

# ALTEC ENGINEERING NOTES

TECHNICAL LETTER NO. 205

## HIGH-FREQUENCY DRIVER PROTECTION CAPACITOR FOR BIAMPLIFIED SOUND SYSTEMS

In sound systems which include bi-amplification, it is desirable to use a capacitor between the high-frequency amplifier and the 70V distribution system when conventional 70V line transformers are used.

### NOTE

The capacitor isolation technique can be used at speaker impedances but this usually results in very large capacitance values.

The reason for the capacitor is to prevent low-frequency energy from the amplifier inreaching the driver (which may occur due turn on/turn off, line transients, etc.). Capacitive protection is not required if an ALTEC 15045A Line Transformer is used. A general rule would be to select a capacitor whose break point, with respect to the load impedance, would be 3 dB down at approximately one-half the high pass filter cutoff frequency of the bi-amplifier. Selection of power capacitance value can be easily determined from the graph in Figure 1. The lines on the graph represent the break point of the capacitor and load impedance. The following example is typical.

The 50-watt tap of a 70V line distribution transformer has been selected. The bi-amplifier crossover frequency is 500 Hz. A line is drawn from the base of the graph at the 50W position and intersects the 300 Hz curve because the 300 Hz curve is approximately one-half the frequency break point. A horizontal line is drawn from the intersection of the vertical line and the 300 Hz line to the left side of the graph. The desired capacitance value is read at the left side of the graph. This value would be 5 microfarads.

### CAUTION

The capacitors used for this application should be Mylar\* types but if electrolytic capacitors are used, they should be non-polar.

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\*Mylar is a registered trademark of Dupont.

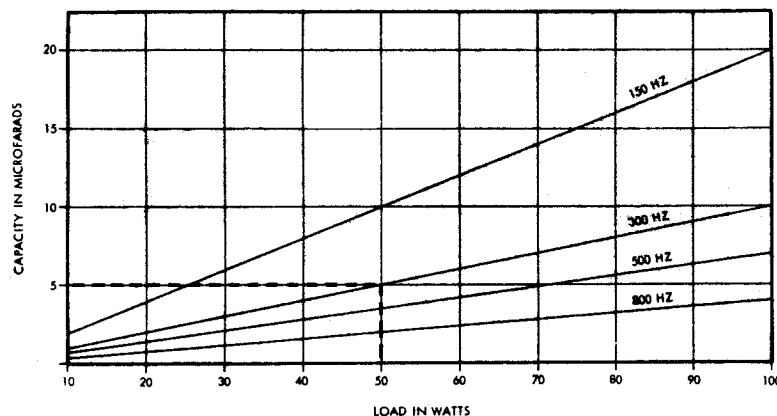
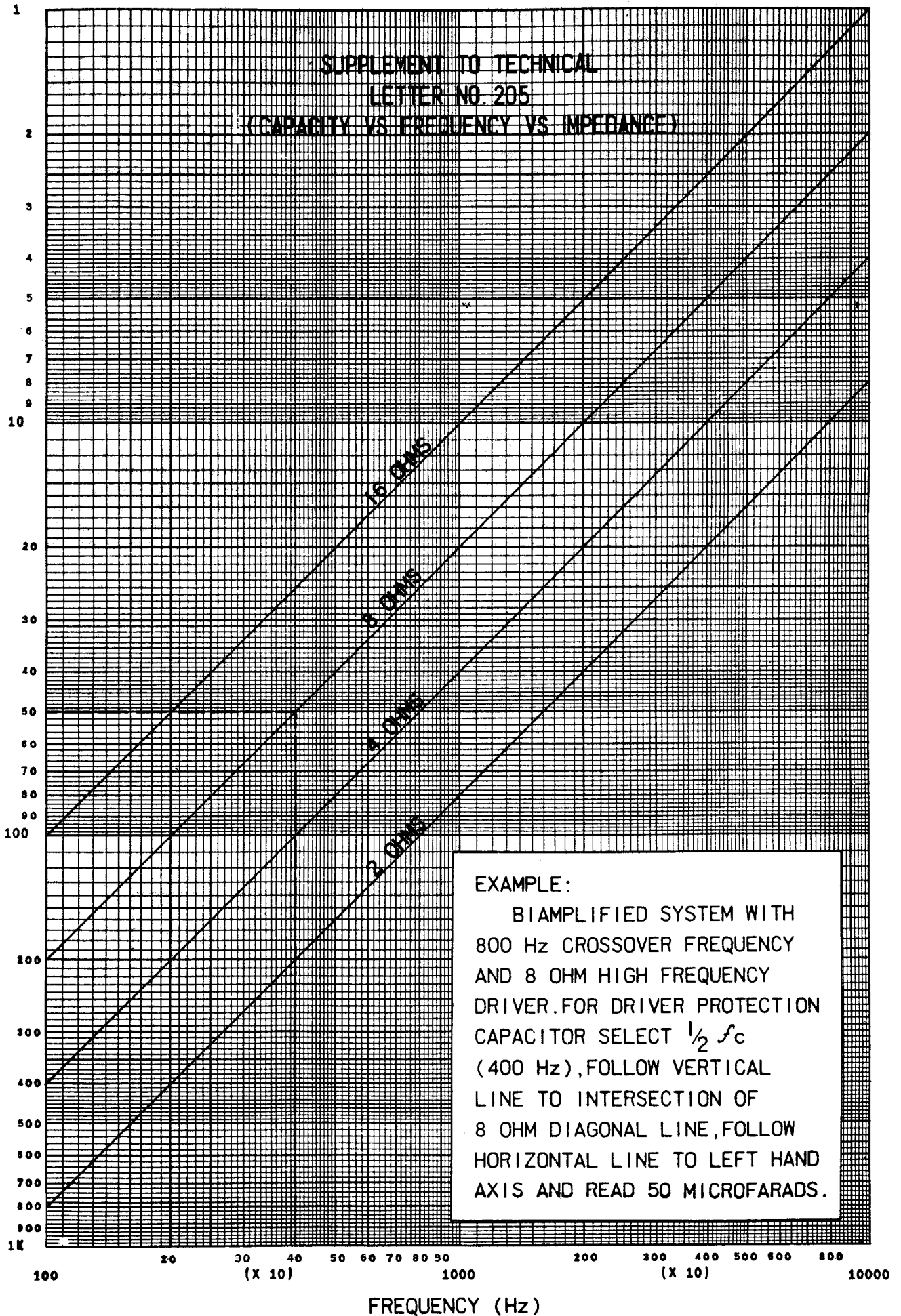


Figure 1. Protective Capacitance in Microfarads Versus Load in Watts

SUPPLEMENT TO TECHNICAL  
LETTER NO. 205  
(CAPACITY VS FREQUENCY VS IMPEADANCE)

CAPACITY IN MICROFARADS



EXAMPLE:

BIAMPLIFIED SYSTEM WITH  
800 Hz CROSSOVER FREQUENCY  
AND 8 OHM HIGH FREQUENCY  
DRIVER. FOR DRIVER PROTECTION  
CAPACITOR SELECT  $\frac{1}{2} f_c$   
(400 Hz), FOLLOW VERTICAL  
LINE TO INTERSECTION OF  
8 OHM DIAGONAL LINE, FOLLOW  
HORIZONTAL LINE TO LEFT HAND  
AXIS AND READ 50 MICROFARADS.