The DSBSC is redundant.

Consider the concept of SSBSC where we start with a DSBSC signal.
where \( S_{DSB}(t) \) = \( S\cdot DSB(t) \)**hLPF(-k)** where hLPF(t) = hL5(t) wherein hL5(t) = 0 when t < 0.5, hL5(t) = \( \frac{1 - 2 \cdot \sin(\pi \cdot t \cdot f_s)}{\pi \cdot t \cdot f_s} \) when 0.5 < t < 1, and hL5(t) = 0 when t > 1.
Generate a SSB modulated signal using an intermediate frequency given \( m(t) \) s.t. \( M(f) = \frac{1}{2} s.s. B(0) \)
An intermediate signal is generated as
\[ s_i(t) = \cos(2\pi f_i t) \] where \( f_i > B \)

The first step is
\[ S_{ssB}(\omega) = (m(t) \cos 2\pi f_i t) * h_{LS}(\omega) \]
We would like to freeze SSB to 

\[ f_2 + f_c \approx f_c \text{ for } f_2 \approx f_c \text{ in the intermediate SSB} \]

\[ \Sigma(t) = \left( S_{SB}(t) \cos 2\pi t f_c \right) \star h_{L32}(t) \]

\[ \frac{\Sigma(t)}{\Sigma} \stackrel{z}{\approx} \frac{S(t - f_c)}{S(t)} \]

We located at \( f_c \)}
NOTE: In practice an additional offset is implemented such that...
Demodulate SSB using IF

\[ S_{SSB}(f) \]

Let the lower side \( f_{LO} < f_c \)

\[ S_{SSB}(t) \xrightarrow{\times} H_{LP}(f) \]

\[ H_{LP}(f) \]

Let \( f_I = f_c - f_{LO} \)

\[ f_{LO} = f_c - f_I \]