Exhibit Construction Foreman Don Greene (left) and Collections Manager Brian Wallace (right) clean the Johnniac's buses (the wires or pathways over which information travels).
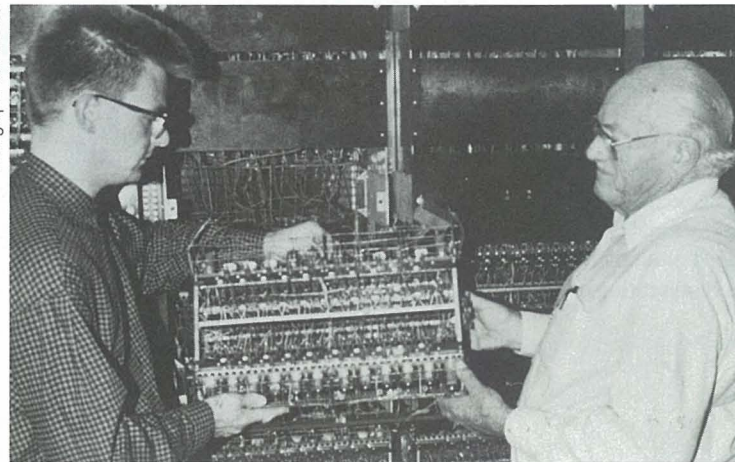
Rebuilding the Johnniac

In late 1989, when The Computer Museum acquired Johnniac, it was delivered in eight large crates accompanied by a bare aluminum mainframe. The components were supposedly complete but in a bewildering array. Fortunately, Willis Ware at Rand Corporation, where Johnniac was built, identified one of the original engineers who constructed the computer. Ray Clewett volunteered to spend two weeks pulling the pieces back together in response to Rand's offer to fly him and his wife to Boston.

Johnniac was built between 1950 and 1953. Weekly plans were sent to Rand in Santa Monica, California, by John von Neumann and his team at Princeton so that another computer could be added to the handful in operation. The Rand project team, Cliff Shaw, John Williams, George Brown and Bill Gunning, were assisted by mechanical engineer Ray Clewett. Johnniac was operational at Rand until 1966, after which it became an exhibit at the Los Angeles County Museum of Natural History.

On October 14, 1990, the day before the reconstruction began, 15 MIT volunteers emptied the eight crates and cleaned years of grime (and two birds' nests!) from the hundreds of components. The glistening parts were laid out in a collections storage area for re-assembly into the original configuration.

Then, Collections Manager Brian Wallace, and two other Museum employees, Geoff Pangonis and Don Greene, looked over old photographs of Johnniac, discussed where the more baffling parts should go, and helped refresh Clewett's memories of the computer. Slowly, subframes, power supplies, memory amplifiers, buses, and other components were re-attached to the 15 foot mainframe. Clewett recalled that aluminum was chosen for nearly all the pieces of the computer, including the beige panels on the top and all the polished trim of the exterior structure. The green clamshell doors on either end of the computer are an exception; they are steel, since aluminum alloys of the time were not sufficiently rigid for wide doors in constant use.

When it became apparent that several parts were missing, Clewett's expertise (and his memory) proved invaluable: he took a long look, measured various sections of the ten foot high computer, and produced specifications for replacement parts. Once the aluminum and steel had been procured, Clewett fashioned a new crossbar for the very top of the machine, essential for holding the curved top panels in place, and two lower runners for the sliding glass and aluminum main doors.

The final task was to reinstall the 48 modular vacuum tube registers in their original slots on the front and back of the computer. Johnniac reconstructed stands eleven feet high, six feet deep, and nearly fifteen feet long.

At a brief ceremony celebrating the success of the reconstruction project, Clewett, genuinely moved, said, "Johnniac represents three years of my life."

The Rand Corporation used the Johnniac for 13 years, developing advanced graphics input and output devices and the first interactive time-sharing system with what was originally an experimental computer architecture. Johnniac's IAS architecture, its reliability in operation, and the innovative uses to which it was put make the machine an important artifact in the Museum's collection and the history of computers.

Collections Manager Brian Wallace and mechanical engineer Ray Clewett reinstall the final vacuum tube register.