

Oak Ridge Technical Enterprises Corporation – ORTEC:
Building the enterprise
(As published in *The Oak Ridger's Historically Speaking* column on December 13, 2011)

As we continue Hal Schmitt's amazing story of the formation of the first technology transfer at Oak Ridge to form the ORTEC company, a look is taken at the next steps after forming the company and locating it in the present day Tunnell Building (Note: Lawrence Tunnell called to tell me the history of ownership of this building that he now owns. It seems the building was actually owned by a building tenants group of which Ken Thurmand was president at the time ORTEC rented space there. Lawrence and a partner bought the building soon after ORTEC's first rental agreement.)

Hal Schmitt continues:

"By the end of June, 1960, with Mansel Ramsey's preliminary assurances of June 1 to the effect that we were okay with Oak Ridge National Laboratory policy, we were deep into the business of setting up the company. Enthusiasm had developed in our group – far beyond what I might have expected.

"As I worked on it and looked at it, I got more and more excited about the effort, as did the others involved. Everyone was not only working on his part of the operation – we were supporting each other and enthusiastically supporting the overall effort. That mutual support, enthusiasm, and the mutual trust that we practiced and built increasingly strongly as we went along were without doubt major keys to the ultimate success of the enterprise.

"There was a lot to do and we needed to keep track carefully. During capitalization we talked with Joe Guarneri, who had accounting experience and was a member of (I believe) the Finance division, which assigned and managed the administrative assistants in the major divisions at ORNL.

"Joe was assigned to the Instrumentation and Controls Division (Cas Borkowski's division), but did not report to Cas. He was enthusiastic to join in with ORTEC and was glad not to be affected by Cas's "blanket ban" on I&C division members' association with ORTEC. Joe agreed to be Secretary-Treasurer and to keep the books for the company.

"ORTEC's first budget was simply a budget for the cash outlays required to get started. Joe was to make the distinctions between expense and balance sheet items and keep the records in accordance with good accounting practices and IRS rules.

"We had divided the various areas of work among us, but now we had to deal with actual purchases, work and budgets. We thought it best, for reasons of efficiency, initiative, and accountability, to set up so that the guys in charge of an area also had budget responsibility for that area.

"We were a group of independent personalities and knew that everyone would want to make his own decisions about expenditures. Everyone agreed.

"We also agreed that if any major account items in the budget were going to be overrun, we would bring it to the board as soon as we knew, discuss it, and decide jointly how to handle it. It was clear that budget overruns were serious matters, not to be regarded lightly. We all took budgetary matters as a challenge, and our approach here seemed to add greatly to the rapport we had in setting up the company.

"The immediate tasks facing us were practical and each task had its own kind of difficulty. We had a lot to do in the next two to three months in our evening-and-weekend activities.

"We needed an attorney to draw up corporate documents including charter, bylaws, state filing forms, stock subscription agreement, etc. Attorney Elliott Adams did the legal work, but only after we had

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selected a name and had a corporate address. Recall, the name Oak Ridge Technical Enterprises Corporation (ORTEC) was selected June 15, 1960.

"Immediately after we had a company name we rented a post office box, obtained a telephone number, initial letterhead, and began stationery and brochure design, etc. Jim Johnson was our designer and graphic artist; he came up with a logo.

"After we found and arranged for a location (July 7), we needed to clean the rooms and physically set up the facility. This included installing the telephones, lab benches, shelves, cabinets, proper electrical and plumbing connections, painting the walls and surfaces, insuring cleanliness throughout, etc., etc.

"The phones and the electrical and plumbing parts were done by professionals; the rest was done by crews of shareholders who came to the new facility and pitched in with enthusiastic help. – A fun atmosphere prevailed while this was going on. Leaders were John Walter and John Neiler, with ten to fifteen shareholders participating at various times.

"Probably the single most expensive equipment item we would need was a vacuum evaporator. We would try for a lease-purchase arrangement, but also compare that with outright purchase. A deal was arranged with Consolidated Electrodynamics Corp.

"Machined parts for our specific purposes added about another \$300 to the purchase price of \$1700. Detector mounts and other machined parts, jigs, etc., had to be designed and made; Jim Johnson and Al Lynch did this.

"We needed a multichannel analyzer for alpha-particle testing of detectors. Dallas Yeager, an instrument sales representative who had joined in as an investor, arranged an agreement with Vern Hartzler, President of RIDL (Radiation Instrument Development Laboratories, Inc., an instrumentation company), whereby RIDL furnished us an analyzer as a „demonstration unit" at no charge.

"They required only that we place on each detector test spectrum a label stating that it was taken with an RIDL analyzer. -- No problem there! This saved us a capital expenditure of ~\$5000 or more! Tom Emmer led this effort along with John Neiler and John Walter.

"Yeager also agreed that he and his secretary could answer the ORTEC telephone during workdays while we were at work at ORNL. We arranged with AT&T to install an extension in Yeager's office, several blocks away. This was an enormous help in that they could call any of us if a really urgent call came in. Mostly they would take messages so that we could return calls as appropriate.

"We also had to negotiate a supply of n-type single-crystal silicon. John Walter made sure the specifications were right and talked with the technical people at MERCK & Co., which was known to us as a quality supplier. The quoted price was \$1.89 per gram and we needed an ingot section of about 300 grams to start.

"We were convinced that the technical person at MERCK understood our requirements, but of course his instructions (to ship) came from the sales and/or credit department. The sales/credit guys had a hard time understanding our special requirements and also didn't readily understand who we were or what we were doing.

"Finally, I ended up talking with the sales manager for specialty items who said, after being sure that his technical guy understood, „Oh, well, I'll give you a \$500 line of credit and we'll ship it to you, whatever it is." They did, and we of course paid the invoice immediately after it arrived.

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"That started a good relationship through which they provided for our regular needs and provided, as well, ingot sections of rarer high-resistivity silicon as they became available, needed later for a number of our customers" applications.

"The ingots we received from MERCK had to be sliced, and the slices had to be cut and shaped into the detector shapes we needed. The saw cuts would cause the loss of useful material of course, so we searched for a firm that could cut the ingots with minimum-thickness cuts. We used the firm that the MERCK technical people recommended, which was Semiconductor Specialties Corporation in New Jersey, who did an excellent job for us.

"We applied for and received a license from the Atomic Energy Commission for handling radioactive materials, so that we could procure alpha-particle sources and use them for testing the detectors. We had to work out and understand the procedure for purchasing the sources from ORNL, where we knew good sources, especially ²⁴¹Am, would be made by Al Chetham-Strode and his group, who had made excellent sources for my work at ORNL. Phil Baker, in the Isotopes group at ORNL, helped us a lot with all this, smoothing out the procedural wrinkles.

"Neiler and Emmer took care of electronics. They found some equipment and supplies at Union Carbide surplus, and purchased outside whatever could not be found. However, the main job here was to arrange the design and production of the electronics (charge-sensitive preamplifier and amplifier system) that we would supply to those who wanted the electronics accompanying their detectors. We would of course use one of the same systems in our tests of the detectors.

"Since Ed Fairstein, while he was at ORNL, had designed a preamplifier-amplifier system for John Walter's work, it was a natural thing to ask him to design such a system for ORTEC. Ed had just formed Tennelec at that time and gladly agreed to design the system and check out the units prior to shipment.

"We entered into a mutual agreement that ORTEC would place a decal on the electronics indicating that it had been designed by Tennelec, and Ed would receive a fee for every unit sold. Also we mutually agreed that the electronics would be fabricated under contract by Infabco, Inc., a company newly started by Herman Hurst, formerly a technician at ORNL who had worked for Ed both at ORNL and in Tennelec.

"Herman had done excellent work and we were confident of the quality that he would, and did, deliver. The arrangement was that ORTEC would purchase the units fabricated by Infabco, with a profit included for Infabco. I think it was two or three years later that ORTEC acquired Infabco and Herman Hurst became production manager in ORTEC. We wanted Ed to join, but he very much valued his independence.

"Design and fabrication of the mechanical parts, including test chamber and vacuum systems, etc. was led by Jim Johnson, with Al Lynch, a really excellent machinist just retired from ORNL, doing the machining. Al had his own shop at home and handled our requirements efficiently and with high quality.

"While all this was going on, Jack Gibbons and Phil Miller, our designated „sales guys," were generating lists of potential customers' names, addresses, telephone numbers, etc. They solicited names from shareholders, most of whom responded with information about their acquaintances around the country, and even internationally, who they thought might be interested.

"Most people on the list were at accelerator laboratories and of course almost all were nuclear researchers. In addition, Jack and Phil worked on an initial brochure and price list, although price setting was a board item just beginning to be discussed.

"John Dabbs was beginning his work on the first operating manuals for the detectors and electronics, which we would then review, print and furnish with each order for detectors or electronics - absolutely invaluable aids to experimenters.

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“John Walter and John Neiler made the first detectors and in the process worked out procedures that could be followed by others of us working off-hours. Tom Emmer and Ed Fairstein made the first prototype preamplifier-amplifier system. Jim Johnson made sure all the mechanical parts and vacuum systems were made correctly and were working.

“Finally we could test the first detectors and electronic system. Naturally, some debugging was required, after which we cautiously deemed ourselves „ready for business.”



Tunnell Building, first home for ORTEC, now the first building recognized by the Oak Ridge Heritage and Preservation Association for historic significance and now identified as a Preserve America historic building

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Hal Schmitt, author of ORTEC Story