



# SouthEastern Repeater Association, Inc.

To: All applicants for frequency coordination

Enclosed is your Frequency Coordination Package, which contains:

- (1) Coordination Policies and Guidelines of SERA, January 1987, Revised January 2001
- (2) Application for Repeater Frequency, SERA Form 03, Redesigned June 2, 2001
- (3) SERA VHF/UHF Frequency Utilization Plan, Revised January 2001

Please take the time to read the Coordination Policies and Guidelines as well as FCC Part 97. You must have read both of these and understand them prior to signing the certification on the application form. Part 97 is available at several sites on the Internet, as well as from ARRL and other sources.

If your proposed repeater will be located in an area served by a large number of other repeaters or will be a wide area repeater, you should expect a delay in coordination. Please be patient, as your frequency coordinator will have to contact a number of people that may be affected by your repeater.

Thank you for working with us. Your frequency coordinator will start the process of coordination as soon as your completed application is received.

Regards,

Donald L. Williams, Jr., W4VT  
President

Your frequency coordinator's name can be found in the current issue of the Repeater Journal, published quarterly by the SouthEastern Repeater Association.

You can also find it listed on the SERA Web Site by accessing [www.sera.org](http://www.sera.org) and clicking on the button at the top of the page entitled, "SERA Districts."

This document and its accompanying forms can all be found under "Downloadable Forms" on the "Coordination" page.

**COORDINATION CAN TAKE MORE THAN  
THIRTY DAYS. WE STRONGLY  
RECOMMEND THAT YOU DO NOT BUY  
EQUIPMENT, PARTICULARLY ON TWO  
METERS, UNTIL RECEIPT OF  
COORDINATION APPROVAL.**

## COORDINATION POLICY AND GUIDELINES of the SouthEastern Repeater Association, Inc.

*Representing Coordination and VHF/UHF interests throughout Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia.*

Revised and Adopted January, 1987. **Latest Revision January 2001.**

A guide for our Frequency Coordinators and for the prospective repeater owner and/or trustee explaining rules on how to achieve coordinated status and governing their duties for operating and maintaining repeaters in the VHF, UHF, and microwave amateur frequency spectrum as set forth according to the Federal Communications Commission (FCC), and by the SouthEastern Repeater Association, Inc. (SERA) which is the recognized coordinating body of the member states in the southeastern United States.

### INTRODUCTION

The SERA Coordination Policy and Guidelines were rewritten at the request of the Board of Directors and approved at the annual meeting in January, 1987, with updates approved at the January and July, 1995, board meetings. The rewrite was required to update the old coordination policy and to coincide with new FCC Rules and Regulations concerning repeater councils, repeater owners, trustees, and users, and the coordination of repeater, link, and control frequencies in general. The rewrite committee sought to cover every area involving repeater coordination. The rewrite was based on FCC information and rules governing the operation of repeater councils across the nation. The policy is written in such a way as to explain in detail what is required by FCC Rules and Regulations and recommendations for coordination procedure when placing a repeater on the air. Interference and arbitration is defined so that repeater owners, trustees, and users will know how the SERA will stand on each issue.

This document covers in detail the recommended allocations to various modes of operation in the Amateur Radio Service on VHF, UHF, and microwave bands. The SERA Frequency Utilization Plan carefully spells out where operators may operate using various modes and, at the same time; comply with FCC Rules and Regulations and SERA Policy and Guidelines. The committee also made every effort to allocate frequencies for operational capabilities in every amateur radio mode. By drafting this comprehensive document, addressing every possible aspect of coordinating VHF, UHF, and microwave frequencies, the SERA feels that the best interest of all amateurs will be served for years to come.

As the amateur frequency spectrum becomes more crowded, the future adherence to these guidelines will foster pleasing operation on VHF, UHF, and microwave amateur bands in our service area, as well as good relationships among repeater owners, trustees, and users throughout the SERA districts. Although coordination is strictly voluntary and even though FCC Rules and Regulations do not require coordination, in all cases of conflict an uncoordinated repeater bears the primary responsibility of resolving any problems. The SERA Coordination Policy and Guidelines are written for those who wish to coordinate, giving a clear definition of what is required of the repeater owner and/or trustee in order to acquire coordinated status. Since 1971, voluntary compliance by repeater owners and/or trustees and users is what has, and will; continue to make our coordinating system work.

### POLICY 1 - GENERAL INTRODUCTION

Originally formed in 1971 as the North Carolina FM Repeater Association, in 1973, becoming the Carolinas-Virginia Repeater Association, Inc., and in 1981, CVRA-SouthEastern Repeater Association, Inc. (CVRA-SERA) and in 1987, SouthEastern Repeater Association, Inc. (SERA), the Association is the recognized amateur frequency coordinating body for the following geographical areas, herein called

#### DISTRICTS:

- A. the entire state of NORTH CAROLINA,
- B. the state of VIRGINIA, south of a line formed by the 38 degree parallel of latitude extending from the Atlantic Ocean, west to U.S. Route 33, then following U.S. Route 33 to the West Virginia State line,
- C. the entire state of SOUTH CAROLINA,
- D. the entire state of TENNESSEE,

- E. the state of WEST VIRGINIA, except an easternmost area referred to as the "panhandle", which is made up of the counties of: Berkeley, Hampshire, Hardy, Jefferson, and Morgan,
- F. the entire state of KENTUCKY,
- G. the entire state of GEORGIA, and
- F. the entire state of MISSISSIPPI.

### POLICY 2 - FIXED COORDINATION

SERA coordinates only the types of fixed amateur transmitting facilities in those amateur frequency segments as authorized by the FCC:

- A. Repeaters
- B. Link/Control
- C. Auxiliary Stations

A digipeater is usually a simplex operating system. Duplex digital systems which utilize FM repeater input and output pairs are classified as repeaters, operating digital, and shall be coordinated by the SERA, as would any other FM repeater pair.

The SERA recognizes organized statewide digital communications organizations. Further, the SERA recommends allocation of frequencies for digital (packet) radio use. Finally, the SERA delegates the recognized digital groups the task of assigning digital systems and operation within the allocated frequencies. In order to become a "delegated digital organization" as recognized by the SERA, the organization must contact the Director of that SERA District by letter and fulfill the current requirements.

### POLICY 3 - SIMPLEX FREQUENCIES

The SERA will designate FM simplex frequencies, which will be listed in the SERA Frequency Utilization Plan. These simplex frequencies shall not be used for digipeaters, although simplex digital (keyboard to keyboard) operation is permitted as is CW, RTTY, and other FM simplex operation.

The SERA coordinates repeater, link, and control frequencies with maximum frequency utilization of designated amateur bands. Voluntary compliance with our policy has proven successful in each of our districts.

#### *Recommended Repeater Frequency Utilization:*

- A. 28 MHz: ten meter pairs are issued with low in, high out, with a 100 KHz offset. Channel spacing is 20 KHz.
- B. 50 MHz: six meter pairs are issued low in, high out, and a 1 MHz offset. Channel spacing is 20 KHz.
- C. 144-148 MHz: most two meter pairs are issued with a plus (+)600 KHz offset and 15 KHz channel spacing above 147 MHz; minus (-)600 KHz offset and 15 KHz channel spacing between 146 and 147 MHz; and minus (-)600 KHz offset and 20 KHz channel spacing below 146 MHz.
- D. 222 MHz: all 222 MHz pairs are issued with a minus (-)1.6 MHz offset and 20 KHz channel spacing.
- E. 440 MHz: all 440 MHz pairs are issued with a plus (+)5 MHz offset, high input, low output, and 25 KHz channel spacing.

- F. 902 MHz: all 902 MHz pairs are issued with a minus (-)12 MHz offset, low input, high output, and 100 KHz channel spacing. This will be changed to 50 KHz and then 25 KHz channel spacing when limitations require.
- G. 1240 MHz: all 1.2 GHz pairs are issued with a minus (-)20 MHz offset, low input, high output, and 100 KHz channel spacing.

#### **POLICY 4 - FREQUENCY COORDINATORS**

SERA Frequency Coordinators are the Directors, Vice Directors, and their Assistants in each district. Their job is to make maximum use of frequencies available for amateur use by using the SERA Coordination Policy and Guidelines and through mutual cooperation of repeater trustees. The SERA offers coordination to benefit both repeater trustees and users.

#### **POLICY 5 - REPEATER COORDINATION PARAMETERS**

Under normal circumstances, the SERA normally maintains the following recommended repeater distance spacing:

- A. Co-channel distances:
1. 28 and 50 MHz repeaters: 100 miles. It should be noted that repeaters on these bands may require special consideration when determining mileage for co-channel spacing. Coordination for repeaters on these bands will be considered on a case by case basis. Additionally, coordination may require contact with many neighboring states that may, or may not, be an SERA District.
  2. 144-148, & 222, repeaters: 100 miles.
  3. 440, 902, 1240 MHz, and above, repeaters: 75 miles.
- B. Adjacent channel distances:
1. 28, 50, & 222 MHz repeaters: 25 miles at 20 KHz spacing.
  2. 144-148 MHz repeaters:
    - a. 144-145 MHz: 25 miles at 20 KHz spacing.
    - b. 146-148 MHz: 50 miles at 15 KHz spacing.
  3. 440 MHz repeaters: 25 miles at 25 KHz spacing.
  4. 902, 1240 MHz, and above, repeaters: 25 miles at 100 KHz spacing.

#### **POLICY 6 - REPEATER DISTANCE VARIANCE**

Channel spacing distances referred to in Policy 5 may be adjusted as necessary by the Frequency Coordinator. Repeater locations that are unusually higher than the surrounding average terrain (i.e. mountain peaks or a multiple floor building in a metropolitan area) may require spacing distance in excess of Policy 5 guidelines. Repeater locations where terrain and low ERP are a factor may allow for less distance. Decisions concerning distances are based on various technical parameters of the proposed repeater. Those decisions are made at the discretion of the Frequency Coordinator.

#### **POLICY 7 - REPEATER POWER LIMITATIONS**

Although the FCC has eliminated specific power limits for repeaters according to height above average terrain (HAAT) as contained in the former Section 97.67(c), the SERA will continue to observe this policy. Any decision to grant a variance from the power to HAAT ratio will be left to the Frequency Coordinators. Frequency Coordinators also have the authority to impose power limitations of a repeater which may be based in whole or in part on calculated effective radiated power (ERP), height above average

terrain (HAAT), antenna system design, and separation from co-channel and adjacent repeaters.

- A. For 28 MHz through 225 MHz:
1. up to 100 feet HAAT - 800w ERP
  2. 100-500 feet HAAT - 400w ERP
  3. 500-1000 feet HAAT - 200w ERP
  4. 1000 feet and above - 100w ERP
- B. For 430 MHz and above, under normal circumstances:
1. up to 1000 feet HAAT - 800w ERP
  2. 1000 feet and above - 400w ERP
- C. As a rule, the SERA does not honor requests for repeater pairs that are contrary to our recommended plan, which has been designed for maximum utilization of frequencies in our areas.

#### **POLICY 8 - TRUSTEE & HOLDER OF RECORD**

The trustee is the holder of record of a coordination, except in the case of a club sponsored repeater for which the club is the holder of record and the appointed trustee will act on behalf of the sponsor.

All requests for coordination, or for changes in listing, callsign, sponsorship, or trustee information for a repeater or its associated link(s) shall be submitted in writing on the appropriate SERA form over the signature of the owner/trustee, except for club repeaters, which will be over the signature of the trustee and the club president. Club sponsors may make a trustee change, provided the request is signed by the new trustee and club president.

If a repeater that is originally coordinated to an individual later becomes sponsored by a club, the individual still remains the holder of record, unless the coordination is transferred similar to the steps as outlined in Policy 11.

- A. If the coordination is transferred the club becomes the "primary" sponsor.
- B. If the owner/trustee retains the coordination in his name, the club may provide "secondary" sponsorship.

Frequency Coordination requests will be made on an official "Application for Frequency Coordination" form. The applicant shall provide all requested information and submit the application to the appropriate district Frequency Coordinator for his final approval.

#### **POLICY 9 - HEIGHT, POWER, FREQUENCY, OR LOCATION CHANGES**

Coordination is based on information provided by the applicant and contained on the "Application for Frequency Coordination" form. If a repeater trustee significantly changes the location, antenna height or pattern, effective radiated power, frequency, or other operating parameters of his system, the repeater will be required to be re-coordinated. The SERA Frequency Coordinator shall be notified in writing on the appropriate form. Re-coordination is required to verify that interference to or from other repeaters does not occur. Re-coordination is not to allow another repeater or proposed repeater to be assigned to the frequency.

Note: Significantly shall be a power change of 1 dB, an antenna height change of more than fifteen feet, or a horizontal move of more than 1,500 feet. For the 1 dB power change, the SERA uses a factor of .75 or 1.25 of the original power. For example a 100 watt ERP station multiplied by .75 would be 75 watts, or multiplied by 1.25 would be 125 watts.

#### **POLICY 10 - DIRECTIONAL & NON-DIRECTIONAL**

In all cases, a coordinated repeater using a non-directional antenna and changing to a directional antenna or using a directional antenna and changing to a non-directional antenna will require re-coordination. Any subsequent approval will transfer the repeater to the status of a newly coordinated repeater as defined in Policy 12.

**POLICY 11 - REPEATER PAIRS RELINQUISHED**

Normally, repeater frequency coordinations are not transferable. When the current trustee of record relinquishes his coordination in writing, the frequencies revert back to the SERA frequency pool. If a trustee sells his repeater system to another person, the same frequency pair may be re-coordinated to the new owner; provided, the coordination request meets the SERA Coordination Policy and Guidelines, the proposed new trustee makes an application to his respective Frequency Coordinator within thirty days of the sale, and the current trustee of record has relinquished that frequency pair. If the new owner does not make an application within thirty days, the frequencies shall revert back to the SERA frequency pool.

**POLICY 12 - REPEATER RE-COORDINATION**

Re-coordination transfers a repeater to newly coordinated, with regard to "first on channel" status.

**POLICY 13 - TRUSTEE RESPONSIBILITY**

A trustee of a coordinated repeater shall notify their SERA Frequency Coordinator and the SERA Computer Records Manager, in writing, within ten days of any change in their mailing address. Trustees shall notify their Frequency Coordinator in writing, within ten days of the date the repeater ceases operation. If a repeater permanently ceases operation or is sold for relocation, the trustee shall notify their Frequency Coordinator in writing, within ten days of the event. Such cessation letter will be construed to mean the trustee is relinquishing the assigned frequency pair. Failure to return the annual SERA Datasheet may also be construed as notification that the repeater has ceased operation and the frequencies are available for re-assignment.

**POLICY 14 - COORDINATION SPECIFICS**

In terms of coordination, the SERA has established policies dealing with priorities for repeater frequency requests.

- A. The SERA recognizes two fundamental motivations for the establishment of an amateur repeater:
1. As a service to other amateurs living or traveling in the service area, and
  2. As an exercise in individual achievement on the part of the owner(s) or trustee(s).

Both of these motivations are equally valid and in the traditional spirit of amateur radio. However, in cases where these two rationales are in conflict, service must prevail over individual achievement. For example: The desire of an operator to set up a new repeater, largely for reasons of self achievement, in an area already well served by existing repeaters, must be accommodated in a way that does not detract from the existing area serviced, in terms of co-channel or adjacent channel interference.

Most large cities already have enough two meter repeaters for both emergency and routine communication. Therefore, small towns and rural areas that are removed from those cities may take priority in the allocation of available frequency pairs. Those less populated areas may not be able to utilize other bands as easily as more populated areas because of the limited number of amateurs available to support the use of alternate bands.

- B. The owner and/or trustee of the proposed repeater shall actively participate with the Frequency Coordinator in the survey of available frequencies and the coverage area of existing systems. Further, the owner and/or trustee will bear the primary responsibility for any testing or monitoring period that might be required by the Frequency Coordinator. The Frequency Coordinator may also require the logging of signals heard, at the proposed coordination site, from co-channel and/or adjacent users. Although the final decision will be at the discretion of the Frequency Coordinator, during any arbitration

that may take place; the burden of proof of an alleged clear frequency will rest with the proposed repeater owner and/or trustee.

- C. Repeater frequency assignments shall be made with more consideration given to the transmissions of fixed and mobile stations than the output signal of the repeater. The majority of repeater coordination problems arise from fixed and mobile stations inadvertently accessing co-channel and adjacent channel repeaters in addition to the one intended.
- D. Just as with AM & FM commercial broadcast allocations, "first on frequency" is the accepted principle. Existing coordinated repeaters have first right to continued use of their frequencies and reasonable service areas. The effective use of an existing repeater should not be appreciably diminished by a new repeater.

These rights have great weight, but are not absolute. *For example:* An established wide area repeater should tolerate minor loss of fringe coverage and the occasional inadvertent access, to allow a new repeater to provide needed service in a location distant from the first. Further, "first on frequency" carries no special right to make a technical parameter change without re-coordination of the frequency assignment, as stated in Policy 9.

- E. Requests for closed repeaters will be discouraged. The rationale for our position is simple. Frequency pairs are a limited and valuable resource and they should be made available to all amateurs.
- F. Repeater linking via remotely controlled transmitters and/or receivers, utilizing and allocated SERA repeater input and/or output frequency, has the potential to cause harmful interference to coordinated repeater operations and is therefore highly discouraged.
- G. Eight numbered CTCSS frequency pools, containing five standard tone frequencies, have been recommended for use on 28, 50, 144-148, & 222 MHz in specific geographical areas. CTCSS tones will be assigned, and their use will be required, on 440, 902, 1240 MHz, and above. Of these designated pools, two have been reserved for common or alternate use. Further, two discrete tone frequencies have been reserved for common use.

POOL #1: TN-E, NC-E	67.0 (XZ), 88.5 (YB), 118.8 (2B), 156.7 (5A), 206.5 (8Z)
POOL #2: WV, TN-M, SC	69.3 (WZ), 91.5 (ZZ), 123.0 (3Z), 162.2 (5B), 210.7 (M2)
POOL #3: NC-W	71.9 (XA), 94.8 (ZA), 127.3 (3A), 167.9 (6Z), 218.1 (M3)
POOL #4: GA-S, TN-W, VA-E	74.4 (WA), 97.4 (ZB), 131.8 (3B), 173.8 (6A), 225.7 (M4)
POOL #5: MS-S, KY-W, VA-W	77.0 (XB), 103.5 (1A), 136.5 (4Z), 179.9 (6B), 229.1 (9Z)
POOL #6: KY-E, GA-N, MS-N	79.9 (WB), 107.2 (1B), 141.3 (4A), 186.2 (7Z), 233.6 (M5)
POOL #7: Common Pool 1	82.5 (YZ), 110.9 (2Z), 146.2 (4B), 192.8 (7A), 241.8 (M6)
POOL #8: Common Pool 2	85.4 (YA), 114.8 (2A), 151.4 (5Z), 203.5 (M1), 250.3 (M7)
Common Tone 1	100.0 (1Z)
Common Tone 2	254.1 (OZ)

**POLICY 15 - GOOD REPEATER OPERATING PRACTICES**

Good operating practices are needed by repeater owners and/or trustees and users alike to achieve the standards that are expected in the amateur

radio service. Although coordination councils lack the actual "police power" to regulate amateur frequencies, mutual cooperation between the coordination council, owners and/or trustees, and users is required to make frequency coordination work. Our coordination policy is an outline, which, if followed on a voluntary basis by all, will allow the coordination plan to work, thereby providing a better operating climate for all within amateur radio.

Further, the SERA advocates:

- A. Repeater owners and/or trustees and users are expected to maintain good engineering and operating practices, as well as common amateur courtesy. Good amateur practice promotes harmony and prevents unwanted interference to, and from, other systems.
- B. Repeater users should use only the necessary amount of power to operate into repeaters. This prevents unwanted activation of other repeaters on the same frequency, and at times, on nearby adjacent channel repeaters.
- C. Repeater users should see that their equipment operates on the proper frequency and their deviation should not exceed 5 KHz peaks. Digital operation may require a lower deviation setting to prevent over-deviation into a digital system.
- D. When the repeater's effective radiated power exceeds its receive capability, operators tend to use excessive transceiver power in order to access a repeater. This creates an atmosphere of potential interference to other co-channel and adjacent channel repeaters. Therefore, it is strongly suggested that repeater ERP should always equal the receive capability.
- E. Repeater owners and/or trustees are encouraged to use state of the art equipment with sufficient filtering on input and output, as well as maintaining proper calibrations, to prevent adjacent channel interference.

### **POLICY 16 - REQUESTS FOR COORDINATION**

Although voluntary from the beginning of repeater operation, frequency coordination has played a large part in maintaining order in the operation of repeaters. The SERA strongly recommends to all amateurs that wish to construct and operate a repeater to seek coordination and cooperate fully with their coordination council.

- A. Any verbal discussion concerning coordination with the Frequency Coordinator is welcomed. No official action will be taken until a complete written application is received providing all of the required information.
- B. Any licensed amateur that wants to construct and operate a repeater shall contact the SERA Frequency Coordinator for their area and request an official "Application for Frequency Coordination" form. Upon receipt of the form, the applicant shall provide all requested information. Incomplete forms cannot be processed and will delay the application.
- C. The SERA shall be provided all control or link frequencies used in a repeater system. This information will be used to help prevent interference from other repeater systems, which might use control or link frequencies. Link and control frequencies are also required to be coordinated. All control or link frequencies must comply with the current SERA band plan. This information will be held as confidential and not be published or made available to anyone, other than frequency coordinators through the regular course of their duties.
- D. New SERA frequency coordinations are issued to the trustee named on the application and are valid for six months from the date of issue. The repeater should be operational within this time period. If unavoidable circumstances prevent the new repeater from being placed on the air, a one time six month construction extension may be issued by the Frequency Coordinator. Requests are to be made on SERA Form 09, or in the absence thereof by letter, and directed to the Frequency Coordinator. The extension request shall state the

problems and/or reasons that prevented the repeater from being operational.

- E. The trustee of a new repeater shall notify the Frequency Coordinator by using SERA Form 09, or in the absence thereof by letter, when his repeater is on the air in a permanent condition and operating within the specifications of the original coordination request.
- F. Although the FCC no longer requires submission of repeater system diagrams, other pertinent data, and logging of repeater operation, repeater trustees are still responsible for maintaining the complete history and system description in written form. Further, it is strongly recommended that each repeater trustee maintain a copy of the current SERA Coordination Policy and Guidelines.

### **POLICY 17 - REPEATER DE-COORDINATION**

To preserve integrity in coordination and to maintain accurate records, the SERA maintains certain rules that shall be followed by repeater owners. If these requirements are not followed de-coordination of the frequency assignment will follow.

- A. Each SERA Frequency Coordinator has the right to revoke a coordinated frequency under the following circumstances:
  - 1. If the FCC orders the system to permanently cease operation,
  - 2. If within six months of coordination, or a one time re-confirmation of a frequency pair, the existence of a working system cannot be confirmed; or if the holder cannot comply with the request of the Frequency Coordinator to demonstrate the operation of such system within thirty days of the request; or if there is not a working system on the air and the trustee has not filed a written request or a Form 09 requesting a construction extension,
  - 3. When a determination has been made, by means of research (to be documented by the Frequency Coordinator) that a frequency pair has not been in use for sixty days, the Frequency Coordinator will send an inquiry by certified mail, return receipt requested, to the trustee of record. Should no response be received within thirty days from the date of receipt of this letter, or if the letter be returned as not delivered the coordination of the frequency pair will be rescinded. If the trustee responds within thirty days requesting that the coordination be maintained, at the discretion of the Frequency Coordinator, any further action may be stayed for up to ninety days,
  - 4. If, in the course of research, a frequency allocation is determined to be vacant and the trustee of record cannot be located by certified mail, return receipt requested, or
  - 5. If the trustee of the system consistently violates good engineering or amateur practices by:
    - a. operating his system with excessive deviation, spurious emissions, or off frequency as to cause harmful interference to adjacent channel users, or
    - b. having been found to be responsible for interference to another system, refuses to cooperate with the other trustee(s) involved and/or the Frequency Coordinator,
    - c. or, operates remotely controlled transmitters and/or receivers for the purpose of repeater linking, which utilize any allocated SERA repeater input and/or output frequency, which cause harmful interference to coordinated repeater operations.
- B. If arbitration proves that the public interest will be better served by a de-coordination act, or that spectrum utilization will be enhanced by the coordination and subsequent re-assignment of that frequency to another party, the Frequency Coordinator may initiate the de-coordination act.

- C. A repeater trustee will have the right to file a one time protest of each de-coordination act by filing a grievance with the President of the SERA within ten days of the final finding by the Frequency Coordinator. If a repeater trustee protests a de-coordination act, the Frequency Coordinator will present all documentation concerning the de-coordination to a review board. This review board will consist of three SERA full members, which will be appointed by the President. If, after the concurrence of the review board, the trustee does not cease operation, the Frequency Coordinator will notify the appropriate field office of the FCC with a request that appropriate action be taken.
1. Various other de-coordination actions may be taken by the Frequency Coordinator for good cause or reason and subject to the same grievance procedure as set forth in Policy 17.B. In all cases the Frequency Coordinator will notify the repeater trustee by certified mail, return receipt requested, setting forth the cause or reasons for the action.
  2. De-coordinated frequencies will be placed back into the frequency pool and made available for future coordination by the Frequency Coordinator of any district.
  3. Re-assignment of de-coordinated frequencies will not take place until:
    - a. an interval of thirty days has passed since final notice has been delivered to the trustee, or
    - b. any pending litigation has been concluded.
- outlining the existing problem and include documentation. The responding trustee shall answer any letter received within thirty days.
- B. If negotiation attempts fail and the interference problem cannot be resolved with the trustee of the interfering repeater, the offended trustee shall then contact his SERA District Director by letter, outlining the problem and provide his documentation of the problem. Any failed attempt to contact the interfering repeater trustee should also be explained in detail.
  - C. The Frequency Coordinator shall use the complete documented history of the affected repeater and offending repeater that is contained in the applicable coordination file and database. If the Frequency Coordinator needs any other information, the individual trustees, or sponsors, shall provide that information within thirty days of any request by the Frequency Coordinator.
  - D. If the Frequency Coordinator cannot resolve the problem, using the guidelines explained above, and the trustee bearing responsibility for the interference does not cooperate, or does not take reasonable action to resolve the problem, or refuses to cooperate with the Frequency Coordinator in any way, the SERA Frequency Coordinator will consult the Engineer in Charge of the local FCC Field Office by letter, outlining the existing problem. He will also notify the affected repeater trustee and offending repeater trustee by photocopy of the letter being sent to the FCC. Upon consultation with the Engineer in Charge of the FCC Field Office, the Frequency Coordinator may continue negotiations with the repeater trustee or turn all documentation over to the SERA President who will impanel a review board. The review board shall have thirty days to uphold the suggested action or recommend further investigation, negotiations, or alternative actions.

### **POLICY 18 - INTERFERENCE POLICIES**

The SERA maintains a policy of dealing with interference problems between repeater owners, trustees, and sponsors to resolve these disputes. This policy complies with FCC rulings and guidelines.

- A. If an uncoordinated repeater causes harmful interference to a coordinated repeater, the primary responsibility for correcting the interference rests with the trustee of the uncoordinated repeater in accordance with FCC Part 97.205(c).
  - B. If both repeater systems are coordinated, the trustee of the most recently coordinated or re-coordinated system bears the responsibility for correcting the interference.
  - C. If both repeater systems are uncoordinated SERA will not litigate the problem.
  - D. In cases where a repeater in a SERA district is involved with interference with a system operated outside of a SERA district, the SERA Frequency Coordinator will work with the frequency coordinator from the other territory and should work within SERA Policies and Guidelines while working to resolve the dispute with the other repeater and Frequency Coordinator.
  - E. If a repeater trustee changes the location, antenna height or pattern, ERP, frequency, or other operating parameters of his system, as defined in Policy 9, and subsequently causes interference to other co-channel or adjacent channel repeaters, that repeater trustee bears primary responsibility for correcting the interference.
1. If the decision of the Frequency Coordinator is upheld, the review board shall notify the trustee of the interfering repeater by certified mail, return receipt requested, and all other involved parties within ten days of the affirmed finding.
  2. If the trustee of the interfering repeater does not comply with the findings of the review board or refuses to agree to binding arbitration, the Frequency Coordinator shall notify the repeater trustee by certified mail, return receipt requested, that his frequency has been de-coordinated. The Frequency Coordinator will then write to the FCC Field Office, whose jurisdiction the interfering repeater is located, and request enforcement of the de-coordination in accordance with current FCC regulations. The Frequency Coordinator shall include an outline of all action taken and photocopies of all documents generated as a result of this matter. At this point, any further action rests with the FCC.
    - a. If the trustee of the interfering repeater agrees to binding arbitration, an arbitration committee will be impaneled. Consisting of three members, one appointment will be made by the SERA Executive Committee and one appointment will be made by the trustee of the interfering repeater. These two appointees will unanimously select a third member who will serve as the committee chairman. The members of this arbitration committee will be licensed amateur operators, as well as repeater trustees, and full members of the SERA. No member of the arbitration committee shall be an elected officer or appointee of the involved SERA district. No officer or appointee of another coordinating entity may be a member of a SERA arbitration committee. The decision of this committee will be final.
    - b. No professional arbitrators will be used. It is strongly believed that problems involving amateur radio is best understood by licensed amateur radio operators.
    - c. The SERA will pay all of the reasonable and necessary out of pocket expenses incurred by the arbitration committee. Expenses will be subject to approval by the Executive Committee. Expenses will not include fees for services rendered.

### **POLICY 19 - INTERFERENCE REVIEW PROCEDURES**

SERA policies provide equal fairness to all parties that are involved in review and arbitration procedures that are a result of repeater interference complaints.

- A. A repeater trustee who is a victim of harmful interference from another repeater system, or its operators, shall document times, band conditions, station call signs, and the type of interference experienced. Abnormal band conditions will not be considered as a valid reason for filing an interference complaint. The trustee of the repeater who is receiving interference shall contact the trustee of the interfering repeater by certified mail, return receipt requested,

- E. All cases of malicious interference shall be forwarded to the FCC Field Office having jurisdiction in the area where interference is located after proper documentation has been made. Documentation shall include, but not be limited to, times, band conditions, station call signs, and the type of interference experienced.
- F. The FCC has adopted rules to define the NATIONAL RADIO QUIET ZONE, which is referred to in Part 97.3(k). The area is bounded by latitude 39 degrees, 15 minutes, north; longitude 78 degrees, 30 minutes, east; latitude 37 degrees, 30 minutes, south; and longitude 80 degrees, 30 minutes, west. Located in the area surrounding the National Radio Astronomy Observatory at Green Bank, WV, and the U. S. Naval Research Laboratory at Sugar Grove, WV, the Quiet Zone protects the area where sensitive radio astronomy and national security operations take place. Amateurs who wish to place repeaters, beacons, or other transmitting devices within the Quiet Zone, shall contact the SERA for coordination of the requested frequencies. Upon receipt of the approved coordination from the SERA, final permission to place the repeater system on the air shall be obtained from: National Radio Astronomy Observatory, Interference Officer, P. O. Box 2, Green Bank, WV 24944-0002. Like any other coordinated system, changes in location, antenna height or pattern, ERP, frequency, or any other operating parameters of the system, as defined in Policy 9, require approval from your SERA Frequency Coordinator AND the Interference Officer at Green Bank.
- E. Repeater owners and/or trustees are responsible for the accurate listing of their repeater. Likewise, the owner/trustee is responsible to see that all pertinent operational information is on file with the SERA.
- F. Any correction or change of information contained on the annual SERA Datasheet, made by anyone prior to submission and approval by the respective Frequency Coordinator, may result in that repeater being transferred to uncoordinated status.
- G. Failure to return the SERA "Datasheet", that is mailed on an annual basis, may be construed to infer that the repeater is no longer on the air and the frequency is available for re-assignment. In this case, the Frequency Coordinator may issue a "notice of frequency withdrawal" without any prior warning or notice. If the owner/trustee wants to retain his coordination, it will be the responsibility of the repeater owner/trustee to respond to the Frequency Coordinator, within thirty days, to advise why the datasheet was not returned and request the coordination be left intact.

## **POLICY 20 - REPEATER INDEXES AND PUBLISHED LISTINGS**

Aside from coordination of repeaters in the southeastern United States, the SERA shall maintain an accurate database of information that will be readily available to all officers of the organization. The source of data contained in the Repeater Journal listings, or indexes, is the respective SERA Frequency Coordinator. Listing from any other source will be reviewed and approved by the respective Frequency Coordinator, prior to publication.

- A. The SERA shall maintain a computerized database of all known repeaters in the districts, which it serves. The repeater listings will be updated quarterly for publication in the Repeater Journal, the official publication of the SERA, and are believed to be correct to the best of our knowledge. The published listings will contain only basic pertinent repeater information. All other repeater information, will be held as confidential and will not be published or made available to anyone, other than frequency coordinators through the regular course of their duties. Newly coordinated frequencies may sometimes miss publication deadlines and not readily appears in the Repeater Journal, even though the information will be contained in the master database.
- B. The Repeater Journal shall publish all known repeaters, coordinated or uncoordinated, to satisfy the requirements of our IRS Tax Exempt status. Further, the Repeater Journal reserves the right to publish the status of any repeater within its respective districts. The operational parameters of all repeaters within the SERA districts will be contained in our database. Any repeater operating contrary to the official SERA Frequency Utilization Plan shall be marked as such in the database. By publishing a "non band plan" repeater, the SERA is not condoning such operation.
- C. The SERA Repeater Index may not be published or reproduced, in any form, by any individual, publication, electronic source, or any other means, for distribution without the expressed written consent of the SERA, Inc.
- D. While the SERA makes every attempt to publish correct and accurate indexes, we cannot be responsible for errors in our lists including, but not limited to, those repeaters which may, or may not be, on the air. In cases where proposed repeaters, or repeaters under construction, are listed for one year and no communication has been received by the SERA concerning the status of the repeater, the listing will be deleted in accordance with Policy 16(D).

## **DOCUMENT MODIFICATION HISTORY**

SERA Coordination Policies and Guidelines Rewrite, Adopted by the Board of Directors in January, 1987.

An updated rewrite for clarification, by titling and codification of the individual paragraphs, and deletion of the CVRA title from the organization was made and approved by the Board of Directors in January, 1989.

Boundary changes for the Kentucky District and the addition of the Mississippi District were made in August, 1989.

Clarifications regarding club coordinations and trustee responsibilities (Policies 8, 9, and 13) made July, 1990.

Complete re-writes for Policies 13, 16, 17, 18, and 19, typographical errors, as well as other minor word additions or deletions were approved by the SERA Board of Directors in January, 1995.

Complete re-writes for the Introduction, Policies 2, 3, 5, 6, 7, 8, 9, 10, 12, 14, 15, 17, and 20, typographical errors, as well as other minor word additions or deletions were approved by the SERA Board of Directors in July, 1995.

Minor change in wording of Policy 1 under Districts and reversed the order of appearance of WV & TN was approved by the SERA Board of Directors in January, 1996.

Minor change in adjacent channel spacing contained in Policy 5, Subsection B.1. and B.1.b. was approved by the SERA Board of Directors in June, 1996.

Added policy subsections 14.F and 17.A.5.c, concerning the operation of "remote bases", and renumbered CTCSS/PL policy to 14.G, which was approved by the SERA Board of Directors in June, 1997.

Minor change in wording of Policy 5.B.1 adding 222 MHz where it was apparently omitted from that sentence. Further, the proper abbreviations for kilohertz and megahertz were inserted. Both changes approved as an administrative error correction by the SERA Board of Directors, in January, 1999.

Minor change to correct a clerical error in the wording of Policy 7A and 7B, where 222 MHz needed changed to read 225 MHz and 450 MHz needed changed to read 430 MHz. Correction approved by SERA Board of Directors in June, 1999.

A change was made in Policy 5.A.3 whereby co-channel spacing was reduced from 100 to 75 miles for repeaters operating on 440, 902, 1240 MHz, and above. A change was made in Policy 14.G requiring the mandatory assignment and use of CTCSS tones for repeaters operating on 440, 902, 1240 MHz, and above. A change was made to Policy 20.C where it applies to the copyright of the SERA Repeater Journal Index(es). All references to "limited coverage" 440 MHz repeaters were deleted from Policy 5. The SERA Board of Directors adopted these changes in January, 2001.

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## Important Notice About Band Plans

The ARRL National Repeater Directory publishes what is called "ARRL National Band Plans." As is mentioned, these plans are set forth as a starting guideline for repeater users. Each coordinator across the nation has an option of either following the ARRL Band Plan, or adding, changing, or deleting certain frequencies or portions to better utilize spectrum in their particular coordination location. One should never assume the ARRL suggested band plan is correct for all areas.

Of particular note, some simplex frequencies listed in the ARRL Band Plan may, or may not, be repeater inputs in some areas as our coordinators make changes to better suit their area.

Another example is the different assignments of spectrum for FM Voice Simplex, and Packet/ Digital Simplex. Repeater users as well as

packet/digital users are asked to honor these frequencies by utilizing the ones specifically assigned to the particular mode they are operating.

All coordination and spectrum management by coordinators is based on "gentlemen's agreements" and usage by all hams whether they are operators using FM repeaters, simplex, or packet digital using duplex packet modes or simplex. For spectrum management to continue to work successfully around the nation, operators must take the responsibility of working only frequencies in the mode in which that frequency is assigned.

This prevents chaos and interference and arguments. All modes of amateur operations are well represented by frequency spectrum assignments on most all bands. Using only those frequencies assigned prevents unwanted problems.

### SERA 29 MHz

29.300 - 29.500 OSCAR (satellites) (200 KHz.)  
29.600           SIMPLEX  
29.520 - 29.580 Repeater Inputs  
29.620 - 29.680 Repeater Outputs (600 KHz.)

#### Repeater Pairs

**4 Repeater Pairs, 20 KHz Channel Spacing, 100 KHz in/out**

29.520 - 29.620 29.540 - 29.640 29.560 - 29.660  
29.580 - 29.680

### SERA 50 - 54 MHz

50.000 - 50.100 CW and Beacons (100 KHz)  
50.060 - 50.080 Automatic Control Beacons  
                  (20 KHz)  
50.100 - 50.600 SSB & AM (500 KHz)  
50.110           SSB DX Calling Frequency  
50.200           SSB National Calling Frequency  
50.400           AM Calling Frequency  
50.600 - 51.000 Experimental/Special Modes  
                  (400 KHz)  
50.700 -        TTY Calling Frequency  
50.800 - 50.980 Remote Control Model Radio  
                  (180 KHz)  
51.000 - 51.100 Pacific DX Window (100 KHz)  
51.100 - 52.000 FM Repeaters & Simplex, Voice &  
                  Packet/Digital  
52.000 - 52.050 Pacific DX Window (50 KHz)  
52.000 - 54.000 FM Repeaters & Simplex Voice &  
                  Packet/Digital

#### DUPLEX VOICE FM REPEATERS

**15 Repeater Pairs, 20 KHz spacing, 500 KHz - in/out**

51.200 - 51.700   51.220 - 51.720  
51.240 - 51.740   51.260 - 51.760  
51.280 - 51.780   51.300 - 51.800  
51.320 - 51.820   51.340 - 51.840  
51.360 - 51.860   51.380 - 51.880  
51.400 - 51.900   51.420 - 51.920  
51.440 - 51.940   51.460 - 51.960  
51.480 - 51.980

**15 Repeater Pairs, 20 KHz spacing, 1 MHz - in/out**

52.710 - 53.710   52.730 - 53.730  
52.750 - 53.750   52.770 - 53.770  
52.790 - 53.790   52.810 - 53.810  
52.830 - 53.830   52.850 - 53.850  
52.870 - 53.870   52.890 - 53.890  
52.910 - 53.910   52.930 - 53.930  
52.950 - 53.950   52.970 - 53.970  
52.990 - 53.990

**15 Repeater Pairs, 20 KHz spacing, 2.51 MHz - in/out**

51.200 - 53.710   51.220 - 53.730  
51.240 - 53.750   51.260 - 53.770  
51.280 - 53.790   51.300 - 53.810  
51.320 - 53.830   51.340 - 53.850  
51.360 - 53.870   51.380 - 53.890  
51.400 - 53.910   51.420 - 53.930  
51.440 - 53.950   51.460 - 53.970  
51.480 - 53.990

#### DUPLEX VOICE FM REPEATERS (Standard Pairs)

**24 Repeater Pairs, 20 KHz spacing, 1 MHz - in/out**

52.010 - 53.010   52.030 - 53.030  
52.050 - 53.050   52.070 - 53.070  
52.090 - 53.090   52.110 - 53.110  
52.130 - 53.130   52.150 - 53.150  
52.170 - 53.170   52.190 - 53.190  
52.210 - 53.210   52.230 - 53.230  
52.250 - 53.250   52.270 - 53.270  
52.290 - 53.290   52.310 - 53.310  
52.330 - 53.330   52.350 - 53.350  
52.370 - 53.370   52.390 - 53.390  
52.410 - 53.410   52.430 - 53.430  
52.450 - 53.450   52.470 - 53.470

#### DUPLEX FM PACKET/DIGITAL REPEATERS

**4 Repeater Pairs, 20 KHz spacing, 500 KHz - in/out**

51.120 - 51.620   51.140 - 51.640  
51.160 - 51.660   51.180 - 51.680

**5 Repeater Pairs, 20 KHz spacing, 1 MHz - in/out**

52.610 - 53.610   52.630 - 53.630  
52.650 - 53.650   52.670 - 53.670  
52.690 - 53.690

**4 Repeater Pairs, 20 KHz spacing, 2.51 MHz - in/out**

51.120 - 53.630   51.140 - 53.650  
51.160 - 53.670   51.180 - 53.690

#### VOICE FM SIMPLEX FREQUENCIES

##### 12 Simplex Channels

51.500 51.520 51.540 51.560  
51.580 51.600  
52.490 52.510 **52.525\*** 52.550  
52.570 52.590

\* **52.525** is the National FM Voice Simplex Calling Frequency

#### PACKET/DIGITAL FM SIMPLEX FREQUENCIES

53.490 53.510 53.530 53.550  
53.570 53.590

**NOTE:** The SERA Board of Directors revised the 6-Meter frequency utilization plan in February, 1996, in order to utilize the 51 MHz repeater sub-band and provide more spectrum for packet/digital operation. If there are any questions, contact your local Frequency Coordinator.

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### SERA 144 - 148 MHz

144.000 - 144.050 EME CW  
144.050 - 144.100 General CW Operation  
144.100           CW National Calling Frequency  
144.100 - 144.200 EME and Weak Signal SSB  
144.200 - 144.300 General SSB Operation  
144.200           SSB National Calling  
                  Frequency  
144.275 - 144.300 Propagation Beacons  
144.300 - 144.500 Multi-Mode Operation  
144.390           APRS Nationwide (Mode =  
                  1200 Baud FM Packet)  
144.510 - 144.890 FM Repeater Inputs  
144.910 - 145.090 FM Digital/Packet Simplex

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145.110 - 145.490 FM Repeater Outputs  
145.510 - 145.790 FM Digital/Packet Simplex  
145.800 - 146.000 Satellite Sub-Band  
146.010 - 146.505 FM Repeater Inputs  
146.400 - 146.585 FM Voice Simplex and  
Alternate Repeater Inputs  
146.520 FM National Calling Frequency  
146.610 - 147.390 FM Repeater Outputs  
147.405 - 147.585 FM Voice Simplex and  
Alternate Repeater Inputs  
147.600 - 147.990 FM Repeater Inputs

## REPEATER SUB-BAND 144.50 - 145.50 MHz

### 20 Repeater Pairs, 20 KHz spacing, 600 KHz in/out

144.510 - 145.110	144.530 - 145.130
144.550 - 145.150	144.570 - 145.170
144.590 - 145.190	144.610 - 145.210
144.630 - 145.230	144.650 - 145.250
144.670 - 145.270	144.690 - 145.290
144.710 - 145.310	144.730 - 145.330
144.750 - 145.350	144.770 - 145.370
144.790 - 145.390	144.810 - 145.410
144.830 - 145.430	144.850 - 145.450
144.870 - 145.470	144.890 - 145.490

## DIGITAL/PACKET SIMPLEX FREQUENCIES

### 25 Simplex Channels

144.910	144.930	144.950	144.970
144.990	145.010	145.030	145.050
145.070	145.090	145.510	145.530
145.550	145.570	145.590	145.610
145.630	145.650	145.670	145.690
145.710	145.730	145.750	145.770
145.790			

## FM Voice Simplex Frequencies

146.400*	146.415*	146.430*	146.445*
146.460*	146.475*	146.490*	146.505*
<b>146.520</b>	146.535	146.550	146.565
146.580	146.595		
147.405*	147.420*	147.435*	147.450*
147.465*	147.480*	147.495*	147.510
147.525	147.540	147.555	147.570
147.585			

### 146.520 is the National FM Voice Simplex Calling Frequency

**IMPORTANT NOTE:** \* = Permitted for simplex use as long as it does not cause interference to nearby repeater inputs. Please be aware that SERA coordinates some of these frequencies as repeater inputs in some areas. Check the repeater directory in your area to see if any such repeaters are present.

## Standard Repeater Band 146 - 148 MHz 68 Repeater Pairs, 15 KHz spacing, 600 KHz in/out, (with alternate input & output frequency pairs shown)

146.010 - 146.610	146.025 - 146.625
146.040 - 146.640	146.055 - 146.655
146.070 - 146.670	146.085 - 146.685
146.100 - 146.700	146.115 - 146.715
146.130 - 146.730	146.145 - 146.745
146.160 - 146.760	146.175 - 146.775
146.190 - 146.790	146.205 - 146.805
146.220 - 146.820	146.235 - 146.835
146.250 - 146.850	146.265 - 146.865
146.280 - 146.880	146.295 - 146.895
146.310 - 146.910	146.325 - 146.925
146.340 - 146.940	146.355 - 146.955
146.370 - 146.970	146.385 - 146.985
146.400 - 147.000	146.415 - 147.015
146.430 - 147.030	146.445 - 147.045
146.460 - 147.060	146.475 - 147.075
146.490 - 147.090	146.505 - 147.105
147.405 - 146.805	147.420 - 146.820
147.435 - 146.835	147.450 - 146.850
147.465 - 146.865	147.480 - 146.880
147.495 - 146.895	147.600 - 147.000
147.615 - 147.015	147.630 - 147.030
147.645 - 147.045	147.660 - 147.060
147.675 - 147.075	147.690 - 147.090
147.705 - 147.105	147.720 - 147.120
147.735 - 147.135	147.750 - 147.150
147.765 - 147.165	147.780 - 147.180
147.795 - 147.195	147.810 - 147.210
147.825 - 147.225	147.840 - 147.240
147.855 - 147.255	147.870 - 147.270
147.885 - 147.285	147.900 - 147.300
147.915 - 147.315	147.930 - 147.330
147.945 - 147.345	147.960 - 147.360
147.975 - 147.375	147.990 - 147.390

## SERA 222-225 MHz

222.000 - 222.015	Guard Band (15 KHz)
222.015 - 222.050	EME - (Earth/Moon/Earth) (50 KHz)
222.050 - 222.060	Propagation Beacons (10 KHz)
222.060 - 222.100	Weak Signal CW/Experimental (40 KHz)
222.100	CW/SSB Calling Frequency
222.100 - 222.200	Weak Signal CW/SSB (100 KHz)
222.200 - 222.350	Repeater Control/Link Frequency (150 KHz)
222.350 - 222.450	Hi Speed Digital w/222.40 Center (100 KHz)
222.450 - 222.460	Propagation Beacons (10 KHz)
222.460 - 222.490	EME/Weak Signal/Experimental (30 KHz)
222.500 - 223.380	FM Repeater Inputs (880 KHz with 20 KHz spacing)
223.400 - 223.640	FM Simplex Voice (240 KHz)
223.660 - 223.780	Digital Channels (120 KHz with 20 KHz spacing)
223.800 - 223.900	Hi Speed Digital w/223.85 center (100 KHz)
223.910 - 224.080	Control & Link Frequencies (170 KHz)
224.100 - 224.980	FM Repeater Outputs (880 KHz with 20 KHz spacing)
224.990 - 225.000	Guard Band (10 KHz)

## Repeater Pairs from 222.50 - 224.98 MHz 45 Repeater Pairs, 20 KHz channel spacing, 1.6 MHz in/out

222.500 - 224.100	222.520 - 224.120
222.540 - 224.140	222.560 - 224.160
222.580 - 224.180	222.600 - 224.200
222.620 - 224.220	222.640 - 224.240
222.660 - 224.260	222.680 - 224.280
222.700 - 224.300	222.720 - 224.320
222.740 - 224.340	222.760 - 224.360
222.780 - 224.380	222.800 - 224.400
222.820 - 224.420	222.840 - 224.440
222.860 - 224.460	222.880 - 224.480
222.900 - 224.500	222.920 - 224.520
222.940 - 224.540	222.960 - 224.560
222.980 - 224.580	223.000 - 224.600
223.020 - 224.620	223.040 - 224.640
223.060 - 224.660	223.080 - 224.680
223.100 - 224.700	223.120 - 224.720
223.140 - 224.740	223.160 - 224.760
223.180 - 224.780	223.200 - 224.800
223.220 - 224.820	223.240 - 224.840
223.260 - 224.860	223.280 - 224.880
223.300 - 224.900	223.320 - 224.920
223.340 - 224.940	223.360 - 224.960
223.380 - 224.980	

## FM Voice Simplex Frequencies

223.400	223.420	223.440	223.460
223.480	<b>223.500*</b>	223.520	223.540
223.560	223.580	223.600	223.620
223.640			

\* **223.500** is the National FM Voice Simplex Calling Frequency

## Packet/Digital Simplex Frequencies

223.660	223.680	223.700	223.720
223.740	223.760	223.780	

## High Speed Digital Channels, 100 KHz wide

222.35 - 222.45	(222.40 Center)
223.80 - 223.90	(223.85 Center)

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## SERA 420-450 MHz

420.0000 - 420.2000	Repeater Links
420.0000 - 426.0000	ATV Repeater Output
	421.250 Video - 425.750 Audio
426.0000 - 432.0000	ATV Simplex
	427.250 Video - 431.750 Audio
432.0000 - 433.0000	SSB & Weak Signal
432.100	National SSB Calling Frequency
433.0125 - 433.2000	Repeater Links
433.0000 - 439.0000	ATV Simplex Only
	434.000 Video - 438.500 Audio
438.7750 - 439.5875	Repeater Links
439.6000 - 440.4750	FM Digital/Packet Operation
440.5125 - 440.7250	Narrow Band Digital Repeater Outputs/Duplex
	Backbones/Link
440.7375 - 440.9000	Simplex Cross Band Voice - Base

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440.9125 - 441.1750 Simplex Digital  
441.1875 - 441.4875 Links, Control Frequencies  
441.5000 Simplex Digital  
441.000 National Digital Calling  
Frequency  
441.5250 - 441.7750 Duplex Link Repeaters  
441.8000 - 444.9750 FM Standard Repeater  
Outputs  
445.0250 - 445.4750 Digital  
445.5125 - 445.7250 Digital Repeater Inputs  
445.7375 - 445.9000 Simplex Cross Band Voice -  
Mobile  
445.9125 - 446.1750 FM Simplex 446.000  
National FM Calling  
Frequency  
446.1875 - 446.4875 Links, Control Frequencies  
446.5000 Simplex Digital  
446.5250 - 446.7750 Duplex Link Repeaters  
446.8000 - 449.9750 FM Standard Repeater  
Inputs

## VOICE FM SIMPLEX FREQUENCIES

### 22 Simplex FM Voice Channels

445.9125	445.9250	445.9375	445.9500
445.9625	445.9750	445.9875	446.0000*
446.0125	446.0250	446.0375	446.0500
446.0625	446.0750	446.0875	446.1000
446.1125	446.1250	446.1375	446.1500
446.1625	446.1750		

\* 446.000 is the National FM Voice Simplex Calling  
Frequency

## NARROW BAND FM DIGITAL REPEATER/DIGITAL DUPLEX BACKBONE

### 18 Duplex Channels, 12.5 KHz split, 5 MHz split, High/input - Low/output

445.5125 - 440.5125	445.5250 - 440.5250
445.5375 - 440.5375	445.5500 - 440.5500
445.5625 - 440.5625	445.5750 - 440.5750
445.5875 - 440.5875	445.6000 - 440.6000
445.6125 - 440.6125	445.6250 - 440.6250
445.6375 - 440.6375	445.6500 - 440.6500
445.6625 - 440.6625	445.6750 - 440.6750
445.6875 - 440.6875	445.7000 - 440.7000
445.7125 - 440.7125	445.7250 - 440.7250

## WIDE BAND DIGITAL DUPLEX BACKBONES/LINKS

### 19 Duplex Channels, Mixed 50/100 KHz, 5 MHz split, High/input - Low/output, polarization optional - horizontal or vertical

445.0250 - 440.0250	445.0500 - 440.0500
445.0750 - 440.0750	445.1000 - 440.1000
445.1250 - 440.1250	445.1500 - 440.1500
445.1750 - 440.1750	445.2000 - 440.2000
445.2250 - 440.2250	445.2500 - 440.2500
445.2750 - 440.2750	445.3000 - 440.3000
445.3250 - 440.3250	445.3500 - 440.3500
445.3750 - 440.3750	445.4000 - 440.4000
445.4250 - 440.4250	445.4500 - 440.4500
445.4750 - 440.4750	

## Narrow Band FM Digital/Packet Simplex

440.9125	440.9250	440.9375	440.9500
440.9625	440.9750	440.9875	441.0000*
441.0125	441.0250	441.0375	441.0500
441.0625	441.0750	441.0875	441.1000
441.1125	441.1250	441.1375	441.1500
441.1625	441.1750		

\* 441.000 is the National Digital Simplex Calling  
Frequency

## STANDARD FM REPEATERS

### 128 Repeater Pairs, 25 KHz spacing, 5 MHz split, High/input, Low/output

446.800 - 441.800	446.825 - 441.825
446.850 - 441.850	446.875 - 441.875
446.900 - 441.900	446.925 - 441.925
446.950 - 441.950	446.975 - 441.975
447.000 - 442.000	447.025 - 442.025
447.050 - 442.050	447.075 - 442.075
447.100 - 442.100	447.125 - 442.125
447.150 - 442.150	447.175 - 442.175
447.200 - 442.200	447.225 - 442.225
447.250 - 442.250	447.275 - 442.275
447.300 - 442.300	447.325 - 442.325
447.350 - 442.350	447.375 - 442.375
447.400 - 442.400	447.425 - 442.425
447.450 - 442.450	447.475 - 442.475
447.500 - 442.500	447.525 - 442.525
447.550 - 442.550	447.575 - 442.575
447.600 - 442.600	447.625 - 442.625
447.650 - 442.650	447.675 - 442.675
447.700 - 442.700	447.725 - 442.725
447.750 - 442.750	447.775 - 442.775
447.800 - 442.800	447.825 - 442.825
447.850 - 442.850	447.875 - 442.875
447.900 - 442.900	447.925 - 442.925
447.950 - 442.950	447.975 - 442.975
448.000 - 443.000	448.025 - 443.025
448.050 - 443.050	448.075 - 443.075
448.100 - 443.100	448.125 - 443.125
448.150 - 443.150	448.175 - 443.175
448.200 - 443.200	448.225 - 443.225
448.250 - 443.250	448.275 - 443.275
448.300 - 443.300	448.325 - 443.325
448.350 - 443.350	448.375 - 443.375
448.400 - 443.400	448.425 - 443.425
448.450 - 443.450	448.475 - 443.475
448.500 - 443.500	448.525 - 443.525
448.550 - 443.550	448.575 - 443.575
448.600 - 443.600	448.625 - 443.625
448.650 - 443.650	448.675 - 443.675
448.700 - 443.700	448.725 - 443.725
448.750 - 443.750	448.775 - 443.775
448.800 - 443.800	448.825 - 443.825
448.850 - 443.850	448.875 - 443.875
448.900 - 443.900	448.925 - 443.925
448.950 - 443.950	448.975 - 443.975
449.000 - 444.000	449.025 - 444.025
449.050 - 444.050	449.075 - 444.075
449.100 - 444.100	449.125 - 444.125
449.150 - 444.150	449.175 - 444.175
449.200 - 444.200	449.225 - 444.225
449.250 - 444.250	449.275 - 444.275
449.300 - 444.300	449.325 - 444.325
449.350 - 444.350	449.375 - 444.375
449.400 - 444.400	449.425 - 444.425
449.450 - 444.450	449.475 - 444.475

449.500 - 444.500	449.525 - 444.525
449.550 - 444.550	449.575 - 444.575
449.600 - 444.600	449.625 - 444.625
449.650 - 444.650	449.675 - 444.675
449.700 - 444.700	449.725 - 444.725
449.750 - 444.750	449.775 - 444.775
449.800 - 444.800	449.825 - 444.825
449.850 - 444.850	449.875 - 444.875
449.900 - 444.900	449.925 - 444.925
449.950 - 444.950	449.975 - 444.975

## FM ITINERANT VOICE REPEATERS

### 2 Repeater Pairs, 25 KHz spacing between channels, 5 MHz split, High/input, Low/output

445.750 - 440.750 445.800 - 440.800

Reserved for itinerant and short term use during a  
special event or emergency with no formal  
coordination required. Trustees/Owners are  
encouraged to notify their local coordinator to  
inform them of system parameters and expected  
duration of use.

## FM CROSSBAND REPEAT SIMPLEX (NBFM)

### Channels for Fixed Stations ONLY, 12 Simplex Channels, for Fixed Cross Band Repeat

440.7375	440.7625	440.7750	440.7875
440.8125	440.8250	440.8375	440.8500
440.8625	440.8750	440.8875	440.9000

### Channels for Mobile Stations ONLY, 12 Simplex Channels, for Mobile Cross Band Repeat

445.7375	445.7625	445.7750	445.7875
445.8125	445.8250	445.8375	445.8500
445.8625	445.8750	445.8875	445.9000

## LINK & CONTROL CHANNELS (Narrow Band FM)

May be paired on "440", or individually paired  
with 222 MHz band fixed link frequencies. May  
be individually coordinated. Some may be  
coordinated as simplex remote base or remote  
control systems.

446.1875 - 441.1875	446.2000 - 441.2000
446.2125 - 441.2125	446.2250 - 441.2250
446.2375 - 441.2375	446.2500 - 441.2500
446.2625 - 441.2625	446.2750 - 441.2750
446.2875 - 441.2875	446.3000 - 441.3000
446.3125 - 441.3125	446.3250 - 441.3250
446.3375 - 441.3375	446.3500 - 441.3500
446.3625 - 441.3625	446.3750 - 441.3750
446.3875 - 441.3875	446.4000 - 441.4000
446.4125 - 441.4125	446.4250 - 441.4250
446.4375 - 441.4375	446.4500 - 441.4500
446.4625 - 441.4625	446.4750 - 441.4750
446.4875 - 441.4875	

# SouthEastern Repeater Association, Inc. Frequency Utilization Plan (FUP)

January 2001

(Coordination package Page 11 of 15)

## Duplex "Hub" Linking Repeaters

**11 Repeater Pairs, 25 KHz spacing, 5 MHz split, High/input, Low/output, maximum 100w ERP.**

446.525 - 441.525	446.550 - 441.550
446.575 - 441.575	446.600 - 441.600
446.625 - 441.625	446.650 - 441.650
446.675 - 441.675	446.700 - 441.700
446.725 - 441.725	446.750 - 441.750
446.775 - 441.775	

These repeater pairs are reserved for use as a wide area linking "hub" repeater that tie a group of standard FM voice repeaters together. The SERA strongly recommends this method of linking rather than using in band, or remote base, type linking.

## Link Channels (Narrow Band FM)

**These link channels share designated ATV Bandwidths using horizontal antenna polarity. Frequencies will be coordinated with a maximum 25 watts ERP and directional antenna systems.**

420.0125	420.0250	420.0375	420.0500
420.0625	420.0750	420.0875	420.1000
420.1125	420.1250	420.1375	420.1500
420.1625	420.1750	420.1875	420.2000
433.0125	433.0250	433.0375	433.0500
433.0625	433.0750	433.0875	433.1000
433.1125	433.1250	433.1375	433.1500
433.1625	433.1750	433.1875	433.2000
438.7750	438.7875	438.8000	438.8125
438.8250	438.8375	438.8500	438.8625
438.8750	438.8875	438.9000	438.9125
438.9250	438.9375	438.9500	438.9625
438.9750	438.9875		

439.0000*	439.0125*	439.0250*	439.0375*
439.0500*	439.0625*	439.0750*	439.0875*
439.1000*	439.1125*	439.1250*	439.1375*
439.1500*	439.1625*	439.1750*	439.1875*
439.2000*	439.2125*	439.2250*	439.2375*
439.2500*	439.2625*	439.2750*	439.2875*
439.3000*	439.3125*	439.3250*	439.3375*
439.3500*	439.3625*	439.3750*	439.3875*
439.4000*	439.4125*	439.4250*	439.4375*
439.4500*	439.4625*	439.4750*	439.4875*
439.5000*	439.5125*	439.5250*	439.5375*
439.5500*	439.5625*	439.5750*	439.5875*

\* Link frequencies above 439 MHz may use vertical polarity at the coordinator's discretion.

**NOTE:** Contact your respective SERA Director, Vice Director, or Frequency Coordinator, for information about the need for coordination of your system, before installing and operating the system. Most simplex voice and digital operations are itinerant in nature, and as such will not be coordinated by SERA. Digital operators should contact their local digital society for additional information. Simplex cross band voice, as is possible with most over the counter dual band radios, is also considered itinerant in nature and will not be coordinated; however, users are asked to use the assigned frequencies shown in this document.

Approved version 02/14/2000 @10:29 AM/EDT  
FAL/HAHjr

Typographical error CORRECTED 01/04/01 @  
23:20 PM/EST HAHjr

Amended by action of the SERA Board of Directors  
- 01/06/01 HAHjr

## SERA 902-928 MHz

902.000 - 902.800	SSTV, FAX, & ACSSB experimental
902.800 - 903.000	Reserved - EME & CW expansion
903.000 - 903.050	EME - exclusive
903.070 - 903.080	CW Beacons
903.100	CW, SSB Calling Frequency
903.400 - 903.600	Cross band linear translator inputs
903.600 - 903.800	Cross band linear translator outputs
903.800 - 904.000	Experimental Beacons - exclusive
904.000 - 906.000	Digital Communications
906.000 - 907.000	Narrow Band FM Simplex (25 KHz channels)
906.500	National FM Simplex Calling Frequency
907.000 - 910.000	FM Repeater Inputs
910.000 - 916.000	ATV
916.000 - 918.000	Digital Communications
918.000 - 919.000	Narrow Band FM Control Links & Remote Bases
919.000 - 922.000	FM Repeater Outputs
922.000 - 928.000	Wide Band Experimental, ATV, & Simplex Spread Spectrum

## FM Repeater Pairs - 907.10 to 921.90 MHz

**29 Repeater Pairs, 100 KHz spacing between channels, 12 MHz in/out**

907.100 - 919.100	907.200 - 919.200
907.300 - 919.300	907.400 - 919.400
907.500 - 919.500	907.600 - 919.600
907.700 - 919.700	907.800 - 919.800
907.900 - 919.900	908.000 - 920.000
908.100 - 920.100	908.200 - 920.200
908.300 - 920.300	908.400 - 920.400
908.500 - 920.500	908.600 - 920.600
908.700 - 920.700	908.800 - 920.800
908.900 - 920.900	909.000 - 921.000
909.100 - 921.100	909.200 - 921.200
909.300 - 921.300	909.400 - 921.400
909.500 - 921.500	909.600 - 921.600
909.700 - 921.700	909.800 - 921.800
909.900 - 921.900	

**Note:** SERA will coordinate the 33 cm band repeater pairs with 100 KHz spacing between channels until all pairs are used, then with 50 KHz spacing, and finally 25 KHz spacing. Splinter channel spacing will be utilized as required in the future.

## FM Voice Simplex Channels

**Channel every 25 KHz**

906.000 to 907.000 MHz  
906.500 National FM Simplex Calling Frequency

## Digital Packet Simplex Channels

**Channel every 25 KHz**

904.000 to 906.000 MHz  
916.000 to 918.000 MHz

## SERA 1240-1300 GHz

1240.00 - 1246.00	ATV #1
1246.00 - 1248.00	NBFM point to point links and digital duplex
1248.00 - 1258.00	Digital Communications
1252.00 - 1258.00	ATV #2
1258.00 - 1260.00	NBFM point to point links and digital duplex
1260.00 - 1270.00	Satellite up links, experimental simplex ATV
1270.00 - 1276.00	FM Repeater inputs, 239 pairs, every 25 KHz
1271.00 - 1283.00	Non-coordinated test pair
1276.00 - 1282.00	ATV #3
1282.00 - 1288.00	FM Repeater outputs paired with 1270-1276 GHz
1288.00 - 1294.00	Wide Band experimental, simplex ATV
1294.00 - 1295.00	Narrow Band FM simplex, every 25 KHz
1294.50	National simplex calling channel
1295.00 - 1297.00	Narrow Band weak signal (Nc FM)
1295.00 - 1295.80	SSTV, FAX, & ACSSB experimental
1295.00 - 1296.00	Reserved for EME & CW expansion
1296.00 - 1296.05	EME - exclusive
1296.07 - 1296.08	CW Beacons
1296.10	CW, SSB Calling Frequency
1296.40 - 1296.60	Cross Band linear translator output
1296.80 - 1297.00	Experimental Beacons - exclusive
1297.00 - 1300.00	Digital Communications

**NOTE:** This represents the ARRL recommended 1.2 GHz. Band Plan. The SERA has not compiled, or issued, a proposal for this frequency spectrum.



SERA Form 03, Revised 6/2/2001

**Application for Frequency Coordination**  
**SouthEastern Repeater Association, Inc**  
 Representing Coordination and UHF/VHF Interests throughout  
 Georgia, Kentucky, Mississippi, North Carolina, South  
 Carolina, Tennessee, Virginia, and West Virginia  
 Page One of Two

Please return this form to your local coordinator (see your district page at [www.sera.org](http://www.sera.org)).

The SERA provides a service of repeater coordination in FCC authorized bands above 29.5 MHz. Volunteers provide this service, and its effectiveness is directly proportional to the degree of cooperation between amateur repeater owners and the SERA. Not all repeater owners cooperate, and there is no guarantee that the frequency we assign will be free of interference. Applicants are expected to actively participate with coordinators to determine which frequencies are usable in their area. Please provide ALL information (print or type) requested, as incomplete forms will delay your application. This information will be kept confidential and will be used only for coordination. We value your cooperation and will respond to your request as soon as possible.

**For additional information, see the SERA web page [www.sera.org](http://www.sera.org) or contact your frequency coordinator.**

Desired Frequency: \_\_\_\_\_ Input: \_\_\_\_\_ Output: \_\_\_\_\_  
 For auxiliary frequencies (control, link, voting receiver links, link to hub repeater, etc), please attach a system drawing that shows how the auxiliary station will be used and what band(s) on which coordination is desired. The coordinator can be asked to assign a frequency.

**Proposed Location of Repeater:** \_\_\_\_\_

Describe the EXACT location of the repeater **above**, enabling your coordinator to pinpoint its location on a map. Please don't use coordinates here.

**Please supply a published map of sufficient scale, or a clear photocopy, clearly indicating accurately the exact location of the repeater**

City/Town: \_\_\_\_\_ County: \_\_\_\_\_ State: \_\_\_\_\_

**Location Specifics:**

Latitude and longitude below should be provided to the nearest second. Do NOT use decimals for either degrees or minutes. (Only first line required if transmitter AND receiver are at the same site)

Transmitter: Latitude: \_\_\_\_\_ Longitude: \_\_\_\_\_  
 Receiver: Latitude: \_\_\_\_\_ Longitude: \_\_\_\_\_

Enter latitude and longitude in Degrees, Minutes, and Seconds. Remember that minutes must be an integer of 59 or less and that seconds must be a number less than 60.

If this repeater will have more than one remote receiver, please attach another sheet describing the exact location and other installation details.

ARRL Grid Square:  (Calculated by Frequency Coordinator)

Repeater Callsign: \_\_\_\_\_ Repeater Directory Listing/City Name (limit 16 characters): \_\_\_\_\_

Trustee Name: _____	Sponsor Name: _____
Call: _____	Call: _____
Address: _____	Address: _____
City, State, Zip: _____	City, State, Zip: _____
Phone: _____	Phone: _____
Email Address: _____	Email Address: _____

Type of coordination:  Individual or  Club

Holder of Record ("Holder" of the coordination):  Trustee or  Sponsor

Person responsible for answering SERA correspondence:  Trustee or  Sponsor

I have in my possession and have also read and understand both the **Coordination Policy and Guidelines of the SouthEastern Repeater Association, Inc., Revised January 2001**, and the latest edition of the **FCC Part 97 rules** pertaining to repeater operation.

Trustee (Printed): \_\_\_\_\_ Signature: \_\_\_\_\_  
 If Club Sponsored: \_\_\_\_\_ Officer \_\_\_\_\_  
 Officer (Printed): \_\_\_\_\_ Callsign: \_\_\_\_\_ Date: \_\_\_\_\_

**Complete both sides and return this signed original form to your coordinator via US Mail or Fax (if available)**

**Antenna information**

Transmit site Ground elevation Above Mean Sea Level **GAMSL** \_\_\_\_\_ Feet  
 Center of Antenna Height of Above Ground **AHAG** \_\_\_\_\_ Feet  
 Total: (Height of center of Antenna Above Mean Sea Level) **AAMSL** \_\_\_\_\_ Feet

Antenna pattern (circle one) **OMNI** **DIRECTIONAL** to: \_\_\_\_\_ (Azimuth) USE degrees, NOT direction name or abbreviation

Antenna Height Above Average Terrain

(Calculated only by Frequency Coordinator)	<b>AHAAT:</b>	Feet
(Entered only by Frequency Coordinator)	<b>ERP:</b>	Watts

Effective Radiated Power

**SERA Coordination Policy and Guidelines**  
**POLICY 7 - REPEATER POWER LIMITATIONS:**

28 MHz to 225 MHz	420 MHz and above
up to 100 feet HAAT - 800w ERP	up to 1000 feet HAAT - 800w ERP 1000 feet and above - 400w ERP
100-500 feet HAAT - 400w ERP	
500-1000 feet HAAT - 200w ERP	
1000 feet and above - 100w ERP	

Frequency Coordinators also have the authority to impose power limitations of a repeater which may be based in whole or in part on calculated effective radiated power (ERP), height above average terrain (HAAT), antenna system design, and separation from co-channel and adjacent repeaters.

**General Information: (Please circle all that apply. ARRL code follows each item if used in ARRL Repeater Directory.)**

<b>Mode will be</b>	FM	ATV	OTHER:				
<b>Access will be</b>	TONE BURST	DTMF	DCS CODE _____ ds	CTCSS _____ Hz t	Publish code/tone? YES NO		
<b>Other features</b>	OPEN AUTOPATCH <b>a</b>	CLOSED AUTOPATCH <b>(ca)</b>	EMERGENCY POWER <b>e</b>	SOLAR POWER <b>e-sun</b>	WIND POWER <b>e-wind</b>	LINKED OR CROSSBAND <b>l</b>	SKYWARN <b>Wx</b>
	REMOTE BASE SYSTEM <b>RB</b>	RACES AFFILIATED <b>R</b>	ARES AFFILIATED <b>S</b>	OTHER:			

Transmitter output power: <b>(A)</b>	Watts	Antenna gain (from manufacturer specs.): <b>(B)</b>	dB	Length of antenna feed line: <b>(C)</b>	Ft
Brand, Model (& diameter) of antenna feed line: <b>(D)</b>		Duplexer insertion loss (manufacturer. specs): <b>(E)</b>	dB	Transmitting frequency band: <b>(F)</b>	MHz

**Tables below for use of frequency coordinator only**

**Table I – Conversion between Watts and dBW**

Watts	dBW	Watts	dBW	Watts	dBW	Watts	dBW
1	= 0.0	35	= 15.4	125	= 21.0	475	= 26.8
2	= 3.0	40	= 16.0	150	= 21.8	500	= 27.0
3	= 4.8	45	= 16.5	175	= 22.5	525	= 27.2
4	= 6.0	50	= 17.0	200	= 23.0	550	= 27.4
5	= 7.0	55	= 17.4	225	= 23.5	575	= 27.6
6	= 7.8	60	= 17.8	250	= 24.0	600	= 27.8
7	= 8.5	65	= 18.1	275	= 24.4	625	= 28.0
8	= 9.0	70	= 18.5	300	= 24.8	650	= 28.1
9	= 9.5	75	= 18.8	325	= 25.1	675	= 28.3
10	= 10.0	80	= 19.0	350	= 25.4	700	= 28.5
15	= 11.8	85	= 19.3	375	= 25.7	725	= 28.6
20	= 13.0	90	= 19.5	400	= 26.0	750	= 28.8
25	= 14.0	95	= 19.8	425	= 26.3	775	= 28.9
30	= 14.8	100	= 20.0	450	= 26.5	800	= 29.0

**Table II**  
Coaxial Cable feed line loss factors (dB per 100 feet at 50 ohms)

Freq. MHz	Typical RG-8	9913 RG-8	1/2" LDF	7/8" LDF	1-5/8" LDF
28	.88	.68	.37	.20	0.12
50	1.20	.90	.48	.26	0.16
144	1.80	1.30	.85	.46	0.27
222	2.80	1.85	1.04	.57	0.35
440	4.20	2.70	1.51	.84	0.50
902	6.70	4.20	2.29	1.28	0.78
1240	8.20	5.20	2.64	1.48	0.90
2400					0.94

Rule of thumb: Shoot for a maximum loss of 2 dB

**GAINS:** Power **(A)** (converted to **dBW** in **Table I**): \_\_\_\_\_ + Antenna Gain **(B)**: \_\_\_\_\_ = \_\_\_\_\_ **dB = SYSTEM GAIN**

**LOSSES:** Feed Line length **(C)** \_\_\_\_\_ Ft /100 = \_\_\_\_\_ x **Table II** for Feed Line **(D)** = \_\_\_\_\_ **dB = CABLE LOSS** (enter on next line)

**CABLE LOSS:** \_\_\_\_\_ + Insertion Loss **(E)**: \_\_\_\_\_ = \_\_\_\_\_ **dB = SYSTEM LOSS**

**SYSTEM GAIN:** \_\_\_\_\_ dB – **SYSTEM LOSS** \_\_\_\_\_ dB = **ERP in dBW** \_\_\_\_\_ (This is NOT watts)

**ERP:** (dBW) converted back to Watts, using **Table I** = \_\_\_\_\_ **Watts** (Transfer to ERP, at top of page)

Please remember that this section is for use of the frequency coordinator only.