



USER'S GUIDE FOR REPEATER OPERATION

THE DALLAS AMATEUR RADIO CLUB

REVISED 10/11/2006

Welcome to the Dallas Amateur Radio Club's W5FC repeaters. This *User's Guide for Repeater Operation* will help you make better use of our repeaters and serve as an introduction to one of the oldest amateur radio clubs in the country. As a member of the DARC, four state-of-the-art FM repeaters are available for your use in the Dallas area. Your privileges are available 24 hours a day, every day. Your responsibilities require that you operate at all times in compliance with all FCC rules and regulations (including Part 97), follow the DARC repeater rules and guidelines, and observe all instructions from W5FC control operators and net control operators using the repeaters.

THE W5FC REPEATERS

band	output	input	PL tone
2 m	146.880 MHz	146.280 MHz	110.9
1.25 m	224.880	223.280	110.9
70 cm	442.425	447.425	110.9
33 cm	927.850	902.850	DPL 125N

2 METER REPEATER

output frequency 146.880 MHz

Our main VHF repeater, known locally as the eight-eight machine, is located atop a tall building near SMU and downtown Dallas. It transmits an effective radiated power of 70 watts. The input frequency for this repeater is 146.280 Mhz (negative offset) and CTCSS or PL tone of 110.9 is required for access.

Various courtesy tones are heard during the repeater's operation. During the repeater's normal state, you should hear a bli-blip tone or bubble-up after you release the PTT switch and a short (3-4 second) delay called a squelch tail. This is called a courtesy tone. **IT IS OUR PRACTICE ON ALL DARC REPEATERS TO WAIT UNTIL THE SQUELCH TAIL DROPS BEFORE KEYING UP IN RESPONSE TO A TRANSMISSION OR BEFORE MAKING ANOTHER CALL.** At night (from 12:00 a.m. to 5:30 a.m.), the bli-blip tone is different, to indicate that the phone patch (see *Phone Patch* section) is off.

During a net operation (see *Nets* below); such as a RACES net or training net, the DFW traffic net, a simulated emergency test net or a public service event net; a single, sharp tone is transmitted and the squelch tail is shortened. The net control operator directs communications during these nets, when teamwork is important.

Should the main 88 repeater be offline for maintenance, the backup repeater may be activated. During such times, there will be no tone sent between transmissions and the squelch tail will be shortened.

The repeater automatically identifies itself on a regular basis, by either a voice announcement or by Morse code (W5FC/R is sent). Users should wait until the repeater ID is finished to resume transmitting and then transmit their own IDs. Club bulletins as well as weather alerts for the RACES members are frequently sent in addition to the ID.

Eight-eight's main repeater provides excellent coverage throughout the Dallas area over a 35-mile radius. Depending on tropospheric or weather conditions and users' equipment, the coverage extends into south Texas, Louisiana, Arkansas, Oklahoma, and Kansas. Be considerate of distant listeners.

1.25 METER REPEATER

output frequency 224.880 MHz

Our 220 Mhz repeater has an input frequency of 223.280 Mhz (negative offset). A PL (CTCSS) tone of 110.9 is required to operate it. Only a few hams use this repeater, often making it a wide-open frequency for anyone with equipment capable of utilizing it.

70 CENTIMETER REPEATER

output frequency 442.425 MHz

Our main UHF repeater has an input frequency of 447.425 Mhz (positive offset). A PL (CTCSS) tone of 110.9 is required to operate it.

A two-step courtesy tone is heard when the repeater is properly accessed. The tones of the four-forty machine and the eight-eight machine are markedly different. Again, a squelch tail is present after you release the PTT switch, so the same waiting rule applies.

The 440 machine puts out approximately 100 watts of effective radiated power. This gives our UHF repeater more range than its 2-meter counterpart, again depending on conditions, your location and your equipment.

33 CENTIMETER REPEATER

output frequency 927.850 MHz

The 33 cm repeater is our newest repeater. The input frequency is 902.850 Mhz (negative offset) and a DPL Tone of 125N is required to operate it.

FOR SECURITY REASONS, WE DO NOT DIVULGE THE EXACT LOCATION OF THE REPEATERS.

UNAUTHORIZED USERS AND INTERFERENCE WITH THE REPEATER

Willful and/or malicious interference with any repeater is a violation of federal law, punishable by fine, revocation of license, confiscation of equipment, and/or imprisonment in a federal penitentiary. This includes unidentified transmissions, playing music or other forms of broadcasting, talking to unlicensed scanner listeners, keying down on a QSO, obscene language, willful transmission of a false emergency call, or using the repeater for any illegal purpose.

The FCC and the Dallas Amateur Radio Club have considerable resources to track down and identify such interference. Users who monitor illegal activity are urged to make a note of the time, content, duration and beam heading from the input frequency (if available) and contact any club control operator or board member via telephone or alternate frequency.

Resist the understandable temptation to key-down on the offender. Not only is it illegal to do so, but it may hamper attempts to get a fixed location on the interfering signal. Do not acknowledge or talk about the malicious interference while on club repeaters. If you must do so, then do it on the phone or another frequency.

NETS

Our 2 meter repeater is the designated repeater for several important emergency and communication operations called nets. **WHEN THESE NETS ARE IN OPERATION, THEY HAVE PRIORITY OVER ALL OTHER USERS EXCEPT FOR STATIONS WITH ACTUAL EMERGENCIES** (see *Glossary* for definition of emergency).

Dallas County RACES (Radio Amateur Civil Emergency Service) uses the eight-eight repeater for training and emergency operations. RACES training nets are on the first and third Sunday nights of the month at 8:00 p.m. Only authorized RACES members may participate, by mandate of Part 97.

When emergency conditions warrant, the Dallas County RACES officials will call a net with a series of long tones. A short courtesy tone with no squelch tail will alert users to the operation. When you hear these, immediately sign off from the repeater and follow all instructions from the net control station. Failure to yield the frequency to an emergency net or a RACES net is a serious breach of federal law.

For further information about Dallas County RACES and an application to join, send a SASE to Claude Head K5DTN, 13315 Spring Grove, Dallas TX 75240. Visit our web page at <http://www.w5fc.org/races.htm> or the RACES home page at <http://www.cloudcowboy.net>.

Each evening at 6:30 p.m., the Dallas / Ft. Worth Metroplex Traffic Net meets on the 88 machine for purposes of exchanging message traffic into and out of the D/FW area and training amateurs in the operation of a formal net and handling message traffic. This net is a part of the ARRL National Traffic System (NTS) and all interested amateurs are invited to participate. Additional information is given at the end of each session as to how to get further involved with the NTS nets. The repeater's courtesy tone is shortened during net operation, as it is during RACES operations. During this net, the net control station has priority over all other normal amateur traffic.

Occasionally, public service nets use the club repeaters. To do your public service, you are encouraged to learn more and participate in these events and to extend the proper courtesy to those who are engaged in this important facet of amateur radio. Additional information on public service events is available from those responsible at our monthly club meetings and online at our web page, <http://www.w5fc.org>.

Twice a month, the DARC conducts a *Meeting On The Air* on both the 88 and 440 repeaters. This social net occurs on the first and third Sunday of each month, at 7:00PM, immediately preceding the RACES training net. This is a fun and friendly net, open to participation by all licensed amateurs, and you are invited to participate. Technical questions may be answered, ham and club news, a *buzzword* and a swap net will be offered.

HINTS FOR BETTER MOBILE OPERATION

To receive maximum benefit from the club repeaters, your rig must operate properly. Thoroughly read your radio's operator's manual and learn how to use it well. If you need assistance, there are dozens of DARC members who are more than willing to help – just ask. And remember the following:

- 1) Don't try to hit the repeater from inside your car with a hand-held radio using its rubber duck antenna.
- 2) Invest in a good outside antenna, mounted as high as you can, even if you're using an HT.
- 3) If you power your rig through the cigarette lighter socket, make sure there is no alternator whine or ignition noise present. RFI suppressors, like those sold at electronics stores such as Radio Shack or Tanner's, will usually take care of this problem.
- 4) It is better to power your transceiver directly by the car's battery. Run heavy gauge cable (14-gauge minimum) directly from your rig to the positive and negative terminals on the car battery, and install fuses at the battery in both the positive and negative cables.
- 5) Play it safe. Don't try to watch your radio and drive at the same time.

GOOD MANNERS

We are all judged by the company that we keep. No one wants to be associated with a bunch of ill-mannered, rude and discourteous people. You are responsible for your conduct on the air. Our club will use all its resources to track down abusers of the repeaters and help proper authorities prosecute them to the fullest extent of the law.

Consider the analogy of two people having a conversation on the street. Would you jump into their conversation without permission? Would you annoy them or try to talk over them? Would you try to take every other turn to talk, instead of waiting for your turn?

PRACTICE THE FOLLOWING COURTESIES:

- 1) Listen and listen again before making a call.
- 2) If in doubt, listen again and ask "is the frequency in use?"
- 3) Enter the repeater with your call sign alone or simply "KX5XXX, listening" or "KX5XXX mobile" or "WY5YYY, this is KX5XXX."
- 4) Don't say *BREAK* unless you have emergency traffic. It is not necessary to correct visitors, as the opposite is true on most other repeaters. However, we have reserved the pro-sign *BREAK* as the signal of an emergency.
- 5) Don't jump into QSOs to make another call without asking; ask courteously. Other stations will welcome your courtesy and acknowledge your call.
- 6) Don't *kerchunk* the repeater. The FCC defines this as an illegal transmission. If you want to see if you're getting in, and the frequency is clear, call "KX5XXX, testing."
- 7) Stay off the other ham's squelch tail by not *tailgating*. Wait until the signal drops (your S-meter will show you when there is no signal from the repeater) before responding. The repeaters will automatically time out if they detect 3 minutes of unbroken transmission (1.5 minutes during rush hours or if tailgating is deemed excessive). "Bozo alert" will be heard by the other hams and "Repeater time out for XX seconds" will be transmitted over the repeater after the offender un-keys. During the time-out, the repeater will be shut down.
- 8) There is no need to say "for ID" when you identify. Simply say your callsign.
- 9) Be patient with newcomers.
- 10) Give others a chance to use the machine by moving long conversations to a simplex frequency. In other words, don't be a repeater hog.
- 11) Yield to others because they have asked courteously.
- 12) **YIELD IMMEDIATELY TO EMERGENCY TRAFFIC.**
- 13) Don't give directions if you don't know them.
- 14) Listen carefully for the other ham's callsign so he or she doesn't have to repeat it.
- 15) Give your callsign phonetically the first time to new contacts so they can clearly understand your callsign.
- 16) Cooperate with our control operators and follow their instructions.
- 17) Make sure your equipment is operating properly with fully charged batteries, a good antenna and tuned to the correct frequency.
- 18) Follow all FCC rules and regulations. They are the LAW.
- 19) Use only enough power to fully connect with the repeater.
- 20) If you are not hitting the machine, wait until you are in range or can improve your operating position or power, rather than continuing to try to make it into the repeater. Your persistence will only annoy others.
- 21) Give meaningful signal reports when asked. "Full quieting" or "Your signal is unreadable" or "You're readable but noisy" are examples of meaningful repeater strength reports.
- 22) There is no need to acknowledge negative contact, no contact, or no response.
- 23) When ducting conditions are present, you may hear and work distant stations. Remember, though, if they are getting in here, we may be getting in there, so use as little power as possible and pause for the squelch.
- 24) Don't use the repeater to discuss politics.
- 25) **THERE IS NOT AN ADULT HOUR ON THE REPEATER. IF IT'S IN POOR TASTE, THEN IT'S IN POOR TASTE, NO MATTER WHAT TIME OF DAY, AND IT IS NOT PERMITTED ON A DARC REPEATER. THIS INCLUDES INNUENDO. IF YOU ABUSE THIS COMMON-SENSE RULE, THE REPEATER WILL BE SHUT DOWN BY THE CONTROL OPERATOR.**

THE PHONE PATCH

Paid-up members of the DARC have access to a powerful feature of our 2-meter and 440 repeaters – the phone patch. With this feature, you can place a non-toll (local) telephone call from anywhere in these repeaters' coverage area using your DTMF-equipped (touch-tone) FM transceiver. Both repeaters have phone patch capability every day during the hours of 5:30 a.m. to midnight. Usually, the 440 phone patch is up 24 hours a day.

You must have a patch access code (sent to the membership by email whenever the code is changed) to use the patch. This code is issued to members upon payment of annual dues. If you do not have the current code, contact the club Treasurer to obtain it. The code is occasionally changed to prevent unauthorized use of the patch. The patch code is the same for both repeaters.

You must have a solid signal to access and complete a phone patch. Please do not tie up the repeater by continued efforts to use the autopatch if your signal is not strong enough.

Do not interrupt a QSO in progress to ask permission to make a phone patch, unless it is an emergency that involves a threat to life or property. *The DARC repeaters are all QSO-priority machines!* Make sure the frequency is not in use by asking "Is the frequency in use? KX5XXX (*your callsign*)."
If you receive no response after waiting a few seconds, proceed.

ALWAYS IDENTIFY YOURSELF BEFORE DIALING. Users who do not identify are in violation of FCC rules and will have their connection attempt immediately cancelled by the control operators.

TO USE THE AUTOPATCH FOLLOW THESE INSTRUCTIONS:

Key your mike (press the PTT switch) and identify yourself as "KX5XXX (*your callsign*) to the W5FC autopatch." Do not let up on the PTT button. Enter the patch code immediately, followed with the phone number, by using your DTMF (touch-tone) keypad. Remember: ID, patch code, area code and phone number, all in one transmission. After entering these numbers, release the PTT button and wait.

You will hear the repeater say "autopatch" and transmit a series of tones. The patch will attempt to dial the number.

When the called party answers the phone, begin the conversation. The first thing you must say is to tell the party you called that you are using your radio and that the call is NOT PRIVATE. Use your PTT switch to speak to the party on the phone and then release to listen.

If the called party is unfamiliar with autopatch calls, briefly tell them that they must wait until you've finished speaking before talking and so forth.

Remember that during the call, anyone on the air can speak to the called party while the patch is up.

When your conversation is over, identify again with "KX5XXX (*your callsign*) clear of the patch." and bring the patch down by pressing the # or pound key while holding down the PTT button. The repeater will come back with "Call complete at (*the current time*)."

For information on contacting local law enforcement authorities, see *Emergency Procedures*.

Avoid using the autopatch during typical rush-hour drive times unless it is an emergency.

Remember that you and the club are responsible for everything said on the air during an autopatch call.

It is OK to call your home answering machine for messages, if you do not do this for any form of business.

It is OK to call your office but announce this intent and make sure that you do not discuss any business related matters.

It is NOT OK to call your office to tell them what time you'll be in or that you're sick or you're coming in late. That is a business matter, so DON'T DO IT. If in doubt, don't make the call.

It is NOT OK to order a pizza or arrange furniture delivery on the air. Do not do business on the air.

It is OK to ask another ham whether he or she has a component to give or lend you.

It is OK to make an offer to another ham to buy or sell your own or his or her own ham equipment, but ONLY if you do not do it as part of your business or your employer's business or part of the other ham's business. It must be equipment that you own, not inventory that you deal in.

It is NOT OK to tell another ham on the air about a sale they're having in your store.

It is NOT OK to call a ham or electronics store or to ask an employee of a ham store or a dealer on the air for price information or availability of a radio or a component.

It is OK to use the patch to call a wrecker service if you or someone else is faced with an emergency situation.

EMERGENCY PROCEDURES

The most important function of all DARC repeaters is to assist in emergency communication. In an emergency, all other amateur use of the repeater is secondary.

AN EMERGENCY IS DEFINED AS AN EVENT WHERE THERE IS AN IMMEDIATE THREAT TO LIFE OR PROPERTY. A fender-bender is not an emergency, nor is a box in the middle of the road. If an accident is tying up traffic on Central Expressway, you may use the system to call the police, but this is not defined as an emergency, unless there are injuries that require immediate attention.

At our disposal is a tool to assist local law enforcement and fire/rescue authorities throughout our area. You, or in this case any user of the repeater, may use the autopatch to directly contact these agencies to report emergency situations by the following procedure:

- 1) If an emergency presents an immediate threat to life or serious property damage, at the first opportunity, key your mike and call *BREAK-BREAK* and identify yourself.
- 2) Other stations should immediately yield the frequency to you.
- 3) Identify to the autopatch and, while keyed up, punch in the autopatch access code and the access code of the agency you need to contact (see below).
- 4) The repeater will say, for example, "Dallas Police. Wait."
- 5) When the dispatcher comes on the line, slowly, calmly, and very briefly report the emergency, such as "I want to report an accident. Then un-key your mike and LISTEN.
- 6) The dispatcher will ask for more information. Be prepared to give the following information:
 - a) The exact location and cross street,
 - b) the nature of injuries, if known,
 - c) other pertinent information, if asked, and
 - d) your name, if asked.
 - e) If the dispatcher ask your phone number, say that you calling from your radio in your car.
- 7) After the dispatcher hangs up, give your callsign and bring down the patch by pressing your # key.

At this point, your job as a communicator of emergency traffic is done. Do not attempt to render aid unless you are qualified to do so. If you elect to remain at the scene, remember that you are a private citizen and your ham ticket does NOT convey any special privileges!

If you want to report such events as debris in the roadway or traffic tie-ups caused by fender benders, do NOT use the pro-sign *BREAK* and do NOT use the 911 codes below. These are for emergencies ONLY. An emergency is defined as a situation in which there is an immediate threat to life or property.

Your GOOD JUDGEMENT and COMMON SENSE are the best instructions available – USE THEM!

911 ACCESS CODES

Dallas	9110	Texas DPS	9115
Garland	9111	Duncanville	9116
Richardson	9112	Irving	9117
Carrollton	9113	Grand Prairie	9118
Farmers Branch	9114	Highland Park	9119

Key up, identify yourself by callsign and dial the normal patch access code followed by the digits above for the appropriate agency while continuing to transmit. Then release the PTT button.

If you are not sure which agency to call, use the Dallas code and they will transfer your call to the appropriate agency.

GLOSSARY

73: Best wishes...a ham's way of saying good-by on the air.

88: Hugs and kisses.

Access Code: a series of numbers which, when punched into a DTMF keypad while depressing the PTT switch, allow the user to access the autopatch or other repeater functions.

Autopatch: an electronic interface between the repeater and telephone lines, allowing two-way communication between an amateur radio station and a local telephone customer or emergency agency.

Back Door: a communications system used only by control operators to contact the repeater for maintenance or programming functions.

Bozo Alert: a message sent by the repeater when a transmission exceeds the allowed length of time (usually 3 minutes or less) between courtesy tones, causing the machine to time-out (shut down).

Break: pro-sign given by an amateur station with emergency traffic, asking the users of the repeater to yield the frequency in order to handle the emergency. Only used when there is an immediate threat to life or property.

Controller: an electronic device, which interfaces the repeaters' radios, duplexers and other equipment. The controller is the brains of the repeater.

Control Operator: DARC officials who monitor the repeater for illegal use and who maintain a backdoor connection with the repeater controller for command and control functions.

CTCSS Tones: Continuous Tone Coded Squelch System, which are sub-audible tones sent by a transmitter to a repeater which, upon receipt by the CTCSS-enabled repeater, will allow the transmitted signal to be retransmitted by the repeater. Also known as a PL tone.

Courtesy Tone: a tone or series of tones sent by the repeater to acknowledge successful contact immediately after you let up on the PTT button of your transmitter.

DTMF: Dual Tone Multi Function. Also known as telephone touch tones. Many of today's transceivers have a DTMF keypad as part of the radio or microphone.

Ducting: unusually long propagation of radio signals due to temperature inversions or tropospheric conditions.

Duplex: the ability to receive and transmit simultaneously. A repeater operates duplex.

Emergency Traffic: communications dealing with an immediate threat to human life or property.

FCC: the Federal Communications Commission.

Full Quieting: when your transmitted signal is strong enough to reach the repeater without any white noise. A signal which completely quiets all weak signal noise is said to be full quieting. Note this term does not convey any description of audio quality, only signal strength.

HT: a handi-talkie, a hand-held transceiver, usually sold with an inadequate rubber duck antenna.

Kerchunking: the illegal practice of briefly keying a transmitter with an unidentified, unmodulated signal on a repeater's input frequency. Offenders who kerchunk usually do in expectation of determining whether their radios are strong enough to operate the repeater. Their operating ethics are not strong enough for them to ID.

Key Up: another term for depressing the PTT button on a transceiver's microphone.

Keypad or Touch-Tone: a telephone-style set of push buttons which are numbered 0 - 9, # (pound) and * (star or asterisk), which are used to send DTMF signals to the repeater or another transceiver.

Lid: a radio amateur who either doesn't know how or doesn't care to operate correctly. If it's the former, then he or she needs training and encouragement improve his or her operating practices. If it's the latter and he or she does not improve, they are to be shunned as poor operators and, if serious enough, reported to the FCC.

Machine: slang term for the repeater system.

PL Tone: see CTCSS tone above.

PTT Switch: Push To Talk. A button, usually found on one side of a mobile microphone which, when pressed, activates the transmitter side of a transceiver radio.

Rubber Duck: the flexible short antenna that is typically provided with the sale of an HT, a poor antenna.

QSO: a conversation on the air.

Quieting: the effect a strong received FM signal has of capturing the receiver so as to completely eliminate all other signals or noise.

Public Service Event: an opportunity for radio amateurs to serve charitable or civic agencies, while also practicing the skills that would be necessary in time of emergency.

RACES: Radio Amateur Civil Emergency Service.

Repeater: a system designed to immediately retransmit all signals received on its input frequency at high power on its output frequency, with a centrally located and tall antenna, so as to greatly increase the range of operation for weak or mobile stations.

Simulated Emergency Test: a practice run to train for disaster response of any type. It includes debriefing and evaluation afterward.

Simplex: a communications mode whereby two or more stations utilize the same frequency for transmit and receive.

Skywarn: an official net for trained storm spotters. Skywarn nets are called at the request of the National Weather Service or a civil entity, such as the City of Dallas.

Skywarn School: a class conducted by the National Weather Service to train storm spotters.

Squelch Tail: a brief unmodulated carrier sent by the repeater after you release the PTT button. During this period, all stations should wait until the carrier drops.

Time-Out: a situation where the repeater controller automatically shuts down the machine when it detects an unbroken transmission exceeding the allowable transmission time (typically 3 minutes or less). This is done to ensure compliance with FCC regulations and DARC rules.

Turkey: an unauthorized user who deliberately makes illegal transmissions. A turkey may or may not be licensed. See *lid*.

W5FC: the callsign of the Dallas Amateur Radio Club, as licensed by the FCC.

Your questions, suggestions, and feedback are welcomed by the Dallas Amateur Radio Club. Please direct your comments to any club officer or board member. See the club website or write to us at:

The Dallas Amateur Radio Club Inc.; P.O. Box 744266; Dallas, Texas 75374-4266.

www.w5fc.org