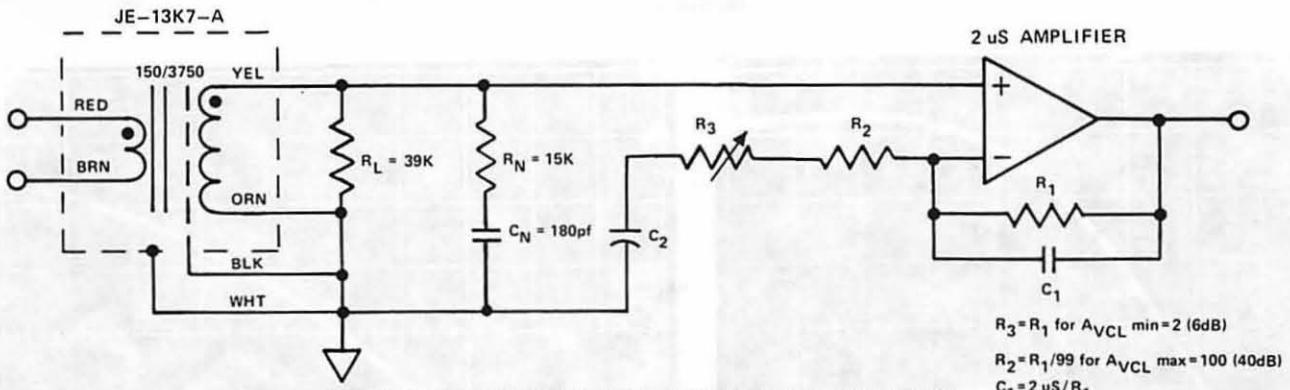
Data Sheet

jensen transformers
INCORPORATED

JE-13K7-A
MICROPHONE INPUT TRANSFORMER

The JE-13K7-A is a 1:5 turns ratio (150/3750 ohm) microphone input transformer for use with European type input circuits. It handles levels to +8dBv Re: 0.775v @ 20Hz (1% THD). Below saturation, the 20Hz THD is less than 0.1%. The bandwidth is ~~100~~ 85KHz kHz with no overshoot independent of the amplifier bandwidth. The JE-13K7-A has a multiple interleaved layer winding, similar to the JE-115K-E, for low leakage inductance. This yields wide bandwidth quite insensitive to load, low losses which affect noise in the upper spectrum, and very high frequency low Q resonance. A series RC network of ~~15K~~ 12.1K 1% ohms and ~~180~~ 270pF pf should be connected across the 39K ohm secondary load resistor for minimum transient distortion.

The series loss ratio referred to the secondary for 20kHz bandwidth is 1.55 ohm/ohm. This results in the transformer related noise figure of only 2.3dB. The 10kHz secondary source impedance is only 4.9% higher than that at 1kHz, so the noise spectrum is very close to a pure resistance. The 20kHz equivalent input noise is −128.0dBv Re: 0.775v when used with the NE5534A or the ~~SSM~~ MA-332-CP operational amplifier (3.0 nv/rt Hz per xstr & 0.3 pa/rt Hz).

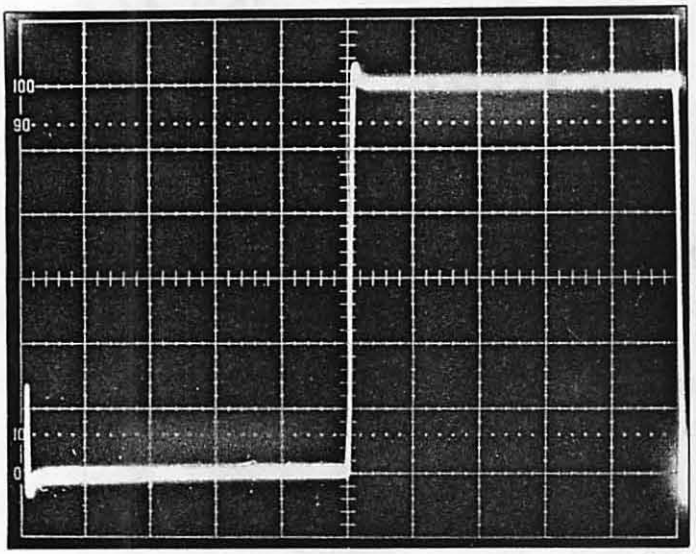


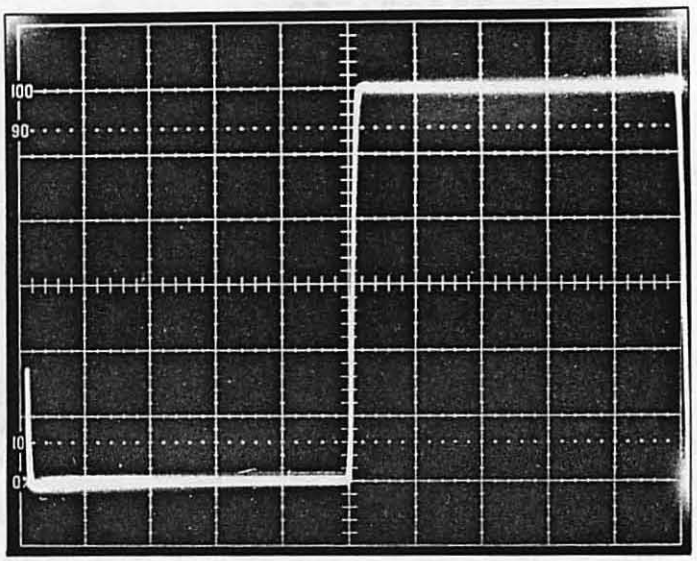
SCHEMATIC DIAGRAM OF TYPICAL TRANSFORMER APPLICATION

REGARDING THE OSCILLOSCOPE PHOTOS

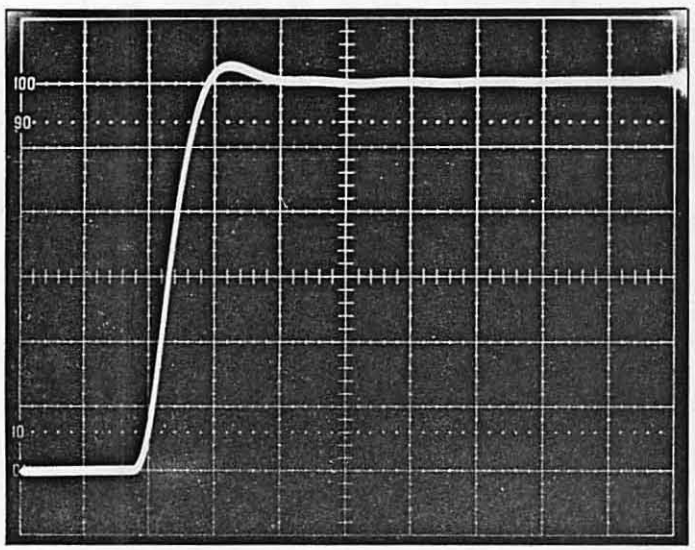
Actual oscilloscope photos were made from a Tektronix Model 453A (certified calibration). Left column is transformer with secondary termination network and right column includes a 2 microsecond amplifier.

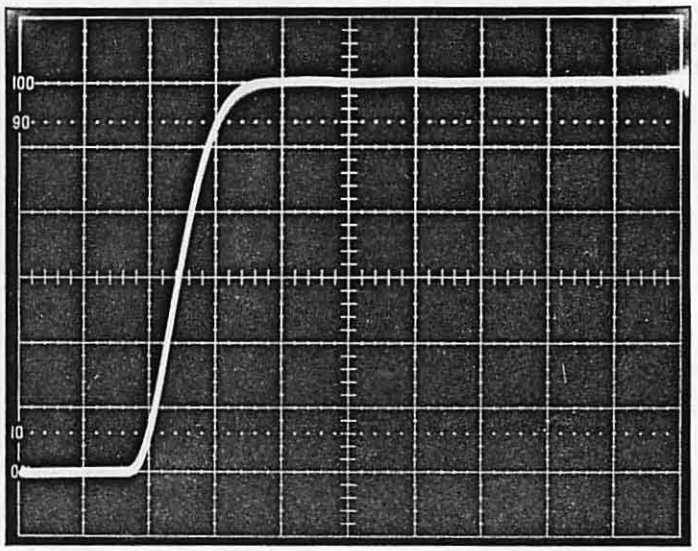
2kHz Square Wave



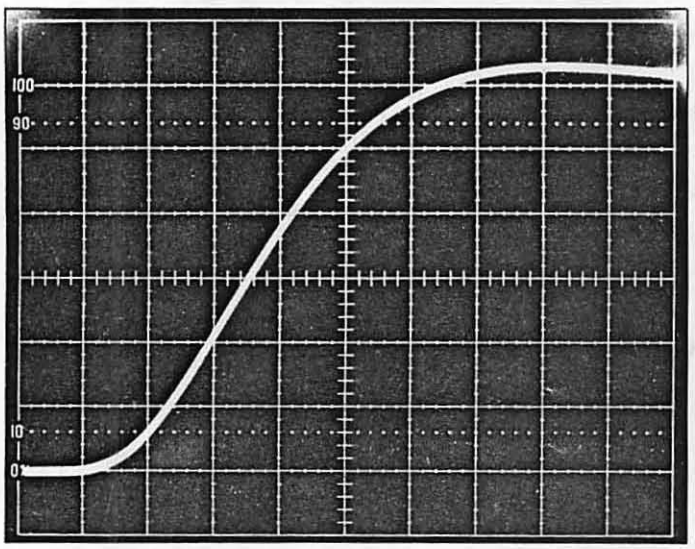


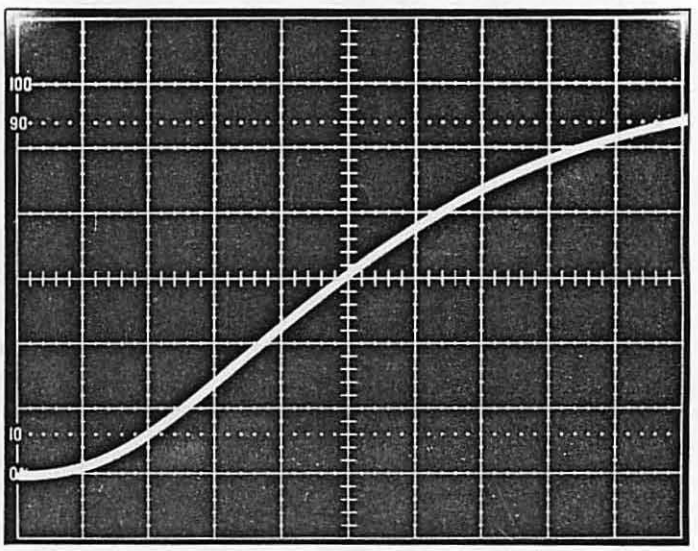
50μS/division





5μS/division

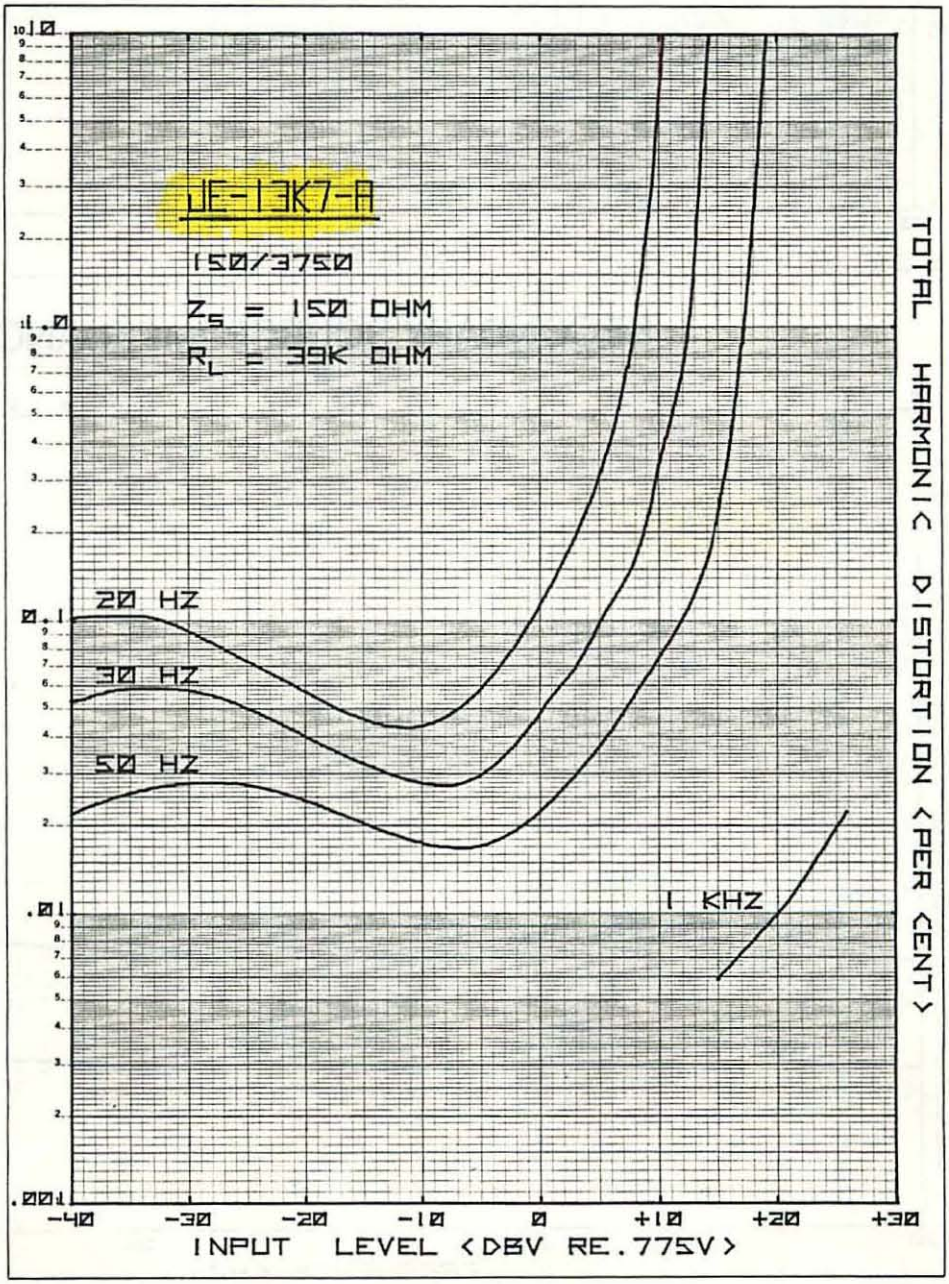




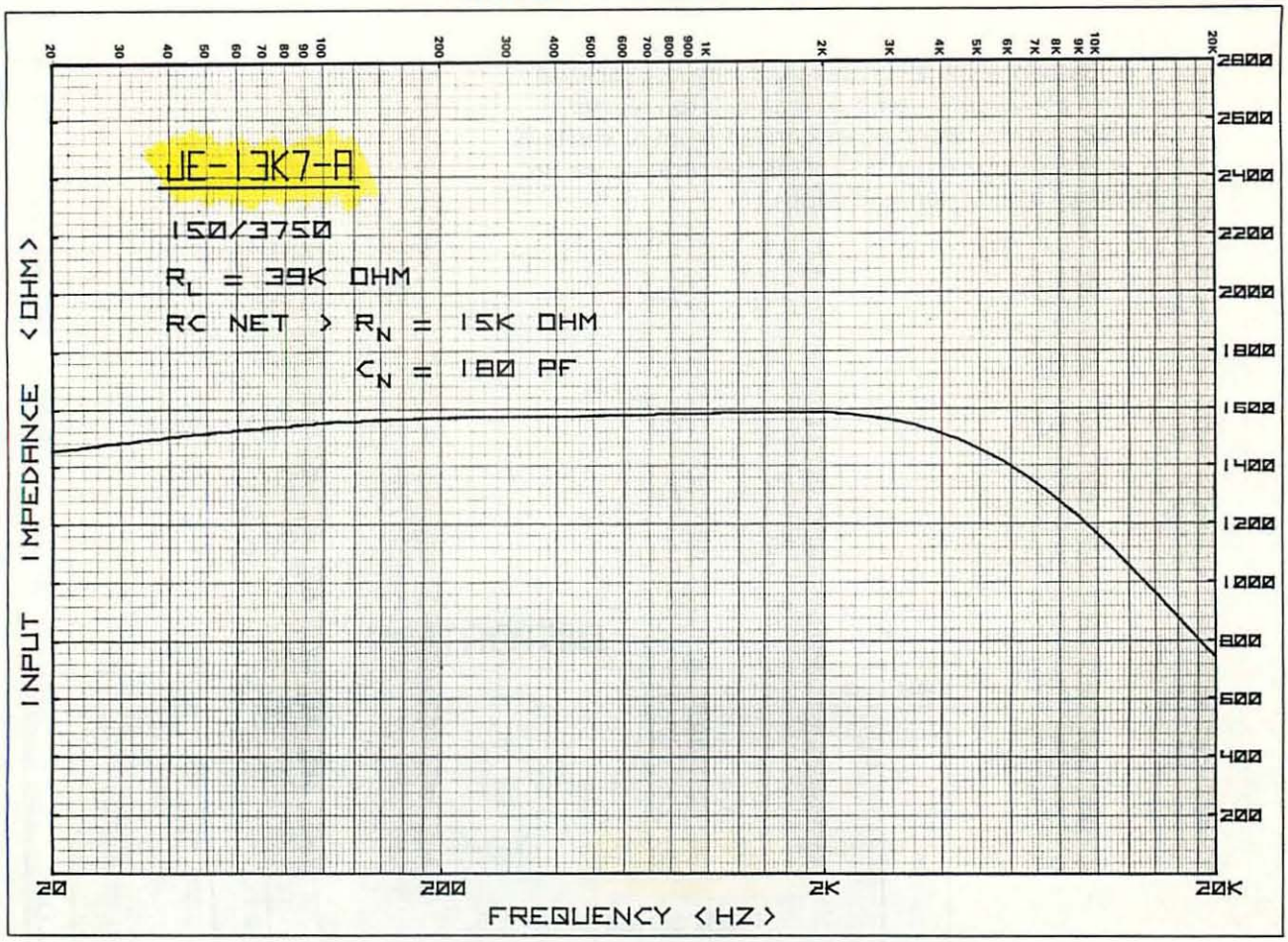
1μS/division

All curves were generated by a Hewlett-Packard 9815A/9862A programmable calculator/plotter. All calculations were either derived from or verified by actual measurements. Verified accuracies are on the order of one pen-line width.

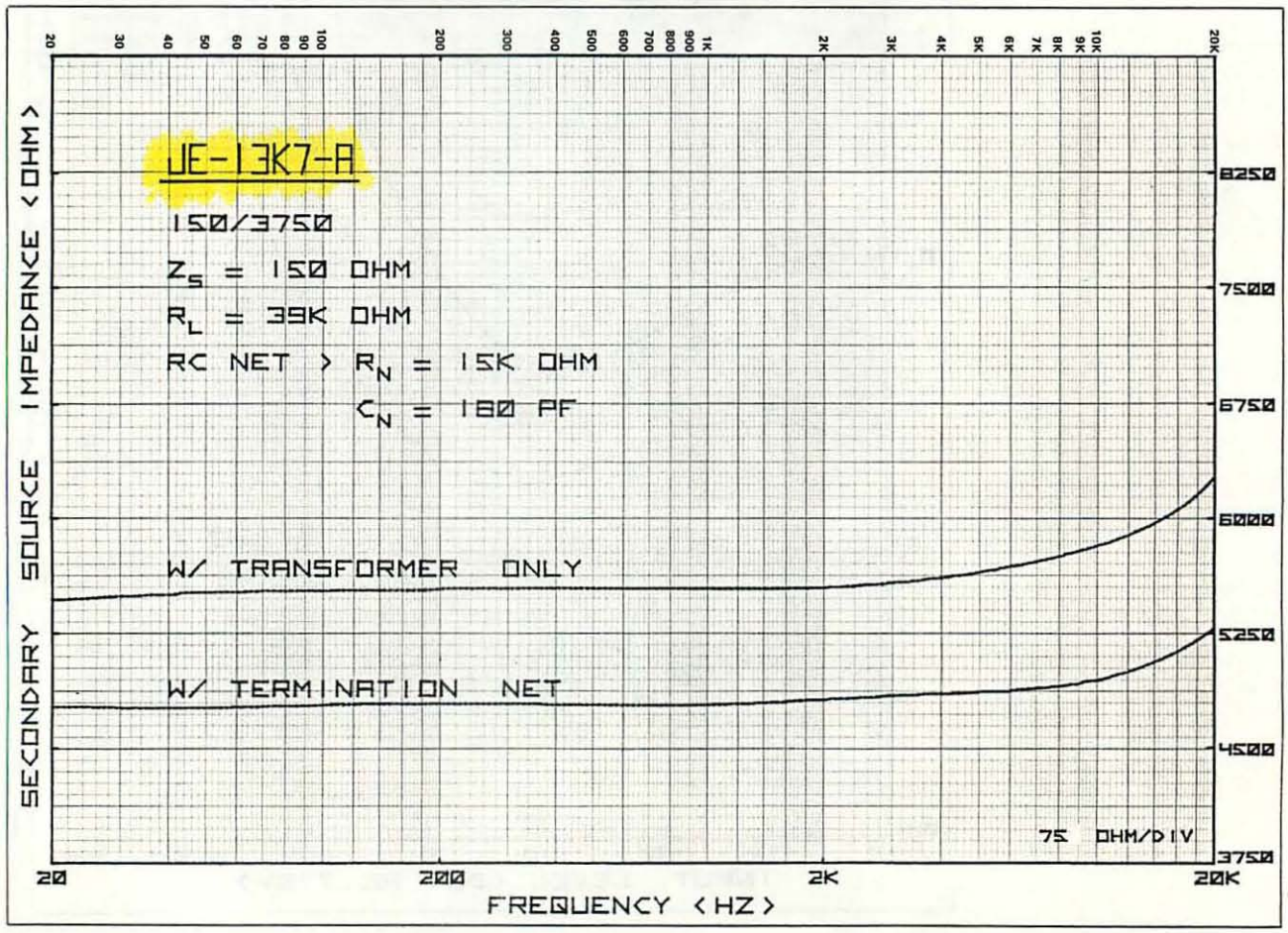
DISTORTION



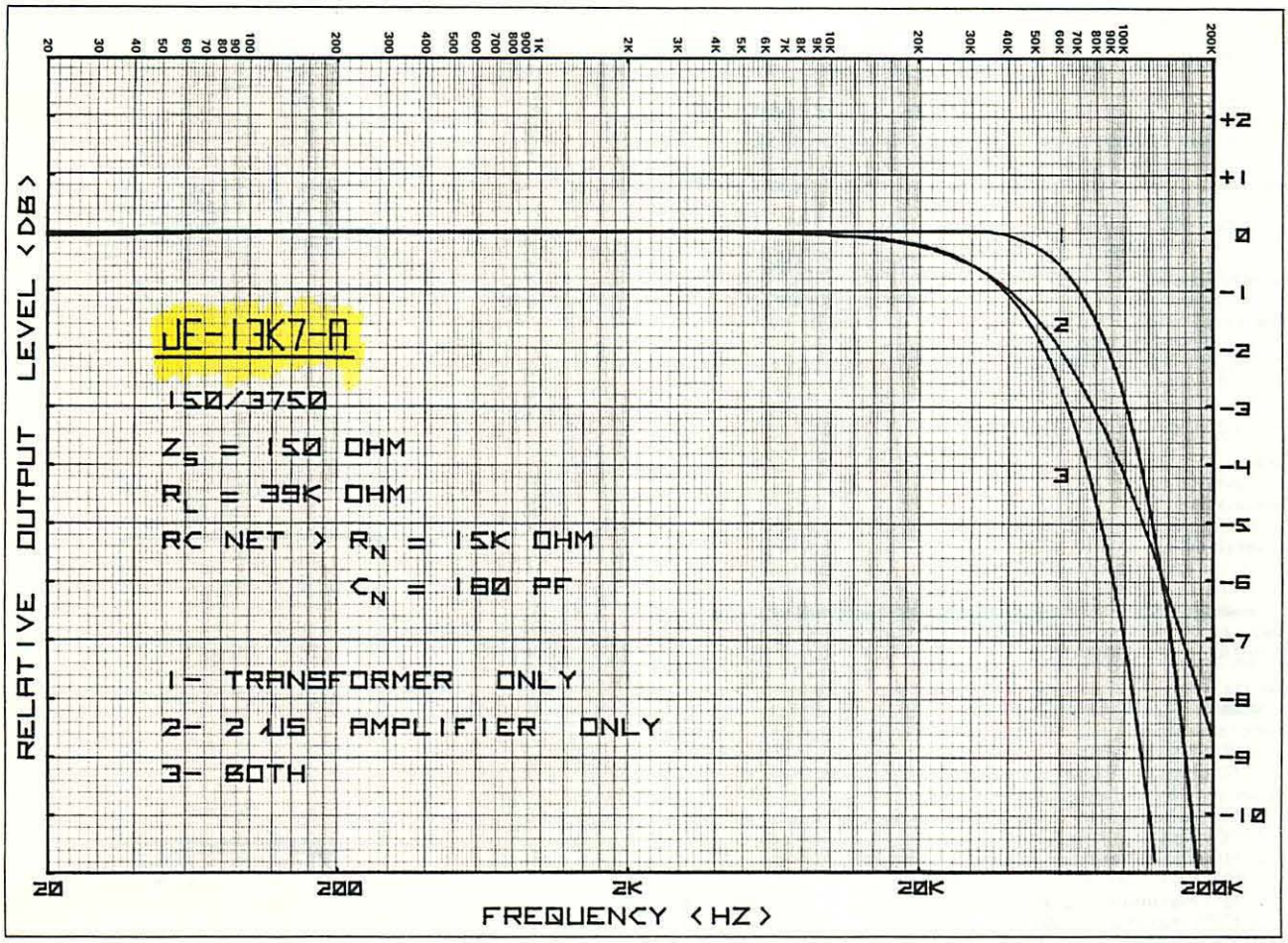
INPUT IMPEDANCE



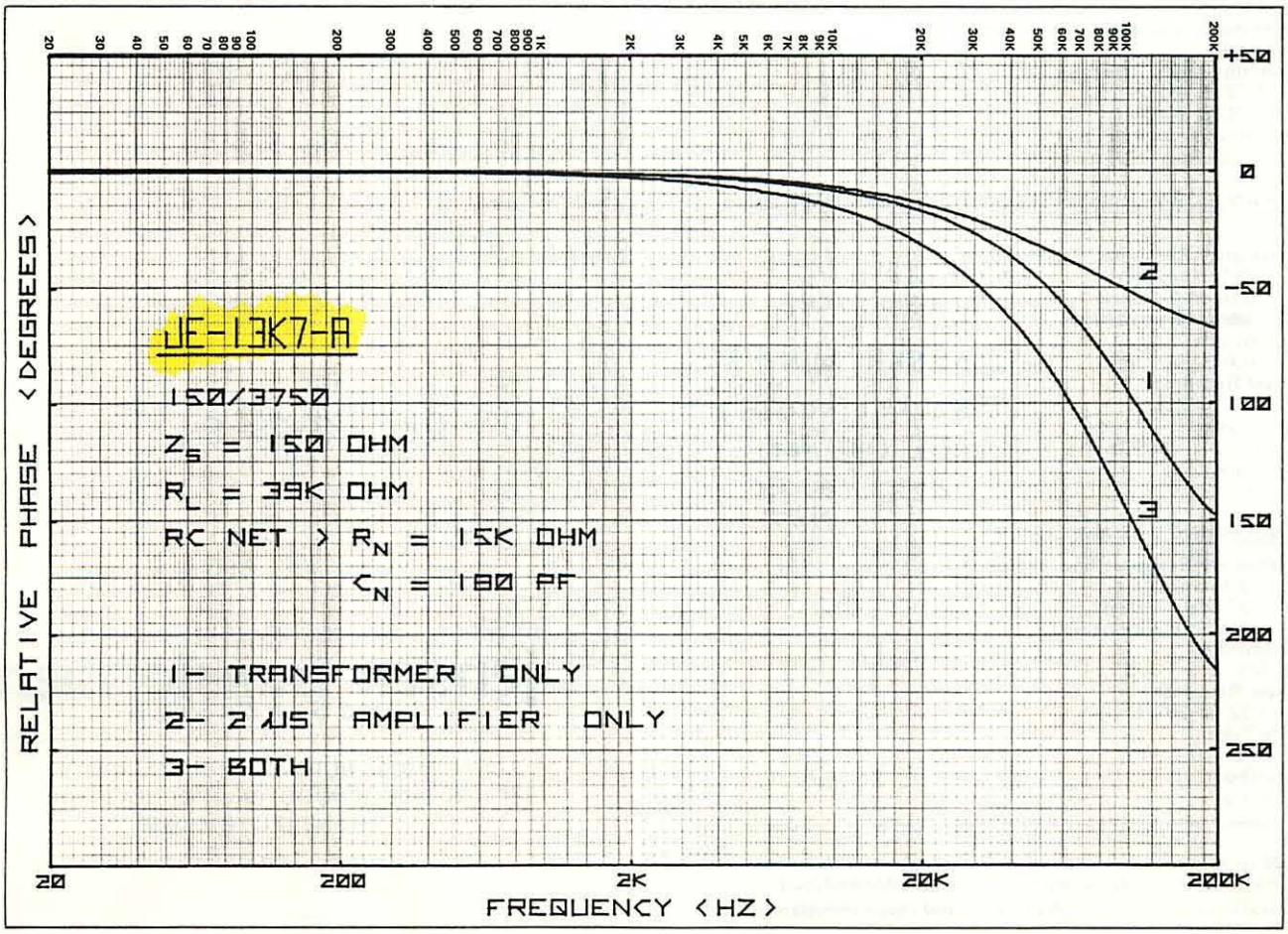
SECONDARY SOURCE IMPEDANCE



FREQUENCY RESPONSE



PHASE RESPONSE



GENERAL CHARACTERISTICS

Turns Ratio
1:5
Impedance Ratio
150/3750
Primary Source Impedance
150 ohms
Secondary Load Resistor
39K ohms
Secondary RC Network
R_N = 15K ohms C_N = 180pf
Faraday Shield
Separate lead
Magnetic Shield
30dB, separate case lead
Maximum Input Level at 20Hz
+9dBv (Re: 0.775v)

WITH WIDE-BANDWIDTH PREAMPS - USE NEW RC NETWORK: USE 12.1K 1% 270pF 2.5% POLYSTYRENE

PHYSICAL CHARACTERISTICS

Package
Mu-metal can
Termination
Wire leads
Dimensions
1-5/16" diameter, 1-9/16" high
Mounting
[redacted] clamp
SUPPLIED WITH TRANSFORMER

TYPICAL PERFORMANCE

Voltage Gain
[redacted] 13.6 dB
Input Impedance
1580 ohms @ 1kHz
1160 ohms @ 10kHz
Secondary Source Impedance
5550 ohms @ 1kHz
5820 ohms @ 10kHz
Total Harmonic Distortion (Below Saturation)
0.10% maximum @ 20Hz
0.06% maximum @ 30Hz
0.028% maximum @ 50Hz
0.006% @ 1kHz
Input Level @ 1% Saturation (dBv Re: 0.775v)
+8dBv @ 20Hz
+12dBv @ 30Hz
+17dBv @ 50Hz
Common-Mode Voltage (maximum)
>200v peak
Common-Mode Rejection Ratio
>85dB @ 1kHz
>65dB @ 10kHz
Transformer Noise Figure*
2.3dB Re: 132.8 ohms**

(TRANSFORMER WITH SECONDARY TERMINATION ONLY)

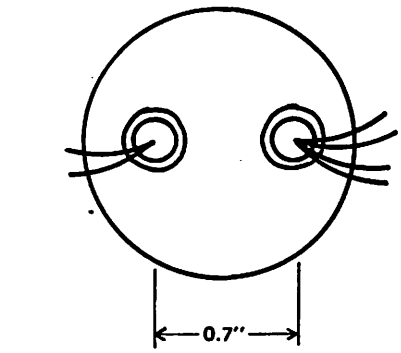
Frequency Response (Re: 1kHz)
−0.1dB @ 20Hz −0.09 dB @ 20Hz
+0.02dB @ 20kHz −0.21 dB @ 20KHz
[redacted]
Bandwidth
100kHz @ −3dB −3dB @ 85KHz W/NEW RC NET
Phase Response
−18° @ 20kHz 19° @ 20KHz (NEW NET)
Rise Time
3.4µS (10%-90%) 4.1µsec (NEW NET)
Overshoot
5% <2% NEW RC NET

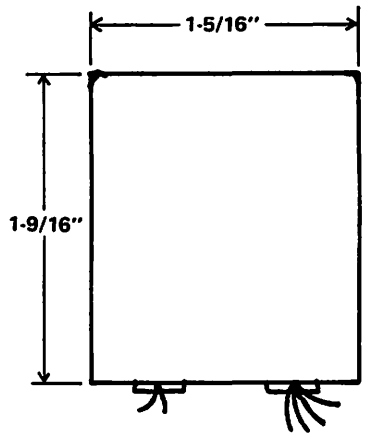
(INCLUDING 2µS AMPLIFIER)

Frequency Response (Re: 1kHz)
−0.1dB @ 20Hz
−0.25dB @ 20kHz
(No resonance peak)
Bandwidth
68kHz @ −3dB
Phase Response
−32° @ 20kHz
Rise Time
8µS (10%-90%)
Overshoot
<1%

Add to amplifier NF referred to impedance of 4950 ohms. (Parallel value of secondary source impedance and load)

***Parallel value of source impedance and input impedance.*





Lead Holes
Use 0.35" hole to clear grommet

REV. 3-23-84

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(Visitors by Appointment Only)