

# Abstract

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This report contains an overview of the workings of a caller-id. A brief introduction would be given on the importance of the caller-id in today communications. Two basic formats used to transmit the type of data via the caller-id were also identified. They were namely, single and multiple data message formats.

The timing diagrams for the message formats were provided. For the Multiple Data Message Format, the message was broken down into different parameters, with the arrangement being decided by the local caller-id provider.

Finally, some limitations of the caller-id were given. It was hoped that future improvements could be done to address these limitations and make the caller-id an user-friendlier instrument for us.

## INTRODUCTION

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The Calling Line Identification service is a subscriber feature that has been implemented in most major communities and is becoming more prevalent in smaller ones as well. Data is transmitted during the silent period between the first and second ring. Regardless whether the caller is subscribed or not, data will still be transmitted. The caller does have the option of preventing his or her information from being sent if he or she chooses to do so. The Calling Line Identification service makes it possible to display a variety of data such as the number, time, and date of the incoming call.

The data is transmitted serially between the first and second rings of the incoming call. The data is transmitted at 1200 bits per second in FSK mode. 1200 Hz represents a logical 1 (mark) and 2200 Hz a logical 0 (space). Each 8 bit word is preceded by a start bit (space) and followed by a stop bit (mark). Up to the 10 mark bits can be added between words. To initialize the system, 30 bytes of 0101.... are sent for the first 250 ms followed by 70 ms of marks.

The data that is transmitted actually depends upon the format used by the telephone company providing the service. There are two basic formats being used at present:

- Single Data Message Format (SDMF)
- Multiple Data Message Format (MDMF)

## **SINGLE MESSAGE DATA FORMAT**

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The Single Data Message Format includes the data actual time and the phone number of the calling party. Figure 1 shows the single data message format in a timing diagram. The first part of the data is the message type. 04 hex stands for single message format. The second part transmits the length of the message. This is followed by month, day, hour (24 hr format), minute and the number (up to 10 digits).

If the calling party is out of your area or does not wish his/her information displayed, an "O" or "P" is displayed instead of that number. The last part of the message is a checksum which equals the 2's compliment of the sum of all the bits in the word.

Fig 1: Timing diagram of a Single data message format

For example, the number 206 - 329 - 8524 calling at 2:30pm on 11-30-95 would be transmitted as follows:

{type} {length} 113014302063298524 {checksum}

The message type and the message length are sent in binary, while each character of the month, day, hour minute and telephone number are sent in standard 8-bit ASCII code.

## MULTIPLE DATA MESSAGE FORMAT

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In order to be able to send more information through the phone line, the Multiple Data Message Format was created. In addition to the information sent by the single message format, this format also includes the name that the number calling you is registered to. Figure 2 shows a timing diagram of the multiple data message format.

Fig 2: Timing diagram of a multiple data message format

The message delivered by the multiple data message format is broken down into different parameters. For instance, data and time of the incoming call is delivered in a different parameter as the calling number. The arrangement of these parameters within the message depends upon the local caller id provider. Figure 3 shows several different parameter types that can be included in the message. The last piece of data in the message is a checksum which is the 2's complement of all the bits of all the words in the data transmission.

|                                |  |                                |
|--------------------------------|--|--------------------------------|
| <b>DATE AND TIME PARAMETER</b> |  | <b>NUMBER PARAMETER</b>        |
| PARAMETER TYPE CODE =<br>01hex |  | PARAMETER TYPE CODE =<br>02hex |
| PARAMETER LENGTH               |  | DIGIT 1                        |
| MONTH                          |  | DIGIT 2                        |
| DAY                            |  |                                |
| HOUR                           |  |                                |
| MINUTE                         |  | UP TO 10 DIGITS                |

|                                |
|--------------------------------|
| <b>NAME PARAMETER</b>          |
| PARAMETER TYPE CODE =<br>07hex |
| PARAMETER LENGTH               |
| CHARACTER 1                    |
| CHARACTER 2                    |
|                                |
| UP TO 15 CHARACTERS            |

|                                         |
|-----------------------------------------|
| <b>REASON FOR ABSENCE OF<br/>NUMBER</b> |
| PARAMETER TYPE CODE =<br>04hex          |
| PARAMETER LENGTH                        |
| "O" or "P"                              |

|                                       |
|---------------------------------------|
| <b>REASON FOR ABSENCE OF<br/>NAME</b> |
| PARAMETER TYPE CODE =<br>08hex        |
| PARAMETER LENGTH                      |
| "O" or "P"                            |

Fig 3: Different parameter types included in a message

## **LIMITATIONS**

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There are two basic limitations upon the caller id system. Firstly, if the person who is calling does not wish his/her information to be displayed on the caller id unit, the information can be blocked by entering a special code prior to dialing a phone number. In most areas, this code is a \*67. When the caller id unit encounters this situation, it displays a "P" for private to inform the person that the information has been blocked.

The second limitation is that caller id will not be provided for those outside of your calling area. If someone dials in long distance, the caller will see an "O" for out of area displayed upon the caller-id screen.

## Conclusion

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It could be seen that while the caller-id could give the callee useful information about the caller, it could also mean that certain identity about the caller would be revealed without his or her permission, thus it had been argued that it actually infringed on privacy.

However, it is fortunate that the caller has a choice to block information about himself. However, few had opted for this as it would entail additional charges. However, if everyone chose to have his or her information blocked, then the caller-id would be deemed useless then. Therefore, there must be some degree of mutual agreement between the callee and caller.

Nevertheless, the caller-id is a useful instrument to us as it could give us useful information about the person who called. It could be helpful to us later on should we want to get certain information, for instance, the time which he or she called or the contact number of the callee, etc.

## References

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