

CRYSTOP DISPLAY GMBH



AUTOSAT

**AUTOSAT 2**

**AUTOSAT 2 DVB**

■ Intelligent Satellite Receiver System for Motor Homes and Caravans

■ Operating Instructions





## Important Notes:

Please read these operating instructions before installation and start-up of your AutoSat2.

**Always make sure (even when your AutoSat2 will be retracted by your starter key, see chapter 4.2 Power Supply) that the system has really retracted when starting your vehicle. In case of interrupted supply voltage, for instance, the aerial can no longer be automatically retracted.**

**Very important:** The external unit **must** be assembled in stationary position with the aerial folded in a direction **opposite to driving direction** on the vehicle roof as otherwise one cannot rule out that the aerial will be righted by the wind during high-speed driving.

When **loading the vehicle on a train**, the aerial must be fixed in stationary position by additional suitable means (expander belts, etc.), due to railway wagons being turned around when recoupling.

**Do not clean your AutoSat2 external unit with a steam cleaner.** The rubber seals used for sealing will be OK for rain and water spray but cannot survive a water jet of several bars of pressure.

**Do not use drive-in wash stations**, which will be used entirely at your risk.

A condition for satellite reception will be **free sight to the satellite**, i.e. trees for instance cannot be penetrated by a satellite signal !!

**In European marginal zones** you may not be able to receive all your stations. Therefore ensure that satellite search in these areas operates with a station receivable there

### **WARNING:**

In order to prevent damage to your vehicle roof, your AutoSat2 must not be operated in high winds and gusts.

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# I. Assembly Instructions

## !!! Note

Please read these assembly instructions before commencing installation!

## 1.0 Scope of Supply

- 1 Receiver with integrated motor control and IR remote control
- 1 External unit and satellite aerial (dish or flat aerial)
- 1 Connecting cable for power supply, 1 m length
- 1 12-way connector housing
- 1 Assembly material for satellite aerial
  - self-tapping screws 3.9x25
- 1 Junction box

## 2.0 Selection of Installation Site

### 2.1 Receiver

Initially select site for positioning your receiver. It should be close to your TV set, if possible and be seen from where you sit, due to the receiver being controlled by an IR remote control.

## !!! Note

When using a separate control with an integral IR receiver supplied as an option, the receiver may also be concealed in a cabinet.

Please pay particular attention to:

Sufficient ventilation for the receiver, no additional heat sources inside a cabinet.

The need to reach the receiver conveniently with the necessary cables.

**Supply of short screws (max. 7 mm depth into the unit), should the receiver have to be fastened directly to the housing and in original bores only.**

## 2.2 External Unit

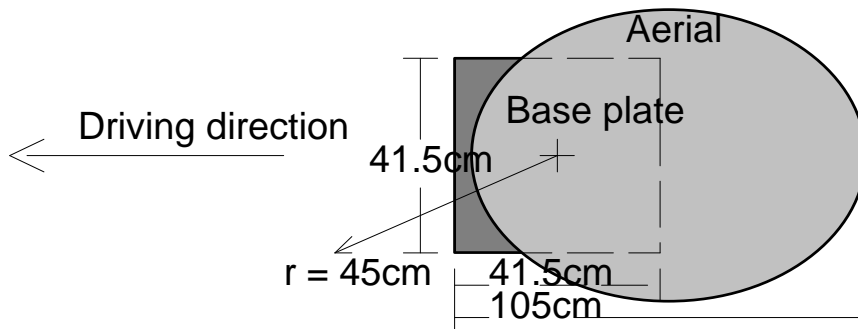
When selecting the installation site, please notice that cables to the external unit are 4 (6) m long and ensure that the external unit will have a sufficient clearance for rotation.

### **Flat aerial:**

The AutoSat2 (50 cm flat aerial) has a base of 41.5 x 41.5 cm and in search mode will require a maximum radius of 25 cm for objects of up to 15 cm height. For higher objects, a radius of 45 cm will have to be reserved.

### **Dish aerial**

The AutoSat2S (85 cm dish) has a base of 41.5 x 41.5 cm and in search mode will require a free area of 45 cm radius, due to the LNB, for instance, rotating just above the roof in Northern Europe. In stationary position, the space required is shown in the following sketch:



Now find sufficient free space on your roof around the cable gland. The direct vicinity of the site selected must be free from high objects (exceeding 20 cm), which might shadow the aerial.

When this installation site has been found, once again make sure whether the receiver is within a cable length of 4 (6) m. If not, relocate the installation site or the receiver or extend the cable by an additional extension set (obtainable from us).

### **!!! Note:**

Mount and secure the external unit in such a way that detachment or falling down of the unit is impossible. For sandwich roofs not offering adequate facilities for assembly, a through-screw and an internal doubler plate is recommended.

In case of doubt consult the maker of your vehicle.

## 3.0 Mounting the External Unit

Proceed in the following sequence

Use Sikaflex-252 as an adhesive/sealant

1. Position external unit with the outgoing cable pointing towards the rear of the vehicle.
2. Drill 2 diagonal holes from the base plate of the external unit by using a 2.4 mm drill.
3. Fix external unit by two self-tapping screws of 3.9 x 25 to the roof. Lightly tighten screws. **The aluminium coating of the roof is thin and the screws may be easily tightened too hard.** Then drill remaining holes.
4. Lift off external unit and clean underside and edges of base plate as well as the roof mounting area from dirt and fatty residues. Fully coat base plate with a thin coating of Sikaflex-252 and position external unit on roof in chosen position.
5. Before turning in the screws, seal holes with Sikaflex. Arrange a sealing joint around edge of base plate.
6. Drill a hole (min. dia. 15 mm) for the three cables through the roof.
7. Wrap cable contacts with adhesive tape to avoid damage. Carefully push cables from side into junction box and through roof. Fix junction box over this hole with Sikaflex-252 and 3 bolts of 3.9 x 25. Position and fix cables to roof. It is recommended to use a cable trunking 20 x 20 mm, attached to the roof by Sikaflex-252.
8. The aerial can only be mounted after the system has been connected to the power supply and is ready for operation, as the arm of the aerial will have to be extended from stationary position. Switch on AutoSat2, wait until arm has sufficiently extended and interrupt power supply (remove cable). Use washers for all four screws.
  - 8.1 **Flat aerial:** Carefully tighten nut of aerial cable on aerial by a 11mm open-ended spanner but **not too tightly.**
  - 8.2 **Dish aerial:** After assembly of aerial dish, fasten **support block, whilst the aerial is in stationary position, below free end of aerial dish.**

This concludes work on the roof.

## 4.0 Cable Connection to AutoSat2 Receiver

### 4.1 External Unit

Lay cables from external unit to receiver. Cables may not rub against sharp edges or be laid close to heat sources. Ensure prior to engaging contacts in connector housing that **contacts are in faultless condition and not bent. In particular, contact blades must not have excessive spacings.** Engage contacts in connector housing to the following sketch. Individual cable cores are marked in colours and connector-housing recesses are numbered to eliminate confusion.

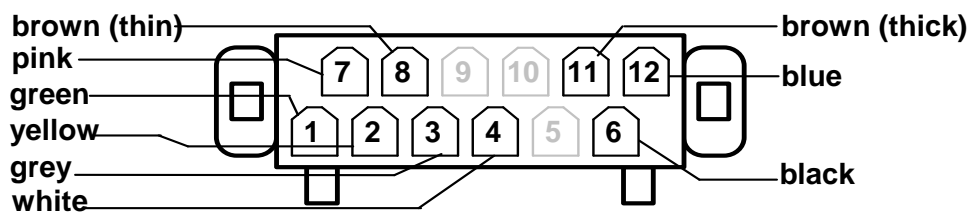
Work very carefully, because contacts, once inserted, cannot be removed.

Ensure that contacts are fully inserted to allow blade to engage (can be heard as a click). After inserting all contacts, push connector housing together in vertical direction to contacts.

#### Sketch of connector housing (*rear view!!*)

6-core cable:

3-core cable:



For power supply connection see next page

## 4.2 Power Supply

Proceed in accordance with wiring diagram on following page. Connect short 3-core connecting cable supplied by a suitable connector to your 12 V vehicle mains.

**For a 24 V vehicle mains, a 24V/12V transformer will be required.**

Use a **cable section of min. 4 mm<sup>2</sup>** for voltage supply to keep cable losses to a minimum. The AutoSat2 should ideally be directly connected to the battery by a dedicated supply cable. Ensure that no other major users are connected to the same supply cable. If so, the cable section must be of a suitable larger size.

Connect blue cable of 1 mm<sup>2</sup> to terminal 15 (ignition on) and/or D+ (alternator). This will ensure automatic retraction to stationary position of the unit when starting to drive. Both a 12 V and 24 V signal may be connected in this case (applicable to control cable D+ ONLY).

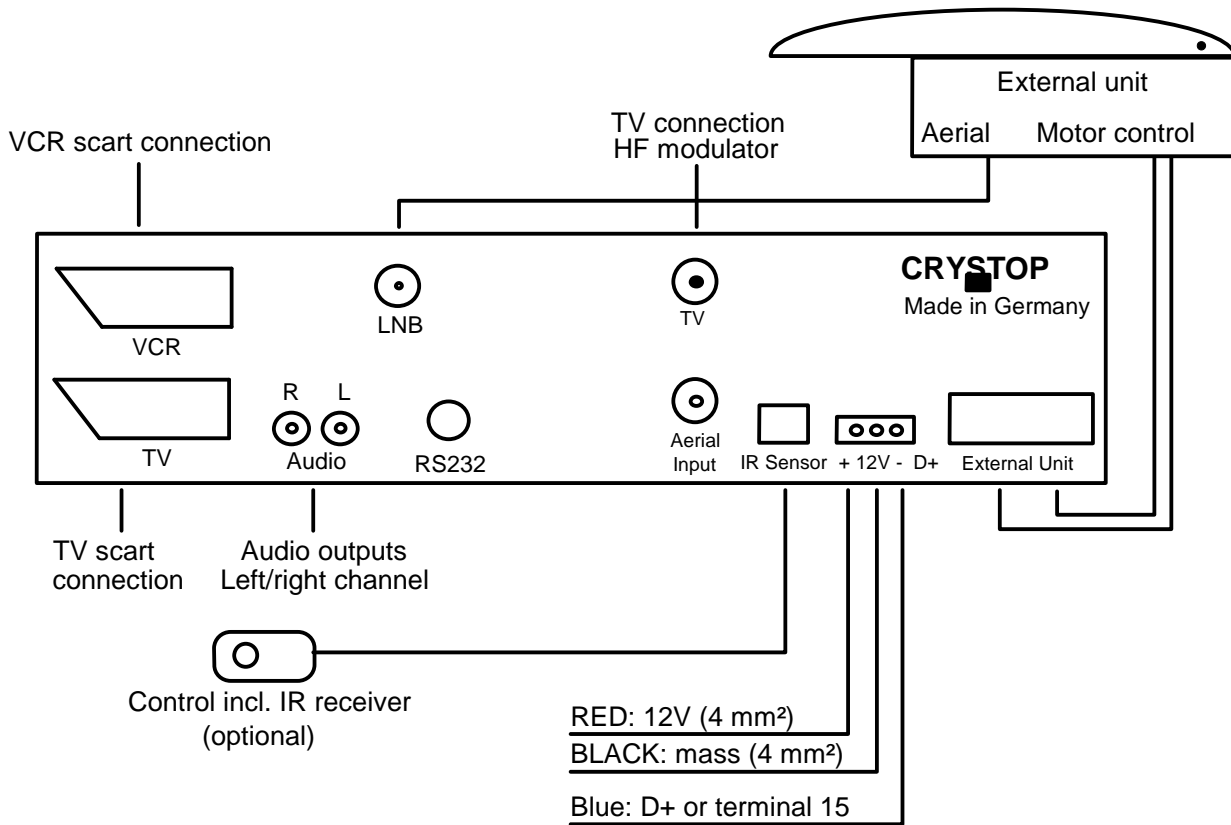
**Always ensure that system is fully retracted when starting to drive. When the power supply is interrupted, the automatic mechanism will be unable to retract the aerial.**

The system is equipped with a polarity reversal protection system.

Please use your AutoSat2 only connected to a battery and/or to a stabilized and regulated DC power supply with at least 10 A continuous current.

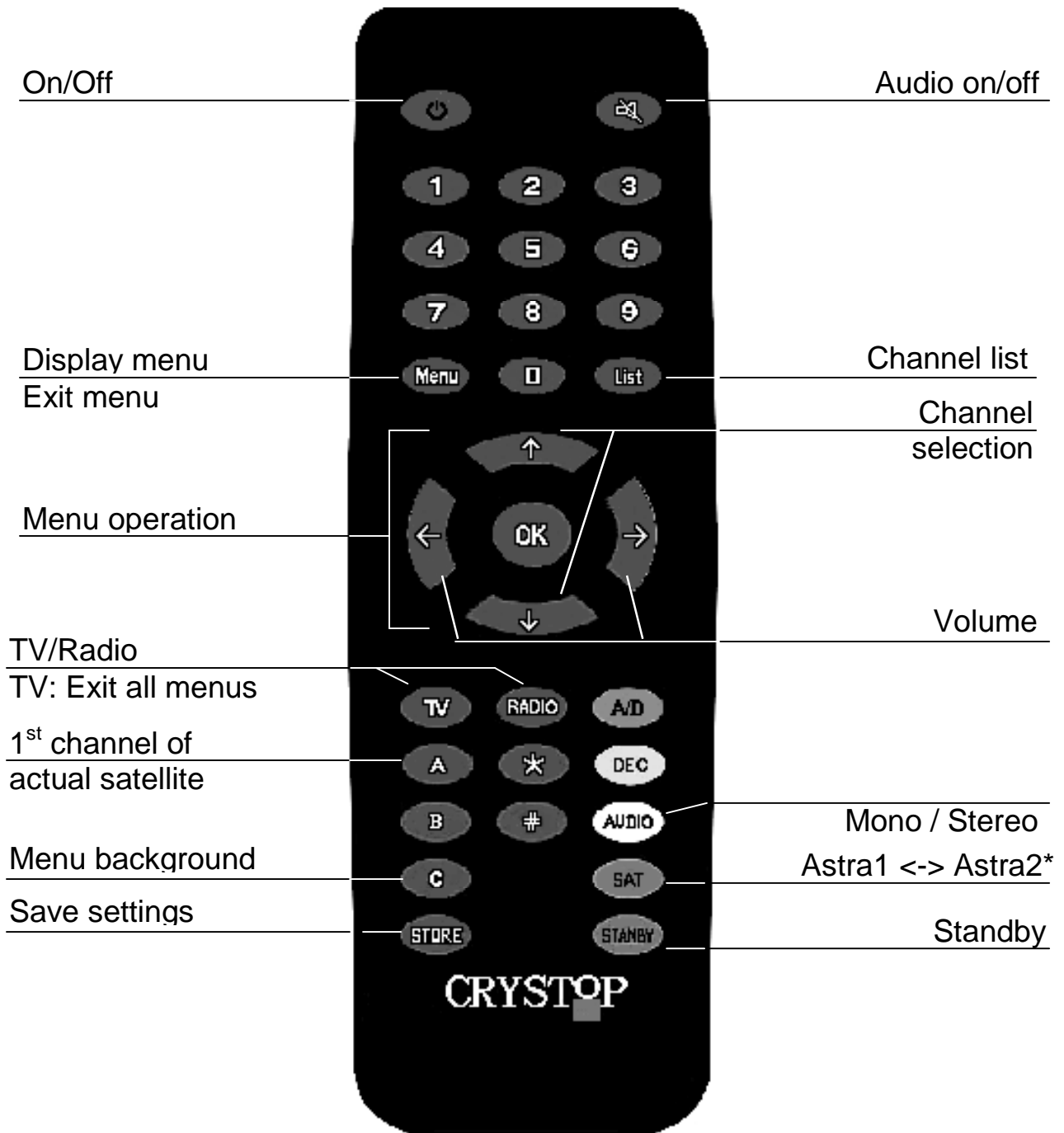


# Connecting Diagram



Connecting facilities for TV with/without a scart and video recorder see appendix **A.1**.

# Remote Control



# II. Operating Instructions

## 5.0 General

AutoSat2 DVB offers digital channels of factory preset or personally programmed satellites of the satellites ASTRA 1, HOTBIRD and ASTRA 2.

### 5.1 Enabling

Please enable your TV first to enable *On Screen Display* of your AutoSat.

**AutoSat2 On:** Use centre key at front of unit or key at separate controller (optional) only.

**AutoSat2 Off:** Use centre key at front of unit or key at separate controller (optional) or **ON/OFF** key on remote control.

**After enabling the unit, an automatic search will be started with your last selected channel active. No further operation will be necessary for automatic search except you want to change the channel or satellite. AutoSat2, please wait...** will be displayed and the aerial is extended to start extension.

**During this phase only, the search procedure may be interrupted in order to change channels or to select satellite** (see chapter 5.3 or 6.2):

Possible keys for manipulation are:

<b>↑, ↓</b>	1 change of channel
<b>0 ... 9</b>	Channel direct input
<b>LIST</b>	Channel list
<b>MENU</b>	Search satellite

followed by the search being automatically continued.

**During satellite search, AutoSat2 will *not* react to remote control (except the ON/OFF key).**

### 5.2 Procedure for Automatic Satellite Search

The search may comprise up to 2 passes, with the second pass searching at a higher sensitivity until the satellite has been found.

After rough location of a satellite, **fine tuning** will start, with the system searching for optimum reception. This may take more or less time depending on the quality of reception and/or the selected station.

**Fine tuning may be aborted by pressing any key.** In case of abortion, no optimum image may be ensured for all channels.

## 5.3 How To Select a TV or Radio Channel

Channel selection is effected by the following keys:

- **↑, ↓** keys      Press briefly: 1 change of channel  
                         Press and hold: fast channel changes
- **0 ... 9**            Channel direct input, 1, 2 or 3-digit.  
                         For input of multi-digit numbers enter figures fast.
- **LIST**                Station list, see chapter 7.1
- **TV, RADIO**        Switch **TV <-> Radio**

## 5.4 Volume Control

Set volume by **←** and **→** keys.

Press **STORE** key (whilst VOLUME is inserted) for permanent storage of setting  
Set volume at TV Set to higher range (not maximum), save this setting and  
adjust AutoSat2 volume to your personal taste.

## 5.5 OK-Key: Information on Broadcasts

Press **OK**-key to obtain information on present and following broadcast (not  
always available). Sometimes there is additional information available on 2<sup>nd</sup>  
press of **OK**-key. Follow top line of screen for further information. Possible only  
when no menu has been selected.

## 6.0 Explanation of Menus

### 6.1 MAIN MENU

After pressing the **MENU** key, the main menu will be displayed.

MAIN MENU	
AUTOSAT:	
Search satellite →	see chapter 6.2
→ Fine tuning	see chapter 6.3
Standby:       OFF	see chapter 6.4
Manual →	see chapter 6.5
RECEIVER	
Channel setting →	see chapter 6.6
Sound →	see chapter 6.7
Installation →	see chapter 6.8

- ↑, ↓ key:                   Select desired sub-menu or function. The sub-menu or function will be marked by the arrow.
- OK** key:                    Activate sub-menu or function
- MENU** key:                 Exit main menu or sub-menu

### 6.2 SEARCH SATELLITE

Should the AutoSat2 not have found the required satellite based on the same transponder frequencies of more than one satellite, the search may be continued with this function.

As well another satellite may be searched as follows:

- Key sequence:   **MENU**    Display main menu
- ↑            Arrow pointed at SEARCH SATELLITE
- OK**         The SEARCH SATELLITE menu will be displayed

SEARCH SATELLITE	
→ ASTRA 1	
HOTBIRD	
ASTRA 2	
Other Satellites	

- ↑, ↓ key:                   Select desired satellite
- OK** key:                    Start search

**!!! Note:**

Should the same search cycle be activated for the satellite found (ASTRA found -> Search ASTRA) AutoSat2 will no longer find this satellite during this search cycle, due to the first found position having been blocked by the new search cycle -> Switch AutoSat2 off and on again.

## 6.3 FINE TUNING

Key sequence: **MENU** Display of main menu, arrow on FINE TUNING  
**OK** Activate fine tuning

Re-optimisation of receiving position. This may be required should reception be affected by external influences.

In addition, some channels have mildly varying beam directions, possibly causing an improvement in reception with an additional fine tuning after changing a channel.

## 6.4 STANDBY MODE

Key sequence: **MENU** Display main menu  
**↓** Arrow on STANDBY  
**←, →** Set time: OFF 1 ... 30 hrs.  
**STORE** Save

The period of time may be set here, within which the AutoSat2 may be re-activated by the *ON/OFF* key of the remote control after activating Standby Mode (*STANDBY* key, see chapter 7.2).

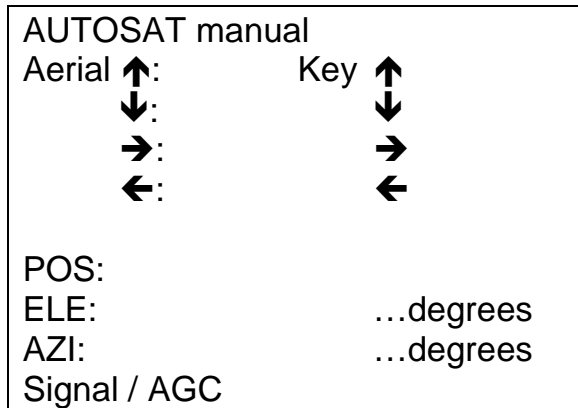
After expiry of this time, press *ON/OFF* key on front of unit (centre key) or on separate controller (optional) for enabling AutoSat2 as power to the unit is cut off.

**!!! Note:**

It is recommended to use this function only briefly or when the vehicle is connected to external mains (220 V) and/or powered by solar power, as in Standby Mode power input to the receiver is reduced by approx. 50% but the unit is still consuming approx. 8 W.

## 6.5 MANUAL MENU

Key sequence: **MENU** Display main menu  
2 x ↓ Arrow on MANUAL  
**OK** Display of MANUAL menu



Press key **briefly** Movement in small increments  
**Press + hold** key Continuous movement

**C/N / AGC:** Display of C/N and tuner AGC value (DVB mode only).

**POS ELE/AZI:** Aerial position in horizontal and/or vertical alignment.

Key **C:** Switches between coloured background and image

## 6.6 CHANNEL SETTING

Key sequence: **MENU** Display main menu  
3x ↓ Arrow pointing to CHANNEL SETTING ->  
**OK** Display of DVB MAIN MENU

### DVB MAIN MENU

Possible keys for operation are displayed on the screen. The bottom line of the display shows information applicable to the selected menu item.

**Station information:** Shows information for currently selected station.

**Index:** General Index

**Settings, general:** For setting the screen display of the DVB logo, GMT difference and station data update.

**Settings, station search:** Setting of required satellites and associated symbol rates. In addition, this may be used for setting whether only freely available or encoded stations should be saved during a station search.

**Station search:** Add new stations

**Satellite:** For setting the satellite on which a station search is to be effected (the satellite must have been preset in the above menu item. The aerial must be tuned to the satellite).

**Set transponder manually:** Search for any stations on this set transponder, for accurate selection of which stations will be saved during a search (for instance English language only).

**Add new stations:** All stations available for reception on the set satellite will be searched (including foreign language stations) and appended to the station list.

### **Service Menu:**

**Service Information:** For obtaining information of the DVB module, signal amplitude and C/N.

**Edit station lists:** Transfer of station lists by serial interface, will only be possible in the factory!

**Start firmware download:** will only be possible in the factory!

## **6.7 SOUND SETTING**

Key sequence: **MENU** Display main menu  
4x **↓** The arrow points at SOUND ->  
**OK** Display SET SOUND menu:

**↑, ↓** key: Select line

Press **←** or **→** key for setting BALANCE, TREBLE, BASSES and LOUDNESS to your personal taste.

**STORE** key: For permanent saving of a setting.



## 6.8 INSTALLATION MENU

Key sequence: **MENU**  
5x ↓  
**OK**

Display of main menu  
Arrow points at INSTALLATION ->  
Display of INSTALLATION menu:

INSTALLATION	
→ Language:	English
Preset:	STORE
LNB frequency:	9.75 / 10.6

↑, ↓ key: Select line  
←, → key: Change setting  
**STORE** key: Store settings  
**MENU** key: Exit menu

### 6.8.1 Select Language

For selection of four languages:

German

English

French

Dutch (or Italian)

**STORE** key: For permanent storage of language selected.  
The **sequence of stations** will be reprogrammed according to national usage.

### 6.8.2 Preset

**STORE** key: Repeat factory preset of stations (analog stations only!).

### 6.8.3 LNB Frequency

A universal LNB of 9.75-/10.6 GHz LOF is used as a standard setting. This may *not* be altered.

## 7.0 Special Functions

### 7.1 *LIST* Key: Station List

After pressing the *LIST* key, a list of stations saved will be displayed. The present station is marked by an arrow / highlighted.

<b>←, →</b> key	Page forward and/or backward
<b>↑, ↓</b> key	Select station
<b>OK</b> key	Change to selected station
<b>Random</b> key	Exit without changing station
<b>A</b> key	Sorting / deletion of stations
<b>B</b> key	Individual volume setting for each station
<b>C</b> key	Change name of station
	Follow screen display for operation

## 7.2 **STANDBY** Key

Switch AutoSat2 to Standby mode by pressing the **STANDBY** key.

The aerial will remain in receive position and the receiver will switch off (display: OFF). **There is no power consumption in this condition.** However, the AutoSat2 may not be switched on by remote control but only at front of unit. To remind you that the aerial is extended, an LED will flash on the front of the unit and the separate controller (optional). Power consumption of this LED is negligible (0.1 W).

There is also a facility for switching the AutoSat2 to Standby, with the aerial remaining extended and the TV image disappearing. However, the AutoSat2 may be re-activated by remote control (**ON/OFF** key) (**the unit is under power: 8 Watts !**). The time during which the AutoSat2 may be re-activated may be permanently set once by the STANDBY menu (chapter 6.4) or by pressing the **STANDBY** key several times. After expiry of the set time, AutoSat2 will automatically switch off its power supply. Press **ON/OFF** key at front of unit or on separate controller (optional) to enable AutoSat2 again.

## 7.3 **SAT** Key: Changing the Satellite

Holding the **SAT** key will change AutoSat2 from the ASTRA 1 satellite to the ASTRA 2 satellite and vice versa (ASTRA 2 to ASTRA). This is subject to you just receiving one of the satellites and the other satellite also being available for reception at your location.

## 7.4 **AUDIO** Key: Selection of Languages

Press the **AUDIO** key to select language of multi-lingual broadcasts.

Press the **AUDIO** key to select mono or stereo.

## 7.5 **ON/OFF** Key at Front of Unit: Additional Function

Whilst the unit is switched on, additional functions such as **Fine Tuning** and/or **Search Satellite** (same function as in menu) may be activated. (Press **ON/OFF** key until insert appears on screen). This additional function is provided in case the remote control should be relocated or fail.

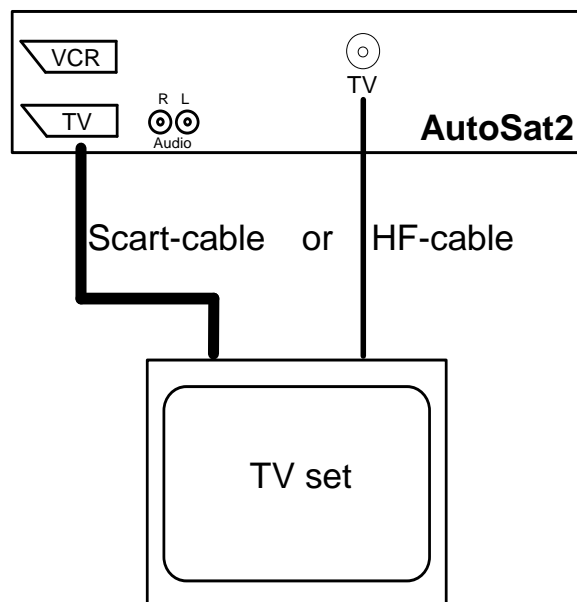
## 7.6 **#**-Key: Adjusting the HF-Modulator

Press and hold the **#**-key allows adjustment of the modulator channel, should your TV unit have been connected to the AutoSat2 by a coaxial cable (we recommend connection by a Scart cable, as this will clearly improve your image quality). Set channel from 21 to 69 by using the **↑** or **↓** key. The presently set channel (channel 38 ex works) will be shown at the front of the AutoSat2. The **←** and **→** key alters the sound carrier from UK to German mode and vice versa. Use **STORE** key for permanent saving.

# A. Appendix

## A.1 Connecting Facilities

### Connection of AutoSat2 receiver to a TV set



#### Setting at TV set:

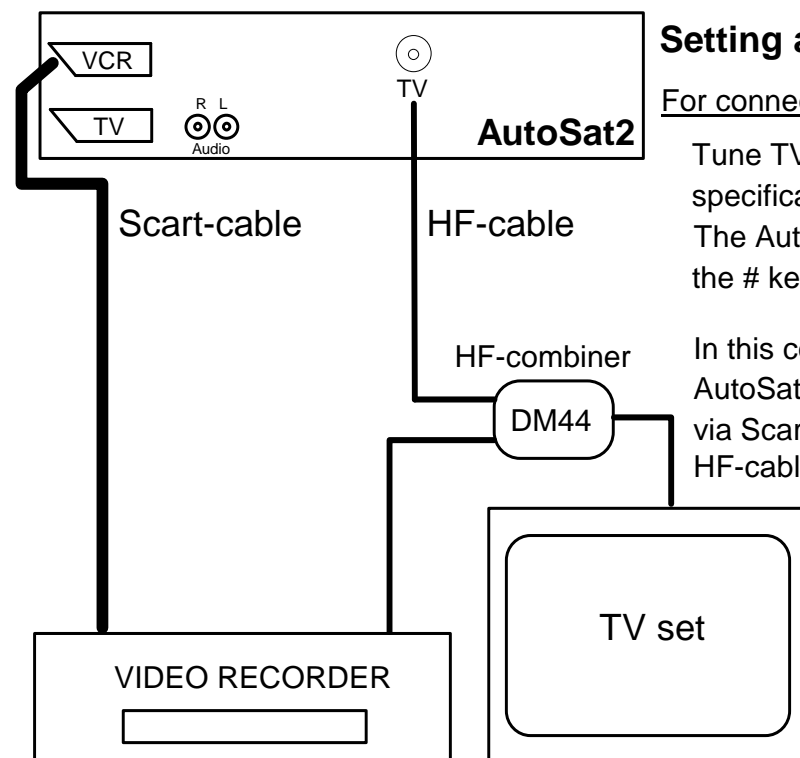
##### For connection by SCART-cable:

Switch TV to AV or channel 0

##### For connection by HF-cable:

Tune TV set to preset AutoSat channel (see specification: TV connection HF-modulator). The channel may be adjusted by using the # key see chapter 7.6.

### Connection of AutoSat2 receiver to a TV set and a video recorder



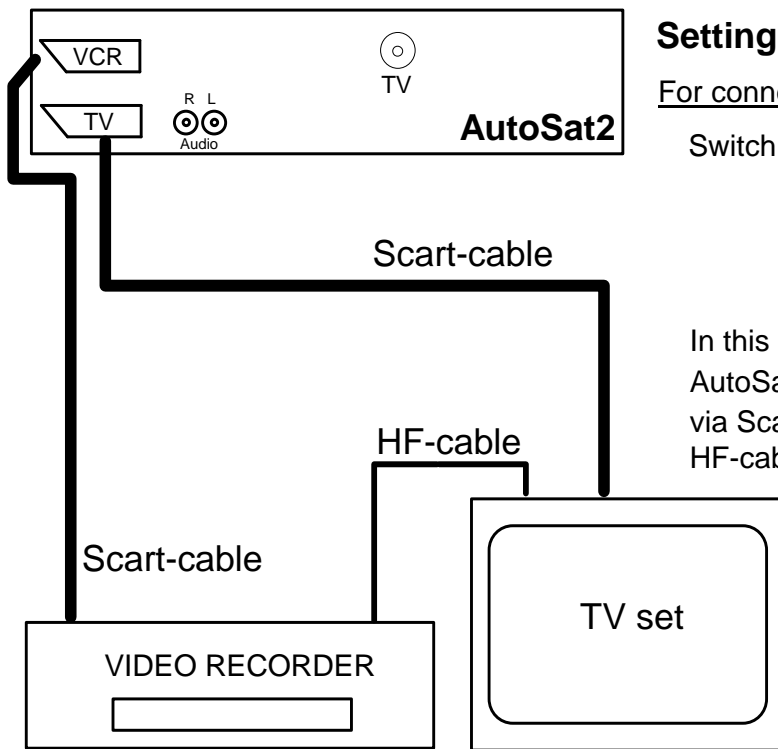
#### Setting at TV set:

##### For connection by HF-cable:

Tune TV set to preset AutoSat channel (see specification: TV connection HF-modulator). The AutoSat channel may be adjusted by using the # key: see chapter 7.6.

In this configuration the VCR may record from AutoSat by Scart-cable. Playback is possible via Scart by switching AutoSat channel 0 or via HF-cable without AutoSat being activated.

## Connection of AutoSat2 receiver to a TV set and a video recorder



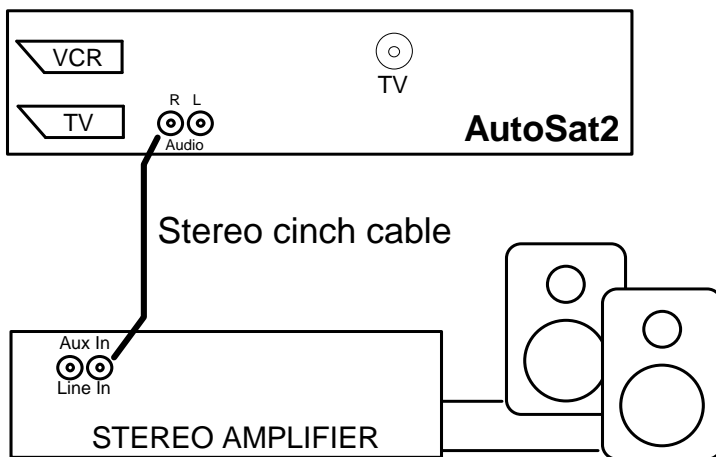
### Setting at TV set:

For connection by SCART-cable:

Switch TV set to AV or channel 0

In this configuration the VCR may record from AutoSat by Scart-cable. Playback is possible via Scart by switching AutoSat channel 0 or via HF-cable without AutoSat being activated.

## Connection of AutoSat2 receiver to a stereo set



## A.2 Brief Operating Instructions

Function	Operation
Enable	Only by pressing the <b>ON/OFF</b> key at front of unit or on separate control (optional)
Disable	<b>ON/OFF</b> key at front of unit or <b>ON/OFF</b> key on remote control
Standby	<b>STANDBY</b> key
Change station	↑, ↓ key on remote control ↑, ↓ key at front of unit
Direct station selection	Keys <b>0 ... 9</b> Enter 1, 2 or 3-digit figures
Select station from list	<b>LIST</b> key: The station list is displayed ↑, ↓, ←, → key: Select station <b>OK</b> key: Change to selected station <b>Random</b> key: Return - no change
TV <-> radio	<b>Radio</b> or <b>TV</b> key
Information	<b>OK</b> key: Information on present / following broadcast
Volume	←, → key: To change volume <b>STORE</b> key: Save setting (while volume is displayed)
Main menu	<b>MENU</b> key ↑, ↓ key: Select function / sub-menu <b>OK</b> key: Activate function / sub-menu ←, → key: Change settings <b>STORE</b> key: Save settings <b>MENU</b> key: Exit menu
Search satellite	Automatically after activating the unit or <b>MENU</b> key -> SEARCH SATELLITE or <b>SAT</b> key: Change ASTRA 1 -> ASTRA 2 and vice versa.
Fine tuning	Automatically after satellite has been found or <b>MENU</b> key -> FINE TUNING

## A.3 Faults and Remedies

Fault	Remedies
<b>No satellite found</b>	<ol style="list-style-type: none"> <li>1) Check whether sight is free in southerly direction. There will be no reception under trees!</li> <li>2) There is no transmission on your selected station, try another station for search.</li> <li>3) Whilst moving about in marginal European areas: for searching switch to a station, which can be positively found.</li> <li>4) Check aerial cable to external unit (firm attachment of connector, cable break)</li> </ol>
<b>Aerial in position but no image</b>	<ol style="list-style-type: none"> <li>1) Check connection to TV set.</li> <li>2) Should your TV set be connected via an HF cable, check setting on TV set (channel position).</li> <li>3) For connection by SCART cable, switch TV set to AV (or channel 0).</li> </ol>
<b>Incorrect satellite found</b>	<ol style="list-style-type: none"> <li>1) Repeat satellite search: <b>MENU</b> key -&gt; SEARCH SATELLITE</li> </ol>
<b>Inferior image quality</b>	<ol style="list-style-type: none"> <li>1) Perform FINE TUNING from main menu.</li> <li>2) You are in the marginal area of the satellite's coverage</li> <li>3) Should 2) not apply, check aerial cable (for firm attachment of connector)</li> </ol>
<b>Motor cannot turn</b>	<ol style="list-style-type: none"> <li>1) Check whether external unit is free to move.</li> <li>2) Check connectors of motor cable for firm attachment. All contacts must be firmly attached to recesses in connector housing.</li> </ol>
<b>Motor overload protection</b>	<ol style="list-style-type: none"> <li>1) Check whether external unit is free to move.</li> </ol>
<b>Unit switched off immediately</b>	<ol style="list-style-type: none"> <li>1) Check battery voltage</li> <li>2) Your vehicle has been started</li> </ol>
<b>Inexplicable malfunctions</b>	<ol style="list-style-type: none"> <li>1) Switch AutoSat2 off and on again.</li> <li>2) Temperature too high, let AutoSat2 cool down (perhaps there is not enough ventilation / another heat source nearby)</li> </ol>

## A.4 Specification

### Power supply

Supply voltage	10...16 V DC
Supply voltage control line D+	10...30 V DC
Current / power input	
Search mode typ.	Approx. 3 A / 36 W
Reception mode typ.	1.4 A / 18 W
Standby mode typ.	0.7 A / 8 W
Current limit, motors	approx. 8 A
LNB control	14/18 V, 300 mA max. 22 kHz, Toneburst

### LNB

LOF	9.75 / 10.6 MHz
Noise level low / high band single LNB	0.5 dB typ.
twin LNB	0.7 dB typ.

### TV Connection SCART TV

Video	CCIR, 625 lines
Output level	1 V <sub>ss</sub> to 75 Ohms
Audio, 2 channels, R, L	
Modes	Mono A/B, Stereo
Output level	0.5 V eff.

### TV connection HF-modulator

Setting range	Channels 21...69
Presetting	Channel 38
Output level	72 +/- 4dB $\mu$ V
Output impedance	75 Ohms

### VCR Connection via SCART VCR

Video/audio output	See SCART TV connection
Video input	FBAS, 1 V <sub>ss</sub> to 75 Ohms
Audio	R, L, approx. 0.5 eff.



**CINCH connections**  
AUDIO L/R

Audio left / right  
see SCART TV connection

# CRYSTOP

Display

## **Gesellschaft für Anzeigesysteme mbH**

Durlacher Allee 47  
76 131 Karlsruhe

☎: 0721 / 61 10 71

📠: 0721 / 62 27 57

[www.crystop.de](http://www.crystop.de)