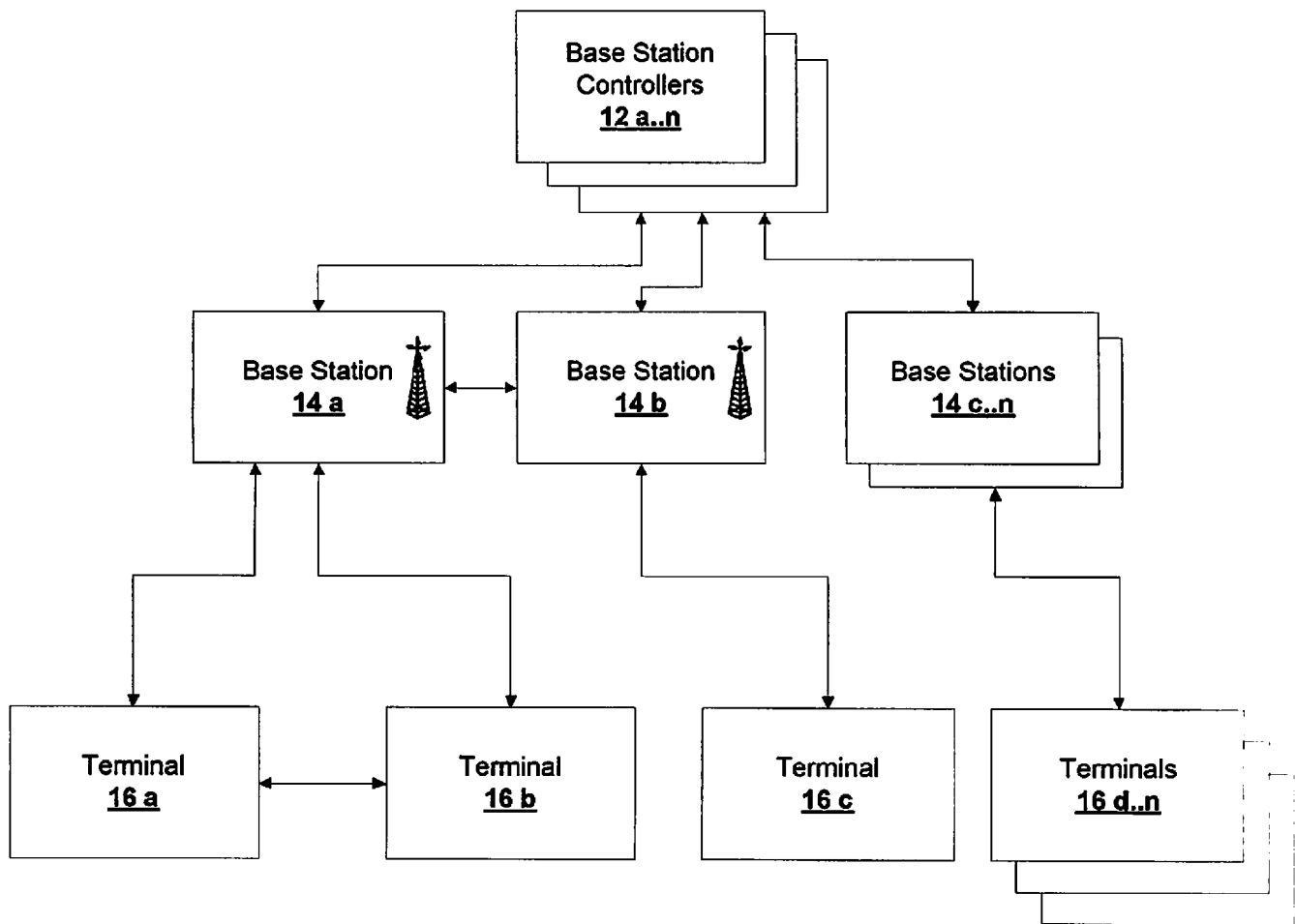


**FIG. 1**

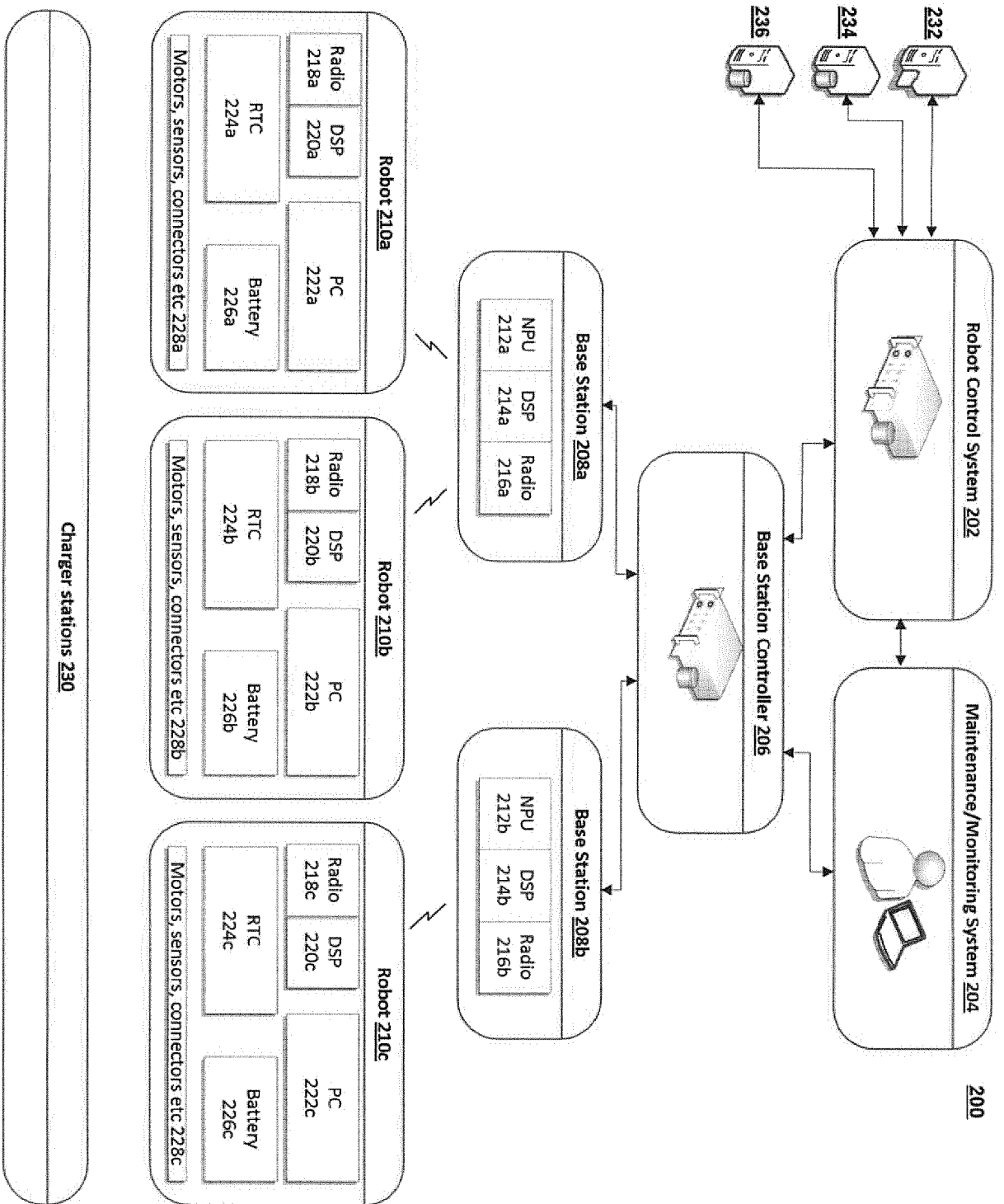
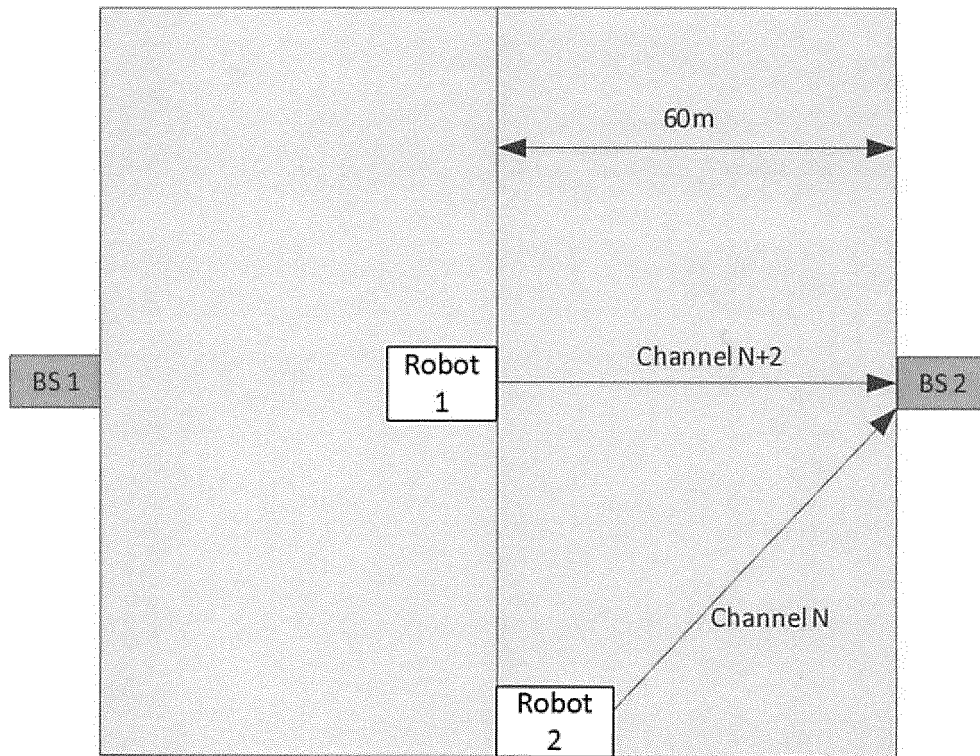


FIG. 2

**FIG. 3**

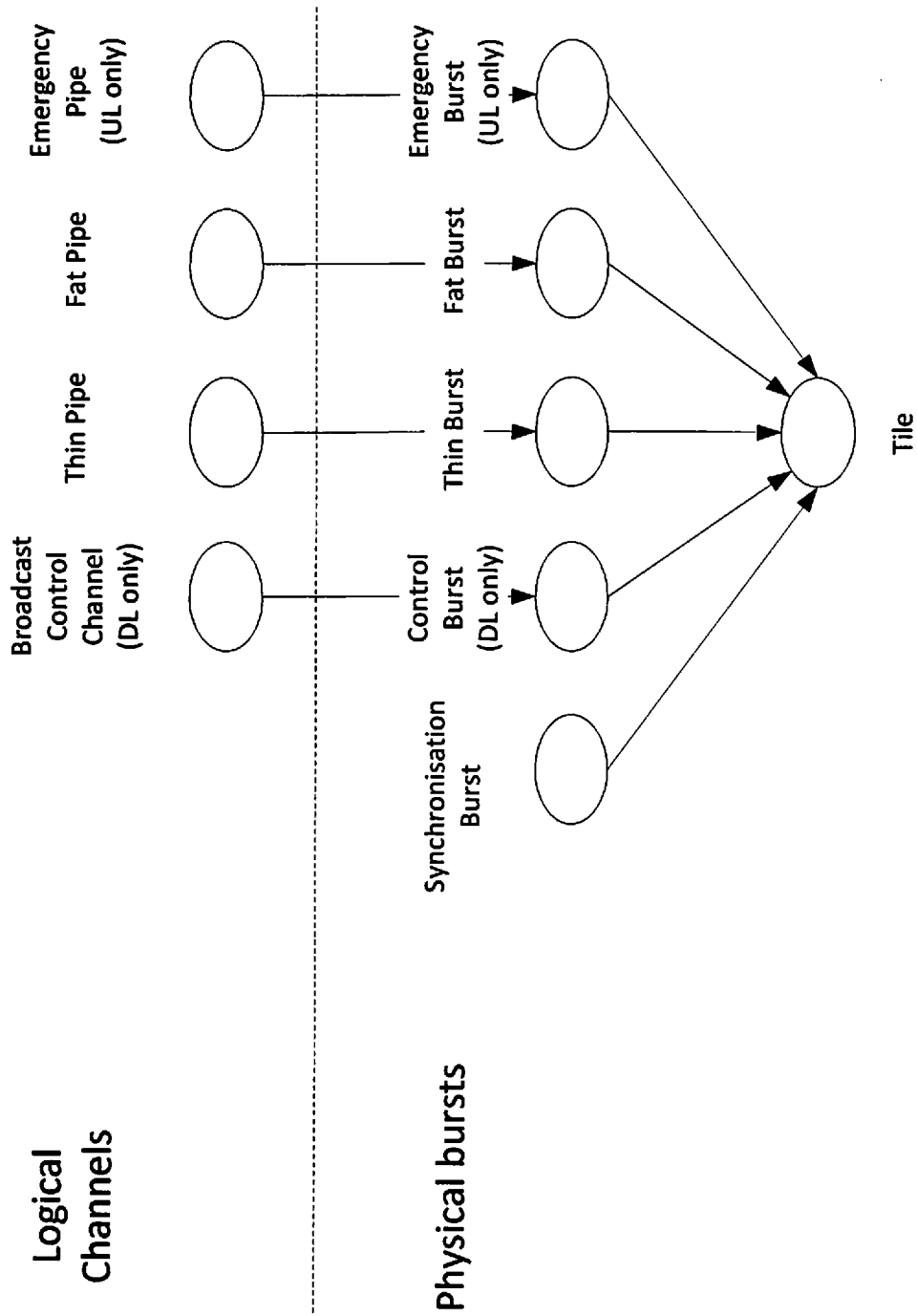


FIG. 4

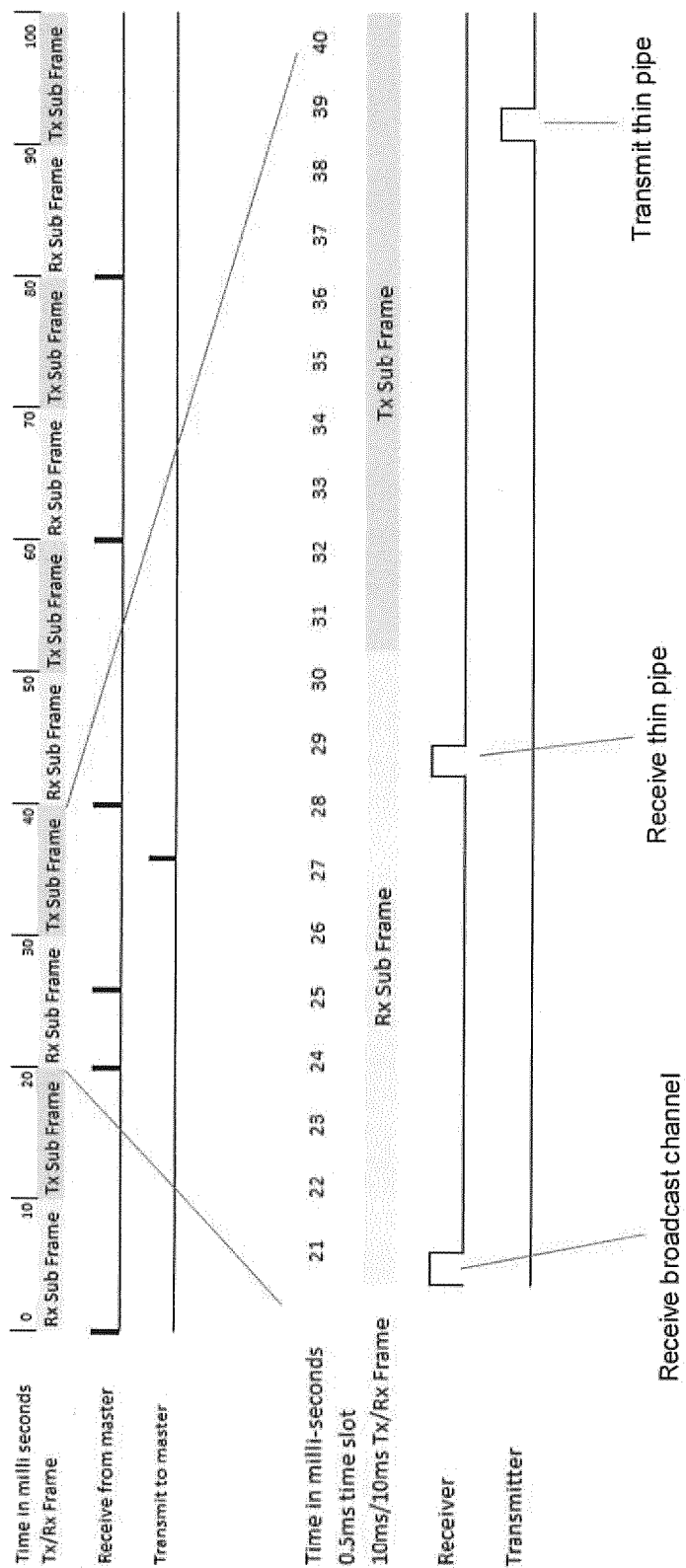
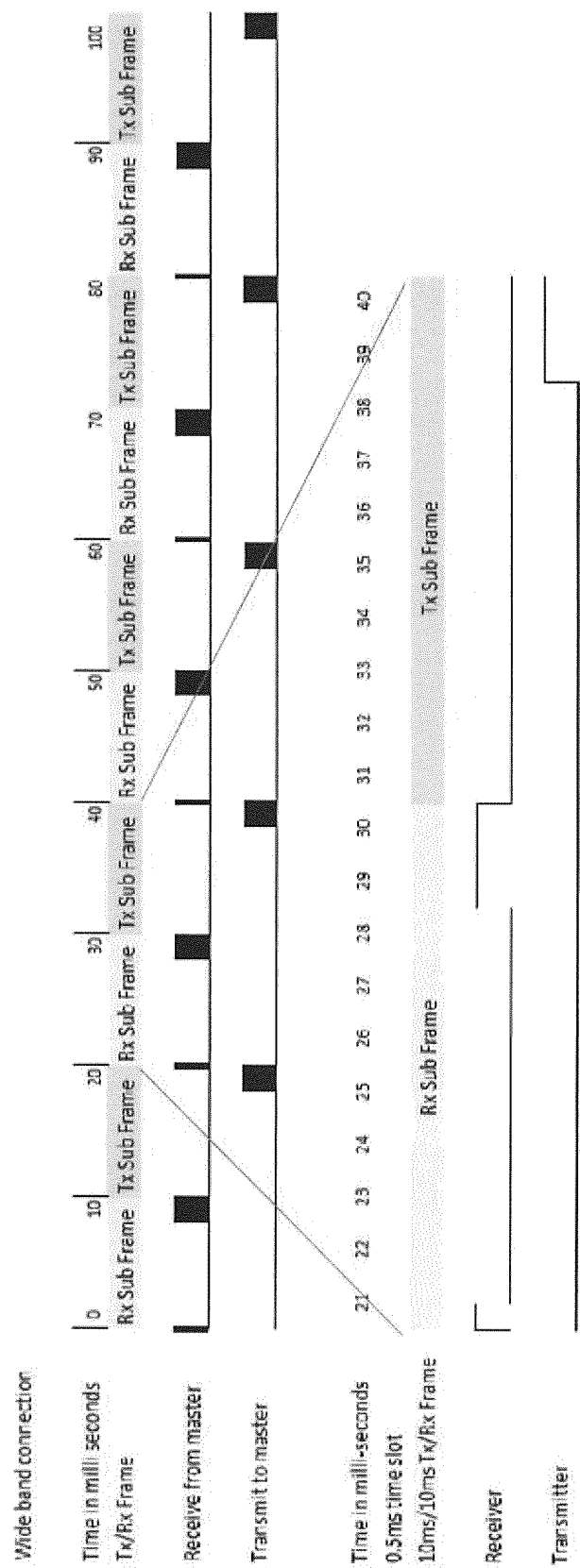


FIG. 5a



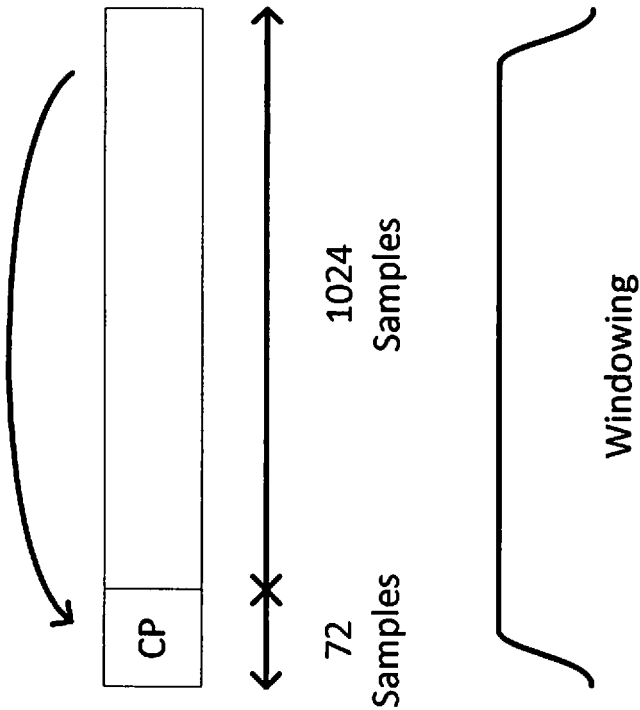


FIG. 6

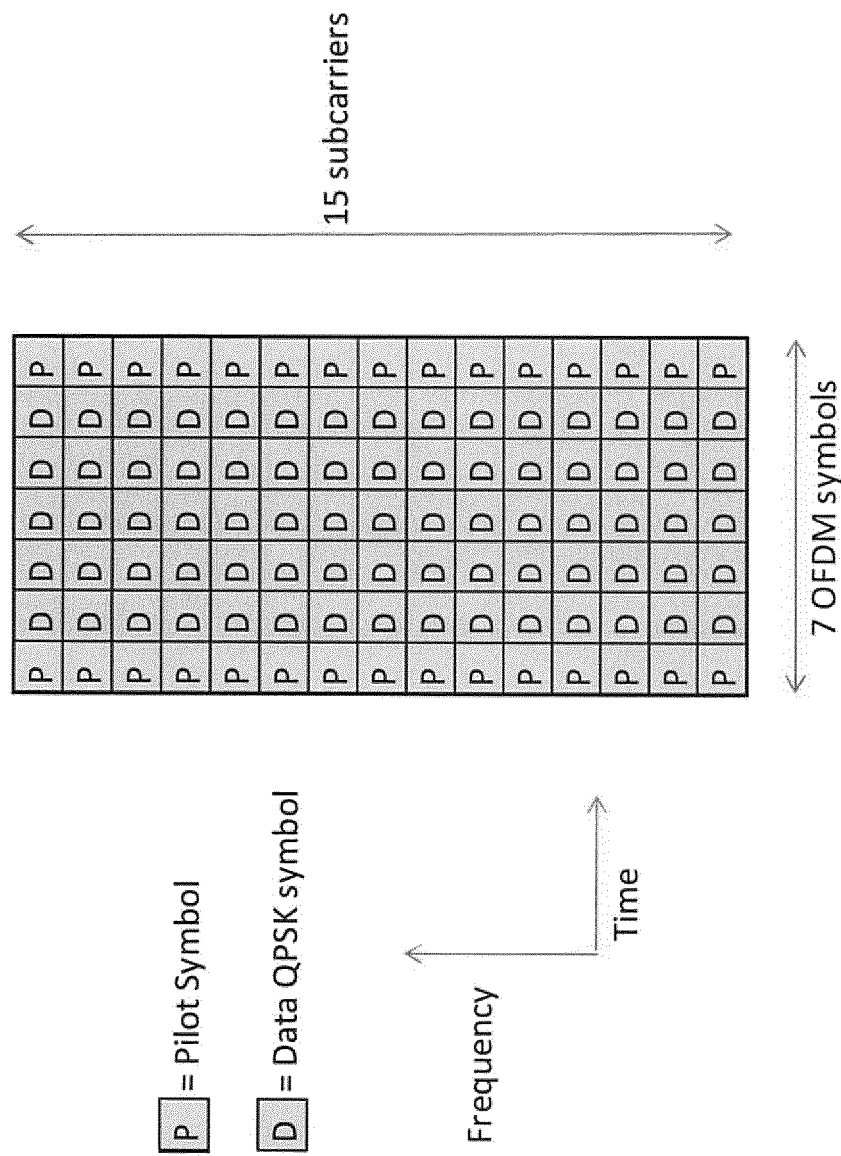


FIG. 7

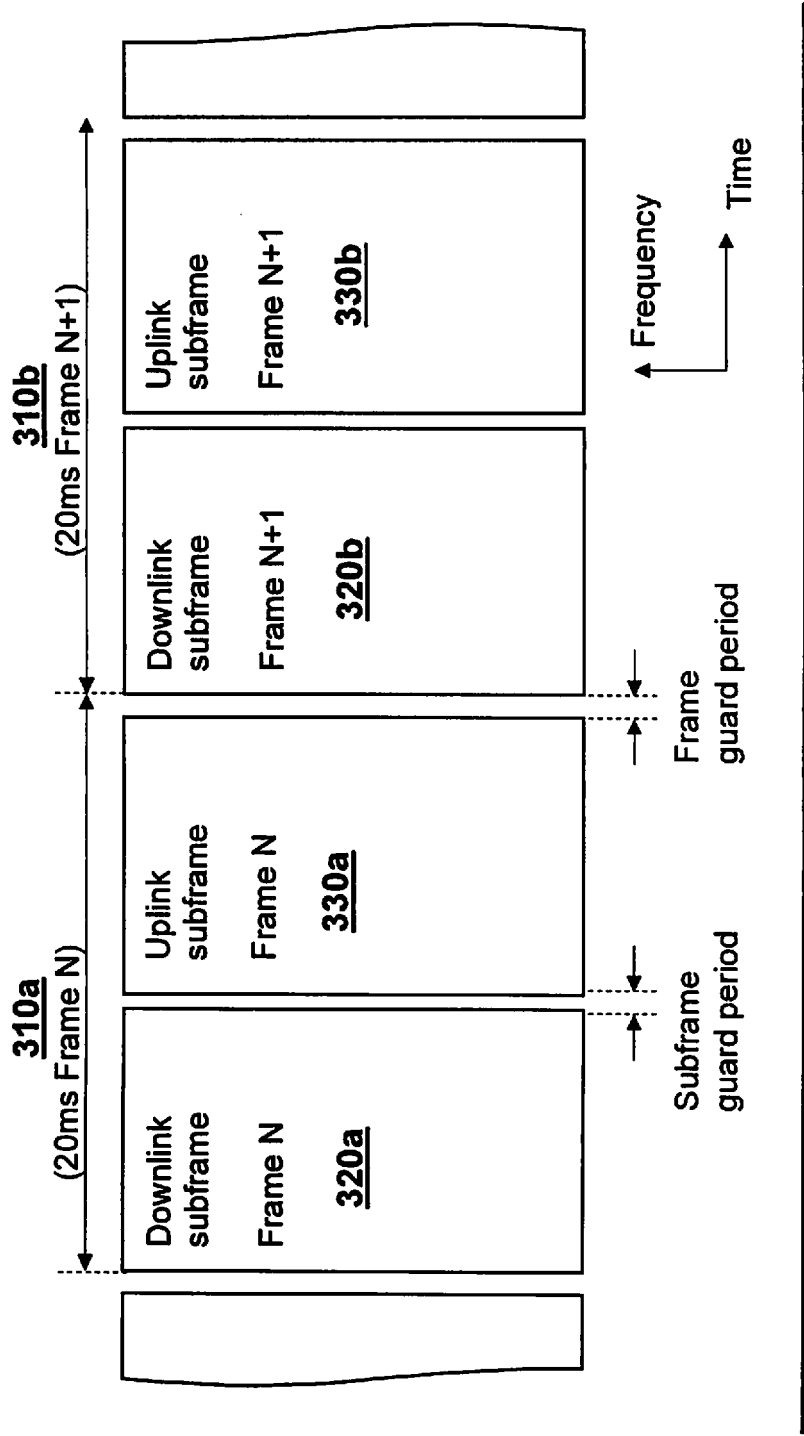
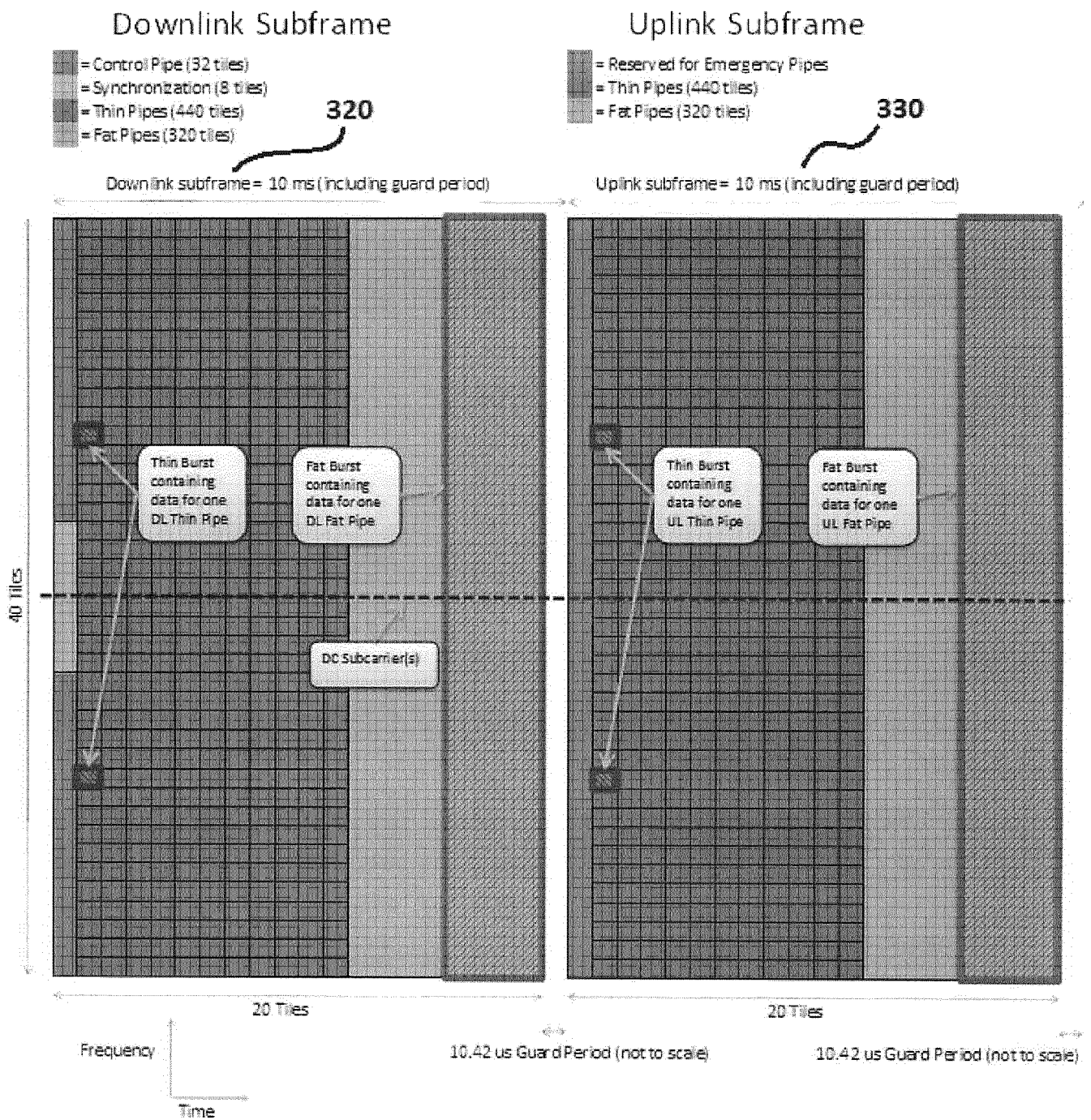
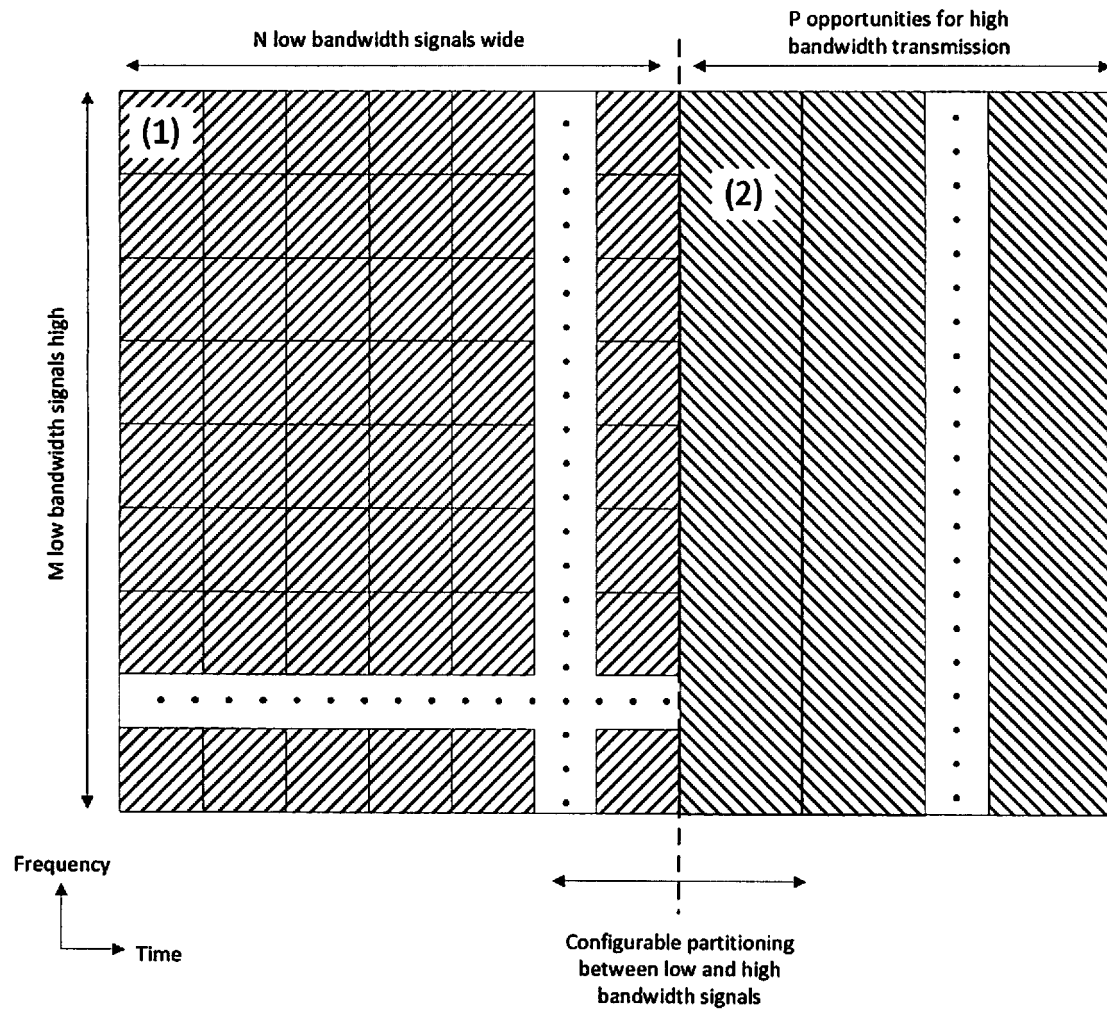
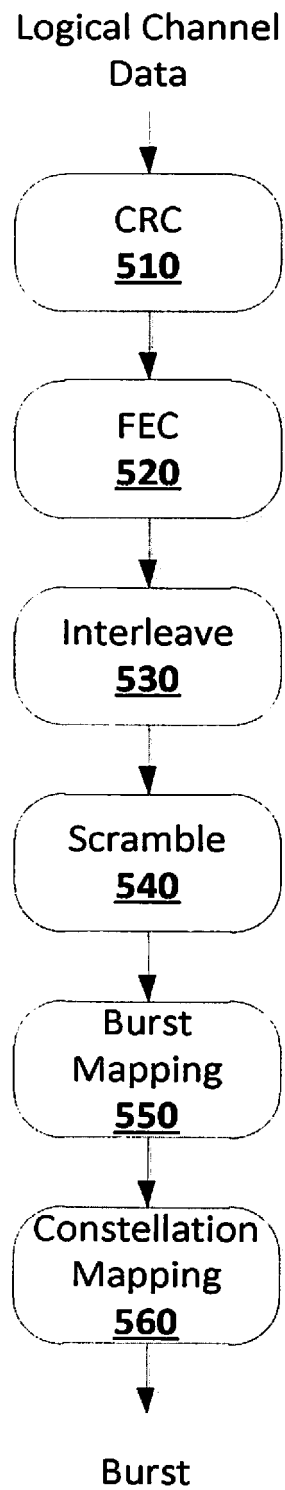
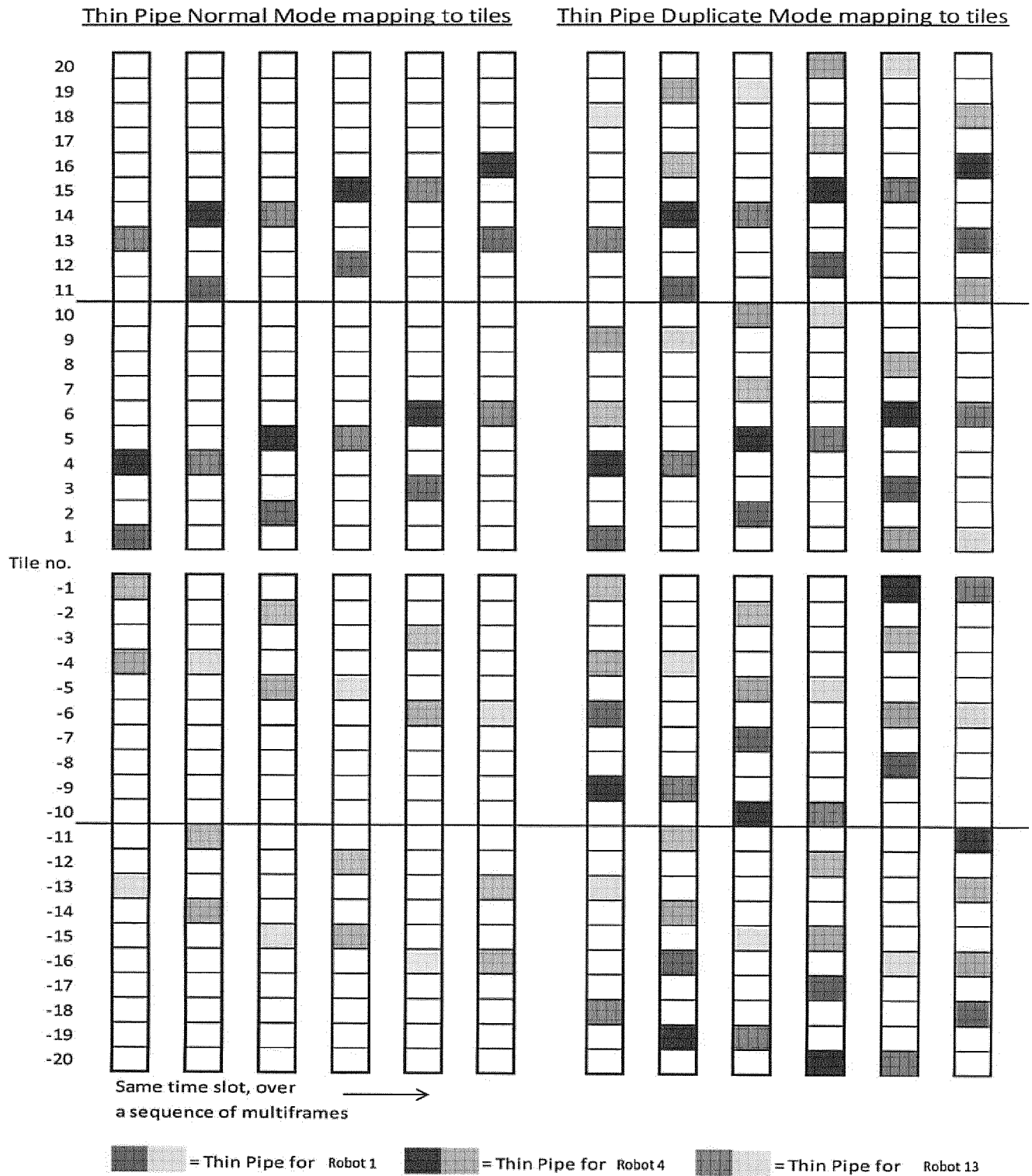


FIG. 8

**FIG. 9a**

**FIG. 9b**

**FIG. 10**

**FIG. 11**

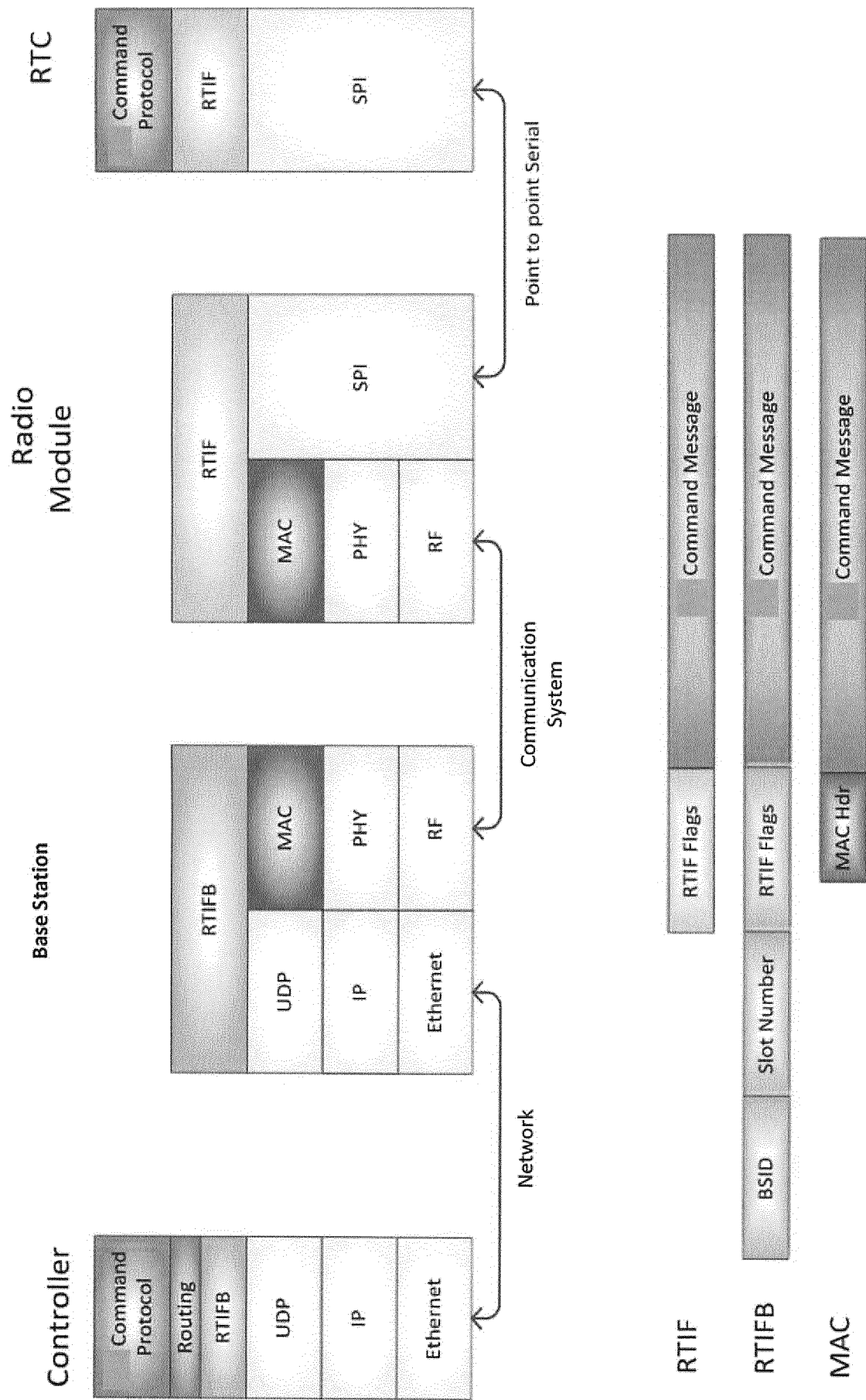


FIG. 12

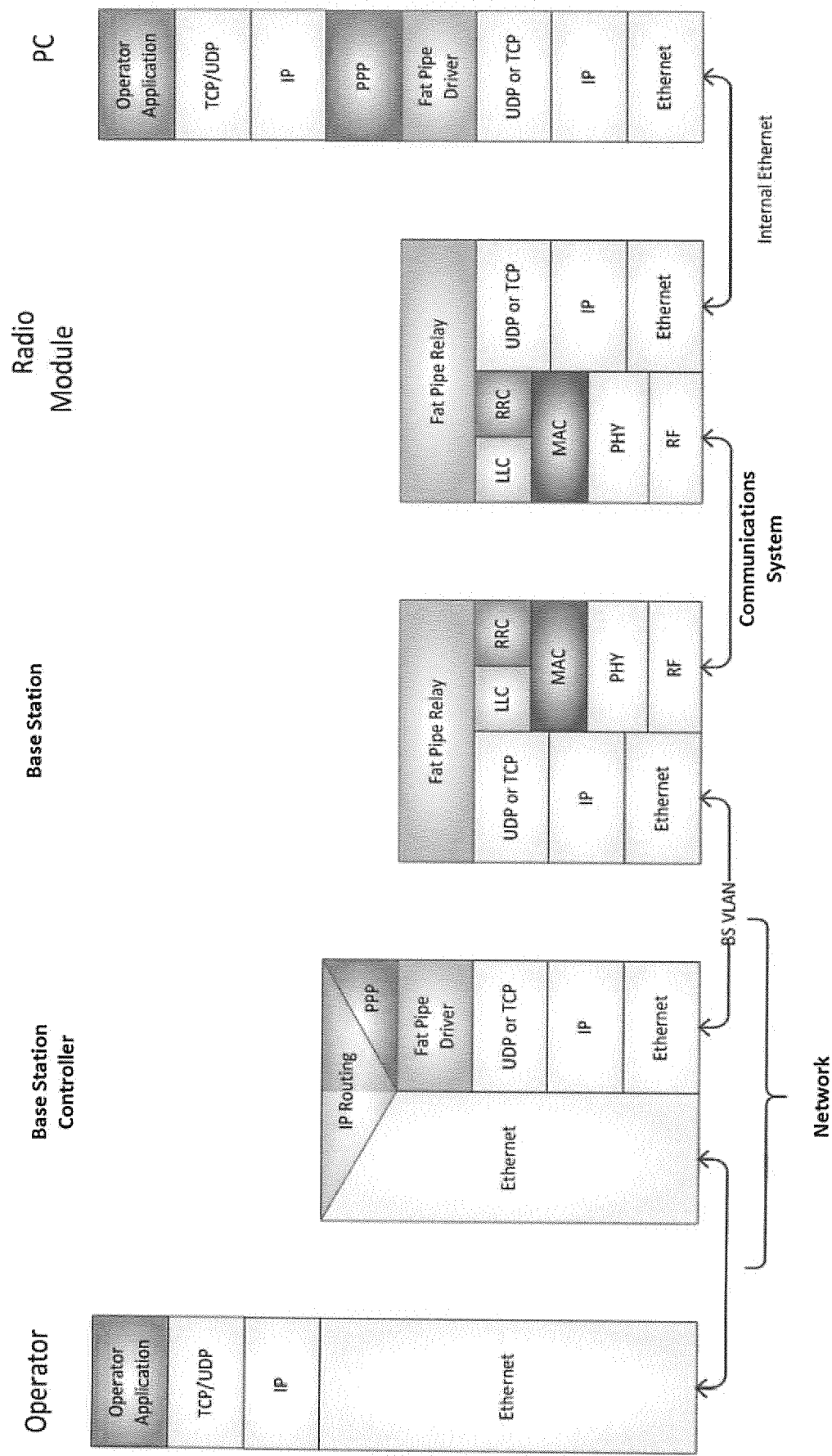
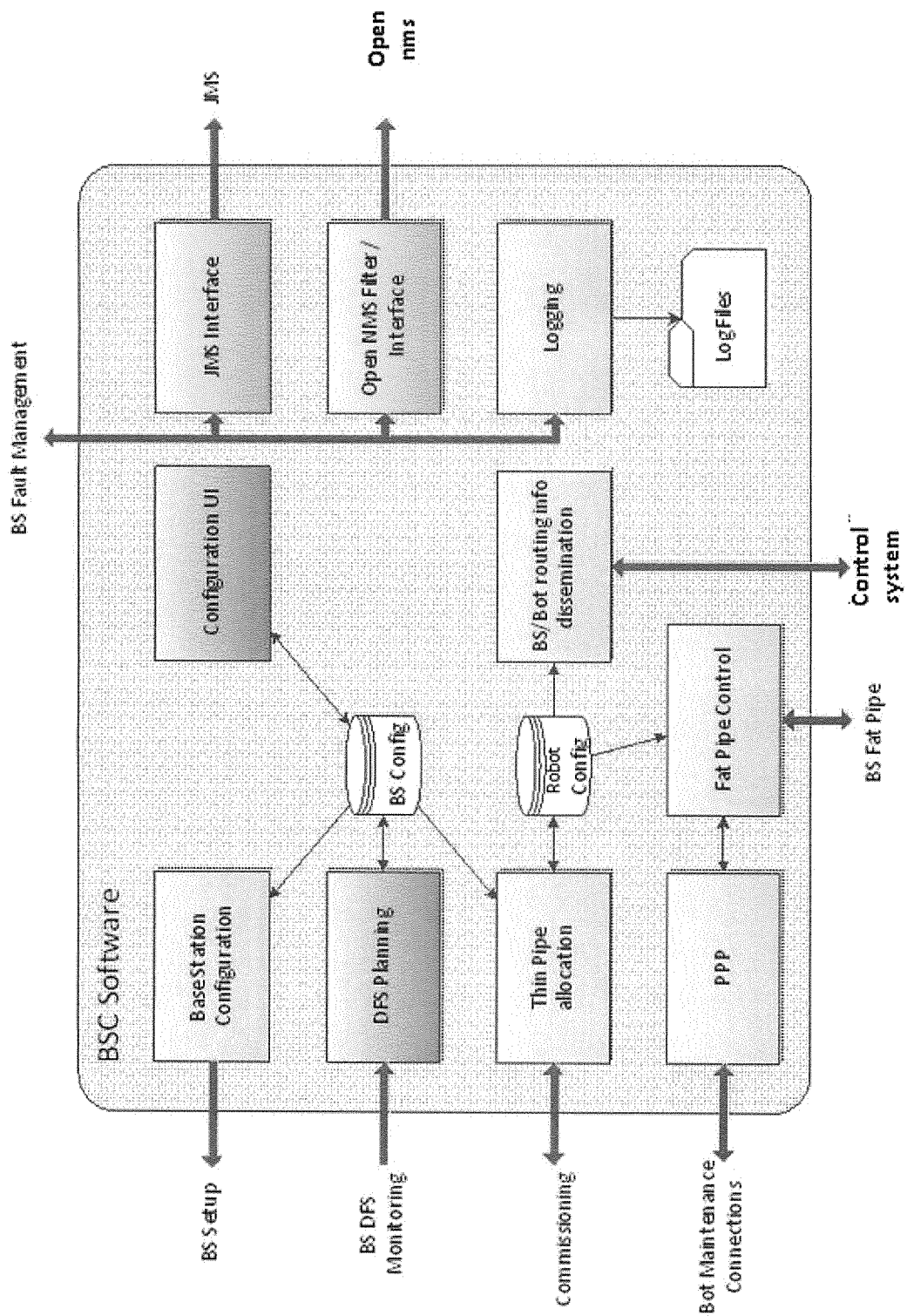


FIG. 13

**FIG. 14**

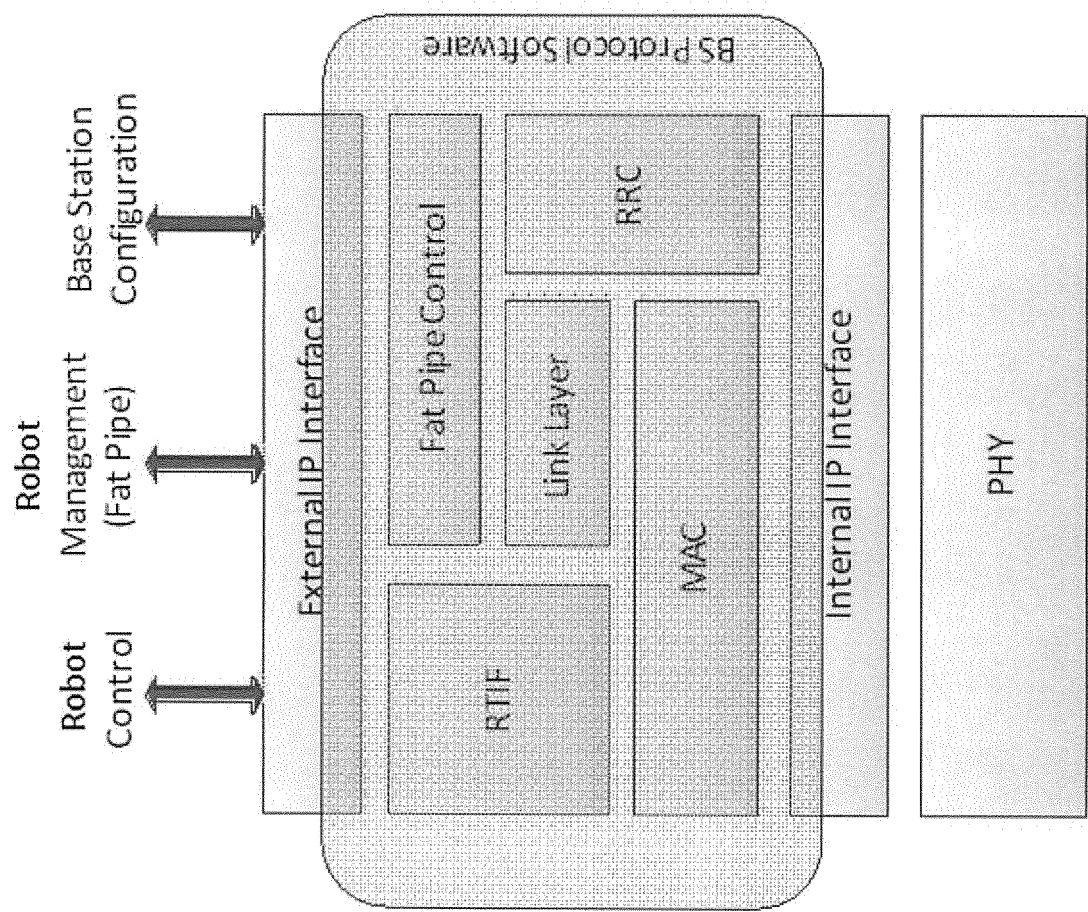


FIG. 15a

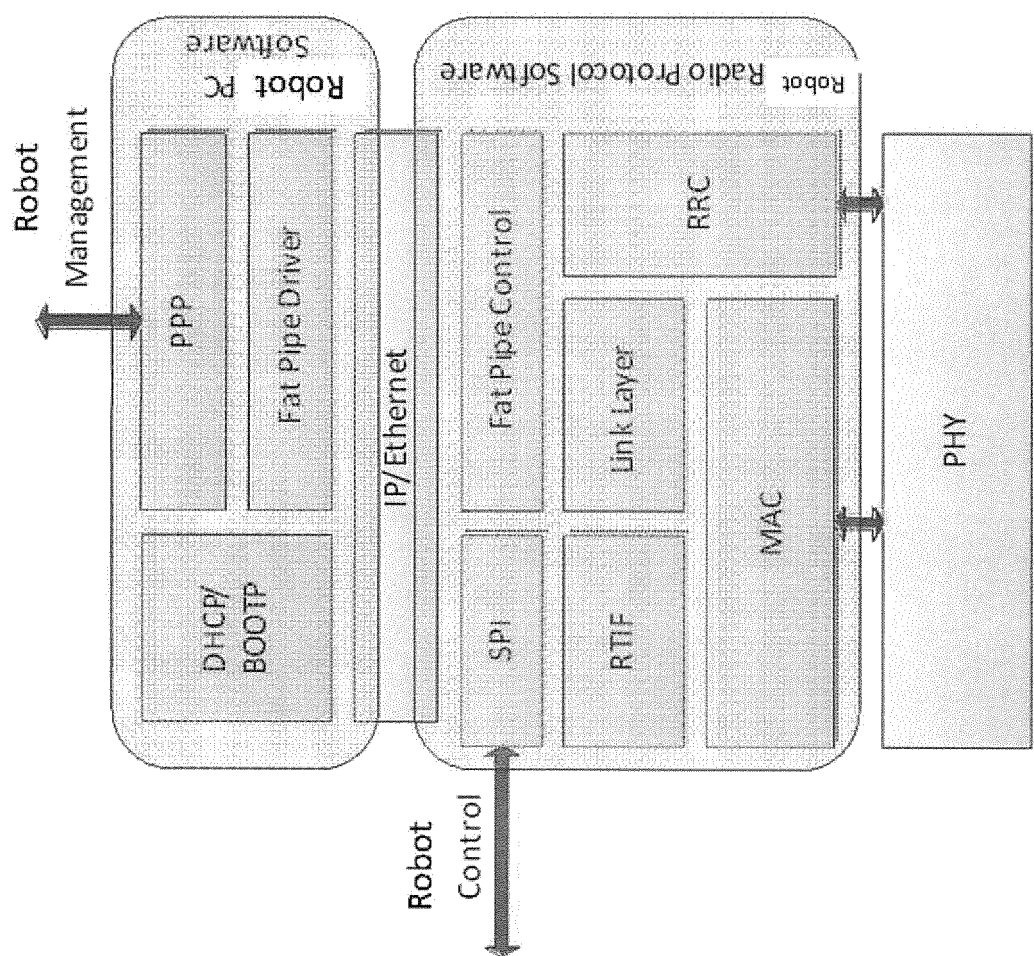


FIG. 15b

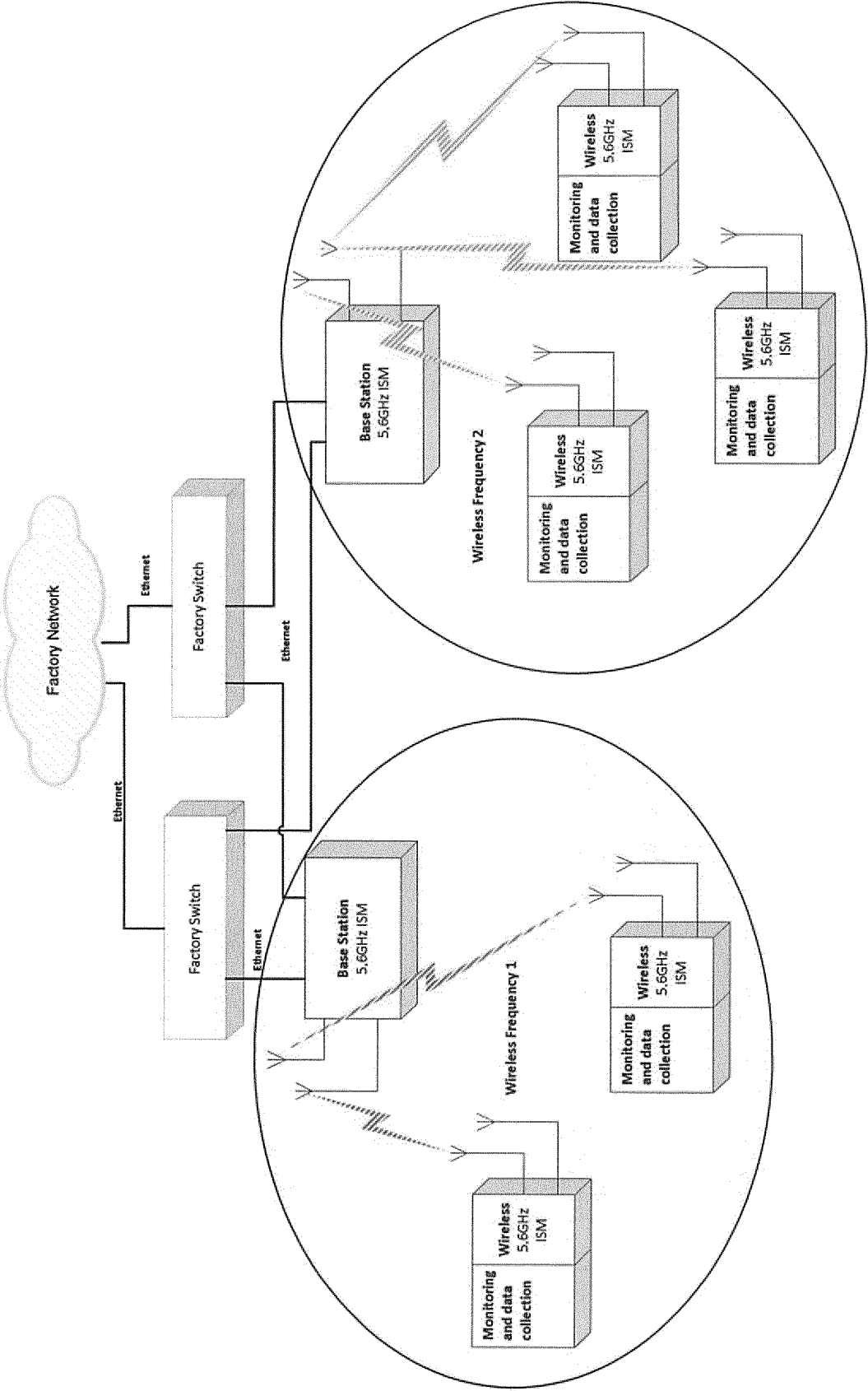


FIG. 16

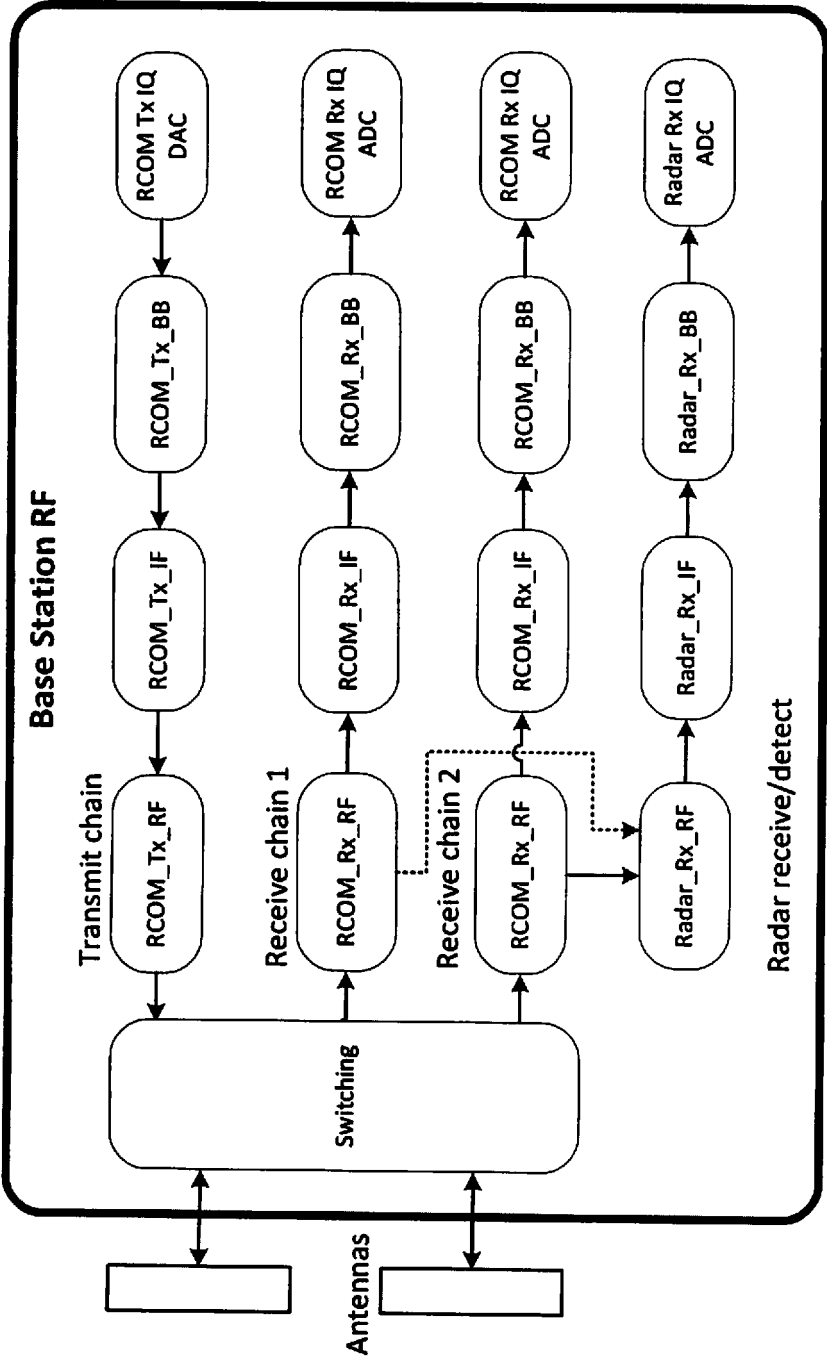


FIG. 17

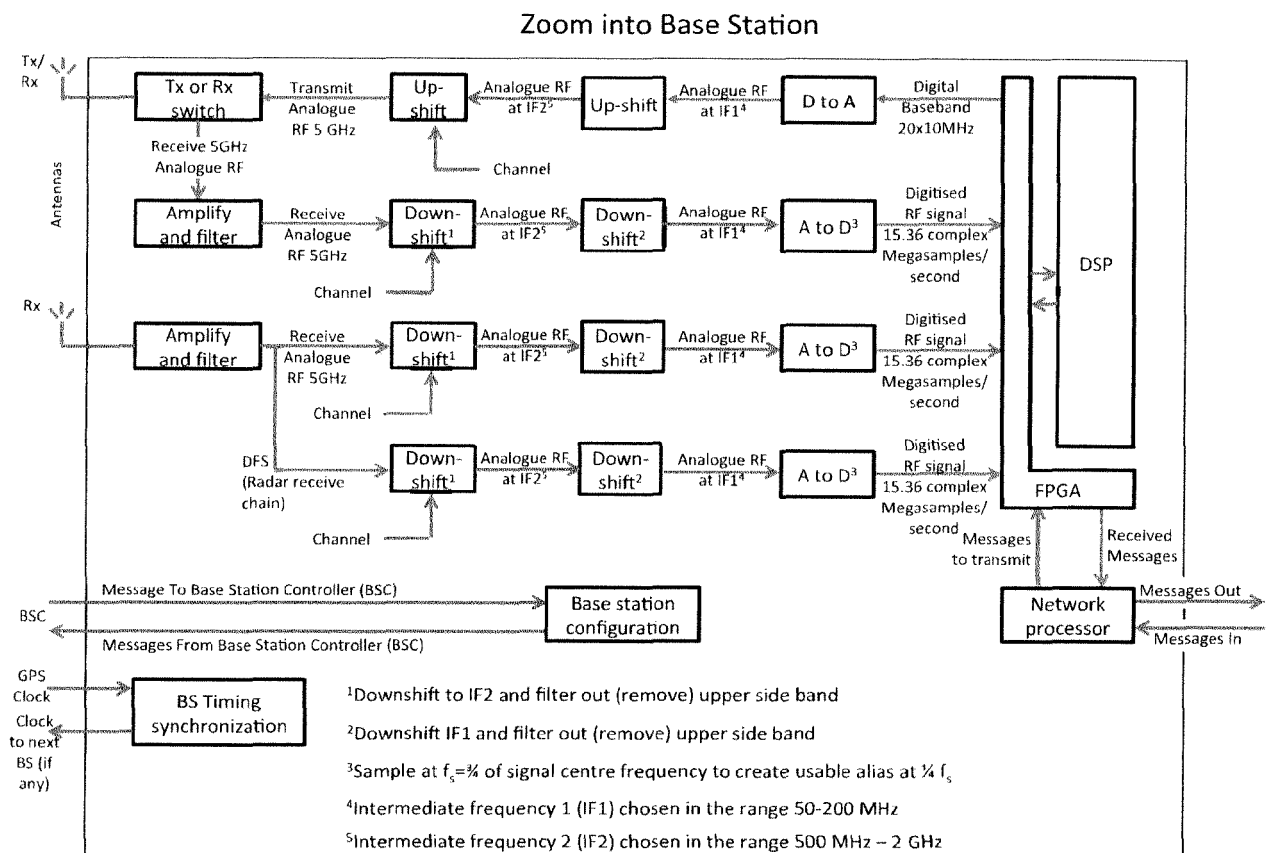


FIG. 17A

Estimated Uplink Max Signal Level

Frequency	5800.00 MHz	
Tx Power	6.50 dBm	The transmitter must produce at least this power Power setting tolerance Assuming 0dBi 10dBm/MHz and we are -3.5dB down for 450kHz assuming we are using uplink power control. Transmitting at least this but no more than 6.5
Testing tolerance	0.00 dB	
Tx Antenna Gain	0.00 dBi	
EIRP	6.50 dBm	
Range	1.00 m	Assumed closest distance
Mean Path Loss	-47.71 dB	Assumed Line Of Site
Fading/Diversity Gain/Other Interference	0.00 dB	Assumes no fading
Receiver Antenna Gain	18.00 dBi	Assumes highest gain on boresight
Received Signal Level	-23.21 dBm	At antenna connector

FIG. 18

Estimated Uplink Minimum Signal Level

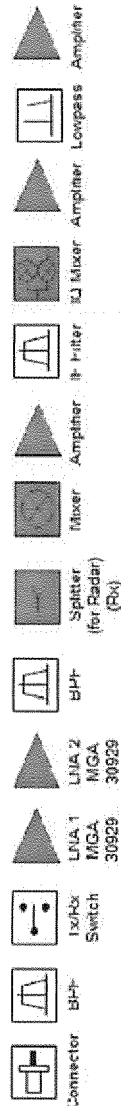
Frequency	5800.00 MHz	
Tx Power	6.50 dBm	The transmitter must produce at least this power Power setting tolerance Assuming 0dBi 10dBm/MHz and we are -3.5dB down for 450kHz assuming we are using uplink power control. Transmitting at least this but no more than 6.5
Testing tolerance	-1.50 dB	
Tx Antenna Gain	0.00 dBi	
EIRP	5.00 dBm	
Range	135.00 m	Assumed at the corner of the grid Assumed Line Of Site Assumes -10dB down after MRC
Mean Path Loss	-90.31 dB	
Fading/Diversity Gain/Other Interference	-10.00 dB	
Receiver Antenna Gain	9.00 dBi	Assumes the minimum BS antenna gain
Received Signal Level	-86.31 dBm	
Thermal Noise	-174.00 dBm/Hz	450kHz Bandwidth Estimate
Bandwidth	56.53 dBHz	
Noise Figure	8.00 dB	
Noise power	-109.47 dBm/Hz	
Required CNR	8.50 dB	From Mathcad calculation Approximately, receiver must receive this
Receiver sensitivity	-100.97 dB	
Achieved CNR	23.16 dB	
Margin	14.66 dB	

FIG. 19

Base Station Receive Chain

Version 0.0 / Fraser Edwards

DRAFT under Development



Individual Stage Values

Stage gain min tolerance	-1.0	-1.5	-1.5	7.5	7.5	-1.5	-4.0	5.0	9.0	-4.0	4.0	7.0	-5.0	4.0 dB
Stage gain NOMINAL	-1.0	-1.0	-0.5	8.0	8.0	-1.0	-4.0	6.0	10.0	-6.0	5.0	8.0	-4.0	4.0 dB
Stage gain max tolerance	-1.0	-0.8	-0.4	8.5	8.5	-0.8	-4.0	7.0	11.0	-6.5	6.0	9.0	-3.0	4.0 dB
Stage NF min tolerance gain	1.0	1.5	1.5	2.5	2.5	1.5	4.0	11.7	6.0	4.0	11.0	6.0	5.0	6.0 dB
Stage noise figure NOMINAL	1.0	1.0	0.6	2.0	2.0	1.0	4.0	11.7	6.0	6.0	11.0	6.0	4.0	6.0 dB
Stage NF max tolerance gain	1.0	0.8	0.4	1.6	1.6	0.8	4.0	11.7	6.0	6.5	11.0	6.0	3.0	6.0 dB
Stage OIP3 min tolerance gain	100.0	100.0	39.0	35.0	35.0	100.0	100.0	24.0	25.0	100.0	14.0	24.0	100.0	20.0 dBm
Stage OIP3 NOMINAL	100.0	100.0	39.0	35.0	35.0	100.0	100.0	25.0	25.0	100.0	15.0	24.0	100.0	20.0 dBm
Stage OIP3 max tolerance gain	100.0	100.0	39.0	35.0	35.0	100.0	100.0	26.0	25.0	100.0	16.0	24.0	100.0	20.0 dBm
Approx. stage P1dB min tol gain	100.0	100.0	27.0	22.0	22.0	100.0	100.0	11.0	10.0	100.0	10.0	20.0	100.0	20.0 dBm
Approx. stage P1dB NOMINAL	100.0	100.0	27.0	22.0	22.0	100.0	100.0	11.0	10.0	100.0	10.0	20.0	100.0	20.0 dBm
Approx. stage P1dB max tol gain	100.0	100.0	27.0	22.0	22.0	100.0	100.0	11.0	10.0	100.0	10.0	20.0	100.0	20.0 dBm

Cumulative Stage Values

Cum gain min tolerance	-1.0	-1.5	-3.0	4.5	12.0	10.5	20.5	15.5	24.5	16.5	20.5	27.5	22.5	26.5 dB
Cumulative gain NOMINAL	-1.0	-1.0	-1.5	6.6	11.6	13.5	26.6	19.6	29.6	19.6	21.6	32.6	28.6	32.6 dB
Cum gain max tolerance	1.0	0.8	1.2	7.3	15.8	15.0	29.0	22.0	33.0	22.5	28.5	37.5	34.5	38.6 dB
Cum NF min tolerance gain	1.0	2.5	3.7	5.9	6.2	6.2	7.4	7.4	7.4	7.4	7.6	7.7	7.7	7.7 dB
Cumulative NF NOMINAL	1.0	2.0	2.4	4.1	4.3	4.3	5.3	5.2	5.3	5.3	5.4	5.4	5.4	5.5 dB
Cum NF max tolerance gain	1.0	1.8	2.1	3.5	3.6	3.6	4.4	4.4	4.4	4.4	4.5	4.5	4.5	4.5 dB
Cum OIP3 min tolerance gain	100.0	96.2	39.0	34.7	34.2	32.7	20.3	23.8	24.3	16.3	13.1	18.6	13.6	15.6 dBm
Cumulative OIP3 NOMINAL	100.0	96.5	39.0	31.7	31.3	33.3	20.6	21.8	21.6	11.6	13.7	19.7	15.7	16.8 dBm
Cum OIP3 max tolerance gain	100.0	96.6	39.0	34.8	34.4	33.6	20.7	26.9	24.7	14.2	14.5	20.8	17.8	17.8 dBm
Cum IP3 min tolerance gain	101.0	97.7	42.0	30.2	22.2	22.2	-0.2	8.3	-0.2	-0.2	-7.4	-0.9	-0.9	-10.9 dBm
Cumulative IP3 NOMINAL	101.0	97.5	40.5	26.2	19.8	19.8	-4.9	5.3	-4.9	-4.9	-10.8	-12.8	-12.8	-15.7 dBm
Cum IP3 max tolerance gain	101.0	97.4	40.2	27.5	18.6	18.6	-8.3	3.9	-8.3	-8.3	-13.9	-16.7	-16.7	-20.7 dBm

Signal Levels & Headroom

Signal Levels & Headroom															Voltage on a 200 Ohm load	
Antenna Connector Signal Level																
Cumulative level min tolerance gain	-107.0	-108.0	-109.5	-111.0	-103.5	-96.0	-87.5	-92.5	-83.5	-91.5	-87.5	-80.5	-85.5	-81.5 dBm	0.04 mVrms	
Cumulative level NOMINAL	-107.0	-108.0	-109.0	-109.5	-101.5	-93.5	-82.5	-88.5	-78.5	-88.5	-83.5	-75.5	-79.5	-75.5 dBm	0.08 mVrms	
Cumulative level max tolerance gain	-107.0	-108.0	-108.8	-109.2	-100.7	-92.2	-79.0	-86.0	-75.0	-85.5	-79.5	-70.5	-73.5	-69.5 dBm	0.15 mVrms	
Cumulative level min tolerance gain	-23.0	-24.0	-25.5	-27.0	-19.5	-12.0	-13.5	-8.5	0.5	-7.5	-3.5	3.5	-1.5	2.5 dBm	595.37 mVrms	
Cumulative level NOMINAL	-23.0	-24.0	-25.0	-25.5	-17.5	-9.5	-10.5	-1.5	5.5	-1.5	0.5	8.5	1.5	8.5 dBm	1189.91 mVrms	
Cumulative level max tolerance gain	-23.0	-24.0	-24.8	-25.2	-16.7	-8.2	9.0	2.0	9.0	1.5	4.5	13.5	10.5	14.5 dBm	2374.19 mVrms	

FIG. 20

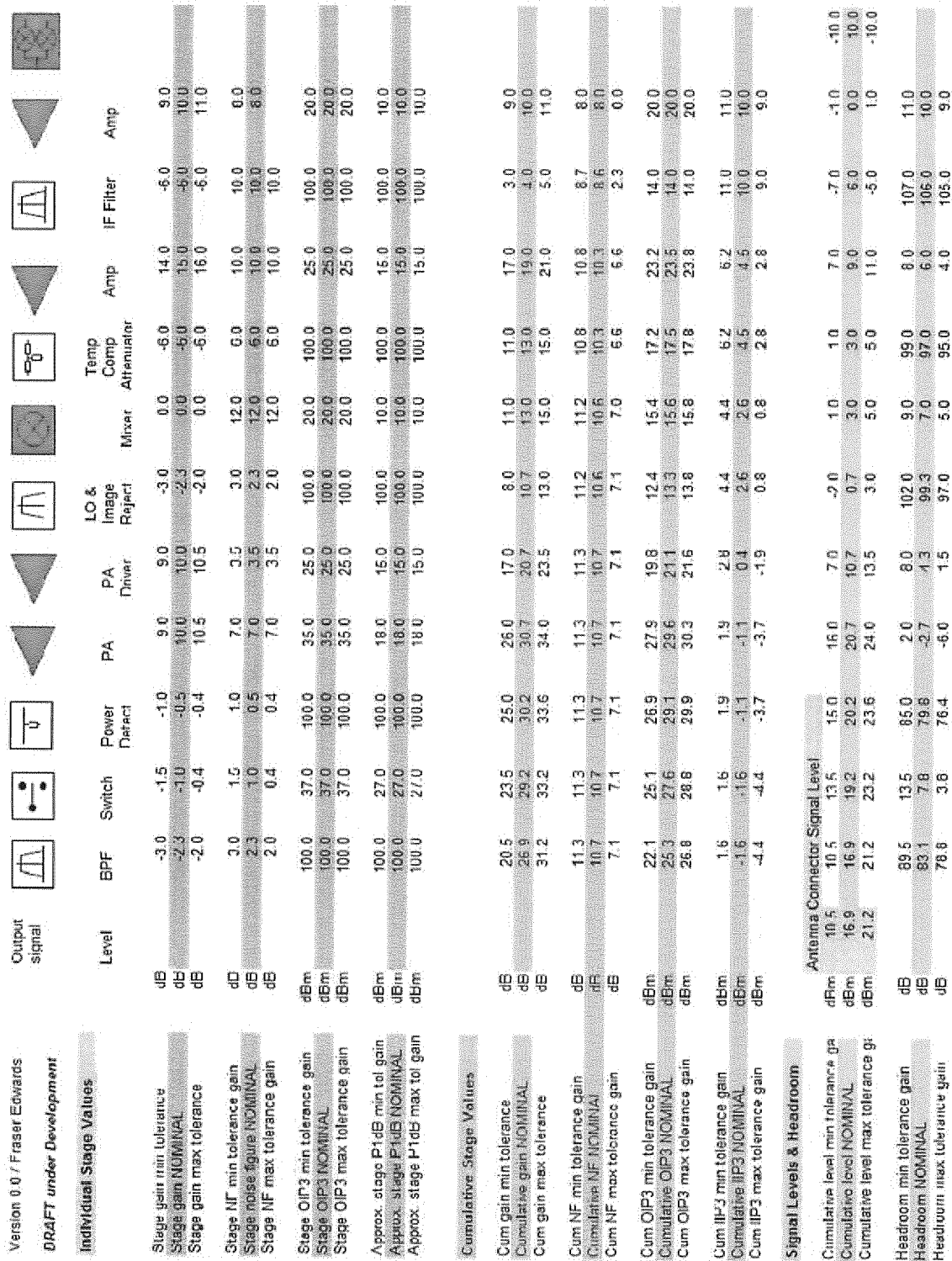
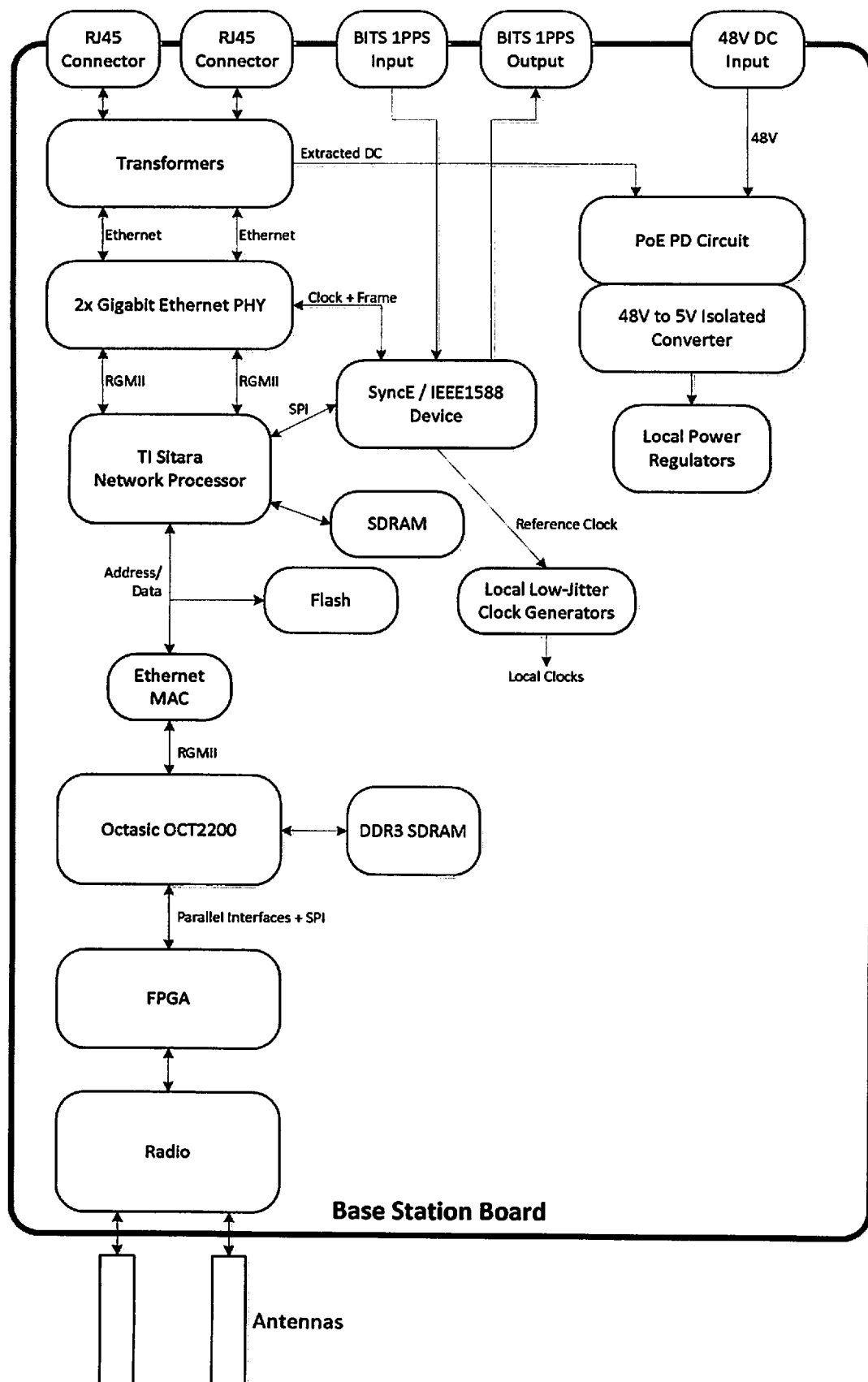
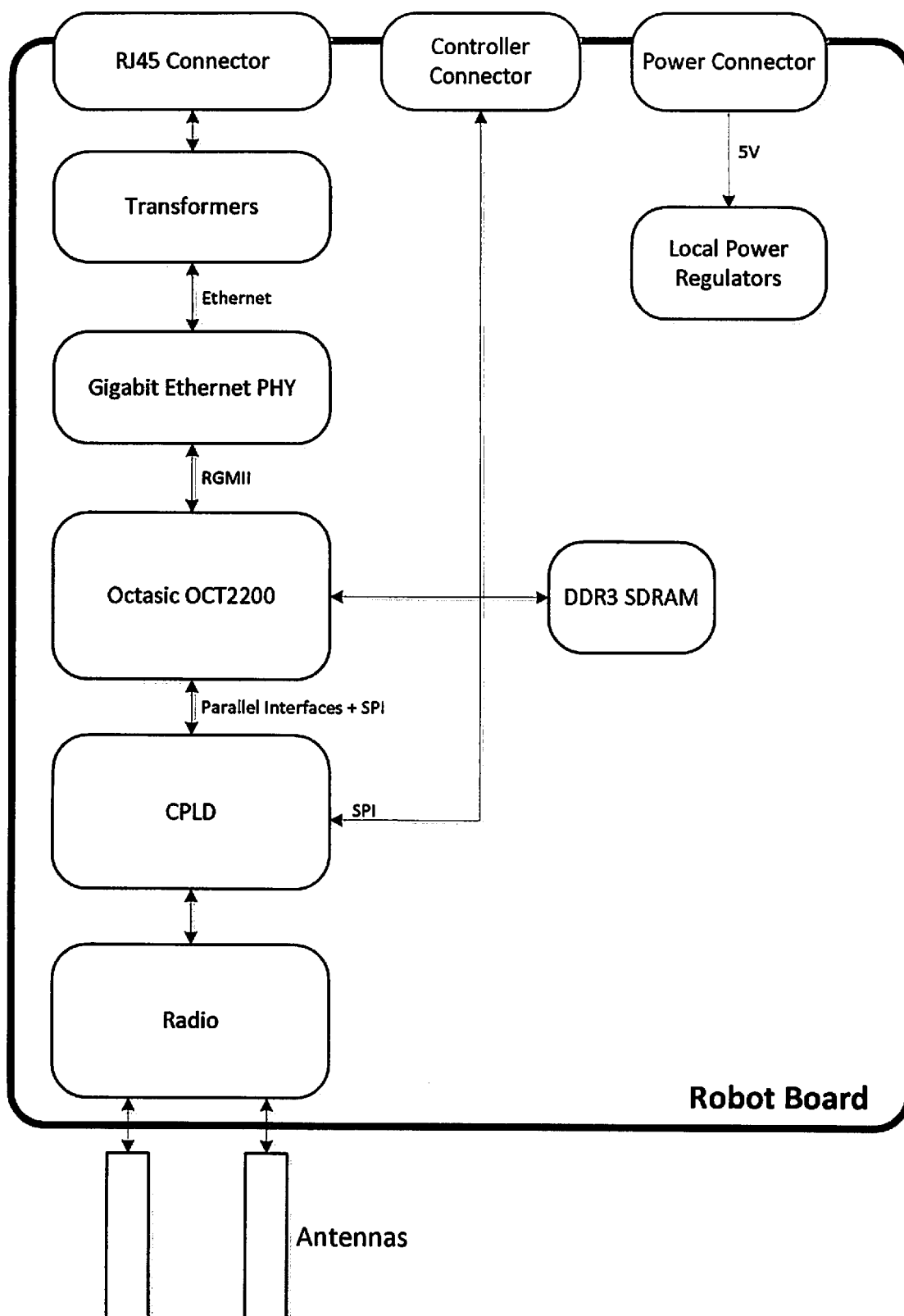


FIG. 21

**FIG. 22**

**FIG. 23**

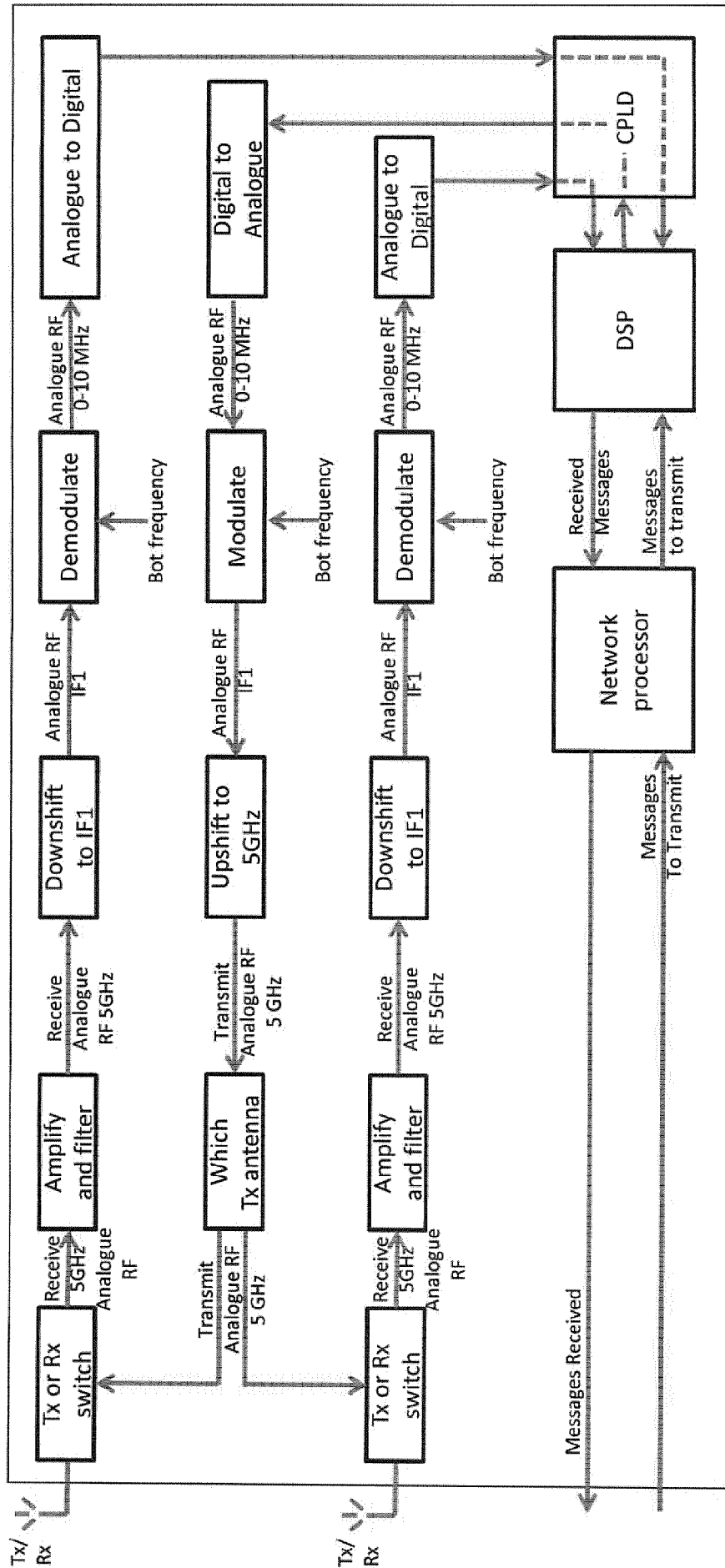
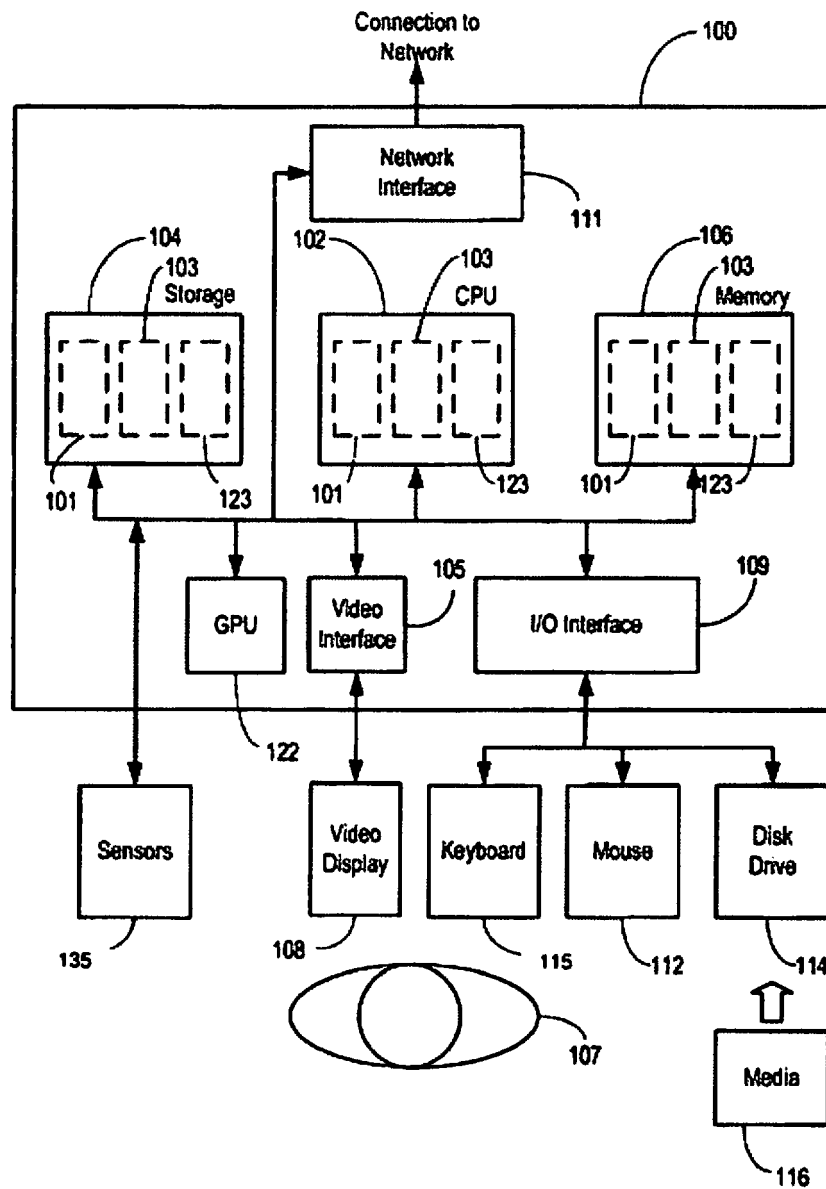


FIGURE 23A

**FIG. 24**