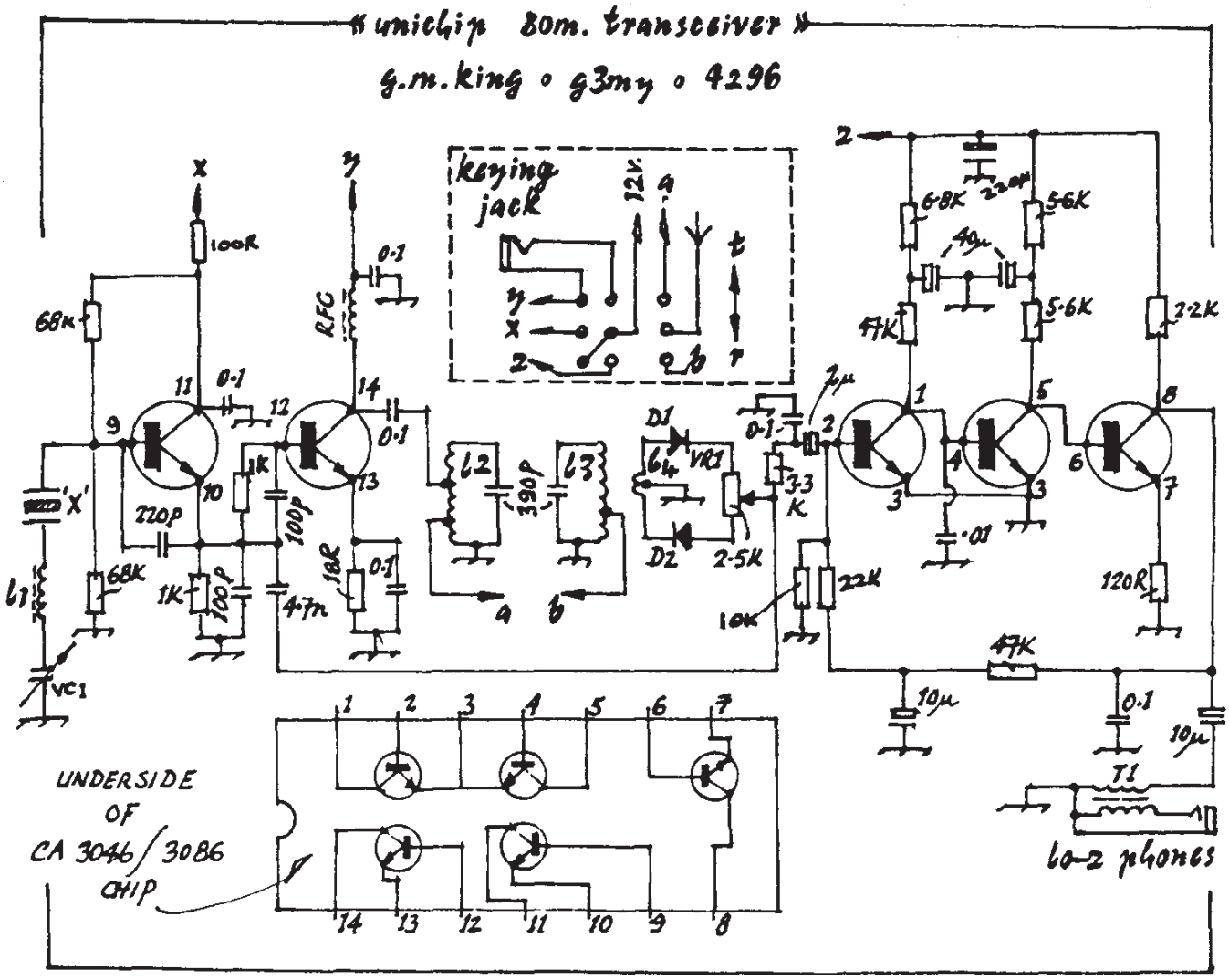
THE UNICHIP

By Mike King G3MY

The Unichip is built around a single CA 3046 chip which is described as a differential pair plus three separate units. The layout of the pins makes the device very suitable for a design with the chip in a holder in the middle of the circuit board. The receiver is then layed out on one side and the transmitter on the opposite side.

The transceiver was designed as a simple no frills circuit and it is sufficient to say that it worked the minute it was switched on, only requiring the two slug tuned coils to be resonated. Input to the "PA" stage is 50/55 Ma at 12 volts and the measured output is just short of 300 milliwatts into a 50 ohm load. The VXO runs all the time on receive but is keyed along with the PA on transmit so that if needs be it can be used with a separate receiver without any sidetone and of course no drain on the Nicads except when the set is actually transmitting.
The transceiver was built on Veroboard because I am no great designer of Printed Circuits; although I am sure that it should be quite simple to produce a suitable board and thereby make construction very much easier. (and quicker).
I might add that the chips came from Birkett some years ago and were the usual untested devices but I am glad to say that 9 out of the original 10 work satisfactorily. I think they were 5 for £1 but the newer and equivalent CA3086 can be bought for 45p, as a top quality branded device.



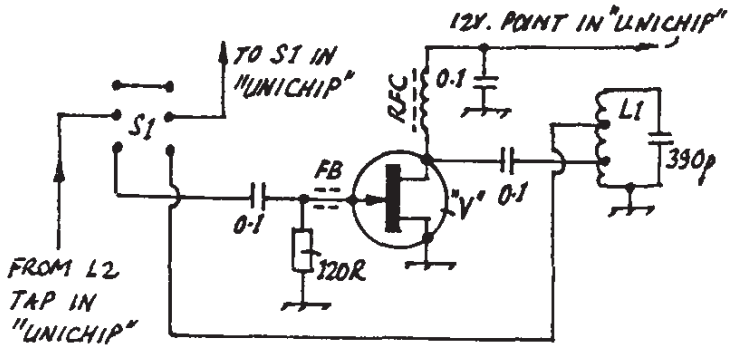
EDITORS NOTE: In an attempt to get Mike's interesting circuit into the the last issue of SPRAT, it was rushed through without an author's check. Naturally Murphy struck and it contained several errors. We reprint the whole article and add a club offer in PRINTED CIRCUIT BOARDS for the UNICHIP and "BOOTS"

Components

X Crystal 3560 kHz
L1 120uH iron core choke
VC1 100pf polycon or air spaced
RFC 7T 30swg enamel wire on 2 ferrite beads end to end
L2 30T 28swg close wound on 7mm slug tuned former, taps at 6T and 12T from ground
L3 Same as L2, tap 5T from ground
L4 3 bifilar turns over middle of L3

After winding the cores and the RFC sprayed with "Holts Ignition Sealer" plastic spray.

D1 D2 IN914 T1 = LT700. SI T/R switch 3 pole 2 way toggle switch



'BOOTS' FOR "THE UNICHIP"

By Mike King G3MY

The Unichip has grown a pair of "Wellies" in the form of an outboard VMOS PA, which is fixed to ther back of the little ABS. box used to house the transceiver. This PA can be switched in or out by means of a simple toggle switchas show in the circuit. In this way the function of the T/R switch in the transceiver is not effected.

RFC 2 Ferrite beads end to end 6T 28 swg enamelled wire.
L1 7mm slug tuned from 30T 28swg enamelled wire close wound, taps at 9T and 12T from ground.
S1 2 pole 2 way toggle switch (HI/LO POWER!)
FB Ferrite bead on the gate lead - right up at the device fixed in place with polystyrene cement.
V N Channel VMOS, VN10KM or VN66AF with 6sq cm copper heat sink. Bolted to small copper tab - 4BA bolt takes heat from tab through to external heat sink.
VN90AA also fine, more QRO, TO3 type mounting.

Built in a 60mm x 40mm x 25mm plastic box, heat sink external. Box glued to back of unichip box with Araldite.
VMOS PA cut off with no drive so there is no need to key the stage.
RF output 2.0 - 2.5 watts, d.c. input approx 300-350 mA at 12 - 14 volts.

UNICHIP PRINTED CIRCUIT BOARDS

A COMPLETE ETCHED AND DRILLED PRINTED CIRCUIT BOARD IS AVAILABLE FOR THE UNICHIP AND THE "BOOTS" AMPLIFIER FOR £1.75 INCLUDING POSTAGE.
DAVE AIZLEWOOD, G4WZV, 36 KING ST, WINTERTON, SOUTH HUMBERSIDE, DN15 9TP

NOTES:

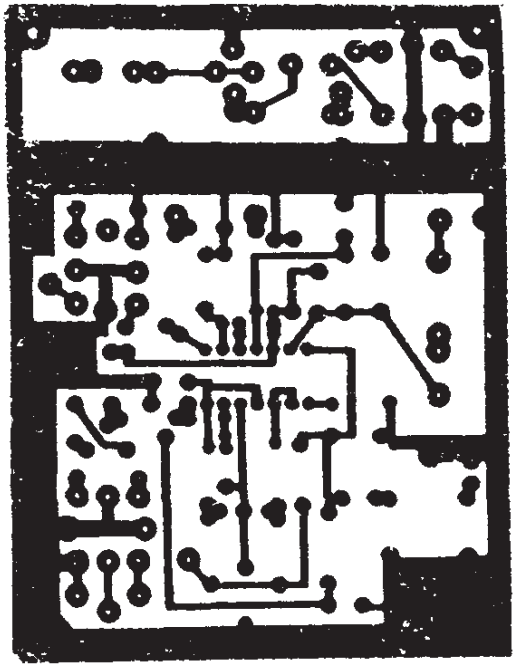
The PCB uses 5mm Formers (see note below)

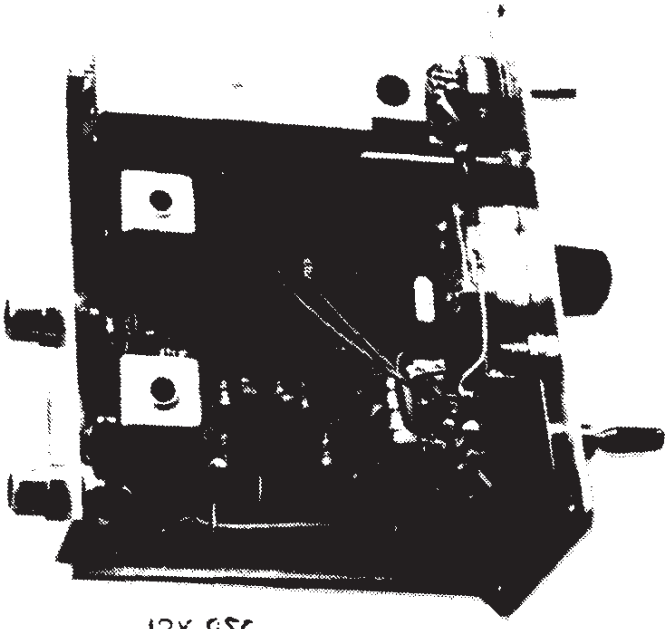
3 Pole Toggle Changeover Switches are available from ELECTROVALUE (UK)

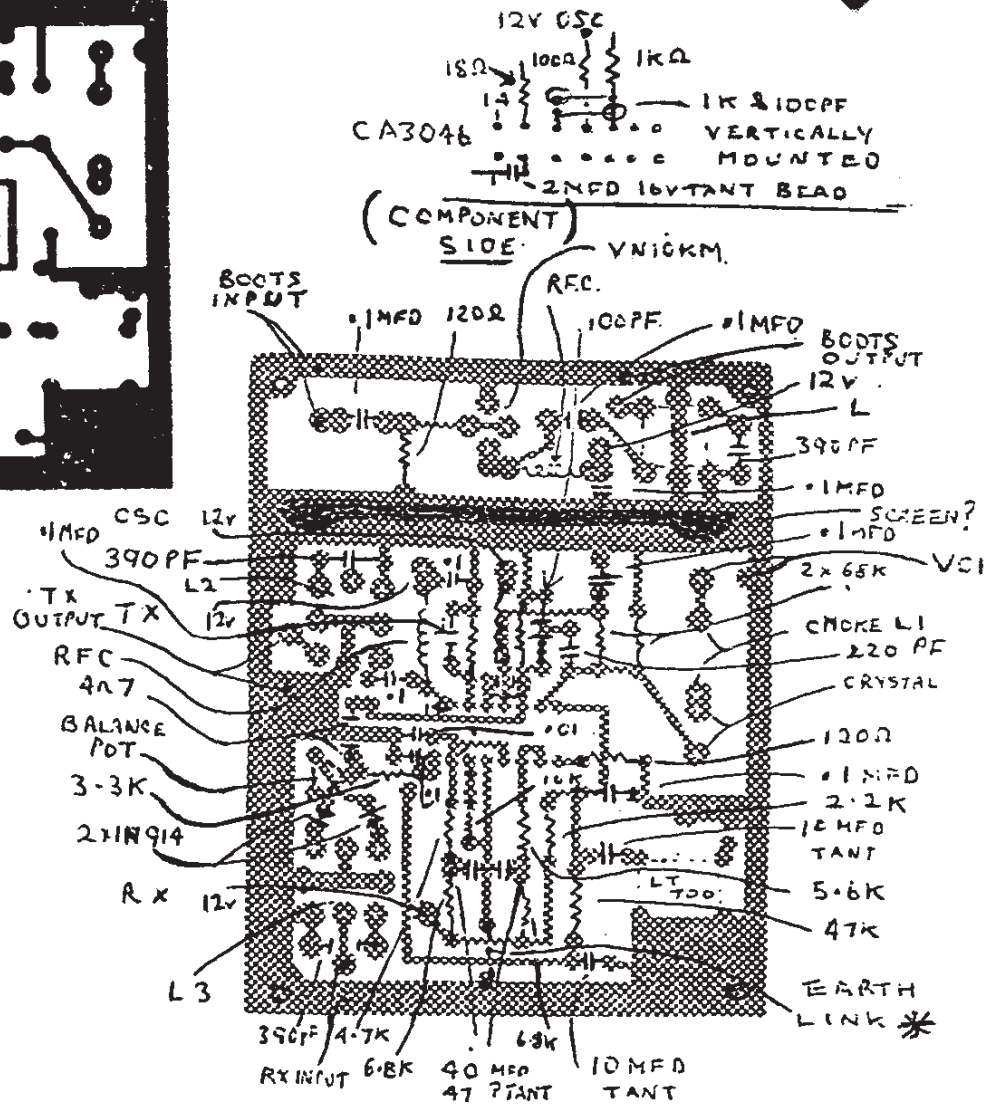
A TO92 Heatsink, suitable for the VN10K is available from MAPLINS
5mm formers + bases also from MAPLIN.

PCB DESIGN BY JACK G4ZQK

THE PCB IS SHOWN HALF SIZE







WINDINGS ON 5mm FORMER
(3/16" outer diameter)

UNICHIP:
L1 = 40 turns tapped 9/16
L3 = 40 turns tapped 7
BOOTS:
L1 = 40 turns tapped 12/16

All wound with 32 s.w.g.