

FOX Hunting Tools

New Toys!

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Job: fox`present`4

File: fox`present`4.tex



Outline



Introduction

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ICARC Step Attenuator

Section Label

Introduction



Fox Hunting toys



Fun little projects; easy to build surface mount boards

All of them fit in a Hammond 1599B enclosure

Maybe not quite this involved...

You will find these projects much less expensive to destroy than the circuit board on your \$1,250 radio!



NVARC RF Detector



Basic tuned inductor
RF detector.
L1/C1 is the tank.

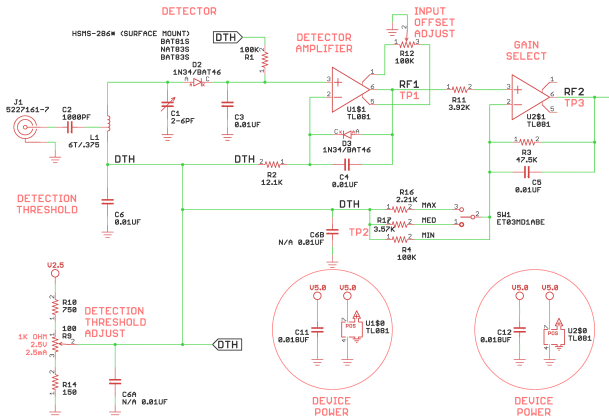
DTH net forward bias
D2 (detection diode).

U1 lowers detection
impedance.

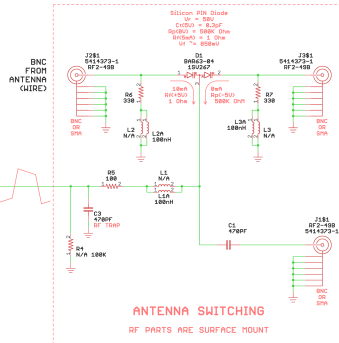
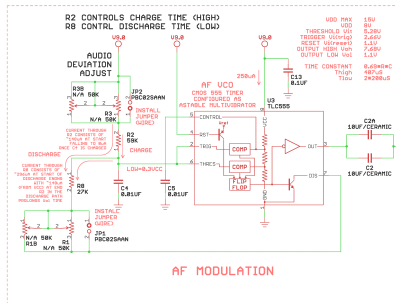
U2 provides DC gain
SW1 provides RF
gain select.

RF2 net voltage proportional to RF level
connects to voltage controlled audio oscillator

Regulator and audio circuits not shown



ICARC TDOA Switch 1



Basic antenna switch

555 timer to generate audio frequency square wave

PIN Diode Antenna switch

555 a bit tricky to trim to get square wave to 50%.



ICARC TDOA Switch 2



Improved antenna switch

Switch timing element to CD4047

Note divide-by-2 results is square wave

All surface mount

CD4047 has both **true** and **inverted** outputs

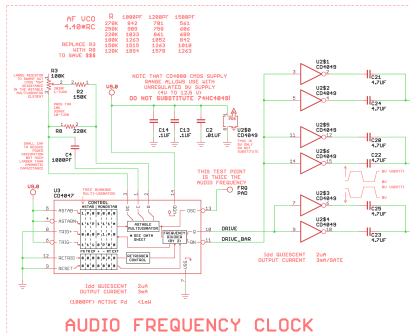
4000 series CMOS runs directly from battery (no regulator required)

NO 74HC substitutions!!! (74HC is 6V max)

Production units eliminate R2/R3
only used on prototype to select R2/R3

CD4049 provides current buffer for one normal and
2 inverted outputs (see next page)

Setting audio (modulation) frequency reduced
to selecting two parts: C4/R8



ICARC TDOA Switch 2



Improved isolation in the antenna switch

Same PIN diode

higher reverse bias voltage

more drive current

LEFT_BIAS and **RIGHT_BIAS**

are isolated but same *phase*

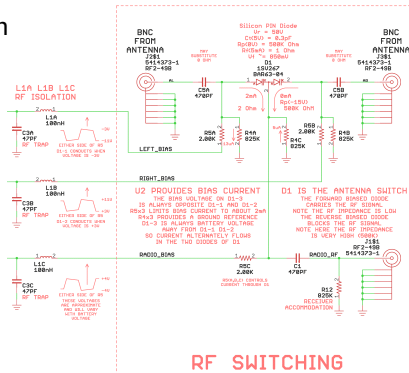
RADIO_BIAS opposite phase

voltage measurements from prototype shown in red

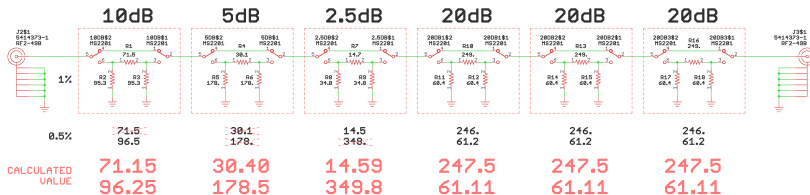
L1(x3) provides RF isolation

R4(x3) provides weak DC bias

Populate board with SMA or BNC, pads accommodate either.



ICARC Step Attenuator



Basic PI-Network attenuator array

Use cheap slide switches (C&K toggles are \$5-\$10 each!)

Resistors are surface mount (0805 package 1/10 cost of axial parts)

BNC or SMA may be installed on the board

Attenuators are **not** directional (R_p are same value)

Note **calculated values in red**
(parts list makes use of 1% values)



Section Text

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Hey! we're all done now!