Seeker

- Initialization
  - Read .sserc and Configuration Files
  - Expected Components
    - *Start up and configure Channelizers*
    - *Start up and configure DXs*
    - Start up and configureTelescope/Beamformer Interface
    - Startup and configure Archiver
  - Read Parameter File (*Add new parms for channelizer and DX*)
- Send Start Strategy to Scheduler
- Receive Stop Command
  - Terminate observing, shutdown the system

Scheduler – Primary Observer

- Calibration
  - Select Calibration Sources
  - Run Delay, Phase, and Frequency Calibration Activities
- Start Observing Pipeline
  - Select Primary Field of View and 2-3 beam targets
    - Lookup Observing History in Database
    - Apply target selection criterea
    - Select unobserved Frequencies
  - Create and start new Activity with Parameters
  - *Assign Beamformer and Polarization to Channelizers*
  - *Assign channel numbers to DXs*
  - Create and Start a new Activity when Data Collection completes or the Activity completes (max 2 activities)

Activity(1)

- Send Parameters to System Components
  - Send Beams pointings and Frequencies to Telescope and Beamformer
  - *Send Parameters to Channelizer*
  - *Assign Frequencies and channel numbers for each DX*
  - Create ActivityUnits and Send DX Parameters
- Set and send DX start time when all components are ready

Activity (2)

- Wait for Completion of Primary Detection
- Notify ActivityUnits to start Secondary Detection
- Wait for Completion of Secondary Detection
- Notify ActivityUnits to resolve candidates
- Wait for Signal Detection done and statistics from all ActivityUnits
- Report finding confirmed Candidates to Scheduler

ActivityUnit(1)

- Receive and forward Parameters To DX via DxProxy
- Create Recent RFI Mask for assigned Target and Frequency, send to DX
- Receive and forward Start Time to DX
- Receive and store Science Data (Baselines and Complex Amplitudes) from DX in temporary directory and permanent archive
- Receive CW and Pulse Candidates from DX, store in database and record in permanent archive
- Receive CW and Pulse Signals from DX, store in database and record in permanent archive

ActivityUnit(2)

- Lookup secondary candidates from other beams in the database and send to DX
- Receive and reclassify Secondary Confirmation Candidates from DX
- Update Database and permanent archive
- Lookup primary candidates resolution by other beams
- Update Database and permanent archive
- *Request archiving from DX for Candidates*
- Report Candidates statistics to Activity

Channelizer

- *Receive Parameters from SSE*
- Receive and verify Packets from Beamformer
- Data Buffering
- Data conversion to Floating Point
- N-Folding Least Squares DFB (nominal 10)
- 256-point FFT
- Distribution to Channel Buffers
- Conversion to fixed point, Packet Assembly, and transmission via multicast
- *Report periodic multicast Status and statistics*

DX(1)

- *Receive Parameters, channel number from SSE*
- Receive start time from SSE
- Receive channel packets for both polarizations
- Start Baselining at Start time
- Synchronize packet stream
- Start Data Collection
- Subchannelize by half frame (400 Khz to 1 Khz)
  - Convert to Floating Point
  - N-Folding Least Squares DFB (nominal 10)
  - 1024-point FFT
  - Corner Turn into subchannel half frame buffers

DX(2)

- Spectrometry
  - Compute and apply new baseline
  - Compute and buffer CD data (1KHz, 4 bit real & imag)
  - Compute spectra for all Resolutions (1 – 128 Hz, *256-512 Hz*)
  - Threshold Pulse Data for all Resolutions (bin, spectrum, power, polarization)
  - Compute DADD Data for one CW Resolution (2 bit power), selectable Hanning Windowing
- Signal Detection
  - CW Power Detection (DADD), Pulse Triplets, *Singlets*
  - Clustering, RFI Mitigation, and Reporting
  - Coherent CW Detection and Reporting
  - Secondary Candidate CW (Coherent) and Pulse Detection and Reporting
  - *Archiving Candidates*