

KEYPAD SCANNING ROUTINE:

The keyboard is multiplexed in a 2x5 array. It is scanned by INT5 and INT6 lines in conjunction with port PG(0..4).

While waiting for the key-press, the interrupts should be armed (negative going edge), and configured as inputs, while port PG is configured as outputs, with all bits set low. When any key is pressed, either of the two interrupts will be triggered. This trips the interrupt routine.

The interrupt service will scan the keyboard to determine which key(s) are pressed, and will return this value to the main program flow. The scanning is performed as follows:

1. Disarm INT 5 and 6.
2. Debounce: a 20 ms delay will get rid of signal bouncing (this is critical when scanning switches).
3. Set port PG to input state.
4. Set INT 5 line to output low state, and INT6 to input state.
5. Reading PG(0..4) will provide states of the 5 switches on INT5 branch. A 0 will mean that the switch is pressed. Switches on INT6 branch will have no effect.
6. Set INT 6 line to output low state, and INT5 to input state.
7. Reading PG(0..4) will provide states of the 5 switches on INT6 branch. A 0 will mean that the switch is pressed. Switches on INT5 branch will have no effect.
8. Depending on program flow, it may be a good idea to wait for a switch release, not to trigger the interrupt when releasing the switch (debouncing noise).
9. Restore the INT5 and 6 to inputs, and PG(0..4) to outputs with low on all bits.
10. INT5 and 6 should be re-armed after the interrupt has been exited.

CONFIDENTIAL

This document is private and the sole property of Nova Tracker, Inc. The concepts, ideas and information are proprietary and may not be disclosed to third parties. All rights reserved. Printed in USA. This document, or parts thereof, may not be reproduced in any form by photo, electrostatic, mechanical, or any other method for any use, including information storage and retrieval without written permission from Nova Tracker, Inc.

Designed Under Contract by:

Eng: Chris Krstanovic  
Venture Technologies, Inc  
83 Rangeway Rd.  
No. Billerica, MA 01862

Integris

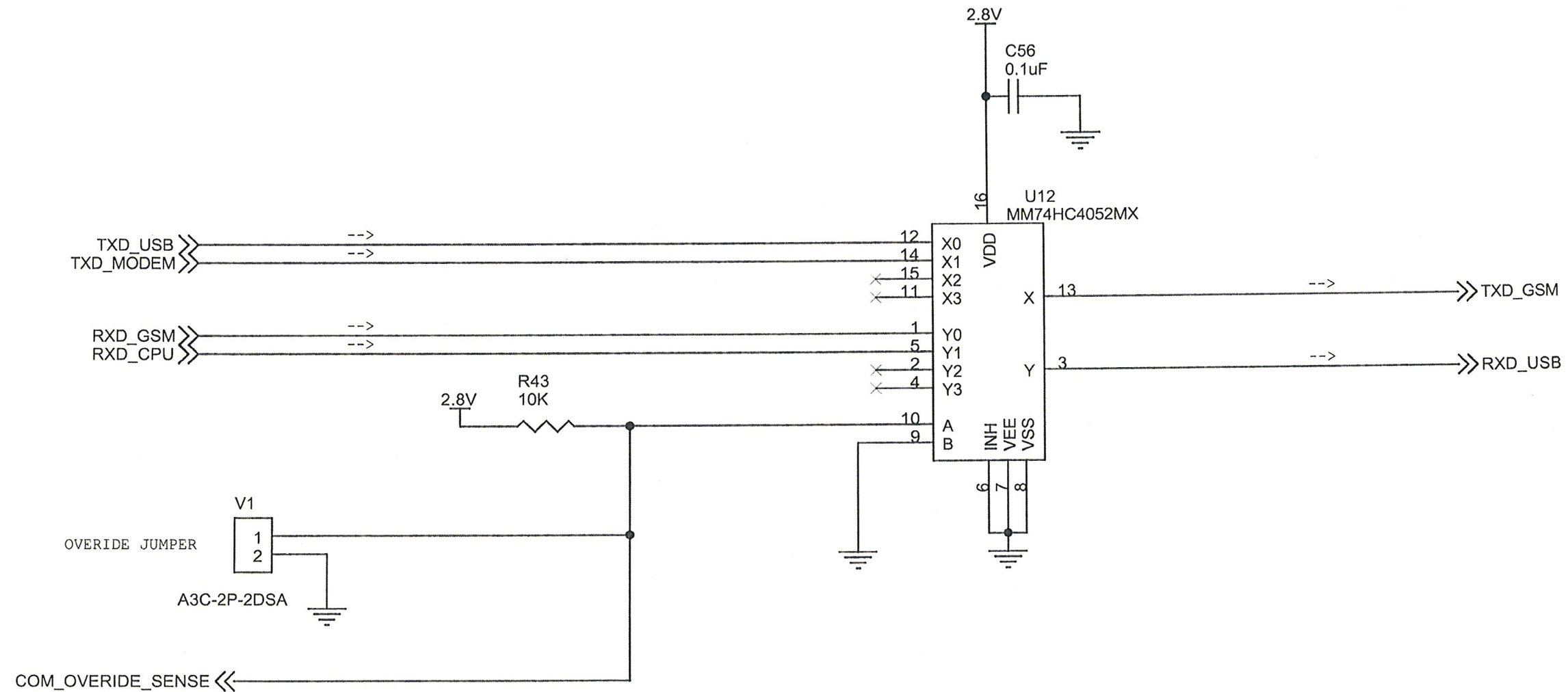
Title  
GuardTrax - SCHEMATIC NOTES

Size  
B Document Number  
GT-500100

Date: Sunday, November 01, 2009 Sheet 7 of 7

REV

[H]



**NOTE:**

During the normal operation, the jumper V1 is removed, and the CPU directly communicates with the GE863 modem, while the USB com port is connected to CPU secondary com port.

When the jumper is inserted, the signals are re-routed so that the USB port is directly connected to the GE863 modem for testing purposes. Please note that the CPU transmit (TXD) line cannot be connected to the modem in this mode (output clash). Also note that both CPU ports are able to "hear" the data coming from the modem and the USB. This may be useful for test purposes.

The CPU can detect the jumper override, and subsequently cease normal communications with the GE863 modem.

**CONFIDENTIAL**

This document is private and the sole property of Nova Tracker, Inc. The concepts, ideas and information are proprietary and may not be disclosed to third parties. All rights reserved. Printed in USA. This document, or parts thereof, may not be reproduced in any form by photo, electrostatic, mechanical, or any other method for any use, including information storage and retrieval without written permission from Nova Tracker, Inc.

Designed Under Contract by:

Eng: Chris Krstanovic

Venture Technologies, Inc  
85 Rangeway Rd.

No. Billerica, MA 01862

**Integrus**

Title

**GuardTrax - COMMUNICATIONS MUX SCHEMATIC**

Size  
A

Document Number  
GT-500100

Date: Sunday, November 01, 2009

Sheet 6 of 7

REV  
H