

## Lunenfeld, Jonathan (JLUNENFE)

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**From:** Kynard, Richard [richard.kynard@garmin.com]  
**Sent:** Thursday, September 01, 2011 11:03 AM  
**To:** Lunenfeld, Jonathan (JLUNENFE)  
**Subject:** RE: Price Quote 45 (PO # 171071)-receipt for VISA payment

Jonathan,

Please find my responses in red below.

4. Is this authorization to be used for fulfilling the requirement of a government contract with an agency of the United States Government? If "YES", include as an exhibit a narrative statement describing the government project, agency and contract number.

[RK] - No

5. Is this authorization to be used for the exclusive purpose of developing radio equipment for export to be employed by stations under the jurisdiction of a foreign government? If "YES", include the contract number and the name of the foreign government concerned as an exhibit.

[RK] - No

6. Is this authorization to be used for providing communications essential to a research project? (The radio communication is not the objective of the research project)? If "YES", include as an exhibit the following information:

- a. A description of the nature of the research project being conducted.
- b. A showing that the communications facilities requested are necessary for the research project.
- c. A showing that existing communications facilities are inadequate.

[RK] – No, the radio is integral to the research project.

7. If all the answers to Items 4, 5, 6 are "NO", include as an exhibit a narrative statement describing in detail the following items:

- a. The complete program of research and experimentation proposed including description of equipment and theory of operation.

[RK] – The program of research is related to aviation data links for the purpose of air-ground communications for the purpose of communicating safety related air traffic control messages between aircraft crew and air traffic route controllers. The avionics will communicate with ground based stations through an RF link known to the aviation community as VDL (VHF Digital Link) Mode 2. VDL Mode 2 is an air-ground communications protocol which operates in the aviation COM band of 118-137 MHz. VDL Mode 2 typically operates on its common signaling channel of 136.975 MHz. VDL Mode 2 is characterized by Differential 8 Phase Shift Keying digital modulation, 25 kHz channel spacing, a raw data rate of 31.5 kbps, and a carrier sense multiple access technique for operation on a shared channel.

Before beginning flight trials with our avionics, Garmin will mount our GDR 66 aviation radio and antenna from a fixed location on our facility. This radio will communicate with a VDL Mode 2 ground station provided

by ARINC Inc at nearby New Century Airport (KIXD). Garmin has received approval from ARINC Inc. to connect to this ground station for testing purposes.

b. The specific objectives sought to be accomplished.

[RK] – The objective of this research will allow Garmin to test the interoperability of our avionic data link system and data link radio (GDR 66) with the ARINC Inc ground station.

c. How the program of experimentation has a reasonable promise of contribution to the development, extension, expansion or utilization of the radio art, or is along line not already investigated.

[RK] – This experimentation will be instrumental in developing data link avionic systems and radios to be eventually used by civil aircraft. The ultimate goal of this research is to develop next generation air traffic control systems to promote safety of the operation of civil aircraft and to improve the capability and efficiency of the air traffic control system, including but not limited to the system provided by the FAA..

10. List below transmitting equipment to be installed (if experimental, so state) if additional rows are required, please submit equipment list as an exhibit: \* Please provide model of radio and I assume 1 unit?

[RK] – This installation will include 1 experimental radio capable of communicating over the VDL Mode 2 protocol. The Garmin model number designation for this radio is the GDR 66.

**From:** Lunenfeld, Jonathan (JLUNENFE) [mailto:JLUNENFE@arinc.com]  
**Sent:** Tuesday, August 30, 2011 6:33 PM  
**To:** Kynard, Richard  
**Subject:** RE: Price Quote 45 (PO # 171071)-receipt for VISA payment  
**Importance:** High

Richard:

Can you answer these questions from the FCC form.

Is this authorization to be used for fulfilling the requirement of a government contract with an agency of the United States Government? If "YES", include as an exhibit a narrative statement describing the government project, agency and contract number.

Yes No

5. \*

Is this authorization to be used for the exclusive purpose of developing radio equipment for export to be employed by stations under the jurisdiction of a foreign government? If "YES", include the contract number and the name of the foreign government concerned as an exhibit.

Yes No

6. \*

Is this authorization to be used for providing communications essential to a research project? (The radio communication is not the objective of the research project)? If "YES", include as an exhibit the following information:

- a. A description of the nature of the research project being conducted.
- b. A showing that the communications facilities requested are necessary for the research project.
- c. A showing that existing communications facilities are inadequate.

Yes No