Noua Tehnologie de transmisie flexibilă MIS

■In the 10-11/2011 issue of TELE-satellite we introduced a number of new PC cards from Tenow including the professional TBS6925 card. This card is also capable of receiving MIS satellite transmissions.

- *Receiverul allege modul optim de recepţie*
- *Furnizorii de programme pot optimiza costurile de transmisie*
- *Calitatea imaginii pe baza semnalului disponibil*
- *Din Broad-cast devine Individual-cast*

DVB-S2 MIS Reception with VCM/ACM

Thomas Haring

With the change from DVB-S to DVB-S2, a more efficient method was created that permits more channels to be carried over one and the same transponder. This increase in efficiency is due in large part to the significant improvement in error correction so that fewer error correction bits need to be transmitted. From a mathematical point of view the increase in efficiency compared to DVB-S is roughly 30%, a value that in reality isn't quite reached, but it is definitely showing potential.

There are a variety of ways that programming can be transmitted. With DVB-S and for the moment also with DVB-S2, it's mostly CCM (Constant Coding and Modulation) that is used. In this process the programming organizer selects a fixed error correction and modulation process with which every receiver within a satellite's footprint can receive a usable signal with a reasonable amount of effort. If the programming organizer wants to also be able to reach as many viewers as possible at the edge of a satellite's footprint, he chooses an all around correction process so that these users can also obtain an acceptable signal. If the provider is looking to reach only those viewers in the heart of the footprint, he'd choose a less costly error correction.

The operator has to make some decisions. But how? It would be much more efficient and the operator could avoid having to make these technical decisions if the signal was transmitted in exactly the same way that it would be needed by the receiver.

This is precisely the strategy behind VCM (Variable Coding and Modulation) as well as ACM (Adaptive Coding and Modulation): the entire bandwidth of a transponder is split into multiple segments and through the use of various modulations and error correction processes, these bandwidth segments would be filled with different programming content corresponding to the available bandwidth. For receivers in the heart of the satellite's footprint, a very small error correction and highly efficient modulation process could be used so that a relatively high data rate could be achieved. At the same time, the lower the signal level along the edge of the footprint, the better the error correction and more reliable modulation that could be used.

EIRP (dBW)	Modulation / Error Correction	Data Rate	Zone	Amount of Bandwidth	Resulting Bandwidth
53	16-ASP 2/3	~ 35 MB/s	1	20%	~ 7 Mbps
52	8-PSK 3/4	~ 30 MB/s	2	20%	~ 6 Mbps
51	8-PSK 2/3	~ 26 MB/s	3	20%	~ 5 Mbps
50	QPSK 8/9	~ 23 MB/s	4	20%	~ 4.5 Mbps
49	QPSK 4/5	~ 21 MB/s	5 + further	20%	~ 4.2 Mbps
				Total:	**~ 27 Mbps**

Thanks to VCM technology, multiple transponder streams with different parameters can be made available on a single transponder

This all takes place within one transponder, that is, one and the same transponder transmits through VCM different modulation and error correction processes! We're referring in this case here to MIS (Multi Input Streams). With MIS a satellite receiver can receive multiple transponder streams from one transponder that are transmitted completely independent from each other with differing modulations and error correction. The idea behind all of this is that depending on the reception location, not every transponder stream from a transponder can be received. The end user can only receive signals that are strong enough at his location. This means that the receiver would automatically measure the signal and use these values to determine which transponder streams it could process and use.

A VCM target area could look something like this: in the heart of the satellite's footprint the available TV channels would be receivable in HD or 3D while on the outer edge of the footprint these channels would only be available in SD; all of this would occur over one single transponder. The TV viewers in the center of the footprint would profit from the higher data transmission rates while the viewers on the footprint's edge could still receive the signal with smaller antennas thanks to the more complex error correction and the more reliable modulation that would be used, it just wouldn't be HD or 3D. It's important to note that no return channel from the receiver is necessary with VCM while ACM is geared more towards studio transmissions (feeds) since here the reception quality of the return channel has to be taken into consideration and the modulation and error correction are matched from the transmitting end.

This transmission technology is so new that VCM or ACM transponders cannot be received by most DVB-S2 receivers. Once more PayTV providers have switched over to this new VCM method or have begun some intensive testing, we can assume that more and more receivers will support this clever system that optimizes a satellite's bandwidth use. There's already an exciting opportunity to receive this new transmission technology: the PC card manufacturer Tenow has already integrated this technology in its professional PC card TBS6925. An initial test report on the TBS6925 was presented in the 10-11/2011 edition of TELE-satellite. Now we can actually take a closer look at the MIS capabilities of this PC card.

If you try to look for ACM/VCM transponders in your favorite Internet satellite list, you won't have much luck. Most providers of this kind of information have not included this data in their lists simply because there's hardly any reception hardware available that can receive these transponders. So the first you would do is to search for ACM/VCM transponder using blindscan tools such as CrazyScan and TBS Blindscan - you may check this forum for more background information: http://www.tbsdtv.com/forum/viewtopic.php?f=25&t=447

Items	Satellite	Frequency (MHz)	Symbol Rate (KSps)	Mode
1	Astra 1G 31.5E	11914 H	27500	8PSK/VCM
2	Astra 1G 31.5E	11875H	29999	32APSK CCM
3	Astra 1G 31.5E	11895V	29999	32APSK CCM
4	Astra 1G 31.5E	11973V	29999	32APSK CCM
5	Astra 1G 31.5E	12051V	29999	32APSK CCM
6	Astra 1G 31.5E	12109H	29999	32APSK CCM
7	Astra 1G 31.5E	12187H	29999	16APSK CCM
8	Astra 1G 31.5E	12262H	3000	32APSK CCM
9	Astra 1G 31.5E	12284V	29999	16APSK CCM
10	Astra 1G 31.5E	12363V	29999	32APSK CCM
11	Astra2 28.2E	12708 H	5000	ACM
12	Badr/Eurobird 26E	11566 H	5625	ACM
13	Eutelsat W6 21.6E	10964 H	1000	16APSK
14	Eutelsat W6 21.6E	11413 V	18500	ACM-FEC 8/9
15	Eutelsat W6 21.6E	11327 V	22075	16APSK ACM/VCM
16	Eutelsat W6 21.6E	11308V	5623	16APSK ACM
17	Eutelsat W6 21.6E	11186H	2000	QPSK ACM
18	Eutelsat W6 21.6E	12647V	1283	QPSK ACM
19	Eutelsat W6 21.6E	11628V	5000	QPSK ACM
20	Eutelsat W6 21.6E	11509V	1644	8PSK ACM
21	Eutelsat W3 7E	11548 H	7200	32APSK-FEC 3/4 ACM/VCM
22	Eurobird 4A 4E	11458 V	7570	
23	Amos 2 Middle East 4W	11746 H	27500	16APSK-CCM
24	Amos 2 Middle East 4W	12053 H	27500	16APSK-CCM
25	Amos 2 Middle East 4W	12168 H	27500	16APSK-CCM
26	Atlantic Bird 1 12.5W	12528 H	1250	32APSK-CCM
27	Atlantic Bird 1 12.5W	12712 V	1863	32APSK-CCM
28	Atlantic Bird 1 12.5W	12718 H	36513	ACM
29	Telestar12 15W	10996 H	5307	32APSK-FEC 3/4 ACM/VCM
30	Telstar12 15W	11495 H	5750	16APSK
31	Telstar12 15W	11497 V	5595	32APSK
32	NSS 7 22W	11571 H	5108	32APSK-ACM/VCM
33	NSS 7 22 W	11574 H	5108	8PSK-FEC 3/4-ACM/VCM
34	NSS 7 22 W	10968 H	1033	8PSK-FEC 3/4-ACM/VCM
35	NSS 7 22 W	11654 H	3671	32APSK-FEC 3/4-ACM/VCM
36	Hispasat 1C/1D/1E 30W	10889 H	29999	16APSK-ACM/VCM
37	Hispasat 1C/1D/1E 30W	11789 V	3750	8PSK – FEC 2/3 – ACM/VCM
38	Hispasat 1C/1D/1E 30W	11800 V	5236	16APSK – FEC 2/3 -ACM/VCM
39	Hispasat 1C/1D/1E 30W	11853 V	8947	8PSK – FEC 2/3 – ACM/VCM
40	Hispasat 1C/1D/1E 30W	11909 V	7199	8PSK – FEC 3/5 – CCM
41	Hispasat 1C/1D/1E 30W	11924 V	5667	32APSK – FEC 3/4 – ACM/VCM
42	Hispasat 1C/1D/1E 30W	12013 V	30000	QPSK – FEC ?/? – ACM/VCM
43	Hispasat 1C/1D/1E 30W	12151 V	3700	QPSK – FEC5/6 – ACM/VCM
44	Hispasat 1C/1D/1E 30W	12591 H	30000	ACM/VCM?
45	Telstar 11N 37.5W	11019 V	8229	32APSK
46	Telstar 11N 37.5W	11065 V	2060	?
47	Telstar 11N 37.5 W	11499 H	2316	16APSK-ACM/CCM
48	Telstar 11N 37.5W	11507 H	2640	ACM
49	Telstar 11N 37.5 W	11646 H	3846	8PSK-ACM/VCM
50	Telstar 11N 37.5 W	12349 H	2316	16APSK-ACM/CCM
51	Telstar 11N 37.5 W	12496 H	3846	8PSK-ACM/CCM
52	Telstar 11N 37.5W	12549 H	1034	32APSK
53	Intelsat 14 45W	11523 H	9800	ACM
54	Intelsat 805 55.5W	4162 H	7200	8PSK – FEC 3/5 – ACM/VCM
55	AMC 6 72W	11628 H	15166	16APSK – FEC 4/5 – ACM/VCM
56	AMC 6 72W	11644 H	10425	QPSK – FEC: 3/4 – ACM/VCM
57	AMC 6 72W	11674 H	11500	8PSK – FEC: 3/4 – ACM/VCM
58	AMC 2 79W	11792 V	1000	32APSK
59	Galaxy 28 89.0W	11760 H	30000	8APSK/ACM/VCM
60	SES-1 101W	3996 V	15120	2/3 FEC VCM
61	Galaxy 13 127W	11720 H	20330	32APSK

Currently active MIS Satellite Transponders

Once you know transponders available with your reception setup, you have to start the TBS6925 TS recorder. This program, that we also introduced to you in the 10-11/2011 issue of TELE-satellite, can be used as an aid in selecting the desired transport streams. After entering the parameters of the MIS transponder (frequency, polarization and symbol rate), you then simply need to click on the „Lock TP" button after which the software reads the desired transponder.

In the lower most lines of Tools, one or more numbers appear in the field „Input Stream Identify" that highlight the available transponder streams in the transponder. Here you simply make a choice and click on one of the entries. You can now stop the TBS6925 TS recorder and start any of the popular TBS6925 compatible TV viewers. For our tests we opted to use DVBViewer. Simply start a scan on the frequency of the MIS transponder, the software will then read in the available channels and store them. With that you've read in the first of multiple transponder streams on that transponder. Now you would repeat these steps as often as necessary until all the streams in the „Input Stream Identify" field have been selected and read in. You'll be amazed! With each newly selected stream the TV software will recognize an entirely new set of channels, all on the same frequency!

For our tests we used the 12718 MHz transponder on ATLANTIC BIRD 1 at 12.5° west on which are four fully independent transponder streams that each carry their own set of programming. The bandwidth is enough for 11 channels in SD resolution or up to three in HD or 3D. Naturally, all of the typical features, such as EPG or language selection, are available with MIS reception. The only difference with CCM is the number of available transponder streams per transponder.

The abbreviation MIS is something we'll all have to start getting used to seeing more often. Gradually, more and more programming providers will begin taking advantage of this new technology and once this happens the need for compatible satellite receivers will naturally grow.

DVB-S2 MIS Reception

Thomas Haring

Three of the four transponderstreams transmitted by ATLANTIC BIRD 1. MIS compatible receivers or PC cards will choose the streams best suited in the circumstance, depending on the signal level at the reception site. In this example, viewers in the center of beam with the maximum level of signal quality can watch LA7's 3D test transmissions, whilst viewers in fringe areas of beam with a less good signal level can only view the HD channels and viewers outside beam will only get channels in SD. MIS compatible satellite receivers will choose the stream according to the signal level available. Special softwares as the TBS6925 TS Recorder from Tenow allows the viewer to choose individually the desired stream.

DVBS **352.5°E** Network Name TIMB4 Recording Thomas Haring
Transmitter ATLANTIC BIRD 1 12.718H *Remark* MIS

PID	Hex PID	Stream Type	Encrypted	kbps	%	Service Name
757	0x02F5	H.264 Video	-	9232.66	41.14	LA7 HD
762	0x02FA	H.264 Video	-	9232.39	41.14	LA7 test 3D
101	0x0065	H.264 Video	-	1801.87	8.03	LA7 test MOSAICO
8191	0x1FFF	Null Packets	-	1158.70	5.16	N/A
763	0x02FB	MPEG Audio	-	394.77	1.76	LA7 test 3D
758	0x02F6	MPEG Audio	-	394.68	1.76	LA7 HD
18	0x0012	EIT	-	39.17	0.17	N/A
104	0x0068	AAC Audio	-	26.64	0.12	LA7 test MOSAICO
102	0x0066	AAC Audio	-	26.64	0.12	LA7 test MOSAICO
105	0x0069	AAC Audio	-	26.55	0.12	LA7 test MOSAICO
103	0x0067	AAC Audio	-	26.55	0.12	LA7 test MOSAICO
1	0x0001	CAT	-	15.13	0.07	N/A
771	0x0303	PMT	-	15.04	0.07	LA7 test MOSAICO
761	0x02F9	PMT	-	15.04	0.07	LA7 test 3D
756	0x02F4	PMT	-	15.04	0.07	LA7 HD
0	0x0000	PAT	-	15.04	0.07	N/A
21	0x0015	Network Sync	-	2.51	0.01	N/A
17	0x0011	SDT	-	1.58	0.01	N/A
16	0x0010	NIT	-	0.28	0.00	N/A
20	0x0014	TOT	-	0.09	0.00	N/A

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DVBS **352.5°E** Network Name TIMB2 Recording Thomas Haring
Transmitter ATLANTIC BIRD 1 12.718H *Remark* MIS

PID	Hex PID	Stream Type	Encrypted	kbps	%	Service Name
757	0x02F5	H.264 Video	-	8717.97	38.86	LA7 HD
770	0x0302	H.264 Video	-	4112.51	18.33	LA7D HD
766	0x02FE	H.264 Video	-	3089.98	13.77	MTV HD
790	0x0316	MPEG2 Video	-	2567.23	11.44	RTL 102.5 TV
650	0x028A	MPEG2 Video	-	1465.59	6.53	Padre Pio TV
772	0x0304	AC3 Audio	-	423.75	1.89	LA7D HD
759	0x02F7	AC3 Audio	-	423.75	1.89	LA7 HD
768	0x0300	AC3 Audio	-	423.65	1.89	MTV HD
18	0x0012	EIT	-	259.40	1.16	N/A
792	0x0318	MPEG Audio	-	200.78	0.90	RTL 102.5
791	0x0317	MPEG Audio	-	198.71	0.89	RTL 102.5 TV
8191	0x1FFF	Null Packets	-	193.95	0.86	N/A
651	0x028B	MPEG Audio	-	135.94	0.61	Padre Pio TV
7094	0x1BB6	Data	-	35.05	0.16	ROVI
7041	0x1B81	Data	-	23.86	0.11	ROVI
33	0x0021	PMT	-	15.15	0.07	MTV MUSIC HD
1	0x0001	CAT	-	15.15	0.07	N/A
769	0x0301	PMT	-	15.05	0.07	LA7D HD
765	0x02FD	PMT	-	15.05	0.07	MTV HD
756	0x02F4	PMT	-	15.05	0.07	LA7 HD
549	0x0225	PMT	-	15.05	0.07	Padre Pio TV
490	0x01EA	PMT	-	15.05	0.07	RTL 102.5
290	0x0122	PMT	-	15.05	0.07	RTL 102.5 TV
269	0x010D	PMT	-	15.05	0.07	ROVI
0	0x0000	PAT	-	15.05	0.07	N/A
7040	0x1B80	Data	-	4.65	0.02	ROVI
17	0x0011	SDT	-	2.97	0.01	N/A
21	0x0015	Network Sync	-	2.48	0.01	N/A
16	0x0010	NIT	-	0.30	0.00	N/A
20	0x0014	TOT	-	0.20	0.00	N/A

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DVBS **352.5°E** Network Name TIMB3 Recording Thomas Haring
Transmitter ATLANTIC BIRD 1 12.718H *Remark* MIS

PID	Hex PID	Stream Type	Encrypted	kbps	%	Service Name
6112	0x17E0	MPEG2 Video	-	5023.91	22.39	LA7
6122	0x17EA	MPEG2 Video	-	2874.71	12.81	LA7D
6132	0x17F4	MPEG2 Video	-	2567.58	11.44	MTV MUSIC
6117	0x17E5	MPEG2 Video	-	2465.31	10.99	MTV
1457	0x05B1	MPEG2 Video	-	2362.96	10.53	frisbee
981	0x03D5	MPEG2 Video	-	2362.88	10.53	K2
8191	0x1FFF	Null Packets	-	1262.97	5.63	N/A
2039	0x07F7	MPEG2 Video	-	433.78	1.93	La7ondemand
6133	0x17F5	MPEG Audio	-	394.71	1.76	MTV MUSIC
6118	0x17E6	MPEG Audio	-	394.71	1.76	MTV
6113	0x17E1	MPEG Audio	-	263.61	1.17	LA7
18	0x0012	EIT	-	259.63	1.16	N/A
7011	0x1B63	MHP	-	244.39	1.09	LA7
6120	0x17E8	Teletext	-	188.37	0.84	MTV
6115	0x17E3	Teletext	-	150.71	0.67	LA7
7001	0x1B59	MHP	-	144.31	0.64	LA7
7081	0x1BA9	MHP	-	144.23	0.64	LA7
6123	0x17EB	MPEG Audio	-	132.51	0.59	LA7D
1458	0x05B2	MPEG Audio	-	132.51	0.59	frisbee
982	0x03D6	MPEG Audio	-	132.51	0.59	K2
990	0x03DE	MHP	-	94.15	0.42	CUBOVISION
6111	0x17DF	PMT	-	30.16	0.13	LA7
6160	0x1810	PMT	-	15.08	0.07	MTV
6157	0x180D	PMT	-	15.08	0.07	La7ondemand
6152	0x1808	PMT	-	15.08	0.07	LA7D
6141	0x17FD	PMT	-	15.08	0.07	MTV MUSIC
6131	0x17F3	PMT	-	15.08	0.07	MTV MUSIC
6116	0x17E4	PMT	-	15.08	0.07	MTV
6106	0x17DA	PMT	-	15.08	0.07	CUBOVISION
1551	0x060F	PMT	-	15.08	0.07	PIU' SERVIZI
1546	0x060A	PMT	-	15.08	0.07	PORTALE SERVIZI TELECOM
1541	0x0605	PMT	-	15.08	0.07	MTV MUSIC On Demand
1536	0x0600	PMT	-	15.08	0.07	MTV+ On Demand
1531	0x05FB	PMT	-	15.08	0.07	La7 Servizi On Demand
1526	0x05F6	PMT	-	15.08	0.07	La7D On Demand
1521	0x05F1	PMT	-	15.08	0.07	MTV On Demand
1516	0x05EC	PMT	-	15.08	0.07	MTV News On Demand
1512	0x05E8	PMT	-	15.08	0.07	La7 News On Demand
1461	0x05B5	PMT	-	15.08	0.07	frisbee
0	0x0000	PAT	-	15.08	0.07	N/A
6151	0x1807	PMT	-	15.00	0.07	LA7D
6150	0x1806	PMT	-	15.00	0.07	LA7
1511	0x05E7	PMT	-	15.00	0.07	K2
1	0x0001	CAT	-	15.00	0.07	N/A
590	0x024E	Private Sections	-	6.09	0.03	N/A
7080	0x1BA8	Private Sections	-	6.02	0.03	N/A
7010	0x1B62	Private Sections	-	6.02	0.03	N/A
7000	0x1B58	Private Sections	-	6.02	0.03	N/A
577	0x0241	Private Sections	-	6.02	0.03	N/A
400	0x0190	Private Sections	-	6.02	0.03	N/A
17	0x0011	SDT	-	4.45	0.02	N/A
21	0x0015	Network Sync	-	2.42	0.01	N/A
16	0x0010	NIT	-	0.63	0.00	N/A
20	0x0014	TOT	-	0.23	0.00	N/A

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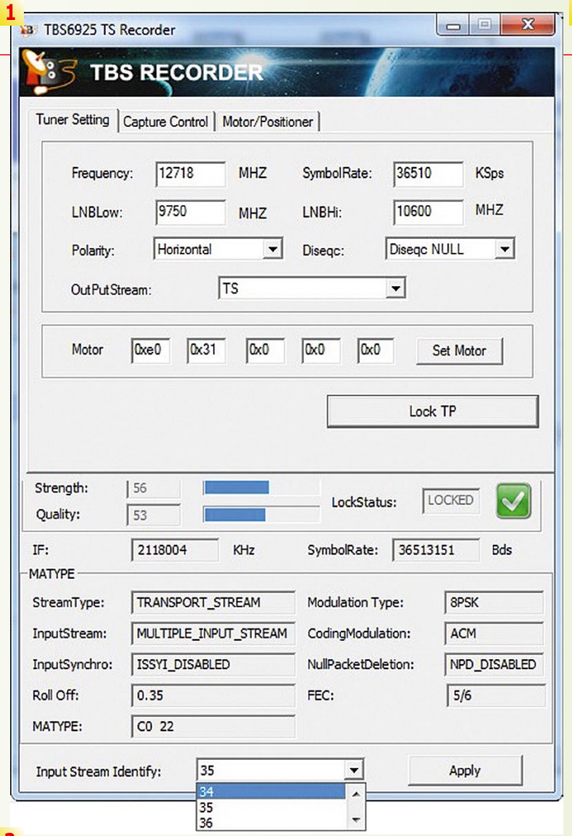

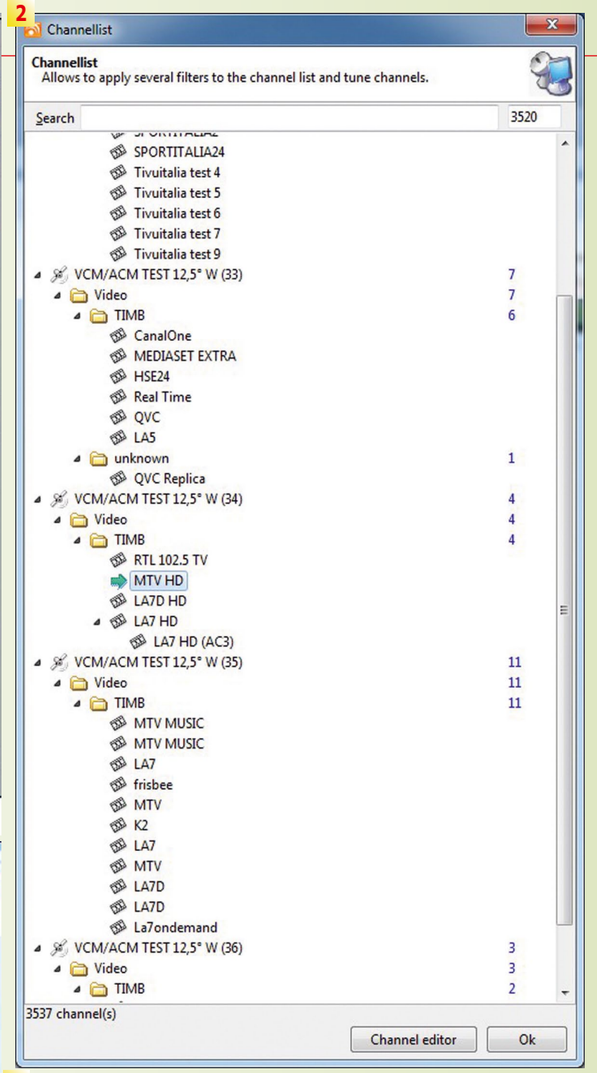

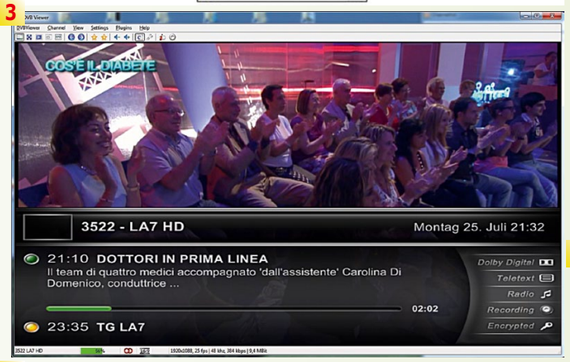

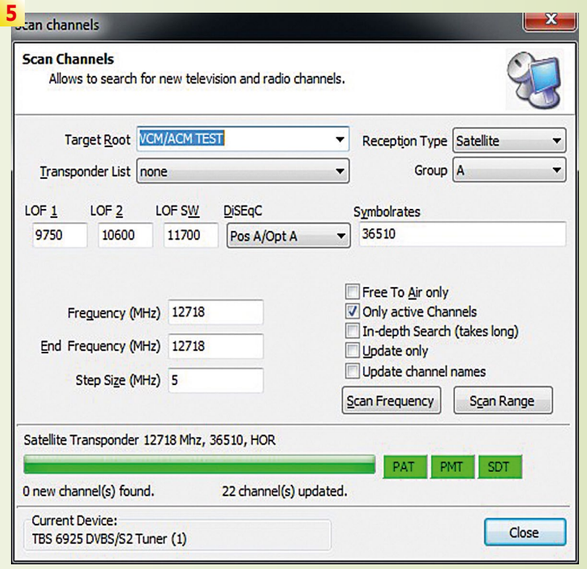

1. To identify MIS (Multiple Input Stream) transmissions, you enter in the reception parameters in the TBS Recorder program. This program is included with the Tenow TBS6925 PC card. The Input Stream Identifiers recognized by the software are listed in the lower-most drop-down menu.

2. The channels that were found can be viewed in a TV Viewer such as DVBViewer; for example, LA7 on ATLANTIC BIRD 1 at 12.5° west.

3,4. The TBS6925 can receive the channels that were found.

5. The Tenow software's scan function finds the corresponding channels.