

DATE Dec 19 1947  
CASE No. 39139-7

Two points on surface of this  
unit less than  $\frac{1}{64}$ " apart

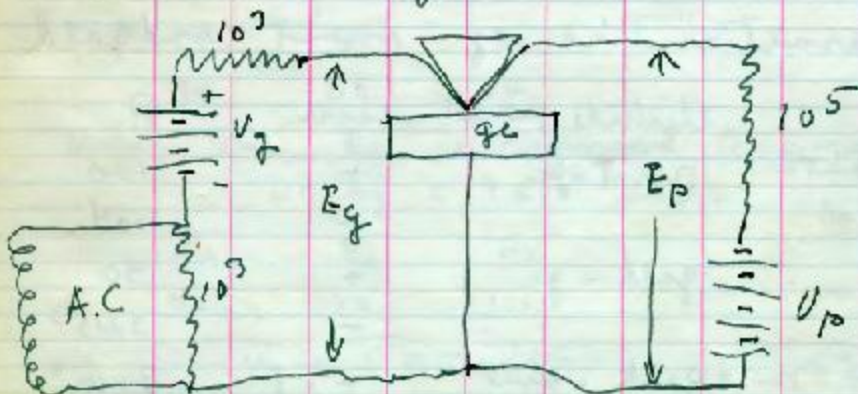
1 wire  $100 + 10^6$  ohms

2 point  $100 + 2 \times 10^6$  ohms

very little resistivity

Dec 24 1947

using the Ge surface (see  
top of page 197 N.B. 18194 and  
the gold contacts according to  
B.A. 240026 the following circuit  
was set up



with  $V_g \sim 3$  volts  $V_p = 90$  volts  
 $I_g \sim 4 \times 10^{-4}$  amps  $I_p = 4 \times 10^{-4}$  amps  
 $I_p \sim 4.5 \times 10^{-4}$  amps  
the above being D.C. values

We obtained the following A. C. values at 1000 cycles

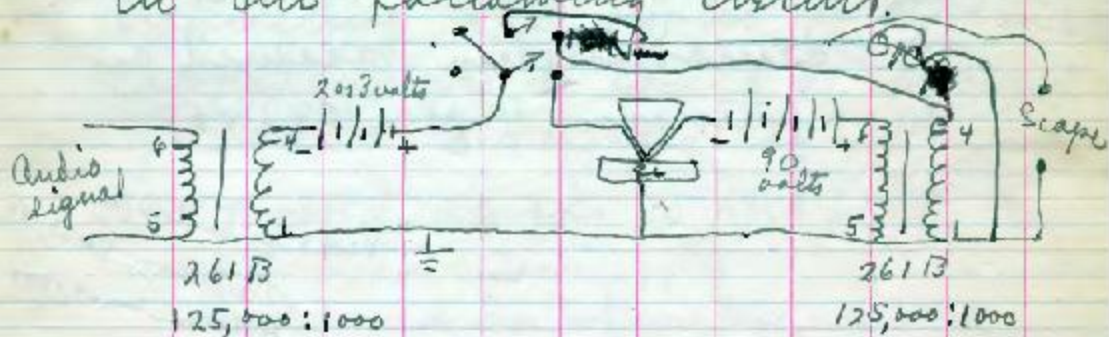
$$E_g = .016 \text{ R.M.S. volts} \quad E_p = 1.5 \text{ R.M.S. volts}$$

$$P_g = \frac{6.4 \times 10^{-7} \text{ watts}}{5.4 \times 10^{-7} \text{ watts}} \quad P_p = 2.25 \times 10^{-5}$$

Voltage gain 100 Power gain 40

Current loss  $\frac{1}{2.5}$

This unit was then connected in the following circuit.



This circuit was actually spoken over and by switching ~~from~~ the device in and out a distinct gain in speech level could be heard and seen on the scope presentation with no noticeable change in ~~power~~ quality. By measurements at a fixed frequency



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in it was determined that the power gain was the order of factors of 18 or greater. Various people witnessed this test and listened (were present)

of whom name were the following  
R. D. Gibney, H. P. Moore, J. Bardner  
J. L. Pearson, W. Shackley, H. Fletcher  
R. Brown. Mrs. W. P. Moore assisted  
in setting up the circuit and  
the demonstration occurred on  
the afternoon of Dec 23 1947

Revised understood by  
G. A. Pearson Dec 24, 1947  
H. R. Moore Dec 24, 1947

Dec 24 1947

This morning H.P. Insore changed the circuit on page 7 as follows



With this circuit the device could be made to amplify audio signal and by turning of the input audio signal and closing switch X and putting phono across output switch Y the device could be used to oscillate. The oscillations were also observed on the scope. The frequency 200 cycles with distributed capacity, and could be changed to about 50 cycles by putting 1000 uuf across 5 and 6 of the input transformer.

Above Demonstration witnessed and understood

24 Dec 47 W. Shockley

H.R. Munn Dec 29 '47

Tues Dec 30 1947

To investigate the H. B. V sample that Gibney prepared in normal fashion on both sides then tried to anodize with diluted glycol



borate on one side but the anodic film failed to form. On the other side the regular glycol glycol borate sol was used and forming was obtained up to 90 volts.

On the side that did not form ~~point~~ contact gave regular N rect with rather low reverse resistance some modulation was obtained.

On the formed side point contact gave P type rectification showing in this case a definite P type layer. Modulation was obtained with 2 points  $\frac{1}{4}$ " apart. The modulation was greatest for the plate biased positive

a positive bias on the grid did not change the plate point direction but increased the impedance of the plate point + and a negative bias on the grid decreased the impedance of plate point +

Dec 31 1947

Gibney tells me that both sides were treated in dilute solution and then only one side treated in the concentrated sol.

Jan 6 1948

On the above sample it was found that the P type rectification was due to poor contact on the back of the Ge. Further investigation of the formed side indicated considerable spreading of current when the point was positive none with the point negative ~~to~~ on the formed side. With the Cu wedge on spot was found that gave very good amplification