André Punt's Guide to Parameter Phasing in Stock Synthesis

General:
- Get the scale of the population right first. First estimate the parameter that determines scale in an SS model (R_0 - expected recruitment in an unfished state) then refine the model fit by adding parameters.
- The parameters are added at each phase so, for example, the parameters that are estimated in phase 3 are those estimated in phase 2 **PLUS** those designated as to be estimated in phase 3.
- The phasing sequence **should** not matter but (a) good phasing can speed things up, (b) bad phasing can lead to the estimation being trapped in a local minimum, and (c) jittering™ can help to assess how reliable the final estimates are.
- The schema below is based on seven phases but sometimes I will "skip a phase", e.g. place the other "annual deviations" in phase 8 rather than phase 7 (And estimate no "new" parameters in phase 7) to allow the estimation method to better characterize the parameters estimated in phases 1-6.

Andre's preferred order:
1. Start with an "Age-structured Production Model", estimating R_0 and catchability, q.
2. Add recruitment deviations (as these can pick up signals from the age and length data on cohort size) (at this point your model is analogous to JABBA)
3. Now estimate the base selectivity [and retention] parameters (enabling this to be refined)
4. Now estimate growth
5. Now estimate natural mortality, M (if feeling brave!)
6. Now estimate steepness, h (h may hit an unrealistic bound, i.e., 0.2 or 1 - if the data are in conflict so be wary)
7. Now estimate the other annual deviations (e.g., annual deviations on kappa or age-year deviations on selectivity).
8. Finally environmental linkages, e.g., between recruitment and an environmental variable such as temperature.