

Citizens Band Emergency Radio Network (CBERN):

Citizens Band radios offer reasonably good performance at low cost. A new CB radio costs in the range of 40 dollars. When combined with a high-quality mag-mount or fixed mobile antenna one can attain mobile-to-mobile coverage of 7 to 10 miles and mobile-to-base coverage of upwards to 20 miles. Hand-held CB radios, with careful antenna selection, can offer coverage range to a base unit of 3 or more miles.

Used CB radios are often available at garage sales for reasonable prices. It is quite common to find CB mobile or base radios selling for 10 to 20 dollars or less at estate or garage sales during the summer months. Such low-cost communications equipment allows anyone to establish a basic emergency communications capability at little cost.

The combination of low-cost equipment, lack of formal licensing procedures, and universality of the Citizens Band Radio Service can be of great benefit for those wishing to establish a community network.

CB Limitations:

CB radios work best in deep suburban areas, smaller cities, and rural locations. CB is generally a poor option in major metropolitan areas for a variety of reasons, including:

- Interference from unintentional radiators and power line leaks.
- Intentional interference from a sub-culture of users.
- Excessive demand on the limited number of channels.

Radio Relay International therefore recommends that CB radio use be limited mainly to areas outside of major metropolitan areas. If one requires communications in an urban environment, far more flexible options exist in the form of GMRS radios or direct use of Amateur Radio frequencies operating in the licensed, VHF or UHF spectrum.

CB radio frequencies are also subject to “skip” conditions at various times during the sun-spot cycle. This can result in interference from distant stations and an increased noise floor on 40 available channels. If using CB radio, users should install the highest performance antenna system practical for both mobile and base operation to ensure connectivity during periods when the noise floor on the selected channel(s) increases. One should also be prepared to deal with the occasional abuses that go with any unlicensed, unregulated radio service.

Network Purpose:

The CBERN program is designed to provide basic emergency communications and coordination for those who do not require the full complement of capabilities offered by the Amateur Radio Service. The CBERN program can be built around three fundamental purposes:



1. Provide a sense of community and a forum for discussion devoid of big-tech censorship.
2. Create and enhance mutual assistance between members of a community.
3. Provide effective emergency communications and situational awareness data in time of emergency, particularly during events that result in commercial system outages.

Two-way radio networks are ideal for promoting spontaneous problem solving. The fact that all members of the group can overhear communications often facilitates collaboration and the sharing of important information that leads to effective solutions for emerging problems.

Obviously, a CBERN organization can prove extremely valuable in the event of a cellular telephone or Internet outage such as that which occurred after the terrorist attacks of September 11, 2001 or that which occurred during the aftermath of the Nashville bombing. A CBERN program can also prove quite useful in areas subject to major hurricanes, earthquakes, and other natural disasters.

Training:

Members of a local CBERN should be trained in:

- Basic radiotelephone net procedures
- The proper use of the standard, universal radiogram format.
- The proper formatting of basic messages including the Radio Relay International Situational Awareness (SITREP), Operational Readiness (OPRED), and Weather Observation (WXOBS) message formats.

Weekly Nets:

Members participate in a weekly on-air gathering called a “net.” These net sessions are used to practice emergency communications procedures. Activities include:

1. Reporting into the net.
2. Exchanging signal reports.
3. Practice receiving radiogram messages.
4. Practice transmitting radiogram messages.
5. An occasional discussion topic designed to promote emergency preparedness.

Calling versus watch-frequency:

Weekly nets and emergency operations should occur on the selected emergency channel; typically, CB channel 3.

General conversation or routine message exchange between any two stations should typically use an adjacent channel, such as channel 2 or 4. The channels used may vary to accommodate existing users, such as a nearby business using a specific channel to coordinate incoming deliveries via



commercial trucking. The goal is to be a “good neighbor,” as opposed to causing difficulties for nearby businesses and other user groups.

Calling frequencies work as follows (when a net is not in session):

1. Call your station on the primary net channel. Move to an adjacent channel to converse.
2. Return to the calling/net frequency when the conversation or message exchange is complete.

Call signs:

The FCC no longer issues call signs for CB radio frequencies. Therefore, the sponsoring ham radio club, or CB radio organization should assign unit numbers or another form of identifier to participants. For example: “Unit 3 calling Net Control, OVER.” A roster of registered CBERN members should be developed and updated periodically. This roster can be shared with members to facilitate coordination.

Amateur Radio Interface:

CB radio networks have limited range. This is often an advantage in that networks can be layered by geographic area. However, for maximum flexibility in time of emergency, the CB network should operate under the control of a radio amateur or ham radio organization that also provides a “gateway.” This gateway operator/station can take messages from the CB network to Amateur Radio Service networks with connectivity to local emergency management, police and fire service, or the International Traffic System to reach families or agencies far outside the local area.

The ham radio club, emergency communications group, or CB club is also responsible for providing the standardized Radio Relay International training to ensure universal procedures are in place to facilitate interoperability across all radio services.

Volunteer organizations active in disaster response (VOADs), such as search and rescue teams, faith-based groups, or relief organizations can use the CBERN system to ensure access to upper-level ham radio networks with direct access to local, state, and national agencies and organizations.

Health and Welfare Traffic:

In the event of a major disaster, the CBERN organization can provide a method to accept basic radiogram (radio-telegram) messages – like brief email messages – addressed to individuals anywhere in North America. For example, if someone in a community where cellular data networks and the Internet are disrupted would like to send a welfare message to a relative elsewhere in North America, this “radio-telegram” or “radiogram” message can be originated on the CB net and transferred to the Amateur Radio iNTS network, where it will be routed to its destination for delivery. Replies are routed in a similar fashion.



Establishing your CBERN group:

A CBERN can be established in any community. It is often a simple matter of circulating fliers or posting an invitation in a local newspaper or via broadcast or social media. “Preppers,” volunteers associated with relief organizations, volunteer fire fighters, scouting organizations, and similar individuals are all potential members of a CBERN. Ideally, the sponsoring individual or entity establishes the organization then issues the invitations to join.

Getting Started:

A simple 5-watt CB radio connected to a dipole antenna oriented vertically at 45 feet in the air, connected with good-quality coaxial cable, will provide excellent coverage. The total cost of such an installation will typically be less than 100-dollars.

Mobile installations are similar in cost. A five-watt CB radio connected to a 102-inch CB whip antenna will provide excellent mobile coverage throughout much of a county. Lower profile antennas are also available, but communications coverage is reduced somewhat.

A base CB unit can be installed at any convenient location in a home or workshop. Select a location that allows other family members access in time of emergency. Ensure that all are trained in the use of the transceiver along with proper radiotelephone procedures and message formatting.





An older CB base unit installed on a home-office desk. Cost: \$ 50.00 on “Craigslist.”

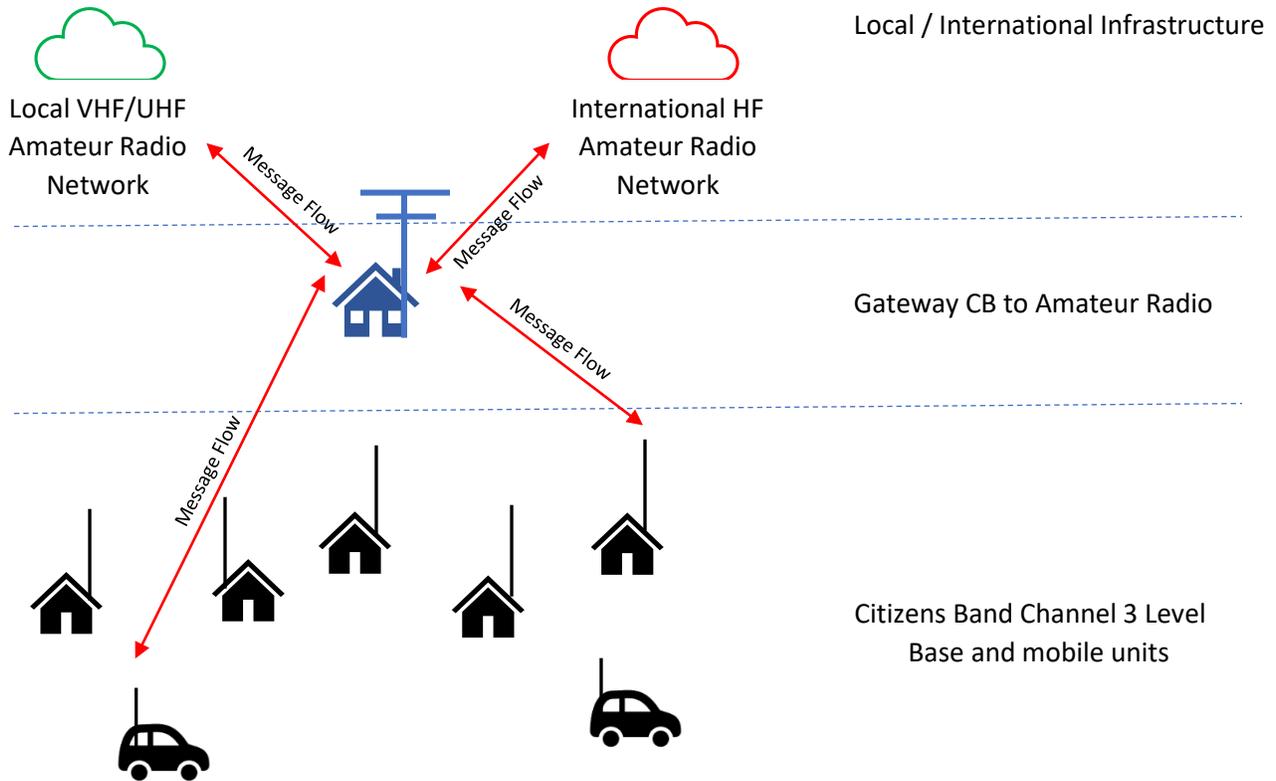
Use it or lose it:

In the era of text messaging and instantaneous cellular data communications, two-way radio may seem like an anachronism. However, two-way radios, whether operating in the Citizens Radio Service, Amateur Radio Service, or elsewhere in the radio frequency spectrum, are extremely survivable. It is for this reason that law enforcement and military services still rely on two-way radio systems and networks for critical functions.

Members of the CBERN should use the two-way radios regularly. This creates familiarities with both capabilities and limitations. It inculcates good operating practices. It ensures operational readiness. Check-in with the family on the way home from work. Let the spouse know you are going to stop at the supermarket. While all of this can be done via cell phone, remember that the idea is to exercise the two-way radio network and ensure operational readiness while having some fun with the equipment.



CBERB Topology Diagram:



ITU Phonetic Alphabet

A	Alpha	AL FAH
B	Bravo	BRAH VOH
C	Charlie	CHAR LEE
D	Delta	DELL TAH
E	Echo	ECK OH
F	Foxtrot	FOKS TROT
G	Golf	GOLF
H	Hotel	HOH TELL
I	India	IN DEE AH
J	Juliett	JEW LEE ETT
K	Kilo	KEY LOH
L	Lima	LEE MAH
M	Mike	MIKE
N	November	NO VEM BER
O	Oscar	OSS CAR
P	Papa	PAH PAH
Q	Quebec	KEH BECK
R	Romeo	ROW ME OH
S	Sierra	SEE AIR RAH
T	Tango	TANG GO
U	Uniform	YOU NEE FORM
V	Victor	VIK TAH
W	Whiskey	WISS KEY
X	X-ray	ECKS RAY
Y	Yankee	YANG KEY
Z	Zulu	ZOO LOO

Procedural Phrases:

I SPELL Indicates word or mixed group to be spelled phonetically.

FIGURES Indicates group consisting only of numbers and special characters.

INITIALS Indicates group consisting only of letters, such as an acronym, abbreviation, etc.

Examples:

1. Walters, **I SPELL**, Whiskey, Alpha, Lima, Tango, Echo, Romeo, Sierra
2. **FIGURES**, 4 8 2 0 3. Note: If a number is not preceded by the proword **FIGURES**, it is assumed to be written out. For example, "twenty one" versus "FIGURES 2 1." Never "chunk" numbers
3. **INITIALS**, Mike, Charlie, Romeo, Delta, **INITIALS**, Romeo, Tango, Bravo, November.... [Transcribed: MCRD RTBN]
4. Avoid unnecessary phrases, which waste valuable circuit capacity, such as:
 - "Telephone with area code"
 - "Amateur Call" (Use "I SPELL" instead)
 - Preamble titles, such as "station of origin," "check," "place of origin," etc.

Remember! Brevity and economy of language preserve critical circuit capacity in time of emergency.

Basic CBERN Radiotelephone Procedure Examples:

Calling Net Control: Net Control, this is Unit 2, OVER (reply expected)

Calling another station: Unit 1 this is Unit 2, OVER

Direct to working channel: Unit 1 move to Channel ____, OVER

Acknowledge move to working channel: This is unit 1, roger, OUT (no reply expected)

Acknowledging a radiogram message: Unit 3, roger message number ____, OUT.

Acknowledging a tactical message: Unit 3, roger, Out.

Requesting a fill in a message: Say again, word after _____, OVER
Say again, word before _____, OVER
Say again, from _____ to _____, OVER

Signal Reports: Loud and clear
Good readable
Weak readable
Weak unreadable

Prowords (“procedural words”): ROGER: Received and Understood.
OVER: Reply expected.
OUT: No reply expected (like hanging up the phone).

Message priority: ROUTINE: Not time-sensitive; low importance.
WELFARE: Pertaining to the wellbeing of an individual.
PRIORITY: Time sensitive in nature or official message.
EMERGENCY: Life-critical or immediate safety critical.

Operational recommendations:

1. Develop a grid map for CBERN coverage area to quickly identify general location.
2. Participants should keep a basic radio log with time and summary of important communications.
3. Practice communications security. Do not reveal base-station locations on-air.
4. Use the network regularly for routine activities to become familiar with capabilities and limitations.
5. Specify a secondary and tertiary watch channel for use in the event of skip, harassment, or other interference.
6. Affiliate with REACT, RRI and other appropriate organizations to provide community service.
7. If channel-9 priority over-ride capability is available on one’s CB radio, enable this feature unless skip interference is present.