TRACK TRANSMITTER
TRACK108

PLEASE NOTE THAT IT IS FORBIDDEN TO BUILT OR USE A RADIO TRANSMITTER OPERATING ON 108 MHZ! THIS DESIGN IS THEREFORE ILLEGAL IN BOTH SWEDEN AND IN EUROPE!

Further examples of the theme: Radio with HC logic - will come here... Radio communication is fascinating, sure is it? The usage may be - to find a stolen object more easily, which implies that the track transmitters (before the time of the theft) are applied in the "object". The unit's design and function is of the less advanced nature. Another important factor is the space it needs; hence, I use only surface-mounted components.

The circuit board size is 20x65 mm, which in today's mobile society is an extremely large space in proportion to the objective function. Given that track the transmitter must be equipped with some sort of power - type a battery, it makes no difference anyway. The most suitable battery type seems to be a 9 volt battery, but higher voltages can also be present. As the supply voltage must be 3 to 6 volts, requires a voltage regulator. This means that the device does not stop functioning until the battery voltage drops below 7 volts and then the track transmitter’s activity subside gradually. The track transmitter emits a pulsating tone which can be received by a conventional FM radio.

The radio wave derived from a square wave oscillator. The frequency is 12MHz, and through an antenna filter will only the ninth harmonic pass, from the square wave energy spectra. The term “transmitter” is somewhat exaggerated, since it basically is a logic circuit that having, via the output, a bit wire connected. The design required a double side board but there are no circuit patterns on the ground plane.

If you choose to shield the device, it can also serve as shelter for the 9V battery. The screen is a bit smaller than the circuit board (17x62). Then it will be solder on the board’s top. The walls should be high, so that a 9V battery fits inside. The battery and the track transmitter is then a single encapsulated unit. A hole must be drilled for the antenna wire. The most effective antenna type tends to be a 5/8- spiral antenna. Such an antenna can be constructed with a stick or an electrical tube plus the wire-management.

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From a track transmitter is the step to a spy transmitters not very far. Even here, one could use this design in an alarm system - In what way then? It's a good question, but the use can of course vary beyond this...

The size is the same as for TRACK108 (20x65). The Power supply is also here 3 - 6V, which requires a voltage regulator. The difference is that the microphone is connected directly from the battery and not after LM340MP. The transmitter frequency can be between 106 to 110 MHz, entirely dependent on the choice of resistance between the capacitance diode modulation point, in relation to the ground. When the capacitance diode is very sensitive to small voltage variations; is there no need for a microphone amplifier. Fully unattunated (P1 max) recorded even soft sounds clearly. This also applies to low frequency sounds, such items like traffic. Traffic can interfere with and dominate the sound, therefore, is the bass register subdued. If one wishes to counteract the bass attenuation should you choose C1 and C2 greater. When the device is used outdoors it is not enough with a bass filter. The input from the microphone must be attenuated. In addition, the microphone should be encapsulated with foam rubber of any kind, which protects against the wind. When high audio quality is priority, select C1 and C2 to 470nF and the fact that a microphone encapsulating, attenuate high audio frequencies (treble) we also need Cp and it can be chosen to 1nF. The lifting action of the higher frequencies may also compensate for a bad microphone. For recording of live audio should P1 be adjusted to about in the middle.

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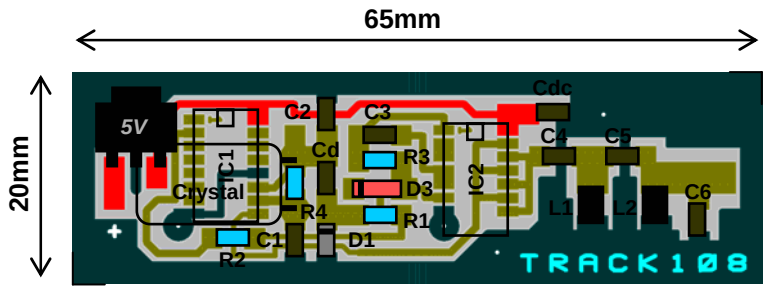
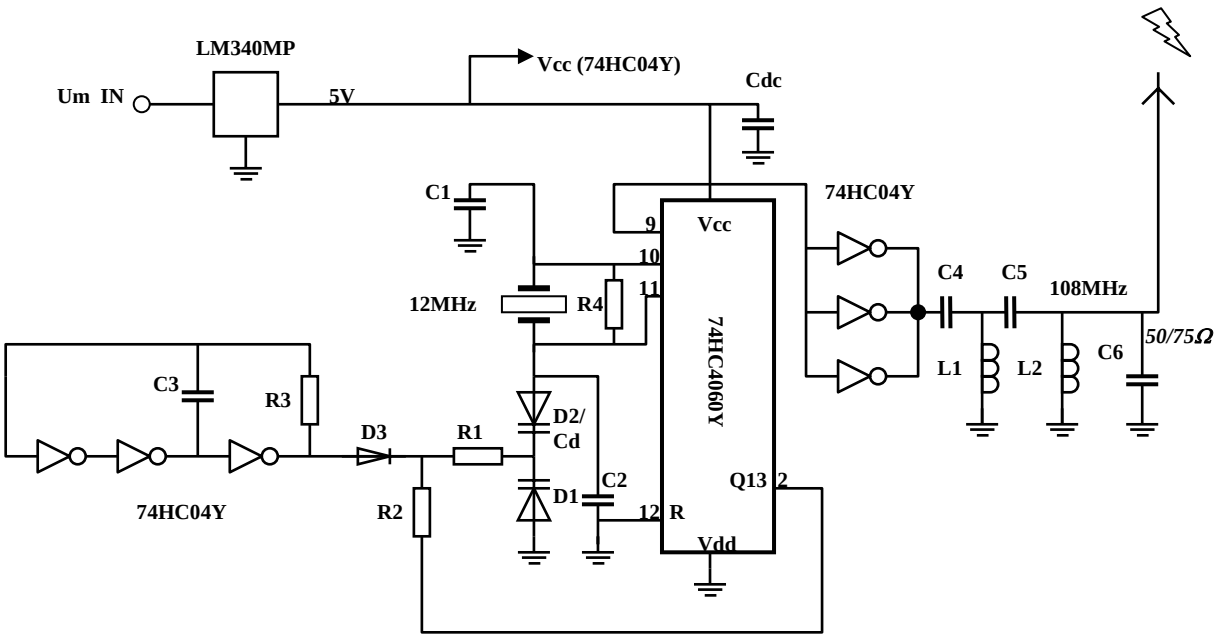
CIRCUIT DIAGRAM AND PLACING OF COMPONENTS



SMR1206:
R1 = 10k
R2 = 4k7
R3 = 3M3
R4 = 560k

SMC1206:
C1 = 100p
C2 = 15p
C3 = 100n
C4 = 4p7
C5 = 4p7
C6 = 10p
Cdc = 10n

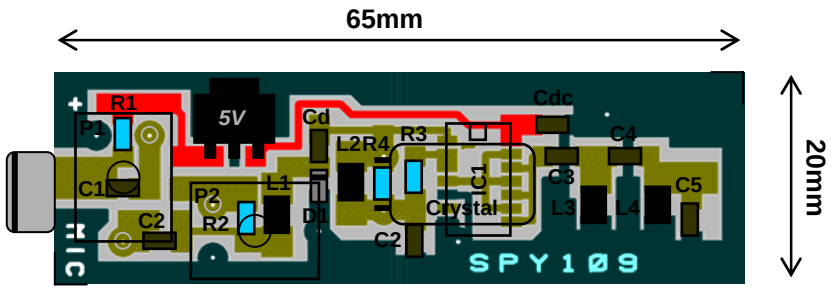
Other components:
L1&L2 = 220nH , Chip coil
D1&D2 = BB204 , Double capacitance diode
or: D1 = BB132 and Cd = 220p
D3 = Chip diode , Silicon , Switch type
IC1 = 74HC4060 , SMD
IC2 = 74HC04 , SMD
Stab. 5V = LM340MP, SMD or similar
CPU-crystal = 12.000MHz



Double side board. 4 marked holes shall be drilled through and to the ground plane. All components shall be handled as SMD because the ground plane do not have any tracks. The units can be shielded with sheet metal.

PROJECT	*Track transmitter*	
MODULE		
MODEL	**TRACK108**	
AUDIT	A-1	**DRAWING: 1 of 1**
SUPPLY	≥ +7 VDC	≤ +35 VDC
CURRENT	10mA	
OTHER	-	
B. Lindqvist		*2003-05*

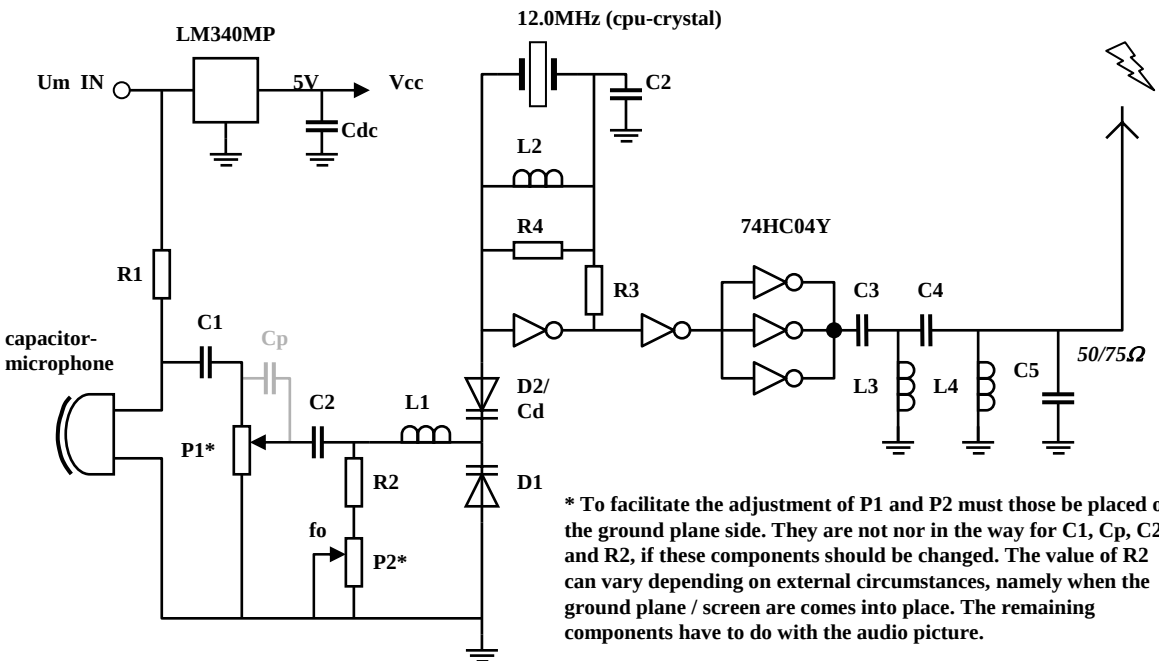
CIRCUIT DIAGRAM AND PLACING OF COMPONENTS



SMR1206:
R1 = 5k6
R2 = 68k
R3 = 2k2
R4 = 100k

SMC1206:
C1 = 100n
C2 = 100n
C2 = 220p
C3 = 4p7
C4 = 4p7
C5 = 10p
Cdc = 10n

Other components:
P1 = 25k (placing on the ground plane)
P2 = 25k (placing on the ground plane)
L1 = 47µ , Chip coil
L2 = 10µ , Chip coil
L3&L4 = 220nH , Chip coil
D1&D2 = BB204 , Double capacitance diode
or: D1 = BB132 and Cd = 220p
IC1 = 74HC04 , SMD
Stab. 5V = LM340MP, SMD or similar
CPU-crystal = 12.000MHz

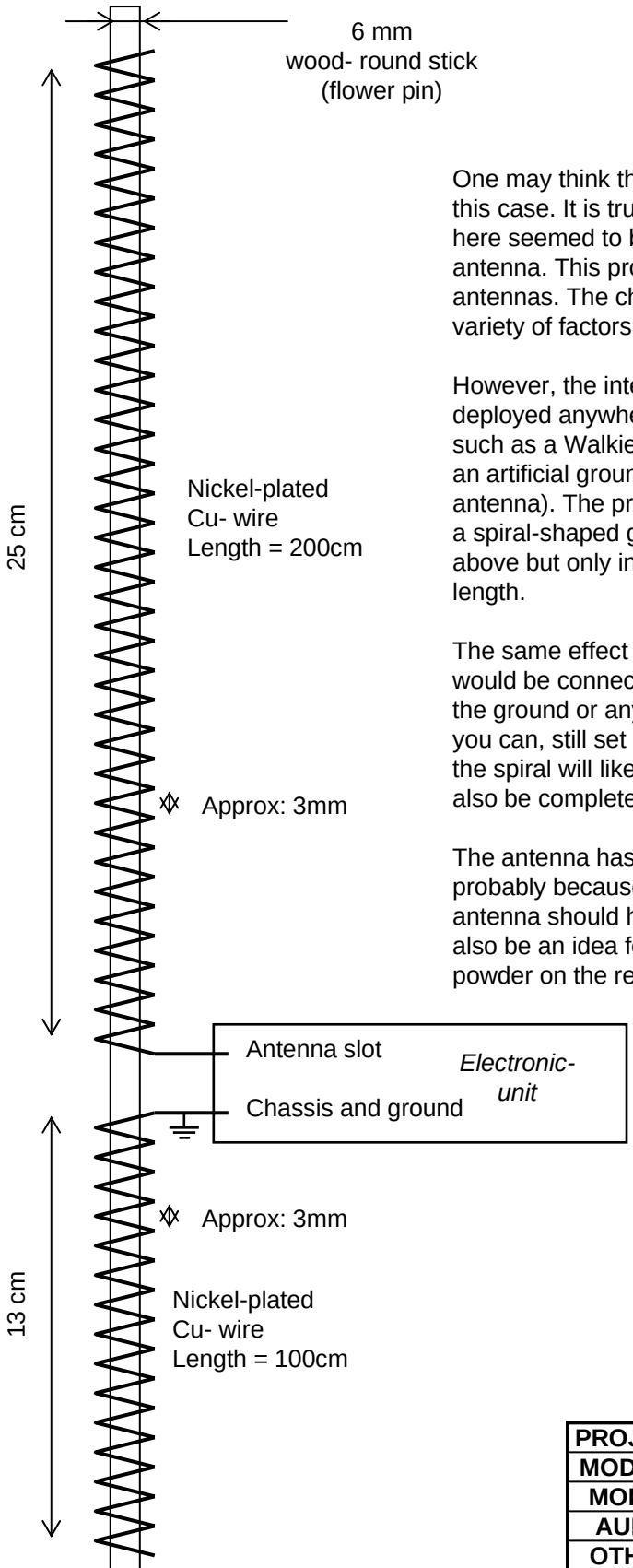


*** To facilitate the adjustment of P1 and P2 must those be placed on the ground plane side. They are not nor in the way for C1, Cp, C2 and R2, if these components should be changed. The value of R2 can vary depending on external circumstances, namely when the ground plane / screen are comes into place. The remaining components have to do with the audio picture.**

Single or double side board. 2 marked holes can be drilled through and to the ground plane. All components shall be handled as SMD because the ground plane do not have any tracks. The units shall be shielded with sheet metal.

PROJECT	*Spy transmitter*	
MODULE		
MODEL	**SPY109**	
AUDIT	A-1	**DRAWING: 1 of 1**
SUPPLY	≥ +7 VDC	≤ +15 VDC
CURRENT	10mA	
OTHER	-	
B. Lindqvist		*2004-08*

DRAWING



One may think that a tuned dipole is perfectly viable in this case. It is true, but pretty stupid because the point here seemed to be to keep a low profile with a discreet antenna. This project is not designed for symmetric antennas. The choice of antenna may be due to a variety of factors.

However, the intention is that the device should be deployed anywhere without a physical ground plane, such as a Walkie Talkie. For this reason, there must be an artificial ground plane built-in in the antenna (a GP-antenna). The proposed antenna is thus provided with a spiral-shaped ground plane, just like the antenna above but only in half in both wire length and physical length.

The same effect is reached if the chassis of the device would be connected to an extensive ground plane as the ground or any large metal objects. With this design, you can, still set the device to a grounded object and the spiral will likely connecting to the object, but it can also be completely alone.

The antenna has been shown to have a narrow range, probably because the antenna diameter. An efficient antenna should have a diameter of about 10mm. It can also be an idea for this project, rather wasting the powder on the receiving antenna. If you have 2 pcs. of model SPY109, then we can do recordings in stereo of various events, both inside and outside, without direct be present.

PROJECT	*Track & spy transmitter*	
MODULE	*Spiral antenna*	
MODEL	**Specima 1**	
AUDIT	A-1	**DRAWING: 1 of 1**
OTHER	*107- 110 MHz*	
B. Lindqvist		*2004-08*

PHOTO OF SPY109