

05.2014

# Packet Radio Users Guide

Cupertino ARES/RACES



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**Quick Reference**

**County Packet BBS Specifics**

<b>Call Sign</b>	<b>2m Access</b>	<b>1.25m Access</b>	<b>Location</b>
W1XSC-1	145.750	223.620	Santa Clara Co Office (San Jose)
W2XSC-1	145.730	223.560	Crystal Peak (South County)
W3XSC-1	144.310	223.540	Mountain View
W4XSC-1	145.690	223.600	Frazier Peak (above Milpitas)
<b>Other Available BBS's</b>			
K6FB-2	145.050		Los Gatos, 2800', Las Cumbres ARC

**Cupertino Tactical Calls**

**Arks**

CUPDZA	DeAnza College
CUPGGA	Garden Gate School
CUPHYA	Hyde Middle School
CUPLSA	Lawson Middle School

CUPMVA	Monta Vista Ark
CUPSSA	Seven Springs Ark
CUPSCA	Stevens Canyon Ark
CUPMBA	Montebello Ridge Ark

**City Facilities**

CUPBBF	Cupertino Blackberry Farm (OES)
CUPCRE	Creekside Park
CUPCCY	Cupertino Corp Yard
CUPEOC	Cupertino EOC
CUPJOL	Jollyman Park
CUPMEM	Memorial Park
CUPOPS	Field Operations
CUPPOR	Portal Park

CUPQLN	Quinlan Community Center/Shelter
CUPWVS	West Valley Service Center

**Public Safety**

CUPCSO	County Sheriff's Station, West Side
XSCF71	Cupertino Fire
XSCF72	Seven Springs Fire
XSCF77	Monta Vista Fire

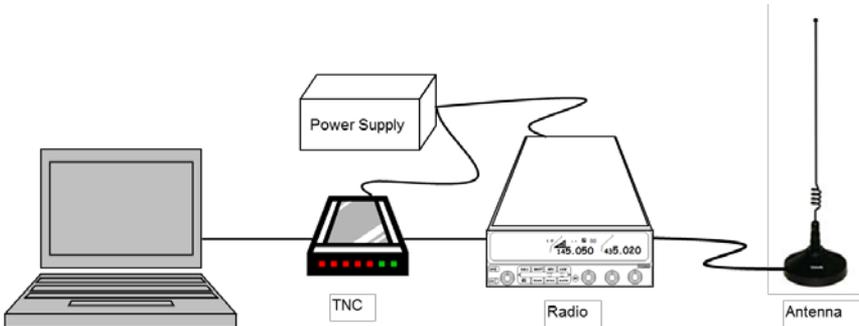
**Services**

CUPCMC	Cupertino Medical Center
CUPSJW	San Jose Water in Cupertino
CUPSAN	Cupertino Sanitary District
CUP001 through CUP009	Ad-hoc use

# 1 Ham Radio Packet Overview

## What is Ham Radio Packet?

- Amateur packet radio is one of many digital modes that hams can use.
- Packet Radio is used to transmit digital data by radio or other wireless communications links.
- Packet radio can send to or retrieve "mail" from a packet Bulletin Board System (BBS).



## Typical Packet System

- Computer: Runs the packet software that communicates with the BBS.  
TNC: Terminal Node Controller; the interface between your radio and your computer (similar to a telephone modem).  
Radio: Set to the frequency of the BBS and other packet stations.  
Antenna: Connected to the Radio.  
Power Supply: Powers the Radio and TNC; could also be a battery.

## Why use Packet Radio?

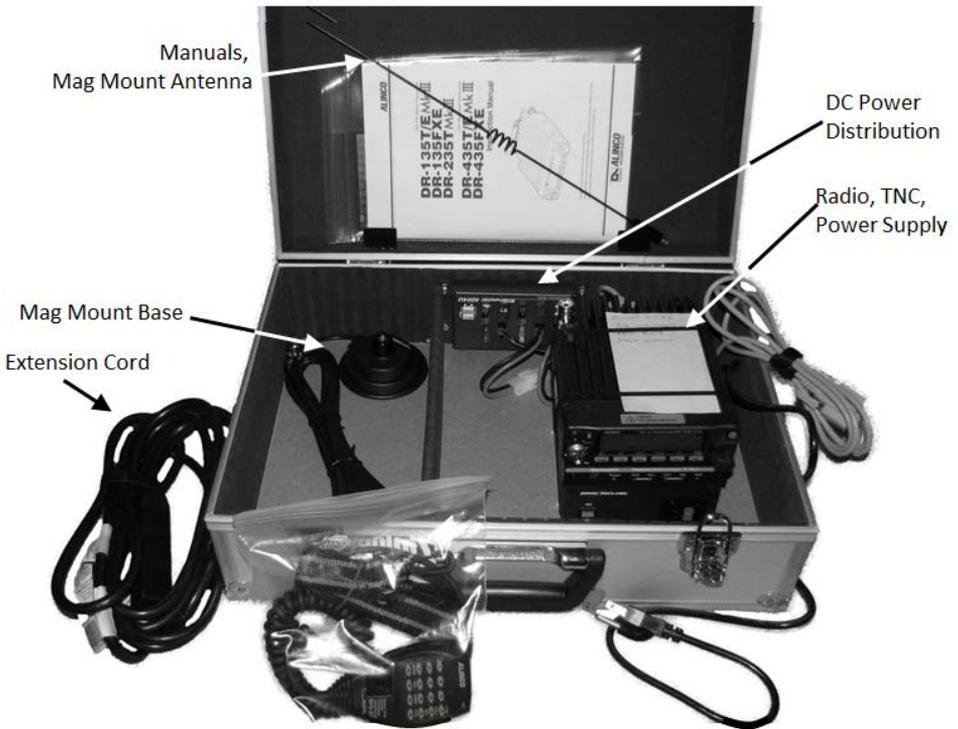
1. BBSs allow messages to be stored, retrieved, or forwarded throughout the connected BBS network.
2. The recipient does not need to be on line to get the message, meaning that messages can be retrieved at the recipient's convenience.
3. Packet is ideal for passing lists of material, addresses, instructions, or complex words (e.g. pharmaceuticals or chemicals)
4. We would use packet radio for the same reasons we would use internet email: message accuracy, delivery, and the ability to handle message complexity.
5. The Santa Clara County Emergency Management Association (EMA) knows that our local communications infrastructure **WILL FAIL** during an earthquake and **expects** Ham Radio to enable the response and speed the recovery. Packet Radio is part of the response.

## 2 Setting up the Packet Station

Cupertino ARES/RACES is responsible for setting up and doing an initial checkout of the Packet System. The setup instructions are included here.

### 2.1 Radio Packet Kit Components

1. Radio/TNC/Power Supply package
2. Extension Cord, 15ft
3. Mag mount Base and Antenna
4. Parts Bag
  - a. Shoulder Strap
  - b. Radio Microphone (backup for 2 meter voice traffic)
  - c. Adaptor, PL-259/F to BNC/M
5. Manuals Bag
  - a. Packet Radio Users Guide (this manual)
  - b. Radio, Alinco, DR-135 2 meter transceiver
  - c. West Mountain, RR/4004USB power distribution
  - d. Powerwerx, SS-30V Power supply



### 2.2 PC Packet Kit Components

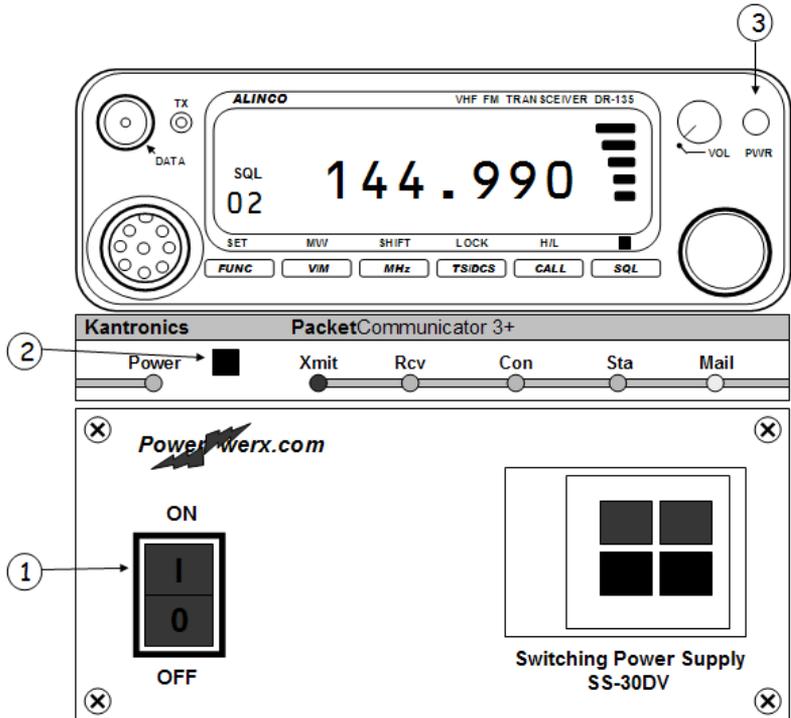
1. Laptop, includes Power module
2. Printer, includes Power module
3. USB-to-Serial Adaptor

## 2.3 Connecting the parts

1. Connect the Radio Kit Serial Cable to the Laptop serial connector (or USB-to-Serial adaptor if required, not supplied).
2. Connect the Printer USB cable to the designated Laptop USB port.
3. Put the Antenna on top of a metal surface, such as the ARK.
4. Connect the Antenna Coax to the radio antenna connector.
5. Connect the Laptop power module.
6. Connect the Printer power module.
7. Plug the Radio Kit, Laptop, and Printer into the extension cable/power strip.
8. Start the Generator if available.

## 2.4 Power on sequence

1. Turn on the Laptop. Verify the Laptop boots up.
2. Turn on the Printer. Verify the printer powers on.
3. Turn on the Radio Power Supply ①. Verify the On/Off switch illuminates.
4. Turn on the TNC ②. Verify the TNC Power LED illuminates.
5. Turn on the Radio ③. Verify the Radio display comes on.  
See Section 5 Alinco Radio Setup for details.



Packet Radio Kit, Front view

## 2.5 Application Startup

1. **Start Outpost.** Find the Outpost icon on the PC desktop, and double-click on it:



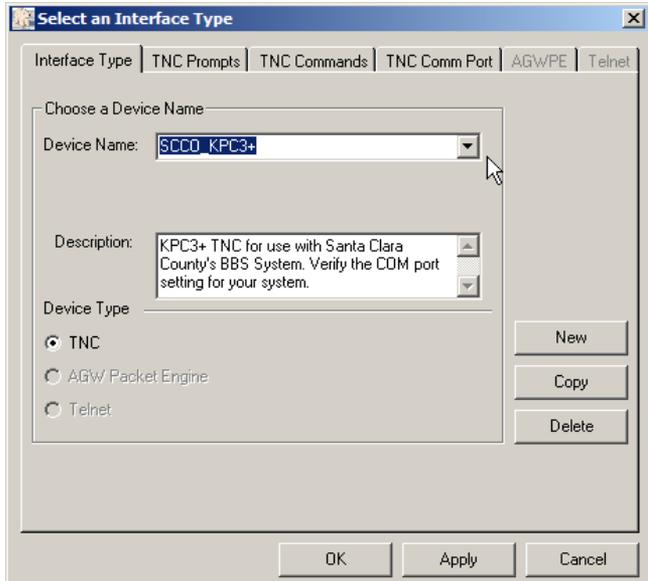
2. **The Station Identification Form** will be the first window that you will see.

- a. Verify the Fields on this form are filled in as follows:

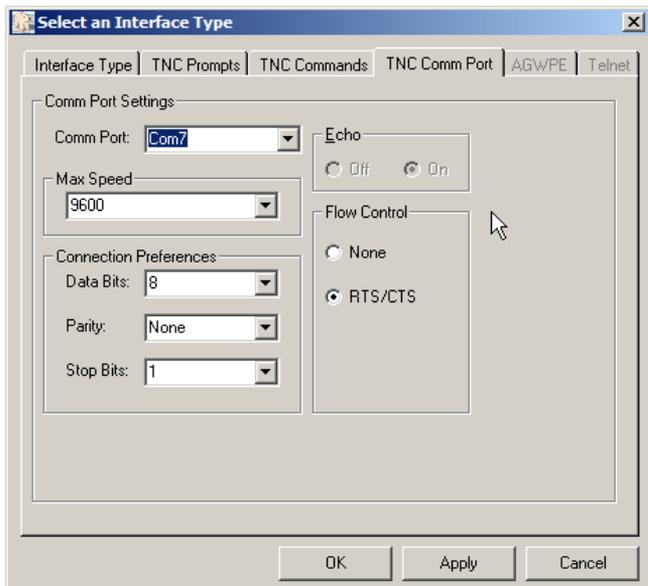
User Call Sign: Contains this station's FCC Call Sign of the Control Operator.	< your call sign >
User Name: Contains the Control Operator's Name.	< your name >
User Tactical Call:	<input checked="" type="checkbox"/> CHECKED.
Tactical Call Sign: The six (6) character Tactical Call for your station	< see page 2, or ask the Comm Team Lead >
Additional ID Text: Enter the Ark Name	
Message ID: This is the unique 3 character version of your Tactical Call.	< Usually the 1 <sup>st</sup> or last 3 characters of your tactical call >

- b. Press OK when done. The Outpost main window will open.

3. **Setting up the TNC.** From Outpost, select **Setup** > **TNC Settings**.
- On the **Interface Type** tab, set the **Device Name** as **SCCO\_KPC3+**.



- On the **TNC Comm Port** tab, select the **PC Comm Port** to which the TNC is connected.



- Do not change any fields on any other tabs.
- Press **OK** to Save your settings.

4. **Setting up the BBS.** From Outpost, select Setups > BBS Settings.
  - a. On the BBS Name tab, set the BBS Name as **SCC BBS 1....**

- b. Confirm “BBS Type” is set to “**Let Outpost determine...**”
  - c. Press **Set/Get TNC** to reopen the TNC Settings form, and press **OK** from that form. This links the TNC to this BBS.
  - d. Do not change any fields on any other tabs.
  - e. Press **OK** to Save your settings
5. **Confirm your settings.** Check the bottom of the Outpost main window and confirm you see your Station ID, Tactical Call, TNC, and BBS listed as you have just set up.



6. **Other important Settings.** There are several settings that can be made in Outpost. The following are important when operating with the SCC County BBS.

**Tools > Send/Receive Settings**

Tab	Option	What to set
Automation	<input checked="" type="radio"/> Schedule a Send/Receive Session every [ 10 ] minutes.	Checked
	<input type="checkbox"/> Send a message immediately when it is complete	Unchecked
Retrieving	<input checked="" type="checkbox"/> Retrieve Private Messages	Checked
	<input type="checkbox"/> Retrieve NTS	Unchecked
	<input type="checkbox"/> Retrieve Bulletins	Unchecked
	<input type="checkbox"/> Retrieve Selected Bulletins or xNOS Areas	Unchecked
	Enter as a list of filter items:	Leave Blank
	<input checked="" type="checkbox"/> Skip (do not retrieve) NTS Messages I send to the BBS	Checked
Receiving	<input checked="" type="checkbox"/> Play this sound on arrival: [incoming.wav]	Checked
Printing	<input type="checkbox"/> Print received, sent messages	No preference
	<input checked="" type="checkbox"/> Print with message headers	Checked
	<input type="checkbox"/> Print Delivery, Receive Receipts	Unchecked
Alerts	<input checked="" type="checkbox"/> N0 through N3	Check All
	<input checked="" type="checkbox"/> Play this sound on notification [sound136.wav]	Checked
Other	<input checked="" type="checkbox"/> Show the TNC session form during Send/Receive	Checked

- a. Press **OK** to Save your settings.

**Tools > Message Settings**

Tab	Option	What to set
New Messages	<input checked="" type="radio"/> Set default to Private	Checked
	<input type="checkbox"/> Create and send NTS messages as private	Unchecked
	<input checked="" type="checkbox"/> Default destination [ CUPEOC ]	Checked
	<input type="checkbox"/> Insert Signature (users' preference)	Optional

Tab	Option	What to set
Message Numbering	<input checked="" type="checkbox"/> Add Message number to subject line ⊙ With hyphenation	Checked
	<input checked="" type="checkbox"/> Use Global Message Numbers	Checked
	<input checked="" type="checkbox"/> Assign a local message number to inbound messages.	
Replies / Forwards	<input type="radio"/> Set default to private	Checked
	<input checked="" type="checkbox"/> Close original message on reply or forward	Checked
Tracking	<input type="checkbox"/> Always request a Delivery Receipt	Unchecked
	<input checked="" type="checkbox"/> Always request a Read receipt	Checked
	<input type="checkbox"/> Auto-Delivery Receipt	Unchecked
	<input type="checkbox"/> Auto-Read Receipt	Unchecked
Deleting	<input checked="" type="checkbox"/> Prompt before permanently deleting a message	Checked
Adv	<input checked="" type="checkbox"/> Automatically start Opdirect Message Capture System	Checked
	When opening a locally originated PacFORM message ⊙ Never Open in its native program	Checked
	When opening a received PacFORM message ⊙ Prompt before opening in its native program	Optional

- a. Press **OK** to Save your settings.
- b. Exit and restart Outpost to ensure the **Adv** Opdirect settings take effect.

### Tools > Report Settings

Tab	Option	What to set
Variables	Global Variables: Next Message Number:	Next Msg Number
	Tactical ID (3 character): (see table below)	See the table below
	Tactical TX Text: (see table below)	See the table below
	All other fields are at your discretion	Optional
ICS309	<input type="radio"/> No Automation	Checked
	Task ID:	Activation No.
	Task Name:	Event Name

- a. Press **OK** to Save your settings.

### Tactical Call Report Settings

Ark site	Tactical ID	3 char TacID	Tactical Text
Monta Vista	CUPMVA	MVA	Monta Vista Ark
Garden Gate School	CUPGGA	GGA	Garden Gate Ark
Hyde School	CUPHYA	HYA	Hyde Ark
Lawson School	CUPLSA	LSA	Lawson Ark
DeAnza College	CUPDZA	DZA	DeAnza Ark
Seven Springs	CUPSSA	SSA	Seven Springs Ark
Stevens Canyon	CUPSCA	SCA	Stevens Canyon Ark
Cupertino Medical	CUPCMC	CMC	Cupertino Medical

### Tools > Log Settings

Tab	Option	What to set
	<input checked="" type="checkbox"/> L1: Send/Receive Session Window Logging	Checked
	<input type="checkbox"/> L2: Interface Data Logging	Unchecked
	<input type="checkbox"/> L3: Diagnostic Logging	Unchecked

- a. Press **OK** to Save your settings.

### Tools > General Setup

Tab	Option	What to set
	<input type="checkbox"/> Show Station Identification Form on Startup	Optional
	<input checked="" type="checkbox"/> Auto-print with message headers	Checked
	<input type="checkbox"/> PC Time Check, at startup... Recently used configuration list [ 8 ]	Optional
	<input checked="" type="checkbox"/> Use hierarchical address Continent parameter in validation.	Checked

- a. Press **OK** to Save your settings.

### Tools > Script Settings

Tab	Option	What to set
	Run this script on startup	Unchecked
	Run this script on exit	Unchecked
	<input checked="" type="radio"/> Send/Receive runs standard process	Checked

- a. Press **OK** to Save your settings.

7. **Connection Test.** Verify connectivity with the BBS. From the Outpost Main Menu tool bar, press **Send/Receive**. Verify that the Packet Session window opens. When done, verify that it closes without error.

### 3 Packet message addressing basics

Addressing a Packet message requires 2 types of addresses:

1. To what individual do you want to send the message?
2. What Packet station can deliver it to the individual?

We want to “embed” our message below into a packet message with additional addressing information



**From:** Seven Springs Ops  
**To:** Cupertino Ops  
**Subj:** Ark Staffing Summary

~~~~~  
~~~~~  
~~~~~  
~~~~~

Signed,  
Dave Miller Ops Chief



**BBS:** W1XSC-1  
**From:** CUPSSA  
**To:** CUPEOC  
**Subj:** SSA348: Ark Staffing Summary

**From:** Seven Springs Ops  
**To:** Cupertino Ops  
**Subj:** Ark Staffing Summary

~~~~~  
~~~~~  
~~~~~  
~~~~~

Signed,  
Dave Miller Ops Chief

#### 1. Packet Address Header

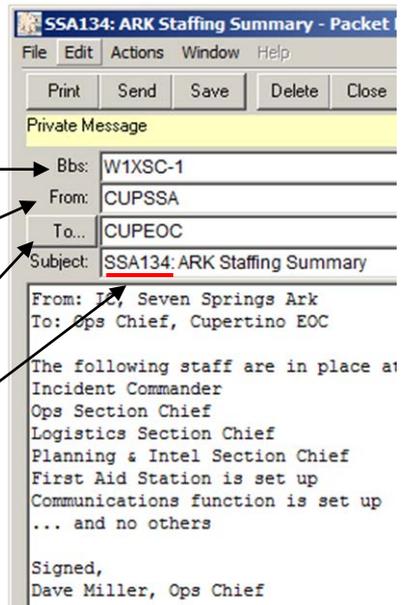
The packet address header gets the message to the correct packet station.

**BBS:** The “store and forward” mail drop where this message is sent. **Automatically filled in.**

**From:** Tactical call of your packet station. **Automatically filled in.**

**To:** Defaults to the destination station set up in Outpost. This can be changed.

**Subject:** The Message ID is automatically added to the subject line. You fill in the rest of the subject text.



## 2. Recipient Address and Message

To ensure the message gets to the right person, fill in the rest of the message.

**Subject:** Fill in the rest of the subject line after the Message ID.

### Message Body

**From:** Who is the message from? Include the ICS position or function.

**To:** Who do you want to receive the message? Include ICS position or function.

**Message** Fill in the message details.

**Signature:** Put whom the message is from.

The screenshot shows a 'Private Message' window with the following fields and content:

- Bbs:** W1XSC-1
- From:** CUPSSA
- To...:** CUPEOC
- Subject:** SSA134: ARK Staffing Summary
- Message Body:**  
From: IC, Seven Springs Ark  
To: Ops Chief, Cupertino EOC  
The following staff are in place at Incident Commander  
Ops Section Chief  
Logistics Section Chief  
Planning & Intel Section Chief  
First Aid Station is set up  
Communications function is set up ... and no others  
Signed,  
Dave Miller, Ops Chief

## 4 Creating packet messages

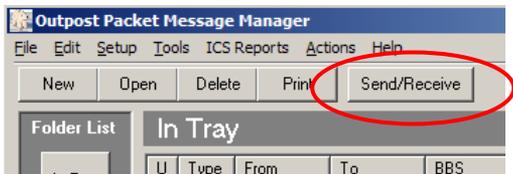
### 4.1 Free Form Message

1. From Outpost's main window, you can create a new message by either pressing the **New** button, or selecting the **Actions > New Message** menu. The following form opens.

The screenshot shows a 'Private Message' window with the following fields and content:

- Bbs:** W1XSC-1
- From:** CUPSSA
- To...:** CUPBBF
- Subject:** SSA165: What is BBF Status?
- Message Body:**  
BBF Incident Commander  
Please report your staffing status ASAP.  
  
signed,  
Dave Smith  
Operations Section Chief  
Seven Springs Ark

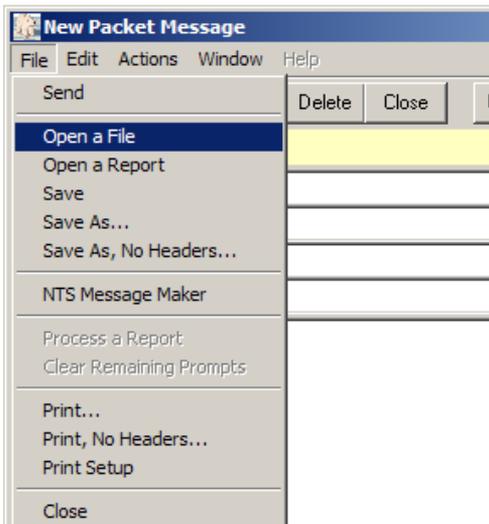
2. The **BBS:** and **From:** fields are filled in with the BBS and Identifier that were previously defined.
3. Fill in the **To:** field with the call sign or tactical call of the station to which this message is going.
4. Complete the **Subject:** text. Add your text after the Message ID characters (**SSA165:** in the above example).
5. Enter body of the message.
6. Press **Send** when done.
7. From Outpost, press **Send/Receive** to connect and deliver the message to the BBS.



#### 4.2 Sending a Text File

The text of the message can originate from a text file created elsewhere. To import a message from a text file, do the following:

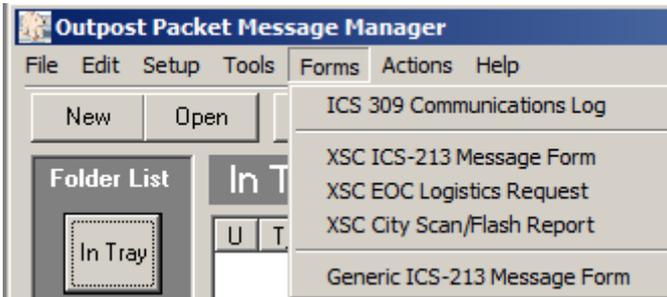
1. From the Outpost main window, click on the **New** button.
2. Select **File > Open a File**. Navigate to the directory where the file resides and select the file. Press **OK**.
3. The text will be loaded into the Message area.
4. The message Subject is set to the text file name.
5. Press **Send** when done.
6. From Outpost, press **Send/Receive** to connect and deliver the message to the BBS.



### 4.3 Sending a PacFORM message

#### INTRODUCTION

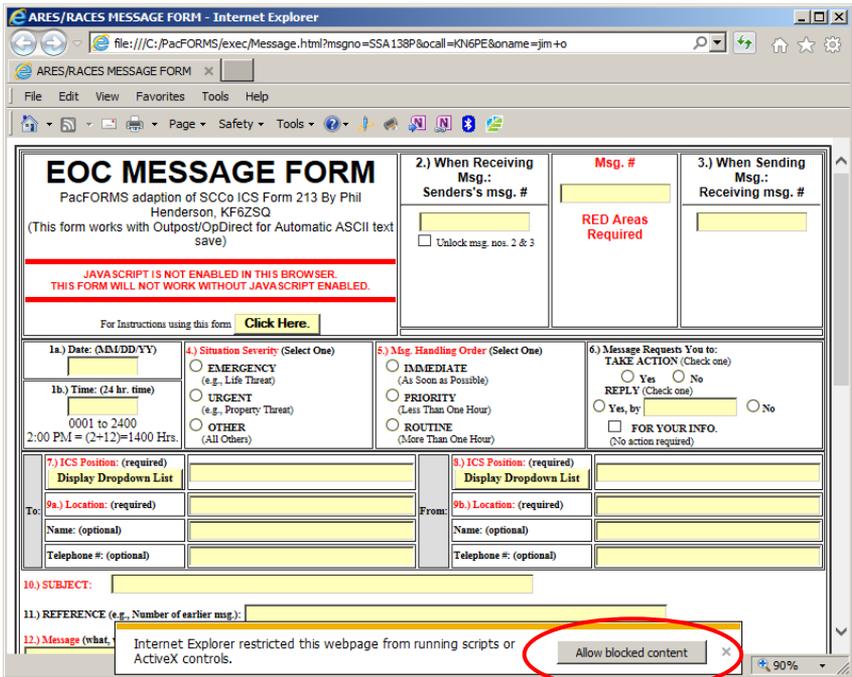
1. PacFORMS are browser-based fill-in-the-blank message forms used within Santa Clara County RACES.
  - a. To run the forms manually, look on your desktop for the PacFORMS folder, and double-click on the desired form.
  - b. To open the forms from Outpost, go to the Forms Menu, and choose the desired form (**Recommended method**).



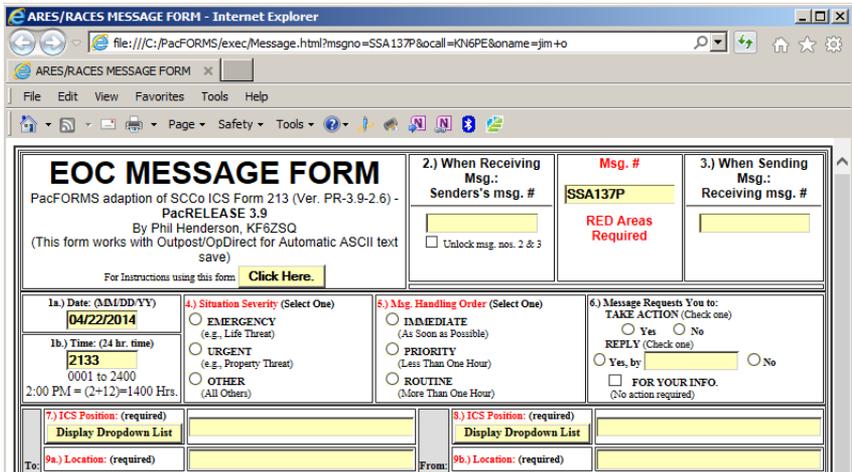
Form name	Purpose
<b>Standard Santa Clara County PacFORMS</b>	
XSC ICS-213 Message Form	Used to send a message from Cupertino to Santa Clara County EOC, or other jurisdictions within the county.
XSC EOC Logistics Request	PacFORMS version of the Santa Clara County Logistics Request Form.
XSC City Scan/Flash Report	PacFORMS version of the "City-Scan" Flash Report.
<b>Other Forms</b>	
ICS 309 Communications Log	Creates a standard ICS 309 Comm log report based on packet messages sent. Different report options let you customize the data, and look and feel. Run this report at the end of your shift.
Generic ICS-213 Message Form	This form is a program that can be run from a remote PC on the same subnet as Outpost. See the ICS-213mm Message Manager User Guide for details.

2. For City-to-County packet messages, we will use either free form messages or the 3 standard Santa Clara County PacFORMS listed above.
3. Running the PacFORMS from Outpost is recommended since several fields are filled in for you.

- After double-clicking on your PacFORM, you will get a message that essentially says that **Scripts** or **ActiveX controls** are restricted from running.
  - On Windows XP, click on the **yellow banner** at the top of the browser window. Select the option to “Allow Blocked Content”.
  - On Windows 7 & 8, press “Allow Blocked Content” button at the bottom the Browser window.



- Once you enable Scripting, the default fields will be populated.



## COMPLETING THE PacFORM

- All required fields are indicated with accompanying **RED** Text.
- When done, scroll to the bottom of the form, and press **Submit Message Form to Outpost**.

CC:  Management  Operations  Planning  Logistics  Finance

**14.) Operator use Only**

How Received  or Sent  (Check One this line and one below)

Telephone  Dispatch Center  
 EOC Radio  FAX  Courier  
 Amateur Radio  Other **Packet**

Operator Call Sign: **KN6PE**  
Operator Name: **jim oberhofer**  
Date: \_\_\_\_\_ Time: \_\_\_\_\_ Date/Time updated at Submit

**Outgoing (Sent):**  
Message Originator: Send the top copy (white) to Radio, yellow to PLANNING, retain the pink copy for originators file.  
Radio: After sending, complete Action Taken info. in gray area, keep white for file in Radio.

**Incoming (Received):**  
Radio: After receiving, complete Action Taken info. in gray area, route top copy (white) to the addressee, pink copy to PLANNING; retain yellow for file in Radio.  
Addressee: Take appropriate action.

SCCo ICS FORM 213 (Ver. PR-3.9-2.6), 08/11/2013

Below you will see two SUBMIT buttons. The one on the left, when Submitted, will open a new window with the ASCII text so you can manually capture, copy, paste and save the text. Follow instructions in red in that window.

The SUBMIT button to the right will automatically transfer the ASCII text extracted from the form to the Outpost database via via OpDirect. OpDirect must be running to make this work or nothing is saved.

**SUBMIT Message Form: Manual Copy & Save**      **SUBMIT Message Form to Outpost**      **Clear Input**

- The form will be transferred to Outpost and loaded in a message form.

**CUP139P\_U/P\_IC5213\_Stevens Creek Dam Status - Packet Message**

File Edit Actions Window Help

Print Send Save Delete Close Urg Pvt Bul NTS ↑ ↓ A A

Urgent, Private Message

Bbs: **W1XSC-1**  
From: **CUPEOC**  
To...  
Subject: **CUP139P\_U/P\_IC5213\_Stevens Creek Dam Status**

**!PACF! SSA139P\_U/P\_IC5213\_Stevens Creek Dam Status**  
**# EOC MESSAGE FORM**  
**# JS-ver. PR-3.9-2.6, 08/11/13,**  
**# FORMFILENAME: Message.html**  
MsgNo: [SSA139P]  
1a.: [04/22/2014]  
1b.: [2137]  
4.: [URGENT]  
5.: [PRIORITY]  
6a.: [No]  
7.: [Planning]  
9a.: [County EOC]  
8.: [Planning]  
9b.: [Cupertino EOC]

- Fill in any remaining fields, and then press **Send**.
- From Outpost, press **Send/Receive** to send the message.

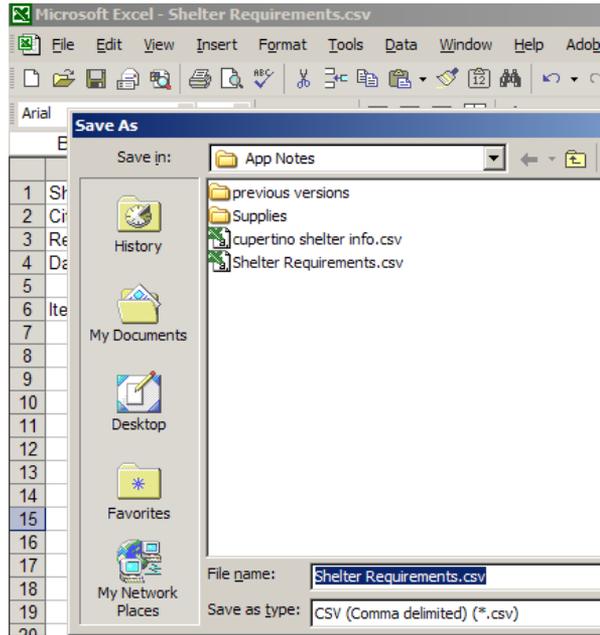
## 4.4 Sending a spreadsheet .csv file

Attempting to send a standard spreadsheet file will cause Outpost, the BBS, or both, to hang because of embedded binary content in the spreadsheet.

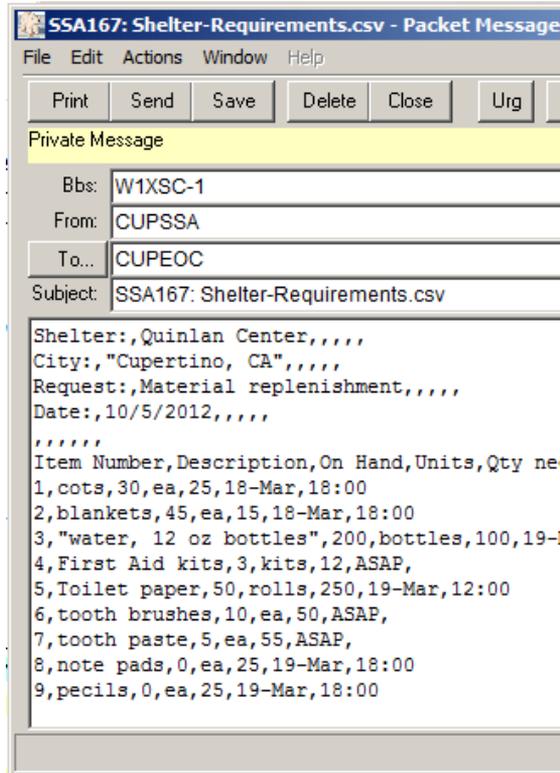
However, most spreadsheet applications support a way to export spreadsheet data into one or more ASCII formats that are compatible with Outpost.

This approach also works with other spreadsheet packages.

1. Once the spreadsheet is created, move a copy of it to the PC where Outpost resides.
2. At the Outpost PC, open the spreadsheet, press **File->Save As** from the spreadsheet menu.
3. Change the “Save as Type” to “Comma Delimited (\*.csv)”. Press **Save**. A file with a \*.csv extension is created.



4. Go back to Outpost. Open an Outpost message form. Press **File->Open** from the Outpost message menu.
5. Change the "Files of Type" to "All files (\*.\*)"."
6. Change the directory to where the \*.csv file is located, select the file, and press **Open**. The \*.csv file is written on to the message form.
7. Take a look at the example to the right. Note that all fields are separated by commas, and fields with embedded commas are surrounded by quotes.
8. When done, press **Send** to move the message to the Out Tray.
9. From Outpost, press **Send/Receive** to connect and deliver the message to the BBS.



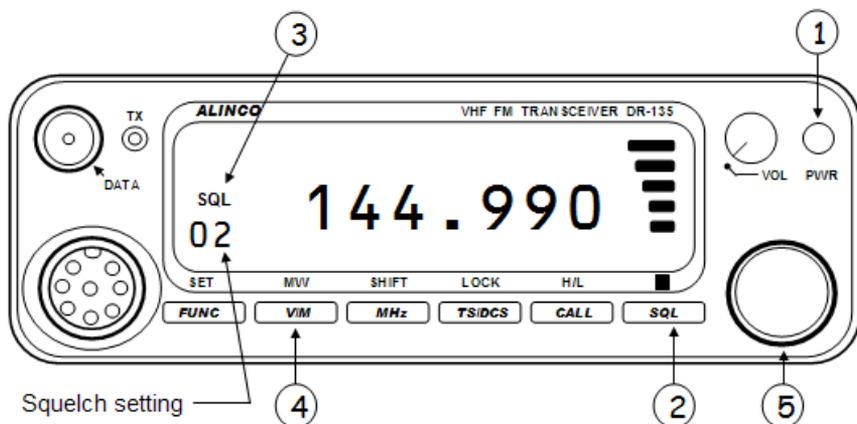
**NOTE:** The file name is also set as part of the Subject. This will come in handy at the receiving end.

#### 4.5 Receiving a spreadsheet .csv file

Continuing with the above example, proceed to recover the file as follows:

1. Once the Outpost message arrives, open the message.
2. Press **File->Save As** from the Outpost message menu.
3. The file name will default to that of the message's subject with the correct \*.csv extension. Press **Save**. Close the message.
4. Open Excel.
5. Press **File->Open** from the Excel menu. Change the "Files of Type" to "Comma Delimited (\*.csv)." Locate the file saved by Outpost. Press **Open**.
6. The entire message is brought into the spreadsheet. Delete any header lines that may show up in the file.

## 5 Alinco DR-135 Radio Setup Details



1. Turn the radio on by pressing the **PWR** button ①
2. Set the Squelch by pressing the **SQL** key ②. The **SQL** ③ icon appears on the display and the squelch level will be shown. Turn the tuning knob to set the Squelch level to 2. After 5 seconds, the display returns to normal.
3. Set the Volume level to so that the indicator is in the 10 o'clock position.
4. Select Memory Mode by depressing the **V/M** key ④. Verify that the **M** icon appears on the display.
5. Rotate the **MAIN** Dial ⑤ to select the frequency: 145.750 MHz. See Quick Reference section on Page 2 for BBS / Frequency combinations.

### Changing Power Levels

6. Press **FUNC** and then **CALL (H/L)**. Note the L, M, <blank> indicator in the upper left portion of the display. Repeating this key sequence causes the Power Level cycle through each of the setting.







**Cupertino ARES/RACES**

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