Technical Review of the Micro-Cap “Douglas-L-Konzen” Circuit Files

Potential sources of apparent over-unity in the spark-gap model and energy accounting

Purpose: Constructive technical feedback based on a static inspection of eight supplied Micro-Cap 12 circuit files and the published description of the simulation. The report does not allege intentional error; it identifies model and measurement choices that must be resolved before an over-unity interpretation can be considered.

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Scope: static file review. The simulations were not rerun for this report.

1. Executive summary

Main conclusion. The supplied files do not presently demonstrate over-unity. They contain known initial stored energy, use a spark-gap macro that includes an ideal negative resistor, and calculate “COP” in a way that omits the initial energy and does not measure signed source energy. These factors can produce large or growing simulated waveforms without implying a physical energy source.

- The component labelled “neonbulb” is Micro-Cap’s SPARKGAP macro, intended for a gas-filled surge arrestor rather than a small neon indicator lamp.
- The macro is instantiated with RNEG = -1 ohm. This ideal negative resistor is an active mathematical element at the component level: its instantaneous power is $p = RNEG \cdot i^2 = -i^2$. The complete macro may still be net dissipative within its intended operating range, but passivity is not guaranteed outside that range.
- Versions v3, v4, v4a and v5 explicitly initialize C2 = 20 uF to 102 V, corresponding to 104.04 mJ. Versions v4b and v6 initialize it to 94 V, corresponding to 88.36 mJ.
- Versions v4b and v6 contain no independent voltage or current source. In those files, all load energy must come from the initial stored energy, the component models, or numerical error.
- The plotted expression V(NEONBULB.10) is not sufficient to establish that internal node 10 is the documented Switchchk node. The standard Switchchk command produces only 10 V or 10 nV before its delay network; a reported excursion to -1.8 kV therefore requires the actual macro file and named-node probing to interpret.
- The saved “COP” expression uses RMS(V)·RMS(I). At a nonlinear/reactive source this is not signed average power, and it omits all initial stored energy. In the low-amplitude-source versions, the ratio is particularly ill-conditioned.
- A four-run passivity test using v6, with C2 initial voltage set to 94 V or 0 V and RNEG set to -1 ohm or 0 ohm, should clearly separate ordinary discharge energy from energy introduced by the macro or solver.

Recommended status: Treat the present result as a model-validation problem, not an energy-generation result, until a complete time-domain energy balance closes and remains stable under model, time-step, tolerance and integration-method changes.

2. Scope and method

The review covered the following supplied files: **Douglas-L-Konzen.cir, v2, v3, v4, v4a, v4b, v5 and v6**. The review extracted component attributes, source definitions, capacitor initial conditions, spark-gap parameters, plotted expressions and saved transient-analysis limits. SHA-256 hashes are listed in Appendix A.

The spark-gap interpretation was checked against Spectrum Software’s published SPARKGAP macro description. The author’s public article was used only to identify the stated interpretation of the internal 10 V signal and the claimed over-unity behaviour [1, 2].

Limitations. The actual Sparkgap macro circuit file used by the installation was not included, and Micro-Cap global settings such as RELTOL are not verifiably embedded in the supplied circuit files. Therefore, this report does not claim to reproduce the numerical waveforms; it identifies issues visible directly in the files and in the documented standard macro.

3. Comparison of the supplied circuit versions

File	Independent source(s)	C2 initial condition	Stored energy in C2	Spark-gap	Saved transient limits
Base	V1: sine, 169.7056 V peak, 60 Hz	No C2	-	None	Tmax 100 ms; automatic step
v2	V1: sine, 169.7056 V peak, 60 Hz	No C2 IC	-	RNEG = -1 ohm	Tmax 30 ms; automatic step
v3	V1: sine, 1 uV peak, 722 Hz	20 uF at 102 V	104.04 mJ	RNEG = -1 ohm	Tmax 32.0397 ms; automatic step
v4 / v4a	V1: sine, 1 uV peak, 722 Hz	20 uF at 102 V	104.04 mJ	RNEG = -1 ohm	Tmax 35 ms; max step 4 ns
v4b	None	20 uF at 94 V	88.36 mJ	RNEG = -1 ohm	Tmax 1 ns; max step 4 ns

File	Independent source(s)	C2 initial condition	Stored energy in C2	Spark-gap	Saved transient limits
v5	V1: 1 uV peak and I1: 1 uA peak, both 722 Hz	20 uF at 102 V	104.04 mJ	RNEG = -1 ohm	Tmax 40 s; automatic step
v6	None	20 uF at 94 V	88.36 mJ	RNEG = -1 ohm	Tmax 35.7 ms; max step 4 ns

Notes: v4 and v4a are byte-for-byte identical (same SHA-256 hash). “Tmax” and “max step” are the values saved in each file’s Transient Limits section. The v4b combination of Tmax = 1 ns and max step = 4 ns is internally unusual and should be checked before reproduction; v5 is saved for 40 seconds, not 40 ms.

4. Explicit initial energy in capacitor C2

The later files contain an explicit capacitor initial condition in the component value, for example:

```
C2 = 20 uF, IC = 102 V
C2 = 20 uF, IC = 94 V
```

The initial energy in a capacitor is:

$$E\_C = 1/2 \cdot C \cdot V^2$$

Initial voltage	Calculation	Initial energy
102 V	0.5 × 20 uF × (102 V)²	0.10404 J = 104.04 mJ
94 V	0.5 × 20 uF × (94 V)²	0.08836 J = 88.36 mJ

Consequence for v6. Because v6 contains no independent source, a passive implementation must satisfy, for every end time t:

$$E\_load(t) + E\_losses(t) + E\_stored(t) <= 88.36 \text{ mJ}$$

If the total exceeds 88.36 mJ by more than numerical error, the excess must be traced to a non-passive component model, an unaccounted initial condition, or numerical integration error. Large voltage or power peaks alone are not evidence of excess energy; energy is the time integral of power.

5. The “neonbulb” is a SPARKGAP surge-arrestor macro

Every file from v2 onward instantiates:

```
PART = neonbulb
FILE = Sparkgap
VTHRES = 90 V, VARC = 10 V, ISUS = 500 mA
RNEG = -1 ohm, LPL = 130 nH, RPL = 2 kohm
CPAR = 1 pF, CARC = 3 pF
```

Spectrum Software describes SPARKGAP as a macro for a gas-filled spark-gap or surge arrestor. Its published example uses almost the same parameters for a Siemens A81-C90X arrestor. It is not a validated model of an ordinary low-current neon indicator lamp [2].

The official description states that, after ignition, the conducting branch includes back-to-back zener diodes with breakdown voltage VARC and a resistor whose value is RNEG. The state is controlled by an internal nonlinear source. The documented command is:

```
IF(ABS(V(Pin1,Pin2)) > V(Thresh), 10,
   IF(ABS(I(V1)) > ISUS, 10, 10n))
```

This produces 10 V when the switch is commanded on and 10 nV when it is commanded off. The value controls an internal nonlinear current source; it is not connected to the external pins as a simple 10 V battery. Therefore, the 10 V control signal is not by itself evidence of an injected 10 V supply [2].

6. Why RNEG = -1 ohm requires a passivity test

A real gas discharge can exhibit negative differential resistance: its terminal voltage may decrease as current increases while the device still absorbs positive power. A literal ideal resistor of -1 ohm is mathematically different. Under the passive sign convention its instantaneous power is:

$$p\_RNEG = v \cdot i = RNEG \cdot i^2 = -i^2$$

Thus the RNEG element itself supplies power whenever current flows. The remainder of the spark-gap macro - principally the 10 V clamp and losses - may consume enough power to keep the complete two-terminal macro passive within the intended current range. However, the model is not guaranteed to remain passive when extrapolated to large resonant currents.

A simplified conducting-state approximation is:

$$v\_gap \approx \text{sign}(i) \cdot VARC + RNEG \cdot i$$

With VARC = 10 V and RNEG = -1 ohm, the corresponding approximate terminal power is $10|i| - i^2$. It crosses zero near 10 A. This is not a precise prediction of the full macro, but it demonstrates why a large-current resonant simulation can leave the model's physically intended range and become a net source.

Key distinction: Negative differential resistance can be physically passive. An unbounded ideal negative resistor is an active mathematical element. The only reliable check is to integrate the complete macro's terminal power over time.

7. Interpretation of V(NEONBULB.10)

The article identifies the plotted expression V(NEONBULB.10) as the 10 V trigger and reports that it falls to approximately -1.8 kV before rising above 10 V [1]. The supplied files do contain this plot expression. However:

- The actual Sparkgap macro file used by the author was not supplied, so the mapping of internal numeric node 10 cannot be independently verified.
- The standard named Switchchk control is commanded to 10 V or 10 nV. A value of -1.8 kV would not be a normal output of that command.
- The macro contains several other internal nodes and dependent sources, including a differentiator for dv/dt. A numeric node may therefore represent something other than Switchchk.
- The correct diagnostic is to open the macro and plot V(Switchchk) by its node name, together with the spark-gap terminal voltage, current and integrated terminal energy.

Until the node mapping is confirmed, the -1.8 kV trace should not be described as the state of the 10 V on/off trigger.

8. The saved COP expression is not a complete energy balance

The source-fed versions save the following expression:

```
RMS(V(LightBulb100W)) * RMS(I(LightBulb100W))
-------------------------------------------------
          RMS(V(V1)) * RMS(I(V1))
```

There are three separate problems with interpreting this as coefficient of performance:

1. At the source, RMS voltage multiplied by RMS current is not signed average real power for a nonlinear or reactive waveform. Correct source energy requires integration of instantaneous terminal power $v(t) \cdot i(t)$, with the current sign convention verified.
2. The expression omits initial stored energy. In v3-v5, C2 begins with 104.04 mJ, which can be transferred to the load without any source contribution during the observed interval.
3. In v3-v5 the voltage source amplitude is only 1 uV. Dividing by a very small source-power estimate makes the ratio numerically ill-conditioned; an arbitrarily large ratio can result while the absolute output energy remains finite and supplied by the initial condition or a model.

For the fixed resistive load, RMS(V)·RMS(I) is equivalent to average load power if the component is an ideal constant resistor and both quantities refer to the same branch. The main defects are therefore the denominator, the missing energy terms, and the lack of a signed integral over a defined time interval.

9. Reproducibility issues in the saved analysis setup

- The schematic text in v3-v6 says “RELTOL = 0.6m”, but no verifiable RELTOL setting was found in the circuit files. The actual Micro-Cap Global Settings or configuration file is needed to reproduce it.
- v4b is saved with Tmax = 1 ns and maximum time step = 4 ns. This is inconsistent with the millisecond-scale behaviour discussed publicly and may be an accidentally saved limit.
- v5 is saved with Tmax = 40 with no suffix, which means 40 seconds rather than 40 ms.
- v4 and v4a are exact duplicates, despite separate names.
- The article shows several different RELTOL values. A valid result should be demonstrated by a convergence study, not by a single tolerance setting.

10. Proposed decisive test plan

10.1 Four-run passivity matrix using v6

Run	C2 initial voltage	RNEG	Purpose
A	94 V	-1 ohm	Reproduce the claimed configuration.
B	0 V	-1 ohm	Tests whether the spark-gap model or solver can start energy growth from nominally zero stored energy.
C	94 V	0 ohm	Tests ordinary discharge with the negative-resistance term removed.
D	0 V	0 ohm	Passive zero-energy control case; all waveforms should remain at zero apart from numerical noise.

Interpretation: if A grows while C does not, RNEG is the controlling cause. If B grows, the model or solver is acting as an energy source. If D grows materially, there is a more fundamental numerical or hidden-initial-condition problem.

10.2 Quantities to integrate

- Initial and final energy of every capacitor: $0.5 \cdot C \cdot V^2$.
- Initial and final energy of every inductor and coupled winding, including mutual-energy terms or Micro-Cap’s own energy probe.
- Load energy: integral of the load’s instantaneous power over exactly the simulated interval.
- Complete spark-gap terminal energy: integral of terminal voltage times terminal current. Do not sum only selected internal elements.
- Energy delivered or absorbed by every independent source using signed instantaneous power.
- Residual of the energy balance at each time: initial storage + source energy - load energy - losses - final storage.

A useful acceptance condition is that the residual remains small compared with the largest energy term and decreases as tolerances and time steps are tightened.

10.3 Numerical convergence checks

- Repeat with progressively smaller maximum time steps and at least three RELTOL values.
- Repeat with the available integration methods, such as trapezoidal and Gear, and compare integrated energies rather than only peak voltages.
- Replace RNEG with 0 ohm, +1 ohm and a bounded nonlinear V-I curve derived from measured lamp data.
- Probe V(Switchchk) by name after opening the macro; do not infer its identity from numeric node 10.
- Export raw numeric results so that the energy integrals can be independently recalculated.

11. Conclusion

The strongest finding is not that the internal 10 V control source directly powers the circuit. The 10 V / 10 nV signal is documented as a switch-control quantity. The stronger concerns are the explicit initial capacitor energy, the ideal RNEG = -1 ohm element inside a surge-arrestor macro, and the incomplete COP calculation.

Version v6 is especially useful because it has no independent source. Its physical energy budget begins with 88.36 mJ in C2. If a reproducible simulation delivers more total load energy than the initial stored energy while ending with nonnegative stored energy, the first place to look is the integrated terminal energy of the spark-gap macro. A negative value would show that the macro, not an unexplained physical mechanism, supplied the excess.

Accordingly, the present files should be regarded as an interesting nonlinear simulation requiring passivity and convergence validation, but not as evidence of free energy. A result that survives the proposed four-run matrix, complete energy accounting, named-node verification and numerical convergence tests would merit further investigation.

References

[1] Vinyasi, “Douglas L. Konzen’s Hunt for Free Energy, with a Neon Bulb on its Self-Shorted, Central Coil,” 14 July 2026. Substack article

[2] Spectrum Software, “Spark-Gap Macro,” Winter 1999 newsletter. Archived technical description

[3] Spectrum Software, Micro-Cap Reference Manual, SPARKGAP macro entry: VTHRES, VARC, ISUS, RNEG, LPL, RPL, CPAR and CARC.

Appendix A - File inventory and hashes

File	SHA-256
Douglas-L-Konzen-v2.cir	74a880c2f2f462f4bb657ce9c007b18e13ad130f42d7453dd7bdcfb9f8ccf363
Douglas-L-Konzen-v3.cir	50b2cf05695f211197c01b03b771e678034b62610abd0e9df0037606c4cf3230
Douglas-L-Konzen-v4.cir	7fbc9e5a28d0cd8cffa70fcb52f0f2ac89c479461e820fabb9be9e94462b76d6
Douglas-L-Konzen-v4a.cir	7fbc9e5a28d0cd8cffa70fcb52f0f2ac89c479461e820fabb9be9e94462b76d6
Douglas-L-Konzen-v4b.cir	365b0bf7e7f7fae58125cdefb6a1e37b50e9525a9a244d5b5af5e3090a0c8fd3
Douglas-L-Konzen-v5.cir	5be57666acf396ad861c5f0be590bc435809c1a499e9b1446efff5a3c58ac379
Douglas-L-Konzen-v6.cir	da11d29e4ba69f20c499abe549f2b6395eab03c7611f675c11013aeecd5bc929
Douglas-L-Konzen.cir	94b45376abcb20d4ec54e1aba50c5f223e8c75a60c35ab1c8ecb6c5f3cf81118

Identical hashes confirm that Douglas-L-Konzen-v4.cir and Douglas-L-Konzen-v4a.cir are the same file content.

Appendix B - Key extracted attributes

```
Spark-gap instance in v2-v6:
  FILE=Sparkgap; VTHRES=90; VARC=10; ISUS=500m;
  RNEG=-1; LPL=130n; RPL=2k; CPAR=1p; CARC=3p

C2 in v3/v4/v4a/v5:
  CAPACITANCE=20u ic=102

C2 in v4b/v6:
  CAPACITANCE=20u ic=94

Saved COP expression in source-fed versions:
  (RMS(V(LightBulb100W))*RMS(I(LightBulb100W))) /
  (RMS(V(V1))*RMS(I(V1)))

Saved internal-node plot:
  V(NEONBULB.10)
```