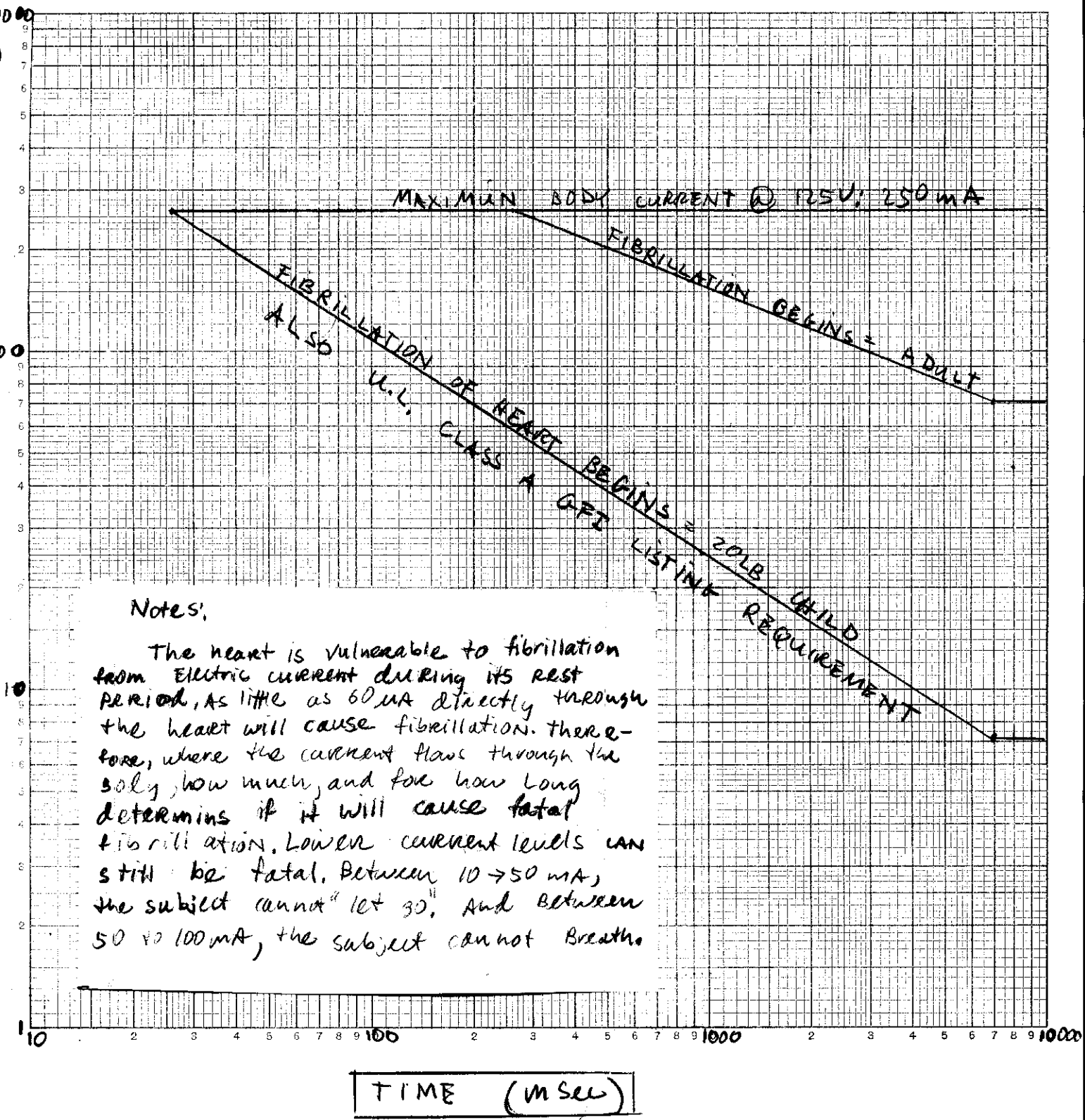
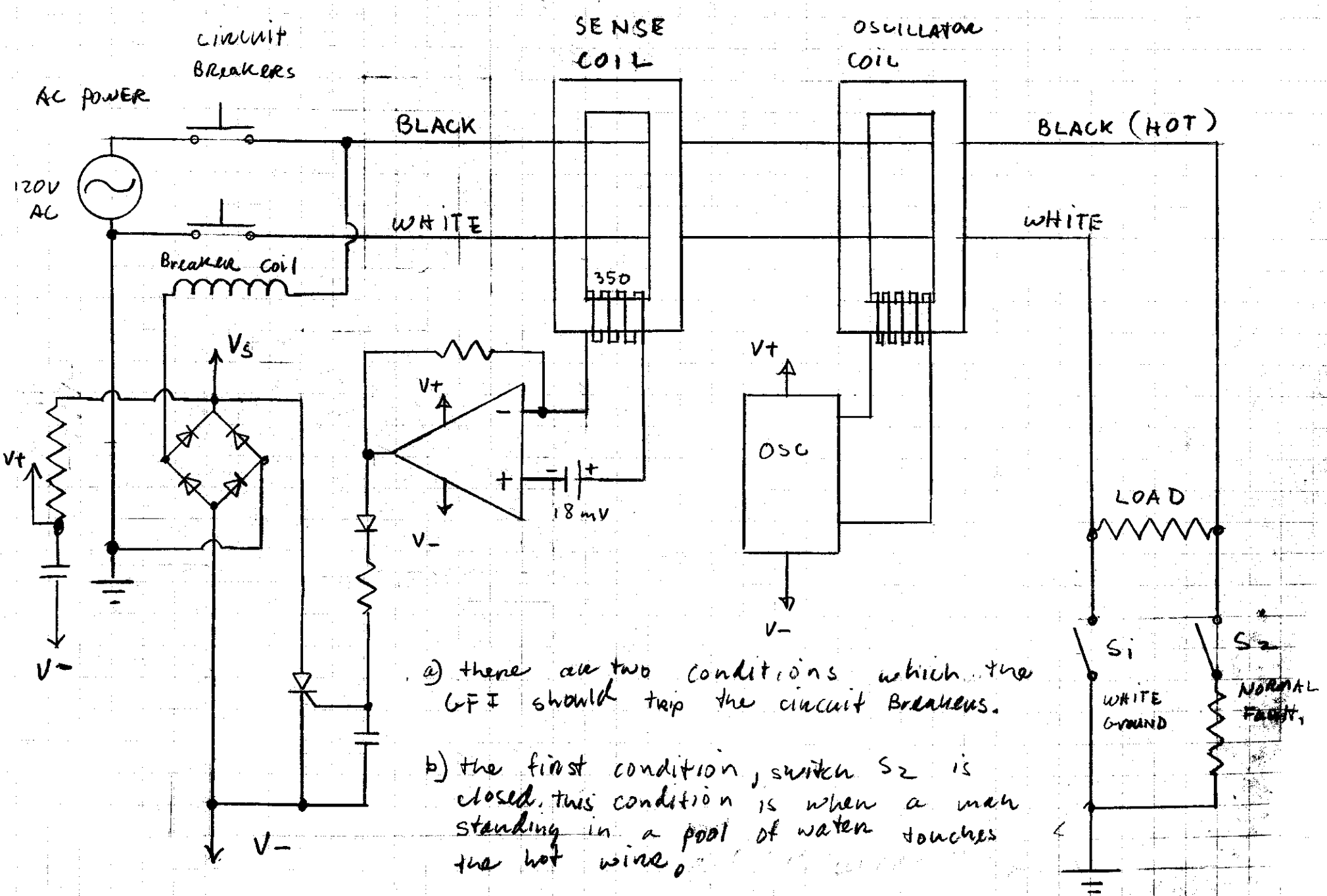


HEART FIBRILLATION AS RELATED TO FAULT CURRENT VERSUS TIME



Notes:

The heart is vulnerable to fibrillation from electric current during its rest period, as little as 60 mA directly through the heart will cause fibrillation. therefore, where the current flows through the body, how much, and for how long determines if it will cause fatal fibrillation. Lower current levels can still be fatal. Between 10 → 50 mA, the subject cannot let go. And between 50 to 100 mA, the subject cannot breathe.

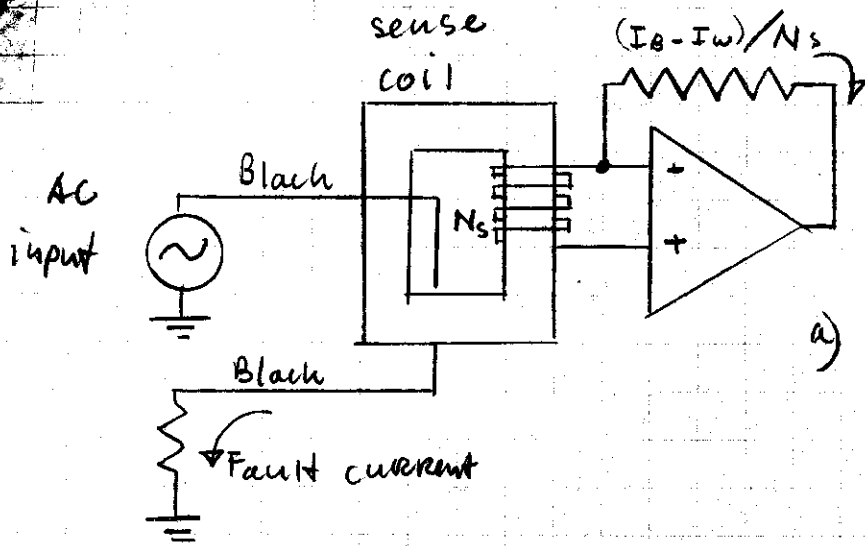


a) there are two conditions which the GFI should trip the circuit breakers.

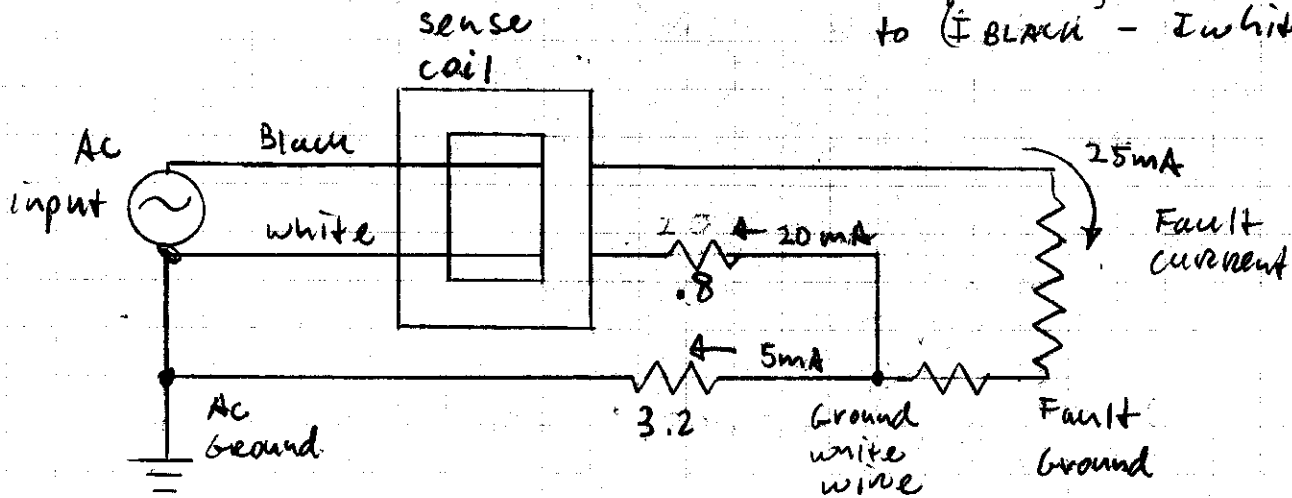
b) the first condition, switch S₂ is closed, this condition is when a man standing in a pool of water touches the hot wire.

c) the second condition is when the white wire is grounded. (S₁ is closed). Although this condition is not dangerous in itself, if S₁ and S₂ are both closed, the GFI will not operate.

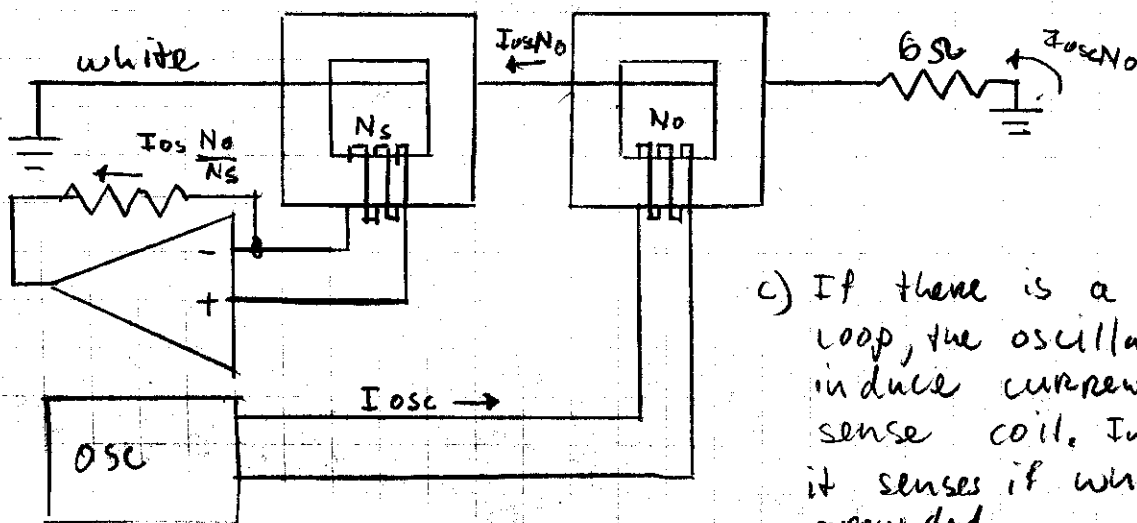
Parameter	Min	Max	Units	
1) Gain OPEN LOOP (circuit close loop gain 5k)	50k			
2) Input offset voltage (C set to 18mV)	-50	0	mV	✓
3) Input Bias Current		.8	uA	✓
4) Supply Line Rejection (change in sensitivity)		1%	%	add loop feedback Rejection
5) I _{output}	1		uA	
6) I _{in} threshold (13uA in circuit)	4.3 = 12.28 3.85 uA	5.7 16.2 6.3	uA	add loop
7) I _{in} max	12.3	200	uA	✓
8) Oscillator Freq	4	6	kHz	100% ✓
9) Oscillation Output (they decided on the chf)	8	10	Volts	100% ✓
10) Test conditions:				
a) Input voltage	10.2	13.2	Vac (rms)	
b) Power Resistor	15	27	uΩ	
c) Gain Resistor		680 ± 1%	uΩ	
d) Input transformer		350:1		
e) Oscillator Capacitor		.01 ± 1%	nF	



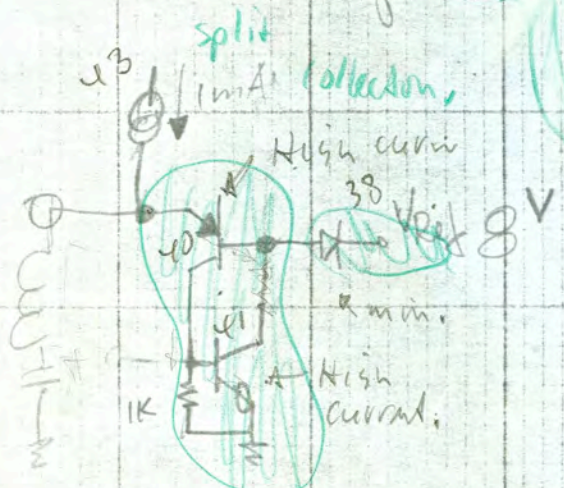
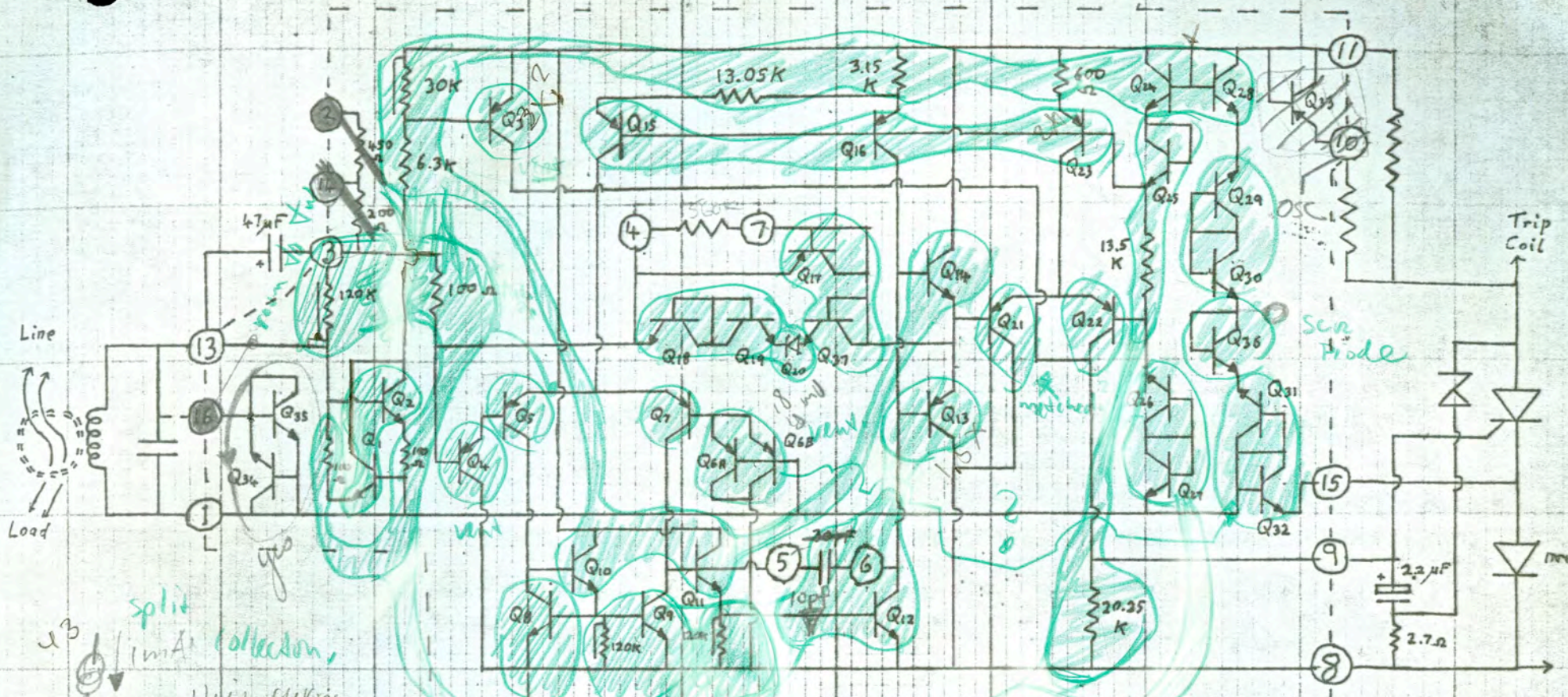
a) Fault current is from the Black (Hot) lead to ground, the sense coil acts as a transformer with the primary current equal to $(I_{BLACK} - I_{WHITE})$.



b) Suppose the GFI is set to trip at 5 mA ΔI through center of sense coil. If the white wire is grounded next to the ground of the fault current and if the ground of the white wire has "high" resistance to the ground of the AC input, then it is possible to need greater than 5 mA fault current to trip the GFI



c) If there is a ground loop, the oscillator can induce current in the sense coil. In this way it senses if white is grounded.



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GROUND FAULT INTERRUPTOR 1 OF 1

INTERDESIGN

BY *LB* DATE 2/15/74

ENGINEER *Brookshaw*

CUSTOMER PART MOA 354

REV. PART NO. MOA 354A

ORIG. PART NO. MOA 354

SCI Systems, Inc