FIG 1 - CCA IN IDEAL SINGLE NETWORK SCENARIOS

A. Range (radius) of Rx node \(^{[1]}\)
   \((-80\text{dBm Sens @10E-5, no fade})\)
   
   \(2x\) 230m @ 10E-1
   \(1x\) 115m @ 100mw
   \(.5x\) 60m @ 10mw

B. Range (diameter) of network = range (radius) of Rx node

C. Hidden node @ 10E-5

D. Network’s RF Shadow -
   10E-5: 3 x range, 9 x area
   10E-1: 5 x range, 25 x area
FIG 2 - CCA IN IDEAL MULTIPLE NETWORK SCENARIOS

A. If Separation of all A nodes to all B nodes > 2x
   No Interference

B. 1x < Separation < 2x
   Some Interference on Channel

C. 0 < Separation < 1x
   Significant Interference on & adj channels

D. Overlapping Networks
   Destructive Intrfr. on & adj channels

Note: shadows based on 10E-5, no fading
FIG 3 - CCA METHODS VS RF POWER & BER [2]

POWER

-75
-80
-85
-90

CLOCK

-75
-80
-85
-90

HYBRID

-75
-80
-85
-90

SYNC

-75
-80
-85
-90

PACKET

-75
-80
-85
-90

BER

10E
-7
-5
-3
-1

Tx

Defer

If CK

If CK*

If SY

If SY*

If PK

If PK*

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FIG 4 - HUMAN MODEL VS CCA MODEL: CASE #1

Loudness

Th3: -20dBm

Foreground

Th2: -50dBm

Background

Th1: -85 dBm*

Quietness

1

Stillness

Speak

ED<Th1

Tx

KEY: Observation

human

Response

Speak/defer

CCA

Tx/scan

Submission

Charlie Jenkins, GEC Plessey
FIG 6 - HUMAN MODEL VS CCA MODEL: CASE #3

Loudness

Th3: -20dBm

Foreground

Th2: -50dBm

Background

Th1: -85 dBm

Quietness

Submission 6 Charlie Jenkins, GEC Plessey
FIG 7 - HUMAN MODEL VS CCA MODEL: CASE #4

Loudness

Th3: - 20dBm

Foreground

Th2: - 50dBm

Background

Th1: - 85 dBm

Quietness

Submission 7 Charlie Jenkins, GEC Plessey
FIG 8 - HUMAN MODEL VS CCA MODEL: CASE #5

Loudness

Th3: -20dBm

Foreground

Voice

Th2: -50dBm

TD = Data

Background

Defer

TD = Noise

Scan

TD = Noise

Scan

Quietness

TD = No trans

Tx

Submitter

Charlie Jenkins, GEC Plessey
FIG 9 - HUMAN MODEL VS CCA MODEL: CASE #6

Loudness

Th3: -20dBm

Foreground

Th2: -50dBm

Background

Th1: -85 dBm

Quietness

Loud Racket

Defe

ED>Th3

Scan

TD = Noise

Scan

TD = No trans

Tx

TD = Data

Scan

TD = Noise

Tx