Coordination Guidelines
Metropolitan Coordination Association, Inc.

This page contains information about frequency coordination with MetroCor.

Introduction

Spectrum Management or frequency coordination in the Amateur Radio Service is administered by Amateur Radio Licensees, who voluntarily assist in the continuing effort to achieve optimum spectrum use and minimal interference for all members of the Amateur community.

Coordination grants do not confer, or warrant the exclusive use of any frequency, nor does it preclude the possibility of some amount of co channel activity. The goal is to allow for constructive use of ALL available frequencies, for the most effective sharing of a limited resource.

MetroCor does not warrant any frequency to be suitable for any usage; it is the sole responsibility of the applicant to determine the suitability of your choice of frequency before beginning operation.

The role of coordination is a "balancing act", where the interests of all spectrum users are taken into account. The ongoing needs of the Amateur Radio community have caused this role to evolve from simple FM repeater, link and control channel coordination into one of more efficient spectrum management. Spectrum management must now account for the needs of weak signal, FM simplex, ATV, packet and other new technology spectrum users.

METROCOR

MetroCor, Inc. is the NFCC recognized spectrum management body in the New Jersey/New York and Long Island area.

For administrative purposes, MetroCor is divided into Regions. These Regions are:

1. Northern New Jersey ARRL Section (NNJ)

2. New York City and Long Island (NLI)

3. Westchester (ENY)

The MetroCor Executive Board

The Executive Board is composed of both elected and appointed officers. The elective offices are President, Vice President, Treasurer and Secretary. Directors are elected by vote the Executive Board.

The President appoints coordination committees for the various bands and modes. Committee appointees' duties on behalf of their local area appointment include verifying operations of systems as well as being advocates for system operators. Committee appointees are also available to assist in mediation of frequency disputes, as well as in assisting the ADR Committee.

Why Coordinate?

The FCC has encouraged the development of coordination bodies as part of the Amateur Radio community's effort at self-regulation. Where an interference matter exists between amateur radio repeater station systems, the FCC requires the operator of an uncoordinated system take full responsibility for resolution of any interference issues affecting the operations of the coordinated system.

When considering fixed frequency operations, such as those identified above, Amateur operators should contact MetroCor to determine if there is any possibility of interference to a coordinated system. For modes where there is no individual station coordination, MetroCor can provide guidance on current activities by referencing the MetroCor "Band Plans". MetroCor’s Band Plans are regional refinements of the ARRL National Band Plans, which supersede the National Plans in MetroCor’s coverage area.

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Publication of Coordination Data

The coordination process depends on both the cooperation of the Amateur community and the availability of information to the Amateur community. The Amateur Radio coordination process is the management of the PUBLIC radio spectrum resource on behalf of the Amateur community. As such, those who have been granted coordination are accountable to that community for the relatively exclusive use of that spectrum associated with their coordination. As MetroCor is a membership organization, MetroCor will publish and disseminate information pertaining to coordination grants made to MetroCor members.

In order to provide a balance of accountability and privacy, MetroCor will publish coordination lists limiting public access to certain coordination elements, under the following column headings:

Frequency of operation.

Mode/Use.

Access, PL, DPL, etc.

County of operation.

Municipality of operation.

Name and call sign.

MetroCor will NOT publish link frequency lists, but will make them available to other coordination bodies on an as- needed basis. All control and/or link frequencies must be coordinated; this information will be used by MetroCor to help prevent interference to other repeater systems; which might use control or link frequencies. All such frequencies must comply with existing band plans and technical parameters as set forth herein. A functional diagram of all such link/control frequency use shall accompany the repeater station coordination application as an attachment.

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Transfer of Coordination

MetroCor has established guidelines for the transfer of frequency coordination grants from one Trustee to another. Coordination may be transferred to a new Trustee under only two conditions:

Club/Organization. The coordination grant(s) to a system(s) is/are held by a club/organization. The club/organization wishes merely to change Trustees. In order to maintain coordination of the club/organization system(s), the succeeding Trustee must provide documentation proving active membership in that club/organization.

Individual. The coordination grant(s) to a system(s) is/are held by an individual station Trustee, who wishes to transfer a coordination to another individual station Trustee or club Trustee, provided that

The re-coordinated system will continue to serve the same user base.

The new Trustee must be able to document frequent personal use of that system for a minimum of one year, prior to the request for a change of Trustee.

In situations where either of these two conditions cannot be met, the frequency pair is declared available for reassignment.

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Technical Guidelines

Band Plans

MetroCor will maintain its band plans for those bands where the membership has decided to adopt them. Where no MetroCor band plan has been adopted, the ARRL National Band Plan will be used. MetroCor currently maintains band plans for the following Amateur frequency bands: 28 MHz, 50 MHz, 144 MHz, 222 MHz, 420 MHz, 902 MHz, and 1240 MHz. These band plans are to be carried as appendices to this document.

28 Mhz: ten-meter pairs are issued with low input, high output, with a 100 KHz offset. Tone control is mandated. Channel spacing is 20 KHz.

50 Mhz: six meter pairs are issued as low input, high output with a 1 MHz offset, Channel spacing is 20 KHz.

144-148 MHz. 2-meter pairs are issued with a 600 KHz Offset. From 144 to 146 MHz, channel spacing is 20 KHz. From 146 to 148 Mhz channel spacing is 15 KHz. NO 1 MHz offset pairs will be considered at this time.

222 Mhz, all 222 MHz pairs are issued with a 1.6 MHz offset, and 20KHz Channel spacing. Output is high; input is low on all pairs.

440 Mhz: all 70cm. pairs are issued with a 5 MHz offset, and 25 kHz Channel spacing. Channels ending with a “5” as the last significant digit shall be low input, high output. Those channels ending with a “0” as the last significant digit shall be high input, and low output.

902-927 MHz: 12.5 KHz spacing of channels, 25 MHz TX-Rx separations, low input, high output. Click the link in the first paragraph of this section for the entire band plan.

TONE/DPL control shall be required on ALL repeater stations to be coordinated.

Channel spacing, and station spacing distances for coordinated systems may be adjusted by the chief coordinator on a case-by-case basis due to several factors, including terrain, area of coverage, antenna height, gain, and power output, both actual and ERP. The goal of MetroCor is to provide the greatest number of usable frequency pairs with the minimum amount of interference possible.

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Repeater Technical Parameters

Separation Requirements in Miles (see notes that follow):

Band	Co-Channel	First Adjacent Channel	Minimum Coverage Radius
28 MHz	125	50	50
50 MHz	125	35	35
144 MHz	70	10	15
146 MHz	70	25	15
222 MHz	70	10	15
420 MHz	70	10	15
440 MHz	70	15	15
902 MHz	50	10	10
1240 MHz	50	10	10

Notes:

1. 145 MHz repeaters were originally spaced at 50 miles (Co-Channel) and 25 miles (First Adjacent). This is no longer the case. However an existing system(s) are "grand fathered" until their coordination grant(s) expire.
2. Minimum coverage measurements will be made with a 25 W ERP mobile station.
3. When the height of a given repeater is 1000 feet (HASL) or higher, the repeater must have minimum separation of 100 miles or more from its co-channel, for the 144 MHz and 220 MHz bands.
4. Repeater Coordination grants are based upon a single site with a co-located transmitter and receiver, intended to cover the specific geographic area as described under the "Geographic Information for Repeater Transmitter Site" section of the MetroCor "Repeater Frequencies Coordination Application / Renewal" form, unless otherwise noted. (See "Split Site" system as noted on the application).

   In order to maintain the quality of service in a system's intended coverage area, additional remote receivers are permitted. Systems such as these also reduce the potential for co-channel interference. Remote receivers which are designed to extend coverage beyond a system's intended service area violates the single use presumption upon which a coordination is based, and as such, will be considered a violation of the coordination itself.

5. Separation distances are based on terrain considerations, which are also subject to review MetroCor and coordination approval on a case-by-case basis.
6. An emitter will be considered "inactive" if not used for purposes of communications for at least ten (10) hours per month. Also, if a repeater system does not increase the range and readability of two mobile units operating simplex in the same frequency band, it would not be considered operational. As stated above, if the emitter is inactive and/or does not meet the requirements of an operational emitter system, MetroCor may request the Licensee to furnish MetroCor with written documentation of the status, operational history, and technical parameters of the system in question, along with any other pertinent data requested at least 10 days prior to the next board meeting of MetroCor to show cause why the frequency should not be reassigned.

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Transmitter

1. Center Frequency Accuracy and Stability (0 to 50 degrees C.

Band	Design Goal	Minimum Requirement
28 MHz	+/- 150 Hz	+/- 292 Hz
52 MHz	+/- 150 Hz	+/- 292 Hz
146 MHz	+/- 150 Hz	+/- 292 Hz
220 MHz	+/- 150 Hz	+/- 448 Hz
440 MHz	+/- 150 Hz	+/- 980 Hz
902 MHz	+/- 1.3 kHz	+/- 2.60 kHz
1240 MHz	+/- 1.3 kHz	+/- 2.60 kHz

2. Peak Deviation: +/- 4.8 kHz, maximum, symmetrically centered about the center frequency. This maximum deviation includes the sum of all voice, PL, ID, and DTMF tone signals in any combination. Nominal voice deviation should be +/- 3.5 kHz with constant deviation systems preferred (Automatic Gain Control).
3. Audio Frequency Response: Limited to 3 kHz maximum, with 40 dB per octave roll-off after limiter of compression circuitry and prior to entering modulator. Audio response, 100 Hz to 3.0 kHz @ +0/-3 dB. This reduces occupied RF bandwidth and "splatter" to adjacent channels.
4. ID Level: Low distortion, sine-wave generator preferred, signal should pass through low pass filter prior to entering modulator. Maximum deviation, +/- 2 kHz; minimum +/- 1 kHz.
5. Touch-Tone Frequencies and Levels: Frequencies per BTL standards and adjusted to not exceed peak deviation of +/- 3.8 kHz; minimum of +/- 2.8 kHz; nominal, +/- 3.5 kHz.
6. PL Frequencies and Levels: Frequencies for CTCSS tone encoding systems are to be per EIA standards. Level is to be adjusted to produce +/- 600 Hz, maximum transmitter deviation; +/- 400 Hz minimum. Only sub-audible frequencies below 300 Hz should be used. "Whistle-Up" and "Burst" type PL systems are discouraged since they produce high amplitude, high frequency sideband signals from the transmitter.
7. Power Output Level: Commensurate with minimum ERP required for coverage area and maximum allowed by FCC for height.
8. Modulator Linearity: 5% or less ("straight-line" method). (Reduces adjacent channel splatter and recovered audio distortion).
9. Hum and Noise: Excluding PL, ID and DTMF, 50 dB below peak deviation.
10. Spurious (In and Out-of-Band)/Harmonic Outputs: 70 dB below transmitter power output.

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Repeater System Considerations

1. Duplexers with "band-pass" and band reject, rather than "band reject" only characteristics are preferred since they attenuate frequencies on both sides of their pass-band.
2. Antennas should have VSWR of 1.25:1 or better on transmit and receiver frequencies at a duplex site in order to properly terminate the duplexer.
3. Ferrite-Isolators: should be used on transmitter final outputs prior to the duplexer in order to reduce IM products, spurious emissions, and improve RF stability. A low pass, or notch type filter should be used after an isolator to prevent unwanted 2nd. order products from being emitted.
4. Telephone Interfaces: levels and frequencies per BTL standards, 0 dBm max, 1 MW, 600 ohms balanced (0.775 Vrms).
5. Solid State Design: For improved DC to RF efficiency and reliability. Battery/charger operation desirable for emergency situations.
6. TOR, PL & ANTI PL Control Systems: must be utilized for effective spectrum utilization on repeater pairs.

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Receivers

1. Center Frequency Stability: same as transmitter specification.
2. Selectivity: overall receiver performance due to RF and IF filtering should have the following characteristics:

BW	13 kHz (+/- 6.5 kHz)	- 6 dB
BW	30 kHz (+/- 15 kHz)	- 100 dB
In-Band Ripple	+/- 1.5 dB max	

1. Audio Frequency Response and Distortion: 100 Hz to 3.0 kHz @ +0 -3 dB and less than 5% distortion.
2. Sensitivity: commensurate with coverage area and transmitter ERP.
3. Squelch: Digital Signaling (DPL) or sub-audible tone-operated only.

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Satellite Receivers, Link and Control Technical Parameters

The following additional technical requirements/parameters are required of systems of this type:

1. Directional Antennas *
2. Non-carrier squelch
3. Minimum required power
4. Satellite Receivers included as a part of a repeater system must be listed on an additional sheet of paper to be attached to the coordination request. The frequency, access type and code, exact location, antenna type, gain, and orientation and manner in which the signal is to be conveyed to the repeater shall all be included along with a functional diagram of the system.
5. This information is for MetroCor's use only, satellite receivers are not coordinated.
6. MetroCor reserves the right to request any additional data we deem necessary, in order to properly consider any and all coordination requests.

* Directional antennas are not required for voting/satellite receivers.

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ADDITIONAL COORDINATION REQUIREMENTS

1) Upon receipt of your coordination approval notification from MetroCor, you will have a 120-day time period to make your station operational within the parameters so noted on the coordination application(s).
2) Upon your station's operational startup, you must notify MetroCor, in writing, within 10 days of the operational start up and the stations compliance with the coordinated parameters.
3) Should your start up be delayed beyond the 120-day initial period, you must notify MetroCor in writing, before the expiration of the 120-day period, with the reasons for the delay. An additional period of up to 90 days may be granted, at the option of MetroCor's representative.
4) Stations that do not meet these requirements, nor comply with the furnishing of the data requested will automatically lose their coordinated status and the frequency(s) be made available for reassignment.

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Trustee Responsibilities

A trustee of a coordinated repeater shall notify MetroCor, in writing, within 10 days of any change of their mailing address. MetroCor must always have a valid, direct, means of contacting the trustee of a coordinated repeater. If a trustee is not reachable either by telephone, or US Mail within 20 days of such attempt, it shall be construed that the repeater is operating in violation of it's coordination, and de coordination procedures may be instituted. Trustees shall notify MetroCor, in writing, within 20 days of cessation of repeater's operation for any cause. If a repeater permanently ceases operation, or is sold or otherwise conferred to another person or organization, the trustee shall notify MetroCor of such action within 20 days of the event. Such cessation shall be construed as to mean that the trustee has relinquished their coordination to the assigned frequency pair(s).

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Station Coordination Document Parameters

This document contains the administrative and technical parameters necessary for coordination grants by MetroCor.

It will contain the necessary signature lines for:

- The preliminary coordination signature (by a MetroCor authorized representative),
- The operational notice signature (by the applicant), and
- The final verification signatures (by both the applicant and the President).

The coordination document will also include the parameters listed below, as well as any additional documentation as required for a specific system.

1. The desired band or frequency of the desired coordinated operation;
2. Mode/use;
3. The name, call sign, address and telephone of the Trustee and one additional contact;
4. Sponsoring organization and address;
5. The type of operation;
6. The longitude and latitude, and the address of the site;
7. The height above the ground and above sea level;
8. The planned power output and antenna system characteristics;
9. Intended coverage/service area;
10. The current operational status;
11. Access method PL, or DPL

An applicant's individual coordination documentation may have additional parameters, subject to the same administrative requirements as those listed above.

If use of CTCSS, (PL) DPL, Touch Tone, or any other means of effecting limited access is specified as a condition of assignment, assignments adjacent to the affected system shall consider the use of such equipment as being implemented and protection afforded as such.

Only those coordination grants confirmed on this document in writing shall be considered official and binding.

Upon final approval and receipt of document of coordination, the coordination will expire upon either the Trustee's expiration of the Trustee's Amateur Radio License, or upon revocation by the Federal Communications Commission.

There is a 6-month grace period for late renewal of expired coordinations.

A sample Coordination Document is included as an appendix to this document.

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Exceptions to Coordination Guidelines

Exceptions may be made to the MetroCor Guidelines as follows:

Notice of the proposed exception shall be made in writing, either by email, or US Postal Mail to any station deemed to be effected by the proposed exception. Should the recipient station feel that they could provide sound technical reasons to deny the proposed exception, they must do so, in writing within 20 days of the receipt of the mailing. All technical documentation and submissions are to be included in the reply to MetroCor. The Board of Directors and the Chief Coordinator in keeping with MetroCor's policy of effective spectrum usage shall review the response. Both stations shall be notified of MetroCor's decision.

1. The exception to the Guidelines will require the written approval of both the authorized MetroCor representative and the Executive Board.

Any exceptions to the guidelines made during the coordination process shall be taken into account when the coordination is presented for renewal.

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Changes to Coordination Parameters

MetroCor, prior to implementation, must approve any changes to coordination parameters. Any unauthorized change to the operating parameters as specified in the Coordination Document will cause the coordination grant, as previously issued by MetroCor, to be void. It is the responsibility of the Trustee or authorized representative of that coordination grant to inform MetroCor of the need to change any coordination parameter.

These changes include any change of transmitter location, antenna height, gain, or pattern, ERP or actual RF power output.

Any of these changes deemed to be significant by MetroCor will require the station trustee/owner to apply for a modified/new coordination within 60 days of such change. Failure to do so will result in the existing coordination being deemed void.

Should the Coordination Parameter change be of an exigent circumstance, MetroCor must be notified, in writing, within 20 days of such change.

If the change(s) is/are consistent with the guidelines, they will be noted by the authorized MetroCor representative and accepted without further processing.

If the requested change(s) do not meet MetroCor Guidelines or cannot be accommodated through the exemption process, the Trustee will be required to control the system in a manner consistent with the requirements of an uncoordinated system, as defined in the United States Code of Federal Regulations (U.S. C.F.R.) Title 47, Part 97.

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Modifications to Band Plans and Coordination

METROCOR may modify the coordination guidelines at will, and without prior notice, in order to properly consider changes in the technical and regulatory environments.

Such modifications may take advantage of current state of the art, i.e. – recognition of new technologies available for use for the Amateur Radio Service by changes in FCC Regulations.

Current MetroCor band plans may also be subject to modification due to Government mandated change in usable spectrum made available for the Amateur Radio Service. This may necessitate the modification of existing band plans and coordination.

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Expiration of Coordination

All coordination grants expire upon either:

> The expiration date of the Trustee's Amateur Radio License, after issuance of a coordination document, or
>
> Notification by the FCC to the Amateur Radio public of action taken by the FCC, resulting in the revocation of the Trustee's Amateur Radio License. MetroCor will deem such FCC action as automatic revocation of any and all coordination grants issued by MetroCor to the person and/or persons and/or club(s)/organization(s) who received such coordination grant(s).
>
> Coordination for systems existing when MetroCor approved the Coordination Guidelines shall also be subject to expiration. Said expiration will also be the expiration date of the Trustee's Amateur Radio License.

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Notification of Expiration

Those Amateur Radio Licensed Trustees possessing a coordination grant(s) must be notified of the impending expiration of said grant via regular mail, six (6) months prior to the expiration. A renewal notice will include a new coordination form, which is to be completed by the Trustee and returned by US Mail. If the Trustee or representative has not responded within 60 days prior to expiration, the package will be re-sent by certified US Mail return receipt requested to the Trustee or representative with a warning that loss of coordination grant would follow on a specific date. Such date will be determined from information derived from the FCC database showing expiration of the Trustee's license.

Coordination may be renewed if the current Coordination Guidelines so permit. In the event that the current Coordination Guidelines no longer permit such a coordination to be renewed, then the coordination may be provisionally renewed for a period not to exceed five years from the date of the change to the Coordination Guidelines, which invalidated the then current Coordination Guidelines. This ensures that a reasonable period of use has justified the time, labor, and expense associated with the deployment of a coordinated system.

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Revocation of Coordination/ Revocation Process

The revocation process has several distinct conditions:

1. Expiration of coordination due to changes in the Guidelines
2. For cause.
3. Cessation of Station Activity
4. Expiration of coordination due to changes in the Guidelines.

The first condition is implicit and does not require a formal process. It is the responsibility of the trustee to remain current with MetroCor guidelines. Therefore formal notification of revocation of coordination due to guideline changes is not required.

2. For cause.

Revocation of coordination for cause requires MetroCor to perform the following actions:

a. Notice of system activity not in compliance with the guidelines must be made in writing to the system trustee and/or secondary contact, via (US MAIL).
b. If after thirty (20) days from the date of the first mailing, if the system trustee and/or secondary contact has not responded, a second and final notice may be issued with a second (20) twenty day response period. This is to be made by certified US Mail, delivery receipt requested.
c. If, after the second (20) day period, the system operator has not brought the system into compliance, or received a written extension from the authorized MetroCor representative, the authorized MetroCor representative may, in writing, request approval of the Executive Board for revocation of MetroCor's coordination grant for that trustee.
d. Withdrawal of a coordination will require the system operator to remove the system from the air or resolve any received interference
e. complaints as required of uncoordinated systems in US CFR Title 47, Part 97.

3. Cessation of station activity

   If the existence of a working, coordination compliant, system cannot be confirmed, or, if the coordination holder cannot comply with the request of the frequency coordinator to demonstrate the operational status of such system within 3o days of a request to do so, or, If a working system is not on the air and the owner or trustee has not notified MetroCor, in writing, including requesting a construction extension, the channel assignment shall be deemed void and the coordination canceled without further notice.

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Changes to the Guidelines

The Coordination Guidelines may be changed in accordance to the MetroCor Constitution and By-laws.

If a proposal(s) for change(s) to the Guidelines is to be presented for adoption by vote of the Membership, notification of said proposal(s) must be issued in accordance to the MetroCor Constitution and By-laws.

If so adopted, the effective date of the change(s) will be immediate except in cases where MetroCor so directs.

Should any part of these guidelines be adjudged in a court of applicable jurisdiction, as unenforceable or not in concurrence with Federal Communications Rules and Regulations, only that part shall be struck. All other parts contained herein shall remain in full force and effect.

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Concurrence with Guidelines

All those amateur radio licensees granted new or renewal coordination will sign the coordination document (s) for their system (s), which will include a statement that they have read, and agree to abide by, the current

Coordination Guidelines, under the terms their coordination has been issued by MetroCor, Inc.

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