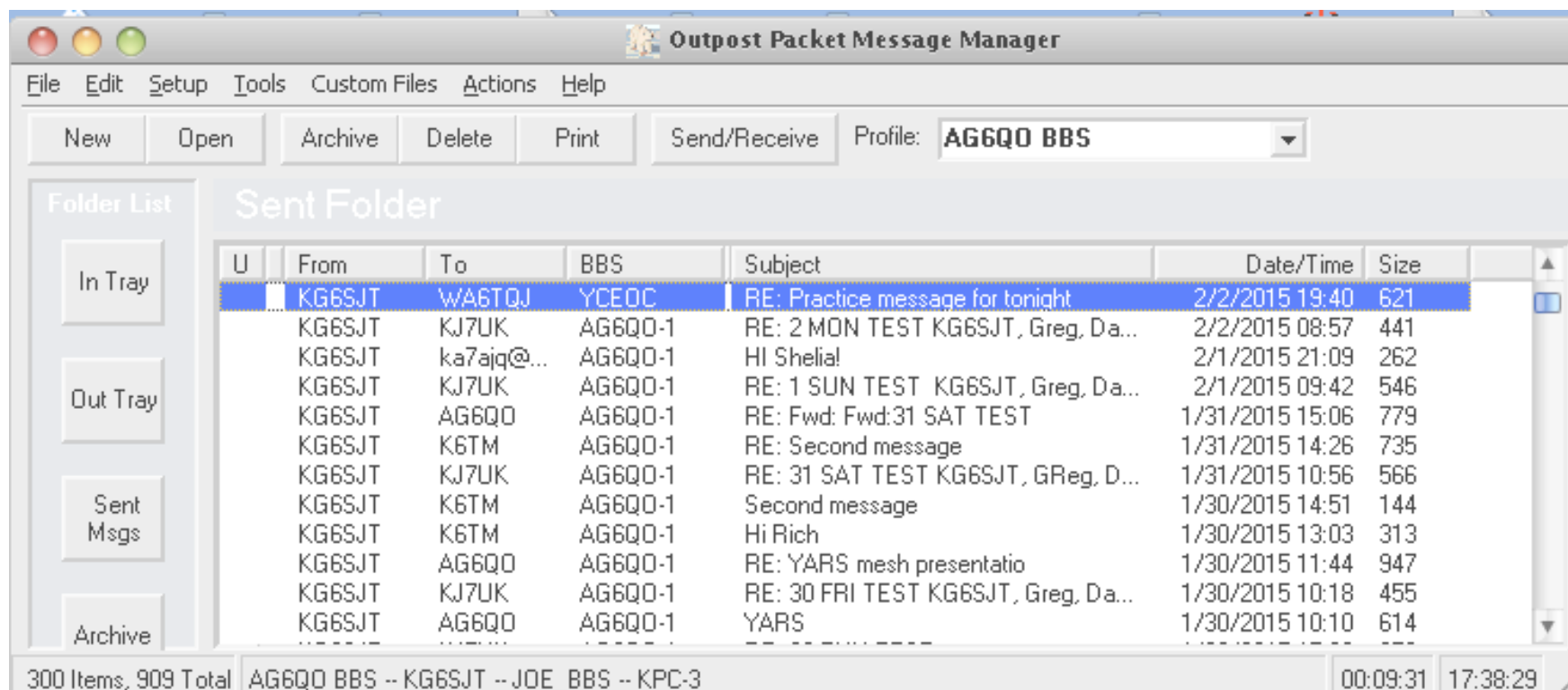


Packet Radio



Greg Kruckewitt, ARRL Sacramento Valley District 3 EC

Topics

- Introduction
- What is Packet Radio?
- Why use Packet Radio?
- Building a Packet Station
- Software for Sending Packet Messages
- Demo

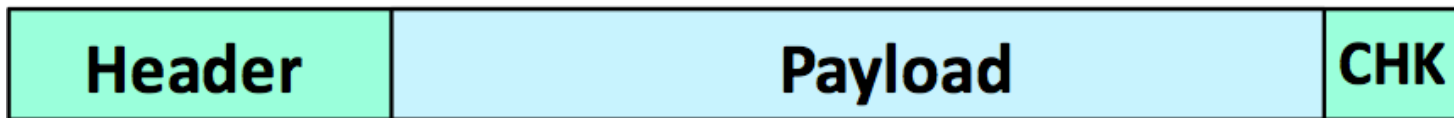


What is Packet Radio?

- Amateur Packet Radio is one of many digital modes that Hams can use to build wireless computer networks
- Packet establishes a “private connection” between two stations while sharing a frequency with other stations
- Packet can use Bulletin Board Systems (BBSs) for dropping off and retrieving messages between users
- You can take advantage of packet nodes to connect to distant stations

How Packet Radio Works

- Packet Radio uses the AX.25 protocol
- Sends packets (an envelope + payload)

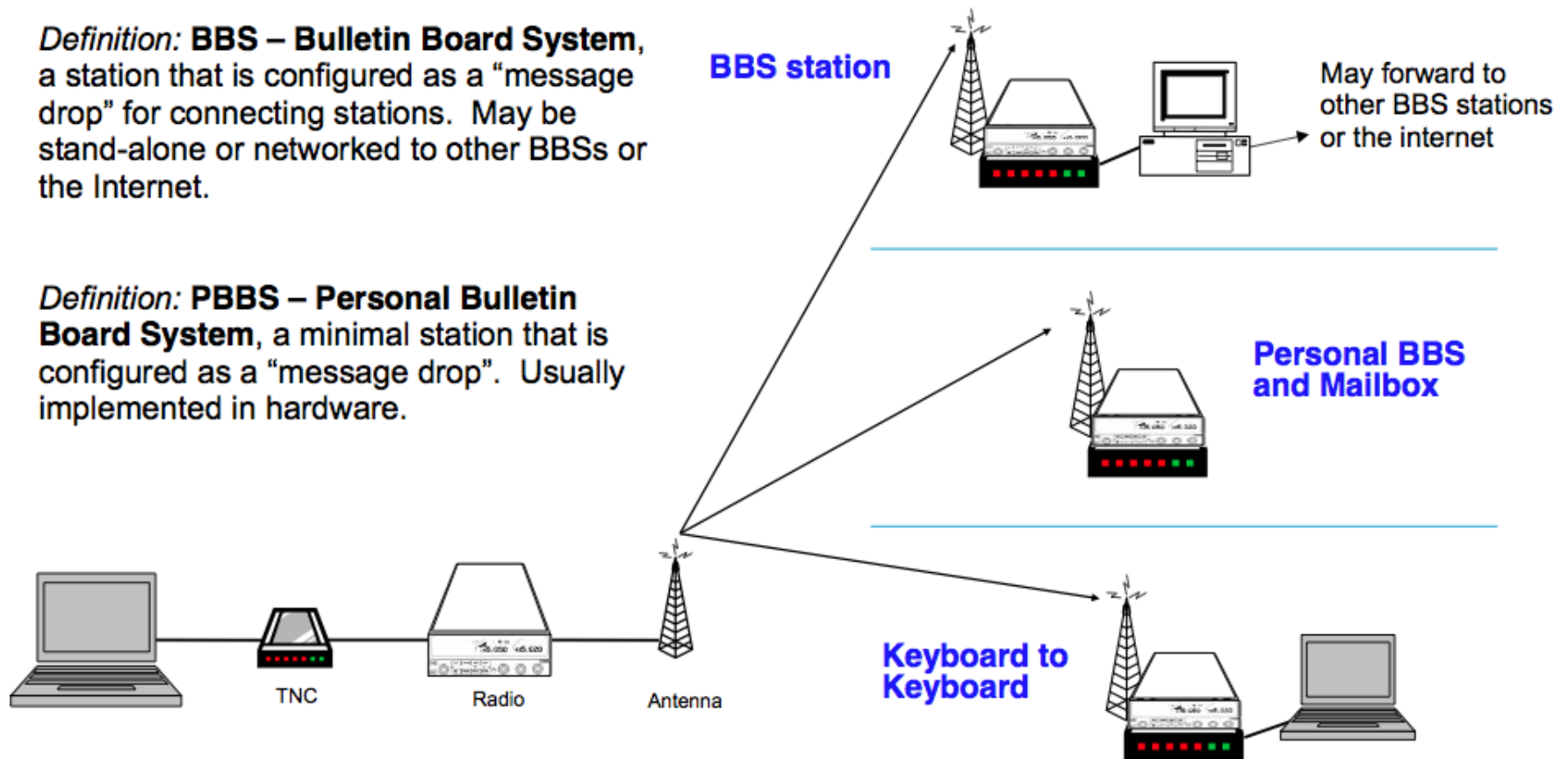


- Envelope contains the header at the beginning and a checksum at end
- Header contains addressing information (to, from)
- Checksum determines if packet is ***error-free***
- Payload contains the data to be sent

Packet – Making Connections...

Definition: **BBS – Bulletin Board System**, a station that is configured as a “message drop” for connecting stations. May be stand-alone or networked to other BBSs or the Internet.

Definition: **PBBS – Personal Bulletin Board System**, a minimal station that is configured as a “message drop”. Usually implemented in hardware.



Advantages of Packet Radio?

- Messages sent to a BBS can be stored and forwarded throughout connected BBS networks.
- The recipient does not need to be on-line to get the message, meaning that messages can be retrieved at the recipient's convenience.
This can save computer's battery power.

Advantages of Packet Radio?

- Packet radio is ideal for sending **complex messages**
 - passing lists of material, addresses, instructions, or complex words (i.e. pharmaceuticals or chemicals)
 - You would not want to mistake Hydrogen Sulphide (a gas) with Hydrogen Sulfate (an acid)
- *Error checking insures that messages are sent error-free*

Complex Data Sent from Tevis Ride

Subject: DATA JUDGE DAVIS 0912

```
25 Mile Endurance
DATA JUDGE DAVIS 0912
BEGIN JUDGE DAVIS
206      0921      IN
210      0944      IN
202      0950      IN
203      0950      IN
205      0954      IN
206      1003      OUT
208      1011      IN
207      1017      OUT
201      1028      IN
202      1029      OUT
205      1030      OUT
203      1037      OUT
208      1056      OUT
```


Building a Packet Station

- To build a packet station you will need:

- Computer



- Terminal Node Controller



- Radio

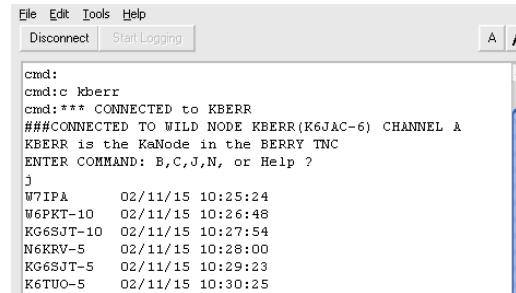


- Cables from computer to TNC
and from TNC to radio



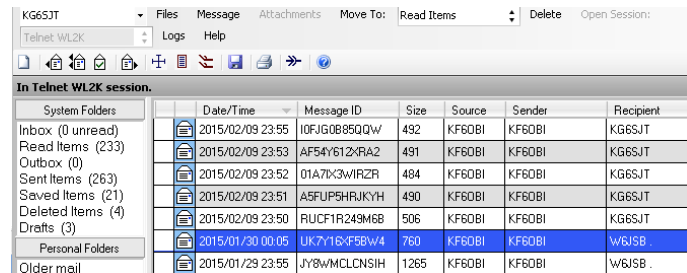
Packet Radio Software

- Terminal program
- RMS Express
- Outpost Packet Manager

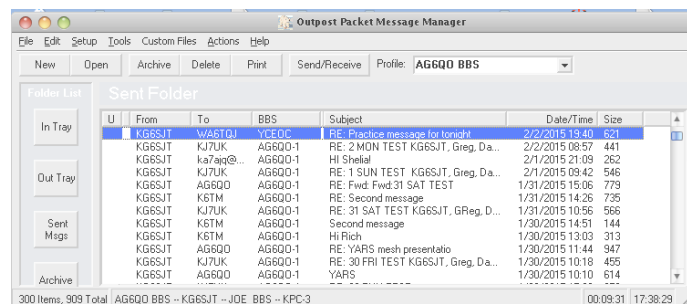


```
File Edit Tools Help
Disconnect Start Logging A A

cmd:
cmd:c kberr
cmd:*** CONNECTED to KBERR
###CONNECTED TO WILD NODE KBERR(K6JAC-6) CHANNEL A
KBERR is the KaNode in the BERRY TNC
ENTER COMMAND: B,C,J,N, or Help ?
J
W7IPA      02/11/15 10:25:24
W6PKT-10   02/11/15 10:26:48
KG6SJT-10  02/11/15 10:27:54
N6KRV-5    02/11/15 10:28:00
KG6SJT-5   02/11/15 10:29:23
K6TUO-5    02/11/15 10:30:25
```



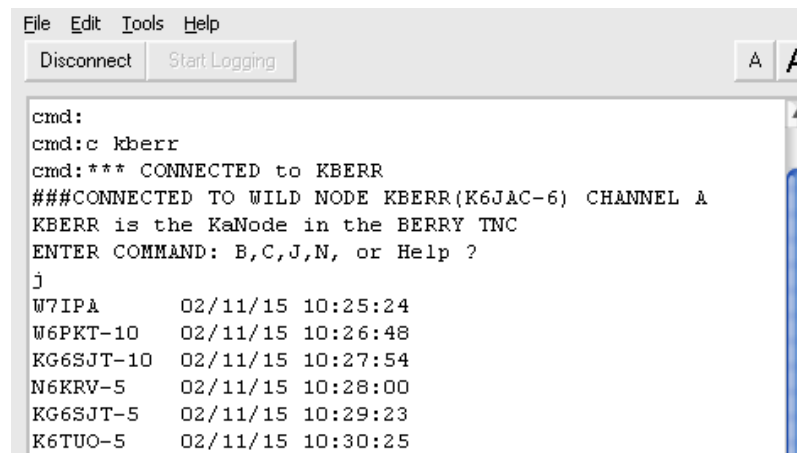
System Folders	Date/Time	Message ID	Size	Source	Sender	Recipient
Inbox (0 unread)	2015/02/09 23:55	10FJG08850QW	492	KF60BI	KF60BI	KG6SJT
Read Items (233)	2015/02/09 23:53	AF54Y61ZPRA2	491	KF60BI	KF60BI	KG6SJT
Outbox (0)	2015/02/09 23:52	01A7X3WIRZR	484	KF60BI	KF60BI	KG6SJT
Sent Items (263)	2015/02/09 23:51	AGFUP5HRJKYH	490	KF60BI	KF60BI	KG6SJT
Saved Items (21)	2015/02/09 23:50	RUCF1R249M6B	506	KF60BI	KF60BI	KG6SJT
Deleted Items (4)	2015/01/30 00:05	UK7Y1GXF5BW4	760	KF60BI	KF60BI	W6JSB
Drafts (3)	2015/01/29 23:55	JY8WMLCLNSIH	1265	KF60BI	KF60BI	W6JSB
Personal Folders						
Older mail						



Folder List	From	To	BBS	Subject	Date/Time	Size
In Tray	KG6SJT	W6STDJ	YLEDG	RE: Practice message for tonight	2/2/2015 19:40	521
	KG6SJT	KJ7UK	AG6Q0-1	RE: 2 MON TEST KG6SJT, Greg, Da...	2/2/2015 08:57	441
	KG6SJT	ka7aq@...	AG6Q0-1	Hi Sheila	2/1/2015 21:09	262
	KG6SJT	KJ7UK	AG6Q0-1	RE: 1 SUN TEST KG6SJT, Greg, Da...	2/1/2015 09:42	546
	KG6SJT	AG6Q0	AG6Q0-1	RE: Fwd: Fwd:31 SAT TEST	1/31/2015 15:06	779
	KG6SJT	K8TM	AG6Q0-1	RE: Second message	1/31/2015 14:26	735
	KG6SJT	KJ7UK	AG6Q0-1	RE: 31 SAT TEST KG6SJT, GReg, D...	1/31/2015 10:56	568
	KG6SJT	K8TM	AG6Q0-1	Second message	1/30/2015 14:51	144
	KG6SJT	K8TM	AG6Q0-1	Hi Rich	1/30/2015 13:03	313
	KG6SJT	AG6Q0	AG6Q0-1	RE: YARS mesh presentatio	1/30/2015 11:44	947
	KG6SJT	KJ7UK	AG6Q0-1	RE: 30 FRI TEST KG6SJT, Greg, Da...	1/30/2015 10:18	455
	KG6SJT	AG6Q0	AG6Q0-1	YARS	1/30/2015 10:10	614

Terminal Program

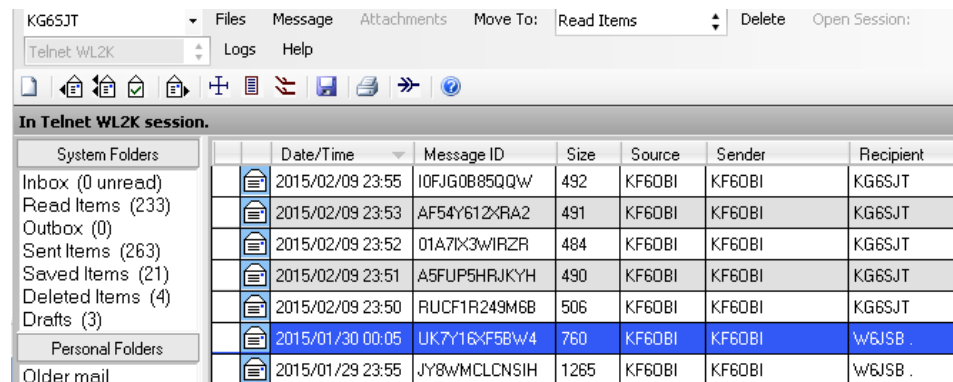
- Terminal programs can be used to connect and send short packet messages
- Many commands to learn
- Can be used for keyboard to keyboard messaging



```
File Edit Tools Help
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cmd:
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cmd:*** CONNECTED to KBERR
###CONNECTED TO WILD NODE KBERR(K6JAC-6) CHANNEL A
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K6TUO-5    02/11/15 10:30:25
```

RMS Express

- Designed to be used with exclusively Winlink Email System
- *Cannot* be used to connect to a BBS or PBBS
- Ideal to send email anywhere in the world
- Can send attachments such as small photos

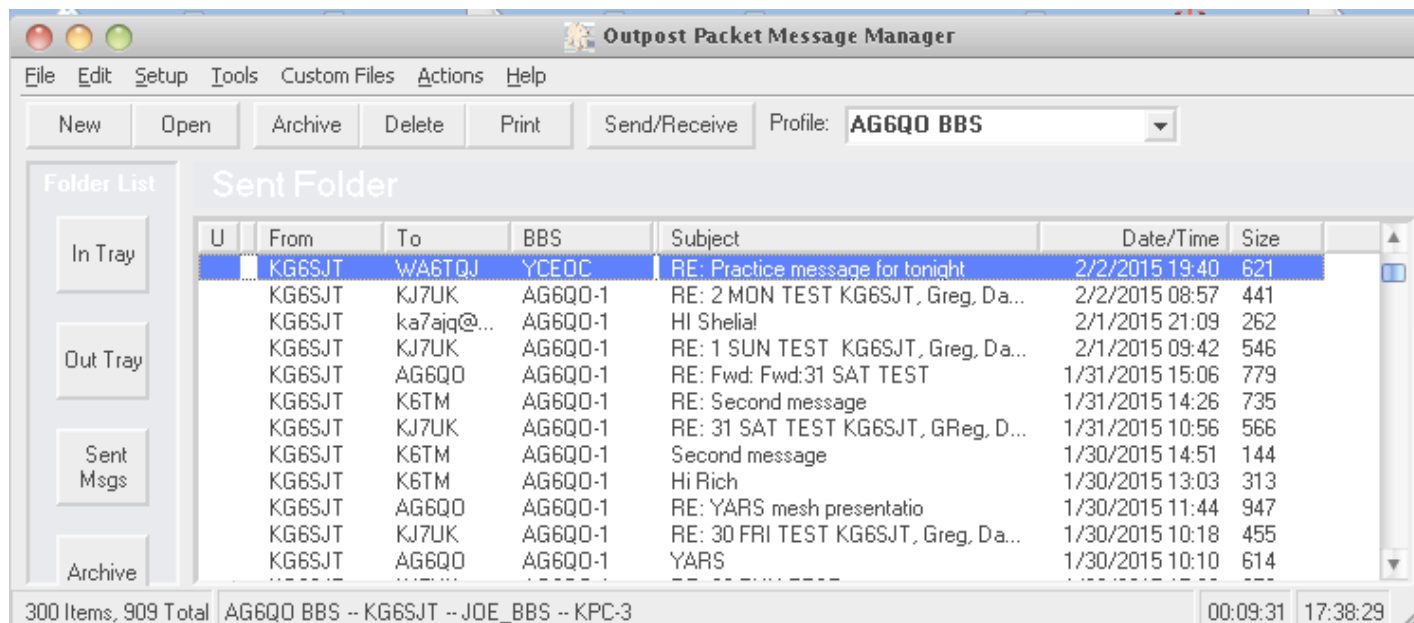


The screenshot shows the RMS Express software interface. At the top, there is a menu bar with options: Files, Message, Attachments, Move To: Read Items, Delete, and Open Session: Telnet WL2K. Below the menu bar is a toolbar with various icons. The main window displays a table of email messages in a Telnet session. The table has columns for System Folders, Date/Time, Message ID, Size, Source, Sender, and Recipient. The messages are listed in chronological order, with the most recent at the top. The message with Message ID UK7Y16XF5BW4 is highlighted in blue.

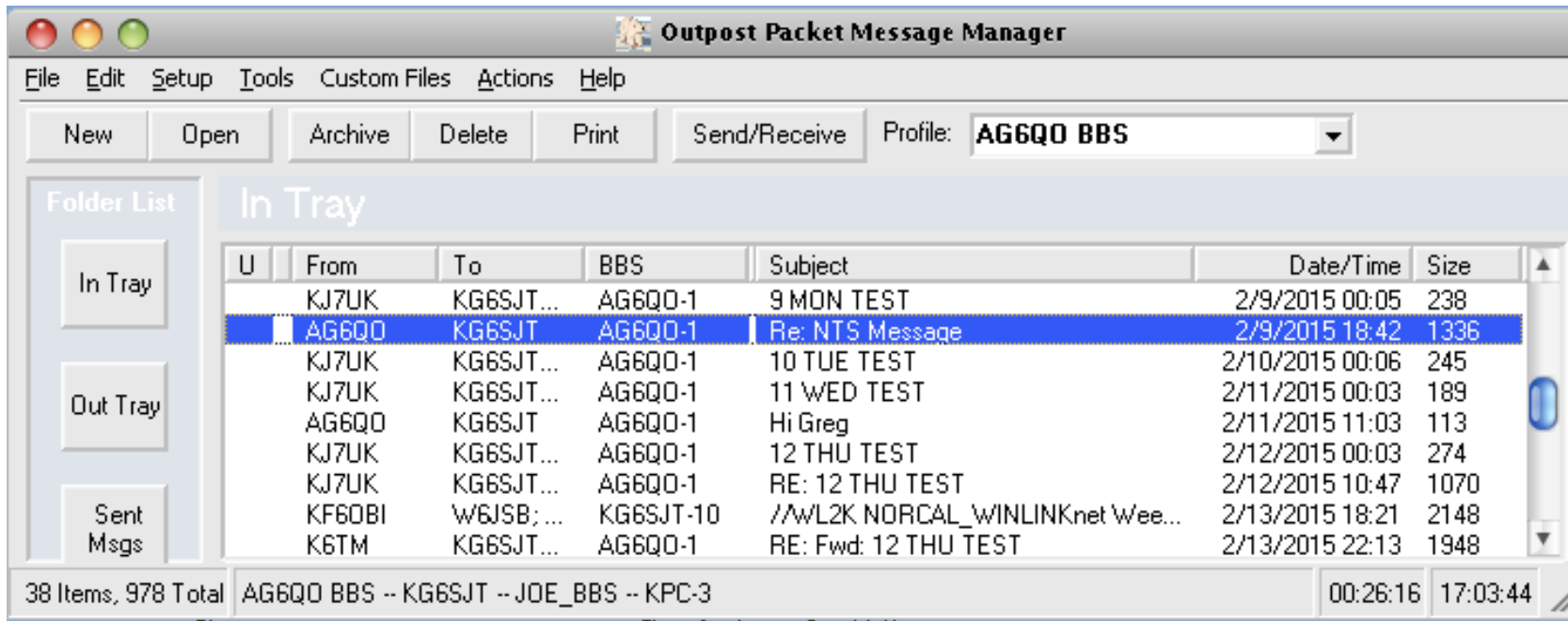
System Folders	Date/Time	Message ID	Size	Source	Sender	Recipient
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Read Items (233)	2015/02/09 23:53	AF54Y612XRA2	491	KF60BI	KF60BI	KG6SJT
Outbox (0)	2015/02/09 23:52	01A7X3WIRZR	484	KF60BI	KF60BI	KG6SJT
Sent Items (263)	2015/02/09 23:51	A5FUP5HRJKYH	490	KF60BI	KF60BI	KG6SJT
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Deleted Items (4)	2015/01/30 00:05	UK7Y16XF5BW4	760	KF60BI	KF60BI	w6JSB .
Drafts (3)	2015/01/29 23:55	JY8wMCLCNSIH	1265	KF60BI	KF60BI	w6JSB .
Personal Folders						
Older mail						

Outpost Packet Manager

- Designed for ARES/RACES Emcomms by Jim Oberhofer, KN6PE specifically for ARES/RACES in Santa Clara County. Used by many ARES groups for digital communications in the US.



Outpost: Message List



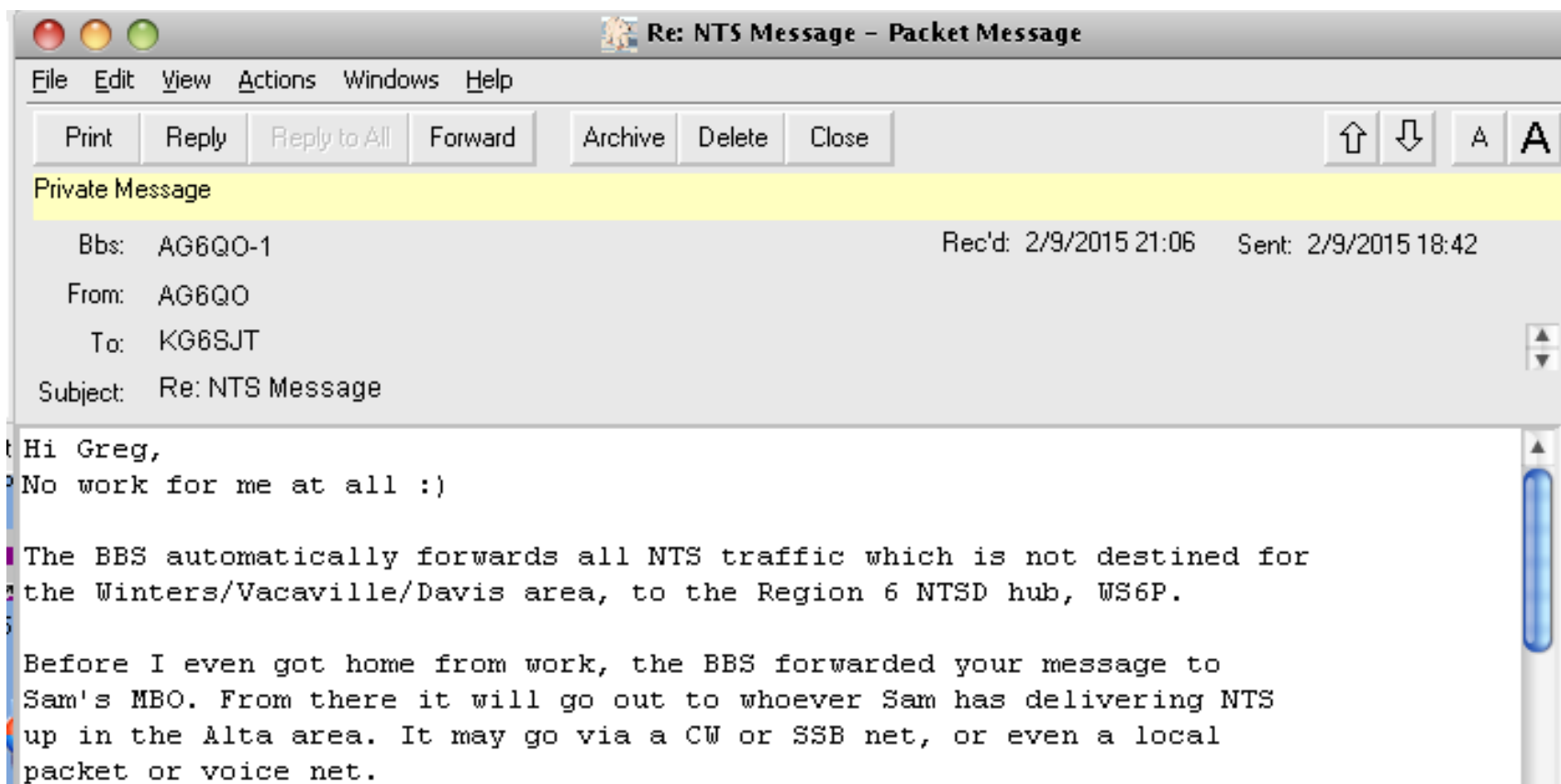
The screenshot shows the Outpost Packet Message Manager interface. The title bar reads "Outpost Packet Message Manager". The menu bar includes "File", "Edit", "Setup", "Tools", "Custom Files", "Actions", and "Help". Below the menu bar is a toolbar with buttons for "New", "Open", "Archive", "Delete", "Print", and "Send/Receive". A "Profile:" dropdown menu is set to "AG6QO BBS".

On the left, a "Folder List" panel shows "In Tray", "Out Tray", and "Sent Msgs". The main area displays the "In Tray" folder with a message list table. The table has columns for "U", "From", "To", "BBS", "Subject", "Date/Time", and "Size". The second row is selected, showing a message from "AG6QO" to "KG6SJT" with the subject "Re: NTS Message".

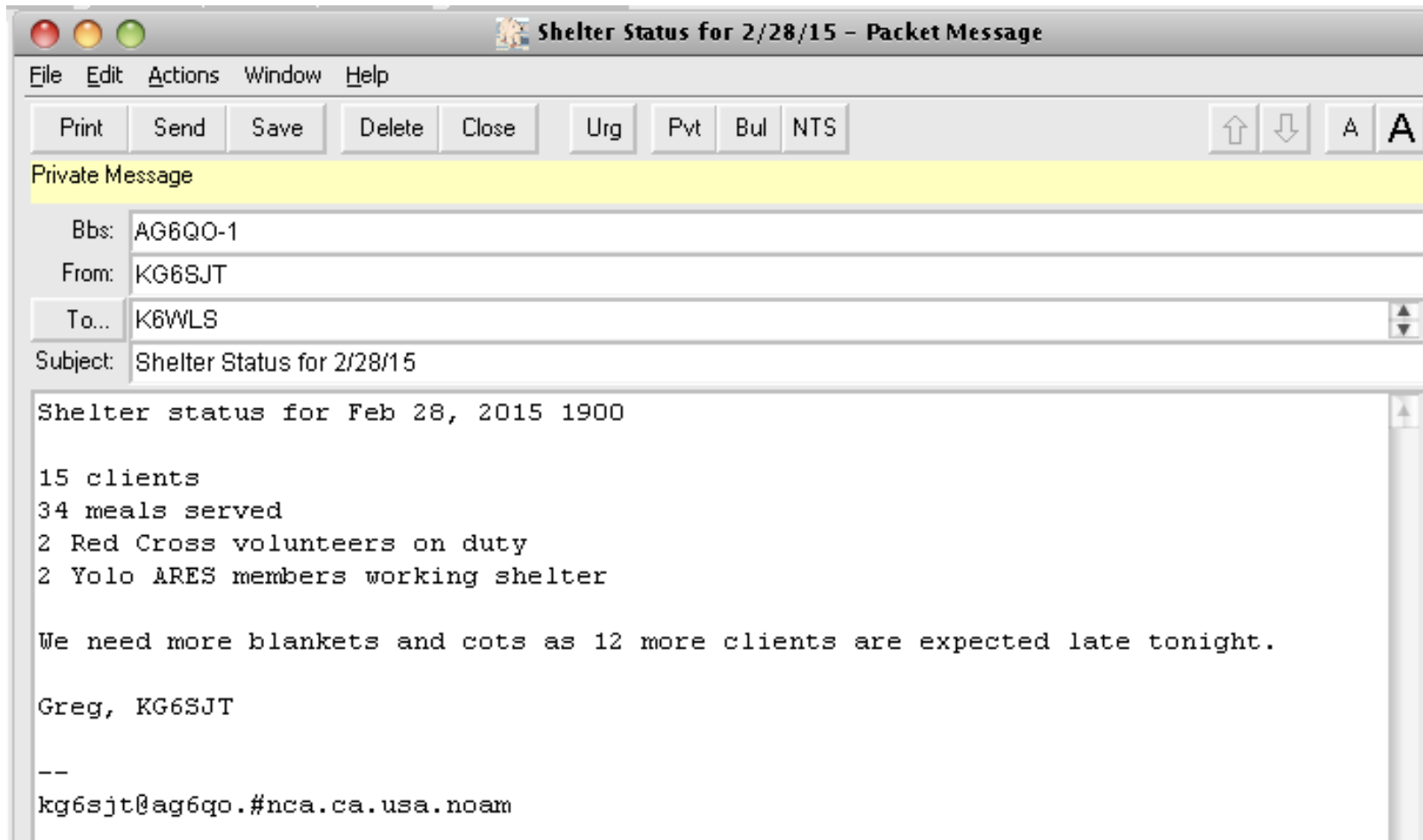
U	From	To	BBS	Subject	Date/Time	Size
	KJ7UK	KG6SJT...	AG6QO-1	9 MON TEST	2/9/2015 00:05	238
	AG6QO	KG6SJT	AG6QO-1	Re: NTS Message	2/9/2015 18:42	1336
	KJ7UK	KG6SJT...	AG6QO-1	10 TUE TEST	2/10/2015 00:06	245
	KJ7UK	KG6SJT...	AG6QO-1	11 WED TEST	2/11/2015 00:03	189
	AG6QO	KG6SJT	AG6QO-1	Hi Greg	2/11/2015 11:03	113
	KJ7UK	KG6SJT...	AG6QO-1	12 THU TEST	2/12/2015 00:03	274
	KJ7UK	KG6SJT...	AG6QO-1	RE: 12 THU TEST	2/12/2015 10:47	1070
	KF6QBI	W6JSB;...	KG6SJT-10	//wL2K NORCAL_WINLINKnet Wee...	2/13/2015 18:21	2148
	K6TM	KG6SJT...	AG6QO-1	RE: Fwd: 12 THU TEST	2/13/2015 22:13	1948

At the bottom, a status bar shows "38 Items, 978 Total" and "AG6QO BBS -- KG6SJT -- JOE_BBS -- KPC-3". On the right, it displays "00:26:16" and "17:03:44".

Outpost: Read Messages



Outpost: Compose a Message



Why Outpost is ideal for ARES

- Easy to use, e-mail like interface
- Folders: Inbox, Outbox, Sent, Archive, Draft, Deleted
- Address book
- Automates comms with TNC/BBS – just press *Send/Receive*
- Auto logging of all messages sent and received
- Makes printing a message as simple as a click

Packet Radio

- Demo using Outpost to connect to:
 - Another packet station (peer to peer)
 - Connecting to a BBS
 - Connecting to Winlink to send a packet email message

Resources

- **Contact information**

Gregory Kruckewitt, KG6SJT
kg6sjt@gmail.com
cell: 530-219-0611

- **Outpost Packet Manager**

<http://www.outpostpm.org/>

- **RMS Express & Winlink**

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

- **www.sacvalleyares.org**

Links to this presentation as well as information on packet and many other topics related to ARES.