

WBU-ISOG
MPEG-4 AVC (H.264) Contribution 1080i/720p Codec
Interoperability Program 2011
Version 1.0a
(Mar 01, 2011)

CHANGE HISTORY

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WBU-ISOG Agreement

Agreement to Participate in the WBU-ISOG MPEG-4 AVC (H. 264) Contribution 1080i/720p Codec Interoperability Program

Thank you for your interest in the WBU-ISOG MPEG-4 AVC (H. 264) Contribution 1080i/720p Codec Interoperability Program. Telesat Canada (“Telesat”) has been appointed as the Test Contractor for the second round of tests under the Interoperability Program. Your company agreed to participate in the second round of tests under the Interoperability Program as a Participating Vendor upon the following terms and conditions (capitalized terms are those in the Interoperability Program):

1. Participating Vendors will accept Test Tapes or Test Material in another format from Telesat and will return Test Tapes/Test Material to Telesat at the completion of the Interoperability Program or upon termination of this Participation Agreement.
2. Participating Vendors will share Transport Streams via an FTP file server provided by Telesat in accordance with the Interoperability Program.
3. Participating Vendors will provide their latest model MPEG-4 AVC (H. 264) encoder or latest model MPEG-4 AVC (H. 264) decoder (or both if they manufacture both) to Telesat for a two-week test period at Telesat’s headquarters in Ottawa, Ontario at a time specified by Telesat. Testing is estimated to take no more than five (5) days to complete. Participating Vendors will pay shipping costs of codecs. Telesat will use reasonable care and standard industry practices in storing, deploying, operating, locating and packing/unpacking the codecs, but the risk of loss, damage or destruction of the codecs will be borne by the Participating Vendor. Participating Vendors will send a Participating Vendor representative to Telesat during the test period to assist Telesat in operating the codec.
4. Participating Vendors will pay a one-time Testing/Sharing Fee of \$8,000 (U.S.) for the second round of tests to Telesat within 30 days of counter-signing this agreement. Payment will be made payable to: Telesat Canada. The Testing/Sharing Fee is non-refundable unless Telesat withdraws as Test Contractor because less than seven (7) manufacturers have entered into Participation Agreements, in which case Telesat will refund the fee.
5. The Participation Agreement will be effective as of the date of execution by Participating Vendor and will terminate November 1, 2011, unless earlier terminated. A Participating Vendor may discontinue its participation in the Interoperability Program and terminate this Participation Agreement at any time upon prior written notice to Telesat and WBU-ISOG. In such case, the Testing/Share Fee will not be refunded.
6. Participating Vendors will use the Test Tapes/Source Material solely for the purposes of implementing the Interoperability Program in accordance with this

Participation Agreement. Participating Vendors will not provide the Test Tapes/Source Material to any third party, except to third party contractors involved in the implementation of the Interoperability Program who agree to the non-disclosure terms of this Participation Agreement. Participating Vendors will not use the Test Tapes/Source Material for any public exhibition. Participating Vendors will return the Test Tapes/Source Material to Telesat upon completion of Interoperability Program or upon termination of this Participation Agreement.

7. Telesat agrees that it will use the Transport Streams generated by Participating Vendors solely for purposes of implementing the Interoperability Program. Without limitation Telesat agrees that it will not provide Transport Streams to any third party except Participating Vendors and will not use Transport Streams for reverse engineering. All Transport Streams will remain the property of the Participating Vendor that uploaded the Transport Stream to the file server and will be promptly destroyed or returned to the owner upon owner's written request. All Transport Streams downloaded from the Telesat FTP file server will be promptly destroyed upon the completion of the Interoperability Program or upon termination of this Participation Agreement.
8. Upon execution of this Participation Agreement, each Participating Vendor authorizes Telesat and other Participating Vendors to use the Participating Vendor's Transport Streams, which the Participating Vendor has uploaded to Telesat's FTP file server, solely for the purposes of implementing the Interoperability Program. Each Participating Vendor agrees that it will use Transport Streams, which the Participating Vendor has downloaded from Telesat's FTP file server, solely for the purposes of implementing the Interoperability Program. Without limitation, each Participating Vendor agrees that it will not provide such downloaded Transport Streams to any third party and that it will not use downloaded Transport Streams for any reverse engineering. All Transport Streams downloaded from the Telesat FTP file server will remain the property of the Participating Vendor that uploaded the Transport Stream to the file server and will be promptly destroyed or returned to the owner upon owner's written request. All Transport Streams downloaded from the Telesat FTP file server will be promptly destroyed by participants upon the completion of the Interoperability Program or upon termination of this Participation Agreement.
9. Telesat's role as Test Contractor is to implement the Interoperability Program, both by conducting the testing of the Participating Vendors' decoders and encoders, and by providing the facilities required for the testing and resolution of interoperability issues. The compensation provided to Telesat from the Participating Vendors is directly related to the costs to be incurred by Telesat in conducting the testing and providing the facilities. As such, Telesat shall not be directly or indirectly liable to WBU-ISOG or any Participating Vendor, for any losses, injuries, damages or expenses, whether the basis of liability is breach of contract, tort (including any negligence and strict liability), statute or any other legal theory, arising out of Telesat's implementation of, or failure to implement, the Interoperability Program.
10. Participating Vendor hereby releases Telesat, and its directors, officers, shareholders, employees, and agents from any and all liability, whether direct or

indirect, arising out of Telesat's implementation of, or failure to implement, the Interoperability Program. Participating Vendor also releases WBU-ISOG and WBU-ISOG members from any and all liability, whether direct or indirect, arising out of WBU-ISOG's implementation of, or failure to implement, the Interoperability Program.

11. Paragraphs 9 and 10 shall survive the termination of this Participation Agreement.
12. When the Participating Vendors or any of their representatives are present at Telesat facilities, they shall comply with all applicable federal, provincial, municipal and/or other governmental laws, by-laws, rules or regulations, and abide by all directives or instructions provided to them by Telesat for the duration of their stay at the Telesat facilities.
13. This Participation Agreement contains the entire agreement between the parties with respect to participation in the Interoperability Program.

Test Parameters

- a. Tests will be conducted only for high definition formats.
- b. Tests will be conducted using bit rates for high quality contribution (e.g., major events, potential concatenation), medium quality contribution and SNG. Tests for medium quality will be curtailed if necessary due to time constraints.
- c. The chroma for each bit rate are as indicated in the transport stream table.
- d. Four video formats will be tested.
- e. Latency will be tested because if latency is too extreme for a particular vendor decoder, the decoder may not be interoperable because it cannot effectively be used. Codec settings for latency at each bit rate are as indicated.

Video Formats:

1080i/59.94
1080i/50
720p/59.94
720p/50

Transport Stream Bit Rates:

High Quality: 38 Mbps
Medium Quality: 20 Mbps
SNG: 10.3 Mbps

Chroma:

High Quality: 4:2:2 (Hi 422 @L4 10 bit, 8 bit)
Medium Quality: 4:2:2 (Hi 422@L4 10 bit, 8 bit)

SNG: 4:2:0 (HiP@L4 8 bit)

or if 4:2:2 not supported:

High Quality: 4:2:0 (HiP @ L4 8 bit)

Medium Quality: 4:2:0 (HiP @ L4 8 bit)

Coding Structure/GOP:

High Quality: Mfg's choice for high quality

Medium Quality: Mfg's choice for medium quality

SNG: Mfg's choice for SNG quality

Ultra Low Latency: Mfg's choice for lowest latency with medium quality.

Audio Format:

MPEG-2 4 Ch. Audio, (MPEG 1 Layer 2)

Dolby E 20 bit mode, 8 channels (SMPTE 302 M 2002)

PCM – 4 Channel and 8 Channel (SMPTE 302 M 2002)

AAC - MPEG2 AAC-LC, audio synchronized to video, sample rate 48Khz

- 4 channels @ 96Kb/channel in mono or stereo, audio on all channels.

Lip Sync:

Test all audio formats

Latency:

High Quality - Standard latency

Medium Quality - Standard latency

- Ultra Low latency

SNG - Low Latency

Resolution:

All tests will be done at full resolution:

1920 (1080 line) h pixels

1280 (720 line) h pixels

Carrier Identification:

Encoding equipment capable of carrier ID (CID) shall have it enabled.

See Appendix 1 for CID specification details.

WBU-ISOG Interoperability Test File Creation and Exchange Plan

As Test Contractor, Telesat has installed a secure Internet FTP server that is available to all participating vendors of the test program. The purpose of the server is to store and distribute MPEG-2 transport test stream files. The FTP server address and access instructions shall be provided by Telesat to all participants.

Vendors shall generate MPEG-2 transport test stream files as described in table 4. Vendors shall use the source material provided by WBU-ISOG, and upload encoded files to the Telesat

FTP server over the Internet, or supplied to Telesat via other media e.g.;DVD. Vendors will be given access to download all of the files stored on the server.

With the largest file using a transport stream rate of 38 Mbps, up/download time should be about 40 minutes per minute of encoded transport stream file, at an average Internet rate of 1 Mbps. Load times will vary in proportion to the actual file size and delivery rate. **As an alternative delivery method, vendors may also submit and request files on DVD.**

Files shall be clearly identified by using the attached template (Table 5). Telesat will verify that submitted files conform to relevant MPEG-2 transport and elementary stream standards, and alert the submitter of any deviation from the standard. For this purpose, Telesat will use a transport and elementary stream analyzer.

All files shall be MPEG-2 transport streams, preferably with extension ".ts". The tables needed are the "Network Information Table" (NIT), "Program Association Table" (PAT) and "Program Map Table" (PMT). The "Program Clock Reference" (PCR) shall use the same packet identification (PID) as the video elementary stream.

MPEG-2 Default PIDs for contribution using the WBUISOG Recommended Defaults.

PAT = 0x 0000
PMT = 0x 0100
VIDEO PID = 0x 0200
PCR PID = 0x 0200 (embedded in Video PID)

AUDIO I PID = 0x 1010
AUDIO II PID = 0x 1020
AUDIO III PID = 0x 1030
AUDIO IV PID = 0x 1040

Chroma format shall be as defined in Table 4.

Transport data rate shall be set at the value defined in Table 4. The peak elementary stream data rate shall be no less than 95% of transport rate. VBR or CBR encoding methods are acceptable.

Source Material

Participating Vendors will reuse Test Tapes from Telesat that were provided in 2008 or can directly download the test material from the program FTP server. Alternatively Telesat can provide the content to vendors via DVD on request.

Table 1: CBC Source Tape

CBC D5-HD Source Tape (1920x1080i59.94)		
Segment	Audio (note 2)	Duration
CBC Content – see tape sleeve	AES3, 24-bit, 8-channel	1 minute
Vistek lip sync signal (note 1)	AES3, 24-bit, 8-channel	30 seconds

Table 2: FOX Source Tape

FOX D5-HD Source Tape (1280x720p59.94)		
Segment	Audio (note 3)	Duration
Vistek lip sync signal (note 1)	AES3, 20-bit, 4-channel	30 seconds
FOX Content	AES3, 20-bit, 4-channel	1 minute

Table 3a: EBU Source Tape

EBU D5-HD Source Tape (1920x1080i50)		
Segment	Audio (note 4)	Duration
Vistek lip sync signal (note 1)	AES3, 24-bit, 4-channel	30 seconds
EBU Content	AES3, 24-bit, 4-channel	1 minute

Table 3b: EBU Source Tape

EBU D5-HD Source Tape (1280x720p50)		
Segment	Audio (note 4)	Duration
Vistek lip sync signal (note 1)	AES3, 16-bit, 4-channel	30 seconds
EBU Content	AES3, 16-bit, 2-channel	1 minute

Notes:

1. The 4-channel, Vistek lip sync test signal shall be used by the vendors for the measurement of relative video to audio delay at the decoder output. When encoding this segment, each vendor shall ensure that the relative delay coming from their own encoder, and over their own encoder/decoder pair, is zero. When testing for lip sync compatibility with encoded streams from other vendors, the testing vendor shall note the amount of deviation from zero. If a vendor does not have access to a Vistek reader, they may measure lip sync using whatever means with which they are comfortable.
2. The CBC 1080i59.94 tape contains 5.1 discrete audio on Ch 1-6 and a stereo mix on Ch 7-8.
3. The Fox Tape has 4-channel audio and consists of two identical left-right pairs. Channels 3 and 4 are a repetition of channels 1 and 2.
4. EBU 1080i50Hz tape audio format is 24bit 4-channel audio and consists of two identical left-right pairs. Channels 3 and 4 are a repetition of channels 1 and 2. EBU 720p50 tape audio has 16 bit 2-channel audio in the EBU segment, and 16bit 4-channel in the Vistek portion.
5. **IMPORTANT** - The digital copies available on the FTP server of the tape content has only 2 audios. Vendors are required to populate other audios required in each test scenario with either duplicated audio from the file or any appropriate audio source for the multi channel audio tests.

Encoded Output Transport Stream Files

Vendors shall create transport stream files as shown in table 4. (Each TS submitted should equal 3 minutes in duration)

* **Transport data rate.** The "peak" elementary stream data rate shall be no less than 95% of transport rate. VBR or CBR encoding methods are acceptable.

Table 4: Output Files
Transport Streams To Be Supplied By Vendors

TS #	Video Format	Transport Stream Data Rate Mbps	Chroma	8/10 bit	GOP	Audio	Duration
1a	1080i/59.94	38 Mbps*	4:2:2 (Hi 422 @ L4)	10 bit	Vendor GOP Choice	4 ch. MPEG-2 (MPEG-1, Layer 2)	(1 minute content plus 30 sec. Vistek) x 2 = 3 Minutes
1b	1080i/59.94	38 Mbps*	4:2:2 (Hi 422 @ L4)	8 bit	Vendor GOP Choice	4 ch. MPEG-2 (MPEG-1, Layer 2)	(1 minute content plus 30 sec. Vistek) x 2 = 3 Minutes
2	1080i/59.94	38 Mbps*	4:2:0 (HiP@L4)	8 bit	Vendor GOP Choice	4 ch. MPEG-2 (MPEG-1, Layer 2)	(1 minute content plus 30 sec. Vistek) x 2 = 3 Minutes
3	1080i/59.94	38 Mbps*	4:2:2 (Hi 422 @ L4) (if not supported, vendor will supply TS at 4:2:0, 8 bit)	10 bit (if not supported vendor will supply TS at 8 bit)	Vendor GOP Choice	8 ch. PCM (SMPTE 302M 2002)	(1 minute content plus 30 sec. Vistek) x 2 = 3 Minutes
4	1080i/50	38 Mbps*	4:2:2 (Hi 422 @ L4) (if not supported, vendor will supply TS at 4:2:0, 8 bit)	10 bit (if not supported vendor will supply TS at 8 bit)	Vendor GOP Choice	4 ch. MPEG-2 (MPEG-1, Layer 2)	(1 minute content plus 30 sec. Vistek) x 2 = 3 Minutes
5	720p/59.94	38 Mbps*	4:2:2 (Hi 422 @ L4) (if not supported, vendor will supply TS at 4:2:0, 8 bit)	10 bit (if not supported vendor will supply TS at 8 bit)	Vendor GOP Choice	4 ch. MPEG-2 (MPEG-1, Layer 2)	(1 minute content plus 30 sec. Vistek) x 2 = 3 Minutes
6	720p/50	38 Mbps*	4:2:2 (Hi 422 @ L4) (if not supported, vendor will supply TS at 4:2:0, 8 bit)	10 bit (if not supported vendor will supply TS at 8 bit)	Vendor GOP Choice	4 ch. MPEG-2 (MPEG-1, Layer 2)	(1 minute content plus 30 sec. Vistek) x 2 = 3 Minutes

7	1080i/59.94	20 Mbps	4:2:2 (Hi 422 @ L4) (Only 422 otherwise duplicate of 11)	10 bit (if not supported vendor will supply TS at 8 bit)	Vendor GOP Choice	4 ch. MPEG-2 (MPEG-1, Layer 2)	(1 minute content plus 30 sec. Vistek) x 2 = 3 Minutes
8	1080i/59.94	20 Mbps	4:2:2 (Hi 422 @ L4) (if not supported, vendor will supply TS at 4:2:0, 8 bit)	10 bit (if not supported vendor will supply TS at 8 bit)	Vendor GOP Choice	Dolby E (20 bit mode - 8 channels) (SMPTE 302M 2002)	(1 minute content plus 30 sec. Vistek) x 2 = 3 Minutes
9	1080i/59.94	20 Mbps	4:2:2 (Hi 422 @ L4) (if not supported, vendor will supply TS at 4:2:0, 8 bit)	10 bit (if not supported vendor will supply TS at 8 bit)	Vendor GOP Choice	PCM (SMPTE 302M 2002)	(1 minute content plus 30 sec. Vistek) x 2 = 3 Minutes
10	1080i/59.94	20 Mbps	4:2:2 (Hi 422 @ L4) (if not supported, vendor will supply TS at 4:2:0, 8 bit)	10 bit (if not supported vendor will supply TS at 8 bit)	Vendor GOP Choice	AAC (MPEG2 AAC-LC 4CH @ 96Kb/Ch 48KHz sample rate)	(1 minute content plus 30 sec. Vistek) x 2 = 3 Minutes
11	1080i/59.94	20 Mbps	4:2:0 (HiP@L4)	8 bit	Vendor GOP Choice	4 ch. MPEG-2 (MPEG-1, Layer 2)	(1 minute content plus 30 sec. Vistek) x 2 = 3 Minutes
12	1080i/50	20 Mbps	4:2:2 (Hi 422 @ L4) (if not supported, vendor will supply TS at 4:2:0, 8 bit)	10 bit (if not supported vendor will supply TS at 8 bit)	Vendor GOP Choice	4 ch. MPEG-2 (MPEG-1, Layer 2)	(1 minute content plus 30 sec. Vistek) x 2 = 3 Minutes
13	720p/59.94	20 Mbps	4:2:2 (Hi 422 @ L4) (if not supported, vendor will supply TS at 4:2:0, 8 bit)	10 bit (if not supported vendor will supply TS at 8 bit)	Vendor GOP Choice	4 ch. MPEG-2 (MPEG-1, Layer 2)	(1 minute content plus 30 sec. Vistek) x 2 = 3 Minutes
14	720p/50	20 Mbps	4:2:2 (Hi 422 @ L4) (if not supported, vendor will supply TS at 4:2:0, 8 bit)	10 bit (if not supported vendor will supply TS at 8 bit)	Vendor GOP Choice	4 ch. MPEG-2 (MPEG-1, Layer 2)	(1 minute content plus 30 sec. Vistek) x 2 = 3 Minutes
15	1080i/59	10.3 Mbps	4:2:0 (HiP@L4)	8 bit	Vendor GOP Choice	4 ch. MPEG-2 (MPEG-1, Layer 2)	(1 minute content plus 30 sec. Vistek) x 2 = 3 Minutes

16	1080i/50	10.3 Mbps	4:2:0 (HiP@L4)	8 bit	Vendor GOP Choice	4 ch. MPEG-2 (MPEG-1, Layer 2)	(1 minute content plus 30 sec. Vistek) x 2 = 3 Minutes
17	720p/59.94	10.3 Mbps	4:2:0 (HiP@L4)	8 bit	Vendor GOP Choice	4 ch. MPEG-2 (MPEG-1, Layer 2)	(1 minute content plus 30 sec. Vistek) x 2 = 3 Minutes
18	720p/59.94	10.3 Mbps	4:2:0 (HiP@L4)	8 bit	Vendor GOP Choice	Dolby E (20 bit mode - 8 channels)(SMPTE 302M 2002)	(1 minute content plus 30 sec. Vistek) x 2 = 3 Minutes
19	720p/59.94	10.3 Mbps	4:2:0 (HiP@L4)	8 bit	Vendor GOP Choice	PCM (SMPTE 302M 2002)	(1 minute content plus 30 sec. Vistek) x 2 = 3 Minutes
20	720p/59.94	10.3 Mbps	4:2:0 (HiP@L4)	8 bit	Vendor GOP Choice	AAC (MPEG2 AAC-LC 4CH @ 96Kb/Ch 48KHz sample rate)	(1 minute content plus 30 sec. Vistek) x 2 = 3 Minutes
21	720p/50	10.3 Mbps	4:2:0 (HiP@L4)	8 bit	Vendor GOP Choice	4 ch. MPEG-2 (MPEG-1, Layer 2)	(1 minute content plus 30 sec. Vistek) x 2 = 3 Minutes
Ultra Low Latency Stream							
22	1080i/59.94	20 Mbps	4:2:0 (HiP@L4)	8 bit	Vendor GOP Choice IPPP / PPPP	4 ch. MPEG-2 (MPEG-1, Layer 2)	(1 minute content plus 30 sec. Vistek) x 2 = 3 Minutes

File Identification Template

Vendors shall identify all submitted transport files using the template in table 5.

The FTP Server address and passwords will be distributed via a separate cover letter. Uploaded files shall be given names that describe the content in a logical manner. If the stream has multiple choices based on vendor support, please identify the format supplied as in these examples;

Test stream #1 from Table 4 should be named dependant on the supplied format.
 “VendorName_TS1_422_10.ts” or “VendorName_TS1_420_8.ts”

Test stream #23 from Table 4, as it has no options, should be named as follows.
 “VendorName_TS23.ts”

Table 5: File Identification Template

Vendor Name	
Contact Person	
Telephone Number	
E-mail Address	
Vendor FTP file server address	(if applicable)
Encoder Model and Serial Number	
Encoder Firmware Version and Date Created	
Date of File Creation	
File Name (example: VendorName_TS#1_422_10.ts)	
File Number (this example would be 1; see table 4)	(1 to xx)
Transport Stream Data Rate	38, 20 or 10.3 Mbps
Video Stream Data Rate	X Mbps
Audio Stream Data Rate(s)	X Mbps, Y Mbps,.....
PAT PID	0x0000 (hexadecimal)
PMT PID	0x0100 (hexadecimal)
Video PID and PCR PID (must be same)	0x0200 (hexadecimal)
Audio PID(s)	0x1020, 0x1030,.... (hexadecimal)
Video operation mode	Variable bite rate VBR or constant bit rate CBR
Group of Pictures (GOP) Length	e.g. IBBP/GOPxx or other as chosen by vendor.
Carrier Identification Enabled	yes/no

Decoder/Encoder Information Sheet

Vendors shall identify the equipment to be used in the test program and its compliance with the test stream formats being used in the test program in table 6 .

Table 6: Vendor Information Template

DECODER/ENCODER INFORMATION SHEET

	Decoder	Encoder
Vendor Name		
Codec Model		
Codec Serial No.		
1080i/59.94 (Y/N)		
1080i/50 (Y/N)		
720p/59.94 (Y/N)		
720p/50 (Y/N)		
38 Mbps (Y/N)		
20 Mbps (Y/N)		
10.3 Mbps (Y/N)		
4:2:2 (Hi422@LA) 10 bit (Y/N)		
4:2:2 (Hi422@LA) 8 bit (Y/N)		
4:2:0 (HiP@L4) 8 bit (Y/N)		
GOP Capability Range i.e. 12-60 Frames (IBBP) Range i.e. 12-60 Frames (IPPP) Range i.e. 30-144 Frames (PPPP)		
Latency modes Standard (delay ms) Low (delay ms)		
4 Ch Audio MPEG-2 (MPEG, Layer 2) (Y/N)		
Dolby E 20 bit mode 8 Ch. (SMPTE 302M 2002) (Y/N)		
PCM (SMPTE 302M 2002) (Y/N)		
AAC 4 ch. @ 96 kilobits/Channel (Y/N)		
Carrier Identification Capability	n/a	

File Structure of the Telesat FTP Server

ftp://198.96.185.210/WBUIISOG_MPEG4_2011

Anonymous access is not allowed, a username password must be entered.

Enter the ftp command ftp://198.96.185.210/WBUIISOG_MPEG4_2011/ in the address window of your browser or ftp client.

Enter the vendor assigned user-name and password.

If using a web browser that does not prompt for password enter the username:password in the address window in the following format ftp://username:password@198.96.185.210/WBUIISOG_MPEG4_2011/

Write access is only possible in your assigned vendor directory.
Read access is available in all folders.

The server has the following folder and file structure:

WBUIISOG_MPEG4

Content	1080i/59.94 Single File RAR multipart files 1080i/50 720p/59.94 720p/50
Vendor 1	Vendor1_TS1_422_10.ts Vendor1_TS23.ts
Vendor 2	
Vendor 3	*
	*
Vendor 8	Vendor8_TS1_422_10.ts Vendor8_TS23.ts
WBU_Documents	File_Sharing_and_Test_Plan_MPEG4_Rev#-.doc

Issues with the FTP Server should be directed to ;

Jon Birchmore / Telesat

Test Procedures

1. Video Tests

- Uploaded ASI streams used for tests (onsite encoders used only if technical problems arise)
- Pass/fail result
- 3 minute long segment of TS sent to all vendor decoders simultaneously (not looped ASI as in previous years)
- Decoder stations have 24" HD 1920x1080 (60Hz/50Hz monitors)
- Pass/fail assessment done directly at decoder station
- If video present (pass) but impairment is visible, impairment reported and video patched for larger 24" display for closer scrutiny as required.

2. Audio Tests

- Uploaded ASI streams used for tests (onsite encoders used only if technical problems arise)
- Pass/fail
- ASI sent to all vendor decoders simultaneously
- Assessments done at central audio station or at decoder site
- Tests performed with one representative TS in each available audio encoded format (MPEG-2, AAC, PCM, Dolby E)

3. Latency Test

- Live test using on-site encoder
- Performed only at 1080i/59.94
- Tests at 38 Mbps (high quality) with standard latency setting and 10.3 Mbps (SNG quality) with low latency setting
- Tests at 20 Mbps (medium quality) with standard latency.
- Tests at 20 Mbps (medium quality) with ultra low latency.

4. Short Term Lip Sync

- Uploaded ASI streams used for tests (onsite encoders to be used only if technical problems arise)
- Maximum 5 minute duration using 30 second Vistek loop
- 5 minutes reduced if tests show no significant drift
- Tests at 1080i/50Hz MPEG 2 and 1080i/60Hz PCM, AAC, Dolby E with representative TS
- With time as problem, lip sync is done by Telesat following week without vendor support

5. Carrier Identification Compliance

- Uploaded ASI streams used for tests
- With time as problem, this test will be performed by Telesat in advance or the following week without vendor support.

Appendix 1 Carrier Identification



• ABU

ASIA-PACIFIC BROADCASTING UNION
- Kuala Lumpur, Malaysia

• ASBU

ARAB STATES BROADCASTING UNION
- Tunis, Tunisia

• AUB

AFRICAN UNION OF BROADCASTING
- Dakar, Senegal

• CBU

CARIBBEAN BROADCASTING UNION
- St. Michael, Barbados

• EBU

EUROPEAN BROADCASTING UNION
- Geneva, Switzerland

• IAB

INTERNATIONAL ASSOCIATION OF
BROADCASTING
- Montevideo, Uruguay

• NABA

NORTH AMERICAN
BROADCASTERS ASSOCIATION
- Toronto, Canada

• OTI

ORGANIZACION DE
TELECOMUNICACIONES
IBEROAMERICANAS
- Mexico City, Mexico

Re: Establishing Carrier ID's for worldwide uplinking by January 1st, 2011

Carrier ID Forum - Carrier ID Video Specification

Following on from the WBU-ISOG initiative of June 4th, 2008 a second and final specification has been drawn up for all individual Video Encoders and, eventually, Multiplexer systems

Washington, DC, November 18th 2009 – The Satellite Users Interference Reduction Group (SUIRG), through the Carrier ID Forum held at Intelsat HQ, successfully completed the specification for the Carrier ID format for all video transmissions, whether fixed or transportable.

Original Contributors:

Colem Communications	www.colem.co.uk
Link Research	www.linkres.co.uk
Sat Corporation (ISI)	www.sat.com
SiSLive	www.sislive.tv
SUIRG	www.suirg.org

Insertion of Carrier ID Information in the MPEG Stream:

The insertion of carrier ID information in the MPEG stream will assist in the rapid identification of satellite streams which will be of great assistance in troubleshooting satellite interference problems.

The Network information will always contain the manufacturers name and the unique unit serial number and encoders will have the option of having data automatically added into Network Information Tables to provide traceability. Additional information can be added in the MPEG Network Information Table (NIT) by the Uplinker, as requested by the Satellite operator.

WBU-ISOG has endorsed this final specification suggested by the original contributors and encourages broad industry adoption of this non-proprietary practice.

Common Parameter Specification...

1. All fields are fixed length;
2. Descriptor Tag 8 bits & Length 8 bits - Default shall = 196 decimal.
Codes available are from 192 to 254 decimal. Note, this is part the DVB specification for the construction of any service information table;
3. All bytes in descriptor are ASCII and in the range of the standard printable codes...
32 to 126 decimal
20 to 7E hex
4. **Comma ‘,’** shall be used as the field separator (No trailing Comma ‘,’ at end of descriptor);
5. Padding characters shall use **Underscore “_”** only;
6. Manufacturer/Serial number has been added to allow for future use of a global database;
7. ‘Carrier Identifier Format’ allows different formats of Identifier (essentially a version number for future proofing). Now defaults to ‘**02**’ as the final specification constitutes the second version of the format.

Special Considerations...

With reference to the NIT itself the DVB specification allows for this table to be retransmitted between **25ms and 10s** - Ref: ETSI TR101 290 Table Timing Intervals.

Note 1: From an engineering point-of-view it is considered that, “any type of monitoring equipment should be able to extract the NIT within the valid DVB timing range specified above”.

Note 2: In general this is usually sent at a rate of around 1 to 2 seconds.

Carrier Identifier Format Details...

Carrier Identifier Format	2 character string Numeric Only (Now ‘02’)
Comma Separator	1 character string
Encoder Manufacturer	5 character string (Name of Encoder Manufacturer e.g. VSL__)
Comma Separator	1 character string
Encoder Serial Number	12 character string (Electronic Serial Number of Encoder)
Comma Separator	1 character string
Carrier Identifier	5 character string (Name of Carrier Company)
Comma Separator	1 character string
Telephone Number	17 character string Numeric Only & the following “+”, “(” and “)” (Typically – Operator’s MCR/POC Number, etc)
Comma Separator	1 character string
Longitude	9 character string (‘+000.0000’ to ‘+/-180.0000’) Numeric Only & the following “+”, “-” and “.”
Comma Separator	1 character string
Latitude	8 character string (‘+00.0000’ to ‘+/-90.0000’) Numeric Only & the following “+”, “-” and “.”
Comma Separator	1 character string
User Information	15 character string (Service Information/Other User Field, etc)

Total Character Count = 80

(Maximum size for Carrier ID in the NIT excluding Descriptor Tag and Length field)

Typical example...

02,VSL___,0123456789___,SIS___,+44(0)1923474069___,+000.0000,+00.0000,USER_INFO_____

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Manufacturer & Operator Identifier Details...

From discussion, a common, registered database of Manufacturer and Operator IDs should be created and ratified by all participating Satellite Operators. This should be kept on the global Satellite Operator database to ensure validity of issued codes. This shall include Network Management System (NMS) or Monitoring & Control (M&C) suppliers.

The following table suggests suitable IDs for those Manufacturers and Operators already involved in the video ID initiative where equipment applicable...

MANUFACTURERS		OPERATORS	
Manufacturer	ID	Operator	ID
Vislink	VSL___	SiSLive	SIS___
Integral Systems Inc.	ISI___	British Sky Broadcasting	BSKYB
Holkirk	HOL___	Intelsat	INT___
Tandberg Television	LME___	SES World Skies	SES___
Colem Communications	CLM___	Eutelsat	EUT___