



AUXNET

Cache Two-Way Radios

D1SR Auxiliary Communications Team (ACT)
July 2017



U.S. Coast Guard Auxiliary First District, Southern Region

First and Foremost

Agenda

- The purpose of this training
- Why don't we just use cell phones?
- What is a "cache radio"?
- What are the VHF Marine channels?
- What are the AUXNET channels?
- What are the Weather channels?
- Simplex and repeater channels
- Radio call signs
- Calling another radio
- Operating the Vertex VX900V cache radio
- The AUXNET, Marine, and Weather zones
- Channel scan
- Unit ID

The Purpose of this Training

- AUXNET cache radio training is designed to be presented at the Flotilla and Division level by FSO-CM's or SO-CM's to personnel who will be operating VHF portable or mobile radios on a temporary basis.
- Cache radio training should be presented regularly to all Auxiliary members and especially in advance of exercises and emergencies where cache radios may be used.
- This training does not substitute for the TeleCommunications Operators (TCO) Personal Qualification Standard (PQS) which is needed for establishing a fixed or mobile radio facility.

Why don't we just use cell phones?

Practically everyone has a cell phone and it's logical to ask why we in the Coast Guard don't just use cell phones. We don't (and no public safety professional does) with good reason! When it comes to durability, battery life, practicality, reliability and security, two-way radios consistently come out on top, considerably outperforming consumer devices.

- **One-to-many calling** – When you need to send an urgent message to multiple people, would you rather make multiple phone calls, or just one two-way radio call? And when you need help, would you rather dial a phone number and hope that the person answers, or make one two-way radio call heard by everyone in range? Cell redundant phone calls waste time and energy while two-way radios allow communications with large groups of radio users at the push of a button.
- **Private Network** – Our radios operate on private government-only channels. We don't pay a monthly bill, and we keep talking should the cellular system fail or become busy in a major emergency.
- **Battery Life** – Two-way radio batteries can last up to 17 hours, 4 times more than many cell phones.
- **Durability** – Cell phones are three times more likely to fail, with the leading cause being drops. Public safety two-way radios are designed for rough public safety use, typically designed to withstand drops from four feet.
- **Multiple channels** – We can program the VHF Marine channels, weather channels, Coast Guard channels, and other government agencies into one two-way radio. This is impossible for a cell phone.

What is a “Cache Radio”?

A “*cache radio*” is a radio that is stored in a predetermined location to be sent to an incident.

Cache portable radios have been assigned to the following D1SR elements:

- Each Division
- Each Flotilla (according to their Division’s distribution plan)
- Aviation
- D1SR staff positions
- The ADSO-CM’s for Sector New York and Sector Long Island Sound
- The D1SR Communications Trailer

Once a cache radio is assigned to a Division, Flotilla, or Aviation unit, that unit becomes the owner and assumes full responsibility for:

- Carrying the radio on the unit’s inventory.
- Maintenance of the radio, including battery replacement.
- Proper user training.
 - Training is contained in this presentation – TCO is not required for the use of a cache radio.

Return a cache radio to where it was assigned to you at the beginning of your shift.

Commonly Used VHF Marine Radio Channels

These are commonly used VHF Marine channels:

Channel	
6	Ship-to-ship safety, SAR communications to Coast Guard from ships and aircraft.
8	Commercial. Working channel for working ships only.
9	Alternate calling channel for non-commercial vessels.
10	Commercial. Working channel for working ships only.
11	Port Operations. Used to direct ship movements.
12	Port Operations. Used to direct ship movements.
13	Bridge-to-bridge. Used by vessels to clarify their intentions in meeting and passing situations.
14	Port Operations. Used to direct ship movements.
16	Distress and Calling. Used to get the attention of another station (calling) or in emergency (distress).
17	Law Enforcement. Communications to/from state or local governments to their boats.
21A	Coast Guard only. Coast Guard working frequency.
22A	Coast Guard to civilian. Liaison channel for communications between Coast Guard units and civilian stations. Also used for marine information and request broadcasts and for marine assistance broadcasts (MARBs).
23A	Coast Guard only. Coast Guard working frequency.
81A	US Government only.
82A	US Government only.
83A	US Government only.

What are the AUXNET Channels?

AUXNET channels are special government frequencies set aside for the Auxiliary.

- AUXNET channels are not in VHF Marine Band radios.
 - You will not be heard by the boating public.
- VHF Marine channels are limited to use by boats, AUXNET channels have no such restriction, and can be used anywhere for Auxiliary purposes.



AUXNET channels can be used for any of the following purposes:

- Coordinating authorized Auxiliary activities in support of CG operations
- Augmenting the Coast Guard communications system, when required
- Communicating urgent matters of official Auxiliary business
- Training
- Assisting national resources in time of disaster

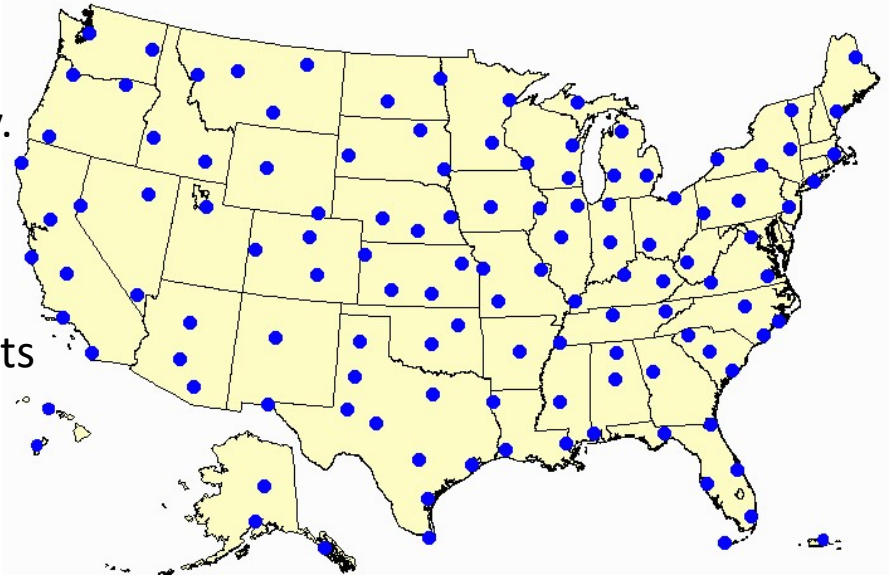
Weather Zone Radio Channels

The National Oceanic and Atmospheric Administration (NOAA) operates radio stations throughout the US that broadcast 24 hours a day. These stations transmit weather and other conditions of value to the mariner.

NOAA weather stations also transmit special alerts regarding hazards such as major storms, flooding, and other situations of immediate concern to citizens.*

There are seven NOAA weather channels and your cache radio is programmed with each. Use the radio's channel selector to move from channel to channel until you hear the weather station broadcasting in your area.

* You can purchase a weather radio for your home that will automatically turn on when NOAA transmits a special weather alert.



Zones and Channels

Public safety grade two-way radios typically have 16 channels. But we need many more than 16 channels to perform our jobs.



We use “zones”, and program each zone with 16 channels logically grouped.

- Your need to switch zones should be minimal.
- Cache radios typically have three zones – the VHF Marine channels, the AUXNET channels, and the Weather channels.
- Get familiar with the type of radio you are using as each radio type will use a different button to change zones.



The Vertex cache radio has its “A” button programmed to change zones.



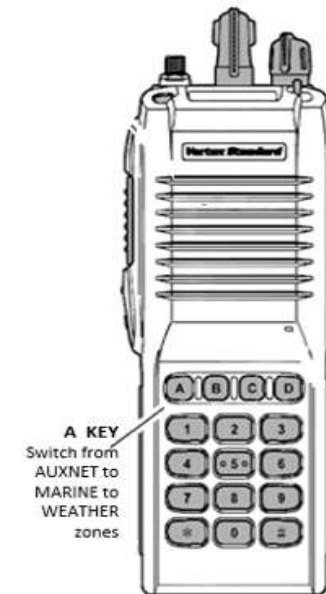
Zones and Channels

The following zones are programmed into the VX900 cache radio:

Zone	Channel Position	Channel Name
AUXNET	1	NAT SPX
AUXNET	2	AUX TAC2
AUXNET	3	D1SR TAC
AUXNET	4	STOWE
AUXNET	5	LK GEOG
AUXNET	6	ALBANY
AUXNET	7	HIGHLAND
AUXNET	8	HUDSON
AUXNET	9	NY CITY
AUXNET	10	SEWARN
AUXNET	11	S HOOK
AUXNET	12	CENT LI
AUXNET	13	EAST LI
AUXNET	14	N LONDON
AUXNET	15	N HAVEN
AUXNET	16	SPL EVNT

Zone	Channel Position	Channel Name
MARINE	1	MAR 06
MARINE	2	MAR 08
MARINE	3	MAR 09
MARINE	4	MAR 10
MARINE	5	MAR 11
MARINE	6	MAR 12
MARINE	7	MAR 13
MARINE	8	MAR 14
MARINE	9	MAR 16
MARINE	10	MAR 17
MARINE	11	MAR 21A
MARINE	12	MAR 22A
MARINE	13	MAR 23A
MARINE	14	MAR 81A
MARINE	15	MAR 82A
MARINE	16	MAR 83A

Zone	Channel Position	Channel Name	
WX	1	162.400	Receive only
WX	2	162.425	Receive only
WX	3	162.450	Receive only
WX	4	162.475	Receive only
WX	5	162.500	Receive only
WX	6	162.525	Receive only
WX	7	162.550	Receive only

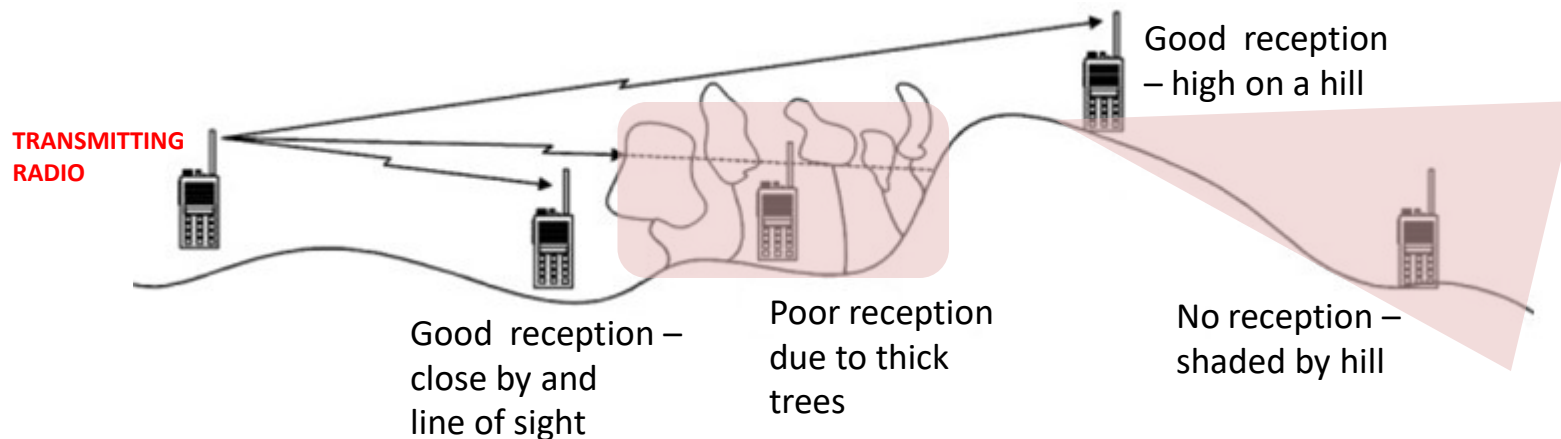


Simplex and Repeater Channels

There are two types of radio channels, simplex and repeater. Almost all VHF Marine and Coast Guard channels are simplex.

Radios on a simplex channel talk directly to each other (because of this simplex is often called “point-to-point”).

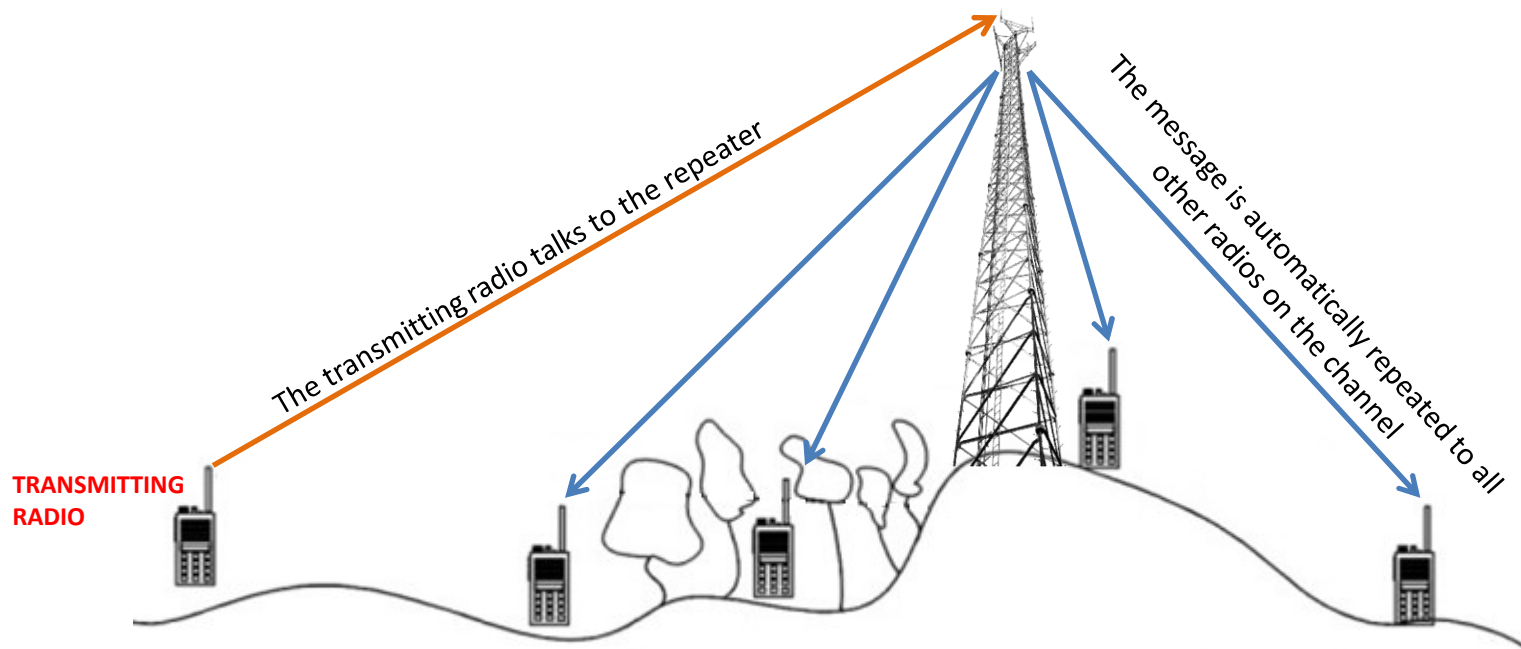
You should expect the range between two portable radios to be about 1 to 1½ miles, less when obstructions such as thick trees, buildings, and hills are present.



Simplex and Repeater Channels (continued)

A repeater is a base station located on a tall building or mountain and is used to extend the range of portable and mobile radios.

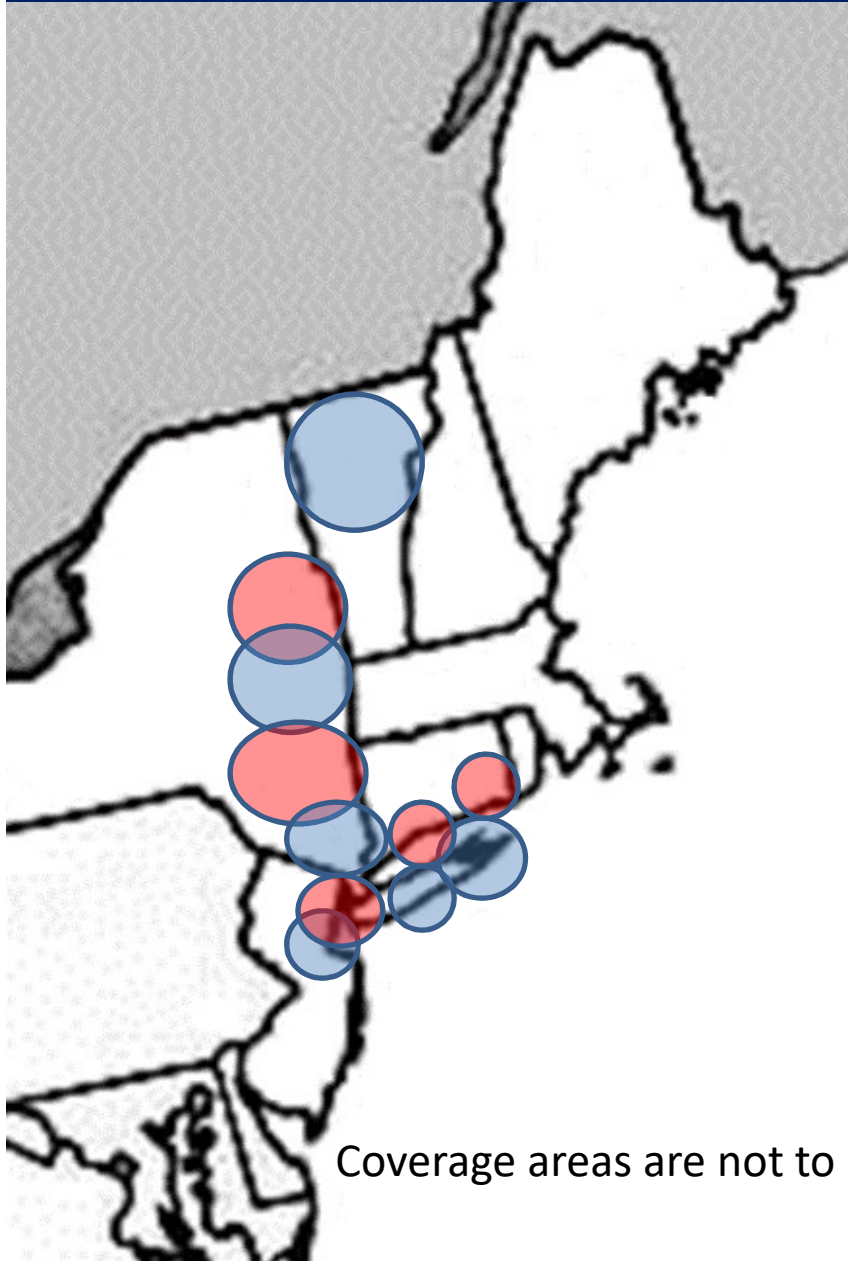
A repeater can extend portable radio range to distances of 20 miles or more.



Careful – you can hear the repeater much further than you can talk to it from a portable radio. And remember, everyone on the repeater can hear everything that you say!

AUXNET Repeaters

There are 12 AUXNET repeaters in D1SR, and portable ones that can be taken to special events or emergencies.



Coverage areas are not to scale.

CHANNEL NAME	LOCATION
STOWE	Stowe, VT
LAKE GEORGE	Lake George, NY
ALBANY	Clarksville, NY
HIGHLAND	Highland, NY
HUDSON	Ossining, NY
NEW YORK CITY	New York City
SEWAREN	Woodbridge, NJ
SANDY HOOK	Sandy Hook, NJ
CENTRAL LI	Babylon, NY
EASTERN LI	Riverhead, NY
NEW HAVEN	New Haven, CT
NEW LONDON	New London, CT
SPECIAL EVENT	Multiple, Deployable

Simplex and Repeater Channels (continued)

Some things to consider...

If you are on a repeater channel but out of the repeater's range, you cannot talk, even to another radio that might be next to you.

Everything said through a repeater is heard by everyone on the channel.

Use simplex channels for short-range communications and use the repeaters for long-range communications only.

Radio Call Signs

You must use a radio call sign when using two-way radios that operate on VHF Marine channels or on US Coast Guard channels. Do not use a cache radio without being assigned a call sign.

If you are using a cache radio on a marine or aviation facility that has its own assigned call sign, you can use that call sign for the cache radio also.

Call signs for special events are issued by your FSO-CM, your SO-CM, or by the Coast Guard command you're assigned to. Cache radios will be assigned a "tactical call sign" that is only valid for the duration of the event.

Some typical tactical call signs are:

- Station Sandy Hook gate guard
- Auxiliary dock master
- Auxiliary sign-in desk

The four digits engraved onto cache radios can also be used as a tactical call sign.

Certain D1SR staff positions have been assigned call signs, these are listed in the D1SR Communications Manual.

Calling Another Radio

When you want to call another radio:

- Make sure that your radio is set to the proper channel.
- Listen before you transmit to make sure you are not interrupting an on-going conversation.
- Press the transmit button, and then speak clearly into the microphone.
- Mention the call sign of the person you are calling first, then your own call sign. For example:
 - “Station New York, this is Auxiliary dock master, over.”
- End each transmission with the word “over.” End your last transmission with “out” when you don’t expect any further answer from the station you are talking to.
- If you can’t make contact with the station you are calling, you might be out of range, on the wrong channel, or the other station’s radio is not on. After calling two or three times, stop calling. Wait a few minutes and try your call again.
- Stay professional – no “10-4” or “got your ears on.” Make sure you get adequate training and listen to other Coast Guard units to hear what they sound like.
- Practice makes perfect – use two-way radios whenever possible.

The instructor should hand out portable radios to students for practice.

Practice Radio Calls

The instructor should hand out portable radios to students for practice.

Give your students a few scenarios and have them make actual radio calls on a simplex channel. Make the announcement that “this is a drill” on the channel at the start and end of each transmission. Here are some suggested scenarios:

- Assign one trainee the tactical call sign “AUX Gas Dock” and have them make radio calls to and receive radio calls from various AUX and CG boats.
- Assign one trainee the tactical call sign “AUX 123 Portable 1” and have them make radio calls to and receive radio calls from the facility they are on (AUX 123) and various AUX and CG stations.
- Assign one trainee the tactical call sign “Station Anywhere Security” and have them make radio calls to and receive radio calls from Station Anywhere regarding security and parking conditions around the station.

Confirm that each call ends with “over” or “out” and that the trainee mentions the call sign of the other radio station first, followed by their own call sign. Instruct them that, upon hearing “out” from another station, they don’t say anything further unless they have to send additional traffic to that station. Provide training on other prowords such as “standby”, “wait one”, “repeat all after ____”, the use of the phonetic alphabet, etc.

Do not make any training calls that might be confused with actual emergency situations by someone listening to the channel.



Operation of the Vertex VX900 Cache Portable Radio



D1SR Auxiliary Communications Team (ACT)
July 2017



U.S. Coast Guard Auxiliary First District, Southern Region

First and Foremost

The Vertex VX900 Portable Radio



The VX900 is a professional grade portable two-way radio.

- VHF (134 – 160 MHz)
- 512 channels
- 3 zones of 16 channels each
- 5 watt transmitter
- .7 watt audio
- Battery life of at least 13 hours
(5% receive, 5% transmit, 90% standby)

Accessories include:

- Rechargeable battery
- Remote speaker microphone
- Single and six unit battery chargers
- Belt clip
- Side connector cover

(Not all accessories are provided)

The instructor should hand out portable radios to students for practice.



SIDE CONNECTOR COVER



SINGLE UNIT BATTERY CHARGER

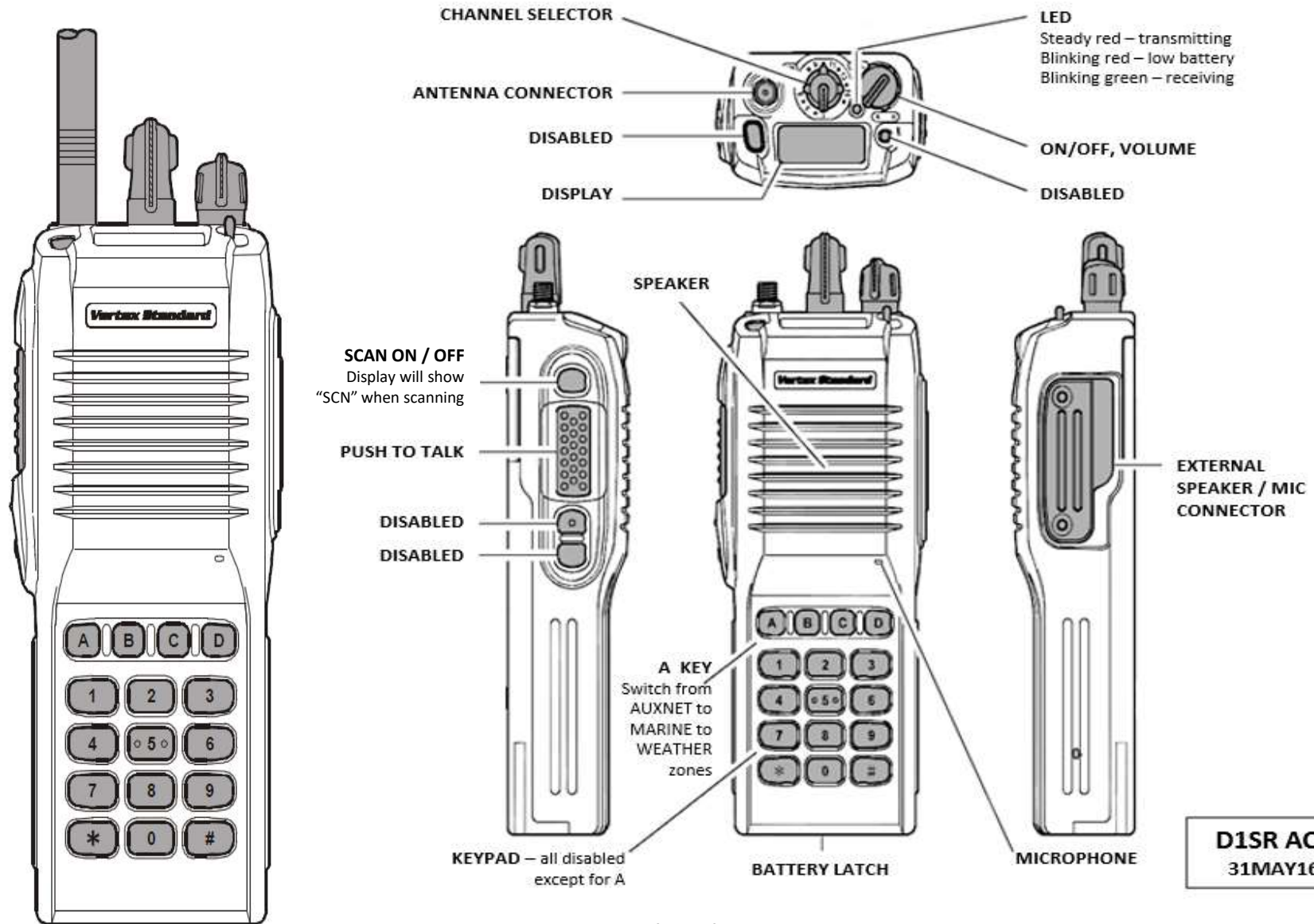


REMOTE SPEAKER MICROPHONE



SIX UNIT BATTERY CHARGER

The Vertex Radio's Controls

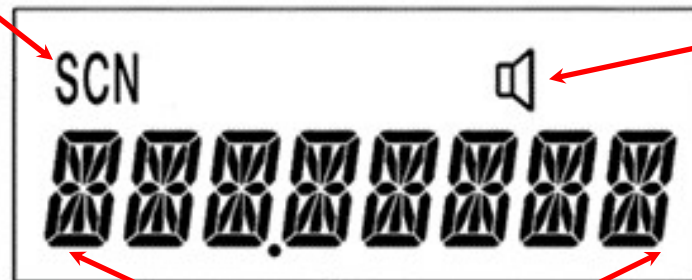


D1SR ACT
31MAY16

The Vertex Radio's Display

The radio is scanning

The selected channel receives in carrier squelch. (Receives in tone squelch if symbol is not displayed.)



The name associated with the selected channel

Source for Accessories

Chargers and batteries are available from Power Products

Larry Sanders, Sales Director

800-529-1618 ext. 122

Single-unit charger
TWC1-VX3, \$31.90



Rechargeable battery
BP3627LI, \$39.00



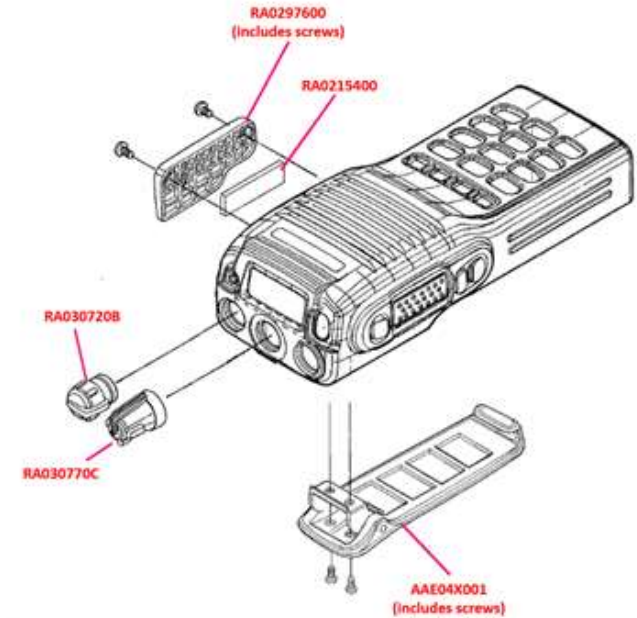
Mobile single-unit charger
TWC1M-VX3, \$47.90



Six-unit charger
TWC6M, \$289.00



Knobs, side covers, and belt clips are available from Vertex Standard



Each of the above parts are available from Vertex Standard, 800-283-7839. Prices quoted are:

Side cover (includes screws)	RA0297600	\$ 1.13
	RA0215400	\$ 0.33
Volume knob	RA030720B	\$ 2.00
Channel knob	RA030770C	\$ 1.80
Belt clip (includes screws)	AAEO4X001	\$ 8.00
Antenna	ARV-8B	\$ 14.00

Vertex Zones and Channels

The following zones are programmed into the VX900 cache radio:

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Zone	Channel Position	Channel Name	
WX	1	162.400	Receive only
WX	2	162.425	Receive only
WX	3	162.450	Receive only
WX	4	162.475	Receive only
WX	5	162.500	Receive only
WX	6	162.525	Receive only
WX	7	162.550	Receive only



AUXNET Zone

The following channels are programmed into the AUXNET zone:

Zone	Channel Position	Channel Name
AUXNET	1	NAT SPX
AUXNET	2	AUX TAC2
AUXNET	3	D1SR TAC
AUXNET	4	STOWE
AUXNET	5	LK GEOG
AUXNET	6	ALBANY
AUXNET	7	HIGHLAND
AUXNET	8	HUDSON
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AUXNET	10	SEWARN
AUXNET	11	S HOOK
AUXNET	12	CENT LI
AUXNET	13	EAST LI
AUXNET	14	N LONDON
AUXNET	15	N HAVEN
AUXNET	16	SPL EVNT

Simplex channels. Use these when you are close to the other station(s) to keep the wide area repeaters free.

Repeater channels. Named for where the repeater is located.

Marine Zone

The following channels are programmed into the Marine zone:

Zone	Channel Position	Channel Name
MARINE	1	MAR 06
MARINE	2	MAR 08
MARINE	3	MAR 09
MARINE	4	MAR 10
MARINE	5	MAR 11
MARINE	6	MAR 12
MARINE	7	MAR 13
MARINE	8	MAR 14
MARINE	9	MAR 16
MARINE	10	MAR 17
MARINE	11	MAR 21A
MARINE	12	MAR 22A
MARINE	13	MAR 23A
MARINE	14	MAR 81A
MARINE	15	MAR 82A
MARINE	16	MAR 83A

Calling – alternate to CH 16 for non-commercial vessels

VTS – Initial calls to VTS New York

VTS – Arthur Kill, KVK, East River, Western Raritan Bay, anchorage admin.

Bridge to Bridge

VTS – Hudson River, Hackensack River, Lower Harbor, Sandy Hook Channel, Raritan Bay

Distress and Calling

Law Enforcement

Civilian to Coast Guard

US Government

Weather Zone

The following channels are programmed into the Weather zone:

Zone	Channel Position	Channel Name	
WX	1	162.400	Receive only
WX	2	162.425	Receive only
WX	3	162.450	Receive only
WX	4	162.475	Receive only
WX	5	162.500	Receive only
WX	6	162.525	Receive only
WX	7	162.550	Receive only



NOAA Weather Channels.

At least one should be heard in any part of the country. These are receive only channels

Channel Scan

Channel Scan allows you to hear activity on multiple channels.

- When the scanner is on, the radio will search all of the channels in your selected zone, and the “SCN” in the top display will appear.
- When one of the channels becomes active, you will hear that conversation.
- If your “priority channel” (the channel selected by the channel knob) becomes active, the radio will switch to that channel even if it is listening to a conversation on another channel.
- When a channel becomes inactive, scanning will resume.

To activate scanning:

- Press the side button above the push-to-talk button.
- The scanner will turn on, and the display will blink.

To stop scanning:

- Press the side button above the push-to-talk button
- The scanner will turn off, and “SCN” will disappear from the display



SCAN ON / OFF
Display will show
“SCN” when scanning



Unit ID

- The portable radio will transmit its unique Unit ID number each time it transmits on an AUXNET channel
- No Unit ID is transmitted on VHF Marine channels.



Review

- Radios that are stored at a particular location for use in an emergency or large-scale event are called “cache” radios.
- Auxiliarists using cache radios need only familiarization training.
- Two-way radios are superior to cell phones – they offer one-to-many calling, operate on government channels and the Marine band channels, don’t have monthly billing, have extended battery life and durable construction.
- AUXNET radio channels are assigned by the government for use by the Auxiliary. These channels cannot be heard by civilians on Marine band radios.
- AUXNET channels can be used for any Auxiliary business, on or off the water.
- Simplex channels are for short range use, about 1 mile. Repeater channels provide extended range.
- You must have a call sign to use a two-way radio.
- There is a “special language” we use on Coast Guard and Marine channels.



Homeland Security

Questions, Answers, and Discussion

