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Numerical techniques for the inverse Sturm-Liouville problem with eigenparameter dependent boundary conditions will be discussed. We will show that the potential  $q$  in

$$-u'' + qu = \lambda u, \quad 0 < x < 1$$

subject to boundary conditions

$$u(0) = 0, \quad (a\lambda + b)u(1) = (c\lambda + d)u'(1)$$

can be reconstructed using finite spectral data. This problem is first approached through the usual Gel'fand-Levitan technique by solving an equivalent hyperbolic boundary value problem. We also consider a shooting method where the right endpoint boundary condition is used in conjunction with a quasi-Newton scheme to recover the unknown potential. (Received October 02, 2000)