

Berks County ARES/RACES Digital Network

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Berks County ARES/RACES

Digital Communications Guidelines Ver. 4.09

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1.0 Purpose

To provide guidelines and suggestions for Berks County ARES/RACES Amateur Radio groups and to establish a working and compatible digital communications network. One that can provide modern emergency communication service to government and NGO in times of disaster or other incidents.

2.0 Background

Internet email has become the globally accepted method for fast written communications for individuals, corporations, government agencies and other served organizations like the Red Cross and Salvation Army. Nevertheless, if a disaster strikes and a community's electrical power or telephone service is disrupted in any way, or the agencies email server goes down, then the Internet link is broken and normal email cannot flow.

The use of an Amateur Radio digital communications network linked to the Internet can then become an effective and important tool in keeping an ARES group and its served agencies connected globally without the normal wired Internet connection. It allows an Amateur station to assist served agencies and keep them connected from inside a disaster area, and without normal email servers or Internet links.

The Eastern Pennsylvania ARES® is dedicated to the use of many forms of communications to transmit messages during times of disaster and/or emergencies. And in order to accomplish our objectives we need to have redundancy and utilize all available communications modes and systems, with a requirement that networks be able to communicate across inter-agency and inter-jurisdictional boundaries. Digital communications (WL2K) has the ability of providing error-free messages to a destination, minimizing public disclosure of sensitive information, and in a written format.

WiFi or HSMM is often used as a convenient link to the Internet from a portable RMS Packet gateway, which in turn provides outlying user stations access to the network via packet radio. This allows quick deployment of an ad-hoc packet infrastructure, and can expand bandwidth for packet users by increasing the number of gateways and frequencies. Only open, public, WiFi access points should be used, as opposed to those intended for private operation. Public use access points can often be found at public libraries and colleges, coffee houses and other locations.

These access points should be located and confirmed before you need them. Some access points are listed on these sites:

<http://www.wififreespot.com>
<http://www.jwire.com>

Please note: The ARRL recommends avoiding WiFi channel one due to its proximity to the AO-40 satellite downlink frequency. WiFi equipment used under FCC Part 97 (HSMM) should adhere to ARRL guidelines for compliance. See:

<http://www.arrrl.org/hsmm>

Listed are numerous Berks County locations where WiFi connections to the internet can be made in an emergency. Please note that all McDonald locations do not have free WIFI internet access in Berks County. In fact, some McDonald's do not have any WIFI access. Most McDonald's use Wayport to access the internet via WIFI. It costs \$2.95/2hrs payable using a credit card.

Reading

[Reading Public Library](#) - 100 South 5th Street
[GoggleWorks Cafe](#) - 201 Washington St - 610 374 4600

West Reading

[Hard Bean](#) - 600 Penn Ave - 610 372 3705

West Lawn

[Giant Food Store Marketplace Cafe](#) - 2104 Van Reed Rd - 610-670-4713

Spring Township

[Panera Bread](#)
Papermill Road
2733 Papermill Road
Reading, PA 19610
Phone: (610) 373-9620

Shillington

[Best Western Reading Inn](#)
2299 Lancaster Pike
Shillington, Pennsylvania, 19607-2380
Phone: 610-777-7888

Exeter Township

McDonald's \$ 5370 Perkiomen Ave. Reading, PA 19606	Gravity 4850 Perkiomen Ave. Reading, PA 19606
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Hamburg

McDonald's \$ 80 Wilderness Dr Hamburg, Pennsylvania 19526	Hard Bean Cafe 317 State Street Hamburg, PA 19526
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Boyertown

[Landis Store Restaurant](#) - 4 Baldy Hill Road

Fleetwood

[Max Crema's Espresso and Coffee Bar](#) - 3130 Pricetown Road, Suite A - 610-898-9001
[Marie's Hard Bean Cafe](#) - 24 E Main St - 610 944 8141

Robesonia

Ozgood's Grill & Bar - 319 E Penn Ave - (610) 693-6685

5.3 Software and Equipment

5.3.1 Software

The recommended VHF/UHF client software is *Paclink* combined with AGW Packet Engine or Packet Engine Pro. Alternatively, *Airmail* is equally well suited, and offers access the Winlink system via VHF/UHF and HF as well. It, in fact, may be the preferred software for a group for ease of local support and general utility. *RMS Packet Software* is the standard for all RMS Packet Stations. *RMS HF Pactor* is the standard for all Pactor WL2K Stations. *RMS Relay* is additional software used to store and forward emails via HF should the pactor station lose its internet connection.

To standardize all WL2K operations Berks County ARES/RACES recommends using Airmail software with a Kantronics KPC-3+ or similar TNC for portable WL2K VHF 1200 baud applications.

Berks County RMS Packet Stations are encouraged to use a Kantronics KPC-3+ or similar TNC and run your .aps file for direct control of the TNC. The .aps file below is pretty much bullet-proof.

All Berks County RMS Packet Stations are encouraged to assign yourcall-2 as a Digipeater and yourcall-3 as a KA-Node. Where "yourcall" is your actual call sign.

RMS Packet, Paclink and Airmail programs are available on the Internet from links at: [Winlink 2000 | Global Radio Email System](#)

6.0 Berks County VHF/UHF Networks

The WL2K Home Frequency for Berks County is 145.770mhz. Presently, WA3WSJ-10 RMS Packet Station located in eastern Berks County and WB3FPL-10 in SW Berks County are assigned to this frequency. The EPA District-2 WL2K Frequency is 145.090mhz. Presently, only the K3WGR-10 RMS Packet Station located in western Berks County is assigned this frequency.

For additional information about Berks County Emcomm go to: <http://www.berkscountyaresraces.homestead.com/>

6.1 WA3WSJ-10 RMS Packet Frequency: 145.770mhz WA3WSJ-2 Digi WA3WSJ-3 KA-Node <i>24/7 operation</i>	Exeter Township, PA (SE Berks)
K3WGR-10 RMS Packet Frequency: 145.090mhz K3WGR-2 Digi K3WGR-3 KA-Node <i>24/7 operation</i>	Wernersville, PA (Western Berks)
KB3LMS-10 RMS Packet Frequency: 145.770mhz (Emergency use only)	Washington Township, PA (Eastern Berks)
WB3FPL-10 RMS Packet Frequency: 145.770mhz WB3FPL-2 Digi <i>24/7 operation</i>	Brecknock Township, PA (SW Berks)

6.2 VHF/UHF Band Plan

The 2 Meter and 70cm frequencies available for use in Berks County are:

144.91	145.01	145.51	145.63	145.77
144.93	145.03	145.55	145.65	
144.95	145.05	145.57	145.67	
144.97	145.07	145.59	145.69	
144.99	145.09	145.61	145.73	
440.9250	440.9500	440.9750	441.0000	441.0250
441.0500	441.0750			

Indicates frequencies presently in use for WL2K in Berks County
Note * 144.910mhz is the WL2K Secondary Frequency

6.3 ARES® Emcomm HF Network

The station list is updated as the national network grows and is published at:
<http://epaaresdigital.pbwiki.com/StatusLinks>
Frequencies, locations and all necessary information for Emcomm.

Berks County has no HF Pactor WL2K capability at this time.

7.0 Emcomm Deployment Priorities

First priority should be for a local group to establish at least two portable stations with NVIS antennas that can use HF Pactor II or III and Airmail when deployed in the field. These stations will be operational where needed, and rely on no local infrastructure. If all else fails, these stations remain in operation and become essential. Further, these stations have the highest value as mutual aid data resources when needed outside your local area. The HF frequencies used are dependent on location and propagation conditions.

Second priority should be to take stock of locally available equipment. If there is an abundance of legacy packet hardware available, put it into service. Establish secure, reliable RMS Packet gateways at good RF locations in your local area. As more operators are trained, more RMS Packet stations should be added to expand and deepen your UHF/VHF infrastructure.

Alternatively, consider installing or pre-deploying multi-mode TNCs and radio equipment at the city and county EOCs and other key public safety and disaster relief organizations such as hospitals, or Red Cross EOCs. Simple VHF/UHF TNCs such as the Kantronics KPC-3 (Version 5.2 and above) or the KPC-9612 can be centrally located within a county or district for portable use.

Next priority should be to encourage and train a group of local operators to become proficient with packet operations and to build field-deployable portable stations. These may be the easiest to put into place, owing to much legacy packet equipment being available.

ARES® groups should prepare portable packet kits that can be deployed anywhere on short notice. These kits must include enough gear to communicate via 1200 baud VHF packet at a minimum. Also included should be a computer (ideally a laptop) with at least Airmail loaded to provide connectivity to the Winlink system via RMS Packet gateways. Ideally, these kits would also include UHF capability and 9600-baud capability as well.

If packet hardware is not abundantly available without purchase, or after other station types are in place and a local infrastructure begin to grow, moving to broadband field stations is highly recommended.

This document is not intended to be a reference for training or technical information. For the best information on the Emcomm use of Winlink, and how to get started see:

<http://www.activeham.com/winlink/wiki>

<http://www.winlink.org>

7.3 Operation: Connection Priorities

To deliver messages with the most efficiency and speed:

1. Determine if the served agencies for which you have messages have Internet access and email service.
2. Determine if you have local internet connectivity. If so, send your messages to their destination using regular email or through the Winlink system using a Telnet connection.
3. If connectivity is missing at either end, determine the best RF path and frequency from your location to the best RMS Packet station or Pactor station. The best may be an HF connection to a pactor station three states away. Or it may be to your local RMS Packet gateway. Send your messages through the gateway or Pactor station.
4. If gateways or pactor stations are not available, consider sending your message via another local Airmail station (*only Airmail-equipped stations are capable of peer-to-peer connections*). Local groups should designate a single Airmail station to act as a 'hub' if other infrastructure is not available. All surrounding stations should connect to that 'hub' station to send and retrieve mail. *When used this way, the "post to" address must be that of the destination station or email address, and the "post via" address must be the next 'hub', or forwarding station and not the default of "WL2K."*
The principle here is to use the internet or high-speed links wherever possible in the path and keep RF channels as open and uncongested as possible.

8.0 Suggested TNC Parameters

Standardized parameters make a tremendous difference in the throughput of the network. These suggested VHF/UHF parameters are for smoother 1200bps AX.25 packet operations.

SSID for RMS Packet nodes should be -10 to standardize with other RMS Packet Stations across Eastern Pennsylvania and the rest of the country.

8.1 Berks County VHF RMS Packet TNC Parameters

```
;This KPC-3+ APS File has been field tested and works fine
;Test initialization file for the KPC3
;After editing rename this file to KPC3_1.aps for use by RMS Packet
;Any line with a leading ";" is ignored
;Any text following a ";" is ignored
8bitcon ON ; Allow transmission of 8 bit data
;Abaud 9600
AUtoIf OFF
Ax25L2v2 ON ;Adapt to level 2 protocol
AXDelay 0 ; no additional delay
AXHang
Beacon EVERY 89 ; Beacon every 10 minutes
BKondel ON
Btext !FN20bh WA3WSJ-10 RMS Packet 145.770 MHz Berks County, PA
BUDCalls NONE
BUdlist NONE
CAnLine $18
CANPac $19
CD INTERNAL ; Set for open squelch
CHeck 20
CMdtime 0
CMSg OFF
COMmand $03
CONList OFF
CONMode CONVERS
CONOk ON
CPactime OFF
CR ON
CRSup OFF
CStamp OFF
CText ; Connect text not used
CWId 0 ;CW ID off
DBIdisc OFF
DElete $08
DIGipeat ON
DWait 0
ECHO OFF
ESCAPE OFF
FILTER OFF
FLOW OFF
FRACK 4
FULLDUP OFF
HBAUD 1200
HEADERln OFF
HID ON
KNTimer 15
LCOK ON
LCStream ON
LEDS ON
LFADD OFF
LFSUP OFF
LLIST OFF
MALL OFF
MAXFRAME 2; upper limit of unacknowledged packets
MBeacon OFF
MCOM OFF
MCon OFF
MONITOR off
MRESP OFF
MYALIAS WA3WSJ-2; Your Digieater alias here if digipeating is enabled
MYCALL WA3WSJ-10; Put your call here
MYNODE WA3WSJ-3; Your KA Node alias here if enabled
```

NDWild OFF
NEWMODE OFF
NOMODE OFF
NUcr 0
NUIf 0
numnodes 1; number of allowable circuits thru KA-Node
PACLEN 128
PACTIME 10; pace rate of packets n* 100ms
PARITY NONE
PASSALL OFF
PBBS 0
PERSIST 63; used with SLOTTIME for channel access
PID OFF
RELINK OFF; TNC with AX25L2V2 ON does not attempt to auto-connect after RETRY is exceeded
RESptime 10
RETRY 5; packet retries
RING OFF
RNRTIME 0
SENDPAC \$0D
SLOTTIME 10
START \$00; only hardware flow control
STOP \$00
STREAMCa OFF
STREAMEV ON
STREAMSW \$7C
SUPCALLS NONE
SUPLIST OFF
TRACE OFF
TRFLOW OFF
TXDELAY 40
TXFLOW OFF
USERS 10; This should agree with MAXUSERS (must be between 1 an 10.)
XFLOW OFF
UNPROTO Airmail VIA WA3WSJ-10; this is the unproto path with digis that the beacon will use
XMITOK ON
MAXUSERS 10; This should be the last command as it causes an automatic KPC3 soft reset.

For additional information on how to install and setup a WL2K Airmail Station, please go to:

<http://berkscountyaresraces.homestead.com/WL2K.html>

Berks and Surrounding Counties WL2K RMS Packet Stations

Callsign	County	City	Freq.	Power	AHG	Gain (DB)
WA3WSJ-10	Berks	Exrter Twp.	145.770	60w	35'	6.0
WB3FPL-10	Berks	Brecknock Twp.	145.770	12W	50'	2.0
K3WGR-10	Berks	Spring Twp.	145.090	50W	62'	6.0
KB3LMS-10	Berks	Washington Twp.	145.770	10W	6'	3.0
W3EOC-10	Chester	French Creek S.P. (South)	145.690	50W	200'	7.0
W3EOC	Chester	West Chester	145.510	35w	250'	6.0
WA3WLH-10	Montgomery	Pennsburg	145.950	60W	25'	5.0
N3RZI-10	Sshuylkill	Frackville	145.710	60W	30'	5.0
K3SNY	Snyder	Selinsgrove	145.010	25W	25'	4.0
W3SG-10	Lehigh	Lehighton	145.550	60W	30'	0.0

Red Indicates Intermittent Operation or Emergency use only

RMS Pactor Stations Surrounding Berks County

W3EOC: Chester County

W3EOC.EPA.USA.NA, Lor Kutchins/W3QA, [FM29ex:West Chester, PA],
(08JAN08)

L 3590.0# 3590.0 7066.9 7103.7# 10145.7# 14108.9#

P W3EOC: 145.510 (1200)

P W3EOC-10: 145.690 (1200)

P W3EOC (D-Star): 1297.100

E lor at w3qa dot net

H www.w3eoc.org digital.w3eoc.org

T w3eoc.no-ip.org (soon to change)

A 3 D-Star network data access points; contact syop for info

A Operated by Chester County Department of Emergency Services

A Secure hardened site. Automatic emergency power for 7 days.

K3SNY: Snyder County

K3SNY.PA.USA.NA, Chris Snyder/NG3F, [FN10nt:Selinsgrove, PA],
(07FEB24)

D 3589.0 7064.0 7101.5# 10144.9 14101.9

E ng3f at ptd dot net

H www.svemcomm.org

T 66.152.132.68 k3sny.no-ip.org

A 7064 is Pactor 1 & 2 ONLY

P Co-located with K3SNY-10: 145.01 (1200) on seperate TNC

A Located at the Snyder County EOC

To locate a HF RMS Pactor station please click on the links below.

http://home.earthlink.net/~bscottmd/hf_freq_lst.htm

<http://www.winlink.org/RMSPactorPositions>

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