LC & RLC CIRCUITS - Damped Oscillations

A series circuits consisting of a decade resistor, a decade capacitor, and a variable inductor are driven by a square wave generator. The damped signal across any of the circuit components can be displayed on an oscilloscope.
X80. Damping in LC(R) Circuit; CRT - 10M

Purpose: Show the effect (damping) of resistance in an LC (R) circuit. Display waveforms on a CRT.

Equipment: LC circuit (values??); square wave generator; CRT

Procedure:
The intrinsic R does the damping.
Pulse (or 'excite') the LRC Circuit with edges of pulse from square wave generator.
Set decay time to be a lot less than time between edges.
Show square wave on scope.
Show multiple excitations in LRC circuit:
   Each excitation damps out rather quickly
Increase sweep speed to show decay from one excitation.
Could compare decay time to that predicted by theory (approx. equal to RC)
DAMPED RLC CIRCUIT
(ACROSS RESISTOR)

DAMPED OSCILLATIONS - Damped RLC Circuit

A series circuit consisting of a cecade resistor, decade capacitor and a variable inductor driven by a square wave generator. The damped signal across any of the circuit components are displayed on an oscilloscope.
DAMPED RLC CIRCUIT

LO

HI

\[ L = 100 \text{mH w/o Core} \]
\[ L = 1 \text{H w/ Core} \]

0-600Ω

.6μF
DAMPED OSCIILLATIONS - Damped RLC Circuit

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1. Circuit Set Up:

Function Gen (FG2)

(Low Output) ---- (High Output)

(R2) ---- (C2)

(Red Inductor

$L = 1.1\, \text{H}}$

(w/o det core)

Scope (OS4)

2. Specifications:

**FG2**:

- **Function**: SQ
- **Range**: $\sqrt{10}$; knob < 5
- **DC offset**: 0
- **Sync Output**: → to Scope A Triggger
- **High Output Level**: → to Inductor
- **Low Output Level**: → to Scope Ch.2

**R2**:

- Originally set @ 0.5Ω
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