FIG. 4A

Initial State

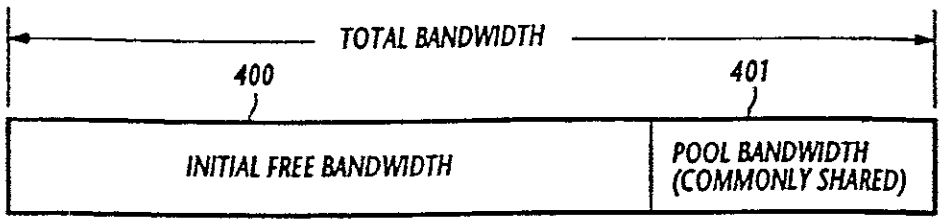


FIG. 4B

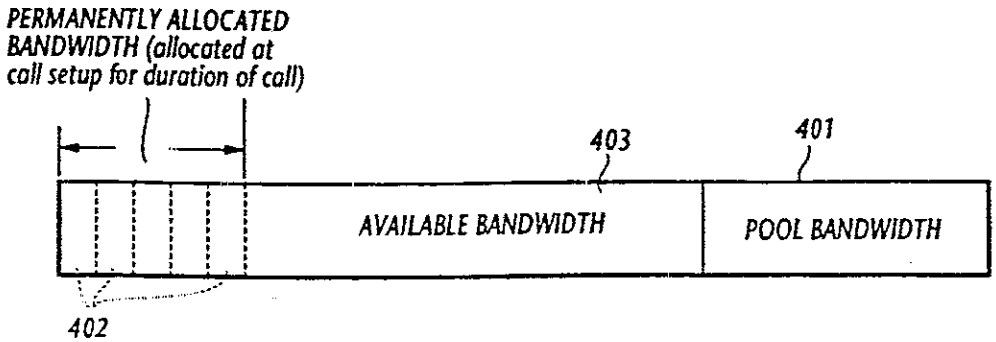


FIG. 5A

Temporary Pool Resource Allocation

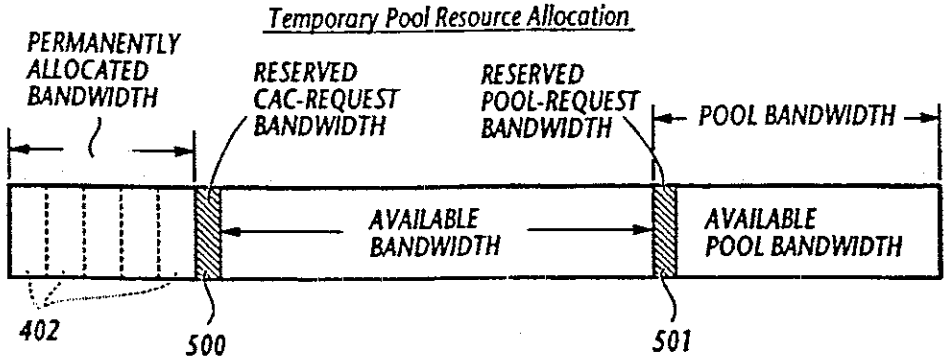


FIG. 5B

Swapping of Reserved Pool with Reserved Free Bandwidth

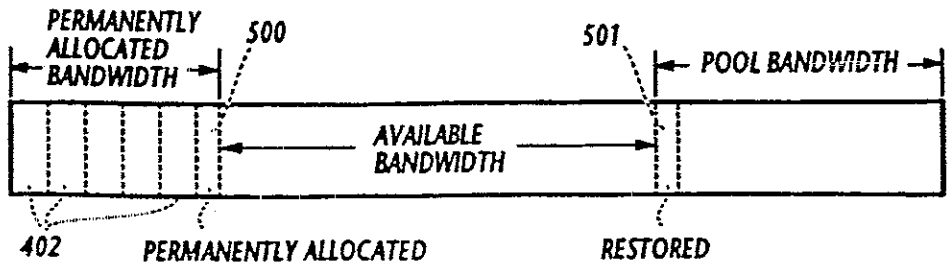


FIG. 6

REALLOCATION PROCEDURE (USER TERMINAL)

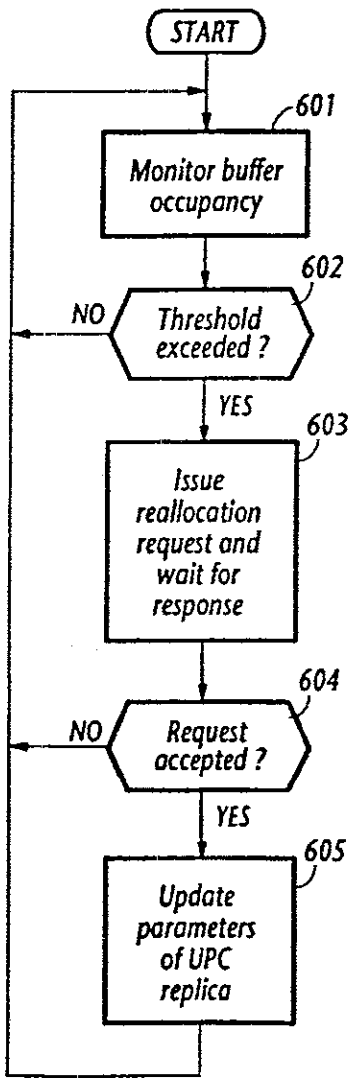
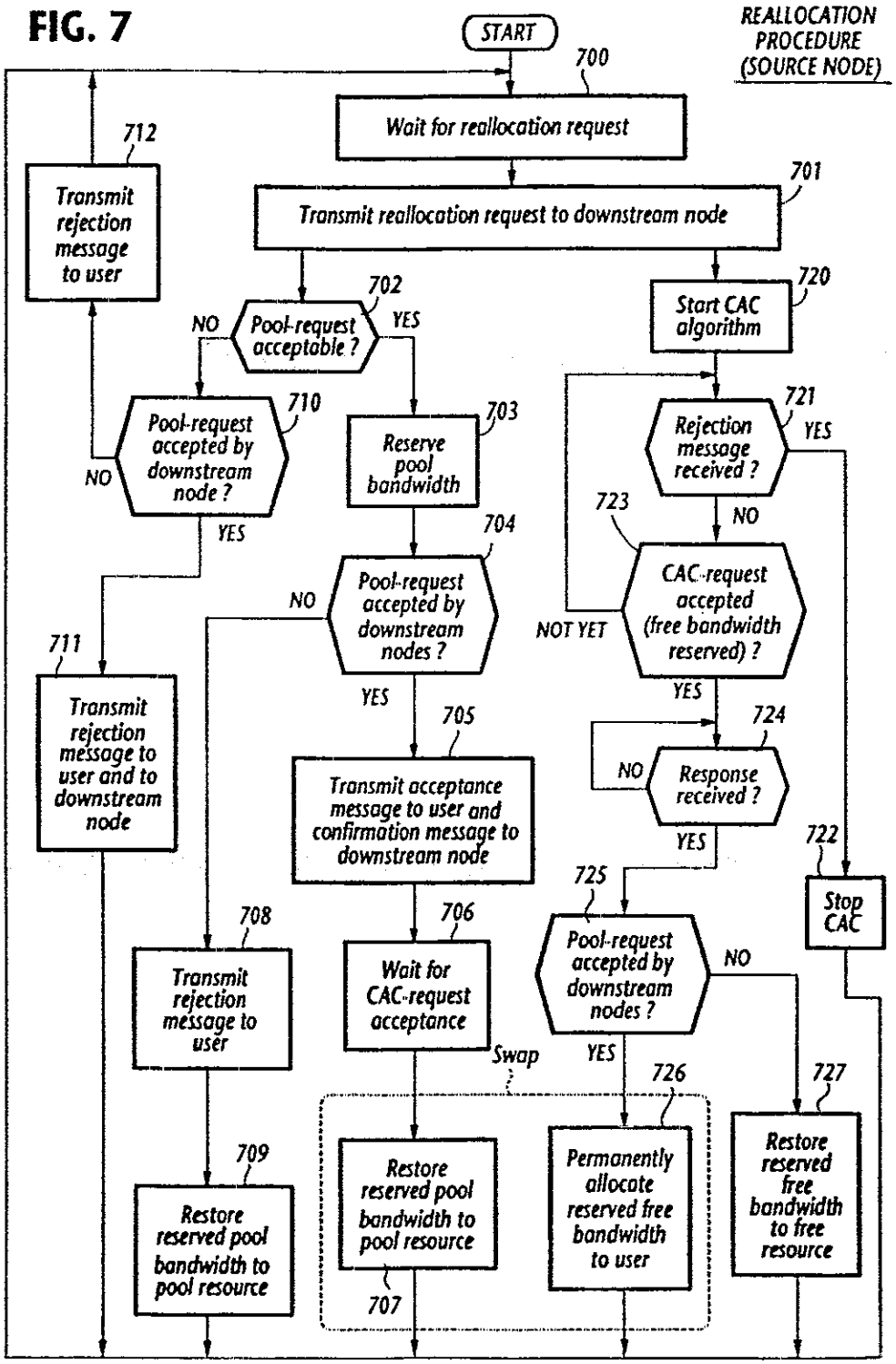


FIG. 7


START
REALLOCATION PROCEDURE (SOURCE NODE)
700
Wait for reallocation request
701
Transmit reallocation request to downstream node
702
Pool-request acceptable ?
NO
YES
712
Transmit rejection message to user
710
Pool-request accepted by downstream node ?
NO
YES
711
Transmit rejection message to user and to downstream node
703
Reserve pool bandwidth
704
Pool-request accepted by downstream nodes ?
NO
YES
705
Transmit acceptance message to user and confirmation message to downstream node
706
Wait for CAC-request acceptance
708
Transmit rejection message to user
709
Restore reserved pool bandwidth to pool resource
Swap
Restore reserved pool bandwidth to pool resource
707
720
Start CAC algorithm
721
Rejection message received ?
YES
NO
723
CAC-request accepted (free bandwidth reserved) ?
NOT YET
YES
724
Response received ?
NO
YES
725
Pool-request accepted by downstream nodes ?
NO
YES
726
Permanently allocate reserved free bandwidth to user
722
Stop CAC
727
Restore reserved free bandwidth to free resource

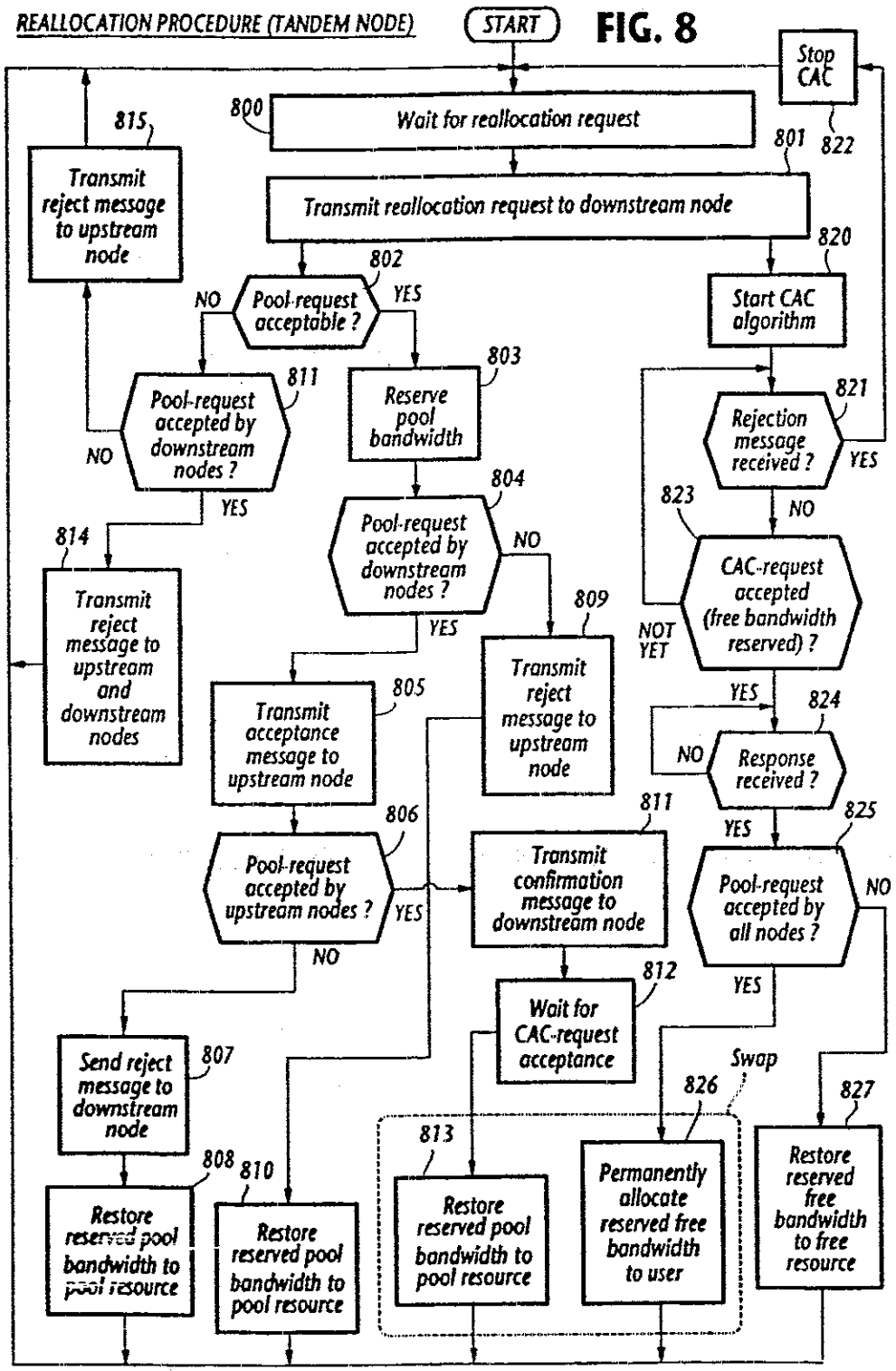

REALLOCATION PROCEDURE (TANDEM NODE)
START
FIG. 8
Stop CAC
822
800
Wait for reallocation request
801
Transmit reallocation request to downstream node
815
Transmit reject message to upstream node
802
Pool-request acceptable ?
NO
YES
820
Start CAC algorithm
803
Reserve pool bandwidth
811
Pool-request accepted by downstream nodes ?
NO
YES
821
Rejection message received ?
YES
NO
804
Pool-request accepted by downstream nodes ?
NO
YES
823
CAC-request accepted (free bandwidth reserved) ?
NOT YET
YES
814
Transmit reject message to upstream and downstream nodes
809
Transmit reject message to upstream node
805
Transmit acceptance message to upstream node
824
Response received ?
NO
YES
806
Pool-request accepted by upstream nodes ?
YES
NO
811
Transmit confirmation message to downstream node
825
Pool-request accepted by all nodes ?
NO
YES
812
Wait for CAC-request acceptance
Swap
826
827
Send reject message to downstream node
807
808
Restore reserved pool bandwidth to pool resource
810
Restore reserved pool bandwidth to pool resource
813
Restore reserved pool bandwidth to pool resource
Permanently allocate reserved free bandwidth to user
Restore reserved free bandwidth to free resource

FIG. 9

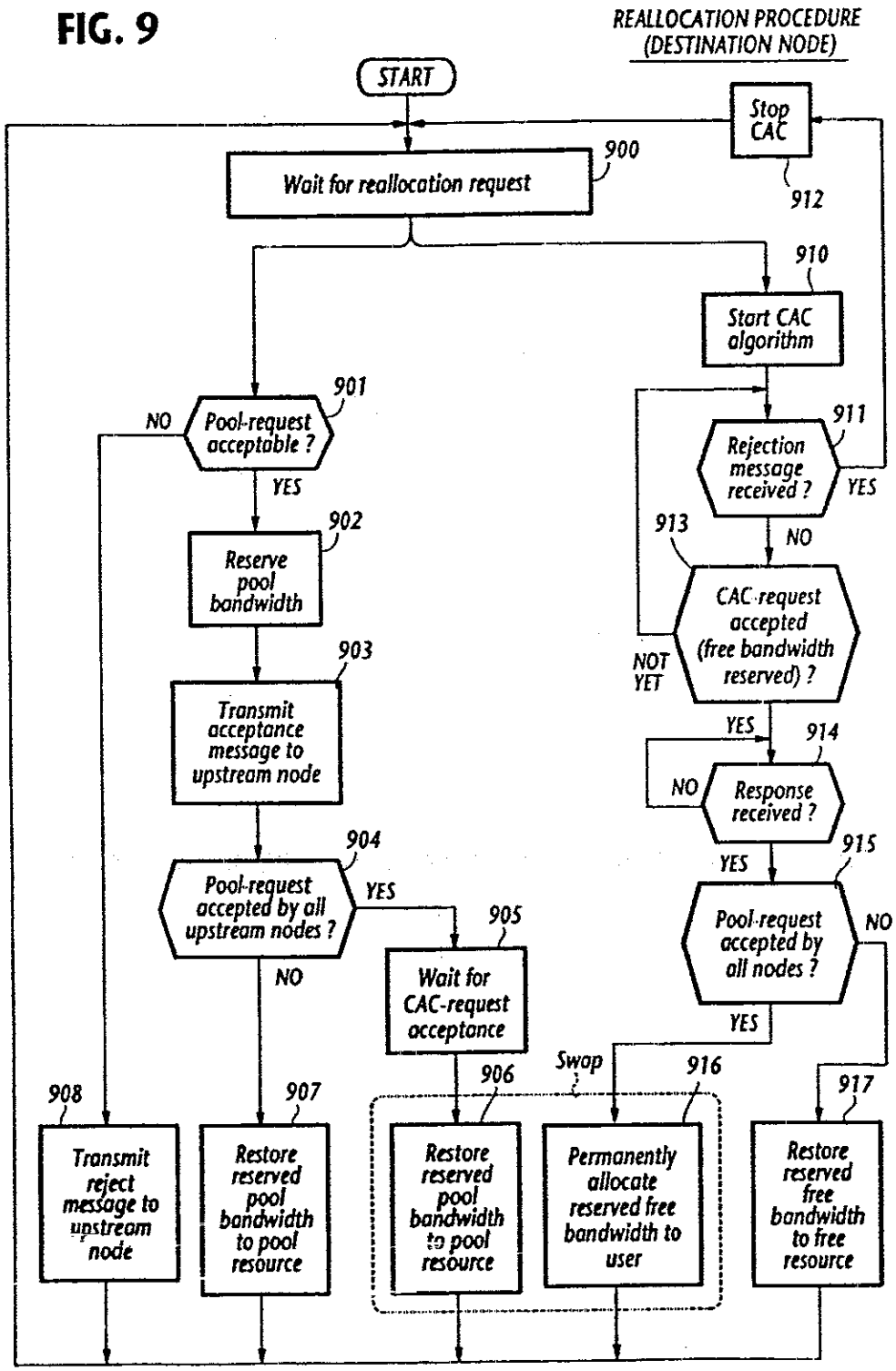

REALLOCATION PROCEDURE
(DESTINATION NODE)
START
Stop CAC
912
Wait for reallocation request
900
910
Start CAC algorithm
901
Pool-request acceptable ?
NO
YES
902
Reserve pool bandwidth
903
Transmit acceptance message to upstream node
904
Pool-request accepted by all upstream nodes ?
YES
NO
905
Wait for CAC-request acceptance
911
Rejection message received ?
YES
NO
913
CAC-request accepted (free bandwidth reserved) ?
NOT YET
YES
914
Response received ?
NO
YES
915
Pool-request accepted by all nodes ?
NO
YES
Swap
908
Transmit reject message to upstream node
907
Restore reserved pool bandwidth to pool resource
906
Restore reserved pool bandwidth to pool resource
916
Permanently allocate reserved free bandwidth to user
917
Restore reserved free bandwidth to free resource

FIG. 10

DEALLOCATION PROCEDURE (USER TERMINAL)

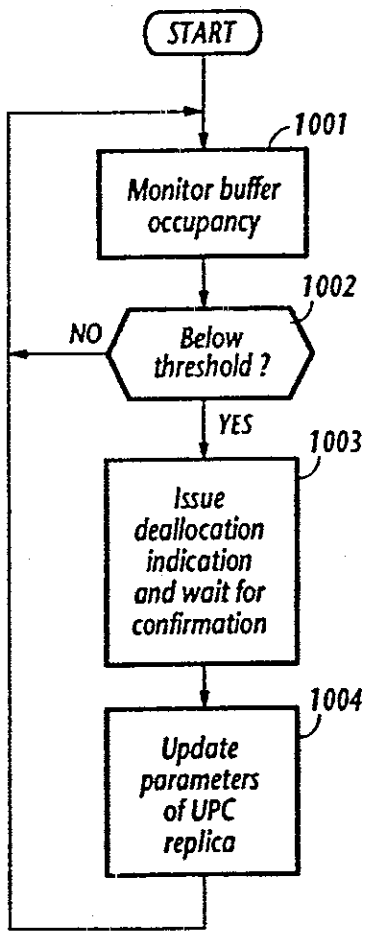


FIG. 11

DEALLOCATION PROCEDURE (ALL NODES)

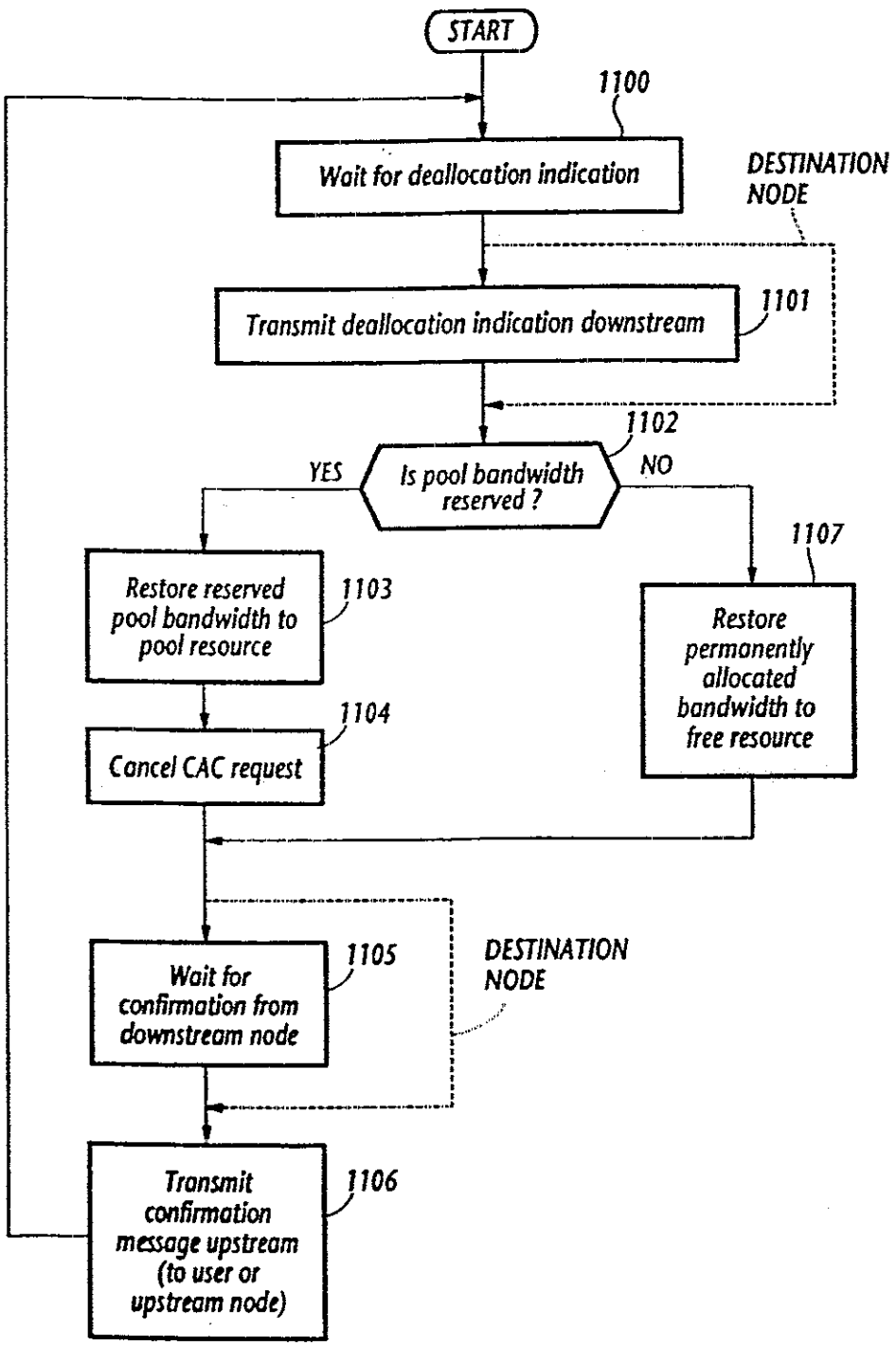
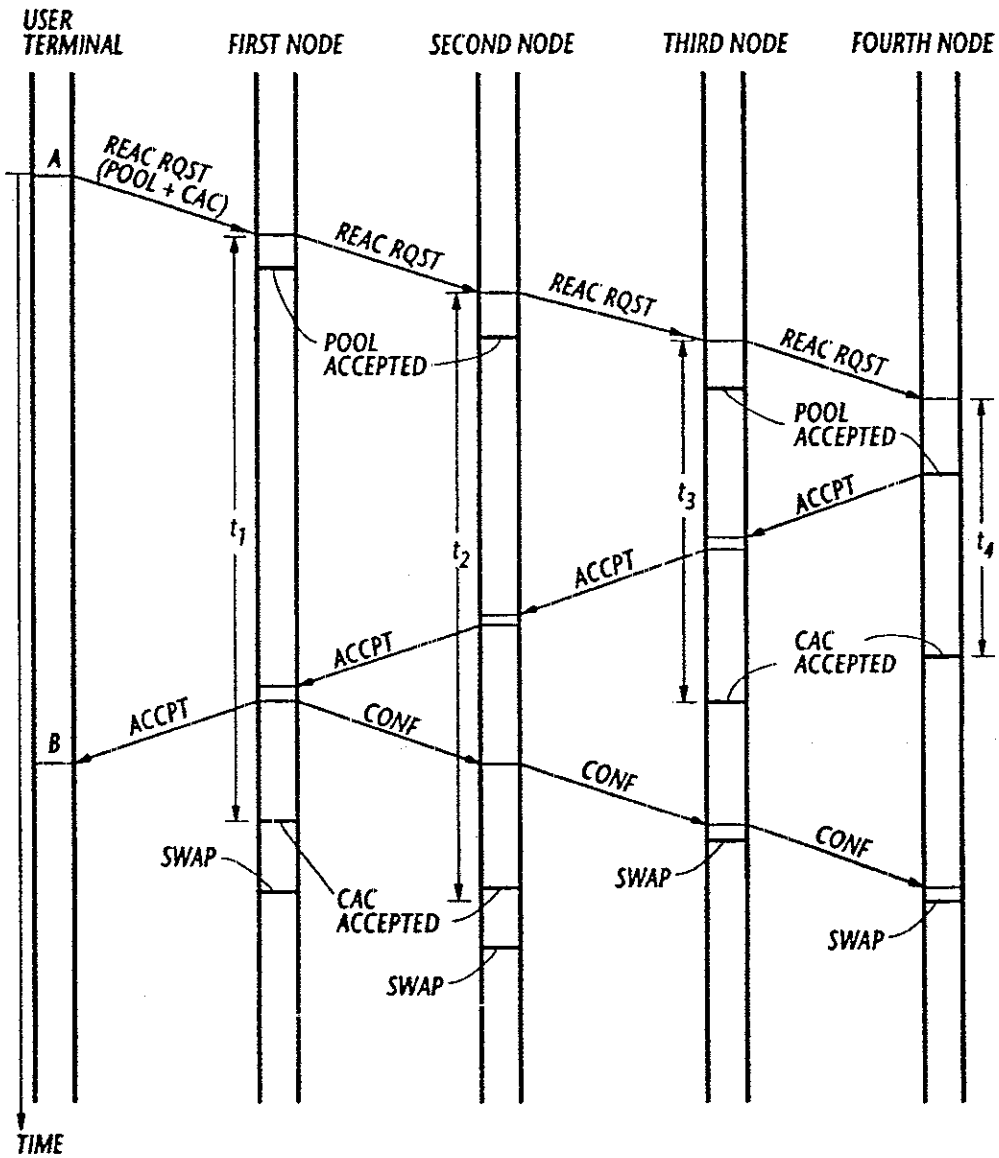


FIG. 12

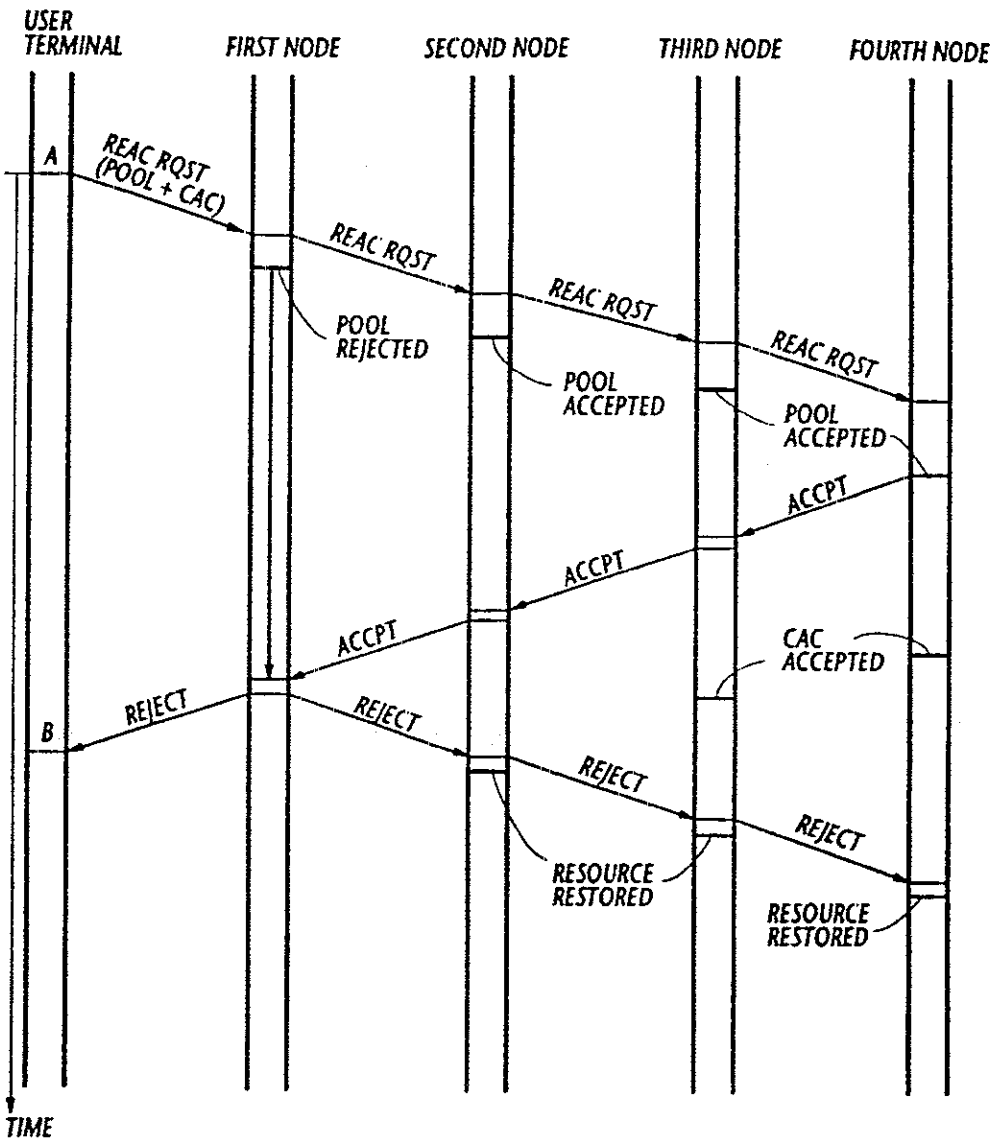
SUCCESSFUL REALLOCATION MESSAGE FLOW



LEGEND: A = TRIGGERING OF REALLOCATION
B = USER IS ALLOWED TO TRANSMIT AT REALLOCATED RATE

FIG. 13

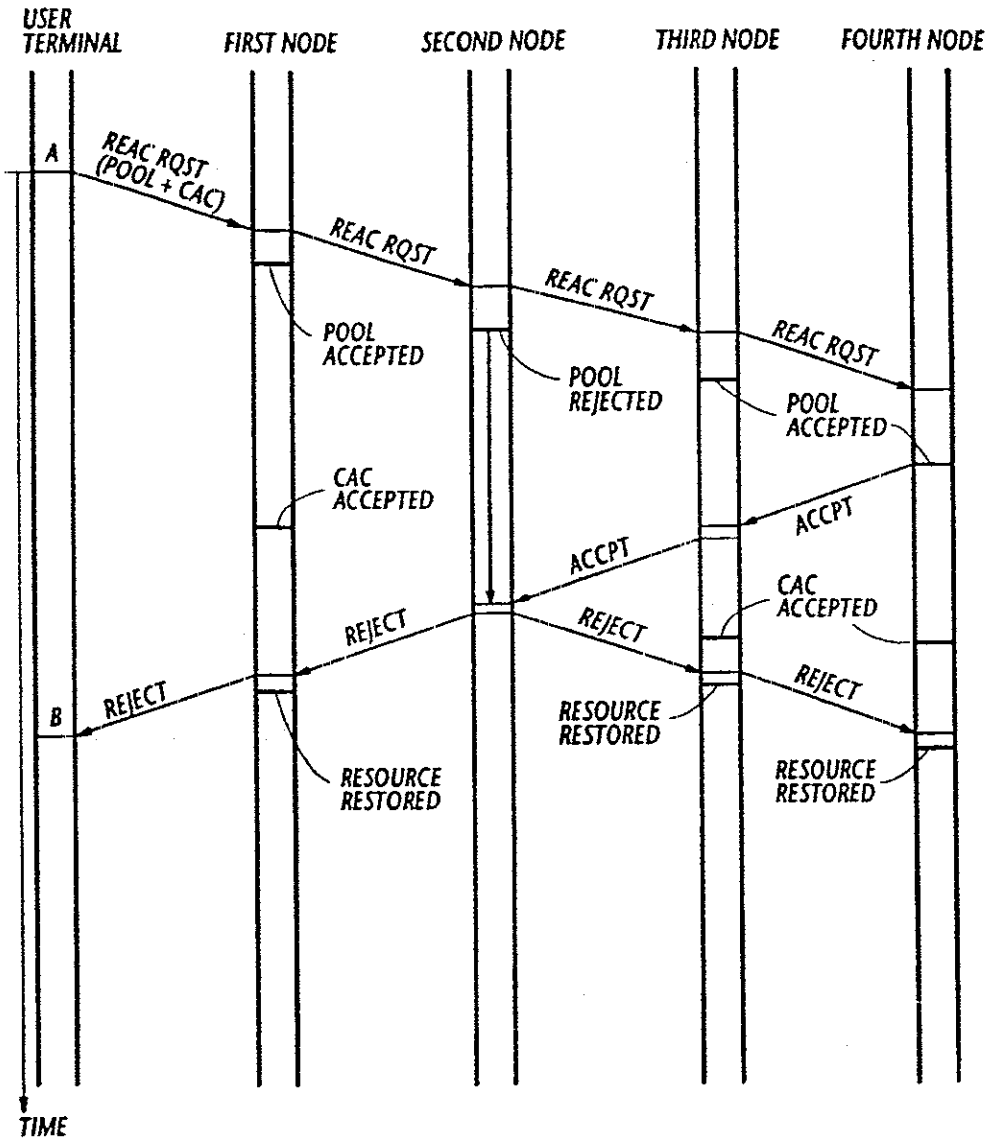
REALLOCATION MESSAGE FLOW (FAILURE IN FIRST NODE)



LEGEND: A = TRIGGERING OF REALLOCATION
B = USER IS NOTIFIED OF REJECTION

FIG. 14

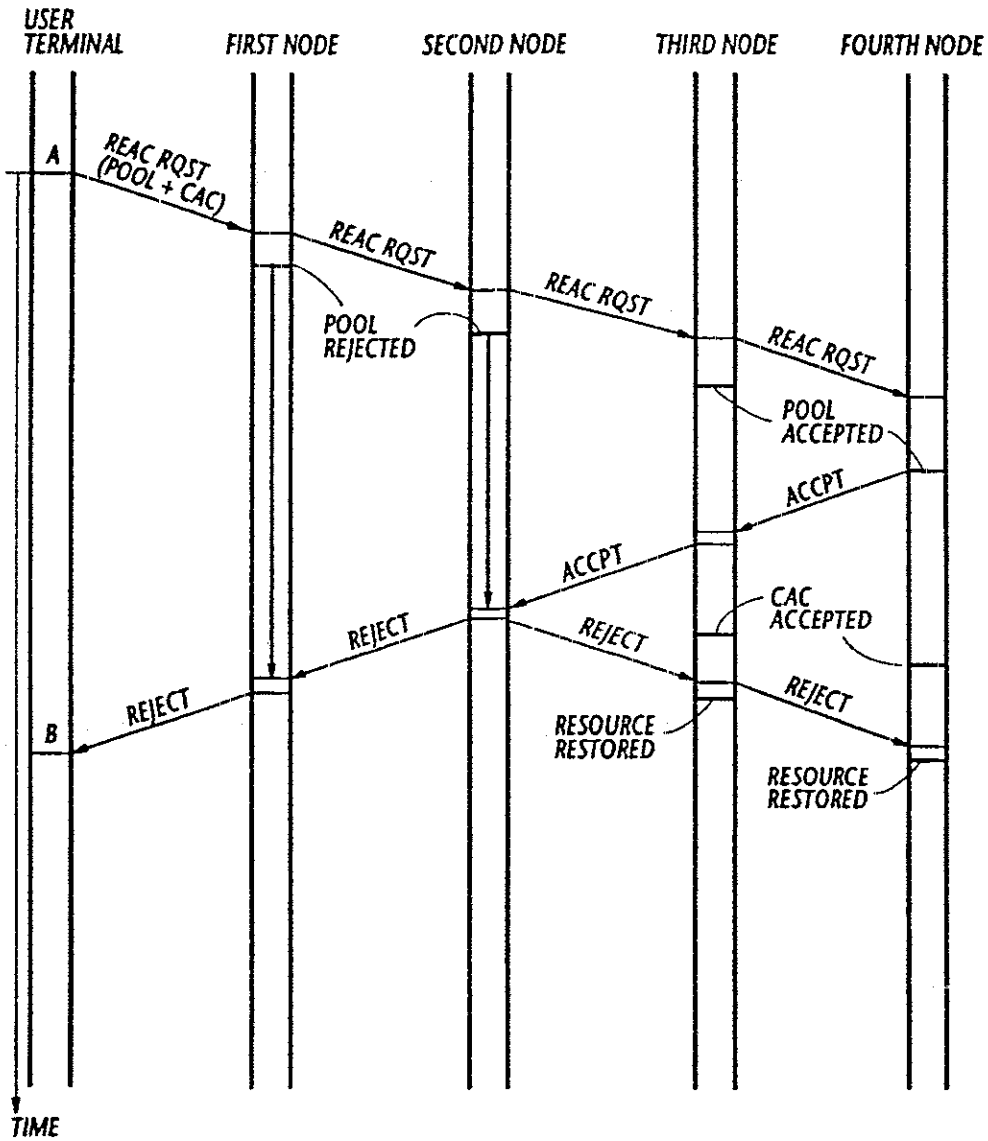
REALLOCATION MESSAGE FLOW (FAILURE IN SECOND NODE)



LEGEND: A = TRIGGERING OF REALLOCATION
B = USER IS NOTIFIED OF REJECTION

FIG. 15

REALLOCATION MESSAGE FLOW (FAILURE IN FIRST AND SECOND NODES)



LEGEND: A = TRIGGERING OF REALLOCATION
B = USER IS NOTIFIED OF REJECTION