

With the recent acquisition of Harmonix (HXI, a wholly owned subsidiary of Renaissance) , a company that support defense, and commercial industries with **Integrated assemblies, Millimeter wave products, and Commercial Radios**, Renaissance now offers an expanded line of high quality integrated RF and Microwave assemblies and sub-systems.

Realizing the present demand of reducing the cost and design time without sacrificing reliability and performance, Renaissance can now custom design and manufacture RF front end receivers and transmitters over the entire frequency spectrum from few kHz to 110 GHz.

The joint capabilities now include COTS or customized solutions for Defense, Space, Medical, Telecommunication, Aerospace markets with the following product offerings:

### *Components*

### *Integrated Assemblies*

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|--------------------------------|--|
| ➤ Low Noise Amplifiers         | ➤ Receiver Multicouplers                         |
| ➤ Power Amplifiers             | ➤ Switch Matrices                                |
| ➤ Mixers and Detectors         | ➤ ATE  |
| ➤ Gunn Oscillators and VCOs    | ➤ ATCA and $\mu$ TCA based integrated assemblies |
| ➤ Frequency Multipliers        | ➤ Transceivers                                   |
| ➤ PIN Switches and Attenuators | ➤ Up/down converters                             |
| ➤ Isolators and Circulators    | ➤ Pulsed Radar, Radio links                      |
| ➤ Power Dividers and Combiners | ➤ Front Ends                                     |
| ➤ Switches - Electromechanical |  |

## HXI Overview

HXI, a wholly-owned subsidiary of Renaissance Electronics in Haverhill, MA, has provided innovative and high quality mmw products to the defense, industrial, and telecom communities since 1992. Our customers include BAE, L-3, Lockheed Martin, Raytheon, Northrop Grumman, Rockwell Collins, SNC, NEC, AFRL, NASA, and NIST.

### Products

- A broad line of active microwave and mmw components, including low noise and high power amplifiers, detectors, mixers, oscillators, and multipliers, plus low and high power ferrite devices, employing both discrete semiconductors and MMICs, operating from 18 to 110 GHz
- Custom integrated subassemblies, including radar front ends for object location in construction and in survey measurements, vehicle obstacle detection and collision warning in transport area.
- "Turnkey" Gigabit Ethernet radios complete with network management software with "Fiber like" characteristics with 30% lower latency.

### Programs

- Sole Source for Ka-band interrogators and transponders for the Tactical Automatic Landing System (TALS) which provides day/night, all-weather, automatic landing and takeoff capabilities for UAVs operating from tactical or fixed bases
- Supplier of the W-band Radar Front End for the Helicopter Autonomous Landing System (HALS) which provides continuous, real-time, 3D radar imagery of the landing zone throughout approach, hover, and landing, in complete brownout conditions; currently in Phase 3.
- Supplier of the full-duplex, 1.25 Gbps air/ground and terrestrial video data links for Project Angel Fire (AFRL)



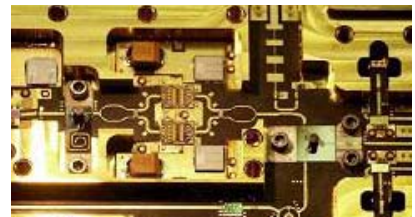
**HXI Haverhill, MA Facility**



**Compact Antenna Range  
(30" x 20" Quiet Zone, operates  
to 100 GHz)**



**Catalog Standard Components**



**Interrogator (Inside View)**



**Angel Fire Terminal on a Test  
Pole**

## Renaissance Overview

Renaissance Electronics Corporation has been custom designing RF and Microwave components for the Military and Commercial industry since 1991. The customer database includes entities such as Northrop Grumman, BAE Systems, Lockheed Martin, Raytheon, L-3, Harris for military and Sprint, T-Mobile, LG Wireless, Proxim Wireless for commercial aspect.



## Products

- Passive Products: Ferrites, Switches, Combiners, Filters, Couplers
  - High Reliability designs to sustain high RF power under harsh environmental conditions with superior RF performance.
  - Compact Designs for radar, missile and airborne applications with low insertion loss and excellent amplitude and phase tracking.
  - Entire range of Microstrip, Stripline, Waveguide and Lumped Element configurations to meet kHz to Ka band, and, mW to MW requirements.
  - Switches – Industry first completely hermetic, Laser Welded Switch and 10 Million cycle Electromechanical Switch for harsh military environment.
  - Combiners/Dividers: High, medium and low power Wilkinson dividers with low amplitude and phase balance.
- Integrated Assemblies
  - Switch Matrices – covering UHF to Ka band, reciprocal/non-reciprocal, blocking/non-blocking and with reliability to sustain ground or air transport operating conditions.
  - MEMS: From SPST, SPDT to 8 x 8 MEMS based matrix to meet reliability and size constraints for battlefield communication network.
  - Receiver Multicouplers: LNA with n-port division to provide unity gain with low noise figure for satellite communication application.
  - Transceivers and Repeaters: Femtocell, Microcell and Macrocell repeaters for WiMAX and LTE applications.



## Programs

- |                                 |                  |
|---------------------------------|------------------|
| • SRP, Patriot, TPQ-47, THAAD:  | Raytheon         |
| • AVAC, ARTEMIS:                | Northrop Grumman |
| • GRAYBAR, PAC3, MEADS, TPS-79: | Lockheed Martin  |
| • CDL, HAWKLINK, WIN-T:         | Harris           |
| • SATELLITE:                    | L-3 Systems      |
| • CM300 ATC RADIO (C4):         | General Dynamics |