Application Note #113:

Solution to Dialing Pagers Using Modems

INTRODUCTION

This application note describes typical problems encountered when using modems to input DTMF tones for use with mobile pagers. Additionally, solutions are provided to avoid the problems.

DEFINITION OF PROBLEM

Sending DTMF tones to a pager requires DTMF tone levels greater than the maximum data rate level of –9 dBm allowed by the FCC. However, FCC Part 68 allows transmission of levels that exceed the –9 dBm level if the *average* power level over any three second interval does not exceed the –9 dBm level maximum.

SOLUTION

The solution requires inputting the DTMF tones in a manner so as not to exceed the average power specification. Since seven DTMF tone digits usually take only 420 milliseconds (i.e., 60 ms per tone) to transmit, there is at least 2680 ms of dead time. This allows a higher level of –3 dBm transmission per tone when averaging the power over a three second interval.

To use this method, the telephone number of the pager system is dialed with the following sequence.

Enter: **ATDT1234567;<CR>** where **1234567** is the pager system phone number
Response: **OK**

The semicolon at the end of the **AT** command string places the modem in the command state after dialing the pager system phone number. The user must then determine and impose suitable delay to allow time for the telephone company to connect to the pager service. After waiting the appropriate time, the number to be paged may then be transmitted using the following sequence.

Enter: **ATDT5551212;<CR>** where **5551212** is phone number to be transmitted to the mobile pager
Response: **OK**

Again, the semicolon at the end of the command string returns the modem to the command state. Further commands may be issued or the modem may be forced to hang up by issuing the **ATH<CR>** command. The only uncertainty in this solution is the time delay needed while waiting for the pager service to connect. Note that while the modem is in the command mode the modem will not respond to received DTMF tones.

ADDITIONAL IMPROVEMENTS

If the mobile pager needs additional time to detect the transmitted DTMF tones, use the **ATS11** command string to increase the duration of the DTMF tone.

Enter: **ATS11=X<CR>** where **X** is the desired duration in milliseconds (50-255 inclusive). Default is 90 milliseconds.
Response: **OK**

Note that increasing the duration of the DTMF tones will adversely affect the average power level.

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