

High-Power RF Capacitors

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Welcome to the fascinating world of «exotic» RF components! «Exotic» means «difficult to locate», because a typical electronics shop will usually not carry these high-voltage items. Below lists of suppliers are not exhaustive, but will hopefully help you find what you need.

Ceramic disc capacitors

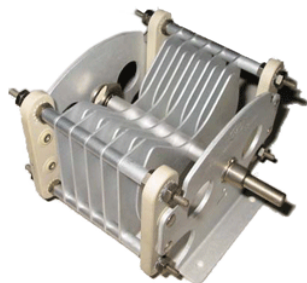


ceramic disc capacitor

Some ceramic disc capacitor are rated up to the kilovolt range. However, RF current handling is limited due to the narrow lead contacts and the skin effect. Some suppliers:

- [RF Parts](#) (San Marcos, CA, USA)
- [Surplus Sales of Nebraska](#) (Omaha, NE, USA)
- [Dan's Small Parts and Kits](#) (Missoula, MT, USA)
- [Kent Electronics](#) (Hoek, Zeeuws-Vlaanderen, Netherlands)
- [Dr Alex Gavva, UR4LL, Surplus Parts & Equipment](#) (Kharkiv, Ukraine)
- Amateur radio boot sales, flea markets, fairs & conventions

Air capacitors



split-stator variable air capacitor

Conventionally-constructed RF air capacitors are not immediately my favourite type of capacitor. Air capacitors collect dust with their open construction. More importantly, air capacitors have a low breakdown voltage. However, one variant of air variable capacitors is unique because of its high current rating. The design of

variable split-stator —or «butterfly»— capacitors is such that no RF conduction currents flow through the bearings of the rotor. In low to moderate power applications, air fixed and variable split-stator capacitors can be a viable and budget-friendly alternative to vacuum capacitors. Some suppliers:

- [Surplus Sales of Nebraska](#) (Omaha, NE, USA)
- [Elektrodump](#) (Emst, Gelderland, Netherlands)
- [Dr Alex Gavva, UR4LL, Surplus Parts & Equipment](#) (Kharkiv, Ukraine)
- Amateur radio boot sales, flea markets, fairs & conventions

Door-knob capacitors



Door-knob capacitors are a cheap, robust, reliable and easily mountable alternative to expensive fixed-value vacuum capacitors. Many European surplus doorknob capacitors are Russian made. Picofarad in the Cyrillic alphabet is denoted as пФ. The Cyrillic letter п may appear to Westerners as a Latin n of nano, but in reality it is a “pe” of pico. Kilo-

volt in Cyrillic is written as кВ. Suppliers:

- CeramTec [RF barrel capacitors](#) & [RF disc capacitors](#) (Germany & worldwide)
- [RF Parts](#) (San Marcos, CA, USA)
- [HV Stuff](#) (Xi'an, China)
- [HVC Capacitor Manufacturing Co.,Ltd](#) (Shenzhen, China)
- [Surplus Sales of Nebraska](#) (Omaha, NE, USAA): [ceramic](#) type and [mica](#) & [ceramic](#) type
- [Elektrodump](#) (Emst, Gelderland, Netherlands)
- [DL9USA](#) (Spremberg, Brandenburg, Germany)
- [Dr Alex Gavva, UR4LL, Surplus Parts & Equipment](#) (Kharkiv, Ukraine)
- Your local [eBay](#) online auction
- Amateur radio boot sales, flea markets, fairs & conventions

Pot capacitors



pot capacitors

RF pot capacitors have a similar field of application as door-knob capacitors. However, on some occasions pot capacitors are a bit more difficult to mount. Suppliers:

- CeramTec [RF pot capacitors](#) & [RF tubular capacitors](#) (Germany & worldwide)

Vacuum capacitors



variable vacuum capacitor

Manufacturers:

- **Jennings Technology** (San Jose, CA, USA)
- **Omnitor** (Meiden) (Foster City, CA, USA)
- **Meiden Europe** (Tilbrook, Milton Keynes, UK)
- **Comet** (Flamatt, Bern, Switzerland)
- **Meidensha Corporation** (Tokyo, Japan)

Suppliers:

- **Max-Gain Systems, Inc.** (Marietta, GA, USA)
- **Elektrodump** (Emst, Gelderland, Netherlands)
- **DL9USA** (Spremberg, Brandenburg, Germany)
- **Dr Alex Gavva, UR4LL, Surplus Parts & Equipment** (Kharkiv, Ukraine)
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Vacuum capacitors can die!

Beware of glass vacuum capacitors that have been badly handled or that have been poorly protected during transit. The glass envelope may have cracked, destroying the vacuum. In capacitors with clear glass envelopes and copper electrodes, air ingress is indicated by slow discoloration of the copper. The voltage rating of an air-filled capacitor at atmospheric pressure (760torr or 1.01bar) is about thirteen times lower than that of an otherwise identical vacuum capacitor (at 10 torr).¹

Home-brew RF capacitors

Over the years, many amateur radio magazines have been publishing articles about building transmitting magnetic loop antennas. These antennas appeal by their very compact size, sharp directivity nulls and high signal-to-noise ratio on reception.

The great flaw of these antennas is their very limited radiation impedance. Consequently, the radiating efficiency of these magnetic dipoles is extremely low. —That is, if you are not resorting to super-conducting materials!— Due to the resulting high Q-factor of these antennas, voltages and currents are extremely high. This lead to a number of very interesting ideas about home-

brewing high-power RF capacitors being published in articles about magnetic loop antennas.

One idea I successfully employed on VHF, consisted out of a copper fitting, lined with a 1.5mm-thick PTFE (Teflon) sheet, and inserted by a snugly fit brass bolt.

References

1. David Knight. Vacuum capacitors. In: *From Transmitter to Antenna*.
http://www.g3ynh.info/comps/vac_caps.html



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