

# **GUIDELINES REGARDING ANALOG FM REPEATER COORDINATION for WNYSORC**

Updated May 2004

## **0. MEMBERSHIP IN WNYSORC IS NOT A REQUISITE FOR COORDINATION.**

### **1. REPEATER COORDINATION PROCESS**

#### **1.1 DEFINITION OF REPEATER COORDINATION**

Repeater coordination is the process of arranging in due and relative order repeaters on frequencies in a manner in which interference between repeater operations is minimized and spectral reuse is maximized; further, it is recognition of an amateur radio operator's use of said frequencies by this repeater Council and adjacent repeater Councils within whose area recognition of the repeater's existence is required in order to make further frequency assignment recommendations. As repeater coordination is a voluntary process, coordinated repeaters *may* not necessarily have any precedence over repeaters which are not coordinated. IC/FCC usually side with the coordinated repeater in any dispute.

#### **1.2 REQUEST FOR A FREQUENCY ASSIGNMENT**

In order to provide equal and fair consideration for each frequency assignment, the Council requests that each prospective licensee owner/trustee submit a written request for frequency assignment. The WNYSORC will provide each applicant with a coordination form which when filled out, contains the information necessary for proper assignment coordination. Upon receipt of the completed coordination form, if a specific frequency has not been requested, the Frequency Coordinator will attempt to identify a frequency assignment that may be usable by the applicant. When a specific frequency is requested, an analysis is made to determine if the frequency might be usable with the conditions indicated in the application.

Once a frequency has been identified which might support the planned operation, the applicant is informed of the suggested frequency assignment and recommended to carry out the 30 Day Test procedure to ensure the frequency is usable. Adjacent repeater Council frequency coordinators are notified of the proposed Installation. Within the WNYSORC region, co-channel and adjacent channel users of record are notified by mail of the proposed installation. All are given 45 days from the date appearing on the coordination notice to respond to the proposal. If an objection to the proposal is made within the prescribed period and the objection can be substantiated, the applicant must either reconsider the planned coverage characteristics or apply for another frequency.

#### **1.3 ACTIVATION OF A REPEATER**

Upon notification of a frequency assignment, it is expected that the applicant will expeditiously carry out the 30 Day Test procedure (refer to Section 3) to confirm the viability of the assignment. Alternatively, but not recommended, the frequency assignment applicant may immediately activate the repeater as described In the application. The 30 Day Test procedure is suggested since it is sufficiently rigorous to reveal any problem which might not be immediately observed during the proposed

operation. In most cases, in the event that the frequency is not usable, it would also be less costly to perform the 30 Day Test procedure first.

For viable frequency assignments, it is expected that the proposed repeater will be fully operational within 6 months of assignment. A 6 month extension may be granted if extenuating circumstances prevent earlier activation of the operation.

During the initial 6-month period, the assignment will be taken into consideration when reviewing other applications. A Query Notice will be issued to holders of assignments which are not fully operational 6 months after the assignment date. Every effort will be made to accommodate the assignment holder; however, it would be contrary to the purpose of this Council to recognize and promote frequency assignments, which are inactive. Unless the applicant can provide a valid reason, assignments which have not achieved fully operational state 12 months after assignment will be rescinded.

#### **1.4 RECOGNITION OF ASSIGNMENT COORDINATION**

The repeater frequency assignment is considered coordinated if no objections to the proposed coordination are received during the notification period; and, if the 30 Day Test procedure demonstrates the viability of the assignment, or no interference problems occur during the first 6 months of activity.

The repeater will continue to be recognized as coordinated as long as it is operational with the specifications stipulated on the coordination form which is maintained in the WNYSORC files, and the owner/trustee supplies this Council with status reports annually and the repeater is operated within the bounds of the station license.

### **2 REPEATER SPECIFICATIONS**

#### **2.1 PURPOSE OF REPEATER**

Unless specified otherwise, coordinations are based on the premise that the purpose of the repeater is to enhance mobile communications.

#### **2.2 STATION DEFINITION**

##### **2.2.1 MOBILE STATION**

For repeater coordination purposes the following is used as a benchmark: The receiver has typical amateur-grade sensitivity, selectivity and intermodulation susceptibility. The antenna is a roof mounted vertically polarized quarter wavelength monopole antenna with an effective height above ground of 1.5m. On transmit, the standard mobile produces a signal with an Effective Radiated Power Of 25 watts and an RF bandwidth which does not exceed 16 kHz.

##### **2.2.2 REPEATER STATION**

The repeater receiver has typical amateur-grade sensitivity, selectivity and intermodulation susceptibility. The transmitter does not produce a signal with an RF bandwidth that exceeds 16 kHz. Harmonic, sub harmonic and spurious emissions, are suppressed to at least the requirement of the licensing authority. All other parameters

are defined in the repeater's coordination form. The station is assembled following proper engineering practice.

### **2.3 COVERAGE AREA**

The actual coverage area of a repeater depends on the repeater transmitters effective radiated power, antenna height above ground, terrain, weather conditions, as well as the mobile station configuration. For coordination purposes, the coverage area is defined as the area contained within the 25 dBuV/m field strength contour for VHF bands (30 - 300 MHz), and the area contained within the 35 dBuV/m field strength contour for UHF bands (300 - 3000 MHz). [TBC]

### **2.4 CO-CHANNEL INTERFERENCE**

Within the coverage area of the repeater, a standard mobile should not receive co-channel repeater transmitters at a level greater than 25 dB below the signal level of the local repeater transmitter. [TBC]

### **2.5 ADJACENT CHANNEL INTERFERENCE**

To protect the standard mobile station from harmful levels of adjacent channel interference, the adjacent channel repeater transmitter should not produce a field strength that exceeds the desired signal by more than 15 dB within the co-channel coverage area. [TBC]

### **2.6 SPATIAL SEPARATION OF REPEATERS**

**2.6.1** Maximizing spatial separation between co-channel and adjacent channel repeaters is the simplest approach for minimizing interference.

**2.6.2** Generally, a site-to-site separation of **160 km (100 miles)** between co-channel repeater transmitter sites and a **56 km (35 miles)** site-to-site separation between adjacent channel assignments will be used. For repeaters with open water (the Great Lakes) consideration of **200km (125 miles)** will have to be taken on an individual basis for each request.

**2.6.3** However, actual spatial separation will be determined on a case-by-case basis using, but not limited to the following criteria: coverage area of the repeaters; topographic features between the sites which can affect propagation; and, user-base characteristics,

### **2.7 ELECTROMAGNETIC COMPATIBILITY**

The licensee of a new frequency assignment will ensure that the planned repeater can be operated in the existing radio environment without causing interference either directly or indirectly to existing services. In making frequency recommendations, this Council will take into account existing radio operations either co-sited or within close proximity of the proposed repeater site, provided a frequency list is supplied with the application. However, it should be noted that there is no guarantee that without on-air testing a frequency will be usable, especially in a dense RF environment.

### **3 - THE 30 DAY TEST**

**3.1** It is highly recommended that the applicant carry out a series of tests to verify that the suggested frequency assignment is not currently in use, and that the proposed installation will not create interference, as defined by Council guidelines, to any existing co-channel or adjacent channel activities. The following tests should be conducted:

**3.1.1** A series of reception tests from a typical user configuration on the proposed repeater transmit frequency from various locations within the proposed coverage area to determine if co-channel or adjacent channel repeaters can be detected and might possibly cause significant interference to reception within the planned coverage area.

**3.1.2** Long duration (i.e., continuous or as close to continuous as possible) reception test on the proposed repeater receive frequency using the proposed site, antenna, and antenna height to determine if co-channel repeater users will access the proposed repeater.

**3.1.3** Long duration transmissions on the proposed repeater transmit frequency from the proposed site, using the planned antenna height and radiated power level. A 1000 Hz test tone should be modulated during the transmissions, Station identification should be done at shorter intervals than the minimum requirements of either the Federal Communications Commission (FCC) or the Industry Canada (IC) depending on the country of origin.

**3.1.4** A series of long duration transmissions, from a typical user configuration on the proposed repeater receive frequency from various locations within the proposed coverage area. Once again, identification as often as possible is requested.

**3.2** The actual test sequence is left to the applicant. However, equal time should be allocated to each test.

**3.3** During the test period, the applicant should collaborate with co-channel and adjacent channel repeater operators so as to establish quantitative test results.

**3.4** A record of weather conditions during the test period may be of assistance in determining the existence of enhanced propagation conditions.

**3.5** A summary of the test results should be submitted within 15 days of the end of the 30 Day Test Period to the Frequency Coordinator as proof that the frequency assignment is viable.

### **4 EXPIRATION OF COORDINATED ASSIGNMENTS**

**4.1** Although it is the right of any amateur radio operator holding an advanced license or privileges, to operate an automatic repeater station, the recognition of a repeater station's ongoing use of a frequency or frequencies in an area is by the spirit of cooperation only. The WNYSORC promotes the effective reuse of repeater frequencies. To maintain fair access to the spectrum, this repeater Council Issues an Annual Activity Report form with the March Notice of April Meeting to each frequency assignment holder of record. The form is to be completed and returned to the Frequency Coordinator by March 31. The form provides room for a brief summary of the operational status of the

repeater during the 12-month period ending December 31. The purpose of the form is to permit this Council to access the status of each frequency assignment. A repeater is defined to be continuously active if it has not been out-of-service for more than a total of 30 days during the 12-month period.

**4.2** This repeater Council believes it is fair and reasonable to request an annual status report from each frequency assignment holder so that it can maintain an accurate database of activity, which is the basis for informing applicants of the availability of a frequency or frequencies which may support a repeater operation in an area. We also ask that they include the annual dues to be determined by the group annually. We ask for ten dollars presently to defer our costs.

**4.3** A Query Notice will be sent to any frequency assignment holder of record who has not responded by March 31. Failure to respond to the Query Notice within 30 days will result in a further notice informing the assignment holder that the repeater Council will delete the assignment from its database if the assignment holder does not respond within the next 90 days following.

**4.4** Once a frequency assignment is deleted from the database, no further recognition or promotion of the assignment holder's use of the frequency or frequencies is made by this Repeater Council.

**4.5** In the odd event that a repeater licensee continues to operate a repeater on the frequency or frequencies, or for that matter, if a repeater licensee exercises the liberties of their license and circumvents the spirit of cooperation, frequency assignment applicants are reminded that their activities are bound by the rules governing their station licenses.

## **5 REASSIGNMENT OF FREQUENCIES**

**5.1** When a frequency assignment is deleted from the Council's database, an opportunity to reassign the frequency to another applicant for use within the same area is created. The following conditions apply.

**5.1.1** An application to use the frequency must be submitted following Section 1, Repeater Coordination Process.

**5.1.3** The coverage area of the now repeater must not exceed the coverage area of the repeater which was removed from the database.

**5.1.4** On assessment of the operating specifications of the proposed repeater, the Frequency Coordinator may waive the recommendation to carry out the 30 day Test procedure.

**5.2** If no application to use the frequency 'as stipulated in Section 5.1 is received within one year of the previous assignments deletion from the database, the frequency will be returned to the pool of available frequencies and assigned when appropriate.

**5.3** Transfer of a frequency assignment from one Individual to another is permitted provided the following conditions are met:

**5.3.1** The individuals are in mutual agreement with the transfer; and

**5.3.2** The Council is informed of the transfer in writing by both parties involved; and

**5.3.3** The new repeater operates with the operational specifications stipulated on the coordination form in WNYSORC files.

## **6 SHARED SPECTRUM**

**6.1** When operating in any band, but in particular a band shared with other services, interference regulations as stipulated by the FCC or IC must be adhered to and may supersede coordinations made by this Council.

## **7 CLUB SPONSORED REPEATERS**

**7.1** It is strongly recommended that any organization which sponsors a repeater, but is not the licensee of the repeater station, should have a formal agreement with the repeater station's licensee (trustee) which (1) clearly states who the recognized frequency assignment holder is; and (2) clearly defines the degree of freedom the repeater station licensee has with respect to the organization sponsored repeater; and (3) identifies the person with whom this Council will correspond.

## **8 VOLUNTARY COMPLIANCE**

**8.1** The philosophy governing this Repeater Council is one of facilitating coordination. WNYSORC promotes spectrum management and the efficient use of spectrum by fostering user-to-user dialogue, providing accurate record keeping and insuring prompt dissemination of information. BUT without the cooperation of all concerned effective coordination becomes merely a vision.

**8.2** This Council cannot enforce coordination, nor does it act as a police force, Policing is left for the IC/FCC if and only if all other means of settling disputes fail, This Repeater Council will act as a neutral mediator to try to resolve inevitable problems and disputes that arise.

**8.3** All owner/trustees have the same non-exclusive access rights to the radio spectrum. WNYSORC endeavors to establish guidelines which promote fair and equal access to this radio spectrum. These guidelines are not etched in stone. As new technology is developed, new ideas realized, and greater understanding of the radio art is achieved, new guidelines can be established to further increase the efficient use of the radio spectrum.

## NOTES

dBuV/m decibels referred to 1 microvolt per meter as 0 dB

TBC - To Be Confirmed