# MORSE CODE (2).

Once the **Example.013** has been examined, we are able to generate some **Morse** codes and now, this program make a noticeable step over. In fact it allows to make up messages and generate them, always by driving the **Buzzer**. Moreover it can be selected the Morse codes generation speed, by choosing many different values, and it generates some special codes.
This program, in few words, can be a comfortable and efficient way to learn the **Morse Code**.
In confront of **Example.013**, that generate only the alphabet letters and digits, the **Example.014** generates also the character of the following table.

| | | |
|---|---|---|
| . | Point | · - · - · - |
| , | Comma | - - · · - - |
| / | Slash | - · · - · |
| + | Plus | · - · - · |
| = | Equal | - · · · - |
| ? | Question mark | · · - - · · |
| ( | Open round bracket | - · - - · |
| ) | Close round bracket | - · - - · - |
| – | Minus | - · · · · - |
| " | Double quotation mark | · - · · - · |
| _ | Underline | · · - - · - |
| ' | Single quotation mark | · - - - - · |
| : | Two points (1) | - - - · · · |
| ; | Point and comma | - · - · - · |
| $ | Dollar | · · · - · · - |
| @ | AT | · - - · - · |
| | Attention | . - . . - |
| | Error | . . . . . |
| | Repeat (ii ii) | . . . . |

The **Example.014**, is conceptually very simple and linear but it isn't a banal program. The demonstration of this opinion can be immediately obtained by looking at the source list.
The current program has all the features of a real application program and it is more that a simple demo program. In order to help you in the comprehension of the same program it has been developed a **Flow** chart and it requires a considerable study and attention. The Flow chart is composed by a first part, with general functionalities, and following parts with deep descriptions of each actions performed by the program.

## Example.014. Training Program for MORSE Code.

***Added Definitions:***
None

***Added Declarations:***
Dim …. As Word

***Added Instructions:***
UCASE ; MID ; ASC

***Added Operators:***
None

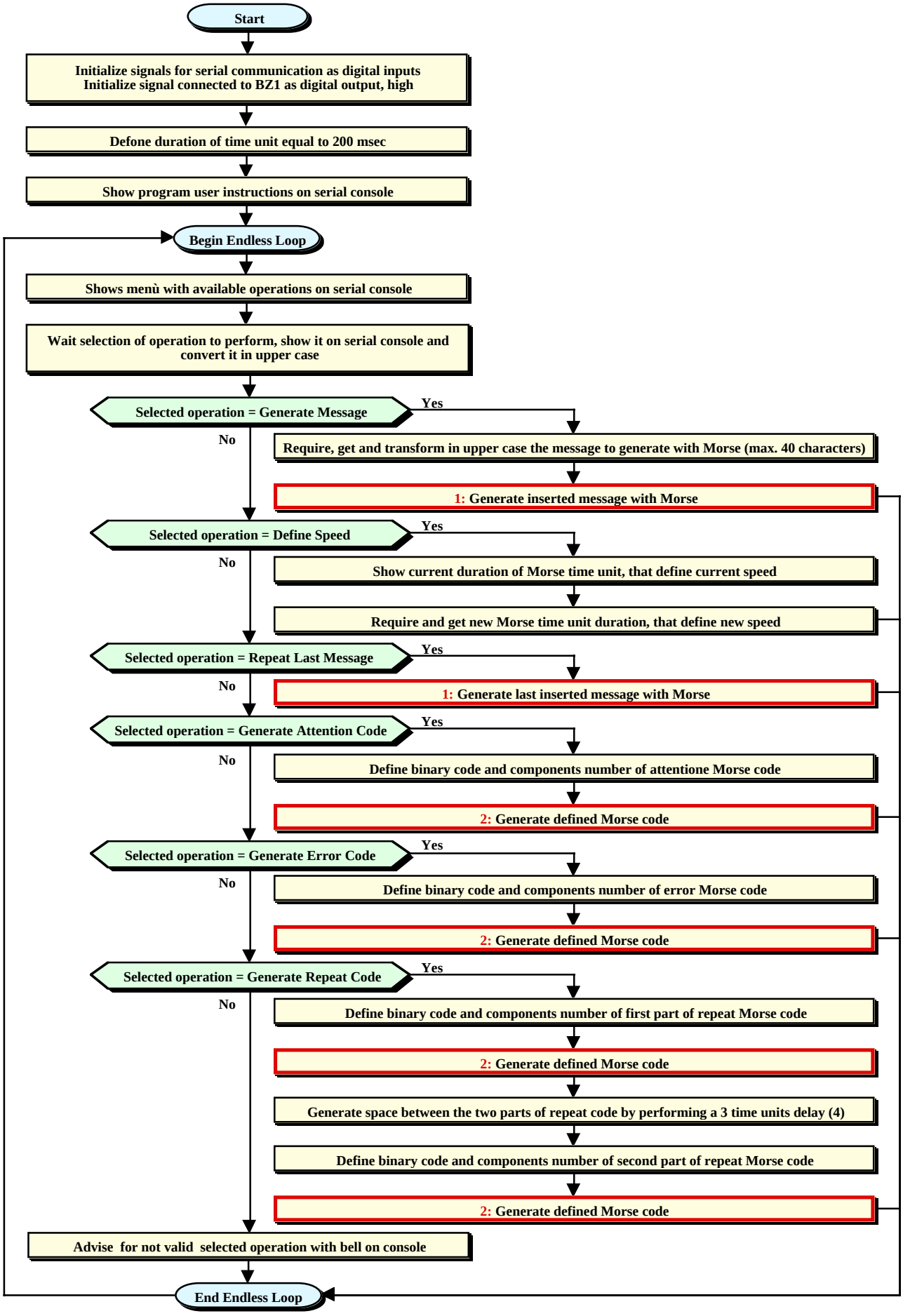
Program **Example.014** of **BASCOM AVR** course.

It manages a **Morse** characters generator with **GMM TST3** on board buzzer.
It allows a **Morse** code training of the user that interacts with it.

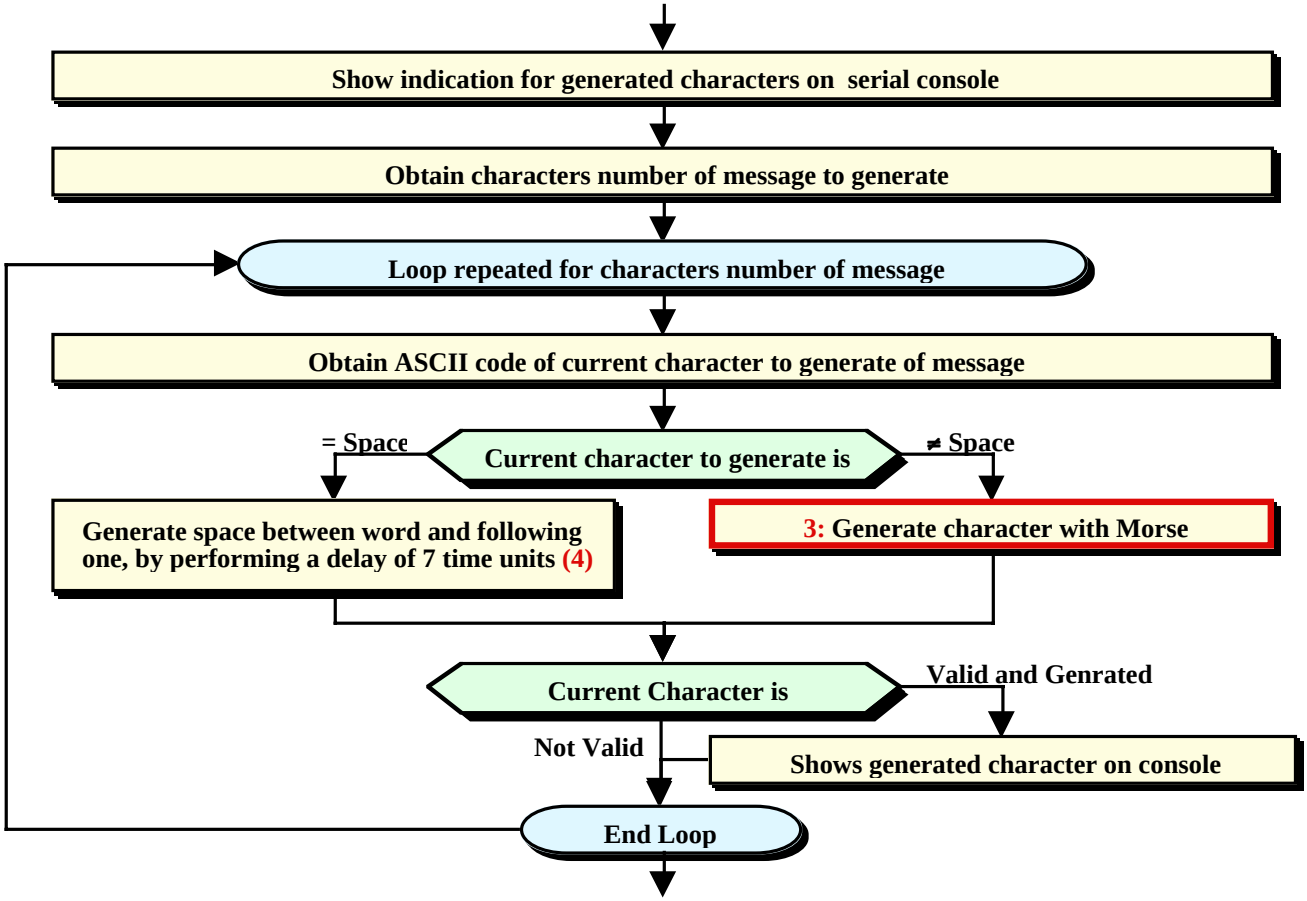
The program can perform the following operations: ask for a message and then generates it with **Morse** codes on **buzzer**, define the generation speed of the **Morse** codes in order to gradually improve the right recognition of the same codes, repeat the generation of the last inserted message and finally it generates the **3** special **Morse** codes dedicated to attention, error and repeat.
The user interactions happen through a serial console provided of keyboard and monitor and it must communicate with a fixed physical protocol at **19.200 Baud**, **8 Bit x chr**, **1 Stop bit**, **No parity**.

This console can be another system capable to support a serial **RS 232** communication. In order to simplify the use it can be used a **PC** provided of one **COMx** line, that execute a terminal emulation program as **HYPERTERMINAL** or the homonym modality provided by **BASCOM AVR** (see **IDE** Configuration).

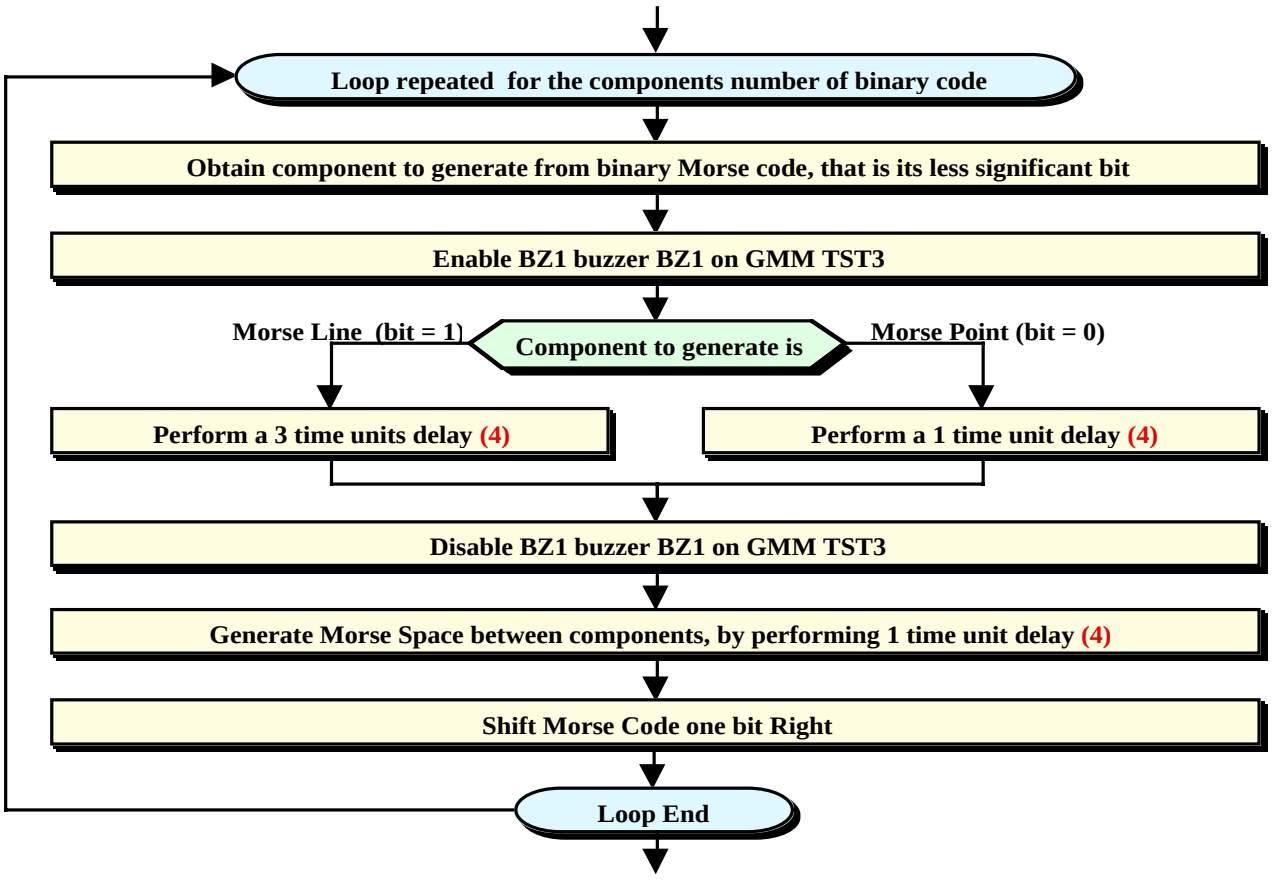
***Telegraph Key.***



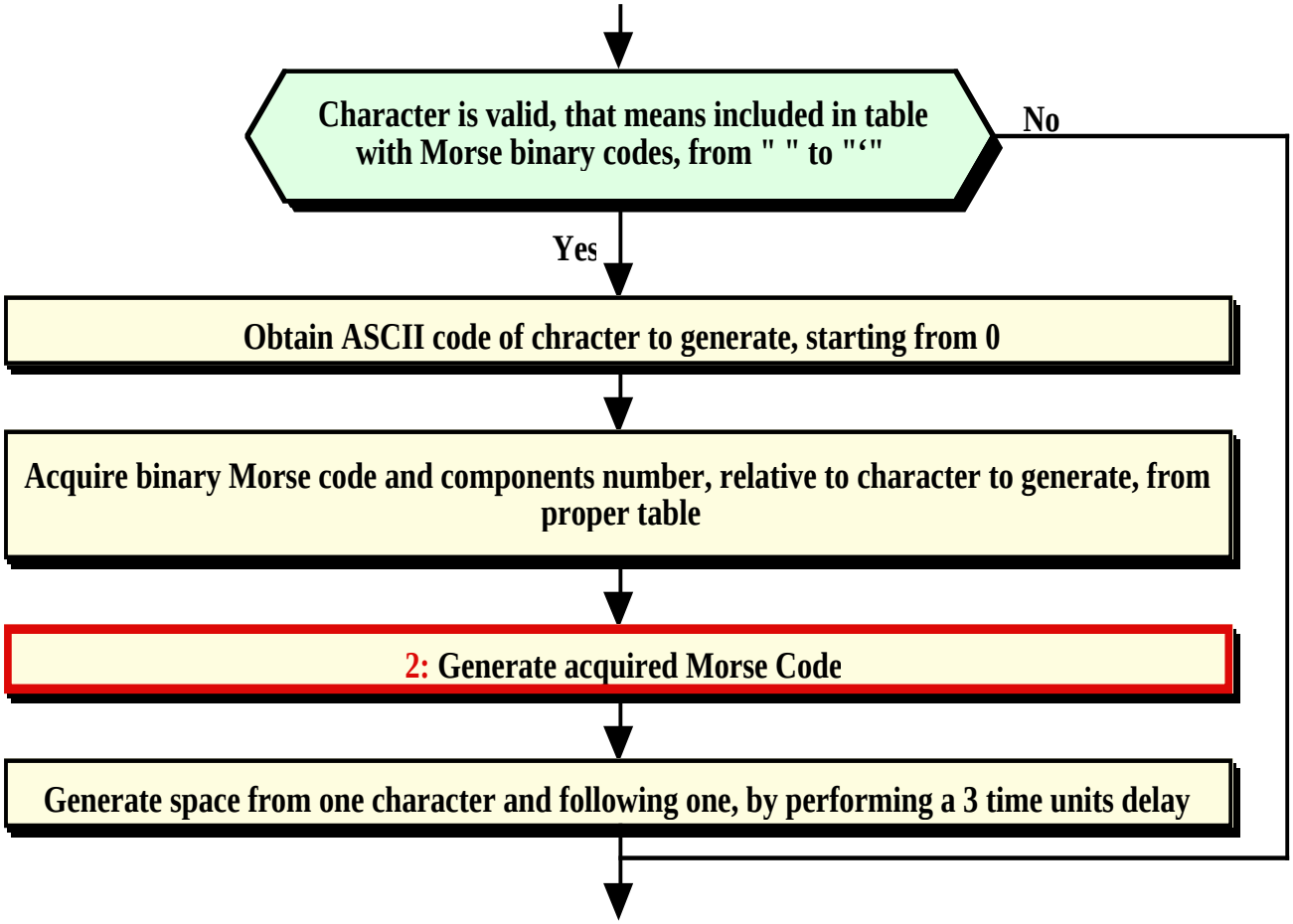

***Flow Chart of the Program.***



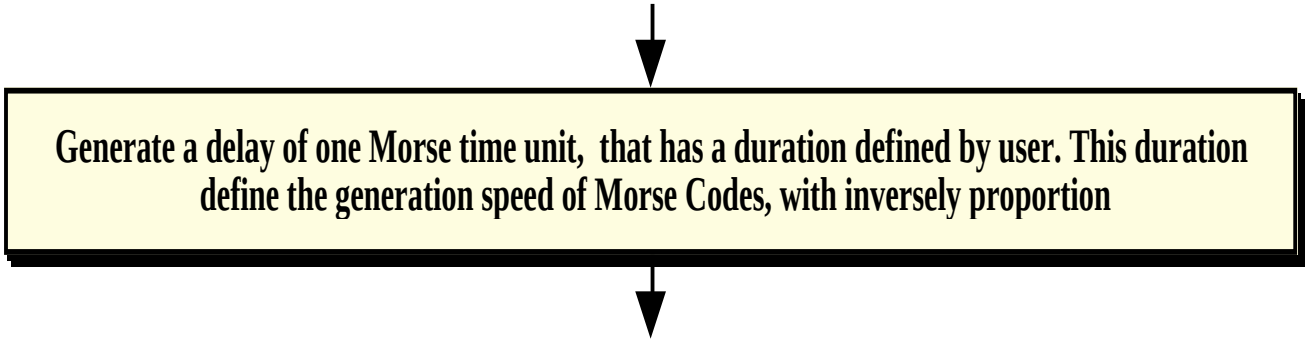

*1: Generate Message in Morse.*




*2: Generate Morse Code.*




*3: Generate Character in Morse.*




*4: Perform Delay of One Time Unit.*