VDIF EDV 0x02

The Atacama Large Millimeter/submillimeter Array (ALMA) will support VLBI through the addition of so-called Phasing Interface Cards (PICs) inserted into the baseline (BL) observatory correlator to produce packets of data. There are 4 correlator "quadrants" for 4 frequency bands, and each has two PIC cards (one per polarization) for a total of 8 PICs in normal operations. This extended data version is registered to document the data stream the PICs will produce.

In addition to an operational use in the ALMA PICs, this version of VDIF is used by some test software available for use with the Mark6 Recorders. It may also be useful for other applications. The VDIF header is shown on the following page. Some specific details:

1. **Word 4, byte 3:** the EDV number, 0x02.
2. **Word 4, bytes 0 through 2:** A "magic/sync" identifier that in effect identifies 2^{24} "subversions".
   1. For the ALMA PICs, the value will be 0xA5AE5X where the least significant nibble is constructed as follows:
      1. **bit 0:** 0 = X-pol PIC, 1 = Y-pol PIC
      2. **bits 1 and 2:** ALMA BL quadrant number minus 1 (i.e. the quadrants are named 1 through 4, so these bits will contain 0 through 3).
      3. **bit 3:** 1 = BL Correlator 0 = 2-ant correlator
   2. For Mark6 testing, the format is not finalized. However, it currently encodes the nominal packet rate and information about test marks made in the data stream.
   3. For use in other applications, 0x000000 through 0x7FFFFF are available.
3. **Word 5:**
   1. **ALMA:** A PIC status word (details TBD).
   2. **Mark6:** Location of data marks (TBD).
4. **Word 6:** Least significant word of the VDIF Transport Protocol (VTP) packet serial number PSN which precedes the packet. The PSN is replicated here so that when the VTP is stripped-off for storage in files of VDIF packets, detailed sequence checking can be performed.
5. **Word 7:** Most significant word of the VTP PSN.

	Byte 3				Byte 2				Byte 1				Byte 0			
	31			24	23			16	15			8	7			0
PSN	[Packet Serial Number LSW]															
	[Packet Serial Number MSW]															
Word 0	0/1	0	Seconds from Reference Epoch													
Word 1	0	0	Reference Epoch		Data Frame # within second											
Word 2	0	0	0	n_chan_log2		Data Frame Length (octets: 629 or 1004)										
Word 3	0	0	0	0	0	1	Thread ID				Station ID					
Word 4	[EDV = 0x02]				[Magic/Sync Word 0xA5EA5X]											
Word 5	[PIC Status Word]															
Word 6	[Packet Serial Number LSW]															
Word 7	[Packet Serial Number MSW]															
Octet 0	c15	c14	c13	c12	c11	c10	c09	c08	c07	c06	c05	c04	c03	c02	c01	c00
	c31	c30	c29	c28	c27	c26	c25	c24	c23	c22	c21	c20	c19	c18	c17	c16
	Octets 1 through N–2															
Octet N–1	c15	c14	c13	c12	c11	c10	c09	c08	c07	c06	c05	c04	c03	c02	c01	c00
	c31	c30	c29	c28	c27	c26	c25	c24	c23	c22	c21	c20	c19	c18	c17	c16
Octet for 16ch	c15	c14	c13	c12	c11	c10	c09	c08	c07	c06	c05	c04	c03	c02	c01	c00
	c15	c14	c13	c12	c11	c10	c09	c08	c07	c06	c05	c04	c03	c02	c01	c00
Octet for 8ch	c07	c06	c05	c04	c03	c02	c01	c00	c07	c06	c05	c04	c03	c02	c01	c00
	c07	c06	c05	c04	c03	c02	c01	c00	c07	c06	c05	c04	c03	c02	c01	c00