Correspondence

Comments on “On the Combining of the Amplitude and Phase Modulation in the Same Signal”
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Abstract—In this correspondence, we comment on the proposed phase modulation scheme described in the above paper. We also suggest revising Table I to eliminate possible confusion.

Index Terms—Amplitude modulation, digital modulation, phase modulation.

For spectral efficiency improvement, a phase modulation scheme based on AM broadcasting is proposed [1], which transmits digital phase modulated data over the existing AM radio channel. In this correspondence, the generation of digitally modulated baseband signal, and its decomposition into a periodic signal and a data signal, are illustrated in detail, as shown in Fig. 1. The digital data stream \( d(t) \) modulates a reference carrier (clock) using the encoding rules of Table I, and results in the digitally modulated baseband signal of \( \text{③} \), which is then decomposed into \( \text{④} \) and \( \text{⑤} \). For clarification purposes we combine Figs. 2 and 3 of [1] in a single Figure. This results in a different but more comprehensive presentation of the encoding rules of Table I. In order to present the whole encoding process, each transitional point in Fig. 1 is aligned and marked with dashed line.

In Table I, we suggest following three changes:

a) The first rule that data transition from logic 0 to 1 will result in the change of logic state to the opposite, one high-clock cycle after the middle of the bit [1, Table I], is suggested to be revised as “half high-clock cycle after the middle of the bit”.

b) The second rule that data transition from logic 1 to 0 will result in the change of logic state to the opposite, one high-clock cycle before the middle of the bit [1, Table I], is suggested to be revised as “half high-clock cycle before the middle of the bit”.

c) The last rule in [1, Table I] is suggested to be revised as “the preservation of either logic state, from 0 to 0 or from 1 to 1, will result in the change of the logic state to the opposite, \( k \) high-clock cycles after the previous change”. In [1], \( k \) is defined as the number of reference clock cycles during each data clock period \( T_b \).

The above three changes are demonstrated by the third sentence in the first paragraph of Section III [1]. Therefore, according to our opinion, the proposed phase modulation scheme becomes more comprehensive and in order to eliminate any possible confusion, the changes proposed above are necessary.

REFERENCES