POTS

This is the Basic Call Model.

Variables:
Busy A: true between an Off-hook A event and the next On-hook A event; between a Start Ringing A B event and the next Stop Ringing A B event, if no Off-hook A intervenes; or between a Start Ringing A B event and the next On-hook A. Ringing A B: true between a Start Ringing A B event immediately following a Dial B A event and the next Stop Ringing A B event. AudibleRinging A B: true between a Start AudibleRinging A B event immediately following a Dial A B event and the next Stop AudibleRinging A B event.

All of the POTS event sequences start and end with Busy A = False (Idle A = True). The values of Busy B in the diagram have been given in the preceding rules, but for illustration we show the value changes, in nodes 4, 9, 10, and 14.
1. **Call Forwarding Busy Line**

This feature permits a subscriber to have incoming calls that encounter a busy condition to be re-directed.

*New Variables:* BLForward B is the line to which incoming calls will be redirected if they encounter a busy condition. If B subscribes to CFBL, this variable is defined and unchanging.

In the sequence diagram below, C = BLForward B.

All of the event sequences in this diagram end with Busy A = False (Idle A = True).
2. Calling Number Delivery

This feature enables the subscriber’s telephone to receive and display the number of the originating party on an incoming call.

*New Variables:*

- LastIncoming A is the address of the originator of the last call to the subscriber A.
- It is always undefined in POTS. For a subscriber to Calling Number Delivery, the value is changed at each Start Ringing event.

```
POTS A<-A B<-B 2

POTS A<-A B<-B 3
  1 Dial A B
  Idle B

2 Start Ringing B A/ LastIncoming B <- A
Start AudibleRinging A B III Display B A

POTS A<-A B<-B 5
POTS A<-A B<-B 13
```
3. **IN Freephone Billing**

This feature allows the subscriber to be charged for incoming calls. Freephone normally includes routing as well, but we define that as a separate feature in Figure 4.

*New Variables:* None.

POTS A<-A B<-B

1 Dial A B

2 Trigger INFO_ANALYZED B A B Time

3 Response ANALYZE_ROUTE B A B B

4 Start AudibleRinging A B III Start Ringing B A

5 Off-hook B

6 Stop AudibleRinging A B III Stop Ringing B A III LogBegin A B B Time

7 On-hook A

8 Disconnect B A III LogEnd A B Time

9 On-hook B

10 On-hook B

11 Disconnect A B III LogEnd A B Time

12 On-hook A

13 LineBusyTone A

14 On-hook A

15 On-hook A

16 Stop Ringing B A III Stop AudibleRinging A B

17 Busy B

18 Idle B
4. **IN Freephone Routing**

This feature allows the subscriber to redirect a call to various telephones, potentially using all or part of the calling number and the time of day.

**New Variables:**
- Redirect A B Time1 Time2 is the line to which a call is redirected when the subscribed line (B) is called from line A between Time1 and Time2. It is undefined for POTS.
- In the following sequence diagram, C=Redirect A B Time1 Time2

![Sequence Diagram]

**Diagram Description:**
- **POTS A<-A B<-B 2**
- **POTS A<-A B<-B 3**
- **Dial A B**
- **2 Trigger INFO_ANALYZED B A B Time**
- **Time1 <= Time < Time2**
- **3 Response ANALYZE_ROUTE B A C A**
- **Busy C**
- **Idle C**
- **4 Start AudibleRinging A C III Start Ringing C A**
- **13 LineBusyTone A**
- **14 On-hook A**
- **5 Off-hook C**
- **15 On-hook A**
- **6 Stop AudibleRinging A C III Stop Ringing C A III LogBegin A B A Time III LogBegin B C B Time**
- **10 On-hook C**
- **16 Stop Ringing C A III Stop AudibleRinging A C**
- **7 On-hook A**
- **11 Disconnect A C III LogEnd A B Time III LogEnd B C Time**
- **8 Disconnect C A III LogEnd A B Time III LogEnd B C Time**
- **9 On-hook C**

**New Variables:**
- Redirect A B Time1 Time2 is the line to which a call is redirected when the subscribed line (B) is called from line A between Time1 and Time2. It is undefined for POTS.
5. IN Teen Line

This feature restricts outgoing calls based on the time of day. The restriction can be over-ridden by entering the correct PIN.

*New Variables:*

TeenPIN A is the valid teen-line PIN for subscriber A. It is undefined for POTS.

TeenTime A Time1 Time2 means that the PIN must be used from Time1 to Time2 in order to initiate a call. These variables are defined and unchanging for subscribers to Teen Line.
6. Terminating Call Screening

This feature allows a subscriber to screen calls based on the originating number.

New Variables:
Screened B is a set of lines from which subscriber B does not accept calls.

This variable is undefined in POTS, defined and unchanging for subscribers to Terminating Call Screening.

```
POTS A<-A B<-B 2

A not in Screened B && Idle B
POTS A<-A B<-B 4

A in Screened B
POTS A<-A B<-B 3
1 Dial A B

A not in Screened B && Busy B
POTS A<-A B<-B 15

3 Announce A ScreenedMessage

4 Onhook A
```
7. Three-Way Calling

This feature allows the connection of three parties in a call. The following diagram represents two different cases, one with X as the originating party and one with X as the terminating party. The symbols “Orig” and “Term” stand for X and Y respectively when X is the originating party, and for Y and X respectively when X is the terminating party. Each use of this diagram when constructing an event sequence introduces a new Z; if it were expanded, we might write Z1, Z2, ... The symbols TWC A, TWC B, ... direct you to another part of the diagram on a subsequent page.

**New Variables:**
ThreeWay X is true when the Three-Way Calling feature is controlling call behavior. Changes in its value are shown in the diagrams. Busy X is changed somewhat by this feature, so its changes are also given in the sequence diagram.
**TWC C: Talking to Y and Ringing Z**

- **58 On-hook X**
  - ThreeWay X <- False
  - Busy X <- False

- **59 Disconnect Y X III LogEnd Orig Term Time III**
  - Stop Ringing Z X III Stop AudibleRinging X Z

- **61 On-hook Y**

- **51 On-hook Y**
  - ThreeWay X <- False

- **52 Disconnect X Y III LogEnd Orig Term Time**

- **62 Flash X**
  - ThreeWay X <- False

- **63 Stop Ringing Z X III Stop AudibleRinging X Z**

  - POTS A<-X B<-Z 5
  - POTS A<-X B<-Z 13

- **TWC X<-X Y<-Y 1**
  - POTS A<-Orig B<-Term 7
  - POTS A<-Orig B<-Term 10

**TWC D: Holding Y and Talking to Z**

- **34 On-hook Z**

- **35 Disconnect X Z III LogEnd X Z Time**

- **36 On-hook Y**

- **37 Flash X**
  - ThreeWay X <- False

- **38 On-hook X**

- **39 Disconnect X Y III LogEnd Orig Term Time**

- **40 Flash X**
  - ThreeWay X <- False

- **41 Off-hook X**
  - ThreeWay X <- False

- **42 On-hook X**

- **43 Start Ringing X Y 2**

- **44 On-hook Y**
  - ThreeWay X <- False

- **45 Disconnect X Y III Stop Ringing X Y III LogEnd Orig Term Time**

  - TWC X<-X Y<-Y 1
  - POTS A<-Orig B<-Term 7
  - POTS A<-Orig B<-Term 10
8. **IN Call Forwarding**

This feature permits a subscriber to have all calls forwarded. The subscriber pays the charges on the forwarded leg.

*New Variables:* ForwardToB is the address of the forward-to line for Call Forwarding subscriber B’s calls.

It is defined and unchanging for subscribers B to IN Call Forwarding. In the following diagram, C=ForwardTo B.

```
POTS A<-A B<-B 2

POTS A<-A B<-B 3
  1 Dial A B

2 Trigger TERMINATION_ATTEMPT B A B Time

3 Response FORWARD_CALL B A B C Time
  Busy C
  Idle C

12 LineBusyTone A
  2 Start Ringing C A III Start AudibleRinging A C

13 On-hook A

10 On-hook A

3 Off-hook C

11 Stop Ringing C A III Stop AudibleRinging A C III Disconnect C A

4 Stop Ringing C A III Stop AudibleRinging A C III LogBegin A B AT ime III LogBegin B C B Time

8 On-hook C

5 On-hook A

9 LogEnd A B Time III LogEnd B C Time III Disconnect A C

6 LogEnd A B Time III LogEnd B C Time III Disconnect C A

10 On-hook A

7 On-hook C
```
9. Call Waiting

The call waiting feature permits the subscriber to accept a second call when the telephone is already in use. The drawing on this page includes just the "sunny day scenario." Less usual user behaviors are shown in diagrams CW A-E. As in the Three-Way Calling diagram, the following diagram represents two different cases, one with X as the originating party and one with X as the terminating party. The symbols "Orig" and "Term" stand for X and Y respectively when X is the originating party, and for Y and X respectively when X is the terminating party. Each use of this diagram when constructing an event sequence introduces a new Z.

New Variables:
CallWaiting X is true when the Call Waiting feature is controlling the call processing for subscriber X. Busy X is redefined for Call Waiting, so changes are shown in the diagram.

Busy X is redefined for Call Waiting, so changes are shown in the diagram.
CW A: Call Waiting - Talking to Y, Waiting Z
CW B. Call Waiting - Talking to Z, Holding Y

16 On-hook X

17 Disconnect Z X III LogEnd Z X Time III Start Ringing X Y 2

20 On-hook Y

22 Stop Ringing X Y / CallWaiting X <- False Busy X <- False III Disconnect X Y III LogEnd Orig Term Time

23 On-hook Y / CallWaiting X <- False

24 Disconnect X Y III LogEnd Orig Term Time

CW X<-X Y<-Z 1

POTS A<-Z B<-X 7

25 On-hook  Y /

26 CallWaiting X <- False

27 LogEnd Orig Term Time

28 Disconnect X Y / CallWaiting X <- False

40 On-hook  Z

41 Disconnect X Z III LogEnd Z X Time

42 Flash X / CallWaiting X <- False

CW X<X Y<Y 1

43 On-hook X

POTS A<-Orig B<-Term 10

POTS A<-Orig B<-Term 7

44 Start Ringing X Y 2

45 Off-hook X

46 Stop Ringing X Y / CallWaiting X <- False

CW X<X Y<Y 1

POTS A<-Orig B<-Term 10

POTS A<-Orig B<-Term 7

47 On-hook Y

48 Stop Ringing X Y III Disconnect X Y III LogEnd Orig Term Time

50 On-hook Y

52 Disconnect X Y / CallWaiting X <- False III LogEnd Orig Term Time

53 On-hook X / Busy X <- False

54 CallWaiting X <- False
CW C. Call Waiting - Talking to Y, Holding Z
CW D. Call Waiting - Holding Z

CW E. Call Waiting - Holding Y
10. **Charge Call**

This feature permits a subscriber to charge a call to a different address than the originating address, if the correct PIN is entered.

*New Variables:*

Charge C is the PIN for C.
**CHARGE A: INVALID PIN**

1. CHARGE A
2. 12 Response SEND_TO_RESOURCE A Invalid PIN
3. 13 Announce A InvalidPIN III Resource A -
4. 14 Response DISCONNECT A -
5. 15 On-hook A

**CHARGE B: VALID PIN**

1. CHARGE B
2. 16 Response ANALYZE_ROUTE A A B C
3. Busy B
4. Idle B
5. POTS A<-A B<-B 15
6. 17 Start AudibleRinging A B III Start Ringing B A
7. 18 Off-hook B
8. 26 On-hook A
9. 19 Stop AudibleRinging A B III Stop Ringing B A III LogBegin A B C Time
10. 27 Stop AudibleRinging A B III Stop Ringing B A
11. 20 On-hook A
12. 23 On-hook B
13. Idle A
14. Idle B
15. 21 Disconnect B A III LogEnd A B Time
16. 24 Disconnect A B III LogEnd A B Time
17. 22 On-hook B
18. 25 On-hook A