

# **Monmouth County Sheriff Radio System**

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# **Monmouth County NJ Sheriff's Radio System Problems to Solve**

Original System consisted of voted receive and 2 site manual steering transmit.

Dispatchers would steer the transmitter to a site based on information as to locations in the field. Field personnel from each end of the county could not talk portable to portable. Officers serving warrants required greater portable coverage indoors

It was decided to implement a GPS controlled simulcast system to accomplish the portable to portable/ dispatch indoor coverage needed

5 sites were selected based availability and propagation mapping as well as cost to the county for the space

The use of T1 channel banks in the system not only allowed for simulcast to be implemented but also eliminated the cost of all leased line circuits going to and from the sites and added capacity.

# **Monmouth County NJ Sheriff's Radio System Equipment and Linking Methods**

**Spectracom Model 8195A with CTCSS option**

**Spectracom 93000 CTCSS Encoder board**

**Harris TDM163 Channel bank with SynchroCast option**

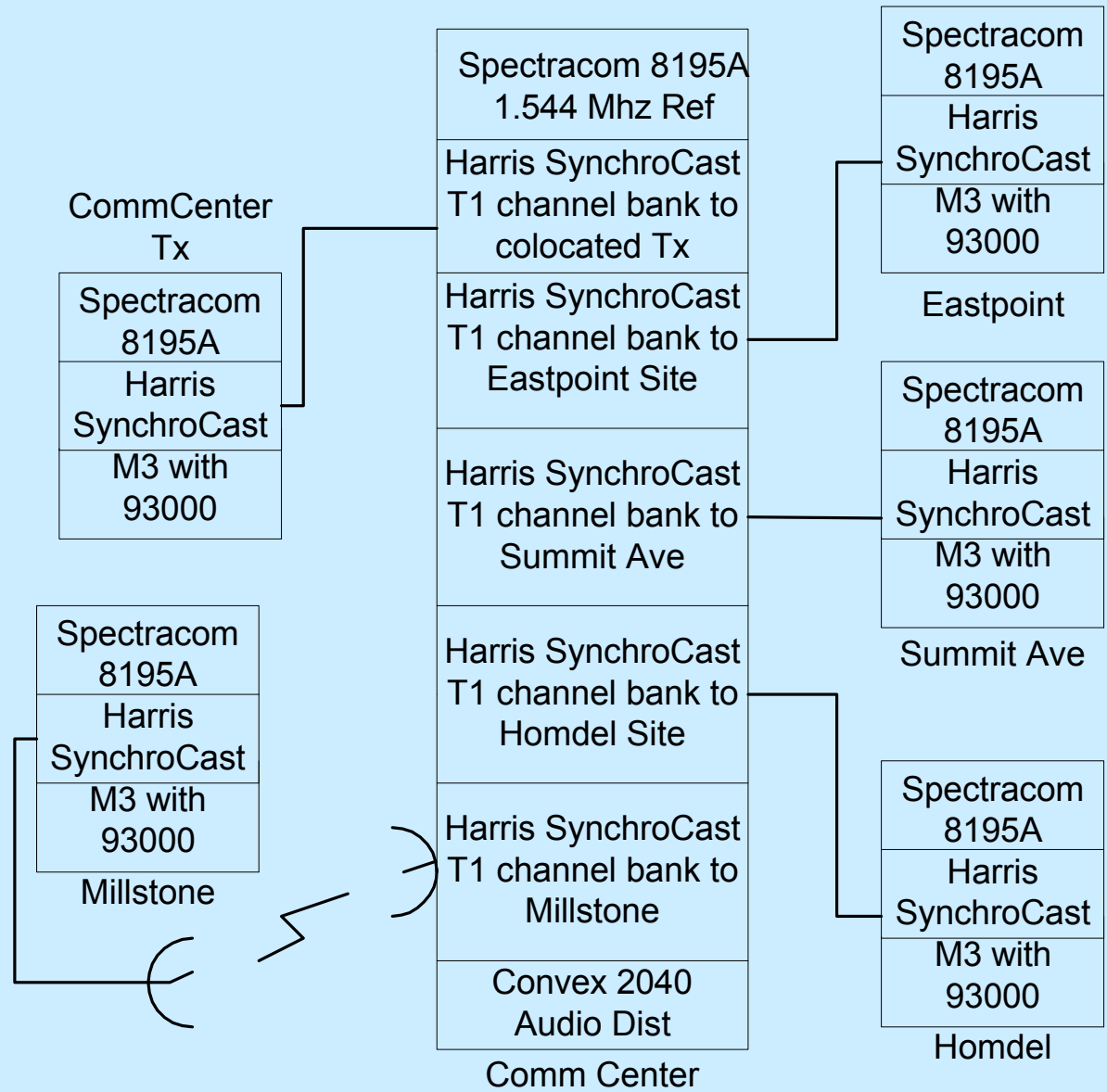
**Convex Model 2040 Audio distribution system**

**M/A-COM Wireless Mastr III Base stations**

**M/A-COM Wireless Voting system (previously installed)**

**Telco provided T1 land circuits (4 sites)**

**California Microwave CM 6 (6Ghz) (1 hop)**



# Monmouth County NJ Sheriff's Radio System

Customer is very satisfied with the final results....

But it took a while

## **Problems on our End :**

Audio polarity problems

Audio balancing issues

Some tail chasing

Unknown what bad simulcast actually sounds like. Is an overlap supposed to sound this way?

## **Problems on the customers end:**

Site acquisition

Moving of sites after original installation

Moving of sites after system coverage mapping and TDI analysis

Had to cut the system in while it was in use

# Monmouth County NJ Sheriff's Radio System

## Audio/CTCSS Connection for Mastr III Stations

### Audio and CTCSS

Tone control stations

Spectracom 93000 Board	Mastr III Back plane	Function
J2 Pin 4	P2 Pin 1	A +
J2 Pin 3	P3 Pin 10	GRD
J2 Pin 5	P3 Pin2	PTT In
J2 Pin 1	P3 Pin 14	EXT LSD/ CTCSS Audio

TX Voice audio on TB 101 terminals 2 and 5

Must use Special editor software for station to open EXT LSD gate on tone sequence

E&M Keying

Spectracom 93000 Board	Mastr III Back plane	Function
J2 Pin 4	P2 Pin 1	A +
J2 Pin 3	P3 Pin 10	GRD
J2 Pin 6	P2 Pin13	PTT to the station
J2 Pin 5		E-Lead closes to Ref Grd
J2 Pin 1	P3 Pin 14	EXT LSD/ CTCSS Audio

TX Voice audio on TB 101 terminals 2 and 5

Must use Special editor software for station to open EXT LSD on Repeat PTT

Set 93000 CTCSS board for desired PTT Delay

# **Monmouth County NJ Sheriff's Radio System**

## **Innovations we put together along the way...**

Use of a good coverage and TDI analysis prediction software.

Put in the budget for another pair of eyes to look at the over air delay for minimal TDI or to move the TDI some place away from your project

Each Tx Synthesizer Card in the Mastr III Stations was realigned to the customer's frequency for 1000 Hz sine wave and 10 Hz square wave. This procedure is outlined in the maintenance manual

# Monmouth County NJ Sheriff's Radio System

Setup of the audio level setting in the station. This is the procedure we are currently using with great results

Initial settings:

DSP Compressor Gain = 1083

Compressor Threshold = 32767

Line Input = 0

Repeater Gain = 1023

Do not send CTCSS audio

Using a TIMS set insert a 1000hz signal into the station at 0 dB. (10 db above avg voice level)

Connect the exciter directly to a service monitor (We were using an HP8920B)

Set the DSP line in pot 100 and adjust the transmit limiter pot for 3.7 kHz (25kHz channel)

3.3 kHz (NPSPAC) If you look on the scope you should see clipping.

Reduce the TIMS level to -10dB. Adjust the DSP line in pot to achieve 3.0 kHz (25kHz channel) 2.5 (NPSPAC)

If you look at the scope a nice rounded off sine wave should be present

Set your CTCSS audio to 0.5 kHz (25kHz Channel) 0.25 (NPSPAC)

With the channel guard soft pot or the amplitude pot on the 93000 board

Audio going into the station from the channel bank should be at -10dB @ 1000Hz

# **Monmouth County NJ Sheriff's Radio System**

**Additional improvements we would make on this system...**

**Because the Harris SynchroCast system is set by the Spectracom 1PPS signal at the remote sites, we should have added an additional RS 232 card to give us remote access to the Spectracom alarm and programming features from the Communications Center.**