# SERVICE NOTE

412A-4

## ℗ MODEL 412A/AR DC VACUUM TUBE VOLTMETER
## SERIAL 004-03632 AND BELOW

## BIAS CIRCUIT IMPROVEMENTS

To further increase the reliability of your ℗ Model 412A/AR DC Vacuum Tube Voltmeter -- particularly at low line voltages (less than 115 volts) -- two changes in the bias supply circuitry are recommended.

In the Model 412A, serial 004-03632 and below, silicon diode CR101 should be replaced by ℗ Stock No. G-29G-79, a silicon diode having improved power capabilities. In serial 004-02882 and below, R122, a 560 ohm 1 watt resistor, should also be changed to 120 ohms, 1 watt.

After completing the modification, adjustment of your Voltmeter is required as outlined below under "Adjustment Procedure".

### PARTS REQUIRED FOR MODIFICATION

| Quantity | Description | ℗ Stock No. |
|---|---|---|
| 1 | Resistor, fixed, composition, 120 ohm, ±10%, 1W for R122 . . | 0690-1211 |
| 1 | ℗ Diode, Silicon, for CR101 . . | G-29G-79 |

### MODIFICATION PROCEDURE

1) Disconnect power and remove cabinet.

2) In serial 004-03632 and below: Change Silicon Diode, CR101, located below the DC AMPLIFIER OUTPUT connector at rear of instrument and on line cord side, to a ℗ G-29G-79 Silicon Diode.

3) In serial 004-02882 and below: Replace R122, a 560 ohm 1 W resistor, located between pin 2 of V103 and tap 2 on Power Transformer, T1, with a 120 ohm, 1 W resistor.

4) Replace cabinet.

### ADJUSTMENT PROCEDURE

Bias adjustment should be performed as outlined in Section IV, of the Operating and Service Manual for your instrument.

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