

Hi! We're the NovAtel GNSSA Team
by Tony Murfin
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The place we were in was a long way from anywhere..... and it was cold. Quite a drive from Minneapolis' airport, in late Fall 1997, down country lanes only just on the map, and we missed the turn to our destination. The hotel was way down a long approach drive, hidden back from the road in the trees. This was where we put it together - the agreement to merge the Global Positioning System (GPS) technologies of two very different companies, to launch a revolution in airborne GPS receivers. Like most dating couples, we had met several times to try to decide if we wanted to get serious - this week we would find out. Three days later we had inked the 'Stillwater Agreement' (named after the town of Stillwater near Minneapolis) and we were presenting our plan to Honeywell - the world's most advanced GPS receiver would be a joint Canadian Marconi / NovAtel creation! The principle of the agreement between NovAtel and Canadian Marconi is that we both share equally the investment required to develop the new receiver and we also share equally the profits resulting from the sales of these receivers.

Then the work really got started. We took Canadian Marconi's digital, interface and certified software from the successful ARINC-743 GNSS, and began a plan to marry it with NovAtel's patented Narrow Correlator Digital Signal Processing (DSP), and RF front-end. The very best both companies had to offer in advanced GPS technology. We called this new receiver the "CMA-4024 Global Navigation System Sensor Approach Module" or GNSSA for short.

The GNSSA is to be developed to the highest possible certification level - RTCA DO-178 Level A. It will be integrated into airborne systems capable of providing automated GPS aircraft landing guidance right down to runways, in virtually blind conditions - referred to as Category III or 'CAT III' landing. Because of this extremely high standard, the GNSSA will also be used as the GPS heart of 'CAT III' Local Area Augmentation System (LAAS) ground stations, which send an integrity and correction signal up from the ground to the landing aircraft.

By January 1998, we had begun to assemble the teams. Canadian Marconi would 'Prime' the project and interface with Honeywell. Canadian Marconi would engineer the digital section with a more powerful processor, and integrate a number of existing discrete functions into a new large 'Computer Interface ASIC (CIA)'. The software would be re-engineered and bring in NovAtel's digital signal processing - a huge task given Level A requirements. We chose to incorporate the very latest of NovAtel's DSP ASICs, and the latest RF front-end design. Both technology elements coming from the latest generation of NovAtel's receiver development.

Then we got to our cultural interfaces – Canadian Marconi, the well structured engineering company with years of airborne aviation experience in long certified product development programs, NovAtel the new kid on the block, specializing in anything which is quick, entrepreneurial and leading technology. Certainly a different outlook on GPS business...

At NovAtel, we took steps to bring the two teams together. We formed the 'Aviation Group' and charged it with execution of our end of the GNSSA program. We brought in some dedicated aviation and program management experience. We began to learn what running a 'Level A' program meant in terms of documentation and evidence of test. And we pulled in David Roberts from Canadian Marconi in Kanata, Ontario, as our ASIC qualification team leader. Dave had recent experience with the qualification of a Microwave Landing System (MLS) ASIC on another Canadian Marconi project. To complete the 'exchange program', we have one of our number working as part of Gino Ricci's software development team - Marcia Bates is also brushing up her French during her two-week spells at Canadian Marconi in Montreal.

Our GNSSA team began to take shape with the hiring of several new people to work on ASIC qualification and RF design and component qualification. We brought in RF expertise from the NovAtel OEM RF development group, and we began to gently ease design and test information from the ASIC development team. We now seem to have worked out the bugs of how the new OEM receiver project and the GNSSA project can co-exist at NovAtel, while both using the same pieces of RF and ASIC technology, and we are forging ahead on both! We recently completed the Preliminary Design Review (PDR) on the GNSSA RF and ASIC qualification, and while we still have a lot of work to do, the outlook for the future looks very bright.

Meet the NovAtel GNSSA team (from left to right round the table) -

Michael Clayton (GNSSA Program Manager - Aviation Group)

Wally Petersen (Snr. VLSI Engineer - OEM Group)

Andy Jakab (GPS Specialist - Aviation Group)

Steve Danielewicz (ASIC Qualification Engineer - Aviation Group)

Damon Adams (RF Engineer - OEM Group)

Curtis Anderson (Project Manager- OEM Group)

Colin O'Brien (Project Manager - Aviation Group)

Tony Murfin (Director - Aviation Group)

Roland Jackman (RF Technologist - Aviation Group)

(by window) Shannon DeMan (Admin Assistant - Aviation Group)

(by window) Dan Bobyn (RF Engineer - Consultant)

(on table) Brian Vlaar (Software Engineer - Aviation Group)

(on table) Ron Alton (Software Engineer - OEM Group)

Dan Knight (GPS Technologist - Aviation Group)

Darcy Semeniuk (Software Quality Engineer - QA Group)

Dave Roberts (ASIC Qual Team Leader - on loan from Canadian Marconi)

- Allan Manz (GPS Software Engineer – Aviation Group)
- Marcia Bates (GPS Software Engineer - Aviation Group)
- Hassan Khazaii-Pool (ASIC Qual Engineer - Aviation Group))
- Jim Rooney (GPS Software Engineer - OEM Group)