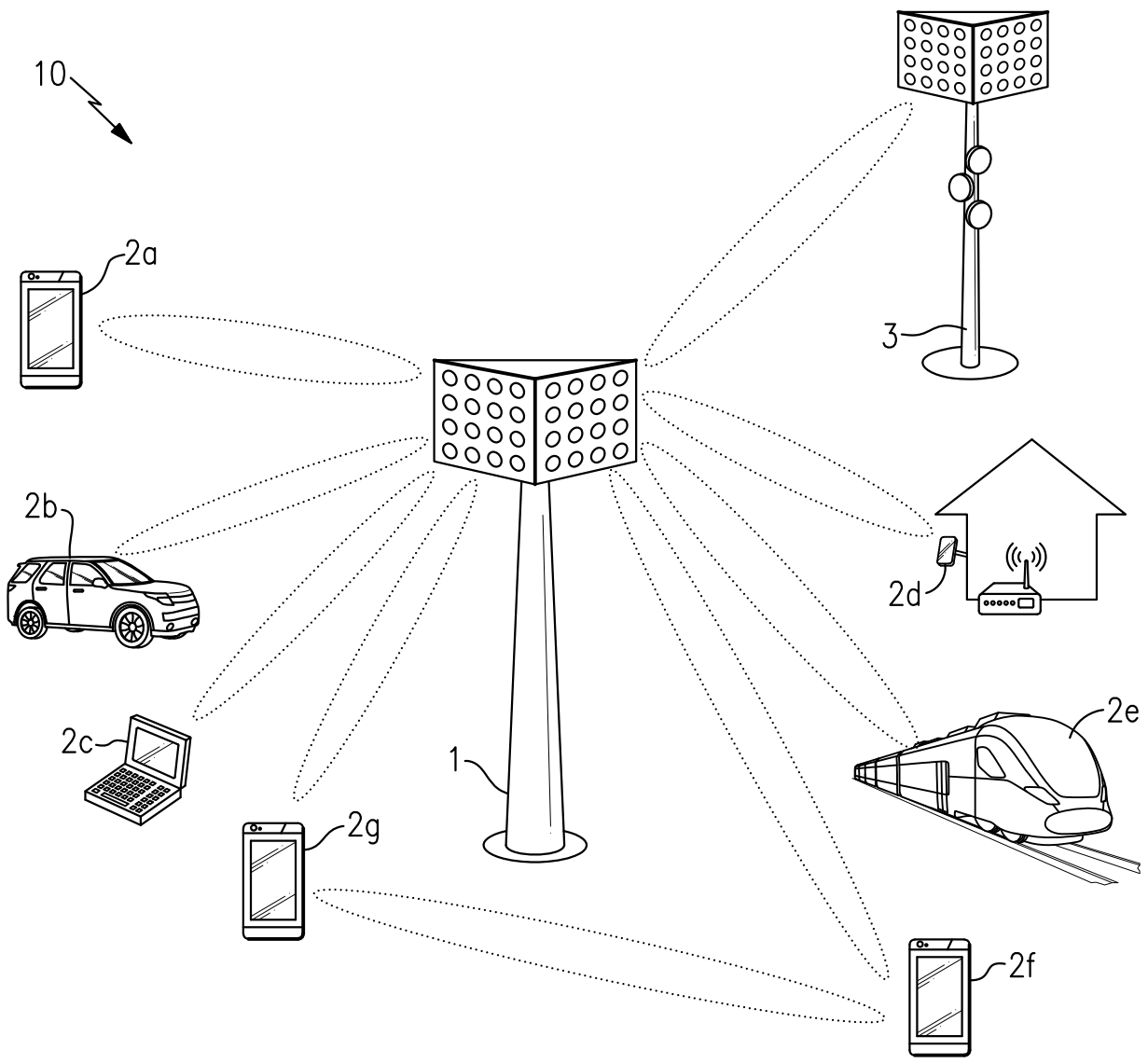


FIG.1

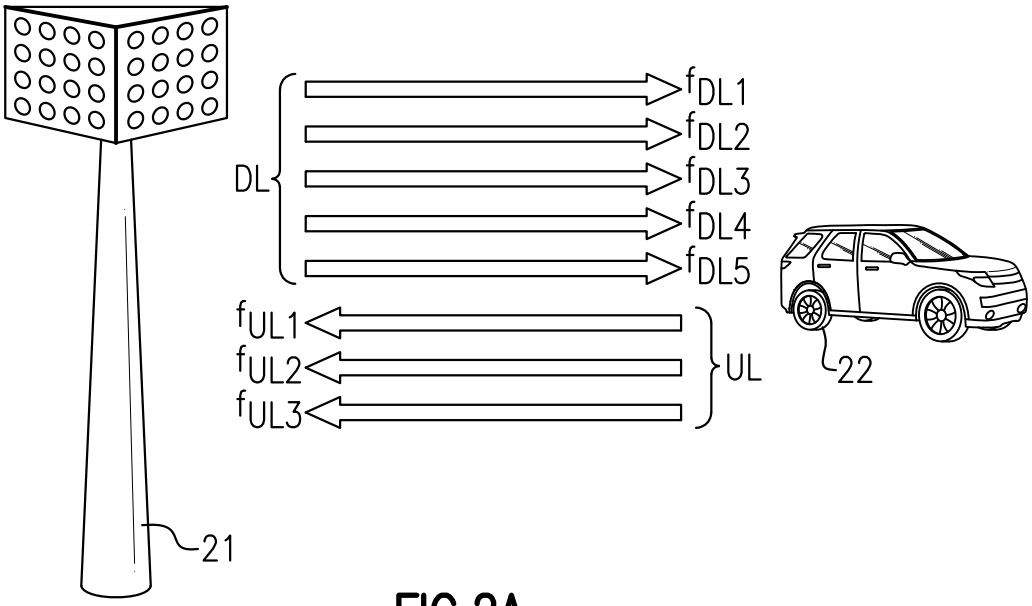

DL
f_{DL1}
f_{DL2}
f_{DL3}
f_{DL4}
f_{DL5}
f_{UL1}
f_{UL2}
f_{UL3}
UL
21
22

FIG.2A

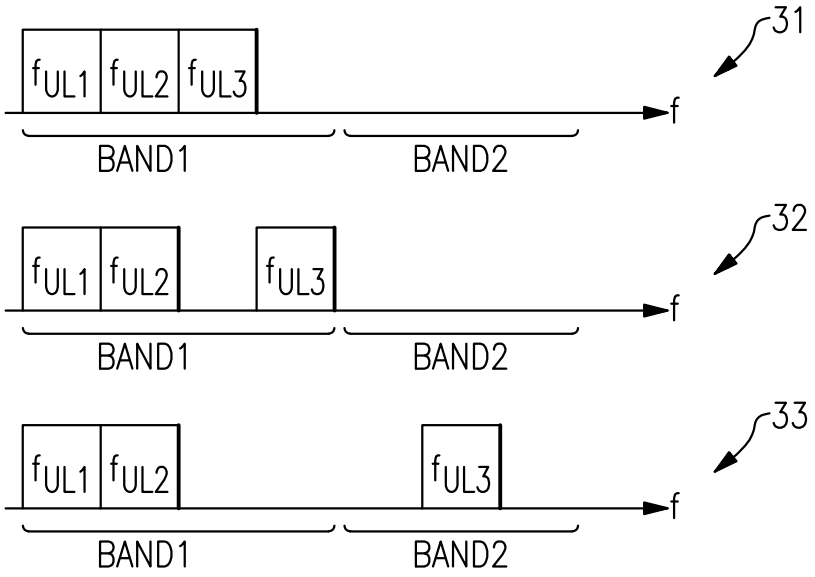

31
f_{UL1} f_{UL2} f_{UL3}
f
BAND1
BAND2
32
f_{UL1} f_{UL2} f_{UL3}
f
BAND1
BAND2
33
f_{UL1} f_{UL2} f_{UL3}
f
BAND1
BAND2

FIG.2B

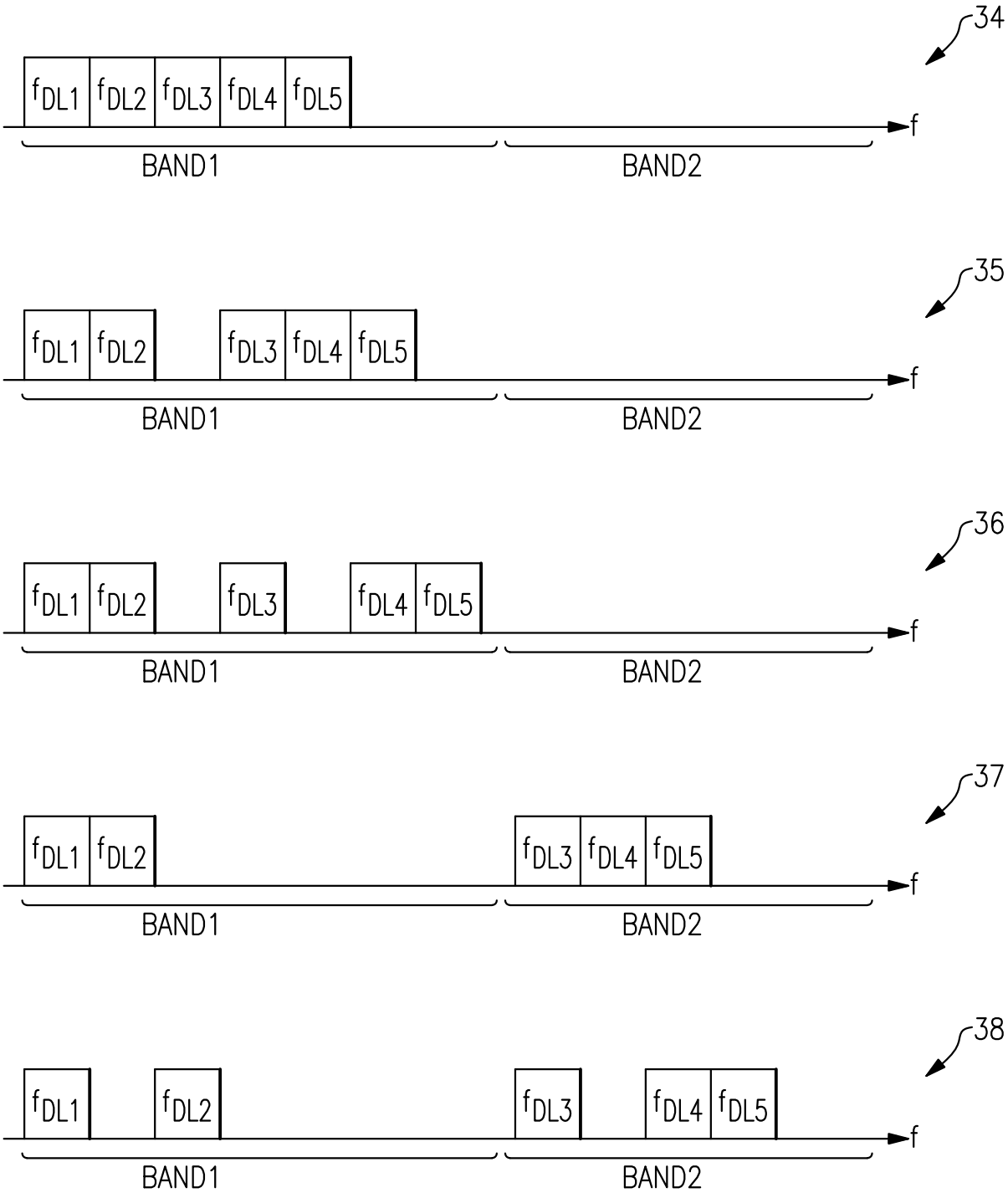

34
f_{DL1} f_{DL2} f_{DL3} f_{DL4} f_{DL5}
f
BAND1
BAND2
35
f_{DL1} f_{DL2} f_{DL3} f_{DL4} f_{DL5}
f
BAND1
BAND2
36
f_{DL1} f_{DL2} f_{DL3} f_{DL4} f_{DL5}
f
BAND1
BAND2
37
f_{DL1} f_{DL2} f_{DL3} f_{DL4} f_{DL5}
f
BAND1
BAND2
38
f_{DL1} f_{DL2} f_{DL3} f_{DL4} f_{DL5}
f
BAND1
BAND2

FIG.2C

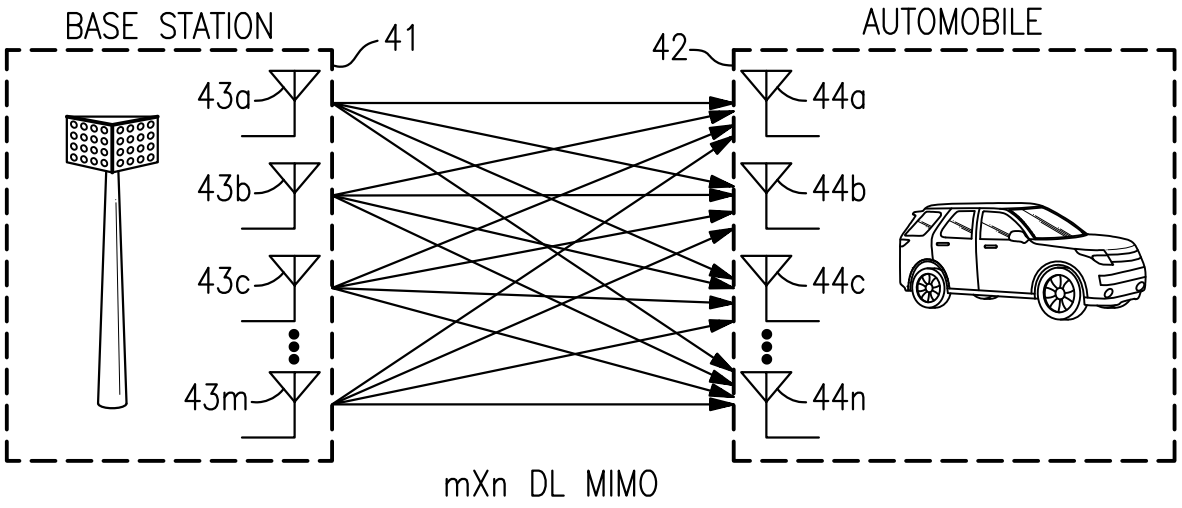

BASE STATION
41
AUTOMOBILE
42
43a
43b
43c
43m
44a
44b
44c
44n
mXn DL MIMO

FIG.3A

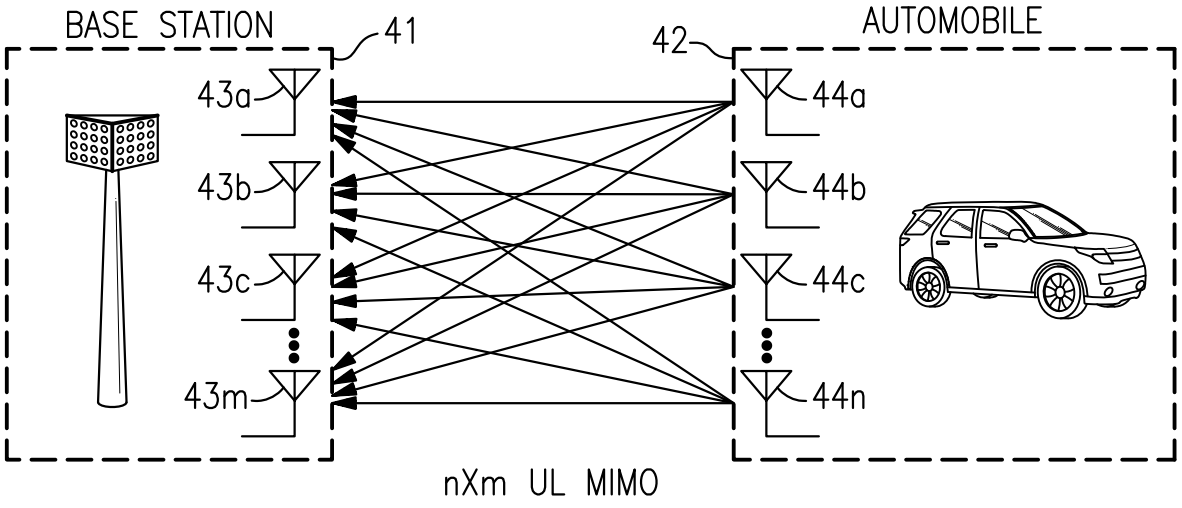

BASE STATION
41
AUTOMOBILE
42
43a
43b
43c
43m
44a
44b
44c
44n
nXm UL MIMO

FIG.3B

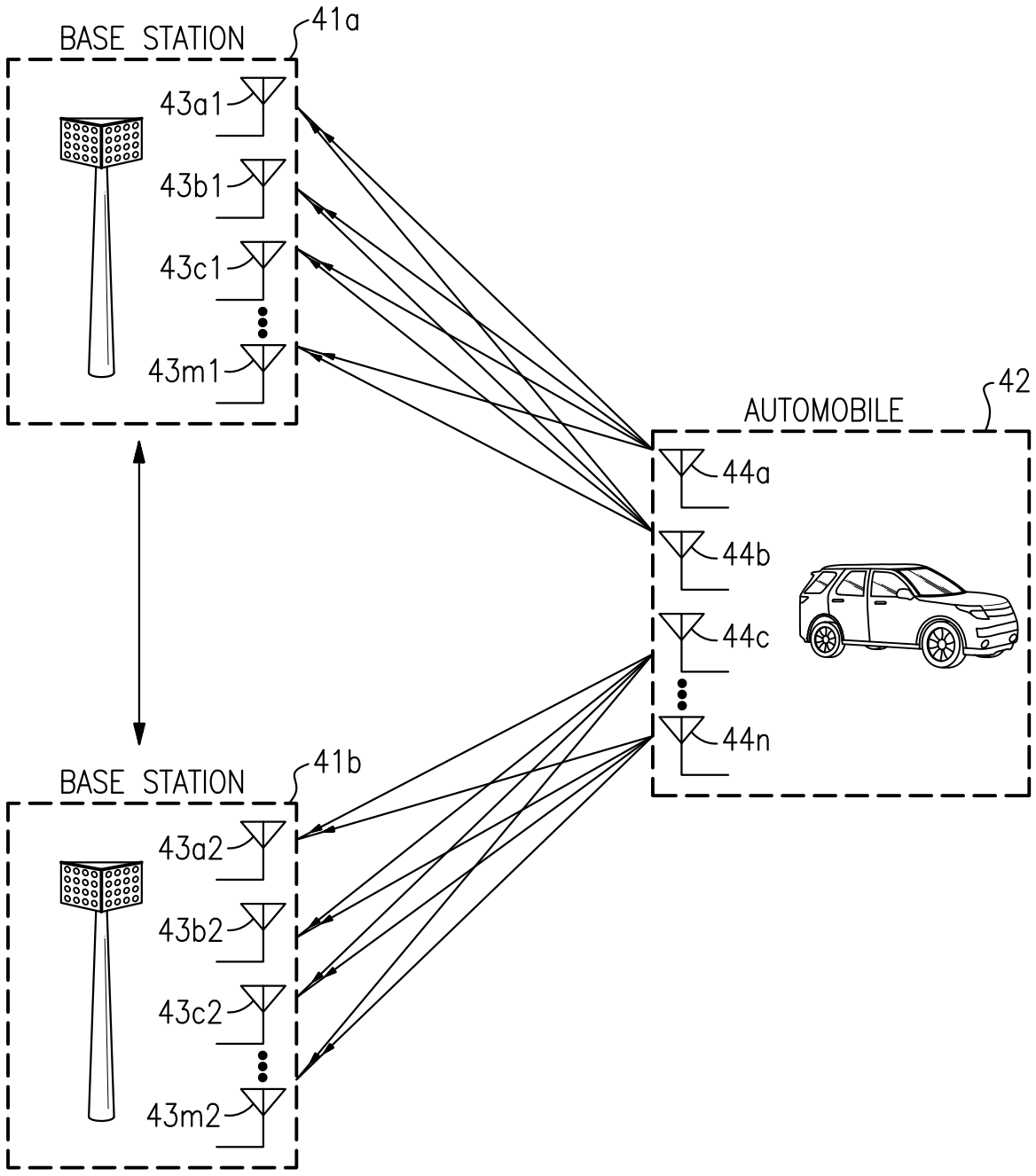

BASE STATION
41a
43a1
43b1
43c1
43m1
AUTOMOBILE
42
44a
44b
44c
44n
BASE STATION
41b
43a2
43b2
43c2
43m2

FIG.3C

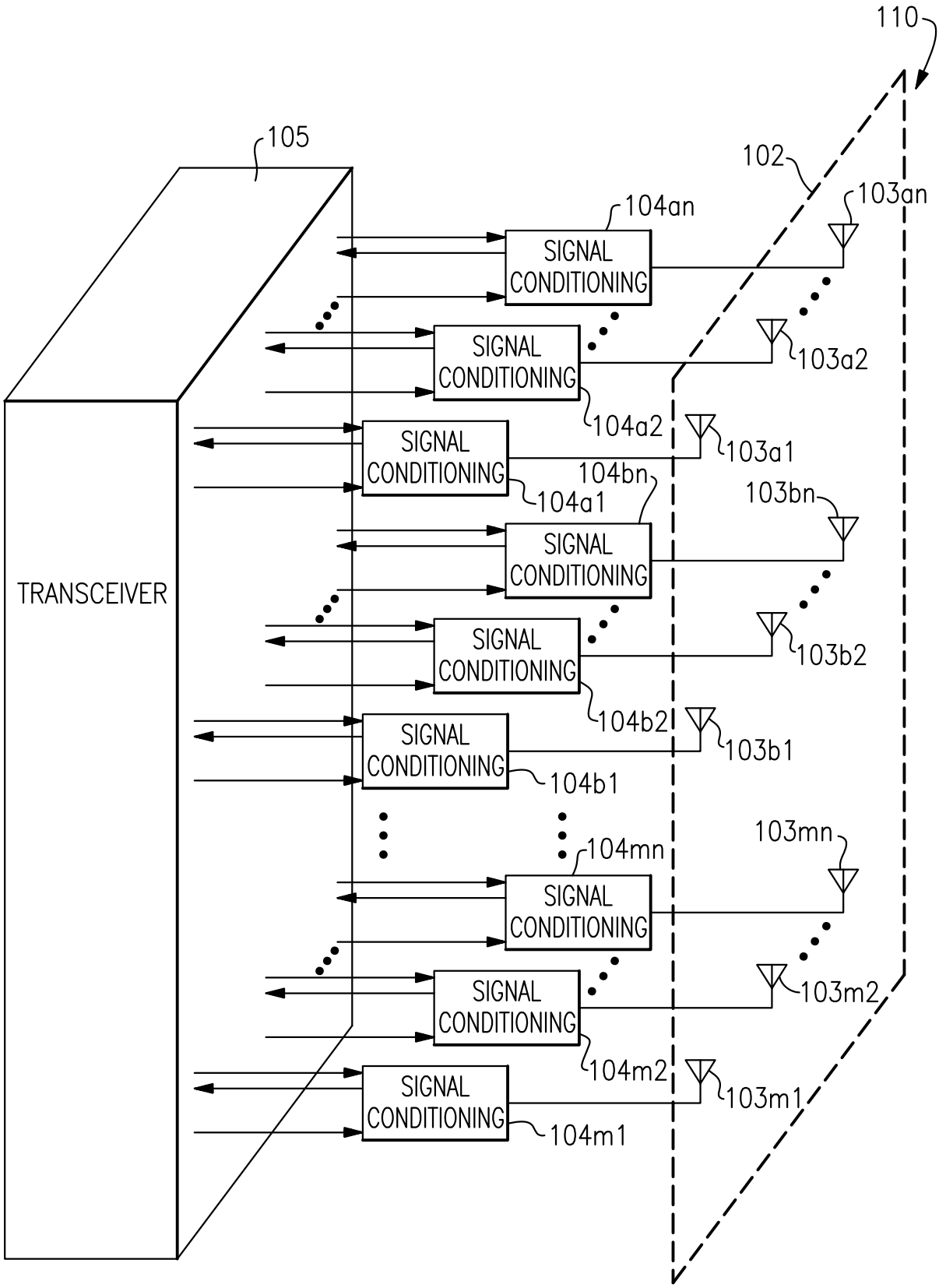

110
105
102
TRANSCEIVER
SIGNAL CONDITIONING
104an
103an
103a2
104a2
103a1
104bn
104a1
103bn
103b2
104b2
103b1
104b1
103mn
104mn
103m2
104m2
103m1
104m1

FIG.4A

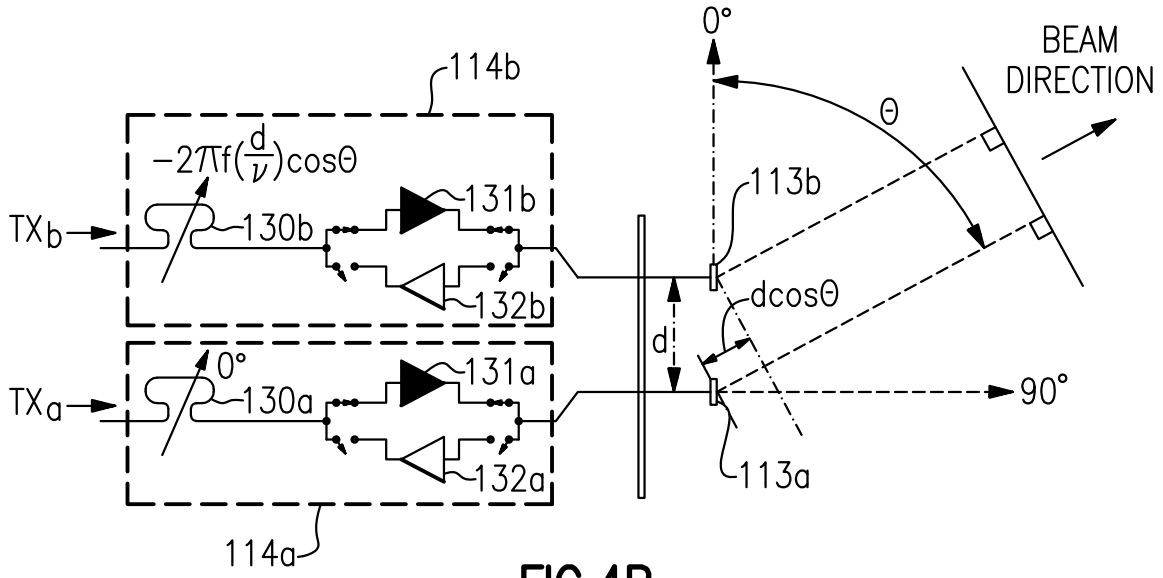

0°
BEAM
DIRECTION
114b
Θ
$-2\pi f(\frac{d}{v})\cos\Theta$
113b
TXb
130b
131b
132b
dcosΘ
d
0°
131a
TXa
130a
132a
90°
113a
114a

FIG.4B

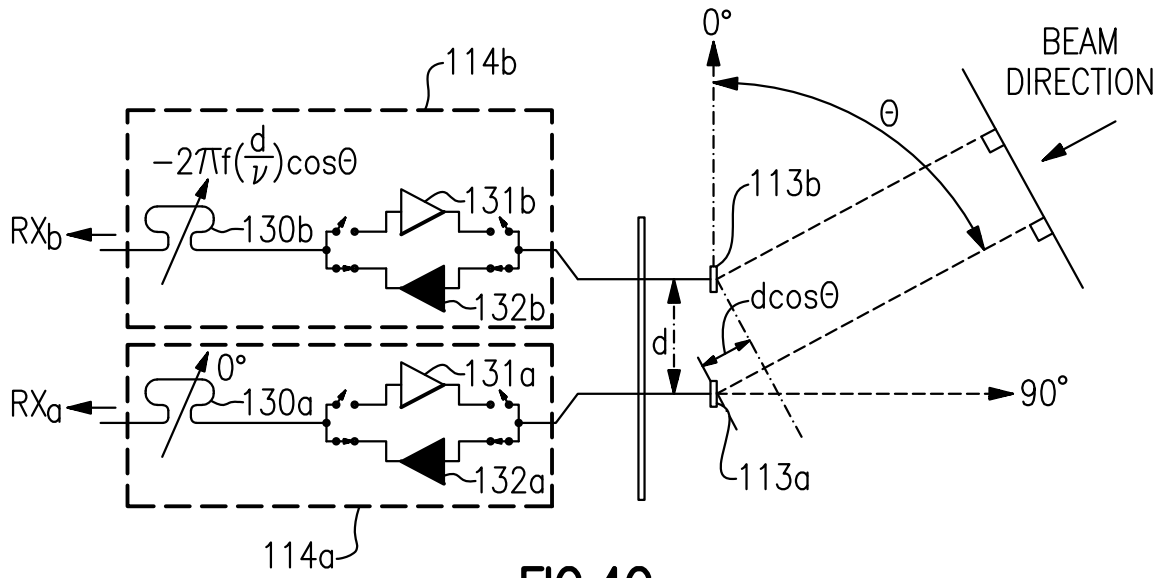

0°
BEAM
DIRECTION
114b
Θ
$-2\pi f(\frac{d}{v})\cos\Theta$
113b
RXb
130b
131b
132b
dcosΘ
d
0°
131a
RXa
130a
132a
90°
113a
114a

FIG.4C

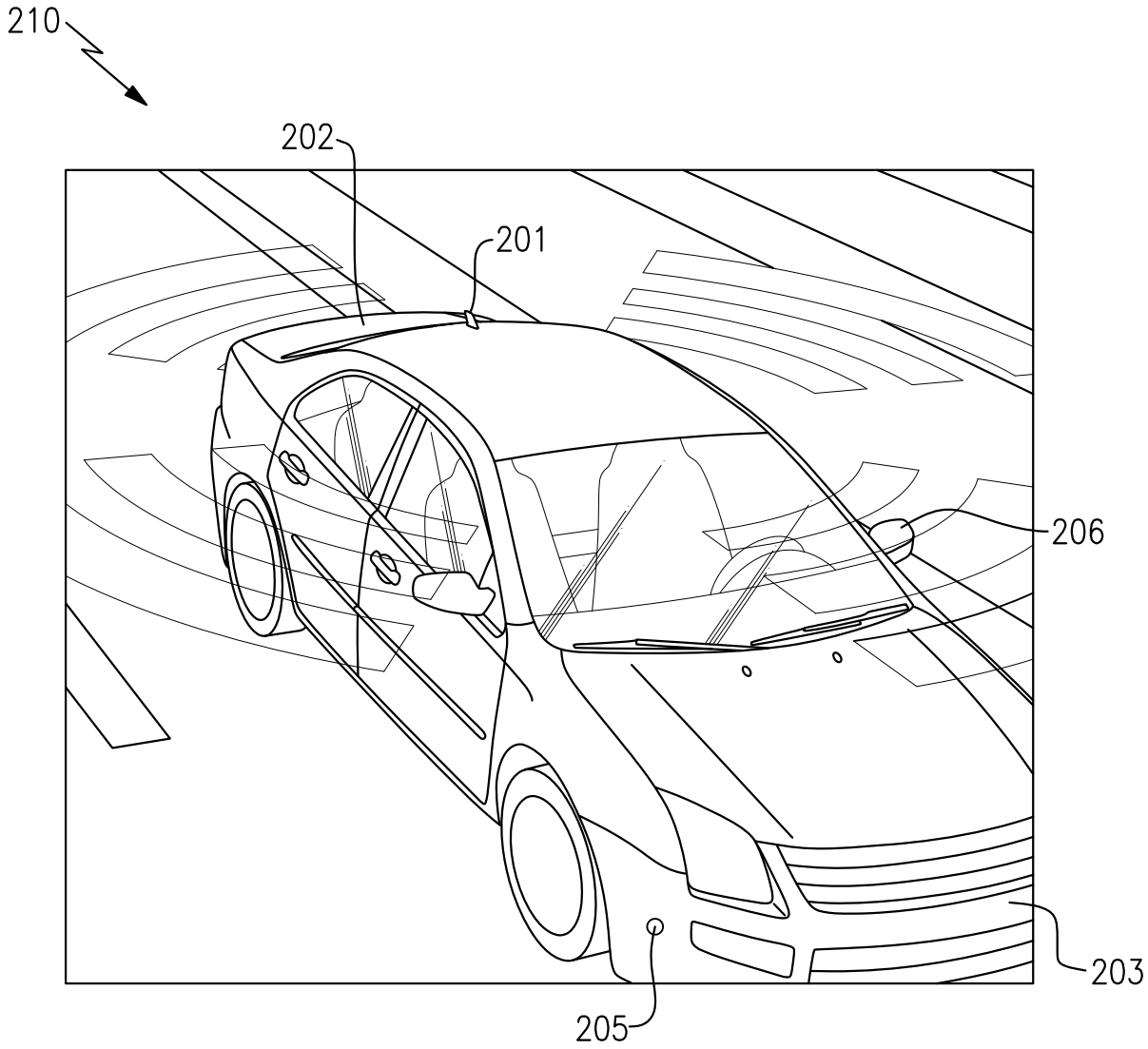


FIG.5

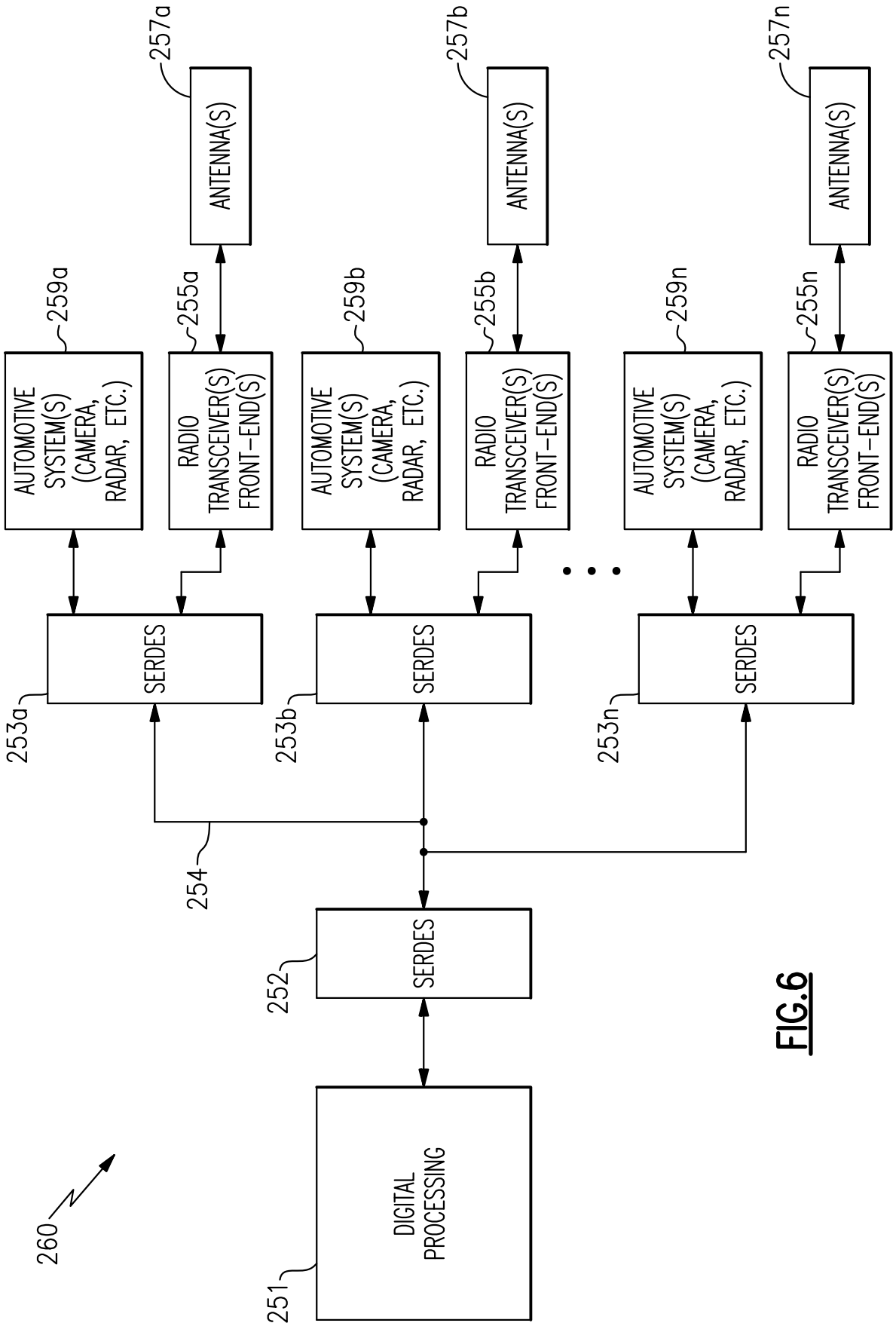

260
DIGITAL PROCESSING
251
SERDES
252
254
SERDES
253a
SERDES
253b
SERDES
253n
AUTOMOTIVE SYSTEM(S) (CAMERA, RADAR, ETC.)
259a
RADIO TRANSCEIVER(S) FRONT-END(S)
255a
ANTENNA(S)
257a
AUTOMOTIVE SYSTEM(S) (CAMERA, RADAR, ETC.)
259b
RADIO TRANSCEIVER(S) FRONT-END(S)
255b
ANTENNA(S)
257b
AUTOMOTIVE SYSTEM(S) (CAMERA, RADAR, ETC.)
259n
RADIO TRANSCEIVER(S) FRONT-END(S)
255n
ANTENNA(S)
257n

FIG.6

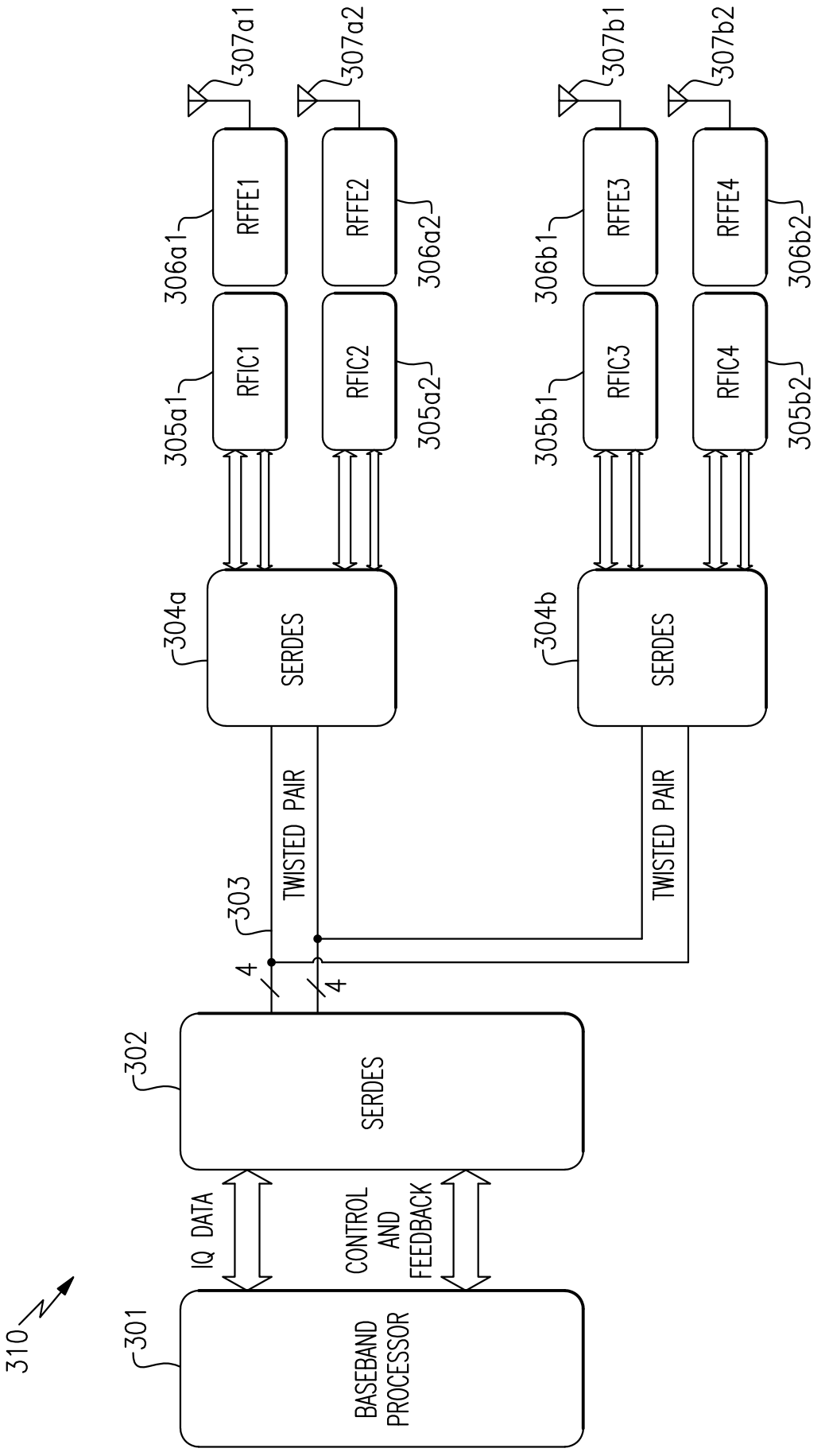

310
301
BASEBAND PROCESSOR
IQ DATA
CONTROL AND FEEDBACK
302
SERDES
303
4
4
TWISTED PAIR
TWISTED PAIR
304a
SERDES
304b
SERDES
305a1
RFIC1
305a2
RFIC2
305b1
RFIC3
305b2
RFIC4
306a1
RFFE1
306a2
RFFE2
306b1
RFFE3
306b2
RFFE4
307a1
307a2
307b1
307b2

FIG.7A

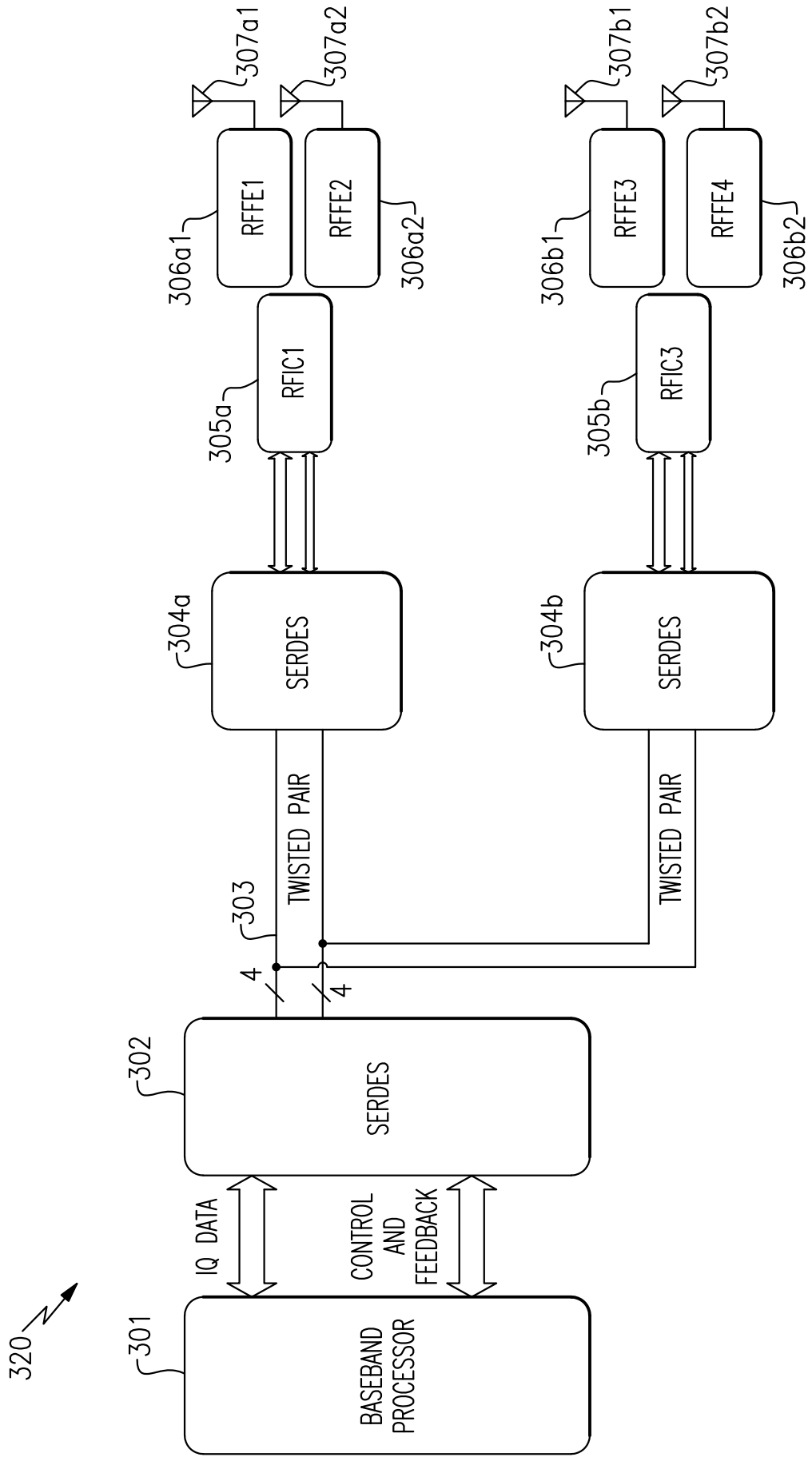

320
301
BASEBAND PROCESSOR
IQ DATA
CONTROL AND FEEDBACK
302
SERDES
303
4
4
TWISTED PAIR
TWISTED PAIR
304a
SERDES
304b
SERDES
305a
RFIC1
305b
RFIC3
306a1
RFFE1
306a2
RFFE2
306b1
RFFE3
306b2
RFFE4
307a1
307a2
307b1
307b2

FIG.7B

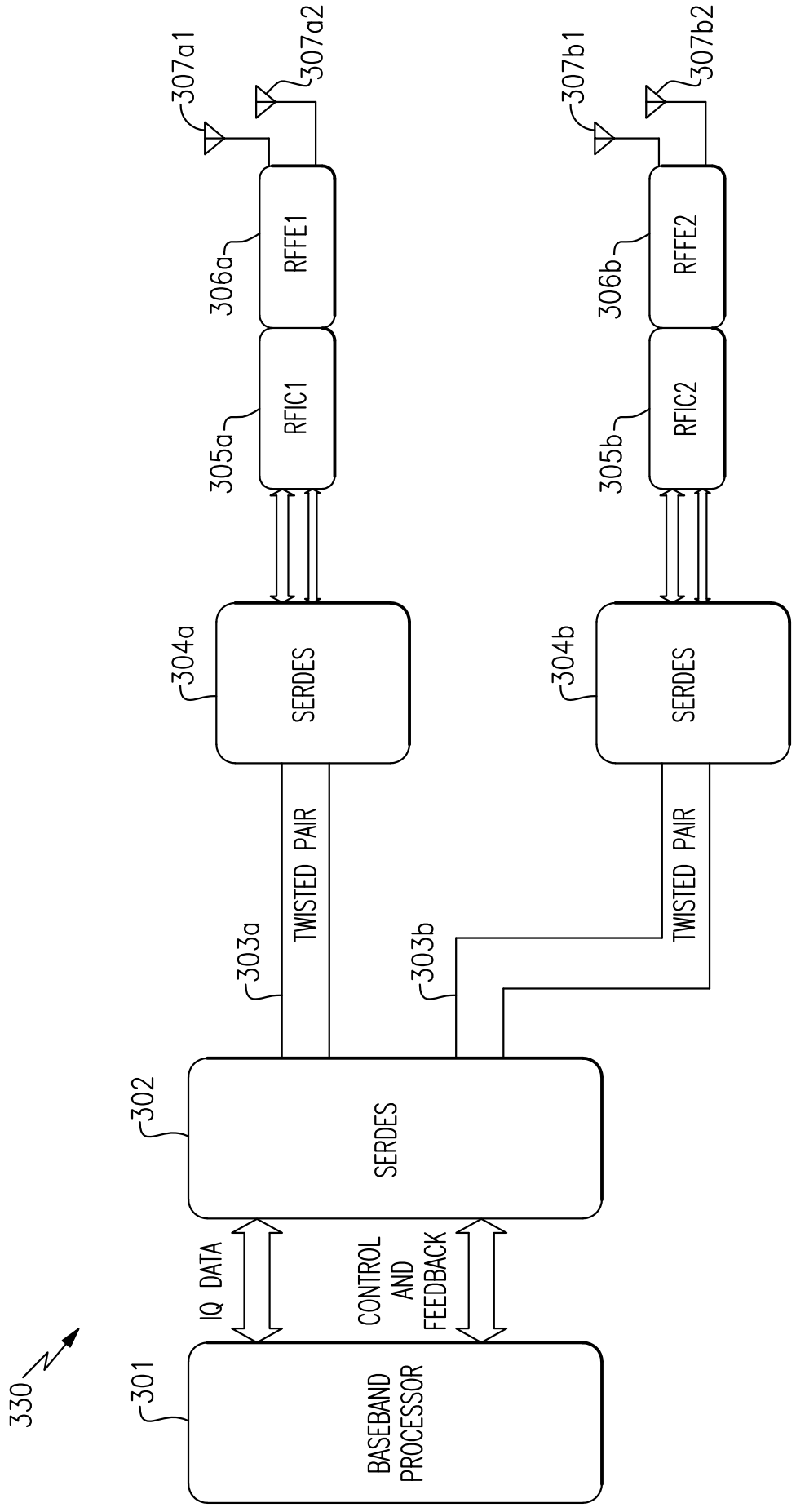

330
301
BASEBAND PROCESSOR
IQ DATA
CONTROL AND FEEDBACK
302
SERDES
303a
303b
TWISTED PAIR
TWISTED PAIR
304a
304b
SERDES
SERDES
305a
305b
RFIC1
RFIC2
306a
306b
RFFE1
RFFE2
307a1
307a2
307b1
307b2

FIG.7C

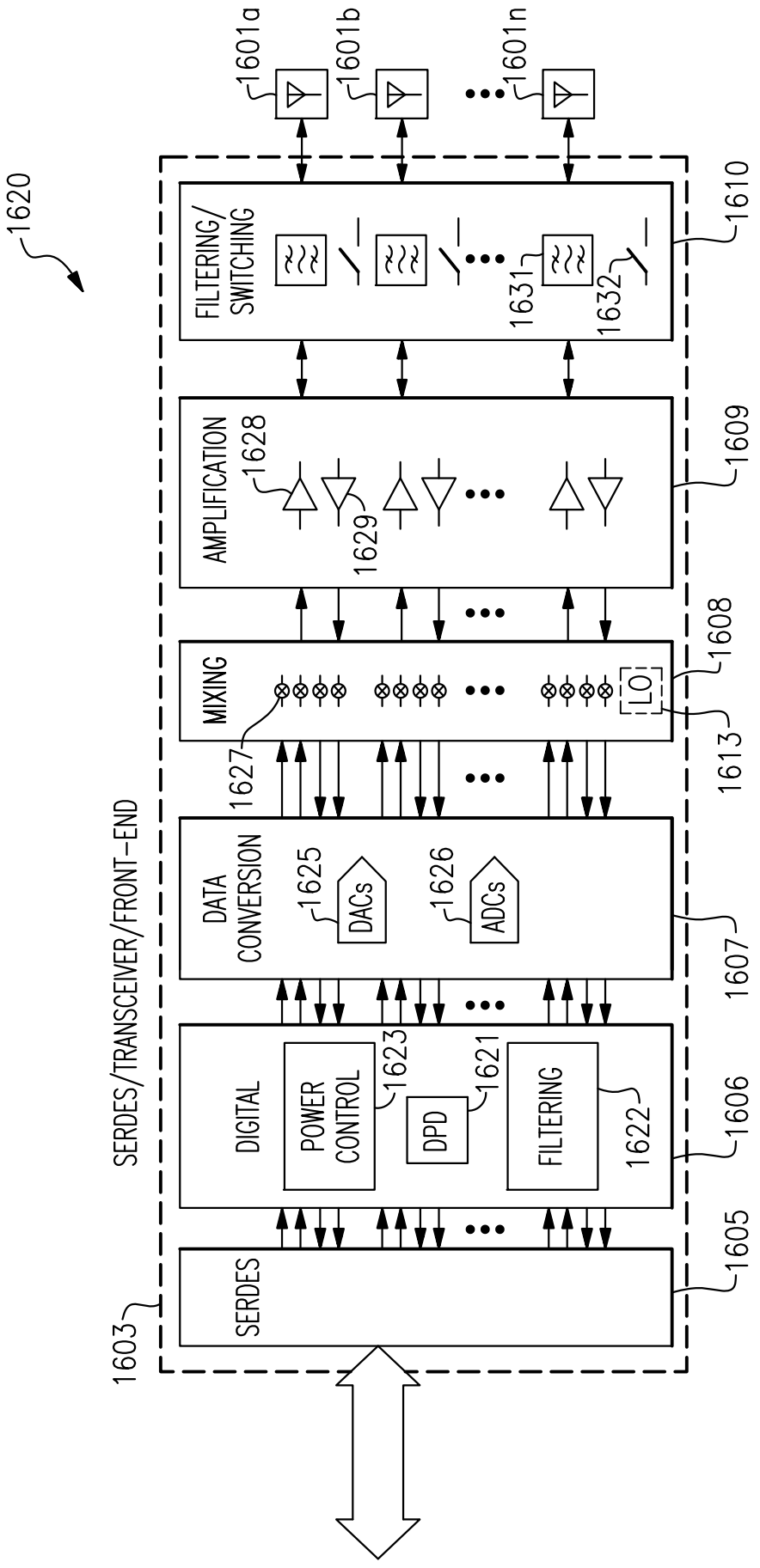

1620
1601a
1601b
1601n
1610
FILTERING/
SWITCHING
1631
1632
1609
AMPLIFICATION
1628
1629
1608
MIXING
LO
1627
1613
1607
DATA
CONVERSION
1625
DACs
1626
ADCs
1606
DIGITAL
POWER
CONTROL
1623
DPD
1621
FILTERING
1622
1605
SERDES
1603
SERDES/TRANSCEIVER/FRONT-END

FIG.8