

## auricap Application Notes

### LEADS

Auricap film capacitors are not polarized. However, Auricaps have an outside foil that is a very useful noise shield when input and output impedances are considerably different values and it is connected to the lower impedance.



All Auricap capacitors have a red and black lead with the black lead exiting from the “outside foil” end of the capacitor. The Auricap XO, the Auricap successor, has red leads. These leads are double twisted design “if the body of the capacitor is large enough to accommodate them”. Auricap leads are made of polished stranded High Purity Oxygen Free Copper while Auricap XO use stranded OHNO Mono Crystal Leads. All leads have XLPE insulation.

- 1) In all coupling applications the input to the Auricap should be the outside foil and connected to the signal source or circuit output with the opposite lead/inside foil continuing on to the next circuit input.
- 2) In all power supply decoupling applications the outside foil should be connected to ground and the opposite lead/inside foil connected to the voltage to be decoupled. This is true for decoupling either voltage polarities.
- 3) In loudspeaker crossover applications, if the Auricap is in series, like feeding a tweeter, the outside foil connects to the input binding post and the opposite lead/inside foil connects to the tweeter. Where the Auricap is in parallel, as typically used for woofers, the outside foil connects to the speaker connection that connects to the input binding post and the opposite lead/inside foil connects to the other speaker terminal. Follow these same rules for midrange connections where you will have a combination of both.

The idea is to always have the outside foil connected to the lower impedance to provide outside foil shielding to noise. Circuit outputs are always lower impedance than inputs and should be connected to the outside foil.

Auricaps will blossom during the first 50 hours of use as they break in for most applications. At first they will be a bit stuffy so please be patient to allow for the magic of these high quality audio grade capacitors to unfold. However, for use in electric guitars, for example, the signal level is so low it could potentially take years for break-in.

To greatly expedite the break-in of capacitors a 30v AC transformer of 25 watts or more can be used across the cap (out of circuit of course) for a minimum of 100 hours. For quicker break in a 60v transformer can be used or a minimum of 50 hours. It is okay to break in capacitors of differing values simultaneously with the transformer. It is also okay to break in large quantities of caps simultaneously.

### BYPASSING

Do not use bypass capacitors in the signal path. A single capacitor for DC blocking/AC coupling creates a simple path with one time constant. The signal quality will be compromised if a bypass or multiple bypass capacitors are added to a signal path capacitor. Bypass capacitors were used in the past to bypass low

quality film capacitors or electrolytic capacitors. The bypass was the lesser of two evils. With the advent of better quality film capacitors the need for a bypass capacitor was eliminated. Bypass capacitors create multiple signal paths with multiple time constants. These time constants are very short but they can still be heard as a smear or overall loss of focus.

Always bypass power supply capacitors. This maintains a low source impedance to the power supply over a wide bandwidth. If budget and space permit it is good to use multiple value power supply bypass capacitors with the smallest value being installed directly at the active device. (Tube or transistor.)

# auricap

## SPECIFICATIONS

**CONSTRUCTION:** Auricap metalized polypropylene capacitors are available only in extended foil (non-inductive) construction.

**PACKAGING:** Polyester tape wrap with epoxy end fills gives the best possible volume density for this type unit.

**LEADS:** *Auricap leads are of polished, stranded High Purity Oxygen Free Copper with XLPE insulation.*

**TEMPERATURE RANGE:** May be operated at rated DC voltage from -55°C to +85°C or to +105°C at voltages indicated by the derating curve on the applications page.

### ELECTRICAL [NON-DESTRUCTIVE] TESTS:

1. Capacitance shall be measured at or referred to 1000Hz  $\pm 20$ Hz at 25°C  $\pm 5$ °C for capacitance values up to and including 1.0MF. Capacitance values greater than 1.0MF shall be measured at 60Hz  $\pm 6$ Hz.

Ref: MIL-STD-202E, Method 305.

2. Dissipation factor shall be measured as described for capacitance and shall not exceed 0.2%. Typical values throughout temperature range, any given on curves on the Auricap Application page.

3. Insulation resistance shall be measured at rated voltage or 500VDC whichever less. After 2 minutes electrification, minimum values shall be 200,000 meg/MF, need not exceed 400,000 megohms.

Ref: MIL-STD-202E, Method 302.

4. Dielectric Strength: Capacitors shall withstand specified DC test potential for 60 seconds through a limiting resistance of 1 ohm/volt.

Terminal to terminal- 150% of DC rating.

Terminal to case- 200% of DC rating.

Ref: MIL-STD-202E, Method 301.

5. Dielectric Absorption: Dielectric absorption shall not exceed 0.1% when tested to MIL-C-19978D.

Ref: MIL-C-19978D. Paragraph 3.22.

6. Tolerance: 10% (unless otherwise noted)

### ENVIRONMENTAL TESTS:

1. **Vibration:** Capacitors will meet or exceed the requirements of MIL-STD-202E, Method 204C.

2 **Moisture Resistance:** Capacitors will meet or exceed the requirements of MIL-STD-202E, Method 103B, Condition B, with 500V or rate voltage applied, whichever is less.

3. **Life Test:** Will withstand 140% of rated DC voltage for 250 hours at 105°C, No more than 1 failure in 12 units permitted when tested..

4. **Lead Pull Test:** The leads on these capacitors shall withstand a steady axially applied pull of 5lbs. For one minute.

# auricap

## APPLICATIONS

Auricap metalized Polypropylene capacitors are cylindrically wound with epoxy end fill and have very good volumetric efficiency. They are wound to exacting industry leading specifications to meet or exceed the requirements of MIL-C-55514A and MIL-STD-E method 103B.

As with all metalized polypropylene film capacitors Auricaps are self healing. Failure mode is as an open circuit. Auricaps are made with the very best film available and are constructed to center value. Special care is taken to insure industry leading ESR values.

Auricaps are designed to be a general purpose capacitor for use in all applications where size, value and temperature considerations are suitable. They are useful in signal coupling, filtering and power factor correction applications. They are available in matched sets as well as 1% tolerance as a special order. Auricaps are available in axial and radial hard lead configurations for printed circuit board use.

Auricap Metalized polypropylene capacitors are rated for use in the temperature range from -55 to +85 deg. C and derate to 60% of their voltage specification at 105 deg.C. Auricaps are proven to have industry leading reliability and are 100% tested to meet specifications.

The outside foil connection of Auricaps is identified with either a black lead (when leads are red and black) or a shorter lead when leads are solid core type. This identification is not a voltage polarity indication but is a consideration for minimum noise pick up.

### AC APPLICATION GUIDE: (AC VOLTAGE RATING, -55°C TO +85°C AMBIENT)

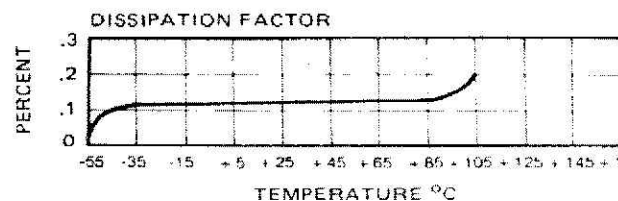
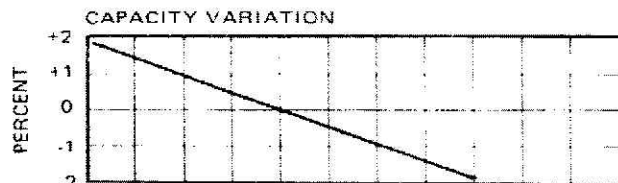
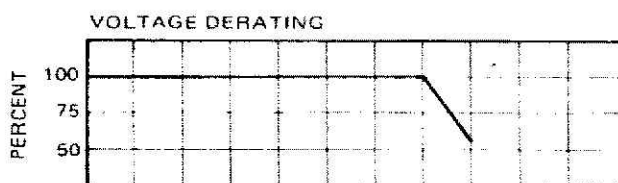
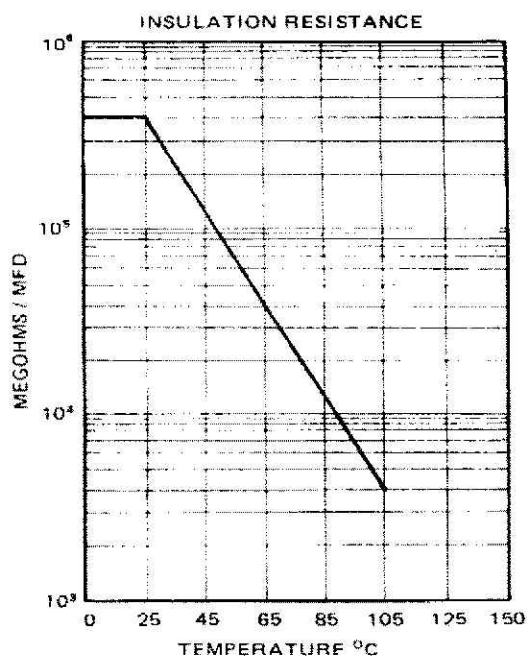
DC VOLTAGE

EQUIVALENT VAC (RMS) RATINGS AT

RATING	60Hz	400Hz	800Hz	1200Hz
200 (.00 $\mu$ F through 1.0 $\mu$ F)	160	120	80	60
(1.1 $\mu$ F through 5.0 $\mu$ F)	120	90	60	50
400 (.001 $\mu$ F through .82 $\mu$ F)	240	180	120	90
(.83 $\mu$ F through 4.0 $\mu$ F)	210	157	105	78
600 (.001 $\mu$ F through .47 $\mu$ F)	504	280	240	90
(.23 $\mu$ F through .82 $\mu$ F)	415	230	195	74

(AC voltage assumed to be sine wave)

### TYPICAL TEMPERATURE CHARACTERISTICS



# Dimensions of Audience Auricap Capacitors

## Inventory of Just Radios Capacitors & Resistors

(Authorized Auricap Dealer)

uF(MFD) / Voltage	Version	Physical Size Dia*Length (inch) (+/- 1/8")
<b>200 Volts</b>	.	.
0.68uF at 200V Auricap (1%)	Auricap-R	9/16 * 5/8
1 uF at 200V Auricap	Auricap XO	5/8 * 3/4
1.2uF at 200V Auricap	Auricap	5/8 * 7/8
1.5uF at 200V Auricap	Auricap XO	1 * 3/4
1.8uF at 200V Auricap	Auricap	11/16 * 7/8
2.0uF at 200V Auricap	Auricap	3/4 * 15/16
2.2uF at 200V Auricap	Auricap XO	15/16 * 7/8
2.7uF at 200V Auricap	Auricap	13/16 * 1
3uF at 200V Auricap	Auricap XO	15/16 * 1 1/8
3.3uF at 200V Auricap	Auricap-R	15/16 * 1
3.3uF at 200V Auricap	Auricap XO	15/16 * 1 1/8
4.7uF at 200V Auricap	Auricap	1 * 1 1/8
4.7uF at 200V Auricap	Auricap XO	1 1/8 * 1 1/8

5.0uF at 200V Auricap	Auricap XO	1 1/8 * 1 1/8
5.25uF at 200V Auricap	Auricap	1 * 1 3/16
5.6uF at 200V Auricap	Auricap	1 * 1 3/16
6uF at 200V Auricap	Auricap	1 * 1 3/8
7uF at 200V Auricap	Auricap	1 * 1 7/16
8uF at 200V Auricap	Auricap	1 1/8 * 1 3/8
8.2uF at 200V Auricap	Auricap	1 1/8 * 1 3/8
9uF at 200V Auricap	Auricap	1 1/8 * 1 3/8
10uF at 200V Auricap	Auricap XO	1 3/8 * 1 5/16
11uF at 200V Auricap	Auricap	1 1/4 * 1 1/2
12uF at 200V Auricap	Auricap	1 1/4 * 1 1/2
13uF at 200V Auricap	Auricap	1 1/4 * 1 5/8
14uF at 200V Auricap	Auricap	1 3/8 * 1 3/4
16.5uF at 200V Auricap	Auricap	1 3/8 * 1 3/4
20uF at 200V Auricap	Auricap	1 1/2 * 1 3/4
22uF at 200V Auricap	Auricap	1 1/2 * 7/8
24uF at 200V Auricap	Auricap	1 5/8 * 1 7/8
25uF at 200V Auricap	Auricap	1 5/8 * 1 7/8
30uF at 200V Auricap	Auricap	1 3/4 * 2
33uF at 200V Auricap	Auricap	1 7/8 * 2

35uF at 200V Auricap	Auricap	1 7/8 * 2 1/4
43uF at 200V Auricap	Auricap	1 7/8 * 2
<b>400 Volts &amp; 450 Volts</b>		.
0.018uF at 400V Auricap	Auricap	1/4 * 9/16
0.1uF at 400V Auricap	Auricap XO	9/16 * 5/8
0.15uF at 400V Auricap	Auricap	3/8 * 5/8
0.18uF at 450V	Auricap	1/2 * 1/2
0.22uF at 400V Auricap	Auricap	1/2 * 5/8
0.33uF at 400V Auricap	Auricap	9/16 * 5/8
0.39uF at 400V Auricap	Auricap	9/16 * 5/8
0.47uF at 400V Auricap	Auricap-R	11/16 * 1
0.47uF at 400V Auricap	Auricap	9/16 * 13/16
0.56uF at 400V Auricap	Auricap	9/16 * 13/16
0.68uF at 400V Auricap	Auricap	5/8 * 7/8
1uF at 400V Auricap	Auricap XO	15/16 * 13/16
1.8uF at 450V	Auricap	13/16 * 1 3/4
3.6uF at 450V	Auricap	1 1/8 * 1 1/4
4uF at 400V Auricap	Auricap	1 * 1 7/16
4.7uF at 400V Auricap	Auricap	1 1/4 * 1 1/4
5uF at 400V Auricap	Auricap	1 * 1 7/8

6uF at 400V Auricap	Auricap	1 1/8 * 1 1/2
6.8uF at 450V	Auricap	1 1/4 * 1 5/8
7.2uF at 400V Auricap	Auricap	1 3/8 * 1 1/2
18uF at 400V Auricap	Auricap	1 3/4 * 2
<b>600 Volts (1%)</b>	.	.
470pF at 600V (1%)	Auricap	3/16 * 1/2
560pF at 600V (1%)	Auricap	1/4 * 7/16
750pF at 600V (1%)	Auricap	1/4 * 7/16
820pF at 600V (1%)	Auricap	1/4 * 7/16
910pF at 600V (1%)	Auricap	1/4 * 3/8
0.0016uF 600V (1%)	Auricap	1/4 * 7/16
0.0022uF 600V (1%)	Auricap-R	1/4 * 5/8
0.0022uF 600V (1%)	Auricap	3/8 * 3/8
0.0024uF 600V (1%)	Auricap	3/8 * 7/16
0.0027uF 600V (1%)	Auricap	7/16 * 7/16
0.0033uF 600V (1%)	Auricap-R	3/8 * 5/8
0.0033uF 600V (1%)	Auricap	3/8 * 3/8
0.0039uF 600V (1%)	Auricap	3/8 * 7/16
0.0047uF 600V (1%)	Auricap-R	3/8 * 5/8
0.0047uF 600V (1%)	Auricap	3/8 * 7/16

0.005uF 600V (1%)	Auricap	3/8 * 9/16
0.0056uF 600V (1%)	Auricap	13/32 * 5/8
0.0068uF 600V (1%)	Auricap	7/16 * 9/16
0.007uF 600V (1%)	Auricap	7/16 * 9/16
0.0078uF 600V (1%)	Auricap	13/32 * 9/16
0.0082uF 600V (1%)	Auricap	1/2 * 5/8
<b>600 Volts</b>	.	.
0.01uF at 600V Auricap	Auricap	3/8 * 9/16
0.01uF at 600V Auricap	Auricap XO	3/8 * 9/16
0.015uF at 600V Auricap	Auricap	7/16 * 1/2
0.015uF at 600V Auricap	Auricap 1 1/2" non-tinned Copper Leads	3/8 * 1/2
0.015uF at 600V Auricap	Auricap XO	7/16 * 9/16
0.0206uF 600V (1%)	Auricap	3/8 * 1/2
0.022uF at 600V Auricap	Auricap-R	7/16 * 5/8
0.022uF at 600V Auricap	Auricap	3/8 * 1/2
0.027uF at 600V Auricap	Auricap	7/16 * 1/2
0.033uF at 600V Auricap	Auricap XO	5/8 * 9/16
0.047uF at 600V Auricap	Auricap	1/2 * 3/4
0.056uF at 600V Auricap	Auricap	9/16 * 5/8
0.068uF at 600V Auricap	Auricap	5/8 * 3/4

0.075uF at 600V Auricap	Auricap 2" Fork Leads	5/8 * 3/4
0.075uF at 600V Auricap	Auricap	5/8 * 3/4
0.1uF at 600V Auricap	Auricap-R	9/16 * 7/8
0.1uF at 600V Auricap	Auricap 1 1/2" Fork Leads	9/16 * 7/8
0.1uF at 600V Auricap	Auricap	5/8 * 3/4
0.15uF at 600V Auricap	Auricap	3/4 * 1
0.33uF at 600V Auricap	Auricap 1 1/2" Fork Leads	13/16 * 1 1/8
0.33uF at 600V Auricap	Auricap	13/16 * 1 3/16
0.39uF at 600V Auricap	Auricap	7/8 * 1 3/16
0.68uF at 600V Auricap	Auricap 2" Fork Leads	1 1/16 * 1 3/16
0.68uF at 600V Auricap	Auricap	1 1/16 * 1 3/16
0.82uF at 600V Auricap	Auricap	1 1/8 * 1 1/4
1uF at 600V Auricap	Auricap XO	7/8 * 1 1/8
1.5uF at 600V Auricap	Auricap (Dampsted)	1 1/2 * 1 1/2
1.68uF at 600V Auricap	Auricap	1 1/2 * 1 1/2
1.9uF at 800V Auricap	Auricap 2 1/2" non-tinned Copper Leads	1 1/2 * 1 3/4
1.9uF at 800V Auricap	Auricap	1 1/2 * 1 3/4
2uF at 600V Auricap	Auricap	1 1/2 * 1 3/4

2uF at 600V Auricap	Auricap 2 1/2" non-tinned Copper Leads	1 1/2 * 1 3/4
3.3uF at 600V Auricap	Auricap	1 1/2 * 1 5/8
4uF at 600V Auricap	Auricap	1 3/4 * 2 1/4
4.7uF at 600V Auricap	Auricap	2 * 2
5uF at 600V Auricap	Auricap	1 7/8 * 2 1/2
<b>1200 Volts</b>	.	.
20uF at 1200V	Auricap	3 13/16 * 4
<b>1500 Volts (1%)</b>	.	..
220pF at 1500V (1%)	Auricap-R	5/16 * 9/16
560pF at 1500V (1%)	Auricap	5/16 * 5/8
0.0018uF 1500V (1%)	Auricap-R	3/8 * 3/4
0.0033uF 1500V (1%)	Auricap-R	1/2 * 3/4
0.0056uF 1500V (1%)	Auricap-R	5/8 * 5/8
<b>1500 Volts</b>	.	..
0.056uF at 1500V	Auricap-R	1 1/8 * 1 1/8
0.056uF at 1500V	Auricap 1 1/2" Fork Leads	1 * 1/4
0.056uF at 1500V	Auricap	1 3/16 * 1 3/16
0.56uF at 1500V	Auricap	1 3/16 * 1 1/2
1uF at 1500V	Auricap	1 3/4 * 2
2uF at 1500V	Auricap	2 1/4 * 2 1/4

4uF at 1500V	Auricap	2 5/8 * 3
5uF at 1500V	Auricap	3 * 3
<b>3000 Volts</b>	.	..
0.01uF at 3000V	Auricap	3/4 * 13/16
<i>The Above prepared by D. Cantelon of JustRadios (Feb 2025)</i>		

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