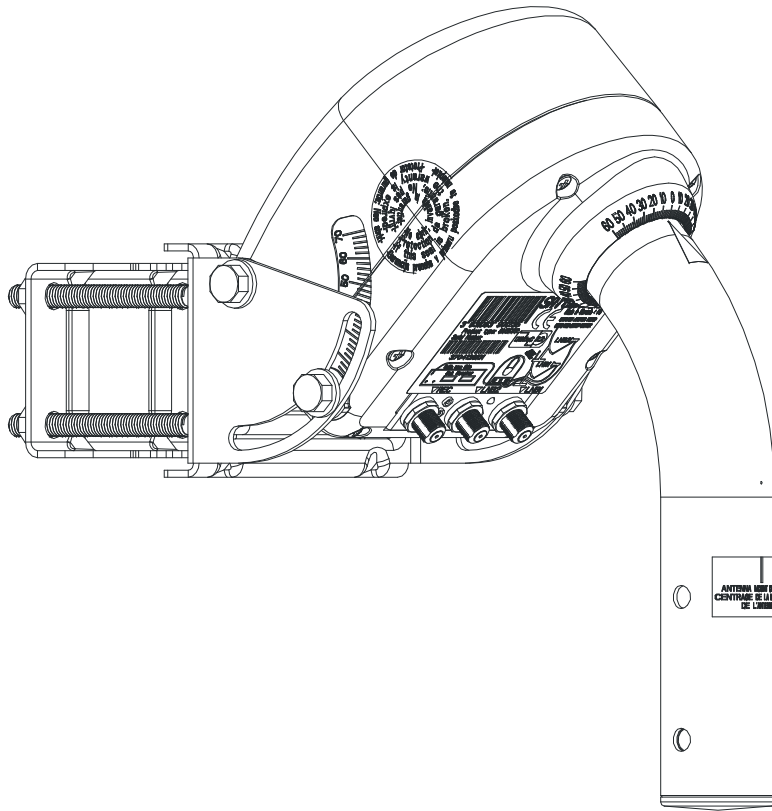*SATELLITE MOTOR*

SM3D22

with a DiSEqC 1.2/2.2 positioner and the »GoToX« function for automatic motor rotation, and a built-in DiSEqC 1.0 antenna switch

INSTRUCTIONS FOR THE INSTALLATION AND USE

FOR HELP WITH THE INSTALLATION, CALL YOUR LOCAL SUPPLIER

SM3D22 SATELLITE MOTOR FEATURES

- ✓ A professional new-generation motor with a DiSEqC 1.2/2.2 and "GoToX" compatible positioner for automatic operation
- ✓ The "GoToX" function for setting the motor without having to program it
- ✓ A built-in DiSEqC 1.0 antenna switch for reception over two different LNBs (Ku, C, H/V, R/L)
- ✓ DiSEqC communication indication
- ✓ Controlled via a single coaxial cable
- ✓ Option of manual motor control and programming via two buttons on the motor for easier installation
- ✓ A powerful "polarmount" structure for the ideal tracking of TV satellites in a geostationary orbit
- ✓ Suitable for all aluminum dishes of up to 1.4m in diameter
- ✓ Fast rotation
- ✓ Silent operation
- ✓ Motor rotation up to 99°
- ✓ Can be used in tropical climate
- ✓ Made in Slovenia (EU)

Technical specifications:

Operating protocol	DiSEqC ™ 1.2/2.2 compatible level and the "GoToX" function
Horizontal rotation	typically 95° (99° max.)
Inclination (motor elevation)	75°
Maximum antenna diameter	140 cm, aluminum
Programmable positions available	50 satellites
Maximum antenna mass	12 kg, when rotating the dish around the centre-of-gravity point
Antenna support length	120 mm
Bent motor pole diameter	40 mm
Rotation speed (unloaded)	2.5°/s (H-18V) 2°/s (V-14V) ±25%
Rotation speed (with a 85-cm dish)	2.3°/s (H-18V) 1.7°/s (V-14V) ±25%
Powered via a coaxial cable	14 / 18 VDC
Power consumption in stand-by mode	15 mA ±25%
Power consumption in operating mode (with a 85-cm dish)	95-150 mA ±25%
Starting movement consumption (80 ms)	350 mA
Operating temperature	-25°C to +70°C
Operating humidity	35% to 100%
Connectors	F type, 7 mm
Connection	coaxial cable with an impedance of 75 Ω
Connection cable up to 30 m	inner conductor CU ø 1.02 mm R=22 Ω/km
Connection cable up to 100m	inner conductor CU ø 1.13 mm R=18 Ω/km
EAST-WEST limits	hardware fixed, no programmable limit
Fine tuning step	0.36°
Mass with box	2.7 kg
Maximum permissible wind speed for a 85-cm/140-cm dish	140 km/h/80 km/h (km per hour)
Maximum permissible torque during rotation	15 Nm
Maximum permissible torque on idle	150 Nm
Control buttons	two (west-call and east-store)
Dimensions of packed into box	295 (L) x 132 (W) x 155 (H) mm
Lifetime min.	50,000 cycles over 180° (90°E + 90°W)

DiSEqC ™ is a trademark of the Eutelsat Company

A) KIT CONTENTS AND TOOLS REQUIRED FOR THE INSTALLATION

The SM3D22 motor kit contains the following components: (shown in the figure below)

1. Mounting bracket   (1 pc)
2. U-bolt   (2 pcs)
3. Fixing bracket   (1 pc)
4. Washer M8   (4 pcs)
5. Nut M8   (4 pcs)
6. SM3D22 motor   (1 pc)
7. Washer   (4 pcs)
8. Bolt M8x20   (4 pcs)
9. User's Manual   (1 pc)
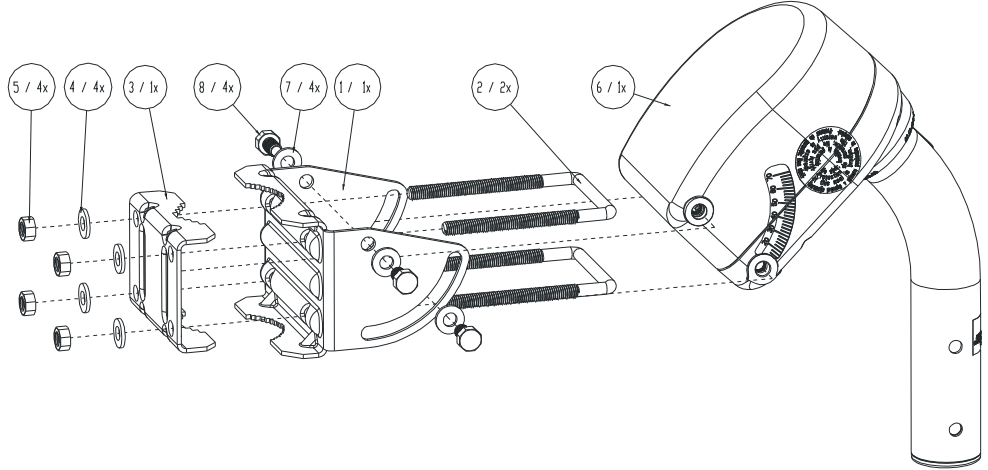
The following tools are required for the dish mounting on an erected mast:

1. Meter
2. Fork wrench, size 13 mm
3. Knife, and combination cutting pliers for coaxial cable preparation
4. Quality insulating tape
5. Satellite kit and TV set
6. Spirit level
7. Compass and a satellite finder are recommended, too.
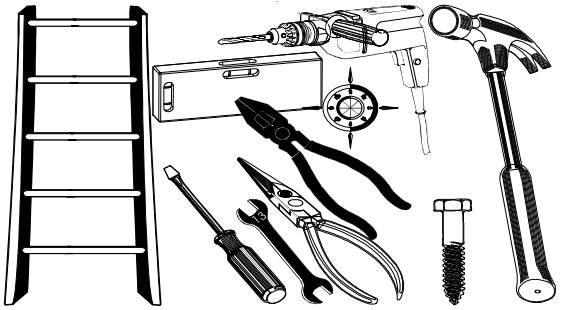
B) DESCRIPTION

You have bought a small, but powerful motor designed for rotating a satellite dish; the motor has a fully automatic control using the DiSEqC 1.2/2.2 and "GoToX" commands of the satellite receiver.

Owing to its innovative design, the SM3D22 motor has several advantages

- Precise installation guarantees ideal "polarmount" alignment, which allows full tracking of all TV satellites within the motor rotation angle, i.e. within 95° minimum For the precise alignment (positioning) over such a wide range we recommend that you call a qualified technician; but if you read and follow these instructions carefully, and if you are a person with basic mechanical skills, you can do it yourself.

These instructions apply to the positioning within a maximum rotation angle; you can also follow them for the alignment within a smaller rotation angle, where precision requirements are even less exacting.

The motor can be mounted on an existing mast for classical TV aerials, or on a wall bracket. In the latter case, the motor should be mounted as close to the wall as possible, or else the dish will be too far from the wall, and the force exerted on the wall anchors will be too big. For a 99-degree rotation, the mast has to be vertically plumb (±0.5°)

Under normal circumstances, the motor works with any (offset) dish of up to 85 cm in diameter. If the dish is not too heavy (up to 12 kg), and is not exposed to hurricane winds or heavy snow, a bigger dish can be mounted as well. When mounting a bigger dish, make sure that it is not too heavy, that its parabolic surface is as close to the mast as possible, and that the dish rotates around the center-of-gravity point. If these conditions are met, the motor operation will be error-free with an aluminum dish as much as 140 cm in diameter.

- A built-in antenna switch allows you to use another LNB on the same dish for the reception of additional channels broadcast in a different range, or by using different polarization. You can also connect an additional fixed antenna to it. In this way you are provided with fast access to a picture from two satellites without having to wait.

C) SAFETY PRECAUTIONS

Do not open and "repair" the motor on your own; always call an authorized service center. An unskillfully assembled motor can fall from the mast, together with the dish.

Be very careful when mounting the dish. If the motor is not mounted securely or the mounting structure is too weak, the dish might slide off the motor pole or the wall anchors might be pulled out. In addition to secure bolt tightening, make sure to choose such an installation location as not to endanger passers-by or objects should the dish support bracket get loose or the wall anchors be pulled out.

D) GLOSSARY

Polarmount – the mounting mode of a rotating dish, whereby the rotation axis is parallel to the earth's axis. It provides a virtually ideal tracking of all TV satellites, except for inclined ones.

Elevation – the angular altitude of the satellite above the horizon.

Azimuth – an angle to the east and west of the southern point.

Inclination – old satellites circle in an inclined orbit that is tilted relative to the geostationary orbit at certain angle; thus, their elevation varies constantly and so does the reception quality. Do not position your dish to such satellites.

E in W - abbreviations for **E**ast and **W**est.

Motor pole – a bent rotating shaft used for dish mounting.

LNB (Low Noise Block) – a device receiving signals collected by a parabolic dish; it has to be located precisely in the focus point of the dish. The LNB converts received signals into a form suitable for the

transfer via a coaxial cable to the satellite receiver.

Longitude - on a detailed map of your country, region or city find a vertical line that is the closest to your place. The latitude has to be determined with a precision of at least 0.5 degree.

Latitude: on a map of your country, region or city find a horizontal line that is the closest to your place (Oslo 60, London 51.5, Berlin 52.5, Munich 48, Paris 49, Ljubljana 46, Rome 42, Madrid 40.5, Ankara 40, Algiers 37, Cairo 30). The longitude has to be determined with a precision of at least one degree.

E) SELECTING THE INSTALLATION LOCATION

- The entire surface of the parabolic dish has to have a line of sight (clear shot) to a satellite (the path must be clear of obstructions, such as trees, roof tiles, etc.). Satellites circle in a geostationary orbit, which is slightly below the orbit of the sun at the equinoxes (figure below).

Make sure to prevent a possibility of causing injuries to passers-by, should the dish accidentally fall down.

The motor is watertight; nevertheless, it is recommended that you mount it under a roof. Rain and, moreover, snow on the dish surface and at the LNB input reduces the reception quality. **Naturally, the roof must not obstruct the sight of the satellite.**

MAKE SURE THE DISH HAS A CLEAR LINE OF SIGHT TO A SATELLITE ALSO WHEN ROTATING THE DISH EAST OR WEST
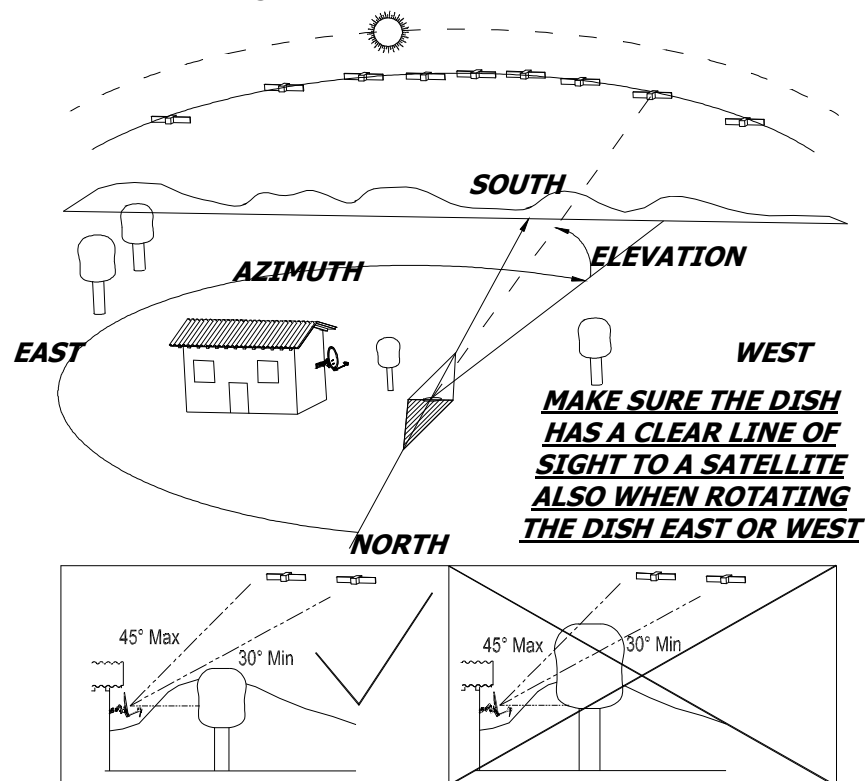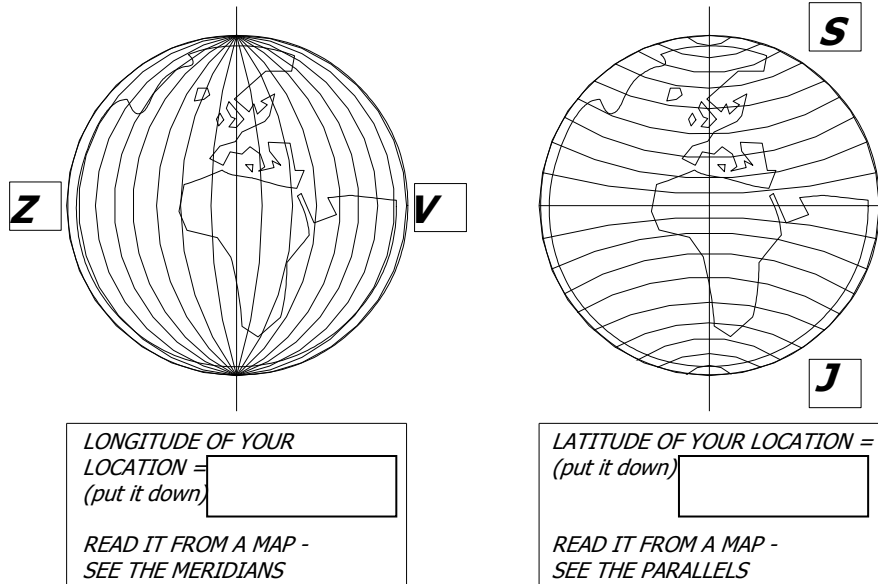
F) CONNECTING CABLE ASSEMBLY

You need three cables fitted with F connectors to interconnect the LNBs, the motor and the satellite receiver. The first cable connects the LNB1 and the motor, the second one the LNB2 and the motor, and the third one the motor and the satellite receiver. Make sure that the F connectors match the cable diameter. Too small connectors may damage the shielding, while too big may get loose. Prepare the cables as shown in the diagram below, and then attach the F connectors to them.

F-CONENCTOR ASSSEMBLY
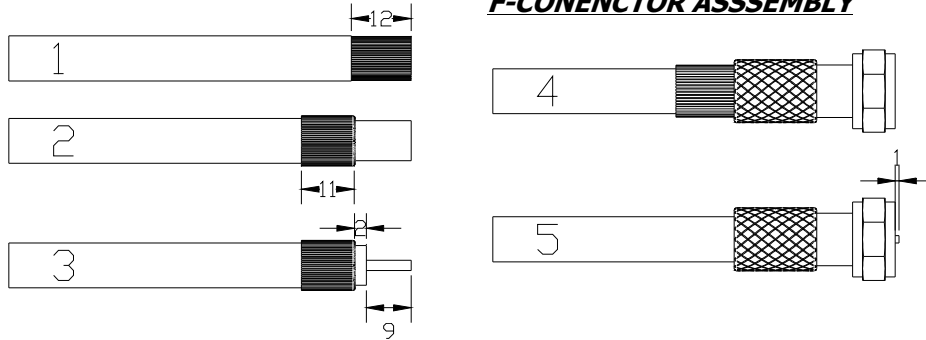
No tools whatsoever should be used for connecting the cables (F connectors) to the receiver, the motor or the LNB: **you can only fix them by hand**. All connectors that might be exposed to moisture must be protected. We recommend that you use a quality insulating tape. In the beginning, the tape should be tightened firmly; at the end you should loosen it slightly, or else the tape will unwind or will not provide watertight protection.

Z   V

S

J

LONGITUDE OF YOUR LOCATION =
(put it down)

READ IT FROM A MAP -
SEE THE MERIDIANS

LATITUDE OF YOUR LOCATION =
(put it down)

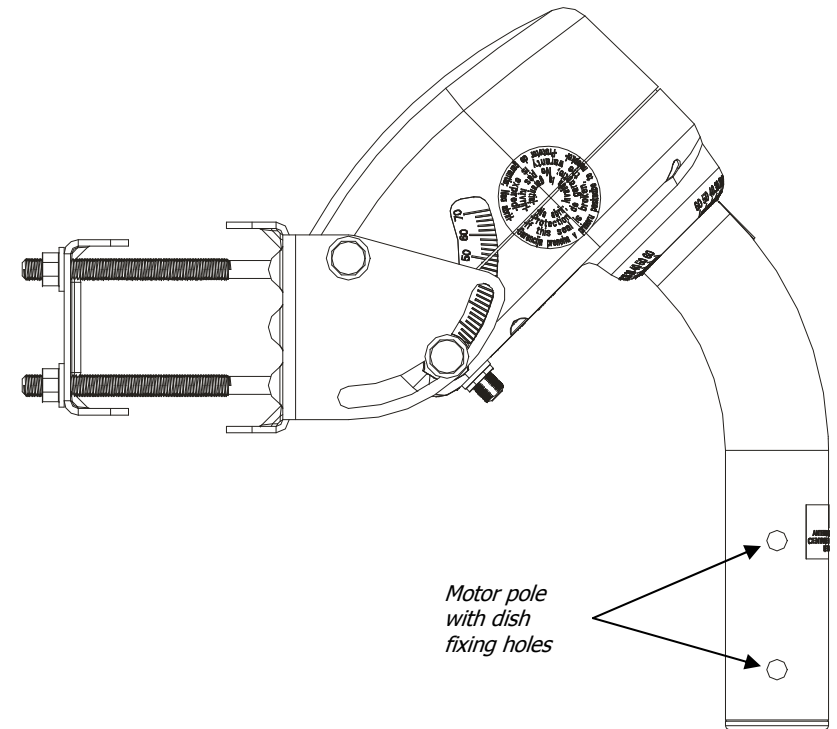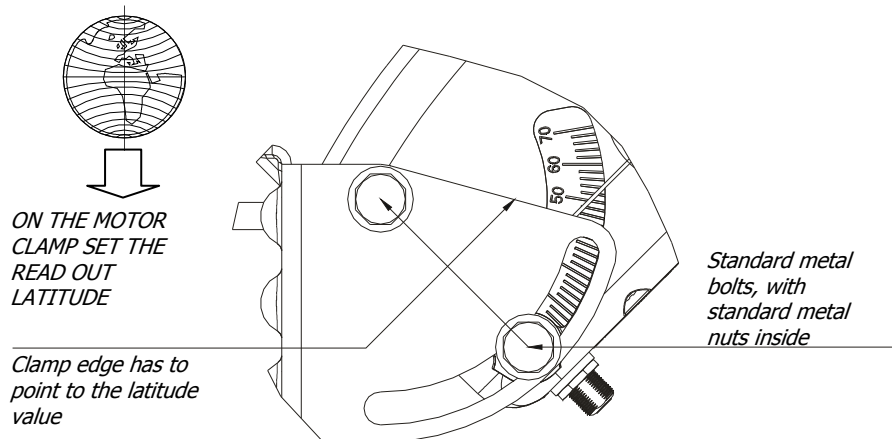READ IT FROM A MAP -
SEE THE PARALLELS

G) MOTOR ASSEMBLY

Assemble the motor following the steps shown in the figure below. First assemble all the components fixed to the motor bracket, and then put the assembly onto the motor.
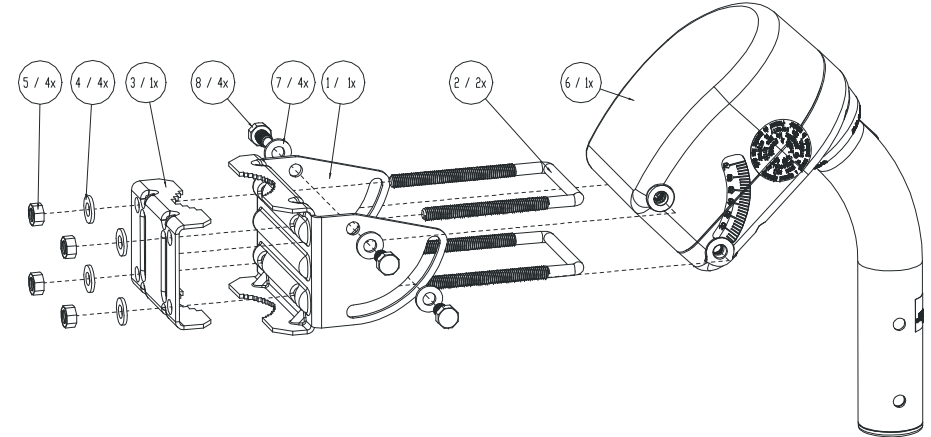
When assembled, the motor looks like this:

Motor pole with dish fixing holes

H) SETTING THE SCALE ON THE MOTOR CLAMP TO YOUR LATITUDE

ON THE MOTOR CLAMP SET THE READ OUT LATITUDE

Clamp edge has to point to the latitude value

Standard metal bolts, with standard metal nuts inside

You have to set the motor clamp at an angle that corresponds to your latitude. The latitude given in degrees directly corresponds to the setting on the motor clamp (X°). Example: for Paris at a latitude of 49° the angle will be 49°, for Slovenia at a latitude of 46° the angle will be 46°. You can tighten the screws firmly as there are standard metal nuts inside the motor.

I) MOUNTING THE DISH ON THE MOTOR POLE

Ordinary dish:

Mount the dish clamp onto the motor pole as shown in the figure below. The label and the point marked on the motor pole make the adjustment of the dish easier. The middle of the clamp has to be lined up precisely with the centerline on the label. Finally, mount the dish on the dish clamp.

Fix the dish clamp at least 1 cm from the bottom in order to reduce the force exerted on the motor. Make sure the dish does not slide off the pole. Secure it.
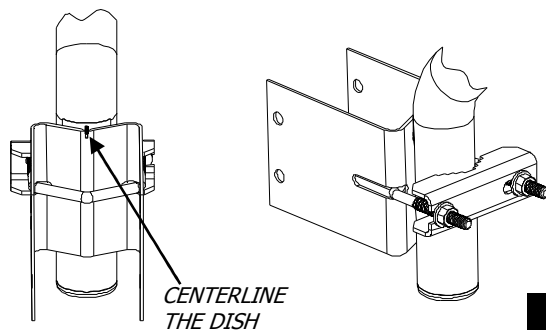
The setting of the dish elevation depends on the type of dish – please follow the instructions attached to the dish. Most easily the elevation angle will be set later, at signal finding (please see the section Installing the satellite on a mast, and searching for the satellite signal).

CENTERLINE THE DISH

Specially adapted dishes:

If you have a dish specially adapted for a motor, fix it with the U-bolt (enclosed to the dish) through the holes on the motor pole.

The following two figures show how to assemble and set a dish adapted for the motor.
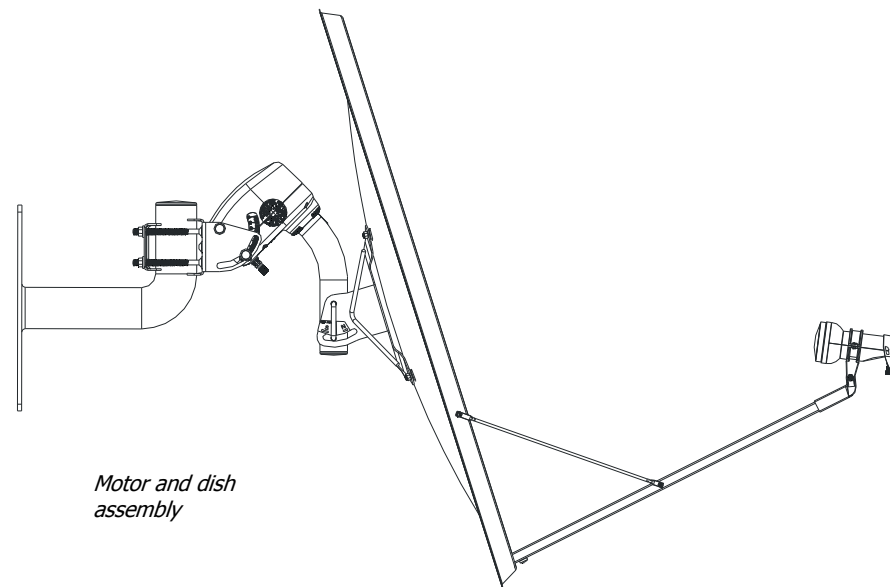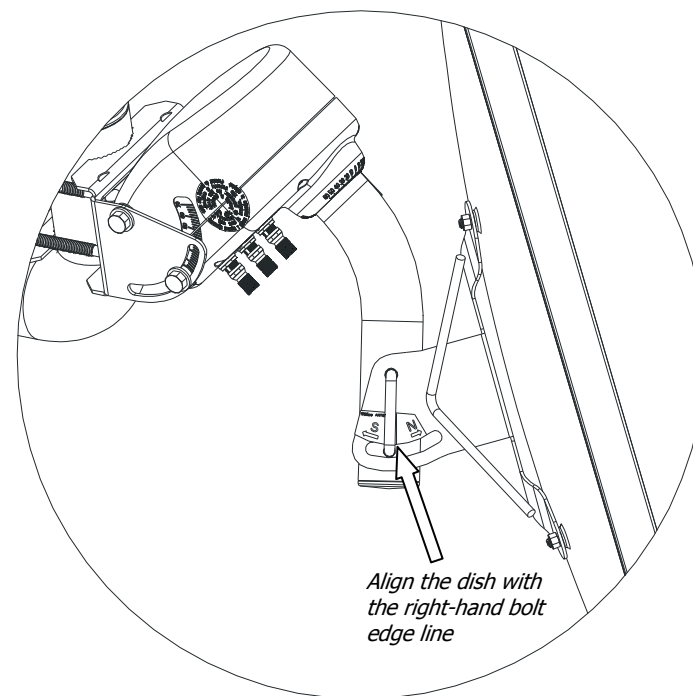
Align the dish with the right-hand bolt edge line

Motor and dish assembly

J) CONNECTING THE RECEIVER AND THE MOTOR

Connect the cables as shown in the figure. Then, turn the receiver on, enable the DiSEqC 1,2 mode or the "GoToX" function on the receiver, and enable the motor and the LNB power supply. When you read the instructions and learn how the motor works, you can mount the assembly on the mast. See the following section.

LNB 2

LNB 1

SATELLITE RECEIVER
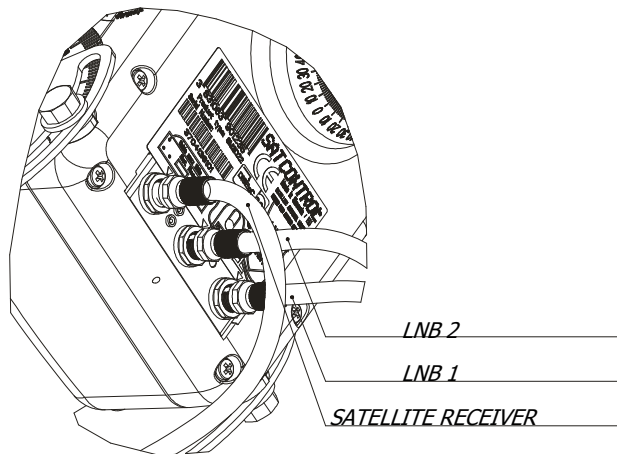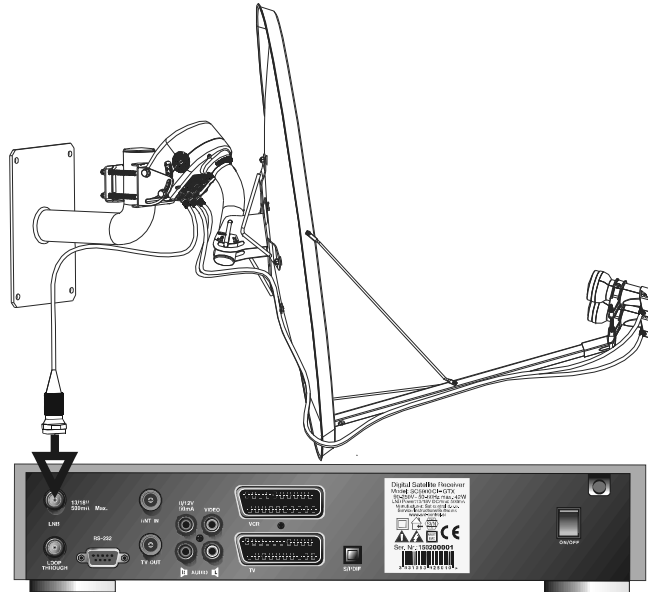
K) THE MEANING OF THE MOTOR FUNCTIONS

An explanation of how to control the motor by using the E/W buttons on the motor
(E-East, W-West)

E=(_ -----------) Keeping the **E** button pressed rotates the motor east **(E)** as long as the button is pressed.
E=(_ -----------) Keeping the **W** button pressed rotates the motor west **(W)** as long as the button is pressed.

	E	*W*	
(_ ----------)= short or long movement	rotating E←	→rotating W	(_ ----------)= short or long movement

The meaning of a LED indicator:

The LED on the motor indicates the receipt of the receiver commands. A green LED denotes that the motor has recognized a sent DiSEqC command, which will be executed immediately. The result is the rotation of the motor to a certain position, or just an internal setting. A red LED indicates that a DiSEqC command has been sent from the receiver, but the motor has not recognized it, and has not executed it. The reason can be disturbances that interfere with a command, or the command has been intended for another device that might be connected to the receiver (switch, LNB, etc.). When the LED indicator glows orange steadily, it means that the 2nd LNB input is in use.

| **green**	Receiver has sent a DiSEqC command	Command has been recognized and executed
red	Receiver has sent a DiSEqC command	Command has not been recognized, and has not been executed
orange	Does not glow – the 1st LNB input is in use	Glows – the 2nd LNB input is in use

L) INTERNAL ANTENNA SWITCH IN THE MOTOR

The motor has a built-in DiSEqC antenna switch. The common output can electrically connect to the 1st or the 2nd LNB input, depending on a command sent from the receiver. Normally, the receiver commands are defined as commands for the LNB-A and the LNB-B switch, or DiSEqC 1.0 positions 1 and 2. The currently selected input is indicated by the LED indicator (see the table above). The active input passes the entire signal to the common output (the receiver), and it also provides power for the LNB. The opposite applies to the inactive input. At a switch-over, the motor will rotate for a default angle, which is 6 degrees.
The purpose of this is reception from satellites with two different LNBs (e.g., a Ku and a C band LNB, or a LNB with linear H/V and circular R/L polarization, etc.). To enable this, the rotation by a default angle at a switch-over (typically 6 degrees) has to be set; you also have to provide a fitting for the mounting of two LNBs on a rotating dish. Mount both LNBs on the fitting. All the satellites that you wish to receive via the first LNB should be marked at the receiver e.g., LNB-A, and the others LNB-B.

Detiled view of the buttons for manual motor rotation east (E) and west (W)
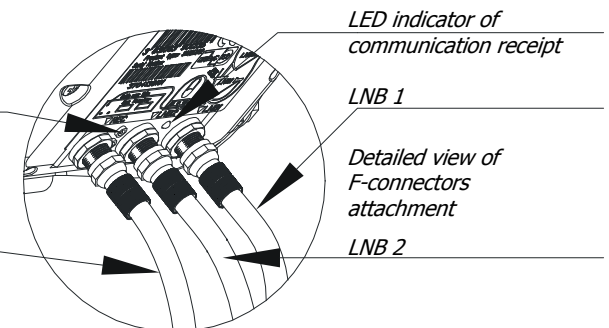
LED indicator of communication receipt

LNB 1

Detailed view of F-connectors attachment

SATELLITE RECEIVER

LNB 2

The operation is as follows: whenever the satellite marked LNB-A is selected at the receiver, the motor will rotate in the direction of this satellite, and the satellite focus will be on the first LNB. Whenever you select a satellite to which the other, LNB-B, is assigned, the motor will rotate in its direction shifting by 6 degrees, so that the satellite will be focused on the other LNB. In this case the LED indicator will glow orange. Now reception from the satellite will be via the other LNB.

The default shift setting is six degrees, and can be changed by internal settings according to the customer's wish – please check with your supplier.

The shift angle can also be zero degrees. Then, the switch is used in the following way: connect the first input to the LNB of a rotating antenna for reception from several satellites, and the other input to some other – a fixed antenna for the quick switch-over to your favorite satellite, or a satellite outside the motor range. In this case, to connect the signal from the LNB1 input to the receiver, the satellite has to be set to LNB-A; this applies to all the satellites except for your favorite satellite from a fixed antenna. On the receiver, your favorite satellite on a fixed antenna should be set to LNB-B for the connection of the LNB2 input – the signal from the fixed antenna to the receiver.

M) MOTOR CONTROL BY USING THE DiSEqC COMMANDS

The motor recognizes the following DiSEqC commands:

1) Rotate East
2) Rotate West
3) Call a satellite by degrees (the GotoX function)
4) Call a satellite by the NN location
5) Store the current position for satellite NN [1]
6) Limit the movement east [1]
7) Limit the movement west [1]
8) Clear the movement limitations (full movement range) [1]
9) Stop – unconditionally stop the motor
10) Switch to the other LNB
11) Go to the starting position – motor reset [2]

Notes:

[1] - The command is not executed while the motor is in motion.

[2] - Use it when the motor loses the state of a position due to external electric interferences and shocks. The same effect is achieved if the motor's **power supply is disconnected while the motor is in motion** (plug out the coaxial cable). Other names are: »HOME«, call satellite 00, go to 0, etc.

N) MOTOR CONTROL BY USING THE »GoToX« FUNCTION

You can only use this function is your receiver supports it, too. There exist other names, e.g., DiSEqC 1.3, USALS, etc. If you have one of these functions, you can ignore the following section.

This function requires no programming at all. It operates in the following manner: the receiver computes the coordinates for any SATELLITE (e.g. ASTRA) on the basis of your location latitude and longitude that you have previously entered; then it sends this computed value by using DiSEqC communication via the coaxial cable to the SM3D22 motor. The motor, in turn, rotates so that it points precisely at such a satellite, depending on your location on the Earth. This will work on one condition, i.e., that the receiver contains a database of satellites, which is usually provided with modern receivers.

When setting the antenna dish you will need your southernmost satellite (see the section INSTALLING THE SATELLITE ON A MAST, AND SEARCHING FOR THE SATELLITE SIGNAL). This will be a satellite in the receiver list that is the nearest to your longitude (e.g., Hotbird). BE CAREFUL. If you use this function on the receiver, skip the following section "O".

O) PROGRAMMING THE SOUTHERN-MOST SATELLITE ON A MOTOR WITH THE DiSEqC 1.2/2.2 RECEIVER

Please read the instructions for the use of the receiver so that you will know how to rotate the motor to the left (E), or to the right (W), store the satellite position in a program location, and change a satellite or a channel.

The setting of satellite positions varies with receivers, therefore follow the receiver manual if you have a receiver that supports the DiSEqC 1.2/2.2 protocol. In the receiver, the satellite positions are normally stored under numbers (e.g., from 1 to 50); so it is recommendable to follow some logical sequence.

First, select and program the southern-most satellite. Proceed as follows: by using the satellite receiver commands, first rotate the motor pole so that the arrow points precisely at the value on the motor scale (ring) that has been calculated according to the formula given below for the southern-most satellite; then store the position under a number chosen in the table below. You will search for and store the other satellites in accordance with the instructions given in the section »Installing the satellite on a mast, and searching for a satellite signal« because the antenna will already track the satellite orbit.

On your site, the southern-most satellite is the one that is the closest to your location's south. **_CAUTION: the southern-most satellite must not be more than 5° east (E) or west (W) of your location's south, or the setting might be wrong. See the table below._**

FORMULA FOR THE CALCULATION OF THE SOUTHERN-MOST SATELLITE SETTING ON THE MOTOR:

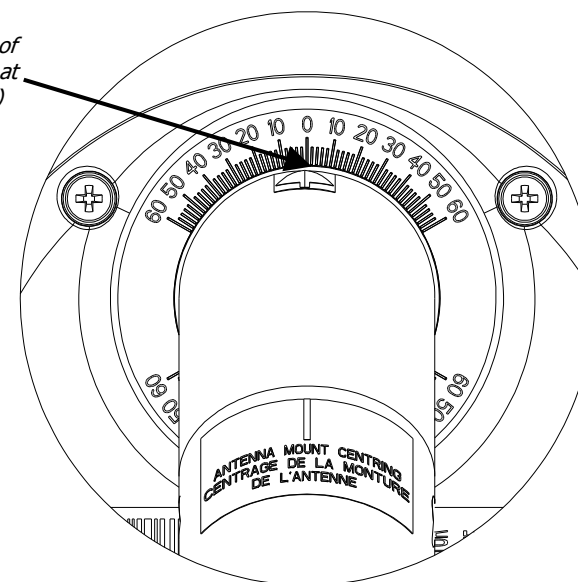**(Satellite longitude – Longitude of your location) x 1.15 = Setting on the motor.**

For west (W) use the + SIGN   For east (E) use the - SIGN

EXAMPLE: if your mounting location is 14° E, choose the satellite HOT BIRD (see the table below); HOT BIRD is at 13°E, so you will have to set the motor pole at 1.15°W (west).

This means: (-13) – (-14) = +1 x 1.15 = +1.15 (see the figure).

Detailed view of the motor set at 1.15°W (west)

To search for and program other satellites, see the table below and the following section.

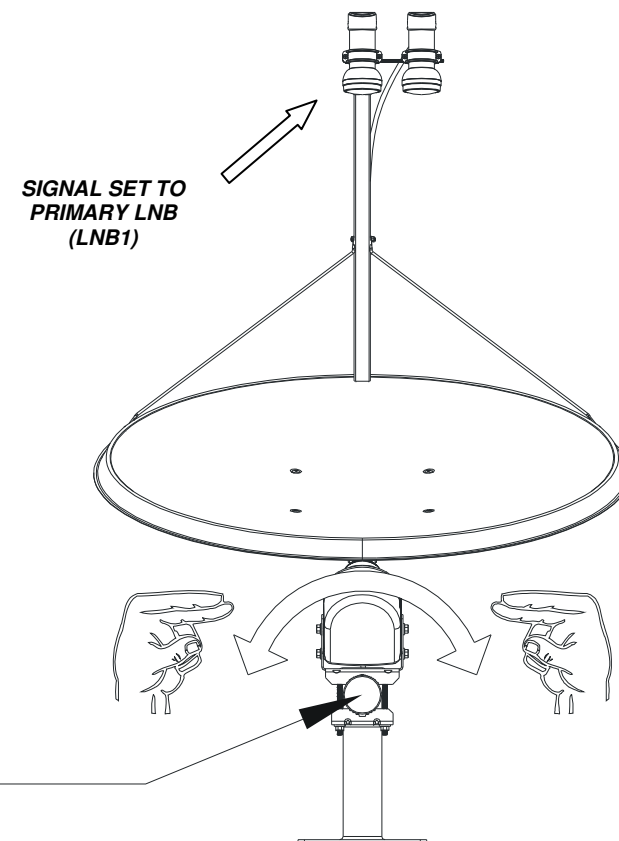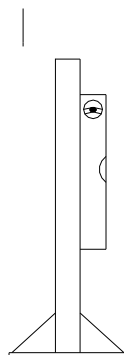| No.	Satellite	Position	No.	Satellite	Position	No.	Satellite	Position
1	Hot Bird	13E	13	Intelsat 803	27.5W	25	Amos	4W
2	Astra 1	19.2E	14	Hispasat	30W	26	Thor	0,8W
3	Eutelsat F3	16E	15	Telstar	37.5W	27	Nilesat	7W
4	Eutelsat F2	10E	16	Kopernicus 3	23.5E	28	Eutelsat	12.5W
5	Eutelsat F4	7E	17	Arabsat 3A	26E	29	Intelsat	31.5W
6	Sirius	5E	18	Astra 2	28.2E	30	Eutelsat	36E
7	Telecom 2C	3E	19	Telstar	15W		PAS	43W
8	Intelsat 707	1W	20	Arabsat 2B	30.5E		Intelsat	50W
9	Telecom 2BD	5W	21	Turksat 1B	31.3E		Intelsat	53W
10	Telecom 2A	8W	22	Turksat 1C	42E		PAS	58W
11	Intelsat 705	18W	23	Intelsat 601	34.5W		Intelsat	62E
12	NSSK, Intelsat	21.5W	24	PAS 1	45W		PAS 4/7	68.5E

If the receiver is not provided with pre-programmed satellite numbers, assign them in accordance with the table above. Some receivers do not use satellite numbers at all, in which case satellite names are used as positions and the table above is irrelevant.

P) INSTALLING THE SATELLITE ON A MAST, AND SEARCHING FOR THE SATELLITE SIGNAL

Before mounting the motor and the dish onto a mast, make sure the mast is vertically plumb. Even a deviation of only a quarter of a degree (inclination of 0.5 cm at a height of 1 m) may cause deviations due to which corrections will be required.

Using a satellite finder/signal meter will make the setting easier for you. Anyway, the latest receivers are provided with a signal meter on their menu.

First, using your receiver call your southernmost satellite (see the previous two sections). When the motor stops somewhere in the middle, hold the motor, loosen the screws of the mounting bracket, look in the receive direction of the dish, and search for the signal by moving the system left-right, and dish elevation up-down. The movement should be VERY slow because the receiver requires a few tens of milliseconds to process a signal. When you find a signal, set it to optimum reception, and tighten the screws carefully. Now you have set the reception to the top of orbit.

SIGNAL SET TO PRIMARY LNB (LNB1)

TO SET THE SOUTHERN SATELLITE, YOU SHOULD ONLY ROTATE THE MOTOR ON THE POLE TOWARD THE SOUTH

If you have a dish specially adapted for the motor, you have set the elevation in the beginning (against a value on the motor scale), so satellite finding will be easier. Horizontal alignment should be made by rotating the motor on the mast, **and not by rotating the motor pole or the dish itself.** The elevation is corrected by adjusting the dish elevation angle, **and not by changing the motor tilt. Make sure that the signal received is the southern-most satellite signal.**

The accuracy of the alignment is very important and you should not be satisfied with the first picture you get on your TV set. A digital receiver and its indicator of the reception quality are very useful tools for the precise dish setting; with an analog receiver we recommend that you decrease or increase the dish elevation angle to the limit of signal reception (the picture is sparkling). You can also do a trick by placing an obstacle (a damp cloth or paper) in front of the LNB (over the input facing the dish); as a result, the reception deteriorates, making optimal alignment easier.

Caution: it is the satellite program schedule on the basis of which you will know which satellite (channel) you are actually viewing. Therefore, check up at web pages or in a magazine that contains all program schedules and frequencies for each satellite.

If you use the »GoToX« function, you have finished the "rough" setting. But if you use the DiSEqC 1.2 / 2.2 location control, you have to take the following additional steps:

You start searching for and programming both east and west satellites. First point the receiver at the next east satellite (see the table, and sort the satellites by the longitude from the easternmost to the westernmost), and check for the signal strength by a minimum dish rotating east/west. If – on rotating the dish – the signal deteriorates, program the position via the receiver under the number indicated in the table. Continue until you reach the motor rotation limit. Then do the same in the west direction.

CAUTION: do not forget that you have to store each satellite under <u>a different number</u>. You can also change the satellite numbers.

Q) FINE TUNING

If you followed the instructions and you had some luck, positioning to the south was precise enough, so the major part of the job is now done. Otherwise, deviations will be slightly bigger, so fine tuning will take longer.

First check up the setting of all the angles. Any error affects the outermost (east and west) satellites the most, and results in a wrong dish elevation angle. This is a high-precision job for a person with some technical skills, equipped with at least a simple satellite finder.

1.) On the satellite receiver, select the easternmost satellite. *This is a satellite as close as possible to the outermost motor rotation limit. If the outermost satellite has a weak signal, we recommend that you select a nearer one, with a stronger signal. Never choose an obsolete inclined satellite (please see the GLOSSARY).*

2.) The second step is to check up the dish elevation for the aligned east satellite. *The easiest way to do this is by leaning the mast back and forth toward the satellite or - if this is not possible - by leaning the dish itself. With this minimum leaning nothing is detached or actually moved; all you have to do is a minimum bending of the mast or dish, **not causing a permanent deformation**.*

This job will be difficult to accomplish without an instrument or a reception quality indicator provided with virtually all digital receivers. To notice a drop in the quality of analog reception on your TV set, the mast or the dish has to be leant a long way, therefore use the tricks described in the previous section. Put down or memorize the results obtained to compare them with those described below.
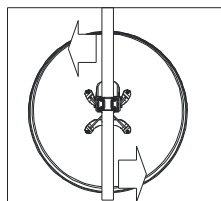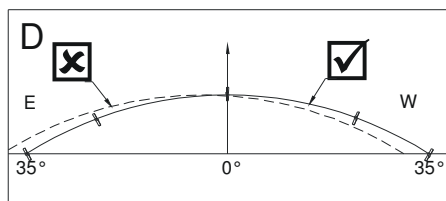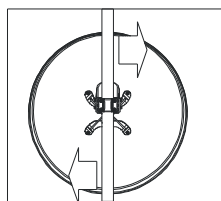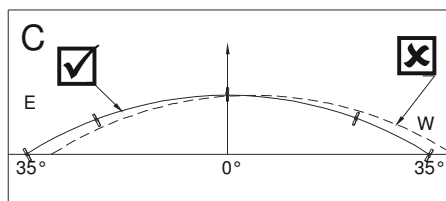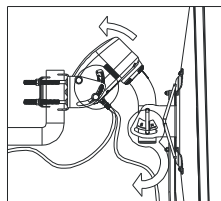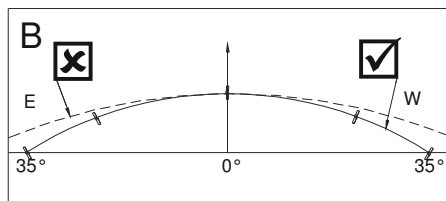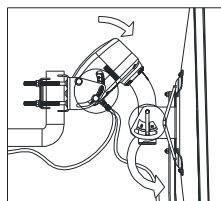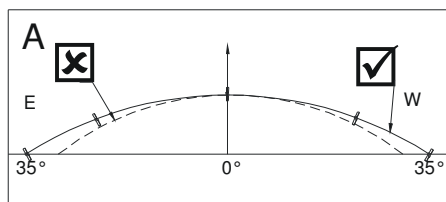
3.) Repeat steps from items 1 and 2 with the westernmost satellite as well. *There can be five basic result combinations.*

A) The dish is "too low" at both outermost points - when leaning the mast or dish back (away from the satellite), the reception improves.

> *Reduce the motor tilt – set a smaller angle, and increase the dish elevation – set a bigger angle.*

B) The dish is "too high" at both outermost points - when leaning the mast or the dish forth (toward the satellite), the reception improves.

> *Increase the motor tilt – set a bigger angle, and reduce the dish elevation – set a smaller angle.*

C) The east satellite is too low, and the west one is too high.

> *Lean the mast with the motor slightly toward the right (west), viewing from the rear (even though the mast has been vertically plumb, you must now lean it and fix it this way).*

D) The east satellite is too high, and the west one is too low.

> *Lean the mast with the motor slightly toward the left (east), viewing from the rear (even though the mast has been vertically plumb, you must now lean it and fix it this way).*

E) Both outermost points have optimum reception.

> **<u>Congratulations! You have done an excellent job.</u>**

Correct and repeat the procedure of checking up the outermost satellites until you get satisfactory results. The tuning completed, do not forget to remove the cloth or paper if you have used them.

Remember: firmly secure the bolts so that the dish or the motor does not get loose, thus losing the signal and the settings, or that it does not fall down. The set-up of your system is now finished.

R) TROUBLESHOOTING

Should an error occur in the operation, first attempt to remedy the problem on your own.

1.) *Whenever the motor does not operate correctly, the first step to be taken is*
   - *resetting the motor, i.e., sending it to the selected outermost (HOME) point.*
   - *If the motor does not respond, plug the satellite receiver out of the mains for a minute, and then plug it in again.*

2.) *Despite taking steps from item 1, the motor will not move.*
   - *The connection between the receiver and the motor might be broken, or there is a short circuit in the LNB or in one of the F connectors. An error may have occurred in the satellite receiver as well – maybe you have switched off the LNB power supply or disabled the DiSEqC 1.2/2.2 mode.*

3.) *Even after you have reset the motor, wrong satellite positions persist. The reason might be an obstruction preventing the dish rotation to the outermost point, or the wind has rotated the motor together with the dish. When the dish is halted by an obstruction while being sent to the outermost point, the motor recognizes the point as a new outermost point, and all the satellites are positioned to once more, but relative to this new point.*

- Reset the motor again and check to see if it can rotate to the outermost position. Remove the obstruction, if any; if the wind has rotated the motor, do as described at item 4.

4.) *All the satellite positions deviate by an equal angle; everything seems all right with regard to the motor scale – please see the item above.*

- Obviously, the motor has been rotated on the mast or the mast itself has rotated. Do not correct positioning to satellites by programming, but by returning the motor to its original position. If you have already "corrected" any of the positions, align the motor to a satellite position not having been "corrected" yet to get an optimum motor position.

5.) *Certain satellite positions only are incorrect. Most likely, these satellite positions have been re-programmed by mistake.*

- Re-program the wrongly positioned satellites.

6.) *When rotating the motor manually, it keeps stopping at the same point and does not move on.*

- Most likely, there is a micro-controller error; reset the motor (send it to the outermost – HOME point).

7.) *The dish does not rotate at the same speed all the time.*

- *Due to horizontal or vertical polarization, the satellite receiver does not supply the same voltage at all times, so this is a normal condition.*

End.

Dear customer,

If you were not able to put the system into operation or have problems installing it, call the Technical Assistance phone as indicated on the first and the last pages. We will be pleased to provide you with further information.

If you have installed the system to your satisfaction, we congratulate you.

Your supplier.

S) TABLE OF CONTENTS