

# SignStream ATSC TS Specifications

## Minimum Encoding Requirements

<b>TS File Multiplex Rate</b>	19.392658 Mbps +/- 54 bps (ATSC)
<b>TS clip start/end</b>	The TS file should begin and end on whole TS packet boundaries. The file should begin with the TS sync byte (0x47) and contain an integer number of TSpackets.
<b>Minimum File Size</b>	16 MB (6.6 secs @ 19.392658 Mbps)
<b>Video Format</b>	One of 18 ATSC Formats (per ATSC A/53b)
<b>Audio Encoding</b>	AC-3 (per ATSC A52)
<b>PSI / PSIP</b>	MPEG-2 PSI (PAT and PMT) must be present in the multiplex. A static set of ATSC PSIP tables should be present in the stream for some consumer decoders that rely on PSIP information to acquire and tune to the channel.  PID assignments in PAT, PMT, and TVCT service location descriptors should be consistent file to file. TVCT should contain at least one valid virtual channel definition.

## Virtually Seamless Playlist Encoding Restrictions

The purpose of seamless mode restrictions is to create splice points at the beginning and end of each file that adhere to the SMPTE-312M defined "seamless splice point" requirements. These specifications are in addition to the requirements above.

<b>Lead in/out black frames</b>	No restriction
<b>Fade-in/out</b>	No restriction
<b>Video Format</b>	1080i, all files in a playlist. The encoded video format must be consistent across all files to be spliced in a playlist.
<b>Programs</b>	1 Program containing 1 Video and 1 Audio service
<b>Program PID assignments</b>	PMT PID: 16 (0x010) PCR PID 17 (0x011) Video PID: 17 (0x011) Audio PID: 20 (0x014)
<b>TS clip start</b>	The first GOP in the file MUST be CLOSED
<b>TS clip end</b>	The file should not be padded with additional null packets.
<b>VBV Encoding Method</b>	The VBV_delay at the beginning and end of every file must be the same to ensure that the video buffer does not underflow or overflow at the splice point.  This concept is identical to the SMPTE-312M restrictions on "splice_delay". This requirement can be achieved by using a constant VBV_delay throughout all files, or by using an encoding algorithm that forces VBV_Delay to a consistent value at the beginning and end of all files.  VBV_delay can be examined as the delay between the access unit arrival (in PCR time) and the actual stamped decoding time per DTS/PTS.

## PSI / PSIP Information

### PSI / PSIP Tables

Placeholders for minimal set of ATSC PSIP/PSI tables must be present. PSIP/PSI should be multiplexed at the PID location and repetition intervals given below:

PAT PID: 0 (0x00), 100ms  
PMT PID: 16 (0x10), 400ms  
MGT PID: 8187 (0x1FFB), 150ms  
TVCT PID: 8187 (0x1FFB), 400ms  
STT PID: 8187 (0x1FFB), 1000ms  
RTT PID: 8187 (0x1FFB), 60s  
EIT-0 PID: 8144 (0x1FD0), 500ms  
EIT-1 PID: 8145 (0x1FD1), 500ms  
EIT-2 PID: 8146 (0x1FD2), 500ms  
EIT-3 PID: 8147 (0x1FD3), 500ms

Note: The PSIP and PSI sections will be replaced by the seamless process in the SignStream Server modulator card to ensure consistency of the broadcast stream from file to file. Because of this, the actual contents of each table are not important (other than the PAT and PMT).

