STATION EQUIPMENT
Telephone Instruments
"Ericofon" Telephone

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1. GENERAL

1.01 This section covers the Ericofon telephone.

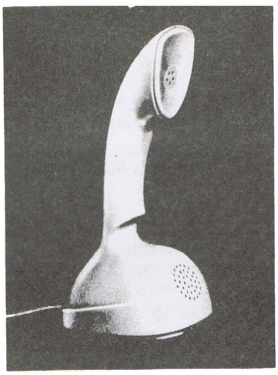
1.02 The Ericofon is available in the following colors:

Color	Stock No.	Color	Stock No.
Sahara Beige	806003	Mandarin Red	806024
Crystal Mint Green	806015	Sandalwood	806027
Candle Glow Ivory	806018	Aquamist Turquoise	806030
Princess Pink	806021	Taj Mahal White	806033

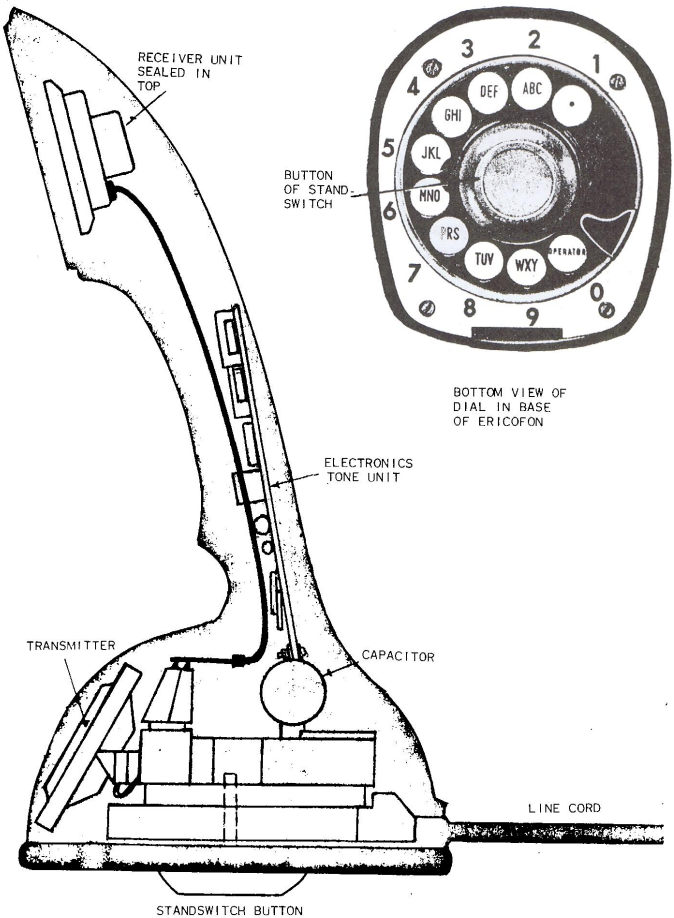
1.03 In case of trouble with the Ericofon, the set shall be replaced with a good set. The defective set shall be returned to the storeroom. No attempt shall be made to repair the set in the field. However, a defective cord may be replaced with a new cord.

2. FEATURES OF THE "ERICOFON" TELEPHONE

2.01 The Ericofon telephone is illustrated on Page 2. Two models are in use, one the older type (Circuit Diagram 222) which requires a bell box, and the other, a Model 50T (Circuit Diagram 226) which uses an electronic tone signal generator.



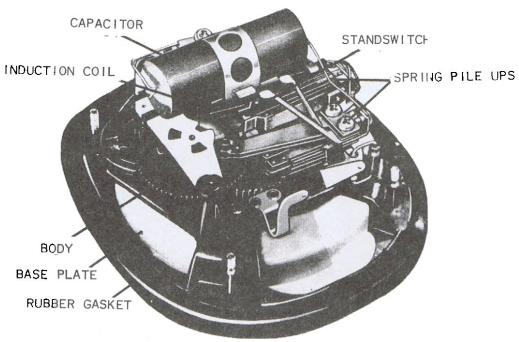
2.02 The Ericofon is a light-weight one-piece stand type telephone with receiver in the top end, transmitter in the top of the base and dial in the bottom end of the base as illustrated on Page 3. In its normal standing position it resembles an ornamental vase that appeals to the eye. It weighs 15 ounces.


RECEIVER UNIT
SEALED IN
TOP
BUTTON
OF STAND-
SWITCH
ELECTRONICS
TONE UNIT
TRANSMITTER
CAPACITOR
LINE CORD
STANDSWITCH BUTTON
BOTTOM VIEW OF
DIAL IN BASE
OF ERICOFON

2.03 The housing is made of a tough thermo plastic material that is resistant to impact and scratches. Is is not affected by perspiration, lotions, and detergents, and can be easily cleaned.

2.04 The receiver is permanently sealed inside the upper end of the housing. The base assembly can be removed to obtain access to the inside.

2.05 The base assembly illustrated below contains the dial, standswitch, induction coil, spring set, capacitor, and electronic tone unit (when used). When the standswitch in the center of the dial is lifted, the Ericofon is connected. When the Ericofon is placed on its base in a standing position, the standswitch is depressed, and the Ericofon is disconnected.



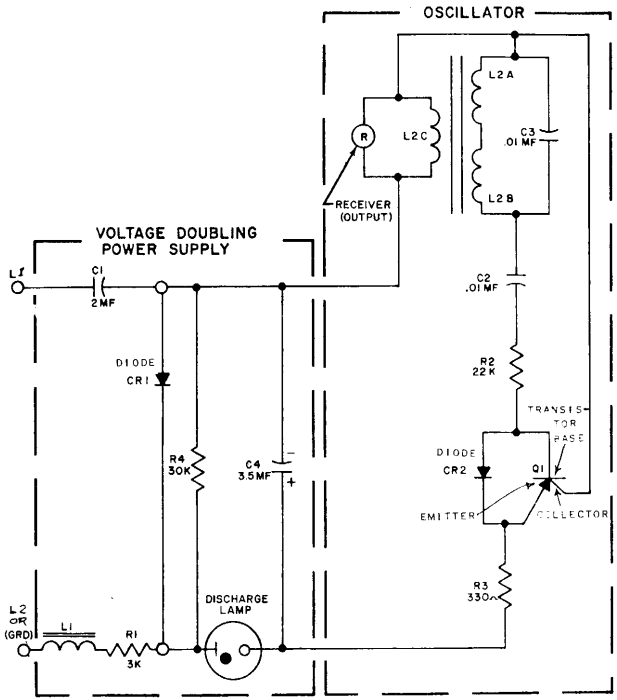
2.06 The transmitter is mounted within a metallic shell, and is fastened within the housing by means of a retaining clip.

2.07 The line cord is a combination straight and coiled cord. This feature permits the Ericofon to be extended seven feet from its connecting block, with the straight portion enabling free movement over desk tops and around corners.

3. ELECTRONIC TONE UNIT

3.01 The Ericofon employs a novel method of signaling the customer when a call comes over his line. This is an electronic tone unit which produces a penetrating warbling tone which will carry for distances up to 150 feet even in noisy locations.

3.02 The circuit of the tone unit is shown below:



3.03 The circuit consists of two basic parts, a voltage doubler and a transformer coupled oscillator. The power supply converts the incoming ringing current into DC pulses. The oscillator produces an amplitude and frequency modulated output which is transmitted to the receiver unit to reproduce the high frequency warbling tone.

3.04 In the voltage doubler circuit, the choke coil (L1) serves to prevent overloading of the talking circuit when bridged ringing is employed. The associated 3000-ohm resistor (R1) improves the impedance match for ringing frequencies. It also helps in preventing dial tapping on extensions.

3.05 The discharge lamp is a small neon lamp which operates to pass current when 40 volts AC at 20 Hz is impressed across line terminals L1 and L2. The current flow causes the 3.5 MF (C4) capacitor to charge to a value of 15 to 30 volts DC, not enough to cause the lamp to operate.

3.06 The diode CR1 operates to short circuit the line when L2 is positive and L1 is negative on ringing current pulses. This causes the 2 MF capacitor (C1) to charge to approximately the peak voltage of the ringing current. When the line polarity reverses as the ringing current changes its direction of flow, the diode presents a high impedance, opening the circuit to the discharge lamp and the capacitor C4. The capacitor C1 now receives an additional charge, resulting in approximately twice the peak voltage of the input ringing voltage or approximately 80 volts DC.

3.07 The discharge lamp then breaks down and conducts, causing capacitor C4 to charge and supply current to the oscillator circuit.

3.08 The inductance coil in the Ericofon telephone circuit doubles as a coupling transformer (L2) in the oscillator circuit. This transformer consists of the secondary winding L2C and the series connected primary windings L2A and L2B. The primary windings are part of the tuned circuit for the oscillator and the secondary winding serves to couple the oscillator output to the receiver R.

3.09 During the cycle of ringing voltage, the DC voltage across the capacitor C4 rises to a peak of 30 volts and falls to about 2 volts. This causes the transistor Q1 to start conducting and amplifying. Positive feedback occurs through the transformer at a frequency determined by the inductive

values of the secondary windings L2A and L2B in parallel with capacitor C_3 (.01 MF). This frequency is pulled to the resonant frequency of the receiver.

3.10 The oscillations of the tuned circuit causes the potential at the base of the transistor to become increasingly more positive. When this occurs, the diode CR2 conducts in the forward direction while the voltage at the base of transistor reaches a peak positive value. This value then decreases until the base voltage attains the same value as the emitter voltage. During the conduction cycle of diode CR2, its low forward resistance maintains a low voltage externally from base to emitter, protecting the transistor from high reverse voltage.

3.11 Capacitor C2 (.01 MF) and resistor R2 (22,000 ohms) form a coupling network which feeds to the base element of the transistor and biases it negative, thus causing an emitter-base current to flow. This condition, in turn, produces an increase in emitter-collector current flow. The negative current is fed back to the base element which provides a sustained and increasing oscillation until cutoff occurs. When this point is reached, the tuned circuit (L2A, L2B and C3) "unwinds" the oscillator, and the cycle is then repeated.

3.12 As the voltage across capacitor C2 rises, a charging current flows through resistor R3 and the base-emitter circuit of the transistor resistor R2, capacitor C2, and transformer L2. This charging current helps start the oscillator circuit by supplying forward bias to the transistor.

3.13 The output frequency at the receiver varies between 2200 and 2400 cycles per second. The power supply voltage across capacitor C4 fluctuates between 2 and 30 volts, and the amplitude of oscillation, the frequency, and the acoustical output thus follows the voltage variations of the ringing current input.

APPROVED:

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