Spectrum Management in Florida

- Bryan Fields, W9CR
- bfields@fasma.org

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Introduction

Background

What happened?

- Amateur radio repeaters
- Need for frequency coordination
- The transition to FASMA

Technical basis

Models and data

- Death of "standard spacing"
- Technical standards
- Part 90 Standards
- Core concepts Finding the right balance
- Hams are not pros
- Modelling and interference
- PL!

FASMA Process

How to coordinate a repeater

- Application Process
- What if you're Rejected
- FASMA's assistance Coordination modelling
- Examples in google earth FASMA initiatives
- Itinerant Policy
- Two meter planning

Background Amateur Radio Repeaters

Florida Amateur Spectrum Management Association Successor to the Florida Repeater Council

•FASMA is the coordinator and is the successor to the Florida Repeater Council

- The FRC was transferred to FASMA once it was 501(c)3
- FASMA is committed to openness and records availability. Our entire database is posted online
- Our email ticketing system is tracked and manages all interactions so we can see the complete history of the process.
- We are committed to treating all people with respect and fairness.
- Coordination is done by a number of people!
 - Our coordination committee is impartial from the board.
 - We have two people doing this now and three other spectrum monitors
 - We need HELP on this!
- FASMA is for coordination between all users with a focus on fixed repeater stations.
 - We maintain the band plan for VHF and UHF for Florida.

Amateur radio repeater coordination background

- The FCC sets standards, but amateurs self comply
 - VHF and UHF frequencies (50-1300 MHz) are used for local communications
 - Typically with a "repeater" station to boost range, but repeaters are not the only users
 - The FCC sets no standards as to what portion of spectrum is to be used for repeaters or other users
- Amateurs must self-regulate
 - FCC has does not not get recognize a frequency coordinator
 - ARRL has stayed out...

Typical Repeater use

- Line of sight comm's
- The repeater enables hidden users to talk so long as they both can see the repeater.
- Different bands are optimized for different uses
- 50 MHz is great in a car/truck with a big (6') antenna. Not good in a portable (HT)
- 440 and 900 MHz is great in a HT, but doesn't have the distance of 144 MHz
- Higher bands have more channels (2m has 72 pairs)
- Lower bands go further, and 2m is popular



Frequency Planning Commercial Standards Applied to amateur radio

Frequency Planning Concepts

- In Part 90 commercial radio it's very important licensees have reliable coverage.
 - FCC station codes
 - FB Fixed base, FB2 Basic repeater 32km radius (may have co-channel), FB6/FB8 Central High coverage, protected repeater up to 120km.
 - MO mobile users, assumed to be at 1.83m AGL (6 feet, remember this!)
 - Planning is based on normal every day propagation.
- In amateur radio coordination we seek to have the most fun and least interference
 - A ham repeater is analogous to FB6/8 under part 90
 - The FCC has the benefit of assuming high-quality radios are used meeting part 90.
- All coordination is based on signal levels as decibel microvolts per meter, dBu
 - 0 dBu = 1 microvolt per meter, -3 dBu = .5 uV/m, +30 = 100 uV/m
 - An absolute value, independent of the receiver or antenna gain used.

Frequency Planning Concepts

What some amateur use as a repeater...







Frequency Planning Concepts continued Interference defined

- Harmful interference is interference which degrades another spectrum user's communications.
 - Not all interference is harmful
- In amateur radio we're use to working "in the noise", But not for repeaters
 - Ducting and tropo can enhance propagation, we can't avoid this
 - We must define a normal service area for the repeater
 - Height, ERP, antenna, all effect this area.
- How best to define a normal service area for our FB8's?
 - The FCC uses the concept of service contours, interference contours, and professional engineering
 - Research into this has been ongoing from empirical data in the 1950's
 - FCC REPORT NO. R-6406 (1964), FCC DA-02-1319 (2002), LMCC research
 - <u>https://fasma.org/library/</u>
- TIA/EIA Standard TSB-88 compiles all this with scientific rigor

Frequency Planning Concepts continued Service contours and the capture effect

- Service contour has a given signal strength and will over ride any interfering signal in the area.
- Using CTCSS/PL made this easy in 1970.
 - All repeaters must use RX and TX tone!
- The issue in this was one of determining the signal levels needed.
- 16K0F3E (wideband) needs about 6-9 dB for this to work, but the FCC never considered digital for it.
- Mostly based on TV modeling



Frequency Planning Concepts continued <u>CTCSS tones by FASMA Region</u>

- FASMA has divided Florida into Regions
- Each region has a defined tone
- Repeaters in different regions are on different tones
- This is only a suggestion for tones, others are permitted, so long as it's not standard of an co-channel adjacent repeater
- All repeaters must use RX and TX tone!



Frequency planning concepts continued TSB-88

- TSB-88 is the major rethinking of the service contour
 - Model each mode, taking into account signal bandwidth, adjacent signals, receiver filters, etc.
 - CPC Channel performance Criteria
 - It defines a voice CPC using delivered audio quality or DAQ for a given system
 - DAQ is 1-4, 3.4 is what most systems use.
 - We can model all the interferers in the desired coverage area and ensure our CPC DAQ is >3.4 in the service area.
 - Adjacent channel users are considered as they may be wideband users overlapping a narrow band channel.

DAQ Delivered Audio Quality	Faded Subjective Performance Description	Static SINAD equivalent intelligibility ^{1,2}
1	Unusable, Speech present but unreadable	<8 dB
2	Understandable with considerable effort. Frequent repetition due to Noise/Distortion	12 ± 4 dB
3	Speech understandable with slight effort. Occasional repetition necessary due to Noise/Distortion	17 ± 5 dB
3.4	Speech understandable with repetition only rarely needed. Some Noise/Distortion	20 ± 5 dB ³
4	Speech easily understood. Occasional Noise/Distortion	25 ± 5 dB
4.5	Speech easily understood. Infrequent Noise/Distortion	30 ± 5 dB
5	Speech easily understood.	>33 dB
¹⁾ The VCPC is set to	the midpoint of the range	•

²⁾ Measurement of SINAD values in fading is not recommended for analog system performance assessment

³⁾ The 20 dBS equivalency necessitates a DAQ of approximately 3.4. This value can then be used for linear interpolation of the existing criteria. Non public safety CPC specifications would normally request a DAQ of 3, while Federal Government agencies commonly use a DAQ of 3.4 at the boundary of a protected service area. Note that regulatory limitations could preclude providing a high probability of achieving this level of CPC for portable in-building coverage. In addition, higher infrastructure costs could be needed with potential lessened frequency reuse.

Frequency planning concepts continued TSB-88 Planning of new sites

- We must first define our service area.
 - This can be based on a model of a known location, or
 - A service area is defined and locations are picked that will provide the required signal level
 - This area is broken up into tiles and each tile is considered
- Once this is done, a frequency search happens and we can identify a frequency
 - Interference is modeled per tile for adjacent and co-channel users.
 - The idea here is the service area will provide a 3.4 DAQ or better even with adjacent channel or cochannel users.
 - We then do the same in reverse to our co-channel users
- This is much more complex than a simple FCC contour.
 - But we have tons of data for every possible interference modulation!

Frequency Planning Amateur Standards

Amateur Radio Repeaters

- Amateur Radio repeaters are used for communications at local scale
- A repeater listens on one frequency and retransmits on another (known as a "split")
- Typically a repeater is located high up (100-1000')
- Have excellent antennas 6-12 dB gain typical.
- Have high power output (50-150W) compared to handheld (1-5W) or mobile/base radio (30-50w)
- Designed for continuous duty operation
- Not easily moved to different frequency
 - Filters needed for transmit and receive simultaneously
 - Need high isolation (85-100 dB) between TX and RX to keep RX working
 - Not easy to "tune"
 - Some require custom cut crystal oscillators (common with older surplus repeaters)
 - These are very expensive

It's hard to change frequency later

Amateur Radio Repeaters Need for coordination

- Two repeaters in the same area on the same (or close channel) will interfere
 - Thus the need for coordination of frequencies
 - It's hard to change frequency
 - Coordinator only looks at the output frequency typically
 - The signal takes up space +- the channel (carrier), this is known as bandwidth
 - Emission designators
 - An emission designator is a code that gives info on a signal's bandwidth and the nature of the signal on the frequency.
 - Typical codes 4K00F1D NXDN, 7K60FXE- DMR, 8K10F1E- P25, 11K2F3E NFM, 16K0F3E WFM,
 - The first part of this code is the bandwidth (4 char) and the second is the type of data carried (3char). We are only worried about the first part for frequency planning. This is the occupied bandwidth of the signal (99.5%, -26dBc), and in the example above is 4.00, 7.60, 8.10 11.2, 16.0, and 20.0 KHz. More info is here https://www.apcointl.org/spectrum-management/resources/licensing-links/emission-designators.html
 - Channel size
 - Coordinators allocate channel size in wide and narrow channels. The tendency is to move to digital methods that occupy less bandwidth than analog FM. This does come at the expense of audio quality

Amateur Radio Repeaters

Standard Splits and bandwidths

- Typically each band has a standard split and channels used
- 10m (28.0-29.7 MHz) = 100kHz 20 KHz Wide only 6m (50MHz) = 500kHz - 20 KHz - Wide only 2m (146MHz) = 600kHz - 20 & 15 KHz Wide, 10 & 7.5 Narrow 1.3m (220MHz) = 1.6MHz - 20 KHz Wide only 70cm (440MHz) = 5MHz - 25 KHz Wide, 12.5 KHz Narrow 33cm (900MHz) = 25MHz - 12.5 KHz Narrow, but 25 KHz is permitted 23cm (1200MHz) = 12MHz - 25 KHz
 - Note, we are working to define this better, as the prior coordinators didn't have it worked out
 - In each band the channels have a size: Wide band channels 25, 20, 15 KHz are common, and Narrow channels are 12.5, 10 and 7.5 KHz.
 - A single wideband channel occupies the space of 2 narrow band channels . This allows more users in the same spectrum, and presents issues with adjacent channels interference.

Adjacent channels Legacy of bad decisions

- 2 meters presents a number of issues
 - Two main channel sizes, 20KHz below 146, 15 KHz above 146
 - Offsets all over the place
 - Narrow band 10 and 7.5 KHz, are difficult to make use of
 - 15khz channels are smaller than the wideband signal, and need to be protected from adjacent users
- Typical ham grade transceivers are effected by strong adjacent channel systems.
- Example mask of a 16K0F3E signal



15 KHz channels

The FCC does it, so it's got to be ok, right?

- Example of wideband FM at full modulation with strong adjacent channels.
- Analog FM only over laps at 100% modulation, Digital is always 100% modulated
- This overlap is is known as Adjacent Channel Power Ratio or ACPR
- This is the worst case, and a typical receiver wouldn't be able to handle this.
- What we can do is determine the relative ratio needed between the center and adjacent channels where we have a DAQ of 3.4.



15 KHz channels The FCC does it, so it's got to be ok, right?

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- Analog FM only over laps at 100% modulation, Digital is always 100% modulated
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- This is the worst case, and a typical receiver wouldn't be able to handle this.
- What we can do is determine the relative ratio needed between the center and adjacent channels where we have a DAQ of 3.4.
- TSB-88 provides this for all known modulations (except Dstar ☺)



Applying TSB-88 to amateur radio Putting it all together

- Keeping the FCC example receiver of a dipole at 1.83m off the ground
 - We'd like a service area of 20 dB SINAD, DAQ of 3.4
 - For FM this means we need to be >6 DB over the interference
 - Assuming our radio needs a -110 dBm input signal and a half wave antenna, this is:
 - e = P + 77.2 dB + 20 log(Fmhz) g(dBi), or e = -110 + 77.2 dB + 20 log(146) 2.15 = 8.33 dBu
 - 16 dB for noise and variance of receiver performance in amateur radio, 24 dB
 - Reliability from a 50% number of dBu to 90% is 12dB at VHF, 14 dB at UHF, so 36.33 dBu
 - The value used by the FCC is 37 for VHF, which matches closely
- 18 dB between our intended signal and any co-channel interferes, meaning any cochannel signals must be under 19 dBu inside that 37 dBu service area.
- Adjacent channel power ratio (ACPR) for wideband FM is +5 dB, meaning at the overlap area, an adjacent channel must be less than 42dBu on the adjacent frequency.

Coordination basics

- A coordinator's job is to find the best pair for a repeater in a given area
- Sometimes there will be no pairs open
- RF prediction is software is used for this.
 - This is used to determine a "service contour" and an interference contour
 - The service contour is a predicted signal level (uV/m) in dBu (0 dBu = 1uV/m). This is predicted for 50% of the time at 50% of locations 2m off the ground.
 - The interference contour is a lower value but at 50/10
 - Optionally there is an adjacent channel contour as well. This is an issue as some bands use a 15 KHz channel for 20 KHz channel, 16K0F3E emissions. Only 2m band has this now.
 - Different bands have different standards for contour levels
 - A coordinator must ensure a interference (or adjacent) contour of a repeater doesn't overlap (much) the service contour of another co-channel repeater.
 - As FM has a "capture effect" a weak signal from a distant repeater may be heard in the service contour of another, but when the primary keys up, it will capture the users radio.
 - This is why CTCSS/DCS is used to not pass distant signals in the receiver.
 - <u>http://wiki.radioreference.com/index.php/Signal_Contour</u>

Visualizing service contours

- Service contour is the dark red
- Interference is the light red/green and is used to ensure red doesn't interfere with the green co-channel user
- Can't have the light green overlap dark red or vice versa. (note it does a bit here!)
- The blue would be an adjacent system, it's circle can't overlap the dark red or blead over will occur.
- Users in the red area in Carrier Squelch (CSQ) may hear green if the red repeater is not keyed up. Once red keys up it's signal will override greens interference and lock them out.



Coordination Standard Contour Levels Per Amateur band

Band	Service Contour	Interference Contour	Adjacent Channel Deratings, if applicable
29 MHz 50-54 MHz	31 dBµ F(50,50)	13 dBµ F(50,10)	There is no adjacent channel protection on 20 KHz users. There are no narrowband channels on these bands.
144-148 219-225 MH	37 dBµ F(50,50) z	19 dBµ F(50,10)	 42 dBμ F(50,10) 15 kHz adjacent channel wide band to wide band 44 dBμ F(50,10) 7.5 kHz adjacent channel narrow band to narrow/wide band. 20 KHz channels need no adjacent channel protection wide to wide 10 KHz channels shall not need adjacent channel unless the intended mode is >8 KHz. If so a 25 dBμ F(50,10) value is to be used for this.
440-450 MH	z 39 dBµ F(50,50)	21 dBµ F(50,10)	There is no adjacent channel protection on 25 or 12.5 KHz users. It's still advisable to be cognizant of this.
900 MHz	40 dBµ F(50,50)	22 dBµ F(50,10)	There is no adjacent channel protection on 25 or 12.5 KHz users. It's still advisable to be cognizant of this.

Modeling coverage Free Software to the rescue

- The standards need a model that can accurately simulate the real world signal levels.
- Standard is based on Longley Rice Irregular Terrain Model
 - <u>https://en.wikipedia.org/wiki/Longley%E2%80%93Rice_model</u>
- Divides a system into radials, and takes into account elevation, terrain, clutter, ERP, gain, receiver height and climate conditions. Can model for a percentage of confidence in each mode.
- Open source, originally written in Latin FORTRAN
 - SPLAT! Free Software, scriptable on Unix
 - SignalServer based on SPLAT!; what we use
 - FASMA has full models built automatically for every coordinated repeater
- All these pull SRTM a digital elevation model of earth. High quality (1 arc second, 30m) is FREE.
 - Entire US dataset is large! 10's of gb's. Florida is about 5gb alone
 - We use 3 arc second data, easier to work with at little loss of resolution
 - North Florida has gaps in the SRTM data

Modeling example

- 224.2800 MHz 16K0F3E emission about 450 W ERP at 500'
- 37 dBu Service contour
- 19 dBu Interference contour
- No adjacent channel (20KHz channel and it's 220)
- Note the mid Florida ridge taken into account
- Exportable as a Keyhole map (KML) for easy display in Google Earth
- Automatically generated based on FASMA database



Frequency Planning Coordination Examples

Coordination Example 1



- 443.525 MHz 16K0F3E emission about 700 W ERP at 147m
- 39 dBu Service contour
- 21 dBu Interference contour
- No adjacent channel (20K bandwidth)
- A smaller coverage repeater in palm beach would likely work on this frequency.
- Coordinator will best fit the contours as a radius in KM
 I = 153 KM, S = 72KM

Coordination Example 2

- Two Co-Channel repeaters
- Tampa, S = 41 Km, I = 92 Km
- Titusville, S = 43Km, I = 97 Km
- 39 dBu Service contour
- 21 dBu Interference contour
- Very little chance of interference here
- Ridge in the middle of the state helps
- Based on the contours alone it's easy to see a repeater in Ocala would work if it's of similar coverage.



Coordination Example 3

- Two Co-Channel repeaters
- Tampa and novel Orlando
- Both are high repeaters (350 & 1000 feet)
- 37 dBu Service contour
- 19 dBu Interference contour
- Very high chance of interference
- FASMA didn't grant this but was able to find a 145 MHz channel that worked for the Orlando repeater



What we can & can't do We're not the FCC

What we can and can't do Our abilities

- FASMA will be happy to moderate harmful interference between coordinated repeaters.
 - Being coordinated means you agree to this
- FASMA cannot do anything with uncoordinated users.
 - We'll ask them nicely if they can coordinate, maybe that will resolve it
- It's on the trustee to contact the FCC
 - FSAMA can provide the trustee with an official proof of coordination.

What we can and can't do Our abilities

Bottom line

• FASMA only recommends parameters for station operation

FASMA cannot function if there's no cooperation between amateurs

FASMA Our Process

Our Process

How to Coordinate your repeater

- 1. Prepare
 - Have a site and permission to put your repeater there
 - Funding: Repeater, Filters, Antenna, Coax, Accessories
 - Know the band and mode(s), if suggesting a frequency, ensure it's clear
- 2. Fill out the application completely and properly
 - It's on the website and has everything you need
- 3. Submit it to <u>coord@fasma.org</u> with a descriptive subject
- 4. Answer any questions promptly
- 5. When it's approved and online let us know.

Our Process

How to Coordinate your repeater

- 1. Prepare
 - Have a site and permission to put your repeater there
 - Funding: Repeater, Filters, Antenna, Coax, Accessories
 - Antennas are consumable items
 - If you're on a building, you'll need insurance too
 - Know that some VHF kit will not cover below 146 MHz
 - Know the band and mode(s), if suggesting a frequency, ensure it's clear
 - Channel width required: WFM on 144-146 is 20 KHz, 146-148 is 15Khz
 - Narrow band channels are easier, but most digital modes can't fit in the 146-148 7.5 KHz channel.
 - UHF will generally be easier to coordinate, 12.5 KHz even better

Our Process

How to Coordinate your repeater

- 2. Fill out the application completely and properly
 - <u>https://fasma.org/coordination-information/</u>
 - This is a long page but it explains everything

Our Process How to Coordinate your

• Excellent form example here

FASMA Coordination/Re-coordination form – May 2020 Detailed instructions for each field are here: https://fasma.org/coordination-information/

Simply type your information in the space below, and email the form as a PDF document to <u>coord@fasma.org</u>. Please when submitting the form, please change the subject to something descriptive; i.e. "<u>W4ABC Frostproof new 440 Repeater</u>".

	Item	Your Station	Example
	Repeater Call Sign	KF4ACN	W4ABC
	Holder Club/Entity	John Vecchio	Must be a legal entity, person or FCC Club
	Holder Email	KF4ACN@SOUTH.NET	sombody@example.com
	Holder Address	1988 SE 23rd Ave Homestead	Mailing address of holder
	Holder State	FL	State of Holder
[Holder Zip	33035	State of Holder
	Trustee Phone	3055551212	(813)-867-5309
	Trustee Name	John Vecchio	Trustee Name
	Trustee Call	KF4ACN	Trustee Callsign
	Trustee Email	KF4ACN@SOUTH.NET	somebody@example.com
	County	FL	The county
	City	Homestead	The city the repeater is in
	Location (GPS)	25.74 -80.31	00.00, -000.00 WGS84 Datum.
	Frequency	Output 927.7375 Input 902.0375	Should be a valid channel, or band
	Channel Bandwidth	12.5 KHz	15/20/25 KHz Wide, or 7.5/10/12.5 KHz Narrow
	Emission designator(s)	11K2F3E and 8K10F1E	May support up to two
	Access	DPL 411 NAC A55	CTCSS/DCS code, NAC, DMR CC, etc.
	Antenna Manufacturer	DB Spectra	Manufacturer
	Antenna Model	SP9A10F36UFD	Model of antenna
	Antenna Gain (dBd)	10.0	Must be in dB over a dipole
	Antenna Pattern	Omni	Omni or describe the pattern
	Antenna Azimuth	0 Deg	Bearing of antenna pattern
	Antenna Height	94.5	From ground to center of radiation in meters.
	Feedline Type	Eupen EC7-50-A	Manufacture and model of feedline
	Feedline Length	100.5	Length of feedline in meters
	Power Out Into Feedline	70 Watts	This is Watts out of all filters into the feedline.
	Supporting Structure	Latice Tower	BANT, GTOWER, Etc.
[Use	Open	Open, ARES/RACES, Bilingual, Other?
@ Proc	Features	Backup Power	Autopatch, backup power, etc.
© biya	URL	None	https://yourclub.org

Our Process How to Coordinate your repeater

Submit it to <u>coord@fasma.org</u>

Use a good subject

You'll get a email from us letting you know it's been received



Our Process How to Coordinate your repeater

You'll get a email from us letting you know it's been received

Note the subject. You must keep the [Coordination #nnn] in all correspondence

Reply will typically do this

From Coordination Queue via RT <coord@fasma.org> 😭 Subject [Coordination #603] AutoReply: testing a coordination 4

To bryan@flscg.org 🚖

Greetings,

This message has been automatically generated in response to the creation of a coordination ticket regarding "testing a coordination", a summary of which appears below.

There is no need to reply to this message right now. Your ticket has been assigned an ID of [Coordination #603].

Please include the string [Coordination #603] in the subject line of all future correspondence about this issue. To do so, you may reply to this message.

Thank you,

Coordination Committee Florida Amateur Spectrum Management Association, Inc. coord@fasma.org

inform here

-

Bryan Fields, W9CR Florida Amateur Spectrum Management Association, Inc. Our Process How to Coordinate your repeat

Please respond to any inquiries promptly

Sat Feb 06 20:56:41 2021	W9CR (Bryan Fields) - Correspondence added	10 mi	Reply	сс
Please respond to this or we will have	e to dismiss the application.			
Thank you and 73's				
 Brvan Fields, W9CR				
Florida Amateur Spectrum Manageme	ent Association, Inc.			
On Thu Jan 28 23:55:55 2021, W9CF - Show quoted text -	R wrote:			
Sat Feb 06 20:55:49 2021	W9CR (Bryan Fields) - Requestor <kf4acn@bellsouth< th=""><th>n.net≻ a</th><th>added</th><th></th></kf4acn@bellsouth<>	n.net≻ a	added	
Sat Feb 06 20:51:45 2021	The RT System itself - Outgoing email about a comm	ent red	corded	
Sat Feb 06 20:51:45 2021	W9CR (Bryan Fields) - Comments added		Reply	cc
Left a VM for him today.				
 Brvan Fields, W9CR				
Florida Amateur Spectrum Managem	ent Association, Inc.			
On Sun Jan 31 15:10:48 2021, W9CF - Show quoted text -	R wrote:			
Sun Jan 31 15:10:48 2021	The RT System itself - Outgoing email recorded			
Sun Jan 31 15:10:48 2021	The RT System itself - Outgoing email recorded			

W9CR (Brvan Fields) - Correspondence added

Thu Jan 28 23:55:55 2021

Normally we need more notice to study this, but there appears to be nothing on that frequency within 200km.

Questions:

900 MHz is split with 25 or 12 mhz spacing. We only coordinate repeaters output frequencies, so I'm assuming you're going with the 902.0375 to be close to the band edge. Any issues with this will be on you, but it looks like there's no other users on it per our records.

Is the NAC in and out A55? and DPL is 411 in/out?

What county is it in?

is this really a 310 m high lattice tower, I'm unaware of anything that size in the state that's not guyed. Is the repeater not tower mounted? You're losing 10 db or so in the coax alone at that length.

Preliminary record

====FASMA RECORD 3569====

Dear John Vecchio, Your repeater, Record: 3569, Callsign: KF4ACN, on 927.7375 is as follows:

Record ID	:	3569
Coord Date	:	2021-01-28
Update Date	:	2021-01-28
Holder	:	John Vecchio
Holder Address	:	1988 SE 23rd Ave Homestead
	:	ERROR: HOLDER CITY, ERROR: STATE 33035
Haldan Dhana	•	305 301 7130

Any response on this or the many others?

Sun Jan 31 15:10:48 2021

5 min Reply CC

Our Process How to Coordinate your repea

Once it's been processed we'll grant it.

You'll get an email back with the record from our database

You have 60 days to go into operation

Please let us know when it's online with a reply to the original ticket

927.7375 KF4ACN Homestead

February 11, 2021 by W9CR

There's a new P25/FM repeater, KF4ACN, on 927.7375 in Homestead.



927.7375 KF4ACN Homestead Service Area

====FASMA COORDINATION RECORD 3569====

Record ID	1	3569	
Coord Date	1	2021-02-11	
Update Date	1	2021-02-11	
Holder	:	John Vecchio	
Tructoo		John Vecchio	KEAACN

Our Process How to Coordinate your repeater

You have 60 days to go into operation

Please let us know when it's online with a reply to the original ticket

 From Bryan Fields via RT <coord@fasma.org>★
Subject [Coordination #841] Proposed 2 meter repeater for Central Florida
 To bfields@fasma.org ☆
Ticket URL: <u>https://rt.fasma.org/Ticket/Display.html?id=841</u>
Just checking, is this online yet?
--Bryan Fields, W9CR
Florida Amateur Spectrum Management Association, Inc.
On Sat May 15 22:19:27 2021, jim.hoge@zradio.org wrote:
Bryan-

Elevator on the Lake Pickett Tower was repaired last Thursday, repeater is in hand and tuned, antennas should be hung in short order. Only one update and that's the PL tone came set to 179.9 Hz transmit and receive. If you can make that change in the database, I would appreciate it.

I'll holler when operational - possibly as early as this weekend!

Thanks for all you did and are doing--

73's

Jim Hoge

W4CC

Enomy Drupp Fields with DT (coond@facma and)

Our Process I'm rejected?

- We will reject incomplete applications
- Handwritten or scans of the form
- Ones we suspect to be fraudulent
- Even if you're rude we'll try to help 😳

Please correct it and resubmit!

• We will reject incomplete application(s)

1048	FASMA-Coordination-Form441.850.pdf	rejected	Coordination	W9CR (Bryan Fields)
	GilDaniel <coclenata@gmail.com></coclenata@gmail.com>	3 weeks ago	3 weeks ago	3 weeks ago
1047	FASMA-Coordination- AE4WE146.850.pdf	rejected	Coordination	W9CR (Bryan Fields)
	GilDaniel <coclenata@gmail.com></coclenata@gmail.com>	3 weeks ago	3 weeks ago	3 weeks ago
1046	FASMA-Coordination- AE4WE146.850.pdf	rejected	Coordination	W9CR (Bryan Fields)
	GilDaniel <coclenata@gmail.com></coclenata@gmail.com>	3 weeks ago	3 weeks ago	3 weeks ago
1045	FASMA-Coordination- AE4WE442.2750.pdf	rejected	Coordination	W9CR (Bryan Fields)
	GilDaniel <coclenata@gmail.com></coclenata@gmail.com>	3 weeks ago	3 weeks ago	3 weeks ago
1044	GilDaniel <coclenata@gmail.com> FASMA-Coordination- AE4WE145.390.pdf</coclenata@gmail.com>	3 weeks ago	3 weeks ago Coordination	3 weeks ago W9CR (Bryan Fields)
1044	GilDaniel <coclenata@gmail.com> FASMA-Coordination- AE4WE145.390.pdf GilDaniel <coclenata@gmail.com></coclenata@gmail.com></coclenata@gmail.com>	3 weeks ago rejected 3 weeks ago	3 weeks ago Coordination 3 weeks ago	3 weeks ago W9CR (Bryan Fields) 3 weeks ago
1044 1043	GilDaniel <coclenata@gmail.com> FASMA-Coordination- AE4WE145.390.pdf GilDaniel <coclenata@gmail.com> FASMA-Coordination- AE4WE146.850.pdf</coclenata@gmail.com></coclenata@gmail.com>	3 weeks ago rejected 3 weeks ago rejected	3 weeks ago Coordination 3 weeks ago Coordination	3 weeks ago W9CR (Bryan Fields) 3 weeks ago W9CR (Bryan Fields)
1044 1043	GilDaniel <coclenata@gmail.com> FASMA-Coordination- AE4WE145.390.pdf GilDaniel <coclenata@gmail.com> FASMA-Coordination- AE4WE146.850.pdf GilDaniel <coclenata@gmail.com></coclenata@gmail.com></coclenata@gmail.com></coclenata@gmail.com>	3 weeks ago rejected 3 weeks ago rejected 3 weeks ago	3 weeks ago Coordination 3 weeks ago Coordination 3 weeks ago	3 weeks ago W9CR (Bryan Fields) 3 weeks ago W9CR (Bryan Fields) 3 weeks ago
1044 1043 1041	GilDaniel <coclenata@gmail.com> FASMA-Coordination- AE4WE145.390.pdf GilDaniel <coclenata@gmail.com> FASMA-Coordination- AE4WE146.850.pdf GilDaniel <coclenata@gmail.com> fasma.org.jpeg/KD4MGRrepeater</coclenata@gmail.com></coclenata@gmail.com></coclenata@gmail.com>	3 weeks ago rejected 3 weeks ago rejected 3 weeks ago rejected	3 weeks ago Coordination 3 weeks ago Coordination 3 weeks ago Coordination	3 weeks ago W9CR (Bryan Fields) 3 weeks ago W9CR (Bryan Fields) 3 weeks ago W9CR (Bryan Fields)
1044 1043 1041	GilDaniel <coclenata@gmail.com> FASMA-Coordination- AE4WE145.390.pdf GilDaniel <coclenata@gmail.com> FASMA-Coordination- AE4WE146.850.pdf GilDaniel <coclenata@gmail.com> fasma.org.jpeg/KD4MGRrepeater johnny deane <johnnydeane1@outlook.com></johnnydeane1@outlook.com></coclenata@gmail.com></coclenata@gmail.com></coclenata@gmail.com>	3 weeks ago rejected 3 weeks ago 3 weeks ago rejected 3 weeks ago	3 weeks ago Coordination 3 weeks ago Coordination 3 weeks ago Coordination 3 weeks ago	3 weeks ago W9CR (Bryan Fields) 3 weeks ago W9CR (Bryan Fields) 3 weeks ago W9CR (Bryan Fields) 3 weeks ago

FASMA Coordination/Re-coordination form – May 2020 Detailed instructions for each field are here: https://fasma.org/coordination-information/

Simply type your information in the space below, and email the form as a PDF document to coord@fasma.org. Please when submitting the form, please change the subject to something descriptive; i.e. "W4ABC Frostproof new 440 Rep.

Item	Your Station	Example
Repeater Call Sign	AE4WE	W4ABC
Holder Club/Entity		Must be a legal entity, person or FCC
Holder Email	AE4W6@yahoo.com	sombody@example.com
Holder Address	1641 SW 85TH CT	Mailing address of holder
Holder State	FL	State of Holder
Holder Zip	33155	State of Holder
Trustee Phone		(813)-867-5309
Trustee Name		Trustee Name
Trustee Call	AE4WE	Trustee Callsign
Trustee Email	AE4W6@yahoo.com	somebody@example.com
County		The county
City		The city the repeater is in
Location (GPS)		00.00, -000.00 WGS84 Datum.
Frequency	146.895	Should be a valid channel, or band
Channel Bandwidth		15/20/25 KHz Wide, or 7.5/10/12.5 I
Emission designator(s)		May support up to two
Access	100.0	CTCSS/DCS code, NAC, DMR CC, etc.
Antenna Manufacturer		Manufacturer
Antenna Model		Model of antenna
Antenna Gain (dBd)		Must be in dB over a dipole
Antenna Pattern		Omni or describe the pattern
Antenna Azimuth		Bearing of antenna pattern
Antenna Height		From ground to center of radiation i
Feedline Type		Manufacture and model of feedline
Feedline Length		Length of feedline in meters
Power Out Into Feedline		This is Watts out of all filters into the
Supporting Structure		BANT, GTOWER, Etc.
Use		Open, ARES/RACES, Bilingual, Other
Features		Autopatch, backup power, etc.
URL		https://yourclub.org

Coordination is predicated under the above parameters only. Any deviation or relocation greater than 8km distance, AGL or 10% power will require re-coordination. Coordination does not grant exclusive use of a frequency.

Additional information:

LUCIANO MARTINEZ

name

IN THE AIR

Submitted by:

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6/29/2021

 Handwritten or scans of the form

2021 FASMA Coordination/Re-coordination form – May 2020 Detailed instructions for each field are here: https://fasma.org/coordination-information/

Simply type your information in the space below, and email the form as a PDF document to coord@fasma.org. Please when submitting the form, please change the subject to something descriptive; i.e. "W4ABC Frostproof new 440 Repeater".

Item	Your Station	Example
Repeater Call Sign	KD4MGA	W4ABC
Holder Club/Entity		Must be a legal entity, person or FCC Club
Holder Email	JAHNDEANED Bell Couth.	sombody@example.com
Holder Address	3207 NIN SZEN NRT	Mailing address of holder
Holder State	EI-	State of Holder
Holder Zip	32605	State of Holder
Trustee Phone	357 246-6473	(813)-867-5309
Trustee Name	JOHN DEANE	Trustee Name
Trustee Call	KD4MGR	Trustee Callsign
Trustee Email	Loca talen Vin TARGANAI	somebody@example.com
County	ALIARANO	The county
City	adine culle	The city the repeater is in
Location (GPS)	29'42 42 42 98 1 82 23 25 11	00.00, -000.00 WGS84 Datum.
Frequency	146.85 0	Should be a valid channel, or band
Channel Bandwidth	15 KHZ	15/20/25 KHz Wide, or 7.5/10/12.5 KHz Narr
Emission designator(s)	16 KDF3E	May support up to two
Access	CIASOR MRON	CTCSS/DCS code, NAC, DMR CC, etc.
Antenna Manufacturer	Che hinasta	Manufacturer
Antenna Model	Se master 11	Model of antenna
Antenna Gain (dBd)	4.8	Must be in dB over a dipole
Antenna Pattern	OMNY	Omni or describe the pattern
Antenna Azimuth	OMNE	Bearing of antenna pattern
Antenna Height	1 7/8V	From ground to center of radiation in meter
Feedline Type	450 Heria X	Manufacture and model of feedline
Feedline Length	450 Fact	Length of feedline in meters
Power Out Into Feedline	50 WATY NO 108 TO Watt	This is Watts out of all filters into the feedlin
Supporting Structure	+17 20 IOWIONA	BANT, GTOWER, Etc.
Use	HAM RAIND	Open, ARES/RACES, Bilingual, Other?
Features	ATA	Autopatch, backup power, etc.
URL	10111	https://yourclub.org

Coordination is predicated under the above parameters only. Any deviation or relocation greater than 8km distance, 5m in AGL or 10% power will require re-coordination. Coordination does not grant exclusive use of a frequency.

Additional information:

• Ones we suspect to be fraudulent

#	f Subject		Statu
	Requestor	∧ The Basics	Creat
32	NARC-Bardmore.pdf Andy Miller <kj4fec@gmail.com></kj4fec@gmail.com>	ld: 37 Status: resolved Worked: 2 hours (120 minutes)	rejecti 4 years
33	NARC-Carilon.pdf Andy Miller <kj4fec@gmail.com></kj4fec@gmail.com>	Users: W9CR: 2 hours (120 minutes) Priority: 0/	rejecto 4 years
34	NARC-Local.pdf Andy Miller <kj4fec@gmail.com></kj4fec@gmail.com>	Queue: Coordination	resolv 4 years
35	NARC-MP.pdf Andy Miller <kj4fec@gmail.com></kj4fec@gmail.com>		resolv 4 years
36	NARC-stjoe.pdf Andy Miller <kj4fec@gmail.com></kj4fec@gmail.com>		rejecto 4 years
37	NARC-AllChild.pdf Andy Miller <kj4fec@gmail.com></kj4fec@gmail.com>		resolv 4 years
114	App for Crystal River Andy Miller <kj4fec@gmail.com></kj4fec@gmail.com>		new 3 years

Atth: Andy Miller Trustee: Andy Miller 10 Cypress Drive Palm Harbor, FL 34684	nelias Amateur Hadio Club	Attn: Andy Miller Trustee: Andy Miller 10 Cypress Drive Palm Harbor, FL 34684	"Inelias Amateur Hadio Ciud
Item	Parameter	Item	Parameter
Repeater Call Sign	KN4GVY	Repeater Call Sign	KN4GVY
Club or Entity	NPARC	Club or Entity	NPARC
Trustee Email & Primary Phone	kj4fec@gmail.com 727-488-4297	Trustee Email & Primary Phone	kj4fec@gmail.com 727-488-4297
Frequency	444.9500 TX / 449.9500 RX	Frequency	444.9500 TX / 449.9500 RX
Access	CC1	Access	CC1
Channel Bandwidth	25 KHz Wideband	Channel Bandwidth	25 KHz Wideband
Location (GPS)	27.76 / -082.64	Location (GPS)	27.76 / -082.64
County	Pinellas	County	Pinellas
Antenna Gain (dBd) Pattern and Azimuth	8 dBd Omni 0 degrees	Antenna Gain (dBd) Pattern and Azimuth	8 dBd Omni 0 degrees
Antenna Type	Sinclair SD314-HF2P2SNM	Antenna Type	Sinclair SD314-HF2P2SNM
Antenna Height Above Ground Level	34 meters	Antenna Height Above Ground Level	34 meters
Power out (after Duplexer) Feedline type/length	50W 100' Helax 1/4"	Power out (after Duplexer) Feedline type/length	50W 100' Helax 1/4"
Use	Open	Use	Open
Features		Features	
Modulation mode(s)	DMR	Modulation mode(s)	DMR

- There were 7 of these, all identical.
- St Pete was said to be on the air
- Just over 3 hours of work total

ed

• Even if you're rude we'll try to help 🙂

Wed Jun 30 07:56:09 2021 W9CR (Bryan Fields) - Correspondence added 5 minutes

This is your 5 time you've submitted this incomplete form. Submitting the same thing multiple times doesn't fix it.

This is incomplete. Please follow https://fasma.org/coordination-inf	the instructions on formation/ and resubmit.	Wed Jun 30 20:37:04 2021 To: coord@fasma.org	GilDa	niel <o< th=""><th>cocl</th><th>enata@gmail.com> - Correspondence added</th></o<>	cocl	enata@gmail.com> - Correspondence added	
Thank you,		Date: Wed, 30 Jun 2021 2	Date: Wed, 30 Jun 2021 20:34:44 -0400				
-		Subject: Re: [Coordination #	1048] FAS	MA-Co	ord	nation-Form441.850.pdf	
Bryan Fields, W9CR Florida Amateur Spectrum Management Association, Inc.		From: "gil saavedra" <cocl< td=""><td>enata@gn</td><td>nail.cor</td><td>m></td><td></td></cocl<>	enata@gn	nail.cor	m>		
On Tue Jun 29 15:13:16 2021, coclenata@gmail.com wrote:							
- Show quoted text -		Greetings Brian, my apologies but	I don't thin	k that's	s the	tone with which you have to speak to me okay	
		Sent from my iPhone					
	Wed Jun 30 22:02:22 2021 W9	CR (Bryan Fields) - Correspondence added	5 minutes	Reply	Com		
	Sir, I intended no insult to you, apologies if incomplete form, and all you've submitted you have any specific questions let me kno Thank you and 73's	f you misinterpreted my email. I'm simply stating that w are incomplete. I provided you a link to our page that o ow.	ve cannot acce explains how to	pt a o fill it out.	. If		

Our Initiatives Backyard repeaters Two meter study

Itinerant Policy

Backyard repeaters

- The FRC was asked to do backyard repeaters for >15 years
- <u>http://fasma.org/proposed-itinerant-repeater-policy/</u>
- FASMA has put together the following:
 - 70cm band
 - Under 50'
 - 20km service contour
 - TPO <40W
 - 6dBd max antenna gain
 - Height above Average terrain must not exceed
 60 feet out 25 miles.
 - CTCSSS/DPL/etc required
 - You have to work with your neighbors
- All frequencies are adjacent, no need to retune

Wideband		Narrowband	
Pair	Output	Pair	Output
1	441.8250	1A	441.8250
		1B	441.8375
2	441.8500	2A	441.8500
		2B	441.8625
3	441.8750	ЗA	441.8750
		3B	441.8875
4	441.8000	4A	441.9000
		4B	441.9125
*5	441.9250	*5A	441.9250
Channel 5A/B 36 Hour max use Truly Itinerant repeater only Hamfest/etc.		*5B	441.9375
		6	441.9500
		7	441.9625
		8	441.9750
		9	441.9875

Two Meter Policy Identifying new or itinerant pairs

PRELIMINARY STUDY

Two Meters has a history of repeater issues:

- Spacing is different
 - 146-148 is 15 KHz Wide, 7.5 Narrow
 - 144-146 is 20 KHz Wide, 10 Narrow
 - First repeaters were only allowed in 146-148 MHz, required an FCC application and a tape recorder!
 - Spacing was based on the old 60 KHz wideband (15k) spacing
- Hams were limited by the equipment of the day, 400-500 KHz tuning range
 - 146.0-146.4 Inputs, 146.52 simplex, 146.6-147.0 for receive.
 - Mobile RX could cover the outputs and simplex, and same for the TX
 - 147-148 was the same
 - In 1970 FCC application requirement was dropped, spectrum opened up

Two Meter Policy Identifying new or itinerant pairs

PRELIMINARY STUDY

Two Meters has a history of repeater issues:

- FASMA is studying converting simplex to repeater pairs on 146 and 147
- 1.005 MHz offset

Showing the raster we're looking at

- 146.52 would be excluded
- It would not be all areas
- Not all pairs would be permitted

Still in the research phase, comments welcome rt@fasma.org

146	147		
146.4000	147.4050	Simplex	
146.4150	147.4200	Simplex	
146.4300	147.4350	Simplex	
146.4450	147.4500	Simplex	
146.4600	147.4650	Simplex	
146.4750	147.4800	Simplex	
146.4900	147.4950	Simplex	
146.5050	147.5100	Simplex	
146.5200	147.5250	Simplex Calling Frequency	
146.5350	147.5400	Simplex	
146.5500	147.5550	Simplex	
146.5650	147.5700	Simplex	
146.5800	147.5850	Simplex	



Thank you!