

CLAIMS

1. A precoding method for generating, from a plurality of baseband signals, a plurality of precoded signals to be transmitted over the same frequency bandwidth at the same time, comprising the steps of:

5 selecting a matrix $F[i]$ from among N matrices while switching between the N matrices, the N matrices defining precoding performed on the plurality of baseband signals, i being an integer from 0 to $N - 1$, and N being an integer at least two; and

 generating a first precoded signal $z1$ and a second precoded signal $z2$ by
10 precoding, in accordance with the selected matrix $F[i]$, a first baseband signal $s1$ generated from a first plurality of bits and a second baseband signal $s2$ generated from a second plurality of bits, a first encoded block and a second encoded block being generated respectively as the first plurality of bits and the second plurality of bits using a predetermined error correction block encoding method, the first
15 baseband signal $s1$ and the second baseband signal $s2$ being generated respectively from the first encoded block and the second encoded block to have M symbols each, the first precoded signal $z1$ and the second precoded signal $z2$ being generated to have M slots each by precoding a combination of the first baseband signal $s1$ and the second baseband signal $s2$, M being an integer at least two,

20 the first precoded signal $z1$ and the second precoded signal $z2$ satisfying the equation $(z1, z2)^T = F[i](s1, s2)^T$.

2. A precoding apparatus for generating, from a plurality of baseband signals, a plurality of precoded signals to be transmitted over the same frequency bandwidth at
25 the same time, comprising:

 a weighting information generation unit configured to select a matrix $F[i]$ from among N matrices while switching between the N matrices, the N matrices

defining precoding performed on the plurality of baseband signals, i being an integer from 0 to $N - 1$, and N being an integer at least two;

a weighting unit configured to generate a first precoded signal z_1 and a second precoded signal z_2 by precoding, in accordance with the selected matrix $F[i]$,

5 a first baseband signal s_1 generated from a first plurality of bits and a second baseband signal s_2 generated from a second plurality of bits;

an error correction coding unit configured to generate a first encoded block as the first plurality of bits and a second encoded block as the second plurality of bits using a predetermined error correction block encoding method; and

10 a mapper configured to generate a baseband signal with M symbols from the first encoded block and a baseband signal with M symbols from the second encoded block, M being an integer at least two,

the first precoded signal z_1 and the second precoded signal z_2 satisfying the equation $(z_1, z_2)^T = F[i](s_1, s_2)^T$, and

15 the weighting unit generating precoded signals with M slots by precoding a combination of the baseband signal generated from the first encoded block and the baseband signal generated from the second encoded block.

CLAIMS

1. A method for generating, from a plurality of baseband signals, a plurality of phase weight altered signals to be transmitted over the same frequency bandwidth at the same time, comprising the steps of:

encoding a first plurality of bits to a first encoded block and a second encoded block by using a predetermined error correction block encoding method;

mapping the first encoded block to a first baseband signal s_1 with M symbols and the second encoded block to a second baseband signal s_2 with M symbols, M being an integer at least two;

selecting a matrix $F[i]$ from among N matrices while switching between the N matrices, the N matrices defining phase weight altering performed on the plurality of baseband signals, i being an integer from 0 to $N - 1$, and N being an integer at least two; and

generating a first phase weight altered signal z_1 and a second phase weight altered signal z_2 by phase weight altering, in accordance with the selected matrix $F[i]$, the first baseband signal s_1 and the second baseband signal s_2 , wherein

the first phase weight altered signal z_1 and the second phase weight altered signal z_2 satisfying the equation $(z_1, z_2)^T = F[i](s_1, s_2)^T$,

$(z_1, z_2)^T$ being a transposed vector of (z_1, z_2) , and

$(s_1, s_2)^T$ being a transposed vector of (s_1, s_2) .

2. A phase weight altering apparatus for generating, from a plurality of baseband signals, a plurality of phase weight altered signals to be transmitted over the same frequency bandwidth at the same time, comprising:

an error correction coding unit that encodes a first plurality of bits to a first encoded block and a second encoded block by using a predetermined error correction block encoding method;

a mapper that maps the first encoded block to a first baseband signal s_1 with M symbols and the second encoded block to a second baseband signal s_2 with M symbols, M being an integer at least two;

a weighting information generation unit that selects a matrix $F[i]$ from among N matrices while switching between the N matrices, the N matrices defining phase weight altering performed on the plurality of baseband signals, i being an integer from 0 to $N - 1$, and N being an integer at least two; and

a weighting unit that generates a first phase weight altered signal z_1 and a

second phase weight altered signal z_2 by phase weight altering, in accordance with the selected matrix $F[i]$, the first baseband signal s_1 and the second baseband signal s_2 , wherein

the first phase weight altered signal z_1 and the second phase weight altered signal z_2 satisfy the equation $(z_1, z_2)^T = F[i](s_1, s_2)^T$,

$(z_1, z_2)^T$ being a transposed vector of (z_1, z_2) , and

$(s_1, s_2)^T$ being a transposed vector of (s_1, s_2) .