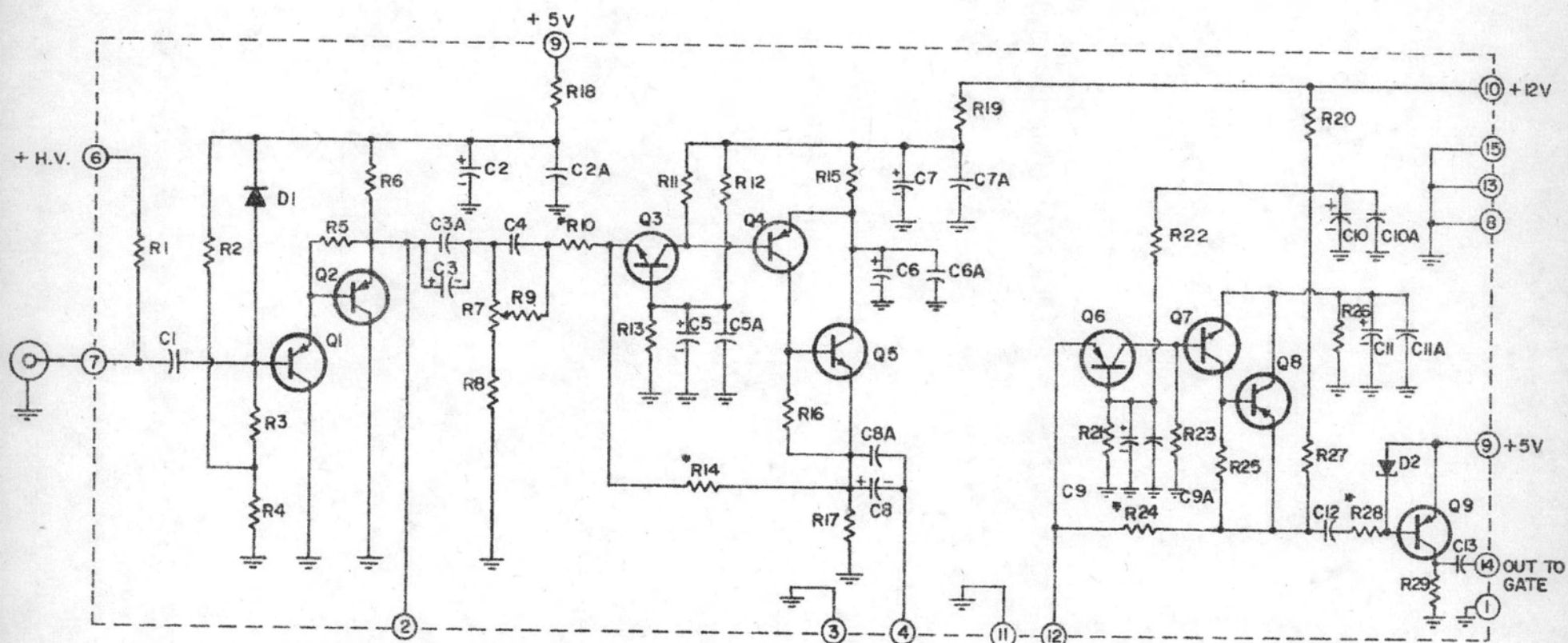


## 2. GENERAL DESCRIPTION OF UP/DOWN PORTABLE SCALER

The UP/DOWN Portable Scaler is a solid-state light weight counting instrument. The introduction of microcircuits into the design has made the scaler more compact and easy to maintain. The unit is powered by a 12 V rechargeable battery power supply with charging capacity of 2 AH. Thus with a current drain of 900 to 950 mA the scaler can be powered continuously at least two hours before recharging of the battery is required.

The unit supplies power to all electronic functions essential for nuclear radiation detectors. The high voltage supply is highly stable through the use of gas discharge voltage regulator and its value depends on the type of the regulator employed in the high voltage supply.

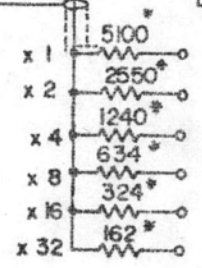
To make the scaler more versatile, the unit is equipped with two separate inputs with different types of connectors, allowing the scaler to be used with long cable detector with preamplifier and cable driver usually encountered in field work as well as detectors without preamplifier normally used in laboratory experiments. The unit has a sensitivity of 2 to 50 mV, suitable for operation with scintillation, proportional and Geiger-Müller counters.



- R1 - 1M 0.5W
- R2 - 56K
- R3, R5 - 100K
- R4 - 18K
- R6, R16, R25 - 1.8K
- R7, R28 - 1K
- R8 - 10K
- R9 - 220
- \*R10 - 255
- R11, R23 - 47K
- R12, R21 - 47K

- R13, R22 - 30K
- \*R14, R24 - 5.1K
- R15, R17, R26, R27 - 390
- R18, R20 - 100
- R19 - 120
- R29 - 3.3K
- \* 1% RESISTOR
- ALL RESISTOR ARE 5% 1/8 W

- Q1, Q2 - 2N3906
- Q3, Q5, Q7 - MPS 3706
- Q4, Q6, Q8 - MPS3702
- Q9 - 2N404A
- D1 - IN4009
- D2 - IN3712



- C1 - 001/6KV
- C2, C5, C6, C9, C11 - 22/15
- C2A, C3A, C7A, C10A - 2.2/25
- C3, C8 - 6.8/35
- C4, C5A, C8A, C8AC9A, C11A - 0.1/25
- C7, C10 - 47/20
- C12 - 0.1/50
- C13 - 390PF

Fig. 3.1 PREAMPLIFIER - AMPLIFIER & DISCRIMINATOR

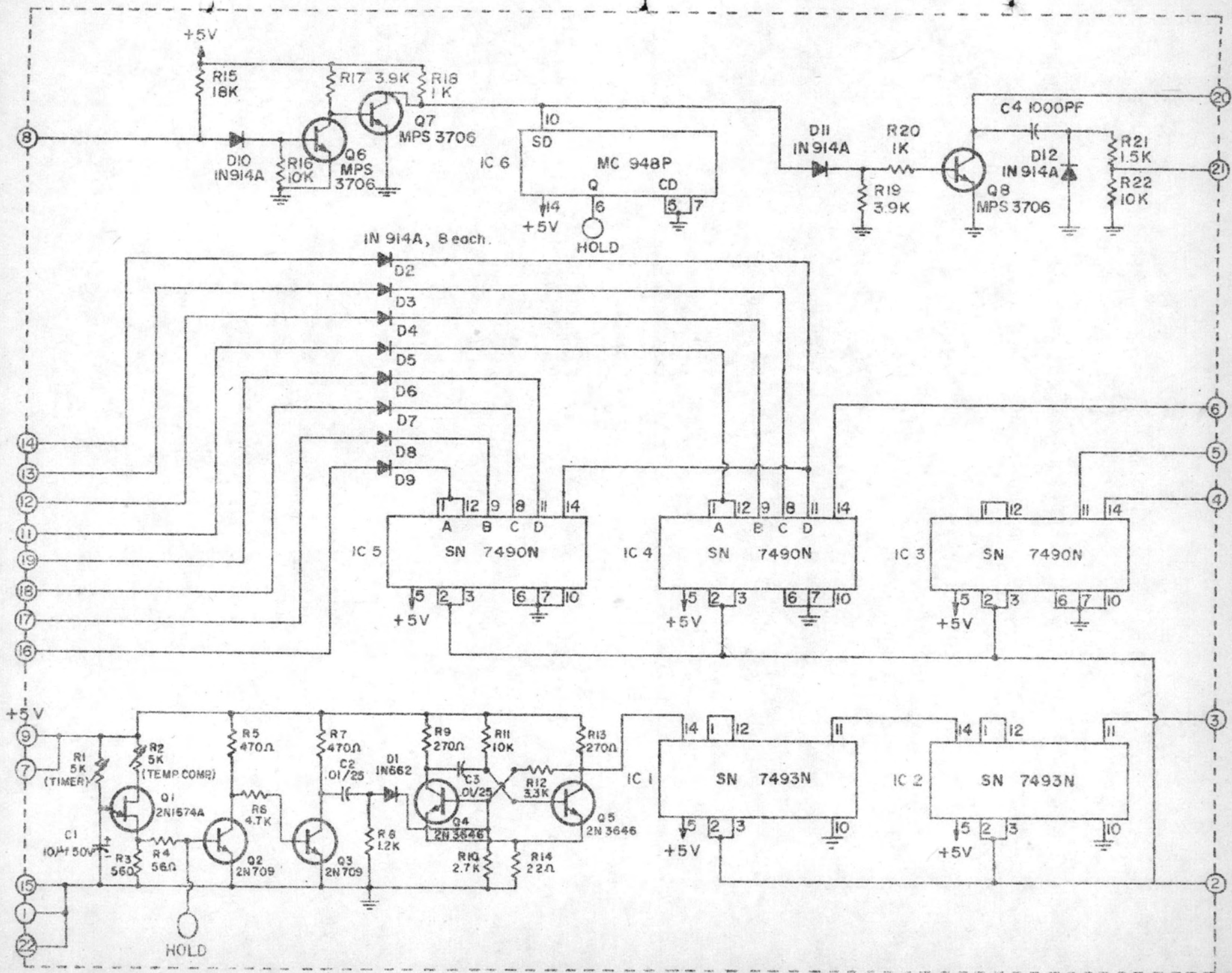


Fig. 3.2 TIMER & GATE

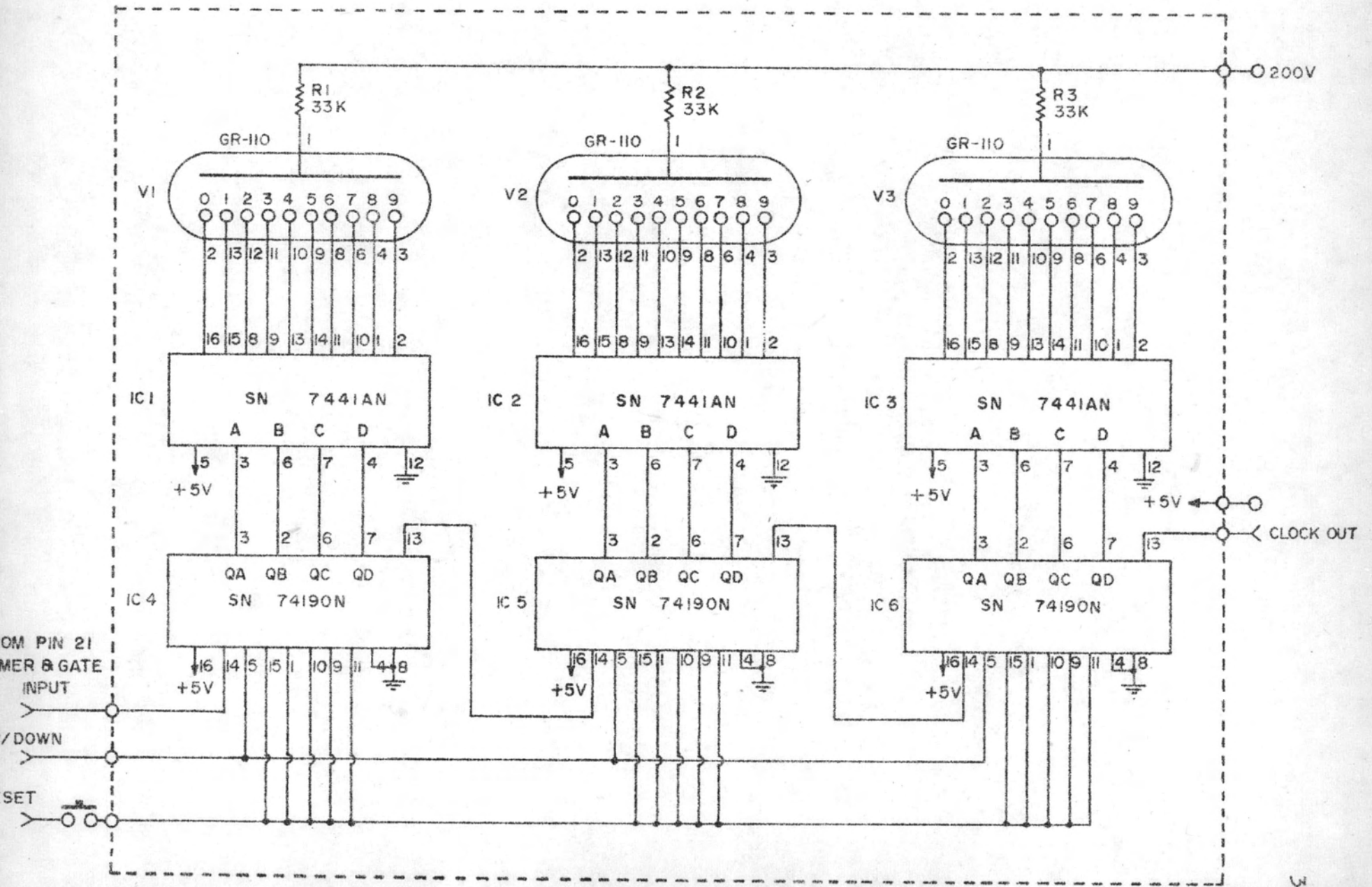
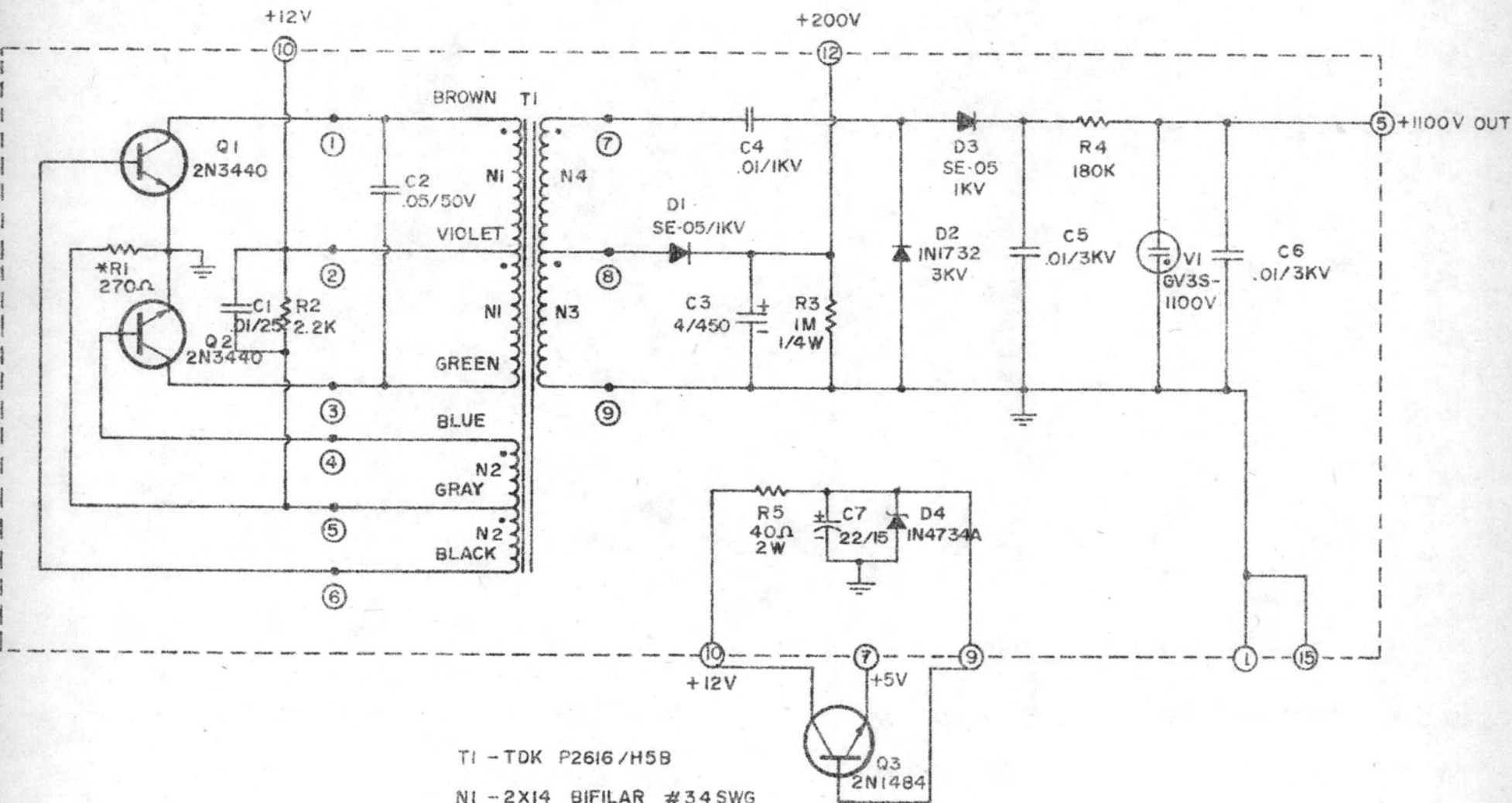


Fig. 3.3 SCALER & DISPLAY



T1 - TDK P2616/H5B

N1 - 2X14 BIFILAR #34 SWG

N2 - 2X16 BIFILAR #34 SWG

N3 - 350 #42 SWG

N4 - 550 #44 SWG FOR 1100V OUTPUT

\* SELECTED TO GIVE BEST PERFORMANCE

Fig.3.4 H.V. SUPPLY & 5V REGULATED SUPPLY