

CLAIMS

1. A signal generation method for generating, from a plurality of baseband signals, a plurality of signals for transmission on a common frequency band and at a common time, comprising the steps of:

5 multiplying a first baseband signal s_1 generated from a first set of bits by u , and multiplying a second baseband signal s_2 generated from a second set of bits by v , where u and v denote real numbers different from each other;

performing a change of phase on each of the first baseband signal s_1 multiplied by u and the second baseband signal s_2 multiplied by v , thus generating a
10 first post-phase-change baseband signal $u \times s_1'$ and a second post-phase-change baseband signal $v \times s_2'$; and

applying weighting according to a predetermined matrix F to the first post-phase-change baseband signal $u \times s_1'$ and to the second post-phase-change baseband signal $v \times s_2'$, thus generating the plurality of signals for transmission on
15 the common frequency band and at the common time as a first weighted signal z_1 and a second weighted signal z_2 , wherein

the first weighted signal z_1 and the second weighted signal z_2 satisfy the relation:

$$(z_1, z_2)^T = F(u \times s_1', v \times s_2')^T$$

20 and the change of phase is performed on the first baseband signal s_1 multiplied by u and the second baseband signal s_2 multiplied by v by using a phase modification value sequentially selected from among N phase modification value candidates, each of the N phase modification value candidates being selected at least once within a predetermined period.

25

2. A signal generation apparatus for generating, from a plurality of baseband signals, a plurality of signals for transmission on a common frequency band and at a common time, comprising:

a power changer multiplying a first baseband signal s_1 generated from a first set of bits by u , and multiplying a second baseband signal s_2 generated from a second set of bits by v , where u and v denote real numbers different from each other;

5 a phase changer performing a change of phase on each of the first baseband signal s_1 multiplied by u and the second baseband signal s_2 multiplied by v , thus generating a first post-phase-change baseband signal $u \times s_1'$ and a second post-phase-change baseband signal $v \times s_2'$; and

a weighting unit applying weighting according to a predetermined matrix F to the first post-phase-change baseband signal $u \times s_1'$ and to the second post-phase-change baseband signal $v \times s_2'$, thus generating the plurality of signals for transmission on the common frequency band and at the common time as a first weighted signal z_1 and a second weighted signal z_2 , wherein

the first weighted signal z_1 and the second weighted signal z_2 satisfy the relation:

15
$$(z_1, z_2)^T = F(u \times s_1', v \times s_2')^T$$

and the change of phase is performed on the first baseband signal s_1 multiplied by u and the second baseband signal s_2 multiplied by v by using a phase modification value sequentially selected from among N phase modification value candidates, each of the N phase modification value candidates being selected at least
20 once within a predetermined period.

CLAIMS

1. A signal generation method for generating, from a plurality of baseband signals, a plurality of signals for transmission on a common frequency band and at a common time, comprising the steps of:

 multiplying, using a power changer, a first baseband signal s_1 generated from a first set of bits by u , and multiplying a second baseband signal s_2 generated from a second set of bits by v , where u and v denote real numbers different from each other;

 performing, using a phase changer, a change of phase on each of the first baseband signal s_1 multiplied by u and the second baseband signal s_2 multiplied by v , thus generating a first post-phase-change baseband signal $u \times s_1'$ and a second post-phase-change baseband signal $v \times s_2'$; and

 applying, using a weighting unit, weighting according to a predetermined matrix F to the first post-phase-change baseband signal $u \times s_1'$ and to the second post-phase-change baseband signal $v \times s_2'$, thus generating the plurality of signals for transmission on the common frequency band and at the common time as a first weighted signal z_1 and a second weighted signal z_2 , wherein

 the first weighted signal z_1 and the second weighted signal z_2 satisfy the relation:

$$(z_1, z_2)^T = F(u \times s_1', v \times s_2')^T$$

 and the change of phase is performed on the first baseband signal s_1 multiplied by u and the second baseband signal s_2 multiplied by v by using a phase modification value sequentially selected from among N phase modification value candidates, each of the N phase modification value candidates being selected at least once within a predetermined period.

2. A signal generation apparatus for generating, from a plurality of baseband signals, a plurality of signals for transmission on a common frequency band and at a common time, comprising:

a power changer multiplying a first baseband signal s_1 generated from a first set of bits by u , and multiplying a second baseband signal s_2 generated from a second set of bits by v , where u and v denote real numbers different from each other;

a phase changer performing a change of phase on each of the first baseband signal s_1 multiplied by u and the second baseband signal s_2 multiplied by v , thus generating a first post-phase-change baseband signal $u \times s_1'$ and a second post-phase-change baseband signal $v \times s_2'$; and

a weighting unit applying weighting according to a predetermined matrix F to the first post-phase-change baseband signal $u \times s_1'$ and to the second post-phase-change baseband signal $v \times s_2'$, thus generating the plurality of signals for transmission on the common frequency band and at the common time as a first weighted signal z_1 and a second weighted signal z_2 , wherein

the first weighted signal z_1 and the second weighted signal z_2 satisfy the relation:

$$(z_1, z_2)^T = F(u \times s_1', v \times s_2')^T$$

and the change of phase is performed on the first baseband signal s_1 multiplied by u and the second baseband signal s_2 multiplied by v by using a phase modification value sequentially selected from among N phase modification value candidates, each of the N phase modification value candidates being selected at least once within a predetermined period.