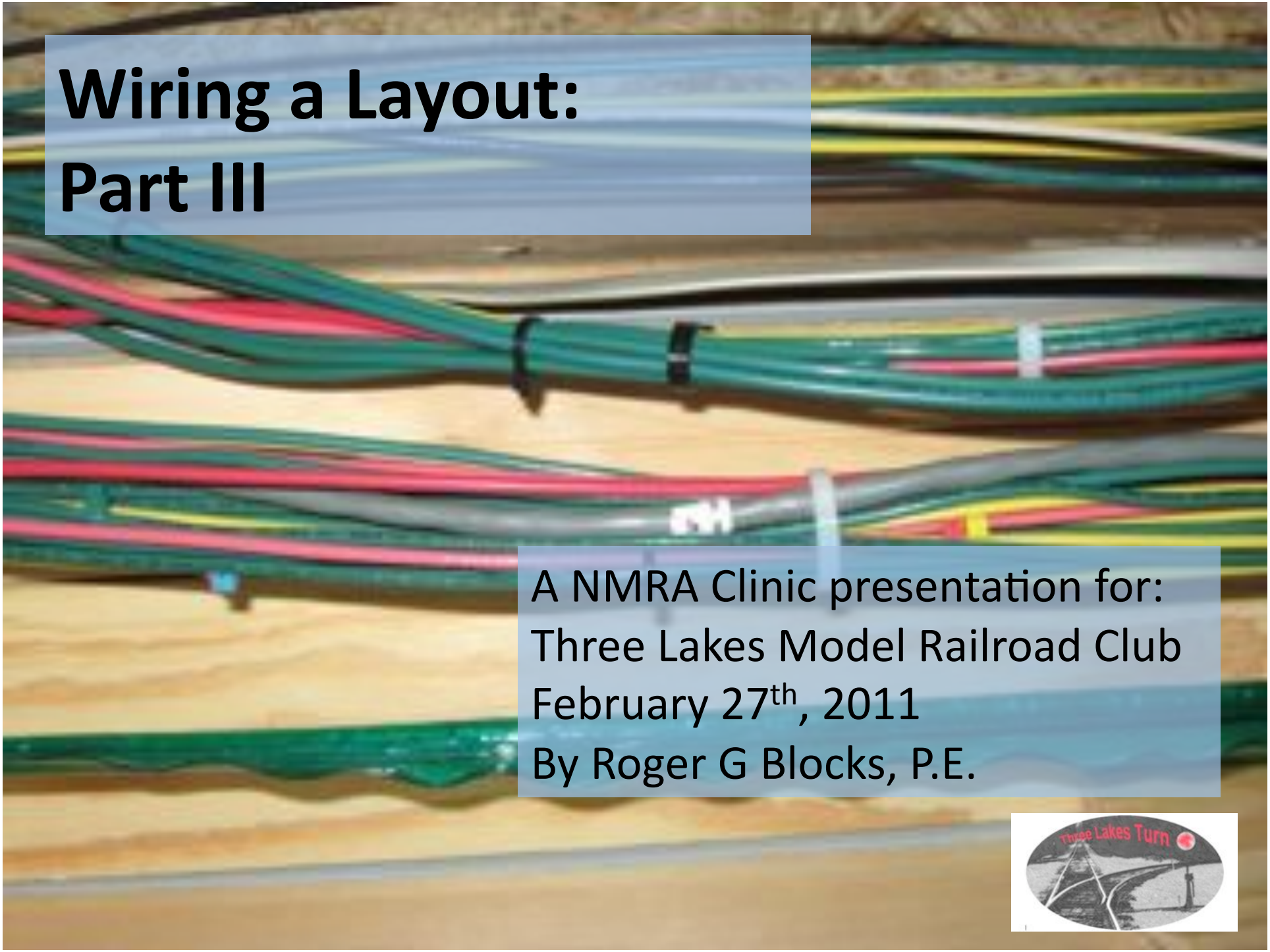


Wiring a Layout: Part III

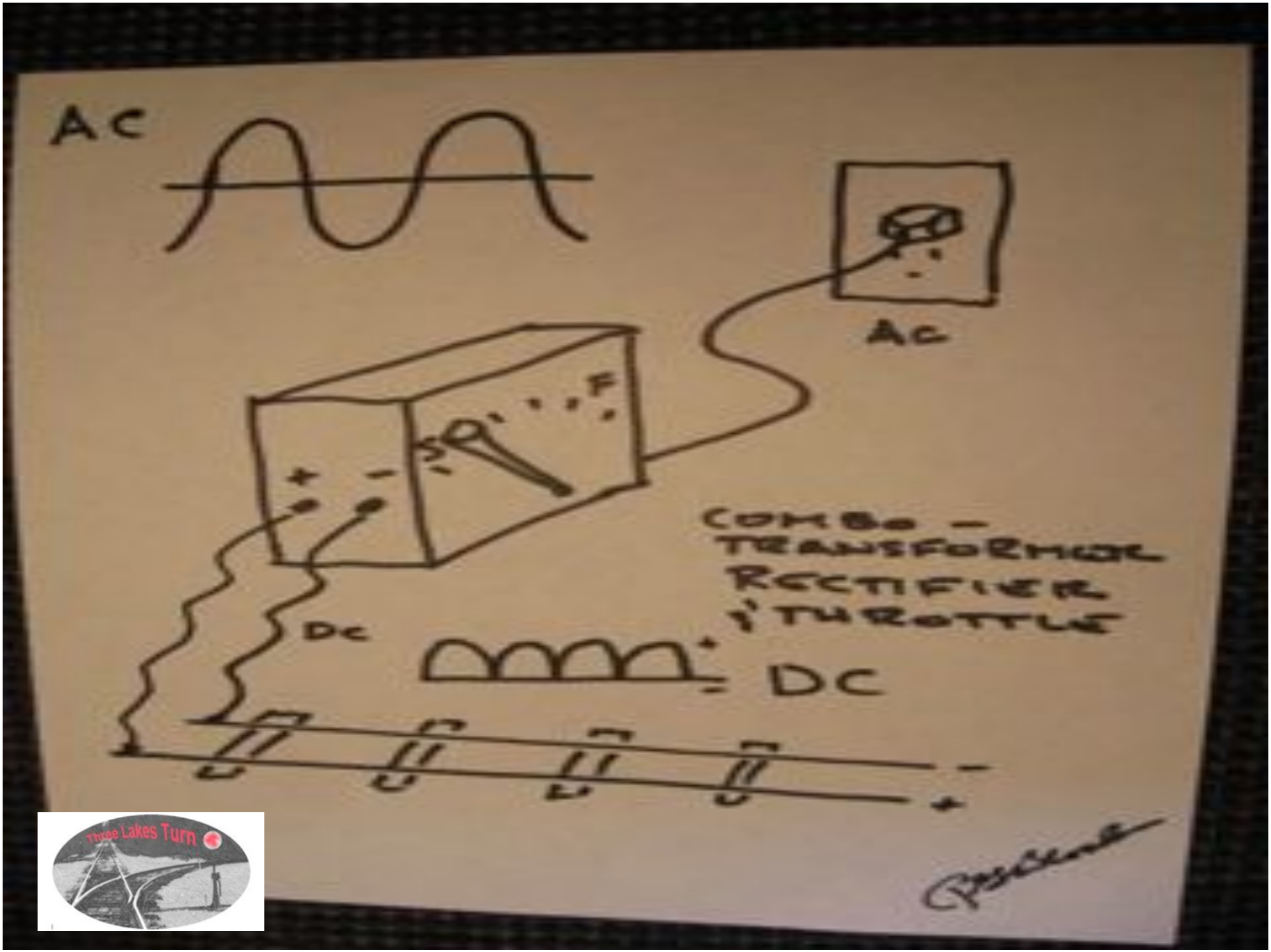
A NMRA Clinic presentation for:
Three Lakes Model Railroad Club
February 27th, 2011
By Roger G Blocks, P.E.

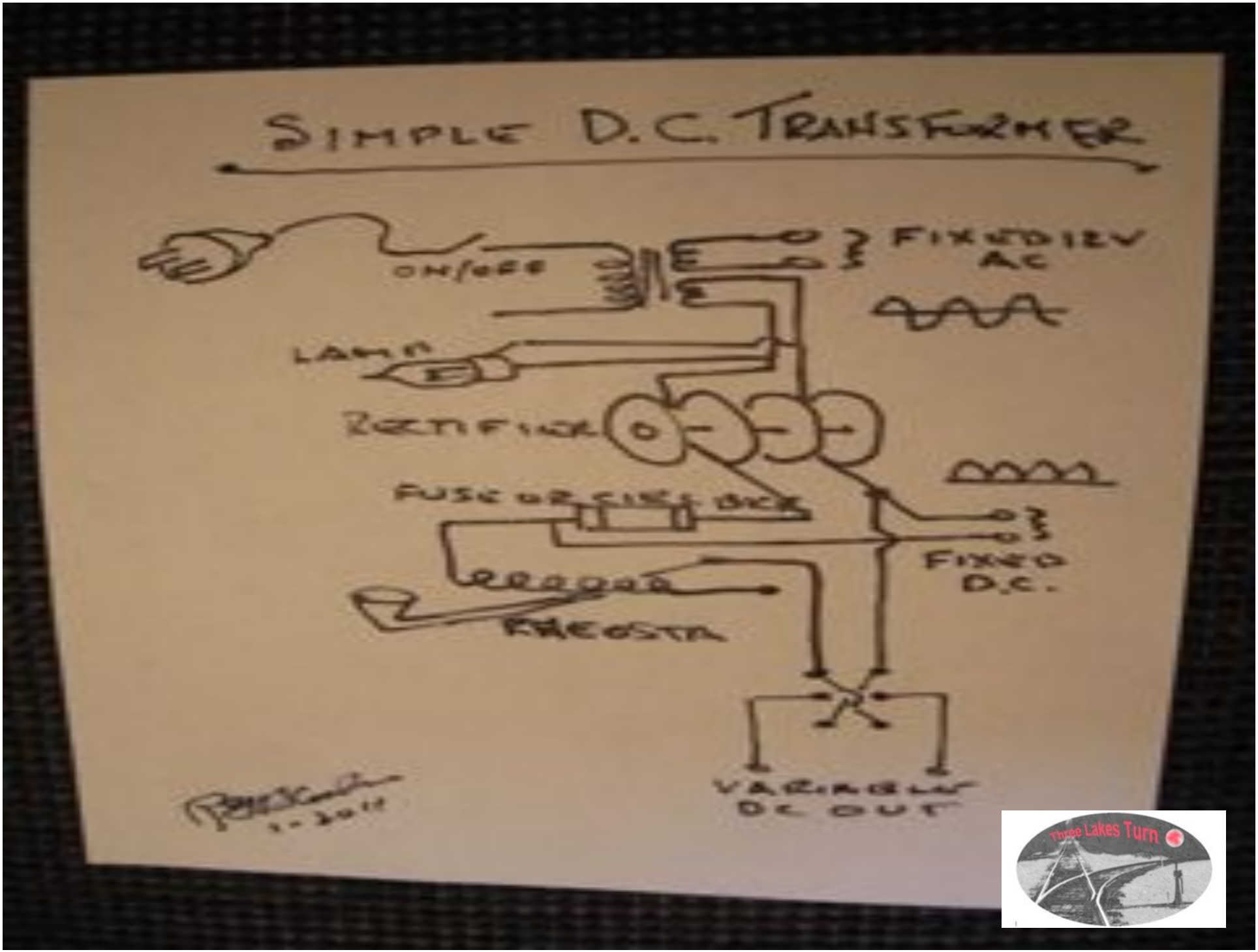
Wiring Part III

- We begin by looking at a simple DC transformer
- Then we look at and discuss block control
- We adapt that control first as an AC railroad
- Then as a DC system and compare them
- And show that children can build such systems
- And combine AC and DC on one panel and
- We find it all works with DCC & DCS as well…

Simple DC Power Supplies

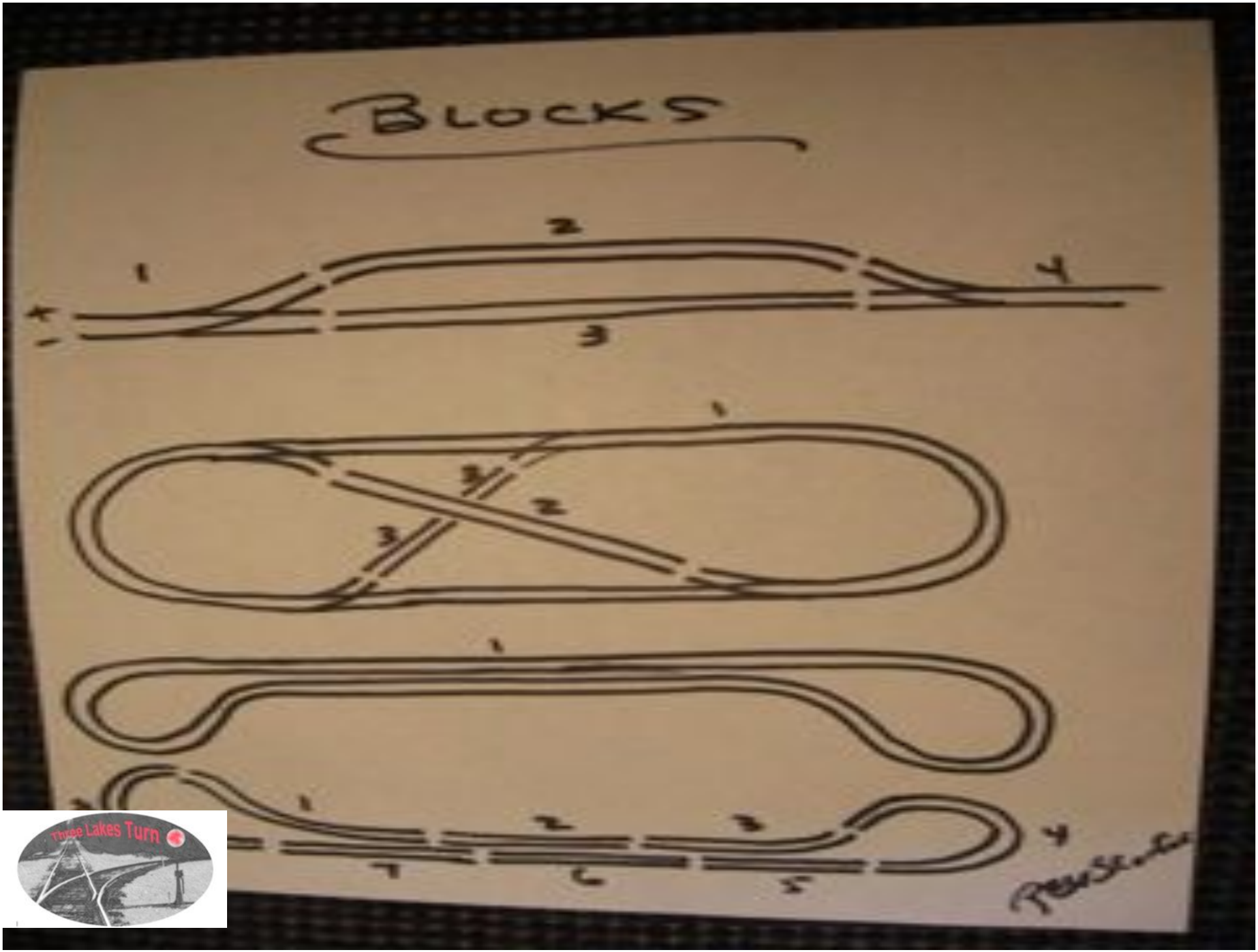
- Similar to AC with a rectifier
- Range perhaps 2 – 12 VDC
- May need to fix range if DCC
- Older units may require external Circuit Breaker
- DCC (and DCS) both require quick response to a short circuit.. See manufacturer's instructions
- Will be updated/discussed in first DCC class !

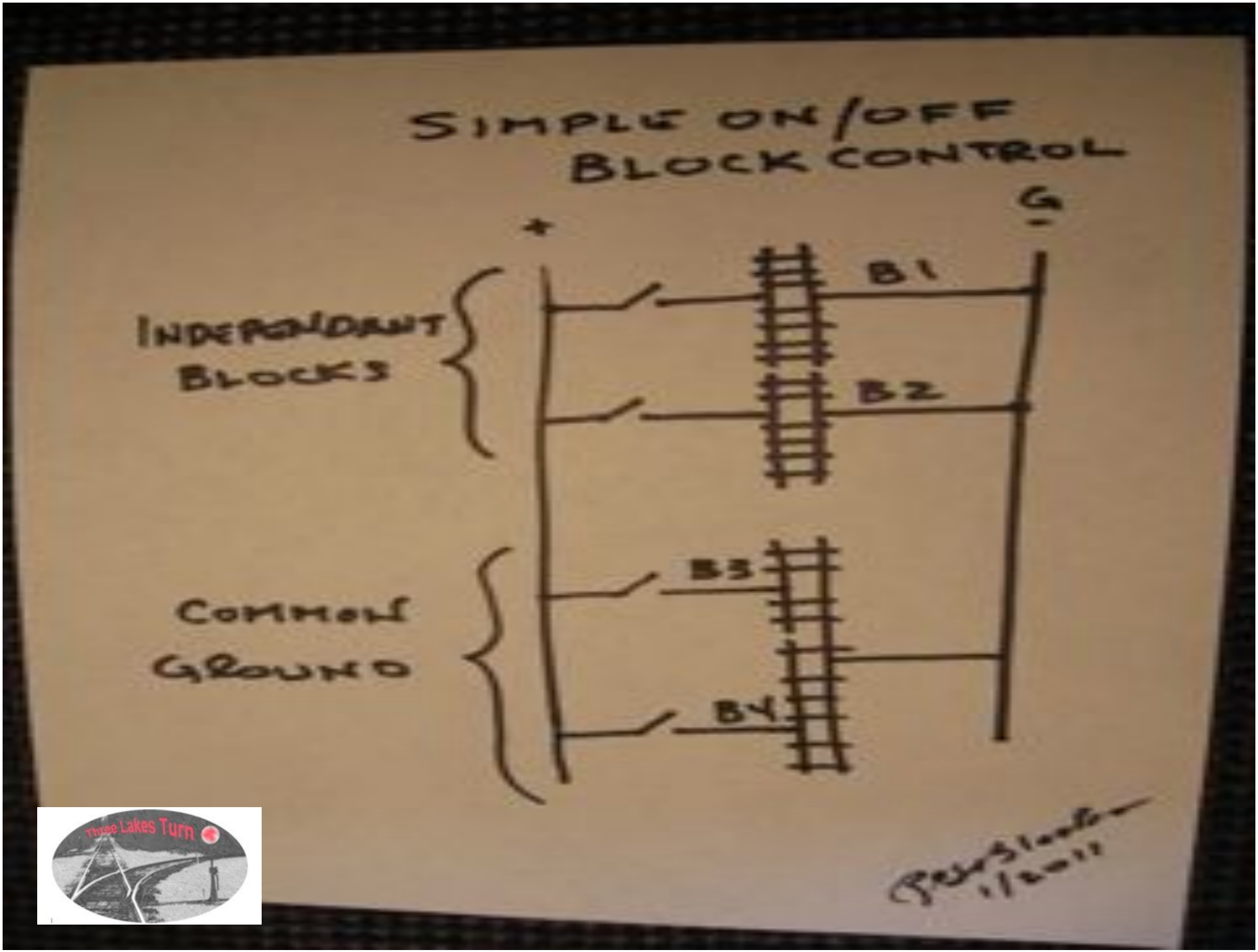

Ac
Ac
F
+
-
COMBO -
TRANSFORMER
RECTIFIER
THROTTLE
Dc
DC
Three Lakes Turn

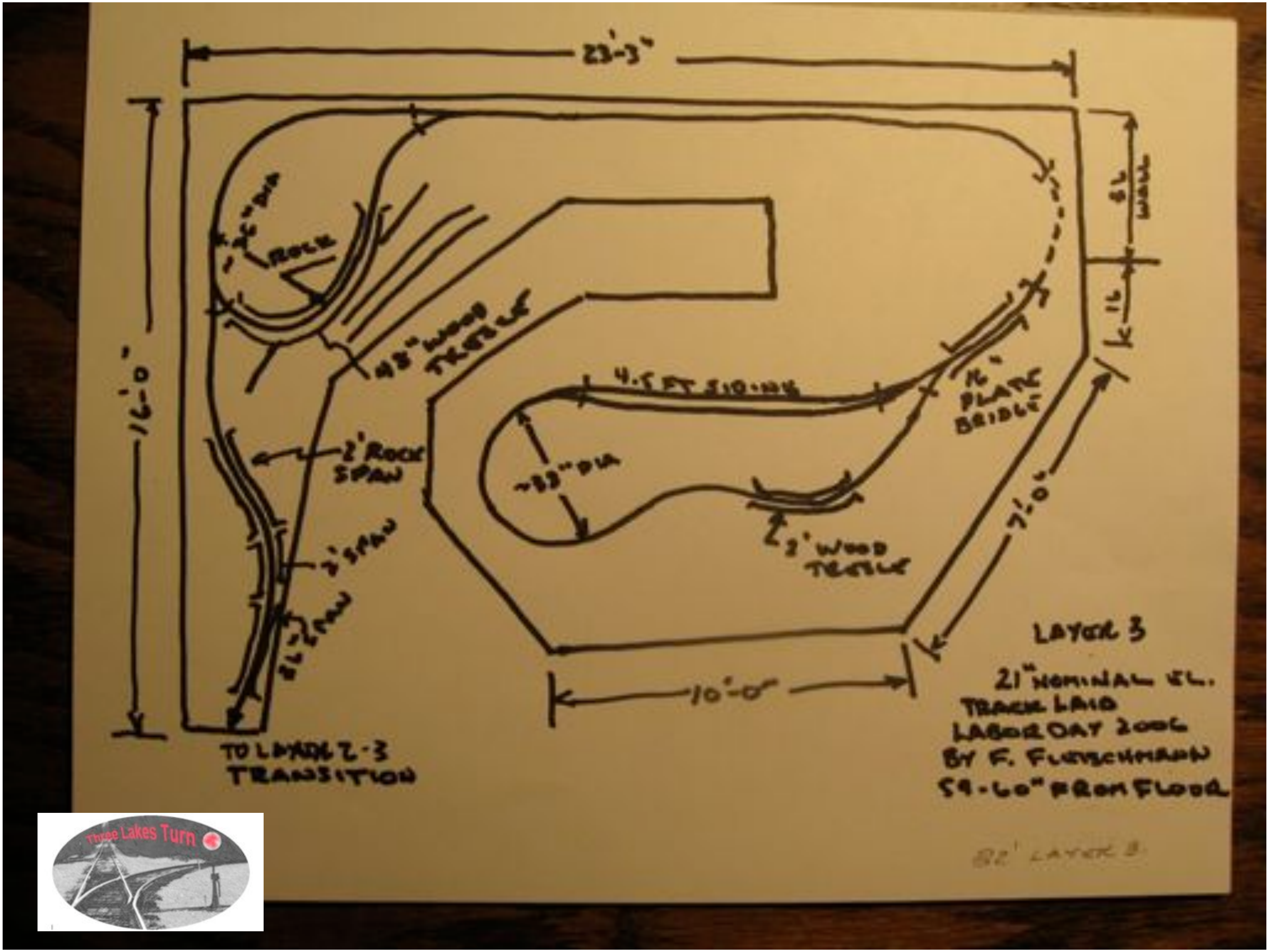

SIMPLE D.C. TRANSFORMER
ON/OFF
FIXED 12V AC
LAMP
RECTIFIER
FUSE OR CIRCUIT BRK
FIXED D.C.
RHEOSTA
VARIABLE DC OUT
1-2011
Three Lakes Turn

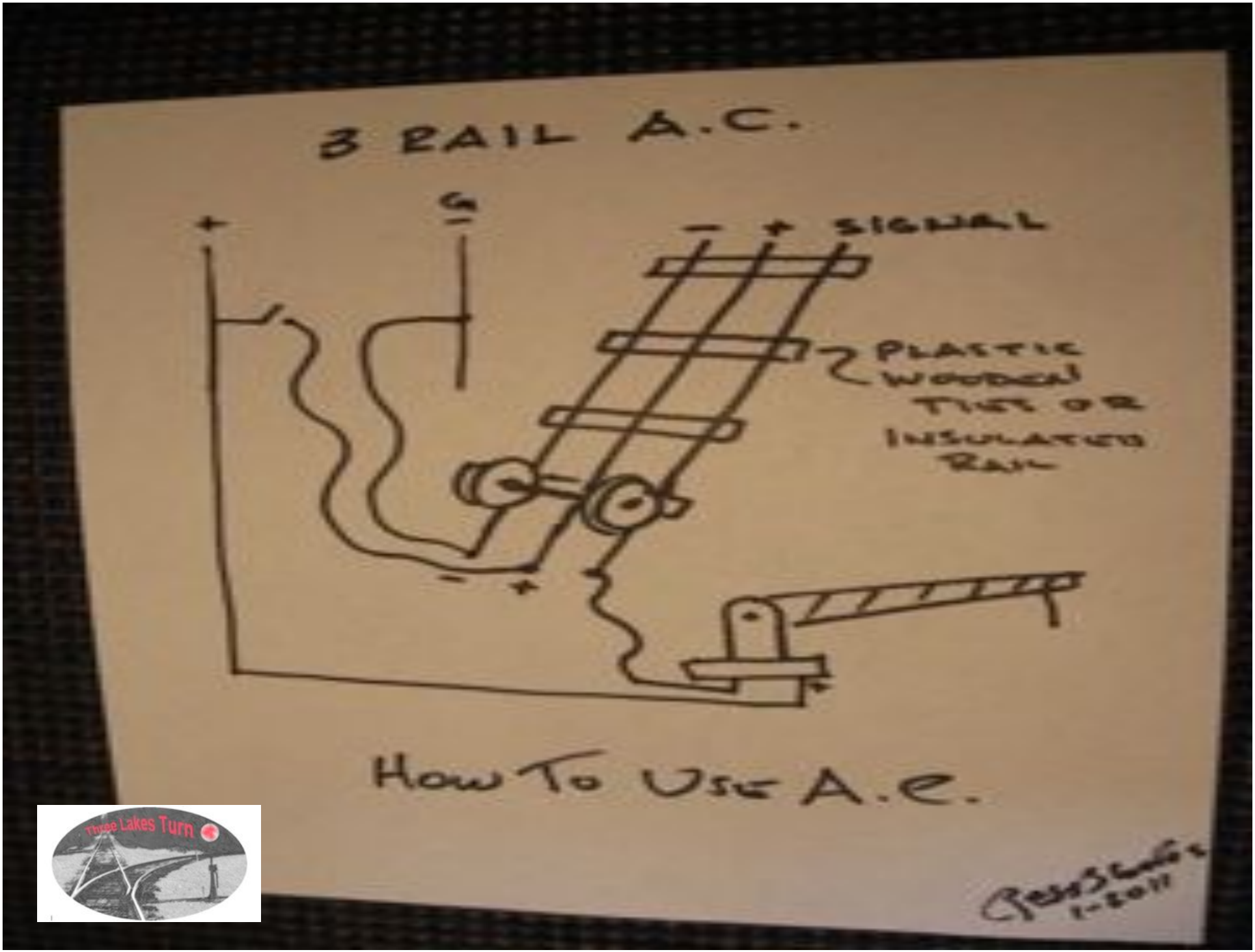
Block Control

- A block is an electrical control zone
- Classically: more blocks = more trains
- Today's DDC, DCS & DCC: still need some
- Generally Favor: isolate both tracks
- AC three rail: signaling & accessory operation


BLOCKS
1
2
3
4
1
2
3
3
1
2
3
4


SIMPLE ON/OFF
BLOCK CONTROL
+
G
-
B1
B2
B3
B4
INDEPENDENT
BLOCKS
COMMON
GROUND
Three Lakes Turn


23'-3"
16'-0"
ROCK
48" WOOD TRESTLE
4.5 FT SIDING
16" PLATE BRIDGE
2' ROCK SPAN
~33" DIA
2' WOOD TRESTLE
7'-0"
10'-0"
TRANSITION
LAYER 3
21" NOMINAL EL.
TRACK LAID
LABOR DAY 2006
BY F. FLEISCHMANN
59-60" FROM FLOOR


3 RAIL A.C.
+
SIGNAL
PLASTIC WOODEN TIES OR INSULATED RAIL
How To Use A.C.

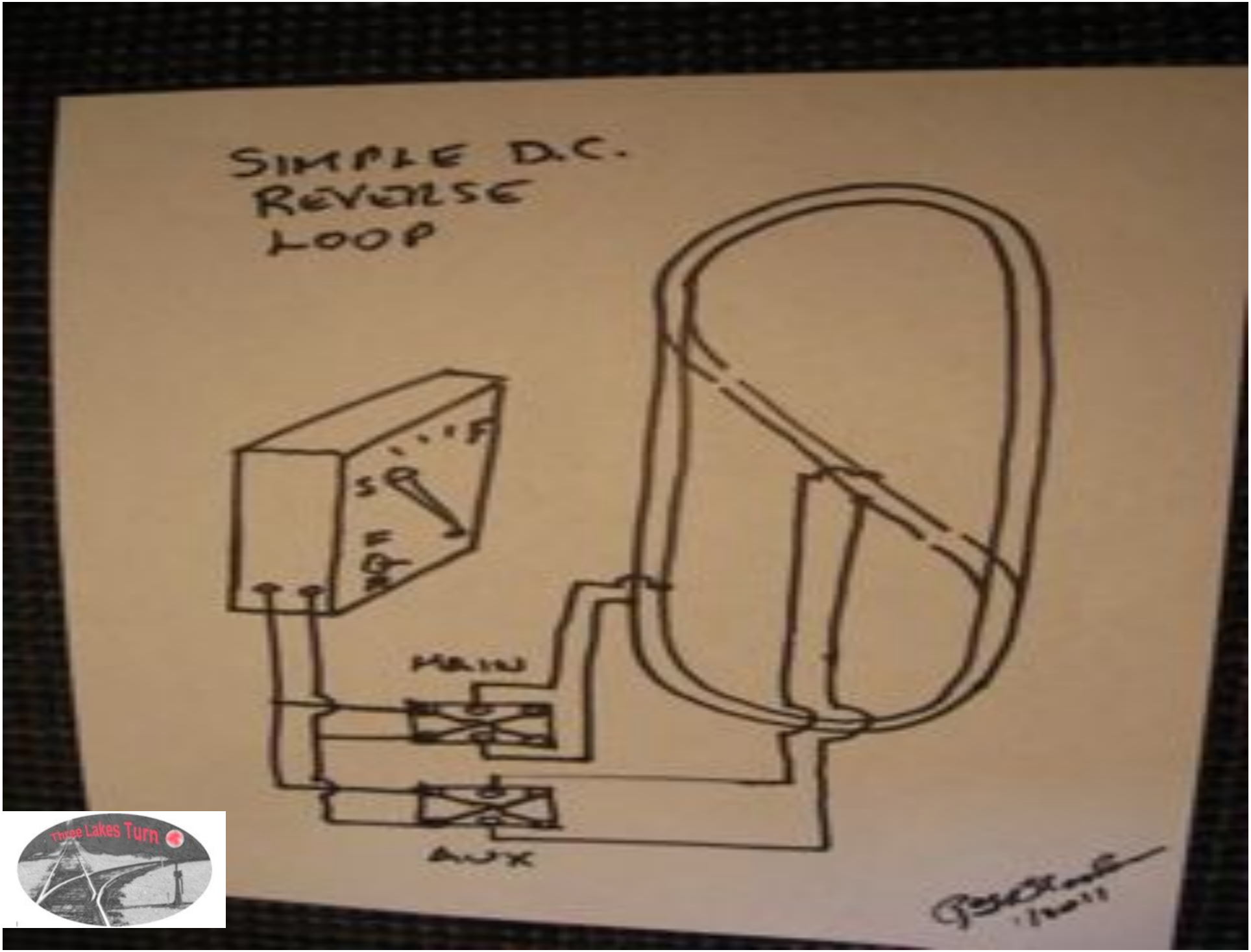
Reversing Engines

- Classic Lionel reversed direction in Engine
- Classic DC reversed polarity at power supply
- DCS from MTH reversed direction in Engine (AC)
- DCC now reverses direction in Engine (DC)
- Digital reversing is done via a signal on or in the power signal (a digital message)
- Want to be able to run classic DC? Keep DPDT.

REVERSING D.C.

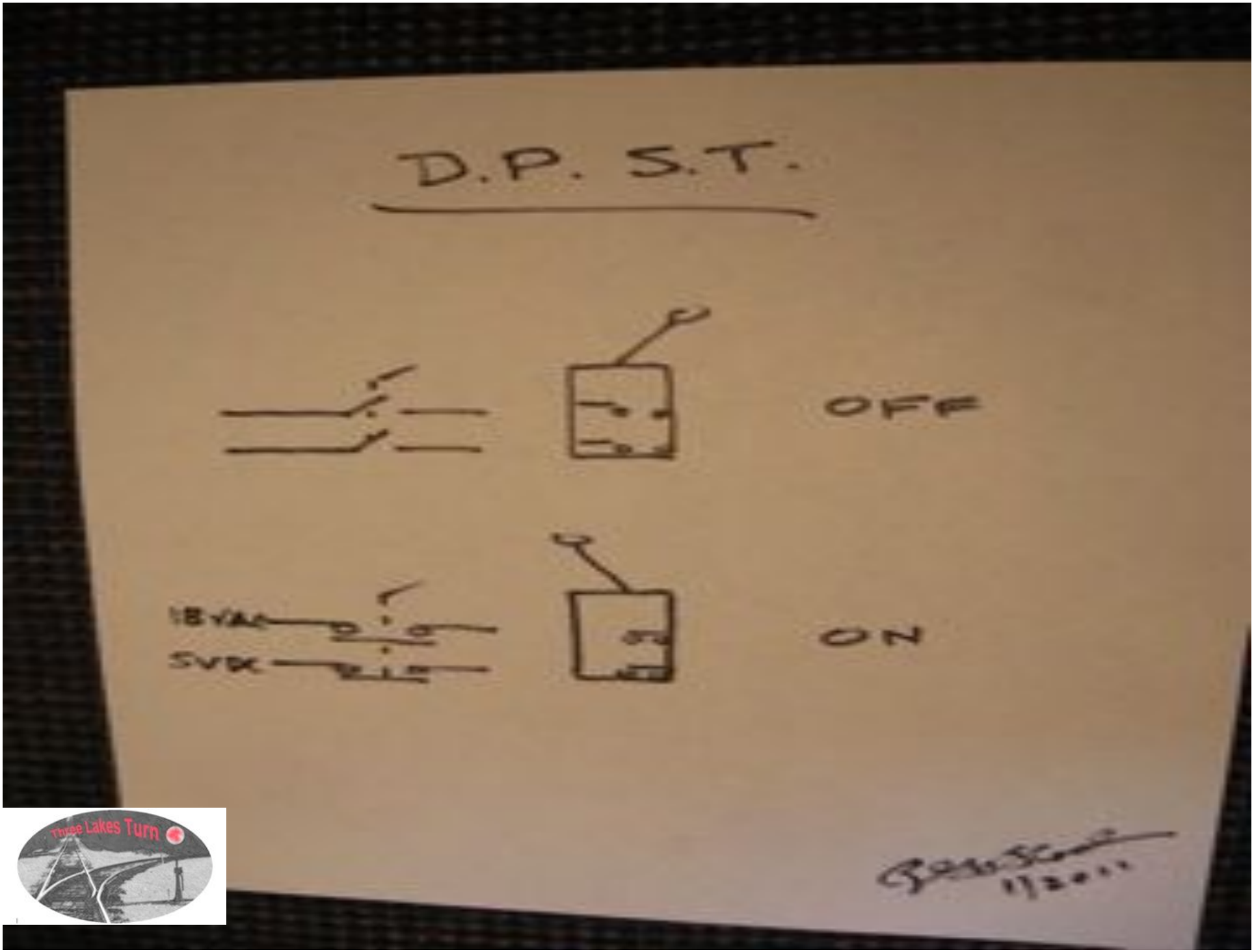
Reverse Loops in DC

- Follow the rails, without blocks = short circuit
- Easy solution: insert a block to prevent short
- Then, add a DPDT switch to reverse polarity
- Y's, Turntables & crossovers have same challenge
- DCC for DC systems solves polarity problems at loops and crossovers with automated devices
- AC systems do not have this problem.


SIMPLE D.C.
REVERSE
LOOP
MAIN
AUX

Light Indication Circuits

- Indication of type and location of power
- Can be done at the same time DCS, AC or DCC
- However, you must use a DPDT or DPST switch
- Modest examples follow..


D.P. S.T.
OFF
ON
11/2011


AÉROPOSTALE
ATHLETICS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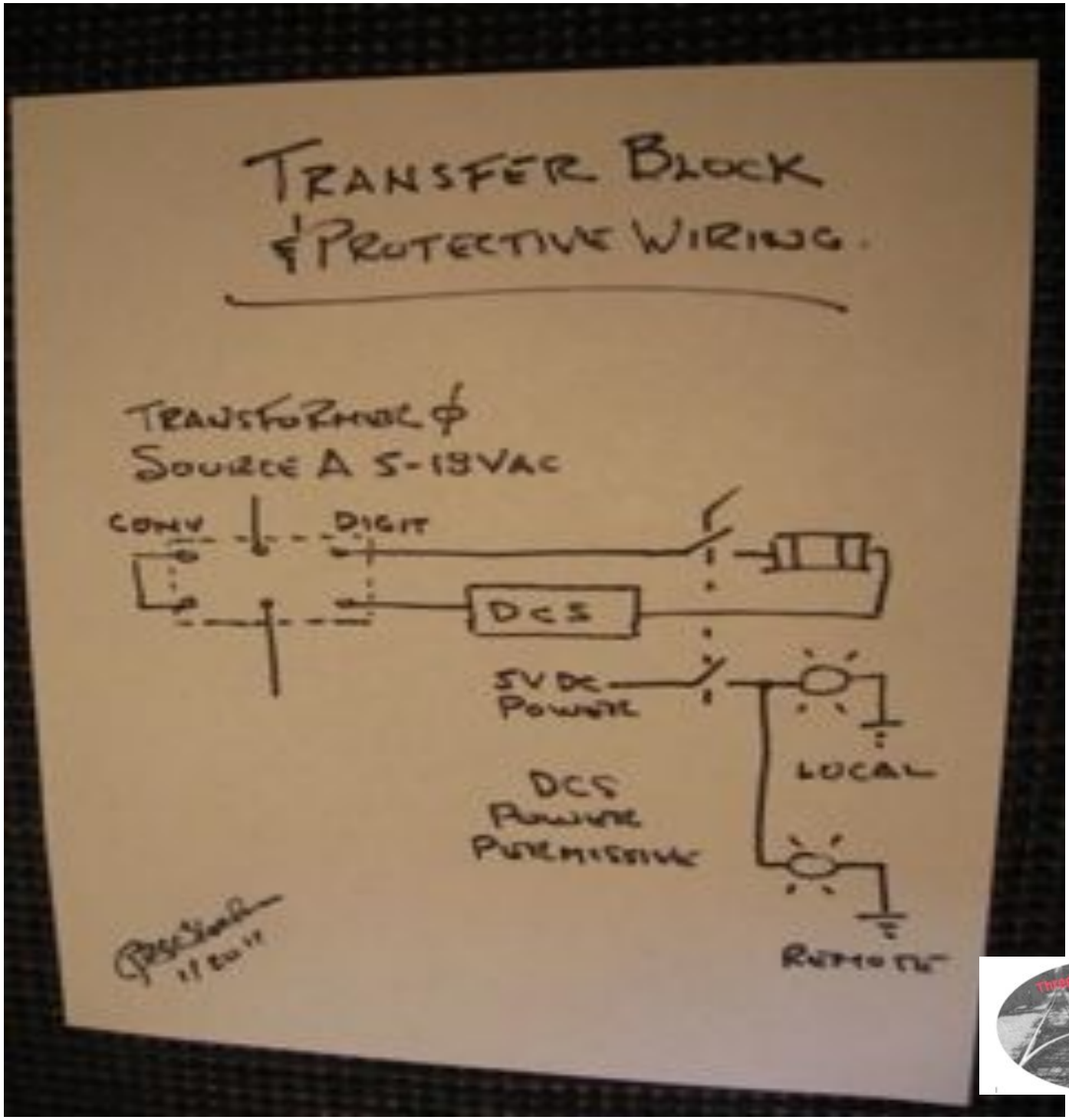
Transfer Block & Protective Wiring

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Three Lakes Turn

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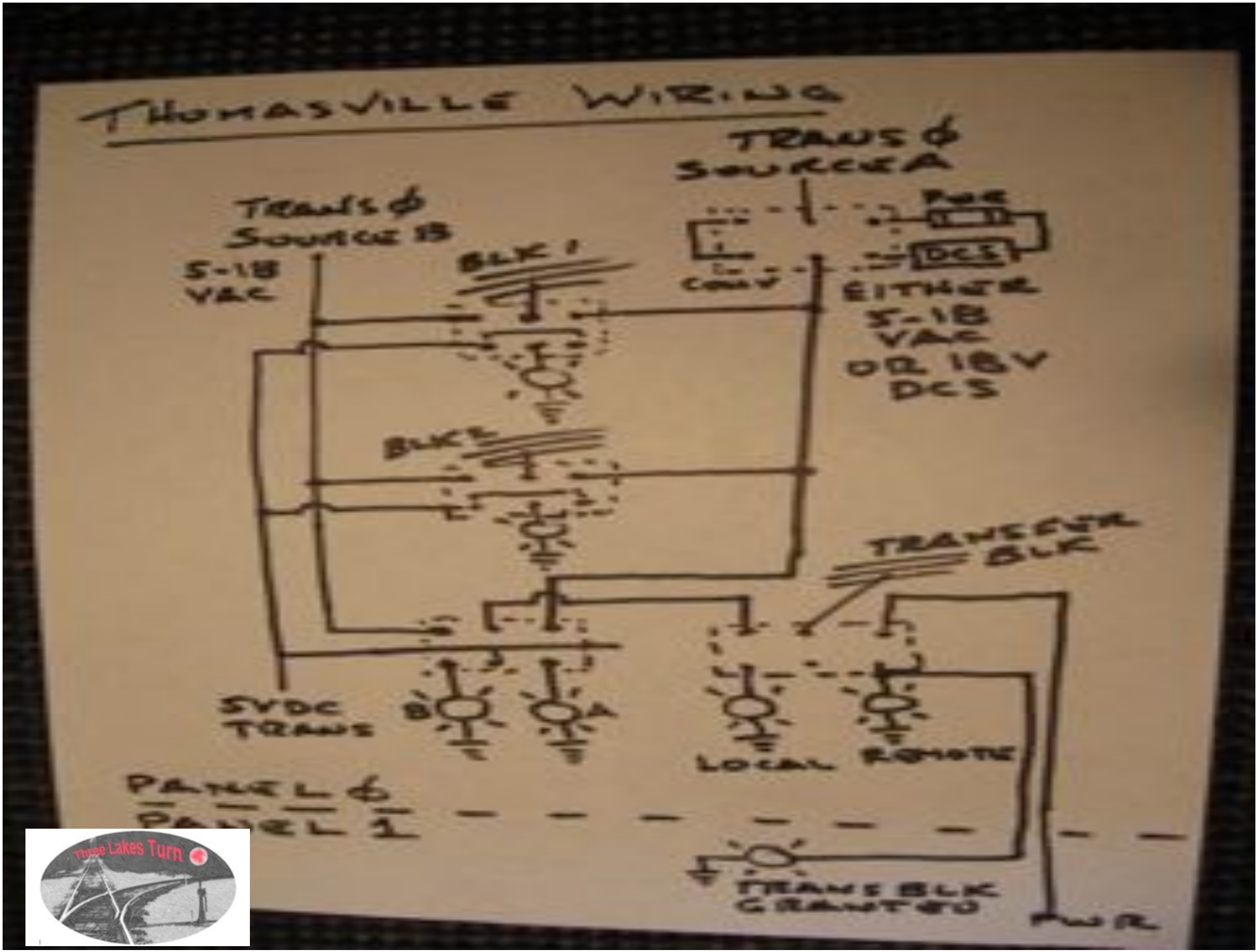
THOMASVILLE WIRING
TRANS Φ SOURCE A
TRANS Φ SOURCE B
5-18 VAC
BLK 1
CONV
EITHER 5-18 VAC OR 18V DCS
BLK 2
TRANSFER BLK
5VDC TRANS
B
A
LOCAL
REMOTE
PANEL Φ
PANEL 1
TRANS BLK GRANTED
PWR


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Summary

- Covered Design: Distributed vs. Centralized
- Blocks and their use
- DPDT contacts: value for reversing or two voltages
- DPST contacts: value for isolation or two voltages
- Logical design for AC and DC classic operations
- Ability to run AC / DDC / and DCS modes
- Background for Auto-Routing and DCC !

Currently wiring these details


May your life and your wiring be well planned,
without fault, clean and understandable…
This isn't the end…
Roger G Blocks, P.E.
Three Lakes Turn