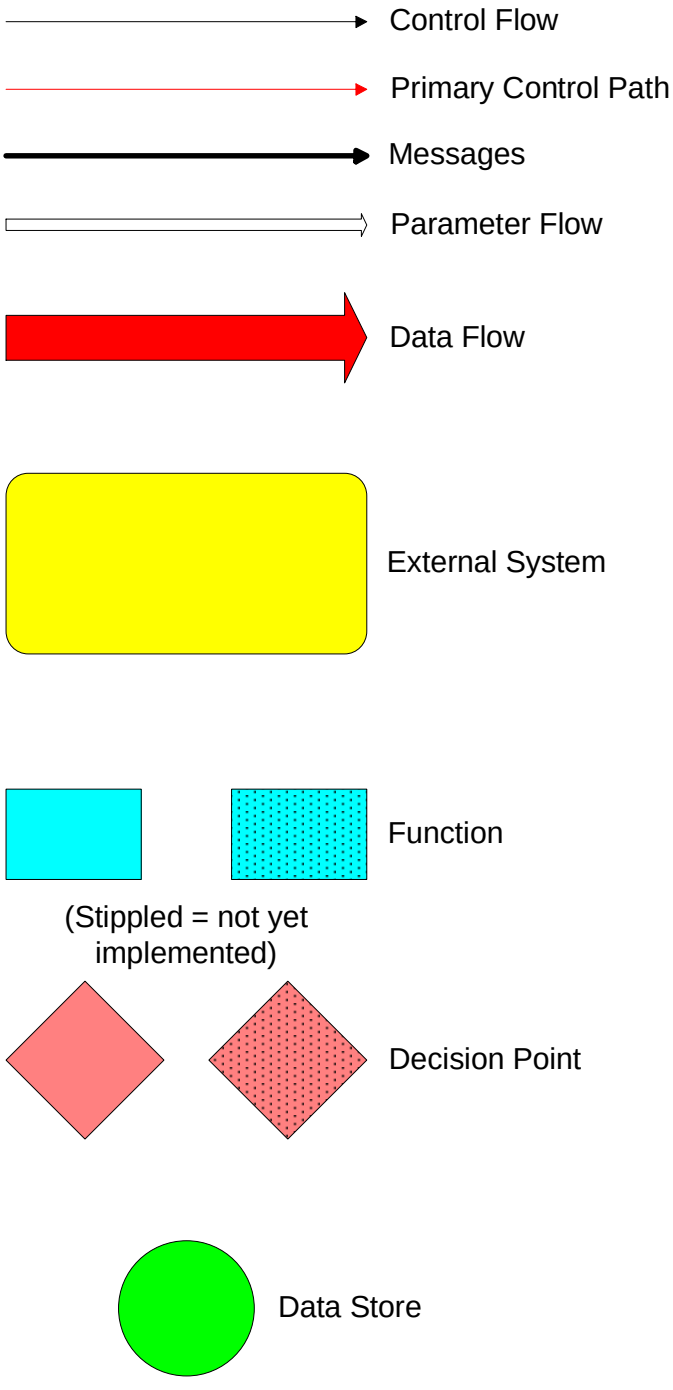
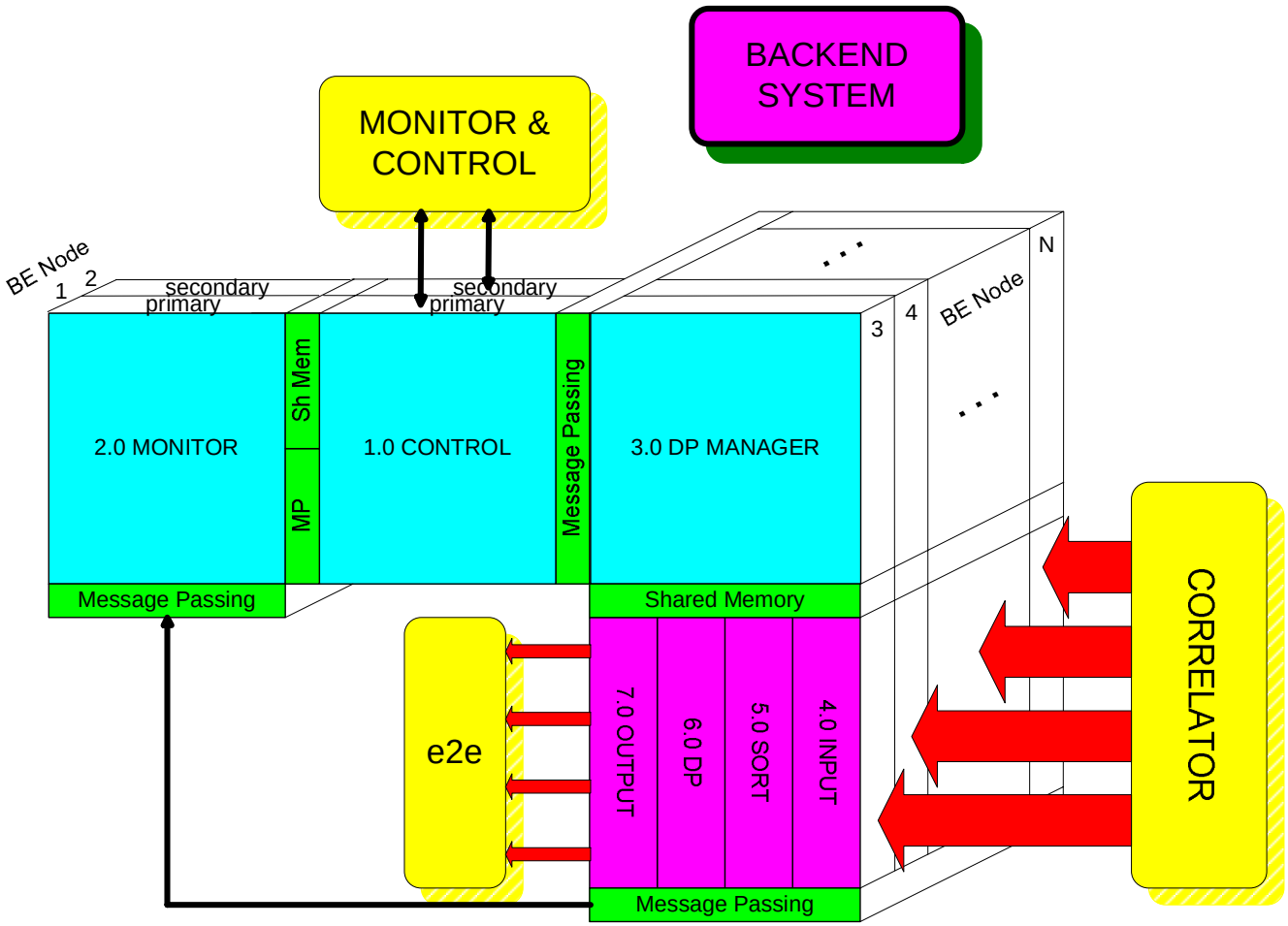
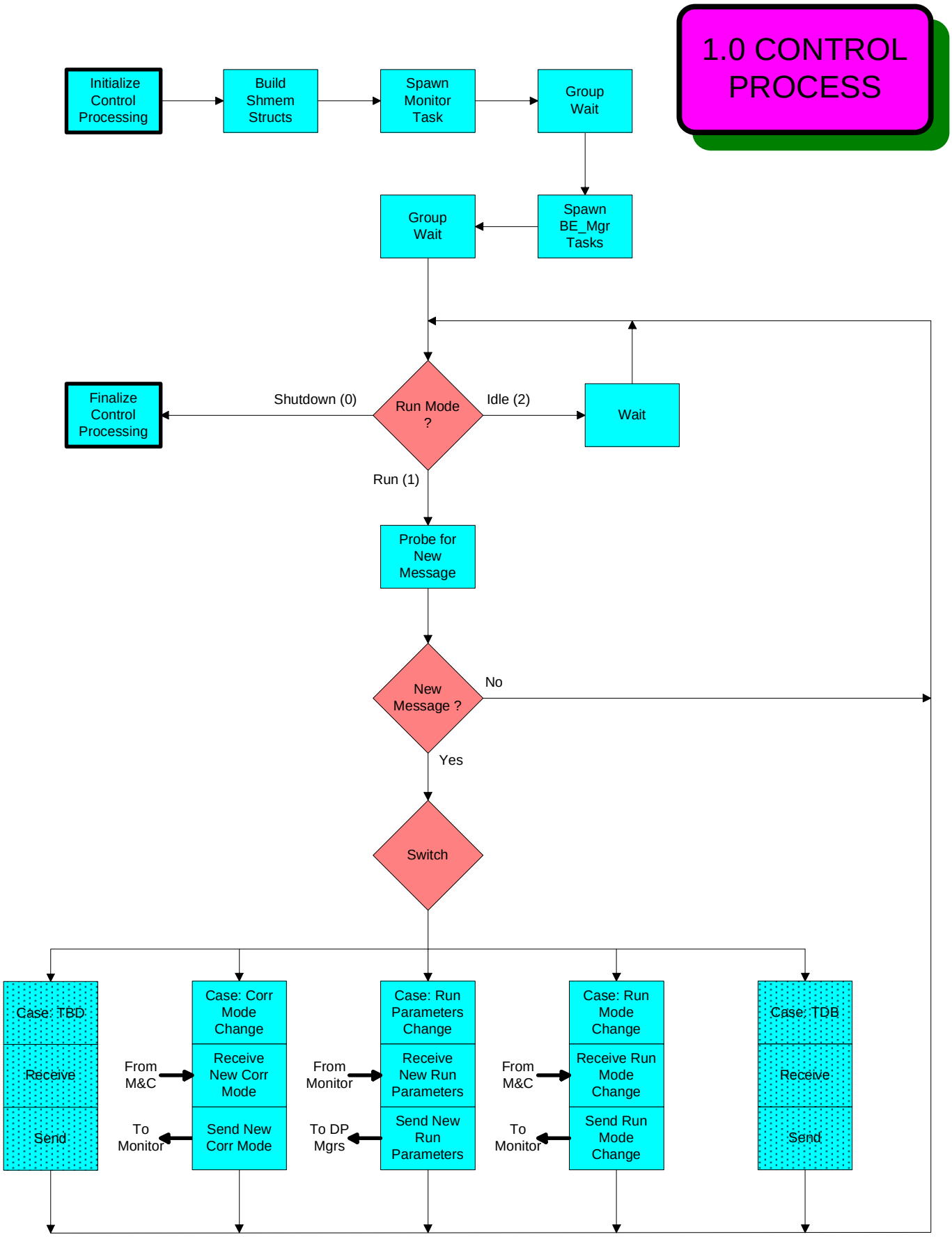
BACKEND SYSTEM LOW LEVEL FUNCTIONAL DESIGN

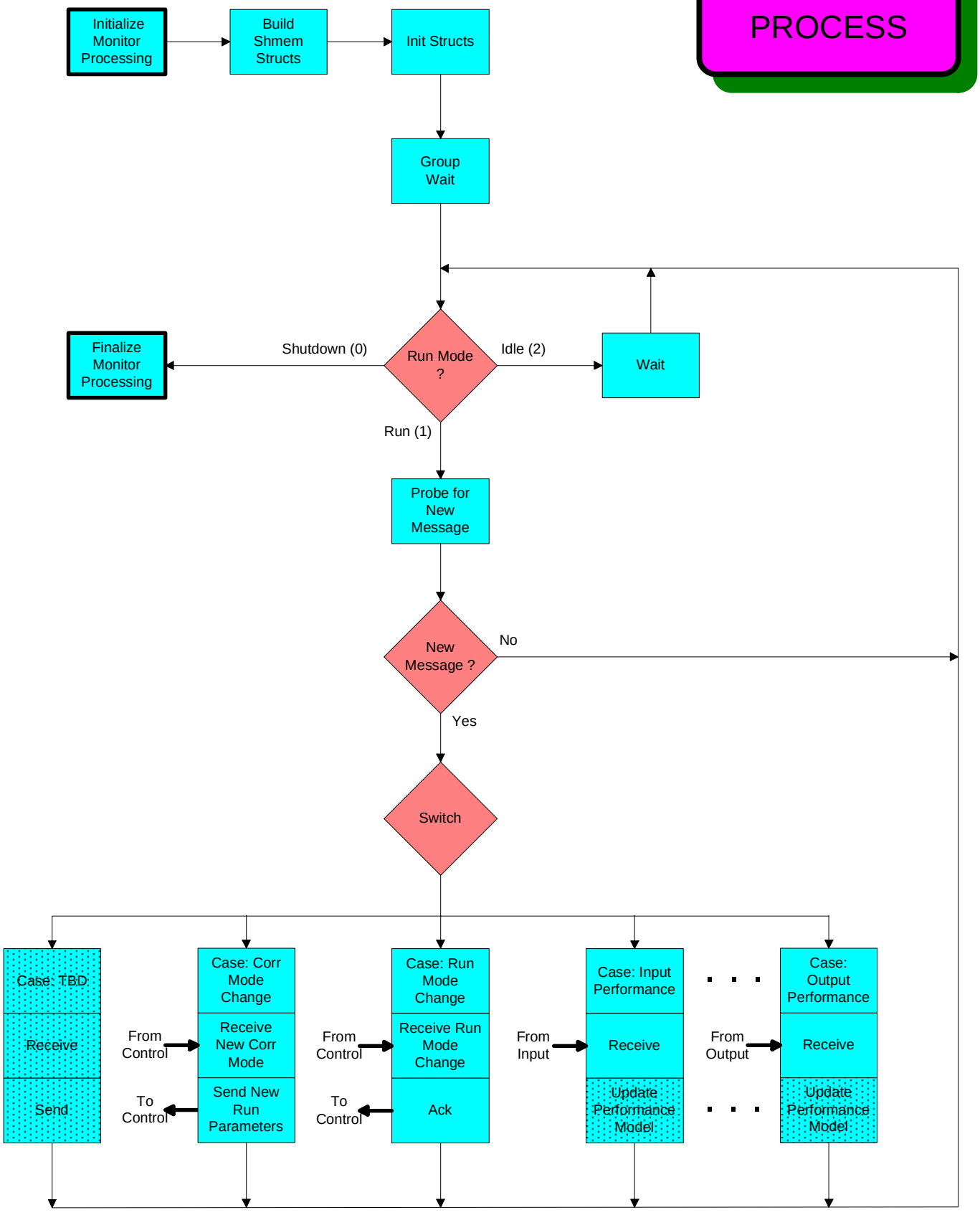
KEY:

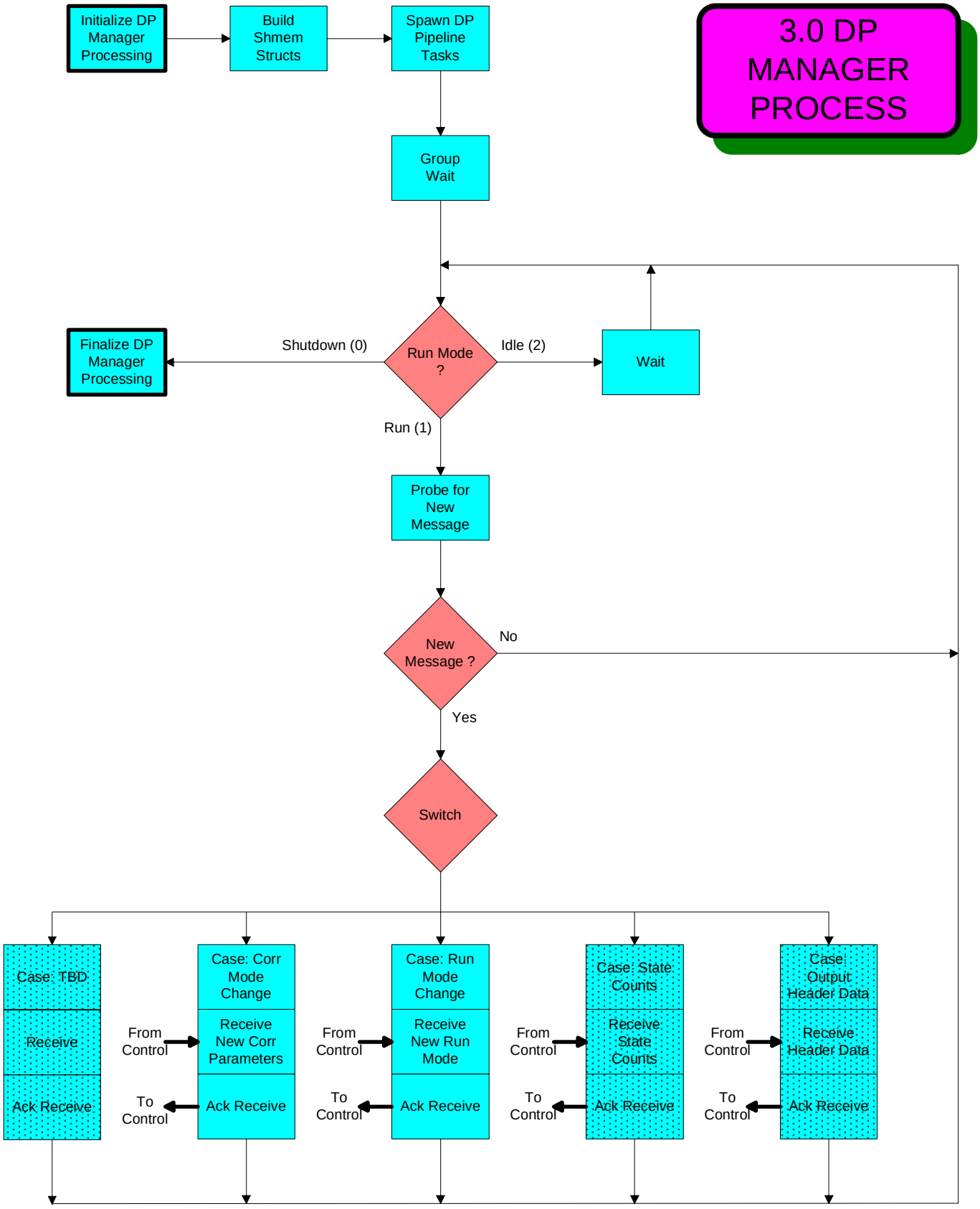


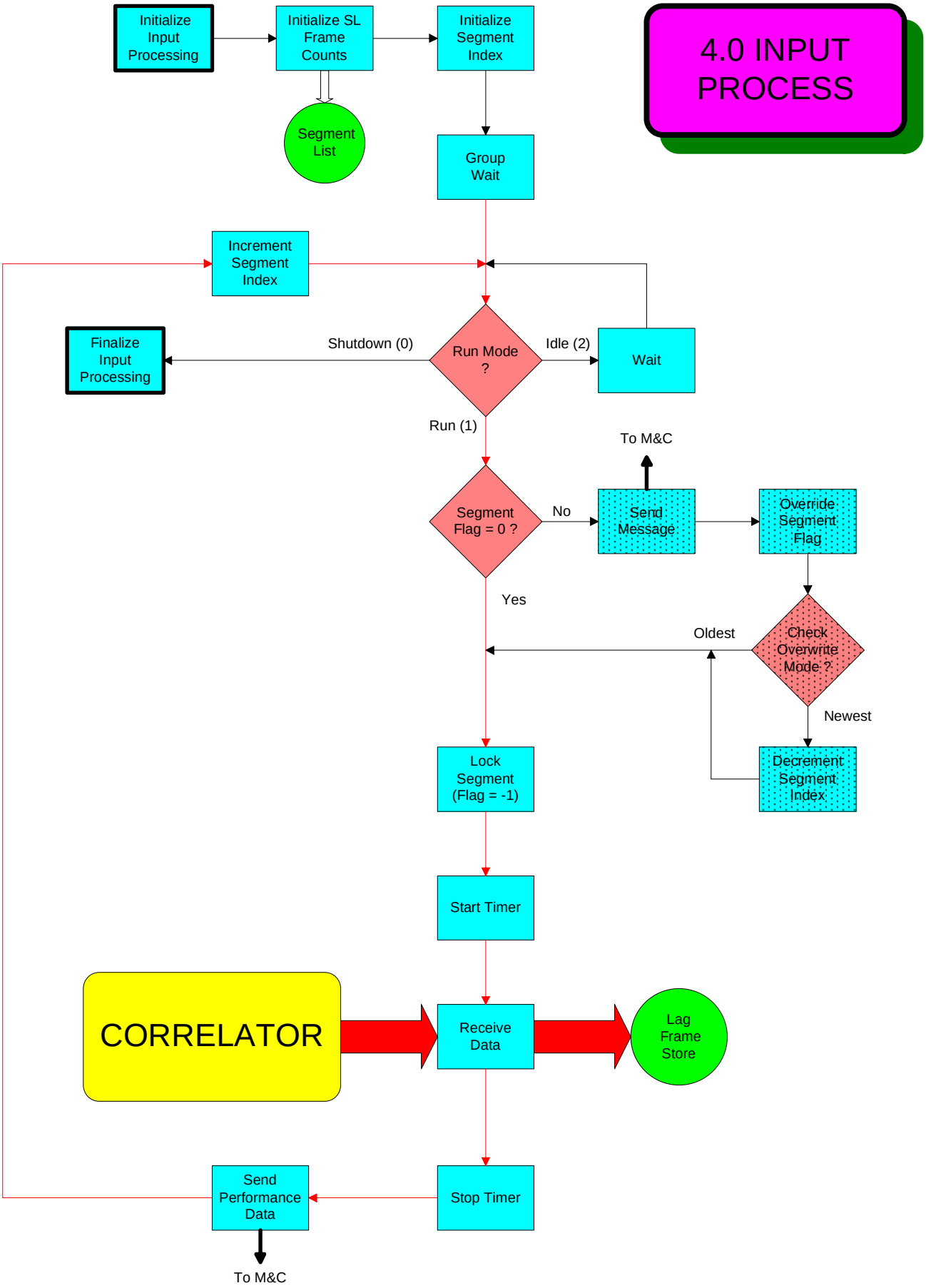

BACKEND SYSTEM
MONITOR & CONTROL
BE Node
1
2
secondary
primary
secondary
primary
3
4
BE Node
N
2.0 MONITOR
Sh Mem
MP
1.0 CONTROL
Message Passing
3.0 DP MANAGER
Message Passing
Shared Memory
e2e
7.0 OUTPUT
6.0 DP
5.0 SORT
4.0 INPUT
Message Passing
CORRELATOR

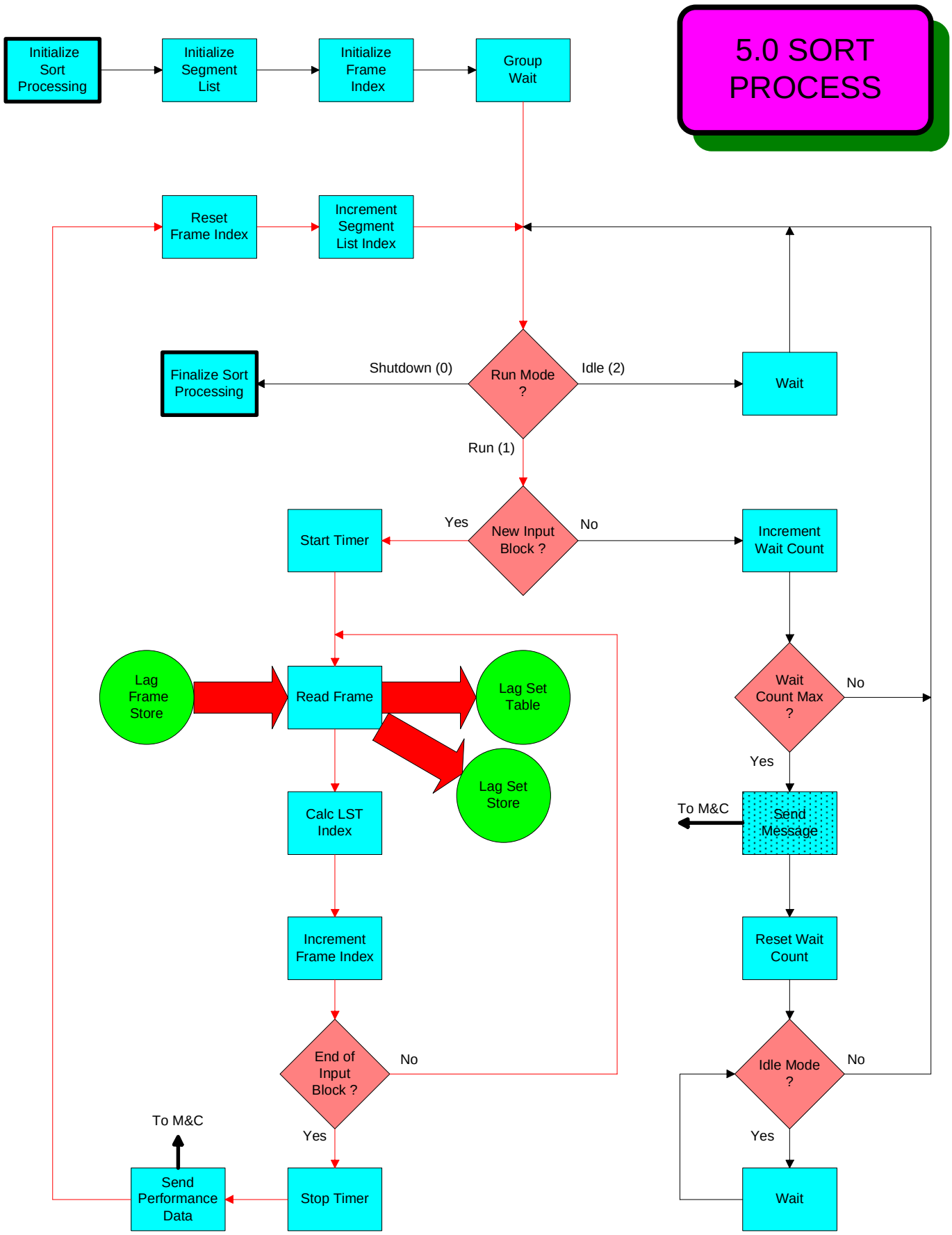

1.0 CONTROL PROCESS
Initialize Control Processing
Build Shmem Structs
Spawn Monitor Task
Group Wait
Spawn BE_Mgr Tasks
Group Wait
Finalize Control Processing
Shutdown (0)
Run Mode ?
Idle (2)
Wait
Run (1)
Probe for New Message
New Message ?
No
Yes
Switch
Case: TBD
Receive
Send
Case: Corr Mode Change
From M&C
Receive New Corr Mode
To Monitor
Send New Corr Mode
Case: Run Parameters Change
From Monitor
Receive New Run Parameters
To DP Mgrs
Send New Run Parameters
Case: Run Mode Change
From M&C
Receive Run Mode Change
To Monitor
Send Run Mode Change
Case: TDB
Receive
Send

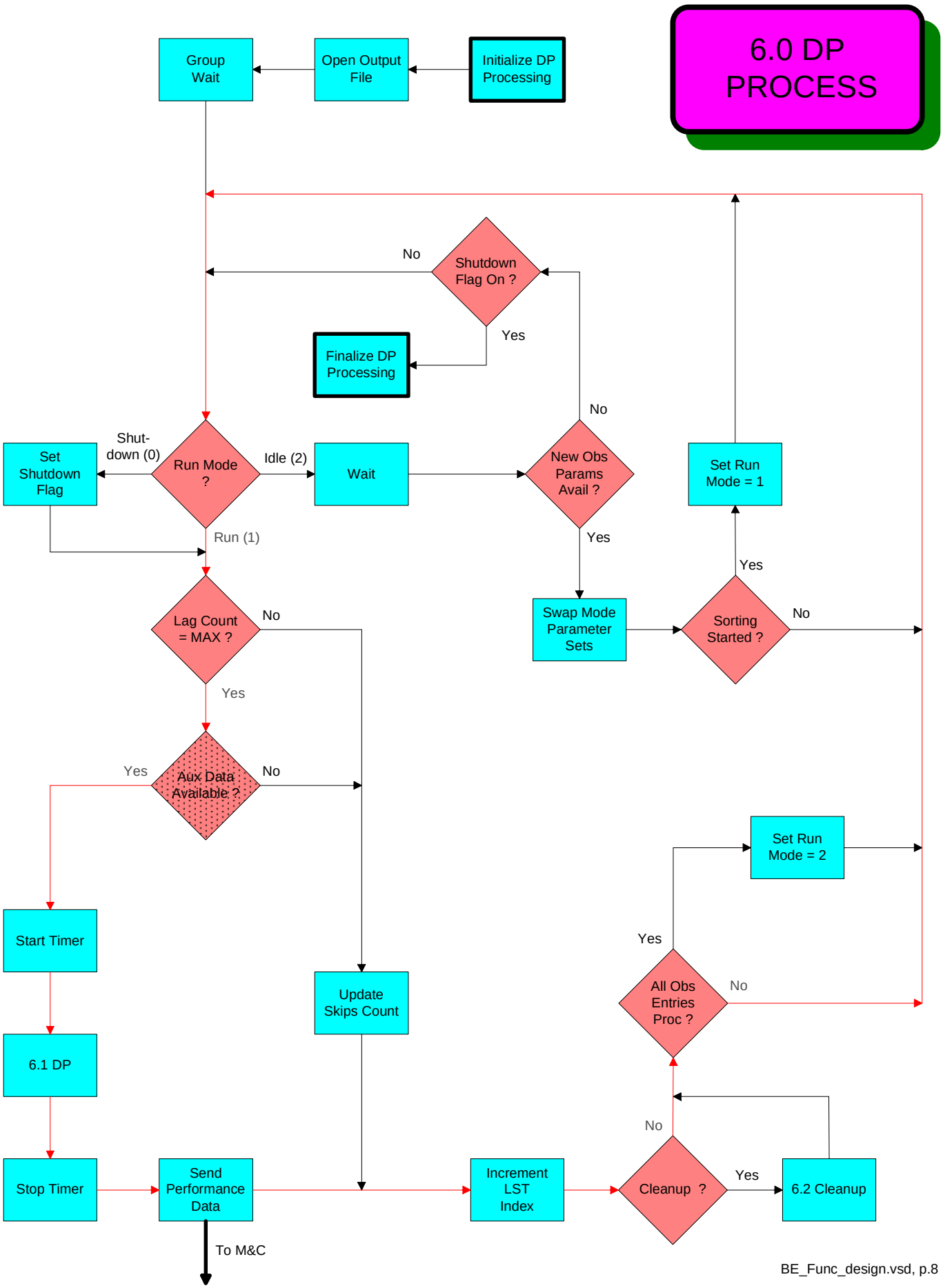
2.0 MONITOR PROCESS

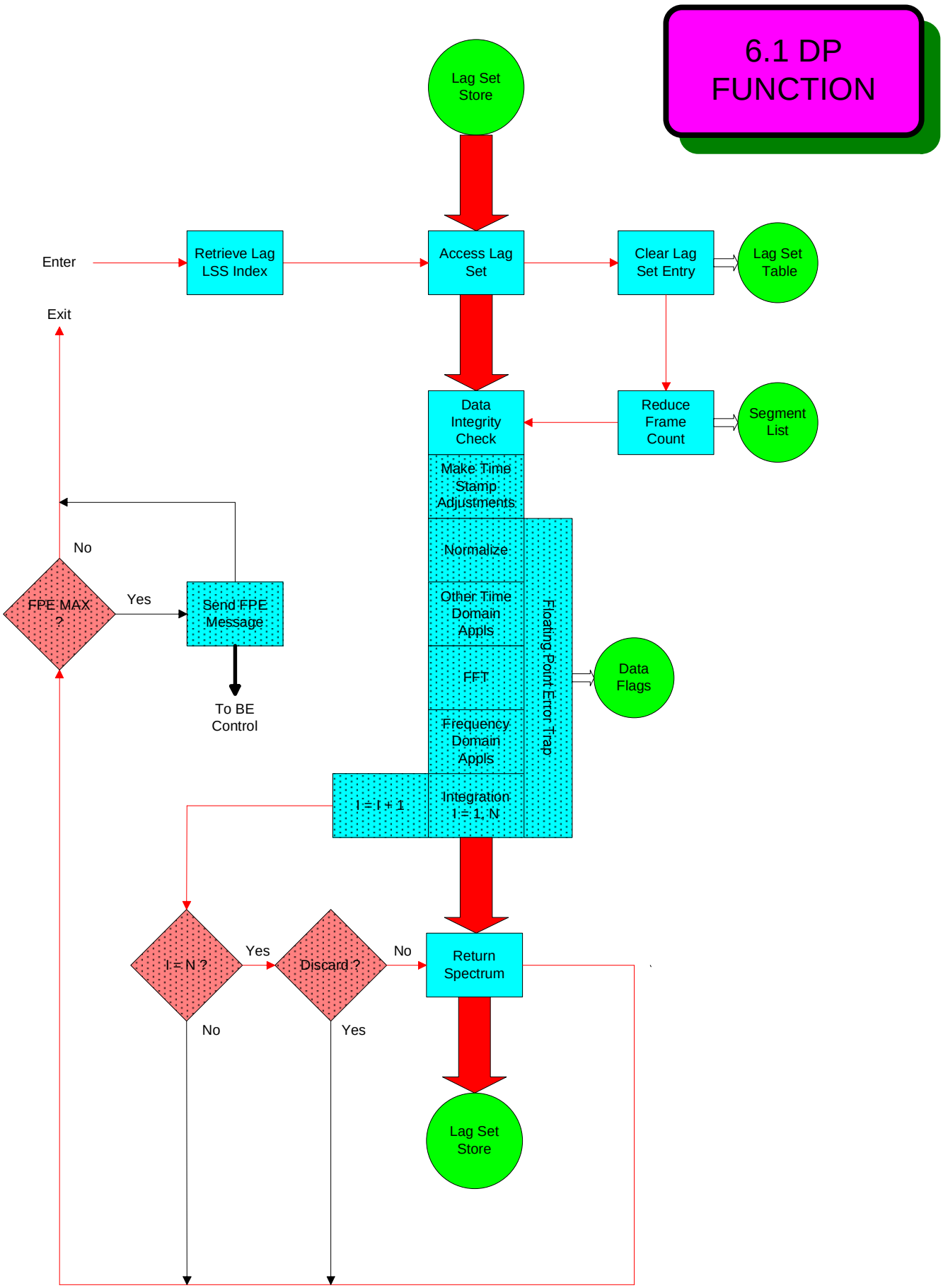



3.0 DP MANAGER PROCESS
Initialize DP Manager Processing
Build Shmem Structs
Spawn DP Pipeline Tasks
Group Wait
Run Mode ?
Shutdown (0)
Idle (2)
Finalize DP Manager Processing
Wait
Run (1)
Probe for New Message
New Message ?
No
Yes
Switch
Case: TBD
Receive
Ack Receive
Case: Corr Mode Change
From Control
Receive New Corr Parameters
To Control
Ack Receive
Case: Run Mode Change
From Control
Receive New Run Mode
To Control
Ack Receive
Case: State Counts
From Control
Receive State Counts
To Control
Ack Receive
Case: Output Header Data
From Control
Receive Header Data
To Control
Ack Receive

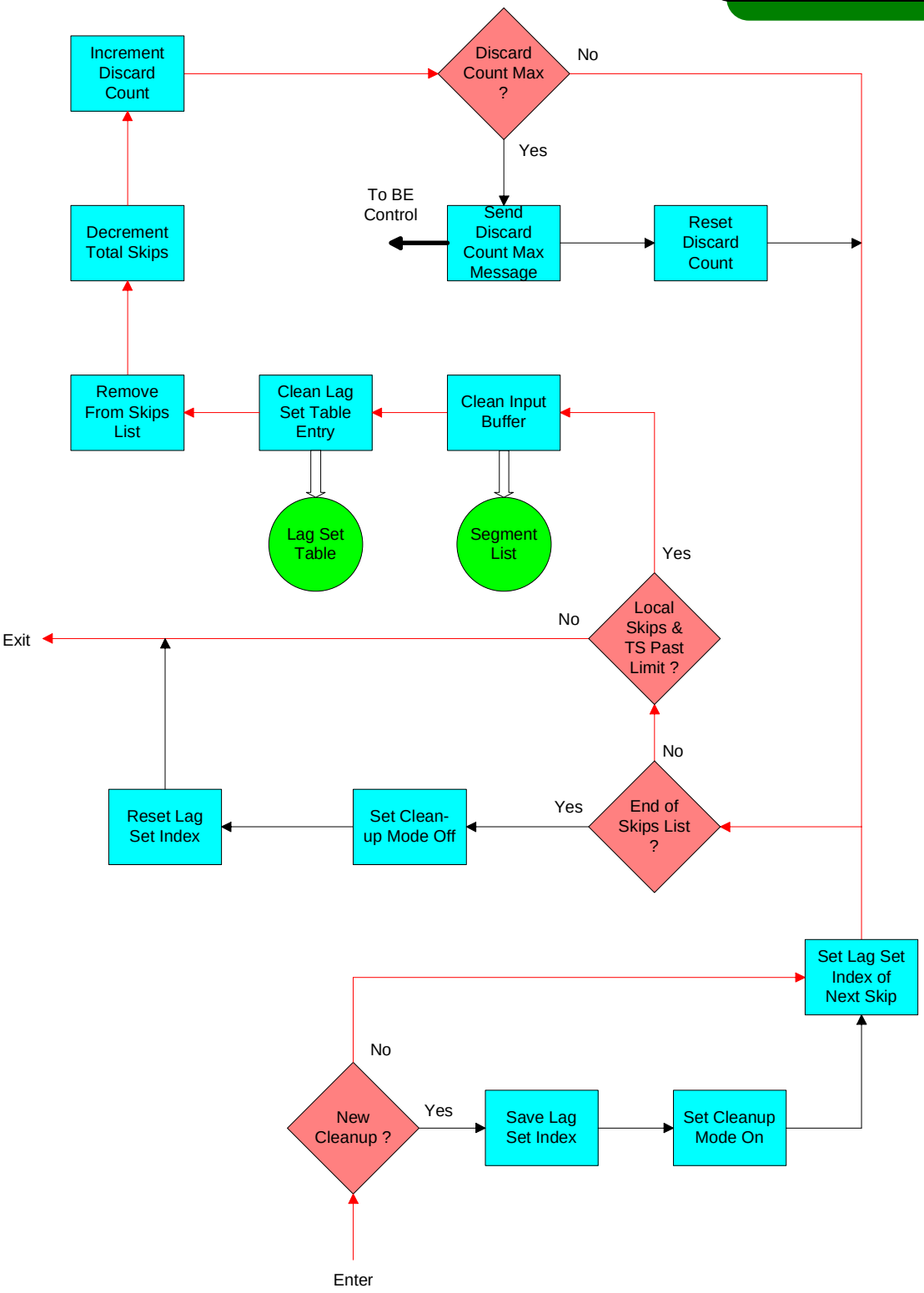

4.0 INPUT PROCESS
Initialize Input Processing
Initialize SL Frame Counts
Initialize Segment Index
Segment List
Group Wait
Increment Segment Index
Finalize Input Processing
Shutdown (0)
Run Mode ?
Idle (2)
Wait
Run (1)
To M&C
Segment Flag = 0 ?
No
Send Message
Override Segment Flag
Yes
Oldest
Check Overwrite Mode ?
Newest
Lock Segment (Flag = -1)
Decrement Segment Index
Start Timer
CORRELATOR
Receive Data
Lag Frame Store
Send Performance Data
Stop Timer
To M&C

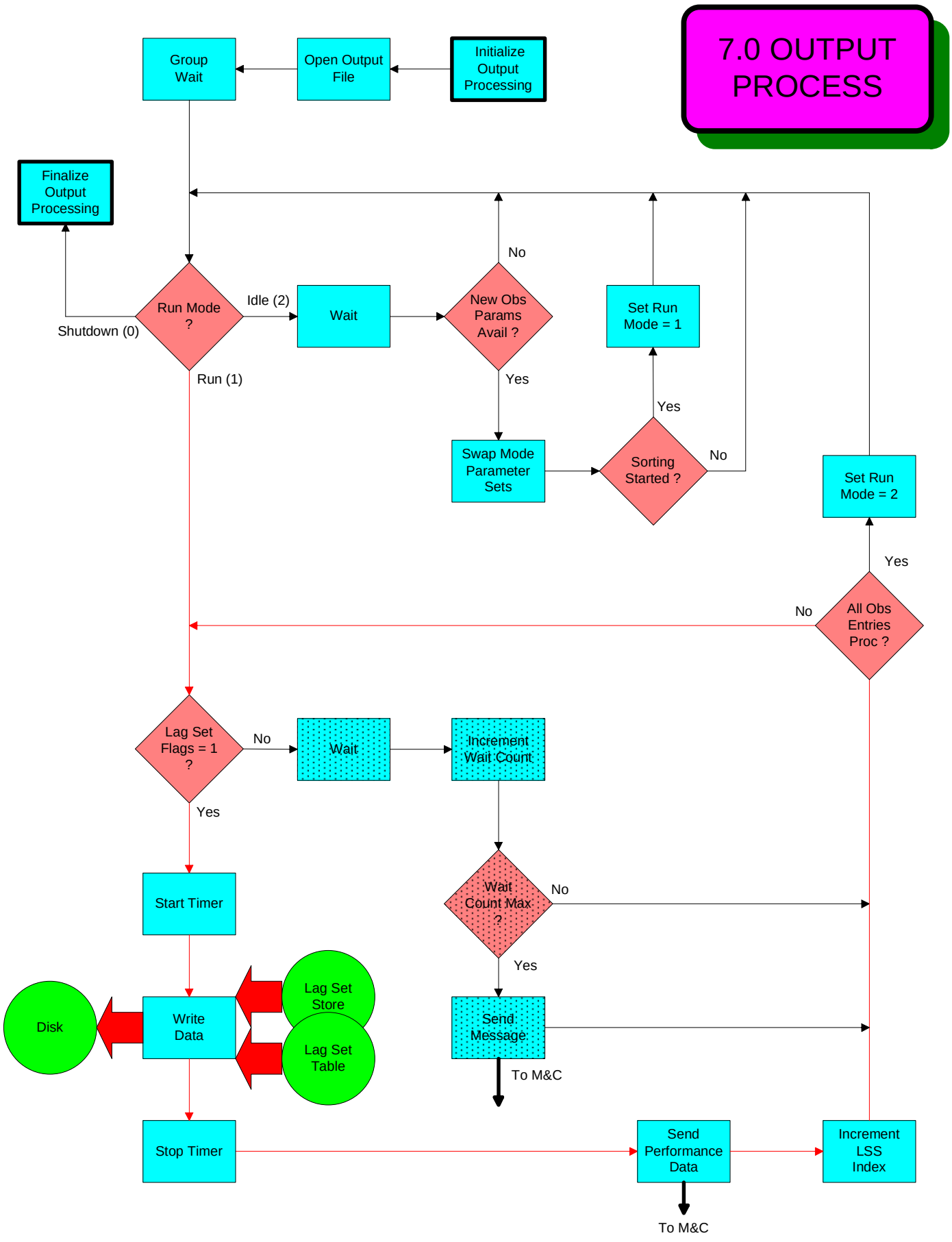

5.0 SORT PROCESS
Initialize Sort Processing
Initialize Segment List
Initialize Frame Index
Group Wait
Reset Frame Index
Increment Segment List Index
Finalize Sort Processing
Shutdown (0)
Run Mode ?
Idle (2)
Wait
Run (1)
Start Timer
Yes
New Input Block ?
No
Increment Wait Count
Lag Frame Store
Read Frame
Lag Set Table
Lag Set Store
Calc LST Index
Increment Frame Index
End of Input Block ?
No
Yes
To M&C
Send Performance Data
Stop Timer
Wait Count Max ?
No
Yes
To M&C
Send Message
Reset Wait Count
Idle Mode ?
No
Yes
Wait


6.0 DP PROCESS
Group Wait
Open Output File
Initialize DP Processing
Shutdown Flag On ?
No
Yes
Finalize DP Processing
Shut-down (0)
Run Mode ?
Idle (2)
Wait
New Obs Params Avail ?
No
Yes
Set Shutdown Flag
Run (1)
Set Run Mode = 1
Yes
Lag Count = MAX ?
No
Swap Mode Parameter Sets
Sorting Started ?
No
Yes
Yes
Aux Data Available ?
No
Set Run Mode = 2
Start Timer
Update Skips Count
Yes
All Obs Entries Proc ?
No
6.1 DP
No
Stop Timer
Send Performance Data
Increment LST Index
Cleanup ?
Yes
6.2 Cleanup
To M&C


6.1 DP FUNCTION
Lag Set Store
Enter
Retrieve Lag LSS Index
Access Lag Set
Clear Lag Set Entry
Lag Set Table
Exit
Data Integrity Check
Reduce Frame Count
Segment List
Make Time Stamp Adjustments
Normalize
Other Time Domain Appls
FFT
Frequency Domain Appls
Integration I = 1, N
Floating Point Error Trap
Data Flags
No
FPE MAX ?
Yes
Send FPE Message
To BE Control
I = I + 1
I = N ?
Yes
No
Discard ?
No
Yes
Return Spectrum
Lag Set Store

6.2 CLEANUP FUNCTION




7.0 OUTPUT PROCESS
Initialize Output Processing
Open Output File
Group Wait
Finalize Output Processing
Run Mode ?
Shutdown (0)
Idle (2)
Run (1)
Wait
New Obs Params Avail ?
No
Yes
Swap Mode Parameter Sets
Sorting Started ?
Yes
No
Set Run Mode = 1
Set Run Mode = 2
All Obs Entries Proc ?
Yes
No
Lag Set Flags = 1 ?
No
Yes
Wait
Increment Wait Count
Wait Count Max ?
No
Yes
Start Timer
Disk
Write Data
Lag Set Store
Lag Set Table
Send Message
To M&C
Stop Timer
Send Performance Data
To M&C
Increment LSS Index