LHC Accelerator Physics and Technology Challenges, L.R. EVANS, CERN - The Large Hadron Collider (LHC) incorporates many technological innovations in order to achieve its design objectives at the lowest cost. The two-in-one magnet design, with the two magnetic channels integrated into a common yoke, has proved to be an economical alternative to two separate rings and allows enough free space in the existing (LEP) tunnel for a possible future re-installation of a lepton ring for e-p physics. In order to achieve the operation at dipole field of 8.3 T, the whole system must operate in superfluid helium at 1.9 K. The LHC will be the first hadron machine to produce appreciable synchrotron radiation which, together with the heat load due to image currents, has to be absorbed at cryogenic temperatures. A brief review of the machine design is given and some of the main technological and accelerator physics issues are discussed.