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TV Repack Update
"Wait, and Hurry Up!"

for

2016 IEEE Broadcast Symposium
IEEE Broadcast Technology Society
Hartford, CT
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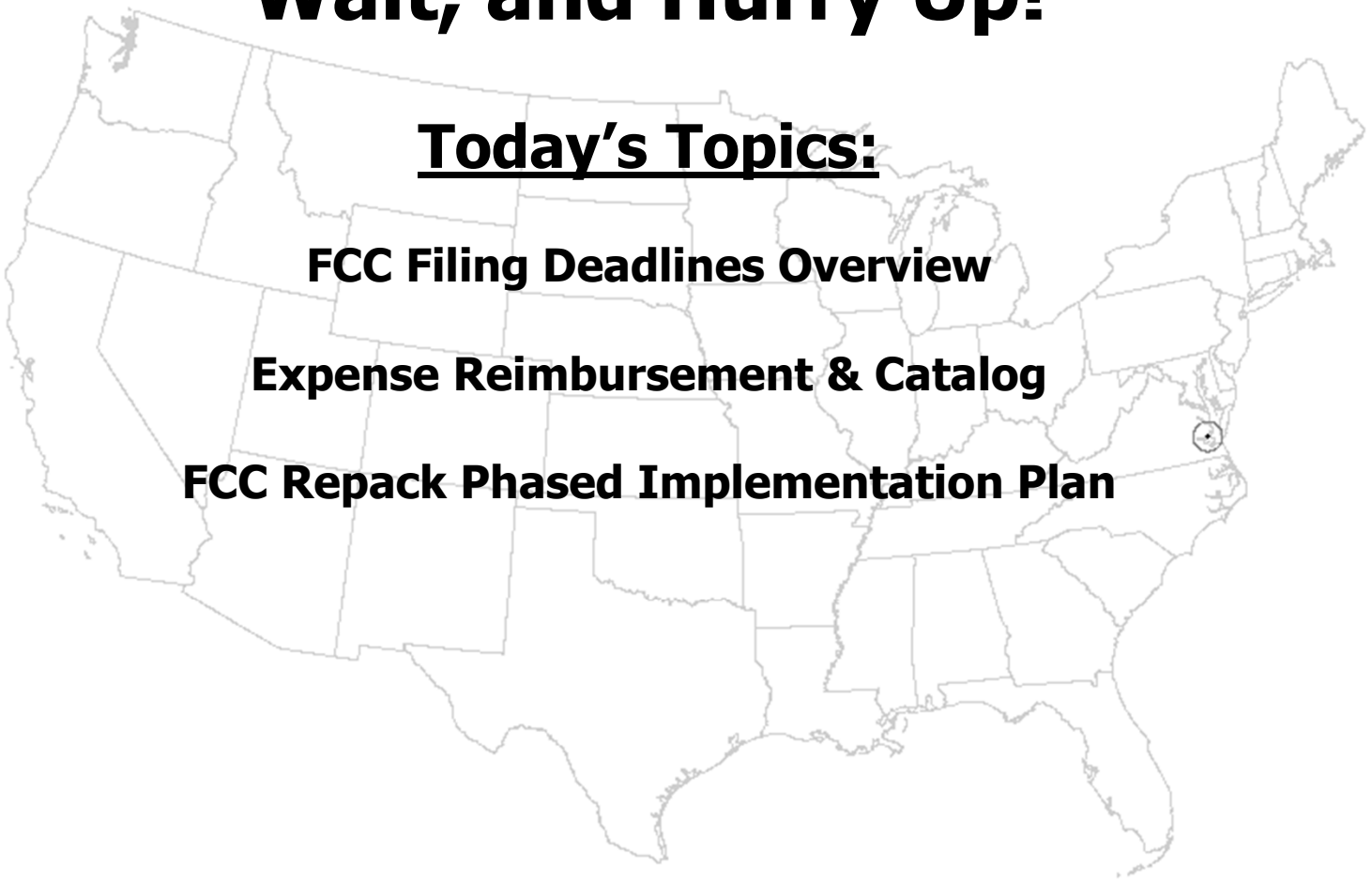
TV Repack Update
"Wait, and Hurry Up!"



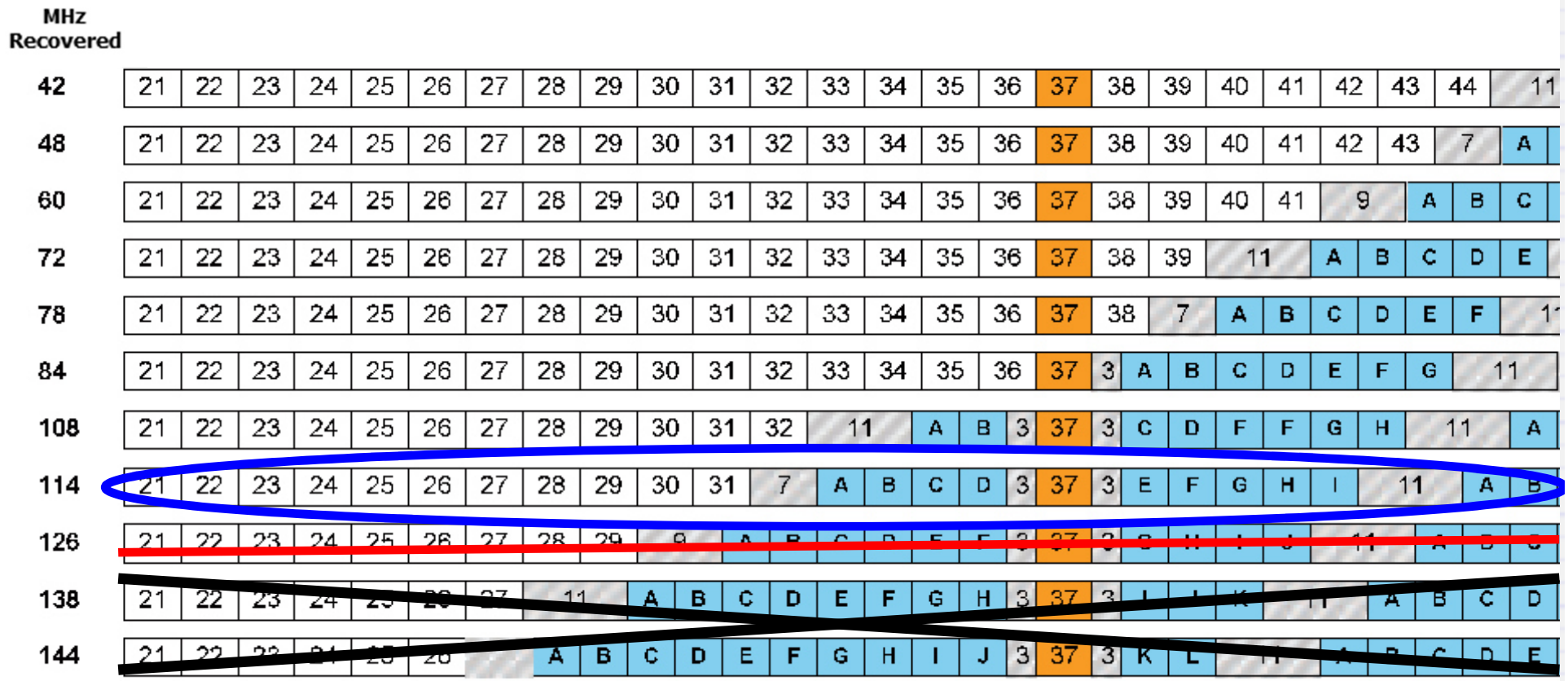
Today's Topics:

FCC Filing Deadlines Overview

Expense Reimbursement & Catalog

FCC Repack Phased Implementation Plan

Post Auction Band Plan Possible Outcomes



Stage 2: 114 MHz Began 09/13, Underway now

Stage 1: 126 MHz 05/31 – 08/30

Filing Deadlines for Repacked Stations

Channel Reassignment Public Notice

t = 0 Post-Auction period begins

All final TV channel assignments and parameters announced

"t + 3" Months

File Initial Construction Permit Applications – generally conforming

File transition plan and estimated costs for channel relocation

Waiver of this deadline must be requested by "t + 2" months

If new assignment can't be constructed as assigned for reasons beyond station's control, will be treated as a "Priority" station

Filing Deadlines for Repacked Stations

Successive Windows to be established after "t + 3" month deadline

FCC to release Public Notice "soon" with details of each window, priority criteria, processing guidelines, cut-off and MX resolution

1. "Priority" Station Window
   1 percent population loss from terrain and/or interference
   Received waiver of the "t + 3" filing deadline
   To include their expanded facility and alternate channel requests
   Priority stations are eligible for full reimbursement

2. "Non-Priority" Station Window
   Expanded facilities and alternate channels
   Reimbursement is based on assigned facility, incremental expenses associated with expansion are not reimbursed

Filing Deadlines for Repacked Stations

3. Stations that are not repacked ("Stays")
   Contour extension and channel substitution freezes lifted

4. LPTV/Translators
   a) Displaced Digital Replacement Translators (DRT)
   b) New Digital-to-Digital Replacement Translators (DTDRT)
   c) Displaced LPTV/Translator Operating as of t = 0
   d) Displaced Unbuilt LPTV/Translator
      (final construction deadline for unbuilt LPTV = t + 51 months)

   After window, then first-come, first-served

Reimbursement for Eligible Expenses

Reimbursement to broadcasters involuntarily repacked $1.75 billion total

Schedule 399, Form 2100
Beta testing of website now available (10/04/2016 PN)

"Predetermined" costs are keyed from Widelity Catalog
Beta shows 2013 catalog items, 2016 update to be released soon

Construction is incomplete.

Cost Information

	Number	Predetermined Cost Est.	Est. Cost	Actual Cost
Transmitters	1	$836,000.00	$751,000.00	$0.00
Antenna Changes	1	$270,000.00	$225,000.00	$0.00
Transmission Line Changes	1	$0.00	$95,000.00	$0.00
Tower Equipment and Rigging Costs	1	$80,000.00	$50,000.00	$0.00
Outside Professional Services	1	$54,250.00	$24,950.00	$0.00
Other Expenses	1	$21,000.00	$25,500.00	$0.00
Total for all systems		$1,261,250.00	$1,171,450.00	$0.00

Reimbursement for Eligible Expenses

Widelity Catalog (2013)

B. ANTENNAS

Most stations moving to a new channel will require a new antenna. The price of an antenna would not include installation or removing an existing antenna (for those expenses, see Section II.D, Tower Equipment and Rigging). In some cases, new transmission lines will also be required (for those expenses, see Section II.C, Transmission Lines).

	Range of Estimated Costs
UHF – High Power Top Mount (200-1000 kW)	
Single station antenna	150,000 – 225,000
Single station antenna – with V polarization or C polarization	180,000 – 270,000
2 Station broadband panel antenna with combiner	450,000
4 Station broadband panel antenna with combiner	850,000
UHF – Lower Power Side Mount	
Single station –200-500 kW	125,000 – 180,000
Single station –200-500 kW with V polarization or C polarization	150,000 – 216,000
Single station antenna – medium power (50-200 kW)	50,000 – 72,000
Class A single station antenna – basic	12,000 – 21,000
Class A broadband panel (cost per panel)	825
Class A broadband panel (multiple channel array - example 4 panel complete array)	6,000
High-VHF	
Single station antenna – top mount	250,000 – 275,000
Single station antenna – top mount with V polarization or C polarization	280,000 – 330,000
Single station antenna – side mount	62,000 – 100,000
Shared broadband panel antenna – 5 station with V polarization or C polarization	700,000

Reimbursement for Eligible Expenses

Federal Communications Commission

FCC Form 399: Incentive Auction Relocation Reimbursement Fund System
To report feedback, questions, or errors, please email form399beta@fcc.gov

User/FRN: 0019683606 | Search | Log Out

KRCA . Facility ID: 703420 .

Approved by OMB 3060-1178
December 2014

FAQ Save & Quit

TV Broadcaster Incentive Auction Reimbursement Fund

Broadcaster Information and Transition Plan

* indicates required field

Attachments Draft Copy

* Is the new channel shared with another broadcaster? Enter the facility ID of the sharing station and click 'prefill' to download that stations licensing information.

Yes No ‹‹ Clear

*** Briefly describe transition plan:**

Turn off old channel
Take stuff apart
Put in new stuff
Turn on new channel

« Back Save & Continue »

APPLICATION SECTIONS

- ✖ Applicant Information
- ✔ Reimbursement Contact Information
- ✔ Preparer Contact Information
- **Broadcaster Information and Transition Plan**
- ✔ Transmitters
- ✔ Antennas
- ✔ Transmission Line
- ✔ Tower Equipment and Rigging Costs
- ✔ Outside Professional Services
- ✔ Other Expenses
- Costs
- Application Summary
- Certify

Schedule 399, Form 2100, Beta test

* Is the existing antenna shared with another station or stations?

Yes No ‹‹ Clear

* Is the existing antenna directional?

Yes No ‹‹ Clear

* Is antenna in operating condition?

Yes No ‹‹ Clear

* Is antenna located on or in close proximity to an antenna farm?

Yes No ‹‹ Clear

Existing Antenna Manufacturer and Type

* Class:
- Class A
- Full Power

* Mounting:
- Top-mount single
- Top-mount stacked
- Side-mount

* Antenna position in stack:
- Not in Stack
- Top
- Middle
- Bottom

* Polarization:
- Horizontal
- Elliptical
- Circular

* Type: Slotted coaxial

* ERP: 1000.00 kW

* Manufacturer: ACME

* Model: R-22 Flamethrower

* Year: 2008

« Back

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- Transmitters
- Antennas
- Transmission Line
- Tower Equipment and Rigging Costs
- Outside Professional Services
- Other Expenses
- Costs
- Application Summary
- Certify

Reimbursement for Eligible Expenses

Recap:

Beta testing of reimbursement filing system

Widelity Catalog 2016 update to be released soon
FCC will seek comments on categories and pricing

FCC Post Auction Transition Scheduling Plan

Public Notice 09/30/2016 Outlines Proposed Plan

FCC Webinar ~~10/13/2016~~ now Monday 10/17/2016 1-4 PM ET

Comments due: 10/31/2016

Reply Comments: 11/15/2016

Establishes:

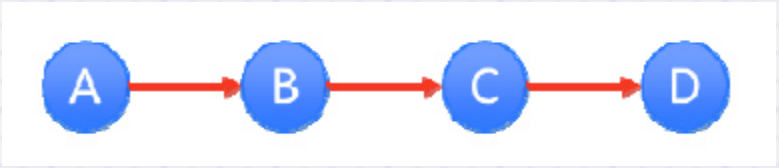
- Advance notice before "t = 0" release of Reassignment PN (via letters)
- Phased transition in 10 successive steps

Critical factors:

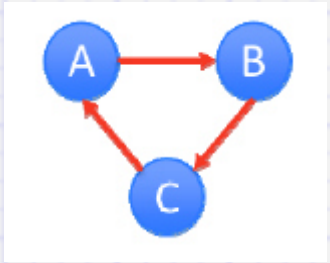
- Daisy chain identification:
  - ("dependencies" "linked stations" "linked station sets")
- Supply of antennas
- Scheduling interval of tower work

FCC Post Auction Transition Scheduling Plan

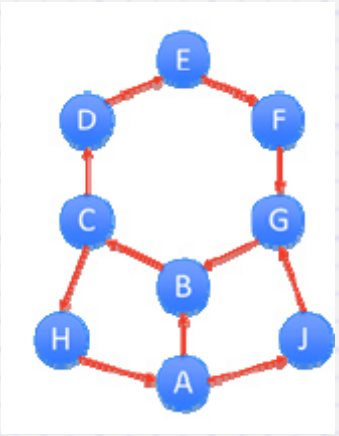
Dependency and Daisy-Chains



Cycles



Daisy-Chained Cycles



FCC Post Auction Transition Scheduling Plan

Transition Phase Assignment - Constraints

1. Maximum number of phases: 10

2. Relaxed interference threshold: 2.0 percent

3. Temporary channels: No
   But maybe? (if complex dependency, close to final channel, low power)

4. Max Number of Phases per DMA: 2

5. "Complicated" stations are not in first phase
   (DMA 1-30; FS vs CA; >1000'; ice/wind zone; co-lo ≥4; extraordinary)

6. Balance number of stations in each phase; limit number of linked stations

6. No Canadian stations transition before third phase

FCC Post Auction Transition Scheduling Plan

Transition Phase Assignment - Objectives

1. Clear out wireless bands in earlier phases
2. Minimize net number of re-scans over all DMAs
3. Minimize total number of linked stations within each phase
4. Minimize the difference in # stations in largest and smallest phases

FCC Post Auction Transition Scheduling Plan

Transition Stage Modeling, FCC assumptions:

Administration/planning: 24, 32, 72 weeks

Antenna Delivery: 12, 24 weeks ARO
Manufacturer Capacity: 80 per month year 1; 84 yr-2; 88 yr-3

Non-Tower Construction Work: 12, 24 , 32 weeks

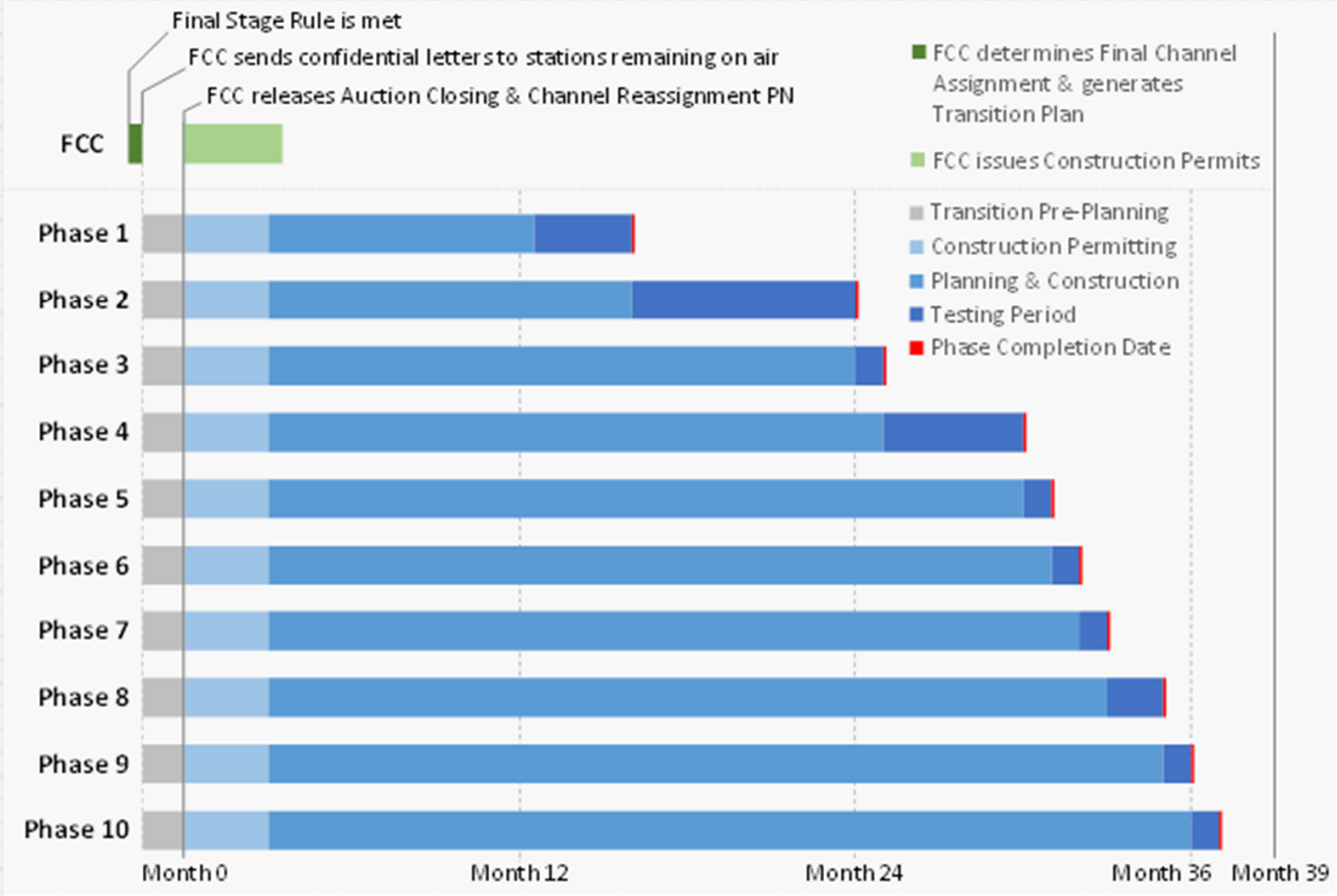
Tower Work: 10 – 40 days with adjustments

Tower Crews, Difficult Sites: 25 year 1; 26 yr-2; 27 yr-3
Tower Crews, Other Sites: 26 year 1; 28 yr-2; 30 yr-3
(No Canadian crews, will be working in Canada)

Minimum of 4 weeks between phases

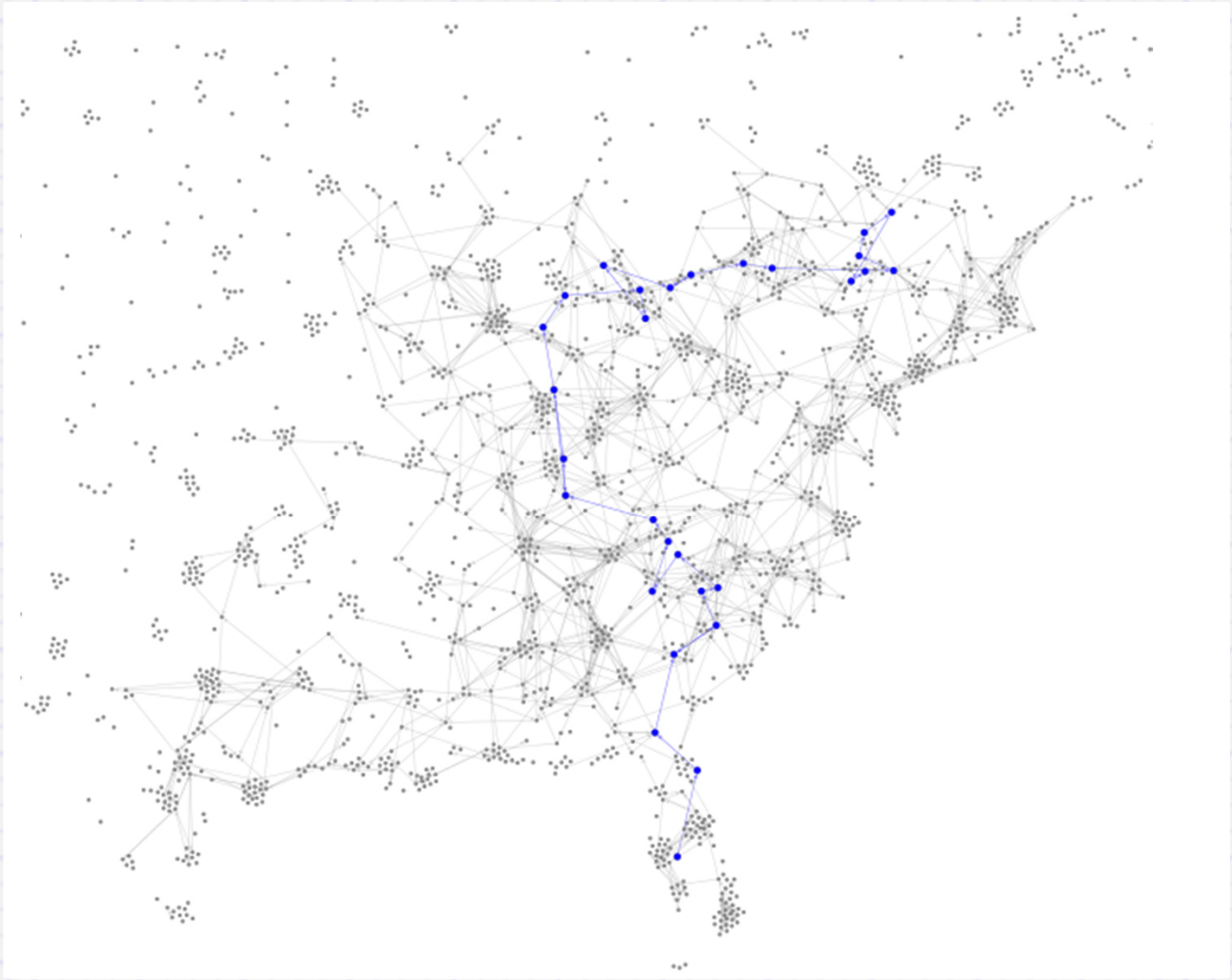
FCC Post Auction Transition Scheduling Plan

FCC Sample Schedule (84 MHz)



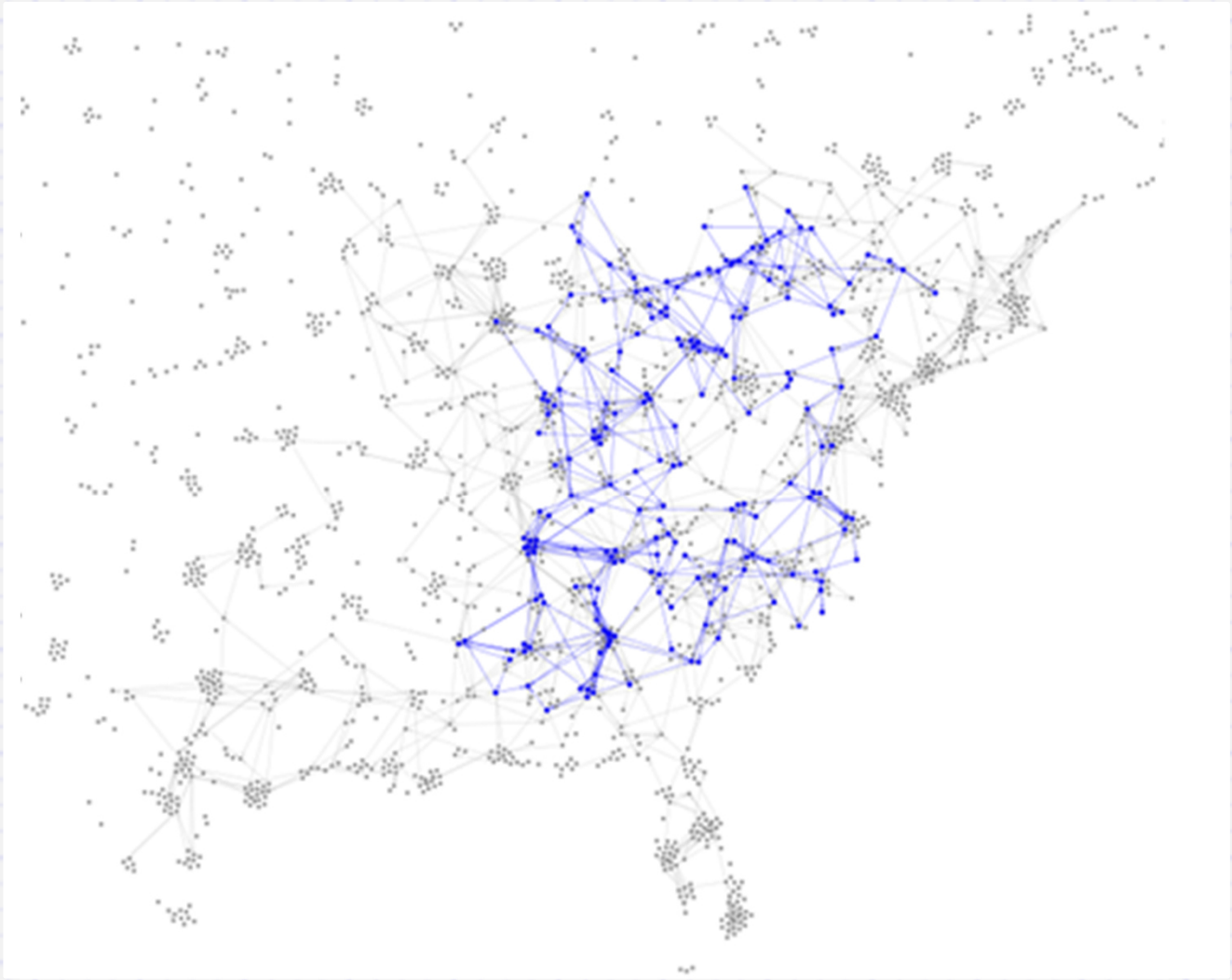
FCC Post Auction Transition Scheduling Plan

FCC 84 MHz Sample: 29 station daisy-chain



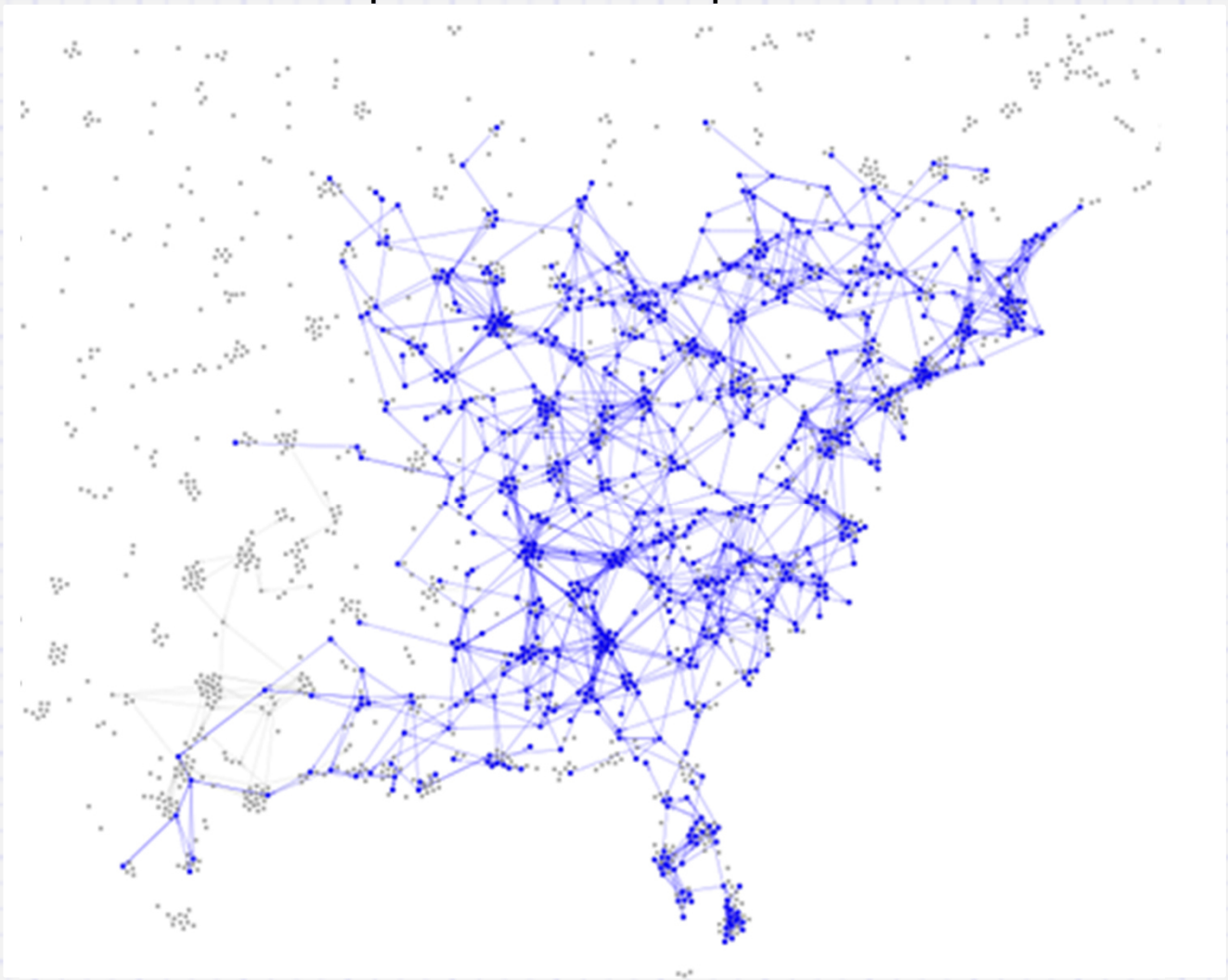
FCC Post Auction Transition Scheduling Plan

FCC 84 MHz Sample: 196 station cycle



FCC Post Auction Transition Scheduling Plan

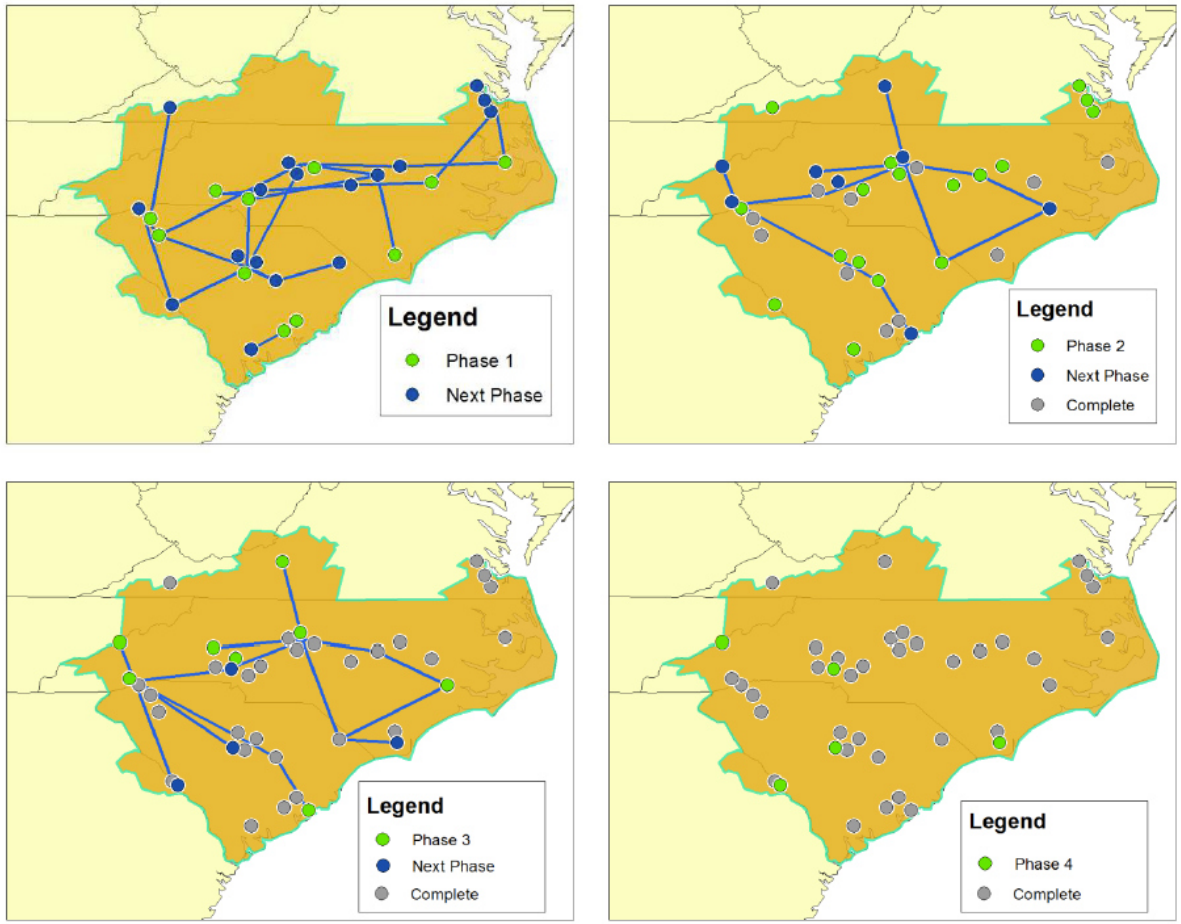
FCC 84 MHz Sample: 796 inter-dependent stations



FCC Post Auction Transition Scheduling Plan

AT&T Ex Parte (Aug 2016) Sub-Region

Our approach requires that each active phase (green dots) is completed prior to moving to the next phase (blue dots) which clear interference dependencies between adjacent phases (blue lines)



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FCC Post Auction Transition Scheduling Plan

"Unconstrained" Resources, not considered in plan:

FCC says "auxiliary antenna manufacturing, transmitter manufacturing, transmission line manufacturing and RF component installers will not affect the time required for a station to complete its transition"

And

"RF consultants and structural engineers will need to complete their work by the end of the initial 3-month filing window for construction permits, and therefore, are also not considered a constrained resource"

FCC Post Auction Transition Scheduling Plan

Thumbs-Up

Finally, a hard look at implementing TV repack and documentation of station interdependencies

Confidential letter notification in advance of Reassignment PN

Thumbs-Down

Earlier analysis could have made reassignment process and buildout period more realistic

At Odds

#1 Objective
Clear wireless bands early

vs.

High numbered stations
are LAST in daisy-chain

Complication: Expansion and channel change proposals to be viewed unfavorably if they create more linked-station sets, impact phasing of other stations, or are likely to drain resources.

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Comments, Questions?

Must be Miller Time…

Thank You!

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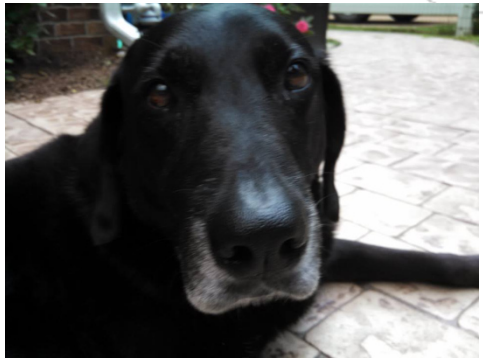

"RF Sniffer"

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