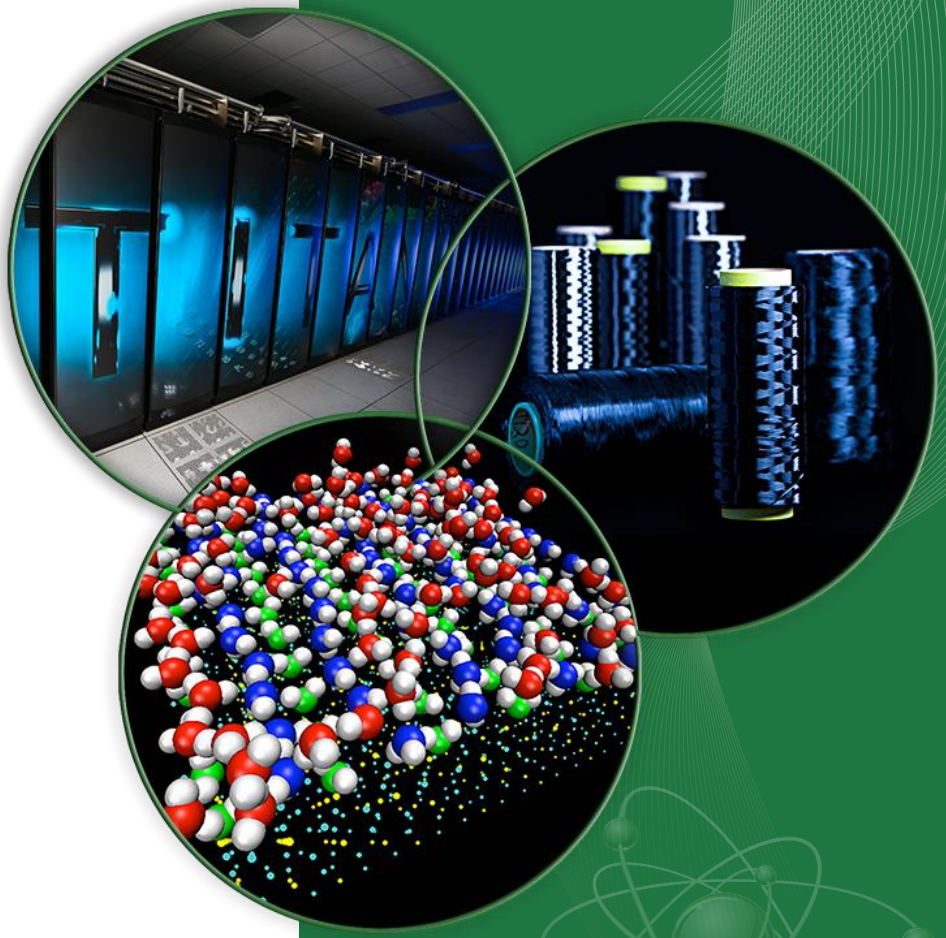
Yarnell Research House Measurement Overview

Public Version



David Fugate

March 13, 2017

ORNL is managed by UT-Battelle
for the US Department of Energy

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Yarnell Research House Measurement Overview

Yarnell House Information

- 1362 Yarnell Station Blvd., Knoxville, TN 37932

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Yarnell Research House Measurement Overview

Yarnell House Information

Significant loads:)

1. Lennox system: advanced heat pump with variable speed compressor and variable speed blower fan.
2. Water Heating - integrated hot water and dehumidification
3. Four space heaters to simulate occupancy sensible loads. Running Building America benchmark

Non-significant loads

1. Two ultrasonic humidifiers.
2. Comcast modem and landline telephone
3. The only lighting is outdoor front porch and corner floods which are on periodically for security lighting. (perhaps considered significant)
4. We have a TV plugged in but never runs …so in standby power.
5. Microwave, dishwasher, and oven are all switched off at the panel.
6. ORNL DAS: one laptop, one small desktop, power supply for one CR1000, another for one CR3000

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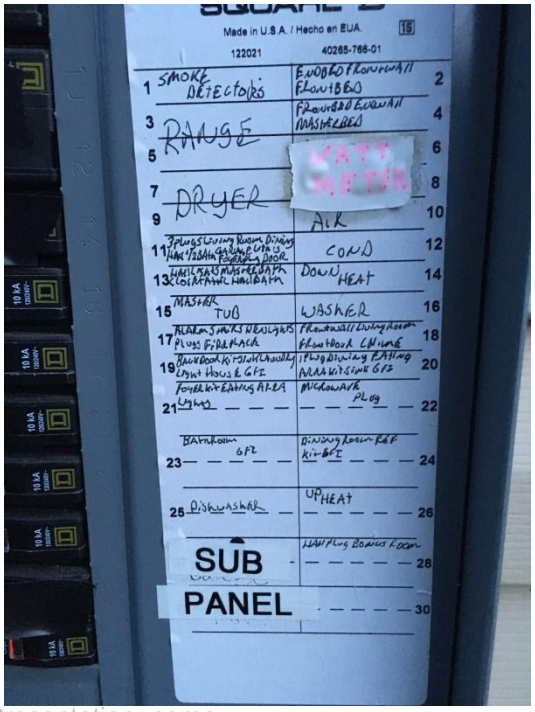
Yarnell Research House Measurement Overview

Yarnell House Information

Main Power Distribution Panel (Outside)



Subpanel Power Distribution (Inside)

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Subpanel Power Distribution
(Inside)

Main Power Distribution Panel
(Outside)

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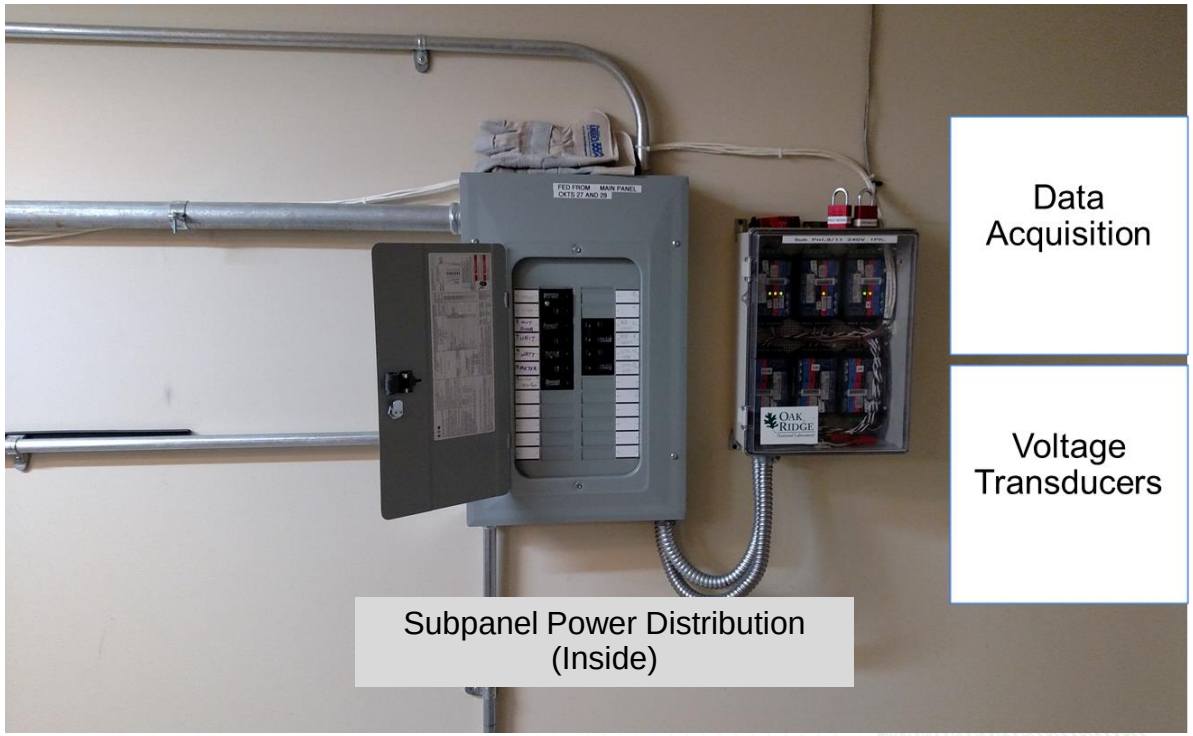
Proposed Installation:

1. Data acquisition and voltage transducers in garage
   - Existing power meters already measure voltage. The voltage access can be shared with the new voltage transducers.
2. Main current measurements can be performed in outside enclosure and a signal cable can be pulled to the proposed data acquisition location.



Yarnell Research House Measurement Overview

Yarnell House Information
Breaker Panel Summaries

Main – 220VAC, 200A

Outdoor Panel								
	Bkr	VAC	A			Bkr	VAC	A
Smoke Detectors	1	120	15		End Bed Front Well, Front Bed	2	120	20
Range	3	220	???		Front Bed, ??, Master Bed	4	120	20
	5				Watt Meter	6	240	15
	7					8		
Dryer?	9		30			10		
3 Plugs Living Room, Dining Halol, 1/2 Bath, Garage, etc.	11	120	20			12		
Hall Lights, Master Bath, Cdloset, Attic, Hall Bath	13	120	20			14		
Master Tub	15	120	20		Washer	16	120	20
Alarm, Stairs, Den Lights, Plugs, Fireplace	17	120	20		Font Wall, Living Room, Front Door Chime	18	120	20
Backdoor, Kitchen, Laundry, Light House & GFI	19	120	20		Dining Eating, Kitch Sink GFI	20	120	20
Foyer, Kitchen, Eating Area, Lighting	21	120	20		Microwave Plug	22	120	20
Bathroom GFI	23	120	20		Dining Room Ref, Kitchen GFI	24	120	20
Dishwasher	25	120	20			26		
Indoor Panel	27	220	125			28		
	29					30		

Indoor Panel – 220VAC, 125A

Indoor Panel								
	Bkr	VAC	A			Bkr	VAC	A
Main	1	220	125			2		
	3					4		
HVAC Outdoor Unit	5	220	30		HVAC Indoor Unit	6	220	60
	7					8		
Watt Meter	9	220	15		Water Heater	10	220	30
	11					12		
Wh-DX Box Recep	13	120	20			14		
	15					16		
	17					18		
	19					20		
	21					22		
	23					24		
	25					26		
	27					28		
	29					30		

- CT Measurements
- VT Measurements

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Yarnell House Information

Summary Current Measurements

- Total of 4 CT's.

Measurement Location	Description – Panel Location	Voltage	Current	Quantity of CT's
C1	Residential Main - Outside	220vac/1ph	200A	1 – L1/L2
C2	HVAC Outdoor Unit – Inside Bkr 5/7	220vac/1ph	30A	1 – L1
C3	HVAC Indoor Unit – Inside Bkr 6/8	220vac/1ph	60A	1 – L1
C4	WH/DX Unit – Inside Bkr 13	120vac/1ph	20A	1 – L1/N
C5				
C6				

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Summary Voltage Measurements

- Total of 2 VT's.

Measurement Location	Description – Panel Location	Voltage	Current	Quantity of VT's
V1	Watt Meter – Inside Bkr 9/11 (Shared from Watt Meter Enclosure)	220vac/1ph	200A	2 – L1/N & L2/N
V2				
V3				

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