



#### i. DIGITAL FIBRE OPTIC STREAMER

The 480 Channel Digital Fibre Optic streamer consists of four major in water elements, Live Sections, Program Plugs, Streamer Electronic Modules (SEM) and Repeater Modules. The M/V Magnificent Creek's streamer is configured for 300 traces comprising 25 separate "clusters", each handling a group of twelve traces.

The three major components making up each "cluster" are a SEM positioned between a Live I and a Live II, with each Live section containing 12 separate 6.25 metre groups. Each group, or trace, contains 16 acceleration-cancelling "dish" type hydrophones. The Program Plug, positioned midway along every Live section, has a twofold function. Firstly it determines whether the Live section is a Live I or a Live II, dependent on which of the two types of plug is installed in the section. Secondly it determines the trace "mix" (1:1, 3:1 or 5:1) of the particular cluster. In the case of a 1:1 plug being installed, the live section acts both as a Live 1 and Live 2. The data from the near six traces being associated with the SEM ahead of the section and the data from the six far traces being associated with the SEM immediately aft.

Signal processing in the streamer is performed by the SEMs. Each SEM receives six groups of analog data from the Live section in front of it (Live I) and six groups of analog data from the Live section behind it (Live II) to form a 12 group configuration. Signal processing consists of preamplification, filtering, multiplexing, gain ranging and analog to digital conversion. The analog data is always sampled by the SEM at a 1 millisecond sample rate and preamplified with a low noise charge amplifier. Each channel may be filtered with a choice of low-cut filters and then applied to a fixed 256 Hz, 72 dB/octave high-cut filter. It is then multiplexed, gain adjusted with a quaternary, instantaneous floating point amplifier and converted to digital form by a 14-bit plus sign, successive approximation, A/D converter. The digital data is added to the incoming data stream, from the previous SEM(s), for transmission by one of two optical fibres to the next SEM. Each optical fibre is capable of handling 252 seismic channels at 1 millisecond sample rate. Besides seismic data, four channels of SEM auxiliary data containing depth, test oscillator and DC offset information (one channel is grounded to provide further crossfeed isolation for the DC offset channel) are digitized and added to the data stream.

Configuration and control of the SEMs is provided by the streamer control system via the command bus. Power for the streamer is provided by the streamer power system via the power bus.