

A Full-Energy Booster for DIAMOND,
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Daresbury Laboratory, Warrington WA4 4AD, UK - A compact, rapid cycling 3 GeV booster synchrotron has been designed for the proposed UK national 3rd generation light source DIAMOND. A FODO lattice cell with 24 bending magnets has been selected, offering low circumference and a high degree of flexibility in terms of lattice functions and working point. The large number of bending magnets provides a low beam emittance, appropriate to injection into the storage ring, and furthermore reduces the maximum required field of the cycled dipole bending magnets. The beam properties of the chosen solution allow RF power to be supplied using only two cavities, and relatively long free straights are available to accommodate the large septum demanded by 3 GeV beam extraction. Alternative "missing dipole" schemes to provide space for extraction have also been assessed; these do not provide a superior or more economical solution and lack the operating flexibility of the preferred design. Component specifications will be presented and booster layout considerations discussed.