CATHODE MODULATION TRANSFORMERS

Cathode modulation brings down the cost of radio telephony by reducing the amount of modulation required. This system was originally developed by Frank Jones, and special matching transformers were developed by UTC with the cooperation of Mr. Jones. The UTC cathode modulation transformers incorporate a wide range of impedances to take care of every modulation requirement.

Up to 200 Watts RF Input

Type CM - 15 cathode er. tapped secondary modulation transform- 300 to 2,000 ohms, will handle 15 watts audio. G-3 Case.

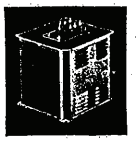
Net Price **$2.40**

Up to 500 Watts RF Input

Type CM - 16 cathode modulation transform- er wih variable tapped secondary 300 to 2,000 ohms, audio power 35 watts. G-4 Case.

Net Price **$3.30**

Up to 1 KW RF Input



Type CM-17 cathode modulation transformer, tapped secondary impedance 300 to 2,000 ohms, for modulating 1 KW plus RF input. This transformer handles 100 watts audio power. G-Case.

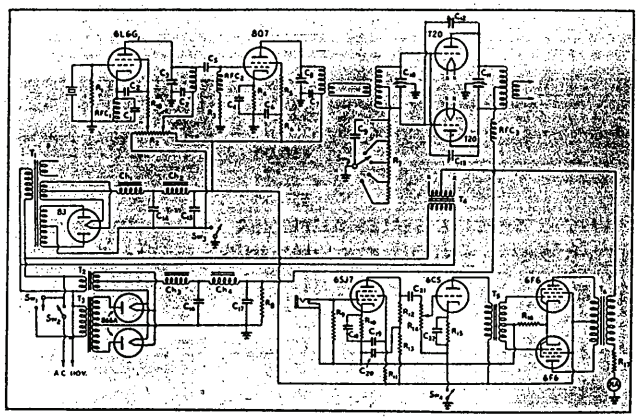
Net Price **$7.20**

Type CM-18—15 watt line matching to RF load. Primary 200, 500 ohms. Secondary 300 to 2000 ohms. G-3 case.....Net **$2.40**

A Popular Cathode Modulation Transmitter Circuit

The circuit shown is complete 'phone transmitter, including power supply and modulator, capable of delivering a 100% modulated carrier of 60 watts.

Cathode modulation is a system of modulation which brings the advantages of high power 'phone operation to a much greater group of amateur operators than has heretofore been possible. By means of cathode modulation it is possible to modulate a high-power Class C amplifier with a surprisingly small amount of audio power, thus appreciably decreasing the size and cost of the modulation equipment.



C_1 — 500-$\mu\mu$fd. mica.
C_2, C_7 — 0.01-μfd. mica.
C_3, C_8 — 100-$\mu\mu$fd. variable.
C_4, C_6, C_{21} — 0.01-μfd. paper.
C_5 — 50-$\mu\mu$fd. mica.
C_9 — 1.0-μfd. paper.
C_{10}, C_{11} — Splitstator, 100 $\mu\mu$fd. each section, variable.
C_{12}, C_{13} — 10-$\mu\mu$fd. neutralising condenser.
C_{14}, C_{15} — 8-μfd., 450-volt electrolytic.
C_{16}, C_{17} — 2-μfd., 1000-volt.
C_{18}, C_{22} — 10-μfd., 25-volt electrolytic.
C_{19} — 0.25-μfd., 400-volt paper.
C_{20} — 0.5-μfd., 400-volt paper.
Ch_1 — 5-25-henry swinging choke, 175 ma. (S-30).
Ch_2 — 10-henry, 175-ma. filter choke (S-29).
Ch_3 — 5-25-henry swinging choke, 225 ma. (S-32).
Ch_4 — 20-henry, 225-ma. filter choke (S-31).
R_1 — 50,000-ohm, 1-watt.
R_2 — 25,000-ohm, 50-watt.
R_3 — 15,000-ohm, 2-watt.
R_4 — 100-ohm, 10-watt.
R_5 — 100-ohm, 1-watt.
R_6 — 20,000-ohm, 20-watt.
R_7 — 16,000-ohm, 20-watt, tapped every 2000 ohms (made from eight 2000-ohm resistors).
R_8 — 50,000-ohm, 100-watt.
R_9, R_{11} — 2-megohm, ½-watt.
R_{10} — 2500-ohm, ½-watt.
R_{12} — 0.25-megohm, ½-watt.
R_{13} — 100,000-ohm, ½-watt.
R_{14} — 1-megohm volume control, with switch.
R_{15} — 2,000-ohm, ½-watt.
R_{16}, R_{17} — 200-ohm, 20-watt.
R_{18} — 10,000-ohm, 1-watt.
RFC_1, RFC_2 — 2.5 mh. r.f. choke, 125 ma.
RFC_3 — 2.5 mh. r.f. choke, 500 ma.
SW_1 — S.p.s.t. toggle.
SW_2, SW_3 — D.p.s.t. toggle.
SW_4 — On volume control.
SW_5 — 11-position rotary switch.
T_1 — Plate-filament transformer; (S-39).
T_2 — Filament transformer, 2½-volt, 10-ampere (S-57).
T_3 — Plate transformer, 990-volt, 200-ma. (S-45).
T_4 — 7.5-volt filament transformer, 8-ampere (S-61).
T_5 — Interstage audio transformer, plate to p.p. grids (S-2)
T_6 — Cathode modulation transformer, 6F6 plates to 300-2000-ohm load (CM-15).

Figures in parentheses refer to UTC type number.

First in Cathode Modulation

UTC Now Presents Universal Transformers for GRID-CATHODE MODULATION

Grid-Cathode Modulation is a form of grid and plate modulation, used for the purpose of reducing the amount of audio power required for 100% modulation of the Class C stage. In Grid-Cathode Modulation, the audio power required is 20% of the Class C input. After determination of the Class C impedance, the proper Grid voltage must also be applied to the Class C stage for correct operating conditions. The UTC-GCM series of transformers is of the Varimatch type, allowing wide latitudes of primary and secondary impedances as well as providing a variable voltage for the grid. A complete chart is provided with each unit illustrating values for practically all popular tube combinations.

- Primary designed to match all popular tubes.
- Secondary provides a wide range of impedances for GCM applications (1000 to 10,000 ohms).
- Separate tapped tertiary grid winding to facilitate exact grid matching.

GCM-1—200 or 500 ohm line to match tubes for GCM service. 30 watts audio output .....Net **$4.80**

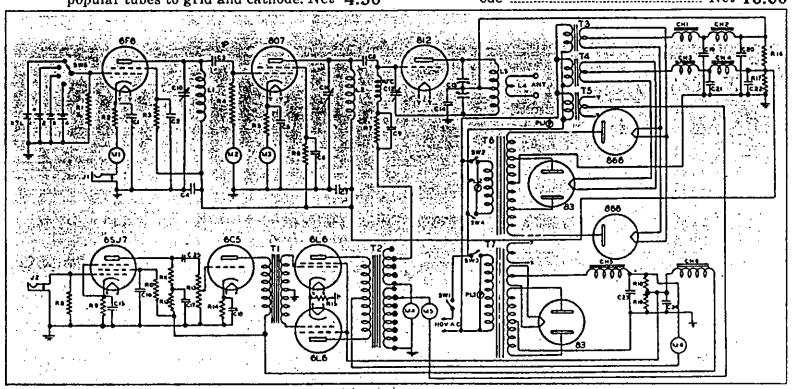
GCM-2—15 watts audio output, from all popular tubes to grid and cathode.Net **3.00**

GCM-3—30 watts audio output, from all popular tubes to grid and cathode. Net **4.50**

GCM-4—60 watts audio output, from all popular tubes to grid and cathode. Net **6.90**

GCM-5—200 watts audio output, from all popular tubes to grid and cathode ..... Net **13.50**

GCM-6—110 watts audio output from all popular tubes to grid and cathode ..... Net **10.00**



TYPICAL GRID-CATHODE TRANSMITTER

50 watts phone, 100 watts CW 10-160 meters

PL1 — Fil. pilot
PL2 — H.V. pilot
PL3 — Mod. pilot
CH1 — UTC S-34
CH2 — UTC S-33
CH3 — UTC S-30
CH4 — UTC S-29
CH5 — UTC S-30
CH6 — UTC S-27
T1 — UTC S-4
T2 — UTC GCM-3
T3 — UTC S-57
T4 — UTC S-54
T5 — UTC S-70
T6 — UTC S-47
T7 — UTC S-40

C1 — .01 mfd. 400 V.
C2 — .01 mfd. 400 V.
C3 — .0001 mfd. 600 V. mica
C4 — .01 mfd. 600 V.
C5 — .01 mfd. 600 V.
C6 — .01 mfd. 600 V.
C7 — .01 mfd. 600 V.
C8 — .0001 mfd. 1500 V. mica
C9 — .01 mfd. 600 V.
C10—.0001 mfd.
C11—.0001 mfd.
C12—15 mfd. 1500 V.
C13—250 mfd.
C14— .002 mfd. 1500 V. mica
C15— 25 mfd. 25 V.
C16— .5 mfd. 400 V.
C17— .5 mfd. 400 V.
C18— 10 mfd. 25 V.
C19— C20 — 2 mfd. 1500 V.

R1 — 50,000 ohms 1 watt
R2 — 500 ohms 1 watt
R3 — 50,000 ohms 2 watt
R4 — 25,000 ohms 1 watt
R5 — 500 ohms
R6 — 25,000 ohms 5 watt
R7 — 10,000 ohms 5 watt
R8 — 2 megohms ½ watt
R9 — 750 ohms ½ watt
R10— 2 megohms ½ watt
R11— 100,000 ohms ½ watt
R12— 100,000 ohms ½ watt
R13— 500,000 ohms
R14— 2,000 ohms ½ watt
R15— 175 ohms 20 watt
R16— 100,000 ohms 20 watt
R17— 100,000 ohms 20 watt
R18— 3,000 ohms 20 watt
R19— 20,000 ohms 20 watt

C21 — C22 — 8-8 mfd. 800 V.
C23 — C24 — 8-8 mfd. 600 V.
C25 — .01 mfd. 400 V.
XTL 1-2-3-4 crystals
SW1 — S.P.S.T.
SW2 — S.P.S.T.
SW3 — S.P.S.T.
SW4 — Safety switch
SW5 — S.P. 4 position
J1 — Key jack
J2 — microphone jack
M1 — 0-100 MA.
M2 — 0-100 MA.
M3 — 0-100 MA.
M4 — 0-100 MA.
M5 — 0-100 MA.
M6 — 0-100 MA.