## Description of State Diagram Variables

### Input/Output Variables

DataIn (X)

Status of DataIn input at port X.
Values: II = *input_idle*; indicates no activity
    −II; indicates activity
Note that DataIn (X) may be undefined during collision
but that it is a don't care in all instances when this is true.

CollIn (X)

Status of ControlIn input at port X.
Values: SQE = *signal_quality_error* ; indicates collision
    −SQE ; indicates no collision

Out (X)

Type of output repeater is sourcing at port X.
Values: Idle ; Repeater is not transmitting
    −Idle ; Repeater is transmitting Preamble Pattern
    or Data or Jam or TwoOnes.
    Preamble Pattern ; Repeater is sourcing alternating 1's and
    0's on port X.
    Data ; Repeater is repeating data frame on port X.
    Jam ; Repeater is sourcing Jam on port X.
    TwoOnes ; Repeater is sourcing two consecutive Manchester
    encoded ones on port X.

DisableOut (X)

Override of Out (X)
Values: ON ; Disable repeater transmission regardless of value of Out (X).
    −ON ; Repeater transmission depends on the value of Out (X).

### Port Variables

TT (X)

Transmit Timer indicates number of bits transmitted on port X.
Values: Positive integers

### Inter-Process Flags

AllDataSent

All received data frame bits have been sent.

Bit Transmitted

Indicates a bit has been transmitted by the repeater unit.

DataRdy

Indicates the repeater has detected the SFD and is ready to send the received data. The search for
SFD shall not begin before 15 bits have been received. Note, transmit and receive clock differences
shall also be accommodated.

Tw1

Wait Timer for the end of transmit recovery time (see 9.5.6.4). It is started by StartTw1. Tw1Done
is satisfied when the end of transmit recovery time is completed.

**Tw2**

> Wait Timer for the end of carrier recovery time (see 9.5.6.5). It is started by StartTw2. Tw2Done is satisfied when the timer has expired.

**Tw3**

> Wait Timer for length of continuous output (see 9.6.5). It is started by StartTw3. Tw3Done is satisfied when the timer has expired.

**Tw4**

> Wait Timer for time to disable output for Jabber Lockup Protection (see 9.6.5). It is started by StartTw4. Tw4Done is satisfied when the timer has expired.

## Port Functions

### Port (*Test*)

> A function that returns the designation of a port passing the test condition. For example, Port (CollIn=SQE) returns the designation: X for a port that has SQE true. If multiple ports meet the test condition, the Port function will be assigned one and only one of the acceptable values.

## Port Designation

Ports are referred to by number. Port information is obtained by replacing the X in the desired function with the number of the port of interest. Ports are referred to in general as follows:

ALL — Indicates all repeater ports are to be considered. All ports shall meet test conditions in order for the test to pass.

ANY — Indicates all ports are to be considered. One or more ports shall meet the test conditions in order for the test to pass.

ONLY1 — Indicates all ports are to be considered. One, but not more than one, port shall meet the test condition in order for the test to pass.

X — Generic port designator. When X is used in a state diagram, its value is local to that diagram and not global to the set of state diagrams.

N — Is defined by the Port function on exiting the IDLE state of Fig 9-2. It indicates a port that caused the exit from the IDLE state.

M — Is defined by the Port function on exiting the TRANSMIT COLLISION state of Fig 9-2. It indicates the only port where CollIn=SQE.

ALLXN — Indicates all ports except N should be considered. All ports considered shall meet the test conditions in order for the test to pass.

ALLXM — Indicates all ports except M should be considered. All ports considered shall meet the test conditions in order for the test to pass.

ANYXN — Indicates any port other than N meeting the test conditions shall cause the test to pass.

ANYXM — Indicates any port other than M meeting the test conditions shall cause the test to pass.

**Fig 9-2**
**Repeater Unit State Diagram**
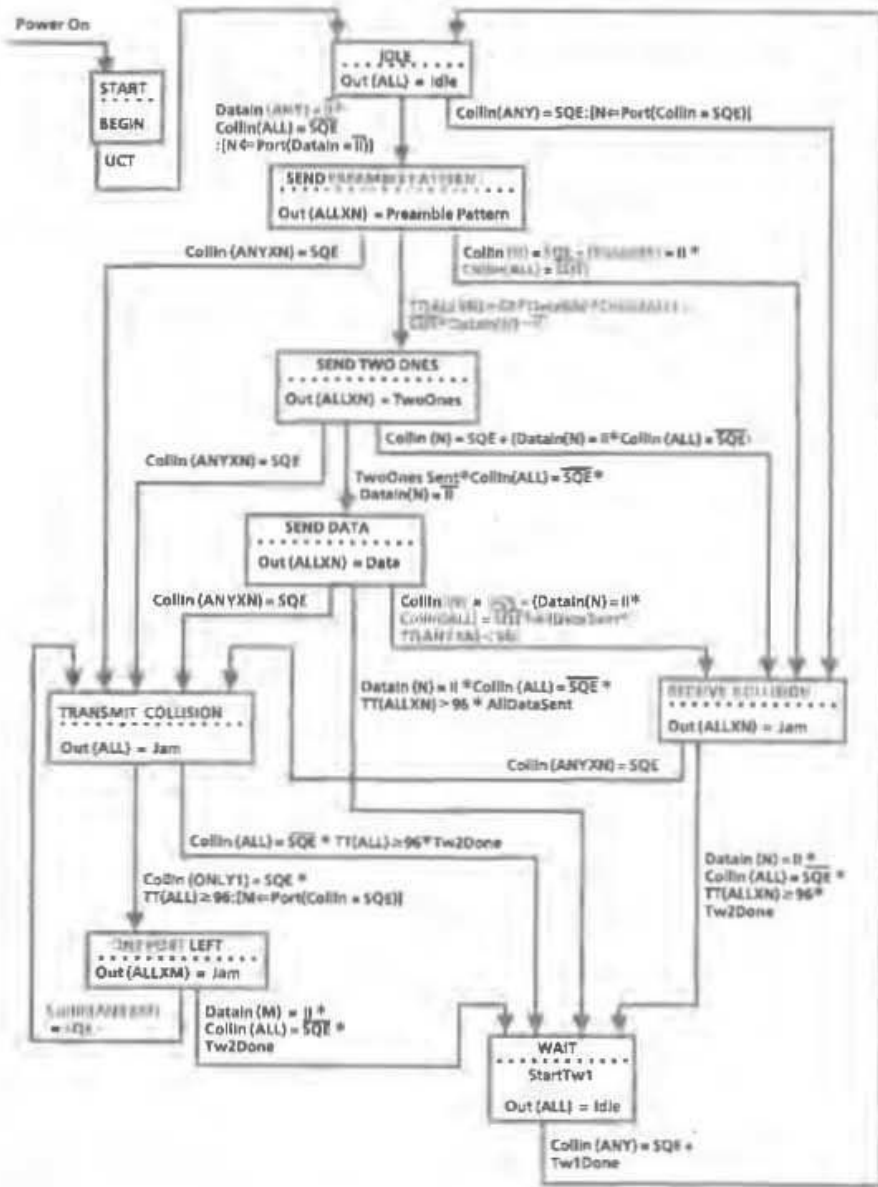
NOTE: Out (X) = Idle in all instances unless specified otherwise.
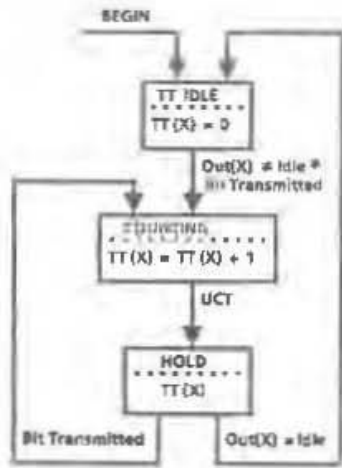
Fig 9-3
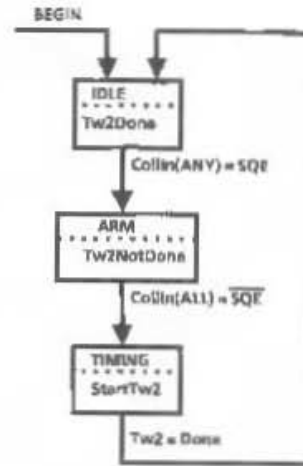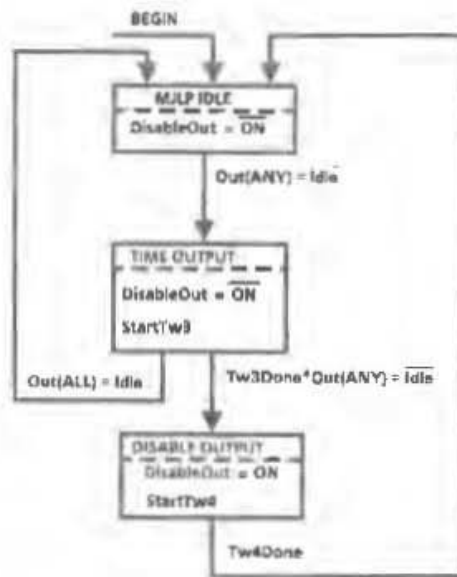Transmit Timer State Diagram
for Port X



Fig 9-4
Tw2 State Diagram



Fig 9-5
MAU Jabber Lockup Protection State Diagram

**9.6.2 Data and Collision Handling.** The repeater unit shall implement the CARRIER_ON function for all its ports. Upon detection of carrier from one port, the repeater unit shall repeat all received signals in the Data Frame from that port to the other port (or ports).

The repeater unit data and collision-handling algorithm shall be as defined in Fig 9-2.

**9.6.3 Preamble Regeneration.** The repeater unit shall output at least 56 bits of preamble followed by the SFD. When the repeater unit must send more than 56 bits, the maximum length preamble pattern it shall send is the number received plus 6.

**9.6.4 Fragment Extension.** If the received bit sequence from CARRIER_ON to CARRIER_OFF is fewer than 96 bits in length, including preamble, the repeater unit shall extend the output bit sequence with Jam such that the total number of bits output from the repeater unit shall equal 96.

**9.6.5 MAU Jabber Lockup Protection.** MAU Jabber Lockup Protection must operate as shown in the MAU Jabber Lockup Protection state diagram. The repeater unit shall interrupt its output if it has transmitted continuously for longer than 5 ms or 50 000 bit times − 20% + 50%. The repeater unit shall then, after 96 to 116 bit times (9.6 to 11.6 μs), re-enable transmissions.

**9.6.6 Auto-Partitioning/Reconnection (Optional)**

**9.6.6.1 Overview.** In large multisegment networks it may be desirable that the repeater unit protect the network from some fault conditions that would halt all network communication. A potentially likely cause of this condition could be due to a cable break, a faulty connector, or a faulty or missing termination.

In order to isolate a faulty segment's collision activity from propagating through the network, the repeater unit may optionally implement an auto-partition algorithm and, on detection of the malfunction being cleared, an auto-reconnection algorithm.

**9.6.6.2 Detailed Auto-Partition/Reconnection Algorithm State Diagram.** Repeater sets with 10BASE-T MAUs shall implement an auto-partition/reconnection algorithm on those parts. The repeater unit may optionally implement an auto-partition/reconnection algorithm that protects the rest of the network from an open-circuited segment. If the repeater unit provides this function, it shall conform to the state diagram of Fig 9-6.

The algorithm defined in Fig 9-6 shall isolate a segment from the network when one of the following two conditions has occurred on the segment:

(1) When a consecutive collision count has been reached; or
(2) When a single collision duration has exceeded a specific amount of time.

When a segment is partitioned, DataIn (X) and CollIn (X) from that segment are forced to II (input idle) and −SQE (no collision), respectively, so that activity on the port will not affect the repeater unit. Output from the repeater to the segment is not blocked.

The segment will be reinstated when the repeater has detected activity on the segment for more than the number of bits specified for Tw5 without incurring a collision.

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