

Topics for Today:

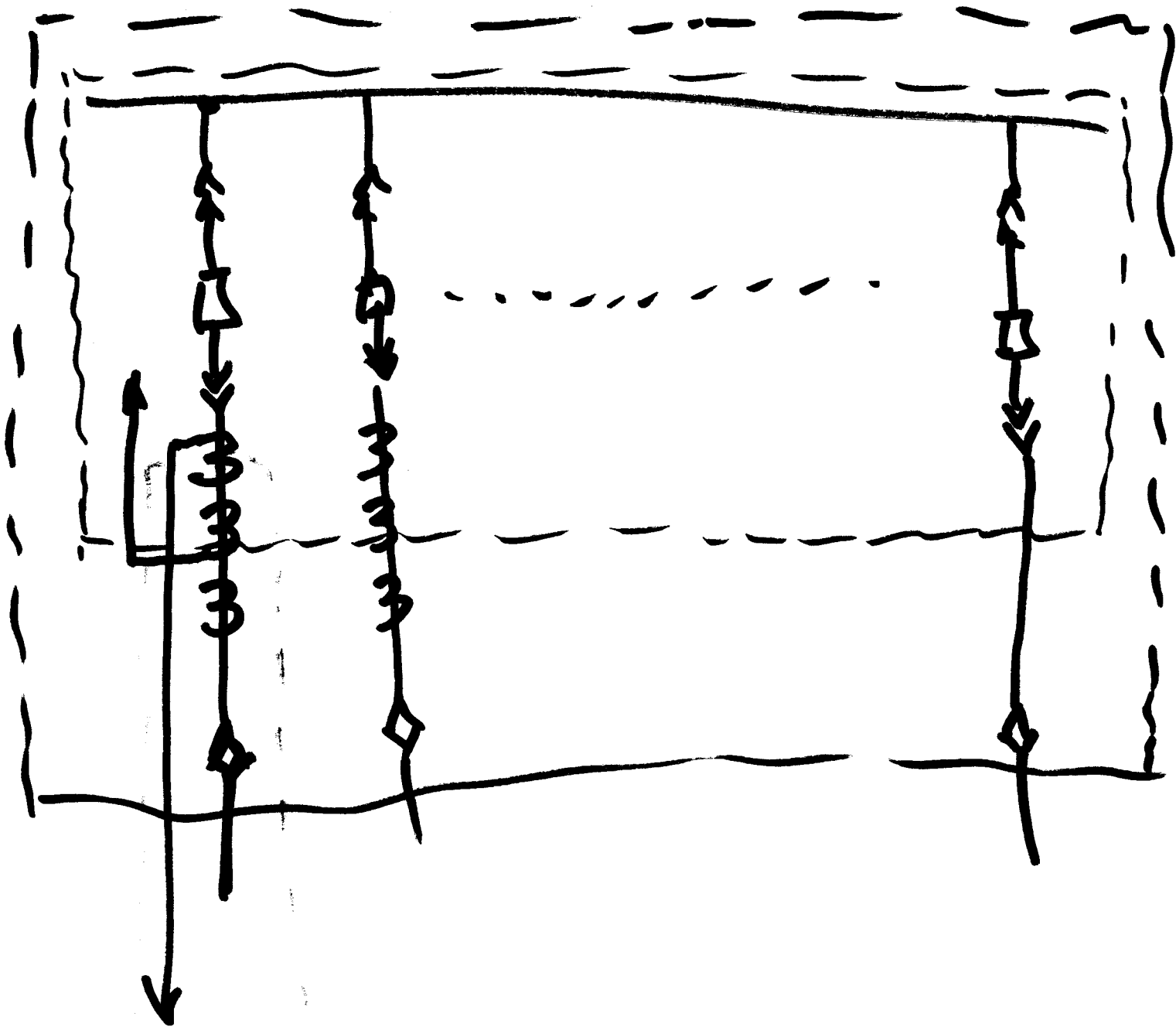
- URL: <http://www.ece.mtu.edu/faculty/bamork/EE5223/index.htm>
- EE5223: 30 total (17 on-campus students; 13 online students)
21 BSEE students; 9 MSEE students
- Labs - EE5224 - Plan to begin in Week 3 (Wed 10am Jan 25th)*
- Bus Configurations (Ch.10, sect 10.1 - 10.10)
 - Single Bus, Single Bus w/tie
 - Main & Transfer
 - Ring Bus
 - Breaker-and-a-half
 - Breaker-and-a-third
- Software - Aspen "OneLiner"(installed on software server)
- Zones of protection - let's look at Assignment #1
- Zones of protection - generators, motors as fault source.
- Reading Relaying One-Lines (examples posted in Week 1)

EE5224 Lab

Labs begin Wed Jan 25th.

Open lab seats:

- Wed 10-noon Seats available
- *Wed 4-6pm Add'l Section if enrollment demands
- *Thurs 4-6pm Add'l Section if enrollment demands
- *Fri 10-noon Add'l Section if enrollment demands



Bus Configurations

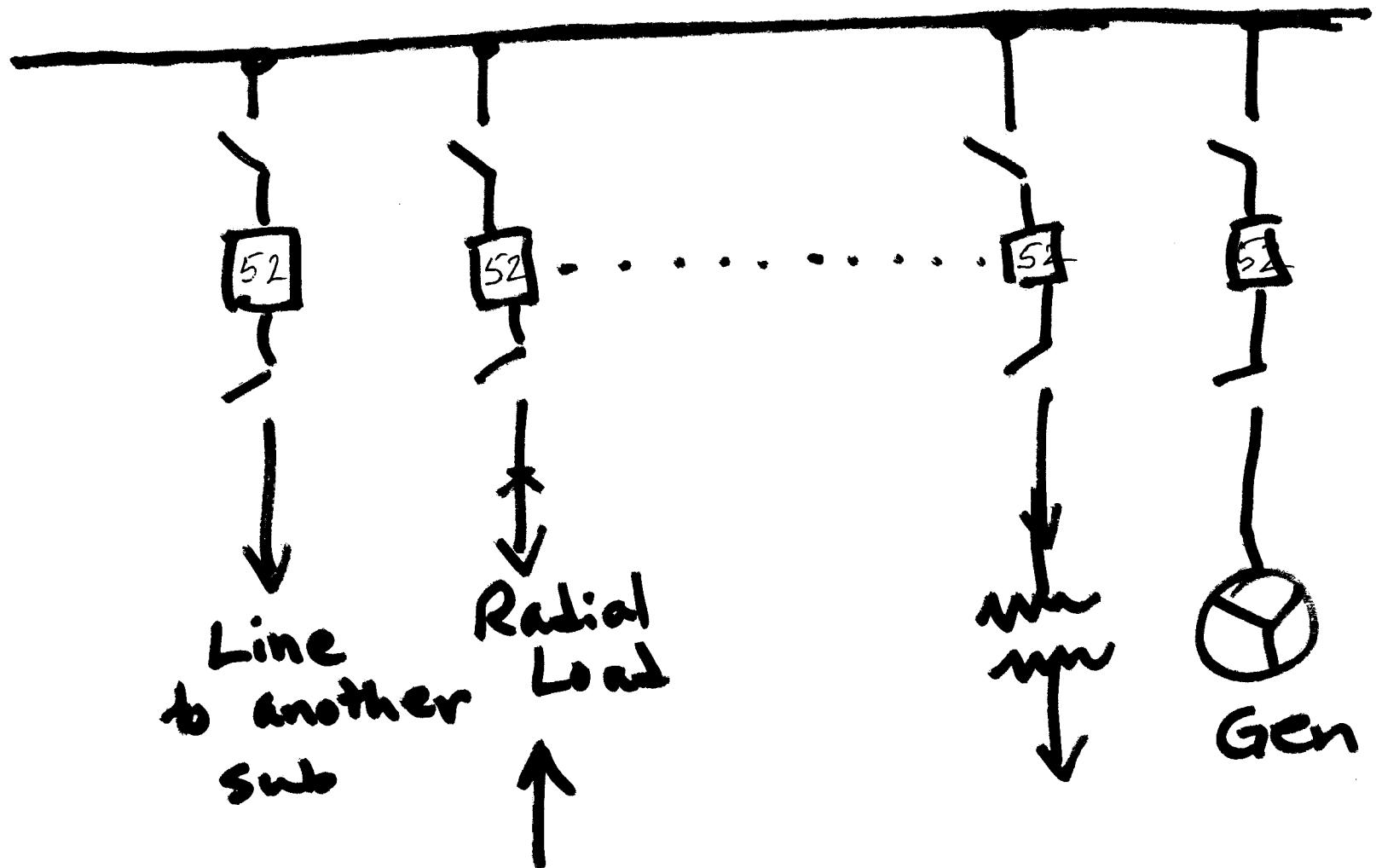
- Flexibility
 - Maintenance
 - Operation
- Reliability, if something fails
 - "Backup" strategies

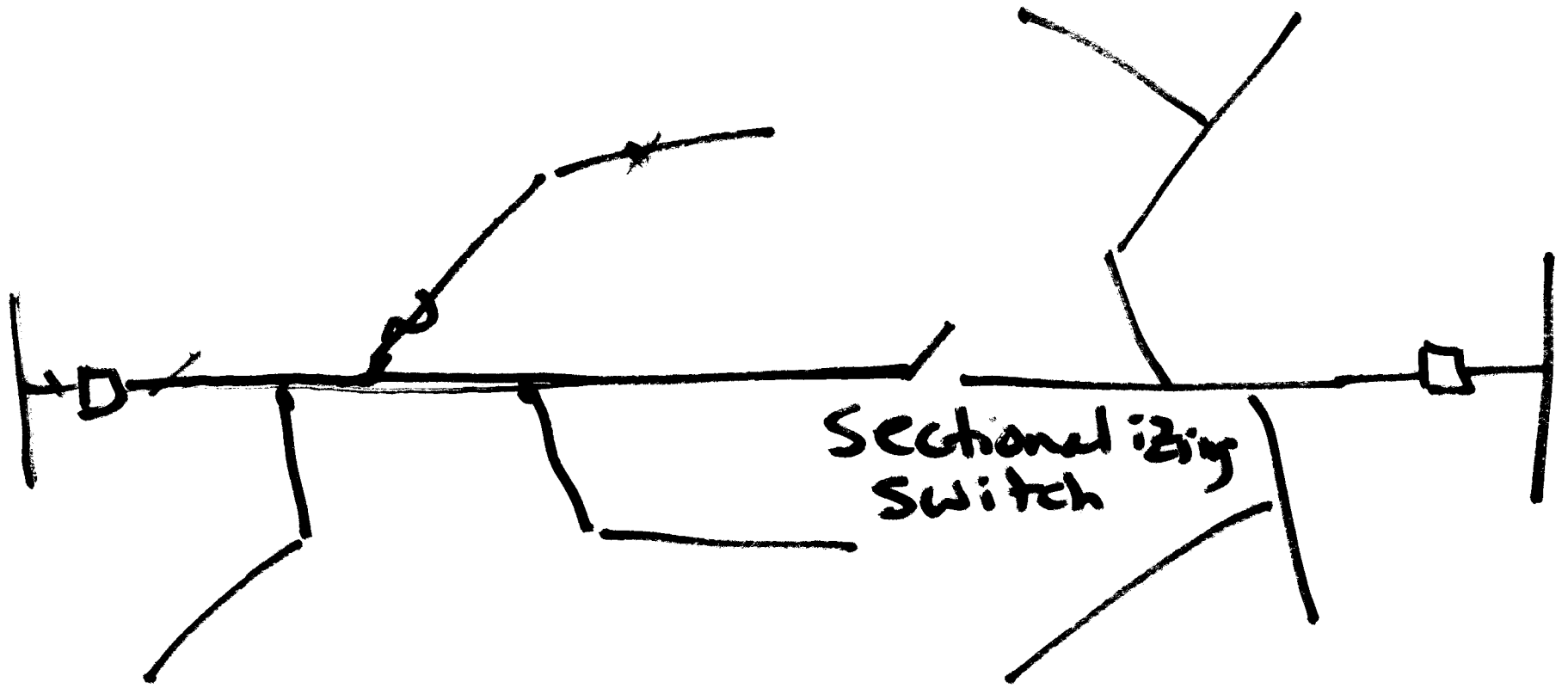
Next: Bus Configs - Sects. 10.1 - 10.10.

- Single Bus
- Double Bus
- Ring Bus
- "Breaker-and-a-half"
- " " " " "third"
-

Ch. 10 - Tables 10.1 & 10.2

Single Breaker, Single Bus

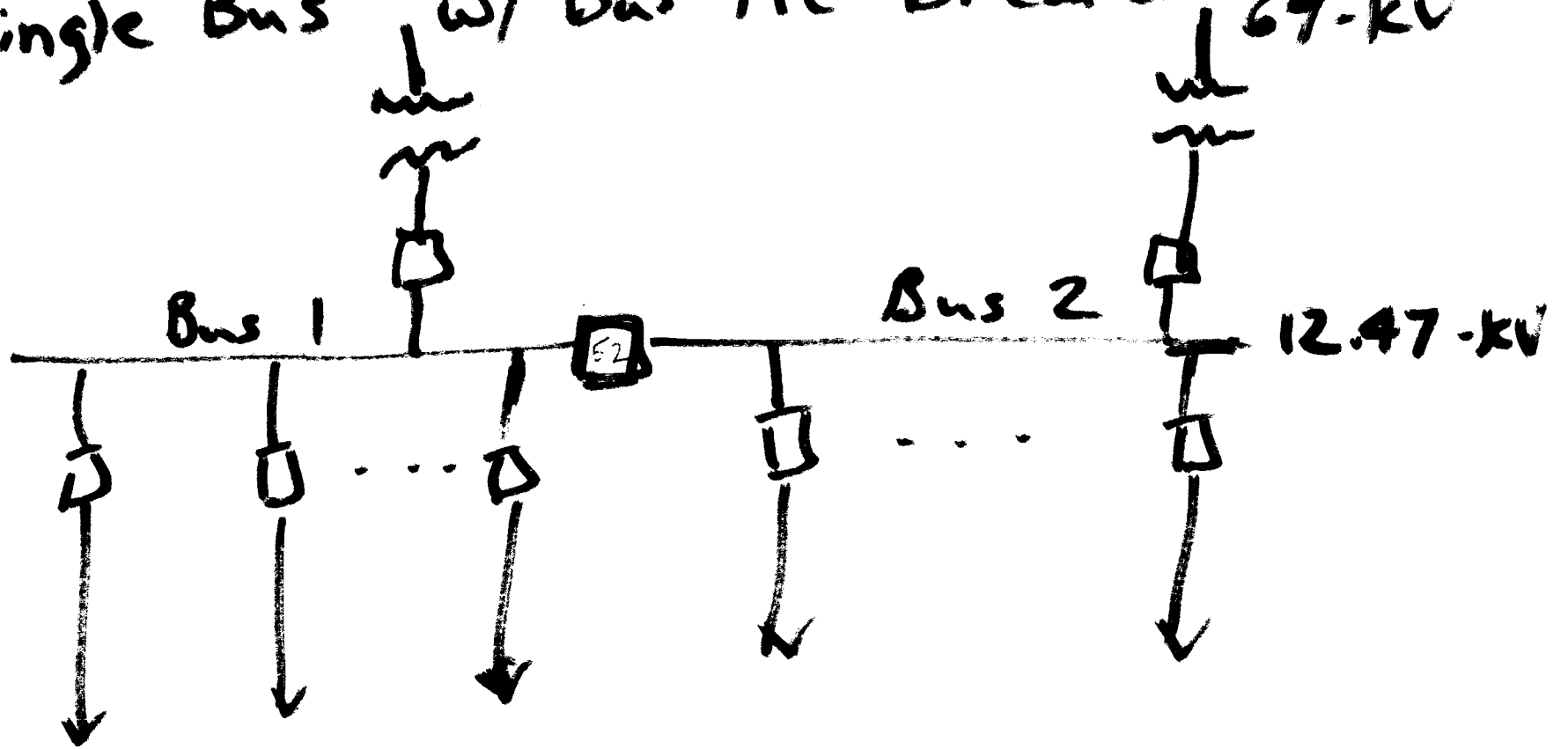




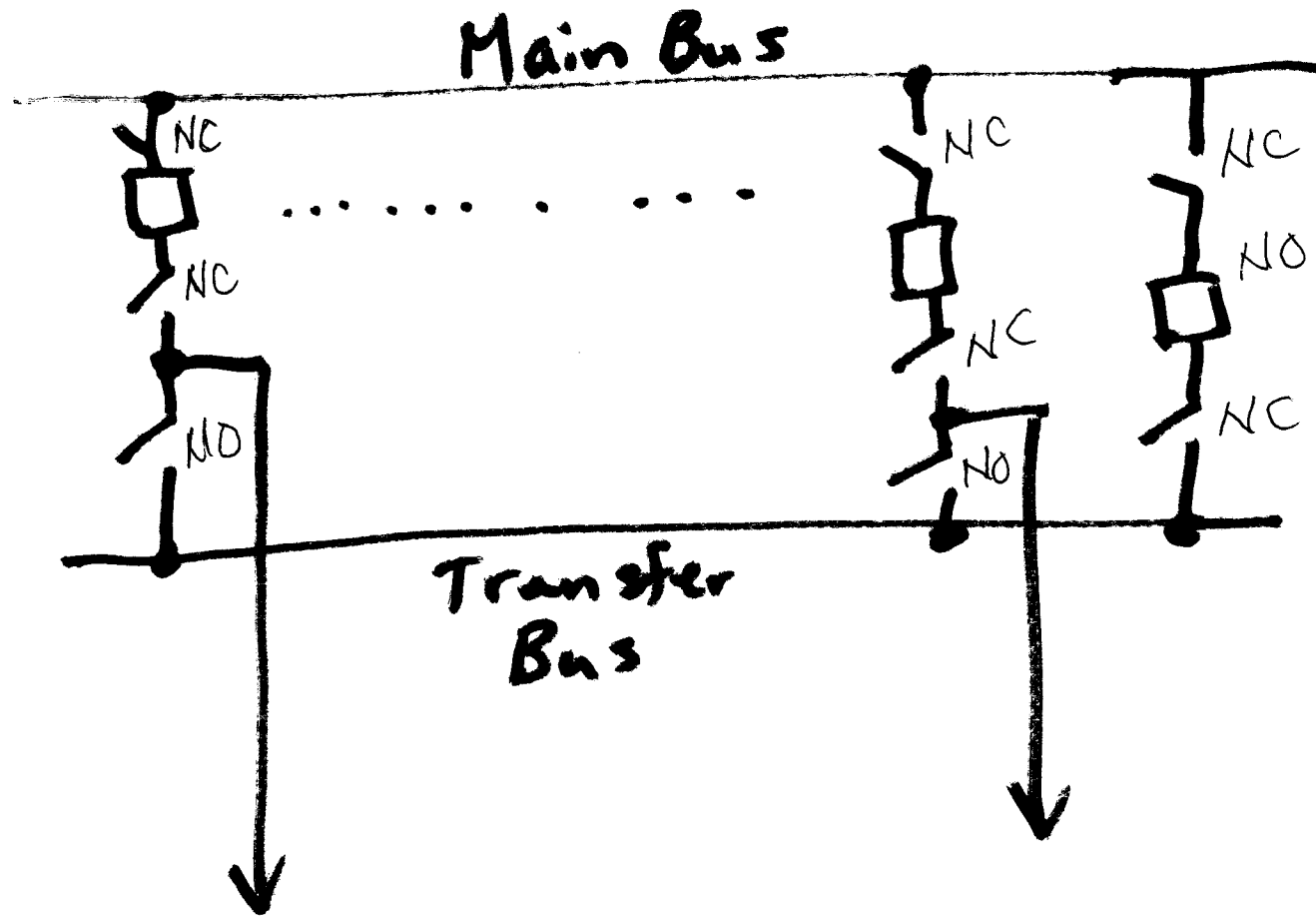
Radial System

- Backfeed thru sect. sw.
in interim for maintenance.

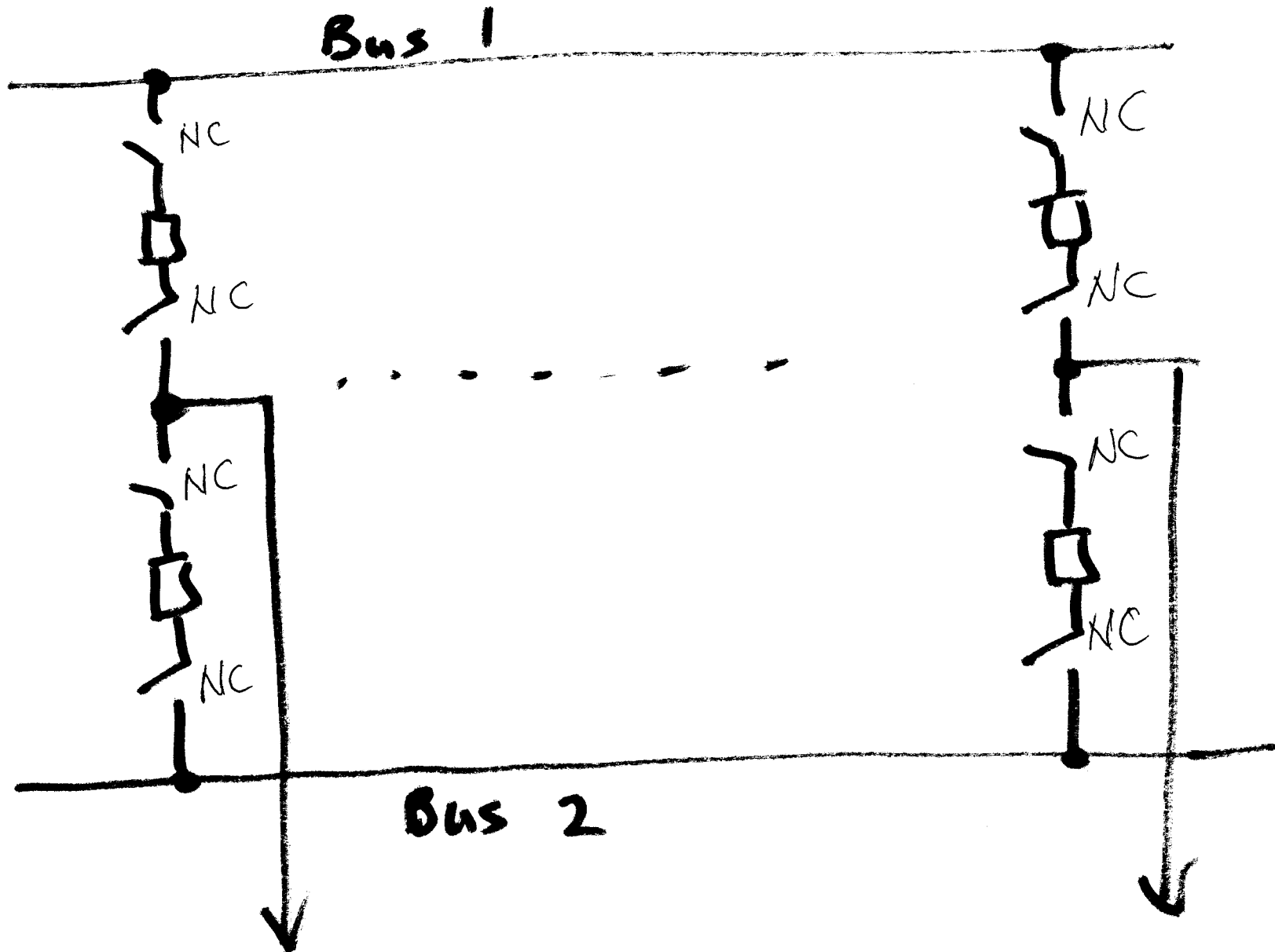
Single Bus w/ Bus Tie Breaker 69-kV



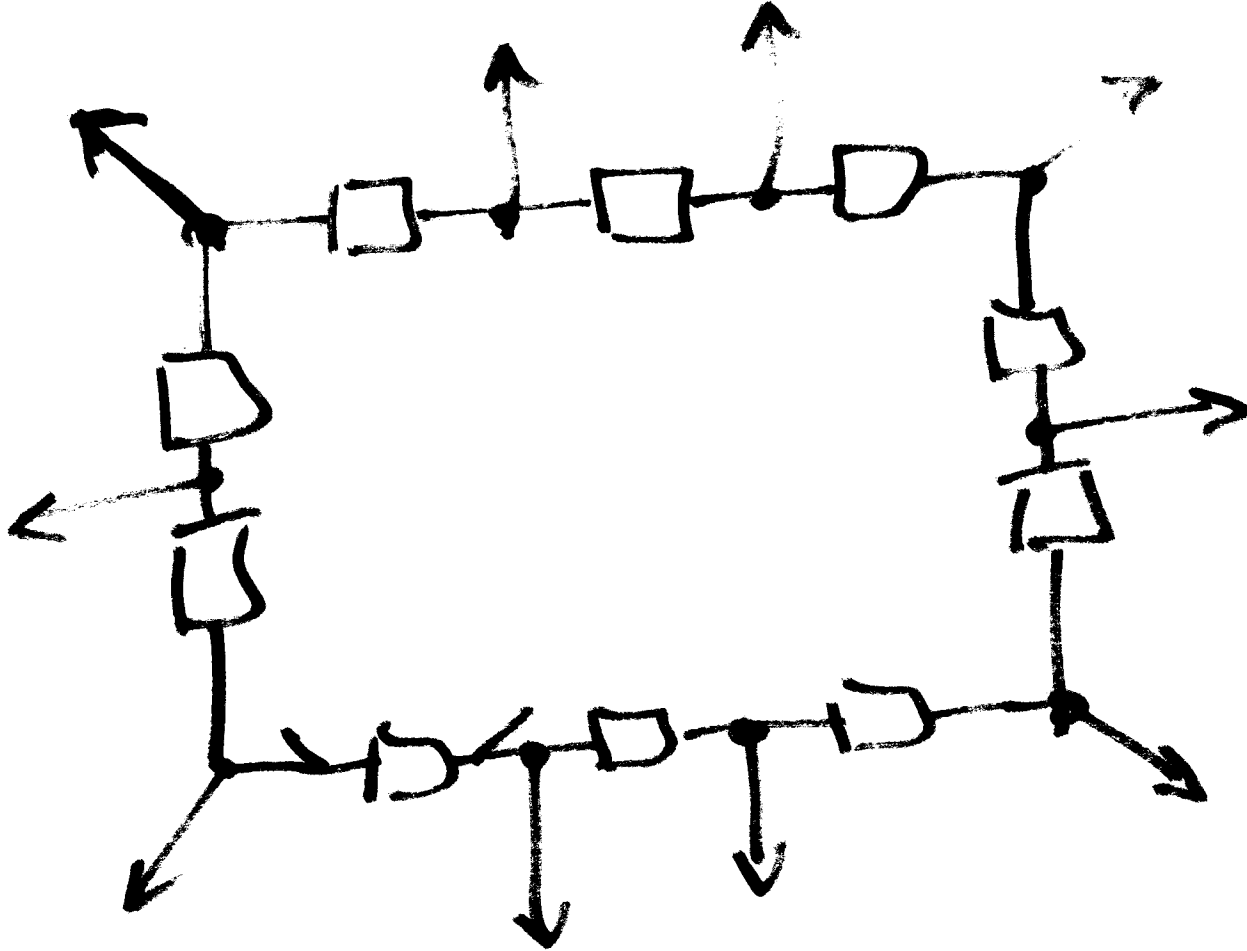
Main & Transfer - Fig. 10.3



Double-Bus Double Breaker

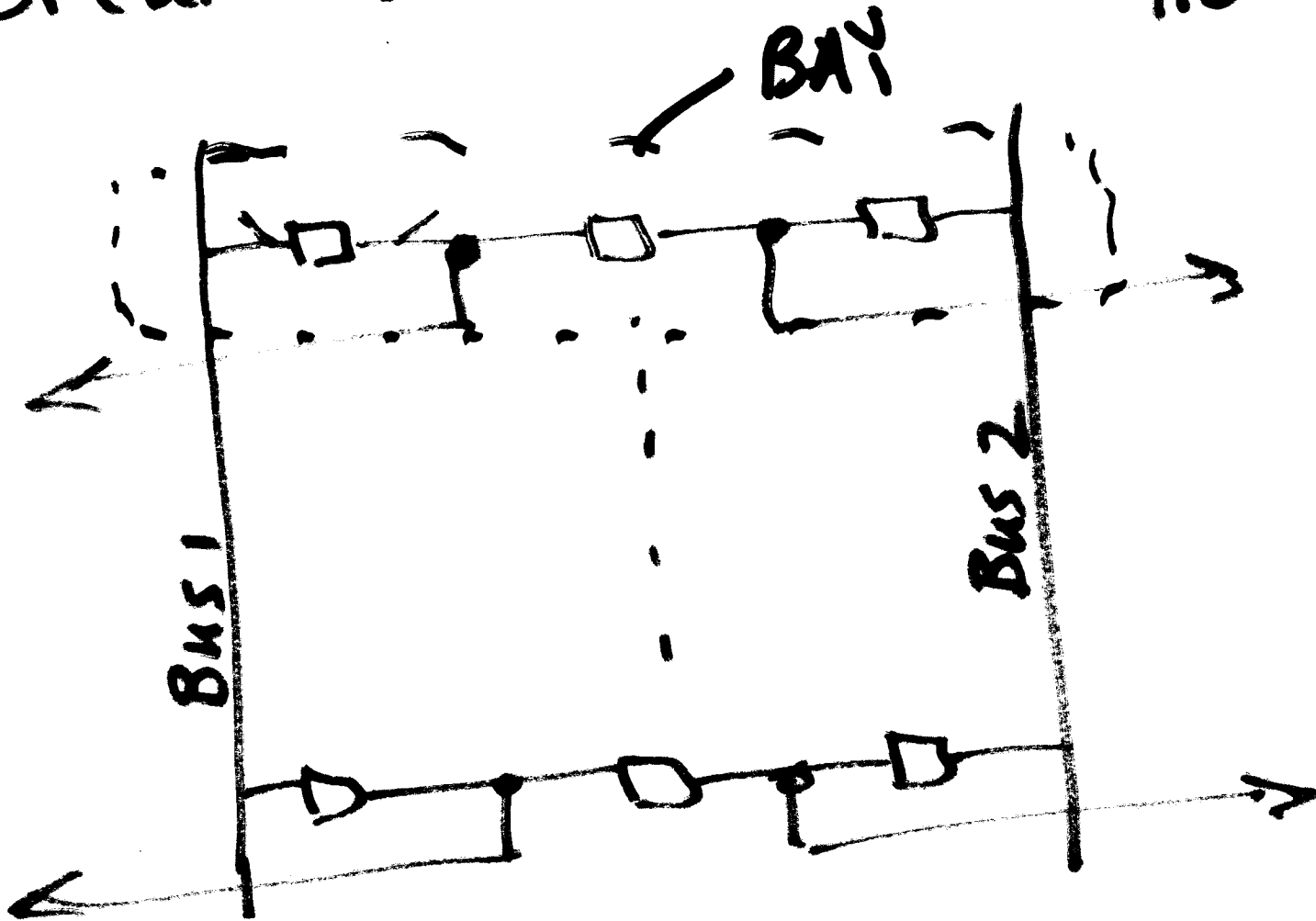


Ring Bus - One CB per circuit



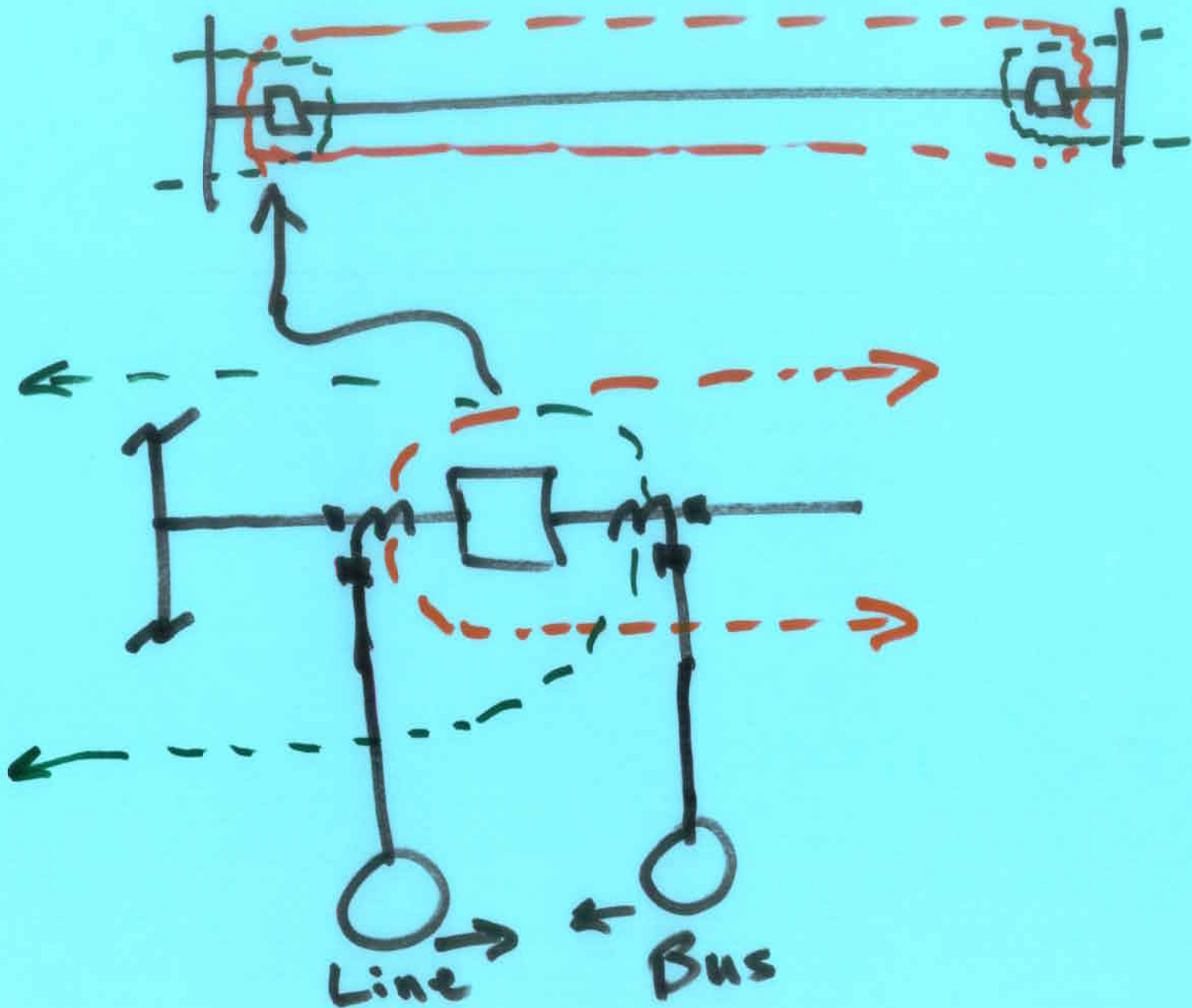
Breaker-and-a-half

1.5 CBs/Line

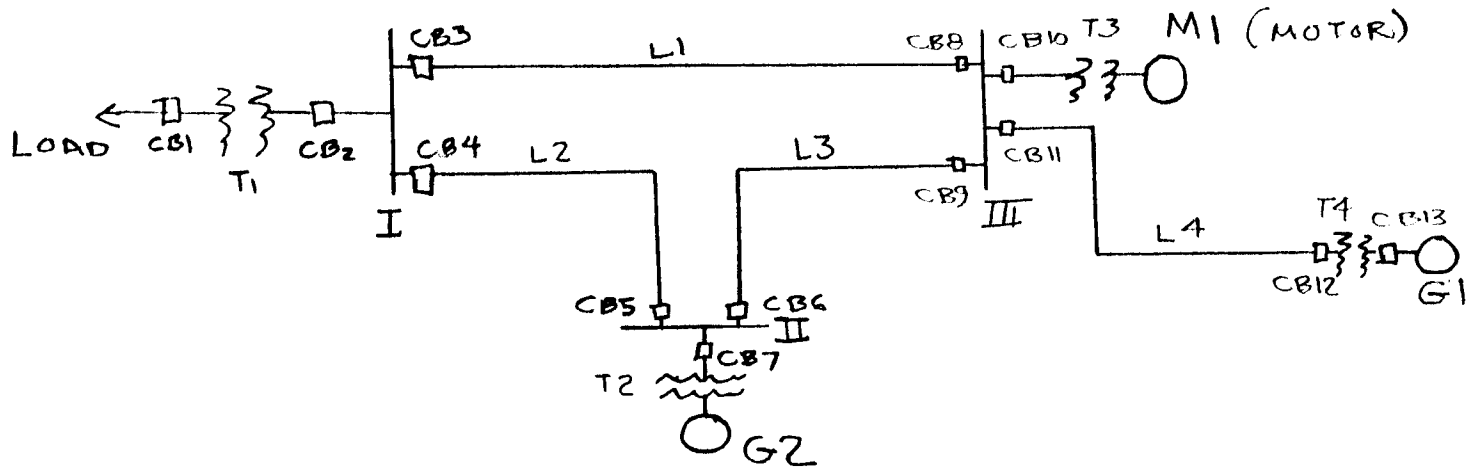


Breaker-and-a-third : 4 CBs/Bay

Zones of Protection



a) CIRCLE THE ZONES OF PROTECTION FOR THE FOLLOWING POWER SYSTEM



b) STATE WHICH CB'S TRIP FOR A FAULT AT:

- 1) L1
- 2) BUS III
- 3) G2
- 4) T4
- 5) BUS II
- 6) LOAD
- 7) M1

c) FOR A FAULT ON BUS I AND CB3 FAILS WHICH CB OPENS AS BACKUP

d) DOES CB2 NEED TO OPERATE FOR A BUS I FAULT

e) FOR A FAULT ON L4 WHICH CB'S BACK UP CB11

f) FOR A FAULT ON L2 WHICH CB'S BACK UP CB4

g) CB6 & 9 TRIP → WHERE WAS FAULT?

h) CB 6, 9, 8, 11 TRIP → WHERE WAS FAULT

i) CB2 TRIPS WHERE WAS FAULT

j) CB1 TRIPS WHERE WAS FAULT

k) CB7 TRIPS WHERE WAS FAULT

l) FOR A FAULT ON BUS III, WHICH CB'S

1) TRIP FIRST

2) IF THE ONES WHICH SHOULD TRIP FIRST DON'T WHICH ONES SHOULD TRIP NEXT.