

# "VIBRASENDER" AND "VIBRASPONDER" DEVICES

In order to develop a dependable, fast, and inexpensive selective signaling systems, Motorola Engineers designed the "Vibrasender" and "Vibrasponder" devices. These two simple but well-designed units represent an engineering advancement that has solved the problem of producing inexpensive but reliable tone generators and responders with excellent frequency stability and extremely long life.

## "VIBRASENDER" OPERATION

The "Vibrasender" resonant reed is the frequency determining element of the tone oscillator. The "Vibrasender" reed is packaged as a small plug-in unit and is completely enclosed. It consists of a tuned cantilever reed of special steel, mounted on a rugged chassis with a coil and two permanent magnets. The entire assembly is spring mounted and hermetically sealed into a metal housing to insure long life at peak performance under all types of conditions.

It will maintain the oscillator frequency accurate within  $\pm 0.15\%$  for all errors including initial setting error and all temperatures effects from  $-20^{\circ}\text{C}$  to  $+80^{\circ}\text{C}$ . This stability approaches that obtainable with crystals and is better than could be produced with any other type of oscillator with the same simplicity and dependability.

The resonant reed is essentially a driven tuning fork. It is used with a single tube or transistor in an oscillating circuit to produce very accurate tones on certain specific frequencies.

## "VIBRASPONDER" OPERATION

The "Vibrasponder" reed is the companion unit to the "Vibrasender" unit and is essentially a resonant reed relay. When a signal of the resonant frequency

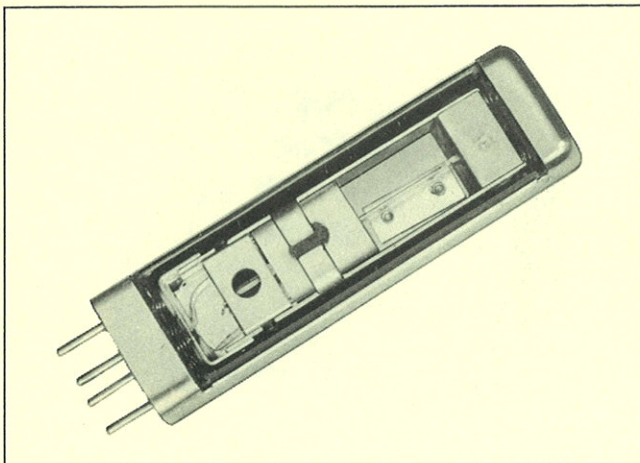
is applied to the reed, the reed vibrates readily. The amplitude builds up quickly and reaches the point where a small contact wire makes contact with the reed. This intermittently closes a circuit which may be used to change the bias on a vacuum tube or a transistor, causing the devices to conduct and close a relay.

Like the "Vibrasender", the "Vibrasponder" device is made with instrument precision, with the vibrating reed made of the same special material. All insulating parts in the structure of the unit are made of Isolantite for extreme mechanical stability. The "Vibrasponder" unit maintains its frequency stability within  $\pm 0.25\%$  from  $-20^{\circ}\text{C}$  to  $+80^{\circ}\text{C}$ . No adjustments are available or necessary.

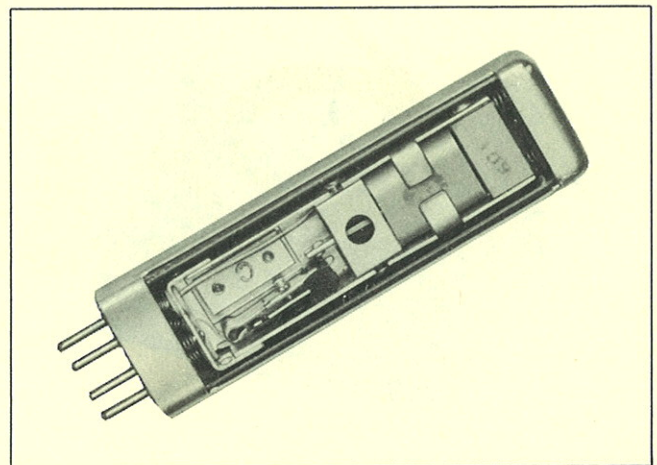
The "Vibrasponder" reed has a response curve very similar to that of a single tuned circuit having a Q of 110. To provide stable channel width, the Q of all units is accurately maintained at this value in manufacture.

With the inherent stability and bandwidth described, the basic frequencies of the tone signaling system may be placed approximately 10% apart. Signals on frequencies  $\pm 10\%$  removed from the specified frequency of a "Vibrasponder" device require a signal level of 25 DB or about 18 times higher than the threshold signal needed to operate the "Vibrasponder" unit.

The "Vibrasponder" unit is normally made with a 3 ohm coil so that it can be operated directly from the output transformer of most types of communications equipment. A 100 cps unit requires only 0.035 volts for threshold operation. By its nature, the "Vibrasponder" device requires an increasing voltage as the frequency increases. Thus, a 1084.0 cps unit requires .210 volts for threshold operation.



"Vibrasender"



"Vibrasponder"