



**Relm GMH Series Adaptor Kit**  
**For**  
**DSP223 Tone Adaptor Panel**  
**Technical Manual**

P.N. 803885

# 1 Description:

The Relm GMH Adaptor kit allows the DSP223 to control (PTT, Monitor and frequency) a GMH series radio. DSP223 operating software version 2.3 or higher is required to control the GMH radio. This software is downloadable from our WEB Site: [www.vega-signaling.com/dspsoftware.htm](http://www.vega-signaling.com/dspsoftware.htm)

The install kit includes the following:

1. 1 EA Serial adaptor PCB
2. 1 EA DSP223 to GMH Radio Interface Cable
3. 1 EA Reprogrammed PLD for DSP223 (U27)

# 2 Installation:

Remove the six screws and lift cover from DSP223.

Align the Serial Adaptor PCB over J3 and J4 and press into place.

Replace U27 PLD, using a small screwdriver pry out old part slowly and push in new supplied PLD.

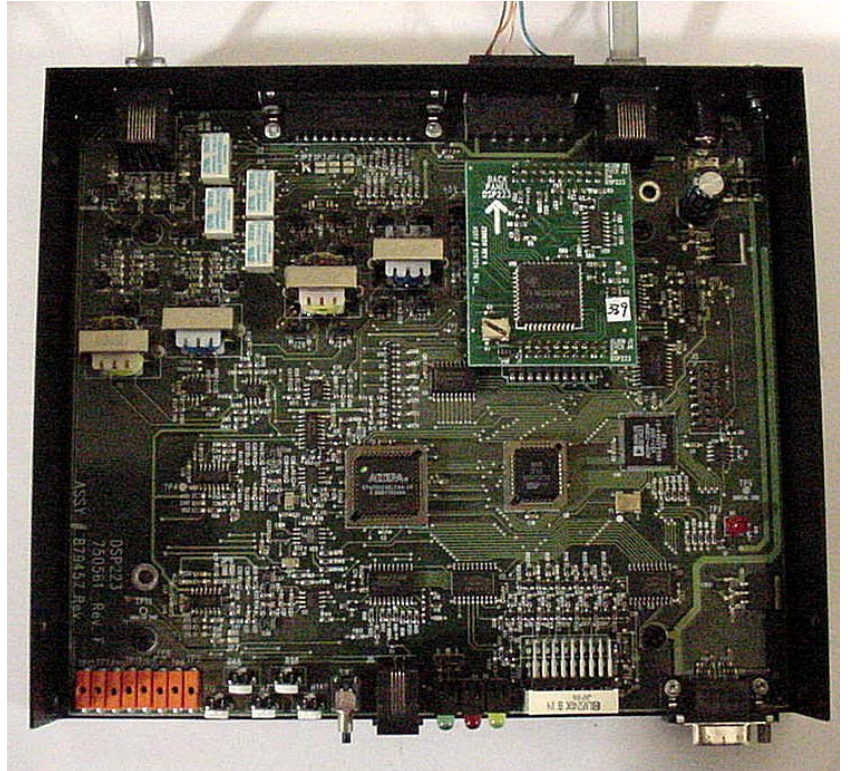
Solder JP2 closed

Set jumpers J14, J15, J22, J23, J24, J25 and J27 to "A" position

Set jumpers J12, J13 and J26 to "B" position

# 3 Connections:

The DSP223 to GMH radio interface cable is provided for connection between the 15-pin high-density connector of the radio and the DSP223 6-pin terminal block and RJ-45 digital port. Power for the DSP223 is provided by the radio via the interface cable.



**TELEX Communications, Inc.**

**Vega Signaling Products**

8601 East Cornhusker Highway, Lincoln, Nebraska, 68507  
Phone: (402) 465-7026 / (800) 752-7560 Fax: (402) 467-3279  
E-mail: [vega@telex.com](mailto:vega@telex.com), Web: [www.vega-signaling.com](http://www.vega-signaling.com)

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## LZA2028 Factory Installation with GMH and Alignment

### A. BOM Index Tree

#### LZA2028

1100-30960-800	DSP223, Radio Tone Adaptor (Panel)	1 ea.
1100-30964-402	DSP223 to GMH/GBH Kit	1 ea.
1100-30960-801	AC Wall Adaptor, 12V, 500mA, Vega 730149	1 ea.
2506-30935-003	Cover, Back	1 ea.
2831-30278-908	Grommet, 3/8. Ned, F, 1/16	1 ea.

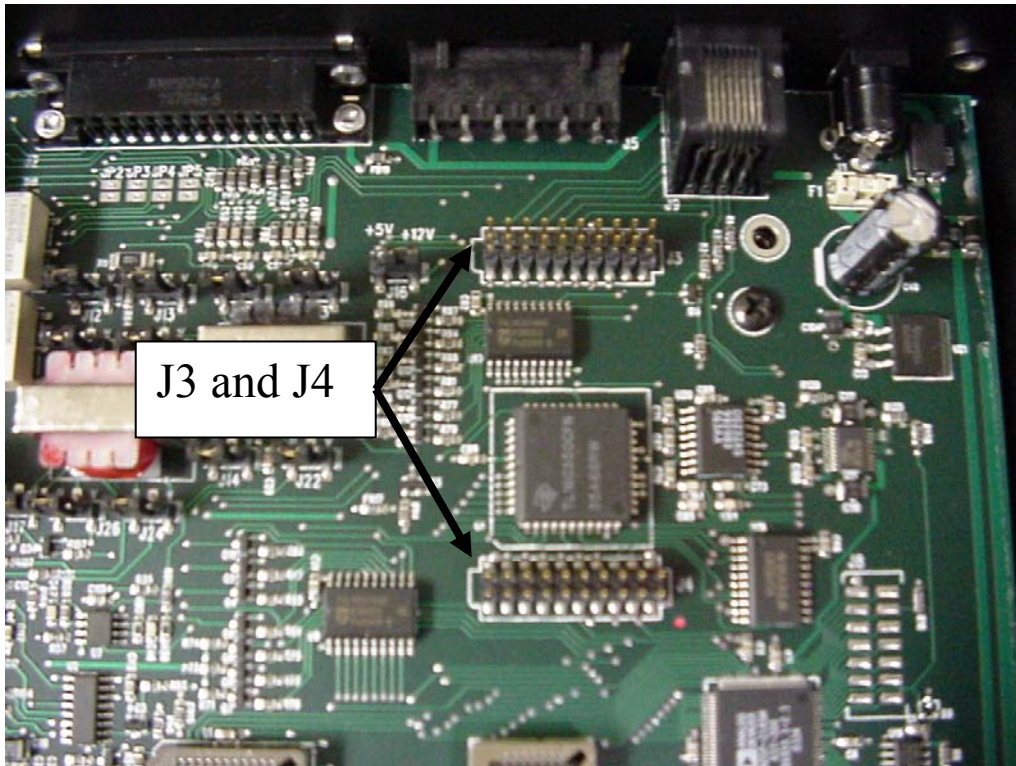
### B. Equipment Needed

- Medium philips blade screwdriver
- Small flat blade screwdriver
- GBH (with cover removed)
- HP8920 Communication Test Set
- RF Coax Cables
- Compatible Tone Remote (IDA 24-66 or Vega C2000)
- Modular line junction box
- RMS Voltmeter
- Personal Computer
- DSP Editor (dsp223\_25.exe)

### C. Installation

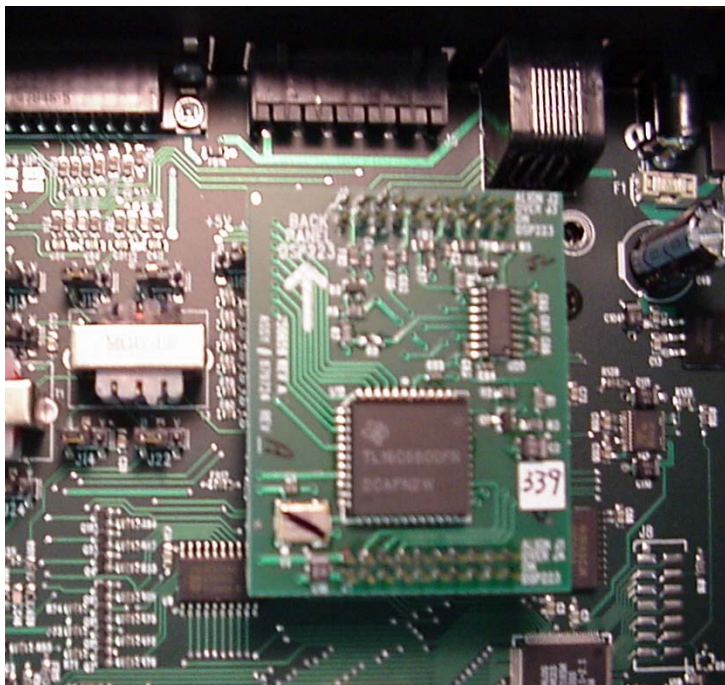
**Caution**  
 Use static strap while handling and installing the Serial Adaptor PCB and PLD.

1. Remove the 6 screws from the sides of the DSP223 (1100- ) and remove the cover.
2. Align the Serial Adaptor PCB (from kit 1100-30964-402) over J3 and J4 of the DSP223 main board. See Figure 1.



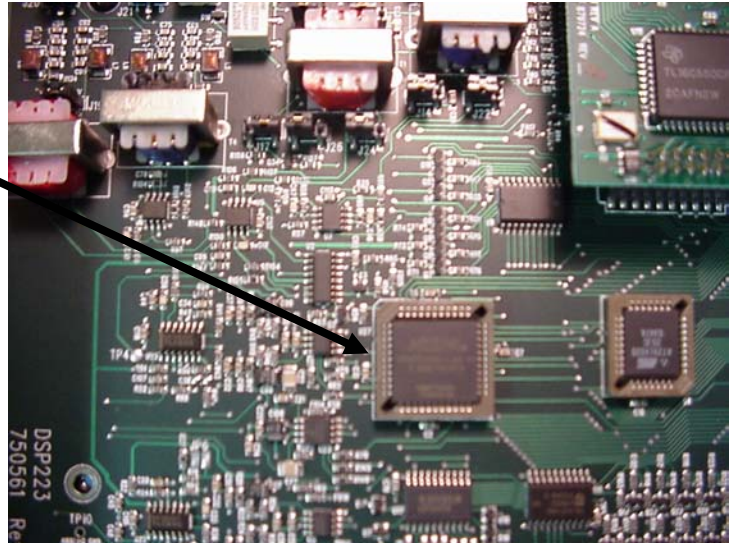
**Figure 1 – Serial Adaptor PCB Location**

3. Carefully press the PCB into place. Make sure the arrow on the adaptor PCB is pointing towards the back panel. See Figure 2.

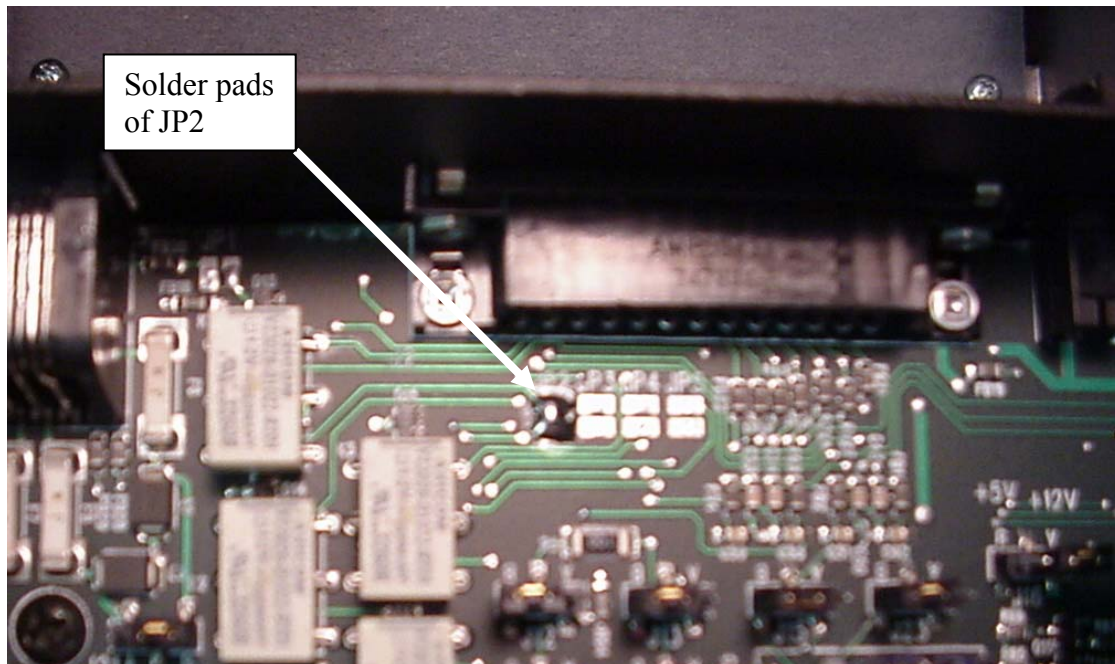


**Figure 2 – Serial Adaptor PCB Location**

4. Replace U27 PLD with the PLD supplied in kit 1100-30964-402. Using a small flatblade screwdriver or IC puller, carefully remove the old IC and replace with the new IC. See Figure 3.



- Solder JP 2 closed. See Figure 4.



**Figure 4 – JP2 location.**

- Set the following Jumpers to the “A” position:  
J14, J15, J22, J23, J24, J25, J26, and J27.
- Set the following Jumpers to the “B” position:  
J12 and J13.
- For a 2 wire or 4 wire line configuration, set the following jumpers respectively:

	<b>J19</b>	<b>J20</b>	<b>J21</b>
<b>2 Wire</b>	B	A	A
<b>4 Wire</b>	A	B	B

- Replace the cover and the 6 screws.

#### **D. Alignment and Tests**

- Remove the non-terminated Termination Block that is plugged into the back of the DSP223.
- Connect the DB9 connector of the supplied cable (from kit 1100-30964-402) into the back of the GMH.
- At the other end of the cable on the 6 connector terminal block, make sure there is no wire connected to “pin 6” of the terminal (Yellow, B+). If there is, remove the wire from the “pin 6” terminal and cut the exposed wire off. (Note: The voltage will be supplied through the separate DC wall adaptor.)
- Connect the terminal block into the terminal block receptacle at the rear of the DSP223 and plug the RJ45 plug into the Digital Expansion jack.
- Plug the remote line into the “Line” jack at the rear of the DSP223.
- Plug the remote and GMH AC plugs into an outlet and switch the GBH “on”.
- Plug the power plug into the DSP223 and plug the AC wall adaptor into the AC outlet.

8. Make sure the GMH has the “remote” option set.
9. Boot-up the DSP Editor (dsp223\_25.exe) and read [Recv from 223] the contents of the DSP223.
10. Connect a dB9 female to male connector from the computer’s Comm Port to the “Programming Port” of the DSP.
11. On the main screen of the editor, select the box next to “Half Duplex, Active”.
12. Write [Send to 223] this change to the DSP. Remove the programming cable from the DSP.
13. **Line RX Set:** Insert the negative voltmeter probe into the “Ground” test point and the positive in the “Line RX” test point. While pushing the PTT of the remote handset with no voice present, the voltage should be approximately 50 – 80 mVrms. Adjust the “Line RX” potentiometer (located at the front of the DSP) if needed.
14. **Radio TX Set:** Push the PTT of the remote handset and voice modulate into the microphone. Adjust the “Radio TX” potentiometer (located at the front of the DSP) to set the voice modulation to approximately 4 – 4.5 kHz.
15. **Radio RX Set:** Insert the negative voltmeter probe into the “Ground” test point and the positive in the “Radio RX” test point. With a standard receive signal applied to the GBH, the voltage should be 0.24Vrms. Adjust the “Radio RX” potentiometer (located at the front of the DSP) if needed.