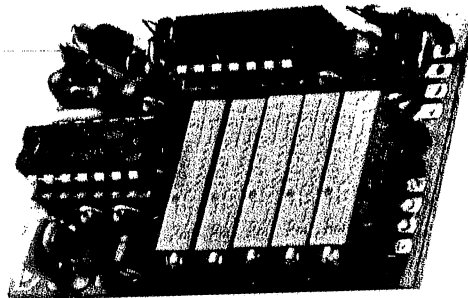


Model 389 Tunable Encoder



Model 389 (PC Board Only)

INTRODUCTION

The Model 389 encoder is a direct replacement for the Model 310 and 311 encoders. The 389 features complete tunability for each frequency from 650 to 3000 Hz. Two encode modes are standard, a burst time of 0.2 or 1.0 second, and a continuous tone mode for push to talk keying.

The 389 is designed to operate on + 5 to + 30 VDC with positive or negative keying.

If desired, another board containing potentiometers may be mounted under the 389 encoder to provide up to 10 selectable frequencies, see Figure 1.

Vega

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Signaling Products Group

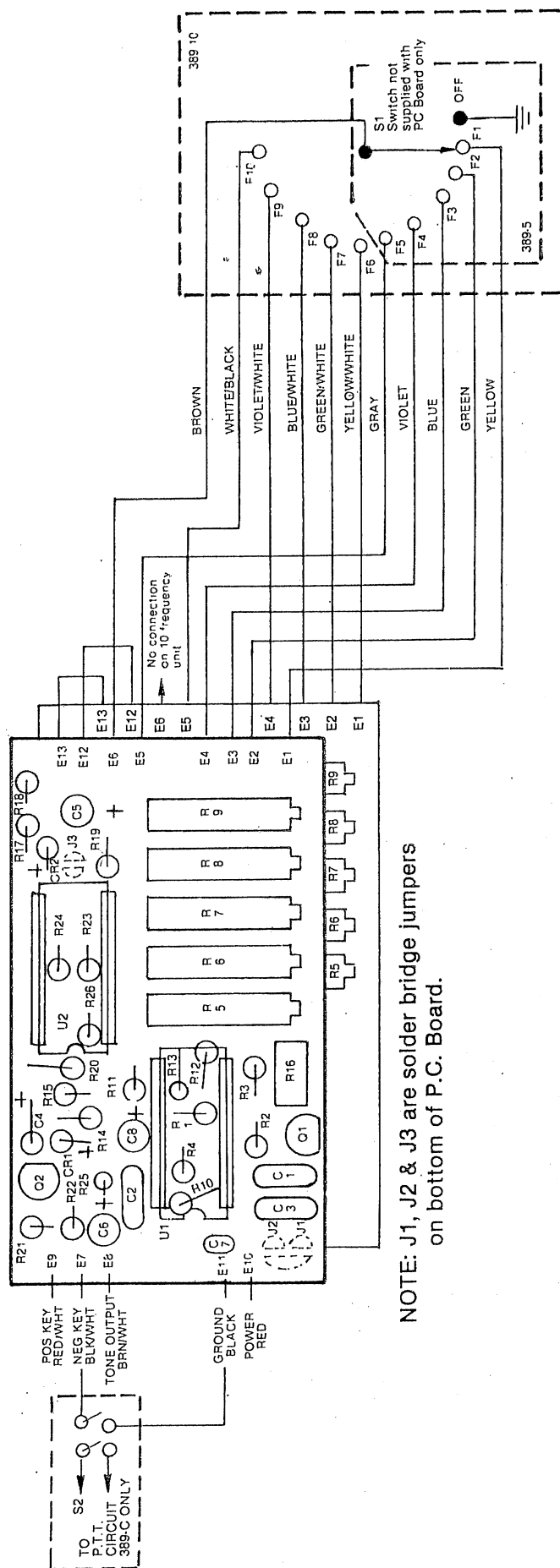
9900 Baldwin Place

El Monte, California 91731-2204

Telephone: (818) 442-0782

Toll-free: 800-877-1771

FAX: (818) 444-1342



NOTE: J1, J2 & J3 are solder bridge jumpers on bottom of P.C. Board.

NOTE: Switch supplied with enclosed Model 389-A and 389-C units.

CONNECTOR FOR THE MODEL 389-A and 389-C

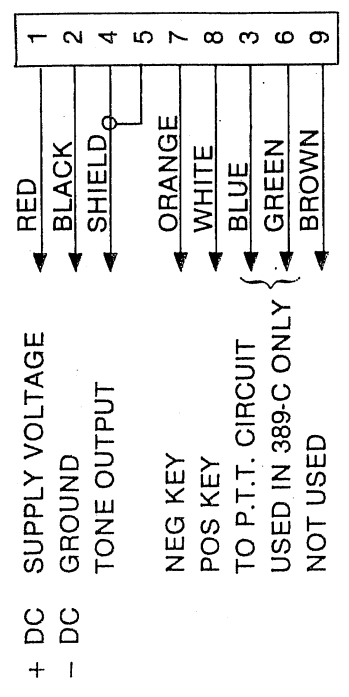
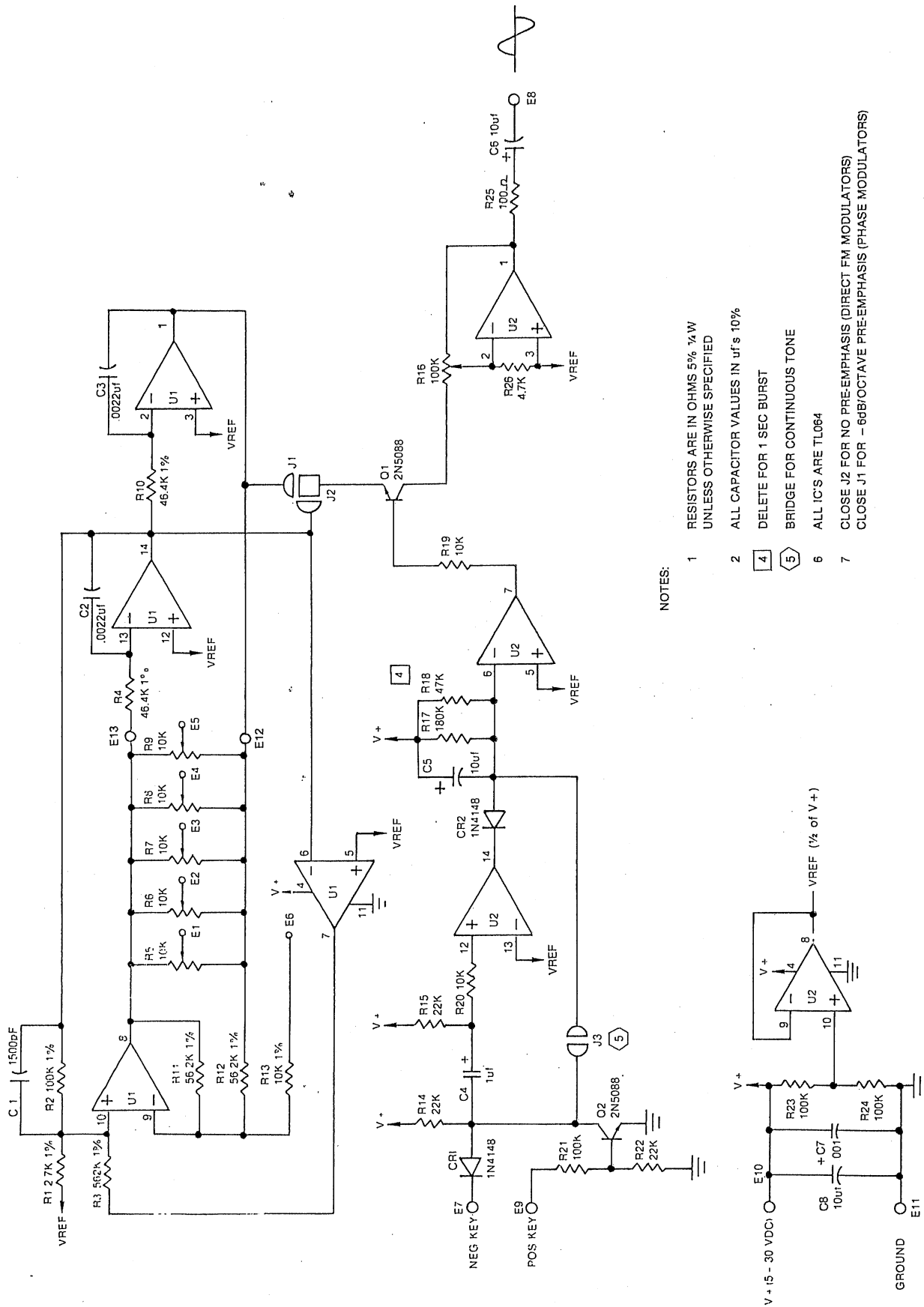


FIGURE 1 PARTS LAYOUT



NOTES:

- 1 RESISTORS ARE IN OHMS 5% 1/4W
UNLESS OTHERWISE SPECIFIED
- 2 ALL CAPACITOR VALUES IN uf's 10%
- 3 DELETE FOR 1 SEC BURST
- 4 BRIDGE FOR CONTINUOUS TONE
- 5 ALL IC'S ARE TL064
- 6 CLOSE J2 FOR NO PRE-EMPHASIS (DIRECT FM MODULATORS)
- 7 CLOSE J1 FOR -6dB/OCTAVE PRE-EMPHASIS (PHASE MODULATORS)

FIGURE 2 SCHEMATIC

GENERAL

The Model 389 is a small and economical multi-frequency encoder (generator). Occupying 2.8 cu. in., the encoder is small enough to fit inside a limited volume control head or crowded radio package. The multiple frequency feature means that one Model 389 takes the place of several single frequency encoders.

The 389 can be jumpered to provide a continuous tone or either of two lengths of tone burst. Output level is adjustable. Keying may be either to the positive supply voltage or to ground. The standard options available in the Model 389 make system applications very easy.

The Model 389 is also available in two encased versions for easy under-dash mounting (see cover page). The 389A-5 provides up to five selectable frequencies. (The last digit signifies the number of frequencies.) The 389C-5 provides both frequency selection and a push button for tone burst applications. The Models 389A-10 and 389C-10 provide up to ten selectable frequencies.

INSTALLATION

Avoid mounting the Model 389 in high temperature locations and away from power transformers and strong radio frequency fields. Wires are attached to the encoder and mounting hardware is provided for easy installation. Connections are shown in Figure 1. A single-pole six or eleven-position rotary switch may be used as shown to select encoder frequency, plus providing an all off mode. Please note that frequency selection lines should not exceed 36" max.

Be sure to return 389 ground connections to shield of microphone or to audio ground in associated transmitter. Be sure transmit key line does not have a voltage greater than the +DC supply to the 389 to prevent possible damage. The connections for all models of the 389 are shown in Figure 1.

MODEL 389 ENCODER SPECIFICATIONS

Tone Frequency	650 to 3000Hz
Tone Frequency Stability	$\pm 0.3\%$
Harmonic Distortion	1% Max.
Tone Output Level	Up to 1.7V into 1K ohm load.
Output Impedance	100 ohms
Number of Tones	Up to ten
Burst Time	0.2 or 1.0 sec.
Supply Voltage	+5 to +30 VDC (Neg Grd)
Current Drain	10mA, approx.
Operating Temperature	-30° to +70°C
Size 389 PC Board	2.35 X 1.35 X 0.51 inch (6 X 3.2 X 1.2 cm)
Size 389-A and 389-C	D 2.15 X H 1.52 X W 4.74 inch (D 5.46 X H 3.86 X W 12.04 cm)

THEORY OF OPERATION

As shown in Figure 2, U1 forms a free running, constant level sine wave oscillator. The circuit oscillates at the frequency set by whichever potentiometer is connected to E6. Grounding E6 will prevent oscillation. The keying and timing circuits gate a burst of tone through Q1 to the output amplifier/buffer. Output level is set at this point by R16.

The 389 as shipped is strapped for a 200 ms burst. If a one second burst is desired, cut out R18. For continuous tone, bridge J3.

Normal keying is effected by taking the negative key line to ground or the positive key line to V+. In either mode, the output will come to full amplitude in less than one cycle.

If the absolute minimum power dissipation is desired, the 389 may be operated by keying a supply line. For positive keying, tie the positive key lead to the plus supply lead and apply the trigger to the pair. For negative keying, tie the negative key lead to the ground line and key the pair. Note that in both cases, turn-on time will be much longer than in the normal mode, due to the start-up time of the oscillator.

WARRANTY

Cetec Vega Signaling Products are guaranteed to be free from defects in material and workmanship for a period of three years from the date of shipment. Warranty is for factory repair or replacement only.
