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21 October, 2007

Dear Geoff,

Fax/data modem operation

Further Information

I hope you found my earlier note on the above issue helpful. I have now returned from holiday and, before I once again immerse myself into everyday tasks, I felt it might be interesting if I did some fundamental research and revision on modem operation. An area I haven't really been deeply involved in for over 10 years. To this end I started ploughing through the ITU-V series recommendations: see: http://www.itu.int/rec/T-REC-V/en

Fax/Data Modem Handshaking

As you would expect, there are a wide number of modem specifications, but the whole story starts with V.21 (300 bit/s) and the inverted specification pyramid is built right up to V.92 (56 kbit/s with enhancements). In all data and facsimile cases the initialisation process relies upon recommendation V.8 (Procedures for starting sessions of data transmission over the public switched telephone network). see: http://www.itu.int/rec/T-REC-V.8/en

You should refer to the T series for more detail on facsimile operation, but specifically T.66, calls up V.8 processes. see: http://www.itu.int/rec/T-REC-T.66-200203-I/en

So this confirms my recollection that facsimile and data modems, initialise in the same basic way.

Busy Tone and Speech Detection

In researching these recommendations I was also interested in how exactly busy tone detection was handled. This led me back to the familiar E series. See: http://www.itu.int/rec/T-REC-E/en

In particular E.180 gave me the characteristics for busy tone. What is interesting here is that it confirms that “busy tone” is only loosely defined by a template to handle both busy and congestion tone. This weak specification is necessary, because busy and congestion tones vary widely from country to country. Furthermore modems need to handle all markets to achieve competitive volume production. Busy tones still differ today, including the UK, Europe and the USA. E.181 (Customer recognition of foreign tones) deals with this rather awkward historic issue. See : http://www.itu.int/rec/T-REC-E.181/en

This means the characteristics of modem filters to detect busy/congestion tone are of necessity wider than one would like. Thus in the presence of high noise levels (e.g. pre-call announcements playing on the line), any busy detection circuit is more likely to false trigger, than if an ideal "tightly" specified (country specific) filter could be used.

The foregoing supports my view that pre-call announcements are likely to lead to error in busy/congestion tone detection and thereby cause premature clear forward (hang-up) by the

originating modem. Furthermore, some more advanced fax/data modems seem to use **speech detection to indicate the user has picked up the line**. Detection of a pre-call announcement will alter modem operation, possibly resulting in failure. This may only affect facsimile and requires further investigation. These findings are also consistent with the quasi-random effects we are observing in the field.

ITU Recommendations - Over 20 years of Working Practice
In trawling through the above, I was reminded of recommendation E.182 (*Application of tones and recorded announcements in telephone services*), where paragraph 3 states:

> *"that when a subscriber should wait for a network reaction, no tones or announcement should be given. This condition applies during, e.g., dial-tone delay and post-dialling delay. Exceptionally when a post-dialling delay on an outgoing international automatic call occurs that is likely to cause a subscriber to abandon the call, an appropriate announcement or a comfort tone may be used if it has been shown to reduce premature abandonment;"*

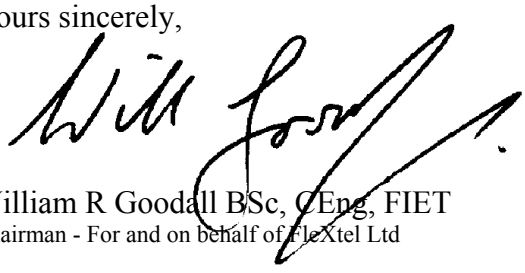
see: http://www.itu.int/rec/T-REC-E.182/en

This implies that the working assumption of modem designers is that busy tone detection is performed **when the line is silent**. This recommendation has been in place at least since 1988, so all modems deployed are likely to assume a silent line and so pre-announcements could easily cause widespread premature hang-up of the originating modem. Although Ofcom may feel that it is objectively justifiable to breach this ITU recommendation, in view of the exception in the second sentence and thereby continue to impose pre-call announcements, Ofcom may wish to consider whether it can continue to take the risk of extensive modem failure.

In Conclusion
I have provided you with evidence, which strongly suggests that Ofcom's intervention is in breach of ITU recommendations. Furthermore it appears that Ofcom has failed to consider very clear advice for sound engineering practice, as suggested by the ITU in those same recommendations. It is now clear that shortening announcement alone, and hence the post-dial-delay, may not be sufficient to ensure reliable system operation. As a result I am confident that further system failures will occur, unless Ofcom and UK OCPs switch-off these dangerous announcements. Indeed this is turning out to be an engineering catastrophe of proportions not seen before in the UK telecom market.

I explicitly warned Ofcom not to use this mechanism and recommended an alternative approach, but Ofcom rejected my recommendation. Naturally it may have been my clear prejudicial interest that led Ofcom to ignore my advice. Obviously these pre-call announcements are severely damaging my bona fide personal numbering business. This business was established in good faith under the auspices of Oftel, who created this innovative market. Ofcom's allocation of 070 ranges to known scammers and Ofcom's subsequent draconian intervention to "fix" the problem created by such a blatant lack of number allocation control, is a matter for a separate discussion. However, the ITU clearly has no such prejudicial interest and Ofcom should therefore have no difficulty in assimilating what is plain for all to see.

Yours sincerely,



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