MOTECK SG-2500

State-of-the-art Technology for New H-H Polar Mount Motor

H-H motors for rotating antennas with a diameter of up to 120 cm from horizon to horizon – as the name implies – have been on the market for roughly ten years now. They allow reception of all satellites that are available at the respective location. The basic design of these motors has remained largely unchanged in these ten years, which can be taken as an indication that it is pretty perfect already. MOTECK's new motor does demonstrate, however, that there is always room for improvement.

TELE SATELLITE AWARD & BROADBAND 06-07/2009

MOTECK MOTOR SG-2500
Very silent motor with tolerance-free drive for exact antenna positioning.

The differences to its predecessor are hard to spot when unpacking the unit, but as soon as you start assembling the motor it's evident that SG-2500 is made of high-grade materials: Rust-proof mounting elements and a stainless die-cast case guarantee a high degree of weatherproofness. An easy to read adjustment scale and exact markings for aligning the antenna in a southerly (northerly) direction allow easy and at the same time precise alignment of motor and antenna.

The SG-2500 works flawlessly under all DiSEqC protocols.

To operate the antenna under DiSEQc 1.0 to 1.1 MOTECK supplies either the V-Box II or the DIGIBOX, which requires

DiSEqC MOTECK ELECTRIC CORP H-H M

the rotation angle as Goto-X values. The exact rotation angle can be calculated using the GAAPS routine which is available from MOTECK for download at www.moteck.com, or from www.gaaps.com.tw. Alternatively, you may also choose to use our own USPOS software, which is also very easy to use (www.TELE-satellite.com/Uspos.exe).

Under DiSEqC 1.2, automatic positioning does not require any additional device. However, operating the motor under 1.2 reveals a weakness of the DiSEqC protocol if the internal memory of the motor is used. The memory used by MOTECK – and other manufacturers are no different – has capacity for up to 60 satellite positions but is unreliable since all entries are deleted whenever the motor is reset. This means all stored satellite positions are lost.

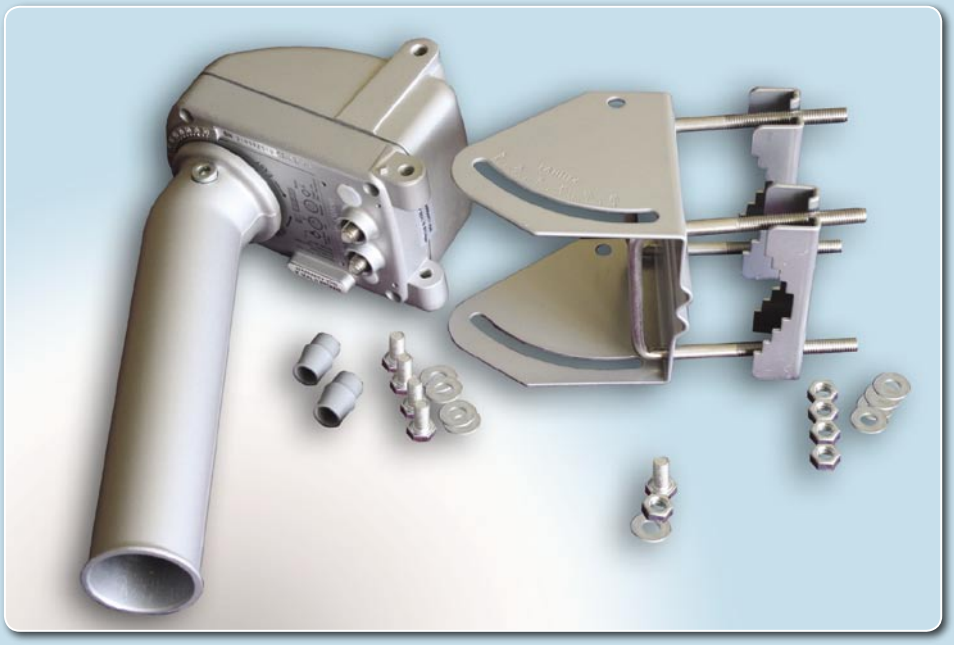
But this is not the only problem with the memory. Its first 26 positions consist of pre-set parameters which – unfortunately – cannot be used in practice. Apart from the fact that these values are calculated for the zero meridian they can also not be used because receivers do not take into account a motor's position number, but invariably write satellite data in ascending order.

For a safe and stable storage of position data you should therefore rely on the receiver rather than the motor. This is the only way to reliably control the motor with the direct DiSEqC 1.2 control command, Goto-X. Some DiSEqC 1.2 receivers even feature a dedicated Goto-X menu. Still, receivers with integrated DiSEqC 1.3 or USALS work best. They automatically calculate the azimuth rotation angle, store it and transmit it together with the Goto-X command. Of course the SG-2500 is perfectly capable of understanding the Goto-X command and therefore is a brilliant match for these receivers.

Attaching the motor to the antenna system is easy

The MOTECK SG-2500 can be assembled quickly with the help of a 13 mm wrench. Just as easily it can be adjusted to the local latitude. The SG-2500 can be attached to masts with a diameter between 35 and 65 mm. To guarantee a stable setup, however, it should not be less than 50 mm. This is also the diameter selected by MOTECK for the rotor.

Once the mast is mounted in a precisely horizontal position, we have to find the exact southern (northern) direction and mark it on the mast with a felt pen. The motor – which by default comes in the zero position – can then be attached and roughly aligned. The manual comes in English and provides useful directions for assembly and alignment. It also lists the corresponding scaling value of the antenna elevation for the local latitude. Alternatively, this calculation can easily



Individual components before assembly

Rotation angle scale of the motor

Latitude adjustment on the motor

Motor attached to the mast

be performed with any trigonometric calculator:

Scaling value = latitude - 60° + arctan((cos (BG)-0.151)/sin(BG))

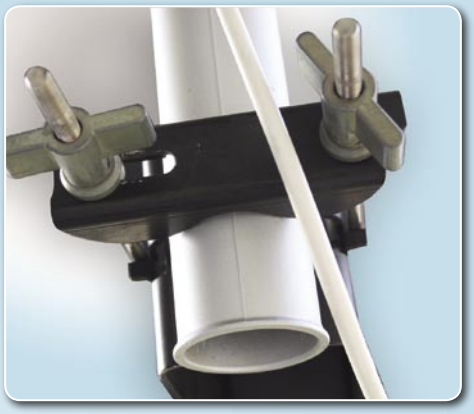
As soon as the antenna (up to 120 cm in diameter or a flat antenna) is aligned to this value it can then be attached to the rotor. Using the guidance groove on the rotor it is next aligned towards the South (North).

In most cases, you will not have immediate reception with the antenna. First of all the motor has to be rotated to the setting angle of a satellite, either manually or using the receiver's menu. For that you need an indication of the incoming signal, which is displayed by the receiver. Generally, however, the receiver is located at a completely different place and thus cannot be used to interpret the signal. A low cost satellite finder can do the trick, when hooked to the cable right at the antenna. Such a device may also come handy at a later stage, after a storm has moved the antenna position, for example. Satellite finders are equipped with an indicator that makes it quite easy to maximise reception: for vertical adjustments you change the elevation scale, for horizontal adjustments you move the antenna on the rotor.

Mark for aligning the motor on the mast to the South

Elevation value that is set on the antenna

Guidance groove on the rotor for aligning the antenna to the South

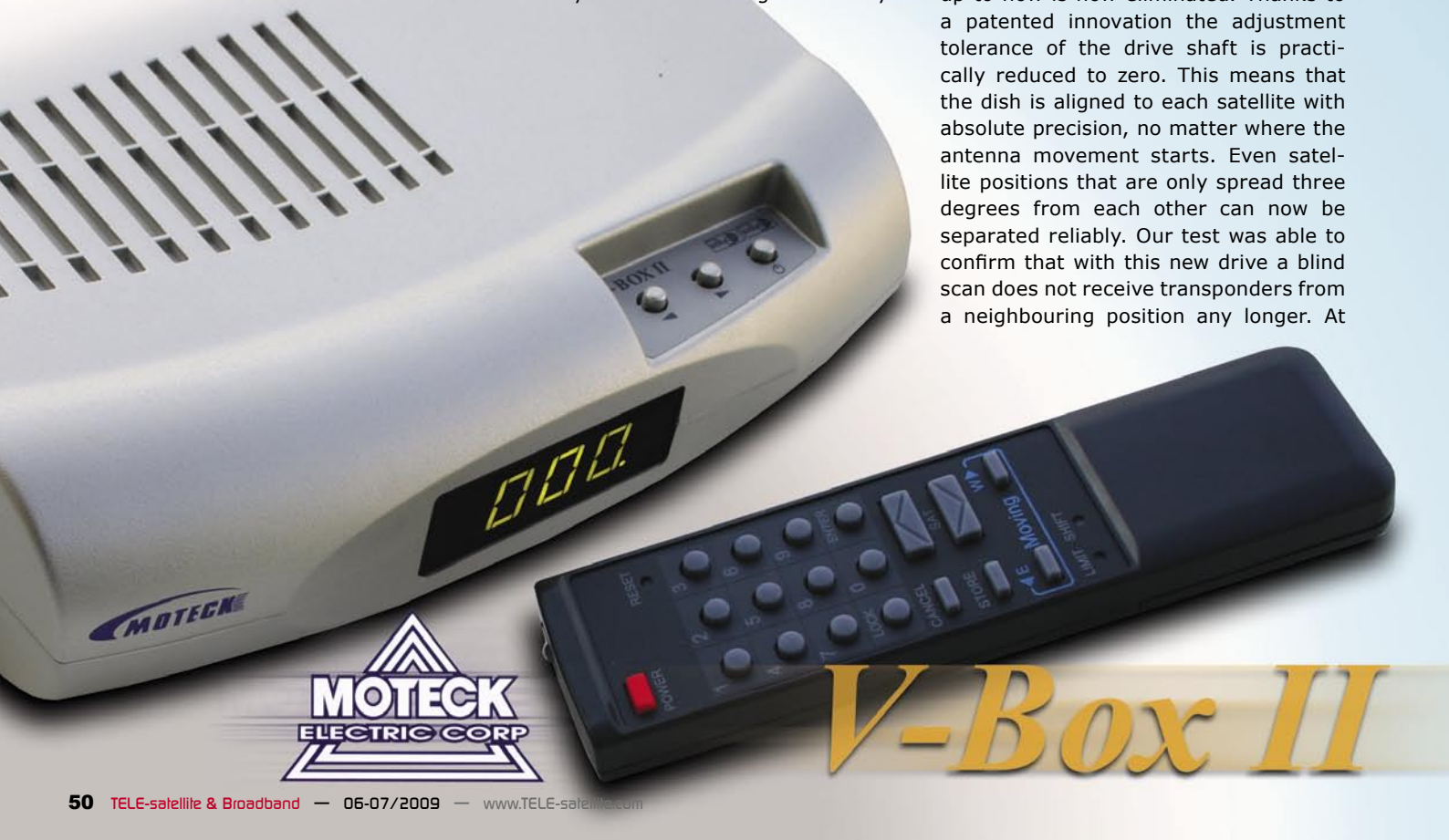


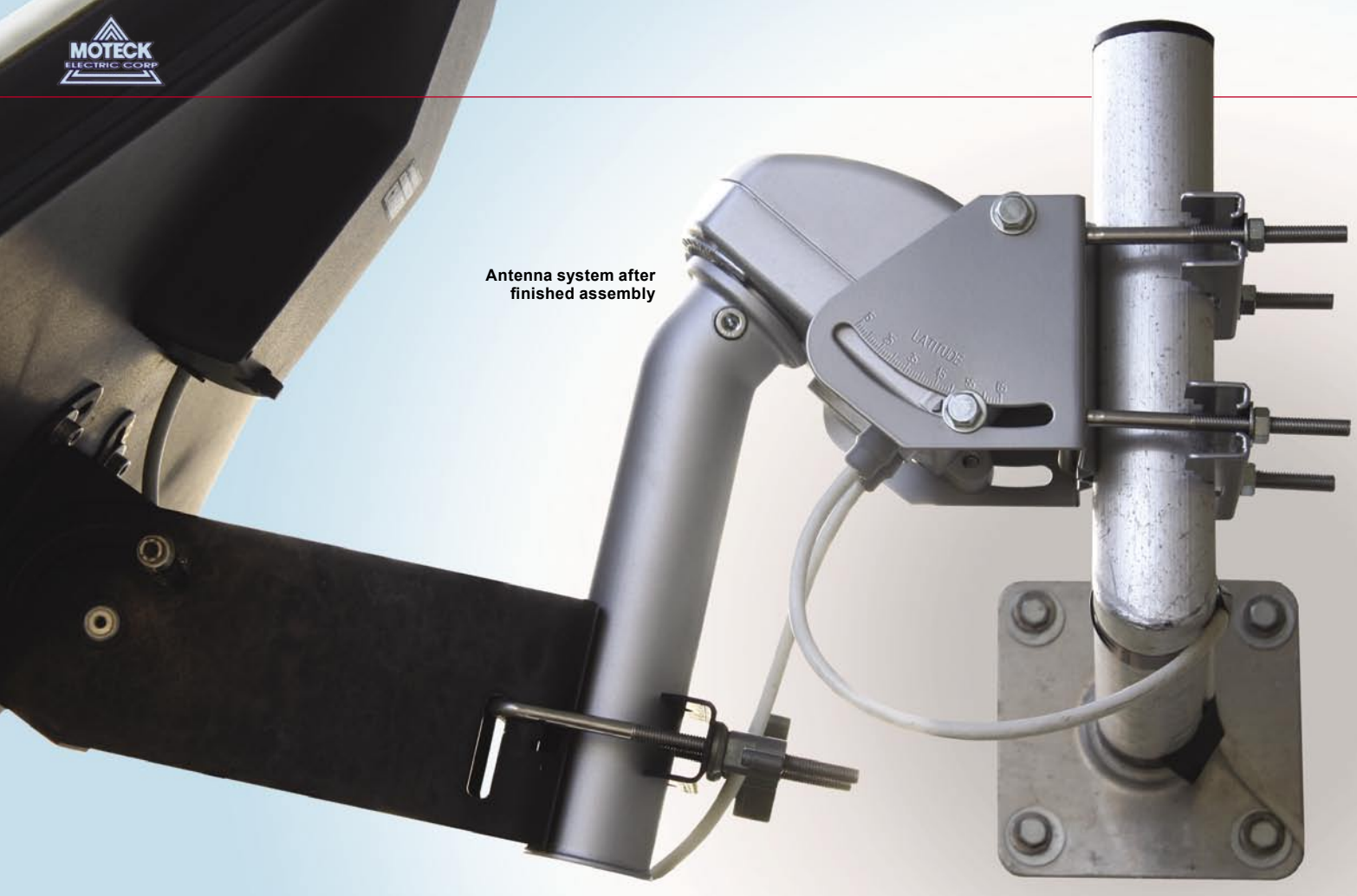
Antenna aligned on the guidance groove

The metal drive works silently and very precisely

The innovative metal drive used for the MOTECK SG-2500 has excellent innovations in store. Our test clearly revealed that the new drive considerably reduces the noise level across the full arc between 75° East and 75° West, without consuming more power than other drives used before. This makes the rotation antenna virtually inaudible for neighbours. If you also use a very inconspicuous flat antenna there is no reason for complaints based on visible or audible annoyances.

The test also showed that a weakness of the drives that have been used up to now is now eliminated. Thanks to a patented innovation the adjustment tolerance of the drive shaft is practically reduced to zero. This means that the dish is aligned to each satellite with absolute precision, no matter where the antenna movement starts. Even satellite positions that are only spread three degrees from each other can now be separated reliably. Our test was able to confirm that with this new drive a blind scan does not receive transponders from a neighbouring position any longer. At





Antenna system after finished assembly

the same time the signal strength of weak transponders close to the reception threshold could be improved.

The new MOTECK SG-2500 motor works reliably and silently. Its new tolerance-free drive systems allows precise separation of satellite positions and consequently maximises reception quality. Using a DiSEqC 1.3 receiver the system can be operated fully automatically.

Connection panel on the motor

Expert opinion

Heinz Koppitz
TELE-satellite
Test Center
Germany

+

Optimum corrosion protection, Extremely low-noise operation, Precise positioning without alignment tolerance, Suitable for both the northern and southern hemispheres

-

Manual only available in English
Built-in position memory out of date

What does USALS mean, and what is GAAPS?

Both terms designate calculation methods for automatic positioning of satellite antennas. The position of each satellite is given as the angle between the zero meridian and the orbital position. This angle value is geocentric, however, meaning that it is calculated with the centre of the earth as pivot point.

For the horizon system of the actual location – which differs for each location – this angle value has to be re-calculated in order to receive the actual alignment direction for a given satellite.

Italian actuator manufacturer Stab was the first to suggest integrating this complex re-calculation of geographic coordinates in receivers and coined the term USALS, which stands for Universal Satellite Automatic Location System.

MOTECK chose the abbreviation GAAPS for its re-calculation formula, which stands for Global Automatic Antenna Positioning System.

The re-calculation of coordinates is not, however, an additional feature implemented at motor level, as the motor receives its control data with the regular Goto-X commands of the DiSEqC 1.2 protocol. Therefore, the re-calculation is performed by the receiver.

Yet, even if the routine for automatic positioning is implemented in receivers, they may not always carry the registered USALS logo. Very often it is necessary to consult the manual to find out whether or not they provide this feature.

Some receivers – and motors, for that matter – simply state "compatible with DiSEqC 1.3" or "compatible with Goto-X".