



Application of Amateur Radio in SAR

Testing Ham Radio Repeaters and Simplex Frequencies from Various Locations in Western Woodland Areas of Yamhill County

The Plan Introduction

By: Joe Gilmore, Updated: July 18, 2016

Knowing that amateur (ham) radio can be great for personal enjoyment and preparation for emergency communications, there have been a few people in the Sheriff's Search and Rescue (SAR) program that have become interested in researching how the resources of ham radio may be a valuable backup to SAR communications if/when conventional radio resources fail. This document will propose the request for ham licensed SAR volunteers with the assistance of other local ham radio operators (members of either the Yamhill County Amateur Radio Emergency Services (YCARES), McMinnville Amateur Radio Club (MARC) and/or Yamhill County Community Emergency Response Team (YCCERT) groups), to travel to various, predetermined (previous SAR Base) locations in the wooded areas of western Yamhill County and perform radio "checks" – where signal quality reports will be documented – and compiled for future reference when SAR missions are deployed.

The goal is to have a good understanding of which ham radio frequencies (whether a repeater pair or simplex) that would be relayed to teams leaving staging for their assignments. If they have a ham license and encounter an emergency situation out in the field, they would be familiar of which ham radio repeater frequency to use to contact SAR base that may not be possible via the VHF SAR simplex radio frequencies ordinarily used.

Additionally, another goal is to attempt communications over ham radio to the Yamhill County Emergency Operations Center (EOC) via simplex. In the future there may possibly be an interest of sending digital communications (in an email-type format) over a ham radio through a computer and modem (TNC) generated signal. This system known as Winlink allows messages to be sent to any email address that could contain sensitive subject or situational information that may need to remain secured. By attempting simplex comms with the EOC, it will generally show the likelihood of being able to connect to a Winlink gateway in the valley.

Locations

In the last 18 years of service with SAR, Marvin Reken, KG7QLE, has recorded 17 different typically common SAR Base locations within the wooded, rural areas of the county and 8 additional have been included. These 8 additional sites were picked for their location away from other test points that may provide a general representation of radio coverage surrounding them. The initial 17 locations appear to be areas that would be good areas to setup SAR Base in the future for search missions so they have been selected as ham radio communication test sites and the main basis for this project. The following table shows which team (preliminarily selected) would be accountable for the location(s), the nearest intersection or street name, major landmarks easily identifiable, and coordinates for easy and reliable navigation to the locations.

Team #	Location Identifier	Description	Landmark(s)	UTM Coordinates	Lat/Long Coordinates	Notes
2	A	Hampton Lumber Mill - Willamina Creek Rd	Lumber mill	10T 461152E 4991891N	45° 04.765'N 123° 29.615'W	
1	B	Agency Creek Rd at Wind River Rd	Fork in road - creek to SW	10T 450763E 4995484N	45° 06.667'N 123° 37.555'W	
1	C	Agency Creek Rd at Yoncalla Creek Rd	Fork in road - large gravel turnout to east	10T 447907E 4997758N	45° 07.882'N 123° 39.748'W	
1	D	Agency Creek Rd at West Fork Agency Creek Rd	Fork in road - circular helipad to north	10T 445857E 4999957N	45° 09.061'N 123° 41.326'W	
1	E	Near Little Hebo Rd	Two large gravel turnouts to north and west of intersection	10T 443288E 5001384N	45° 09.825'N 123° 43.297'W	
1	F	Near NF-14 Road	Large gravel turnout to the east, smaller one to west	10T 451875E 5006055N	45° 12.380'N 123° 36.769'W	
2	G	Gopher Valley Rd near Deer Creek Park Rd	Grass hay field to north with residence to south. Wooded land to east.	10T 469925E 5001151N	45° 09.792'N 123° 22.961'W	Try comms from Deer Creek Park
3	H	Camp Cooper	Wooded area	10T 460068E 5010613N	45° 14.873'N 123° 30.531'W	
3	I	Elk Flat Rd at Bald Mountain Access Rd	Very large gravel turnout to north and smaller one to south - slightly to the SE of the intersection	10T 463367E 5012663N	45° 15.991'N 123° 28.018'W	
3	J	Off of Bald Mountain Access Rd	Grassy turnout (meadow) to the south. A triangle shaped intersection.	10T 464171E 5014135N	45° 16.788'N 123° 27.409'W	
3	K	Sheridan Peak Outlook - Bald Mountain Access Rd	Outlook area - posted with visitor signage	10T 465355E 5013989N	45° 16.713'N 123° 26.503'W	
4	L	Near Rainbow Lake - Baker Creek Rd	Small lake; Gravel turn-around	10T 473315E 5011106N	45° 15.177'N 123° 20.405'W	
4	M	On Baker Creek Rd	Gravel turnout to west and large residence	10T 473812E 5010792N	45° 15.008'N 123° 20.024'W	
4	N	On High Heaven Rd	At intersection with barns to east	10T 474883E 5012444N	45° 15.903'N 123° 19.210'W	
4	O	Camp Smith Driveway at Willis Rd	Gate will be closed at driveway entrance. Do testing from there.	10T 477452E 5012256N	45° 15.806'N 123° 17.244'W	
5	P	Fairdale Rd at Toll Rd	"T" intersection - mixed aged tree stands surrounding - creek to south	10T 474220E 5023370N	45° 21.802'N 123° 19.751'W	
5	Q	Flying M Ranch - Airstrip	Ranch - decommissioned airplane strip to the north	10T 472028E 5023169N	45° 21.688'N 123° 21.430'W	
2	R	Willamina Creek Rd at East Creek Rd	Bridge near intersection and residence to the NE	10T 460718E 5001443N	45° 09.923'N 123° 29.990'W	Turn-out approx. 200 yds from intersection on East Creek Rd
3	S	McGuire Dam North	Northern entrance to reservoir dam; security gate	10T 468033E 5017507N	45° 18.621'N 123° 24.468'W	
3	T	McGuire Dam South	Southern perimeter of reservoir	10T 469240E 5015052N	45° 17.298'N 123° 23.535'W	
6	U	Dupee Valley Rd at Eagle Point Rd	Residences to the west and SE	10T 472438E 5002041N	45° 10.279'N 123° 21.045'W	
6	V	Gopher Valley Rd at Peavine Rd	In small valley. Recent clearcut to the NW.	10T 468813E 5009840N	45° 14.482'N 123° 23.843'W	
6	W	Peavine Rd at Elk Flat Rd	Wooded area intersection	10T 465920E 5010693N	45° 14.934'N 123° 26.057'W	
6	X	Panther Creek Rd at Von Rd	Rural residential area (to NW)	10T 473792E 5016640N	45° 18.166'N 123° 20.057'W	
6	Y	Nestucca Rd at Boundary Rd	Turnout; intersection just north of a bridge on Nestucca Rd	10T 464631E 5019298N	45° 19.578'N 123° 27.080'W	Location of recent search base
Additional Notes:	Lat/Long Coordinate format: <i>Degrees, Decimal Minutes</i>					

This table is also available in the appendix section of this plan. Aerial imagery map views and topographic maps of the locations will be distributed in team packets – so the field team members participating will have a better visual reference to where they are supposed to perform their radio tests.

Roles of the Various Group Participants

Participating field individuals/teams will be given a list of the above mentioned “test” locations and will be asked to travel to those points, utilize a handheld portable radio outside of their vehicle on 5 watts with a typical “rubber duck” antenna (no gain mobile mag-mounts or deployable field antennas) and test their list of frequencies given. This process shall be repeated with a mobile radio at high power (with a maximum of 50 watts) and any gain antenna typical of a mobile (vehicle) installation will be acceptable.

Each member of the participating groups invited will utilize their radio knowledge in accurately assessing the quality of communications using a provided form which is still in development. The form will request signal and audio reports following the “Readability, Strength, Tone” (RST) chart as provided on

<http://www.acsu.buffalo.edu/~maxwell/RSTInfo.html>

Radio operators will need to actually communicate with another radio operator on any repeater or simplex frequency requested of them to be able to log it in their provided reporting form. Simply “activating” a repeater is not effective in this project. Operators participating should feel confident in the reliability of their equipment. Radios that are rated for 50 watts may not actually transmit above 20 or 25 watts (as an example) if they are suffering from age, damage, or poor installation. Antennas should be in good shape and their feedlines should be free of any damage that may limit the quality of participants transmissions.

Gary Burgess, KG7RLV, has contacted the other local ham radio leaderships to determine who will be interested in participating. Joe and Marvin are now coordinating requests and needs of the other operators, through contact with Darrell Flood, KK1NP, which has been a great help in gathering assistance from YCARES, MARC and CERT for this project.

Completed forms shall be submitted to the project organizers so they can be compiled. Results will be shared with all participating groups for their reference.

Safety

Field participants will be teamed up with a minimum of two individuals and shall ensure organizers of this project that they have a mobile radio for communications. If they do not currently personally own a GPS receiver, they will be provided with one since it is also required that they record any radio “checks” with a record of their GPS location.

A “SAR Safety Team” will be stationed at Sheridan Peak (off of Bald Mountain Access Rd) to monitor radio traffic and be a safety relay if any team finds themselves in an emergency situation and cannot obtain assistance on their own. Hourly status checks on field teams will be performed if they are not heard on any of the radio frequencies that they are requested to use during their tests. ALL FIELD TEAMS WILL BE REQUIRED TO TUNE TO 146.550 MHZ SIMPLEX or the YCARES REPEATER (441.800) BEFORE ANY RADIO TESTS THEY PERFORM (IN BETWEEN LOCATION POINTS SO THEY CAN BE ACCOUNTED FOR BY THE SAFETY TEAM). An alternate radio may be used to stay on this calling frequency as well. All field teams must be reachable via this frequency for safety checks when necessary.

In any situation where a radio team encounters any road blockage, dangerous road condition not safe for travel, or any other concern that they feel uncomfortable with completing their “mission”, they need to contact the safety team on 146.550 or 441.800 mhz, record the GPS coordinates and turn around. If there are any alternative routes known to get to their next radio test points, please pursue it unless similar conditions restrict it.

Upon completion of their radio “check” route, teams shall inform the project organizers of their completion. No team will be left out in the field, unaccounted for, so it is absolutely required that everyone is “signed out” from the participant list.

Scheduling

In order to accommodate the greatest majority of interested participants, an online poll (through Doodle.com) has been setup and a link to the poll was distributed to anyone interested in participating. Each person wanting to help were asked to go to the online page and select their choices of date(s) and time(s) that fit their schedule. A majority was determined, and the date and time was chosen for August 13th, 2016 – a Saturday. Other details regarding initial rendezvous/briefing locations have been determined and are included in the document (attached) named Information Email to Send Out to All Field Participants. This document will be emailed out to all planned participants one week before the 13th. All field participants must meet there to be added to the “sign-in sheet”. Upon arrival, the field team members will receive a packet including their briefing sheet, maps, all necessary equipment and forms to fill out during their tests. The EOC and base station operators will be provided a briefing sheet as well to provide them with instructions they will be asked to follow. These vary a little bit since they will be a backup to monitoring the safety status of teams if the SAR Safety Team is unable to communicate with them.

Resources Needed

Some SAR hams will be operating ATV's and will be personally-owned. The Sheriff's Office hummer, some SAR equipment such as GPS receivers will be needed to conduct these tests. The hummer will be staffed by trained SAR operators to follow the ATV team and will be temporarily equipped with the ham mobile radio, which is normally kept in the SAR Incident Command trailer, so the ATV team will have a mobile radio to perform their tests.

Participants will need to provide their own radios as mentioned in this plan. Some of the SAR participants will also carry a SAR portable radio to communicate administrative discussions on the SAR GREEN channel.

Ham radio operators will also be asked to staff the county EOC radio room to record contact reports on the repeater and simplex frequencies later listed. If extra operators are available, YCARES may be interested in staffing their radio trailer as well and encourage other operators to work from home – but this is optional.

Permission from the Sheriff

We are hopeful that Sheriff Svenson will offer his authorization for YCSAR and other members of the YCARES, MARC and/or YCCERT groups that are ham radio licensed operators to participate in this project. A detail authorization form (DAF) has been completed and included in the appendix of this report.

Thank you all for your attention and assistance if you can help.

Gary Burgess 513/KG7RLV
Joe Gilmore 505/KD7MPG
Marvin Reken 544/KG7QLE

Appendix

- 1) YCSO Detail Authorization Form
- 2) Copy of Detailed Radio Test Site Location Sheet
- 3) Copy of Information Email to Send Out to All Field Participants
- 4) Copies of Testing Plan Briefing Sheets
- 5) Copy of "RST" Signal Quality Reporting Sheet

Team #	Location Identifier	Description	Landmark(s)	UTM Coordinates	Lat/Long Coordinates	Notes
2	A	Hampton Lumber Mill - Willamina Creek Rd	Lumber mill	10T 461152E 4991891N	45° 04.765'N 123° 29.615'W	
1	B	Agency Creek Rd at Wind River Rd	Fork in road - creek to SW	10T 450763E 4995484N	45° 06.667'N 123° 37.555'W	
1	C	Agency Creek Rd at Yoncalla Creek Rd	Fork in road - large gravel turnout to east	10T 447907E 4997758N	45° 07.882'N 123° 39.748'W	
1	D	Agency Creek Rd at West Fork Agency Creek Rd	Fork in road - circular helipad to north	10T 445857E 4999957N	45° 09.061'N 123° 41.326'W	
1	E	Near Little Hebo Rd	Two large gravel turnouts to north and west of intersection	10T 443288E 5001384N	45° 09.825'N 123° 43.297'W	
1	F	Near NF-14 Road	Large gravel turnout to the east, smaller one to west	10T 451875E 5006055N	45° 12.380'N 123° 36.769'W	
2	G	Gopher Valley Rd near Deer Creek Park Rd	Grass hay field to north with residence to south. Wooded land to east.	10T 469925E 5001151N	45° 09.792'N 123° 22.961'W	Try comms from Deer Creek Park
3	H	Camp Cooper	Wooded area	10T 460068E 5010613N	45° 14.873'N 123° 30.531'W	
3	I	Elk Flat Rd at Bald Mountain Access Rd	Very large gravel turnout to north and smaller one to south - slightly to the SE of the intersection	10T 463367E 5012663N	45° 15.991'N 123° 28.018'W	
3	J	Off of Bald Mountain Access Rd	Grassy turnout (meadow) to the south. A triangle shaped intersection.	10T 464171E 5014135N	45° 16.788'N 123° 27.409'W	
3	K	Sheridan Peak Outlook - Bald Mountain Access Rd	Outlook area - posted with visitor signage	10T 465355E 5013989N	45° 16.713'N 123° 26.503'W	
4	L	Near Rainbow Lake - Baker Creek Rd	Small lake; Gravel turn-around	10T 473315E 5011106N	45° 15.177'N 123° 20.405'W	
4	M	On Baker Creek Rd	Gravel turnout to west and large residence	10T 473812E 5010792N	45° 15.008'N 123° 20.024'W	
4	N	On High Heaven Rd	At intersection with barns to east	10T 474883E 5012444N	45° 15.903'N 123° 19.210'W	
4	O	Camp Smith Driveway at Willis Rd	Gate will be closed at driveway entrance. Do testing from there.	10T 477452E 5012256N	45° 15.806'N 123° 17.244'W	
5	P	Fairdale Rd at Toll Rd	"T" intersection - mixed aged tree stands surrounding - creek to south	10T 474220E 5023370N	45° 21.802'N 123° 19.751'W	
5	Q	Flying M Ranch - Airstrip	Ranch - decommissioned airplane strip to the north	10T 472028E 5023169N	45° 21.688'N 123° 21.430'W	
2	R	Willamina Creek Rd at East Creek Rd	Bridge near intersection and residence to the NE	10T 460718E 5001443N	45° 09.923'N 123° 29.990'W	Turn-out approx. 200 yds from intersection on East Creek Rd
3	S	McGuire Dam North	Northern entrance to reservoir dam; security gate	10T 468033E 5017507N	45° 18.621'N 123° 24.468'W	
3	T	McGuire Dam South	Southern perimeter of reservoir	10T 469240E 5015052N	45° 17.298'N 123° 23.535'W	
6	U	Dupee Valley Rd at Eagle Point Rd	Residences to the west and SE	10T 472438E 5002041N	45° 10.279'N 123° 21.045'W	
6	V	Gopher Valley Rd at Peavine Rd	In small valley. Recent clearcut to the NW.	10T 468813E 5009840N	45° 14.482'N 123° 23.843'W	
6	W	Peavine Rd at Elk Flat Rd	Wooded area intersection	10T 465920E 5010693N	45° 14.934'N 123° 26.057'W	
6	X	Panther Creek Rd at Von Rd	Rural residential area (to NW)	10T 473792E 5016640N	45° 18.166'N 123° 20.057'W	
6	Y	Nestucca Rd at Boundary Rd	Turnout; intersection just north of a bridge on Nestucca Rd	10T 464631E 5019298N	45° 19.578'N 123° 27.080'W	Location of recent search base

Additional Notes: Lat/Long Coordinate format: *Degrees, Decimal Minutes*

Information (email) to send out to ALL FIELD participants:

We appreciate you signing up to help with the SAR Ham Repeater Testing detail. Below are some tidbits of important information that you need to familiarize yourself with before showing up to the briefing – the morning of the detail.

ALL field teams will meet at the YC Sheriff's Office Conference Room at 9:30AM sharp. If you have never been there before – access is off of Evans street directly east of the parking structure. Walk up the steps next to the soldier statue. Walk to the main doors of the courthouse north entrance. To the left, a side door will be propped open for you to come into the conference room. Talk-in frequency: 146.550 simplex.

*If you have a car (streets-type) GPS, bring it – it should be helpful for navigating to most of the test locations. Cell phones will most likely not get service in most of the areas by the way.

*If you own a handheld (trail/hiking) GPS, bring it too (with fresh batteries) if you think you will be more comfortable using it. If not, you will be checked out one.

If you bring your own – it needs to be setup with the following ahead of time:

- UTM UPS position format
- WGS-84 datum
- Metric units (i.e. meters)
- It will be checked before you head out. (Simply a different datum can throw you off in your coordinates by quite a bit).

*Participants will be on their own for food and beverages throughout the day. Make sure you bring enough for your time out in the field and extra just in case some unforeseen situation keeps you out there longer than expected. Please dress appropriately for the environment and the weather. SAR members shall wear either their polo or tan shirt. We ask others to wear their appropriate uniform to show their official designation as well.

*Make sure your vehicle has a full tank of gas before heading out from town.

*This is a sanctioned YCSO approved detail. All normal policies and procedures apply for the duration of the detail.

*IF YOU SIGNED UP TO HELP IN THE AFTERNOON... do not go to the Sheriff's Office for briefing. We will already be in the woods by then. Please go to the Sheridan Peak Overlook on Bald Mountain Access Rd.

Coordinates: 10T 465355E 5013989N -or- 45° 16.713'N 123° 26.503'W

Directions from Carlton Meat Packing (at Westside and Meadowlake Rd):

- <https://goo.gl/maps/XoSJJ6fkm6q>
- If you not familiar with the route, print the directions from the link above since your phone will lose service.

Talk-in frequency: 146.550 simplex or 441.800 YCARES repeater.

Thank you very much for signing up! See you on the 13th.



Application of Amateur Radio in SAR

Testing Ham Radio Repeaters and Simplex Frequencies from Various Locations in Western Woodland Areas of Yamhill County

Operational Period Briefing (for Field Team Participants):

Schedule:

9:00 AM – Selected SAR members arrive at County Shops to collect SAR radios, GPS', the Hummer and other necessary equipment.

9:30 AM – All field participants arrive at Sheriff's Office Conference Room for briefing.

- Teams assigned; given maps, GPS coordinate info, equipment, safety information.
- Discussion on repeater list and simplex frequencies to be tested.
- Determine who will be meeting at Sheridan Peak following completion of their test list. (Camp out participants – preparations for Applegate Rough Rider's detail following day)

10:00 AM – Teams dispatched to their field assignments. EOC, ARES trailer, and home base operators shall be ready for test operations.

- At each testing location the field team shall contact the SAR Safety Team on 146.550 simplex or the YCARES repeater (441.800) and provide them with the Location ID and their GPS coordinates prior to testing their given frequency list. See steps below.
- ATV team provided a dual band MOBILE radio for testing – temporarily equipped in the hummer that will be following the ATV's.

(Hourly) – Teams should expect a "status-check" from the SAR Safety Team located at Sheridan Peak if they are not heard from on one of the frequencies selected for testing.

12:00 PM – Teams should break for lunch or snacks and water – there is no rush to complete this project. The SAR Safety Team and EOC/ARES Trailer/Home Station operators will continue to monitor their designated frequencies, in the event that team(s) wish to continue their assignment through lunch, however, it is asked that all teams take a break and give the support teams time to have lunch also.

3:00 PM – Teams should wrap-up their testing (if they haven't already) and either start heading home or come up to Sheridan Peak.

- Final "roll-call" will be performed to ensure all team participants are clear from the woods, safe and accounted for. Field participants shall not shut off their radios until they have officially cleared with the SAR Safety Team.

4:00 PM – Once all teams have "checked-out" and are accounted for, the SAR Safety Team, EOC/ARES Trailer/Home Station operators and field participants will close down their stations. SAR Safety Team and those attending the overnight will depart Sheridan Peak and travel to camp site (Bald Mountain).

Locations:

Team 1: Location ID's – B, C, D, E, and F (SAR TEAM)

Team 2: Location ID's – A, G, and R (MORNING OR AFTERNOON-ONLY TEAM – SAR OR ARES)

Team 3: Location ID's – H, I, J, K, S and T (SAR ATV TEAM)

Team 4: Location ID's – L, M, N and O (ARES TEAM)

Team 5: Location ID's – P and Q (MORNING OR AFTERNOON-ONLY TEAM – SAR OR ARES)

Team 6: Location ID's – U, V, W, X, Y (ANY TEAM – “OVERFLOW” LOCATIONS)

Team #	Location Identifier	Description	Landmark(s)	UTM Coordinates	Lat/Long Coordinates	Notes
2	A	Hampton Lumber Mill - Willamina Creek Rd	Lumber mill	10T 461152E 4991891N	45° 04.765'N 123° 29.615'W	
1	B	Agency Creek Rd at Wind River Rd	Fork in road - creek to SW	10T 450763E 4995484N	45° 06.667'N 123° 37.555'W	
1	C	Agency Creek Rd at Yoncalla Creek Rd	Fork in road - large gravel turnout to east	10T 447907E 4997758N	45° 07.882'N 123° 39.748'W	
1	D	Agency Creek Rd at West Fork Agency Creek Rd	Fork in road - circular helipad to north	10T 445857E 4999957N	45° 09.061'N 123° 41.326'W	
1	E	Near Little Hebo Rd	Two large gravel turnouts to north and west of intersection	10T 443288E 5001384N	45° 09.825'N 123° 43.297'W	
1	F	Near NF-14 Road	Large gravel turnout to the east, smaller one to west	10T 451875E 5006055N	45° 12.380'N 123° 36.769'W	
2	G	Gopher Valley Rd near Deer Creek Park Rd	Grass hay field to north with residence to south. Wooded land to east.	10T 469925E 5001151N	45° 09.792'N 123° 22.961'W	Try comms from Deer Creek Park
3	H	Camp Cooper	Wooded area	10T 460068E 5010613N	45° 14.873'N 123° 30.531'W	
3	I	Elk Flat Rd at Bald Mountain Access Rd	Very large gravel turnout to north and smaller one to south - slightly to the SE of the intersection	10T 463367E 5012663N	45° 15.991'N 123° 28.018'W	
3	J	Off of Bald Mountain Access Rd	Grassy turnout (meadow) to the south. A triangle shaped intersection.	10T 464171E 5014135N	45° 16.788'N 123° 27.409'W	
3	K	Sheridan Peak Outlook - Bald Mountain Access Rd	Outlook area - posted with visitor signage	10T 465355E 5013989N	45° 16.713'N 123° 26.503'W	
4	L	Near Rainbow Lake - Baker Creek Rd	Small lake; Gravel turn-around	10T 473315E 5011106N	45° 15.177'N 123° 20.405'W	
4	M	On Baker Creek Rd	Gravel turnout to west and large residence	10T 473812E 5010792N	45° 15.008'N 123° 20.024'W	
4	N	On High Heaven Rd	At intersection with barns to east	10T 474883E 5012444N	45° 15.903'N 123° 19.210'W	
4	O	Camp Smith Driveway at Willis Rd	Gate will be closed at driveway entrance. Do testing from there.	10T 477452E 5012256N	45° 15.806'N 123° 17.244'W	
5	P	Fairdale Rd at Toll Rd	"T" intersection - mixed aged tree stands surrounding - creek to south	10T 474220E 5023370N	45° 21.802'N 123° 19.751'W	
5	Q	Flying M Ranch - Airstrip	Ranch - decommissioned airplane strip to the north	10T 472028E 5023169N	45° 21.688'N 123° 21.430'W	
2	R	Willamina Creek Rd at East Creek Rd	Bridge near intersection and residence to the NE	10T 460718E 5001443N	45° 09.923'N 123° 29.990'W	Turn-out approx. 200 yds from intersection on East Creek Rd
3	S	McGuire Dam North	Northern entrance to reservoir dam; security gate	10T 468033E 5017507N	45° 18.621'N 123° 24.468'W	
3	T	McGuire Dam South	Southern perimeter of reservoir	10T 469240E 5015052N	45° 17.298'N 123° 23.535'W	
6	U	Dupee Valley Rd at Eagle Point Rd	Residences to the west and SE	10T 472438E 5002041N	45° 10.279'N 123° 21.045'W	
6	V	Gopher Valley Rd at Peavine Rd	In small valley. Recent clearcut to the NW.	10T 468813E 5009840N	45° 14.482'N 123° 23.843'W	
6	W	Peavine Rd at Elk Flat Rd	Wooded area intersection	10T 465920E 5010693N	45° 14.934'N 123° 26.057'W	
6	X	Panther Creek Rd at Von Rd	Rural residential area (to NW)	10T 473792E 5016640N	45° 18.166'N 123° 20.057'W	
6	Y	Nestucca Rd at Boundary Rd	Turnout; intersection just north of a bridge on Nestucca Rd	10T 464631E 5019298N	45° 19.578'N 123° 27.080'W	Location of recent search base
Additional Notes:	Lat/Long Coordinate format: <i>Degrees, Decimal Minutes</i>					

Distribution of aerial imagery map views and topographic maps (with coordinates) of the locations to each team as well as “RST”/frequency forms will occur by the SAR Safety Team either at the YCSO (in the AM) or at Sheridan Peak. They will also provide view of areas on topo map software via computer if necessary.

Procedures:

Participating field teams will be given a list of the above mentioned “test” locations and will be asked to travel to those points, utilize a handheld portable radio outside of their vehicle on 5 watts with a typical “rubber duck” antenna (no gain mobile mag-mounts or deployable field antennas) and test their list of frequencies given. This process shall be repeated with a mobile radio at high power (with a maximum of 50 watts) and any gain antenna typical of a mobile (vehicle) installation will be acceptable.

Each member of the participating groups invited will utilize their radio knowledge in accurately assessing the quality of communications using a provided form which is still in development. The form will request signal and audio reports following the “Readability, Strength, Tone” (RST) chart attached.

Radio operators will need to actually communicate with another radio operator on any repeater or simplex frequency requested of them to be able to log it in their provided reporting form. Simply “activating” a repeater is not effective in this project. Operators participating should feel confident in the reliability of their equipment. Radios that are rated for 50 watts may not actually transmit above 20 or 25 watts (as an example) if they are suffering from age, damage, or poor installation. Antennas should be in good shape and their feedlines should be free of any damage that may limit the quality of participants’ transmissions.

The following provides steps of field team operations so that all of the project goals are met:

Step 1: Drive to first test location. Safely park – off of the road if possible – to perform your tests.

Step 2: First call **KD7MPG** (the SAR Safety Team) located at Sheridan Peak using ITU phonetics. Use frequency 146.550 simplex no tone -OR- 441.800 [+] 114.8 tone – the YCARES repeater as a secondary. Provide your callsign, team number, *Location Identifier* letter, and coordinates off of the GPS (**SLOWLY**). Note: 146.550 also known as TALK3S with SAR ham members.

Step 3: Once copied by the SAR Safety Team and cleared, begin your radio checks on the frequencies provided to you. Call for **W7YAM** on all of the frequencies using ITU phonetics – radio signals may be weak. Also make sure to provide W7YAM with your team number, *Location Identifier* letter and callsign!

Step 4: As you make contact with the EOC/YCARES Trailer/Home Station operators (W7YAM) be prepared to take note of the “RST” values on the form provided to you – this is the whole point of the project. Try each frequency twice (if you don’t make contact the first time). If you don’t get a response after the second try and are sure you were not “doubling” with another team/station, move to and attempt your next listed frequency. Only document the “RST” values as received at your station NOT ones that may be told to you by the base operators (as observed on their end).

Step 5: Once all frequencies are attempted (whether successful in a contact or not), and logged on the “RST” form, travel to your next test location.

Step 6: At your next test location, repeat steps 2 through 4 until all locations have been attempted.

Step 7: When all of your team’s locations have been completed – or if a personal emergency requires your team to terminate early – contact the SAR Safety Team and inform them that you are done. You **MUST** inform them when you are “leaving the field” (heading home) or if you plan to come up to Sheridan Peak. All field participants must be accounted for at all times for the safety of everyone.

Administrative:

Participants in this exercise will be responsible for their own meals/snacks and fluids (water). There won't be any food/water supplies brought up to the mountain so you are on your own. Additionally, plan your bathroom schedule appropriately. A decent "outhouse" is available at Sheridan Peak, I think at Deer Creek Park off of Gopher Valley Rd and at Stewart Grenfell Park off of Hwy 18 between Sheridan and Willamina.

All borrowed equipment must be logged and upon completion of your participation returned to either the SAR Safety Team at Sheridan Peak, or if absolutely necessary, at a pre-determined location in the McMinnville area – established over the radio where a SAR member will meet with team(s) there. Borrowed equipment must be returned that day. Completed "RST" forms and maps shall be returned at that time as well.

Safety:

ALL FIELD TEAMS WILL BE REQUIRED TO TUNE TO 146.550 MHZ SIMPLEX OR ON 441.800 (YCARES REPEATER) BEFORE ANY RADIO TESTS THEY PERFORM (AND IN-BETWEEN LOCATION POINTS SO THEY CAN BE ACCESSED BY THE SAFETY TEAM). An alternate radio may be used to stay on this calling frequency as well. All field teams must be reachable via this frequency for safety checks when necessary.

In any situation where a radio team encounters any road blockage, dangerous road condition not safe for travel, or any other concern that they feel uncomfortable with completing their "mission", they need to contact the safety team on the radio, record the GPS coordinates and turn around. If there are any alternative routes known to get to their next radio test points, please pursue it unless similar conditions restrict it.

Any team that gets involved in an emergency situation should announce it on the air with "break, break, break... this is an emergency" followed by your team number and callsign (preferably on the SAR Safety Team simplex frequency or the YCARES repeater). The SAR Safety Team will acknowledge your call for assistance and coordinate the effort of dispatching help. DON'T USE THE TERM: "BREAK" UNLESS YOU HAVE AN EMERGENCY.

Upon completion of their radio "check" route, teams shall inform the SAR Safety Team of their completion. No team will be left out in the field, unaccounted for, so it is absolutely required that everyone is "signed out" from the participant list.

Thank you for helping!! A complete after action report including results will be sent to your leadership.

Gary Burgess 513/KG7RLV/Cell: (971) 241-7610
Joe Gilmore 505/KD7MPG/Cell: (503) 474-7085
Marvin Reken 544/KG7QLE/Cell: (503) 434-3120

Appendix

- 1) Copy of Detailed Radio Test Site Location Sheet
- 2) Copy of "RST" Signal Quality Reporting Sheet
- 3) Collection of Aerial Images/Topo Maps of Test Site Locations



Application of Amateur Radio in SAR

Testing Ham Radio Repeaters and Simplex Frequencies from Various Locations in Western Woodland Areas of Yamhill County

Operational Period Briefing (for YC EOC/ARES Trailer/Home Station Operators):

Schedule:

10:00 AM – Teams dispatched to their field assignments – which may take around an hour for them to arrive at their first testing location. EOC, ARES trailer, and home base operators shall be ready for test operations. Each operator will check-in with the EOC on the YCARES repeater (by calling for W7YAM) to inform them that they are prepared and ready to staff their frequencies.

- At each testing location the field team shall contact the SAR Safety Team on either 146.550 simplex or the YCARES repeater (441.800) and provide them with the Location ID and their GPS coordinates prior to testing their given frequency list.

(Hourly) – Teams should expect a “status-check” from the SAR Safety Team located at Sheridan Peak (on the above mentioned frequencies) if they are not heard from on one of the frequencies selected for testing.

12:00 PM – Teams should break for lunch or snacks and water – there is no rush to complete this project. EOC/ARES Trailer/Home Station operators shall have their lunch near the radio in the event that a field team calls in for signal testing – or have a “fill-in” operator to take over during lunch breaks at the base location(s). This “lunch period” is not mandatory so some teams may continue to perform their tests through the “noon” hour.

3:00 PM – Teams should wrap-up their testing (if they haven’t already) and either start heading home or come up to Sheridan Peak.

- Final “roll-call” will be performed to ensure all team participants are clear from the woods, safe and accounted for. Field participants shall not shut off their radios until they have officially cleared with the SAR Safety Team.

4:00 PM – SAR Safety Team, and other field participants will depart Sheridan Peak and travel to camp site (Bald Mountain). At this time, unless field teams are still unaccounted for or still “operational” and have not officially “checked-out”, the EOC/ARES Trailer/Home Station operators can finish any “loose-ends” on their RST report sheets and close down their stations.

Locations:

Team 1: Location ID’s – B, C, D, E, and F (SAR TEAM)

Team 2: Location ID’s – A, G, and R (MORNING OR AFTERNOON-ONLY TEAM – SAR OR ARES)

Team 3: Location ID’s – H, I, J, K, S and T (SAR ATV TEAM)

Team 4: Location ID’s – L, M, N and O (ARES TEAM)

Team 5: Location ID’s – P and Q (MORNING OR AFTERNOON-ONLY TEAM – SAR OR ARES)

Team 6: Location ID’s – U, V, W, X, Y (ANY TEAM – “OVERFLOW” LOCATIONS)

Team #	Location Identifier	Description	Landmark(s)	UTM Coordinates	Lat/Long Coordinates	Notes
2	A	Hampton Lumber Mill - Willamina Creek Rd	Lumber mill	10T 461152E 4991891N	45° 04.765'N 123° 29.615'W	
1	B	Agency Creek Rd at Wind River Rd	Fork in road - creek to SW	10T 450763E 4995484N	45° 06.667'N 123° 37.555'W	
1	C	Agency Creek Rd at Yoncalla Creek Rd	Fork in road - large gravel turnout to east	10T 447907E 4997758N	45° 07.882'N 123° 39.748'W	
1	D	Agency Creek Rd at West Fork Agency Creek Rd	Fork in road - circular helipad to north	10T 445857E 4999957N	45° 09.061'N 123° 41.326'W	
1	E	Near Little Hebo Rd	Two large gravel turnouts to north and west of intersection	10T 443288E 5001384N	45° 09.825'N 123° 43.297'W	
1	F	Near NF-14 Road	Large gravel turnout to the east, smaller one to west	10T 451875E 5006055N	45° 12.380'N 123° 36.769'W	
2	G	Gopher Valley Rd near Deer Creek Park Rd	Grass hay field to north with residence to south. Wooded land to east.	10T 469925E 5001151N	45° 09.792'N 123° 22.961'W	Try comms from Deer Creek Park
3	H	Camp Cooper	Wooded area	10T 460068E 5010613N	45° 14.873'N 123° 30.531'W	
3	I	Elk Flat Rd at Bald Mountain Access Rd	Very large gravel turnout to north and smaller one to south - slightly to the SE of the intersection	10T 463367E 5012663N	45° 15.991'N 123° 28.018'W	
3	J	Off of Bald Mountain Access Rd	Grassy turnout (meadow) to the south. A triangle shaped intersection.	10T 464171E 5014135N	45° 16.788'N 123° 27.409'W	
3	K	Sheridan Peak Outlook - Bald Mountain Access Rd	Outlook area - posted with visitor signage	10T 465355E 5013989N	45° 16.713'N 123° 26.503'W	
4	L	Near Rainbow Lake - Baker Creek Rd	Small lake; Gravel turn-around	10T 473315E 5011106N	45° 15.177'N 123° 20.405'W	
4	M	On Baker Creek Rd	Gravel turnout to west and large residence	10T 473812E 5010792N	45° 15.008'N 123° 20.024'W	
4	N	On High Heaven Rd	At intersection with barns to east	10T 474883E 5012444N	45° 15.903'N 123° 19.210'W	
4	O	Camp Smith Driveway at Willis Rd	Gate will be closed at driveway entrance. Do testing from there.	10T 477452E 5012256N	45° 15.806'N 123° 17.244'W	
5	P	Fairdale Rd at Toll Rd	"T" intersection - mixed aged tree stands surrounding - creek to south	10T 474220E 5023370N	45° 21.802'N 123° 19.751'W	
5	Q	Flying M Ranch - Airstrip	Ranch - decommissioned airplane strip to the north	10T 472028E 5023169N	45° 21.688'N 123° 21.430'W	
2	R	Willamina Creek Rd at East Creek Rd	Bridge near intersection and residence to the NE	10T 460718E 5001443N	45° 09.923'N 123° 29.990'W	Turn-out approx. 200 yds from intersection on East Creek Rd
3	S	McGuire Dam North	Northern entrance to reservoir dam; security gate	10T 468033E 5017507N	45° 18.621'N 123° 24.468'W	
3	T	McGuire Dam South	Southern perimeter of reservoir	10T 469240E 5015052N	45° 17.298'N 123° 23.535'W	
6	U	Dupee Valley Rd at Eagle Point Rd	Residences to the west and SE	10T 472438E 5002041N	45° 10.279'N 123° 21.045'W	
6	V	Gopher Valley Rd at Peavine Rd	In small valley. Recent clearcut to the NW.	10T 468813E 5009840N	45° 14.482'N 123° 23.843'W	
6	W	Peavine Rd at Elk Flat Rd	Wooded area intersection	10T 465920E 5010693N	45° 14.934'N 123° 26.057'W	
6	X	Panther Creek Rd at Von Rd	Rural residential area (to NW)	10T 473792E 5016640N	45° 18.166'N 123° 20.057'W	
6	Y	Nestucca Rd at Boundary Rd	Turnout; intersection just north of a bridge on Nestucca Rd	10T 464631E 5019298N	45° 19.578'N 123° 27.080'W	Location of recent search base
Additional Notes:	Lat/Long Coordinate format: <i>Degrees, Decimal Minutes</i>					

Distribution of aerial imagery map views and topographic maps (with coordinates) of the locations to each team as well as "RST"/frequency forms will occur by the SAR Safety Team either at the YCSO (in the AM) or at Sheridan Peak. They will also provide view of areas on topo map software via computer if necessary.

Procedures:

Participating field teams will be given a list of the above mentioned "test" locations and will be asked to travel to those points, utilize a handheld portable radio outside of their vehicle on 5 watts with a typical "rubber duck" antenna (no gain mobile mag-mounts or deployable field antennas) and test their list of frequencies given. This process shall be repeated with a mobile radio at high power (with a maximum of 50 watts) and any gain antenna typical of a mobile (vehicle) installation will be acceptable.

Each member of the participating groups invited will utilize their radio knowledge in accurately assessing the quality of communications using a provided form which is attached. The form will request signal and audio reports following the "Readability, Strength, Tone" (RST) chart attached.

Radio operators will need to actually communicate with another radio operator on any repeater or simplex frequency requested of them to be able to log it in their provided reporting form. Simply “activating” a repeater is not effective in this project. Operators participating should feel confident in the reliability of their equipment. Radios that are rated for 50 watts may not actually transmit above 20 or 25 watts (as an example) if they are suffering from age, damage, or poor installation. Antennas should be in good shape and their feedlines should be free of any damage that may limit the quality of participants’ transmissions.

The following provides steps of field team and EOC/ARES Trailer/Home Station operations so that all of the project goals are met:

- Step 1:** Field teams drive to their first test location. Safely park – off of the road if possible – to perform their tests. Teams will first call the SAR Safety Team (KD7MPG) located at Sheridan Peak using ITU phonetics. Use frequency 146.550 simplex no tone -OR- 441.800 [+] 114.8 tone – the YCARES repeater as a secondary. They will provide their *Location Identifier* letter and coordinates off of the GPS (**SLOWLY**). 146.550 also known as TALK3S with SAR ham members.
- Step 2:** Once copied by the SAR Safety Team and cleared, they will begin radio checks on the frequencies provided to them*. They will call for **W7YAM** (which all base operators will acknowledge on the frequencies they are assigned to staff) using ITU phonetics – radio signals may be weak. Field teams will need to make sure to provide W7YAM with their team number and *Location Identifier* letter!
- Step 3:** As field teams make contact with the EOC/YCARES trailer/home station operators (W7YAM) be prepared to take note of the “RST” values on the forms provided to you – this is the whole point of the project. Field teams will try each frequency twice (if they don’t make contact the first time). If they don’t get a response after the second try and are sure they were not “doubling” with another team/station, they will document it, move to and attempt their next listed frequency. Base stations will use the same “RST” sheet to document field teams’ radio signal quality as they make their exchange. Only document the “RST” values as received at your station NOT ones that may be told to you by the field teams (as observed on their end). Base operators shall also give their personal callsigns at the end of each contact with the field teams per FCC rules.
- Step 4:** Once all frequencies are attempted (whether successful in a contact or not), and logged on the “RST” form, field teams will travel to their next test location. The EOC/ARES Trailer/Home Station operators will not be responsible for field team accountability (status/location) checks unless requested via radio or phone by the SAR Safety Team.
- Step 5:** At their next test location, field teams will repeat steps 1 through 4 until all locations have been attempted.
- Step 6:** When all of a team’s locations have been completed – or if a personal emergency requires a team to terminate early – they will contact the SAR Safety Team and inform them that they are done. If at any time an EOC/ARES Trailer/Home Station operator hears that a team is terminating their assignment – and you do not hear SAR Safety Team operators acknowledge, you **MUST** document the information and confirm with SAR Safety team that they were aware of the information. All field participants must be accounted for at all times for the safety of everyone but this will mainly be the responsibility of the SAR Safety Team. Your assistance in assuring this will be appreciated however.

*** A list of frequencies will be provided to each W7YAM (EOC/ARES Trailer/Home) station to monitor and be responsible of staffing.**

Administrative:

Participants in this exercise will be responsible for their own meals/snacks and fluids (water). It is requested that EOC/ARES Trailer/Home Station operators have all of their snacks and fluids nearby their station for the duration of this project – unless replacement operators are scheduled and present. Additionally, plan your bathroom schedule appropriately. Those at base stations that have to leave their station for a bathroom break can ask another station, via the radio or phone, to temporarily staff their assigned frequencies, or utilize a replacement (fill-in) operator at their location.

All borrowed equipment must be logged and upon completion of your participation returned to either the SAR Safety Team at Sheridan Peak, or if absolutely necessary, at a pre-determined location in the McMinnville area – established over the radio where a SAR member will meet with team(s) there. Borrowed equipment must be returned that day. Completed “RST” forms and maps shall be returned at that time as well.

Safety:

ALL FIELD TEAMS WILL BE REQUIRED TO TUNE TO 146.550 MHZ SIMPLEX OR ON 441.800 (YCARES REPEATER) BEFORE ANY RADIO TESTS THEY PERFORM (AND IN-BETWEEN LOCATION POINTS SO THEY CAN BE ACCESSED BY THE SAFETY TEAM). An alternate radio may be used to stay on this calling frequency as well. All field teams must be reachable via this frequency for safety checks when necessary.

In any situation where a radio team encounters any road blockage, dangerous road condition not safe for travel, or any other concern that they feel uncomfortable with completing their “mission”, they need to contact the safety team on the radio, record the GPS coordinates and turn around. If there are any alternative routes known to get to their next radio test points, please pursue it unless similar conditions restrict it.

Any team that gets involved in an emergency situation should announce it on the air with “break, break, break... this is an emergency” followed by their team number and callsign (preferably on the SAR Safety Team simplex frequency or the YCARES repeater). The SAR Safety Team will acknowledge your call for assistance and coordinate the effort of dispatching help. Teams are instructed NOT TO USE THE TERM: “BREAK” UNLESS THEY HAVE AN EMERGENCY. If an EOC/ARES Trailer/Home Station operator hears a call of “break” – with an emergency – and does not hear the SAR Safety Team acknowledge within a reasonable amount of time – they shall acknowledge the team in distress and do what they can to help. Documentation of the emergency will be important and will be expected in writing after the project is complete. Only if the emergency is deemed to require immediate law enforcement support or medical response, call 9-1-1. YCOM (the dispatch center) will need nearest cross streets of the team’s location and/or coordinates in LAT/LONG – not UTM.

If at any time a personal emergency requires an EOC/ARES Trailer/Home Station operator to discontinue their participation in the project, they shall attempt contact with the SAR Safety Team informing them of the situation or inform another base station operator. Coordination of who will take responsibility for the neglected repeater/simplex frequencies will take place immediately. By default, unless another base operator can step-in, the EOC will accept responsibility of the frequencies that the departing operator(s) were staffing.

Upon completion of their radio “check” route, teams shall inform the SAR Safety Team of their completion. No team will be left out in the field, unaccounted for, so it is absolutely required that everyone is “signed out” from the participant list.

Thank you for helping!! A complete after action report including results will be sent to your leadership.

Gary Burgess 513/KG7RLV/Cell: (971) 241-7610

Joe Gilmore 505/KD7MPG/Cell: (503) 474-7085

Marvin Reken 544/KG7QLE/Cell: (503) 434-3120

Darrell Flood KK1NP/Cell: (503) 857-2555

Appendix

- 1) Copy of Detailed Radio Test Site Location Sheet
- 2) Copy of "RST" Signal Quality Reporting Sheets
- 3) Collection of Aerial Images/Topo Maps of Test Site Locations
- 4) Frequency List for the EOC/ARES Trailer/Home Station operators to staff

Repeater and Simplex Frequency Testing "RST" Signal Quality Reporting Sheet

VHF (2M)			Location ID: _____		Location ID: _____		Location ID: _____		Location ID: _____		Location ID: _____	
Radio Alias	Location	Frequency	Comm Quality (Mobile 50W)	Comm Quality (HT 5W)	Comm Quality (Mobile 50W)	Comm Quality (HT 5W)	Comm Quality (Mobile 50W)	Comm Quality (HT 5W)	Comm Quality (Mobile 50W)	Comm Quality (HT 5W)	Comm Quality (Mobile 50W)	Comm Quality (HT 5W)
MARC R	Amity	146.640 (-) PL 100.0										
NEWB1R	Newberg	145.210 (-) PL 110.9										
HEBO2R	Hebo Mt.	147.220 (+) PL 100.0										
POLK1R	Laurel Mt.	147.020 (+) PL 186.2										
TALK3S	Simplex	146.550										
UHF (70cm)												
YCARER	Amity	441.800 (+) PL 114.8										
NEWBR	Newberg	442.550 (+) PL ? (private)										
HIHEVR	High Heaven	441.725 (+) PL 127.3										

Note: See attached "RST" sheet for accurately recording signal quality.

Ham Radio "RST" Signal Reporting System for CW/Phone Operation

Readability - Strength - Tone: RST Signal Reports			
R-S-T Numeric Value	Readability R	Strength S	Tone T (cw only)
1	Unreadable	Faint signals, barely perceptible	Sixty cycle a.c or less, very rough and broad
2	Barely readable, occasional words distinguishable	Very weak signals	Very rough a.c., very harsh and broad
3	Readable with considerable difficulty	Weak signals	Rough a.c. tone, rectified but not filtered
4	Readable with practically no difficulty	Fair signals	Rough note, some trace of filtering
5	Perfectly readable	Fairly good signals	Filtered rectified a.c. but strongly ripple-modulated
6	Not used	Good signals	Filtered tone, definite trace of ripple modulation
7	Not used	Moderately strong signals	Near pure tone, trace of ripple modulation
8	Not used	Strong signals	Near perfect tone, slight trace of modulation
9	Not used	Extremely strong signals	Perfect tone, no trace of ripple or modulation of any kind

Notes

Select the signal's most consistent characteristic from each of the R, S, and T columns in the chart. Select the number from the R-S-T Numeric Value (left) column which corresponds to each characteristic chosen. This R-S-T sequence of numbers becomes the RST signal report.

If the signal has the characteristic stability of crystal control, the letter X may be added to the end of the RST report.

Use the letter C to indicate a chirp on the signal.

Use the letter K for key clicks.

"RST is 599" - means that the morse code cw signal being assessed is Readability 5 (perfectly readable), Strength 9 (extremely strong signal), Tone 9 (perfect tone). This is the ultimate (or "perfect") cw signal.

This reporting system may also be used for phone operation by leaving out the Tone (T) portion of the report. For example, a signal of "5 9" means that the phone signal is Readability 5, and Strength 9; a perfectly readable and extremely strong signal. The term "S-9" is also used to report a Strength 9 for an extremely strong signal. If an S-Meter is being used as a basis of the signal report, an S-9 is the notation for 9 (S-Units) on the meter.



[Go back to my Amateur Radio page](#)