I. GENERAL

The SSC Model 510A miniature CTCSS Encoder/Decoder has been designed for use in most CTCSS applications. Continuously tunable frequency adjustments, miniature size and convenient mounting techniques permit quick universal field installations.

II. OPERATING SPECIFICATIONS

Operating Voltage: 10.9Vdc to +25Vdc (6.0Vdc min. with regulator removed)
Operating Current: 10mA (Nominal)
Frequency Range: Continuously tunable 67.0Hz to 250.0Hz
*Operating Temp.Range: Exceeds BIA Spec. (-30°C to +60°C)
*Frequency Stability: Exceeds BIA Spec. (±5%)
Encoder Output Level (Nominal): Adjustable 0 to 1.5Vrms
Encoder Output Amplitude Stability: Less than 1dB change over full freq.range.
Encoder Output Distortion (THD): Less than 1%
Decoder Input Level Range: 20mVrms to 2mVrms
Decoder Input Impedance: Greater than 30K
Decoder Output: Decoder or decoder open collector (100mA at 40Vdc)
Decoder Operate/Monitor: Normally in monitor, ground to activate decoder.
Size: .5"x1.25"x1.75" (1.7cm x 3.2cm x 4.5cm)
Interface: Flying Leads
*BIA Specification used for industry standard reference only. Actual test data available on request.

III. MOUNTING CONSIDERATIONS

The Model 510A is supplied with a pad of double sided pressure sensitive foam tape with which can be used to mount the unit to any smooth surface. For best results, be sure that mounting surface is clean and dry. Place the unit on desired location and press firmly to insure good contact of adhesive. Do not touch adhesive or attempt to reposition the unit after mounting.

Frequency and output controls have been located on the same side of the board to allow adjustments with the unit mounted. If possible mounting should allow access to these controls.

Although the Model 510A has been designed for maximum immunity to RF interference, an effort should be made to avoid intense RF fields. Keeping power and output lead lengths to a minimum will also insure maximum immunity to RF.

IV. INSTALLATION & ADJUSTMENTS

Power: Connect the red +12 volt lead to a 10.9 to +25Vdc continuous supply. Connect the black lead to the negative side of the supply (ground).

For applications where supply voltage is less than 10.9Vdc, VR1 may be removed and a jumper placed from pin 1 to pin 2. Minimum supply voltage specification is now +6Vdc. The supply should now be well filtered. Normally only the tone output level specification is affected by this modification. The model 510A is available on request with VR1 removed.

Decoder Input: Connect the signal input (white/orange) directly to the discriminator audio.

Hi Pass Filter Input: (white/violet) This input can usually be connected to the same point as the decode input. Breaking the receiver audio path at this point will allow insertion of the high pass filter and buffer the discriminator audio to the audio output (white/blue) point. This input is separated from the decoder to allow use of the radio manufacturer's audio point if desired.

Squelch Gate: Decode (yellow) or decode (blue) outputs are provided; both are 40Vdc open collector outputs. Decode will remain saturated until a proper signal is detected or hang-up (green) is removed from ground. With J01 cut decode (blue) will saturate on detection of a proper signal or hang-up is removed from ground.

Hookswitch Operation: On a congested radio channel a radio equipped with a model 510A will only hear other associated units. Prior to transmitting we recommend monitoring the channel for other user traffic. A microphone hook switch is usually the most convenient method. The model 510A is usually in the encode/monitor mode. Grounding the hang up (green) lead will mute the receiver awaiting a proper input signal.

For applications where a hook switch is not practical CR4 should be installed and EL (orange) used for monitor. In this case connect (green) to a transmit keyed positive voltage to produce encode during transmit. Q1 may be changed to an NPN 2N1904 or equivalent for PTT keying. CR4 installed and Q1 as a 2N1904 is available from the factory by ordering the model 510CA.

* Second "A" in designation indicates uncased model.
IV. INSTALLATION & ADJUSTMENTS (Cont'd)

Encode: With the hang-up (green) lead removed from ground (grounded in option 1 units) an encode tone is present at the tone out (white/green) lead. Connect the (white/green) lead to the CTCSS input tone applique point normally used by the radio manufacturer for factory supplied CTCSS. When a standard applique point is not available or difficult to locate, tone input should be connected similar to fig. 1 or fig. 2.

![Diagram of encode circuit]

Direct FM

FIGURE 1

TONE INPUT
(WHT/GRN)

Oscillator

BUILT OUT RESISTOR

FIGURE 2

TONE INPUT
(WHT/GRN)

AUDIO AMP &
PRE-AMPLIFIER

Deviation Adjustment

MIC

Adjust 213 for the required CTCSS frequency and set the CTCSS tone transmit deviation with R29 (approx. 750Hz deviation)

V. PARTS LIST

<table>
<thead>
<tr>
<th>Reference</th>
<th>Qty.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>1</td>
<td>2.2uF, 25V, 20%, Tantalum</td>
</tr>
<tr>
<td>C2</td>
<td>1</td>
<td>1.0uF, 25V, 20%</td>
</tr>
<tr>
<td>C3</td>
<td>1</td>
<td>0.047uF, 50V, 10%, X7R, Monolithic Ceramic</td>
</tr>
<tr>
<td>C4</td>
<td>1</td>
<td>0.022uF, 50V, 10%, X7R, Monolithic Ceramic</td>
</tr>
<tr>
<td>C5</td>
<td>1</td>
<td>1000pF, 50V, 10%, X7R, Monolithic Ceramic</td>
</tr>
<tr>
<td>C6, C7, C8</td>
<td>3</td>
<td>220pF, 50V, 10%, X7R, Monolithic Ceramic</td>
</tr>
<tr>
<td>C9, C10, C11, C12</td>
<td>4</td>
<td>0.1uF, 50V, 10%, X7R, Monolithic Ceramic</td>
</tr>
<tr>
<td>C13</td>
<td>2</td>
<td>0.1uF, 50V, 10%, X7R, Monolithic Ceramic</td>
</tr>
<tr>
<td>C14</td>
<td>1</td>
<td>220pF, 50V, 20% Monolithic Ceramic, Mica</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cap. Numbers</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>1</td>
</tr>
<tr>
<td>C2, C4, C44</td>
<td>1</td>
</tr>
</tbody>
</table>

ELECTRICALS

<table>
<thead>
<tr>
<th>Reference</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1, Q2</td>
<td>2</td>
</tr>
</tbody>
</table>

VI. WARRANTY

The SSG Model 510A is warranted for five years for replacement of defective parts and two years for labor. This warranty is specifically limited to correction of the defects by factory repair or replacement of the faulty equipment or parts. For a complete warranty statement, please refer to the "Ordering Information" section of your SSG catalog.

SOLID-STATE COMMUNICATIONS, INC.
21060 Corsair Blvd., Hayward, CA 94545
(415) 785-4610