1) Sampler + bandpass filter gets you close.
   The time shift plays a role in achieving the inverted spectrum
   but it requires some finesse.

2) Yes. The center of mass is $\int x \, f(x) \, dx$ which relates
   nicely to $F(s)$.

3) It would be best to agree and disagree with Dr. T.
   Dr. T. is partially correct but additional constraints on
   $s_o$ and $F(s_o)$ are needed to avoid potential ambiguities
   in determining the center of mass.