SIMPLE BEACON- CONSTRUCTION NOTES

Here is a simple, self-contained beacon which can run a few milliwatts or as much as a watt, depending on choice of amplifier (Q1), R2 and supply voltage. The CMOS exciter and IDer draw very little current. As long as the power supply will deliver 5 or 6 volts, Vdd for the three chips can be applied through a single 1 K resistor to further reduce power consumption.

U1 provides a crystal controlled oscillator and a choice of divided outputs. Of these, only pin 7 (divide by 16) and pin 9 (divide by 32) concern us here. Unused outputs of the 4060 should be left floating.

U2 is a simple IDer capable of producing single, simple CW characters, which are defined by the diodes. (K in the arrangement shown in the schematic). The output pins of the 4017 go high in the diagram sequence (3,2,4,7,10,1,5,6,9,11)

U3 provides clock and inverter functions. Note that pins 12 and 13 should be grounded. Vdd of the 4011 (+) is applied to pin 14, pin 7 is grounded. Place a .1 uF capacitor from pin 14 to ground.

SPEED CONTROL- The value of R5 and/or C5 may be adjusted to provide the desired keying speed.

EVEN SIMPLER OPTION- If only dashs (or dots) are desired as keying, U2 may be omitted. If this is done, connect pin 4 of U3 to pins 8 and 9 of U3. Adjust speed to generate the desired tempo.

OUTPUT STAGE- If the 4060 output is connected directly to the amplifier gate, the amplifier is likely to draw a watt or more with an 8 to 12 volt supply. R2 is a crude measure that is effective in reducing drive level for QRP operation. In my case (using a rather uncommon VN46AF in the amplifier), a value of 13k Ohms brought Q1 input to around 100 milliwatts with an 8.5 volt supply. Alternatively, R2 may be omitted and Q1 supply voltage adjusted (use an adjustable regulator if power efficiency is desired).

OUTPUT TANK- C6 should resonate L1 at the operating frequency. I wound up using 3 .047 polystyrene capacitors in series for around .015 UF at 185 kHz. Going to .022 UF resulted in a 50% decrease in output. I suggest starting with .01 uF and adding .001 uF caps until the optimum value is found. Then larger values can be substituted if you don't want that whole wad of little caps taking up space. If you wind up with a number of series capacitors in the tank, you may find that optimum output matching is obtained by connecting the loading coil to the junction of two capacitors. If so, C7 can be omitted.

NOTES- If R2 is incorporated, the waveform at the gate of Q1 will be a more-or-less severely modified squarewave. If R2 is omitted, the driving wave form will be a square wave. In either instance, output of the drain tank will be a reasonably clean sine wave. Assuming the antenna is inductively resonated on the operating frequency, the radiated signal will be quite clean, with second and third harmonics a good 40 dB down. (But don't take my word for it- CHECK THEM...at least 2 thru 10)

This is a transmitter that can be built in a couple of hours for a few dollars. It makes no pretense of being an ultimate design but numerous elaborations are possible.

M. Mideke- Feb. '88

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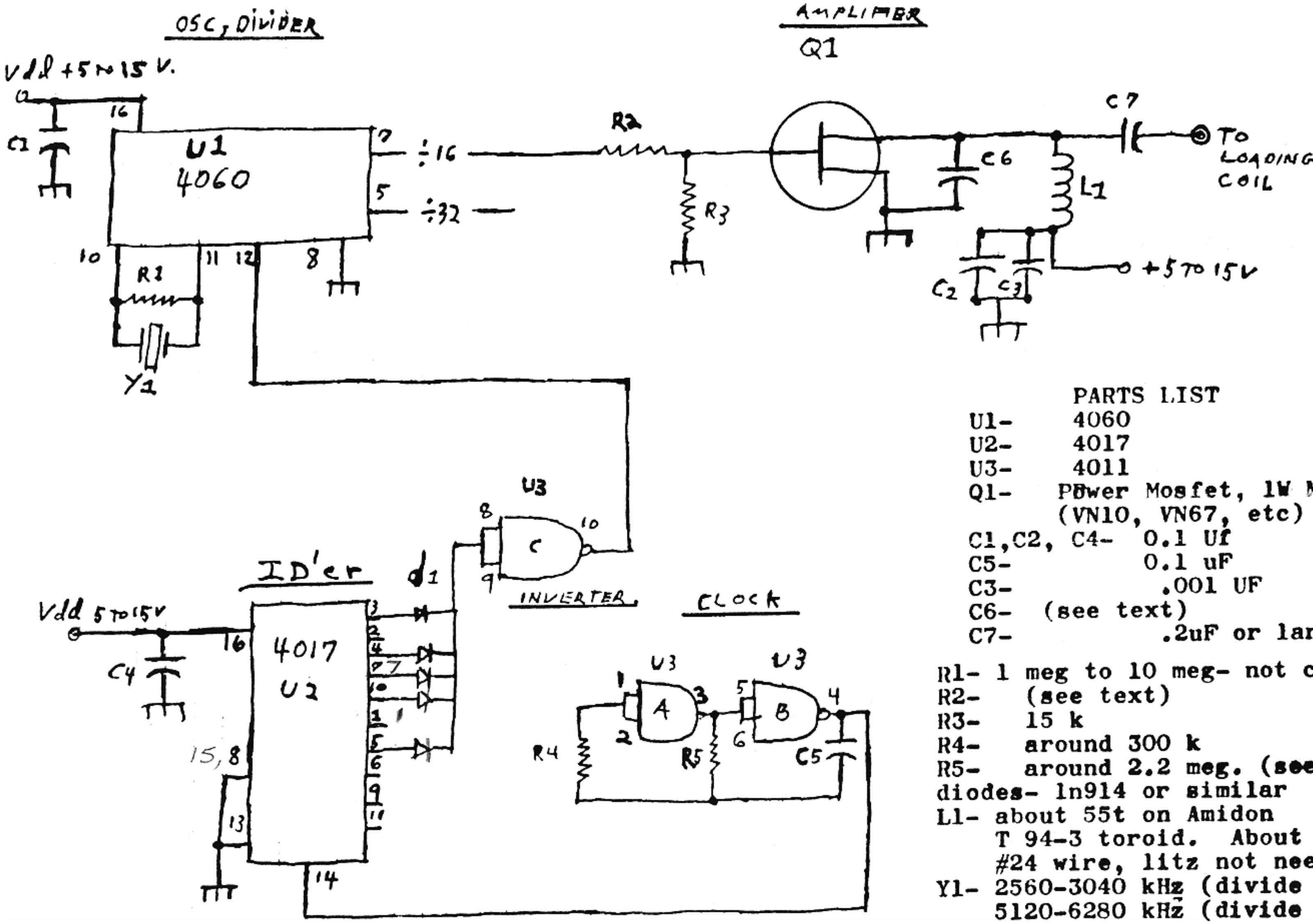

PARTS LIST

U1- 4060
U2- 4017
U3- 4011
Q1- Power Mosfet, 1W Minimum
(VN10, VN67, etc)
C1,C2, C4- 0.1 Uf
C5- 0.1 uF
C3- .001 UF
C6- (see text)
C7- .2uF or larger

R1- 1 meg to 10 meg- not critical
R2- (see text)
R3- 15 k
R4- around 300 k
R5- around 2.2 meg. (see text)
diodes- 1n914 or similar
L1- about 55t on Amidon
T 94-3 toroid. About
#24 wire, litz not needed.
Y1- 2560-3040 kHz (divide by 16)
5120-6280 kHz (divide by 32)