Data Sheet

jensen transformers
By REICHENBACH ENGINEERING

6-30-77

The 918 descrete operational amplifier is a low noise, high speed, low distortion circuit with output current capability to ~ 250 ma peak. The circuit is public domain, and you may use it any way without license.

An assembled 1½ x 2" x ¾" high unpotted module is being offered by Pacific Recorders & Engineering in San Diego. (Jack Williams - 714-453-3255)

AUG 9, 05 NO LONGER THERE IN SAN DIEGO. OWNED BY HARRIS CORP. NOW. THE 918 AMP IS NO LONGER AVAILABLE.

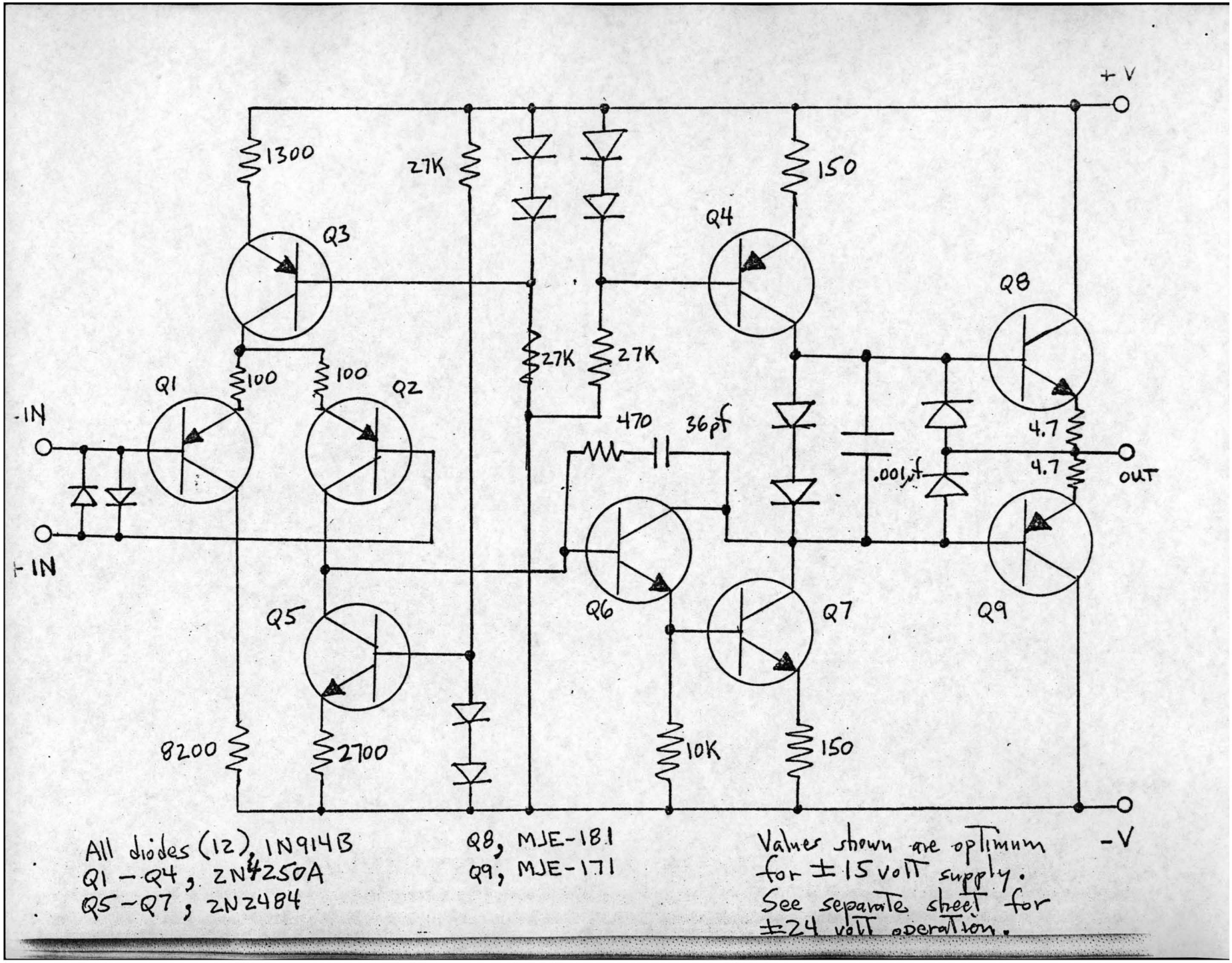
They are using a double sided PC board with the topside as a shield, silk screened labeling for components and a cover which is removable for servicing. The input transistor pair is selected for $H_{fe} > 450$ and 1% match. Along with V_{BE} matching, this is resulting in < 5mv offset with equal resistances on each input.

Gain Bandwidth is 10 MHz, large Signal Bandwidth is 65kHz. Slew Rate is 5.5 V/μs. Noise is < 3 nv/√Hz e_n, and I_n < 0.50 pa/√Hz.

Please feel free to call me for further info.

Deane Jensen.

1617 NORTH FULLER AVENUE • HOLLYWOOD, CALIFORNIA 90046 • PHONE (213) 876-0059

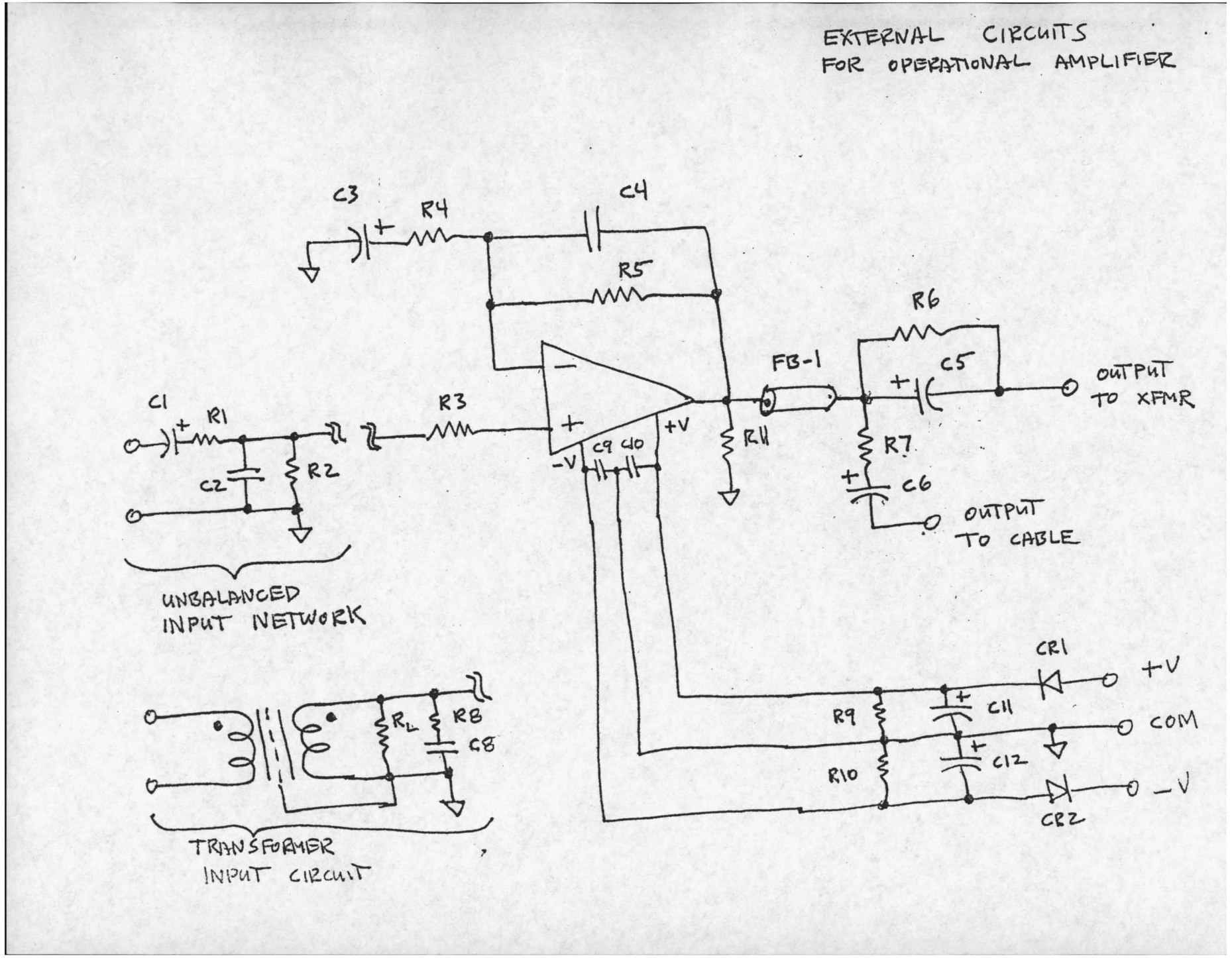


All diodes (12), 1N914B
Q1 – Q4, 2N4250A
Q5 – Q7, 2N2484

Q8, MJE-181
Q9, MJE-171

Values shown are optimum for ±15 volt supply. See separate sheet for ±24 volt operation.

EXTERNAL CIRCUITS FOR OPERATIONAL AMPLIFIER



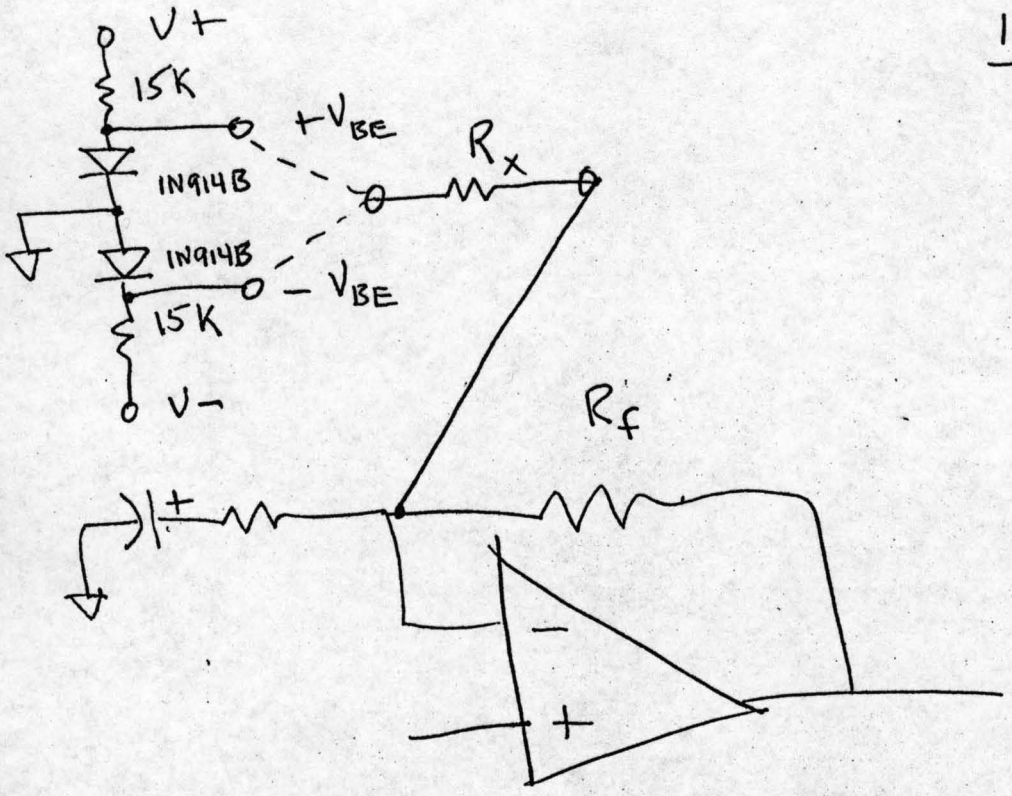
11-2-76 DATE

PAGE

EXTERNAL CIRCUITS FOR OPERATIONAL AMPLIFIER — PARTS LIST

R1	2700 ohm	
R2	100K	
R3	1K	(reqd only on 318)
R4	270 To 27K	
R5	27K	
R6	33	
R7	10	
R8		
R9, 10	15K	
R11	27K	
C1	1.5 mf	
C2	270 pf	
C3	220 mf	
C4	75 pf	
C5	1000 mf	
C6	150 mf	
C7	—	
C8		
C9, 10	0.1 mf	
C11, 12	220 mf	
CR1, 2	IN4001	

11-16-76



Offset compensation method.

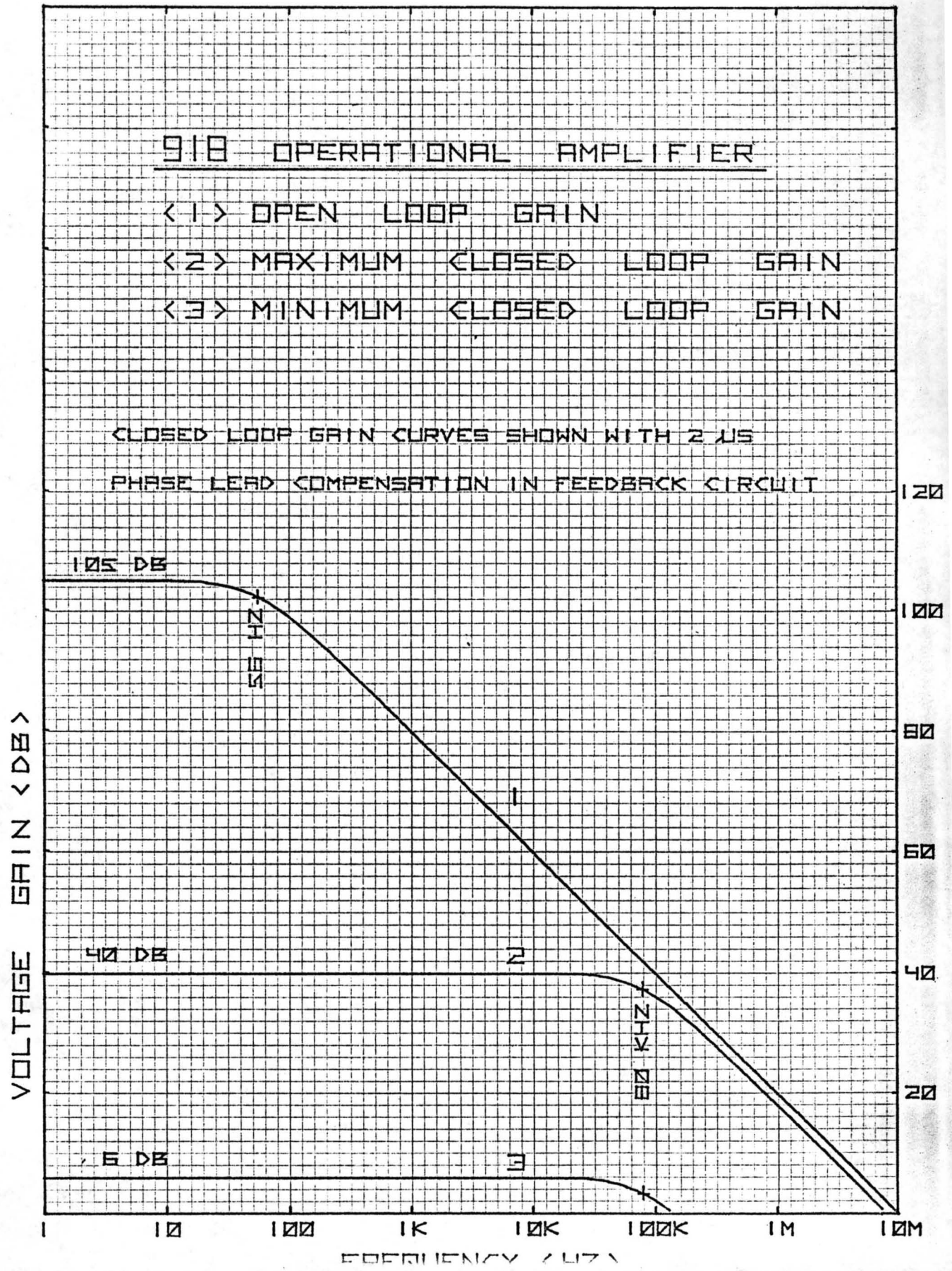
Select value for R_x to null offset. Connect to + or − V_{BE} point depending upon polarity of offset to be compensated.

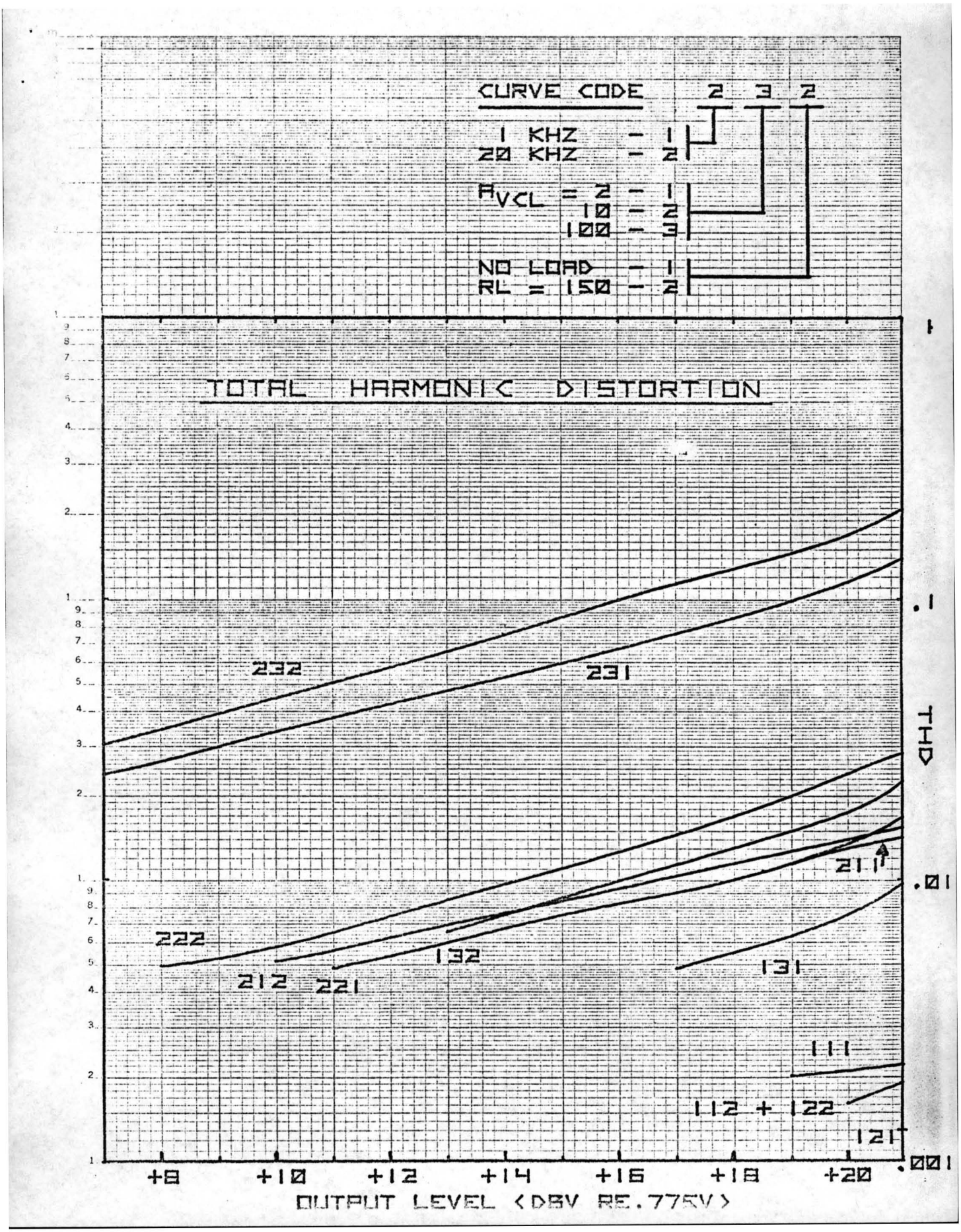
$$R_x \simeq \frac{V_{BE} R_f}{V_{os}}$$

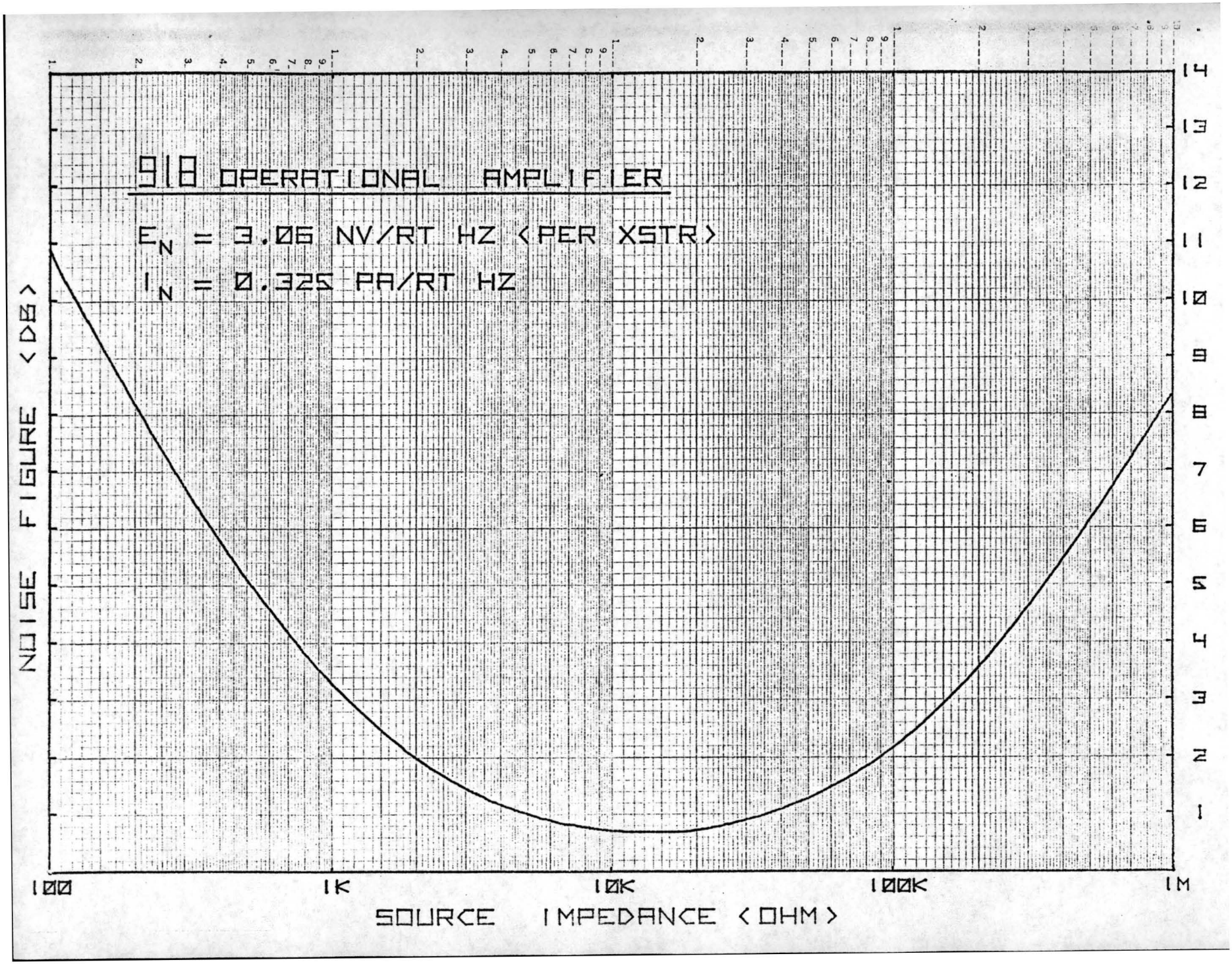
where: R_x is compensation res.
R_f is feedback res.
V_{os} is voltage offset
$V_{BE} \simeq 0.68$ v.

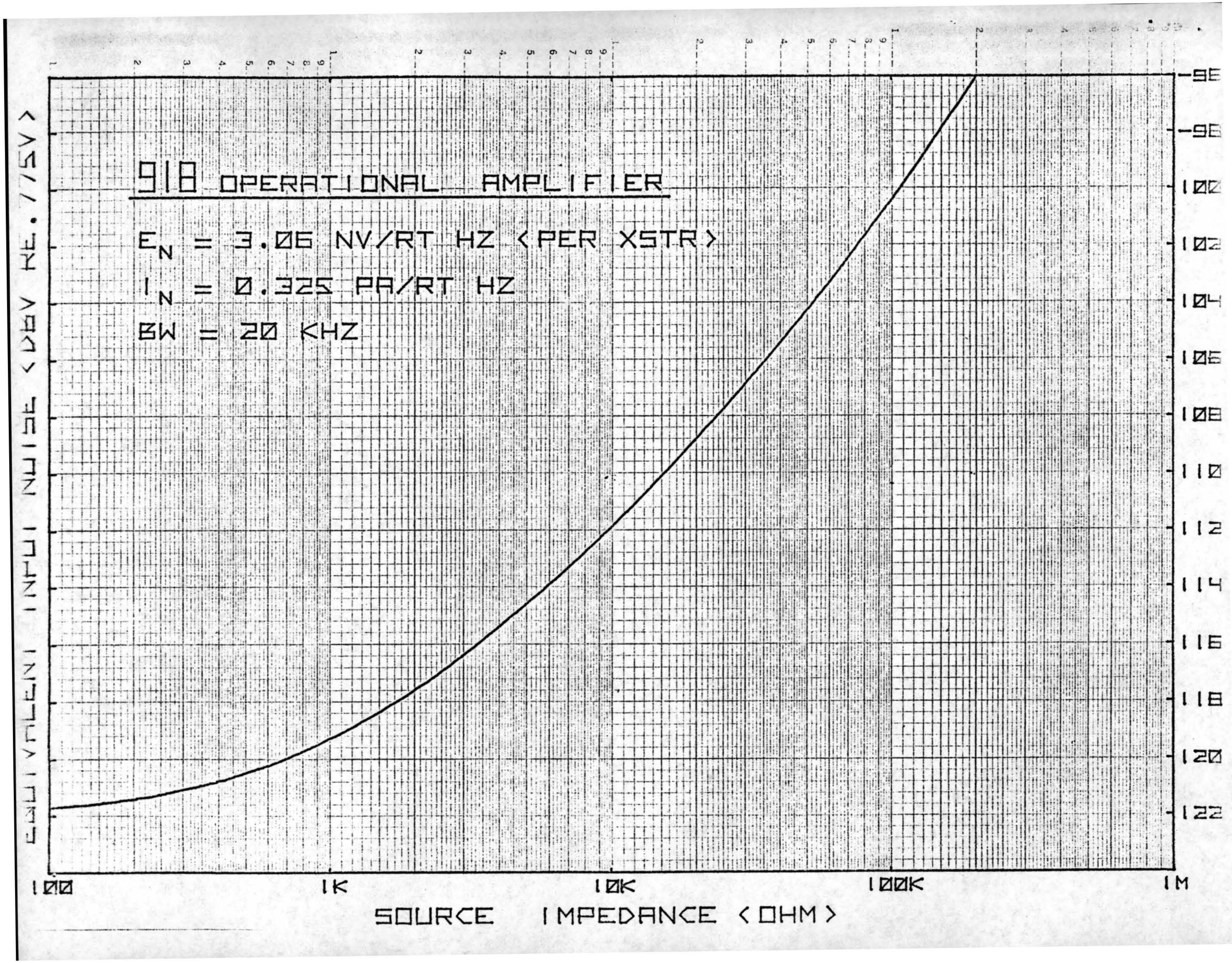
For $R_f = 27K$

V_{os}	R_x
10 mv.	1.8 meg
20 mv.	900 K
50 mv.	370 K


918 OPERATIONAL AMPLIFIER
<1> OPEN LOOP GAIN
<2> MAXIMUM CLOSED LOOP GAIN
<3> MINIMUM CLOSED LOOP GAIN
CLOSED LOOP GAIN CURVES SHOWN WITH 2 μS
PHASE LEAD COMPENSATION IN FEEDBACK CIRCUIT
105 DB
40 DB
6 DB
95 KHZ
800 KHZ
1
2
3
VOLTAGE GAIN <DB>
120
100
80
60
40
20
1
10
100
1K
10K
100K
1M
10M
FREQUENCY (HZ)


CURVE CODE
2 3 2
1 KHZ – 1
20 KHZ – 2
RVCL = 2 – 1
10 – 2
100 – 3
NO LOAD – 1
RL = 150 – 2
TOTAL HARMONIC DISTORTION
232
231
211
222
132
131
212 221
111
112 + 122
121
+8 +10 +12 +14 +16 +18 +20
OUTPUT LEVEL (DBV RE. .775V)
THD
1
.1
.01
.001


918 OPERATIONAL AMPLIFIER
E_N = 3.06 NV/RT HZ (PER XSTR)
I_N = 0.325 PA/RT HZ
NOISE FIGURE (DB)
SOURCE IMPEDANCE (OHM)
100
1K
10K
100K
1M
1
2
3
4
5
6
7
8
9
10
11
12
13
14



918 OPERATIONAL AMPLIFIER
E_N = 3.06 NV/RT HZ (PER XSTR)
I_N = 0.325 PA/RT HZ
BW = 20 KHZ
EQUIVALENT INPUT NOISE (DBV RE .775V)
100
102
104
106
108
110
112
114
116
118
120
122
100
1K
10K
100K
1M
SOURCE IMPEDANCE (OHM)