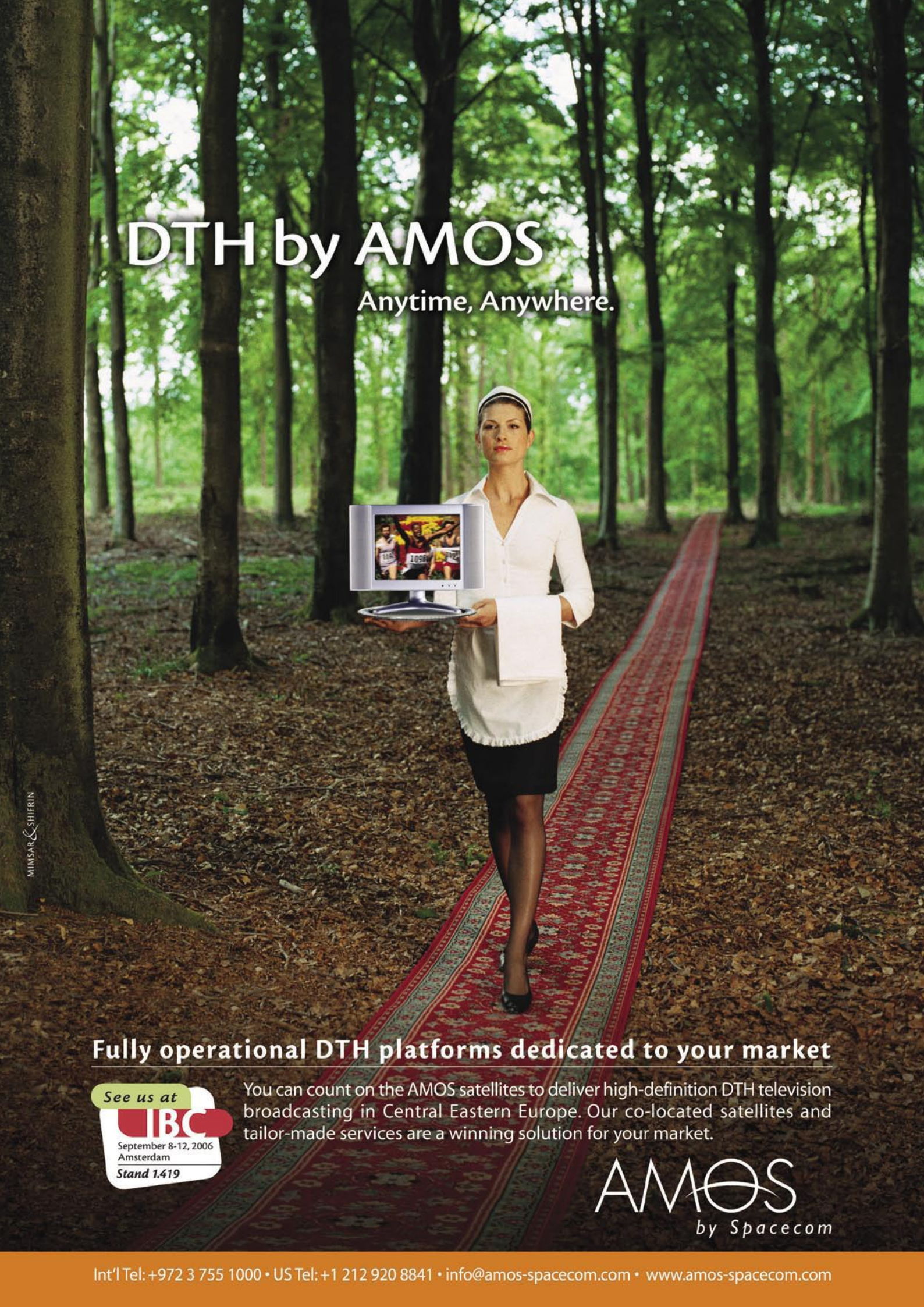
The TV Explorer is an exceptionally handy, lightweight and compact analyzer that comes with everything you'd expect in a modern piece of test equipment. It has no trouble handling any kind of digital signal and can also deal with analog terrestrial signals as well. It is easy and logical to operate and should there ever be a problem, the manufacturer's first class technical support team is there to help. The TV Explorer would not only be a tool for the professional; it would also be an excellent addition to the test equipment rack of any satellite hobbyist.

-

The user manual only provides a general overview of the TV Explorer's basic functions. The manufacturer should consider making some improvements here.

	Measurement Mode	Antenna align Mode
	(ms)	
Terrestrial		
8 MHz	210	122
16 MHz	264	188
32 MHz	440	114
50 MHz	242	90
100 MHz	462	138
200 MHz	510	228
500 MHz	632	280
Full	932	257
Satellite		
16 MHz	144	144
32 MHz	348	144
50 MHz	348	348
100 MHz	416	228
200 MHz	600	224
500 MHz	610	352
Full	714	470

Sampling rates of the TV Explorer spectrum analyzer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The Toroidal Dish in North America

One Dish and Many Satellites

If you've been a regular reader of TELE-satellite magazine for the past years, then you should be familiar with the Wave Frontier T90 Toroidal satellite antenna and what it is all about. Much of the earlier discussions on the T90 had to do with installations in Europe. Its capabilities were never really tested here in North America. After some research, we found that the T90 is readily available in this part of the world so we thought it might not be a bad idea to see what it can do here.

The T90 Antenna

For those of you who are not familiar with the T90 we would like to take a moment and acquaint you with it. The WaveFrontier Toroidal T90 is a fixed Ku-band satellite antenna. What makes it different from other fixed dishes is that it is a multifeed antenna. A multifeed antenna is one that can be fitted with more than one LNB. Of course, you could modify a standard fixed antenna so that it can accept more than one LNB but only one of the LNBs would be in the antenna's focal point. The others would be offset to one side or the other and would not receive as much signal as the central LNB. While this method might work, you usually could not have more than one LNB to either side of the central LNB because of excess signal loss. The reflector of a standard dish focuses the incoming satellite signal to a single point.

The reflector of the Toroidal dish, on the other hand, focuses the signals to a focal line, and not to a single focal point. Any LNB placed in this focal line would be considered in focus with the satellite it was pointed to. And that's the beauty of the T90 antenna: it comes with a rail on which can be mounted multiple LNBs. The rail is long enough to allow satellites within a 40° arc to be received. As long as the antenna is installed on a perfectly vertical mast and the skew is properly adjusted on the antenna mount, you simply need to align the dish to one satellite and all the other satellites you want to receive will easily fall into place. The rail is imprinted with gradients so that the LNBFs can easily be placed. For example, if the first satellite is at 91° west and the next satellite you want is at 97° west, align the dish to 91° west first and then simply slide the second LNBF along the rail to a point six degrees to the right of the first LNBF (when looking at the antenna from the front). The signal from the second satellite should pop right in.

TELE-satellite editor Ron Roessel mounting LNBFs on the rail of a Wavefrontier Toroidal T90 multifeed dish at TELE-satellite's Test Center in the outskirts of New York

The T90 in Action

So obviously, the next question to be answered is, "what can you do with it here in North America?" Well, in order to answer this question we first needed to get our hands on a Toroidal T90 antenna. Once again, our friends at Sadoun Satellite Sales in Hilliard, Ohio came through for us. They provided us with the T90 dish as well as a set of four Sadoun KUL1 standard, single-output Ku-band LNBFs. They have a 0.4 dB noise figure, a 10.750 GHz local oscillator frequency and come in a slim design that makes them perfect for use with the T90. For a receiver we used a Pansat 6000 HXC with twin tuners.

When setting up a Toroidal antenna, it is always a good idea to decide ahead of time what satellites you want to receive with it. In this way you can determine in advance which of those satellites would be your center satellite. For our tests we chose AMC3, AMC5, SBS6 and AMC9. We used AMC5 as the center satellite and installed the first LNBF on the center of the T90's rail (0° point on the rail). The Pansat receiver was tuned to the New York Net mux on 12.182 GHz (H, SR 23000). We then aligned the T90 for maximum signal quality and at the same time made sure that the skew was properly adjusted. The LNBF holders themselves have several adjustments to help maximize the signal. After some fine position adjustments, we managed to get 60% signal quality. A Smart Scan (or Blind Scan) of this satellite revealed quite a few additional active transponders. Obviously, the T90 was correctly aligned to AMC5. Next we wanted to align to other satellites. And this is where the strength of this antenna should be shown. If the T90 was properly installed in the first place, thean we should be able to place additional LNBF's on the rail and simply slide them along the rail into the proper position without any further alignment of the antenna. SBS6 is located 5° to the east of AMC5 so it stands to reason that if a second LNBF were placed on the rail at a point 5° to the right of the first LNBF, we should be able to lock onto SBS6. So, we set up the Pansat box to a known active transponder on SBS6 (12.006 GHz, V, SR 6890), installed the second LNBF on the rail and watched the signal quality display as we slid the LNBF along the rail. Sure enough, the signal magically appeared as the LNBF reached the 5° mark on the rail! The position of the LNBF was adjusted for a maximum signal quality of 60%. Two more LNBF's were installed and aligned to AMC3 and AMC9. In both cases it was just a matter of sliding the LNBF along the rail until it was at

The LNBF holder can be moved left and right on the rail. It can be fixed by a little screw

its designated position. Strong signals were observed on both of these satellites.

Clearly the Wave Frontier T90 Toroidal antenna performs just as advertised. A single fixed dish was used to lock onto four satellites at the same time with exceptional signal quality from each of these satellites. The Pansat receiver easily jumped between these satellites via a DiSEqC 4X1 switch. However, this antenna is not limited to just four LNBF's. The rail has plenty of room for more LNBF's. So, if it's more than four satellites that you want to receive, simply add more LNBF's and position them correctly on the rail. One thing to keep in mind though: The width of the LNBF holders limits how close two satellites can be. As it turns out, the satellites must be 3° or more apart: the LNBF holders cannot be placed any closer than 3° apart. Unfortunately, many of the Ku-band satellites above the North American sky are spaced only 2° apart. The design of the LNBF holder will not let you receive two adjacent satellites. It is possible to modify the holder so that they can be placed closer together on the rail but this would only work if the LNBFs themselves did not have a wide diameter feedhorn. The width of the feedhorn on the Sadoun KUL LNBFs that we used would prevent us from achieving 2° LNBF separation.

Currently, it would seem that the Toroidal T90 antenna has a market with the DishNetwork and DirecTV PayTV services. This is supported by the fact that there are LNBs especially designed for use with the T90 antenna (LOF=11.250 GHZ, circular polarization) that can receive these services. The standard DTH LNBFs that come with the minidish come in a differently shaped housing that will not allow it to be installed on the T90 rail. The T90 will allow you receive a group of these PayTV satellites with just a single antenna while its larger size will give you extra protection against bad weather signal fade. But the purpose of this test was to see how well it would stack up against standard Ku-band satellites and we clearly showed that this versatile antenna can be used for much more than just PayTV signals.

Closeup of the rail

Expert conclusion

Ron Roessel
TELE-satellite
Test Center
North America

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One dish, with very easy way to add several LNBFs

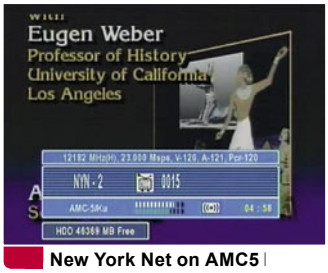
-

The frequently used 2° spacing in North America can only be achieved by manipulating the LNBF holders

Echostar 1,2*	148.0° west
IA7/Echostar 5*	129.0° west
Horizons 1	127.0° west
Galaxy 10R	123.0° west
Echostar 9*	121.0° west
AMC 16/Echostar 7*/DirecTV 7S*	119.0° west
SatMex 5	116.8° west
Anik F2	111.1° west
DirecTV 5*/Echostar8*/Echostar 10*	110.0° west
Anik F1R	107.3° west
AMC 15	105.0° west
AMC 1	103.0° west
AMC 4/DirecTV 1R,4S,8*	101.0° west
Galaxy 4R	99.0° west
IA5	97.0° west
Galaxy 3C	95.0° west
IA6	93.0° west
Galaxy 11/Nimiq 1*	91.0° west
IA8	89.0° west
AMC 3	87.0° west
AMC 2	85.0° west
AMC 9	83.0° west
Nimiq 2*	82.0° west
AMC 5	79.0° west
SBS 6	74.0° west
DirecTV 1*	72.5° west
AMC 6/Nahuel 1	72.0° west
Echostar 3*	61.5° west
Amazonas	61.0° west
Pas 9	58.0° west
Pas 3R	43.0° west
Hispasat	30.0° west
NSS 7	22.0° west
Telstar 12	15.0° west

List of Ku-band satellites that should be receivable in most parts of North America with the T90. The T90 can cover any group of satellites within a 40 deg orbital arc. Note: satellites marked with a * are DTH satellites.

MSNBC Feed on SBS6



New York Net on AMC5

NBC News Color Bars on AMC9

TECHNIC DATA

Model	T90
Dimensions	Main Reflector: 96.7cm (38.1") W x 108.6cm (42.8") H
	Sub Reflector: 36.1cm (14.2") W x 83.6cm (32.9") H
Net Weight	14.1 Kg (31.0 LBS)
Operating Frequency	10.7 – 12.75 GHz
Polarization	linear and circular
Reception Range	40° in orbital arc
Recommended Satellite Spacing	3 deg
Gain	39.65 dB +/- 0.45 dB at 12.5 GHz
Mount Type	Elevation over azimuth
Wind Loading	80 km/h (50 mph) operational and 200 km/h (125 mph) survival
Acceptable Pole Diameter	60mm
LNBF TECHNICAL DATA	
Model	KUL1
Input Frequency	11.7 – 12.2 GHz
Output Frequency	950 – 1450 MHz
LOF	10.750 GHz
LOF Stability	+/- 1 MHz
Noise Figure	0.4 dB
Conversion Gain	57 dB
Cross Polarization Isolation	22 dB
Feedhorn Diameter	40mm

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DG-120 Plus – Made by Jaeger

A sturdy H-H mount

It doesn't happen every day that we receive a product for testing and are absolutely delighted by it. This H-H mount motor drive is one of these notable exceptions. It comes very close to its promise of 'horizon to horizon' and almost covers the complete orbital arc from 80° East to 80° West.

The individual components of Jaeger's DG-120 Plus motor

Easy to assemble

As soon as you open the packaging you feel like you're holding a construction in hand which has a smart design and is well thought through. Only a few individual components that cannot easily be mixed up need to be assembled. Five minutes is all you should need for that.

Before beginning with the assembly you have to make sure to define the local latitude on the latitude scale (not to be confused with the elevation scale on the opposite side). Next, the satellite antenna has to be mounted on the rotating arm. Unfortunately, there are no markings for exactly adjusting the antenna mounting support to the zero point of the motor casing. The crank on the lower side of the rotating arm, however, is very handy as it provides a fixed blocker for the antenna.

The final step towards completion is fixing the motor with the antenna to the pole – luckily this can be achieved in a very simple and quick way. We particular appreciated the fact that the unit can be mounted on the pole at any desired height. The profile of the dual pole clip works like a crampon, which means that the height and the angle of rotation can be slightly adjusted without risking for the whole unit to slide downwards.

Antenna alignment

With a polar mount system there are more aspects to consider than for a fixed antenna. However, the basic steps are similar even though we have to take into account the tilted pivot. The pivot of a polar mount is aligned in parallel to the axis of the Earth and consequently is tilted by an angle which corresponds to the local degree of latitude. This angle has already been considered when assembling the motor. The elevation, on the other hand, is displaced by this angle to an extent which leads for the complete construction to be out of its adjustment range. In order to adjust this displacement the rotating arm of H-H mounts is always bent by 30 or 40 degrees, depending on the manufacturer.

The DG-120 Plus comes with a 40 degree offset bent, which is perfect for use in Central Europe as it allows convenient elevation angles of 32 to 34 degrees on the antenna's scaling.

Everybody is still waiting for a quick fix for aligning the antenna to its zero position and there is no two-dimensional water level to check the upright position of the antenna pole. Pointing towards the South can still only be achieved using a compass or a GPS system and moving the antenna pole. Adjusting the system in line with the correct elevation can be similarly troublesome.

But then again, this deficiency can hardly be blamed on the motor drive, as the adjustment is made on the antenna mount support and the accuracy of its scales is frequently insufficient. In such a case even the alignment chart of the very concise user's manual isn't of much use, although it goes out of its way to show the alignment values for any latitude with three decimal places.

An H-H motor like this one can only work properly if the degree of latitude of the specific location is correct.

The connection sockets of the Jaeger motor. Since the control pulses are sent to the motor through the antenna cable the motor has to be installed between the LNB cables. Next to the F sockets there are buttons for manually moving the antenna to the left or to the right.

Motor operation

From zero position any desired satellite can be addressed using the manual controls or the DiSEqC 1.2 control of the receiver.

Left and right movement can be selected manually thanks to two buttons which are located next to the F-sockets and thus can be reached easily. The alignment scale can be viewed from above so that the current position can be determined quickly.

The motor runs quietly and very fast. This speed results in a rather high power consumption, however, which – together with the power supply of the LNBs – might be too much for some receivers. It is particularly the switch-on peak supply of some 1 Ampere that is cause for concern, as in some case the short-circuit protection of the receiver shut down the system when trying to move the dish.

It is exactly because of this high power consumption that Jaeger offers an optional 'Interface Box' which is installed between the receiver and the motor. It is a fully operational DiSEqC 1.2 transmitter and at the same time provides the power required by the motor. With this Interface Box all receivers – even those with only DiSEqC 1.0 – can be used in connection with a polar mount antenna.

The angle of rotation is entered using a remote control and sent to the motor with a "Goto X" command. This way angle values can be also stored and retrieved through one of 60 position numbers, if required.

Satellite search in everyday use

A DiSEqC 1.2 receiver sends the angle values required for a satellite search as "Goto X" commands in most cases. These commands can be processed flawlessly by the DG-120 Plus.

We experienced occasional system crashes of the motor logic control which are triggered by power failures or short-circuit shutdowns caused by the receiver. Fortunately the motor controls can be reset using the DiSEqC 1.2 reset command ("Goto Reference" or "Goto Zero") generated by the receiver. There is no more need for a mechanical reset directly on the motor.

TECHNIC DATA

Manufacturer	JAEGER Industrial Co.Ltd., Taiwan, ROC
Internet	www.jaeger.com.tw
Distributor	Satellitentechnik Weiß GmbH, 93437 Furth im Wald, Deutschland
Fax	+49-9973-8417-17
Internet	www.iev-weiss.de
E-mail	info@iev-weiss.de
Model	DG120
Description	H-H mount motor
Alignment range	80° East to 80° West
Speed	0.3 sec (19V) and 0.5 sec (13 V)
Motor noise	quiet
Mounting pole	38 to 65 mm diameter
Mounting height	variably on the pole
Antenna offset	40°
Rotating arm	56 mm diameter
Power consumption	200 to 350 mA
Switch-on peak	>1000 mA

Expert conclusion

This is a sturdy and fast H-H mount motor drive which fulfils high demands in terms of its mechanical construction. Its DiSEqC 1.2 functions fully conform to all specifications. In order to make it suitable also for older receivers its power consumption should be reduced, in particular its very high switch-on peak.

Heinz Koppitz
TELE-satellite
Test Center
Germany

C-Band and Ku-Band In Focus

Feed Made From a Vegetable Can

Ingo Salomon

What good is a can of vegetables? Well, how about this: open it up with a can opener, spoon out the contents and have it for lunch, clean out the empty can and then use it to build a combination feed. Just get yourself a copper tube from a hardware store like the ones used in heating systems and off you go.

The C/Ku-Band feed used in real life at a 1.80 m dish receving PAS4 on 72East

There are many satellites that transmit signals in both C-band and Ku-band. If you already have a large antenna, it won't take much to modify the existing system so that both frequency ranges can be received.

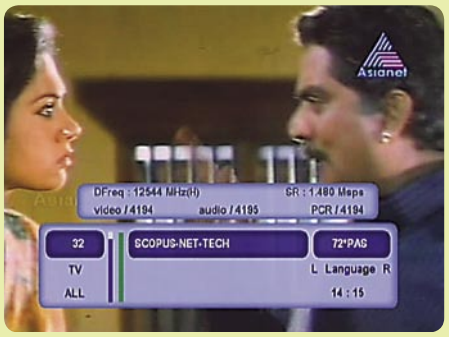
It all starts with a vegetable can that is 65mm in diameter. Remove the lids on both sides. Drill a hole in the side of the can large enough so that a 20mm copper tube can slide into it. A 90° copper elbow is then attached to the copper tube on the inside of the can. The other end of the tube goes to the Ku-band LNB. Important: the copper tube cannot be longer than 80mm while its diameter can be as small as 17mm and is determined by the reception frequency. The higher the frequency, the smaller the diameter.

Installing this piece of handiwork will take some feeling. The C-band LNB should first be aligned to a C/Ku-band satellite such as PAS4 at 72° east in South Africa. The vegetable can is then placed over the C-band feed and slowly turned until the C-band signal is at its strongest. Reception through the copper tube protruding out of the can will of course be somewhat diminished, but by rotating the can the smallest level of attenuation can be found.

Next, attach the Ku-band LNB to the exposed end of the copper tube and rotate it until the best signal strength is achieved. Finally, simply attach a DiSEqC switch so that you only have one cable going to the receiver and there you have it, the number of channels you can receive has greatly increased without any large investment: a C-band LNB for 45 Euros (17K), a Ku-band LNB for 20 Euros (0.4 dB) and some accessories for 5 Euros much of which the do-it-yourselfer will probably already have in his stash of spare parts.

Note: Naturally this combination does tend to reduce the signal level in only one frequency range compared to an individual feed. But this loss seems to be limited to roughly 10%.

C-band Screenshot from Pas4...

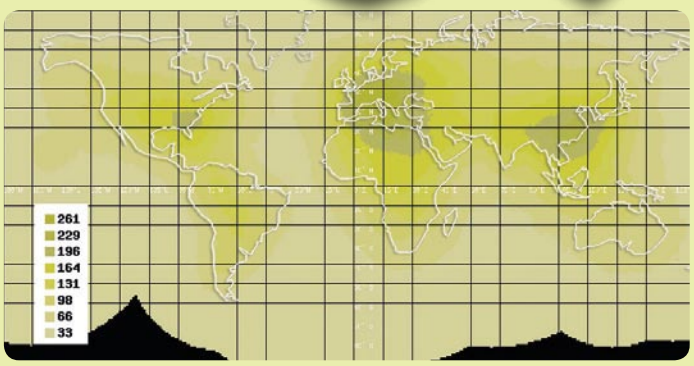


...and from the same satellite in the Ku-band

A peek at the inside of what used to be a vegetable can. The clamp is later used to secure it to the C-band feed.

This was a vegetable can! The Ku-band LNB is mounted to a copper tube that has a 90° elbow

Completed C/Ku-band assembly



C/Ku-band satellites transmit in these areas with a minimum of 42 dBW. In the center of these zones as many as 261 digital FTA channels can be received. In the outer regions this number drops back to 33

TELE-satellite Receiver Guide

Satellite DVB Receivers	Channel Memory	Symbolrate	SCPC Compatible	DiSEqC	USALS Compatible	NTSC/PAL	Modulator Output	Looped-Through IF	SatcoDX Compatible	Power Supply	Digital Audio Output	Audio/Video Output	Scart Output	S-VHS Output	Volt 0/12 Output	Positioner	Mechanical Polarizer	Hard Disk (Built-in)	Serial Interface	CI Slots	Enbedded CA	TSI Magazine
	TV Radio	Ms/sec								Volt Hertz		RCA		S-VHS	V 0/12			GB				Issue
ARION 9400 PV2R	8000	2-45	yes	1.0, 1.1, 1.2, 1.3	yes	PAL D/K, B/G, I	yes, UHF	yes	no	**90-240V** 50/60Hz	yes	yes	yes, 2	yes	yes	no	no	yes	yes, RS-232	yes, 2	no	#192 2006
ARION AF-9300PVR	8000	2-45	yes	1.0, 1.1, 1.2	yes	NTSC/ PAL	yes, UHF	yes	no	**100-240V** 50/60Hz	yes (optical)	yes	yes, 2	yes	yes	no	no	yes	yes, RS-232	yes	no	#188 2005
BEETEL SD98	5000	2-40	yes	1.0, 1.1, 1.2	yes	NTSC/ PAL	yes	yes	no	**80-300V**	yes (S/PDIF)	yes	no	no	yes	no	no	no	no	no	no	#193 2006
BEL 5518	2000	2-40	yes	1.0, 1.1, 1.2	no	PAL	yes	yes	no	**90-270V**	no	yes	no	no	no	no	no	no	no	no	no	#191 2006
BOTECH CA 9000 FTA/CI	4900	2-45	yes	1.2	yes	yes	yes, UHF	yes	no	**90-260 VAC** 50/60Hz	yes	yes	yes, 2	no	no	no	no	no	yes, RS-232	yes, 2	no	#189 2005
CHESS Digital 4000 FTA	3000	2-45	yes	1.0, 1.2	no	NTSC/ PAL	no	yes	no	**230V** 50Hz	yes	yes	yes, 2	yes	yes	no	no	no	yes, RS-232	no	no	#186 2005
DGSTATION Relook 400S	10000	2-40	yes	1.0, 1.1, 1.2, 1.3	yes	PAL D/K, B/G, I	yes	yes	yes	**90-240V** 50/60Hz	yes (optical)	yes	yes, 2	no	no	no	no	yes	yes, RS-232	yes, 2	yes	#191 2006
DIGITAL EVERYWHERE Fire DTV External PC Set Top Box	unlimited	2-40	yes	1.0, 1.1, 1.2	no	NTSC/ PAL	no	yes	no	**12 VDC**	no	no	no	no	no	no	no	yes, in PC	no	yes, 1	no	#187 2005
DSN-DIGITAL DEVICES GR 8300CI CU	5000	2-45	yes	1.0, 1.2, 1.3	yes	NTSC/ PAL	yes	yes	yes	**90-260V** 50/60Hz	yes	yes	yes, 2	no	yes	no	no	no	yes, RS-232	yes	no	#186 2005
DSN-GR 7400 CI EXPLORER	5000 TV 1600 Radio	2-45	yes	1.0, 1.2, 1.3	yes	NTSC/ PAL/ SECAM	yes	yes	no	**95-250V** 50/60Hz	yes (optical)	yes	yes, 2	no	yes	no	no	no	yes, RS-232	yes, 2	no	#188 2005
EDISON 2100 FTA	4000	1-45	yes	1.0, 1.2	no	NTSC/ PAL	yes	yes	no	**90-250V** 50/60Hz	yes	yes	yes, 2	no	yes	no	no	no	yes, RS-232	no	no	#187 2005
EYCOS S30.12 CI	8000	2-45	yes	1.0, 1.1, 1.2, 1.3	yes	NTSC/ PAL	yes	yes	no	**100-240 VAC**	yes	yes	yes, 2	no	no	no	no	no	yes, RS-232	yes, 2	no	#192 2006
EYCOS S50.12 PVR	8000	1-45	yes	1.0, 1.1, 1.2, 1.3	yes	NTSC/ PAL	yes	yes	no	**90-250 VAC**	yes (optical)	yes	yes, 2	no	no	no	no	yes	yes, RS-232	yes	no	#191 2006
EYCOS S10.02F	4000	2-45	yes	1.0, 1.1, 1.2	yes	NTSC/ PAL	no	yes	no	**90-250 VAC**	yes (optical)	yes	yes, 2	no	no	no	no	no	yes, RS-232	no	no	#189 2005
FORTEC STAR FSIR-5400 NA	4800	2-45	yes	1.0, 1.2	yes	NTSC/ PAL	yes	yes	no	**90-240V** 50/60Hz	yes (optical)	yes	no	yes	no	no	no	no	yes, RS-232	no	yes, Irdeto	#190 2005
FORTEC STAR Lifetime Diamond DVB-S & DVB-T	3000	1-45	yes	1.0, 1.2, 1.3	yes	NTSC/ PAL	yes	yes	no	**90-250V** 50/60Hz	no	yes	yes, 2	no	no	no	no	no	yes, RS-232	no	no	#187 2005
GLOBAL TEQ 6000PVR	10000	1-45	yes	1.0, 1.2	yes	NTSC/ PAL	yes	yes	no	**90-250V** 50/60Hz	yes (optical)	yes	yes, 2	yes	no	no	no	yes	yes, RS-232	yes	no	#190 2005
GENERAL SATELLITE FTA-7001S	5000	2-45	yes	1.0, 1.2	no	PAL/ SECAM	yes	yes	no	**190-250V** 50/60Hz	yes	no	yes, 1	yes	no	no	no	no	yes, RS-232	no	no	#189 2005
GOLDEN INTERSTAR 9000 CI PVR Premium	9000	1-45	yes	1.0, 1.1, 1.2	yes	NTSC/ PAL	yes	yes	no	**100-250 VAC**	yes (optical)	yes	yes, 2	yes	no	no	no	yes	yes, RS-232	yes, 2	yes, 2	#190 2005
GOLDEN INTERSTAR DVB-T/S 8300 CI Premium	6000	1-45	yes	1.0, 1.1, 1.2	yes	NTSC/ PAL	yes	yes	no	**100-250 VAC**	yes (optical)	yes	yes, 2	no	yes	no	no	no	yes, RS-232	yes, 2	yes, 2	#189 2005

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	TV Radio	Ms/sec								Volt Hertz		RCA		S-VHS	V 0/12			GB				Issue
HUMAX PR-HD1000	5000	1-45	yes	1.0, 1.2, 1.3	yes	NTSC/ PAL	no	yes	no	**90-250 VAC**	yes (optical)	yes	yes, 2	no	no	no	no	no	yes, RS-232	yes, 2	yes	#193 2006
KATHREIN UFS 821	4000	2-45	yes	1.0, 1.2, 1.3	yes	NTSC/ PAL	no	yes	yes	**100-240 VAC**	yes (optical)	yes	yes, 2	yes	no	no	no	yes	yes, RS-232	yes, 2	no	#191 2006
LEMON 030-CI	6000	starting at 1.8	yes	1.0, 1.1, 1.2	no	NTSC/ PAL	yes	yes	no	**90-260V** 50/60Hz 10.5-14DC	yes, optical &coax	yes	yes, 2	no	no	no	no	no	yes, RS-232	yes, 2	no	#187 2005
MATRIX Java	1000	2-45	yes	1.0	no	NTSC/ PAL	yes RF	yes	no	**80-270 VAC**	no	yes	no	yes	no	no	no	no	yes, RS-232	no	no	#194 2006
NEOTION 601 DVR	5000	2-45	yes	1.0, 1.2	no	NTSC/ PAL	no	yes	no	**90-250V** 50/60Hz	yes	yes	yes, 2	no	no	no	no	yes, external	yes, RS-232	no	yes	#188 2005
PANSAT 6000HXC	10000	1-45	yes	1.0, 1.2, 1.3	yes	NTSC/ PAL	yes, UHF	yes	no	**90-250V** 50/60Hz	yes (S/PDIF)	yes	no	yes	yes	no	no	yes	yes, RS-232	yes, 2	no	#193 2006
PANSAT 3500S	5000	1-45	yes	1.0, 1.2	yes	NTSC/ PAL	yes, UHF	yes	no	**90-250V** 50/60Hz	yes (optical)	yes	no	yes	yes	no	yes	no	yes, RS-232	no	yes, Conax	#190 2005
PANSAT 500HC PVR&CI	10000	1-45	yes	1.0, 1.2, 1.3	yes	NTSC/ PAL	yes	yes, 2	no	**90-250V** 50/60Hz	yes	yes	no	yes	no	no	no	yes	yes, RS-232	yes, 2	no	#187 2005
PIXX Event	10000	1-45	yes	1.0, 1.2	yes	NTSC/ PAL	yes, UHF	yes	no	**90-250V** 50/60Hz	yes (optical)	yes	yes, 2	yes	yes	no	no	yes	yes, RS-232	yes, 2	no	#190 2005
QUALI-TV QS 1080IRCI for HDTV and MPEG 4:2:2	unknown	2-40	yes	1.0, 1.2	no	NTSC/ PAL	no	yes	no	**100-240V** 50/60Hz	yes	yes	yes, 2	no	no	no	no	no	yes, RS-232	yes, 2	yes, Irdeto	#187 2005
STAR SAT SR-X1400D	6500	1-45	yes	1.0, 1.2, 1.3	yes	NTSC/ PAL	yes	yes	no	**100-250 VAC** 50/60Hz	no	yes	yes, 2	no	yes	no	no	no	yes, RS-232	no	no	#193 2006
STAR SAT SR-X2500CUCI	4000	2-45	yes	1.0, 1.2, 1.3	yes	NTSC/ PAL	yes	yes	yes	**90-250 VAC** 50/60Hz	no	yes	yes, 2	no	yes	no	no	no	yes, RS-232	yes, 2	yes, uni-versal	#191 2006
STAR SAT SR-X3500CUCI Ultra	6000	2-45	yes	1.0, 1.2	no	NTSC/ PAL	yes	yes	yes	**90-250 VAC** 50/60Hz	no	yes	yes, 2	yes	yes	no	no	no	yes, RS-232	yes, 2	yes, uni-versal	#189 2005
TECHNISAT Digit 4S	5000	1-45	yes	1.0, 1.2, 1.3	yes	NTSC/ PAL	no	no	no	**180-250 VAC** 50Hz	yes (optical & coax)	yes	yes, 2	no	no	no	no	no	no	no	no	#194 2006
TECHNISAT Digit MF4-S CC	5000	1-45	yes	1.2	no	NTSC/ PAL	no	no	no	**230VAC** 50Hz	yes (optical & coax)	yes	yes, 2	no	no	no	no	no	no	yes	Conax, Crypto-works	#193 2006
TECHNOMATE TM-7755 2VA 2CI	5000	2-45	yes	1.0, 1.2	yes	PAL/ NTSC/ SECAM	yes	yes	no	**90-240 VAC** 50/60Hz	yes (optical)	yes	yes, 2	yes (via scart)	no	no	no	no	yes, RS-232	yes, 2	yes, Viac-cess	#189 2005
TOPFIELD TF6000PVR	5000	1-45	yes	1.0, 1.1, 1.2, 1.3	yes	NTSC/ PAL	no	yes	no	**90-250V** 50/60Hz	yes (optical)	yes	yes, 2	yes	no	no	no	yes	yes, RS-232	yes, 2	no	#192 2006
TOPFIELD TF5000CIP	5000	1-45	yes	1.0, 1.1, 1.2, 1.3	yes	NTSC/ PAL	yes	yes	no	**90-250V** 50/60Hz	yes (optical)	yes	yes, 2	yes	no	yes	no	no	yes, RS-232	yes, 2	no	#190 2005
TOPFIELD TF5000PVR Masterpiece	5000	1-45	yes	1.0, 1.1, 1.2, 1.3	yes	NTSC/ PAL	yes, UHF	yes	no	**90-250V** 50/60Hz	yes (optical)	yes	yes, 2	yes	no	no	no	yes	yes, RS-232	yes, 2	no	#188 2005
VANTAGE VT-X121SCI	4000	1-45	yes	1.0, 1.2, 1.3	yes	NTSC/ PAL	yes, UHF	yes	no	**90-250V** 50/60Hz	yes (S/PDIF)	yes	yes, 2	no	no	no	no	no	yes, RS-232	yes, 2	yes, Conax	#193 2006
VANTAGE VT-X111SCX	4000	2-45	yes	1.0, 1.2, 1.3	yes	NTSC/ PAL	yes, UHF	yes	yes	**90-250V** 50/60Hz	no	yes	yes, 2	no	no	no	no	no	yes, RS-232	no	yes, Conax	#191 2006

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A new DiSEqC motor for large satellite antennas?

If the range of products and equipment increases for a certain system this can be taken as proof that the system has been established as a new standard. The DiSEqC 1.2 protocol, which has made possible the automisation of antenna positioning, is a prime example for this assumption. With its "Mini Actuator", EDON is now introducing a new construction principle which has the potential of replacing the H-H mount. TELE-satellite has tested the mechanical aspects of one of the first antenna motors of this innovative series.

The EDON actuator comes as a kit with different components

The "Mini Actuator" consists of various components that need to be assembled

Thanks to the included manual the assembly of the individual components should be a hassle-free affair for everyone with some experience of putting together furniture bought at 'you-know-which' Swedish furniture stores. The user's manual is printed on an A4 page and with the help of a set of flat spanners (which are not included in the package) assembly should not take longer than 30 minutes.

Assembling the components teaches how the system works

Of course the antenna is mounted parallactically in such a set-up, which means it rotates around its own axis which is aligned towards the polar star (hence the name polar mount). The motor, however, does not sit on this axis any longer. Contrary to the H-H mount the pivot axis is not fixed to the motor, which avoids unilateral wear and tear of the motor bearings due to the weight of the antenna. This new principle therefore allows moving larger and thus heavier antennas as well. The "Mini Actuator" we tested is currently limited to antenna sizes of up to 120 cm.

The rotation is controlled by a driving rod

The centrepiece of the construction principle is the trapezoid antenna support, which is freely movable around the polar axis. As usual the antenna is fixed to a 38 mm pole with 30° offset incline to make sure its elevation scale is within the standard range.

This drive motor moves the antenna support

The movement of the antenna is controlled by a laterally fixed drive motor, and there is no more multiphase motor on the axis. An intelligent control system moves the antenna support with the driving rod and aligns the dish to the selected satellite position. The simplicity of this approach is amazing – but how well does it really work?

Driving rod control in press bearings

For the positioning of the antenna the thrust forces are led through two joints which are unfortunately designed as press bearings. We would have preferred frictionless bearings to minimise wear and tear which might eventually reduce the accuracy of the positioning process. Apart from all other aspects fric-

Mounting the EDON actuator on the top of the pole

The latitude scale is used to align the dish according to the geographic latitude of the location

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tion loss should also be avoided for the sake of minimising power consumption, otherwise some receivers with a 400 mA output might not be strong enough to support the system.

In same cases the driving rod might create a spatial problem because the cylinder which holds the rod points away from the antenna and is rather long. With a full East to West rotation of the antenna it performs an arc which needs up to 45 cm of space. This is why we recommend a rooftop installation with enough free space to all sides.

Searching for satellites

Our test model was not yet equipped with a fully functional DiSEqC 1.2 control (a later test will be performed with this feature) and so we were not able to check the accuracy using receiver commands. However, with the buttons for manual control we were able to align the antenna to any desired position within the positioning range. We particularly appreciated the fact the individual buttons for left and right movement are available. The alignment scale on the pivot axis of the antenna support is difficult to read and should be made larger.

The positioning speed is about average and the motor does a quiet and reliable job. The driving rod construction is currently limited to an arc from 50° East to 50° West, which is sufficient for the reception of most satellites. Only die-hard DXers will miss the possibility to receive birds that are close to the horizon.

The drive joint is designed as a press bearing

Rotation angle scale to determine the position manually

Test results

Power supply	220 to 320 mA
Switch-on pulse	>500 mA
Positioning range	50° East to 50° West
Speed	0,9 °/sec at 19V and 1,2 °/sec at 14 V
Motor noise	quiet
Mounting pole	38 to 65 mm diameter
Mounting type	on pole top, not height adjustable
Distance from wall	West 20 cm, South 35 cm, East 45 cm
Antenna offset	30°
Antenna feed	38 mm diameter

Expert conclusion

An interesting concept which seems to be fit for the future. We should definitely keep an eye on it. Even though not all features were fully functional at the time of testing there should be no doubt that future upgrades will shortly be available.

Heinz Koppitz
TELE-satellite
Test Center
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C-Band Reception in Europe With a 120cm Antenna

Thomas Haring

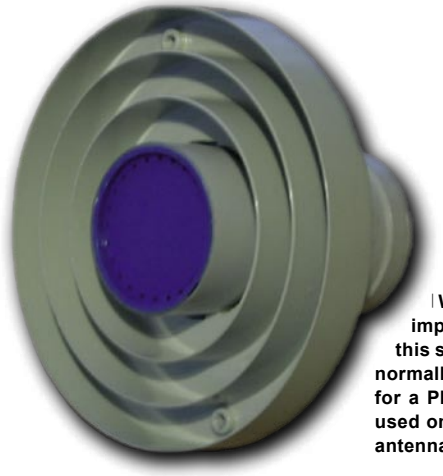
| Thomas Haring adjusts a C-band feed on a 1.2-meter offset antenna while checking his progress with the help of the Prodig-5 signal analyzer also introduced in this issue |

In the last issue of TELE-satellite magazine Sylvain Oscul, from the TELE-satellite test center in France, had a look to see what kind of C-band reception was possible with a 180cm dish. The results were impressive.

Not to be outdone, I decided to take this a step further and see what could be done with a slightly smaller antenna. If you don't have your own backyard and have no choice but to mount your dishes on a steep rooftop or on a balcony, installing large-diameter satellite dishes may not be the most practical thing to do.

Thanks to modern Ku-band satellites with their high output power, a large dish is not really necessary since you should have no trouble getting several thousand channels from a variety of countries. Despite all the variety available on Ku-band, the more exotic programming (like North Korean State TV) or other foreign language programming is usually only available in C-band. So, the question then is, "what can we do in C-band with a 120cm dish?"

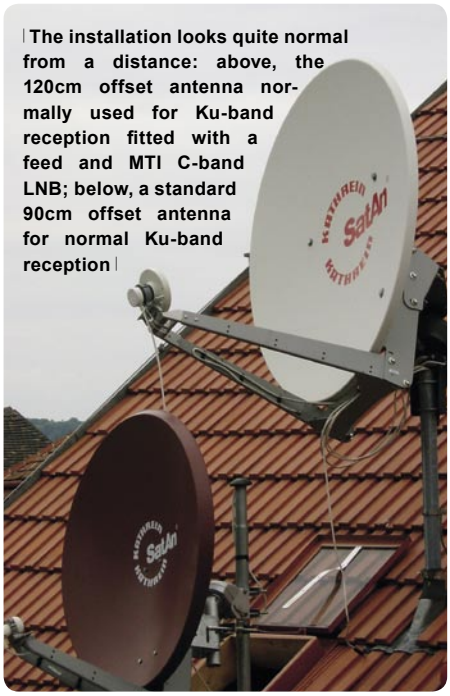
Naturally the first step would be to put together the required antenna assembly. I ran into my first little setback here: I could not find any manufacturer or dealer that could scrape together a special feed for an offset antenna. Ebay wasn't able to help either; only a funnel-type feed was available which we later found out was totally incompatible. This really left me with no choice but to use a feed meant for a parabolic dish and found the MTI AC21-C2B. It is a C-band LNB with standard grooved feed that switches between polarizations through 14/18V control signals. The matching dielectric is already available.



| With a little improvisation this scalar feed, normallydesigned for a PFA, can be used on an Offset antenna too. |

Finally, after all of the parts had been organized, delivered and assembled, a missing feed holder for the Kathrein CAS-120 antenna I was using threatened to put everything on hold. I managed to find an old 60mm feed holder gathering dust in the basement but, as expected, it was not the right size. After some improvising using a 75mm cable conduit I was able to move to the next step. It isn't exactly professional, but it is an effective and inexpensive alternative. It required some skill to install, but after several attempts the feed was ultimately installed in the correct position.

The entire assembly including motor was



| The installation looks quite normal from a distance: above, the 120cm offset antenna normally used for Ku-band reception fitted with a feed and MTI C-band LNB; below, a standard 90cm offset antenna for normal Ku-band reception |

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initially aligned to Ku-band satellites so that the less-sensitive C-band should not present a problem. Just like my colleague in France, I also used a good-old D-box1 with DVB2000 software as well as the Prodig-5 signal analyzer from Promax. With full expectations and anticipation the antenna was turned to the relatively powerful Express A1R C-band satellite at 40° east. The first look at the analyzer display revealed that there was a very strong signal at 3675R. After entering this frequency in the DVB2000 software, numerous Russian channels with plenty of signal strength were found.

According to the frequency list at www.satcodx.com, there were also a number of South American transponders on NSS 806 at 40.5° west with relatively high power outputs. I was able to lock onto several MCPC and SCPC transponders with sufficient signal strength. Especially strong was Rede Gospel on 4108R and RCN TV on 4016R although these channels were unfortunately encrypted. Even the ImpSat package from Venezuela on 3879R was receivable albeit without any bad weather signal reserve. The tests on NSS7 at 22° west were not as successful. Here the only luck was with 3650R. The other transponders did not provide a strong enough signal even though the receiver was able to lock onto some of them on occasion.

RTV Podmoskove on 40° East

Rede Gospel on 40.5° West

TV5 Afrique on 22° West


RTP Afrika on 27.5° West


Kultura Telekanal on 40° East

Bangla Vision on 76.5° East

The transponder at 4158R on Atlantic Bird 3 at 5° west was handled without any problems. The remaining transponders just scratched the surface of the receiver's threshold level and despite clearly recognizable peaks on the analyzer display, the signals were simply not strong enough. The situation was somewhat better on Intelsat 907 at 27.5° west. Here three transponders could be received (3715R, 3830R and 4048R). Intelsat 801 at 31.5° west and Intelsat 903 at 34.5° west each yielded just one transponder that was strong enough. For all the other transponders the antenna was simply too small. Deutsche Welle TV on Intelsat 10-02 (3912R) could also be received without any problems. Express A3 at 11° west is considered a fairly strong C-band satellite yet the 120cm antenna could not pull in any signals; the peaks shown on the analyzer display were simply too weak.

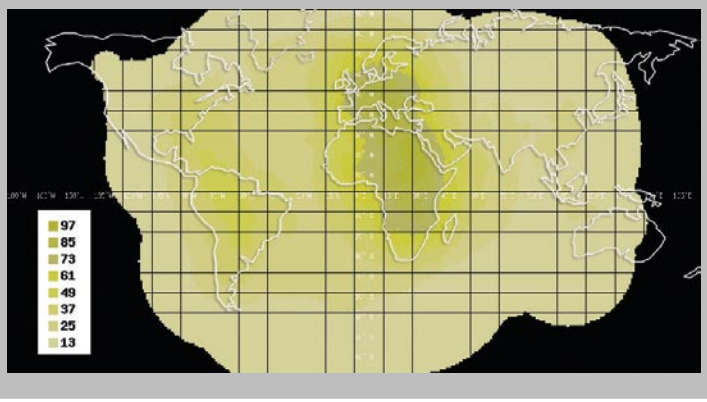
The next step involved taking a closer look at the eastern sky and here I stumbled across a number of surprises: On Intelsat 906 at 64° east the (unfortunately encrypted) AFN package on 4080L was more than strong enough. The Hope Channel on Pas7 (3516V) at 67.5° east was visible while Bangla Vision was receivable on Telstar 10 at 76.5° east (4049H). Express AM1 at 40° east delivered a number of Russian channels with sufficient bad weather reserve. Even a feed channel (3786V) and four radio channels (4026V) on BADRC at 26° east were receivable despite a missing polarizer. Most of the analog channels on these satellites were viewable after some threshold adjustments.

Compared to the previously used grooved feed, we wanted to see what a funnel-type feed could do on the Kathrein antenna such as the Precision PMJ-LNB C Gold. We obtained this feed from a UK seller through an Ebay auction. The LNB was contributed by Olbort Satellite Technologies. Unfortunately, this feed proved to be totally incompatible and should never work with an offset antenna despite what the seller had said. On the strongest C-band satellite position (Express A1R at 40° east), the signal that was identified on the analyzer (3675R) was far too weak to be received. The result was the same with all the other satellites: no reception.

And last but not least, a Ku-band LNB was added alongside the C-band LNB. Of course the C-band LNB had to be moved out of the antenna's focal point to make room for the Ku-band LNB. Though you had to squint a little, reception alongside the Ku-band LNB was still possible.

In general it is safe to say that C-band reception using a 120cm dish is also possible in Europe, just don't expect any miracles. The North Korean state TV channel was still not receivable. Nevertheless, this setup would make for an interesting toy for the satellite hobbyist and at the very least will let you somewhat expand the limits of your satellite system.

This table displays an overview of all European satellite positions that would be worth taking a shot at with a small offset antenna. It also shows the number of channels that we were able to identify with our system. The graphic gives an overall representation of the footprints of all the named satellites and also provides the number of FTA channels transmitted from these satellites. The number of channels that you will be able to receive will depend on your location.



Satellite	Number of channels
TELSTAR 10 76.5° East	1
PAS 7 67.5° East	1
INTELSAT 904 64° East	6
EXPRESS A1R 40° East	20
BADRC 26° East	5
INTELSAT 10-02 1° West	1
ATLANTIC BIRD 3 5° West	10
NSS7 22° West	7
INTELSAT 907 27.5° West	13
INTELSAT 801 31.5° West	1
INTELSAT 903 34.5° West	1
NSS 806 40.5° West	18

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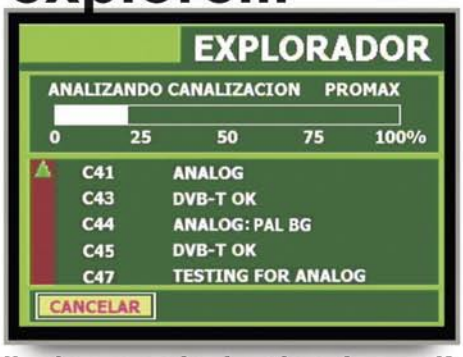
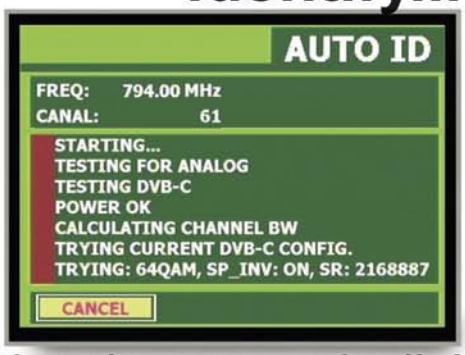
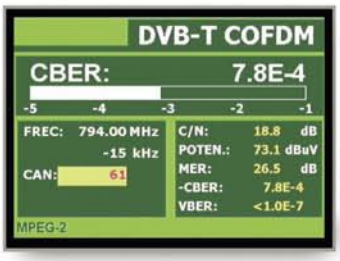


... all channels in the band!

identify...



... signals automatically!



Shows all measurements simultaneously

Shows picture, service list, PID's,...

Direct adjusting of spectrum, without menus

Video Quality in digital TV

Peter Miller

Set-top-box manufacturers when advertising their products, often refer to the excellent video quality ensured by the nature of digital TV. However, when we zap channels we can see great difference in quality between channels. Is it only imperfection of our senses? Unfortunately not! Actually, there is a great difference between channels. Why? One of the most important factors is the video resolution used by service providers.

Video resolution

DVB standard for digital TV allows the providers to use a number of resolutions. The maximum resolution when digitizing PAL signal is 720x576 pixels. However, the service provider may decide to use lower resolution see table 1. Table 2 provides the resolutions for NTSC.

PAL/SECAM
720 x 576
704 x 576
544 x 576
480 x 576
352 x 576
352 x 288

Table 1. Signal resolution for PAL/SECAM.

NTSC
720 x 480
704 x 480
640 x 480
544 x 480
480 x 480
352 x 480
352 x 240

Table 2. Signal resolution for NTSC

As you can see, the difference can be really big! Probably the inquisitive reader will have a few questions here. Let's try to answer the most typical ones.

Why we have the two so close resolutions: 720 and 704 pixels per line? It is due to legacy reasons. In analog TV, the transmitted image was slightly greater than the picture shown on the TV-set screen. Also now, our TV-set can only show 704 pixels. The additional 8 pixels at every end, help our satellite receiver produce slightly better signal at the very edges of the screen. However it can rather be measured than observed.

704 x 576 is close to the 4:3 aspect ratio of a traditional TV-set but what about other resolutions? Figure 1 explains how the signal resolution influences the shape and size of a pixel.

For the 704 x 576 resolution, the pixel is almost exactly a square. For 372 x 576, it is a rectangle that is twice as wide as it is high. For 352 x 288 it is again close to a square but of course it is 2 times wider and 2 times higher than that of the highest resolution. How this influences the quality of picture, you may see this in figure 2. It shows the same picture in the highest and reduced resolution.

An interesting fact is that the number of lines and the number of pixels in a line is always a multiple of 16. That's because digital TV is based on 16 x 16 block structure.

And what does happen in the real world? Which resolutions do the providers use? The quick check of one of the Hotbird transponders (11,727 MHz, V) revealed that all of them use different resolutions! See table 3.

Channel	Video resolution
Zagros TV	720 x 576
TRSP	352 x 288
La Locale	480 x 576
ATN Bangla	544 x 576
Telefortune	480 x 576
N-Test	352 x 576

Table 3. Video resolution for different channels on the same transponder.

Aspect ratio

And what happens if the SDTV signal is transmitted in a widescreen mode? Aspect ratio is no longer 4:3 but 16:9. Do we get extra pixels at each side of the screen? Unfortunately not. The pixels are stretched. Although we can see additional details at both sides of the screen, the actor's face that took 40 pixels, now takes only 30 pixels in horizontal axis.

So, can we say that widescreen mode is better than the regular 4:3 mode? Rather not.

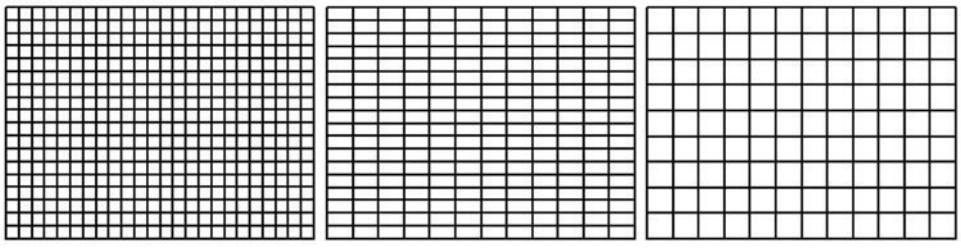


Fig. 1. A comparison of the pixel size and shape for the images: 704 x 576, 352 x 576 and 352 x 288

Fig. 2. The same picture when its resolution is decreased from 720x576 to 352x288.

The actual resolution is what really counts, not the aspect ratio.

Another, perhaps more important thing that you should keep in mind is that when there is a mismatch between the aspect ration of the incoming signal and your TV-set, the picture quality will suffer. Figure 4 shows what you can get in such situation - depending on the setting in your receiver menu.

HDTV and flat panel TV-sets

Fortunately we have much less problems with High Definition TV. Both signal and TV-

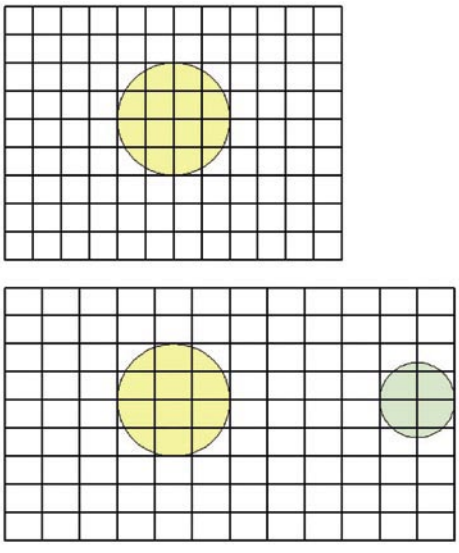


Fig. 3. A comparison of the 4:3 and 16:9 formats for the same resolution SDTV signal.

sets have the 16:9 aspect ratio and there are only 2 resolutions in use: 1280 x 720p and 1920 x 1080i. Pixels are square. Although the authors of the H.264/AVC standard made it very versatile (e.g. they permitted many different aspect ratios), in the digital satellite TV, we should not encounter too many other variations than those mentioned above.

If now, you go to the shop to find a suitable TV-set for yourself, you will probably be confused again. The resolution of the currently available TV-sets (especially those cheaper ones) is quite often different from the values mentioned above. The popular values are: 1366 x 768 and 1024 x 768. Where are they from? They are taken from the PC monitors specifications. See table 4.

PC Monitor Resolutions
640 × 400 VGA
640 × 480 VGA
854 × 480 SVGA
800 × 600 SVGA
1024 × 768 XGA
1280 × 768 XGA
1280 × 1024 SXGA
1600 × 1200 UXGA

Table 4. Standardized resolutions for PC monitors.

WXGA (1366 x 768) is a derivation from XGA. It means that when we receive the HDTV signal, our TV-set must converted it to the so-called native resolution of the screen. It means that the quality of video will be reduced. But will this be really perceivable? It depends on the TV-set size and the distance you will be watching it. Because of the imperfection of our eyesight, for a 32" display, we must come to the screen closer than 1.3 meter to see all details of the 1920 x 1080 pixel picture. In other words, it makes sense to produce the full resolution TV-sets only if they are big enough. For example, the above mentioned distance increases to ca. 2 meters for 50" screen. It makes sense to watch the TV from 2-meter distance (but rather not from 1.3 m).

So, if you want to buy a really big flat panel screen, search for the full HD resolution. If your living room is not that big and a smaller TV-set will do, 1366 x 768 or even 1024 x 768 will be a good enough choice. When making the decision, think of other aspects influencing the video quality like contrast, brightness, reflections of light (the weak point of plasma devices!). Just avoid the cheapest models that have resolution of 852 x 480.

Conclusions

Among the SDTV broadcasts we can easily find a signal of really poor resolution and thus poor video quality. It can be as bad as the VHS tape. So, this is not always true that digital TV ensures better quality that analog one. However this is always true when we talk about HDTV. Only such signals, when seen on proper TV-set, secure high quality.

The resolution is not the only factor that influences the quality of video. As you already know, the mismatch of the aspect ratio between signal and TV-set will also reduce it. But there are also other factors. We will write about them in the next issue of TELE-satellite.

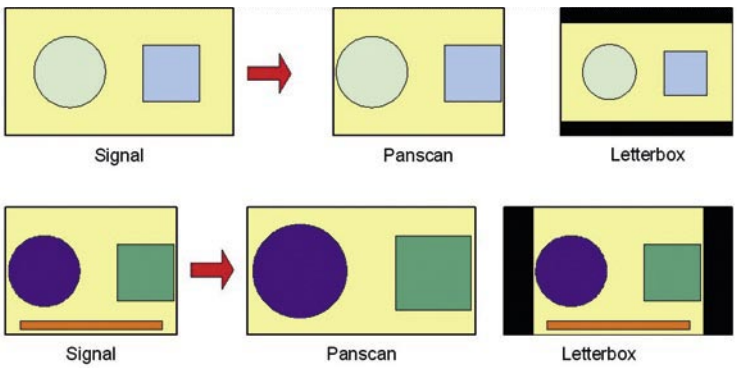


Fig. 4. Converting the picture when there is a mismatch between its aspect ration and the aspect ratio of a TV-set.

Satellites over India

P. SriVatsa

In June 2006 the Master Control Facility in Hassan, India, celebrated 25 years of monitoring and controlling Indian satellites. We at TELE-satellite India took the chance, and visited the place, to get first hand impressions about this first class facility.

A view into the control center for Tracking and Telemetry

Once the first Indian satellites had begun to be built, it became necessary to constantly monitor and control them. 180 km away from Bangalore, in a place called Hassan, the ideal location was found: it's in the midst of a valley, otherwise known for its coffee farms, and there is almost no electro magnetic interference on ground. Another advantage is that it is close to the ISRO headquarters in Bangalore.

The first impression is indeed great, since everything about this place is huge, from the buildings to the rows of giant 11 meter and 7 meter white dish antennas, set against the background of a beautiful green tropical valley. Each satellite has a dedicated antenna pointed towards it. Each satellites sends approximately 1000 parameters every second, these telemetry data include bus voltages, heat temperatures, and informations as distance between Earth and the satellite. All these data are received and processed by sophisticated software built in-house and its output is monitored by the technical personnel.

As we enter the monitoring center, it is apparent looking at the computer screen how much detail this data has, even voltages as small as 5 volts are monitored. In most cases this monitoring is a matter of routine, however, in case of an emergency, for example a satellite becomes too cold or abnormal voltages are noticed, the software automatically sets of alerts, in which case the technical personnel starts the recovery process.

We also got a chance to see the weather photos taken by Indian Weather satellites, this is exciting as in most cases satellite DXers do not have the required equipment to receive these specialized signals. Our tour ended with a visit to the new library, where every possible book on satellites are available.

One of the most notable vistors to this center was in 1984 the then late Prime Minister of India, Mrs.Indira Gandhi, who was well-known for showing interest in making India a modern scientific country. A tree planted by Mrs Indira Gandhi is still growing strong, perhaps reflecting the healthy growth of ISRO.

We at TELE-satellite wish MCF all the best on its well deserved 25th anniversary.

Hassan Satellite Ground Station in India, spaciously located in a tropical valley. Note the high elevation angles of dishes

Photos Courtesy ISRO

Telecom & Broadcasting will build „City of the Future“

Elena Pryadko

The 4th Eastern European exhibition and conference in telecommunications and broadcasting, which will be held between 18 - 20 October 2006 in Kiev, Ukraine, in the exhibition centre „KievExpoPlaza“, will have a new format: One event, One location, All converged.

To get the telecommunications and broadcasting market participants involved into the unified infrastructure of information space, EEBC 2006 will build „City of the Future“.

What does it mean?

The new format of the exhibition places each participant company to its own place, according to its sphere of activity and market positioning.

How does it work?

The „City of the Future“ will consist of the respectively designed Broadcasting Avenues, Telecom streams, Internet streets, Cable and Satellite Boulevards, Content Lanes, Wireless Squares etc.

What‘s the aim?

To let everybody involved participate in the process of creation of the telecommunication infrastructure of the modern city.

Why?

This idea is concordant with the mission of each specialist, and each company in the info-communication market, who every day make enormous contributions into the technologies‘ development, while implementing the idea of „City of the Future“.

„The participants will be involved into this process and participate in the city construction, arranging their booths according to the general idea of the exhibition. It will create the cozy and convenient atmosphere, which will allow to work effectively for both the participants of the exhibition and the visitors,“ says Inna Burgela, Director of TECHEXPO company, the Organizer of EEBC 2006 Telecom & Broadcasting. „The idea is to gather the operators and providers of the information and telecommunication services from all Eastern Europe and post-Soviet countries, to allow for the maximum reflection of the current situation in the telecommunications and broadcast B2B market in the area.“

In today‘s conditions of globalization, especially in B2B markets of goods and services where the quantity of suppliers and customers are limited, separate national markets are too small to guarantee that the participants of the exhibitions will have satisfying return on their marketing investments. At the same time, the need in specialized exhibitions as the instruments of direct marketing communications still remains, and even grows along with the products and technology developments, and the reduction of their life cycle, and the collapse of traditional advertising efficiency. However, what can‘t be built in the frameworks of one country becomes a reality within the region.

Comparatively small number of operators in every country of the region prevents the national exhibitions of operators‘ solutions from becoming a really efficient marketing instrument. However, pan-Eastern European exhibitions are going to be highly effective. The core of such pan-Eastern European exhibition already exists. It is „EEBC:Telecom & Broadcasting“ exhibition and conference, organized by Ukrainian exhibition company „TechExpo“, which successfully were held for the past three years.

The partnership and support of the leading unions and associations of telecommunications services operators and broadcasters from Russia, Ukraine, Belarus, Poland, Bulgaria, Slovakia, Lithuania, Hungary and other countries undoubtedly makes EEBC 2006 the best professional forum for Eastern European business-to-operators market.

Some facts about EEBC:

Held for 4th time in Kiev/Ukraine
Time: 18-20 October 2006
Venue: Exhbition Centre „KievExpoPlaza“
More Information: www.eebc.net.ua

Exhibition Preview

- **5 - 10 September 2006: CeBIT Eurasia 2006**
  International Trade Fair for Information Technology, Telecommunications, Software and Services
  TUYAP Congress Center, Beylikduzu, Istanbul, Turkey
  www.cebitbilisim.com

- **8 - 12 September 2006: IBC 2006**
  The World of Content
  RAI, Amsterdam, Netherlands
  www.ibc.org

- **28 - 30 September 2006: SatExpo 2006**
  Space and Advanced Telecommunications
  Vicenza Trade Fair, Vicenza, Italy
  www.satexpo.it

- **9 - 13 October 2006: Taitronics Autumn**
  Taipei International Electronic Autmun Show
  Taipei World Trade Center (TWTC), TaiWan
  www.taipeitradeshows.com.tw/taitronics/

- **18 - 20 October 2006: EEBC 2006**
  Eastern Europe Broadband Convention
  Exhibition Centre "KievExpoPlaza", Kiew, Ukraine
  www.eebc.com.ua

- **26 - 28 October 2006: SAT KRAK 2006**
  International Satellite Exhibition
  Centrum Targowe, ul. Klimeckiego 14, 30-706 Krakow, Poland
  www.satkrak.com

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