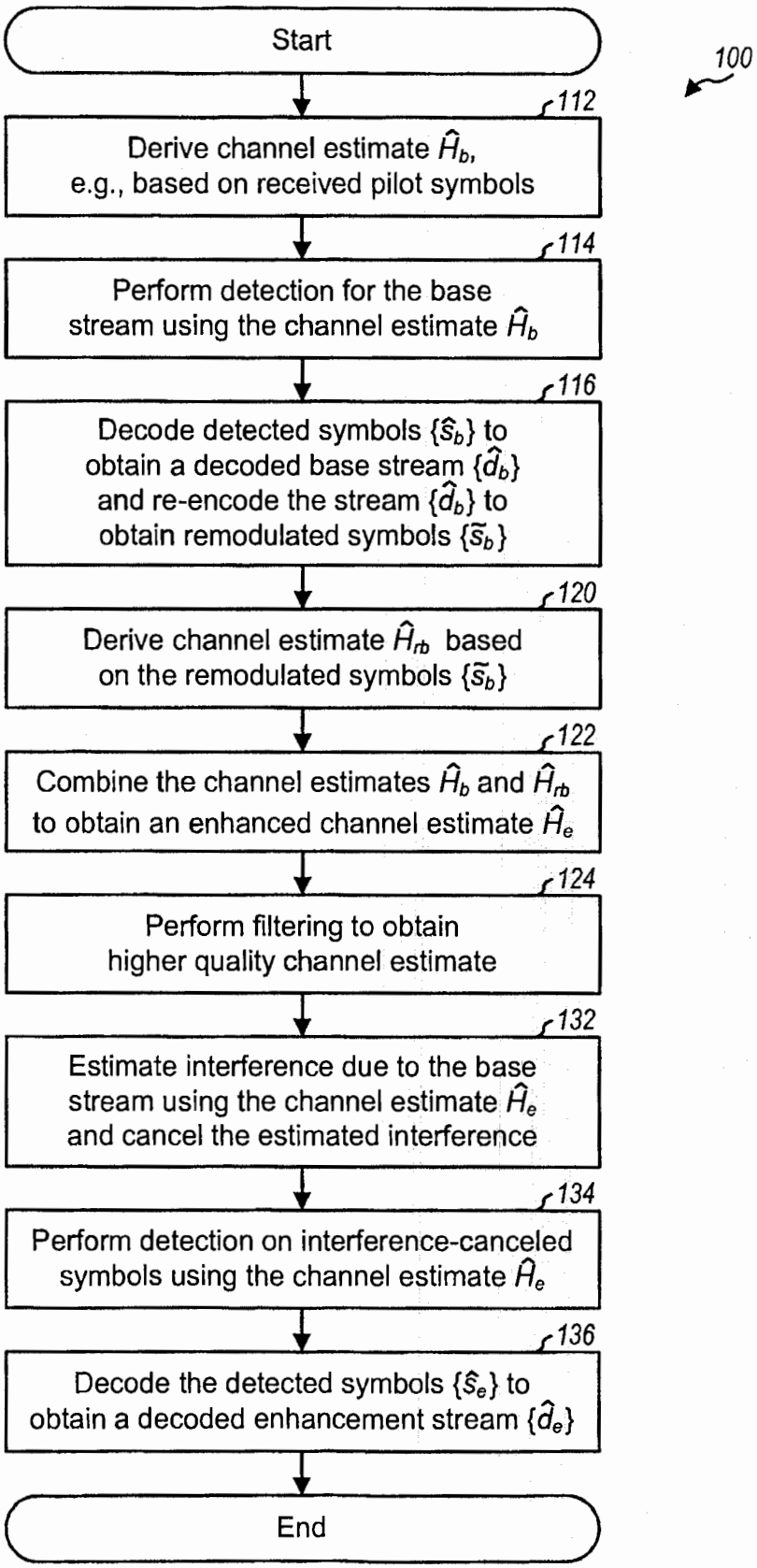

Start
100
112
Derive channel estimate $\hat{H}_b$, e.g., based on received pilot symbols
114
Perform detection for the base stream using the channel estimate $\hat{H}_b$
116
Decode detected symbols $\{\hat{s}_b\}$ to obtain a decoded base stream $\{\hat{d}_b\}$ and re-encode the stream $\{\hat{d}_b\}$ to obtain remodulated symbols $\{\tilde{s}_b\}$
120
Derive channel estimate $\hat{H}_{rb}$ based on the remodulated symbols $\{\tilde{s}_b\}$
122
Combine the channel estimates $\hat{H}_b$ and $\hat{H}_{rb}$ to obtain an enhanced channel estimate $\hat{H}_e$
124
Perform filtering to obtain higher quality channel estimate
132
Estimate interference due to the base stream using the channel estimate $\hat{H}_e$ and cancel the estimated interference
134
Perform detection on interference-canceled symbols using the channel estimate $\hat{H}_e$
136
Decode the detected symbols $\{\hat{s}_e\}$ to obtain a decoded enhancement stream $\{\hat{d}_e\}$
End

Figure 1

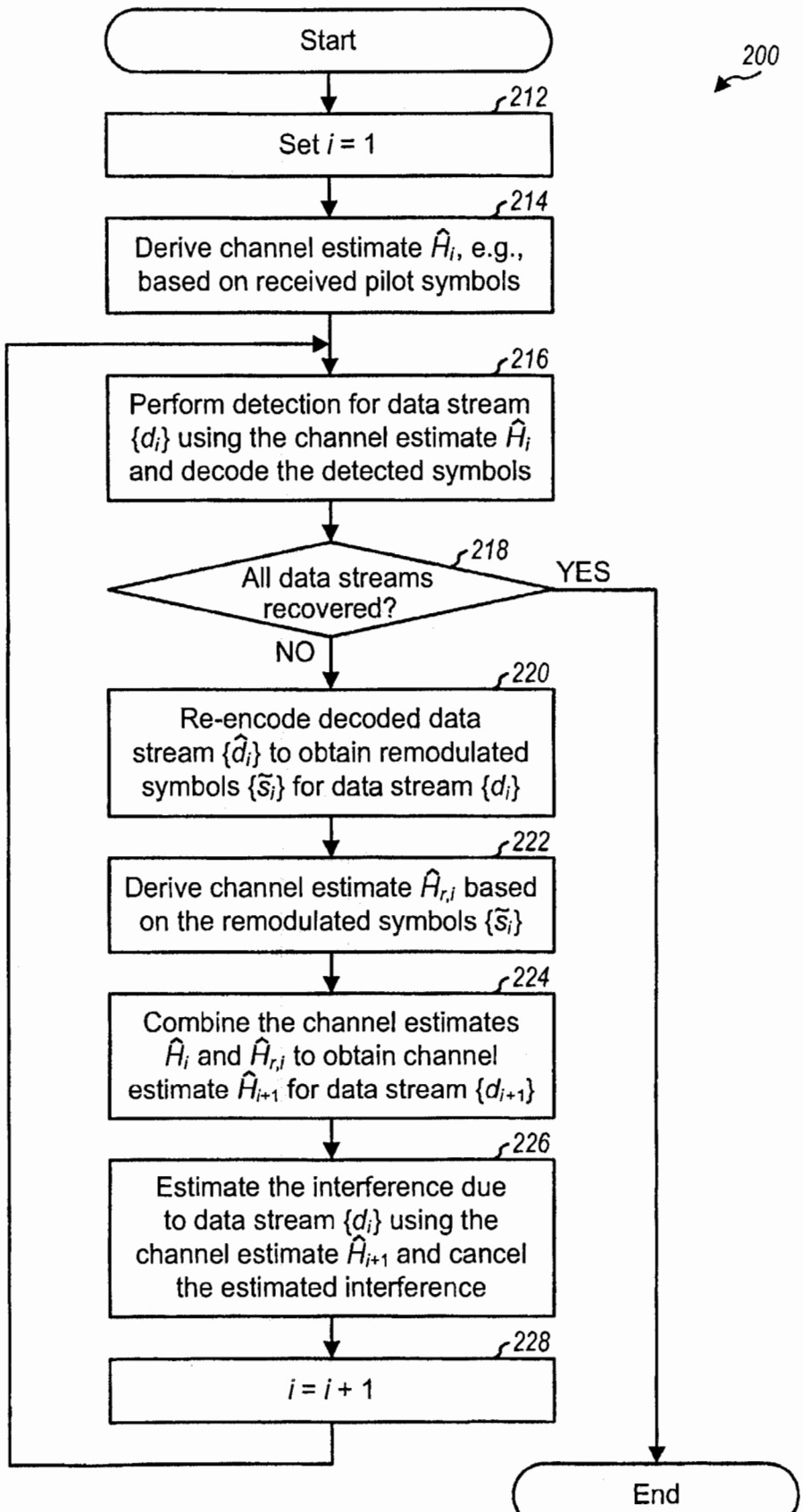

Start
200
212
Set $i = 1$
214
Derive channel estimate $\hat{H}_i$, e.g., based on received pilot symbols
216
Perform detection for data stream $\{d_i\}$ using the channel estimate $\hat{H}_i$ and decode the detected symbols
218
All data streams recovered?
YES
NO
220
Re-encode decoded data stream $\{\hat{d}_i\}$ to obtain remodulated symbols $\{\tilde{s}_i\}$ for data stream $\{d_i\}$
222
Derive channel estimate $\hat{H}_{r,i}$ based on the remodulated symbols $\{\tilde{s}_i\}$
224
Combine the channel estimates $\hat{H}_i$ and $\hat{H}_{r,i}$ to obtain channel estimate $\hat{H}_{i+1}$ for data stream $\{d_{i+1}\}$
226
Estimate the interference due to data stream $\{d_i\}$ using the channel estimate $\hat{H}_{i+1}$ and cancel the estimated interference
228
$i = i + 1$
End

Figure 2

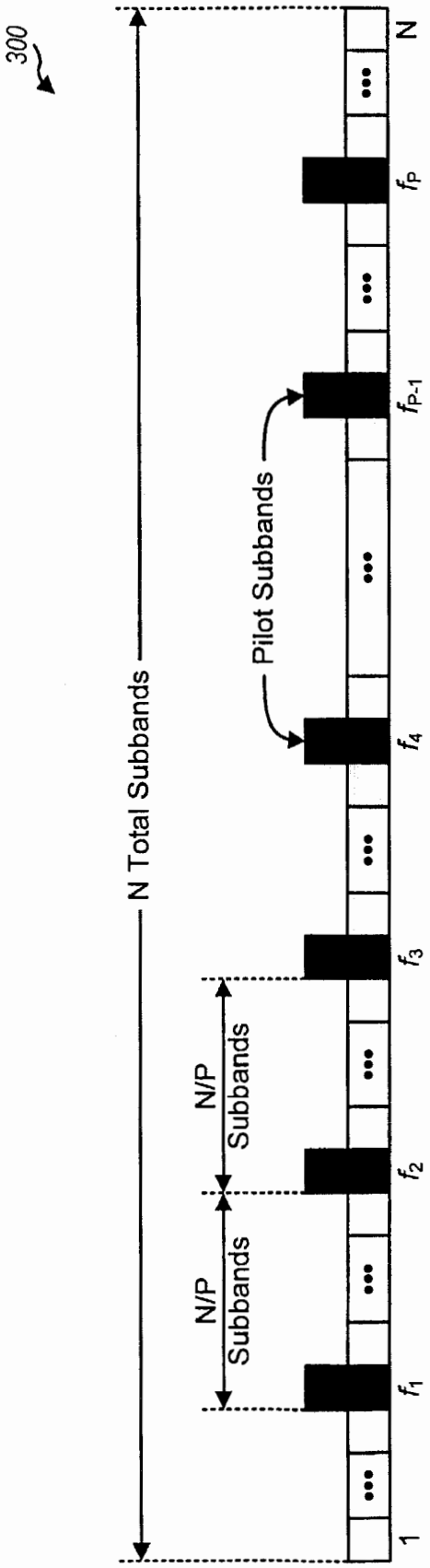

300
N Total Subbands
Pilot Subbands
N/P Subbands
N/P Subbands
1
N
f_1
f_2
f_3
f_4
f_{P-1}
f_P

Figure 3A

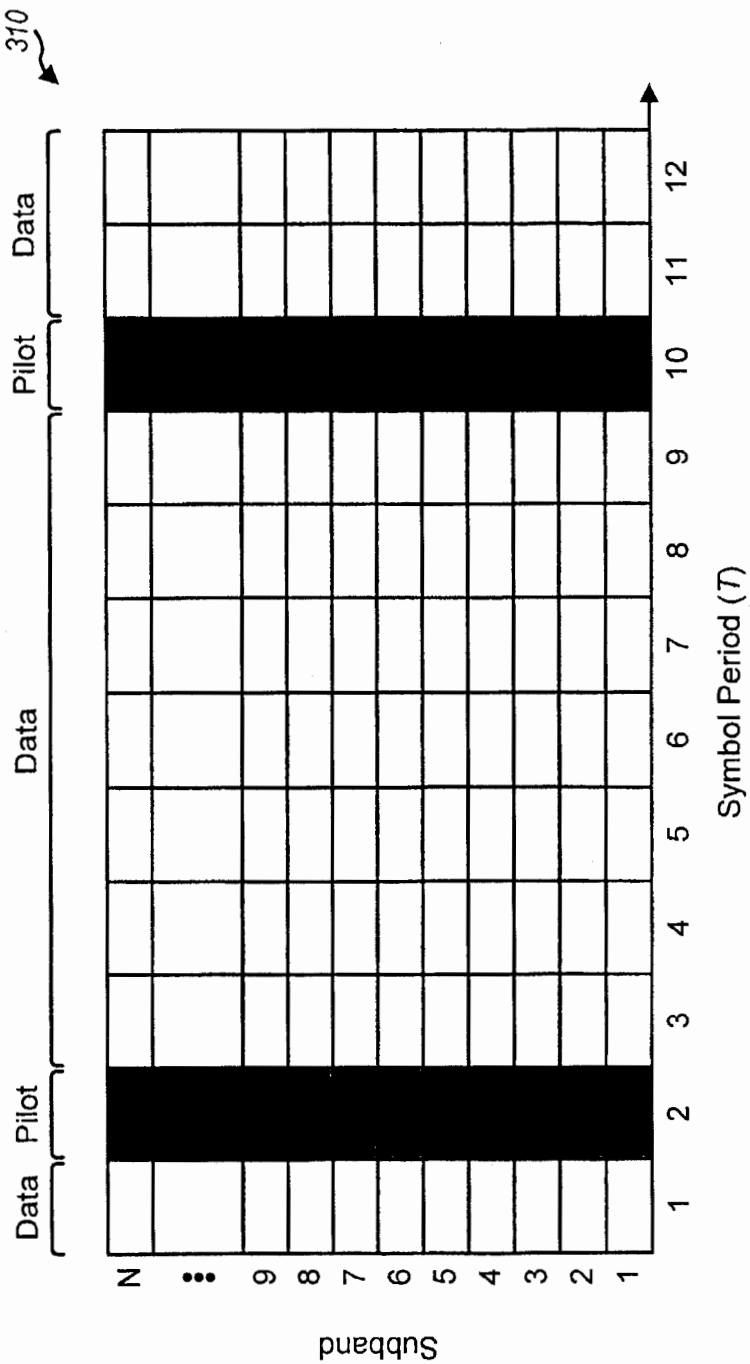

310
Data
Pilot
Data
Pilot
Data
Subband
N
•••
9
8
7
6
5
4
3
2
1
Symbol Period (T)
1
2
3
4
5
6
7
8
9
10
11
12

Figure 3B

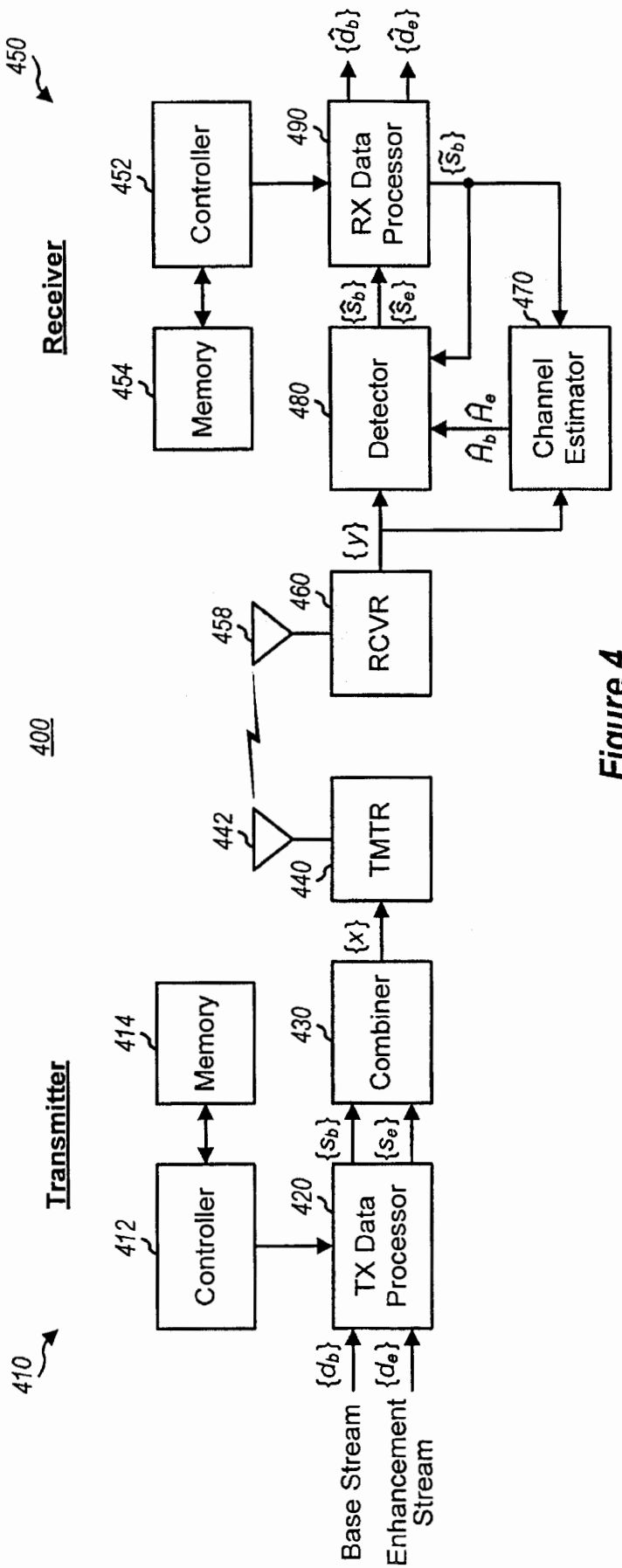

410
Transmitter
400
Receiver
450
Base Stream
Enhancement Stream
{db}
{de}
412
Controller
420
TX Data Processor
{sb}
{se}
414
Memory
430
Combiner
{x}
440
TMTR
442
458
460
RCVR
{y}
452
Controller
454
Memory
490
RX Data Processor
{ŝb}
{ŝe}
{s̃b}
{d̂b}
{d̂e}
480
Detector
Ab
Ae
470
Channel Estimator

Figure 4

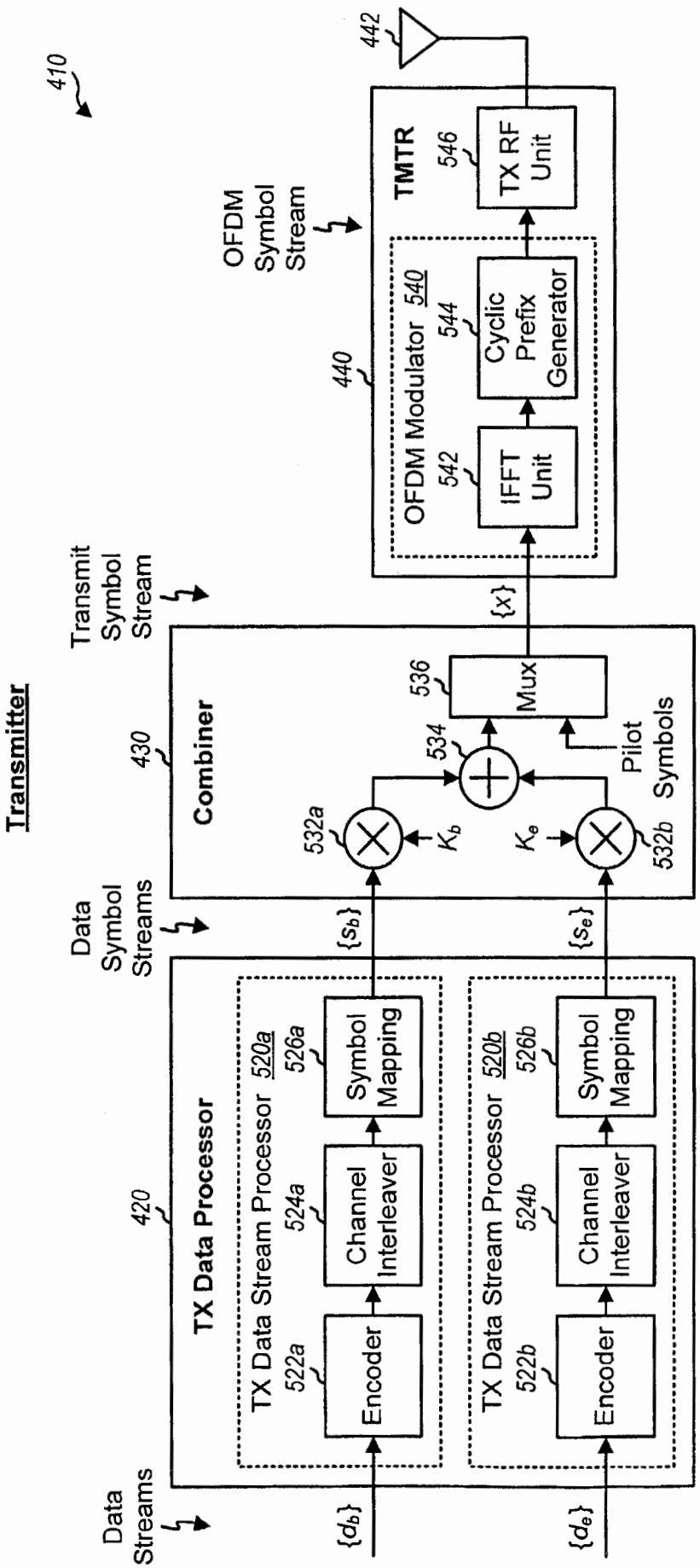

Transmitter
410
Data Streams
{d_b}
{d_e}
TX Data Processor
420
TX Data Stream Processor 520a
522a Encoder
524a Channel Interleaver
526a Symbol Mapping
TX Data Stream Processor 520b
522b Encoder
524b Channel Interleaver
526b Symbol Mapping
Data Symbol Streams
{s_b}
{s_e}
Combiner
430
532a
K_b
K_e
532b
534
536 Mux
Pilot Symbols
Transmit Symbol Stream
{x}
OFDM Symbol Stream
440
OFDM Modulator 540
542 IFFT Unit
544 Cyclic Prefix Generator
TMTR
546 TX RF Unit
442

Figure 5

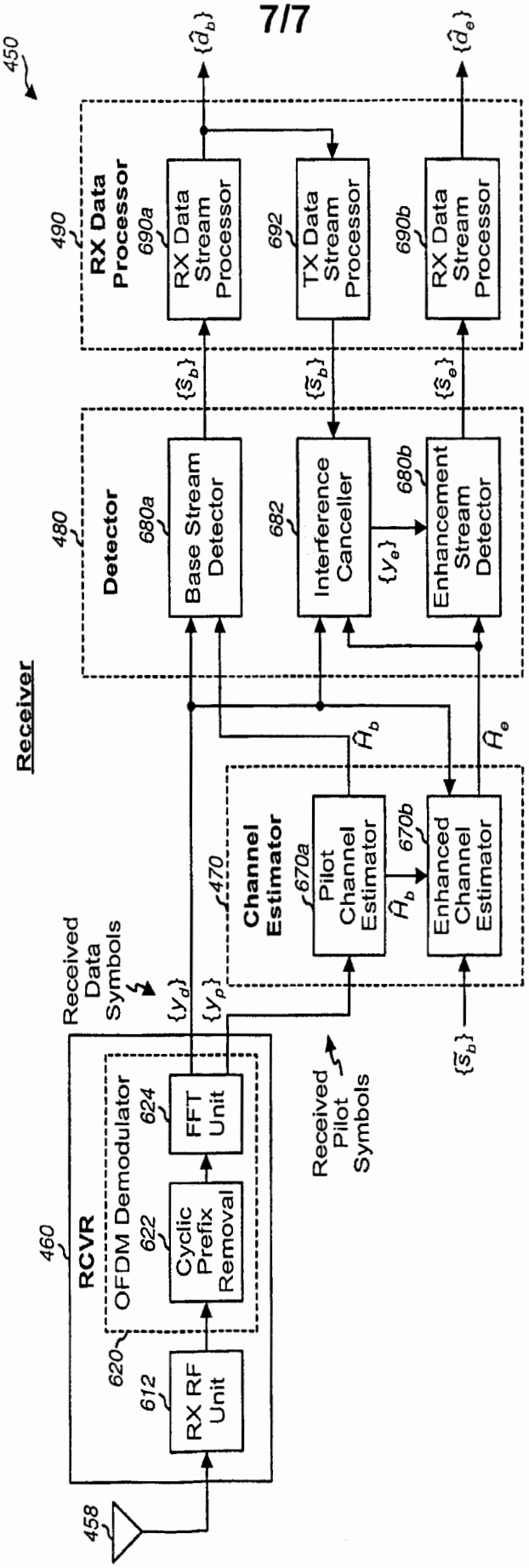

450
Receiver
458
460
RCVR
620
OFDM Demodulator
612
RX RF Unit
622
Cyclic Prefix Removal
624
FFT Unit
Received Data Symbols
$\{y_d\}$
$\{y_p\}$
470
Channel Estimator
670a
Pilot Channel Estimator
670b
Enhanced Channel Estimator
$\hat{A}_b$
$\hat{A}_e$
Received Pilot Symbols
$\{\tilde{s}_b\}$
480
Detector
680a
Base Stream Detector
682
Interference Canceller
$\{y_e\}$
680b
Enhancement Stream Detector
$\{\tilde{s}_b\}$
$\{\tilde{s}_b\}$
$\{\tilde{s}_e\}$
490
RX Data Processor
690a
RX Data Stream Processor
692
TX Data Stream Processor
690b
RX Data Stream Processor
$\{\hat{d}_b\}$
$\{\hat{d}_e\}$

Figure 6