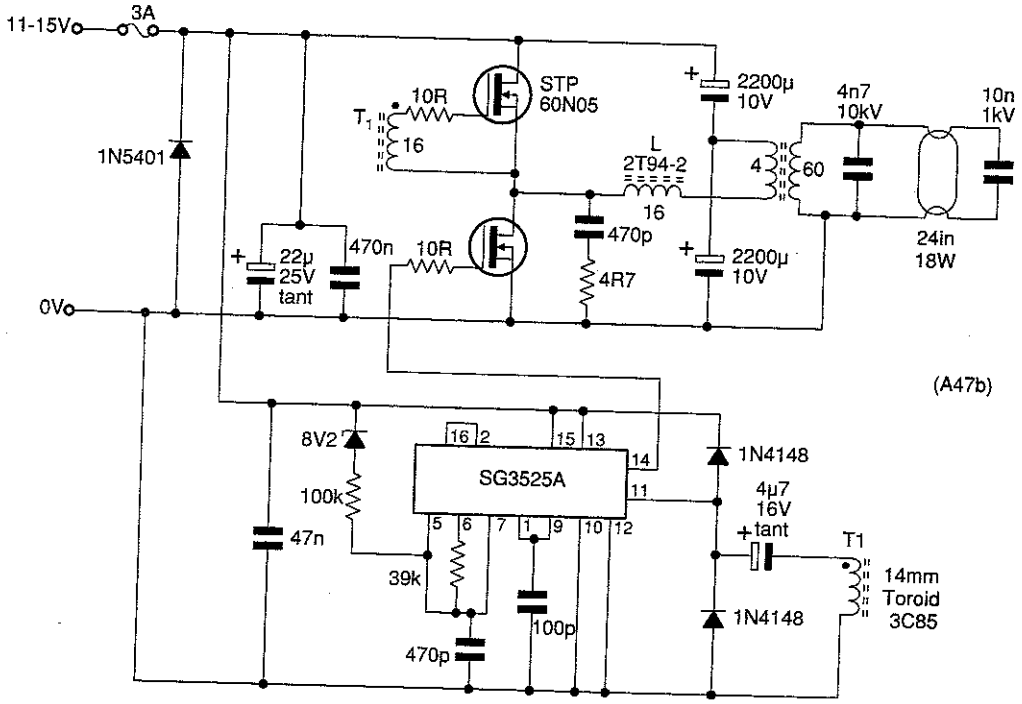
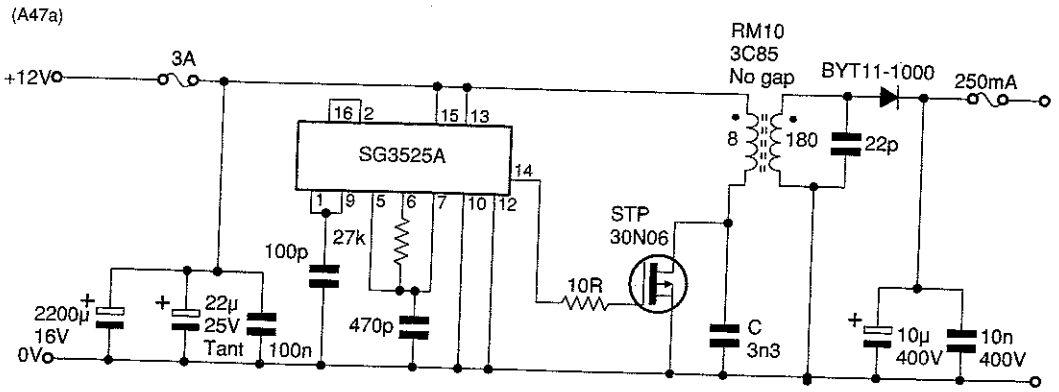
Dc supplies for fluorescent lamps

Both these methods of driving fluorescent lamps use the *SC3525* switched-mode power supply control ic, the first varying its frequency instead of the normal duty cycle variation.



12V, 18W inverter. This will accept 11-15V dc input and drives the tube by means of a half bridge, itself fed by the controller at a fixed duty cycle. Starting is by the inductor *L* and the two capacitors across the tube, which form a resonant circuit to produce a high voltage, some of the resulting current going through the tube cathode for preheating. As the tube strikes, its resistance shunts the capacitors and damps the resonant circuit, the reactance of *L* now limiting lamp current and providing some regulation against changes in input voltage. Further regulation is brought about by shifting the controller's oscillator frequency in response to input voltage, which is applied via a 100kΩ resistor and 8.2V zener. Reflected lamp impedance is only a few ohms, so careful layout and capacitors with low equivalent series resistance are needed.



Dc-to-dc converter for compact lamps. Supplying 300V dc for a compact lamp, this converter accepts 12V input and, since the lamps exhibit a degree of supply-voltage regulation, is a simple tracking type. Loss caused by reverse recovery in the output rectifier is avoided here by applying a half-sine reverse voltage. Choose the transformer turns ratio to suit the supply voltage and the capacitor *C* to resonate with the transformer at a frequency to make the half cycle just occupy the fet's off period. If the half cycle is too short, there will be undue stress on the transistor and diode; if too long, it is chopped by the fet's turning on.

Paul Bennett
Bristol
(A47)