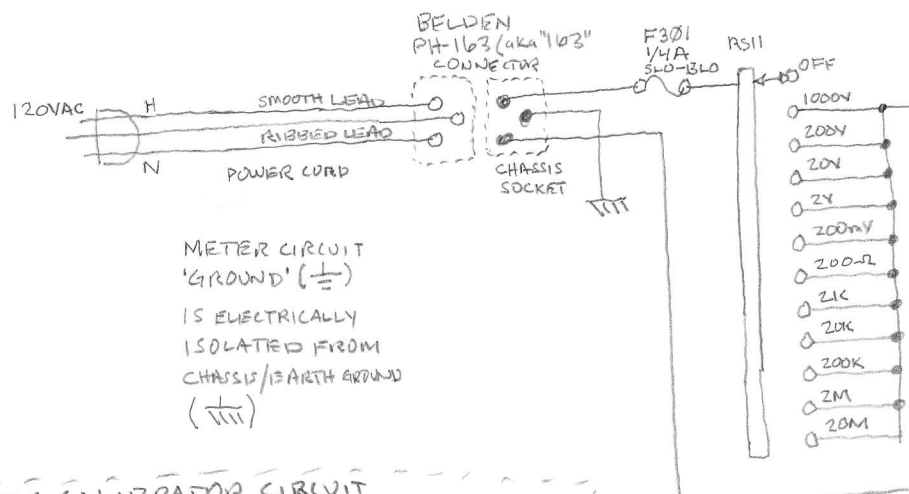
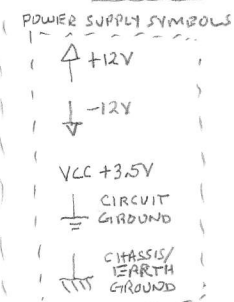
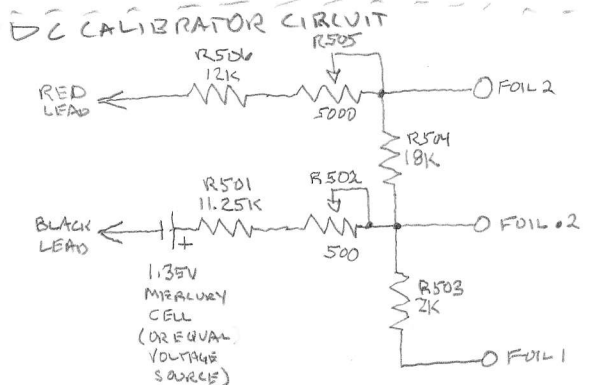


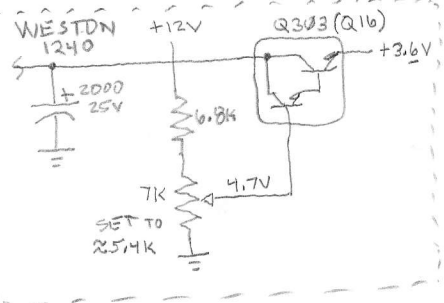
IM-102 POWER SUPPLY AND VOLTAGE CALIBRATOR CIRCUITS



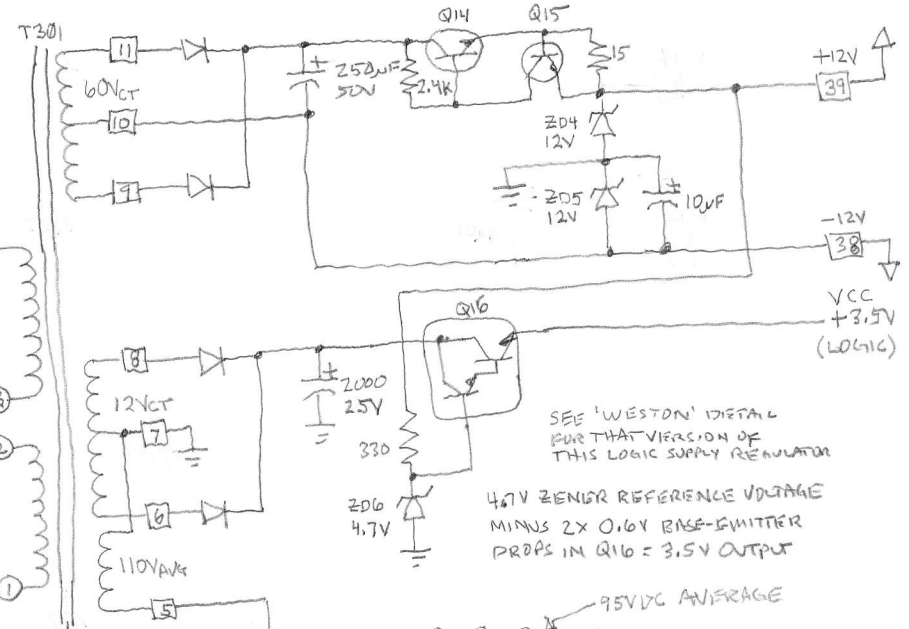
METER CIRCUIT 'GROUND' (⊖) IS ELECTRICALLY ISOLATED FROM CHASSIS/EARTH GROUND (⊕)



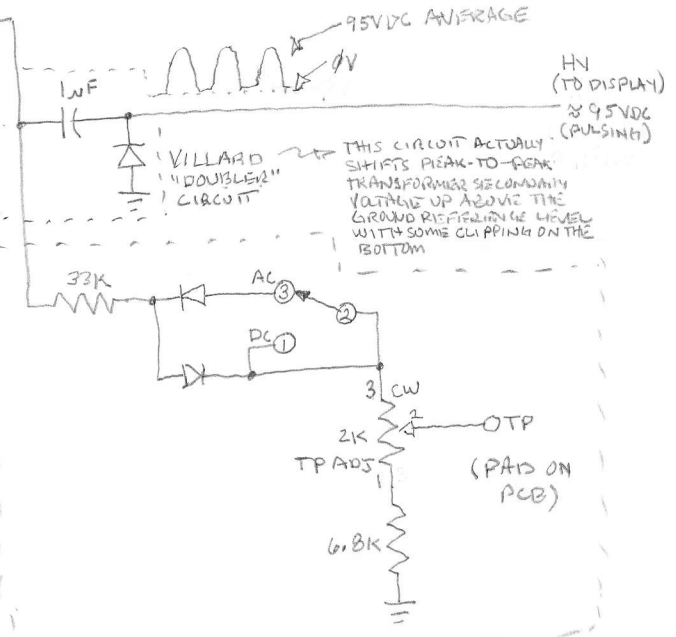
FOR OPERATION AT 240VAC, RS11 CONNECTS ONLY TO (4), NEUTRAL CONNECTS ONLY TO (1), AND A JUMPER CONNECTS (2) AND (3).



- THIS DC CALIBRATOR CIRCUIT IS NOT ON A PCB OF THE IM-102
- THE BLACK LEAD OF THE CALIBRATOR SERVES AS ITS ON/OFF SWITCH. THE 1.35V CELL IS CONNECTED INTO THE CIRCUIT WHENEVER THE 'BLACK LEAD' IS CLIPPED OUT 'FOIL 1' OF THE CALIBRATOR.
- R505 IS ADJUSTED AT THE FACTORY AND SEALED SO THAT EXACTLY 200mV APPEARS ACROSS R503, AND BETWEEN TERMINALS 'FOIL 2' AND 'FOIL 1'. THIS PROVIDES A STANDARD VOLTAGE FOR USE IN CALIBRATING THE METER'S 200mV RANGE.
- WITH THE CALIBRATOR BLACK LEAD DISCONNECTED, AND WITH ITS RED LEAD CONNECTED TO THIS 3.5V POINT ON THE METER'S MAIN PCB, R505 IS ADJUSTED SO THE DISPLAY READS 'OVER 4000' ON THE METER'S 200mV SCALE, WHICH MEANS EXACTLY 200mV. WHEN THIS CONDITION EXISTS, THE CURRENT THROUGH R503, R504, R505 AND R506 WILL PRODUCE A 2VOLT DROP ACROSS R503 AND R504, AND CALIBRATOR FOILS 1 AND 2. THIS VOLTAGE DROP IS USED AS A STANDARD TO ADJUST THE '2VFS' TRIM POT FOR A METER DISPLAY OF 'OVER 4,000'

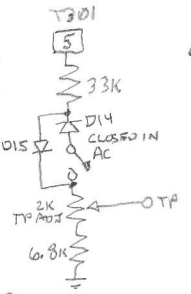


SEE 'WESTON' DIGITAL FOR THAT VERSION OF THIS LOGIC SUPPLY REGULATOR
4.7V ZENER REFERENCE VOLTAGE MINUS 2X 0.6V BASE-EMITTER DROPS IN Q16 = 3.5V OUTPUT



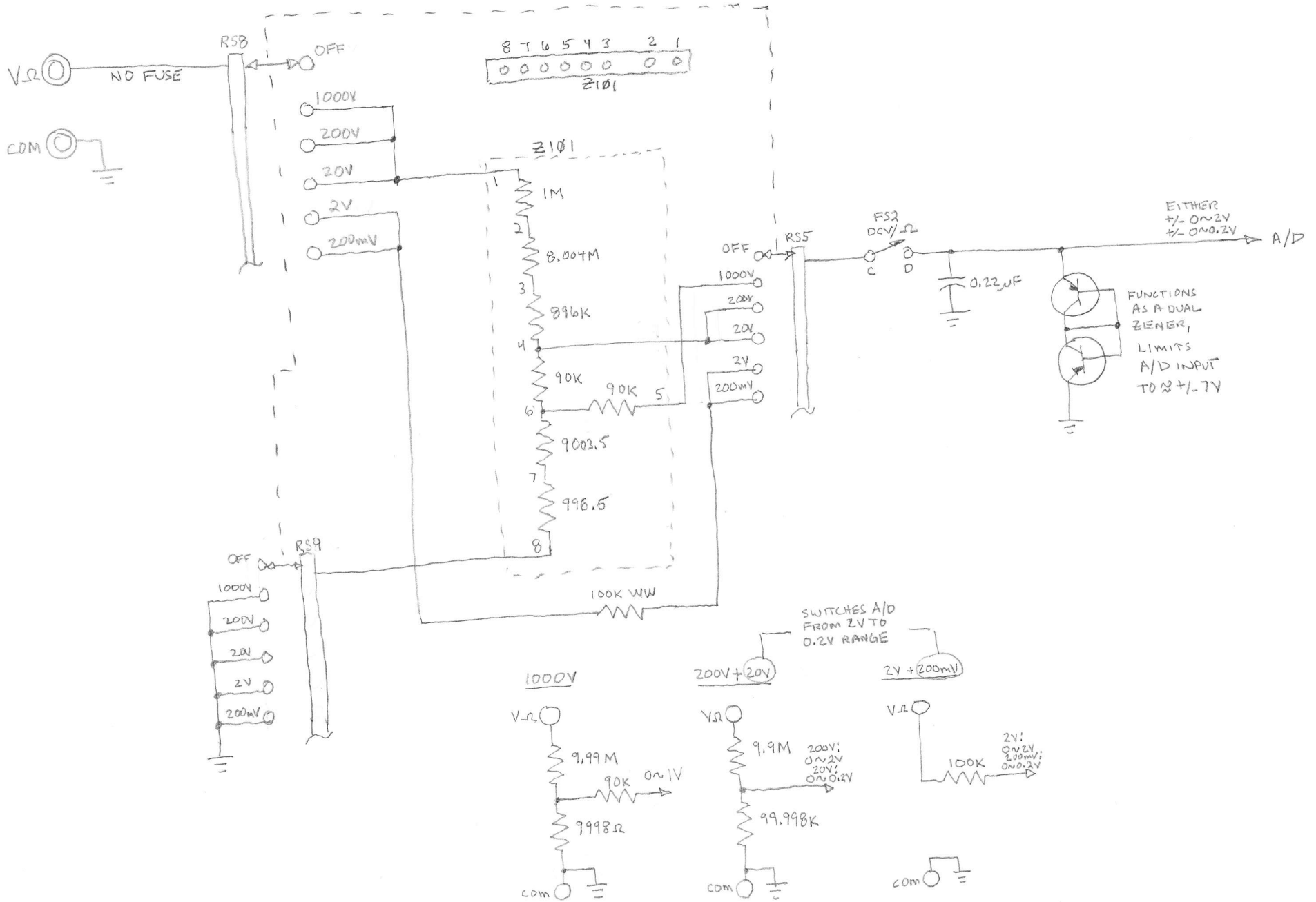
AC CALIBRATE CIRCUIT

- CONTINUED FROM LOWER PAGE WITH THE AC/DC SWITCH IN 'AC' POSITION, D14 IS CONNECTED TO THE DC VERSION OF THE CIRCUIT, MAKING A FULL-WAVE RECTIFIER, AND THE TP VOLTAGE IS DOUBLED AT 19.98+RMS. THE 'AC ADJ' CONTROL ON THE AC CONVERTER PCB IS ADJUSTED FOR A DISPLAY OF "OVER 40.00"

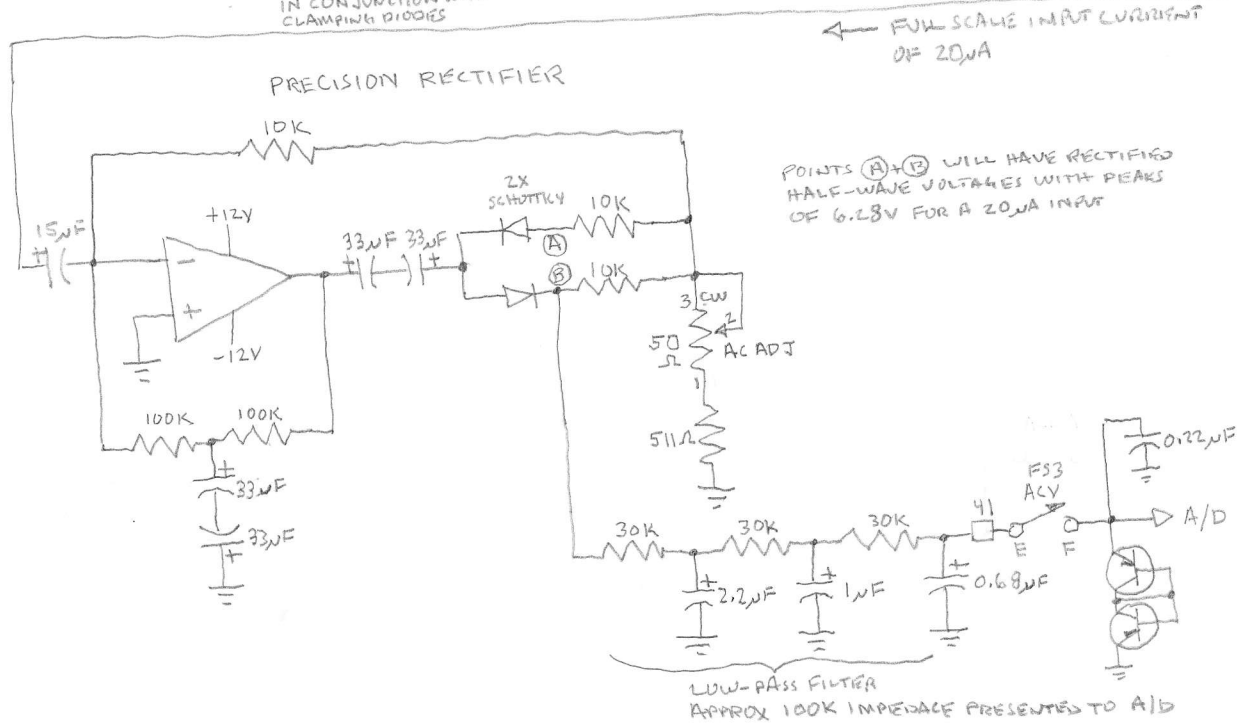
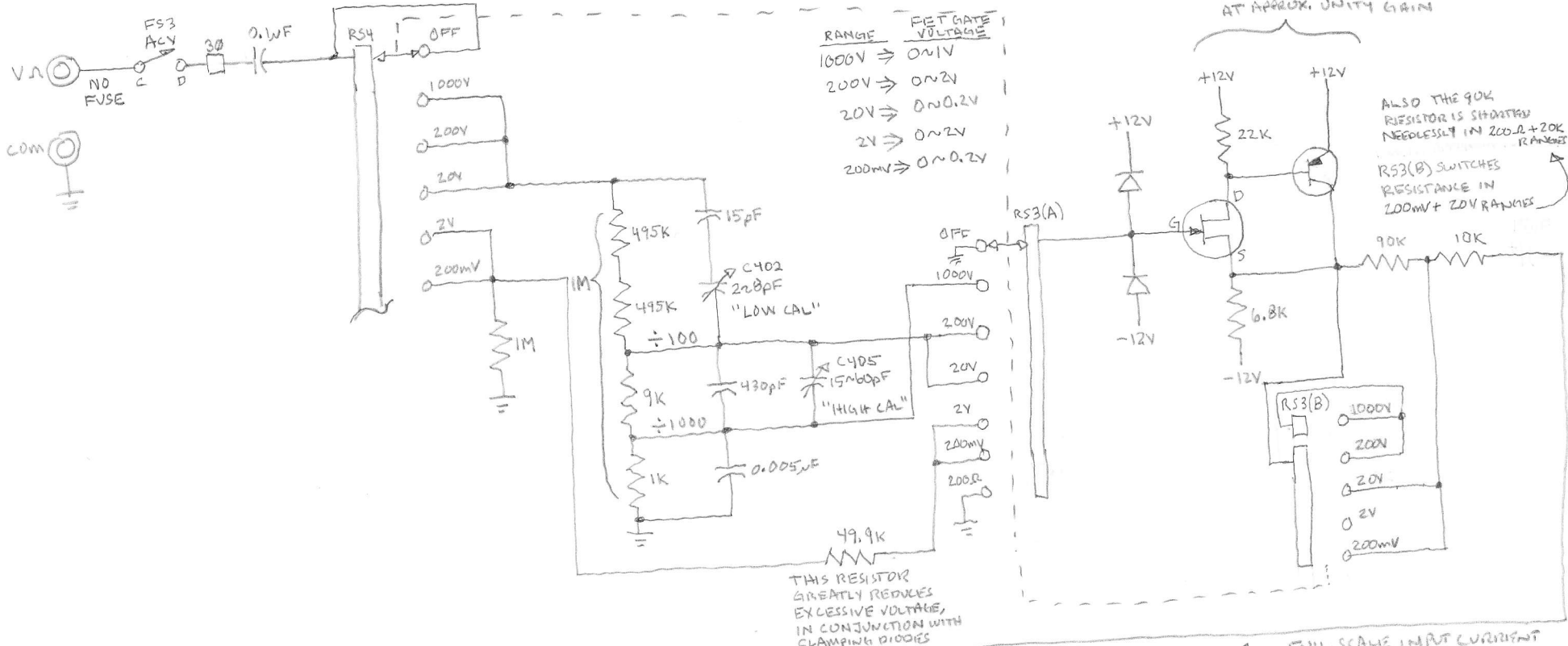


- WHEN METER FUNCTION SWITCH 'FS' IS IN THE DC/V/A POSITION, THE METER WILL DISPLAY THE AVERAGE VALUE OF A HALF-WAVE VOLTAGE. WITH THE AC/DC SWITCH IN 'DC' POSITION, THE 'TP ADJ' IS SET TO DISPLAY +9.99. THIS IS THE AVERAGE VALUE OF THE HALF-WAVE SIGNAL FROM THE WINDING OF T301, RECTIFIED BY D15, BY FORMULA RMS = 1.11 X AVERAGE V, THE 9V AVERAGE IS EQUIVALENT TO 9.99 + VRMS.
- CONTINUED AT LEFT

IM-102 DC VOLTAGE FRONT END

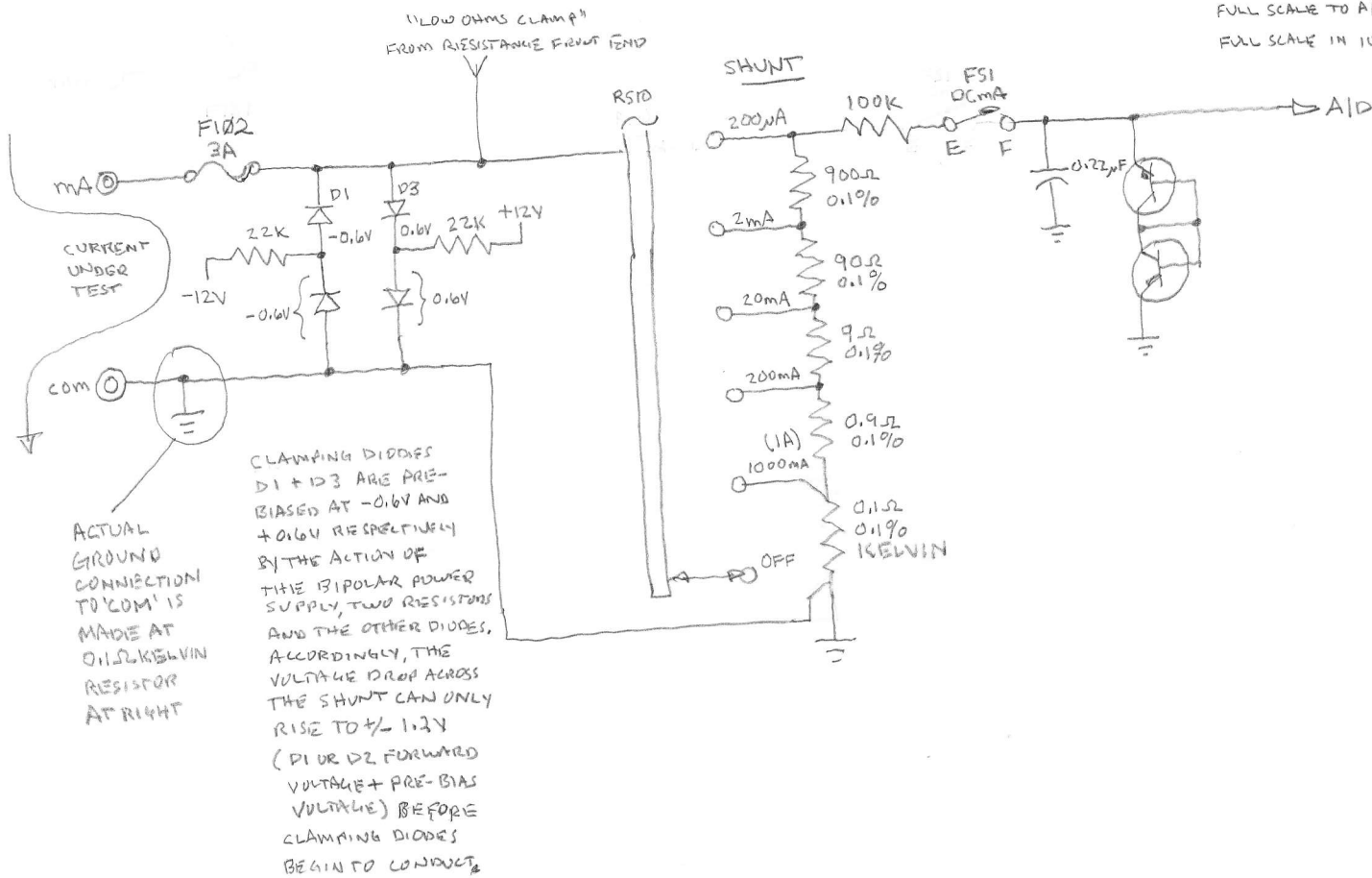


IM-102 AC VOLTAGE FRONT END
 - CIRCUIT MOSTLY ON AC CONVERTER PCB -

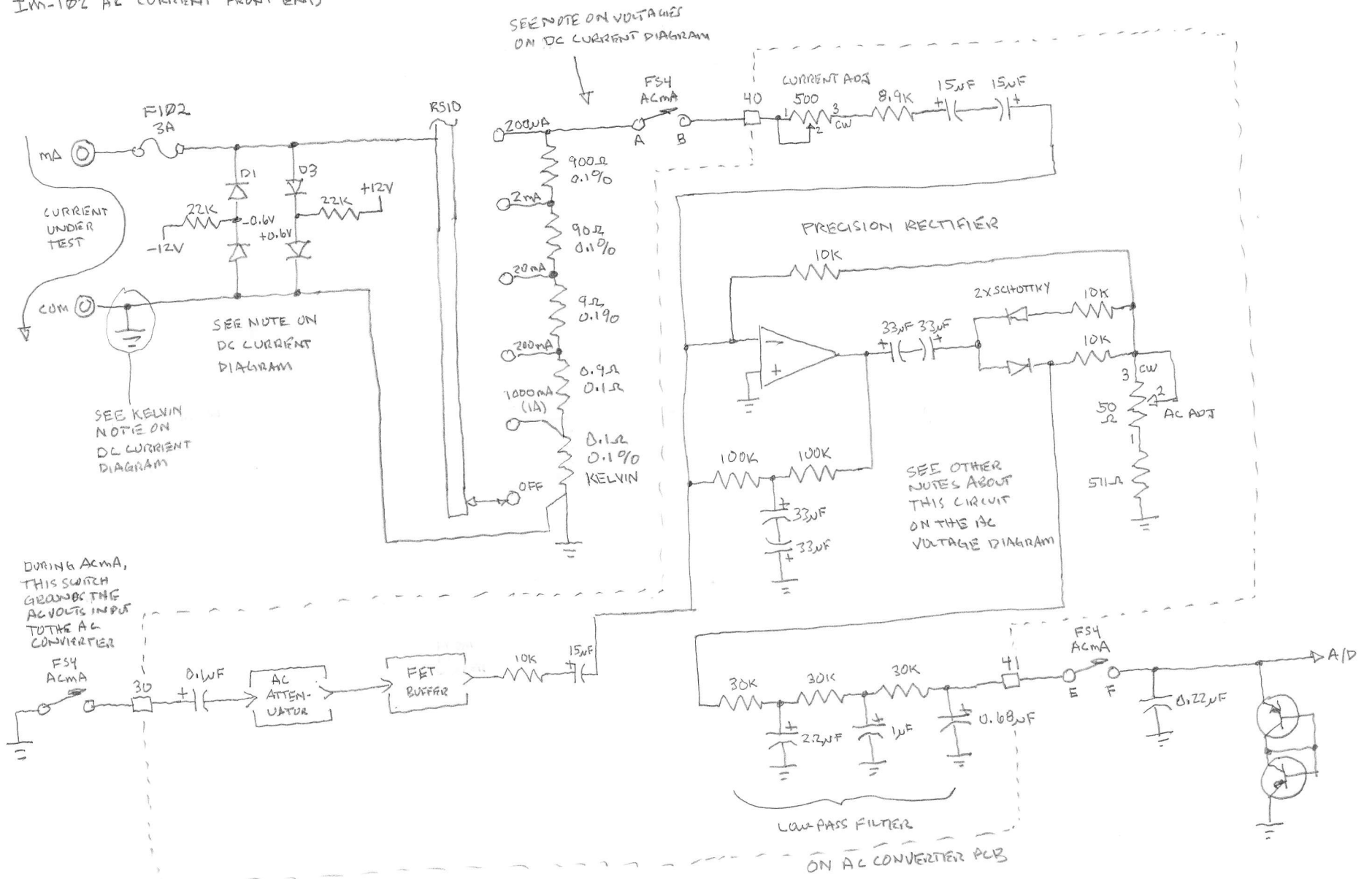


IM-102 DC CURRENT FRONT END

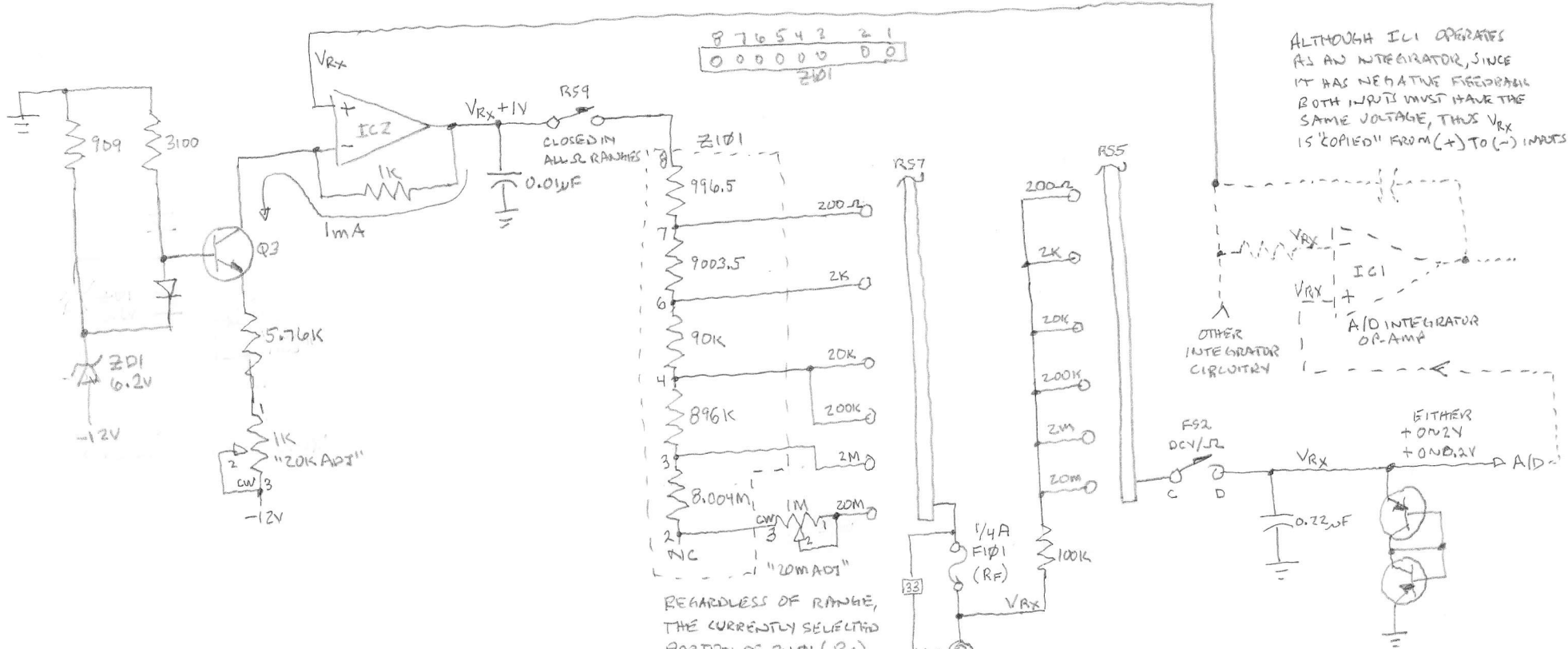
ALL RANGES EXCEPT 1000mA (1A)
 FULL SCALE TO A/D = 0.2V
 FULL SCALE IN 1000mA = 0.1V



IM-102 AC CURRENT FRONT END



IM-101 RESISTANCE (OHMS) FRONT END



ALTHOUGH IC1 OPERATES AS AN INTEGRATOR, SINCE IT HAS NEGATIVE FEEDBACK BOTH INPUTS MUST HAVE THE SAME VOLTAGE, THUS V_{RX} IS 'COPIED' FROM (+) TO (-) INPUTS

REGARDLESS OF RANGE, THE CURRENTLY SELECTED PORTION OF Z101 (R_S) WILL ALWAYS HAVE IN DROPPED ACROSS IT WHILE IN OHMS FUNCTION

OHMS TEST CURRENT (CURRENT THROUGH R_X)

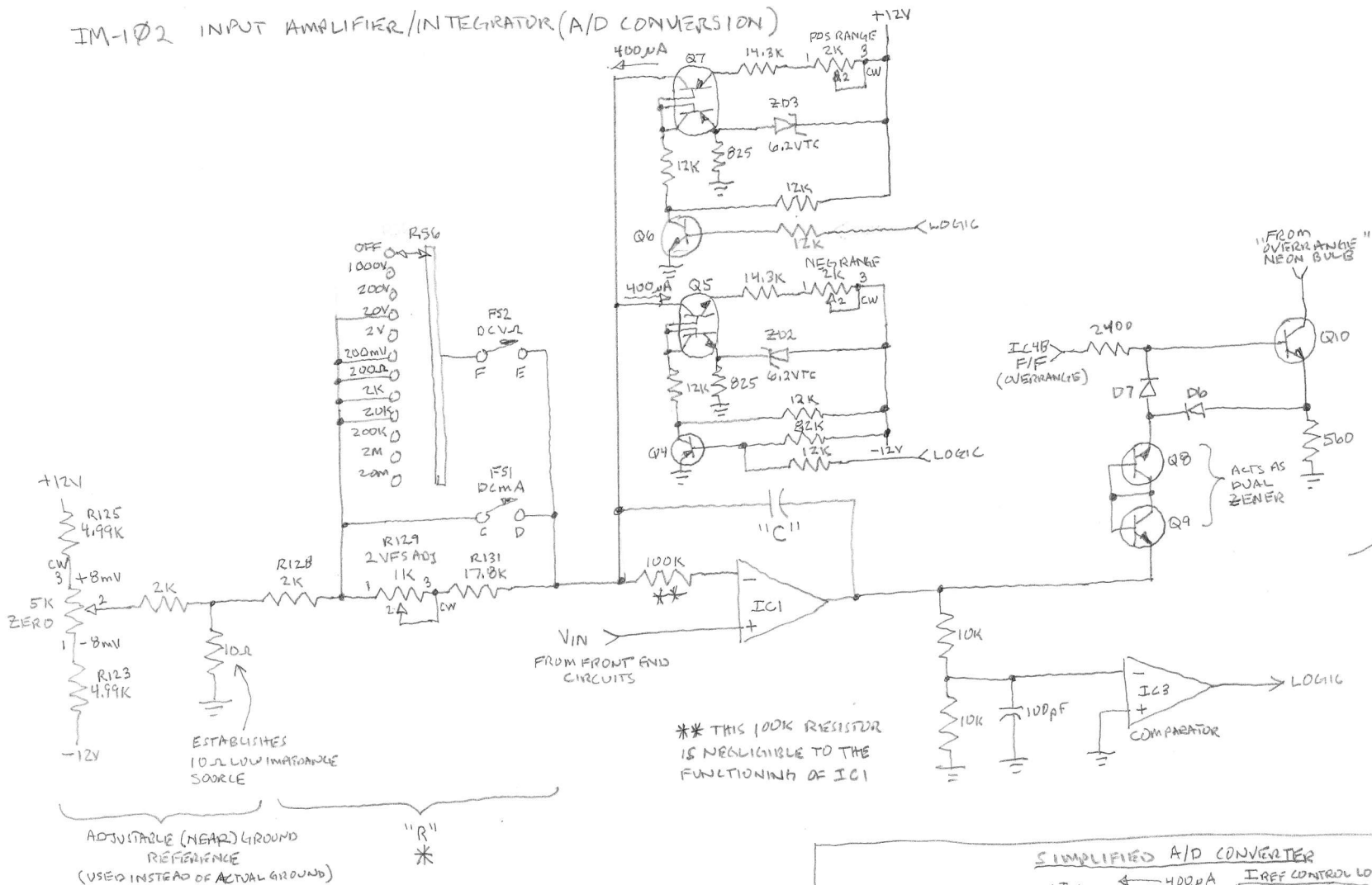
RANGE	$R_{Z101} + R_F$	TEST CURRENT
200Ω	1k	1mA
2k	10k	100μA
[20k 200k]	100k	10μA
2M	≈ 990k	1μA
20M	≈ 9910M	100nA

R_{Z101} VALUES ADJUSTED (REDUCED) IN 2M + 20M RANGES TO COMPENSATE FOR INCREASING SIGNIFICANCE OF CURRENT FLOWING INTO/OUT OF IC2 (-) INPUT

"LOW OHMS CLAMP" TO DC CURRENT FRONT END

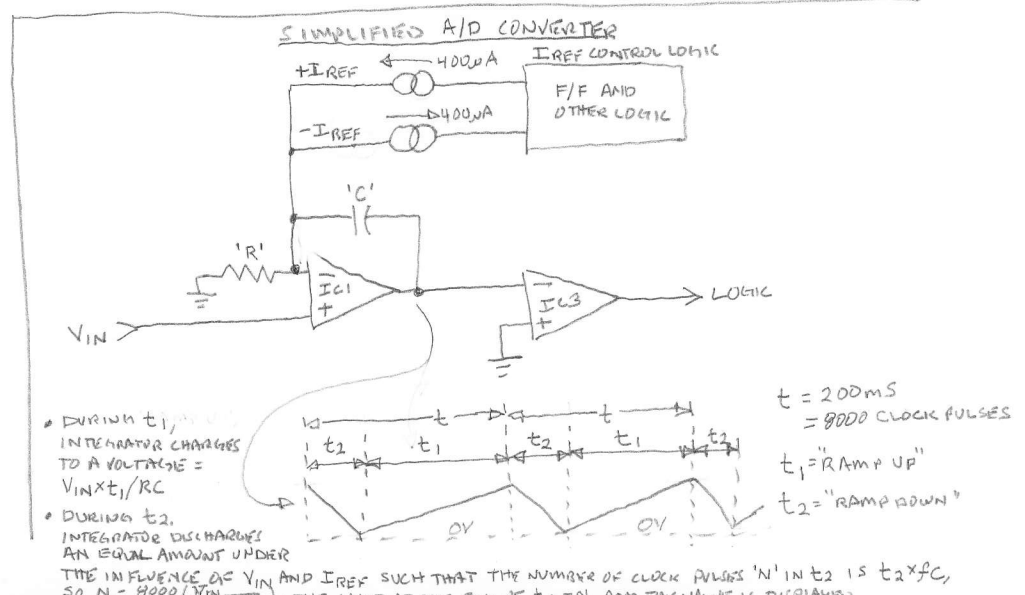
IN TWO OHMS RANGES WHERE VOLTAGE DROP ACROSS R_X CAN BE SIGNIFICANT, THE DCμA CLAMPING CIRCUIT IS ADDED FOR EXTRA PROTECTION

IM-102 INPUT AMPLIFIER/INTEGRATOR (A/D CONVERSION)



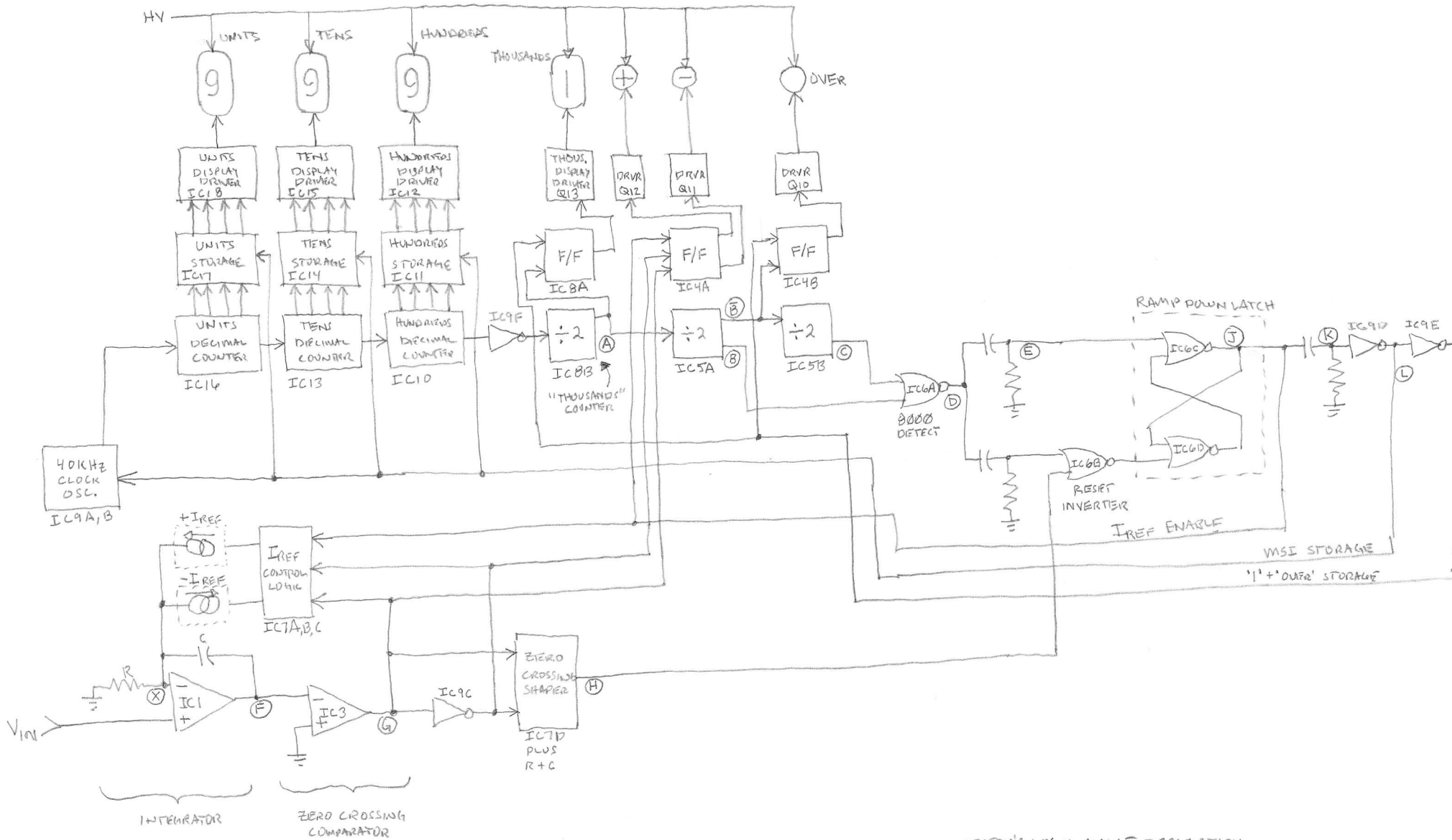
UNDER SOME CONDITIONS NORMAL 'OVERRANGE' LOGIC MIGHT NOT DETECT THE CONDITION. IF IC1 OUTPUT GOES SUFFICIENTLY HIGH OR LOW (+ OR -), THEN VIRTUAL ZENERS Q8+Q9 WILL CONDUCT, FORWARD BIASING D7 AND FORCING Q10 TO TURN ON, OR BIASING D6 ON AND PULLING Q10 EMITTER LOWER, FORCING IT TO CONDUCT, IN EITHER CASE TURNING ON THE 'OVERRANGE' LAMP.

* THE '2VFS' TRIM ADJ R129 IS ADJUSTED TO 200Ω, SO R129 + R131 = 18K. THIS, PLUS R128, = 20K, THUS "R" = 20K, SETTING THE A/D CONVERTER RANGE = ±1.2V. WHEN FS1 (DCMA) OR R56 + FS2 SHORT OUT (R129 + R131), "R" CHANGES FROM 20K TO 2K, SETTING THE A/D CONVERTER RANGE = ±0.2V.



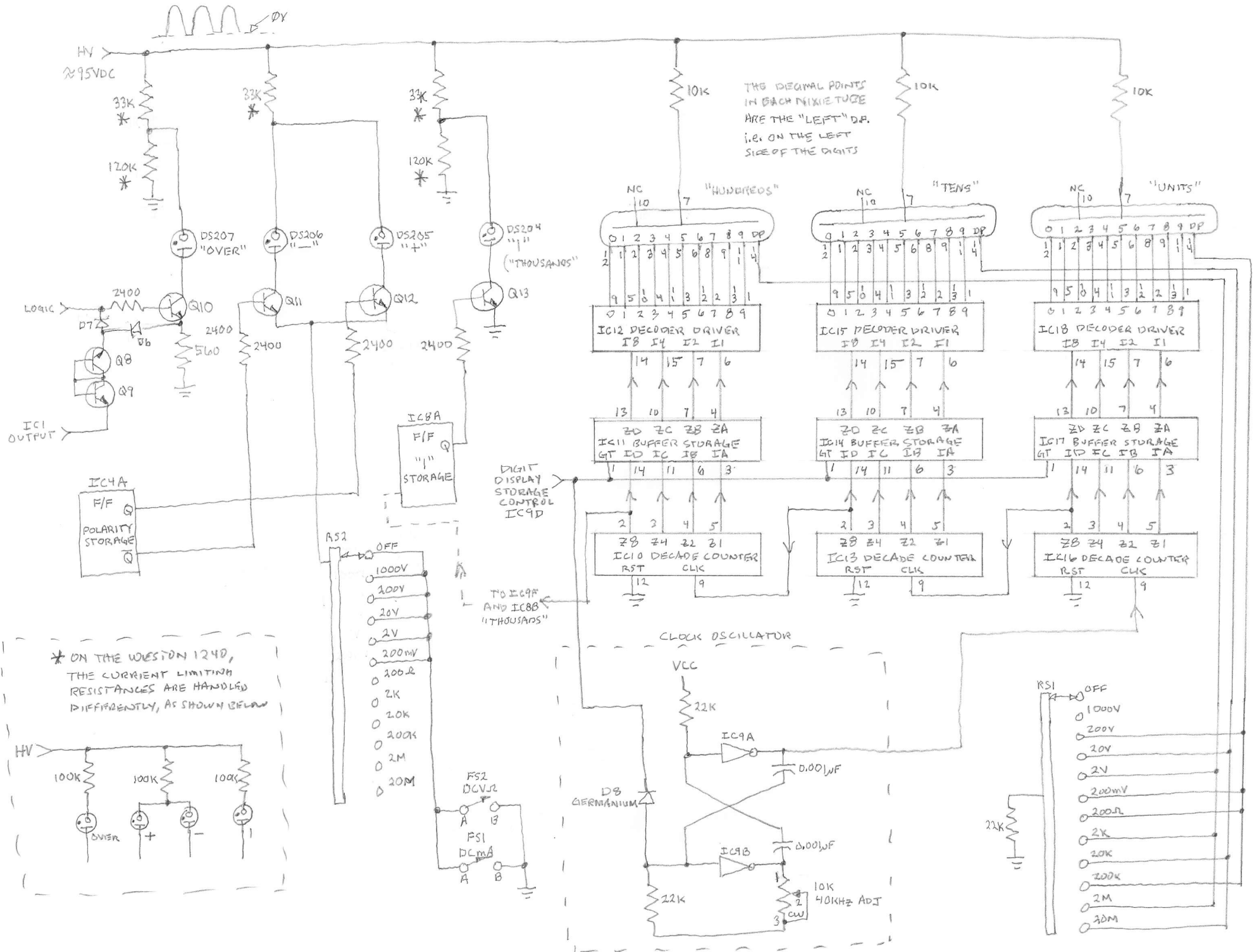
IM-102 (Weston 1240) Logic Block Diagram

LOGIC COMPONENT DESIGNATIONS SHOWN ARE FOR THE IM-102, NOT FOR THE 1240.



LETTERS IN CIRCLES, e.g. (A) ARE POINT REFERENCES USED IN WESTON'S LOGIC CIRCUIT DESCRIPTION

LM-102 HV NIXIE + NEON DISPLAYS AND DRIVERS AND CLOCK OSCILLATOR



* ON THE WIREION 124D, THE CURRENT LIMITING RESISTANCES ARE HANDLED DIFFERENTLY, AS SHOWN BELOW

