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May 11, 2006

FILED ELECTRONICALLY

Ms. Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: *Ex Parte* Presentation in ET Docket No. 04-151, WT Docket No. 05-96, ET Docket No. 02-380, ET Docket No. 98-237

Dear Ms. Dortch:

Pursuant to Section 1.1206 of the Commission's rules, 47 C.F. R. § 1.1206, Airspan Networks submits this notice of an *ex parte* presentation in the above-captioned proceeding.

On March 15, 2006, Dick Lee (VP and General Manager, North America and Caribbean) and David Reeder (VP Sales North America) of Airspan Networks and Mark Adolph (CFO) of Open Range Communications met with Julius Knapp (Deputy Chief, OET), Alan Scrime (Chief, Policy & Rules Division, OET), Gary Thayer (Attorney/Electrical Engineer, OET), Ira Keltz (Chief, Electromagnetic Compatibility Division, OET), Bruce Romano (Associate Chief/Legal Counsel, OET) and Rashmi Doshi (Chief, Laboratory Division, OET). Lauren VanWazer (Special Counsel to the Office Chief) participated by conference call.

At the meeting, various options were discussed for operations and licensing schemes in the 3650 MHz band, as set forth more fully in the attached memorandum and the attached powerpoint presentation, which provides an overview of a carrier sense method of operation. The attached memorandum and carrier sense powerpoint were subsequently provided to Messrs. Knapp and Romano. At the meeting, overviews of Airspan Networks rural U.S. market success and Open Range Communications were also provided.

Airspan Networks only recently realized that an *ex parte* notice regarding the foregoing was not filed in the captioned dockets, and accordingly is making this *ex parte* filing at this time.

Sincerely,

/s/
Martin L. Stern
Attorney for Airspan Networks, Inc.

MLS/jkl
Attachments
FCC Attendees

Options for Operating WiMAX Based Systems in the US 3.65GHz band.

Paul Trubridge
Senior Director, Product Management
Airspan Networks
21st March 2006

The following options are outlined in order to assist the FCC to make an appropriate choice of licensing regime for the 3.65GHz band in the United States.

There are three options which drive varying levels of administration and offer a choice that can be made to best fit the economic constraints of operator business cases wishing to deploy broadband wireless access systems in this band.

All options are designed to support standard WiMAX compliant CPE operating in the band 3.65-3.7GHz. Any carrier sense and subsequent interference avoidance action is coordinated by the Base Station such that additional costs associated with proprietary CPE are avoided.

Option 1 – Fully Licensed

The spectrum is divided into 2 x 20MHz allocations and licensed on a National or regional basis. This requires no change from the standard WiMAX implementation, but carries high administration costs for the FCC. Regional boundaries and guard band definitions would also need to be factored. For administration simplicity, a set guard band should be implemented between the 20MHz allocations.

Option 2 – Semi Licensed with Frequency Channel Exclusivity

The spectrum is divided into 5MHz TDD channels. The 3.65-3.70 GHz band will allow 10 separate channels to be created. Operators apply to deploy base stations on particular channels, in particular locations and, once approval is granted, have exclusive rights to operate on that channel in that location. A second operator will not be granted approval to operate on that channel or its adjacent channels in that area. The boundary will be based on a standard maximum operational range dictated by the EiRP limits of the system.

In addition to the administration associated with this scheme, it is recommended that each Base Station employs a simple carrier sense mechanism to prevent it from interfering directly with other equipment on the same frequency channel. This is illustrated as “phase 1” in figure 1 below.

This mechanism ensures that systems “detect and protect” existing users and usage, but at the same time permit systems to operate without restriction if no other system is detected. The result is that spectrum is effectively used wherever possible and does not lie dormant, just because an operator registers and applies for a license with the FCC . In the event that a system does “detect” another system, the protocol should insist that operators mutually coordinate their usage (around the conditioning that relate to the spectrum license grant).

It should be noted that “phase 1” as shown in figure 1 below has been accepted by the regulator for equipment operating in the 4.9GHz band in Japan. WiMAX based equipment operating in the 4.9GHz band is currently supplied to an operator in Japan by Airspan for a Tokyo-wide network deployment. This deployment is the world’s largest rollout of WiMAX to date.

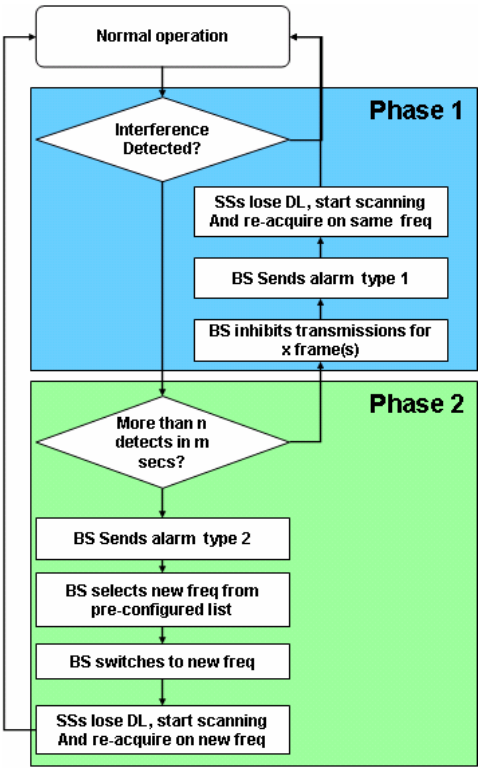

Figure 1 – Carrier Sensing Schemes

Option 3 – Semi Licensed

This option is similar to Option 2 but only grants permission to an operator on a per location basis, not on a particular RF channel. Systems would adopt a carrier sense mechanism which automatically moves to another frequency channel when interference is detected, according to a pre-determined algorithm. This leverages the Dynamic Frequency Selection (DFS) scheme which is a standardised option within the WiMAX system profile. It is illustrated as “phase 2” in figure 1 above.

The advantages of this scheme are that in normal situations the spectrum will be shared fairly without significant coordination between operators. One key choice would be the adoption of a 5 MHz channel size to maximise the number of available “frequency” selection options.

Longer Term Options

In addition to the suggestions above, it should also be noted that IEEE 802.16 is studying coexistence of 802.16 systems. This study group is called IEEE 802.16h. This may produce an optimised “real-time” coordinate / coexistence formula that could be applied.

Airspan & Open Range Communications Proposal for 3.65 GHz FCC certification

15 March 2006

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Agenda

- Introductions
- Airspan Networks
  - Company update
  - Rural Broadband US Market Success
- Open Range Communications
- 3.65 GHz Broadband Wireless Product
  - WiMAX Success
  - Contention/Carrier Sense options
  - 3.65 GHz WiMAX with CS
- Questions, next steps

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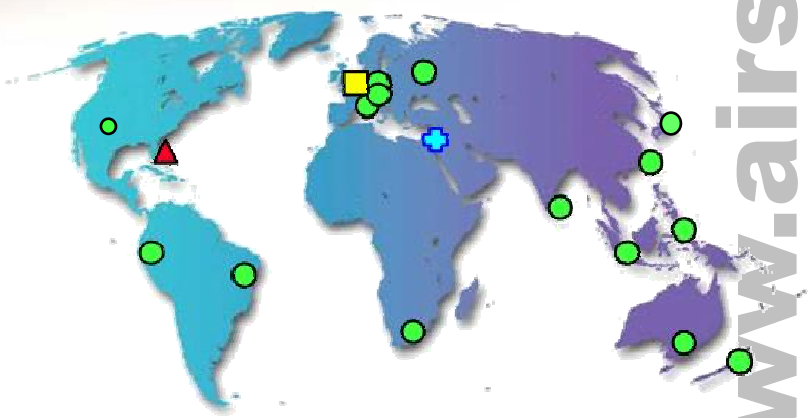
Background: Airspan Networks

- **Broadband Wireless Networking Company**
  - **Formed in 1992**
- **US Listed (NASDAQ Stock Exchange: AIRN)**
- **13 years Wireless Local Loop and Broadband Wireless Experience.**
- **Over 1 Million CPE Deployed, Extensive Experience in Urban, Suburban and Rural Deployment**
- **Made Several Acquisitions in last 3 years**
  - **WipLL from Marconi**
  - **Proximity FWA from Nortel**
  - **VoIP / Softswitch from Arelnet**
  - **WiFi from RadioNet**
- **Airspan has offices in 17 Countries, 300 Major Customers, Networks in 100+ Countries**
- **2005 Revenues were $110.9M US**
  - **US Market 2nd largest after Mexico**



Airspan Around the World

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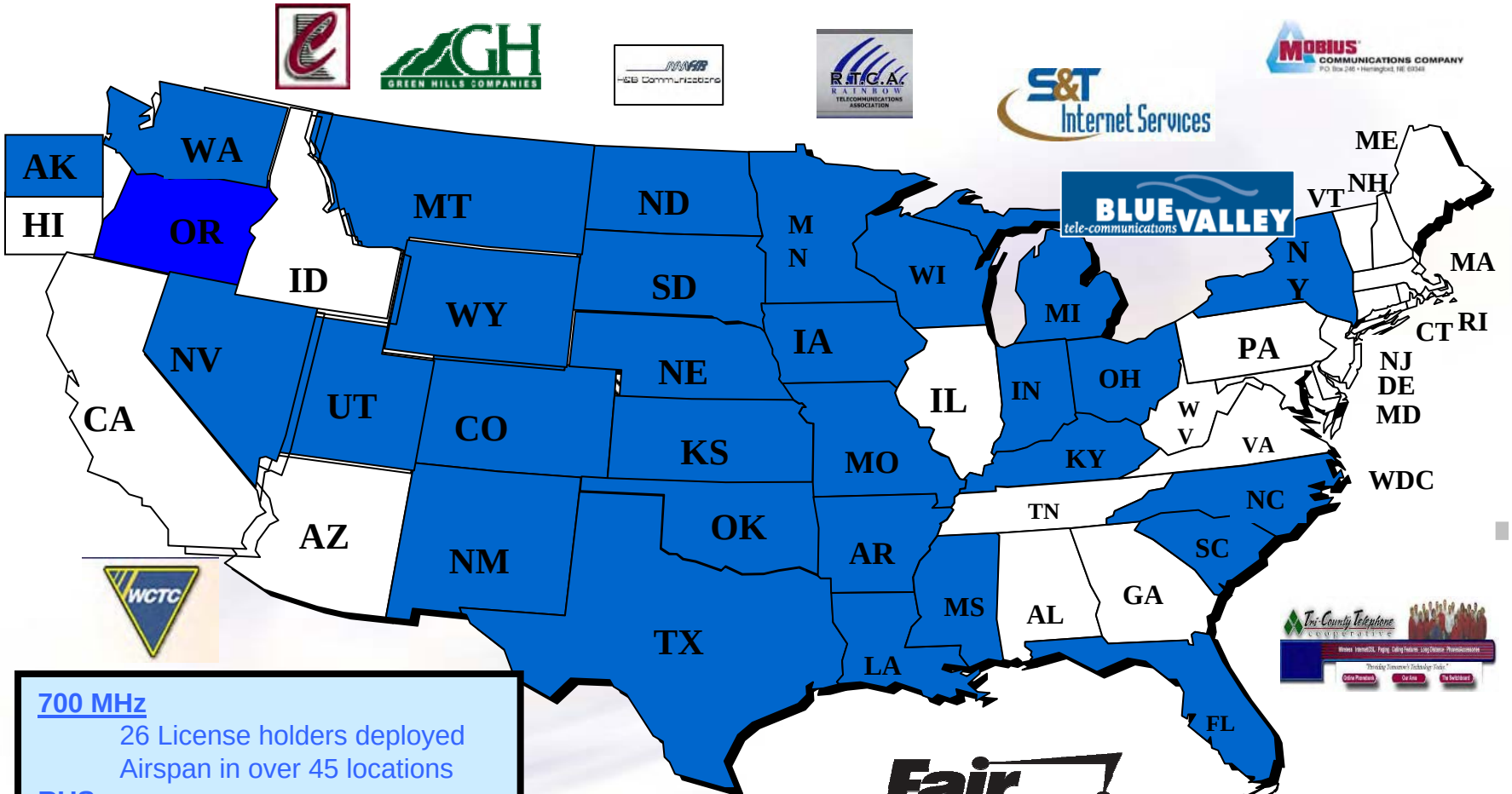
Airspan's Rural Broadband US Success



700 MHz

26 License holders deployed Airspan in over 45 locations

RUS

Operators using RUS funds to deploy Airspan at 700 MHz, 900 MHz, and 2.4 GHz

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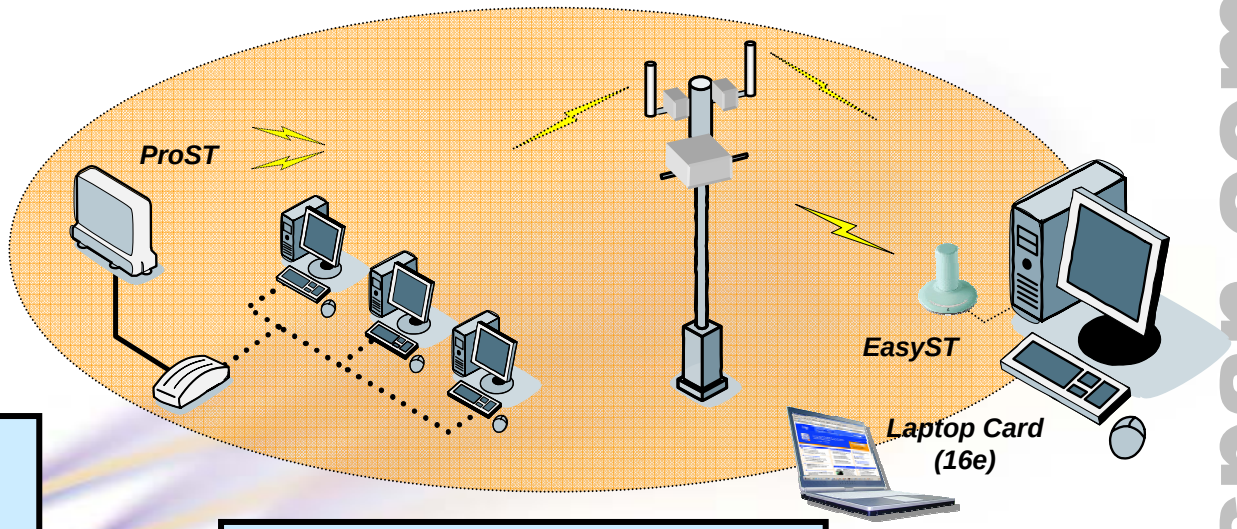
March 2006

Airspan's 3.65 GHz WiMAX System



MicroMAX-SDR Base Station
All Outdoor
OBSAI Radio
SDR (upgradeable to "Mobile WiMAX")
2ch Antenna Diversity

Subscriber Radios
Self-Install WiMAX Modem
Wi-Fi/VoIP Option
USB radio – tri-band 2, 3, 5GHz

MicroMAX-SDR Base Station

EasyST with Wi-Fi "Base"

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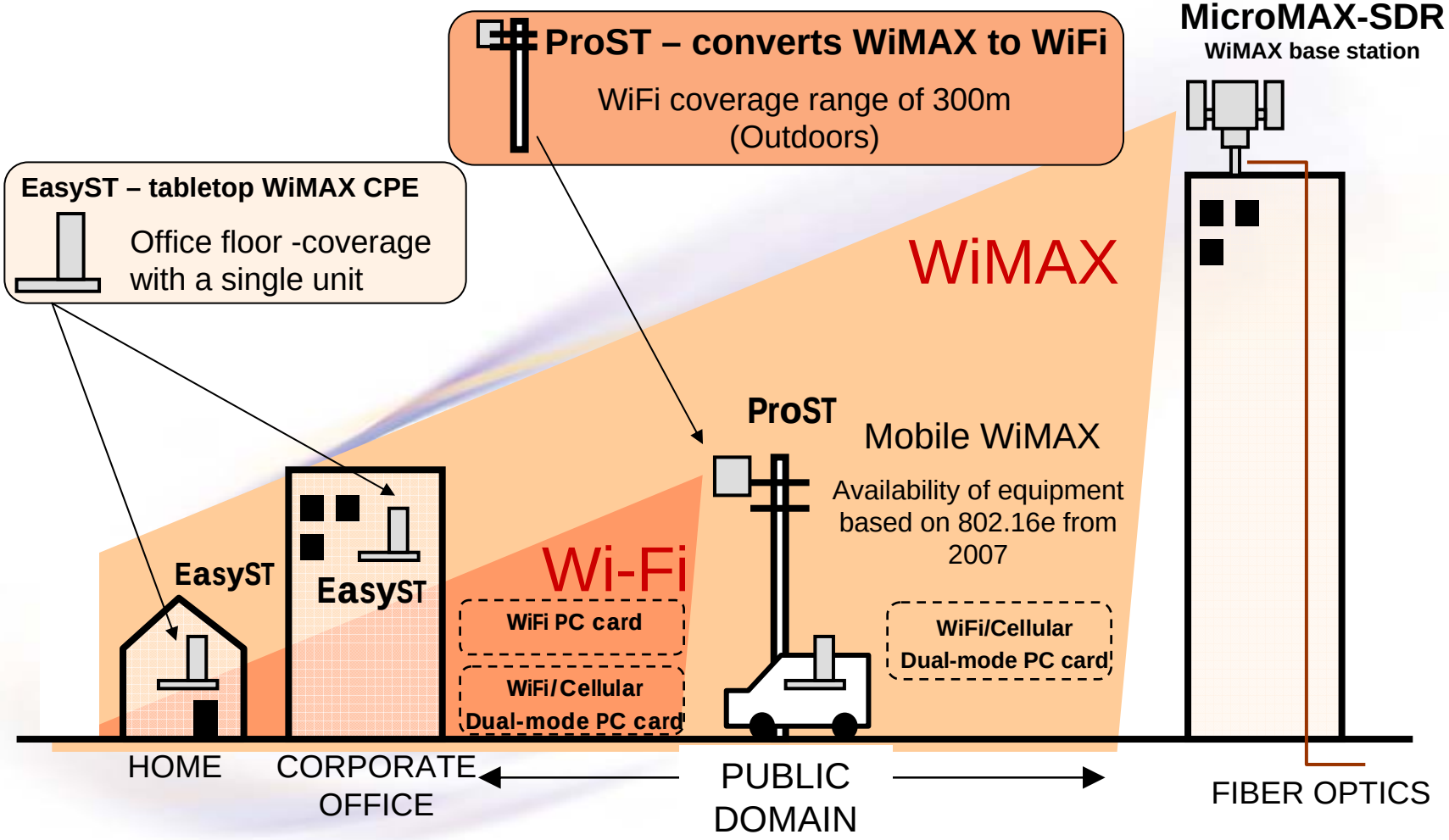
Airspan

AS.MAX: City-Wide Wi-Fi Hotzones



The optimal WiMAX / Wi-Fi Deployment Technology

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Airspan

3.65 GHz Overview

- Airspan's initial proposal for a carrier sense mechanism that allows Operators to deploy an 802.16 product, while meeting the FCC's regulatory requirements for contention protocol in 3.65GHz
- Airspan can commit to delivering this functionality in 2006.

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3.65 GHz Assumptions

- **FCC desires that all equipment operating in 3.65GHz band operates in the same manner:**
  - **Sensing carrier before transmission**
  - **4ms max transmission time**
  - **Defined threshold levels**
- **If interference is detected, the WiMAX system can stop and re-start without continuity of service**
- **Backup Frequency channels can be defined for each BS**

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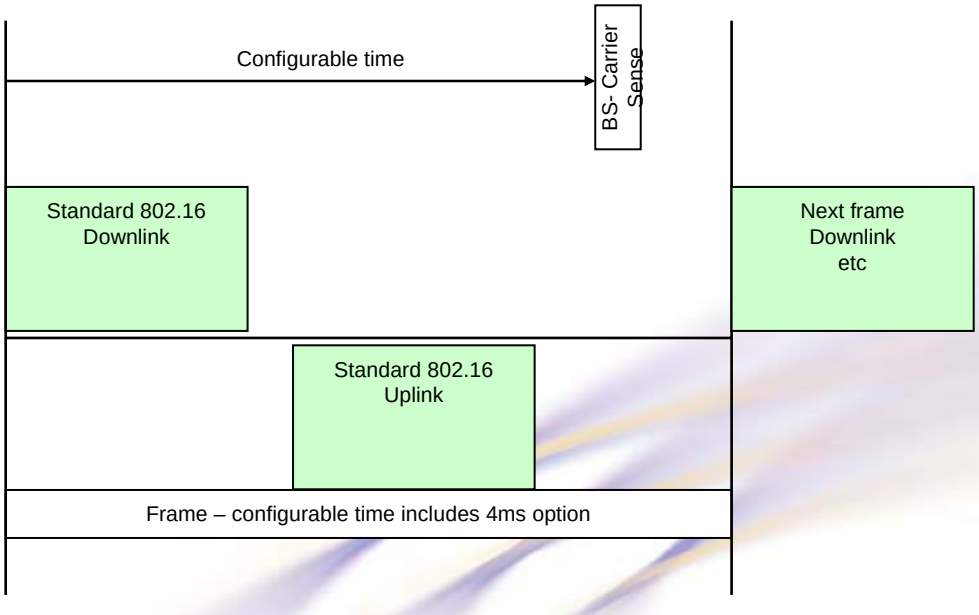
Frame structure



Notes:

- **Carrier sense is every frame**
- **Carrier sense threshold is configurable**
- **Frame length is configurable, including 4ms option**
- **Carrier sense timing within frame is configurable**
- **BS only does carrier sense (i.e. not at SS)**
- **Network is frame synchronized**

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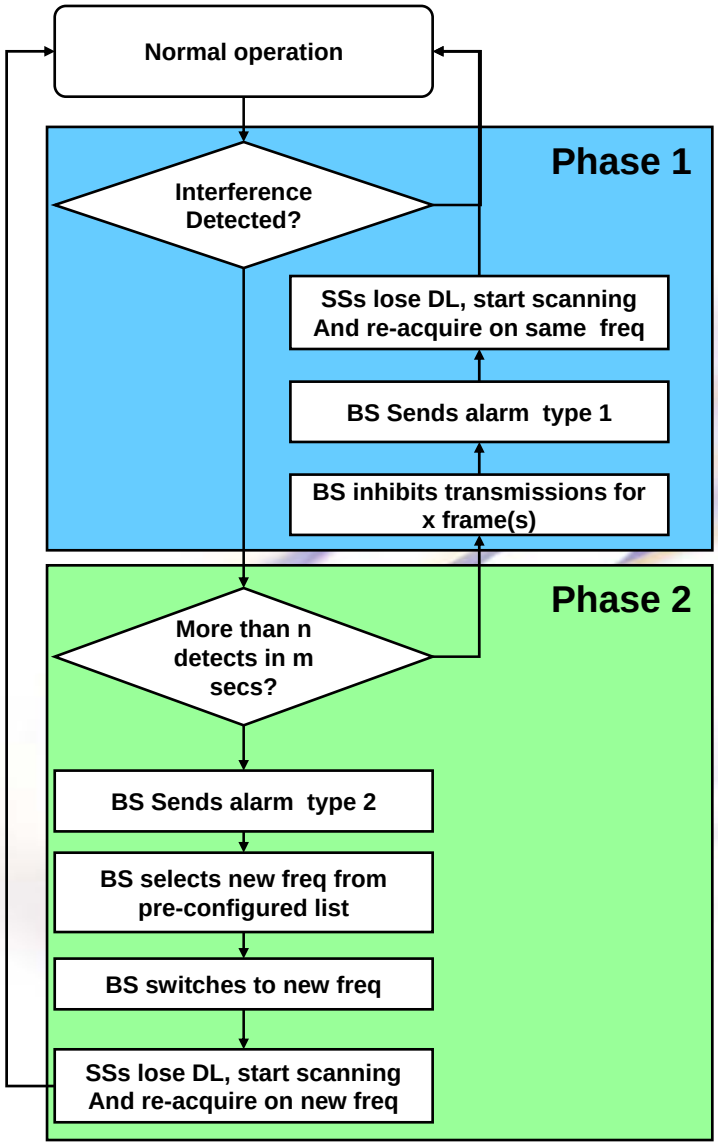
Action on detection



- **Notes:**
- **Phase 1 implementation:**
  - Initial action on detection is to back-off x frames (x >= 1)
  - After break in service SSs re-acquire as in normal start-up
- **Phase 2 implementation:**
  - If repeated interference occurs BS switches to new frequency
  - SSs have pre-configured scan frequencies
  - After BS switch, SSs re-acquire as in normal start-up using scan to determine operational frequency
  - This scheme may be implemented by Airspan as part of a more general DFS implementation
- **In both phases:**
  - Service interruption (following interference) is TBD, probably 10s of seconds
  - This will affect all SSs in the sector

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Proposed text for system specification

- **Frame lengths are configurable from 2.5ms to 20ms. One configurable option is a 4ms frame (one frame contains both downlink and uplink transmissions)**
- **Carrier sensing is performed at the BS during every frame**
- **Carrier sense threshold which can be used to prevent transmission is configurable. One configurable option is as per the following formula:**
  - **Automatic cessation of radio wave when exceeding E (mV/m)**

    $E = 100 \sqrt{(1 / G)} \times \sqrt{(0.16 / (Pt \times 20 / n))}$ (mV/m)

    E: Electric field strength

    Pt: Antenna power (W)

    G: Absolute gain (times)

    n: 20, 10 or 5 for 20 MHz, 10 MHz or 5 MHz system respectively

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Conclusions

- Nationwide deployment of 3.65GHz spectrum for rural broadband access
- WiMAX Technology to insure broadband, high-quality next generation services
- Questions?
- Next Steps

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