Application Note #129:

911 Emergency Interrupt Circuit for CH1786 Modem Modules

INTRODUCTION

Application Note # 129 describes an external circuit that can be used with the CH1786 modem module to automatically disconnect an “in process” data transmission activity and relinquish the PSTN line for immediate use by a shared phone. With this circuit, priority is established on a shared line such that when the CH1786 modem is in the process of sending data and the shared phone is removed from its cradle by the user, the modem will disconnect the data call in progress and relinquish the line to the telephone. If the modem is not in the process of a data call, the shared telephone will have priority and it’s use will prevent the modem from seizing the line. Additionally, multiple phones may be paralleled onto the telephone port, if desired.

THEORY OF OPERATION

Referring to Figure 1, when the modem is in the data mode sending data and a shared phone goes off hook, the off hook will be detected and will trigger a one shot event from component U1. The one shot output will cause the modem to reset thereby terminating the data call. Further, the one shot will also cause the PSTN line to be placed on hook for the period of the one shot event. This on hook sequence signals the remote modem and the local PSTN switch that the existing call is terminated. The PSTN switch will then produce a new dial tone. Note that because the modem is reset, the power up AT command string must be re-sent to the modem the next time the modem is used. The modem can detected when the PSTN line is again free by testing the line for dial tone per Cermetek Application Note # 177. This testing will not affect any telephone call in progress.

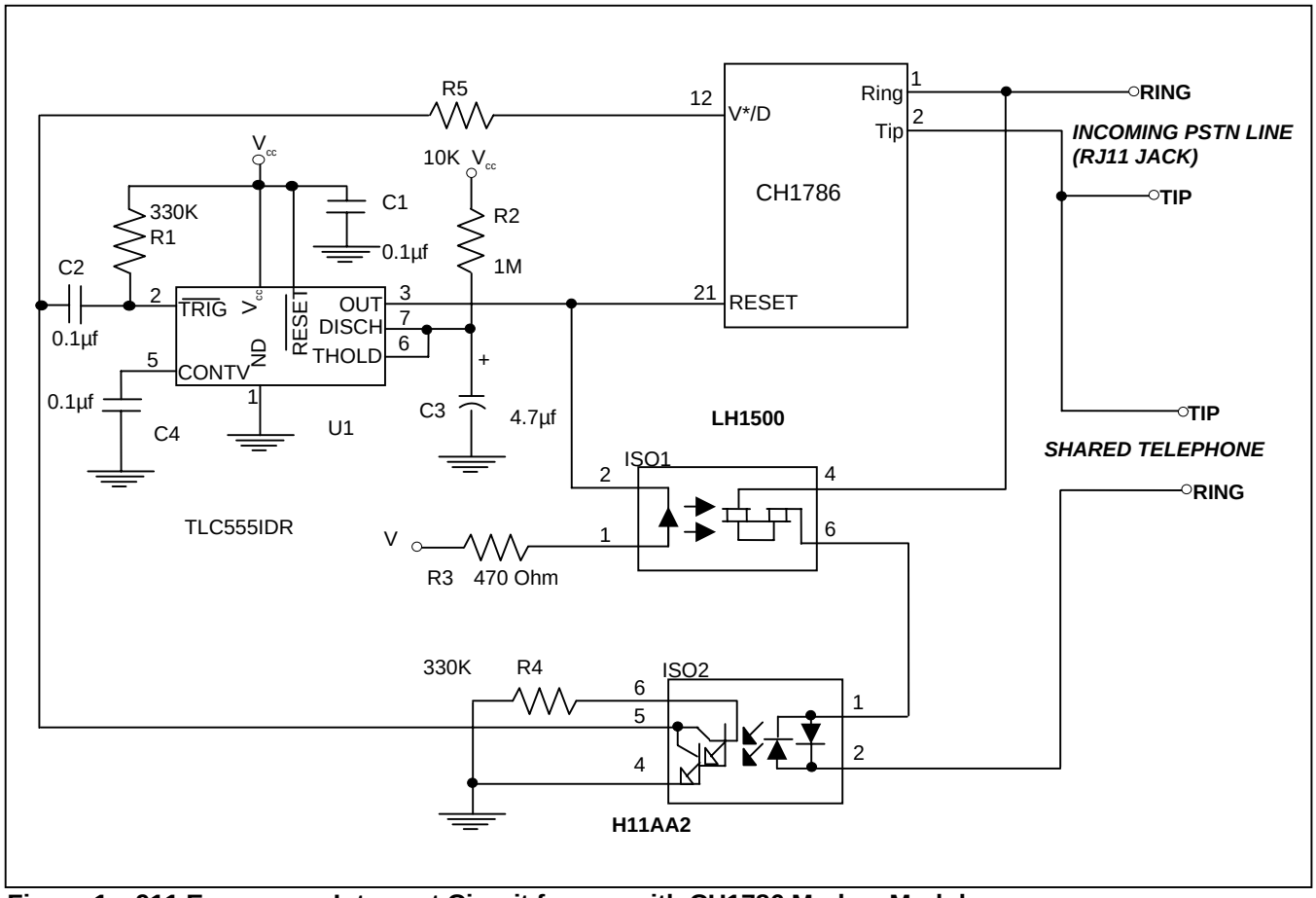

Figure 1. 911 Emergency Interrupt Circuit for use with CH1786 Modem Modules.

ADDITIONAL CIRCUIT IMPLEMENTATION NOTES

The following comments (unless otherwise indicated) apply to the schematic in Figure 1.

1. U1 is configured as a ONE-SHOT. The time constant must be long enough to disconnect from the Central Office, but not too long to make dialing a nuisance.

2. The time constant set by R2 and C3 determines the length of time the PSTN will disconnect after it forces the CH1786 to reset. With R2 set to 470K and C3 set to 4.7µf, a 2.2 second (approximately) disconnect will result.

3. R4 is used to set the detection sensitivity when the shared phone(s) is (are) picked up during data communications. Decreasing R4 will decrease the sensitivity.

4. The H11AA-X series device (item ISO2 on schematic) is easily available. The darlington output may not be needed in all applications.

5. If the user chooses to employ an external positive asserting Reset pulse into pin 21 of the CH1786, then it is recommended that a small signal diode (1N914, IN4148, etc.) be used as a buffer between the reset pulse generator and pin 21 of the CH1786.

6. ISO2 is a bi-directional optically isolated input switch. This switch must handle at least 80mA on the input diodes.

7. The user must take care to ensure that any existing reset pulses do not conflict with the ONE SHOT reset pulse otherwise the CH1786 may disconnect from the PSTN line inadvertently.

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