

ARES®/RACES Operations Manual

Scanners for ARES/RACES

Here we are not talking about optical scanners as used on computers, but about radio receivers that can be set to monitor and/or scan various frequencies or channels. The question we want to answer is:

How can a scanner be useful for ARES/RACES operations?

There are a large number of scanner models on the market today. Some are designed for specific uses such as monitoring auto race-track communications. Others are designed to provide weather alerts transmitted from the National Weather Service (NWS) via the National Oceanic and Atmospheric Administration's (NOAA) VHF radio system. Some are designed to monitor communications using the latest technology of "trunked" systems. Some of the latest models will scan both conventional and trunked systems at the same time. Regardless of the frequency coverage, all scanners manufactured today must block cell phone frequencies. Scanners are also designed in various package styles. Most popular are handheld, mobile, and desktop. If your Amateur Radio transceiver has extended receive capability or can be modified to do so, and can scan its memory channels, it can become a scanner. Regardless of the type of scanner you may have available, or purchase, it can be useful in your ARES/RACES operations.

Here are a few ideas for using scanners in ARES/RACES:

- **Listening to a scanner in a hobby setting.** Aside from using a scanner during an ARES/RACES mission or exercise, you can gain a lot of information and experience listening to a scanner during leisure time or in the background as you are doing other things. Not only do you get a "feel" for things going on in the area, you begin to hone your communication protocol skills by listening to the "professionals". Not that you are to imitate their jargon, but notice the concise manner in which they communicate, especially during tactical situations.
- **Scan and monitor other ARES/RACES frequencies** that you don't have your transceiver tuned to. For example, if you have only one transceiver at your location, you know that you are to monitor the "Coordination Net" frequency at all times. If you also have a scanner, you can set up one of its channels to monitor this frequency. If you receive a call on the net frequency, you can then switch your transceiver over for communication. You can also scan your team simplex frequency and/or other team simplex frequencies. If you are at a "Coordination Center", you can monitor other ARES/RACES district coordination frequencies (for example, Oregon District 1 on 147.320 repeater).
- **Monitor National Weather Service (NWS) broadcasts and alerts.** The NWS provides continuous weather reporting and forecasting on NOAA's several VHF frequencies. Also, severe weather announcements are provided by an alert system called Specific Area Message Encoding (S.A.M.E.). Receivers and scanners equipped with a decoder can sound a warning alert tone when one of these announcements is given. Older scanners equipped with a decoder will sound an alarm for all such announcements. Newer scanners that have the S.A.M.E. decoder will sound an alarm only for announcements to the specific area set up in the scanner. In the Portland area the VHF frequency is 162.550 MHz. The alert system is tested every Wednesday, between 11:00 AM and Noon.
- **Scan "Public Service" frequencies** (fire, police, ambulance, hospital, Life Flight, search and rescue, etc.). For example, if you are supporting Red Cross communications at a search and rescue command post, you might want to monitor the search and rescue frequency and the command post tactical channel to get an overall picture of what is happening.



It is important to remember that any information you may learn from monitoring a Public Service frequency is for your personal information only. You are not to take independent action as a result of any information you may hear. For example, in the mission above where you are supporting Red Cross, you hear the incident command post telling Dispatch that they have released the Red Cross. This information is not an official release to the Red Cross. The Red Cross is released only when Command has officially communicated this to Red Cross personnel.

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- **Scan Public Utility Dispatch frequencies.** In Clark County, the electric utility is Clark Public Utilities (CPU or commonly called PUD). CPU has primary and secondary dispatch frequencies that can provide information about electrical problems during storms and other emergencies. Their primary dispatch frequency is 451.075 MHz and their secondary dispatch frequency is 451.050 MHz.

Bonneville Power Administration is the wholesale distribution utility in the northwest. There is one common dispatch frequency of 172.525 MHz used throughout most of the northwest.

Conventional Scanners:

Conventional scanners scan and monitor specific frequencies. Until the recent technology of “trunked” systems, all services use specifically assigned and licensed frequencies. In fact, each type of service is assigned from a band of frequencies set aside for that service. Almost all services not on a trunked system can be monitored on a conventional scanner (cell phone excepted). Some trunked systems even “patch” some services over to their old frequency. For example in Clark County, the County Fire Dispatch (called Control 7 and on trunked system “talk group” ID 43248) is patched across to their 154.070 MHz frequency. The City of Vancouver Fire Department (called Control 9, “talk group” ID 43216) does not have a patch.

You will notice that in conventional radio systems, there are long gaps or pauses between transmissions if there is little traffic. Trunked systems make use of this characteristic to reduce the total number of frequencies needed by all services in an area.

Trunked Scanners:

A trunked system is a communications system where several services share a group of licensed frequencies (usually in the 800 MHz spectrum), much in the same manner as all telephone subscribers in an exchange share a group of long distant trunks. One of the trunk frequencies is automatically assigned to a user by a controlling computer (over a control channel), when service is requested. This is why, for example, an officer must wait until he/she hears a confirming “bleep” after pushing the “push-to-talk” button on their radio before actually speaking. It takes a fraction of a second for the controlling computer to assign a frequency. The computer keeps track of each type of user/service by using “talk group” IDs.

Trunked scanners (sometimes called TrunkTrackers) have to scan “talk groups” instead of specific frequencies. The trunked scanner must monitor the control channel to obtain information about the actual frequency assigned to a “talk group” during any particular transmission. In this way a trunked scanner can follow a conversation. While a conventional scanner may be able to receive and scan the actual frequencies licensed to a particular trunked system, it is difficult to follow a conversation unless there is no other activity going on at the time.

In Clark County, there are 20 frequencies licensed in the 800 MHz spectrum for its trunked system (Portland uses 30 frequencies), including one for the control channel. These frequencies are listed on Page 4 of this document. Also, is a partial listing of users/services on the system with their talk group IDs. New users are added periodically. Notice that there are more than 120 talk groups using only 20 frequencies.

Of Interest to ARES/RACES:

Following is a table showing a number of frequencies that would be of interest to ARES/RACES here in Clark County. Also, is room where you can write in any frequencies you would like to keep track of for your own reference. The right side of the table is blank for you to use to keep track of frequencies you might want to program into your conventional scanner. At the bottom of Page 4 is an example of how the “scan banks” can be set up on a trunking scanner to scan some of the various users in the Clark County trunked system.

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Clark County 800 MHz Trunked System

BANK 1 (Trunked)		
Ch	Freq.	806 Ch. # / Site
1	856.7625	10 Simulcast*
2	856.9375	09 Simulcast*
3	856.9625	20 Conv. Ridgefield (Future)
4	856.9875	15 IR Washougal/Conv. Canyon Cr.
5	857.7625	08 Simulcast*
6	857.9375	07 Simulcast*
7	857.9625	19 MDT Data Yacolt
8	857.9875	14 IR Washougal/Conv. Canyon Cr.
9	858.7625	06 Simulcast*
10	858.9375	05 Simulcast*
11	858.9625	18 MDT Data West Hills
12	858.9875	13 IR Washougal/Conv. Ridgefield
13	859.7625	04 Simulcast*
14	859.9375	03 Simulcast*
15	859.9625	17 MDT Data Goose Hill
16	859.9875	12 IR Washougal
17	860.7625	02 Simulcast*
18	860.9375	01 Simulcast*
19	860.9625	16 MDT Data Prune Hill
20	860.9875	11 IR Washougal
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		

*Simulcast Sites: WSP, Ludlum Hill, Prune Hill
Livingston Mt., Goose Hill, West Hills
MDT = Mobile Data Terminal

Scanner info can be found at:
www.trunkscanner.com

The control channel is usually Ch 18.

TALK GROUP IDs FOUND (not a complete list)						
Line	ID	Talk Group	ID	Talk Group	ID	Talk Group
1	16	Radio Maint.	43408	Fire Ops 4	46640	C-Tran T8
2	40080	VPD Training	43440	Fire Ops 5	46672	C-Tran SP
3	40112	VPD Central	43472	Fire Ops 6	46704	C-Tran Maint.
4	40144	VPD/VFD	43504	Fire Ops 7	46736	C-Tran Secur.
5	40208	VPD West	43536	Fire Ops 8	47696	St CTRL 1
6	40240	Reserve 1	43568	Fire Ops 9	47728	St CTRL 2
7	40272	Reserve 2	43600	Fire Ops 10	47760	St CTRL 3
8	40304	Reserve 3	43632	Fire Ops 11	47792	St CTRL 4
9	40912	Cowlitz Co	43664	Fire IC 12	47824	St Records
10	40944	Skamania	43696	Fire IC 13	47856	St TAC 1
11	41008	CCSO Central	43728	Fire IC 14	47888	St CTRL 9
12	41040	CCSO West	43760	Fire Marshal 1	47920	St OPS 2
13	41104	Custody 1	43792	Fire Marshal 2	47952	St OPS 3
14	41136	Custody 2	43824	WDOT	48016	ECC 1
15	41168	Custody 3	43856	LifeFlight	48048	ECC 2
16	41200	Custody 4	43888	FT JMS 1	48080	ECC 3
17	41232	Custody 5	43920	FT JMS 2	48112	ECC 4
18	41264	Custody 6	43952	Port of Vanc	48144	ECC 5
19	41296	Work Crew	43984	Fire Training	48176	ECC 6
20	41328	Industry	44016	Fire Prevention	48208	ECC 7
21	41360	CCSO Training	44048	Fire Logistics	48240	ECC 8
22	41456	BG PD City	44080	Fire Planning	48272	Clark A
23	41488	BG PD Com	44112	HAZMAT 3	48304	Clark B
24	41520	REBEL 1	44144	HAZMAT 4	48336	Clark C
25	41616	Camas PD	44336	HEAR/Hosp	44976	EAGLE 1 VPD
26	41648	Camas City	44496	AMR Dispatch	45008	EAGLE 2 VPD
27	41680	Washoug PD	44656	Control 1- Data	45040	EAGLE 3 VPD
28	41712	Washoug Com	44688	Control 2- CSO	45072	EAGLE 4 VPD
29	41776	Ridgefield City	44720	Control 3- VPD	45104	EAGLE 5 VPD
30	41808	Ridgefield Com	44752	Control 4	45136	LERN
31	41840	REBEL 2	44784	Control 5	45168	Private Sec
32	41936	LaCenter City	44816	TAC 1 CCSO	45200	Records
33	41968	LaCenter Com	44848	TAC 2 CCSO	45328	Com Trng
34	42000	REBEL 3	44880	TAC 3 CCSO	45392	SWAT
35	43216	Control 9 CFire	44912	TAC 4 CCSO	45424	WSP Mon
36	43248	Control 7 VFD	44944	TAC 5 CCSO	46416	C-Tran T1
37	43280	Fire Ops 2	46512	C-Tran T4	46448	C-Tran T2
38	43312	Fire Ops 3	46544	C-Tran T5	46480	C-Tran T3
39	43344	Control 8 CFire	46576	C-Tran T6		
40	43376	Control 10	46608	C-Tran T7		

• Put your favorite Talk Group IDs in the Scan Banks and you now have a Trunked Scanner:

SCAN LIST 1		
Ch	ID	Talk Group
1	44656	Control 1
2	44688	Control 2
3	44720	Control 3
4	44752	Control 4
5	44784	Control 5
6	45424	WSP Mon
7	43248	Control 7
8	43344	Control 8
9	43216	Control 9
10	43376	Control 10

SCAN LIST 2		
Ch	ID	Talk Group
1	44816	TAC 1
2	44848	TAC 2
3	44880	TAC 3
4	44912	TAC 4
5	44944	TAC 5
6	44976	EAGLE 1
7	45008	EAGLE 2
8	45040	EAGLE 3
9	45072	EAGLE 4
10	45392	SWAT

SCAN LIST 3		
Ch	ID	Talk Group
1	43856	LifeFlight
2	43280	Fire Ops 2
3	43312	Fire Ops 3
4	43408	Fire Ops 4
5	43440	Fire Ops 5
6	43472	Fire Ops 6
7	43504	Fire Ops 7
8	43536	Fire Ops 8
9	41616	Camas PD
10	41680	Washo PD

SCAN LIST 4		
Ch	ID	Talk Group
1	48016	ECC 1
2	48048	ECC 2
3	48080	ECC 3
4	48112	ECC 4
5	48144	ECC 5
6	48176	ECC 6
7	48208	ECC 7
8	44336	HEAR/hosp
9	44496	AMR Disp
10	45136	LERN

SCAN LIST 5		
Ch	ID	Talk Group
1	40912	Cowlitz Co
2	40944	Skamania
3	40208	VPD West
4	40112	VPD Centr
5		VPD East
6	41040	CSO West
7	41008	CSO Centr
8	16	Radio Maint.
9	46736	C-Tran Sec
10	41168	Custody 3

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Other Frequencies for Reference

GMRS / FRS Frequencies - MHz				
Main	Interstitial	FRS Ch.	Function	Desig.
462.5500			Rptr. Out	(or Simplex)
	462.5625	1		
462.5750			"	White Dot
	462.5875	2		
462.6000			"	
	462.6125	3		
462.6250			"	Black Dot
	462.6375	4		
462.6500			"	
	462.6625	5		
462.6750			"	Orange Dot
	462.6875	6		
462.7000			"	
	462.7125	7		
462.7250			"	
Separator				
467.5500			Rptr. In	(only!)
	467.5625	8		
467.5750			"	
	467.5875	9		
467.6000			"	
	467.6125	10		
467.6250			"	(J Dot)
	467.6375	11		
467.6500			"	
	467.6625	12		
467.6750			"	
	467.6875	13		
467.7000			"	
	467.7125	14		
467.7250			"	

Business Band				
Frequency		VHF/UHF		Dot/Star
151.625		VHF		Red Dot
151.955		VHF		Purple Dot
154.570		VHF		Blue Dot
154.600		VHF		Green Dot
464.5000		UHF		Brown Dot
464.5500		UHF		Yellow Dot
467.6250		UHF		J Dot
467.8125		UHF		K Dot
467.8500		UHF		Silver Star
467.8750		UHF		Gold Star
467.9000		UHF		Red Star
467.9250		UHF		Blue Star

GMRS = General Mobile Radio Service
 FRS = Family Radio Service (limited to 500 mw)

Citizens' Band (CB)		
CB Channel	Frequency MHz	Use
1	26.965	
2	26.975	
3	26.985	
4	27.005	
5	27.015	
6	27.025	
7	27.035	
8	27.055	
9	27.065	Emergency Channel
10	27.075	
11	27.085	
12	27.105	
13	27.115	RV and Boaters
14	27.125	
15	27.135	
16	27.155	
17	27.165	
18	27.175	
19	27.185	Highway Channel
20	27.205	
21	27.215	
22	27.225	
23	27.255	
24	27.235	
25	27.245	
26	27.265	
27	27.275	
28	27.285	
29	27.295	
30	27.305	
31	27.315	
32	27.325	
33	27.335	
34	27.345	
35	27.355	
36	27.365	Single-Sideband
37	27.375	Single-Sideband
38	27.385	Single-Sideband
39	27.395	Single-Sideband
40	27.405	Single-Sideband

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Maritime (Marine) VHF Frequencies

Channel	Frequency MHz	Use
1	156.050	
2	156.100	Duplex w/ 160.700
3	156.150	Duplex w/ 160.075
4	156.200	Duplex w/ 160.800
5	156.250	Duplex w/ 160.850
6	156.300	Commercial
7	156.350	Commercial
8	156.400	Commercial
9	156.450	Commercial
10	156.500	Commercial
11	156.550	Commercial
12	156.600	Port Operations
13	156.650	Navigational
14	156.700	Port Operations
15	156.750	Environmental
16	156.800	Distress / Call
17	156.850	State Control
18	156.900	Commercial
19	156.950	Commercial
20	157.000	Port Ops Duplex w/161.600
21	157.050	US Coast Guard
22A	157.100	US Coast Guard
23	157.150	US Coast Guard
24	157.200	Telephone Duplex w/ 161.800
25	157.250	Telephone Duplex w/ 161.850
26	157.300	Telephone Duplex w/ 161.900
27	157.350	Telephone Duplex w/ 161.950
28	157.400	Telephone Duplex w/ 162.000

Channel	Frequency MHz	Use
60	156.025	Duplex w/ 160.625
61	156.075	Duplex w/ 160.675
62	156.125	Duplex w/ 160.725
63	156.175	Duplex w/ 160.775
64	156.225	Duplex w/ 160.825
65	156.275	Port Ops Duplex w/ 160.875
66	156.325	Port Ops Duplex w/ 160.925
67	156.375	Commercial
68	156.425	Pleasure Craft
69	156.475	Pleasure Craft
70	156.525	Pleasure Craft
71	156.575	Pleasure Craft
72	156.625	Pleasure Craft
73	156.675	Port Operations
74	156.725	Port Operations
75	-	Not Assigned
76	-	Not Assigned
77	156.875	Commercial
78	156.925	Pleasure Craft Duplex w/ 161.525
79	156.975	Commercial Duplex w/ 161.575
80	157.025	Commercial Duplex w/ 161.625
81	157.075	USCG Duplex w/ 161.675
82	157.125	USCG Duplex w/ 161.725
83	157.175	USCG Duplex w/ 161.775
84	157.225	Telephone Duplex w/ 161.825
85	157.275	Telephone Duplex w/ 161.875
86	157.325	Telephone Duplex w/ 161.925
87	157.375	Telephone Duplex w/ 161.975
88	157.425	Commercial Duplex w/ 162.025

NOAA Weather Frequencies		
Channel	Frequency MHz	Locations
1	162.550	Portland OR
2	162.400	Eugene OR
3	162.475	Salem OR & Olympia WA
4	162.425	
5	162.450	
6	162.500	
7	162.525	Woodland WA