RF Communications Board
Functional Requirements

Rev	Date	Description
1.0	8/8/2003	Release for PDR

Functional requirements at system level used for determining board requirements:

- must provide bi-directional long-range wireless communications between the shore and the surface node
- must provide a hard wire copper link to the primary controller console from outside the controller housing.
- must provide a short-range wireless link to establish communications with other platforms within a TBDkm radius.
- must be able to establish a connection to MBARI from the following locations in Outer Monterey Bay:
  - within ~1M of 122° 53' 19.74" W 36° 14' 33.11" N (~57M from MBARI)
  - within ~1M of 122° 55' 56.50" W 36° 14' 34.39" N (~57M from MBARI)
- required to establish an end-to-end data/command connection within (one hour) of event detection with 90% long-term availability where "end-to-end" is defined as from instrument physical interface to shore based user terminal or MOOS data archive
- must establish a data connection at regular intervals and transport a minimum of TBD bytes of data bi-directionally with a maximum system end-to-end latency of 4 hours
- There must be a way to immediately (5 minutes?) establish a link from shore
- The total bandwidth through the shore link shall be no less than: _____
- must communicate notice of event detection to shore *with maximum notification delay 12 hours*
- required to allow downloading of updated event detection algorithms and processes over the buoy to shore communications link
- must follow a set of mission commands communicated from shore, *with maximum system connection/response delay TBD (1 hour?).*
- Must support real-time or near real-time interactive modification of sampling rates
- must provide near real-time (1-4 hrs) bi-directional data to notify shore of the onset of an episodic event, and to receive subsequent mission commands from shore
- must provide near real time (1-4 hrs) data for engineering health monitoring of the MOOS mooring and sensors
- Must have a separate/additional shore link ground fault identification/isolation mechanism that must be separate from the system ground fault isolation mechanism
  - Ideally each communications interface will have a separate ground fault identification/isolation mechanism
- The controller must be able to establish a shore connection at routine intervals of no more than 1 hour
- The controller must be able to be reset from shore.
  - The reset must power cycle the controller(s)

Functional:

- Must provide the capability to galvanically isolate the controller processor electronics and the following interfaces:
  - Long-range radio
  - Short-range radio
  - Console
  - Pager
- Must provide a separate ground fault detection for at least the following interfaces:
  - Long-range radio

  & ideally,

    - Pager
- Must provide the following 9 RS-232 signals on both of the radio interfaces

#	Signal	Description	Direction relative to controller
1	DCD	Data Carrier Detect	Input to controller
2	RX	Receive Data	Input to controller
3	TX	Transmit Data	Output from controller
4	DTR	DTE device ready	Output from controller
5	SG	Signal Ground	Bidirectional
6	DSR	DCE device ready	Input to controller
7	RTS	Request to Send	Output from controller
8	CTS	Clear to Send	Input to controller
9	RI	Ring Indicator	Input to controller

- Must provide, or pass through, switched power to the following interfaces
    - Long-range radio
    - Short-range radio
    - Console
    - Pager
- Target DCE devices

Long-range radios
Qualcom GSP-1620
Motorola 9500 packaged by NAL Research
Short-range radios
Freewave
Teledesigns
Console
ConnectBlue RSPA32s
Freewave
Pager
Custom MBARI interface
Radiocom Electronics - POCSAM