



White Paper: Special Information Tone (SIT)

By: Andrew Kauffman, Senior Partner with AHK & Associates

Background

The special information tone (*SIT*) is provided for those cases in which neither the busy tone nor the network congestion tone (fast busy) can give the required information to the calling party. SIT tones are three precise, sequential tones, typically applied with a recorded announcement to explain the failed call attempt to the calling party.

In the United States we use eight SIT tone sequences, which in turn are a subset of the thirty-two SIT sequences defined by the ITU. The most common SIT tone is the vacant number intercept SIT (*i.e.*: *the number you have dialed is no longer in service*).

Technical Overview

The particular choice of frequencies and duration of each tone used differentiates each of the unique SIT tones. The tones in the cadence are always one of 3 specific, but similar frequencies, so the cadence will always sound the same to the human ear.

The duration of each of three successive tones is 330 milliseconds (*plus or minus 70 milliseconds*). With the 70-millisecond variable, the actual duration of each tone will range from 260 milliseconds to 400 milliseconds. The three tones must be sent in order with the lowest frequency first and the highest frequency last. There is a 50 hertz variable for each of the tones which can be combined with a variable duration to create the different signals for each SIT tone.

The range for each tone:		
Reference Frequency	Lowest range	Highest range
950 Hz	900 Hz	1000 Hz
1400 Hz	1350 Hz	1450 Hz
1800 Hz	1750 Hz	1850 Hz

The Intercept SIT begins with a tone of 913.8 Hz that is played for 274 milliseconds. This tone is followed by a second tone of 1370.6 Hz played for 274 milliseconds and completed with a third tone at 1776.7 Hz played for 380 milliseconds. This last tone is a reference to July 1776. The employees of AT&T, who made the frequency selections many years ago, added this little patriotic artifact.

Special Information Tones and Telemarketing

Predictive Dialers are machines used by telemarketing firms to place many telephone calls at a rapid rate. The machine sorts through all the calls to find the few that are actually answered by a live human, and then transfers these “live” calls to a live agent.

When the SIT tone is received by a telemarketing firm using a predictive dialer, the system notes that the number called is non-working number and removes it from its database so that it will not be called again. SIT tones can be used to fool predictive dialers into thinking your number is out-of-service.

A Predictive Dialer will monitor the call, and take action based on what happens when the phone is answered. The table below shows the actions and the results that could occur.

Predictive Dialer senses this event:	Predictive Dialer takes this action:
Busy tone	Predictive Dialer hangs up
Disconnect tone (SIT)	Predictive Dialer should hang up and delete your number from the call list
No answer	Predictive Dialer hangs up
Answering machine	Predictive Dialer hangs up
Live answer	Predictive Dialer searches for a live agent, if no one is available, the Predictive Dialer hangs up
Live answer	Predictive Dialer searches for a live agent, if one is available, the call is quickly transferred to the agent

Zappers

Devices like the Telezapper emit a “disconnect” SIT tone every time you answer a call. The tone it transmits is a single tone at 914 Hz. The device can also be set to send three tones in cadence to simulate the full SIT signal. It is not clear if this actually works. In fact, with all the publicity about SIT, is likely that the Telemarketers will adjust their Predictive Dialers to ignore the SIT tones. On the other hand, I have heard numerous success stories about this approach from Mike Sandman (www.sandman.com), who built a similar device for many years before the Zapper came on the market.

You can build your own Zapper by adding a SIT tone to your voicemail or answering machine message. There are several recorded versions of the Special Information Tone available for download on Technical Documents page of our web site (www.ahk.com), Record the SIT tone at the beginning of your outgoing message, followed by your regular greeting. You may want to add a brief explanation about the tones so that legitimate callers will not think there is a problem with your line.

Reference documents

ITU-T Recommendation Q.35 “Technical Characteristics of Tones for Telephone Service”

ITU-T Recommendation E.182 “Application of tones and recorded announcements”, Vol. II

ITU-T Recommendation E.181 “Customer recognition of foreign tones”, Vol. II

ITU-T Recommendation Q.552 “Transmission characteristics at 2-wire analogue interfaces of a digital exchange”, Vol. VI, fascicle VI.5

AHK & Associates Inc. is recognized as a leader in technology assessment, implementation, and utilization. Allow us to help your firm with the complex issues of using digital voice, data, and video technologies.

AHK & Associates Inc. also provides education, consulting, and research in emerging telecommunications technology. Our clients have saved millions of dollars using emerging telecommunications technology in new and innovative ways. For over ten years we have integrated leading edge network technology into our clients' wide area networks.

AHK & Associates, Inc.

**Telecommunications Consulting
Specializing in Digital Communications Technologies**

ISDN, DSL, T1/ T3, SONET/SDH

Frame Relay, ATM, Passive Optical Networks, DWDM

415-577-4736

www.ahk.com

Copyright © 2003 by AHK & Associates, Inc