

Control Resource Set information element

```

-- ASN1START
-- TAG-CONTROLRESOURCESET-START

ControlResourceSet ::=
    -- Corresponds to L1 parameter 'CORESET-ID'
    -- Value 0 identifies the common CORESET configured in MIB and in ServingCellConfigCommon
    -- Values 1..maxNrofControlResourceSets-1 identify CORESETs configured by dedicated signalling
    -- The controlResourceSetId is unique among the BWPs of a ServingCell.
    controlResourceSetId
        ControlResourceSetId,

    -- Frequency domain resources for the CORESET. Each bit corresponds a group of 6 RBs, with grouping starting from PRB 0, which is fully
    -- contained in the bandwidth part within which the CORESET is configured.
    -- The most significant bit corresponds to the group of lowest frequency which is fully contained in the bandwidth part within which the
    -- CORESET is configured, each next subsequent lower significance bit corresponds to the next lowest frequency group fully contained within
    -- the bandwidth part within which the CORESET is configured, if any.
    -- Bits corresponding to a group not fully contained within the bandwidth part within which the CORESET is configured are set to zero.
    -- Corresponds to L1 parameter 'CORESET-freq-dom'(see 38.211, section 7.3.2.2)
    frequencyDomainResources
        BIT STRING (SIZE (45)),

    -- Contiguous time duration of the CORESET in number of symbols
    -- Corresponds to L1 parameter 'CORESET-time-duration' (see 38.211, section 7.3.2.2FFS_Section)
    duration
        INTEGER (1..maxCoReSetDuration),

    -- Mapping of Control Channel Elements (CCE) to Resource Element Groups (REG).
    -- Corresponds to L1 parameter 'CORESET-CCE-REG-mapping-type' (see 38.211 Section sections 7.3.2.2 and 7.4.1.3.2)
    cce-REG-MappingType
        CHOICE {
            interleaved
                SEQUENCE {
                    -- Resource Element Groups (REGs) can be bundled to create REG bundles. This parameter defines the size of such bundles.
                    -- Corresponds to L1 parameter 'CORESET-REG-bundle-size' (see 38.211, section FFS_Section)
                    reg-BundleSize
                        ENUMERATED {n2, n3, n6},
                    -- Corresponds to L1 parameter 'CORESET-interleaver-size' (see 38.211, 38.213, section FFS_Section)
                    interleaverSize
                        ENUMERATED {n2, n3, n6},
                    -- Corresponds to L1 parameter 'CORESET-shift-index' (see 38.211, section 7.3.2.2)
                    shiftIndex
                        INTEGER(0..maxNrofPhysicalResourceBlocks-1)
                },
            nonInterleaved
                NULL
        },

    -- Precoder granularity in frequency domain.
    -- Corresponds to L1 parameter 'CORESET-precoder-granularity' (see 38.211, sections 7.3.2.2 and 7.4.1.3.2)
    precoderGranularity
        ENUMERATED {sameAsREG-bundle, allContiguousRBs},

    -- A subset of the TCI states defined in TCI-States used for providing QCL relationships between the DL RS(s) in one RS Set
    -- (TCI-State) and the PDCCH DMRS ports. Corresponds to L1 parameter 'TCI-StatesPDCCH' (see 38.214, section FFS_Section)
    tci-StatesPDCCH
        SEQUENCE(SIZE (1..maxNrofTCI-StatesPDCCH)) OF TCI-StateId

    -- If at least spatial QCL is configured/indicated, this field indicates if TCI field is present or not present in DL-related DCI.
    -- When the field is absent the UE considers the TCI to be absent/disabled.
    -- Corresponds to L1 parameter 'TCI-PresentInDCI' (see 38.213, section 5.1.5)
    tci-PresentInDCI
        ENUMERATED {enabled}

    -- PDCCH DMRS scrambling initialization. Corresponds to L1 parameter 'PDCCH-DMRS-Scrambling-ID' (see 38.214, section 5.1)
    -- When the field is absent the UE applies the value '0'.
    pdcch-DMRS-ScramblingID
        BIT STRING (SIZE (16))
}

-- TAG-CONTROLRESOURCESET-STOP
-- ASN1STOP

```

OPTIONAL, -- Need R

OPTIONAL, -- Need S

OPTIONAL -- Need S

***PDCCH-ConfigCommon* information element**

```
-- ASN1START
-- TAG-PDCCH-CONFIGCOMMON-START

PDCCH-ConfigCommon ::=
    SEQUENCE {
        -- A list of additional common search spaces.
        commonSearchSpaces
            SEQUENCE (SIZE(1..3)) OF SearchSpace
            OPTIONAL, -- Need R

        -- A list of additional control set resources; One is for SIB1, Other System Information and
        -- paging. The other is for Random Access.
        controlResourceSets
            SEQUENCE (SIZE (1..2)) OF ControlResourceSet
            OPTIONAL,

        -- ID of the search space for SIB1 message.
        searchSpaceSIB1
            SearchSpaceId
            OPTIONAL, -- Need R

        -- Corresponds to L1 parameter 'rmsi-SearchSpace' (see 38.213, section 10)
        searchSpaceOtherSystemInformation
            SearchSpaceId
            OPTIONAL, -- Need R

        -- ID of the Search space for other system information, i.e., SIB2 and beyond.
        searchSpacePaging
            SearchSpaceId
            OPTIONAL, -- Need R

        -- ID of the Search space for paging. Corresponds to L1 parameter 'paging-SearchSpace' (see 38.213, section 10)
        searchSpaceOtherSystemInformation
            SearchSpaceId
            OPTIONAL, -- Need R

        -- ID of the Search space for paging. Corresponds to L1 parameter 'paging-SearchSpace' (see 38.213, section 10)
        searchSpacePaging
            SearchSpaceId
            OPTIONAL, -- Need R

        -- CORESET configured for random access. When the field is absent the UE uses the CORESET according to pdccch-ConfigSIB1
        -- which is associated with ControlResourceSetId = 0.
        ra-ControlResourceSet
            ControlResourceSet
            OPTIONAL, -- Need S

        -- ID of the Search space for random access procedure. Corresponds to L1 parameter 'ra-SearchSpace' (see 38.214?, section FFS_Section)
        ra-SearchSpace
            SearchSpaceId
            OPTIONAL, -- Need R

        ...
    }

-- TAG-PDCCH-CONFIGCOMMON-STOP
-- ASN1STOP
```

FIG. 2

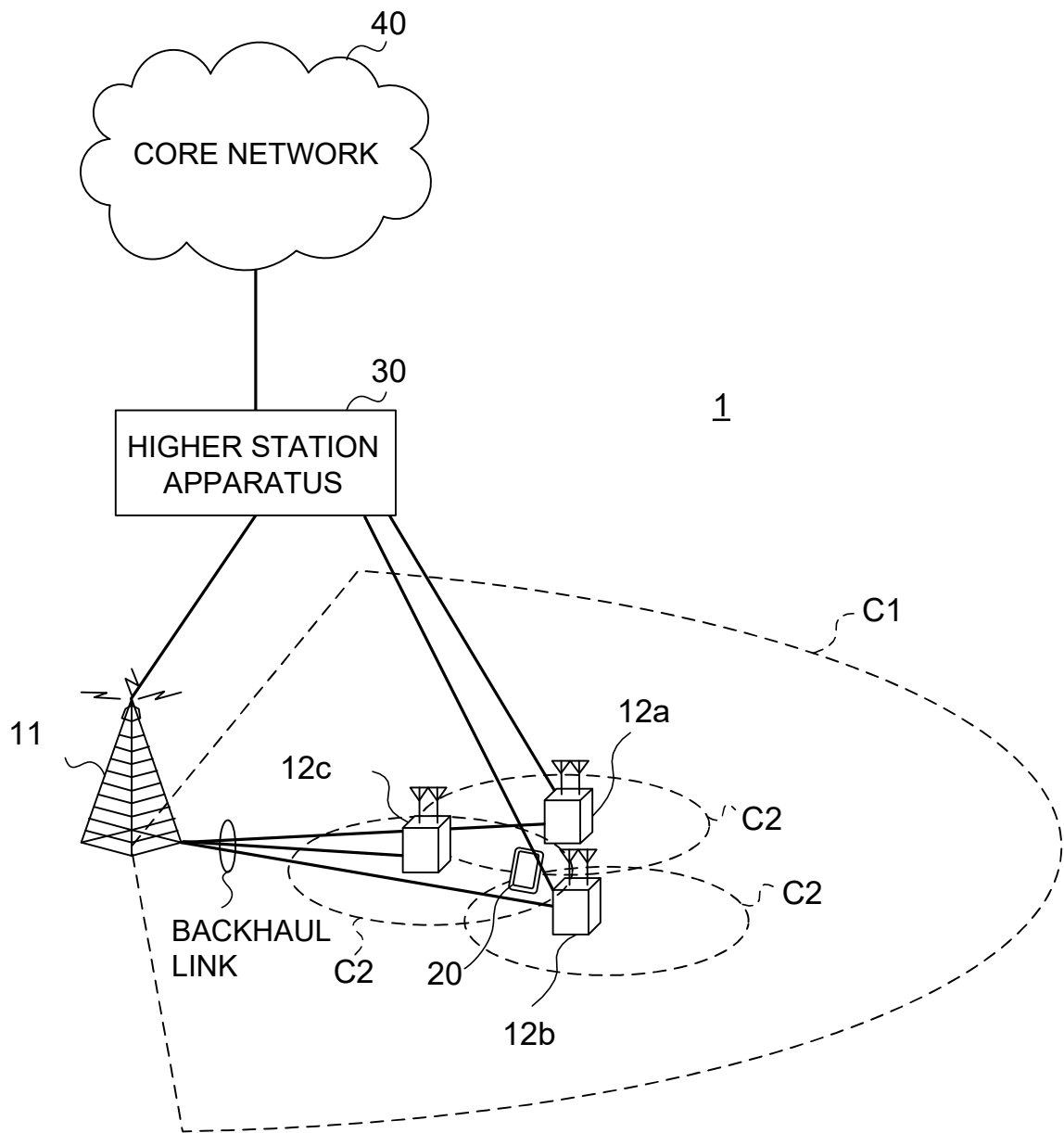


FIG. 3

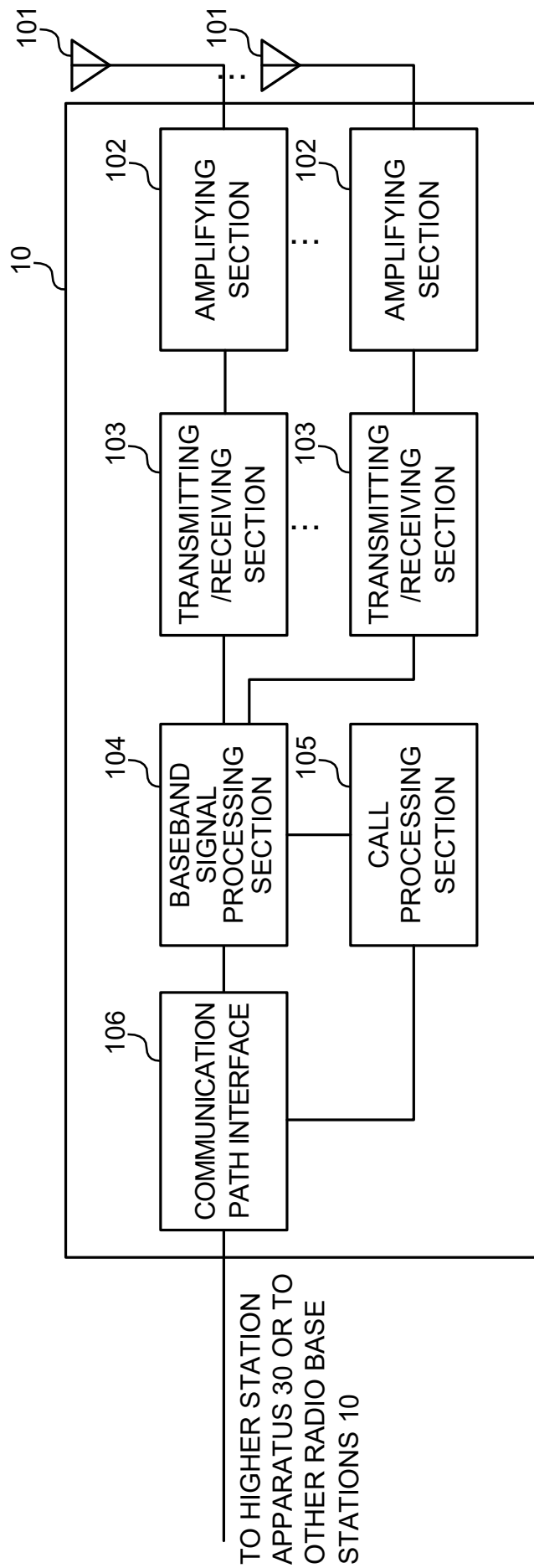


FIG. 4

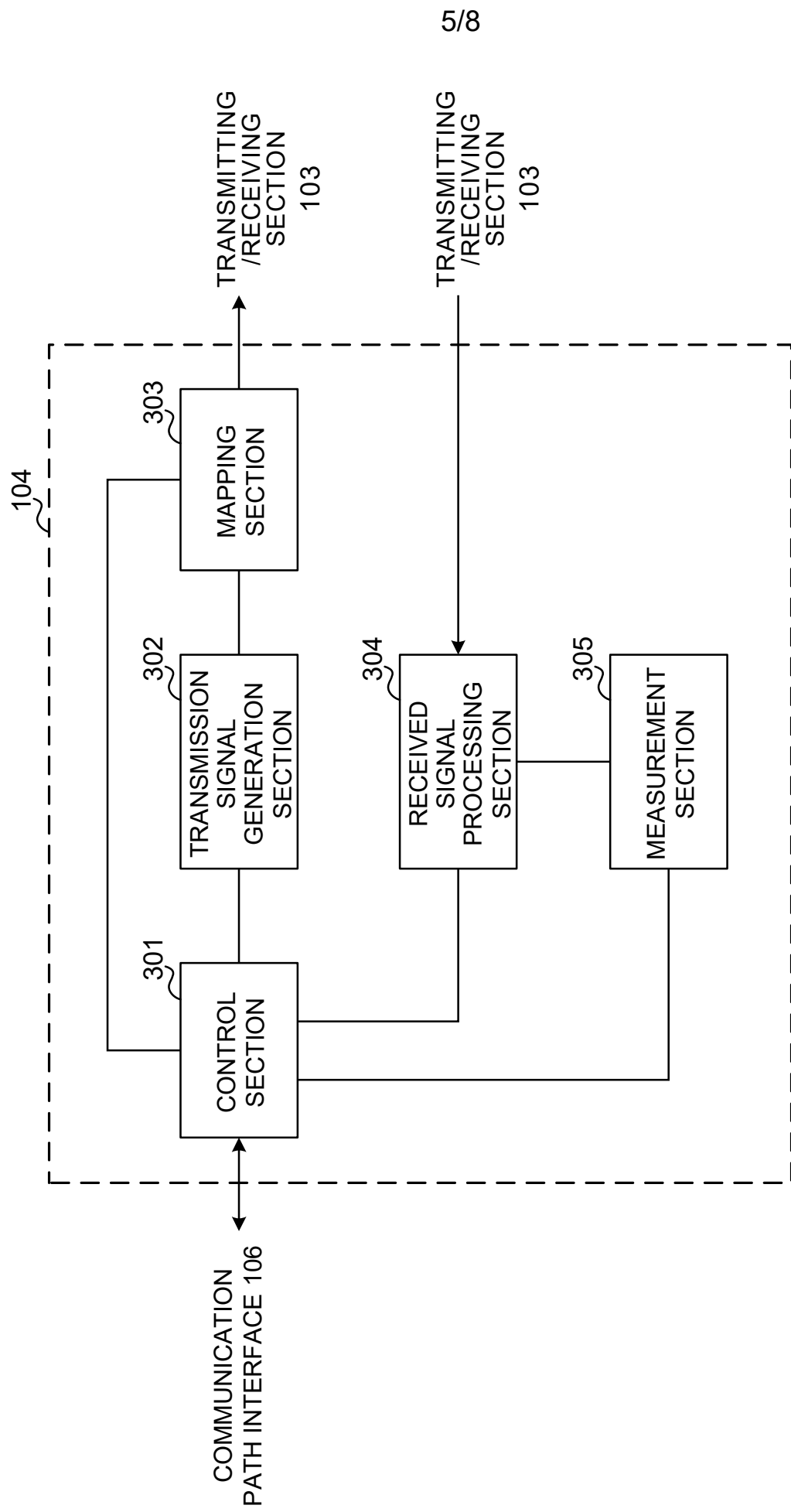


FIG. 5

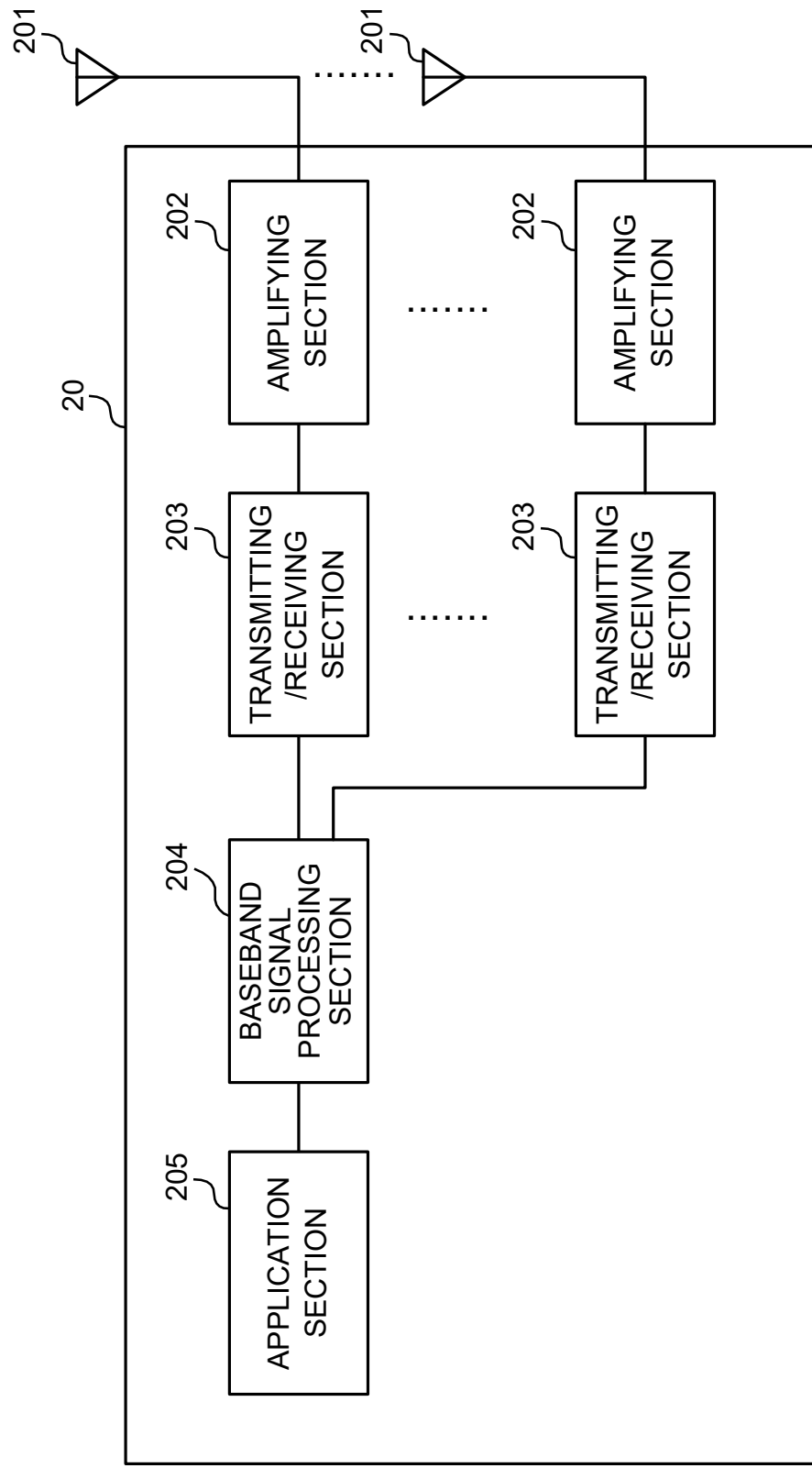


FIG. 6

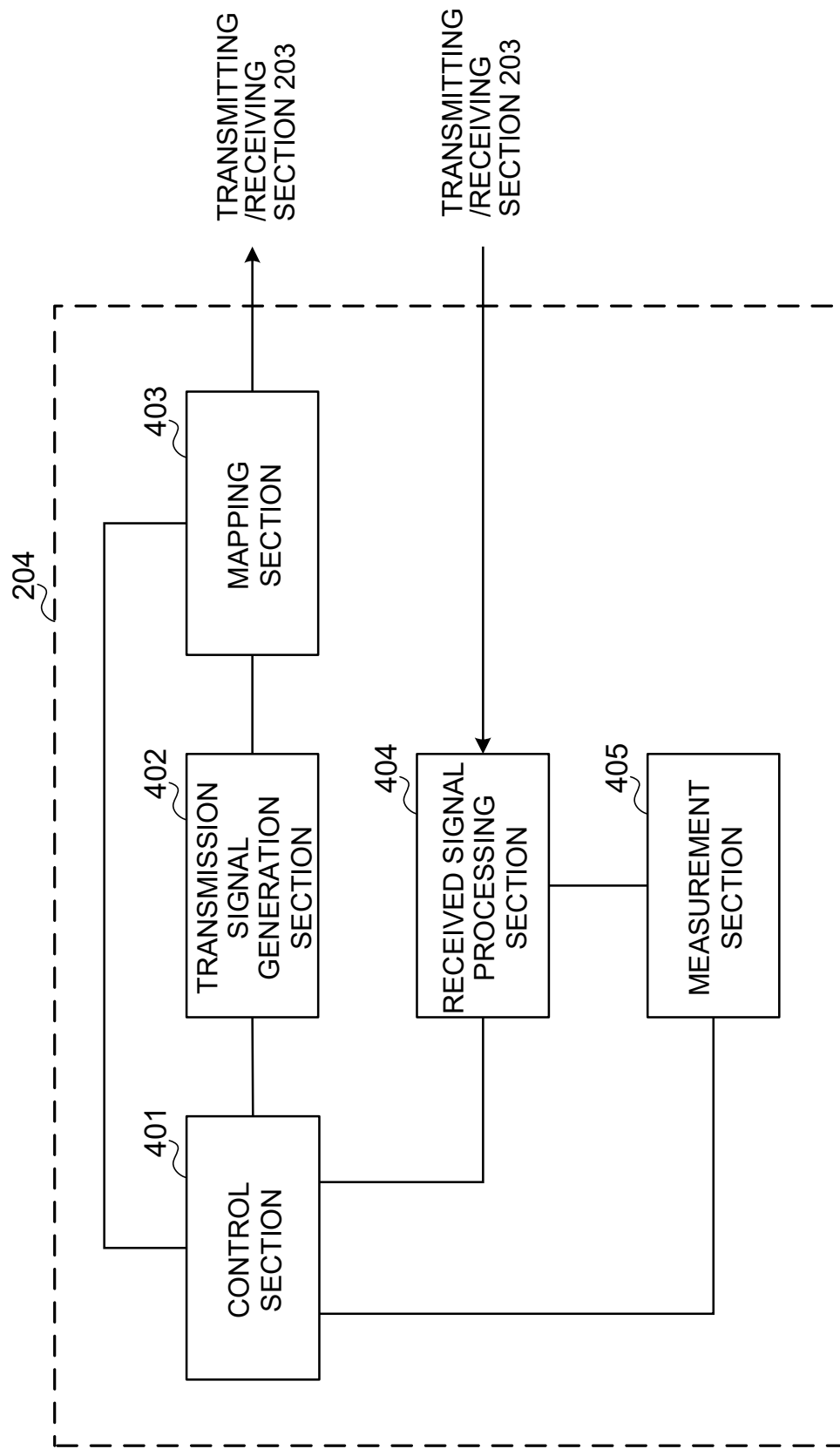


FIG. 7

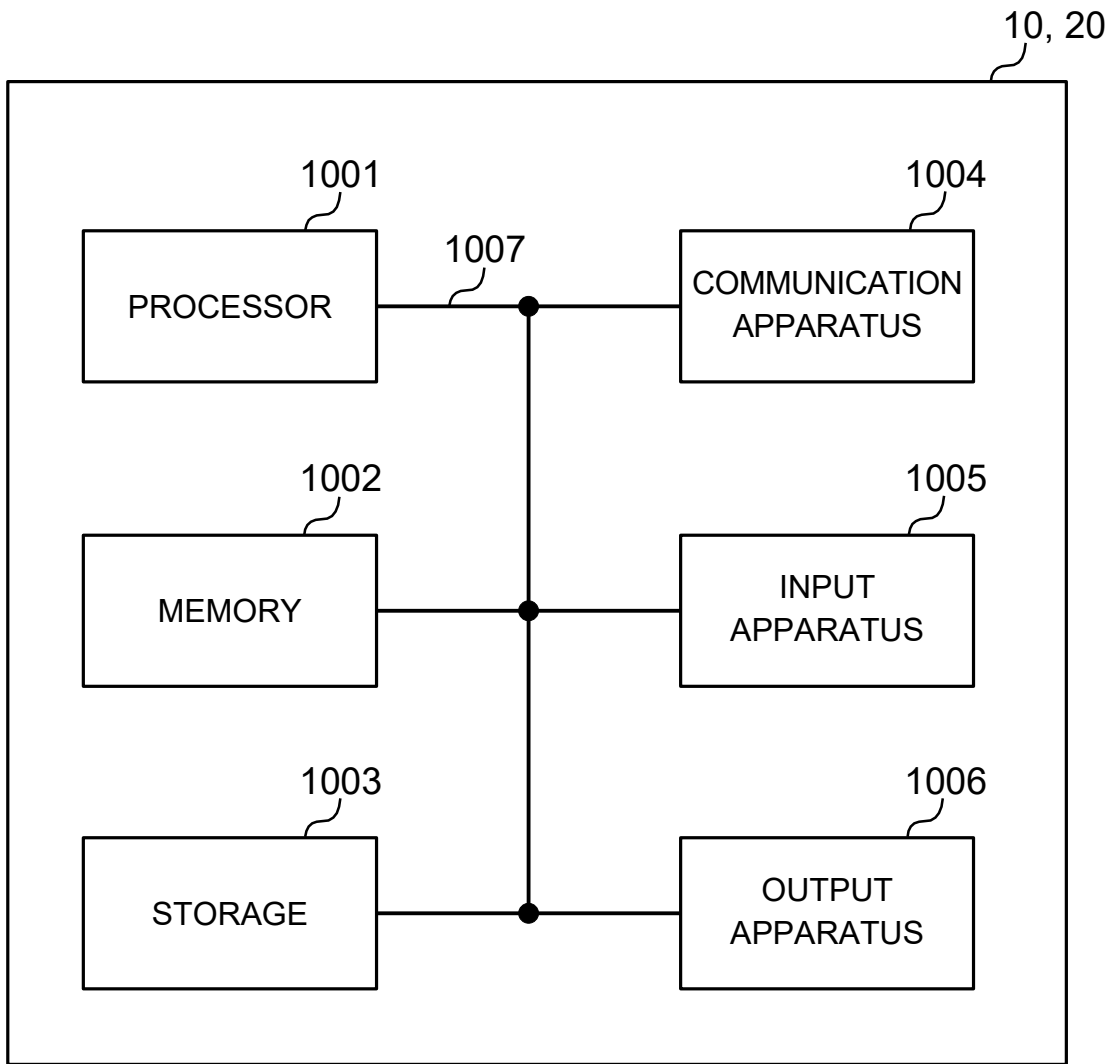


FIG. 8