ELECTRONIC IGNITION 005

The electronic ignition circuit presented here is intended to be inserted into a car's conventional ignition system. In effect, it replaces the original 12 V switching circuit in the primary winding of the coil by one generating more than 100 V. It thereby converts a current circuit, which is upset by lead and stray resistance, into a voltage circuit that is much more efficient.

The pulses emanting from the contact breaker, shown at the extreme lower left-hand side of the diagram, are applied to transistor T1 and subsequently differentiated by R3-C1. This causes a negligible ignition delay. The current through the contact-breaker points is determined by the value of R1. This value has been chosen to ensure that the points remain clean.

Transistor T1 is followed by two monostables, IC1a and IC1b, which are both triggered by the output pulses of T1. However, whereas IC1a is triggered by the trailing edge, IC1b is by the leading edge.

Monostable IC1a passes a pulse of about 1.5 ms—determined by R4-C2—to NAND gate IC2a. This gate switches off high-voltage darlington T3 via gates IC2b, IC2c and IC2d, and driver T2, for the duration of the pulse. Gate IC2 ensures that T3 is switched on only when the engine is running to prevent a current of some amperes flowing through the ignition coil.

As long as pulses emanate from the contact breaker, IC1b is triggered and its Q output remains logic high. The mono time of this stage is about 1s and is determined by R5-C3.

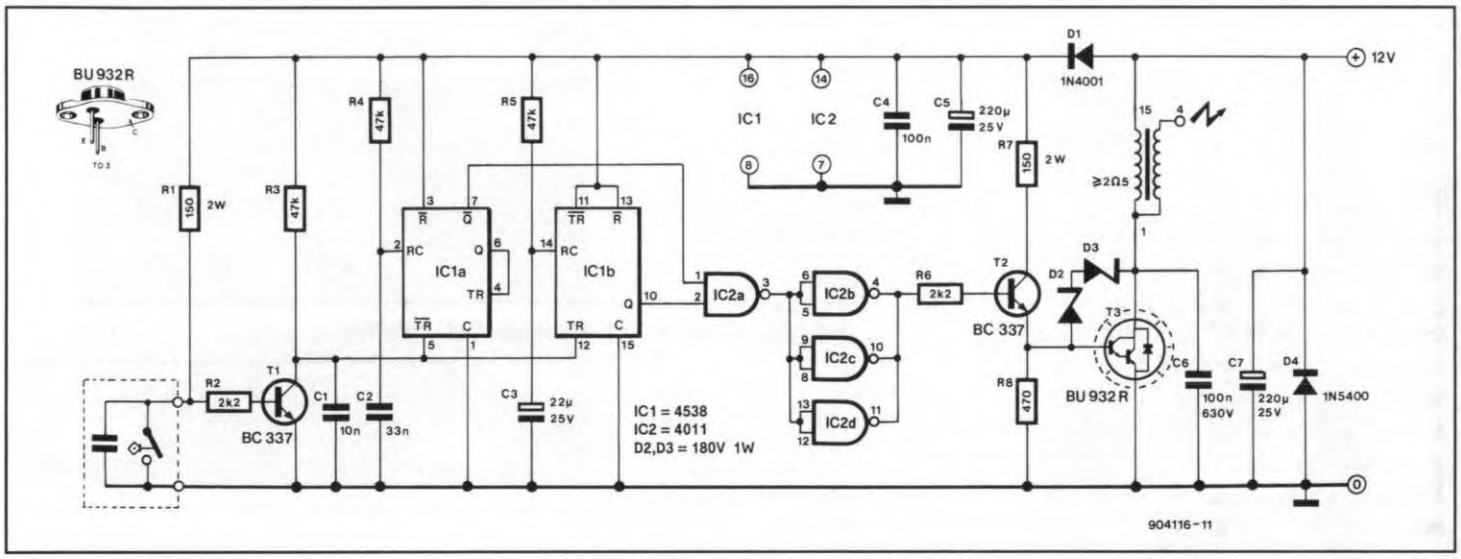
Darlington T3 is switched on via T2 and IC2a–IC2d as long as IC1a does not pass an ignition pulse.

When the engine is not running, the Q output of IC2b goes low after 1 s and this causes T2 and T3 to be switched off.

The two series-connected 180-V zener diodes protect the collector of the BU932R against too high a voltage.

The darlington must be fitted on a suitable heat sink. ■

(H. Döpfer)



WIDEBAND UHF AMPLIFIER 006

The construction of a UHF amplifier frightens most people, unless they are experienced radio/TV enthusiasts. They should, therefore, appreciate the circuit presented here, which is as straightforward as can be. It offers 10–15 dB gain over the frequency range 400–850 MHz and is therefore eminently suitable for situations where the television signal is on the weak side. Moreover, the filters may be adapted to the individual needs of users.

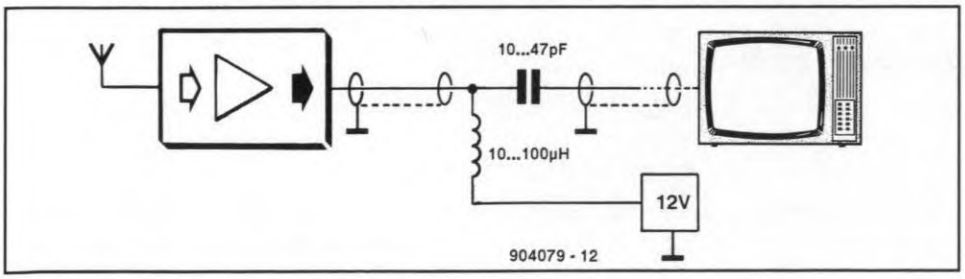
Construction is simplicity itself if the ready-made PCB shown on the next page is used. The tracks should be tinned or silvered for optimum performance and long life.

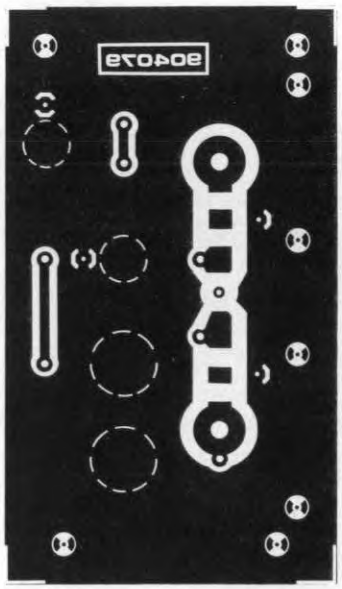
The opening at the centre of the board is intended to accommodate the transistor. This device has two emitter pins, both of which should be connected to ground.

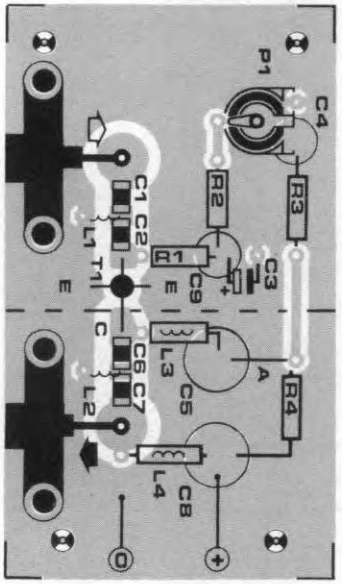
The drawings show that the board is divided into two by a small piece of tin plate, which should have a small cut-out for the transistor.

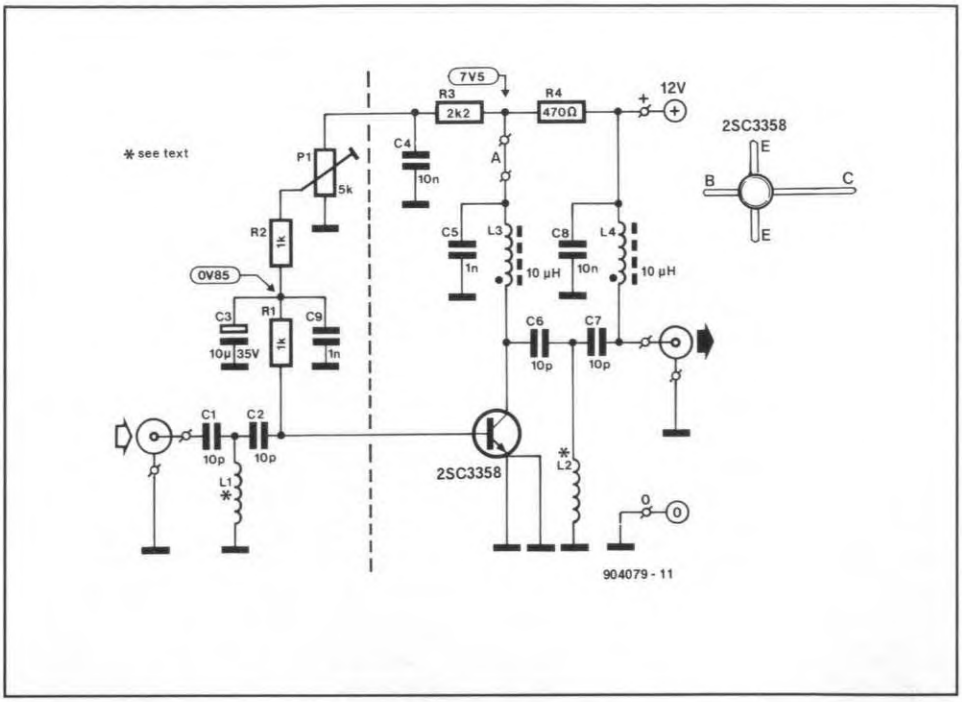
The input and output terminals are made from small cable clamps and M3 nuts and bolts.

One side of disc capacitors C4, C5, C8 and C9 is soldered direct on to the board









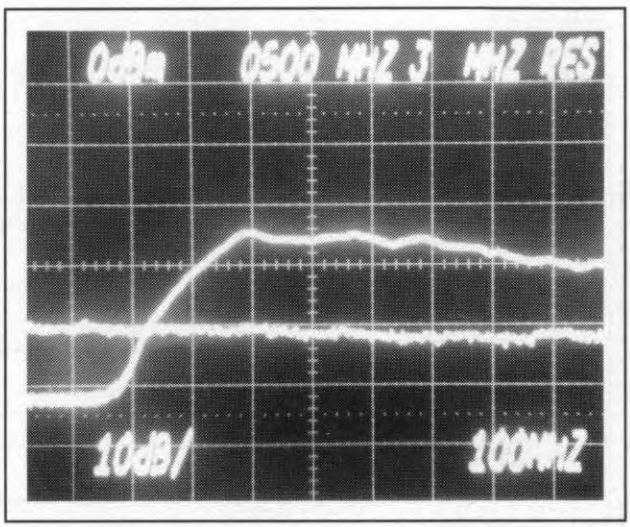
PARTS LIST

Resistors:
R1, R2 = 1 k
R3 = 2k2
R4 = 470 Ω
P1 = 5 k preset pot meter

Capacitors:
C1, C2, C6, C7 = 10 p surface-mount
C3 = 10 µ; 35 V
C4, C8 = 10 n disc type
C5, C9 = 1 n disc type

Inductors:
L1, L2 = air cored, 2 turns of 3 mm dia enamlled copper wire
L3, L4 = 10 µH choke or 10 turns of 0.2 mm dia enamelled copper wire on a ferrite bead.

Semiconductors:
T1 = 2SC3358



for which a fairly large soldering iron should be used.

All remaining components should be fitted with their terminals cut as short is feasible.

Input and output capacitors, C1 and 2, and C6 and C7 respectively are surface-mount types. C1-C2-L1 form an input filter and C6-C7-L2 an output filter. The value of the capacitors may have to be lowered to 3.9 pF to obtain the correct frequency range.

The overall frequency characteristic is shown in the second photograph.

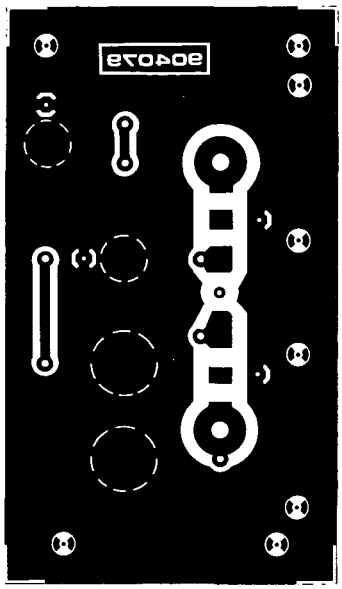
The amplifier may be housed in a watertight case and then mounted near the antenna at the top of the mast (if used).

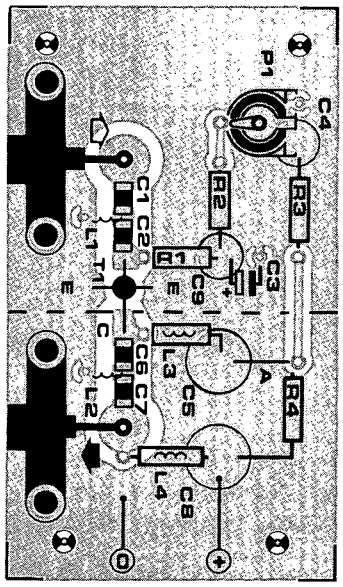
The power is obtained from a simple stabilized 12 V supply: a mains adaptor with a 78L12 will do nicely. This may be kept indoors, of course. The amplifier may be powered via the coaxial feeder cable, for which purpose a 10–100 µH choke is inserted in the supply line.

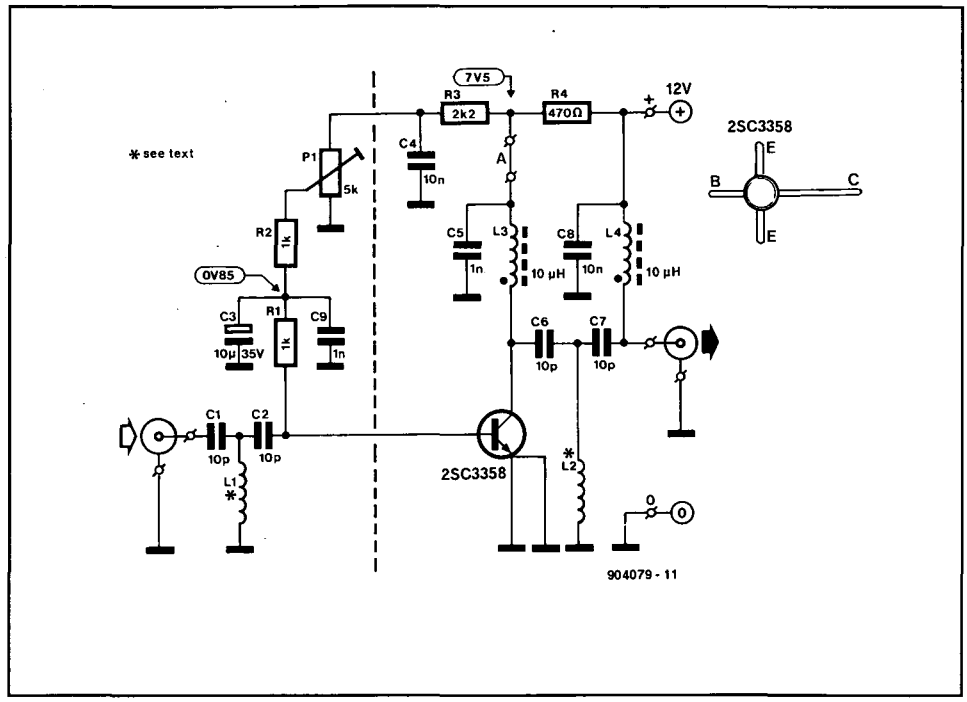
The television receiver is connected to the amplifier via a small coupling capacitor as shown on the previous page.

Calibrating the amplifier is straighforward: set P1 to the centre of its travel and then adjust it for optimum picture quality. In practice, the collector current of the transistor is then 5–15 mA. This may be checked by temporarily replacing jump lead A by a milliammeter. ■

(*K. Kraus*)







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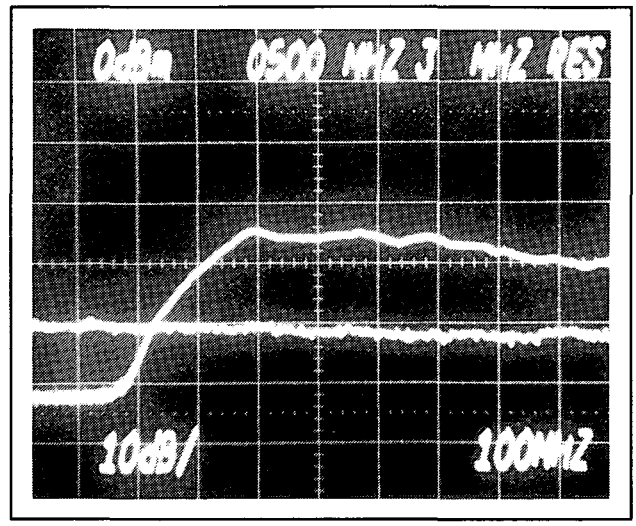

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(*K. Kraus*)

007

LIGHT GUARANTEED

The circuit presented here guarantees that if bulb La1 gives up the ghost, bulb La2 will take over its task, so that there is always light.

In series with La1 is triac Tri2. Resistor R3 and C2 form a delay network. As soon