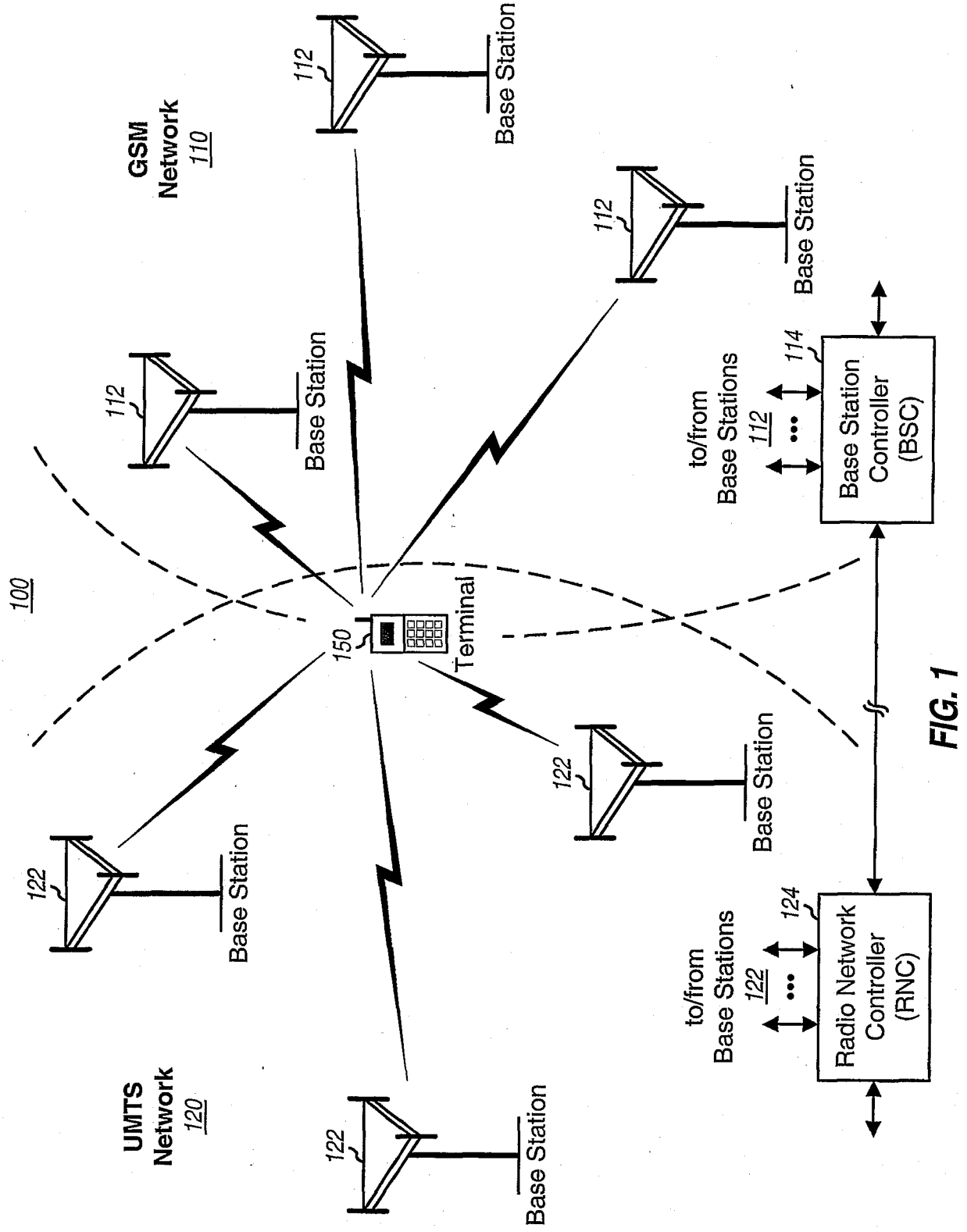

GSM Network 110
UMTS Network 120
100
112
Base Station
122
Base Station
150
Terminal
to/from Base Stations 112
114
Base Station Controller (BSC)
to/from Base Stations 122
124
Radio Network Controller (RNC)

FIG. 1

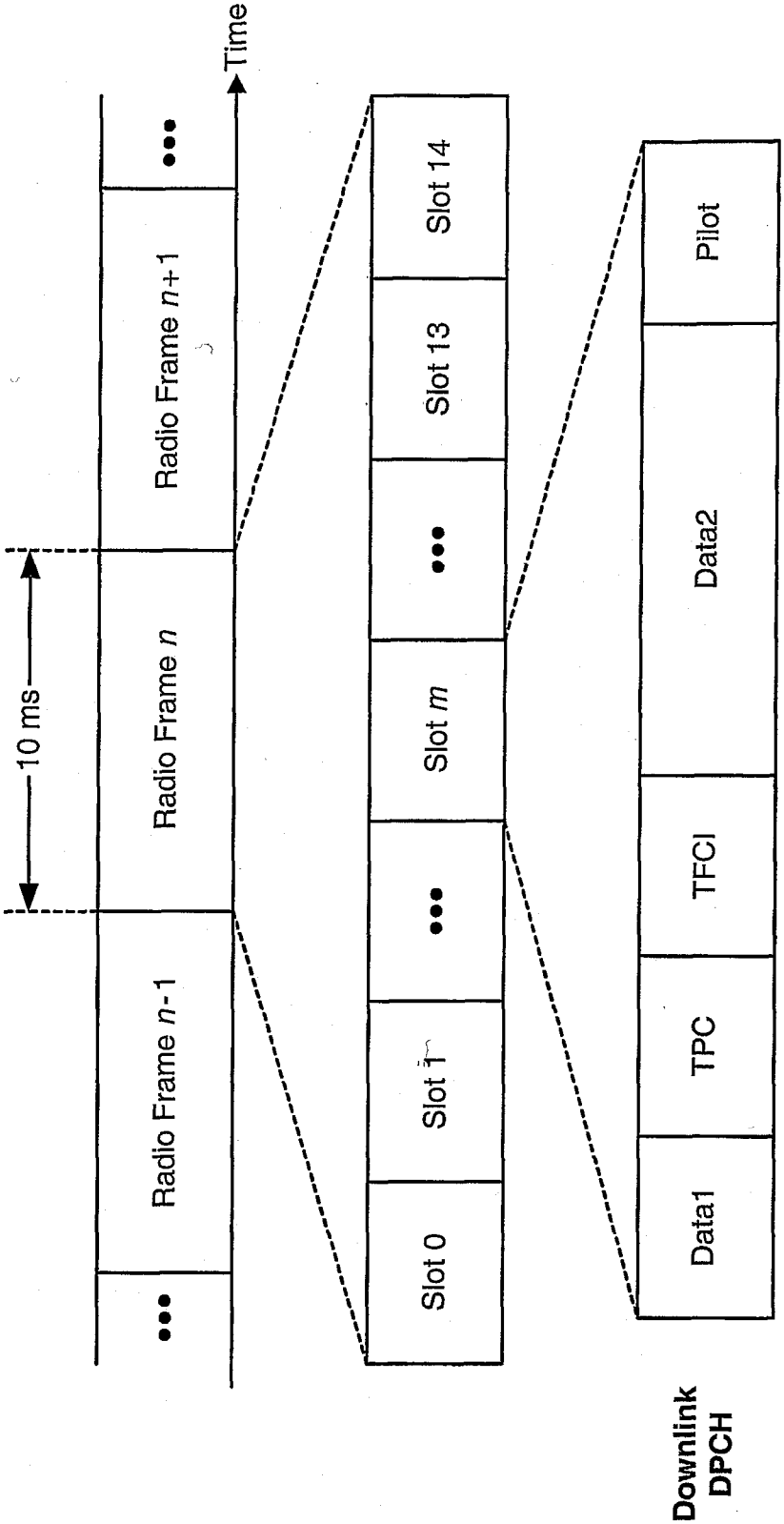

Time
10 ms
Radio Frame n-1
Radio Frame n
Radio Frame n+1
Slot 0
Slot 1
Slot m
Slot 13
Slot 14
Data1
TPC
TFCI
Data2
Pilot
Downlink DPCH

FIG. 2

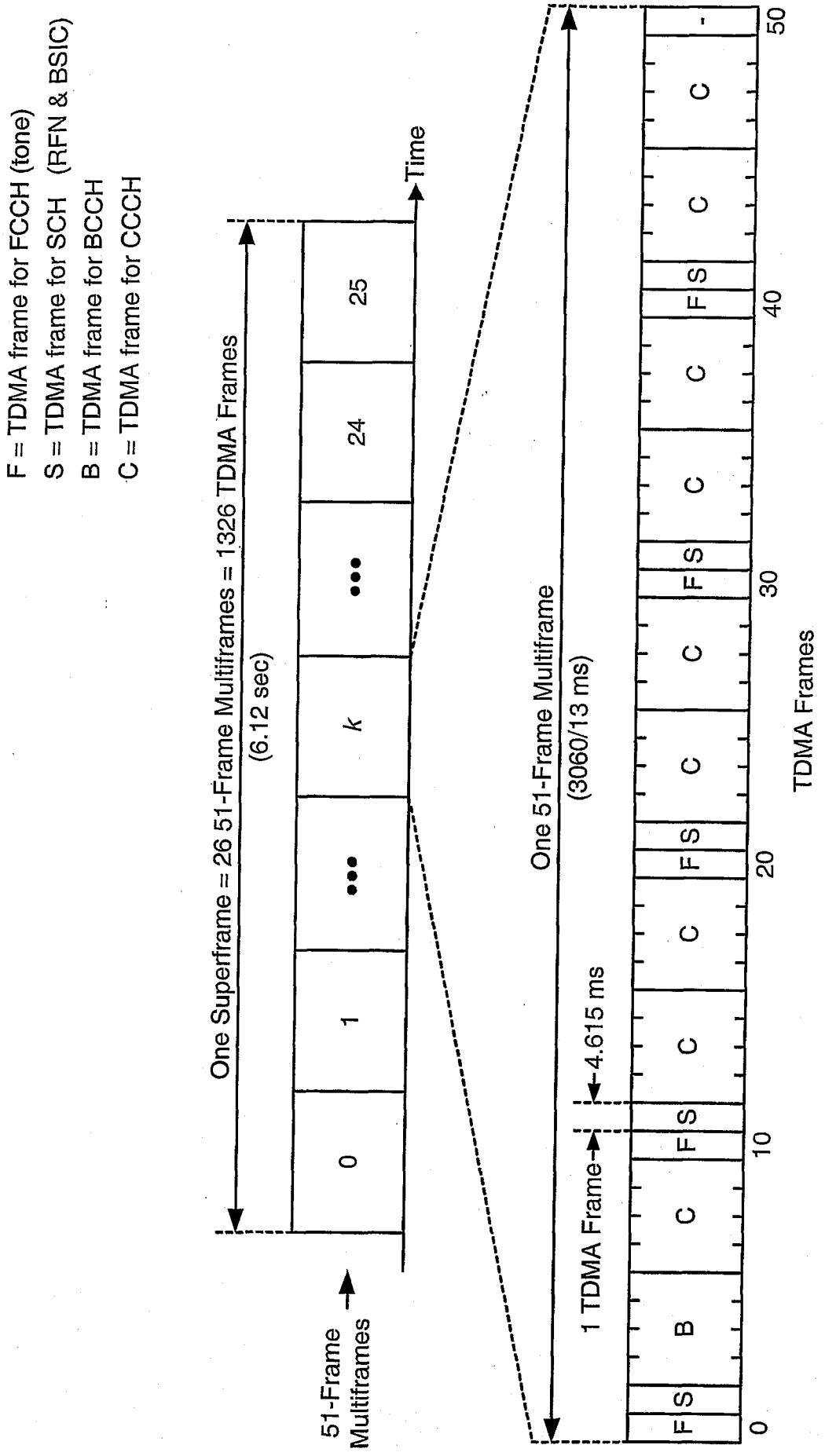

F = TDMA frame for FCCH (tone)
S = TDMA frame for SCH (RFN & BSIC)
B = TDMA frame for BCCH
C = TDMA frame for CCCH
Time
One Superframe = 26 51-Frame Multiframes = 1326 TDMA Frames
(6.12 sec)
0
1
k
24
25
51-Frame Multiframes
One 51-Frame Multiframe
(3060/13 ms)
4.615 ms
1 TDMA Frame
F S B C C C C F S C C C C F S C C C C F S C C C C
0
10
20
30
40
50
TDMA Frames

FIG. 3

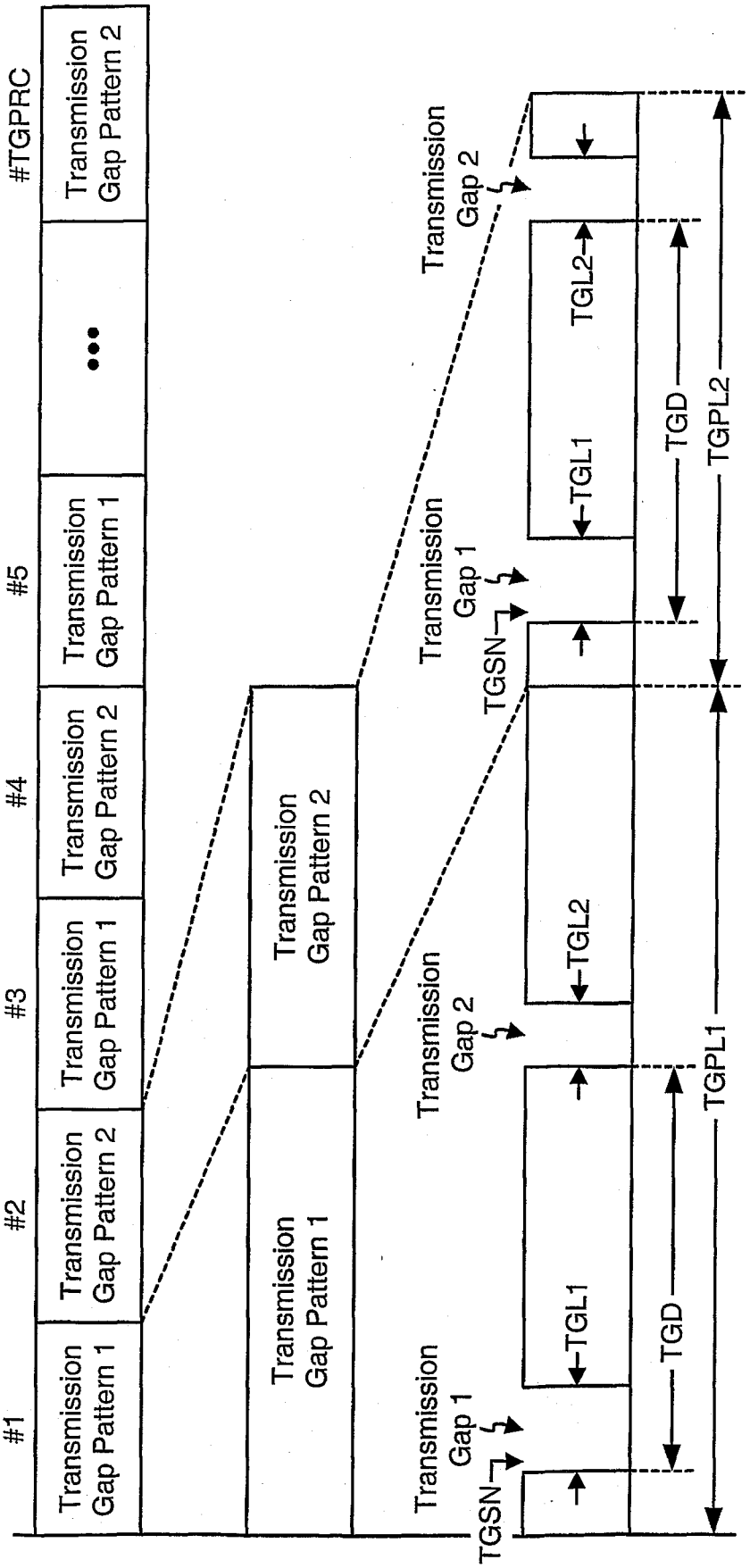

#1
#2
#3
#4
#5
#TGPRC
Transmission Gap Pattern 1
Transmission Gap Pattern 2
Transmission Gap Pattern 1
Transmission Gap Pattern 2
Transmission Gap Pattern 1
...
Transmission Gap Pattern 2
TGSN
Transmission Gap 1
TGL1
TGD
TGPL1
Transmission Gap 2
TGL2
TGPL2

FIG. 4

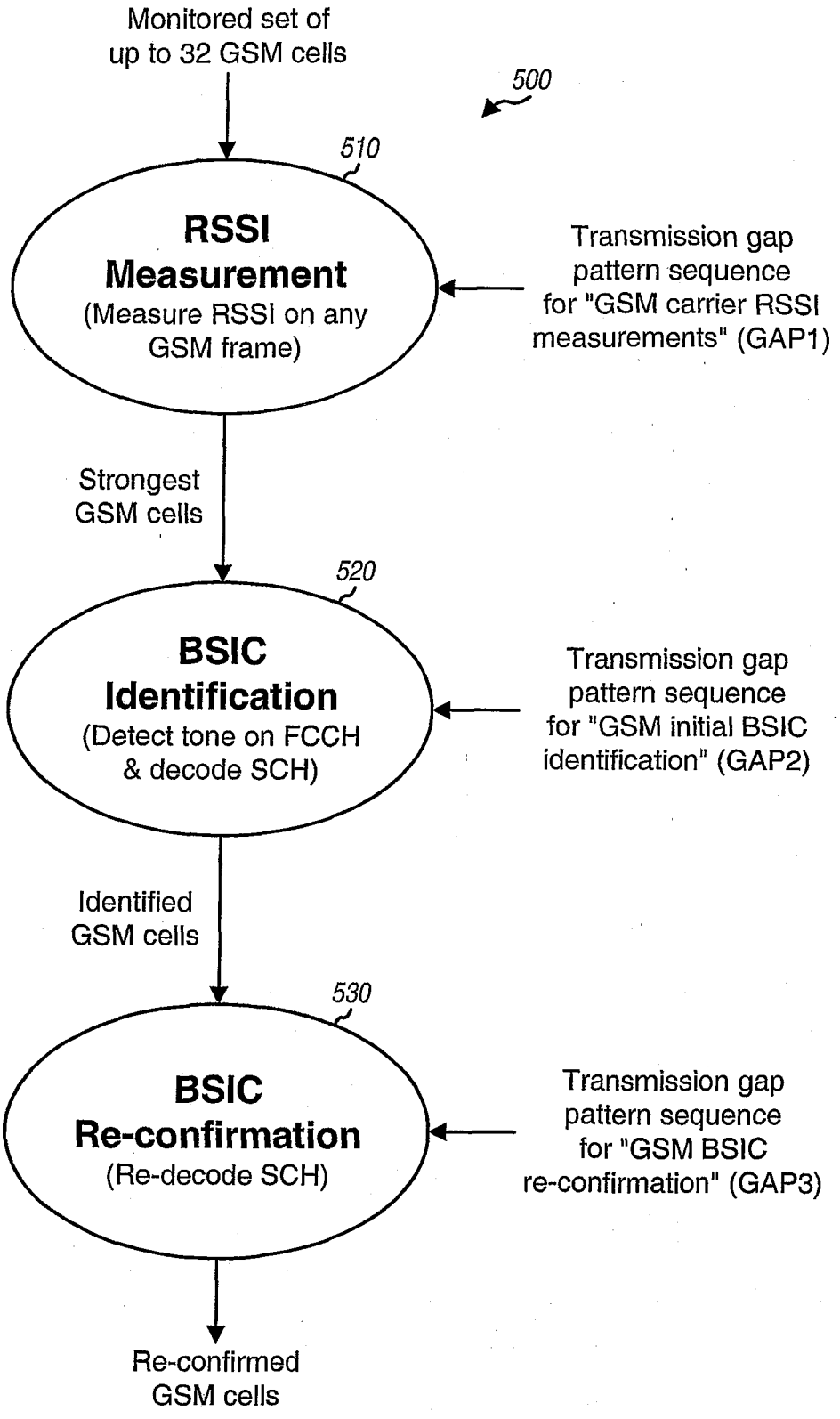

Monitored set of up to 32 GSM cells
500
510
RSSI Measurement
(Measure RSSI on any GSM frame)
Transmission gap pattern sequence for "GSM carrier RSSI measurements" (GAP1)
Strongest GSM cells
520
BSIC Identification
(Detect tone on FCCH & decode SCH)
Transmission gap pattern sequence for "GSM initial BSIC identification" (GAP2)
Identified GSM cells
530
BSIC Re-confirmation
(Re-decode SCH)
Transmission gap pattern sequence for "GSM BSIC re-confirmation" (GAP3)
Re-confirmed GSM cells

FIG. 5

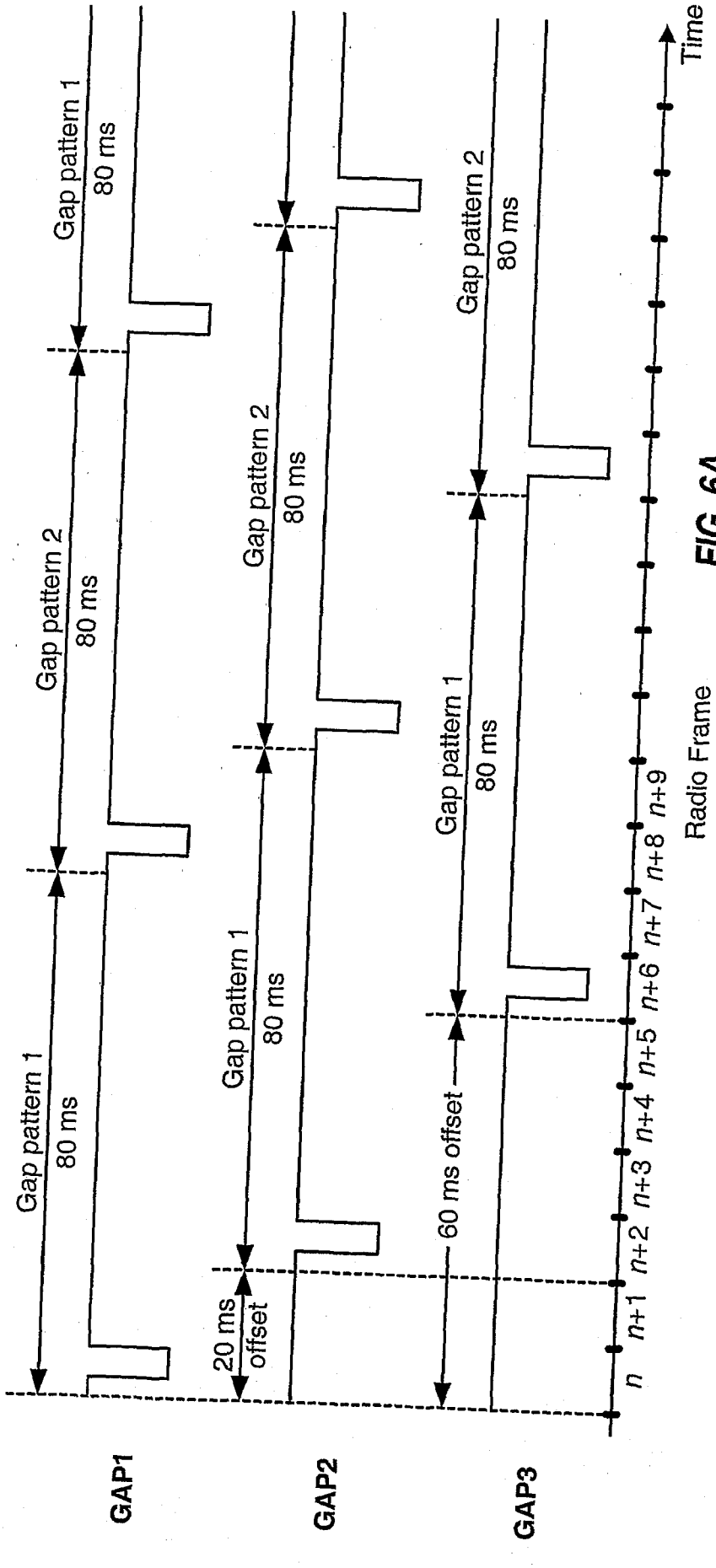

Gap pattern 1
80 ms
Gap pattern 2
80 ms
Gap pattern 1
80 ms
Gap pattern 2
80 ms
Gap pattern 1
80 ms
Gap pattern 2
80 ms
20 ms offset
60 ms offset
Time
n n+1 n+2 n+3 n+4 n+5 n+6 n+7 n+8 n+9
Radio Frame
GAP1
GAP2
GAP3

FIG. 6A

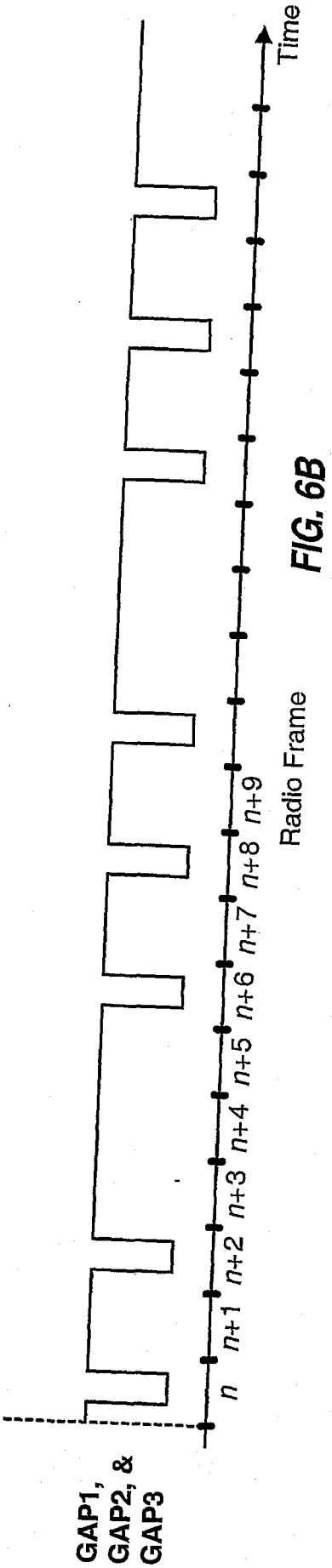

Time
n n+1 n+2 n+3 n+4 n+5 n+6 n+7 n+8 n+9
Radio Frame
GAP1, GAP2, & GAP3

FIG. 6B

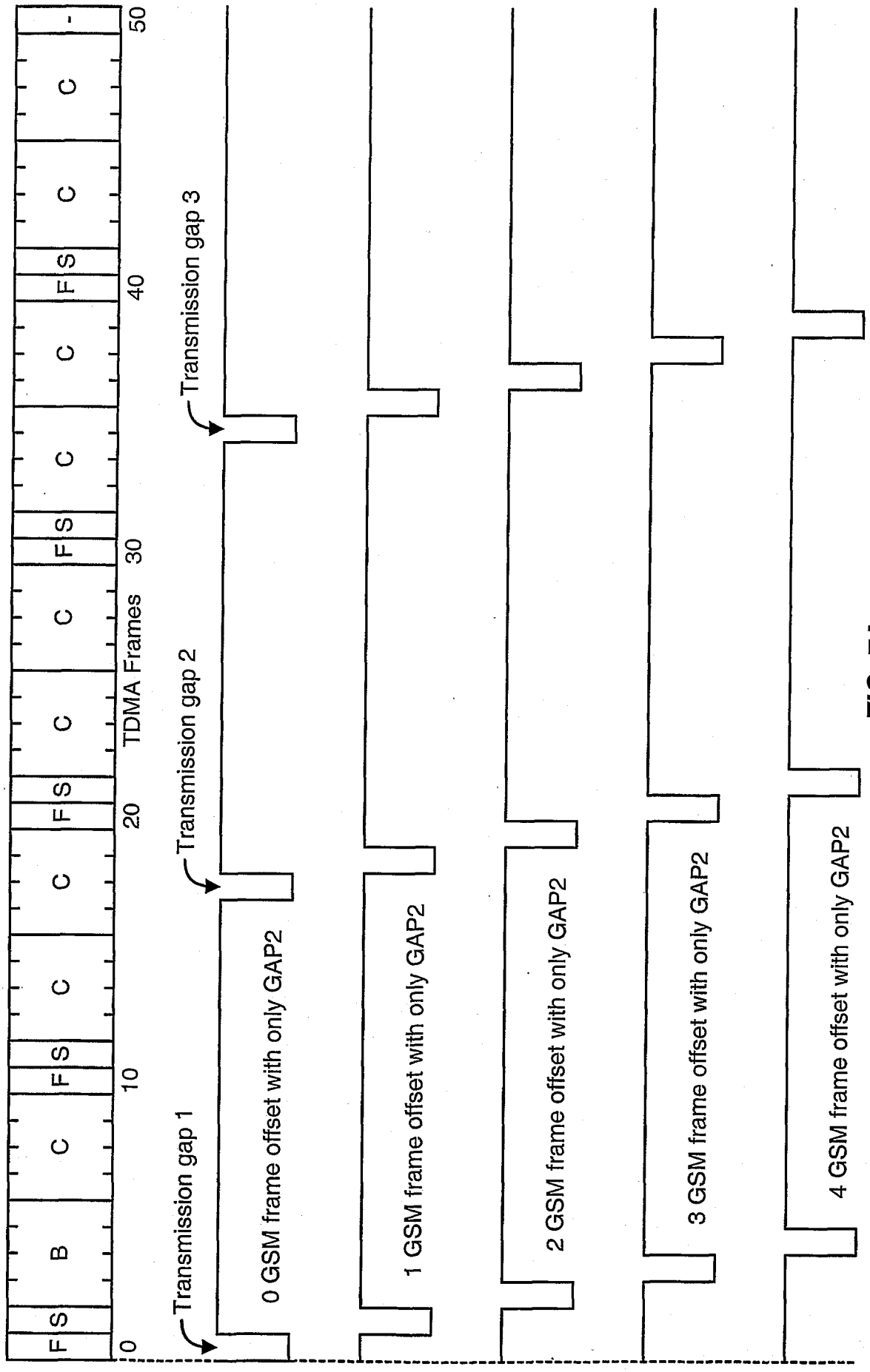

F S B C C F S C C F S C C F S C C -
0
10
20
30
40
50
TDMA Frames
Transmission gap 1
Transmission gap 2
Transmission gap 3
0 GSM frame offset with only GAP2
1 GSM frame offset with only GAP2
2 GSM frame offset with only GAP2
3 GSM frame offset with only GAP2
4 GSM frame offset with only GAP2

FIG. 7A

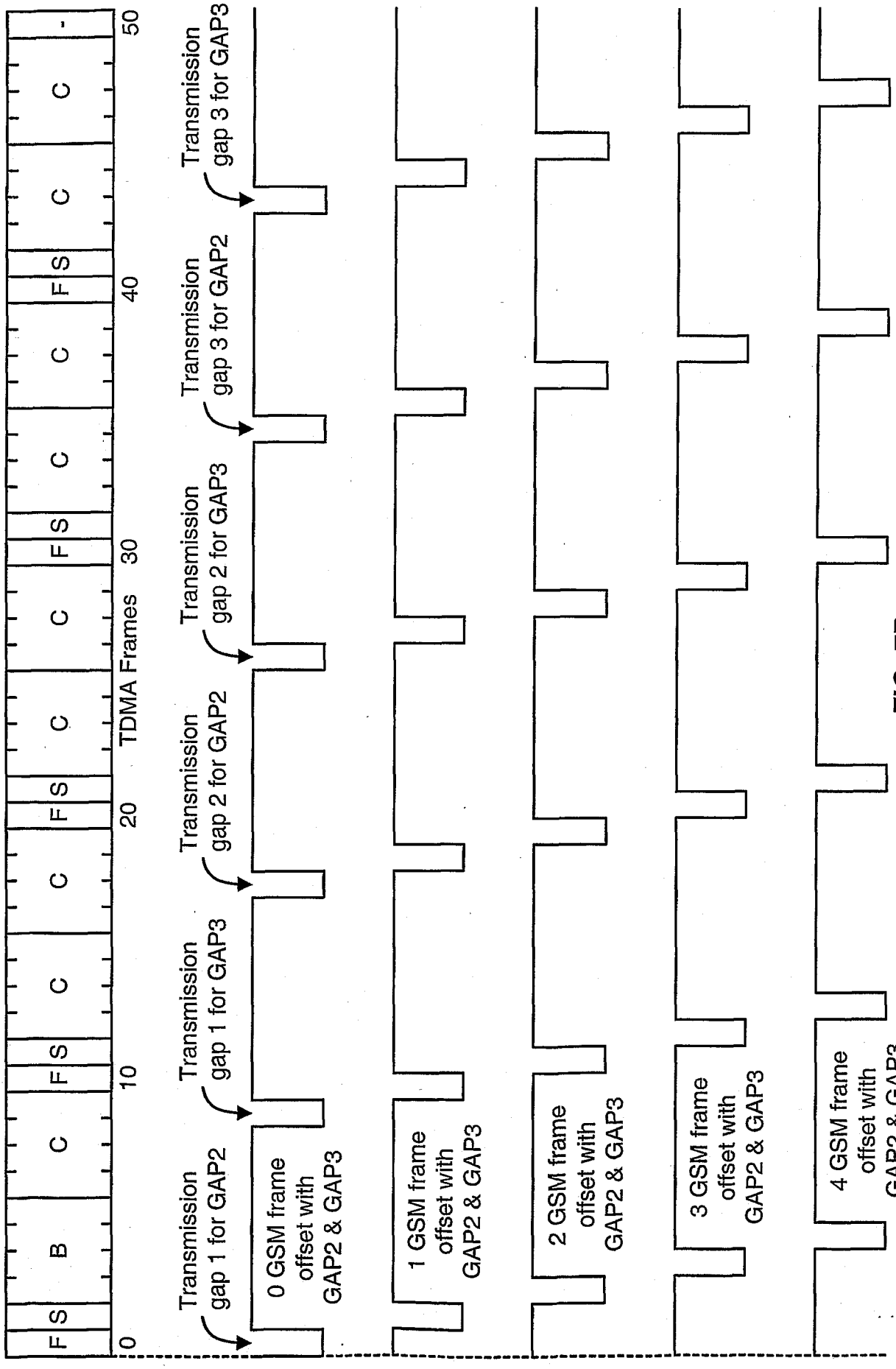

F S
B
C
F S
C
C
F S
C
C
F S
C
C
F S
C
C
C
-
0
10
20
30
40
50
TDMA Frames
Transmission gap 1 for GAP2
Transmission gap 1 for GAP3
Transmission gap 2 for GAP2
Transmission gap 2 for GAP3
Transmission gap 3 for GAP2
Transmission gap 3 for GAP3
0 GSM frame offset with GAP2 & GAP3
1 GSM frame offset with GAP2 & GAP3
2 GSM frame offset with GAP2 & GAP3
3 GSM frame offset with GAP2 & GAP3
4 GSM frame offset with GAP2 & GAP3

FIG. 7B

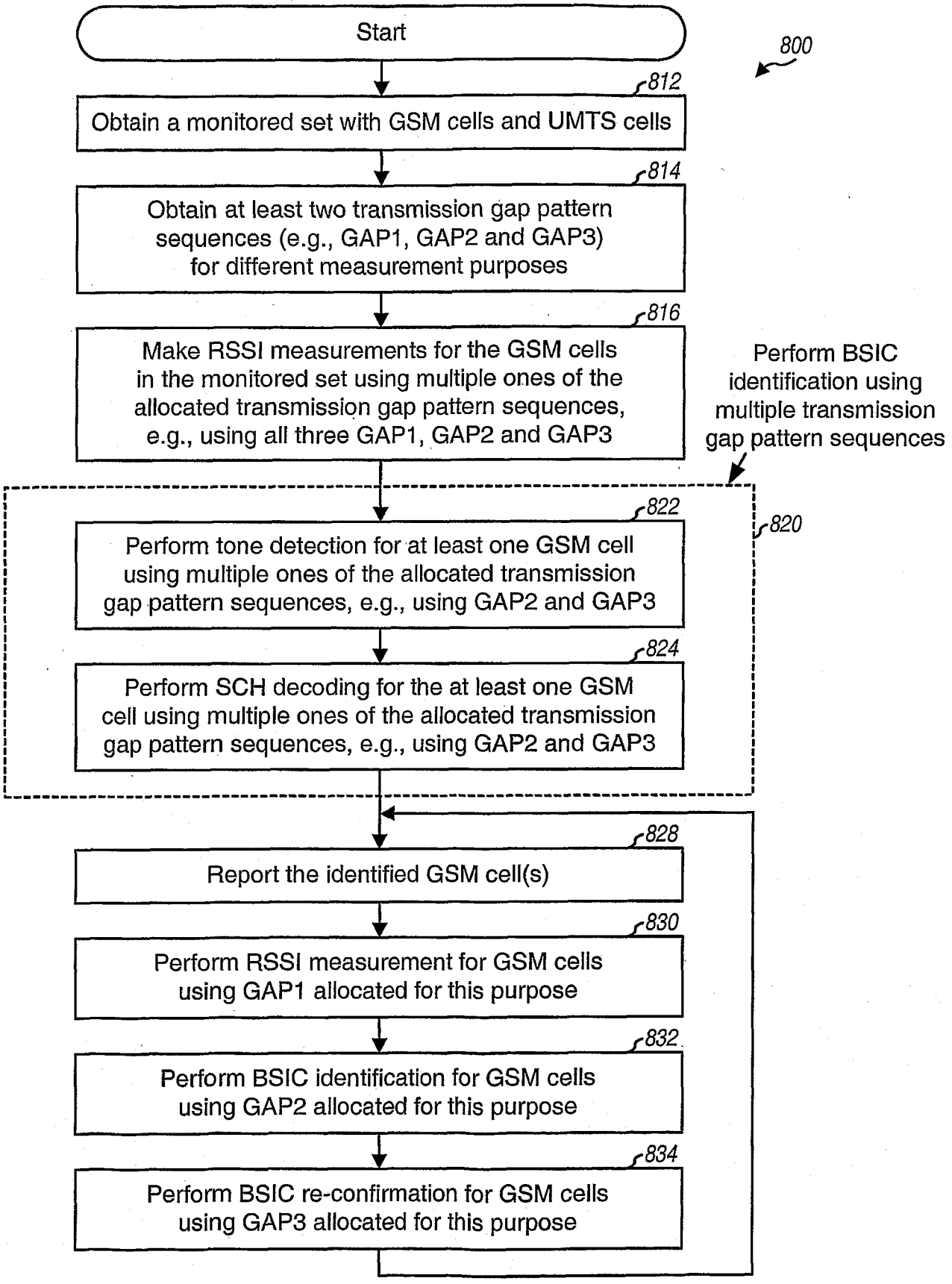

Start
800
812
Obtain a monitored set with GSM cells and UMTS cells
814
Obtain at least two transmission gap pattern sequences (e.g., GAP1, GAP2 and GAP3) for different measurement purposes
816
Make RSSI measurements for the GSM cells in the monitored set using multiple ones of the allocated transmission gap pattern sequences, e.g., using all three GAP1, GAP2 and GAP3
Perform BSIC identification using multiple transmission gap pattern sequences
820
822
Perform tone detection for at least one GSM cell using multiple ones of the allocated transmission gap pattern sequences, e.g., using GAP2 and GAP3
824
Perform SCH decoding for the at least one GSM cell using multiple ones of the allocated transmission gap pattern sequences, e.g., using GAP2 and GAP3
828
Report the identified GSM cell(s)
830
Perform RSSI measurement for GSM cells using GAP1 allocated for this purpose
832
Perform BSIC identification for GSM cells using GAP2 allocated for this purpose
834
Perform BSIC re-confirmation for GSM cells using GAP3 allocated for this purpose

FIG. 8

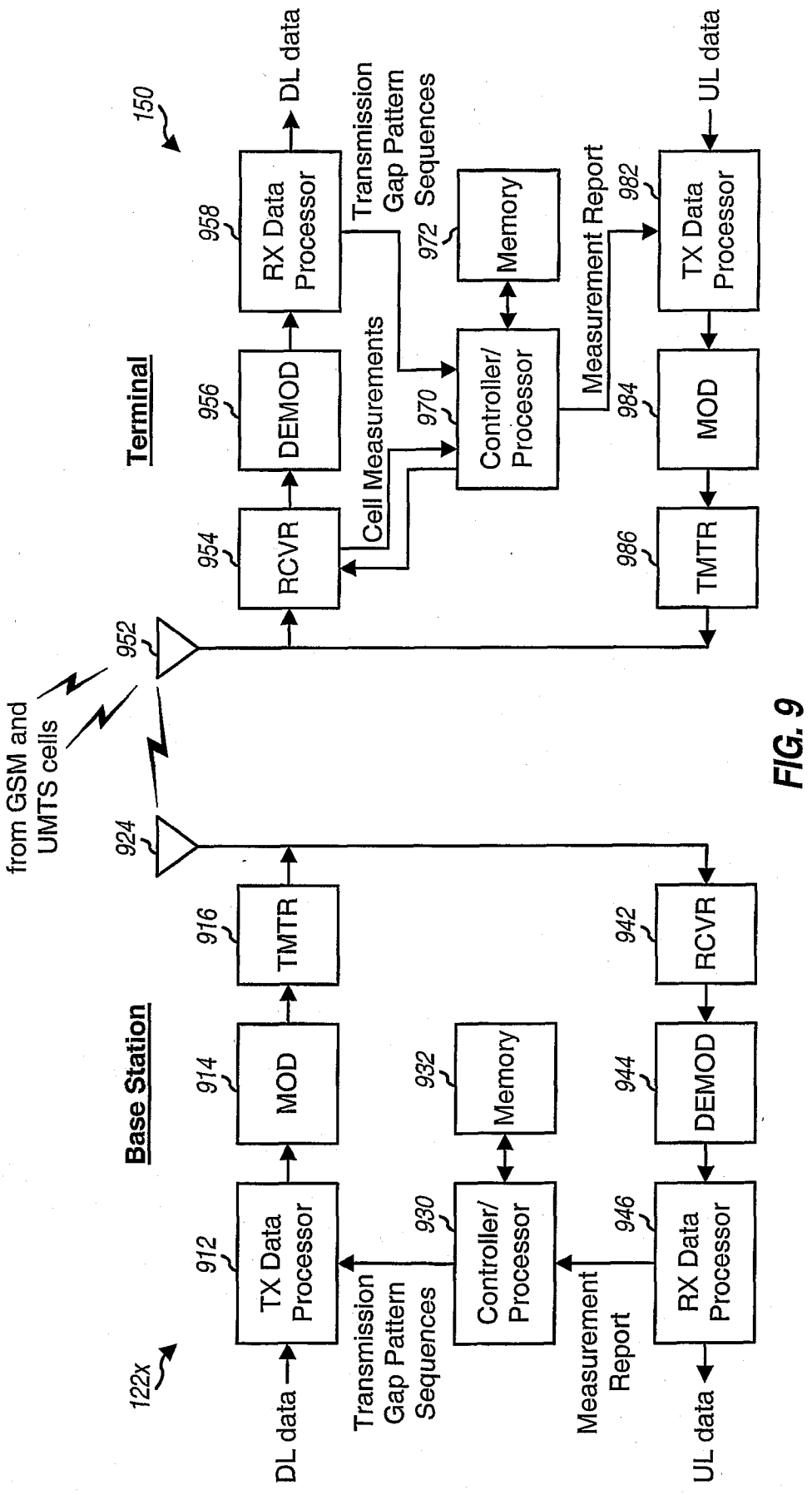

150
Terminal
958
RX Data Processor
DL data
Transmission Gap Pattern Sequences
972
Memory
956
DEMOD
954
RCVR
Cell Measurements
970
Controller/ Processor
Measurement Report
982
TX Data Processor
UL data
984
MOD
986
TMTR
952
924
from GSM and UMTS cells
Base Station
916
TMTR
914
MOD
912
TX Data Processor
DL data
122x
932
Memory
930
Controller/ Processor
Transmission Gap Pattern Sequences
942
RCVR
944
DEMOD
946
RX Data Processor
Measurement Report
UL data

FIG. 9