

# Behind the Scenes at



KATE LANDOW

SOCIETY OF BROADCAST ENGINEERS, IEEE

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WITH CONTRIBUTIONS FROM KARL VOSS

SOCIETY OF BROADCAST ENGINEERS

# Frequency Coordination - History

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- ▶ Started with Super Bowl XXX – Phoenix
- ▶ Game Day Coordination (GDC) Program implemented league wide several years later
- ▶ Added ALL NFL events including
  - ▶ Draft
  - ▶ Owners Meeting
  - ▶ Pro Bowl
  - ▶ Combine



# Game Day Coordinators

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## Who, What, When Where

- ▶ GDCs for all 32 NFL Teams
- ▶ Any Frequency
- ▶ Every Game
- ▶ Every Stadium

## Mexico 2017



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# Game Day Coordinators

## ▶ How

### ▶ Email the Coordinator

- ▶ GDC<teamname>@nfl.com
- ▶ i.e. [GDCBroncos@nfl.com](mailto:GDCBroncos@nfl.com)

### ▶ Include

- ▶ On-Site Contact Info
  - ▶ Company, Name, Cell Phone, email
- ▶ Equipment;
  - ▶ Make, Model, Frequency Band, Current Frequency
- ▶ Use; wireless mic, IFB, 2-way, etc.
- ▶ How will you use it; ENG, Post Game, etc.

# Frequency Coordination – Current Process

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- ▶ GDC responds via email
- ▶ Verify frequency works
- ▶ Check for restrictions
- ▶ Check in with GDC at Game
  - ▶ GDC wears ORANGE HAT
  - ▶ Radio may get tagged



SB51 GDC - karl voss + 1- 3/24/2

Frequency Coordination Confirmation: for Final-Four-2017; AFCC

We removed extra line breaks from this message.

Frequency Coordination Confirmation: for Final-Four-2017; AFCC

The following frequencies have been coordinated for your use at the event listed below:

USER: AFCC - Karl Voss - (602) 989-2283  
VENUE: UOP Stadium - College  
EVENT: Final-Four-2017 from 03/28/17 to 04/04/17

\*\*\* This event has multiple zones. -- Check below to insure that the proper zones are specified. \*\*\*

MANUFACTURER: MODEL NO:  
USE: Weather Radar  
HOW USED: TDWR Radar  
BANDWIDTH: 20.000000  
POWER: 100.000000  
APPROVED ZONES: Press Conference 3-30-17, Final Four Friday - All Star Game, Press Conference 3-31-17, Semi Finals Game and Press Conf 4-1-17, Semi-Final Winner Press Conferences 4-2-17, Nat'l Championship Game 4-3-17

Frequency	Date/Time Updated	Frequency Notes
[REDACTED]	03/15/17 20:00	

Special Notes regarding this request:

located at 33-25-14N 112-09-46W, ~ 48th Av and Lower Buckeye

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# We've been in the press

- ▶ NFL Game Day Frequency Coordinators

- ▶ <https://operations.nfl.com/the-game/gameday-behind-the-scenes/nfl-gameday-frequency-coordinators/>

- ▶ “Quarterbacks, defensive play-callers, coaches and game officials all depend on coordinators to ensure that their systems are interference-free. So do TV and radio broadcasters and reporters, medical and security personnel, staff who use the NFL's instant replay and injury video review systems, concession operators, cleaners, halftime entertainers and many more.”

- ▶ TV Technology

- ▶ <http://www.tvtechnology.com/news/0002/nfl-frequency-coordination-is-all-grown-up/279601>

- ▶ “This can be challenging. The media entrance and RF check-in at the Super Bowl are crucial but can be time-consuming. Crews trying to get around these delays have been caught trying to enter the stadium through gates meant for fans. Fortunately, the GDC crew has coordinators at every stadium entrance; they stop any crew with RF equipment and redirect them to the media entrance.”

# Press Conferences

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Tools



Finding them



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# Opening Night

## Houston



## Arizona



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# The Team

From AFC



To NFC



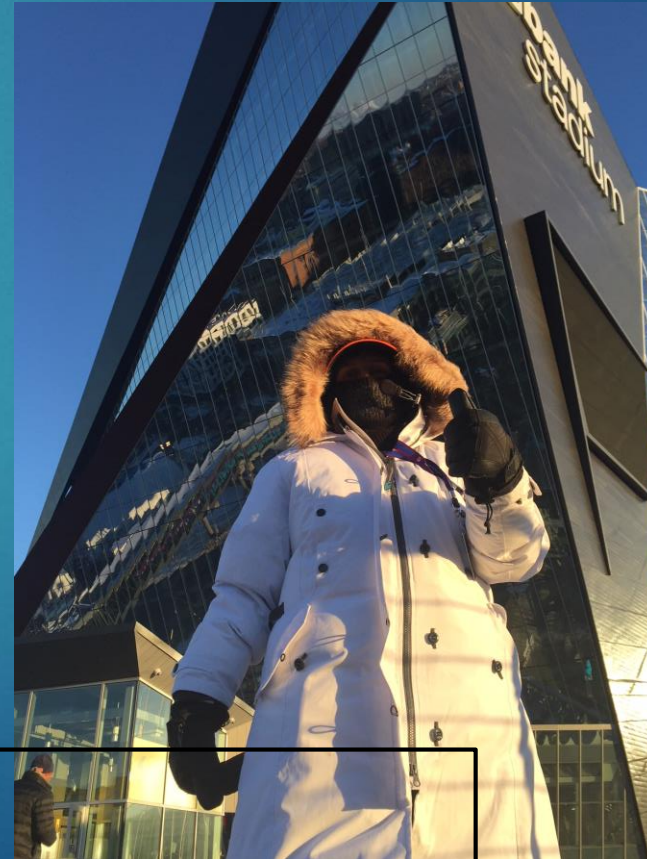
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# SB 51 to 52

## Houston



## Minnesota



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# The Frequencies Behind The Ball...

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- ▶ Technology to be coordinated include:
  - ▶ **Wireless mics – Ref's, Broadcast and Stadium**
  - ▶ IFBs – Stadium and Broadcast
  - ▶ Intercom Systems – Stadium, Coaches, Referee's and Broadcast
  - ▶ 2-Way Radios – Stadium Ops, Broadcast, Public Safety, Coach to Player
  - ▶ Microwave – Stadium and Broadcast
  - ▶ Ultra Wide Band – Player Tracking



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1/

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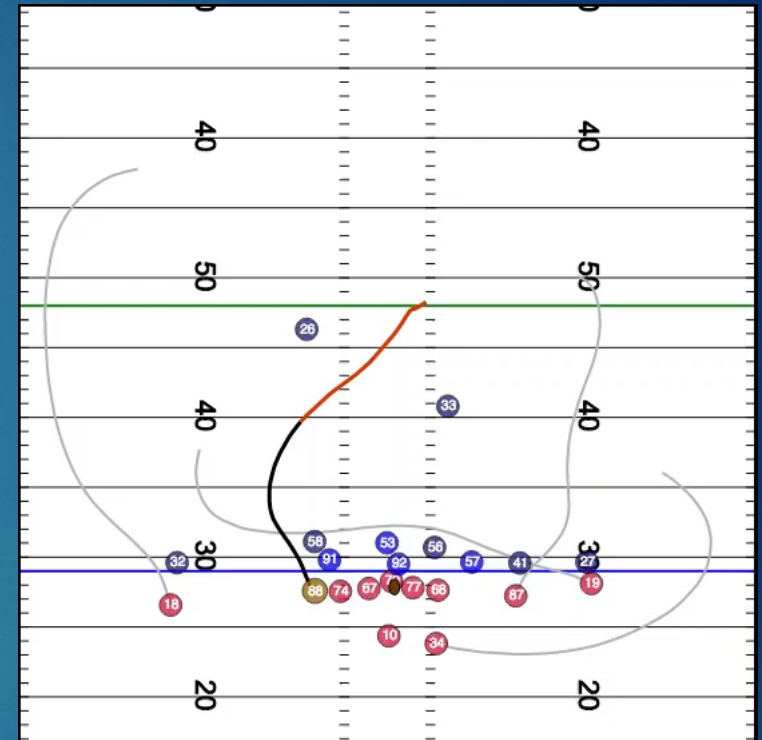




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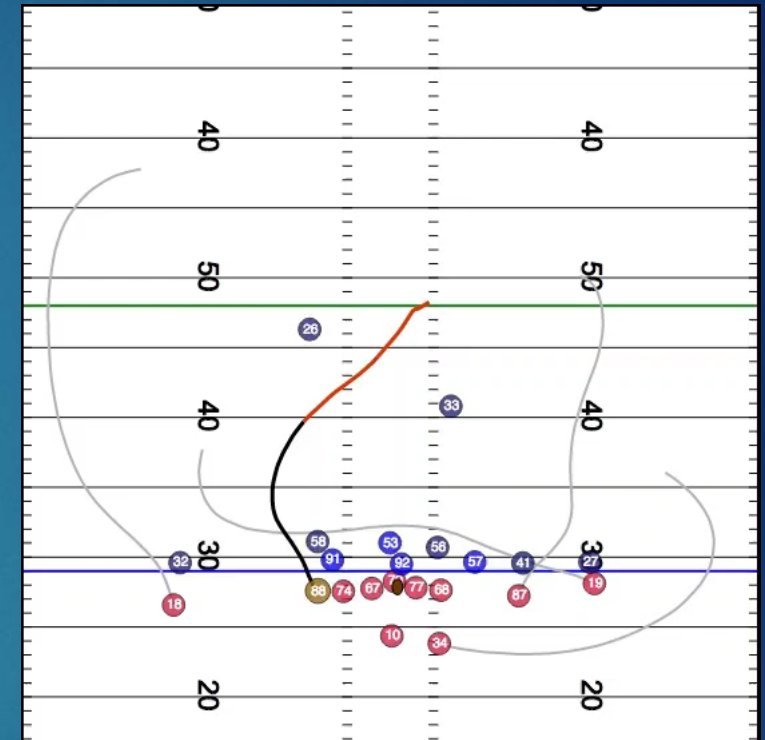
# The Frequencies Behind The Ball...

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## ► And on the Ball....

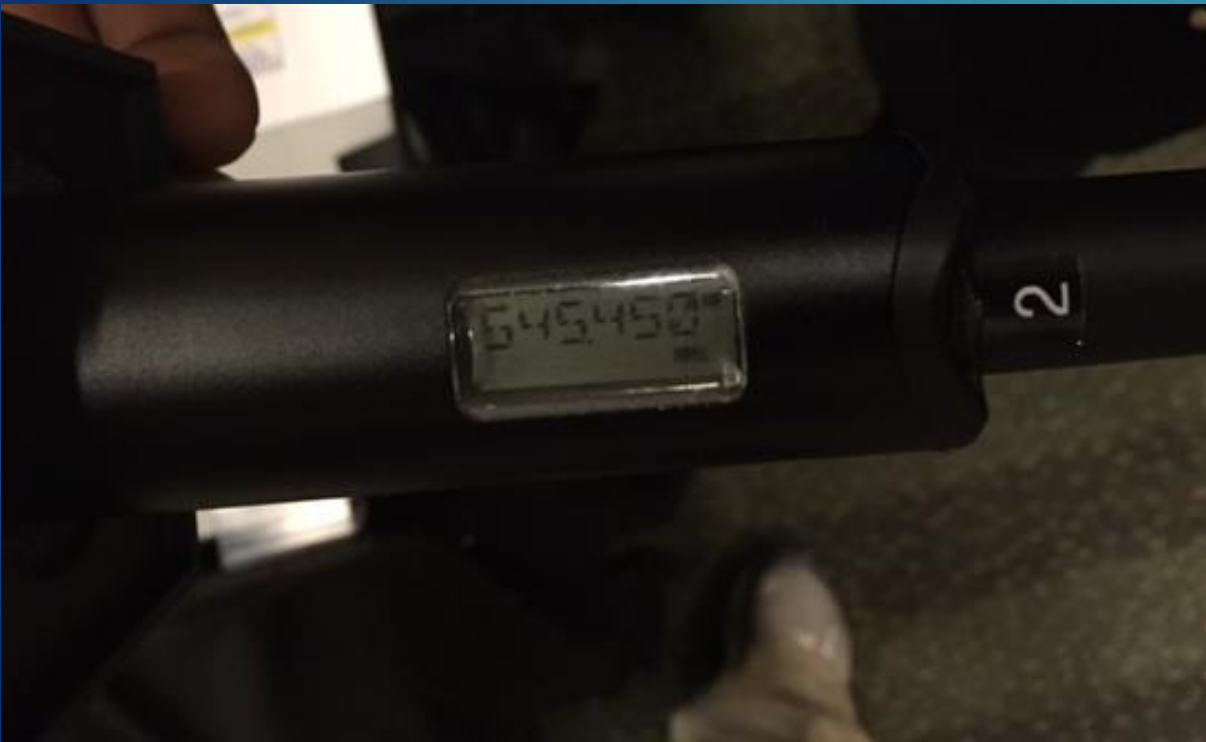
► <https://www.zebra.com/us/en/solutions/location-solutions/zebra-sport-solution.html>

► “As “The Official On-Field Player Tracking Provider” of the NFL, Zebra is committed to supporting the league’s Next Gen Stats initiative by enabling the NFL to collect real-time location data that captures the speed and acceleration of every player and every play on every inch of the field, transforming the ways fans, teams and networks watch, coach, play and analyze the game.”



# Logistics make it work!

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# Logistics make it work!

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# Problems: Frequencies Behind The Ball... 21

- ▶ Technology is never trouble free:
  - ▶ RF is not necessarily “Plug & Play”
  - ▶ Coach to Player Interference
  - ▶ Referee’s mic problems
  - ▶ “ESO” Problems
    - ▶ Wrong channel selected
    - ▶ Wrong frequency tuned into radio
    - ▶ TX/RX frequencies don’t match
  - ▶ It’s “Low Power”, I don’t need to Coordinate

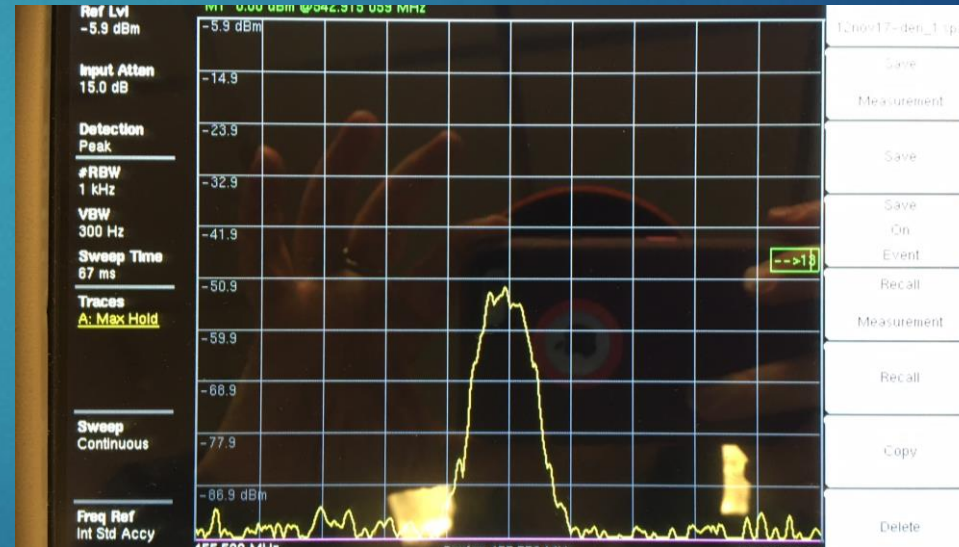


# What We've Seen....

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From New Tech,

To "I forgot"



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# Denver Coordination

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- ▶ Below or Above 1G
- ▶ <http://www.smpte-sbe48.org/freq.php>
  - ▶ **Jim Schoedler:**  
**303-725-9043(M)**  
**303-744-0998(P)**  
**jschoedler@usa.net**
- ▶ Bronco Games
  - ▶ GDCBroncos@Nfl.com



# Incentive Auction Summary

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## FCC Rules

### Wireless mic Rules

1. [http://transition.fcc.gov/Daily\\_Releases/Daily\\_Business/2015/db0811/FCC-15-100A1.pdf](http://transition.fcc.gov/Daily_Releases/Daily_Business/2015/db0811/FCC-15-100A1.pdf) (2015)
2. [https://apps.fcc.gov/edocs\\_public/attachmatch/DOC-345478A1.pdf](https://apps.fcc.gov/edocs_public/attachmatch/DOC-345478A1.pdf) (2017)

### Incentive Auction Channel Assignments Public Notice

[http://transition.fcc.gov/Daily\\_Releases/Daily\\_Business/2017/db0413/DA-17-314A1.pdf](http://transition.fcc.gov/Daily_Releases/Daily_Business/2017/db0413/DA-17-314A1.pdf)

### Incentive Auction TV Transition Data Files

[https://data.fcc.gov/download/incentive-auctions/Current\\_Transition\\_Files/](https://data.fcc.gov/download/incentive-auctions/Current_Transition_Files/)

Unprotected Users play “Spectrum Whack a Mole” as  
600 MHz TX come up on unknown schedule

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# NFL Solutions Under Consideration

- Education of users:
  - RF is not a “Right”
  - New procedures need to be planned for & BUDGETED
- Enforce Licensing Priorities
- Usage is based on NEEDS and not Convenience
  - Wired talent at studio sets
  - Live vs. Post Produced usage
- 3:1 Frequency/Beltpack ratio for wideband intercoms
- Short range operations (i.e. ENG photogs) will be on LP-DT channels
- Auditing & enforcing of RF usage
- Provide customer service for foreign press

