This Lab consists of coding an input signal using a PCM Voice Encoder and decoding the 8-bit signal with a PCM Voice Decoder. Both Encoder and Decoder use the \( \mu \) law.

A. SET UP

Get the SPW Blocks (right hand side) and under Demo Systems, obtain the G721 32KAdpcm system. Save that, and copy blocks from it to generate the block diagram shown in Figure 1. Now you have the \( \mu \)-Law Encoder and Decoder.

Push back the Encoder and Decoder blocks and ensure that you have \( \mu \)-Law as the law. Push next the Signal Sink and Comment ‘Synthesised speech using \( \mu \)-Law pcm Decoder’ and push next the Vector Signal Sink and Comment ‘8-bit \( \mu \)-Law quantized speech’. Get ‘mary’ as the Signal Source.

B. SIMULATIONS:

Simulate the system for 100 iterations. Note results with SDE. Note the immediate response (no delay- as with adaptive filtering).

C. ANALYSIS:

Relate values of ‘mary’, (Signal Source) the 8-bit representation (Vector Signal Sink) and the Decoder amplitude (Signal Sink). The format for the 8-bit code word \( Y \) is follows: \( Y = \text{PSSSQQQQ} \), where:
P = Polarity bit
SSS = 3-bit segment number
QQQQ = 4-bit quantization number

Note also that the code words are inverted (before transmission). What’s the reason for this?

C. HAND-IN

1. Output from SDE
2. Confirmation of all three signal values, as per µ-Law Law.