

La Nouvelle Technologie de transmission MIS flexible

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.



- *Le récepteur choisit le mode de réception optimale*
- *Les Fournisseurs de programmation permettent d'optimiser les coûts de transmission*
- *Une qualité d'image basée sur le signal utile*
- *De la diffusion généralisée à une diffusion personnalisée*

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 high-

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

ly 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.

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

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

more background information: <http://www.tbsdtv.com/forum/viewtopic.php?f=25&t=447>

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 DVViewer. 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 Tenov allows the viewer to choose individually the desired stream.

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

PID	Hex PID	Stream Type	Encrypted	kbps	%	Service Name	Transmitter	ATLANTIC BIRD 1	12.718H	Remark
757	0x02F5	H.264 Video	-	9232.66	41.14	LA7 HD	104	0x0068	AAC Audio	- 26.64 0.12
762	0x02FA	H.264 Video	-	9232.39	41.14	LA7 test 3D	102	0x0066	AAC Audio	- 26.64 0.12
101	0x0065	H.264 Video	-	1801.87	8.03	LA7 test MOSAICO	105	0x0069	AAC Audio	- 26.55 0.12
8191	0x1FFF	Null Packets	-	1158.70	5.16	N/A	103	0x0067	AAC Audio	- 26.55 0.12
763	0x02FB	MPEG Audio	-	394.77	1.76	LA7 test 3D	1	0x0001	CAT	- 15.13 0.07
758	0x02F6	MPEG Audio	-	394.68	1.76	LA7 HD	771	0x0303	PMT	- 15.04 0.07
										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**
MIS
 Transmitter **ATLANTIC BIRD 1 12.718H** Remark

PID	Hex PID	Stream Type	Encrypted	kbps	%	Service Name	Transmitter	ATLANTIC BIRD 1	12.718H	Remark
757	0x02F5	H.264 Video	-	8717.97	38.86	LA7 HD	791	0x0317	MPEG Audio	- 198.71 0.89
770	0x0302	H.264 Video	-	4112.51	18.33	LA7D HD	651	0x028B	MPEG Audio	- 135.94 0.61
766	0x02FE	H.264 Video	-	3089.98	13.77	MTV HD	7094	0x1B86	Data	- 35.05 0.16
790	0x0316	MPEG2 Video	-	2567.23	11.44	RTL 102.5 TV	7041	0x1B81	Data	- 23.86 0.11
650	0x028A	MPEG2 Video	-	1465.59	6.53	Padre Pio TV	33	0x0021	PMT	- 15.15 0.07
772	0x0304	AC3 Audio	-	423.75	1.89	LA7D HD	1	0x0001	CAT	- 15.15 0.07
759	0x02F7	AC3 Audio	-	423.75	1.89	LA7 HD	769	0x0301	PMT	- 15.05 0.07
768	0x0300	AC3 Audio	-	423.65	1.89	MTV HD	765	0x02FD	PMT	- 15.05 0.07
18	0x0012	EIT	-	259.40	1.16	N/A	756	0x02F4	PMT	- 15.05 0.07
792	0x0318	MPEG Audio	-	200.78	0.90	RTL 102.5	549	0x0225	PMT	- 15.05 0.07
										490 0x01EA PMT - 15.05 0.07 RTL 102.5 TV
										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**
MIS
 Transmitter **ATLANTIC BIRD 1 12.718H** Remark

PID	Hex PID	Stream Type	Encrypted	kbps	%	Service Name	Transmitter	ATLANTIC BIRD 1	12.718H	Remark
6112	0x17E0	MPEG2 Video	-	5023.91	22.39	LA7	1458	0x05B2	MPEG Audio	- 132.51 0.59
6122	0x17EA	MPEG2 Video	-	2874.71	12.81	LA7D	982	0x03D6	MPEG Audio	- 132.51 0.59
6132	0x17F4	MPEG2 Video	-	2567.58	11.44	MTV MUSIC	6111	0x17DF	PMT	- 30.16 0.13
6117	0x17E5	MPEG2 Video	-	2465.31	10.99	MTV	6160	0x1810	PMT	- 15.08 0.07
1457	0x05B1	MPEG2 Video	-	2362.96	10.53	frisbee	6157	0x180D	PMT	- 15.08 0.07
981	0x03D5	MPEG2 Video	-	2362.88	10.53	K2	6152	0x1808	PMT	- 15.08 0.07
8191	0x1FFF	Null Packets	-	1262.97	5.63	N/A	6141	0x17FD	PMT	- 15.08 0.07
2039	0x07F7	MPEG2 Video	-	433.78	1.93	La7ondemand	6131	0x17F3	PMT	- 15.08 0.07
6133	0x17F5	MPEG Audio	-	394.71	1.76	MTV MUSIC	6116	0x17E4	PMT	- 15.08 0.07
6118	0x17E6	MPEG Audio	-	394.71	1.76	MTV	6106	0x17DA	PMT	- 15.08 0.07
6113	0x17E1	MPEG Audio	-	263.61	1.17	LA7	1551	0x060F	PMT	- 15.08 0.07
18	0x0012	EIT	-	259.63	1.16	N/A	1546	0x060A	PMT	- 15.08 0.07
7011	0x1B63	MHP	-	244.39	1.09	LA7	1541	0x0605	PMT	- 15.08 0.07
6120	0x17E8	Teletext	-	188.37	0.84	MTV	1536	0x0600	PMT	- 15.08 0.07
6115	0x17E3	Teletext	-	150.71	0.67	LA7	1531	0x05FB	PMT	- 15.08 0.07
7001	0x1B59	MHP	-	144.31	0.64	LA7	1526	0x05F6	PMT	- 15.08 0.07
7081	0x1BA9	MHP	-	144.23	0.64	LA7	1521	0x05F1	PMT	- 15.08 0.07
6123	0x17E8	MPEG Audio	-	132.51	0.59	LA7D	1516	0x05EC	PMT	- 15.08 0.07
										1512 0x05E8 PMT - 15.08 0.07 frisbee
										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 TBS6925 TS Recorder

TBS RECORDER

Tuner Setting | Capture Control | Motor/Positioner

Frequency: 12718 MHz SymbolRate: 36510 KSpS
 LNBLow: 9750 MHz LNBHi: 10600 MHz
 Polarity: Horizontal Diseqc: Diseqc NULL
 OutPutStream: TS

Motor [0xe0] [0x31] [0x0] [0x0] [0x0] Set Motor

Lock TP

Strength: 56 LockStatus: LOCKED
 Quality: 53

IF: 2118004 KHz SymbolRate: 36513151 Bds

MATYPE

StreamType: TRANSPORT_STREAM Modulation Type: 8PSK
 InputStream: MULTIPLE_INPUT_STREAM CodingModulation: ACM
 InputSynchro: ISSYI_DISABLED NullPacketDeletion: NPD_DISABLED
 Roll Off: 0.35 FEC: 5/6
 MATYPE: C0 22

Input Stream Identify: 35 34 35 36 Apply

3 TV Viewer

3522 - LA7 HD Montag 25. Juli 21:32

21:10 DOTTORI IN PRIMA LINEA
 Il team di quattro medici accompagnato dall'assistente Carolina Di Domenico, condurrà...

23:35 TG LA7

4 TV Viewer

3520 - MTV HD Montag 25. Juli 21:32

21:30 Nitro Circus
 Ecco il nuovo show di MTV prodotto da Travis Pastrana e dal suo folle team di stuntmen. Puro divertimento e scarso senso del pericolo vi attendono su Nitro Circus.

22:00 Megadrive

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 Tenov 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.

2 Channellist

Allows to apply several filters to the channel list and tune channels.

Search 3520

- SPORTITALIA24
- Tivitalia test 4
- Tivitalia test 5
- Tivitalia test 6
- Tivitalia test 7
- Tivitalia test 9
- VCM/ACM TEST 12,5° W (33)
 - Video
 - TIMB
 - CanalOne
 - MEDIASET EXTRA
 - HSE24
 - Real Time
 - QVC
 - LA5
 - unknown
 - QVC Replica
 - VCM/ACM TEST 12,5° W (34)
 - Video
 - TIMB
 - RTL 102.5 TV
 - MTV HD
 - LA7D HD
 - LA7 HD
 - LA7 HD (AC3)
 - VCM/ACM TEST 12,5° W (35)
 - Video
 - TIMB
 - MTV MUSIC
 - MTV MUSIC
 - LA7
 - frisbee
 - MTV
 - K2
 - LA7
 - MTV
 - LA7D
 - LA7D
 - La7ondemand
 - VCM/ACM TEST 12,5° W (36)
 - Video
 - TIMB

3537 channel(s)

Channel editor Ok

5 Scan channels

Allows to search for new television and radio channels.

Target Root: VCM/ACM TEST Reception Type: Satellite
 Transponder List: none Group: A

LOF 1: 9750 LOF 2: 10600 LOF SW: 11700 DiSEqC: Pos A/Opt A Symbolrates: 36510

Frequency (MHz): 12718
 End Frequency (MHz): 12718
 Step Size (MHz): 5

Free To Air only
 Only active Channels
 In-depth Search (takes long)
 Update only
 Update channel names

Scan Frequency Scan Range

Satellite Transponder 12718 Mhz, 36510, HOR

0 new channel(s) found. 22 channel(s) updated.

Current Device: TBS 6925 DVBS/S2 Tuner (1)

Close

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

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