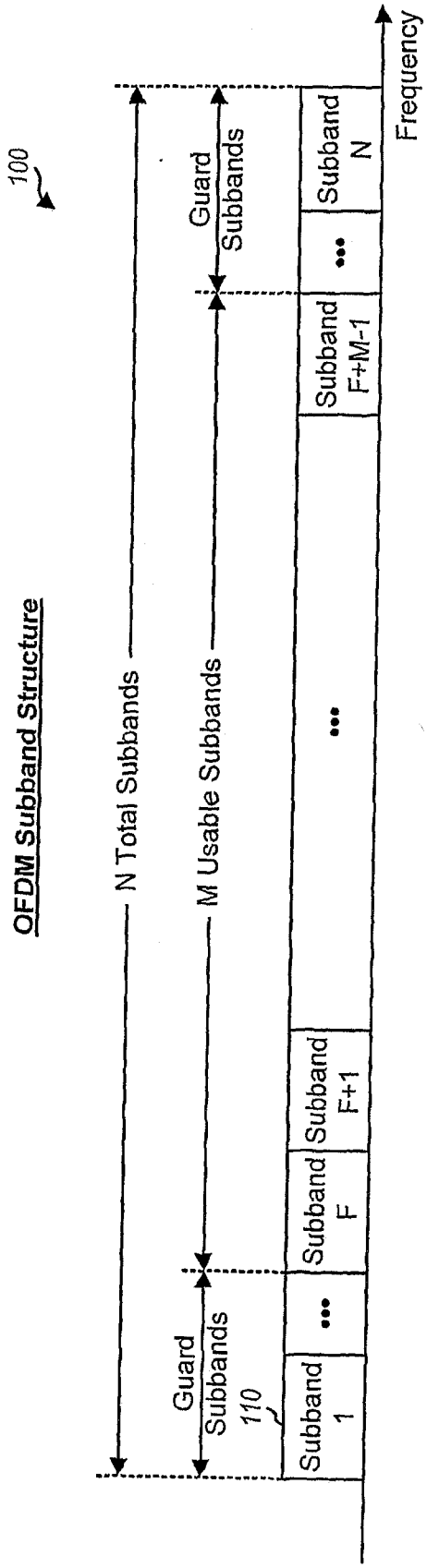

OFDM Subband Structure
100
N Total Subbands
M Usable Subbands
Guard Subbands
Guard Subbands
110
Subband 1
Subband F
Subband F+1
Subband F+M-1
Subband N
Frequency

FIG. 1

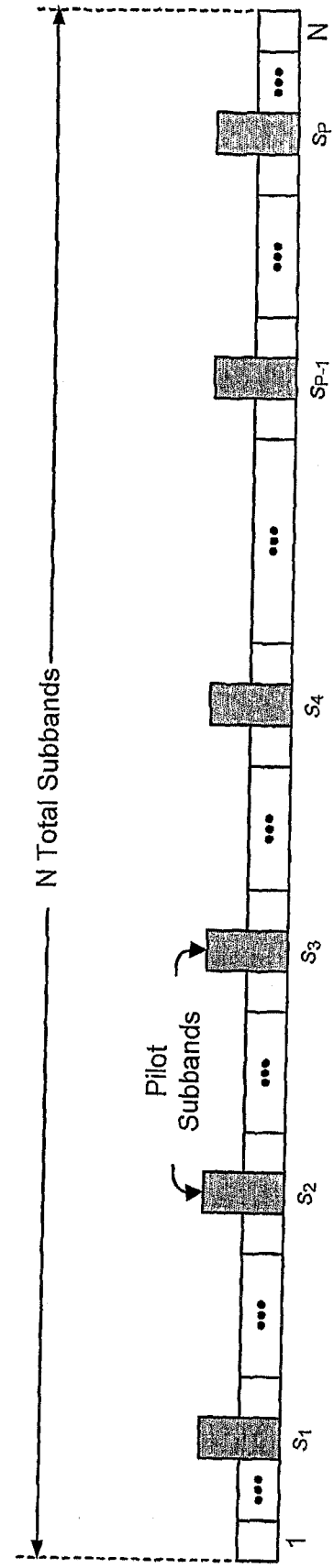

N Total Subbands
Pilot Subbands
1
s_1
s_2
s_3
s_4
s_{P-1}
s_P
N

FIG. 2

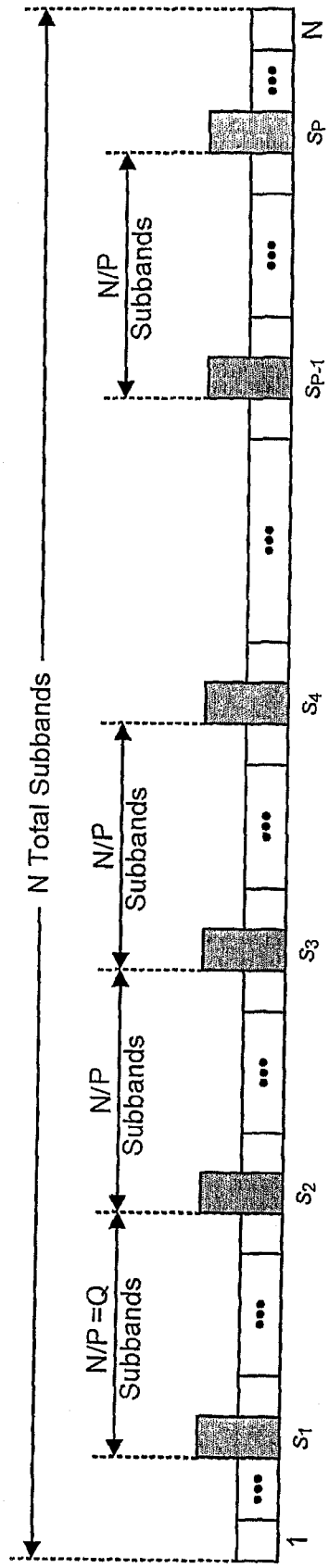

N Total Subbands
N/P =Q Subbands
N/P Subbands
N/P Subbands
N/P Subbands
1
s_1
s_2
s_3
s_4
s_{P-1}
s_P
N

FIG. 3

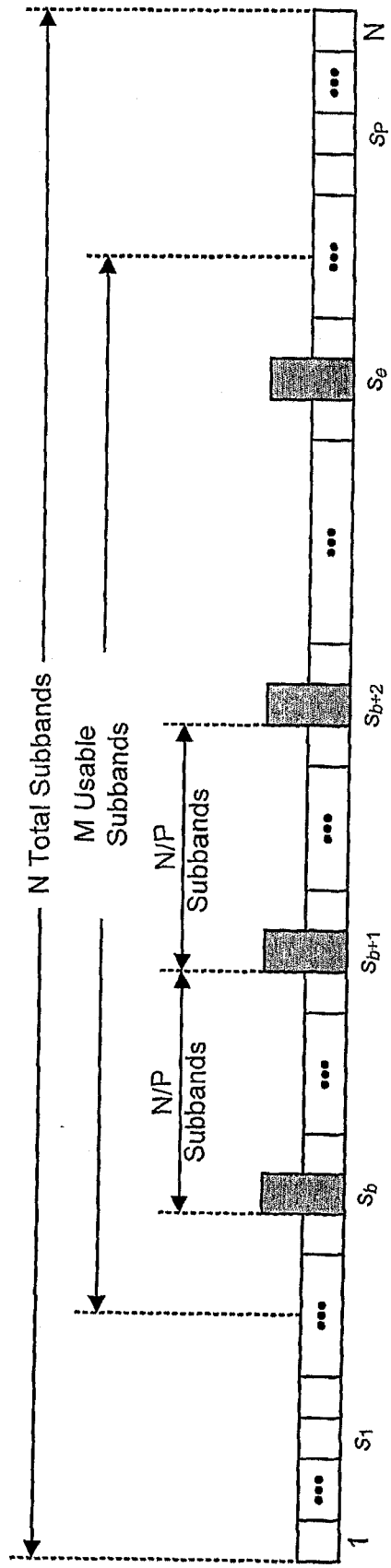

N Total Subbands
M Usable Subbands
N/P Subbands
N/P Subbands
1
s_1
s_b
s_{b+1}
s_{b+2}
s_e
s_P
N

FIG. 4

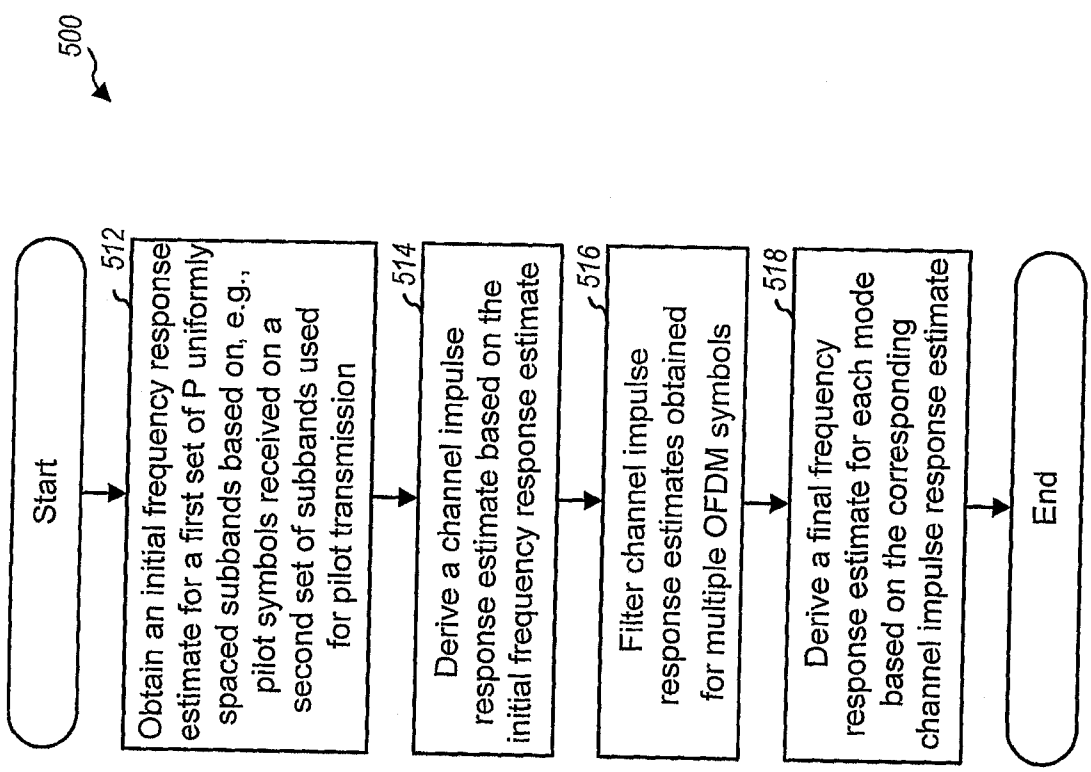

500
Start
512
Obtain an initial frequency response estimate for a first set of P uniformly spaced subbands based on, e.g., pilot symbols received on a second set of subbands used for pilot transmission
514
Derive a channel impulse response estimate based on the initial frequency response estimate
516
Filter channel impulse response estimates obtained for multiple OFDM symbols
518
Derive a final frequency response estimate for each mode based on the corresponding channel impulse response estimate
End

FIG. 5

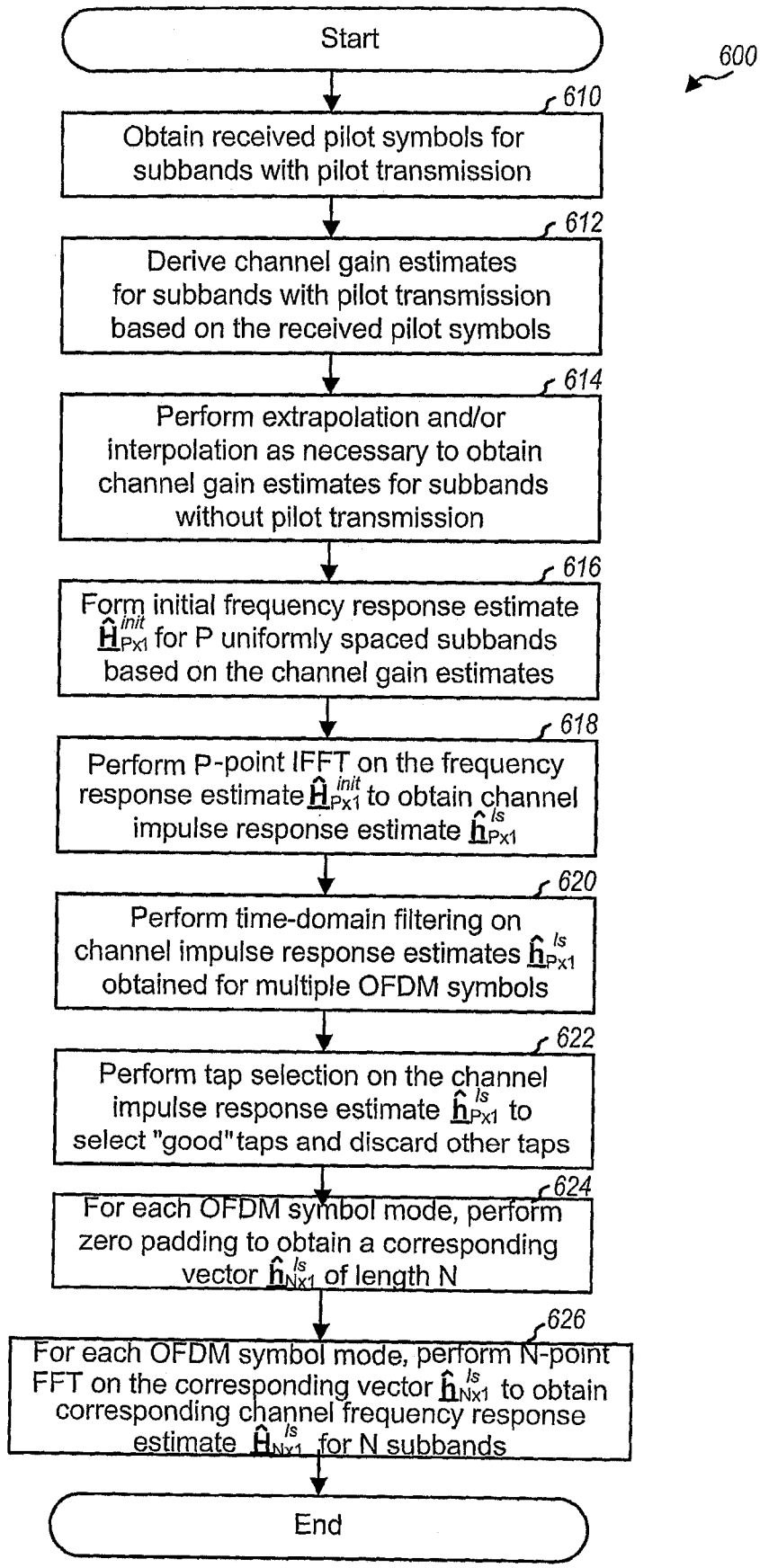

Start
600
610
Obtain received pilot symbols for subbands with pilot transmission
612
Derive channel gain estimates for subbands with pilot transmission based on the received pilot symbols
614
Perform extrapolation and/or interpolation as necessary to obtain channel gain estimates for subbands without pilot transmission
616
Form initial frequency response estimate $\hat{\underline{H}}^{init}_{Px1}$ for P uniformly spaced subbands based on the channel gain estimates
618
Perform P-point IFFT on the frequency response estimate $\hat{\underline{H}}^{init}_{Px1}$ to obtain channel impulse response estimate $\hat{\underline{h}}^{ls}_{Px1}$
620
Perform time-domain filtering on channel impulse response estimates $\hat{\underline{h}}^{ls}_{Px1}$ obtained for multiple OFDM symbols
622
Perform tap selection on the channel impulse response estimate $\hat{\underline{h}}^{ls}_{Px1}$ to select "good" taps and discard other taps
624
For each OFDM symbol mode, perform zero padding to obtain a corresponding vector $\hat{\underline{h}}^{ls}_{Nx1}$ of length N
626
For each OFDM symbol mode, perform N-point FFT on the corresponding vector $\hat{\underline{h}}^{ls}_{Nx1}$ to obtain corresponding channel frequency response estimate $\hat{\underline{H}}^{ls}_{Nx1}$ for N subbands
End

FIG. 6

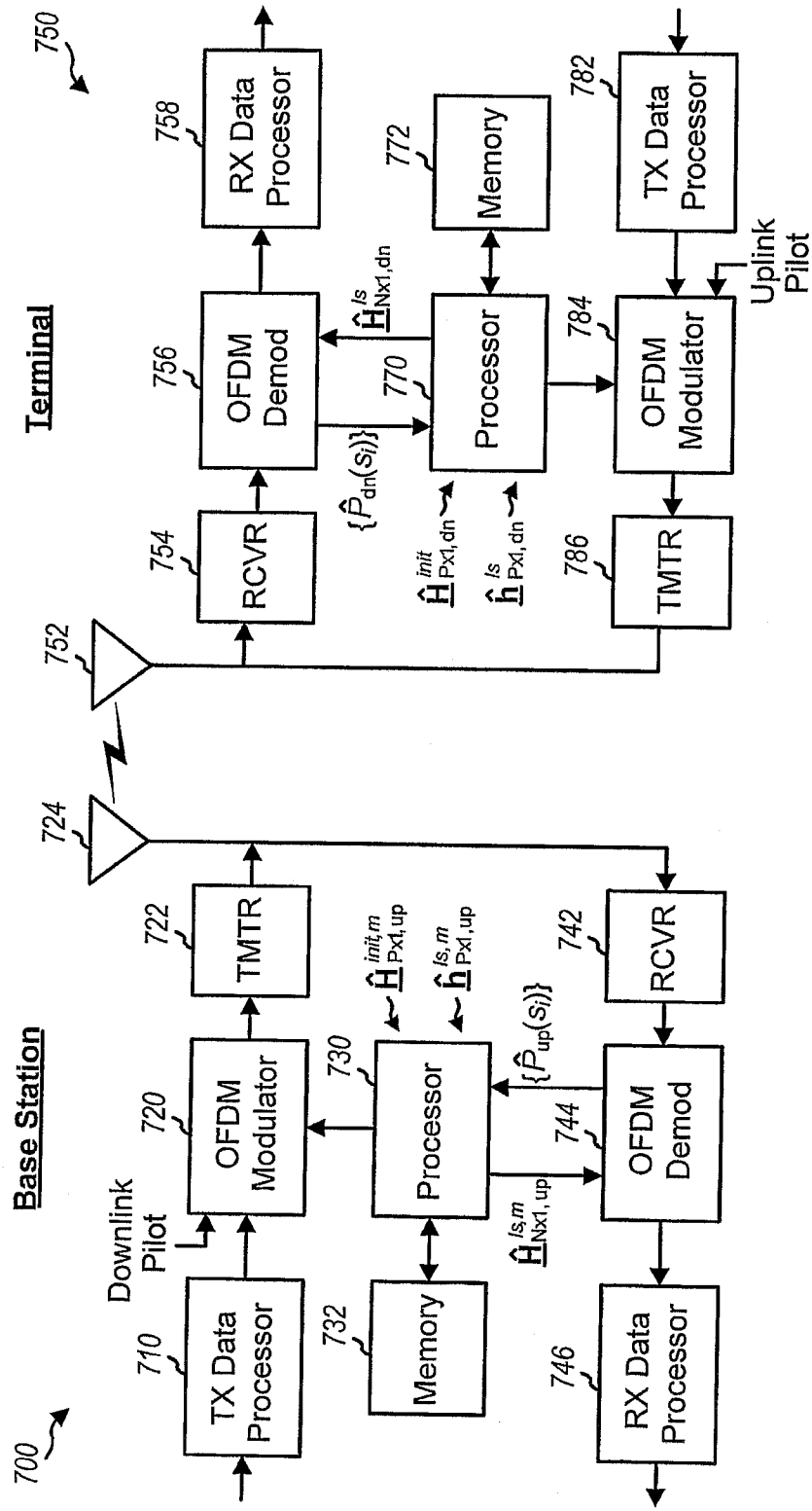

700
Base Station
710
TX Data Processor
Downlink Pilot
720
OFDM Modulator
722
TMTR
724
732
Memory
730
Processor
742
RCVR
744
OFDM Demod
746
RX Data Processor
752
Terminal
754
RCVR
756
OFDM Demod
758
RX Data Processor
750
772
Memory
770
Processor
782
TX Data Processor
784
OFDM Modulator
786
TMTR
Uplink Pilot

FIG. 7

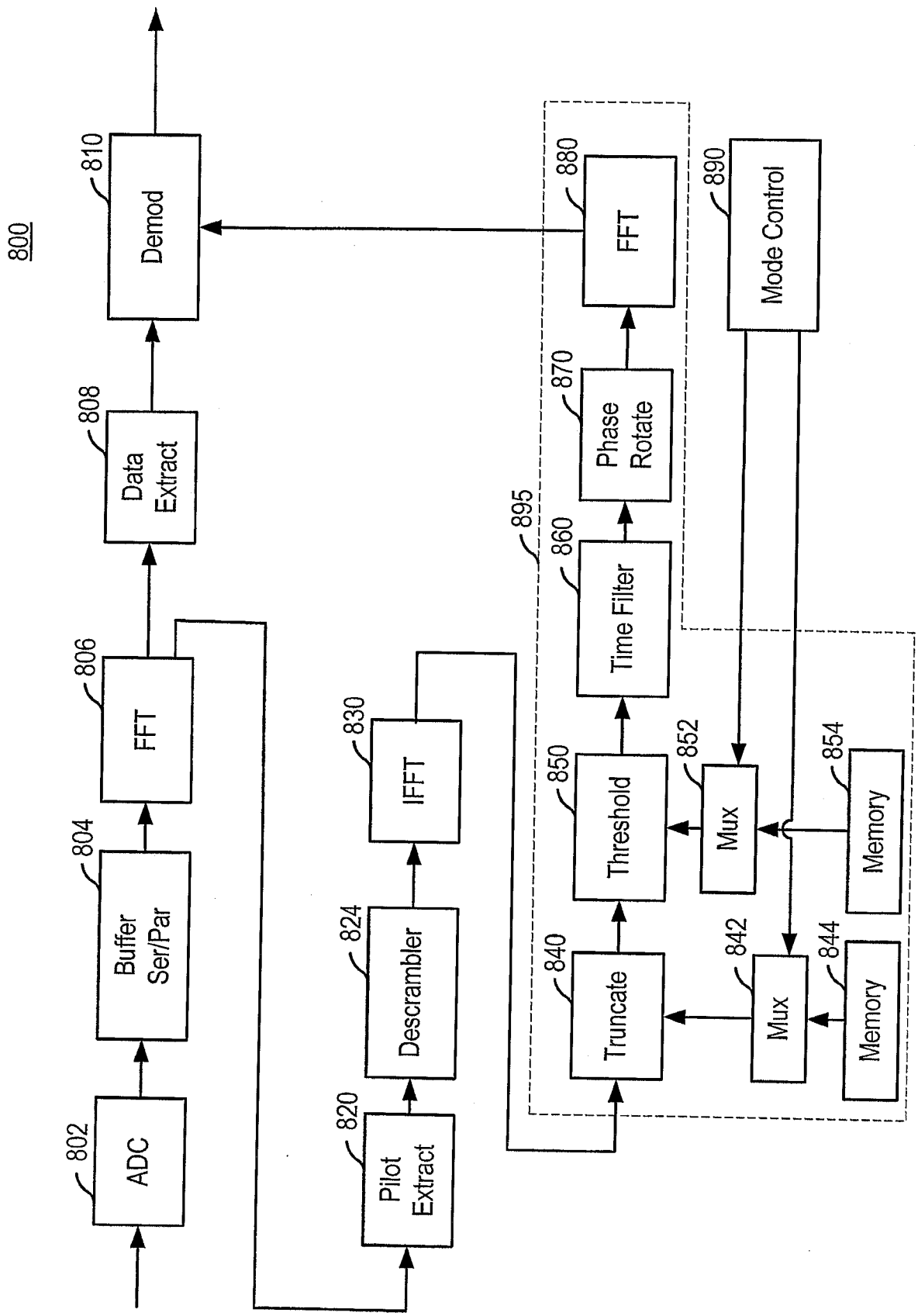

800
802
ADC
804
Buffer Ser/Par
806
FFT
808
Data Extract
810
Demod
820
Pilot Extract
824
Descrambler
830
IFFT
840
Truncate
842
Mux
844
Memory
850
Threshold
852
Mux
854
Memory
860
Time Filter
870
Phase Rotate
880
FFT
890
Mode Control
895

FIG. 8

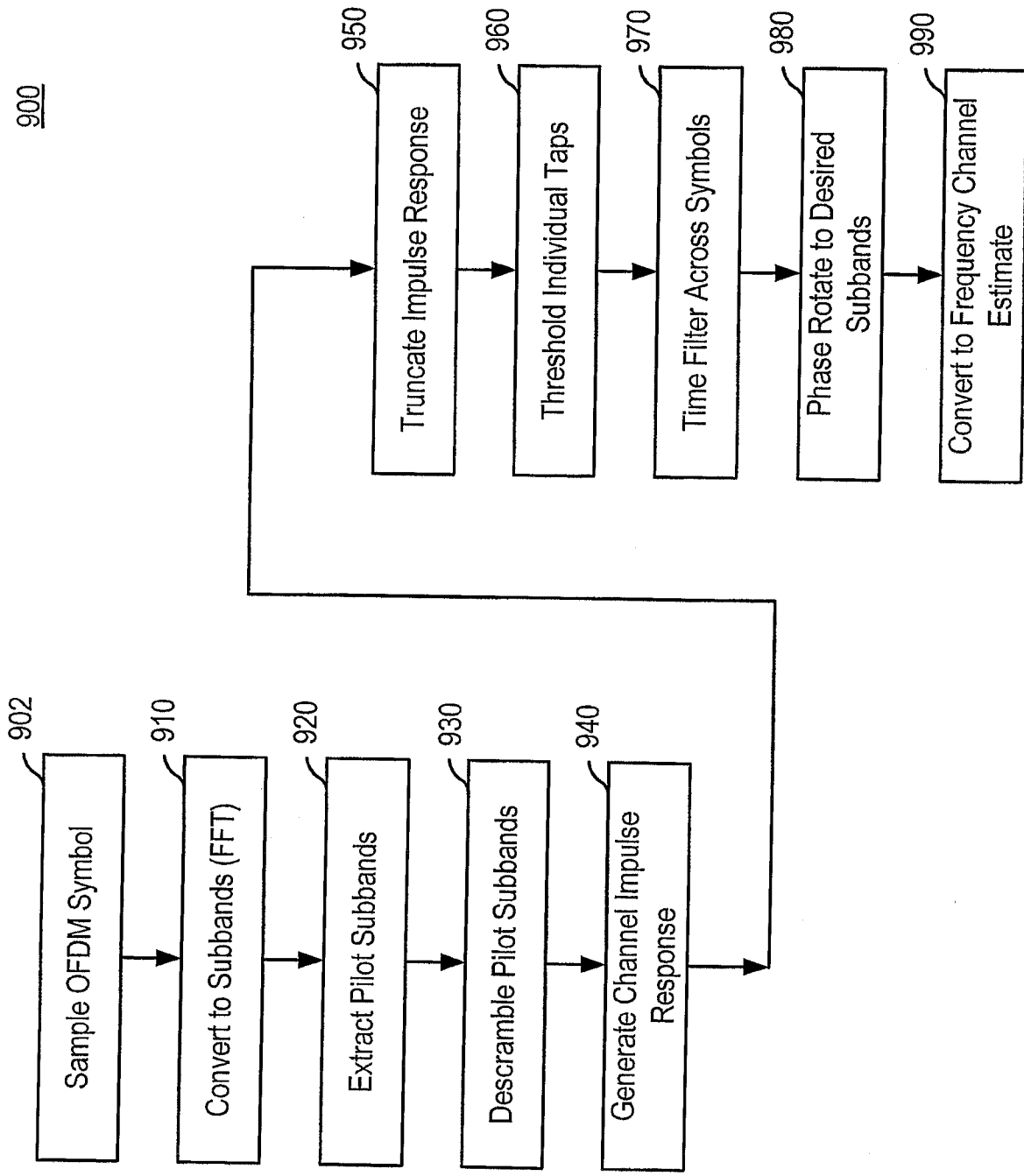

900
902
Sample OFDM Symbol
910
Convert to Subbands (FFT)
920
Extract Pilot Subbands
930
Descramble Pilot Subbands
940
Generate Channel Impulse Response
950
Truncate Impulse Response
960
Threshold Individual Taps
970
Time Filter Across Symbols
980
Phase Rotate to Desired Subbands
990
Convert to Frequency Channel Estimate

FIG. 9