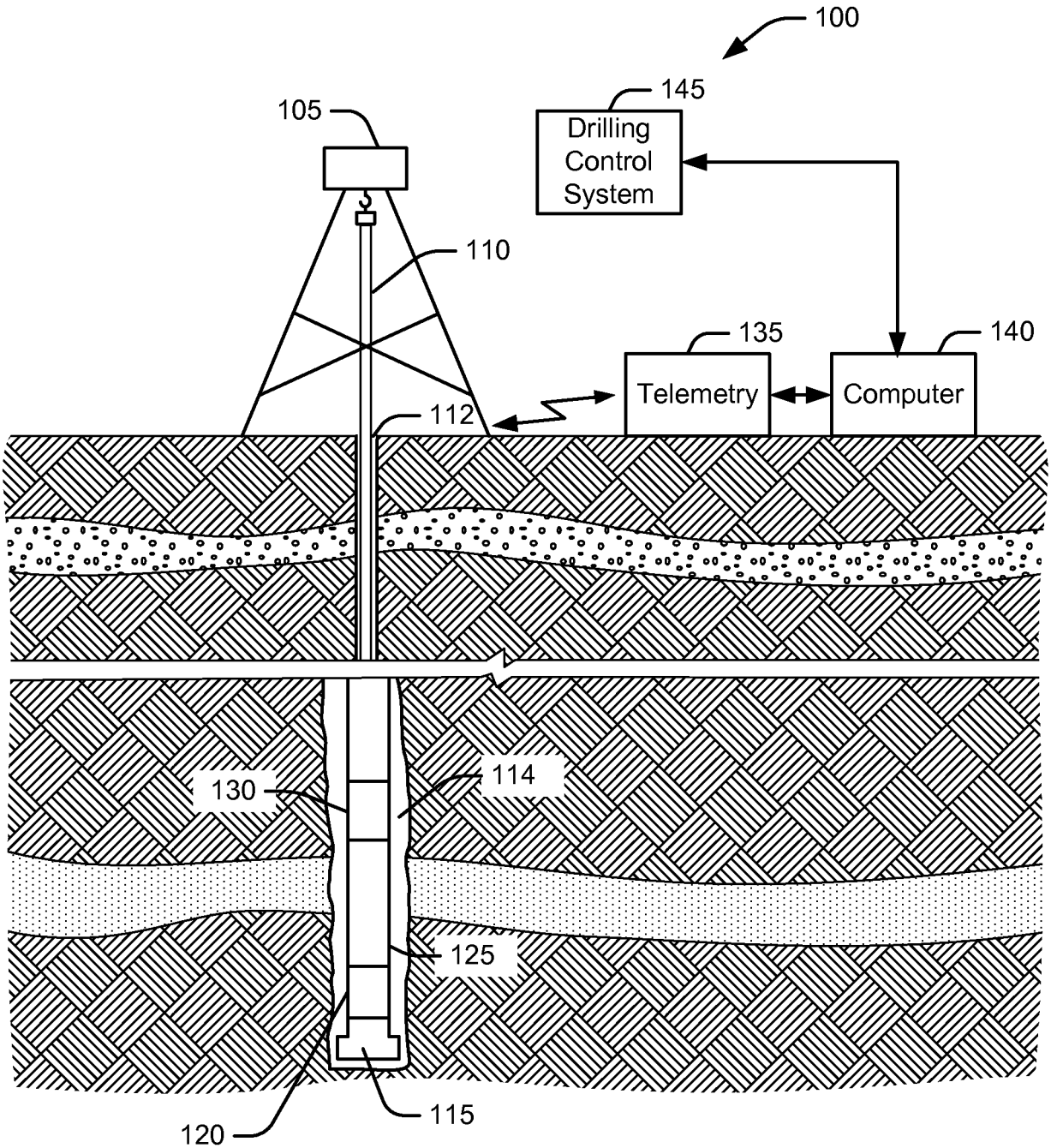

100
145
Drilling Control System
105
110
135
Telemetry
140
Computer
112
130
114
125
115
120

FIG. 1

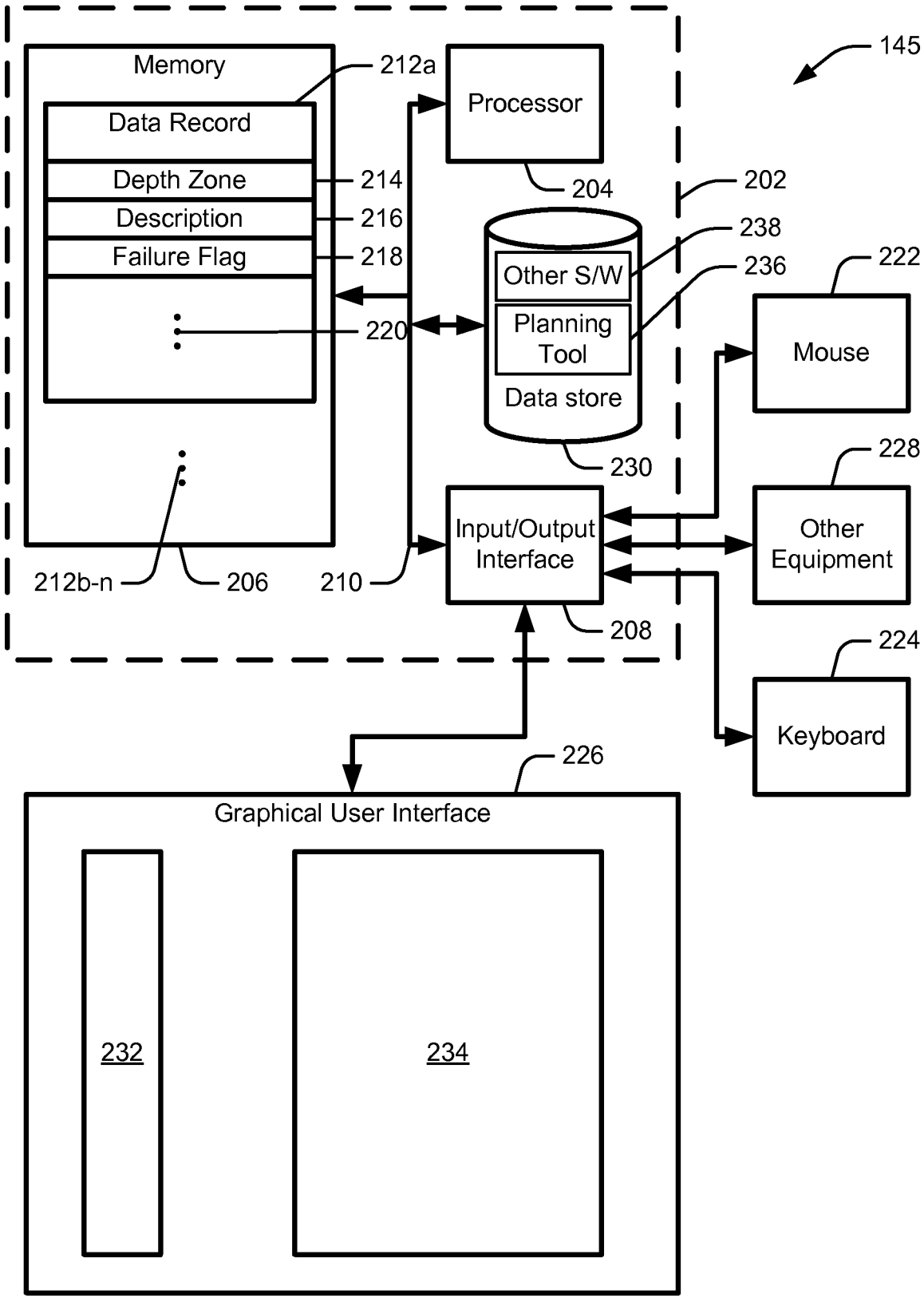
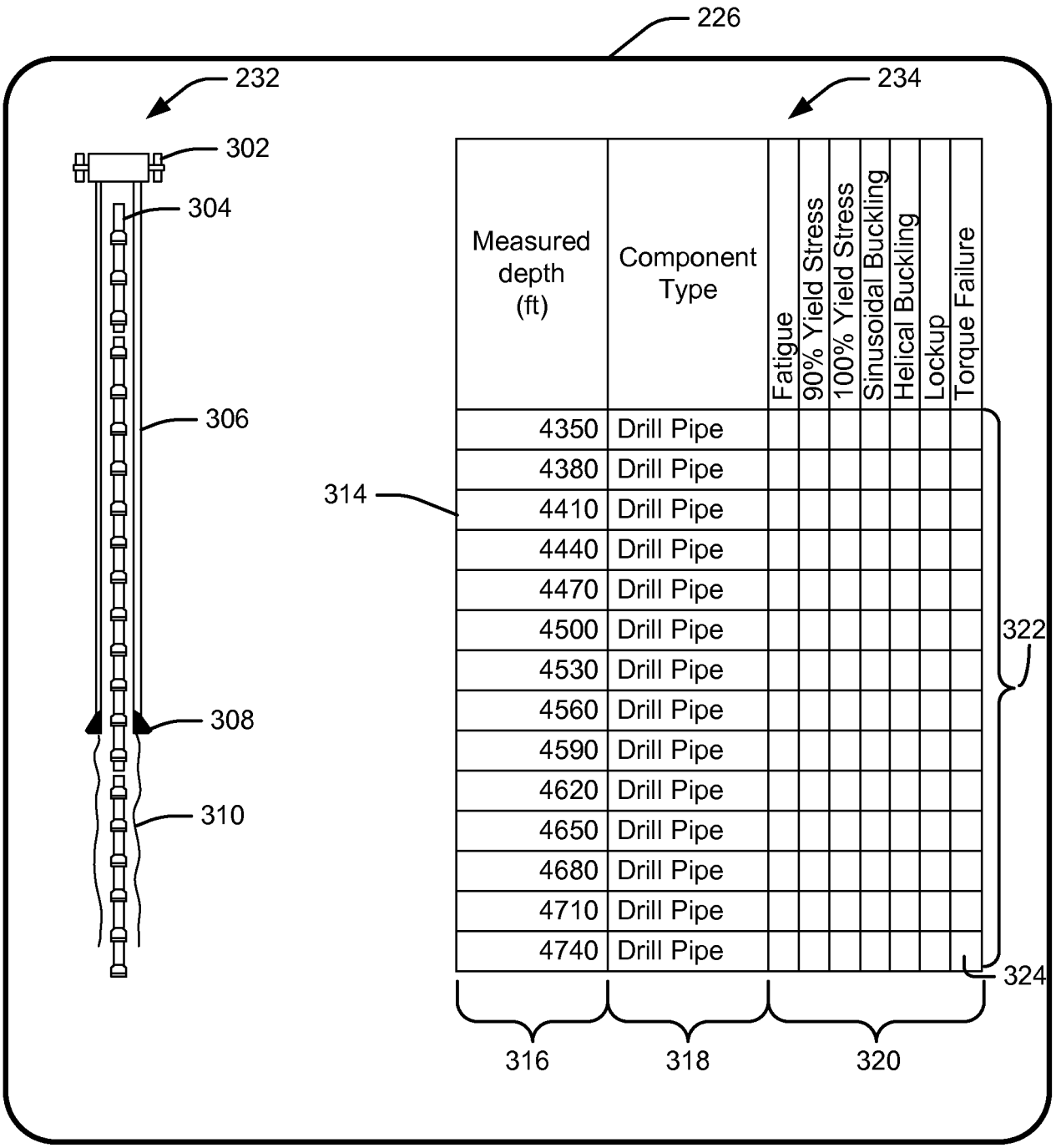
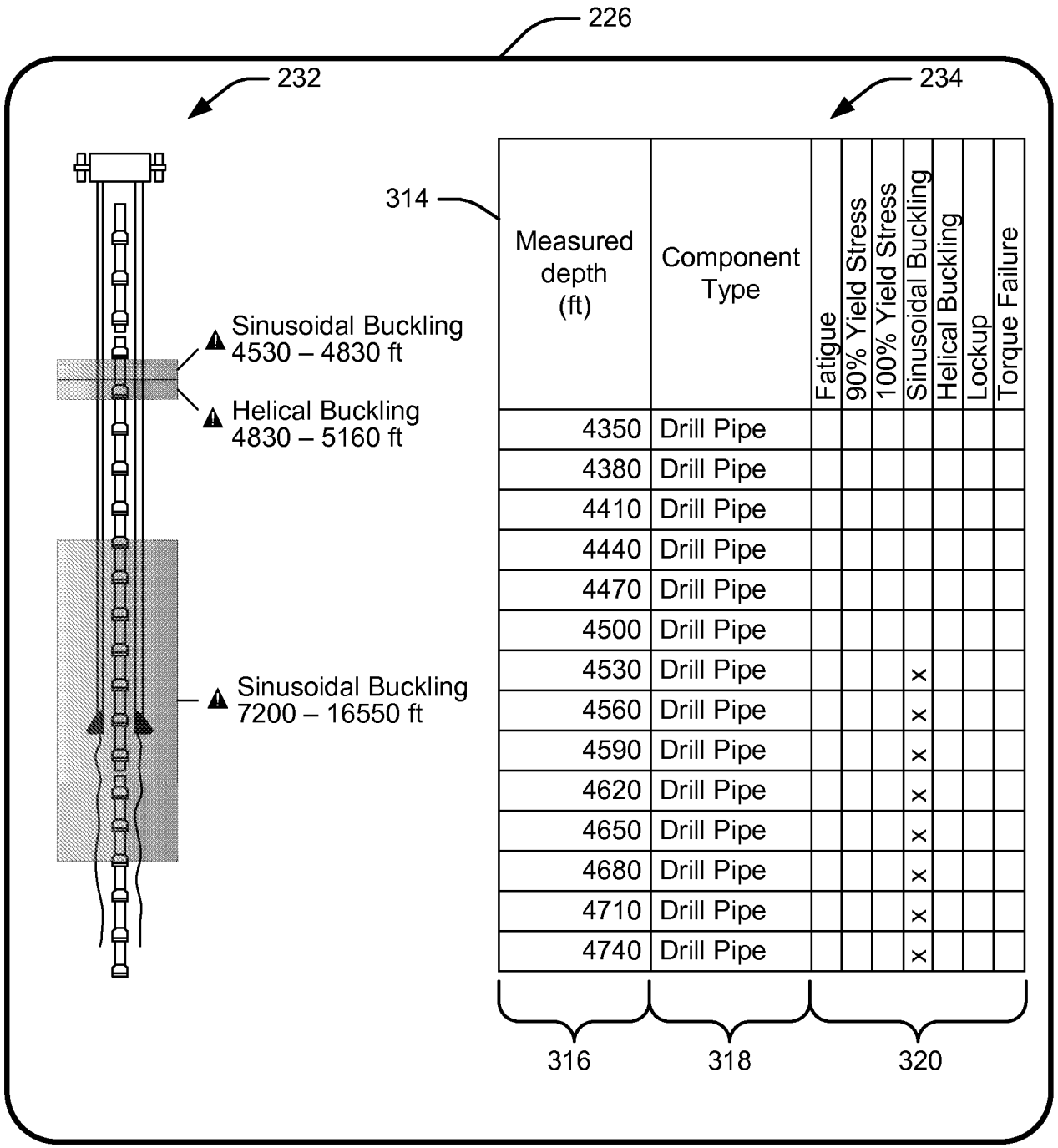

145
Memory
212a
Data Record
Depth Zone
214
Description
216
Failure Flag
218
220
212b-n
206
Processor
204
202
Other S/W
238
Planning Tool
236
Data store
230
222
Mouse
228
Other Equipment
Input/Output Interface
210
208
224
Keyboard
226
Graphical User Interface
232
234

FIG. 2



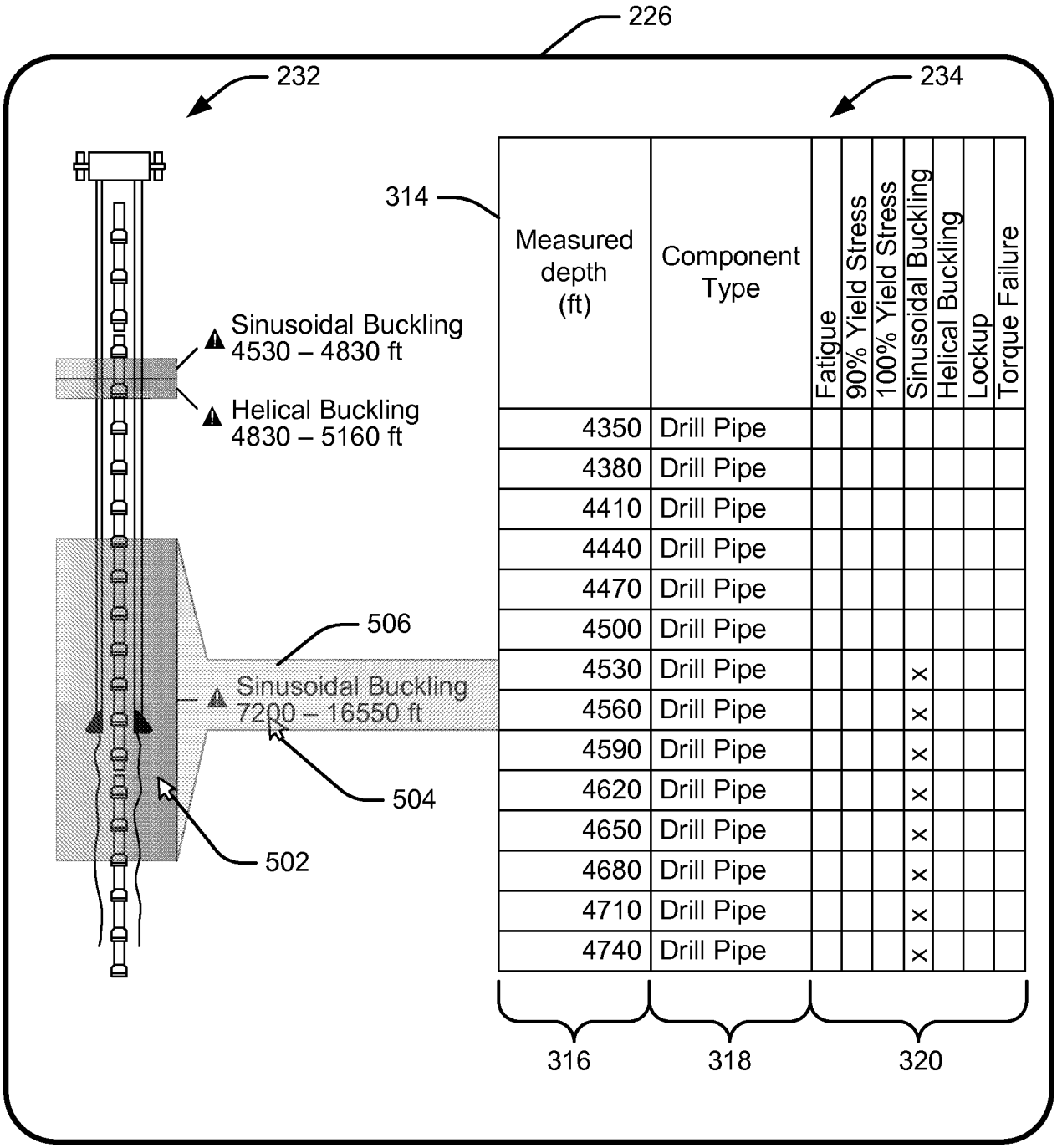

| Measured depth (ft) | Component Type | Fatigue | 90% Yield Stress | 100% Yield Stress | Sinusoidal Buckling | Helical Buckling | Lockup | Torque Failure |
|---|---|---|---|---|---|---|---|---|
| 4350 | Drill Pipe | | | | | | | |
| 4380 | Drill Pipe | | | | | | | |
| 4410 | Drill Pipe | | | | | | | |
| 4440 | Drill Pipe | | | | | | | |
| 4470 | Drill Pipe | | | | | | | |
| 4500 | Drill Pipe | | | | | | | |
| 4530 | Drill Pipe | | | | | | | |
| 4560 | Drill Pipe | | | | | | | |
| 4590 | Drill Pipe | | | | | | | |
| 4620 | Drill Pipe | | | | | | | |
| 4650 | Drill Pipe | | | | | | | |
| 4680 | Drill Pipe | | | | | | | |
| 4710 | Drill Pipe | | | | | | | |
| 4740 | Drill Pipe | | | | | | | |

FIG. 3



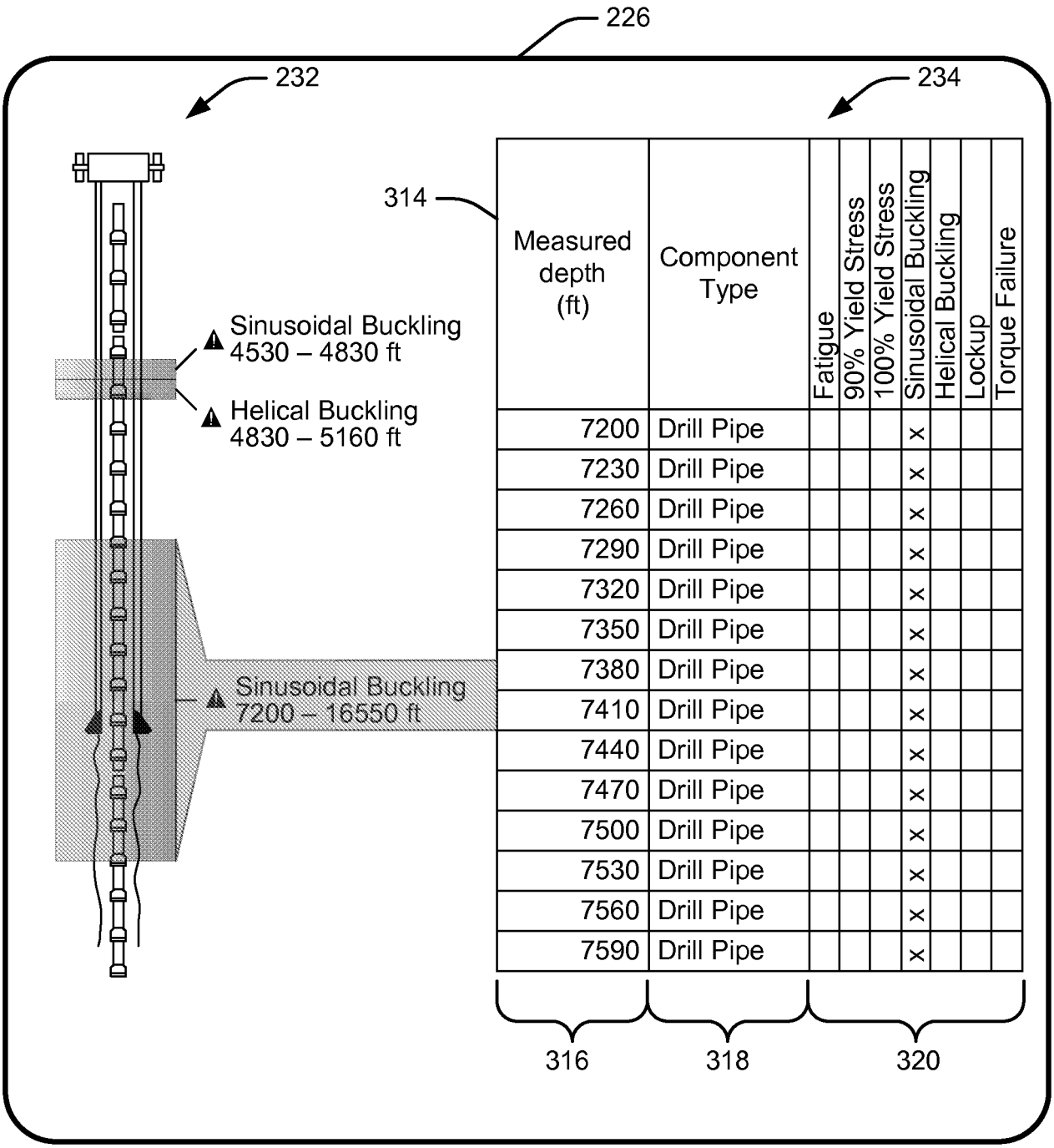

| Measured depth (ft) | Component Type | Fatigue | 90% Yield Stress | 100% Yield Stress | Sinusoidal Buckling | Helical Buckling | Lockup | Torque Failure |
|---|---|---|---|---|---|---|---|---|
| 4350 | Drill Pipe | | | | | | | |
| 4380 | Drill Pipe | | | | | | | |
| 4410 | Drill Pipe | | | | | | | |
| 4440 | Drill Pipe | | | | | | | |
| 4470 | Drill Pipe | | | | | | | |
| 4500 | Drill Pipe | | | | | | | |
| 4530 | Drill Pipe | | | | X | | | |
| 4560 | Drill Pipe | | | | X | | | |
| 4590 | Drill Pipe | | | | X | | | |
| 4620 | Drill Pipe | | | | X | | | |
| 4650 | Drill Pipe | | | | X | | | |
| 4680 | Drill Pipe | | | | X | | | |
| 4710 | Drill Pipe | | | | X | | | |
| 4740 | Drill Pipe | | | | X | | | |

FIG. 4




| Measured depth (ft) | Component Type | Fatigue | 90% Yield Stress | 100% Yield Stress | Sinusoidal Buckling | Helical Buckling | Lockup | Torque Failure |
|---|---|---|---|---|---|---|---|---|
| 4350 | Drill Pipe | | | | | | | |
| 4380 | Drill Pipe | | | | | | | |
| 4410 | Drill Pipe | | | | | | | |
| 4440 | Drill Pipe | | | | | | | |
| 4470 | Drill Pipe | | | | | | | |
| 4500 | Drill Pipe | | | | | | | |
| 4530 | Drill Pipe | | | | x | | | |
| 4560 | Drill Pipe | | | | x | | | |
| 4590 | Drill Pipe | | | | x | | | |
| 4620 | Drill Pipe | | | | x | | | |
| 4650 | Drill Pipe | | | | x | | | |
| 4680 | Drill Pipe | | | | x | | | |
| 4710 | Drill Pipe | | | | x | | | |
| 4740 | Drill Pipe | | | | x | | | |

FIG. 5




| Measured depth (ft) | Component Type | Fatigue | 90% Yield Stress | 100% Yield Stress | Sinusoidal Buckling | Helical Buckling | Lockup | Torque Failure |
|---|---|---|---|---|---|---|---|---|
| 7200 | Drill Pipe | | | | x | | | |
| 7230 | Drill Pipe | | | | x | | | |
| 7260 | Drill Pipe | | | | x | | | |
| 7290 | Drill Pipe | | | | x | | | |
| 7320 | Drill Pipe | | | | x | | | |
| 7350 | Drill Pipe | | | | x | | | |
| 7380 | Drill Pipe | | | | x | | | |
| 7410 | Drill Pipe | | | | x | | | |
| 7440 | Drill Pipe | | | | x | | | |
| 7470 | Drill Pipe | | | | x | | | |
| 7500 | Drill Pipe | | | | x | | | |
| 7530 | Drill Pipe | | | | x | | | |
| 7560 | Drill Pipe | | | | x | | | |
| 7590 | Drill Pipe | | | | x | | | |

FIG. 6

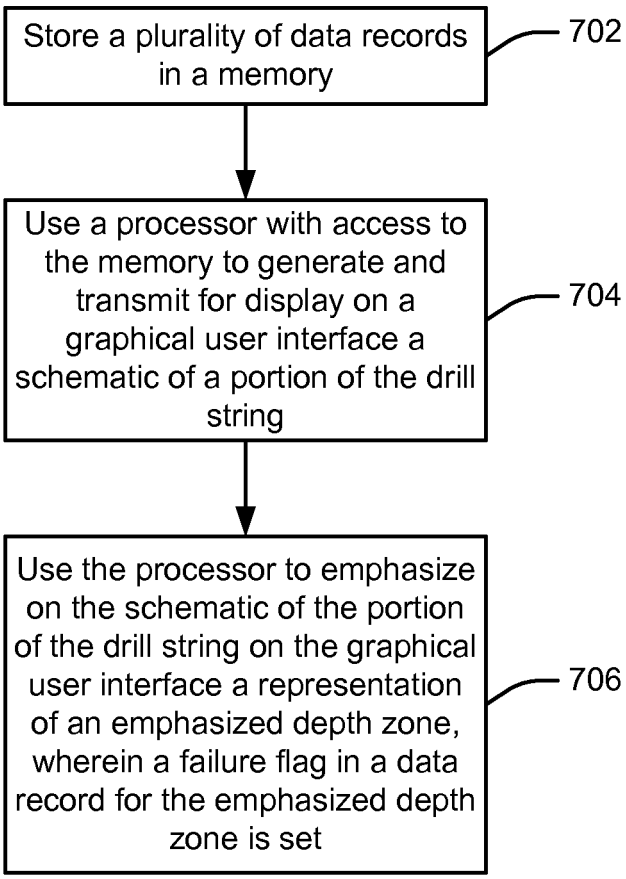

Store a plurality of data records in a memory
702
Use a processor with access to the memory to generate and transmit for display on a graphical user interface a schematic of a portion of the drill string
704
Use the processor to emphasize on the schematic of the portion of the drill string on the graphical user interface a representation of an emphasized depth zone, wherein a failure flag in a data record for the emphasized depth zone is set
706

FIG. 7

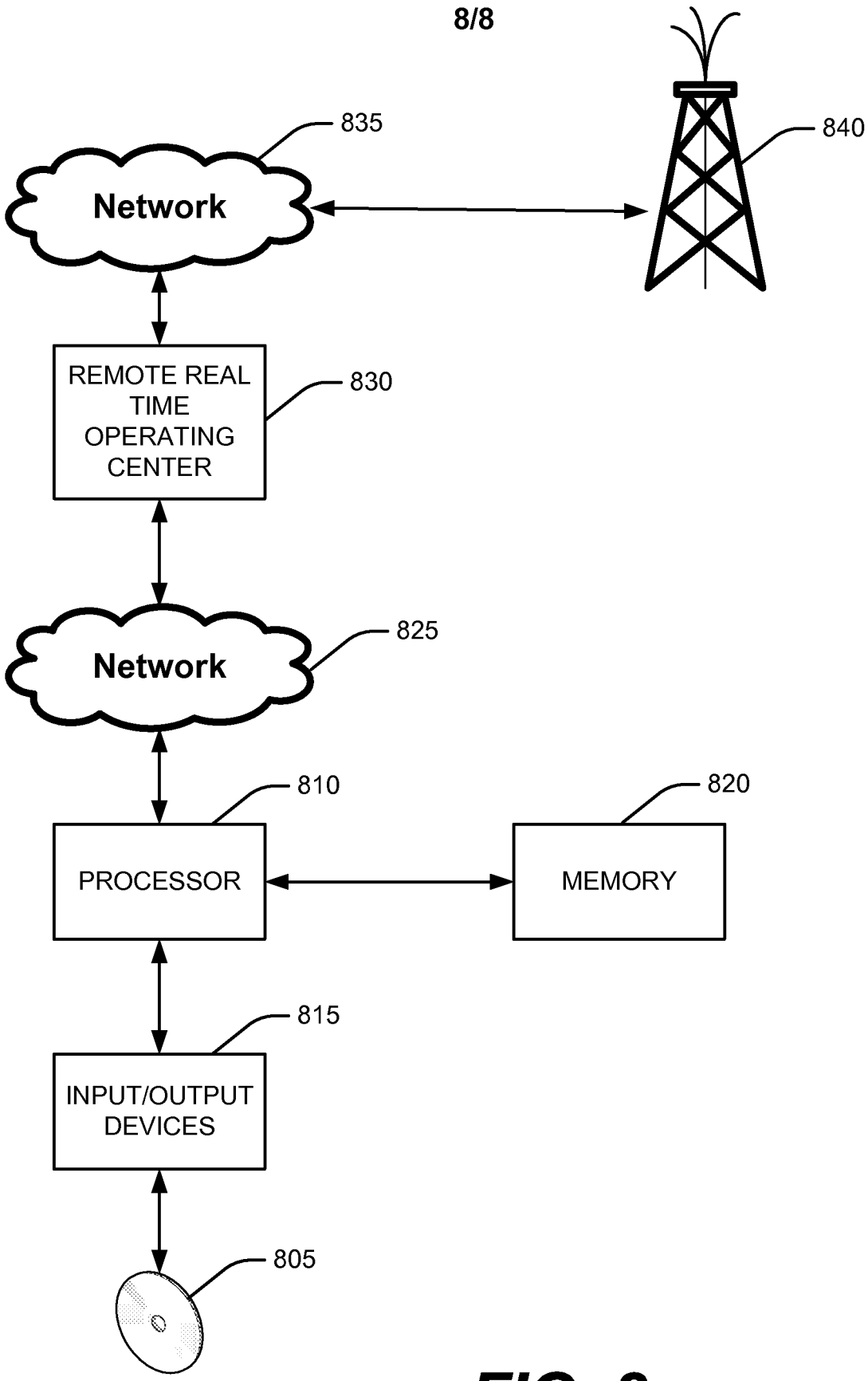

835
Network
840
REMOTE REAL TIME OPERATING CENTER
830
Network
825
810
820
PROCESSOR
MEMORY
815
INPUT/OUTPUT DEVICES
805

FIG. 8