We will be discussing both the 120 Volt AC (Alternating Current) and 12 Volt DC (Direct Current) electrical systems and look at the changes and development of these systems beginning in 1947.
**120 Volt AC**
The 120 Volt AC, (alternating current), is what we have in our homes and which provides power to our appliances, lights, air conditioner, etc. and which we are all somewhat familiar with.

120 Volt AC is derived from our Electric Utility or in the case of our Airstream, Shore Power.

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**12 Volt DC**
The 12 Volt DC, (direct current), is what we find in our tow vehicles and is derived from the tow vehicles alternator and the battery.

In our Airstream the 12 Volt DC can be derived from the Airstream battery, converter, solar cells or from the tow vehicle when connected.
120 Volt AC and 12 Volt DC Wave Forms

120 Volt AC Wave Form

12 Volt DC Wave Form
First I would like to review some Electrical terminology that you may or may not be familiar with.

1. Voltage
2. Current
3. Power
4. Electrical Circuit diagram
**Current** (measured in **Amps**) is the flow of electrons through the wire. (*Similar to water flowing through a hose measured in GPM*).

**Voltage** (measured in **Volts**) is the pressure that pushes the electrons or current through the wire. (*Similar to the pressure of a water pump as measured in PSI*).

**Power** is the product of Voltage and Current and is measured in either Volt-Amps (VA) or in Watts. (*VA and Watts are approximately equal for loads other than motor loads*). **Power (Watts)** = **Voltage (Volts)** × **Current (Amps)**.
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Power is the product of Voltage and Current and is measured in Watts. Therefore:

\[
\text{Power (Watts)} = \text{Voltage (Volts)} \times \text{Current (Amps)}
\]
Qualifier

1. The development of this presentation is still in progress. I am still trying to tie down exact year or period that many of the major electrical changes and advancements took place.

2. Your experience, help, and comments would be appreciated. Contact me, Pat McDowell at 512-922-0283 or pat_mcdwell@yahoo.com
1940s
What Happened?

• 1945 - WW II Ends

• 1945 - Wally Byam convinced Curtis-Wright to build aluminum trailers that were similar to his pre-War Airstream Clipper.

• 1947 - Wally Byam split with Curtis Wright to re-start the Airstream trailer company.
1940s

1948 Airstream 22 foot Liner
1. The 120 Volt AC wiring was extremely simple in these first Airstreams.

2. Only one circuit, protected by two plug fuses. One fuse for the black “hot” wire and one fuse for the white “neutral” wire.

3. Only about four receptacles. Lights plugged into the receptacles.

4. No separate ground wire.
Fuse Holder with two Plug Fuses, Both Hot and Neutral are Fused,

Lights Plugged into Receptacles, No separate Lighting Circuits

From 1948 Airstream Liner
12 Volt DC was not available on these first Airstream models.
1950s

13 Panel, 1953 Airstream 21 foot Flying Cloud
1950s

7 Panel, 1957 thru 1963
1950s
What Happened?

1951 - Replaced pipe frame with 3” ladder frame.

1951 - Went from a curved front and rear to a flattened vertical front and rear.

1952 - Airstream opened a 2nd manufacturing facility in Jackson Center, Ohio.

1954 - Went from vertical rear to a sloped rear design. California plant started building 9 panel Whale Tail design.

1957 - End caps changed from 13 flat panels to 7 compound curve panels.
1950s
What Electrical Changes?

1951 - Loads increased to also include:
  Electric Refrigerator/ice box
  Electric Water Heater
  Electric Vent Fans
  Electric Water Pump

1951 - Added 12 Volt DC and optional battery

1958/1959? - Replaced plug fuses with circuit breaker panel

1950s

120 Volt AC Wall Light

120 volt AC Florescent Ceiling Light

From 1956 Safari
1950s

120 Volt AC Overhead Fan with Switch, 1951 thru 1962

Interior two pole Receptacle, (No Ground) 1947 thru 1963

From 1956 Safari

From 1948 Liner
1950s

120 Volt AC Refrigerator/Ice Box
Typical 1951 thru about 1960?

Marvel Refrigerator/Ice Box from 1955
Flying Cloud
1950s

120 Volt AC Electric Water Heaters
1951 thru about 1958???

From 1952 Flying Cloud

Payne Water Heater
From 1956 Safari
1. The 120 Volt wiring in the 1950 Airstreams was also simple. There were only two or three circuits, each protected by “plug fuses”.

2. Both the “hot” wire and the “neutral” wire were wired through plug fuses. There was no separate ground wire.

3. Electrical loads typically consisted of lighting, vent fans, refrigerator, and water heater.
1950s
Electrical Changes

1947 thru 1958/1959?
Plug Fuses

1958/1959? thru
1972/1973?
Circuit Breaker Panel

1. Circuit Panel with 30 Amp Main breaker and two 15 Amp feeder circuit breakers.
2. Polarity light will light if phase and neutral are reversed when plugged into shore power.
1950s Electrical Changes

1947 thru 1958/1959?
Two Conductors, with No Ground Wire

1958/1959? thru Present
Two Conductors, with Solid Copper Ground Wire
1. In the late 1950s Airstream trailers saw the introduction of circuit breakers in lieu of plug fuses and the use of a separate ground wire.

2. The conductors consisted of a black ("hot") wire, a white ("neutral") wire and a bare copper ("ground") wire. The white neutral wire is not grounded to the trailer.

3. The bare copper ground wire is connected to receptacles and switch grounds and to all equipment grounds. Each circuit ground wire is connected to the ground bus bar, which is grounded to the trailers.
1. On many of the 1950s and early 1960 models, DC Voltage was delivered to the trailer from the cars generator and battery.

2. Voltage was at either at 6 Volt DC or 12 Volt DC depending on the model and year of the tow vehicle. Many cars maintained a 6 Volt DC system through 1954.

3. The negative (-) leads in the trailer were grounded to trailer shell at the light.
1. Batteries could be added as an option.
2. The car generator was used to power the lights and to charge the battery at either 6 or 12 Volt DC depending on voltage of the tow vehicle.
3. Negative (-) leads were grounded at the lights and battery. This was called a negative grounding.
Airstreams without batteries typically had one or two of the above type 12 Volt DC lights.
Airstreams with batteries typically also had four or five 12 Volt DC lights that duplicated the 120 Volt Lights.
Batteries were an added option on early model Airstreams Until about 1960???
1962 - Wally Byam Died. Helen his wife died two years later.

1964 - Changed from 7 panel to 5 panel end caps

1966 - Airstream went Public

1967 - Beatrice acquired Airstream

1969 - Major design change including: Models increased by 4” wider and one Ft. longer, wrap around front windows, more compound curved panels, tapered inward from belt line. Remained the same until 1994(?). Wide Body...
1960s

1957 thru 1963 Seven Panel End Caps

1964 Went to Five Panel End Caps
Major design change included: Models increased by 4” wider and one Ft. longer, wrap around front windows, more compound curved panels, tapered inward from belt line. Remained same until 1994(?) Wide Body.
1960s
Electrical Changes?


1962/1963? - Vent fans and Heater fan could be switched to operate from either a 12 Volt DC or 19 Volt AC source. There were 120/19 Volt transformers located local to fan motors.

1964 - First Univolts transformed 120 Volt to 19 Volt/12 Volt AC. Fan motors operated at either 19 Volt AC or 12 Volt DC. Lights operated at either 12 Volt AC or 12 Volt DC.

1965 - First Univolt Converter that converted 120 Volt AC to 12 Volt DC. All lighting and fan motors were changed to operated at 12 Volt DC.
Major Changes Made in 1962/1963

1947 thru 1962/1963
Two Pole Receptacle
No Ground

From 1962/1963 thru Present
Two Pole Receptacle
With Ground

1. When did Airstream first use three prong receptacles with ground connection?
1960s Electrical Changes

120/19 Volt AC Transformer
1962? Thru 1963

Switch from 19 Volt AC source to 12 Volt DC

Pictures from 1963 TradeWind
1960s Electrical Changes

30Amp Airstream Univolt Converter

Inside of Airstream Univolt Converter

• Airstream Converters after 1965 converted 120 Volt AC to 12 Volt DC
• The first Airstream Univolt transformed 120 Volt AC to 19 and 12 Volt AC
### 1960s Electrical Changes

<table>
<thead>
<tr>
<th>1966 Globe Trotter</th>
<th>1971 Overlander</th>
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<tr>
<td>Includes Fuses and Circuit Breakers</td>
<td>Fuse Panel located inside Univolt</td>
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1. By 1971 the use of 12 Volt DC Circuit Breakers had disappeared. When and Why?
1. The Airstream Univolt Converter that converts 120 Volt AC to 12 Volt DC was introduced by Airstream in 1965.

2. A 12 Volt fuse/breaker panel was added to protect the circuits.

3. The negative (-) wires were brought back to a single insulated ground bar which was grounded to Aluminum shell at one location.

4. Airstream discontinued lights that operated at both 12 Volt DC and 12 Volt AC and fan motors that operated at both 12 Volt DC and 19 Volt AC.
1972 – Art Costello Dies @ age 53

1973 thru 1978 – Oil embargo and poor economy hurt Airstream sales.

1974 – Argosy trailer division established

1977 – Closed California Cerritos Plant

1977 – WBCCI turned over to club for 1$

1980 – Beatrice sold Airstream which became a division of Thor Industries

1980 thru 2010

What Happened?
1970s, 1980s, 1990, 2000s

Electrical Changes


1958/1959? thru Present - 120 Volt AC electrical system configuration has remained the same.

1965 thru Present - 12 Volt AC electrical system configuration has remained the same.

2000???? - Improved Converters that produced clean direct current, with multi-stage battery charging.
1970s, 1980s 1990s & 2000s

1976 Airstream

2007 Airstream
GFCI breakers are used only for the circuit feeding the bathroom receptacles.
Airstream seemed to be inconsistent in use of 12 Volt fuses versus circuit breakers.
The End

By: Pat McDowell