Namaste SuperPortable User Interface Design Document

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Overview

The Namaste SuperPortable is a portable amateur radio satellite communications device designed for text communications, low-bandwidth data, and position location information. Applications include portable amateur radio use as well as emergency communications. This document concerns the development of requirements for the Namaste SuperPortable User Interface.

Functions

1. Text communications
2. Low bandwidth data connection through Ethernet port
3. GPS/APRS
4. Antenna Pointing Assistance

Interfaces

1. 0-9+ keypad
2. Small display
3. NMEA-compatible GPS
4. Ethernet for external data device
5. Bluetooth for external keyboard
6. Antenna
7. Radio
8. Processor
9. Power
10. Enclosure

See appendix A for the Interface n-Square Diagram

Functional Requirements

Text Communications Requirements

The operator must be able to display, edit, send, sort, print, and search received and stored text.
The operator must be able to address text messages from either direct entry or an address book.
The operator must be able to edit, sort, and search the address book.
The operator must be able to send a message to multiple addresses.
There must be an indication of pending messages.
The delivery of messages must be reliable.
There must be an indication of message delivery failure.
There must be a read-only audit trail of all incoming and outgoing messages with timestamp.
The operator must be able to monitor text messages.
The operator shall be able to use Templates in order to accomplish text communications.

Low Bandwidth Data Requirements

The operator must be able to send and receive low bandwidth data through the Ethernet port.
The delivery of data must be reliable.
There must be an indication of data delivery failure.
The operator shall be able to use Templates in order to accomplish low-bandwidth data communications.

GPS/APRS Requirements

Position location information from the GPS system must be available when enabled.
The optional GPS feature requires connection of an NMEA-compatible GPS receiver.
The functions of APRS must be supported.
Settings for APRS will include at a minimum ham call, path, beacon enable, beacon interval, and status message.
The operator shall be able to use Templates in order to use GPS and APRS functions.

Antenna Pointing Assistance

The antenna pointing function must provide azimuth and elevation data for all satellites usable by the ground station.
The antenna pointing function must provide signal strength indication.
The operator shall be able to use Templates to obtain satellite pointing information.

Interface Requirements

The display must be large enough to allow the operator to read and edit text.
The 0-9+ keypad must be large enough to allow the operator to type in text using a standard mobile keypad layout.
Antenna must provide enough gain to close the link.
Uplink digital mode bandwidth must be accomplished within 20kHz.
Downlink digital mode bandwidth must be accomplished within 100kHz.
Power connections must provide sufficient voltage and current.
Power scheme must be selected for portable and mobile applications.
Ethernet port must provide an Ethernet connection.
Bluetooth connection must support an optional external keyboard.

Templates

Templates are text files specifically designed to enhance ease of use for the ground station. They are similar to forms. Templates can be preloaded or they can be created and edited by the operator in the field using the keypad or the optional external keyboard. There are several types of templates.

1. GPS/APRS Templates
2. Address Book Templates
3. Message Templates
4. Antenna Pointing Templates

These templates provide a way to configure and operate the station. In general, a template is a text file with fields that are tagged in a way that makes it easy to select and edit them. For example, the operator selects a template, and can "tab" between the parts of the text that are flagged as fields.

The rest of the text file can be edited, but is intended to be preloaded.

It shall be possible to send a specially tagged text message that then can become a new template. For example, a damage assessment form sent to the station for the operator to fill out and return, instead of relying upon a back-and-forth question-and-answer session. Another example would be an address book for the particular place or event, sent out to all stations located at a particular place or participating in a particular event, in order to provide complete contact information for all participants. Templates can also be used for the body of outgoing messages, so that commonly used phrases or sections of a message or report do not have to be

typed in. Antenna Pointing Templates, along with position location information, would include the information needed to locate satellites.

Open Questions

Gateways to commonly used services need to be identified and possibly supported.
Specifications concerning durability need to be made.
Support for an external display needs to be discussed.

Revision History

Version 1.0 released 22 May 2008

0-9+ keypad								Operator Input		
	Display									
		NMEA-compatible GPS receiver						Position Input		
			Ethernet port for external data device					Data Input		
				Bluetooth port for external keyboard				Operator Input		
					Satellite Antenna	Modulated Downlink				
					Modulated Uplink	Ground Station Antenna	Receive RF			
						Transmit RF	Radio	Receive baseband		
	Operator Output, Status		Data Output				Transmit baseband	Processor	Monitor and Control	
	Electrical Power	Electrical Power	Electrical Power	Electrical Power			Electrical Power	Electrical Power	Electrical System	
Mounting	Mounting	Connection mounting	Connection mounting	Connection mounting		Connection mounting	Mounting	Mounting	Mounting and Connection mounting	Enclosure