The CK5517 is an instant starting, cold cathode, gas-filled, half-wave rectifier of miniature construction, suitable for high voltage low current power supplies up to 12 ma. output. Several tubes can be operated in cascade to produce very high voltages. The tube features small size, and a starter electrode which enables it to fire at reduced ignition voltage. The CK5517 should be used as a replacement for the former type CK1013 in equipment having load currents from 3 to 12 ma. For equipment having average load currents less than 3 ma., such as electronic photo-flash power supplies, the type CK6174 / CK1027 should be used as a replacement for the former type CK1013.

MECHANICAL DATA

**ENVELOPE:** T-5½ Glass
**BASE:** Miniature Button 7-Pin
**TOP CAP:** Skirted Miniature

**TERMINAL CONNECTIONS:**
- Pin 1 Cathode
- Pin 2 Cathode
- Pin 3 No Connection
- Pin 4 Starter Electrode
- Pin 5 No Connection
- Pin 6 Cathode
- Pin 7 Cathode
- Top Cap Anode

**MOUNTING POSITION:** Any

ELECTRICAL DATA

**RATINGS - ABSOLUTE MAXIMUM VALUES:**
- Peak Inverse Voltage: 2800 volts
- Peak Cathode Current (steady state): 100 ma.
- Peak Cathode Current (surge): 300 ma.
- Average Cathode Current (dc): 12 ma.
- Maximum Anode Supply Voltage (peak): 1700 volts
- Minimum Anode and Starter Electrode Supply Voltage (RMS): 500 volts
- Minimum Anode Supply Impedance: 6000 ohms
- Maximum Average Starter Electrode Current (Starter Electrode operating as a Cathode): 125 µa.
- Maximum Peak Starter Electrode Current (Starter Electrode operating as a Cathode): 300 µa.
- Ambient Temperature Range: -50 to +60 °C

**CHARACTERISTICS AND TYPICAL OPERATION - HALF-WAVE RECTIFIER 60 SINUSOIDAL OPERATION:**
- Anode Supply Voltage (Epp) (rms): 1200 volts
- Anode Supply Impedance (Zp): 7500 ohms
- Starter Electrode Limiting Resistance: 10 meq.
- Load Current (dc): 10 ma.
- Approximate Anode to Cathode Voltage Drop: 100 volts
- Load Condenser: 0.5 µf
- Load Resistor: 0.09 meq.

- *The socket terminals for pins 3 and 5 cannot be used as tie point terminal lugs and may not be connected to any other point in the circuit except to the cathode.*
- *To avoid damage to the equipment or tube, it is recommended that the anode supply impedance be adjusted to limit forward currents and intermittent reverse peak currents to stated values. Minimum resistance is 6000 ohms minus the effective equivalent transformer impedance, but never less than 2000 ohms dc resistance. For voltage multiplier circuits, a separate limiting resistor should be connected in series with the anode or cathode of each tube. In the event of a reverse arc, the absence of a 2000 ohm surge limiting resistor causes all of the energy of the filter condenser to be dissipate in the tube.*
- *With starter electrode connected to anode through 10 megohms of resistance.*
- *With the starter electrode connected to operate as an anode on the forward half of the cycle, the starter cathode current rating is the only limitation on the starter electrode current.*
COLD CATHODE HALF-WAVE RECTIFIER

TYPICAL VOLTAGE DOUBLER CIRCUIT FOR COLD CATHODE RECTIFIER

Rs = Surge Resistor. Adjust to keep Peak Cathode Current (steady state) and Peak Cathode Current (surge) within ratings of 100 ma. and 300 ma., respectively. Rs should not be less than 2000 ohms in voltage doubler circuits regardless of transformer characteristics.

R = 3.3 meg., 1/2 watt, 350 Vdc.
C1 = 1.0 µf, 1500 V (Typical for 60 cycle operation.)

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TYPICAL HALF-WAVE CIRCUIT FOR COLD CATHODE RECTIFIER

Raytheon Manufacturing Company

October 15, 1957
NEWTON 58, MASS.
COLD CATHODE HALF-WAVE RECTIFIER

**OUTPUT VOLTAGE vs. ANODE SUPPLY VOLTAGE**

Conditions:
RL = 90 K ± 0.25 %
CL = 2 μF
Zp = Zt + Rs
Zp = 7500 Ω
Zt = Total Secondary Impedance Looking Toward Line Voltage

Half-Wave Circuit shown on page 2 used in preparing this graph.

**PEAK AND AVERAGE OUTPUT CURRENTS vs. ANODE SUPPLY IMPEDANCE**

Conditions:
Epp = 1200 Vac
RL = 90 K ± 0.25 %
CL = 2 μF
Zp = Zt + Rs
Zt = Total Secondary Impedance Looking Toward Line Voltage
Ic vs. Zp = ———
Ib vs. Zp = ————

Half-Wave Circuit shown on page 2 used in preparing this graph.