Some details on the principle and mechanical construction of Lichtenstein SN2 antennae

Mr William Bogdan contacted me recently because he puzzled how the Lichtenstein SN2 antenna worked. I provided especially for him the drawing shown in this document in figure 1. One of his queries was, were the screening caps electrically connected onto the dipole element (rod)? I felt, that it would make sense to show aspects of the Lichtenstein antenna secrets. As has been described in my paper on airborne radar, the visible antenna size was too short to function like a half wave regular dipole. In this case, its mechanical dimensions would make it work at about, say, 125 MHz. Whereas it actually operated on frequencies far below 100 MHz! What was done is shown briefly in the upper drawing. They built-in virtually invisible so-called loading coils (LC) which function it was to increase the electrical size to make it 1/4 wave (1/4 8) radiators. The function of the caps where twofold, one was to fine-adjust the inductance of the loading coils and also keeping them from being watched. When we look closer to what happens, we see that in one way the loading-coil flux is being distorted but also, as is shown in the last drawing, the cap is acting as a short-circuit-ring, which is also lowering the coil inductance.

His second e-mail dealt with aspect of the mechanical construction inside the antenna frame. My paper explains its basic principle, but, I did not went in detail as to how it actually was constructed.
Please regard, that the drawing is not proportional in scale; the gap shows (represents) only in what direction the internal coaxial system goes. It has to be said, though, that the coaxial line leaves the Pawsey-like balun out of centre, but it successively entered centre when it reached the coaxial connector. The principle mechanical construction is shown in the second drawing.
SM in the second drawing is the **s**hort-circuit **m**atch of the Pawsey like balun circuit. Its correct position is related to the value of capacitor C. When the value of C is decreased - SM should be directed towards the Bakelite disk, vice versa.

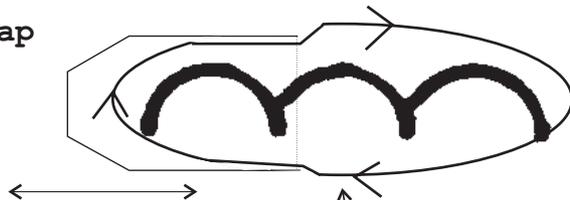I trust that the additional information provided in the drawings will be sufficient.

AOB
20 April 2008

H-field   **H-field**

cap   **cap**
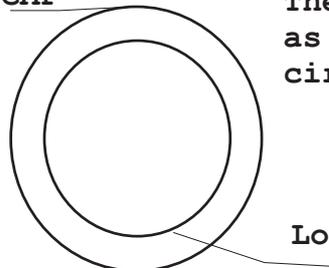
Balun

magnetic flux
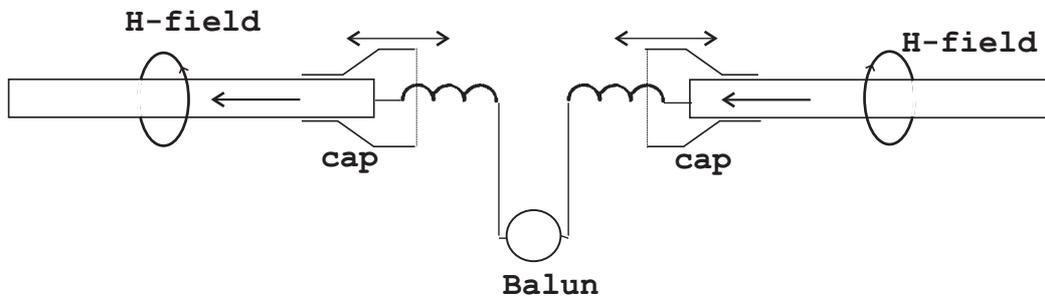
The fluxlines are being distorted by
means of the tuneable cap. Hence the
virtual LC inductance is being reduced.

The more this cap
is moved to the
left, the less
inductance
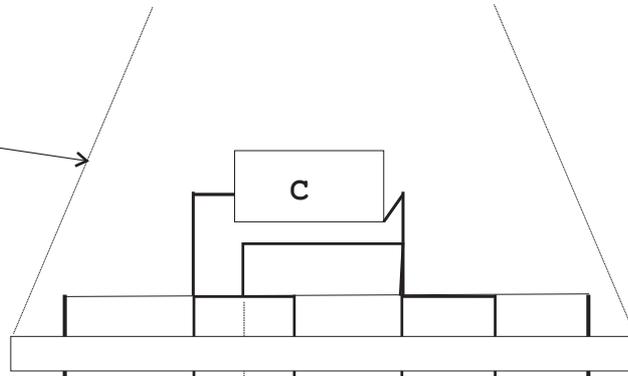reduction is
occuring

**CAP**

The cap is acting
as a single short
circuit winding

Loading coil

In the 18th century an inductance was called a 'multiplicator'.
The actual length of the loading-coil wire is less than when
you would have used a straight single wire, for a virtual
antenna extension.

Streamlined
Bakelite dome

C

SM

This bakelite disk
is the only point
where the inner
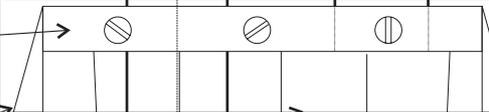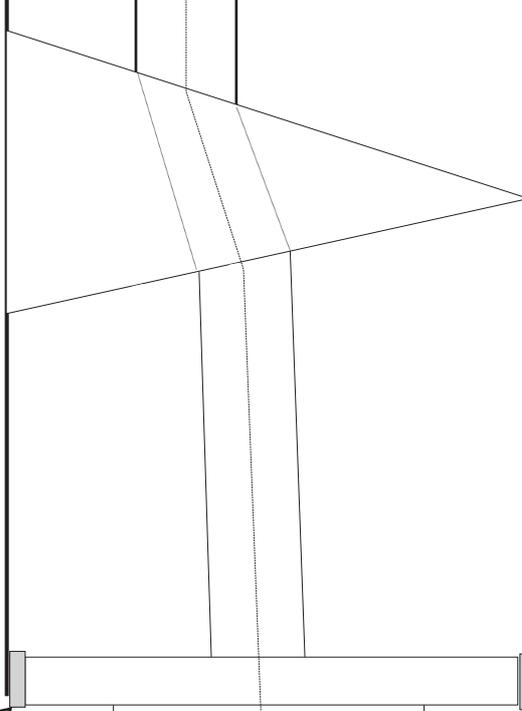system is being
fixed onto the frame
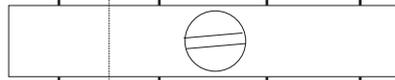
Brass disk

The coaxial system
is only touching
ground at these
points

Brass ring

Antenna frame
40 mm diameter

Pertinax spacer
ring, to keep the
connector insulated
from the frame tube

Coaxial Connector