

Backup Power

The “Cheap Ham” approach

Introduction

- Two safe, legal and inexpensive methods for connecting backup generators to run essential loads (without breaking the bank)
- Bob Peloquin – KB1VUA
30+ years in computers & electronics

Topics of Discussion

- Safely run selected or whole-house electrical loads without danger of back-feeding the grid or exposure to live electric wires
- Simple to operate and easy to understand
- Possible for many home-owners to install themselves (with guidance from the pros of course)

Don't be this guy

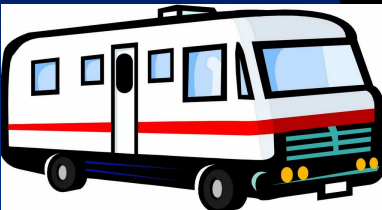
- NEVER EVER DO THIS:
- Suicide Cord (double-male) between generator and drier or welder plug. EXTREME DANGER!!!!!!!!!!
- Backfeed breaker without interlock to protect utility from generator voltage



Real Life Examples



- #1 – 6 circuit manual transfer & 3500 Watt 120/240V generator



- #2 – Whole House back-feed with mechanical interlock and 4000 Watt RV generator (120 volts)

Essential Loads Power

- Multi-circuit manual transfer switch

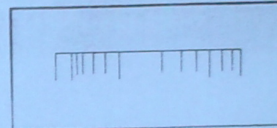
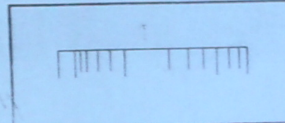
Only essential loads are run from this manual transfer switch.
Cost: about \$400-\$600



All circuits labeled

Figure 20 — Circuit Identification Label

CIRCUIT	CIRCUIT # / DESCRIPTION	CIRCUIT	CIRCUIT # / DESCRIPTION
A	FURNACE/CIRCULATOR PUMP (14)	D	UPSTAIRS REFRIDGERATOR (6)
B	BEDROOMS/OFFICE/FREEZER (4A)	E	DINETT/BATHROOM/PORICH LITE(5)
C	PARLOUR PUGGS (4B)	F	BRZWAY/GARAGE/VIVIANS FURNACE



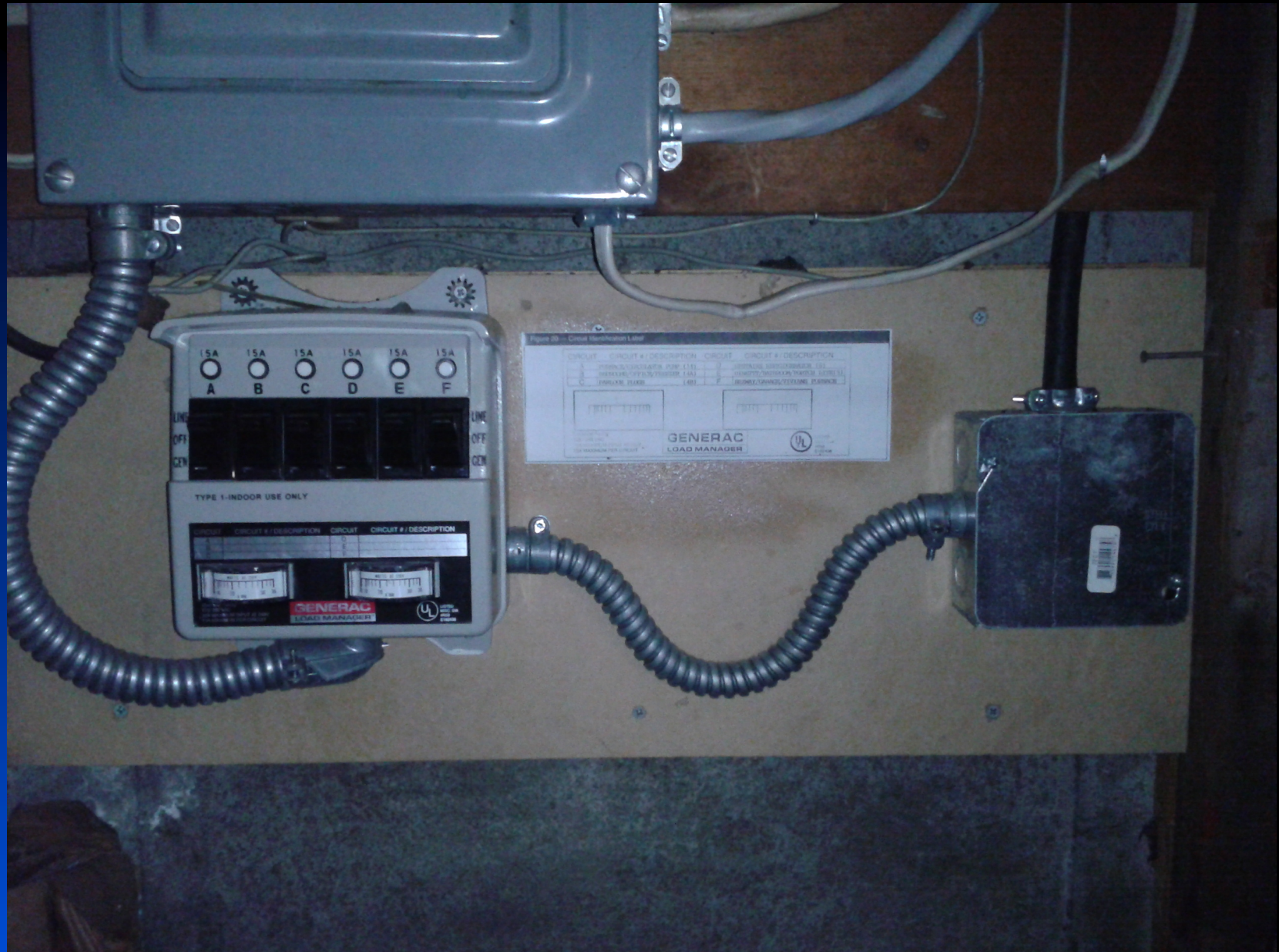
Electrical Rating
125 / 250 VAC
30A MAXIMUM INPUT AT 240V
15A MAXIMUM PER CIRCUIT

GENERAC
LOAD MANAGER



LISTED
MISC. SW
4R50
E182436

All wires neatly run



Whole-House Back-Feed

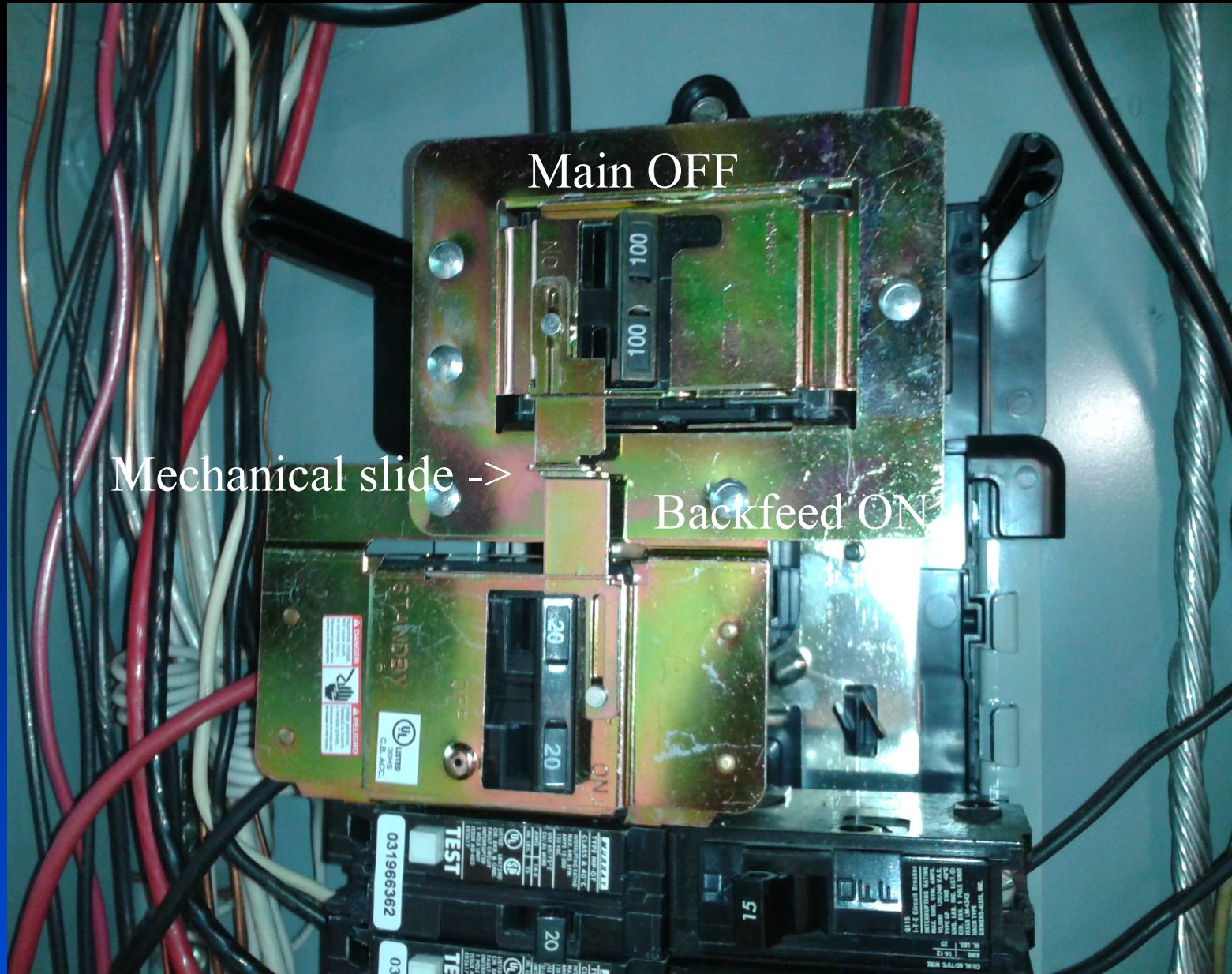
Costs:

Murray/ITE
load-centers –
About \$30 to
\$50

Square-D load-
centers – About
\$25 to \$35

- Back Feed Breaker Interlock
- Legal according to National Electrical Code
- Physically prevents back-feeding utility power grid when generator is providing power
- Requires more empty space in your load-center (2 to 4 empty spaces)

Murray back-feed Interlock

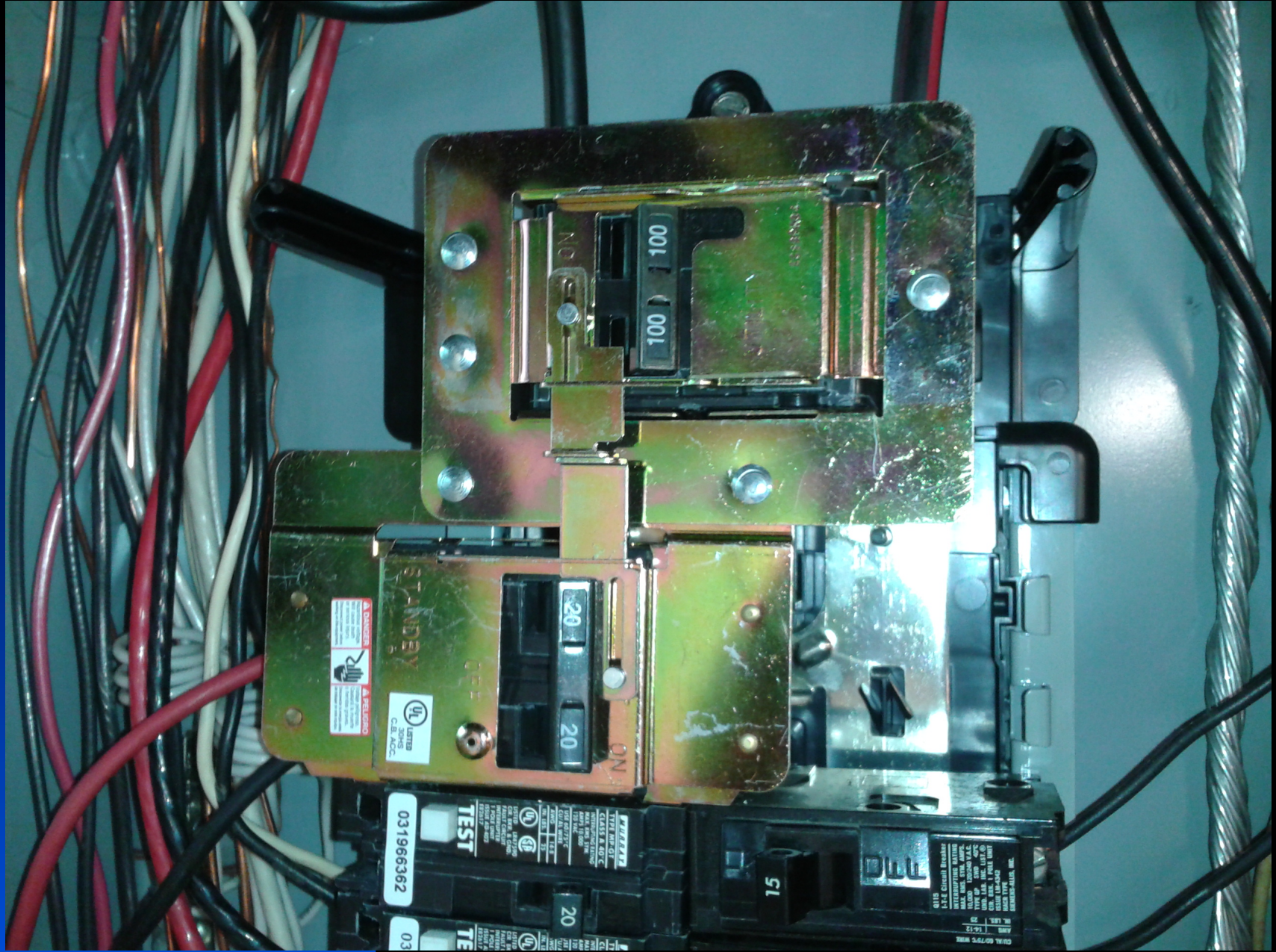


Main OFF

Mechanical slide ->

Backfeed ON

Note back-feed breaker should be sized to match generator capacity and connecting cord wire gauge.



MAIN

MAIN

For generator backup,
start generator first
Connect cable, then open main
breaker, operate interlock
Then close backfeed
breaker.

UL Listed Mechanical
Safety Interlock

Backup
Generator

Kitchen
GFCI



031966362



North Wall
Kitchen
Water

North Wall

Att

MAIN

MAIN

For generator backup,
start generator first

Connect cable, then open main
breaker, operate interlock

Then close backfeed
breaker.

UL Listed Mechanical
Safety Interlock

Backup

Generator

Kitchen

GFCI

Kitchen



031966362

03220

TEST

TEST

20

20

20

100

100

51

North Wall

LR/BR Wall

Attic

Handwritten notes:
North Wall
Kitchen
West Wall

MAIN

MAIN

For generator backup,
start generator first

Connect cable, then open main
breaker, operate interlock

Then close backfeed
breaker.

UL Listed Mechanical
Safety Interlock

Backup

Generator

Kitchen

STANDBY

UL LISTED
30A/5
C.B./ACC.

20

20

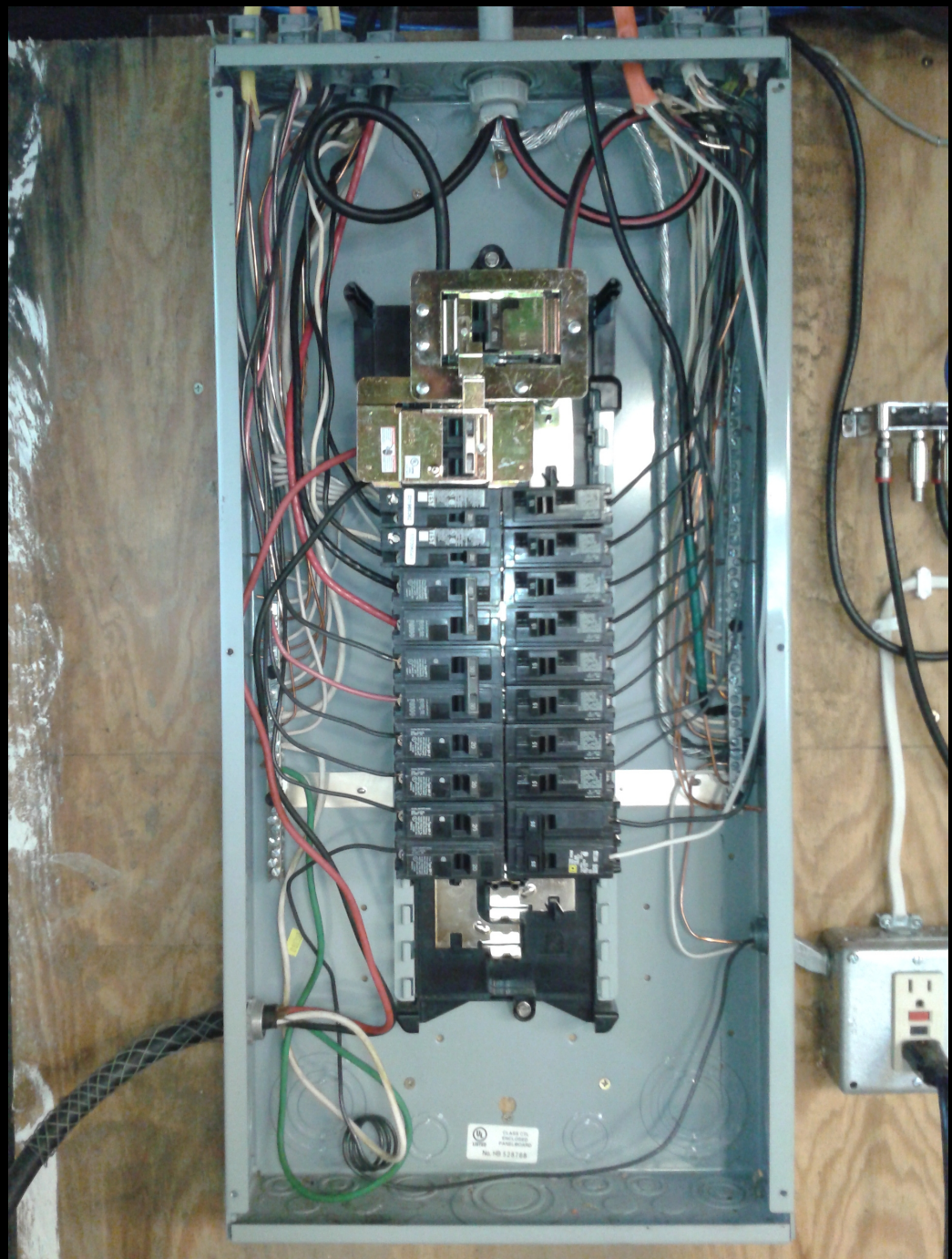
100 / 100

North Wall
KH 32
West
Wall

UL LISTED 30A/5 C.B./ACC. 20 20

Completed whole-house back-feed with Murray Mechanical Main Breaker Interlock.

Note: You will need to move both sets of breakers down 2 slots to use this in my particular Murray electrical box.



What This Means

- While we as Hams know more than the general public about electricity; we are still human and can make mistakes
- Don't take chances with the dedicated lineman's lives. Always use a N.E.C. approved method of isolating your generator from the grid.

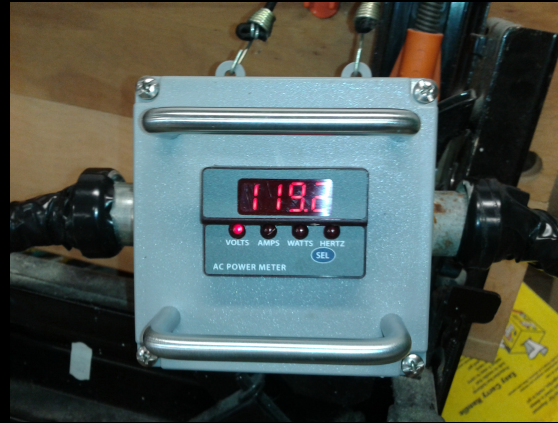
What really happens when the power goes out:

- Will you be home when the lights go out? Probably not. Murphy's law and all that...
- Can someone else safely get the generator up and running in your absence? Yes, if you document it and train them. Practice makes perfect.

Conclusion



Motor-Home
Generator



Multi-function
AC meter



120/240 inlet plug
on outside wall