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APRS

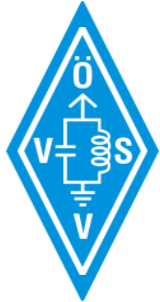
workshop

OE7AAI, OE2LSP



Youngsters On The Air





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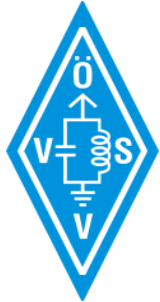
AUTOMATIC PACKET/POSITION REPORTING SYSTEM



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APRS

FEATURES



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- APRS_{TM} is a Registered Trademark to Bob Bruninga, WB4APR
- first documentation from 1994



picture: <http://www.mikebaxter.us>



The network

APRS-IS



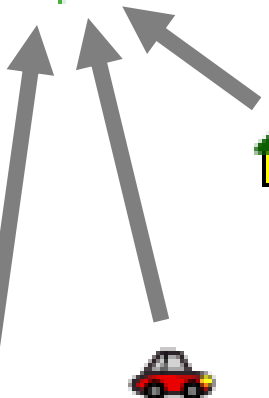
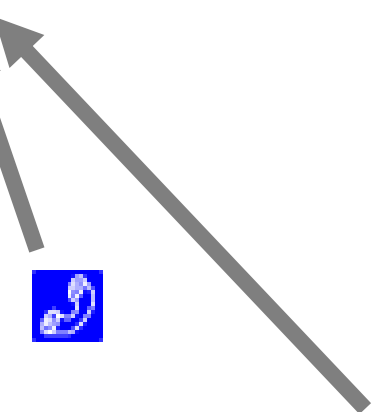
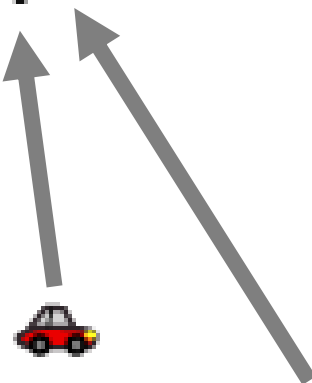
IGATE



Digipeater



Digipeater



stations

symbols by arps.fi

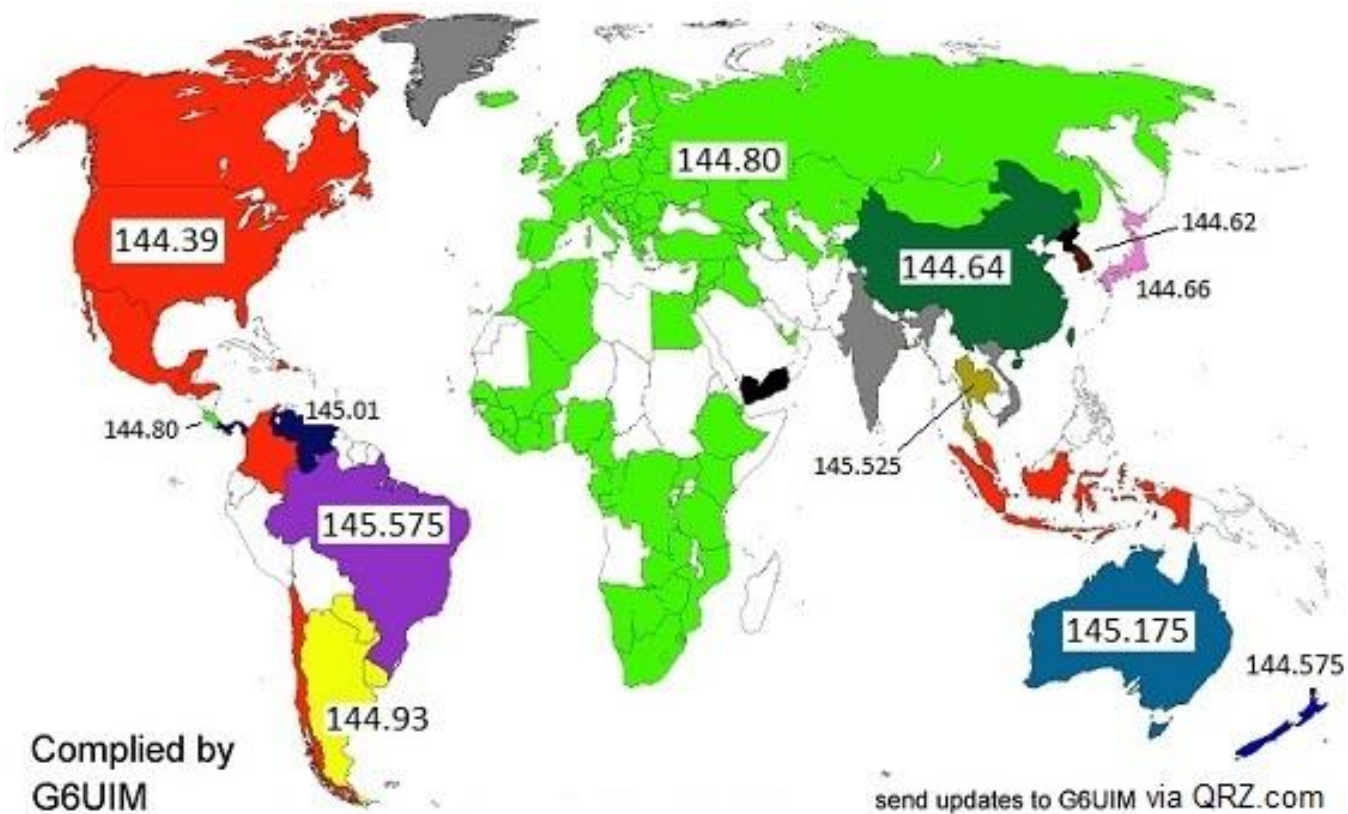


Youngsters On The Air



- shortwave Baud 300, LSB (also proprietary robust packet)
 - 7.035 kHz
 - 10.151 kHz
 - 14.103 kHz
 - 18.102 kHz
 - 21.117 kHz
 - 21.117 kHz
 - 29.250 kHz
- 2m, Baud 1200 AFSK
- 70cm, Baud 1200 AFSK
 - 430.825 kHz
- Sattelites / ISS (145.825kHz)





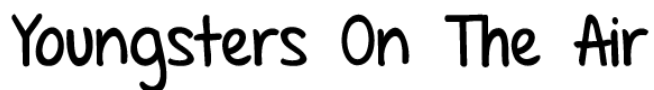
- OE2XHR-11>APMI04,WIDE2-2,qAU,OE2XGR-10:@171005z4725.21N/01303.56E#Digi



- 10:@171005z4725.21N/01303.56E#Digi
primary „/“:

!	"	#	\$	%	&	'	(	)	*	+	,	-	.	/	0
1	2	3	4	5	6	7	8	9	:	;	<	=	>	?	@
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_	`
a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p
q	r	s	t	u	v	w	x	y	z	{		}	~		

	BLOW		DRIZ RAIN		FRZ RAIN		H ₂ E			W					P
						Rx									
			DHX	SLEET	F C		HAN								
						1000				FOG					REV H



- WIDE1-1 directly heard, to be repeated once
- WIDE2-2 directly heard, to be repeated twice
- WIDE2-1 one time repeated



SSIDs (OE1ABC-?)

- -1 generic additional station, digi, mobile, wx, etc
- -2 generic additional station, digi, mobile, wx, etc
- -3 generic additional station, digi, mobile, wx, etc
- -4 generic additional station, digi, mobile, wx, etc
- -5 Other networks (Dstar, Iphones, Androids, Blackberry's etc)
- -6 Special activity, Satellite ops, camping or 6 meters, etc
- -7 walkie talkies, HT's or other human portable
- -8 boats, sailboats, RV's or second main mobile
- -9 Primary Mobile (usually message capable)
- -10 internet, Igates, echolink, winlink, AVRS, APRN, etc
- -11 balloons, aircraft, spacecraft, etc
- -12 APRStt, DTMF, RFID, devices, one-way trackers*, etc
- -13 Weather stations
- -14 Truckers or generally full time drivers
- -15 generic additional station, digi, mobile, wx, etc



- telemetry system for position related data
 - Hamradio stations or infrastructure
- radio repeated
- weather data
- short messages
- emergency function
- bulletins



ways of operating

- radio – built in modem
- radio – (sound) modem – PC
- radio – mobile phone
- HAMNET / Internet – PC



Digipeater - TCE

- TinyCoreLinux on small industrial PCs / raspberry
- soundmodem
- tiny circuit for PTT/ watchdog
- 2 m transceiver
- < 5 watt

optional:

- HAMNET / Internet connection

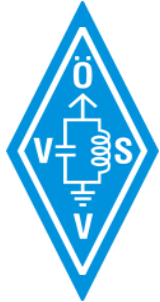


- more information:

http://wiki.oevsv.at/index.php?title=TCE_Tinycore_Linux_Project_englisch



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RaspberryPi

HOW TO CONNECT



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Connecting to raspberry

■ SSH

- Windows: <http://putty.org>

■ RemoteDesktopProtocol

- Windows: mstsc
- Linux: KRDC
- iOS: „Microsoft Remote Desktop“ in AppStore

IPs: 44.143.189.X as printed on raspberrys

username: „**pi**“ password: „**raspberry**“ **please change this!**



First Login

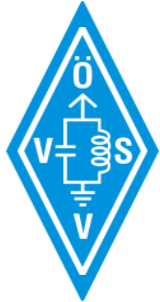
use putty or ssh command

`ssh pi@44.143.189.X` #ip is on the back of your rapsi

to change user pi's default password

`passwd pi`





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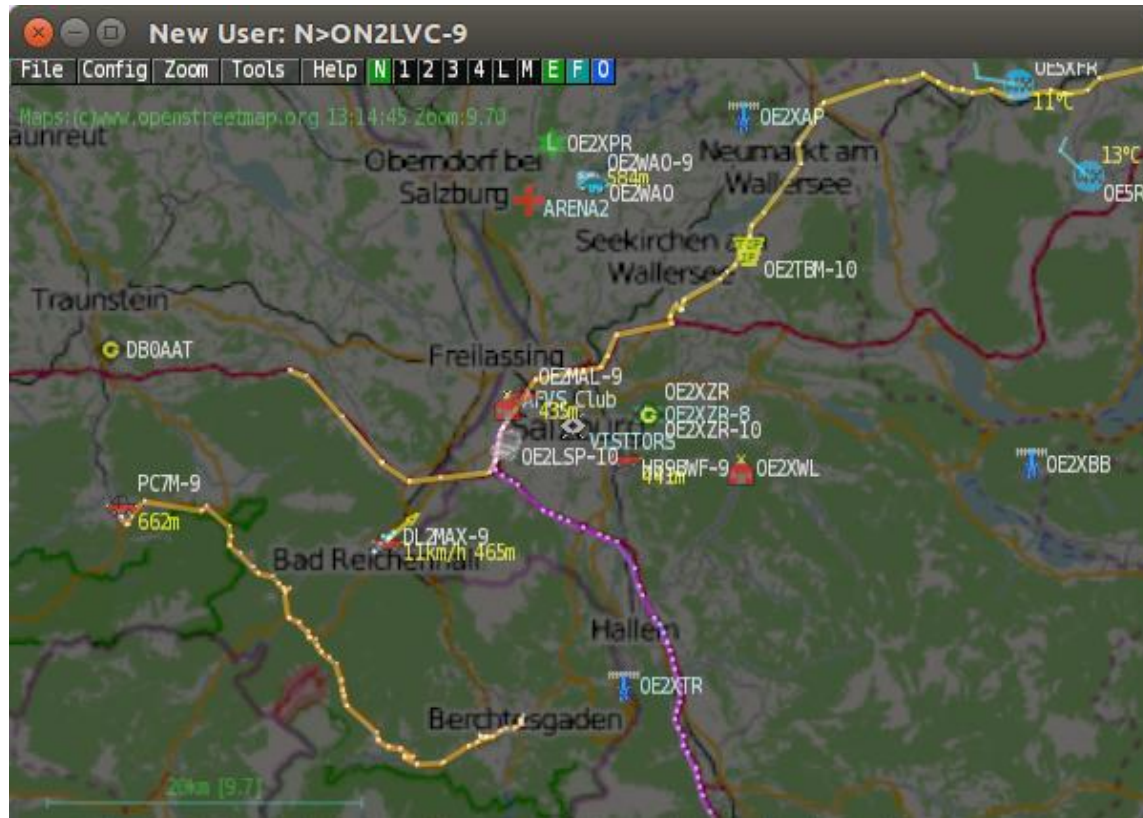
APRSmap



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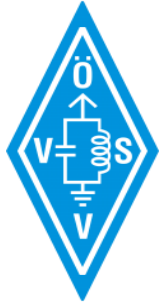


- DXLaprsmmap, APRS-client developed by Christian OE5DXL
- other APRS related tools and projects by OE5DXL:
 - afskmodem (soundmodem)
 - gps2aprs (makes APRS-frames out of GPS-frames)
 - sonde2aprs (decodes weather-ballon in central Europe)
 - DXLtracker (interface between TRX and GPS-modules 2x3cm)
 - IGATE/Digipeater software
 - ...



- download DXLaprsmmap
 - software (Linux / Windows)
 - SRTM data
 - guides
- <http://lspe.org/yota>
- for iOS user you can use wine, virtual machine or raspberry (RDP)





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APRSmap

DATA SOURCE



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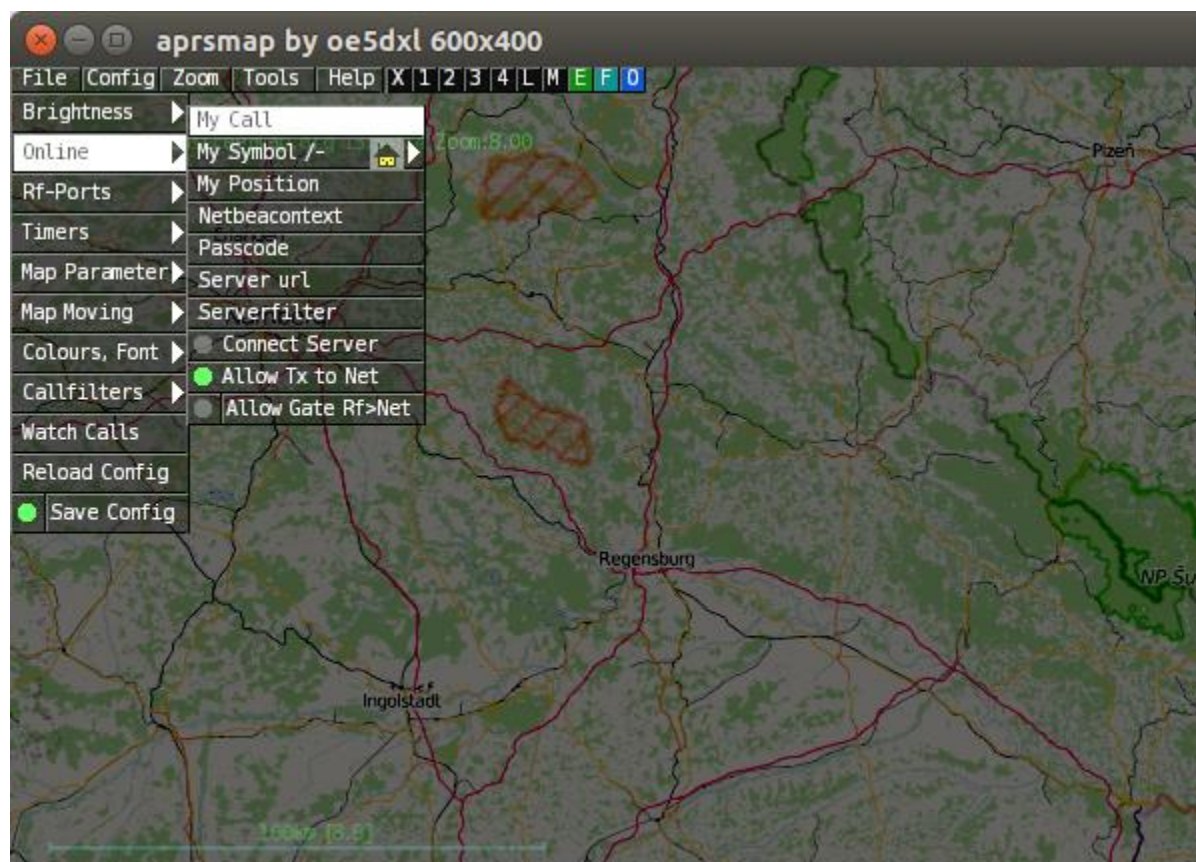
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- APRS-IS (HAMNET/Internet)
- Transceiver
 - ☐ modem
 - ☐ soundcard
- SoftwareDefinedRadio
 - ☐ similar to soundcard



■ Getting started



- Configuring „**Config>Online>**“
 - ☐ My Call
 - ☐ My Symbol
 - ☐ My Position: 4719.972N/01318.406E
 - ☐ Passcode: <http://apps.magicbug.co.uk/passcode/>
 - ☐ Server url: austria.aprs2.net

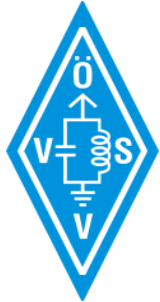
 - ☐ Connect to Server (must be green)



APRS-IS (HAMNET/Internet)

- aprs.oe2xgr.ampr.at:14580
- aprs.oe2x zr.ampr.at:14580
- List on <http://aprs2.net/>





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APRSmap

SOUNDCARD



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- Windows / Linux (pulseaudio)

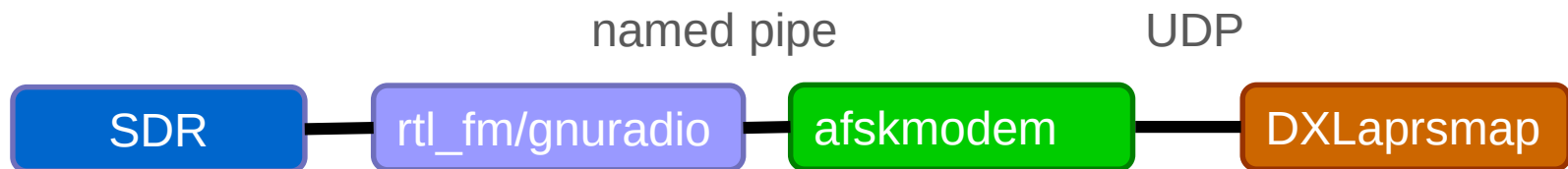


- Linux (oss)

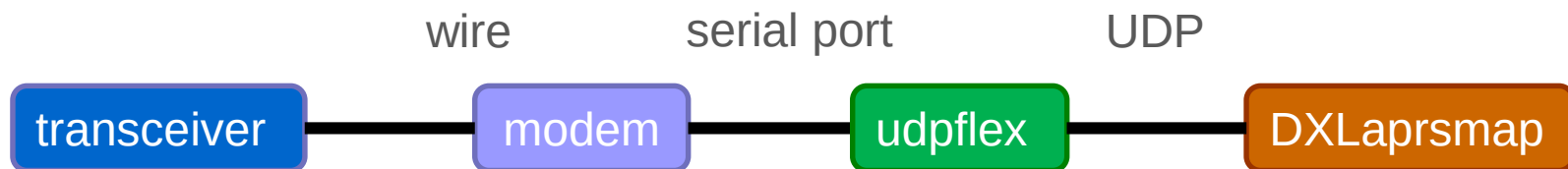


DXLaprsmmap - soundcard

- Linux (SDR)



- Modem

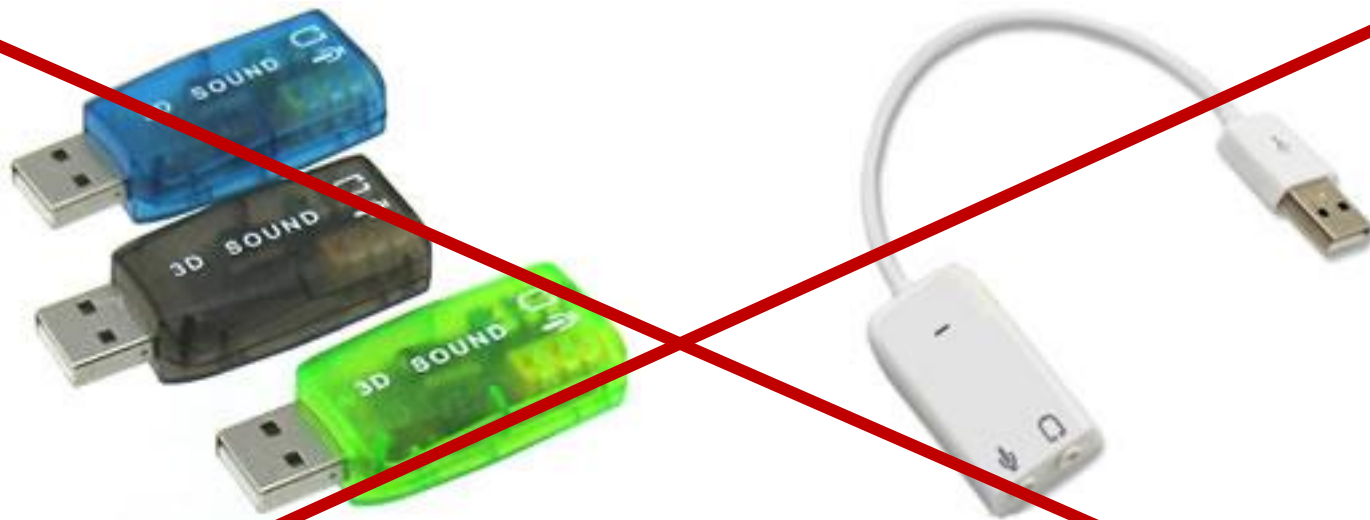


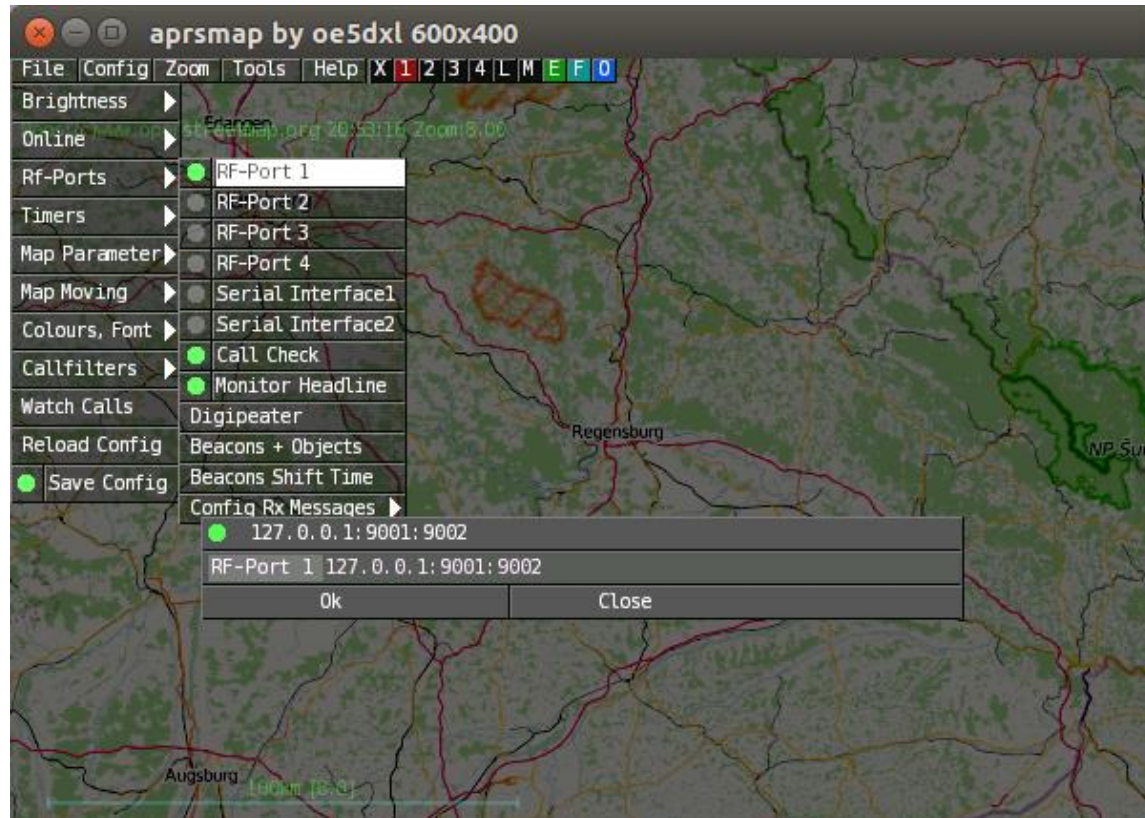
soundcards working



soundcards NOT working

need some rework or are not working properly

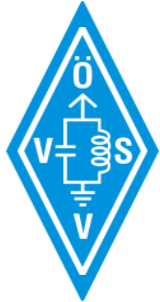




some other functions

- Rf-Path
- heard
- weather data
 - ☐ rain/temperature map
 - ☐ data over time
- moving objects
 - ☐ animate
 - ☐ speed/high
- export





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APRSmap

MESSAGES

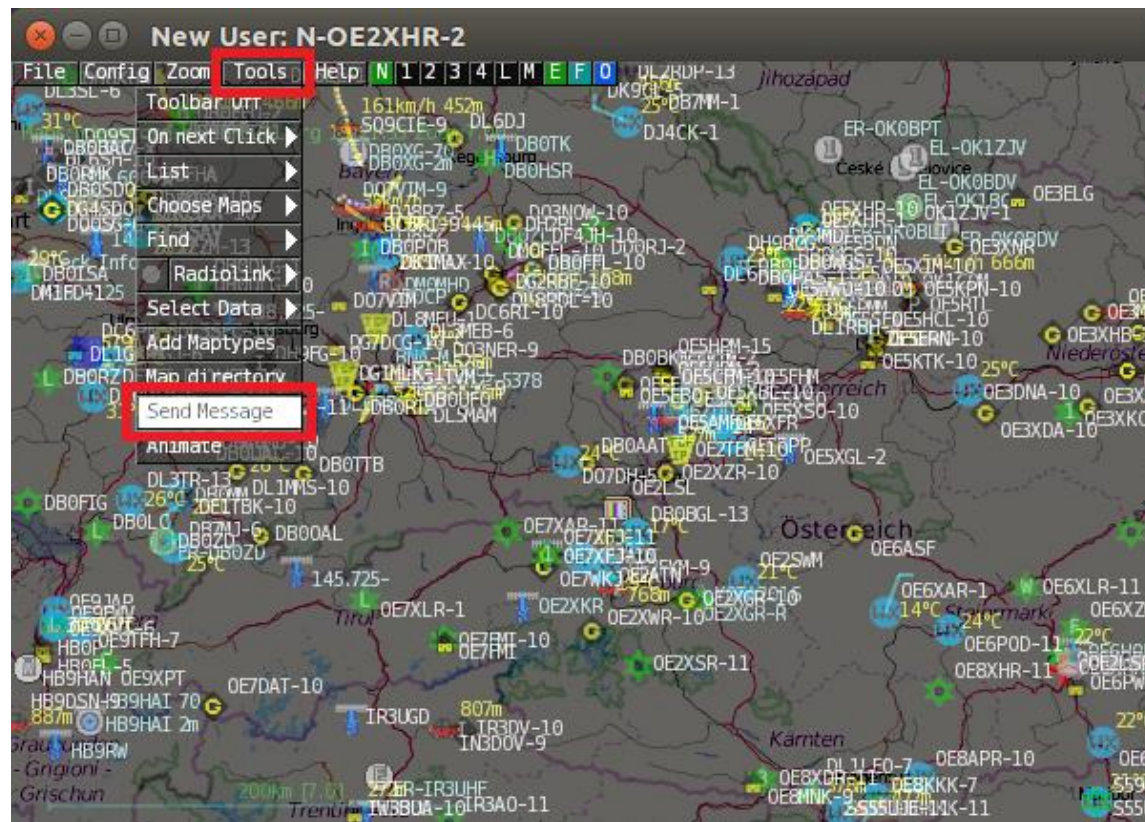


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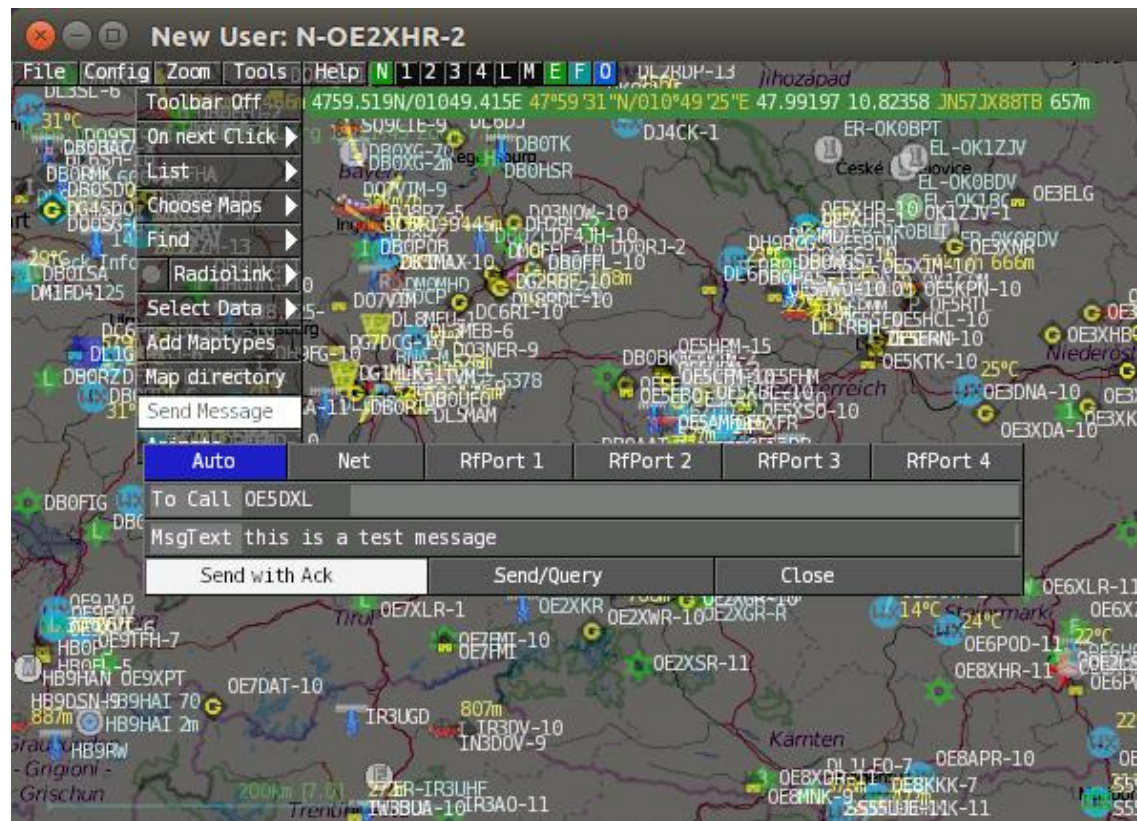
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- sending short messages
- up to 67 characters



- Message with/without acknowlage



DXLaprsmap message

New User: N>F6DHI-12

File Config Zoom Tools Help N 1 2 3 4 L M E F O

Message (1/1) from [OE5DXL] to [OE2LSP] ack[RD] Port[N] 19:28:55
[answer of test message]

Close Next Reply Delete

TxTime	AckTime	Ret	Po	Receiver	AckTxt	Message
19:24:05	19:24:06	1	A	OE5DXL	M4}RD	this is a test message

Auto Net RfPort 1 RfPort 2 RfPort 3 RfPort 4

To Call OE5DXL

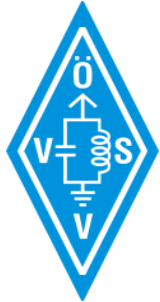
MsgText

Send with Ack Send/Query Close



- sending bulletins to everybody (**Tools>List>Bulletins**)
 - To: „BLN“
- sending messages to gateways (examples):
 - email
To:“EMAIL“ MsgText:“mail@example.com content“
 - WinLink (APRSLink)
<https://www.winlink.org/APRSLink>
- receiving messages from gateways
- to use this functions local IGATEs/APRS-IS network must support these





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RADIO TOOLS

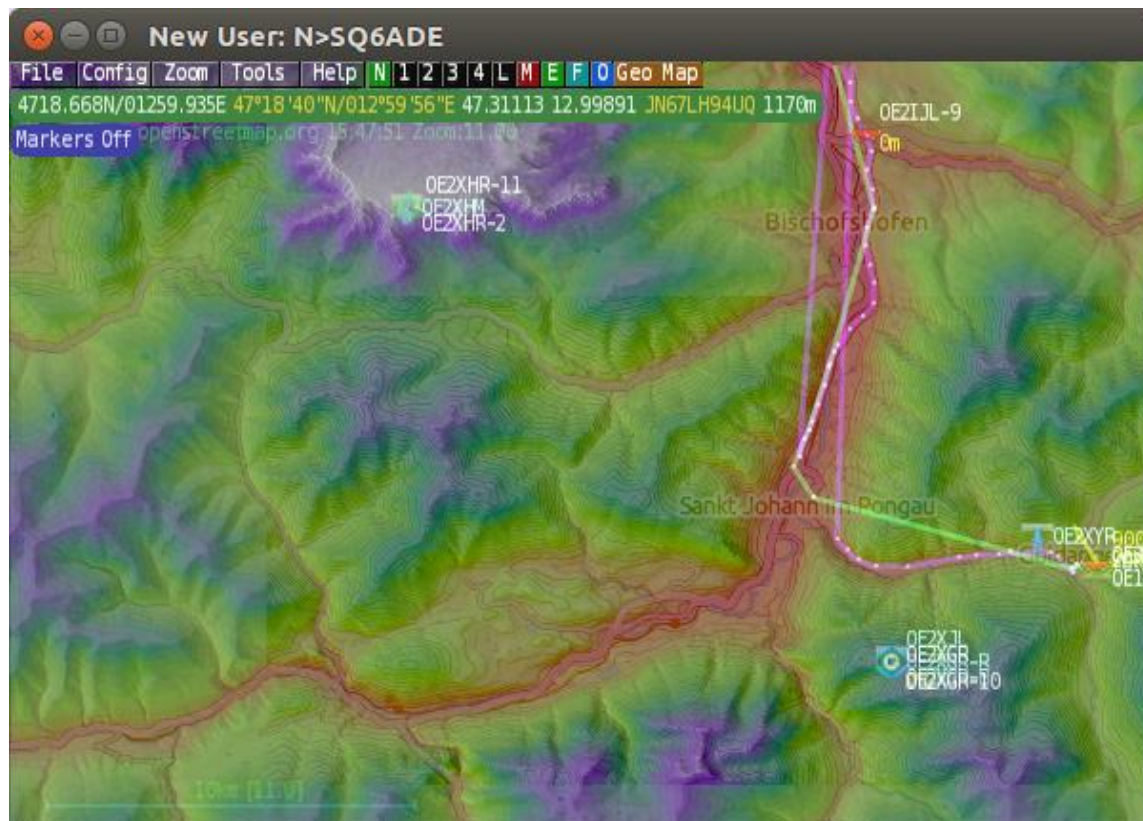


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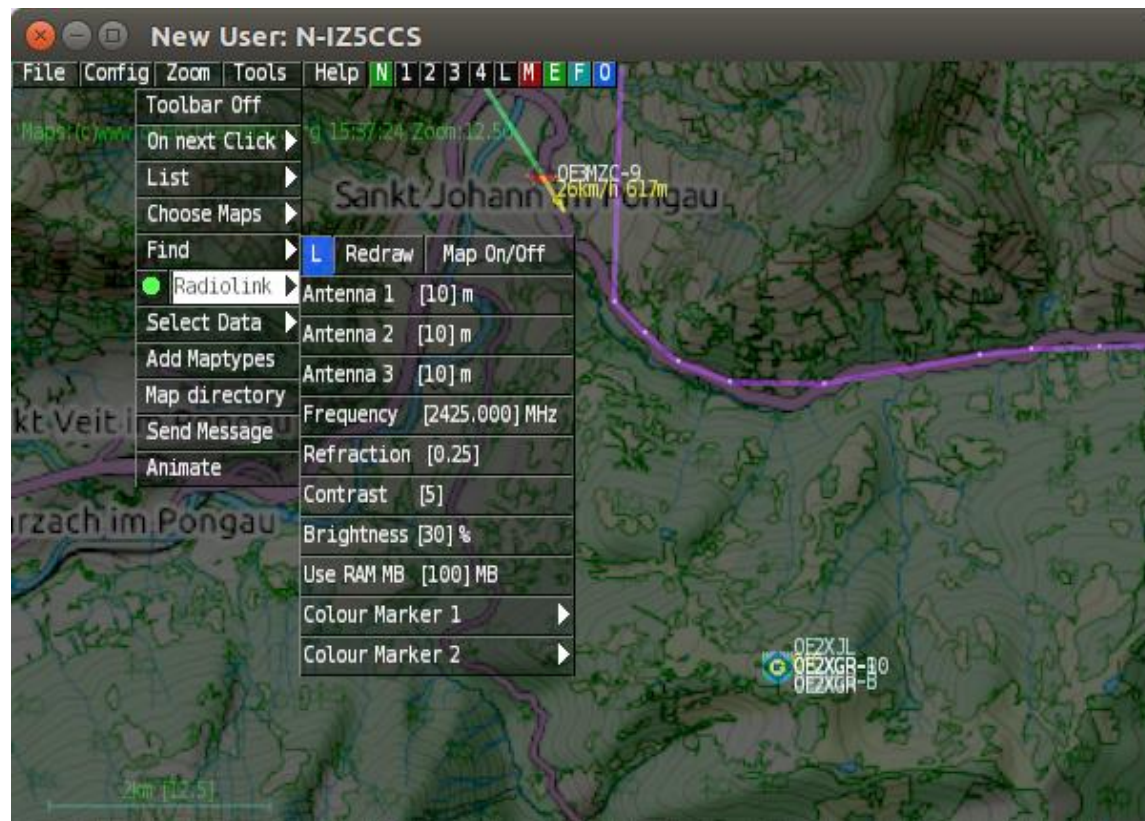
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- to check if you have the correct SRTM-data press „H“

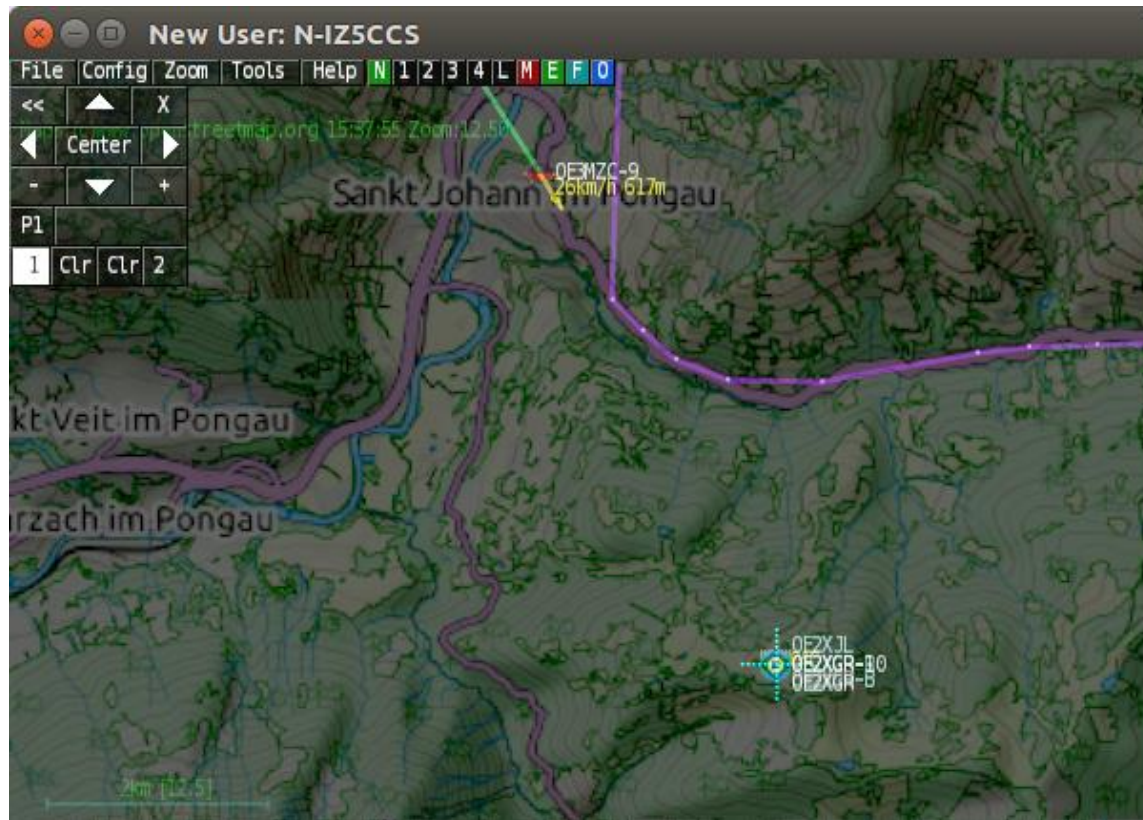


- enable „Radio Link“



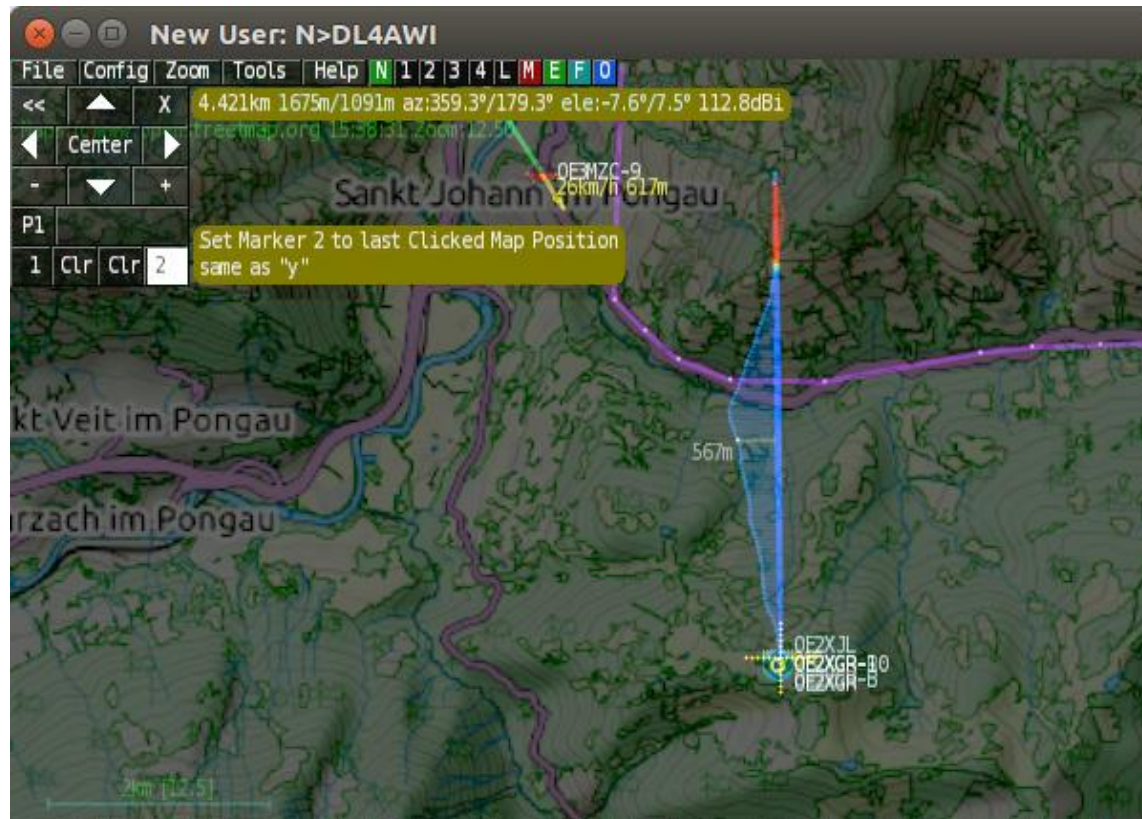
DXLaprsmap radio tools (3)

- to place marker 1 click on to the map
- Next go to „Zoom“ and press „1“

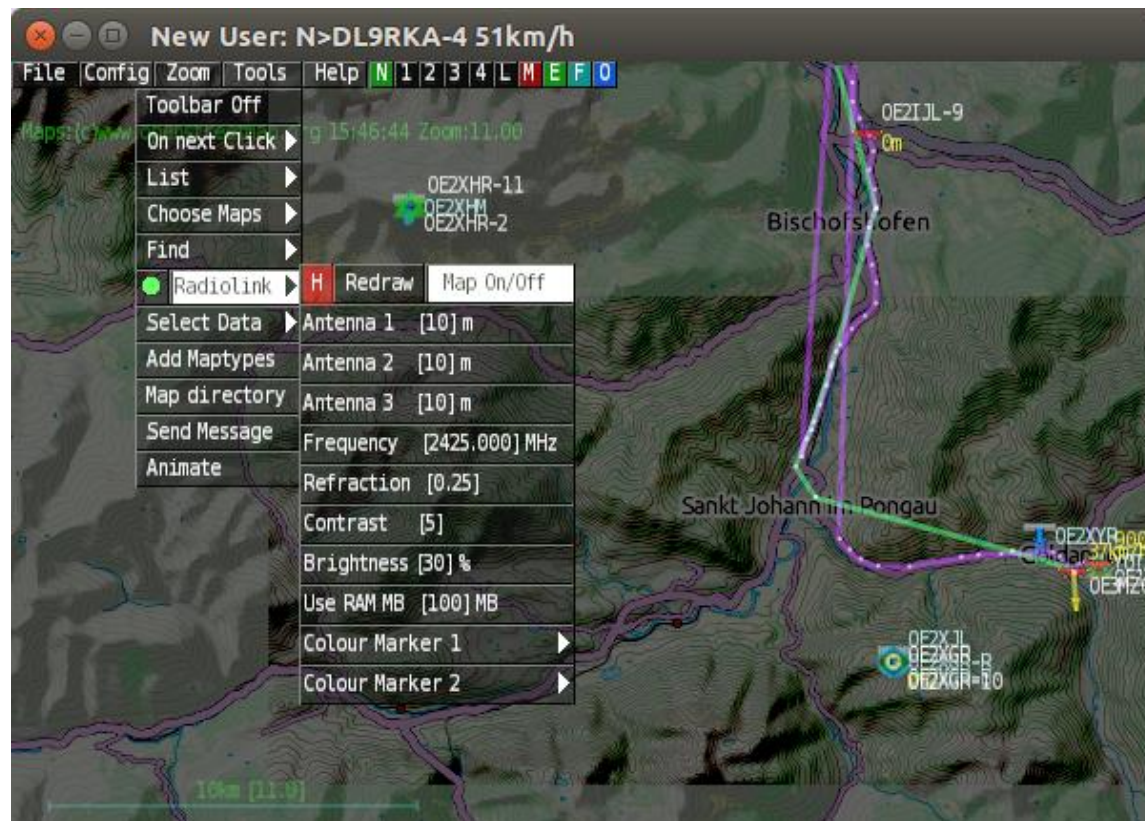


DXLaprsmmap radio tools (4)

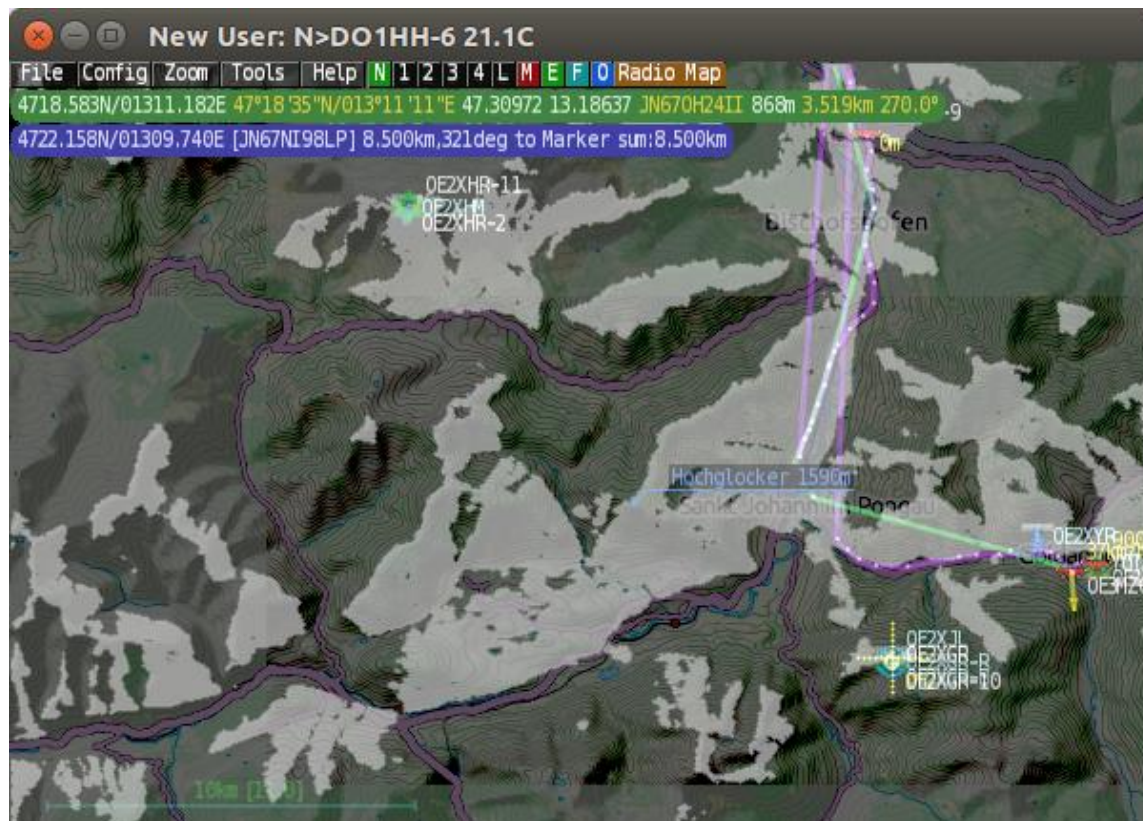
- repeat the step with clicking onto the map, this time press „2“
- instead of navigating through the menu you can press „x“, „y“ on the keyboard



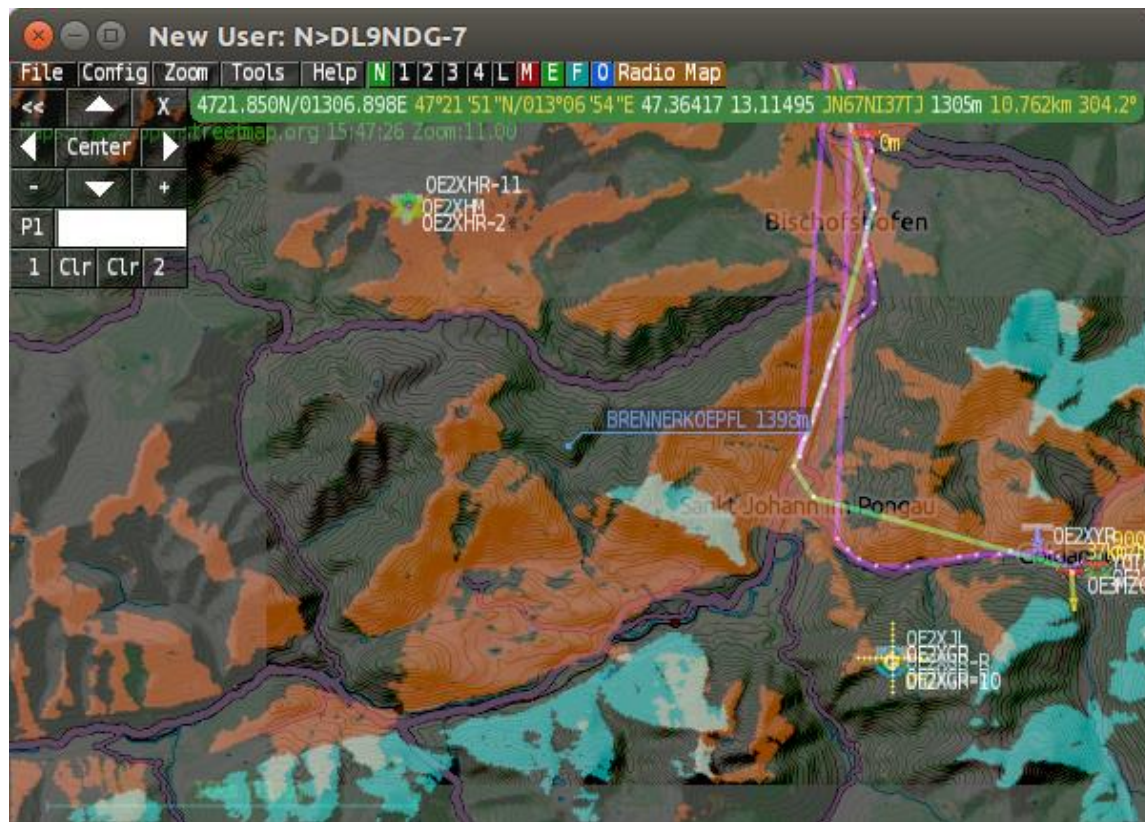
- to display covered areas go to „Tools>Radiolink>“
press „Map On/Off“



- place one marker to see coeraged areas

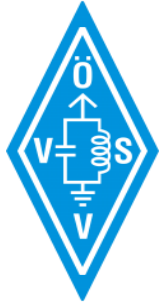


- If you place the second marker, you can see one colour for each marker, white for areas with coverage of both



- Hamradio wiki Austria:
 - http://wiki.oevsv.at/index.php?title=DXL_-_APRSmap_englich
- <https://github.com/oe5hpm/dxlaprs>
- <http://Lspe.org/yota>
- <http://aprs.org>





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Thank you!



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