

INSTRUCTION MANUAL FOR THE TECHNISAT VC 2002 S

SAFETY INSTRUCTIONS

In the interests of safety please read and observe the following instructions before using your new VC 2002 S. This sheet and the following pages concerning installation and operation should be retained for future reference.

INSTALLATION:

The procedures set out on page 5 should be followed carefully.

NOTE:

Always connect the LNB before connecting to the mains supply. Failure to do this may cause damage to the appliance.

Ventilation:

Vents on the top and side panels are provided for necessary ventilation. The appliance should not be placed in a position where the free passage of air would be severely restricted. In addition, for the same reasons as above, the VC 2002 S should not be placed on a soft base.

Water and moisture:

Ensure that the appliance does not come into contact with any dampness or moisture - RISK OF ELECTRIC SHOCK (and/or damage to the VC 2002 S).

Heat:

Do not install the VC 2002 S in the immediate proximity of a heat source (radiator, oven etc.).

CARE AND USE:

Power source:

Connect the VC 2002 S to a power supply which matches the requirements of the appliance (240 V/50 Hz).

Safe connection to the mains:

The mains leads should be routed so that they are not likely to be walked on or pinched by items placed against them.

When not in use:

If the VC 2002 S is left unattended or unused for long periods of time be sure to unplug the mains connector.

Unplug the VC 2002 S from the mains when:

- the mains lead or mains connector is damaged
- the VC 2002 S has been exposed to rain or water
- a solid object or liquid substance has entered the appliance via the air vents
- there is a noticeable change in the performance of the VC 2002 S, the appliance is not operating as normal
- the VC 2002 S has been dropped or the outer casing has been damaged

NOTE:

Servicing and repairs must only be carried out by trained service staff.

Accessories and replacement parts:

Both accessories and replacement parts should only be purchased as recommended by your satellite dealer. Be sure to consult your dealer in all aspects concerning equipment purchase, servicing and repairs.

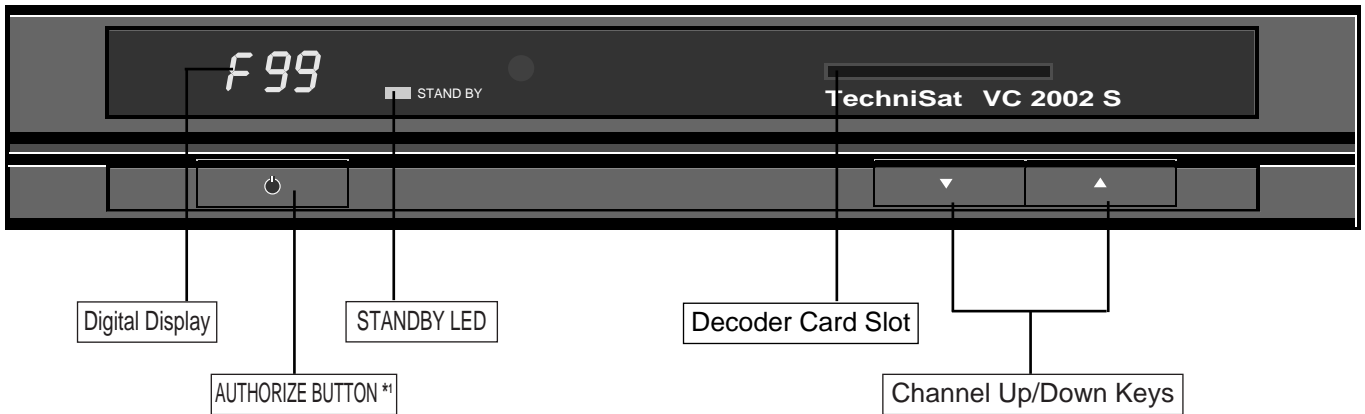
Cleaning:

Disconnect the VC 2002 S from the mains before cleaning. Use a damp cloth only. Do not use liquid or aerosol cleaners.

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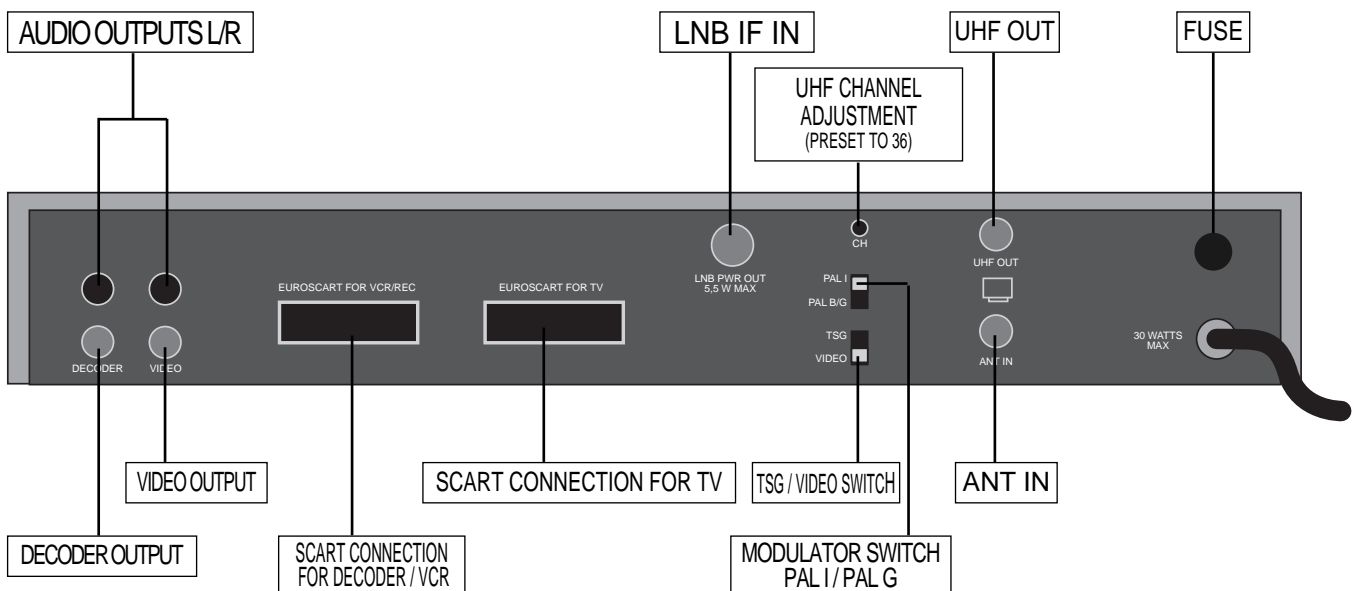
APPLIANCE DESCRIPTION:

FRONT PANEL

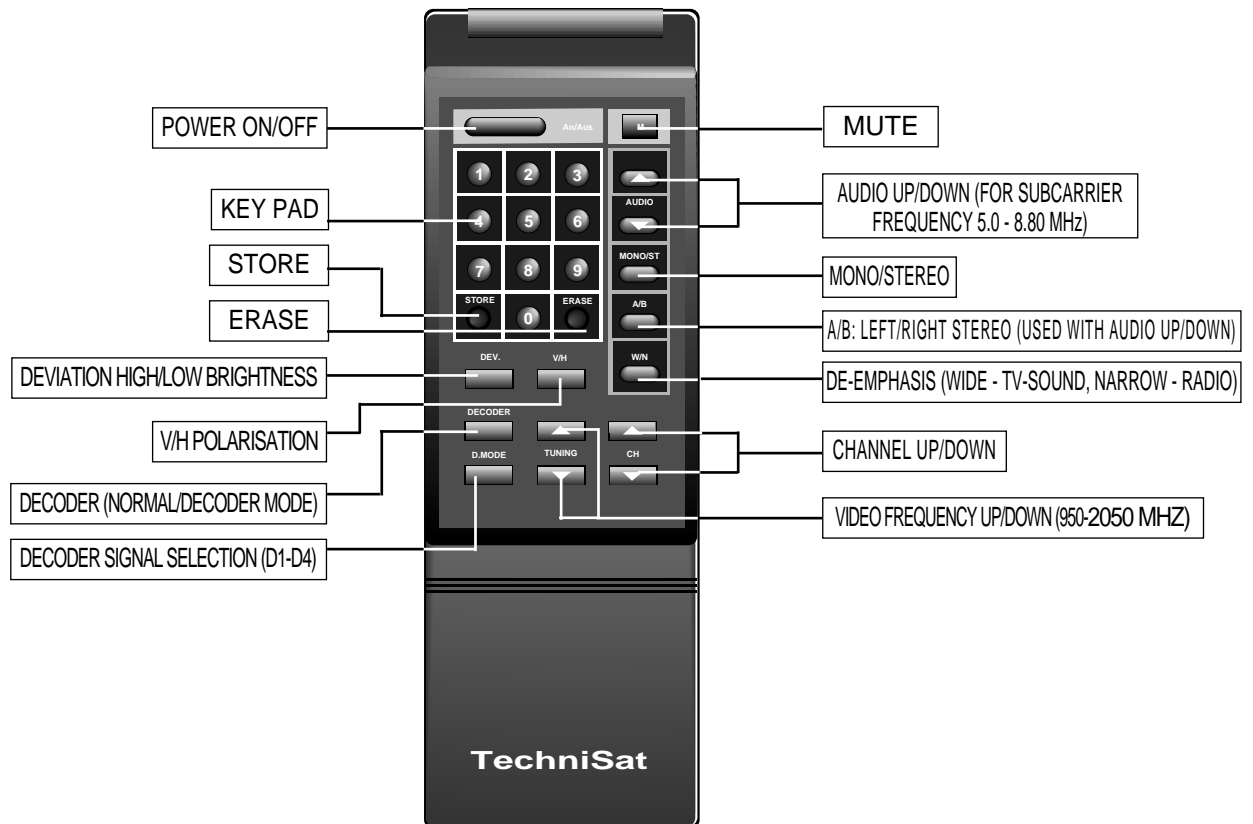


*1 Press this button if you wish to see a "Pay per View" programme.

BACK PANEL



REMOTE CONTROL

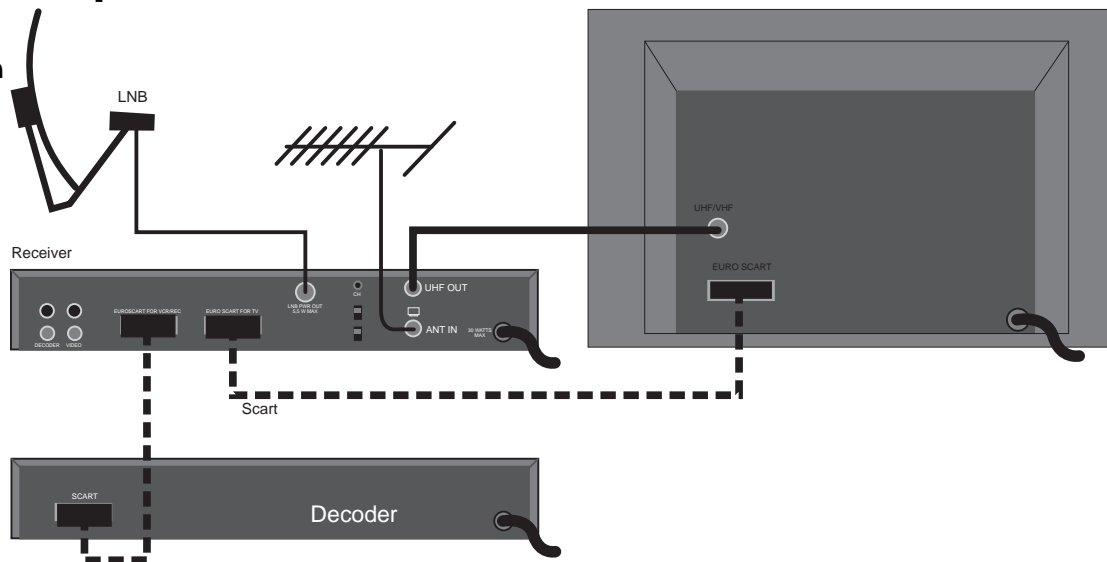


INSTALLATION & INITIAL OPERATION

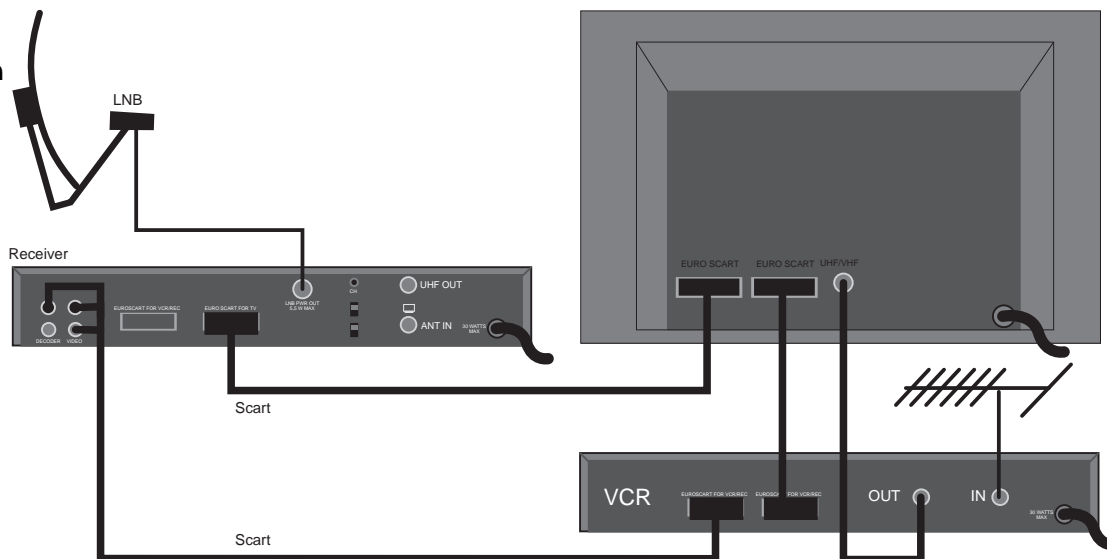
1. Connect the receiver VC 2002 S to the LNB of the outdoor unit using a coaxial cable via IF-IN connection.
2. The connection between receiver and TV is made using a scart cable. Alternatively, you can make the connection using an antenna cable.
3. Connect the receiver to the mains supply (240 V/50 Hz).
4. i) If you are using a scart cable connection, switch your TV to AV.
ii) If UHF cable connections are being used it is necessary to find a suitable UHF channel. The satellite receiver is preprogrammed to channel 36. To set the TV or VCR to this channel select TSG on the receiver back panel and search on the TV until two vertical white bars are clearly visible. If due to interference it is necessary to adjust the UHF channel, this can be done using the channel adjustment switch on the back of the receiver (by turning the screw).

Installation possibilities:

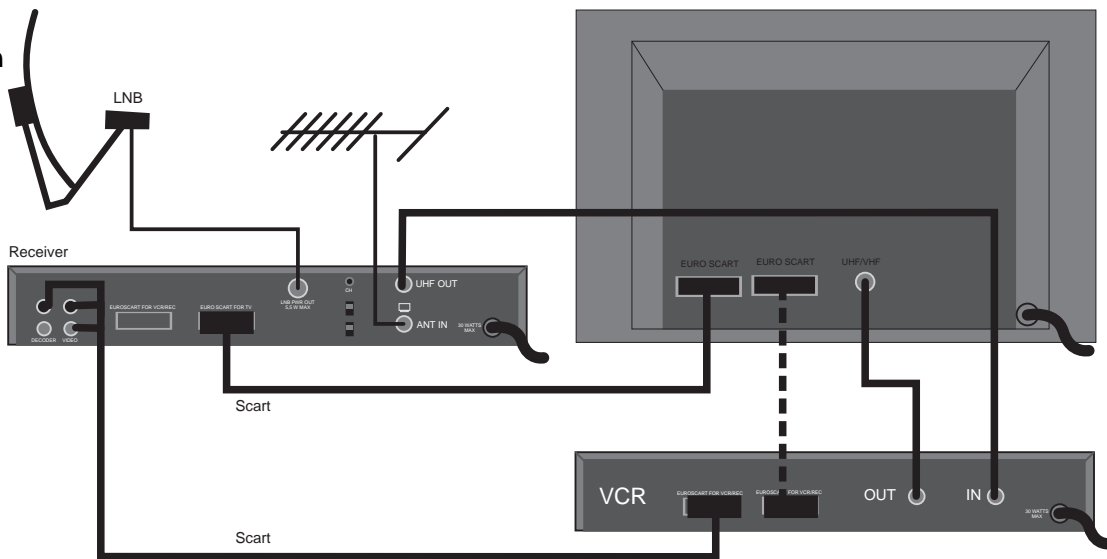
1) Connection to TV (+ external decoder if required)



2) Connection to TV + VCR



3) Connection to TV + VCR



PREPROGRAMMING

At the end of this manual you will find a list of all the preprogrammed TV and radio stations. This table also contains information on the stored audio/video parameters which will give you a guide if you wish to change the preset.

If you are not satisfied with the preprogramming or if you want to add some channels, you can programme the receiver to your own requirements as described in the section on "Individual Programming" (see below).

i) Using V/H LNB: The TechniSat VC 2002 S is preprogrammed in accordance with programme table 1 at the end of this manual.

ii) Using ISISAT LNB: (refer to programme table 2)

If the ISISAT-Preprogramming is called up, the preprogramming for V/H LNBS does not meet the table any more, and all programmes for V/H-LNB need to be programmed again.

1. Switch the receiver to Standby mode (power off)
2. Press both the up and down channel buttons simultaneously for approx. 3 seconds.
The display will indicate "SEL" (select).
3. You can now select a channel:
Channel up = PRG 1 = Normal programme
Channel down = PRG 2 = ISISAT programme
4. Switch on the receiver (power on).

PREPROGRAMMING IS NOW COMPLETED.

CHANNEL SELECTION: The channel number selected is shown on the digital display ie. F01-F99 or C01-C99. Channels preceded with an F are stored channels and can be accessed either directly using the up and down keys or by keying in the respective channel number. Non-stored channels can only be accessed by keying in the channel number.

INDIVIDUAL PROGRAMMING

It is possible to alter each channel or change the preset completely if you so wish. Switch to the channel you would like to alter and enter the video & audio frequencies, polarisation, bandwidth and decoder mode (if necessary) as follows:

POLARISATION: Select the required polarisation (vertical or horizontal) by pressing the V/H button on the remote control.

VIDEO TUNING: After pressing either the up and down tuning key a 3-figure number is shown on the display (frequency in MHz). To alter the frequency you have the option of either pressing the up and down tuning keys or the required frequency can be keyed in directly using the remote control. Although you must always enter a 4-digit number for the frequency (ie. 0950-2050) only the last 3 digits are displayed.

DEV SELECTION: ASTRA channels are preprogrammed Hi (high video level). Other channels can be programmed Lo (low video level).

AUDIO TUNING:

- a) First press either the Mono/Stereo button to select 0- Mono, 0-0 for Stereo.
- b) If stereo is selected the button A/B should be pressed to obtain A (left) or B (right) side audio outputs.
- c) The correct frequency can be set using the audio up/down keys. After selecting A or B the required frequency can be keyed in directly and will be shown on the digital display.
- d) Tune audio bandwidth I--I wide, -II- narrow by pressing the W/N button.

IF STEREO HAS BEEN SELECTED IT IS NECESSARY TO REPEAT STAGES b) AND c) FOR THE OTHER FREQUENCY.

NOTE:

- i) Holding down the AUDIO and TUNING buttons accelerates the frequency change.
- ii) 5 seconds is allowed for keying in the frequencies directly. If this is not achieved (ie. entry does not appear on the display) press the appropriate TUNING or AUDIO key and re-enter.

STORING: Once you have attained the best possible picture and sound quality you can store the channel by using for example a ball point pen to press the sunken STORE button for 1-2 seconds.

ERASING: To erase stored information press and hold down the ERASE key as above. Now the erased channel can only be selected by entering the number via the key pad of the remote control (see also CHANNEL SELECTION).

PROGRAMMING

Watching a scrambled Videocrypt programme

1. Select a coded channel (eg. Movie Channel or Sky Movies Plus).
2. Insert the viewing card as indicated by the arrow.
3. After a few seconds the descrambled picture will appear on the screen.

NOTE: Do not bend or damage the card in any way.

SCREEN MESSAGES:

"Please insert card" - make sure that the card is inserted correctly.

"Please wait" - descrambled picture should appear in a few seconds.

"Your card is invalid" - ensure the card is inserted correctly and/or has not been damaged.

"Your card has expired" - a replacement card is required.

"Channel blocked" - indicates there is something wrong with your card.

In the case of the last 3 messages, first of all try turning the receiver off, disconnect from the mains and leave for one minute. Turn on again and retry card. If this still fails contact B SkyB.

CONNECTING A SEPARATE DECODER: (*)

To choose between normal and decoder mode press DECODER:

In position "n" the reception signal will be connected directly from the TV or video recorder.

In position "d" the coded signal (non-Videocrypt coded channels) is sent from the scart socket to the decoder. The decoded signal is sent back to the receiver and can be picked up at the scart socket or at the UHF output connection.

Press the D MODE button to select the decoder signal according to the following table:

- D1: Flat, MAC compatible signal
- D2: PAL de-emphasised baseband signal
- D3: Unclamped video signal
- D4: Clamped video signal

Be sure to consider the recommendation of the manufacturer regarding the connection of the decoder.

(*) DOES NOT APPLY TO VIDEOCRYPT INTERNAL DECODER, BUT REFERS TO THE USE OF A SEPARATE DECODER FOR NON-VIDEOCRYPT CODED CHANNELS.

FREQUENCY SHIFT:

If the LNB of the outdoor unit does not supply the exact IF-frequency, it is possible to change it as follows:

1. Press the "V/H" button for about 3 seconds.
2. The receiver displays "AFC".
3. Enter "999".
4. The receiver displays "0.0".
5. Now it can be tuned up or down (+/- 5 MHz) with the tuning buttons.
6. Once you have achieved the best picture quality you can store the frequency shift with the STORE button.

NOTE: The frequency shift applies for all channels.

SPECIFICATIONS

1. Tuner

Input Frequency:	950 - 2050 MHz
Input Impedance:	75 Ohm
Input Level:	-70 dBm to -25 dBm
Input Connector:	F-type
LNB Power:	+18 V constant at 300 mA max. (+14 V/18 V for V/H-LNB)
Bandwidth:	26 MHz
Gain Control:	AGC
Tuning:	PLL frequency synthesized

2. Clamped Video

De-Emphasis:	CCIR REC. 405-1, 625 LINE
Bandwidth:	5 MHz
Output Level:	1 V p-p
Output Connector:	Scart and RCA phono

3. Decoder Output

Mode:	4 different modes D1 - D4
Output Level:	1 V p-p
Output Connector:	Scart and RCA phono (L, R)
Output Impedance:	75 Ohm

4. Audio

Frequency Range:	5.0 to 8.8 MHz adjustable
Mode:	Mono/Stereo selectable
Bandwidth:	150 KHz/280 KHz selectable
De-Emphasis:	50 µs/J17
Frequency Response:	20 Hz to 15 kHz
Output Level:	2 V p-p
Output Connector:	Scart and RCA phono (L, R)

5. RF Modulator

UHF:	30 - 39 tunable, preset to 36, switchable PAL I / PAL B
UHF Output Level:	75 +/- 4 dBµV
UHF Output Connector:	IEC Male
Ant. Input Connector:	IEC Female

6. Others

Supply Voltage	240 Volt 50 Hz
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Technical specifications are subject to improvements.

TROUBLE SHOOTING

PROBLEM	CAUSE/SOLUTION
No picture or sound, no indicator lights	<ol style="list-style-type: none"> 1. No power. Make certain that your VC 2002 S is connected to an appropriate AC power supply. 2. Power switch is off. Press power button. 3. Fuse has blown. Replace.
No picture or sound, but indicator lights are lit	<ol style="list-style-type: none"> 1. TV is not set to the right channel, or fine tuning on TV is incorrectly adjusted. Check that TV is tuned to appropriate UHF channel when using modulator output. 2. Antenna is not pointed at a satellite. Check that antenna is aligned to an operating satellite. 3. Bad cable connections. Check all cable connections and connectors. 4. Defective LNB. Replace.
Indicator lights are lit except "stand by"	<p>Internal fuse has blown. Contact dealer.</p>
Picture has sparkles or is grainy	<ol style="list-style-type: none"> 1. Antenna is not aligned to an operating satellite. Readjust antenna. 2. Video fine tuning incorrectly adjusted. Readjust accordingly. 3. Excessive signal loss between LNB and receiver. Install a line amplifier. 4. LNB is defective. Replace. 5. Bad connections. Check all coaxial connections and plugs. 6. Water in coaxial cable. Dry out if necessary and use suitable connector sealant on all outside connections.
Audio sounds distorted	<ol style="list-style-type: none"> 1. Selected AUDIO is not tuned to correct subcarrier. Check the required audio frequency with the programme table.
Remote control does not operate or has poor range.	<ol style="list-style-type: none"> 1. Weak battery in remote control. Replace.

PROGRAMME TABLE 1 (V/H-LNB)

		IF MHz	AUDIO (MHz)		MODE	BAND WIDTH (kHz)	DE-EM PHASIS	VIDEO- LEVEL (External)	DECODER VIDEO	DECODER MODE	POLARI- SATION
			A	B							
ASTRA TV	1	SKY MOVIES PLUS	1.436	7,02 7,20	STER	150	J 17	High	NOR	D-4	Ver
	2	Movie Channel	1.479	7,02 7,20	STER	150	J 17	High	NOR	D-4	Ver
	3	SKY M. GOLD / Adult.Ch.	1.597	7,02 7,20	STER	150	J 17	High	NOR	D-4	Ver
	4	SKY ONE	1.318	7,02 7,20	STER	150	J 17	High	NOR	D-4	Ver
	5	SKY NEWS	1.377	7,02 7,20	STER	150	J 17	High	NOR	D-4	Ver
	6	CNN	1.627	6,50 7,02	MONO	280	50 µs	High	NOR	D-4	Ver
	7	Sky Sports	1.509	7,02 7,20	STER	150	J 17	High	NOR	D-4	Ver
	8	Screensport	1.214	7,02 7,20	MONO	150	J 17	High	NOR	D-4	Hor
	9	EUROSPORT	1.259	6,50 7,02	MONO	280	50 µs	High	NOR	D-4	Ver
	10	MTV	1.421	7,02 7,20	STER	150	J 17	High	NOR	D-4	Hor
	11	LIFESTYLE	1.273	7,02 7,20	STER	150	J 17	High	NOR	D-4	Hor
	12	CHILDR.CH.	1.273	7,38 7,20	MONO	150	J 17	High	NOR	D-4	Hor
	13	Child.Ch.	1.568	7,38 7,20	MONO	150	J 17	High	NOR	D-4	Ver
	14	JSTV	1.568	7,02 7,20	STER	150	J 17	High	NOR	D-4	Ver
	15	FILMNET / D2-MAC	1.362	7,02 7,20	MONO	150	J 17	High	NOR	D-2	Hor
	16	RTL 4 VERONIQUE	1.391	7,02 7,20	STER	150	J 17	High	NOR	D-4	Hor
	17	RTL PLUS	1.229	6,50 7,02	MONO	280	50 µs	High	NOR	D-4	Ver
	18	SAT. 1	1.288	6,50 7,02	MONO	280	50 µs	High	NOR	D-4	Ver
	19	PRO 7	1.406	7,02 7,20	STER	150	J 17	High	NOR	D-4	Ver
	20	TELE 5	1.523	7,02 7,20	STER	150	J 17	High	NOR	D-4	Hor
	21	ARD 1 PLUS	1.494	7,02 7,20	STER	150	J 17	High	NOR	D-4	Hor
	22	3 SAT	1.347	7,02 7,20	STER	150	J 17	High	NOR	D-4	Ver
	23	NORD 3	1.582	7,02 7,20	STER	150	J 17	High	NOR	D-4	Hor
	24	PREMIERE*	1.464	7,02 7,20	STER	150	J 17	High	NOR	D-4	Hor
	25	TELECLUB*	1.332	6,50 7,02	MONO	280	50 µs	High	NOR	D-3	Hor
	26	TV 3 Schwed.*	1.244	6,50 7,02	MONO	280	50 µs	High	NOR	D-1	Hor
	27	TV 1000*	1.303	6,50 7,02	MONO	280	50 µs	High	NOR	D-1	Hor
	28	UK GOLD	1.553	6,50 7,02	MONO	280	50 µs	High	NOR	D-1	Hor
	29	TV 3 Daenemark*	1.612	6,50 7,02	MONO	280	50 µs	High	NOR	D-1	Hor
	30		1.641	6,50 7,02	MONO	280	50 µs	High	NOR	D-4	Hor
	31	TV 3 Norw.*	1.671	6,50 7,02	MONO	280	50 µs	High	NOR	D-1	Hor
	32		1.686	6,50 7,02	MONO	280	50 µs	High	NOR	D-4	Ver

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		IF MHz	AUDIO (MHz)		MODE	BAND WIDTH (kHz)	DE-EM PHASIS	VIDEO- LEVEL (External)	DECODER VIDEO	DECODER MODE	POLARI- SATION
			A	B							
ASTRA RADIO	73	Hit Radio	1.318	7,74 7,92	STER	150	J 17	High	NOR	D-4	Ver
	74	Holland FM	1.479	7,56 7,38	MONO	150	J 17	High	NOR	D-4	Ver
	75	Radio Super Gold	1.377	7,92 7,74	MONO	150	J 17	High	NOR	D-4	Ver
	76	Giant FM	1.377	7,74 7,92	MONO	150	J 17	High	NOR	D-4	Ver
	77	RTL Radio NL	1.391	7,74 7,92	STER	150	J 17	High	NOR	D-4	Hor
	78	Rad.Schwed.Int.	1.597	7,74 7,92	MONO	150	J 17	High	NOR	D-4	Ver
	79	Schweizer Rad.Int.	1.332	7,20 7,02	MONO	150	J 17	High	NOR	D-4	Hor
	80	Sunrise Radio	1.479	7,38 7,56	MONO	150	J 17	High	NOR	D-4	Ver
	81	RTL Radio D	1.523	7,38 7,56	STER	150	J 17	High	NOR	D-4	Hor
	82	DEUTSCHLANDF. III	1.288	7,92 7,74	MONO	150	J 17	High	NOR	D-4	Ver
	83	DEUTSCHLANDF. II	1.288	7,74 7,92	MONO	150	J 17	High	NOR	D-4	Ver
	84	DEUTSCHLANDF. I	1.288	7,38 7,56	STER	150	J 17	High	NOR	D-4	Ver
	85	DTSCH. WELLE II	1.229	7,56 6,50	MONO	150	J 17	High	NOR	D-4	Ver
	86	DTSCH. WELLE I	1.229	7,38 7,56	MONO	150	J 17	High	NOR	D-4	Ver
	87	NDR 2	1.582	7,38 7,56	STER	150	J 17	High	NOR	D-4	Hor
	88	SWF 3	1.494	7,38 7,56	STER	150	J 17	High	NOR	D-4	Hor
	89	STAR SAT RADIO	1.406	7,38 7,56	STER	150	J 17	High	NOR	D-4	Ver
	90	OPUS RADIO	1.332	7,38 7,56	STER	150	J 17	High	NOR	D-4	Hor
	91	Solar Radio	1.509	7,38 7,56	MONO	150	J 17	High	NOR	D-4	Ver
	92	POWER FM	1.421	7,38 7,56	STER	150	J 17	High	NOR	D-4	Hor
	93	RADIO LUX. INT.	1.391	7,38 7,56	STER	150	J 17	High	NOR	D-4	Hor
	94	ASDA-FM	1.436	7,74 7,92	MONO	150	J 17	High	NOR	D-4	Ver
	95	Quality Europe FM	1.436	7,38 7,56	STER	150	J 17	High	NOR	D-4	Ver
	96	CNN Radio	1.627	7,92 7,74	MONO	150	J 17	High	NOR	D-4	Ver
	97	Hit Radio	1.318	7,74 7,92	STER	150	J 17	High	NOR	D-4	Ver
	98	SKY RADIO	1.318	7,38 7,56	STER	150	J 17	High	NOR	D-4	Ver
	99	RADIOROPA INFO	1.406	7,74 7,92	STER	150	J 17	High	NOR	D-4	Ver

PS: The first IF have been calculated on the basis of the following data:
1. For the frequency range 10.95 - 11.7 GHz LOF 10.000 GHz

2. For the frequency range 11.7 - 12.5 GHz LOF 10.750 GHz
3. For the frequency range 12.5 - 12.75 GHz LOF 11.475 GHz

*only with external Decoder

PROGRAMME TABLE 2 (ISISAT-LNB)

		IF MHz	AUDIO (MHz)		MODE	BAND WIDTH (kHz)	DE-EM PHASIS	DECODER VIDEO (External)	DECODER MODE	VIDEO LEVEL
			A	B						
ASTRA TV	01	PRO 7	1706	6.50 7.02	MONO	280	50µs	NOR	D-4	HIGH
	02	RTL PLUS	1529	6.50 7.02	MONO	280	50µs	NOR	D-4	HIGH
	03	SAT.1	1588	6.50 7.02	MONO	280	50µs	NOR	D-4	HIGH
	04	TELE 5	1273	7.02 7.20	STER	150	J17	NOR	D-4	HIGH
	05	ARD 1 PLUS	1244	7.02 7.20	STER	150	J17	NOR	D-4	HIGH
	06	3 SAT	1647	7.02 7.20	STER	150	J17	NOR	D-4	HIGH
	07	NORD 3	1332	7.02 7.20	STER	150	J17	NOR	D-4	HIGH
	08	SPORTKANAL	0964	7.02 7.20	MONO	150	J17	NOR	D-4	HIGH
	09	EUROSPORT	1559	7.20 7.02	MONO	150	J17	NOR	D-4	HIGH
	10	MTV	1171	7.02 7.20	STER	150	J17	NOR	D-4	HIGH
	11	PREMIERE	1214	7.02 7.20	STER	150	J17	NOR	D-4	HIGH
	12	SKY ONE	1618	7.02 7.20	STER	150	J17	NOR	D-4	HIGH
	13	SKY NEWS	1677	7.02 7.20	STER	150	J17	NOR	D-4	HIGH
	14	RTL 4 VERONIQUE	1141	7.02 7.20	STER	150	J17	NOR	D-4	HIGH
	15	LIFESTYLE, CHILD	1023	7.02 7.20	STER	150	J17	NOR	D-4	HIGH
	16	SES VIDEO	1303	6.50 7.02	MONO	280	50µs	NOR	D-4	HIGH
	17	NORD 3	1332	6.50 7.02	MONO	280	50µs	NOR	D-4	HIGH
	18		1362	6.50 7.02	MONO	280	50µs	NOR	D-4	HIGH
	19	TELECLUB	1082	6.50 7.02	MONO	280	50µs	NOR	D-3	HIGH
	20	FILMNET	1112	6.60 7.02	MONO	280	50µs	NOR	D-2	HIGH
	21		1559	6.50 7.02	MONO	280	50µs	NOR	D-4	HIGH
	22	JSTV	1868	6.50 7.02	MONO	280	50µs	NOR	D-4	HIGH
	23		1897	6.50 7.02	MONO	280	50µs	NOR	D-4	HIGH
	24	CNN	1927	6.50 7.02	MONO	280	50µs	NOR	D-4	HIGH
	25		1956	6.50 7.02	MONO	280	50µs	NOR	D-4	HIGH
	26		1986	6.50 7.02	MONO	280	50µs	NOR	D-4	HIGH
	27		0964	6.50 7.02	MONO	280	50µs	NOR	D-4	HIGH
	28		0979	6.50 7.02	MONO	280	50µs	NOR	D-4	HIGH
	29		0994	6.50 7.02	MONO	280	50µs	NOR	D-4	HIGH
	30		1008	6.50 7.02	MONO	280	50µs	NOR	D-4	HIGH
	31		1023	6.50 7.02	MONO	280	50µs	NOR	D-4	HIGH
	32		1038	6.50 7.02	MONO	280	50µs	NOR	D-4	HIGH
	33		1053	6.50 7.02	MONO	280	50µs	NOR	D-4	HIGH
	34		1067	6.50 7.02	MONO	280	50µs	NOR	D-4	HIGH
	35		1082	6.50 7.02	MONO	280	50µs	NOR	D-4	HIGH
	36		1097	6.50 7.02	MONO	280	50µs	NOR	D-4	HIGH
	37		1112	6.50 7.02	MONO	280	50µs	NOR	D-4	HIGH
	38		1126	6.50 7.02	MONO	280	50µs	NOR	D-4	HIGH
	39		1141	6.50 7.02	MONO	280	50µs	NOR	D-4	HIGH
	40		1156	6.50 7.02	MONO	280	50µs	NOR	D-4	HIGH
	41		1171	6.50 7.02	MONO	280	50µs	NOR	D-4	HIGH
	42		1186	6.50 7.02	MONO	280	50µs	NOR	D-4	HIGH

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		IF MHz	AUDIO (MHz)		MODE	BAND WIDTH (kHz)	DE-EM PHASIS	DECODER VIDEO (External)	DECODER MODE	VIDEO LEVEL
			A	B						
ASTRA RADIO	89	SWF 3	1244	7.38 7.56	STER	150	J17	NOR	D-4	HIGH
	90	POWER FM	1171	7.38 7.56	STER	150	J17	NOR	D-4	HIGH
	91	OPUS RADIO	1082	7.38 7.56	STER	150	J17	NOR	D-4	HIGH
	92	RADIO LUX. INT.	1141	7.38 7.56	STER	150	J17	NOR	D-4	HIGH
	93	SKY RADIO	1618	7.38 7.56	STER	150	J17	NOR	D-4	HIGH
	94	STAR SAT RADIO	1706	7.38 7.56	STER	150	J17	NOR	D-4	HIGH
	95	DTSCH. WELLE II	1529	7.56 6.50	MONO	150	J17	NOR	D-4	HIGH
	96	DTSCH. WELLE I	1529	7.38 7.56	MONO	150	J17	NOR	D-4	HIGH
	97	DEUTSCHLANDF. II	1588	7.74 7.56	STER	150	J17	NOR	D-4	HIGH
	98	DEUTSCHLANDF. I	1588	7.38 7.56	STER	150	J17	NOR	D-4	HIGH
99	RADIOROPA INFO	1706	7.74 7.92	STER	150	J17	NOR	D-4	HIGH	

PS: The first IF have been calculated on the basis of the following data:

1. For the frequency range 10.95 - 11.7 GHz LOF 10.000 GHz
2. For the frequency range 11.7 - 12.5 GHz LOF 10.750 GHz
3. For the frequency range 12.5 - 12.75 GHz LOF 11.475 GHz

LOF - Local Oscillator Frequency

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