



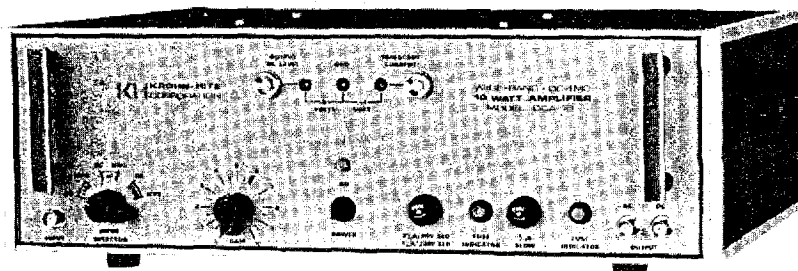
model DCA-10

DC to 1 megacycle
10-WATT
DIRECT-COUPLED
AMPLIFIER
model DCA-10*

- Frequency range: dc to 1 mc
- Frequency response: ± 1 db
- Harmonic distortion: 0.1%
- Dynamic range: 80 db
- Matching load: 600 to 1000 ohms
- Maximum voltage (rms): 105 volts
- Maximum current (rms): 210 ma
- Voltage gain: 20 db

Model DCA-10 is a direct-coupled amplifier which will deliver 10 watts continuously (20 watts peak) from dc to 1 mc, and 20 watts continuously at dc, with extremely low harmonic distortion and flat frequency response. Front panel controls permit operation in any of three modes: fixed gain of 10 (20 db) without phase reversal, fixed gain of unity with phase reversal, or adjustable gain (0 to 10) without phase reversal. Input and output, independently, may be either direct coupled, or capacitor coupled with input cutoff at 1 cps and output cutoff at 30 cps with a 600-ohm resistive load.

With a suitable oscillator, the DCA-10 provides power at very low distortion over an extremely wide frequency range, essential in such applications as precision wide-band meter calibration. With an input impedance of 1 megohm, it is suitable for bridging applications requiring impedance

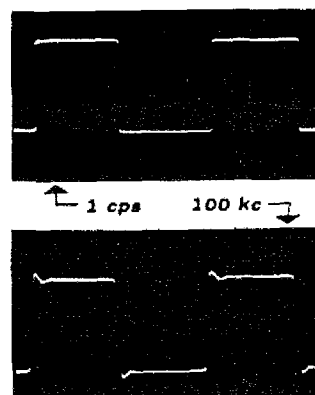
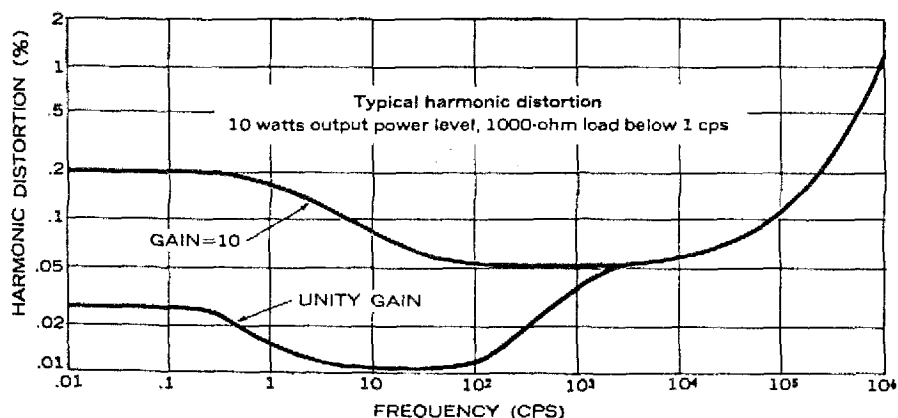


Model DCA-10

transformation with minimum circuit loading, high accuracy, and gain stability. Direct coupling, with distortion as low as 0.2% at 0.01 cps, eliminates waveform disturbances and makes it ideal for many applications in data acquisition, pulsed video, and lower rf work. Since the amplifier provides phase reversal at fixed unity gain, two cascaded units will convert a single-ended signal to a balanced output of up to 20 watts. With the Model MT-56 Matching Transformer, available as an accessory, the 600-ohm output impedance of the amplifier can be matched to loads of 6, 24, 96, or 384 ohms, permitting greater flexibility of application over a wide range of load conditions.

The circuit is direct-coupled throughout, with the first two stages connected as balanced differential amplifiers. In the x10 mode, phase reversal is avoided by applying the input and the voltage feedback to opposite grids of the first stage. In the x1 mode, phase reversal is obtained by grounding the first grid and applying the input to the second grid through a summing network, as in operational feedback amplifiers.

*Patent 3,092,783



Typical square wave response
155v peak-to-peak, 1000 Ω load

SPECIFICATIONS

Performance data below apply only for operation with direct-coupled input and output, unless otherwise specified. Line voltage adjusted to 115 volts.

Output power, rms voltage and current:

Load	dc	to 1 cps	to 500 kc	to 1 mc
R = 10 ohms	42 ma		210 ma	
R = 600 ohms	52 ma		10 w, 78 v, 130 ma	
R = 1000 ohms	10 w, 100 v, 100 ma		80 v	
X _L = 1000 ohms	10 va		80 v	
X _C = 1000 ohms	10 va		70 v	
open circuit			105 v	
	dc	to 1 cps	to 500 kc	to 1 mc

Power as stated is for continuous operation — multiply by 2 to obtain instantaneous peak ratings. With loads under 1000 ohms, output current below 1 cps is limited to avoid tube damage during cycle peaks.

Frequency response: Flat within ± 1 db from dc to 1 megacycle under all specified operating conditions; approximately 3 db down at 2 megacycles.

Harmonic distortion (rms): At full power output, less than 0.1% from 20 cps to 50 kc, rising to approximately 0.5% at 0.1 cps and 100 kc, and approximately 3% at 1 megacycle. DC linearity is within $\pm 1\%$ with loads above 500 ohms.

Output regulation (no load to full resistive load): Better than 2% from 10 cps to 100 kc, approaching 5% at ends of frequency range.

Output dc level: Zero volts at AC OUTPUT terminals, nominal zero volts at DC OUTPUT terminals.

Output dc-level stability (after warm-up, as % of peak rated output voltage): $\pm 0.02\%$ in any one-hour period at fixed line voltage, 0.2% for a 10% change of line voltage within operating limits. This applies for all positions of the INPUT SELECTOR switch except x10 DC and POT DC, where the values are $\pm 0.1\%$ and 1% respectively.

Voltage gain: Unity (0 db ± 1 db) with phase reversal, ten (20 db ± 1 db) or variable from zero to ten without phase reversal, depending on setting of INPUT SELECTOR switch.

Gain stability: Less than 0.05 db change for a 10% change of line voltage within operating limits.

Dynamic range: Approximately 80 db.

Input impedance: Greater than 1 megohm in fixed-gain modes, 5,000 ohms in variable-gain modes. Shunt capacitance approximately 50 μf .

Input coupling: Either direct, or capacitor-coupled with low-frequency cutoff at 1 cps.

Internal impedance: Less than 10 ohms from 10 cps to 50 kc, 50 ohms from dc to 100 kc, 100 ohms above 100 kc.

Phase Shift (matched load): Zero (± 1) degrees from dc to 10 kc in the x10 and POT positions of the INPUT SELECTOR switch; in the x1 positions 180 (± 1) degrees. Linear increase to approximately 40 (or 220) degrees lagging at 1 mc.

Output coupling: Either direct, or through 10 μf .

Load impedance: Matching, nominal 600 ohms from 1 cps to 1 mc; below 1 cps, 1000 ohms minimum for full power output. Minimum load 10 ohms.

Load power factor: Unity to zero, lagging or leading.

Input sensitivity: 7.8 volts rms with a 600-ohm load and 10 volts rms with a 1000-ohm load for 10 watts at a gain of 10.

Input-voltage limits: 400-volt maximum dc component in capacitor-coupled fixed gain modes; combined ac and dc input voltages must not dissipate over 2 watts in the 5000-ohm GAIN potentiometer in variable gain modes.

Hum and noise (referred to output): Less than 10 mv rms with input shorted; less than 20 mv with open-circuit shielded input.

Ambient temperature and duty cycle: Continuous duty at 10 watts output up to 50°C (122°F) ambient.

Front panel controls:

INPUT SELECTOR switch
GAIN control
OUTPUT DC LEVEL control (screwdriver adjust)
QUIESCENT CURRENT control (screwdriver adjust)
POWER ON switch

Terminals: Front and rear — three BNC coaxial connectors, for INPUT, DC OUTPUT, and AC OUTPUT.

Power requirements: 105-125 or 210-250 volts, single phase, 50-60 cycles (400 cycles on special order), 250 watts.

Dimensions and weights: Bench Model DCA-10, 16 $\frac{1}{8}$ " wide, 5 $\frac{1}{4}$ " high, 15" deep; 37 lbs. net, 45 lbs. shipping; rack-mounting Model DCA-10R, 19" wide, 5 $\frac{1}{4}$ " high, 15" deep, 40 lbs. net, 46 lbs. shipping.

Specifications are subject to change without notice.