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AN EFFICIENT ELECTROMECHANICAL COUNTER CIRCUIT

Ronald Zane

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AN EFFICIENT ELECTROMECHANICAL COUNTER CIRCUIT

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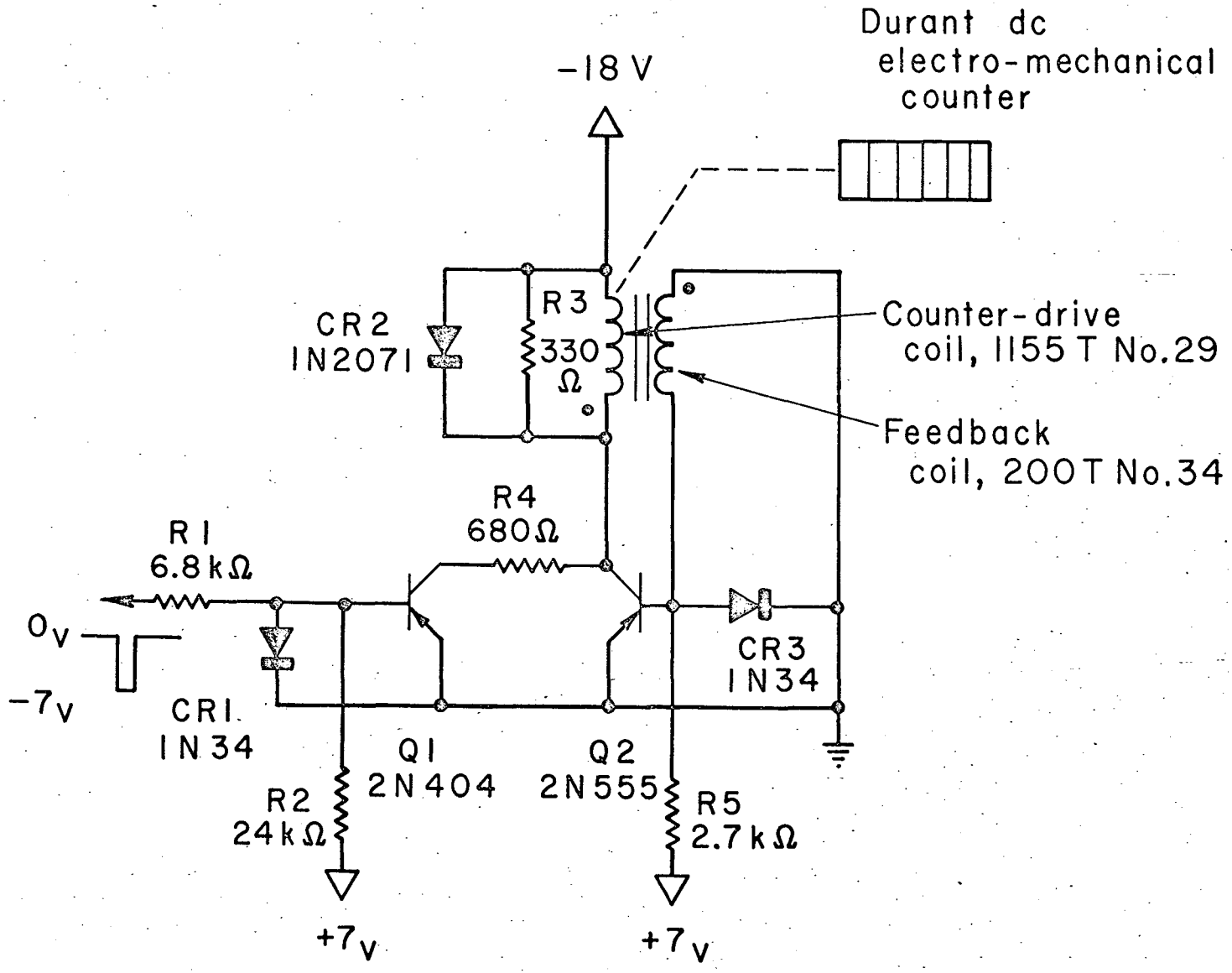
A simple and efficient circuit is needed to drive an electromechanical counter from the overflow output of a scaler in a nuclear-counting instrument. The circuit shown (Fig. 1) is designed to operate on the output pulse from a saturating flip-flop, but it could be driven from any low-power pulse source.

A feedback winding of 200 turns of No. 34 Formvar-insulated copper wire was superimposed on the counter-drive coil bobbin (1155 turns of No. 29) in a Durant dc electromechanical counter. The driver circuit thus consists of a simple blocking oscillator circuit.

Resistor and diode combinations R2/CR1 and R5/CR3 provide turn-off bias for Q1 and Q2, respectively. Additionally, CR1 and CR3 provide dc restoration at the bases of Q1 and Q2. A negative 7-V pulse applied to the input resistor, R1, causes a triggering current of about 20 to 35 mA to be drawn through the counter coil via R4. The triggereing-current pulse through the counter coil induces a regenerative drive in the feedback winding to initiate the turn-on of Q2. When saturation is reached the feedback coil provides a regenerative turn-off drive to force Q2 quickly into cutoff. Ringing of the circuit is damped by R3 and CR2 and free running is therefore prevented.

FIGURE LEGEND

Fig. 1. An efficient electromechanical counter circuit.


Durant dc
electro-mechanical
counter
-18 V
CR2
IN2071
R3
330
Ω
Counter-drive
coil, 1155 T No.29
Feedback
coil, 200T No.34
R4
680Ω
R1
6.8kΩ
0v
-7v
CR1
IN34
CR3
IN34
Q1
2N404
Q2
2N555
R2
24kΩ
R5
2.7kΩ
+7v
+7v
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