October 2023

The Two Perpendicularly Positioned Projection Units that Simultaneously Projects Multiple Projections Where the Images Projected will occur at multiple Distances

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The Two Perpendicularly Positioned Projection Units that Simultaneously Projects Multiple Projections Where the Images Projected will occur at multiple Distances.

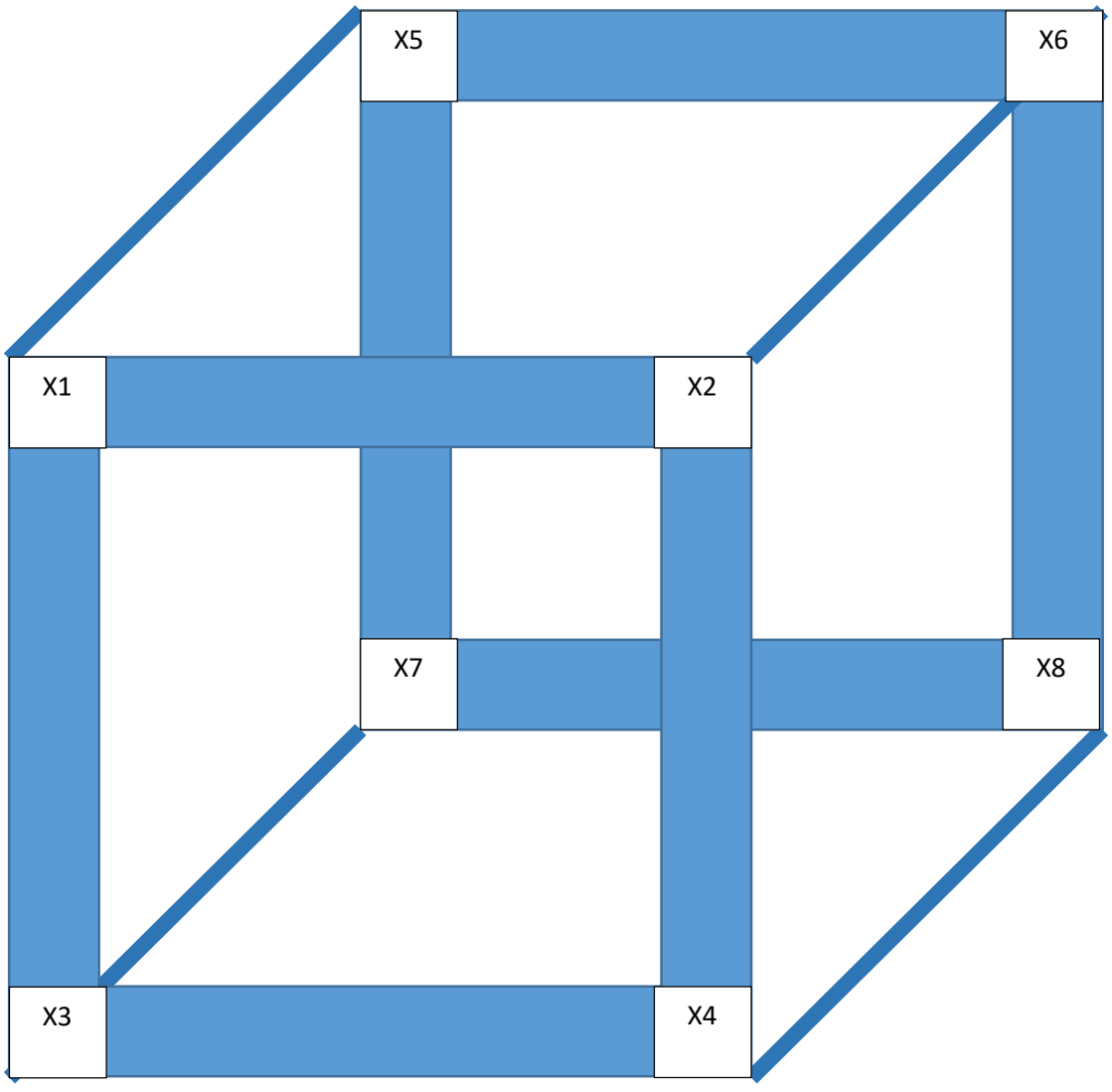
ABSTRACT

This paper describes a configuration which enables to simultaneously project multiple projections that will occur at multiple distances. The entire configuration consists of 2 perpendicularly positioned projection units and a beam splitter. Each projection unit will consists of 4 cyclically arranged beam splitters, 4 cyclically arranged small video displays, 4 cyclically arranged black surfaces and 4 convex lenses arranged in array configuration and a one single large video display. The 2 projection units which are perpendicularly positioned to each other will collectively have the capability to project 4 types of projections. Each projection type will have the capability to project the image projected at a unique distance.

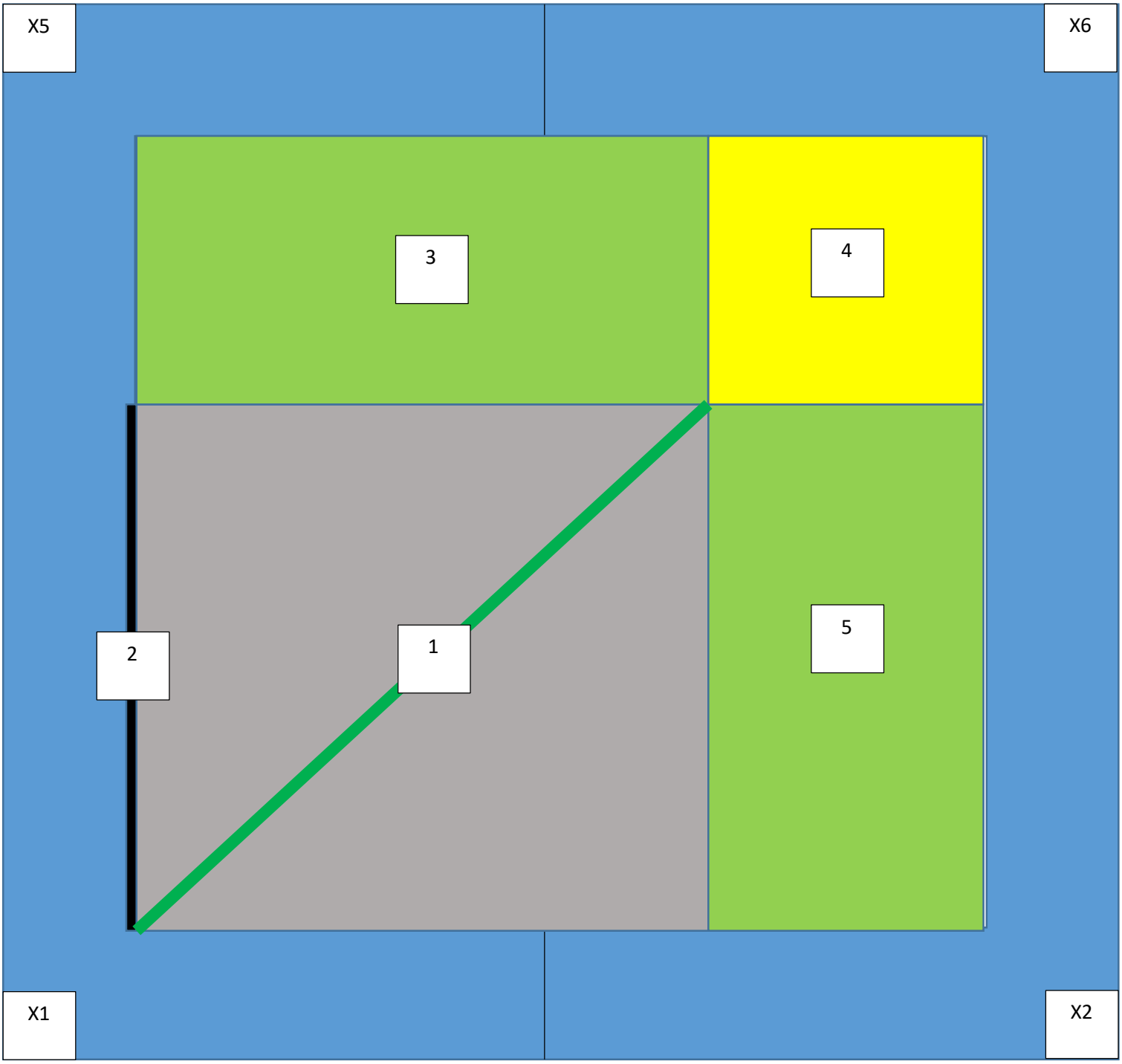
DESCRIPTION

This paper describes a configuration which enables to simultaneously project multiple projections that will occur at multiple distances. The entire configuration consists of 2 perpendicularly positioned projection units and a beam splitter. Each projection unit will consists of 4 cyclically arranged beam splitters, 4 cyclically arranged small video displays, 4 cyclically arranged black surfaces and 4 convex lenses arranged in array configuration and a one single large video display. The 2 projection units which are perpendicularly positioned to each other will collectively have the capability to project 4 types of projections. Each projection type will have the capability to project the image projected at a unique distance. The configuration will be described below. And the configuration will be described utilizing a 3D space representing reference model. This reference model will be provided below.

The reference model



The diagrammatic description of the configuration which describes the arrangement of the 2 perpendicularly positioned projection units will be provided below.



- The description of the labelled parts

The part labelled as number 1:

The main beam splitter

The part labelled as number 2:

The black colored light blocking surface of the main beam splitter

The part labelled as number 3:

The front projection unit

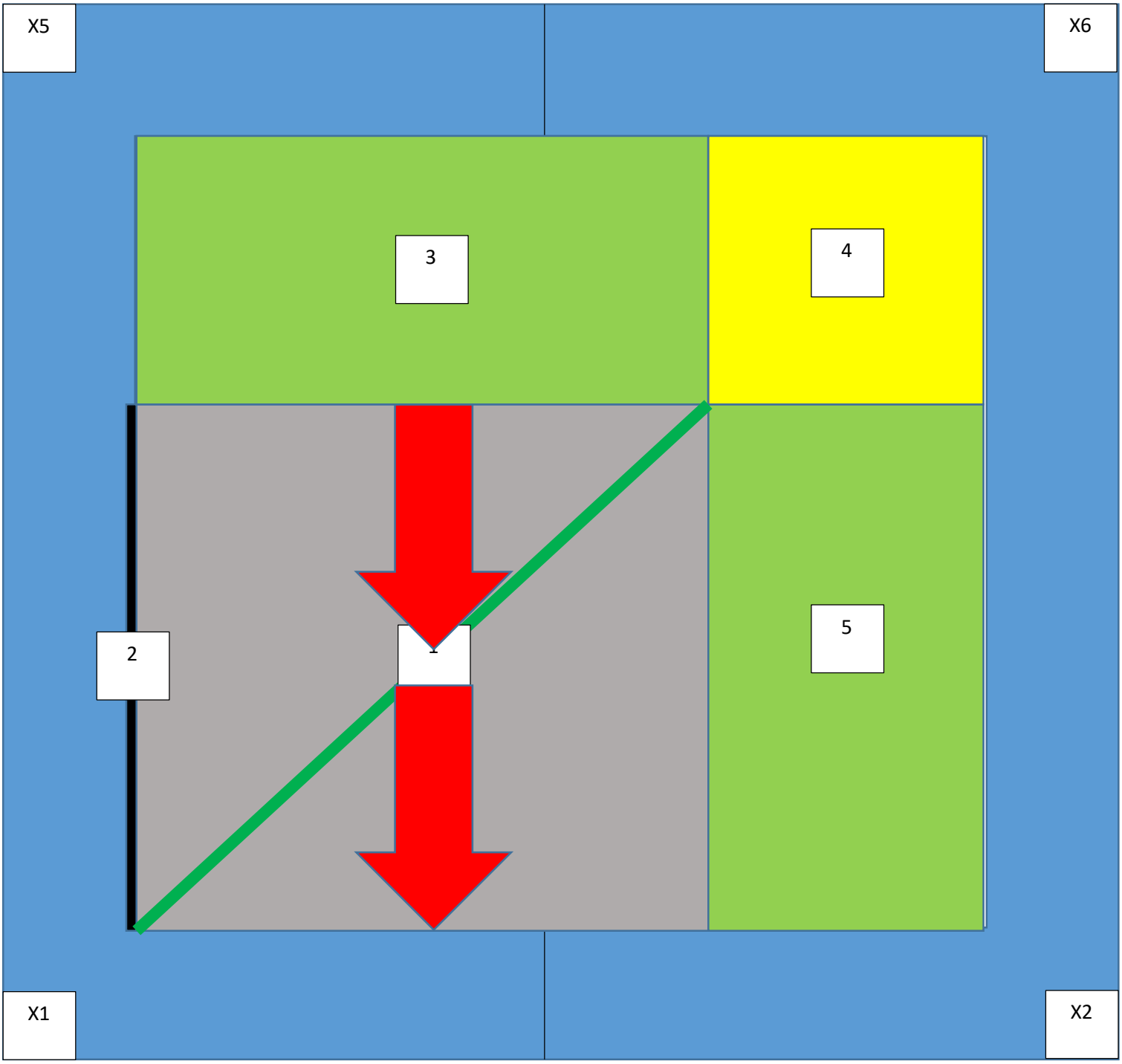
The part labelled as number 4:

The structure to which the 2 perpendicular projection units are connected

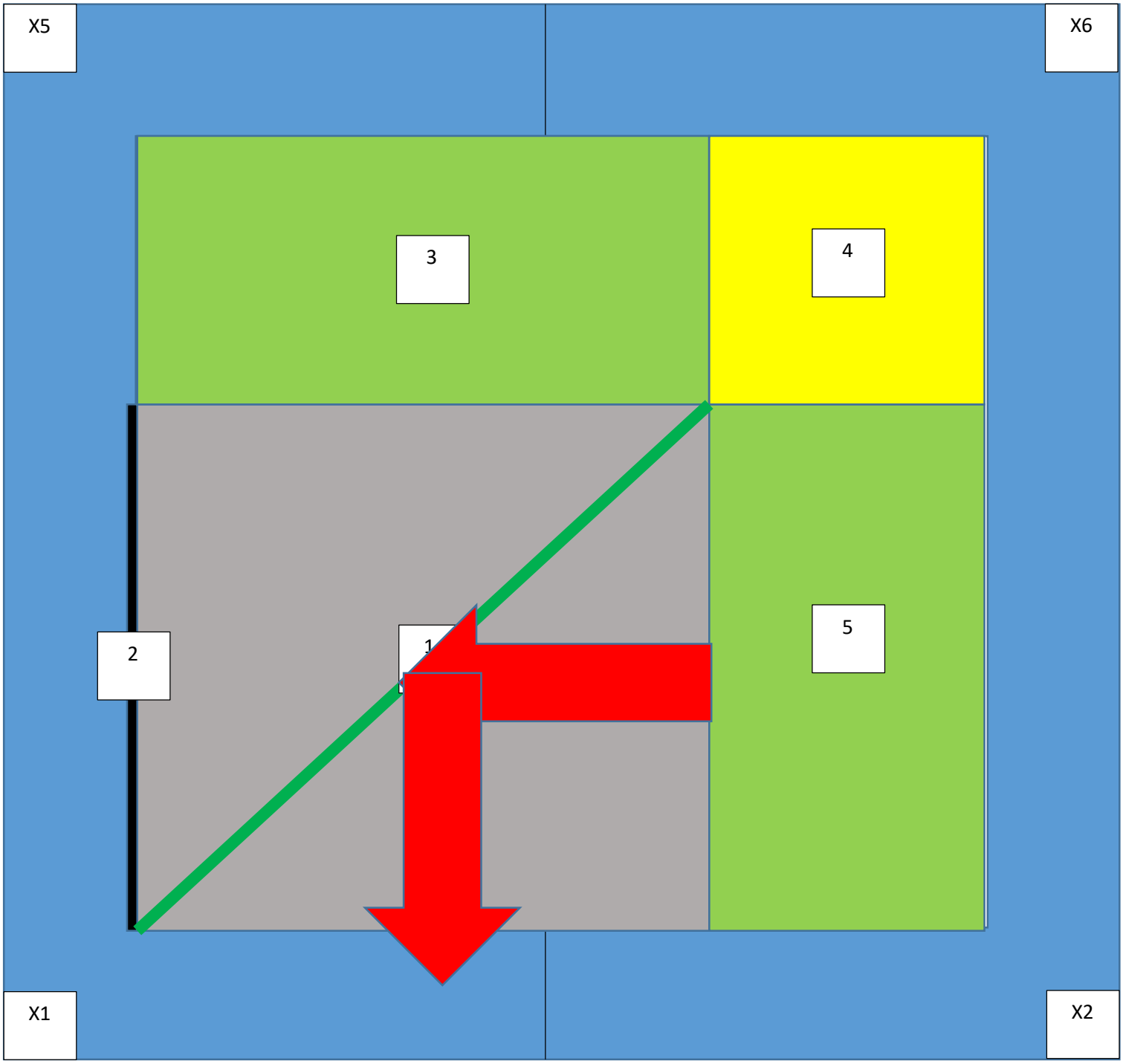
The part labelled as number 5:

The side projection unit

The diagrammatic description of the configuration which describes the projection projecting direction of the front projection unit within the configuration will be provided below.



The diagrammatic description of the configuration which describes the projection projecting direction of the side projection unit within the configuration will be provided below.



The components included in the front projection unit will be provided below.

Component number 1:

The convex lens stack number 1.

The convex lens stack number 1, consists of 2 square shaped convex lenses which are arranged in the stack configuration. The 2 square shaped convex lenses are of identical size. Each side of each square sized lens will be equivalents to A1 units. And the combined effective focal length of the 2 convex lenses arranged in the stack configuration will be equivalent to F units.

Component number 2:

The convex lens stack number 2.

The convex lens stack number 2, consists of 2 square shaped convex lenses which are arranged in the stack configuration. The 2 square shaped convex lenses are of identical size. Each side of each square sized lens will be equivalents to A1 units. And the combined effective focal length of the 2 convex lenses arranged in the stack configuration will be equivalent to F units.

Component number 3:

The convex lens stack number 3.

The convex lens stack number 3, consists of 2 square shaped convex lenses which are arranged in the stack configuration. The 2 square shaped convex lenses are of identical size. Each side of each square sized lens will be equivalents to A1 units. And the combined effective focal length of the 2 convex lenses arranged in the stack configuration will be equivalent to F units.

Component number 4:

The convex lens stack number 4.

The convex lens stack number 4, consists of 2 square shaped convex lenses which are arranged in the stack configuration. The 2 square shaped convex lenses are of identical size. Each side of each square sized lens will be equivalent to A1 units. And the combined effective focal length of the 2 convex lenses arranged in the stack configuration will be equivalent to F units.

Component number 5:

The small video display number 1.

The small video display number 1, is a square shaped video display. Each side of the square shaped small video display will be equivalent to A2 units. And the small video display number 1 have a resolution of R.

Component number 6:

The small video display number 2.

The small video display number 2, is a square shaped video display. Each side of the square shaped small video display will be equivalent to A2 units. And the small video display number 2 have a resolution of R.

Component number 7:

The small video display number 3.

The small video display number 3, is a square shaped video display. Each side of the square shaped small video display will be equivalent to A2 units. And the small video display number 3 have a resolution of R.

Component number 8:

The small video display number 4.

The small video display number 4, is a square shaped video display. Each side of the square shaped small video display will be equivalent to A2 units. And the small video display number 4 have a resolution of R.

Component number 9:

The beam splitter number 1.

The beam splitter number 1, is a 50:50 ratio beam splitter.

Component number 10:

The beam splitter number 2.

The beam splitter number 2, is a 50:50 ratio beam splitter.

Component number 11:

The beam splitter number 3.

The beam splitter number 3, is a 50:50 ratio beam splitter.

Component number 12:

The beam splitter number 4.

The beam splitter number 4, is a 50:50 ratio beam splitter.

Component number 13:

The light blocking part number 1.

The light blocking part number 1, is a square shaped light blocking part. The side of this square shaped light blocking part will be equivalent to A3 units.

Component number 14:

The light blocking part number 2.

The light blocking part number 2, is a square shaped light blocking part. The side of this square shaped light blocking part will be equivalent to A3 units.

Component number 15:

The light blocking part number 3.

The light blocking part number 3, is a square shaped light blocking part. The side of this square shaped light blocking part will be equivalent to A3 units.

Component number 16:

The light blocking part number 4.

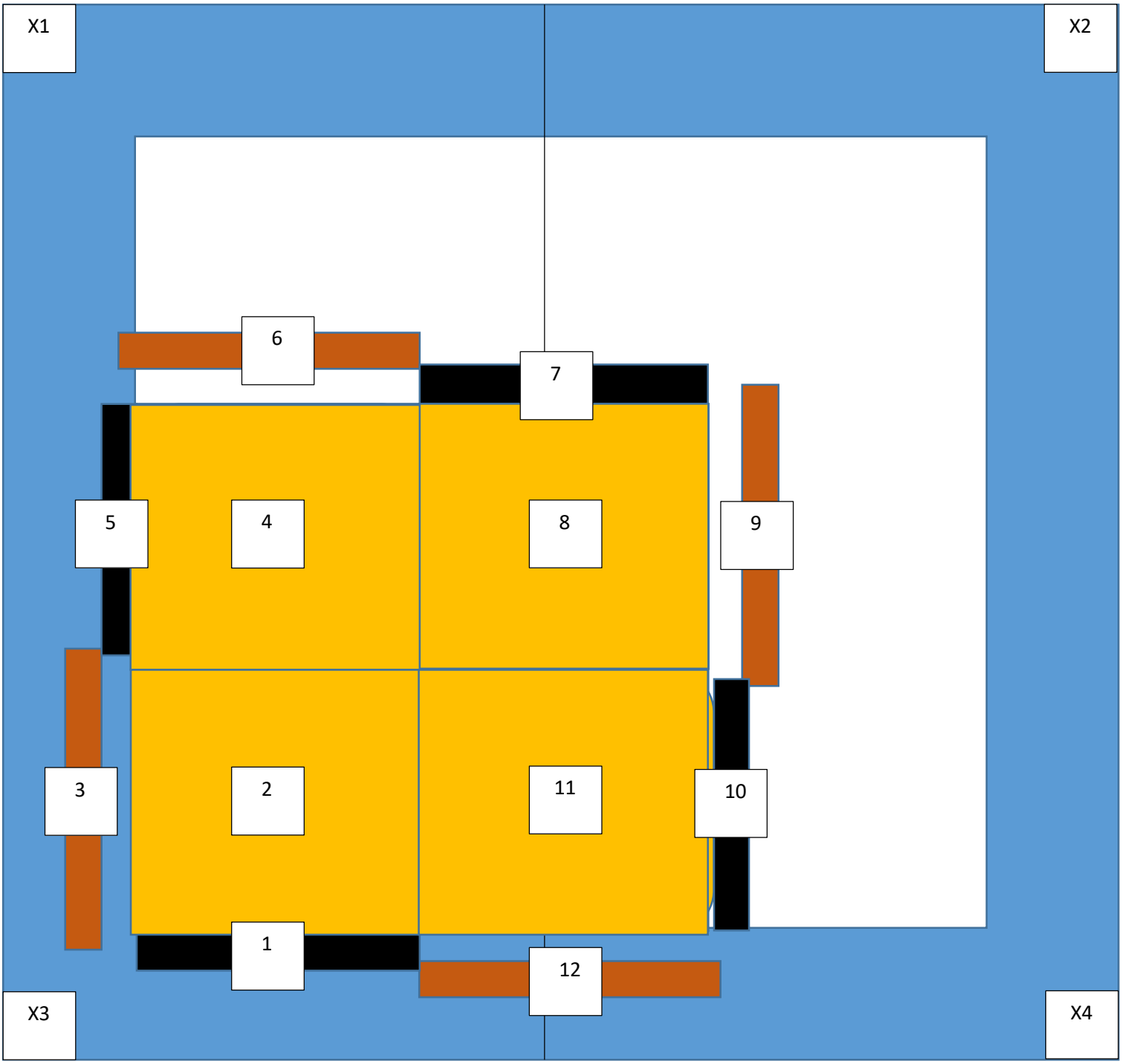
The light blocking part number 4, is a square shaped light blocking part. The side of this square shaped light blocking part will be equivalent to A3 units.

Component number 17:

The large video display.

The large video display, is a square shaped video display. Each side of the square shaped large video display will be equivalent to A4 units. And the large video display have a resolution of 4R.

The diagrammatic description of the rear view of the front projection unit will be provided below.



- The description of the labelled parts

The part labelled as number 1:

The light blocking part number 2

The part labelled as number 2:

The convex lens stack number 1

The part labelled as number 3:

The small video display number 1

The part labelled as number 4:

The convex lens stack number 2

The part labelled as number 5:

The light blocking part number 3

The part labelled as number 6:

The small video display number 2

The part labelled as number 7:

The light blocking part number 4

The part labelled as number 8:

The convex lens stack number 3

The part labelled as number 9:

The small video display number 3

The part labelled as number 10:

The light blocking part number 1

The part labelled as number 11:

The convex lens stack number 4

The part labelled as number 12:

The small video display number 4

In the above diagram, the 4 convex lens stacks will occlude the 4 cyclically arranged beam splitters.

The directional arrangement of the 4 cyclically arranged small video displays and the 4 cyclically arranged beam splitters which are occluded by the 4 convex lens stacks in the configuration of the front projection unit was demonstrated in the augmented reality monocle. (Abeysekera 2021).

The diagrammatic description of the rear view of the front projection unit where the 4 convex lens stacks will not occlude the 4 cyclically arranged beam splitters will be provided below.

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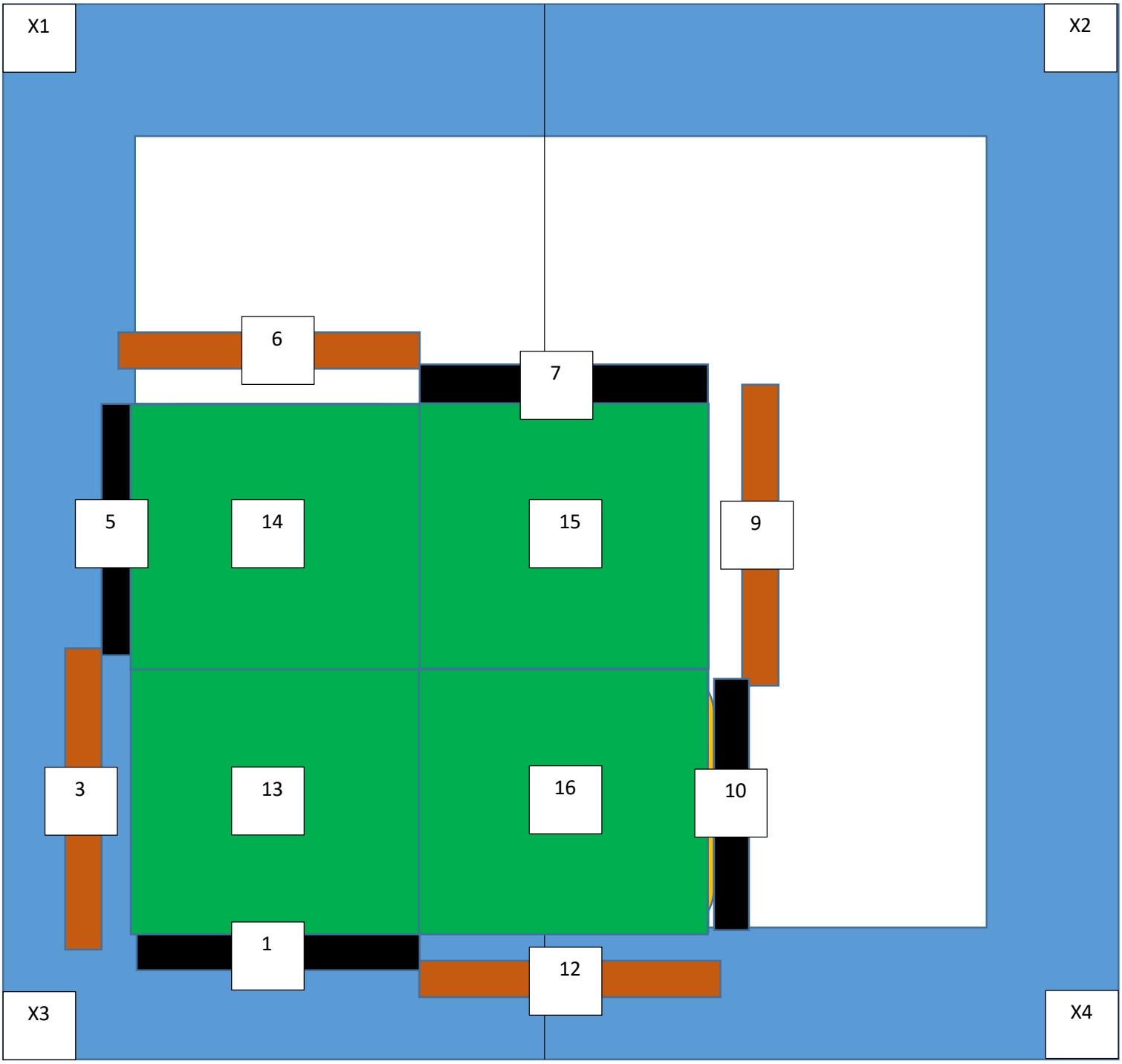


- The description of the labelled parts

The part labelled as number 13:

The beam splitter number 1.

The part labelled as number 14:

The beam splitter number 2.

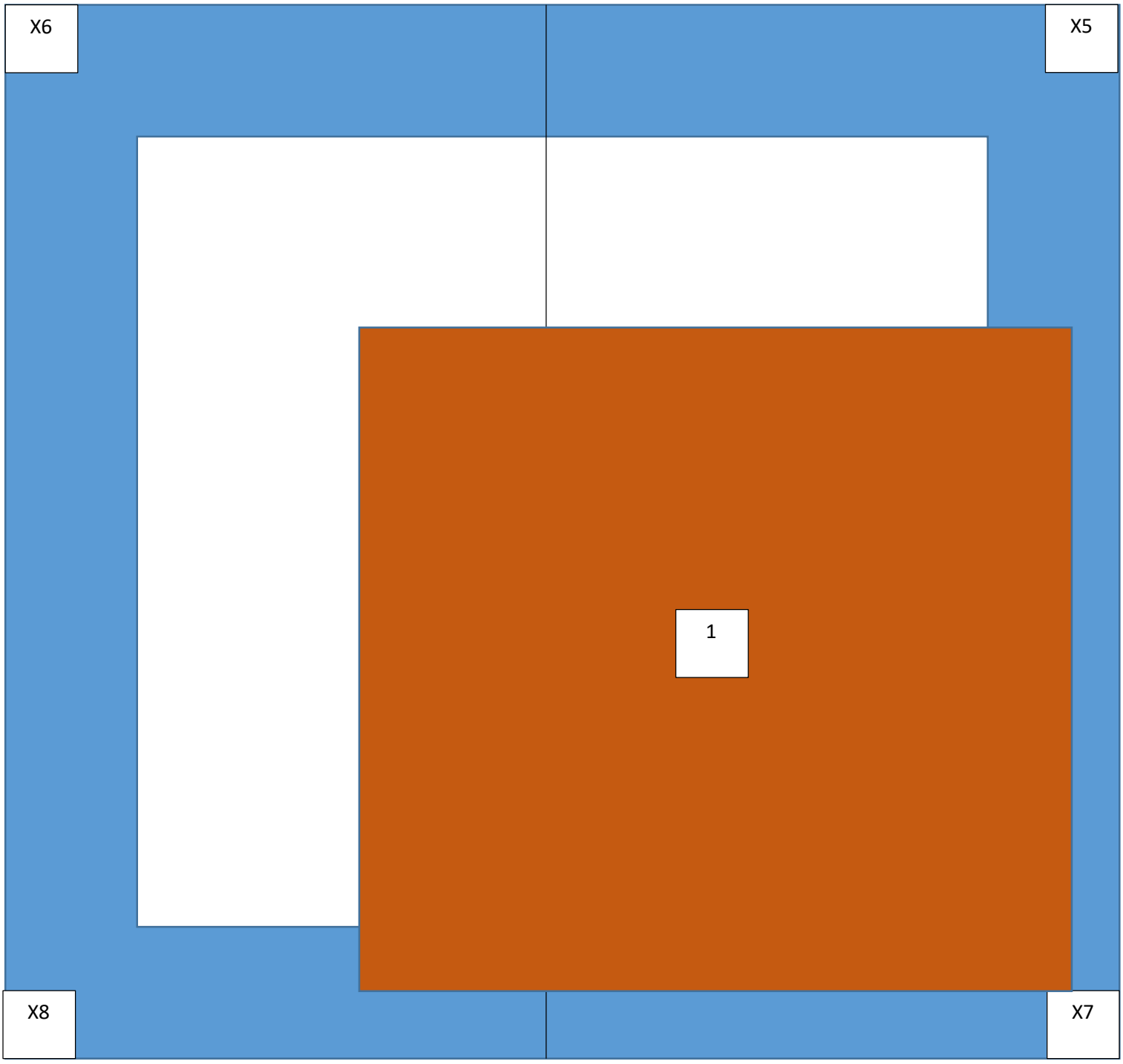
The part labelled as number 15:

The beam splitter number 3.

The part labelled as number 16:

The beam splitter number 4.

The diagrammatic description of the front view of the front projection unit will be provided below.

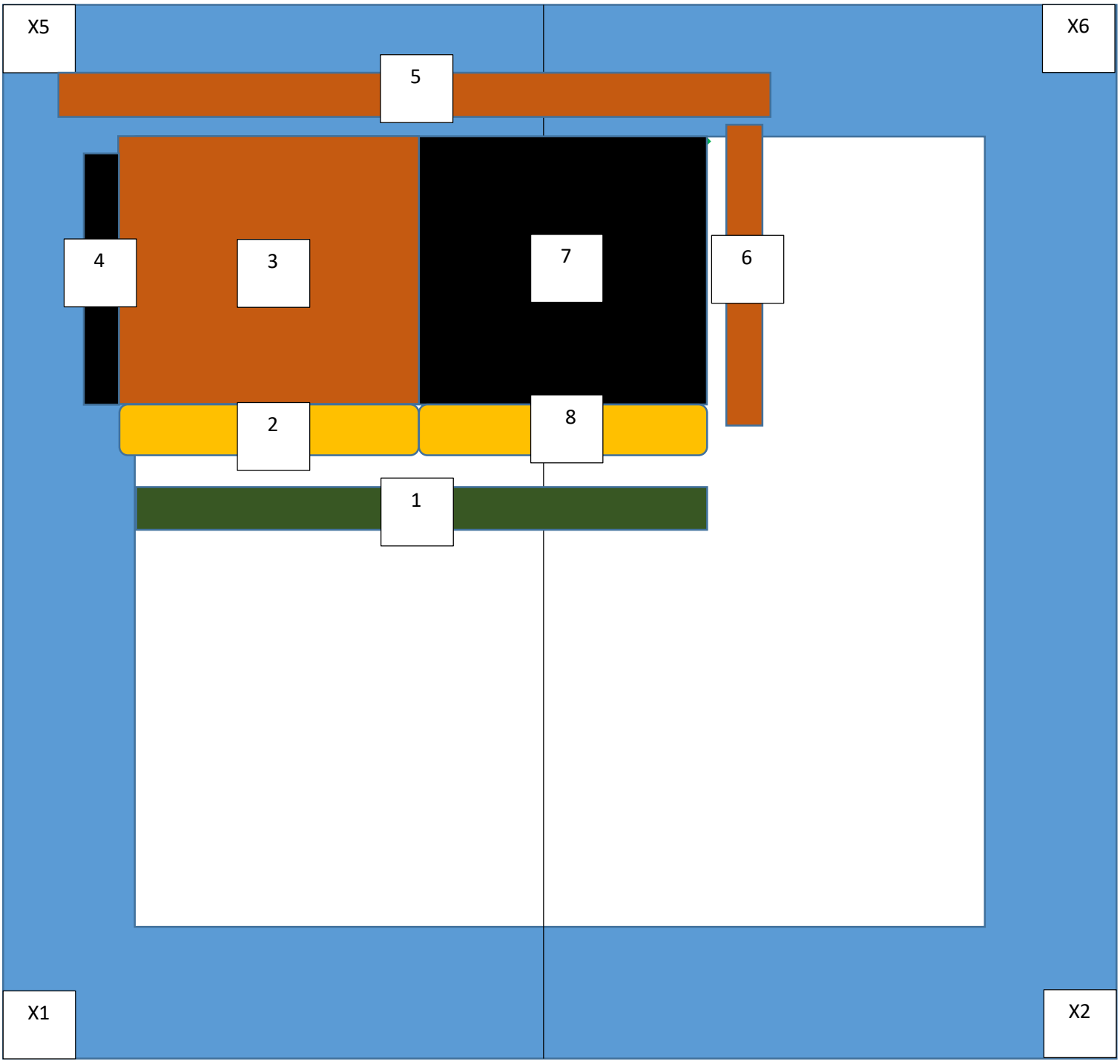


The description of the labelled parts

The part labelled as number 1:

The large video display

The diagrammatic description of the top view of the front projection unit will be provided below.



- The description of the labelled parts

The part labelled as number 1:

The projection viewing plane

The part labelled as number 2:

The convex lens stack number 2

The part labelled as number 3:

The small video display number 2

The part labelled as number 4:

The light blocking part number 3

The part labelled as number 5:

The large video display

The part labelled as number 6:

The small video display number 3

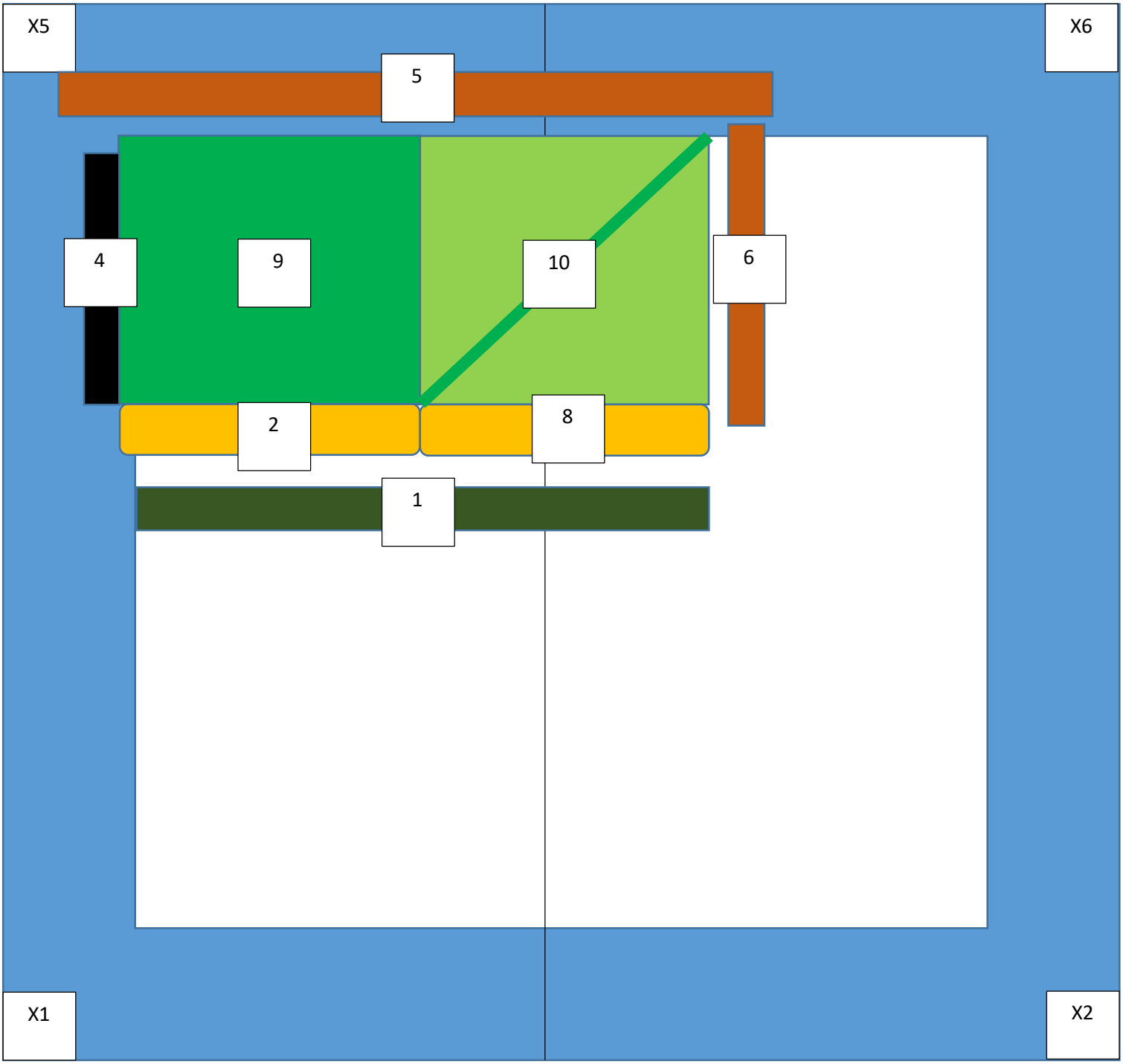
The part labelled as number 7:

The light blocking part number 4

The part labelled as number 8:

The convex lens stack number 3

The diagrammatic description of the top view of the front projection unit where the beam splitters are not occluded will be provided below.



- The description of the labelled parts

The part labelled as number 9:

The beam splitter number 2

The part labelled as number 10:

The beam splitter number 3

The positional configuration of the convex lens stack number 2 and the large video display:

The large video display will be positioned at a distance of F units away from the convex lens stack number 2, in front of the convex lens stack number 2. And the distance of F units will be equivalent to the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 2.

The positional configuration of the convex lens stack number 3 and the large video display:

The large video display will be positioned at a distance of F units away from the convex lens stack number 3, in front of the convex lens stack number 3. And the distance of F units will be equivalent to the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 3.

The positional configuration of the projection viewing plane and the small video display number 3:

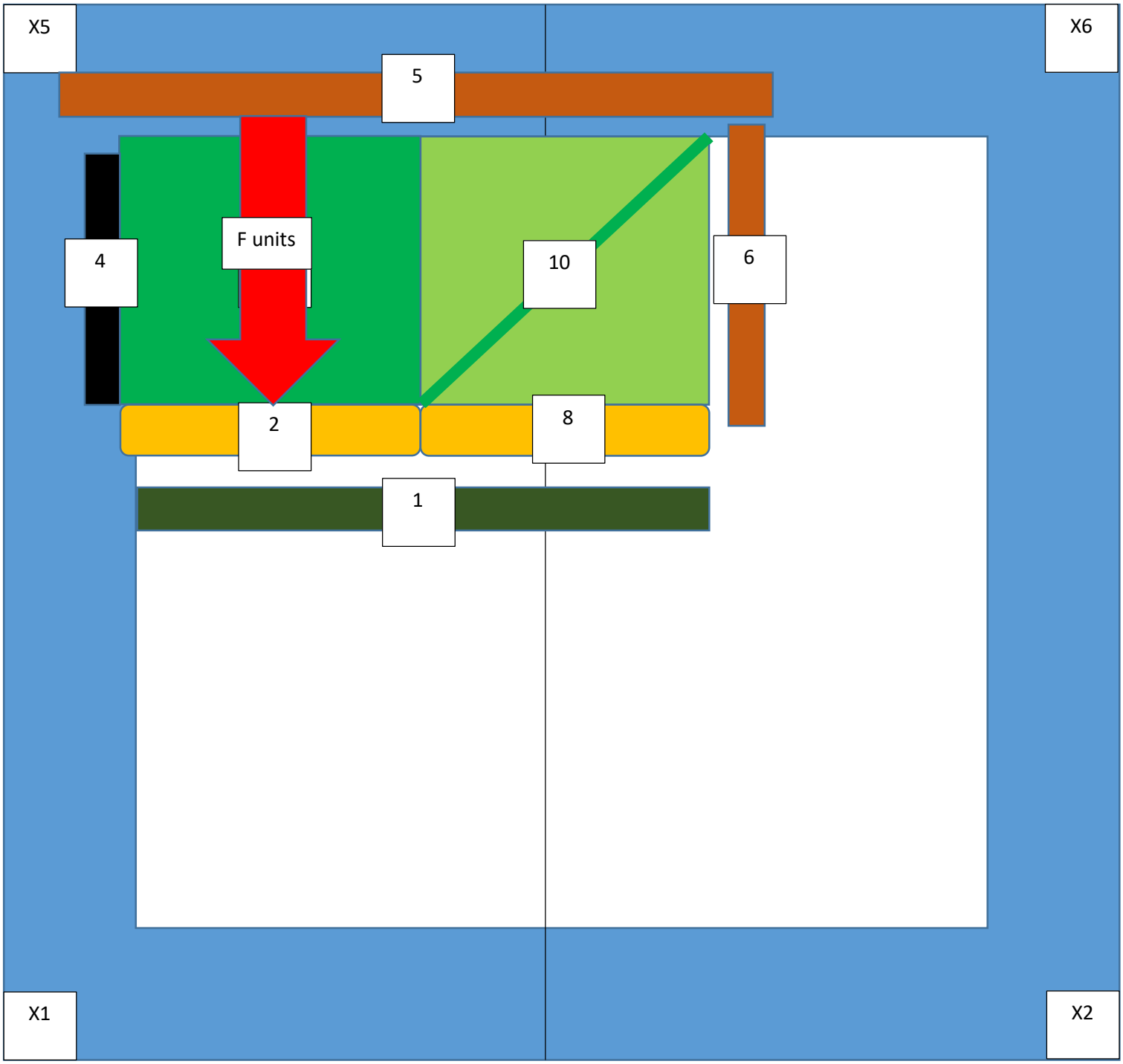
The projection viewing plane and the small video display number 3 are positioned in a perpendicular positional configuration with each other. The distance the projection which will originate from the small video display number 3, will take to reach the projection viewing plane will be equivalent to F units. And the distance of F units will be equivalent to the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 3.

The positional configuration of the convex lens stack number 3 and the small video display number 3:

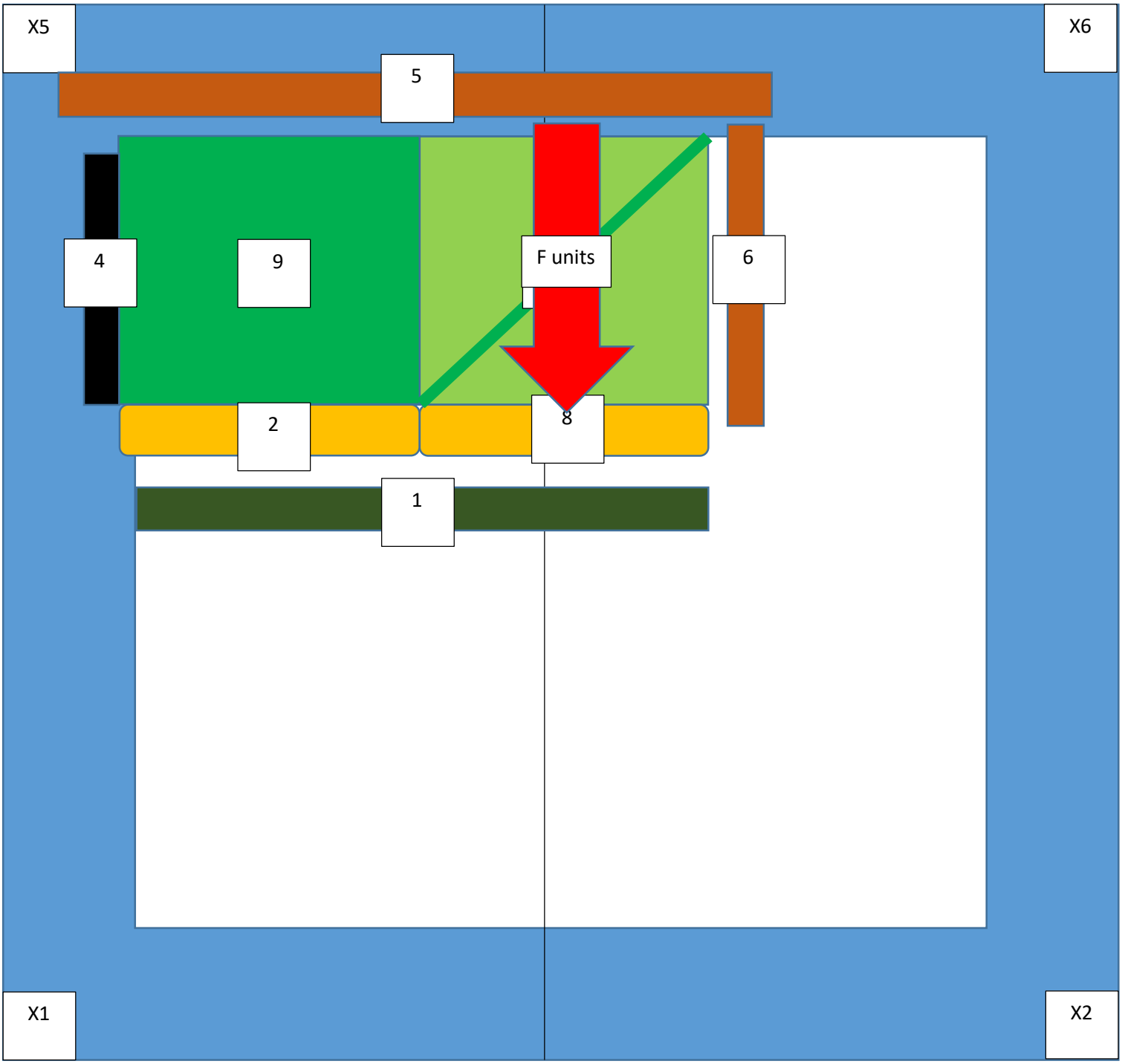
The convex lens stack number 3 and the small video display number 3 are positioned in a perpendicular positional configuration with each other. The distance the projection which will originate from the small video display number 3, will take to reach the convex lens stack number 3, will be equivalent to F1 units. And the distance of F1 units will be lesser than the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 3.

The diagrammatic descriptions of the positional configuration of the convex lens stack number 2 and the large video display, the positional configuration of the convex lens stack number 3 and the large video display, the positional configuration of the projection viewing plane and the small video display number 3 and the positional configuration of the convex lens stack number 3 and the small video display number 3 will be provided below, in the context of the distances the projections originated will take to reach each described component.

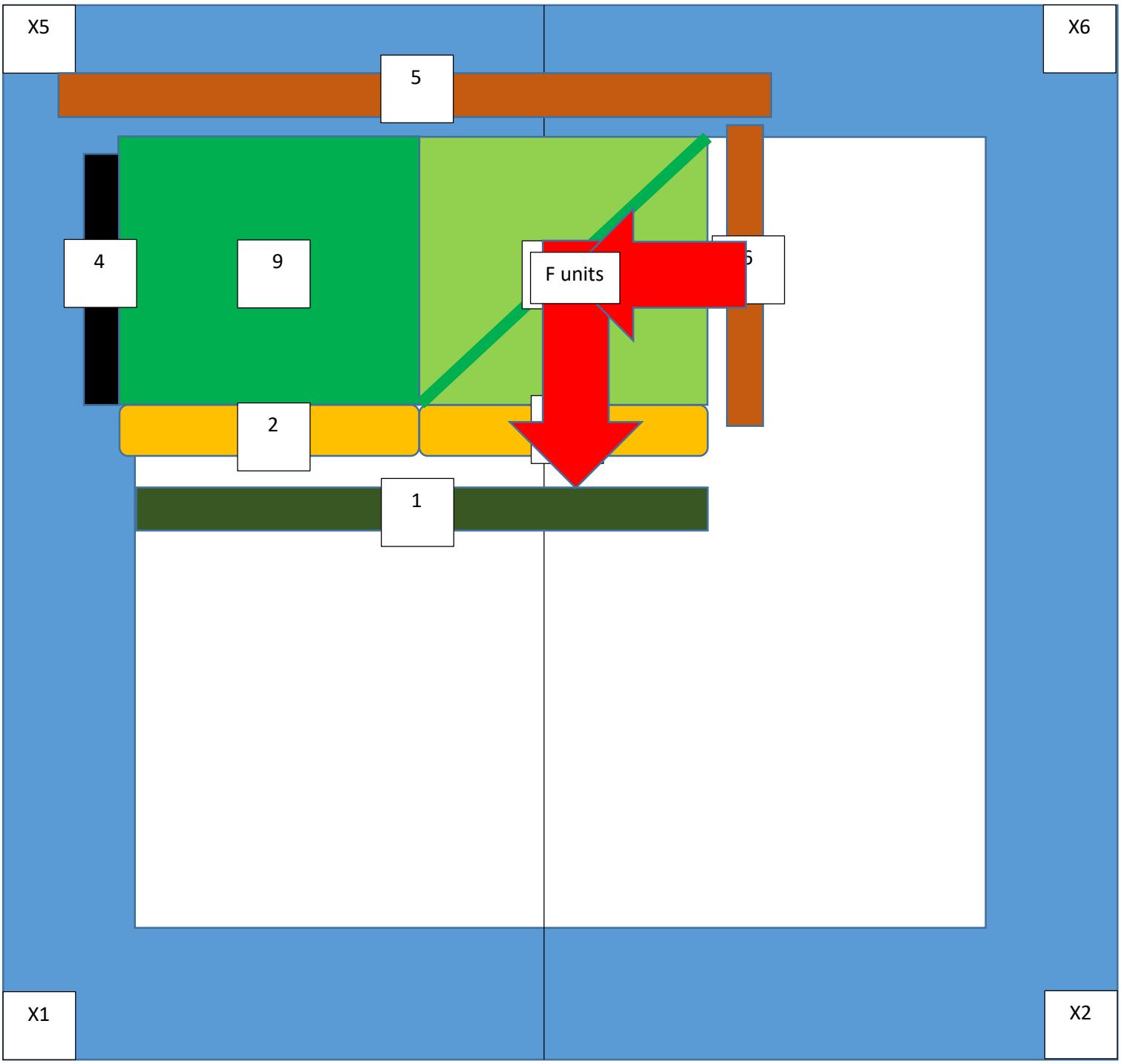
The diagrammatic description of the top view of the front projection unit where the beam splitters are not occluded will be provided below, for the positional configuration of the convex lens stack number 2 and the large video display



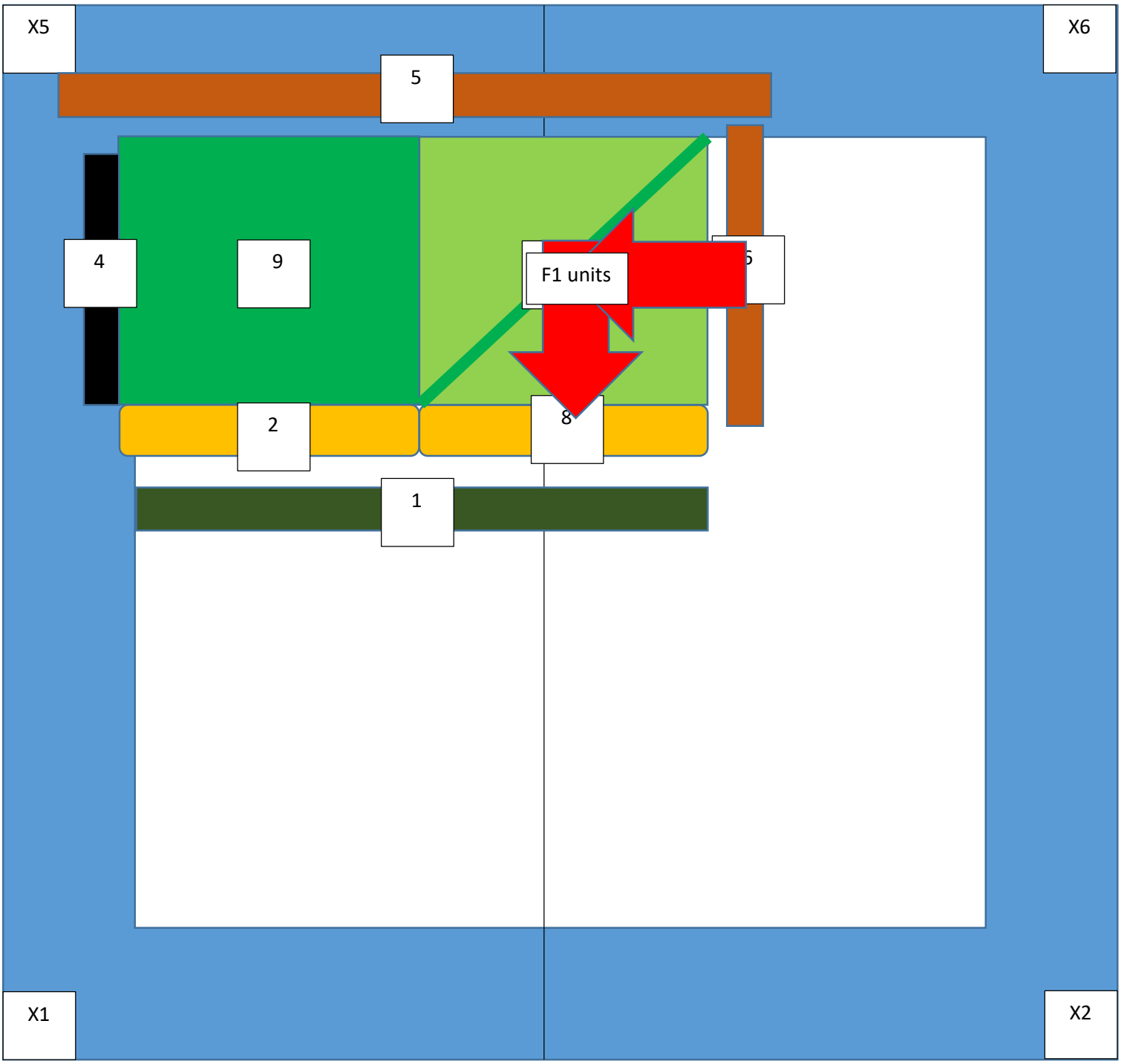
The diagrammatic description of the top view of the front projection unit where the beam splitters are not occluded will be provided below, for the positional configuration of the convex lens stack number 3 and the large video display



The diagrammatic description of the top view of the front projection unit where the beam splitters are not occluded will be provided below, for the positional configuration of the projection viewing plane and the small video display number 3.



The diagrammatic description of the top view of the front projection unit where the beam splitters are not occluded will be provided below, for the positional configuration of the convex lens stack number 3 and the small video display number 3.



The image formation capabilities of the above 3 diagrammatic descriptions which involves the convex lens stacks will be provided below.

The image formation capabilities of the positional configuration of the convex lens stack number 2 and the large video display:

As mentioned before, the large video display will be positioned at a distance of F units away from the convex lens stack number 2, in front of the convex lens stack number 2. And the distance of F units will be equivalent to the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 2. Therefore, the images of the projections projected from the large video display, will be formed at infinity.

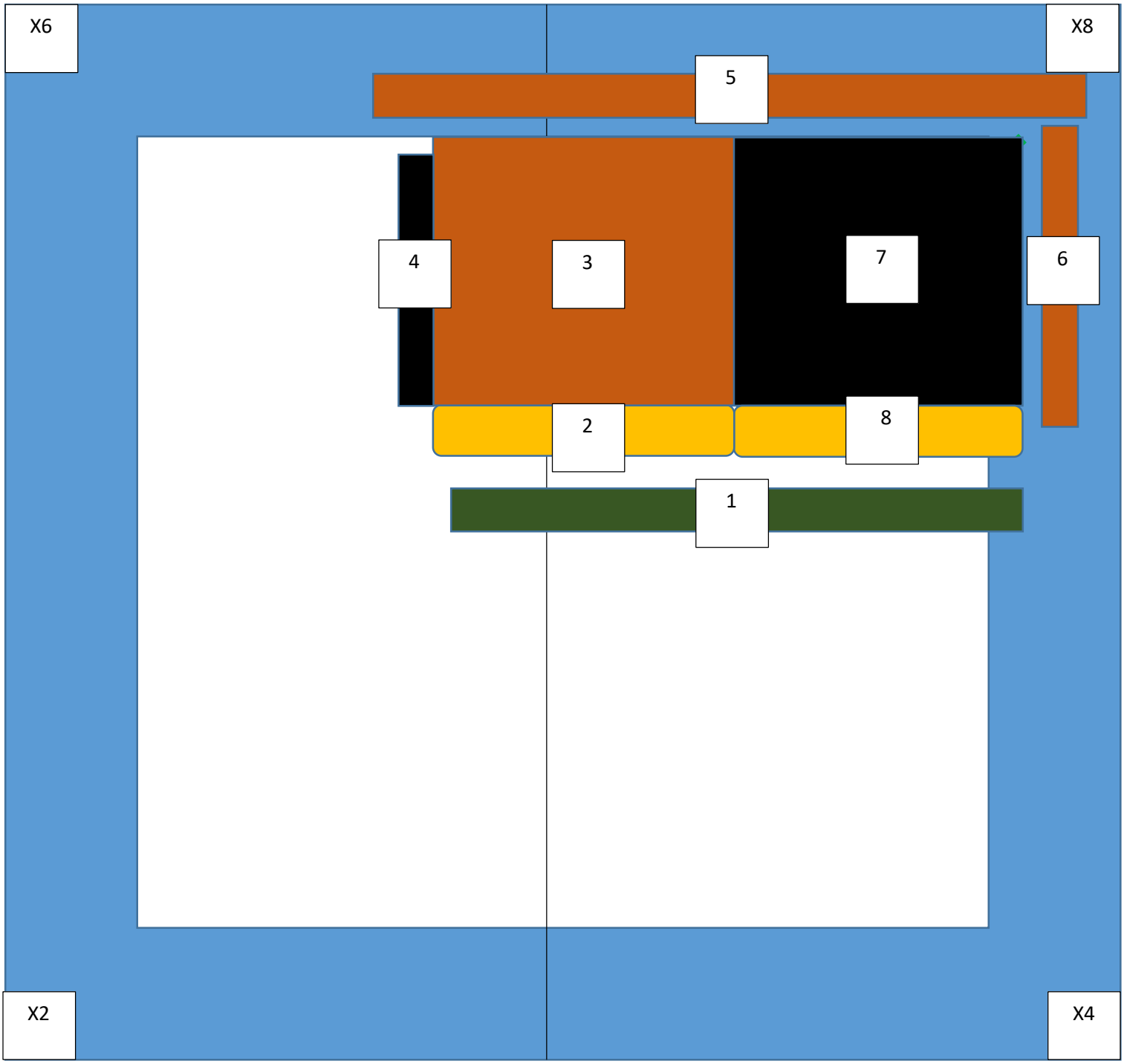
The image formation capabilities of the positional configuration of the convex lens stack number 3 and the large video display:

As mentioned before, the large video display will be positioned at a distance of F units away from the convex lens stack number 3, in front of the convex lens stack number 3. And the distance of F units will be equivalent to the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 3. Therefore, the images of the projections projected from the large video display, will be formed at infinity.

The image formation capabilities of the positional configuration of the convex lens stack number 3 and the small video display number 3.

As mentioned before, the convex lens stack number 3 and the small video display number 3 are positioned in a perpendicular positional configuration with each other. The distance the projection which will originate from the small video display number 3, will take to reach the convex lens stack number 3, will be equivalent to F1 units. And the distance of F1 units will be lesser than the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 3. Therefore, the images of the projections projected from the small video display number 3, will be virtual and will be formed in front of the convex lens stack number 3.

The diagrammatic description of the right side view of the front projection unit will be provided below.



- The description of the labelled parts

The part labelled as number 1:

The projection viewing plane

The part labelled as number 2:

The convex lens stack number 3

The part labelled as number 3:

The small video display number 3

The part labelled as number 4:

The light blocking part number 4

The part labelled as number 5:

The large video display

The part labelled as number 6:

The small video display number 4

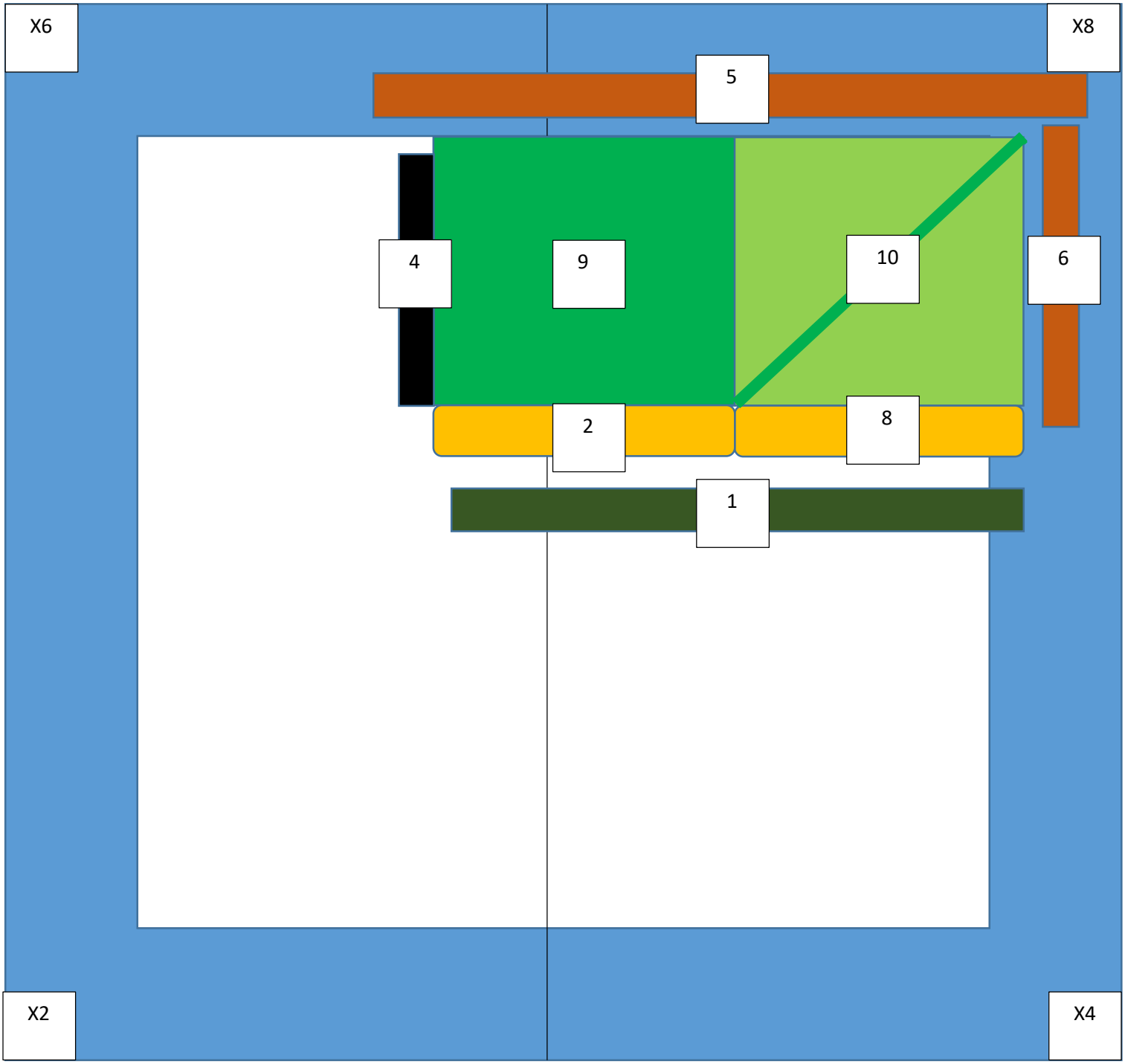
The part labelled as number 7:

The light blocking part number 1

The part labelled as number 8:

The convex lens stack number 4

The diagrammatic description of the right side view of the front projection unit where the beam splitters are not occluded will be provided below.



- The description of the labelled parts

The part labelled as number 9:

The beam splitter number 3

The part labelled as number 10:

The beam splitter number 4

The positional configuration of the convex lens stack number 3 and the large video display:

The large video display will be positioned at a distance of F units away from the convex lens stack number 3, in front of the convex lens stack number 3. And the distance of F units will be equivalent to the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 3.

The positional configuration of the convex lens stack number 4 and the large video display:

The large video display will be positioned at a distance of F units away from the convex lens stack number 4, in front of the convex lens stack number 4. And the distance of F units will be equivalent to the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 4.

The positional configuration of the projection viewing plane and the small video display number 4:

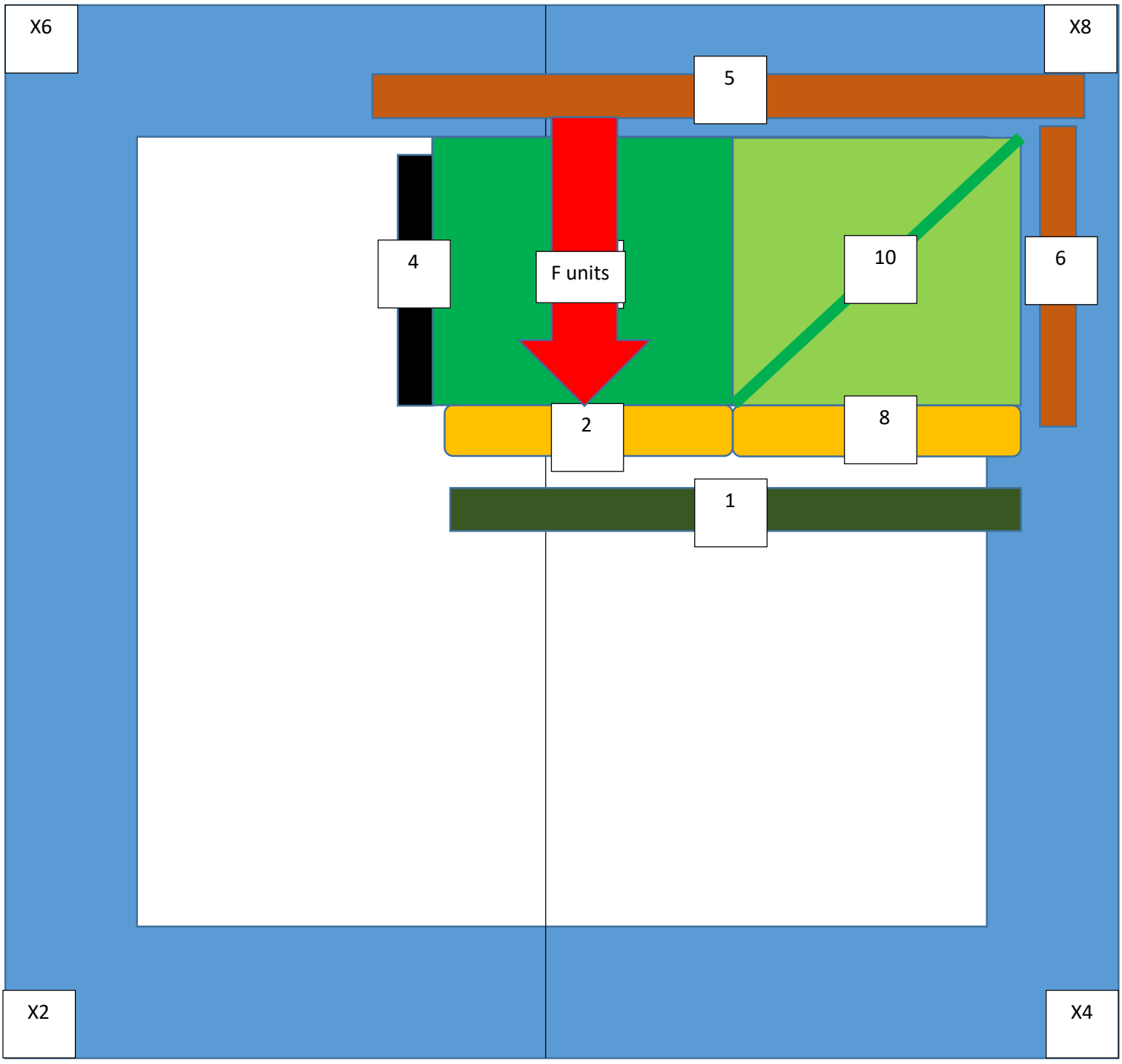
The projection viewing plane and the small video display number 4 are positioned in a perpendicular positional configuration with each other. The distance the projection which will originate from the small video display number 4, will take to reach the projection viewing plane will be equivalent to F units. And the distance of F units will be equivalent to the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 4.

The positional configuration of the convex lens stack number 4 and the small video display number 4:

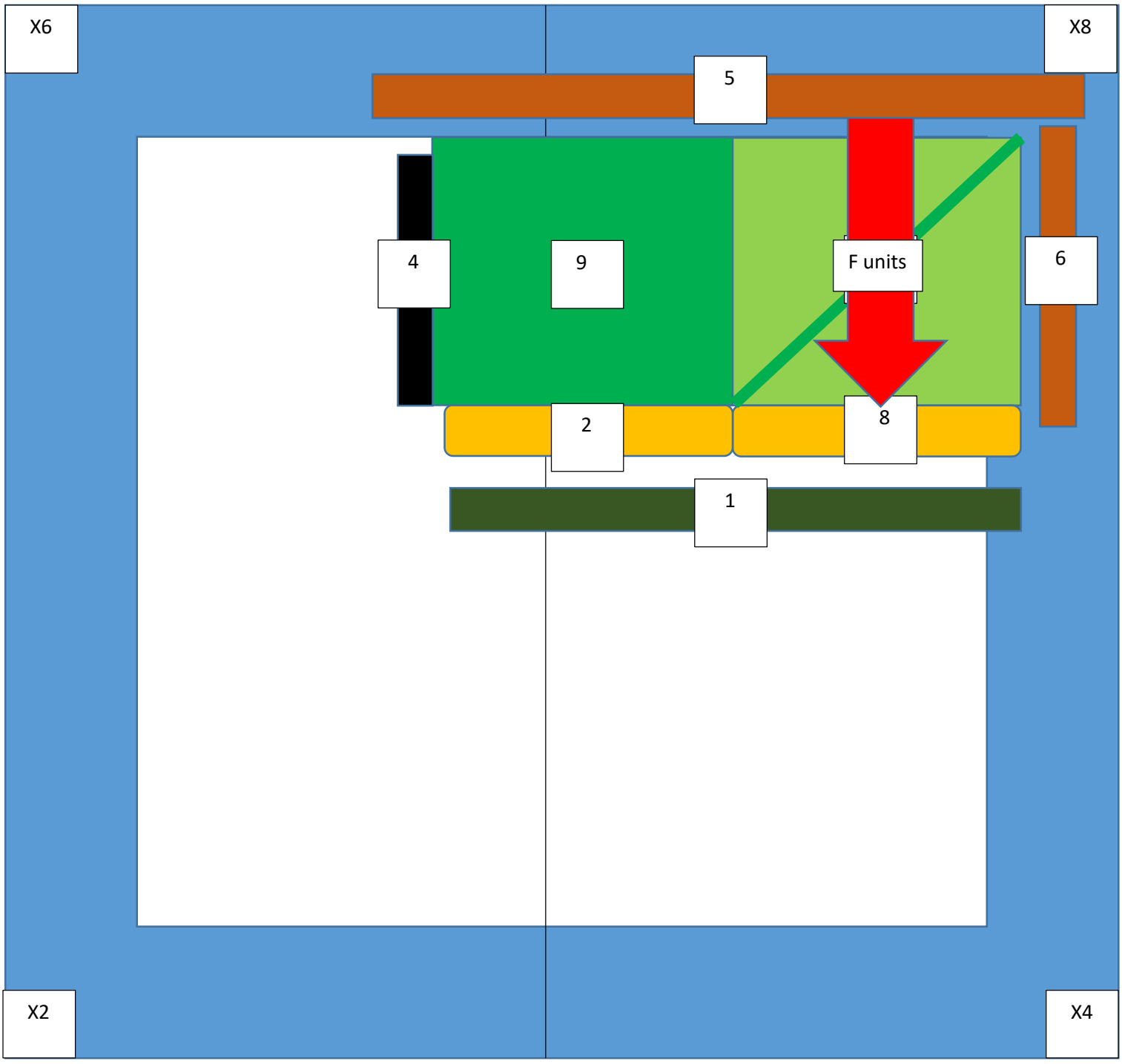
The convex lens stack number 4 and the small video display number 4 are positioned in a perpendicular positional configuration with each other. The distance the projection which will originate from the small video display number 4, will take to reach the convex lens stack number 4, will be equivalent to F1 units. And the distance of F1 units will be lesser than the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 4.

The diagrammatic descriptions of the positional configuration of the convex lens stack number 3 and the large video display, the positional configuration of the convex lens stack number 4 and the large video display, the positional configuration of the projection viewing plane and the small video display number 4 and the positional configuration of the convex lens stack number 4 and the small video display number 4 will be provided below, in the context of the distances the projections originated will take to reach each described component.

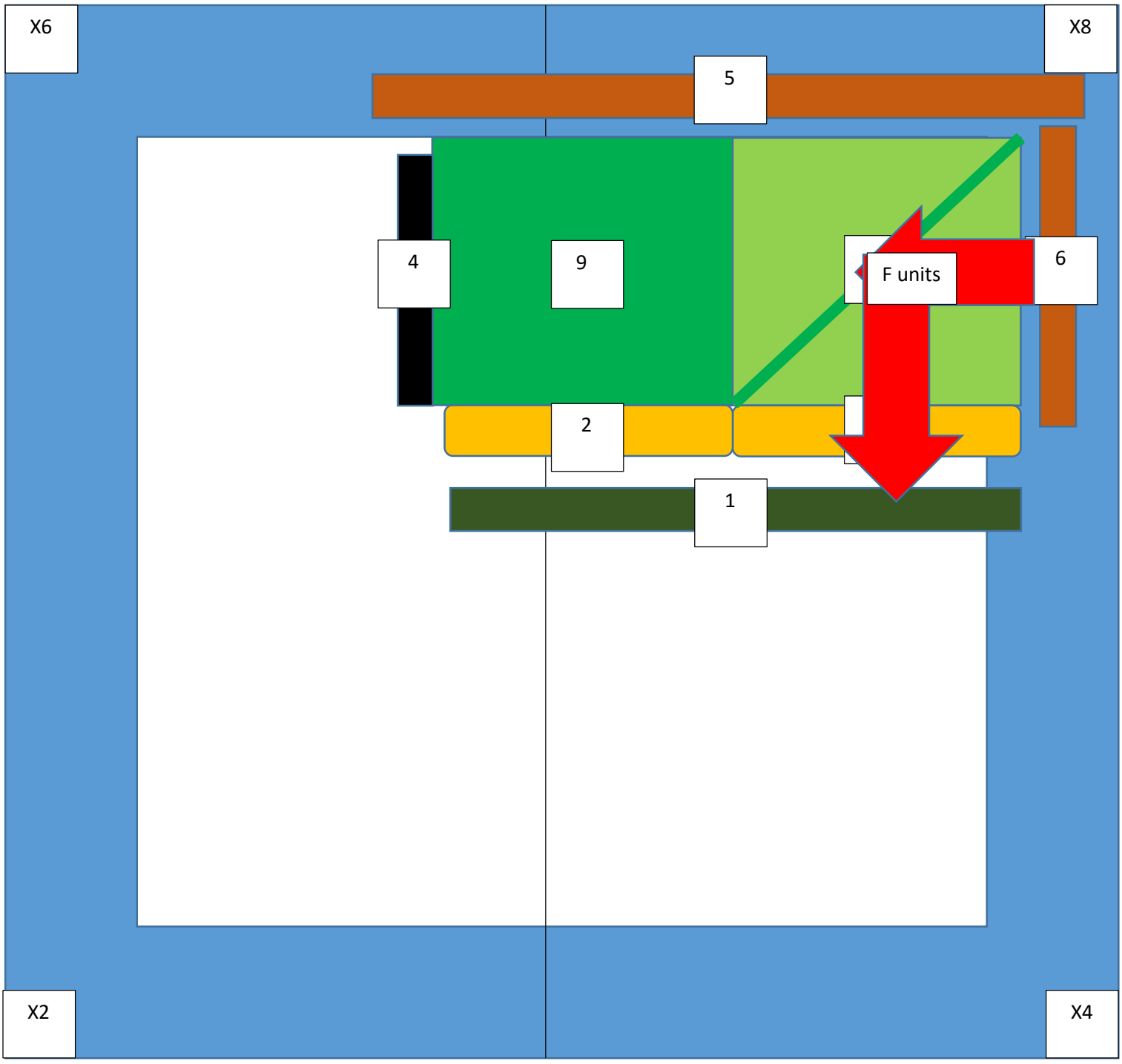
The diagrammatic description of the right side view of the front projection unit where the beam splitters are not occluded will be provided below, for the positional configuration of the convex lens stack number 3 and the large video display



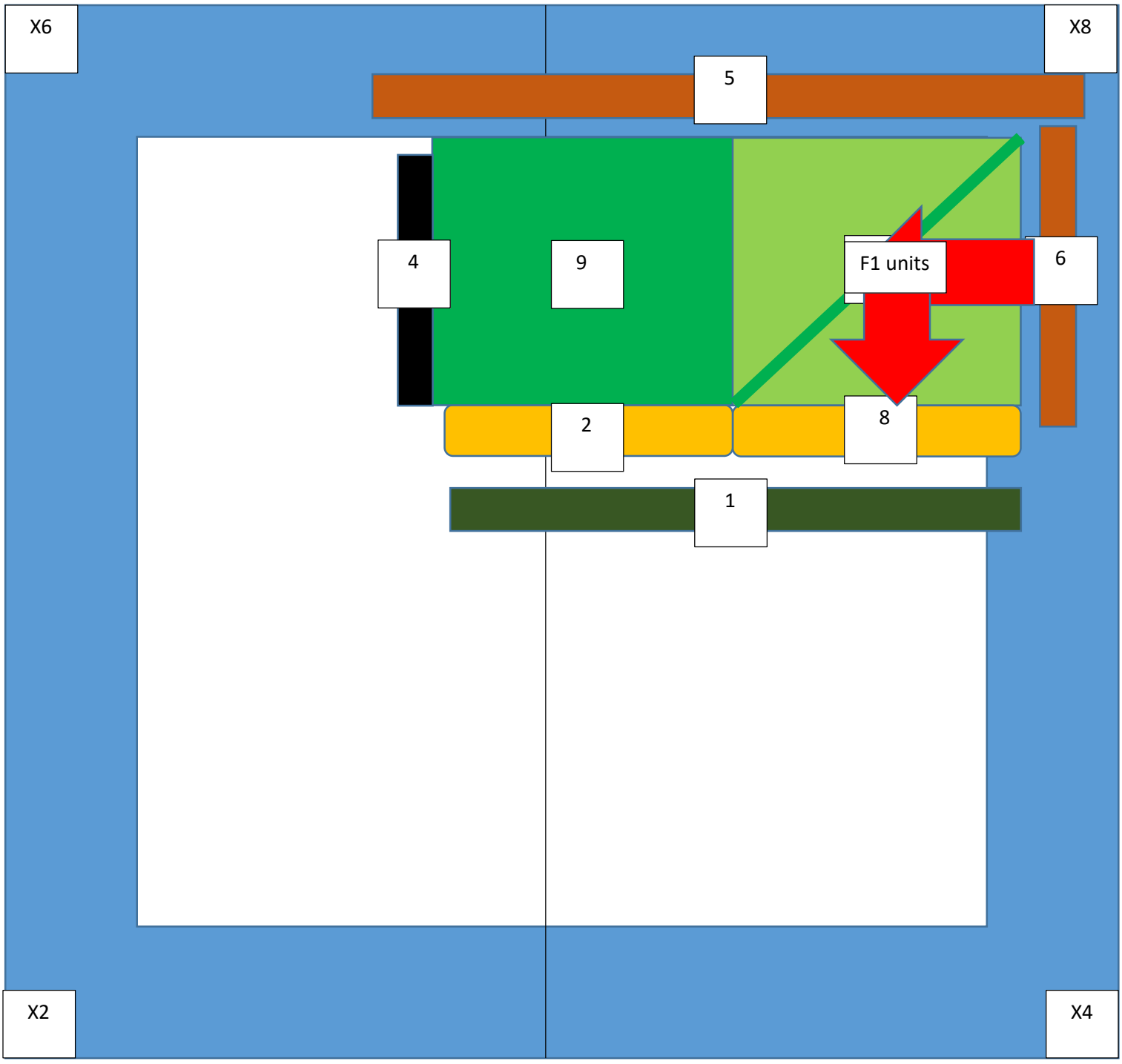
The diagrammatic description of the right side view of the front projection unit where the beam splitters are not occluded will be provided below, for the positional configuration of the convex lens stack number 4 and the large video display



The diagrammatic description of the top view of the front projection unit where the beam splitters are not occluded will be provided below, for the positional configuration of the projection viewing plane and the small video display number 4.



The diagrammatic description of the top view of the front projection unit where the beam splitters are not occluded will be provided below, for the positional configuration of the convex lens stack number 4 and the small video display number 4.



The image formation capabilities of the above 3 diagrammatic descriptions which involves the convex lens stacks will be provided below.

The image formation capabilities of the positional configuration of the convex lens stack number 3 and the large video display:

As mentioned before, the large video display will be positioned at a distance of F units away from the convex lens stack number 3, in front of the convex lens stack number 3. And the distance of F units will be equivalent to the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 3. Therefore, the images of the projections projected from the large video display, will be formed at infinity.

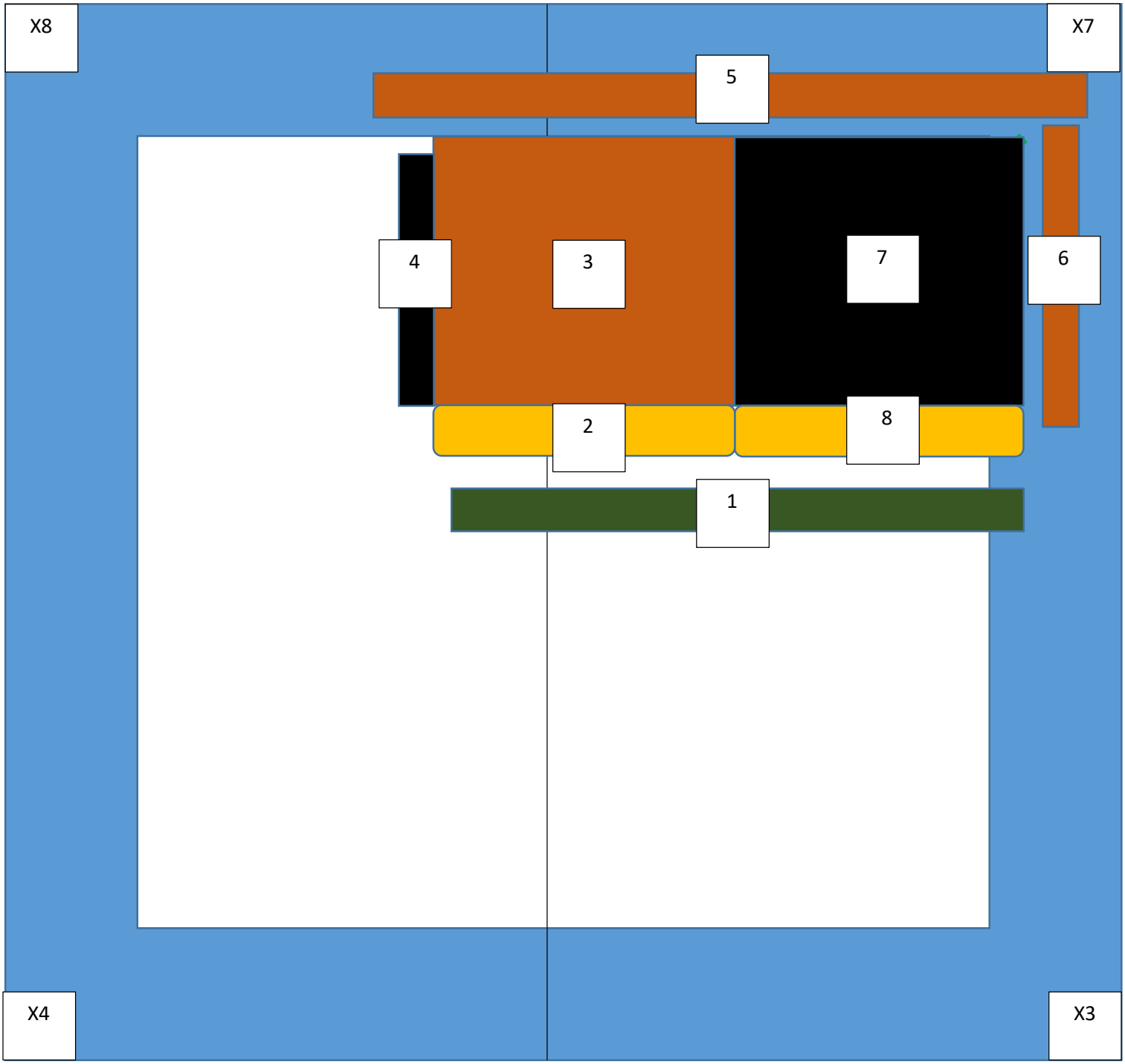
The image formation capabilities of the positional configuration of the convex lens stack number 4 and the large video display:

As mentioned before, the large video display will be positioned at a distance of F units away from the convex lens stack number 4, in front of the convex lens stack number 4. And the distance of F units will be equivalent to the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 4. Therefore, the images of the projections projected from the large video display, will be formed at infinity.

The image formation capabilities of the positional configuration of the convex lens stack number 4 and the small video display number 4.

As mentioned before, the convex lens stack number 4 and the small video display number 4 are positioned in a perpendicular positional configuration with each other. The distance the projection which will originate from the small video display number 4, will take to reach the convex lens stack number 4, will be equivalent to F1 units. And the distance of F1 units will be lesser than the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 4. Therefore, the images of the projections projected from the small video display number 4, will be virtual and will be formed in front of the convex lens stack number 4.

The diagrammatic description of the bottom view of the front projection unit will be provided below.



- The description of the labelled parts

The part labelled as number 1:

The projection viewing plane

The part labelled as number 2:

The convex lens stack number 4

The part labelled as number 3:

The small video display number 4

The part labelled as number 4:

The light blocking part number 1

The part labelled as number 5:

The large video display

The part labelled as number 6:

The small video display number 1

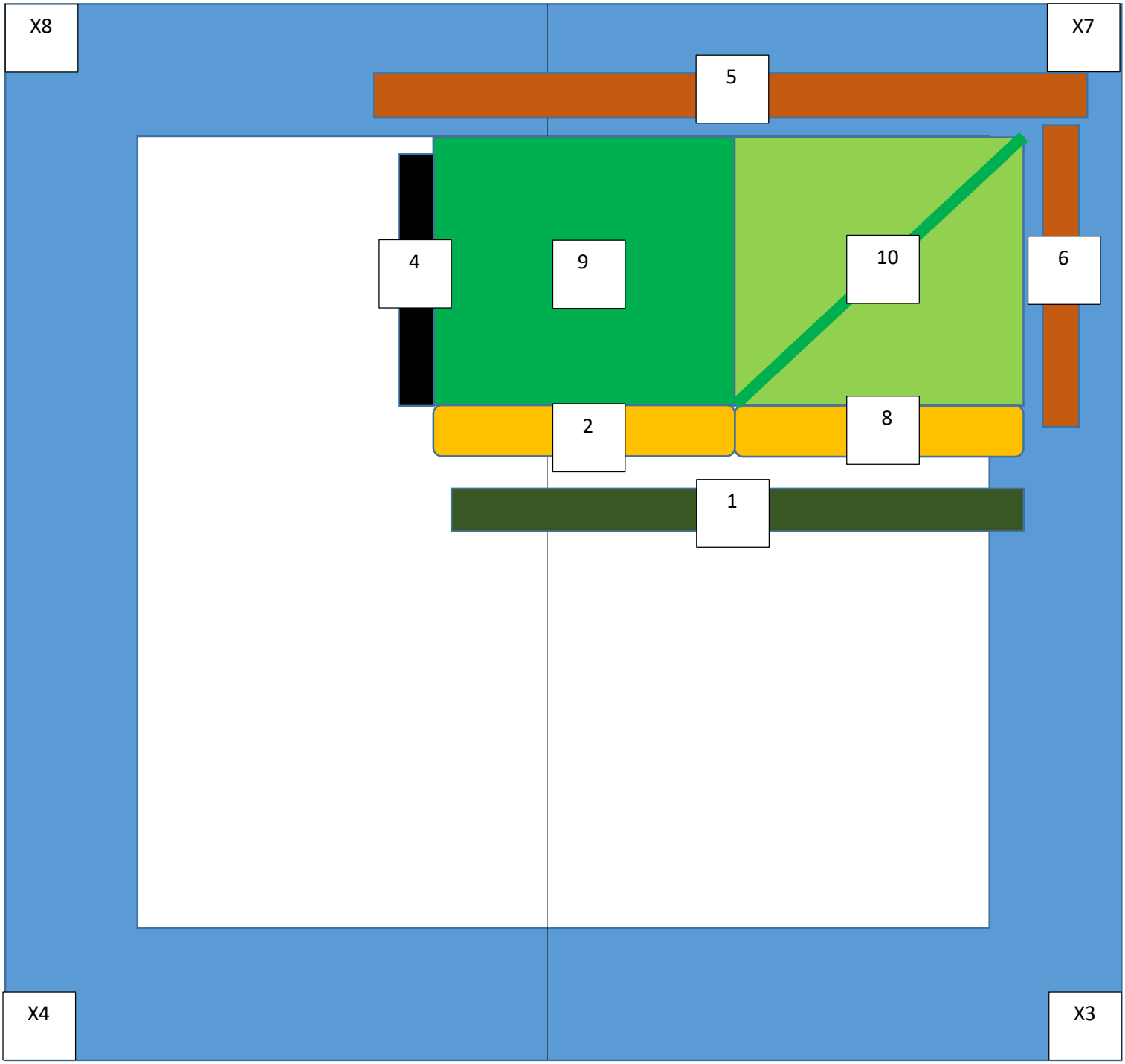
The part labelled as number 7:

The light blocking part number 2

The part labelled as number 8:

The convex lens stack number 1

The diagrammatic description of the bottom view of the front projection unit where the beam splitters are not occluded will be provided below.



- The description of the labelled parts

The part labelled as number 9:

The beam splitter number 4

The part labelled as number 10:

The beam splitter number 1

The positional configuration of the convex lens stack number 4 and the large video display:

The large video display will be positioned at a distance of F units away from the convex lens stack number 4, in front of the convex lens stack number 4. And the distance of F units will be equivalent to the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 4.

The positional configuration of the convex lens stack number 1 and the large video display:

The large video display will be positioned at a distance of F units away from the convex lens stack number 1, in front of the convex lens stack number 1. And the distance of F units will be equivalent to the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 1.

The positional configuration of the projection viewing plane and the small video display number 1:

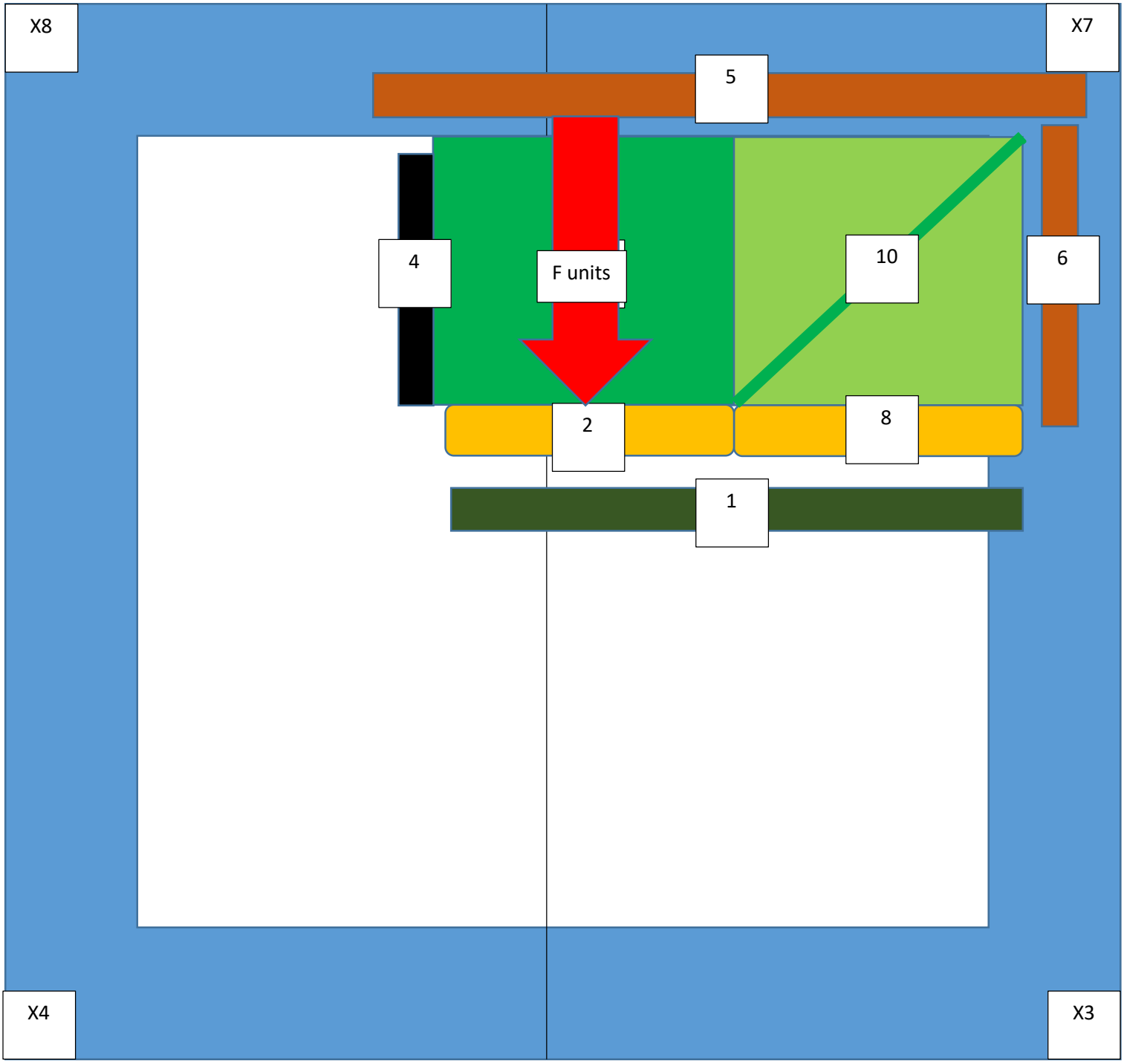
The projection viewing plane and the small video display number 1 are positioned in a perpendicular positional configuration with each other. The distance the projection which will originate from the small video display number 1, will take to reach the projection viewing plane will be equivalent to F units. And the distance of F units will be equivalent to the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 1.

The positional configuration of the convex lens stack number 1 and the small video display number 1:

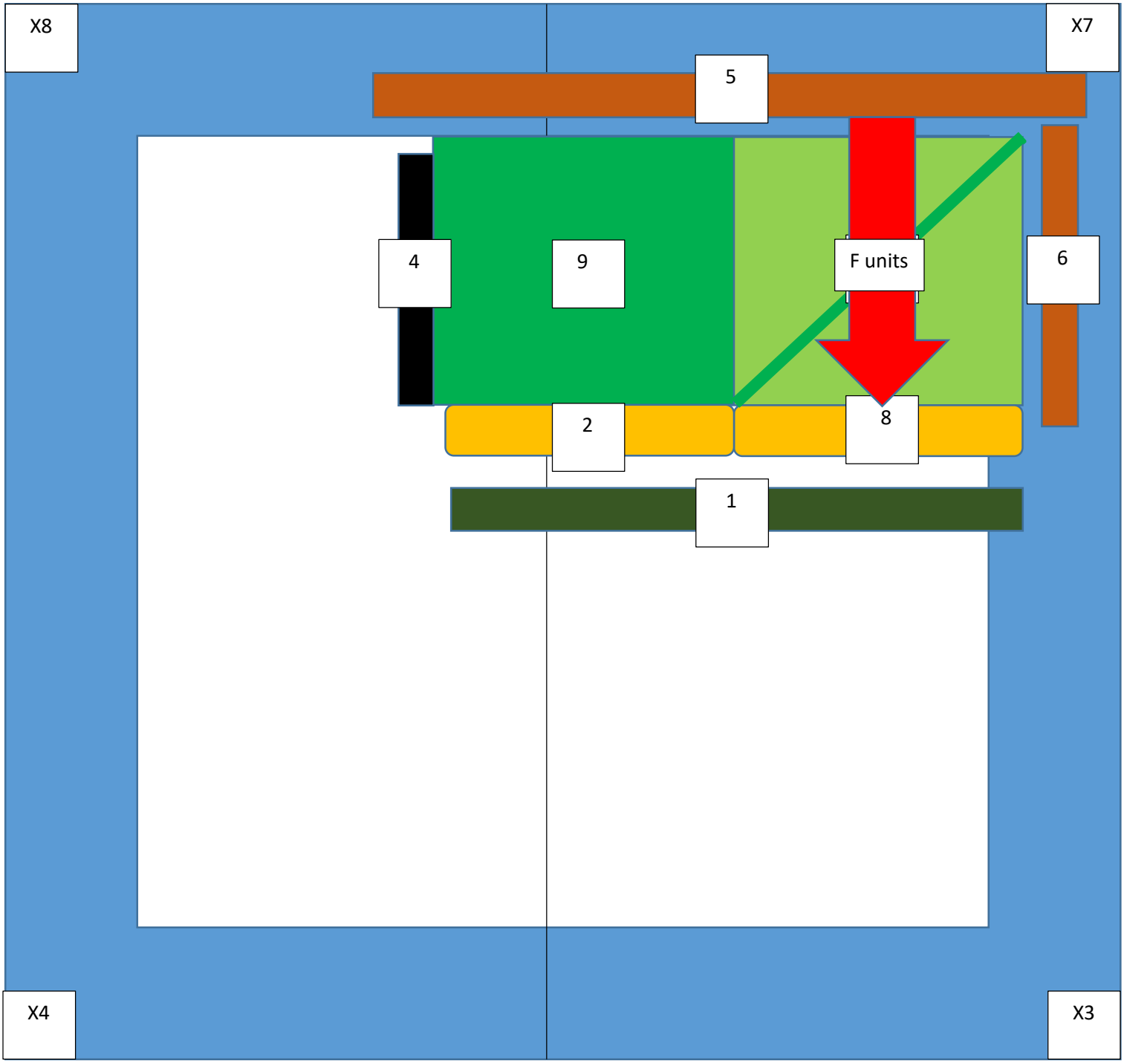
The convex lens stack number 1 and the small video display number 1 are positioned in a perpendicular positional configuration with each other. The distance the projection which will originate from the small video display number 1, will take to reach the convex lens stack number 1, will be equivalent to F1 units. And the distance of F1 units will be lesser than the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 1.

The diagrammatic descriptions of the positional configuration of the convex lens stack number 4 and the large video display, the positional configuration of the convex lens stack number 1 and the large video display, the positional configuration of the projection viewing plane and the small video display number 1 and the positional configuration of the convex lens stack number 1 and the small video display number 1 will be provided below, in the context of the distances the projections originated will take to reach each described component.

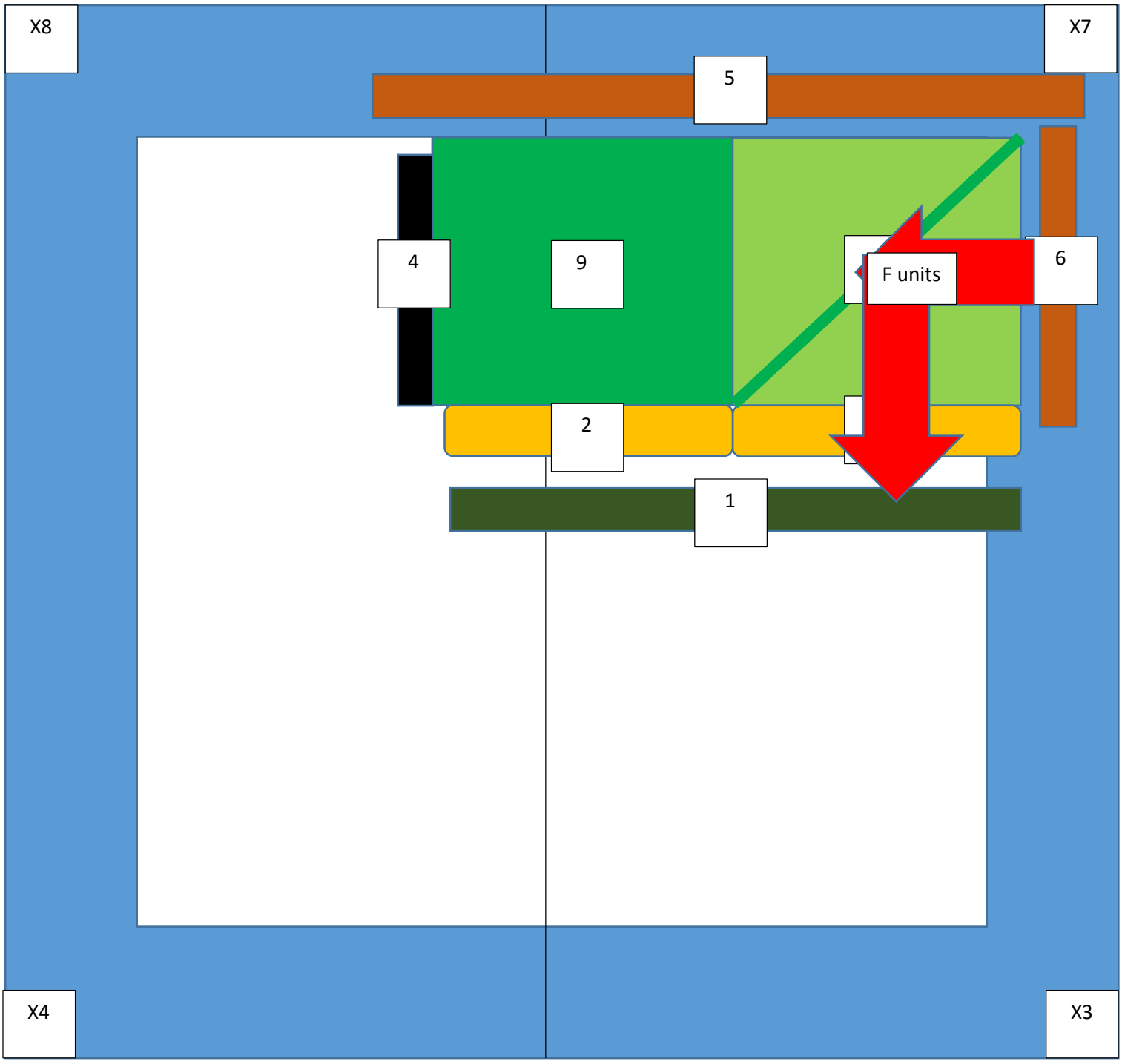
The diagrammatic description of the bottom view of the front projection unit where the beam splitters are not occluded will be provided below, for the positional configuration of the convex lens stack number 4 and the large video display



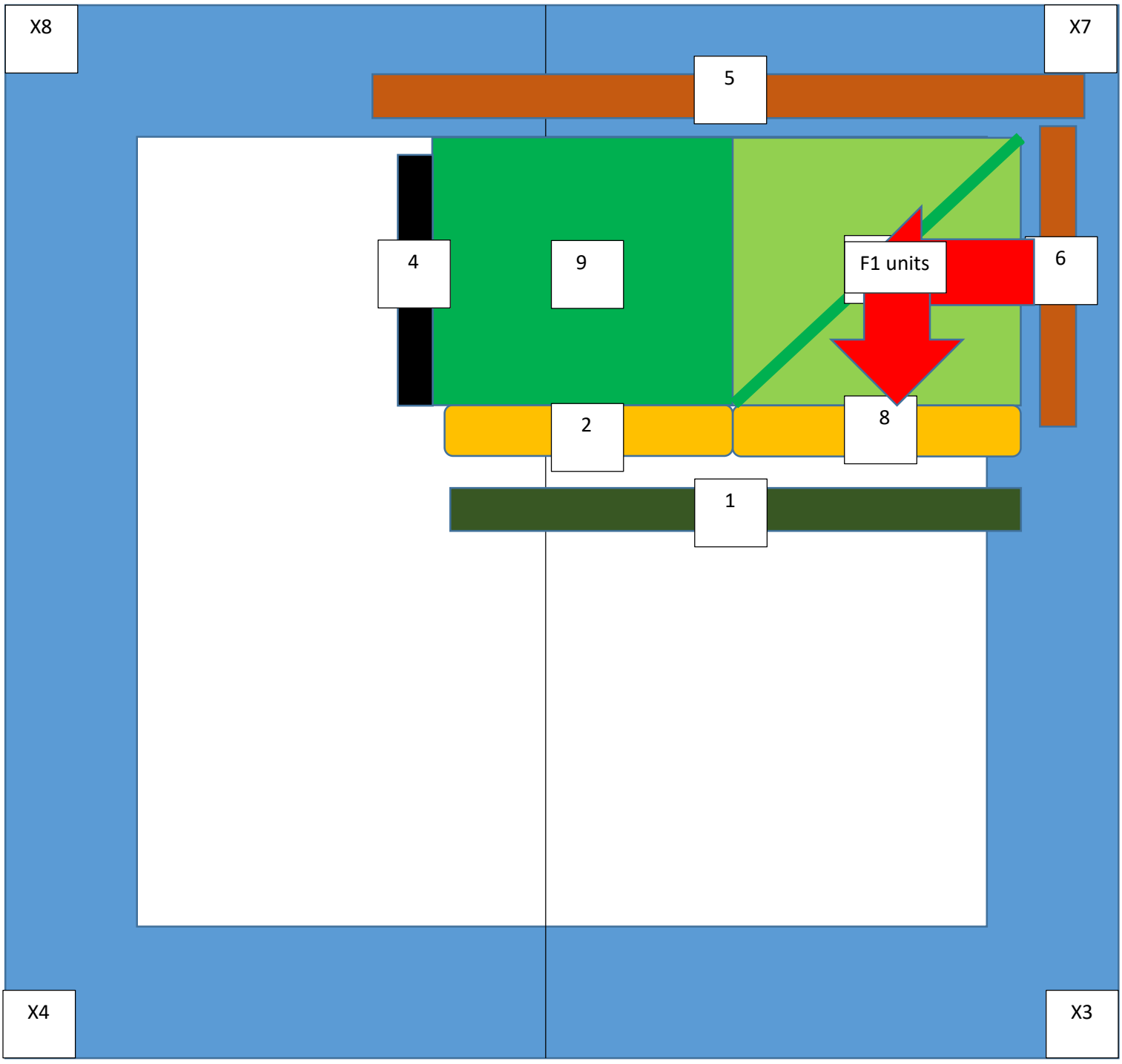
The diagrammatic description of the bottom view of the front projection unit where the beam splitters are not occluded will be provided below, for the positional configuration of the convex lens stack number 1 and the large video display



The diagrammatic description of the bottom view of the front projection unit where the beam splitters are not occluded will be provided below, for the positional configuration of the projection viewing plane and the small video display number 1.



The diagrammatic description of the bottom view of the front projection unit where the beam splitters are not occluded will be provided below, for the positional configuration of the convex lens stack number 1 and the small video display number 1.



The image formation capabilities of the above 3 diagrammatic descriptions which involves the convex lens stacks will be provided below.

The image formation capabilities of the positional configuration of the convex lens stack number 4 and the large video display:

As mentioned before, the large video display will be positioned at a distance of F units away from the convex lens stack number 4, in front of the convex lens stack number 4. And the distance of F units will be equivalent to the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 4. Therefore, the images of the projections projected from the large video display, will be formed at infinity.

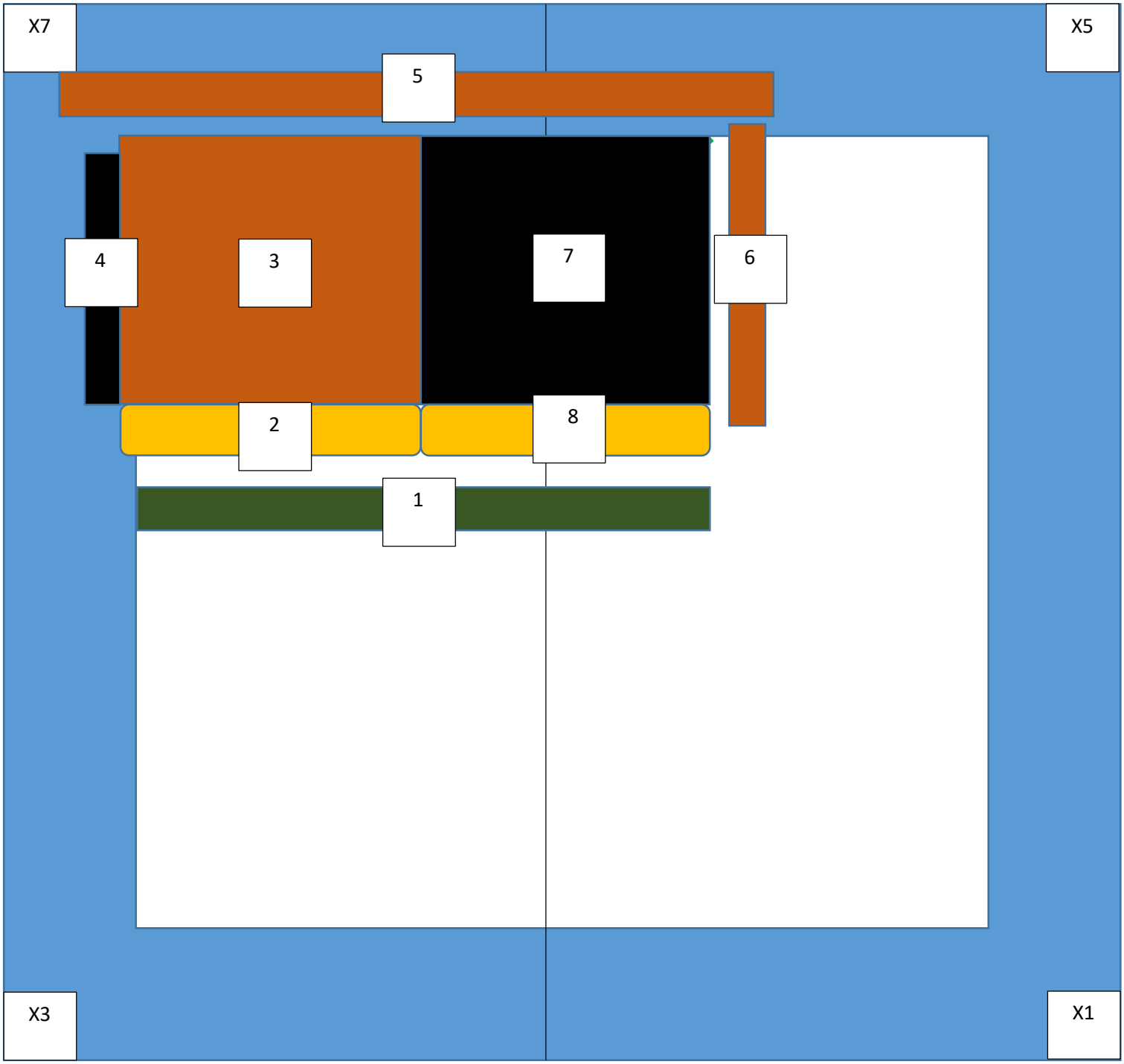
The image formation capabilities of the positional configuration of the convex lens stack number 1 and the large video display:

As mentioned before, the large video display will be positioned at a distance of F units away from the convex lens stack number 1, in front of the convex lens stack number 1. And the distance of F units will be equivalent to the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 1. Therefore, the images of the projections projected from the large video display, will be formed at infinity.

The image formation capabilities of the positional configuration of the convex lens stack number 1 and the small video display number 1.

As mentioned before, the convex lens stack number 1 and the small video display number 1 are positioned in a perpendicular positional configuration with each other. The distance the projection which will originate from the small video display number 1, will take to reach the convex lens stack number 1, will be equivalent to F1 units. And the distance of F1 units will be lesser than the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 1. Therefore, the images of the projections projected from the small video display number 1, will be virtual and will be formed in front of the convex lens stack number 1.

The diagrammatic description of the left view of the front projection unit will be provided below.



- The description of the labelled parts

The part labelled as number 1:

The projection viewing plane

The part labelled as number 2:

The convex lens stack number 1

The part labelled as number 3:

The small video display number 1

The part labelled as number 4:

The light blocking part number 2

The part labelled as number 5:

The large video display

The part labelled as number 6:

The small video display number 2

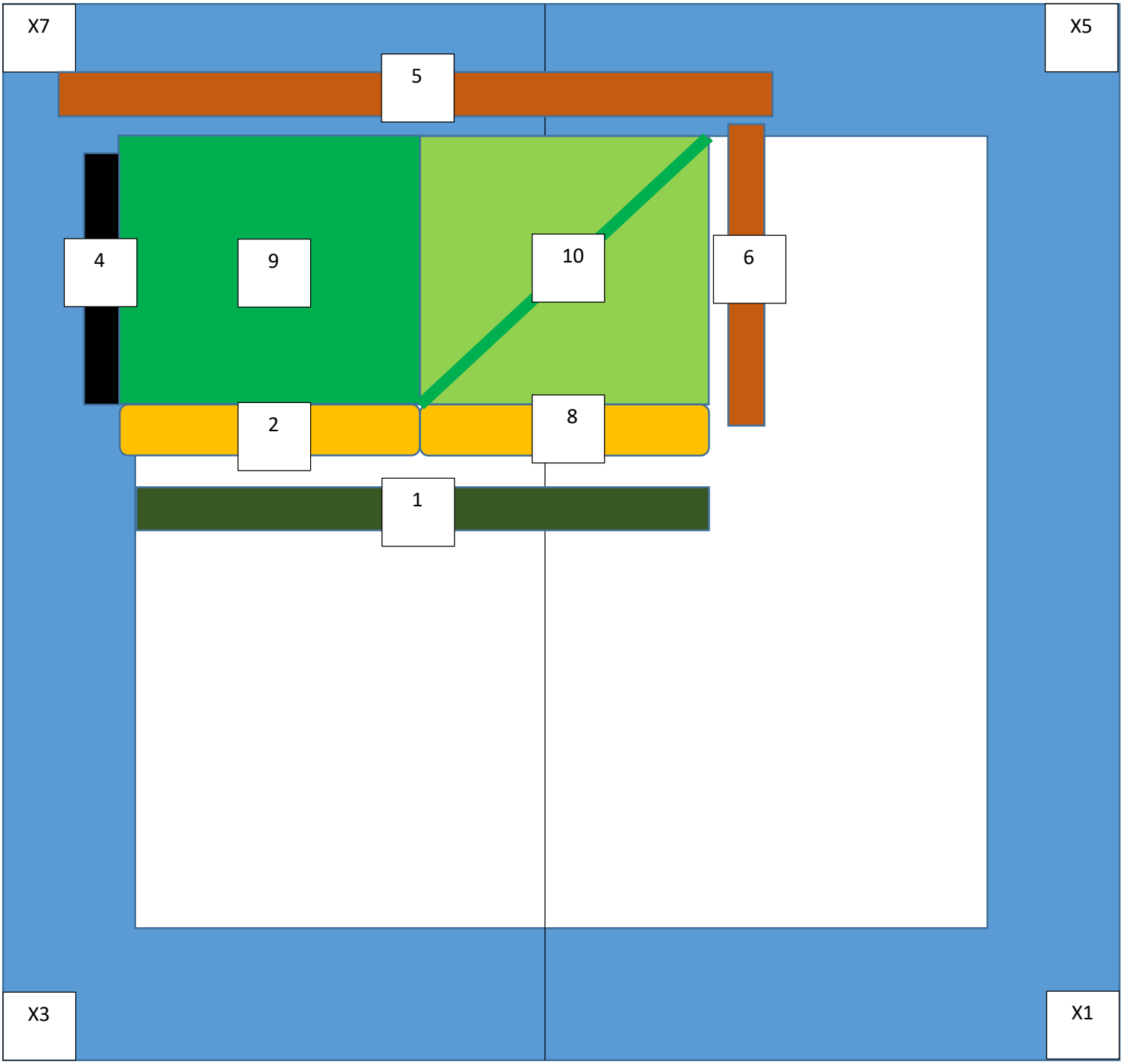
The part labelled as number 7:

The light blocking part number 3

The part labelled as number 8:

The convex lens stack number 2

The diagrammatic description of the left view of the front projection unit where the beam splitters are not occluded will be provided below.



- The description of the labelled parts

The part labelled as number 9:

The beam splitter number 1

The part labelled as number 10:

The beam splitter number 2

The positional configuration of the convex lens stack number 1 and the large video display:

The large video display will be positioned at a distance of F units away from the convex lens stack number 1, in front of the convex lens stack number 1. And the distance of F units will be equivalent to the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 1.

The positional configuration of the convex lens stack number 2 and the large video display:

The large video display will be positioned at a distance of F units away from the convex lens stack number 2, in front of the convex lens stack number 2. And the distance of F units will be equivalent to the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 2.

The positional configuration of the projection viewing plane and the small video display number 2:

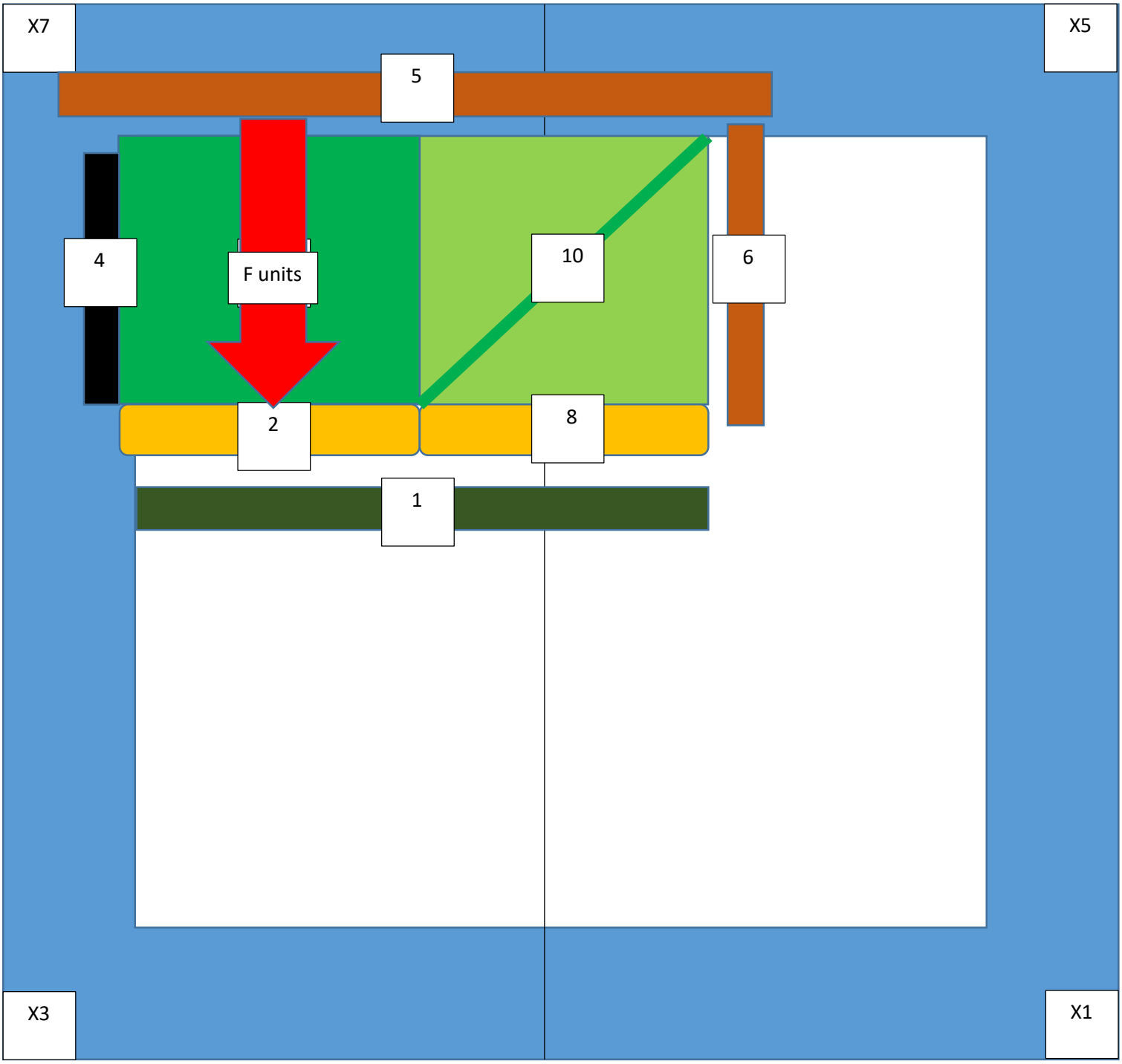
The projection viewing plane and the small video display number 2 are positioned in a perpendicular positional configuration with each other. The distance the projection which will originate from the small video display number 2, will take to reach the projection viewing plane will be equivalent to F units. And the distance of F units will be equivalent to the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 2.

The positional configuration of the convex lens stack number 2 and the small video display number 2:

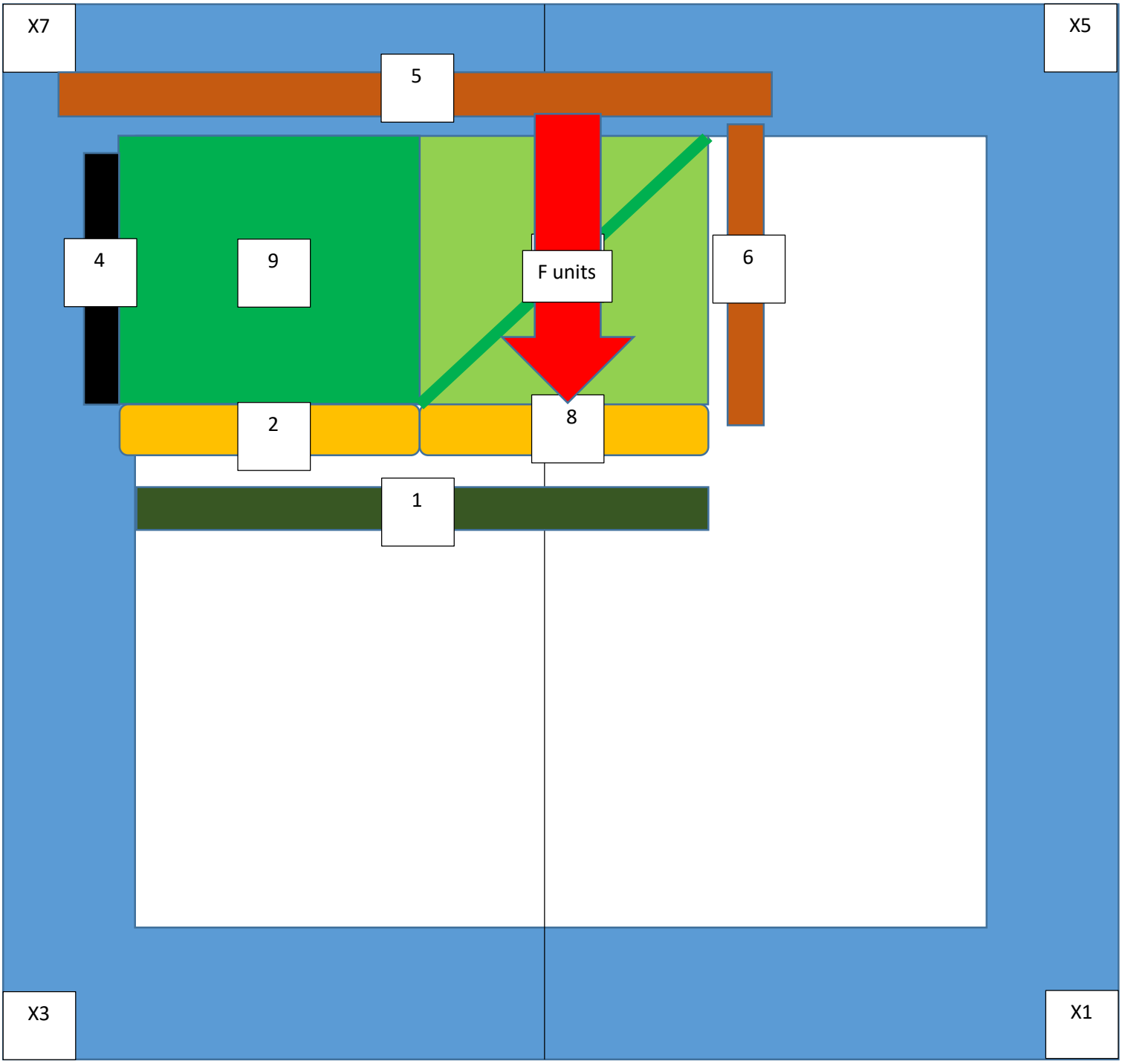
The convex lens stack number 2 and the small video display number 2 are positioned in a perpendicular positional configuration with each other. The distance the projection which will originate from the small video display number 2, will take to reach the convex lens stack number 2, will be equivalent to F1 units. And the distance of F1 units will be lesser than the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 2.

The diagrammatic descriptions of the positional configuration of the convex lens stack number 1 and the large video display, the positional configuration of the convex lens stack number 2 and the large video display, the positional configuration of the projection viewing plane and the small video display number 2 and the positional configuration of the convex lens stack number 2 and the small video display number 2 will be provided below, in the context of the distances the projections originated will take to reach each described component.

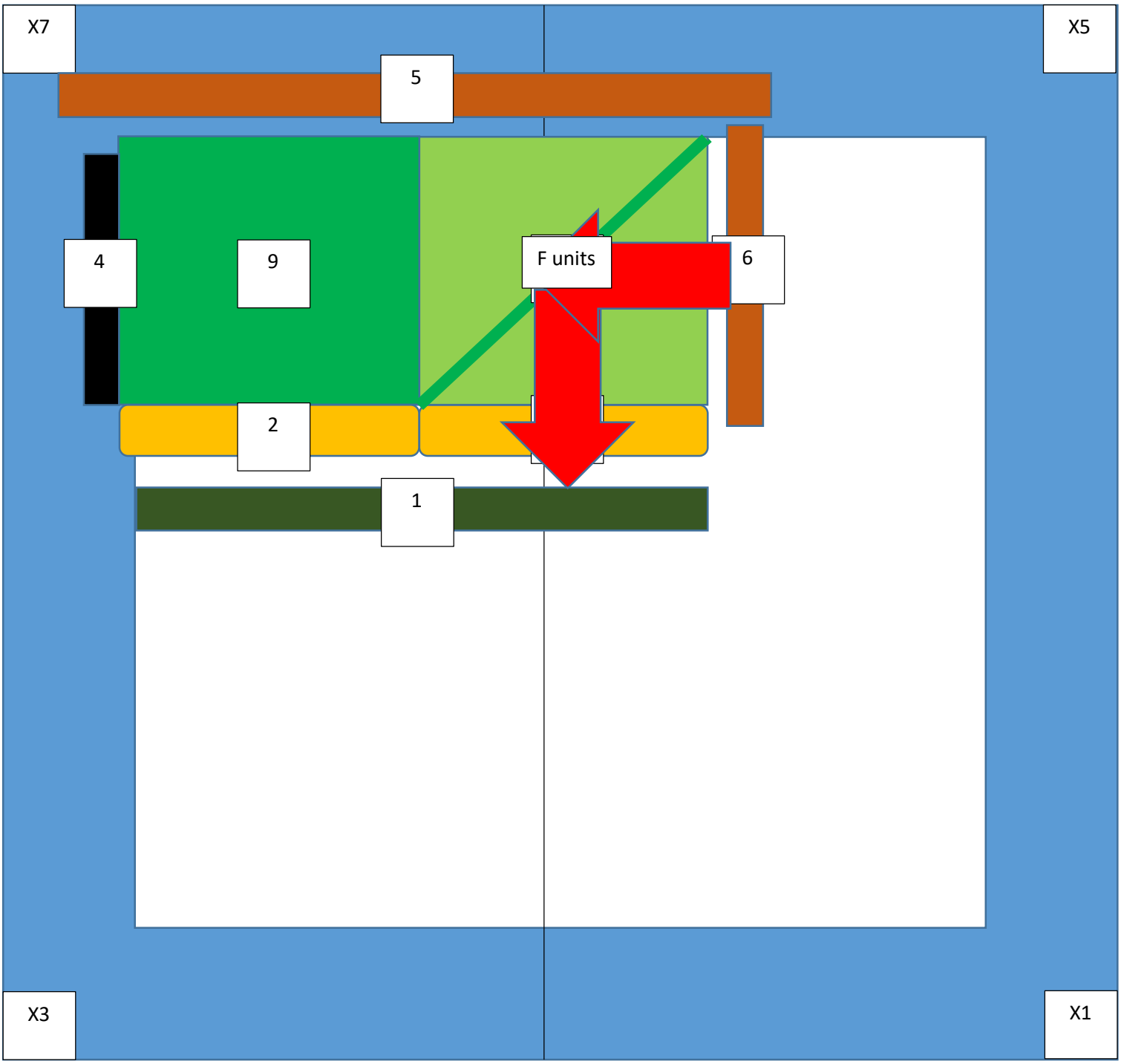
The diagrammatic description of the left view of the front projection unit where the beam splitters are not occluded will be provided below, for the positional configuration of the convex lens stack number 1 and the large video display.



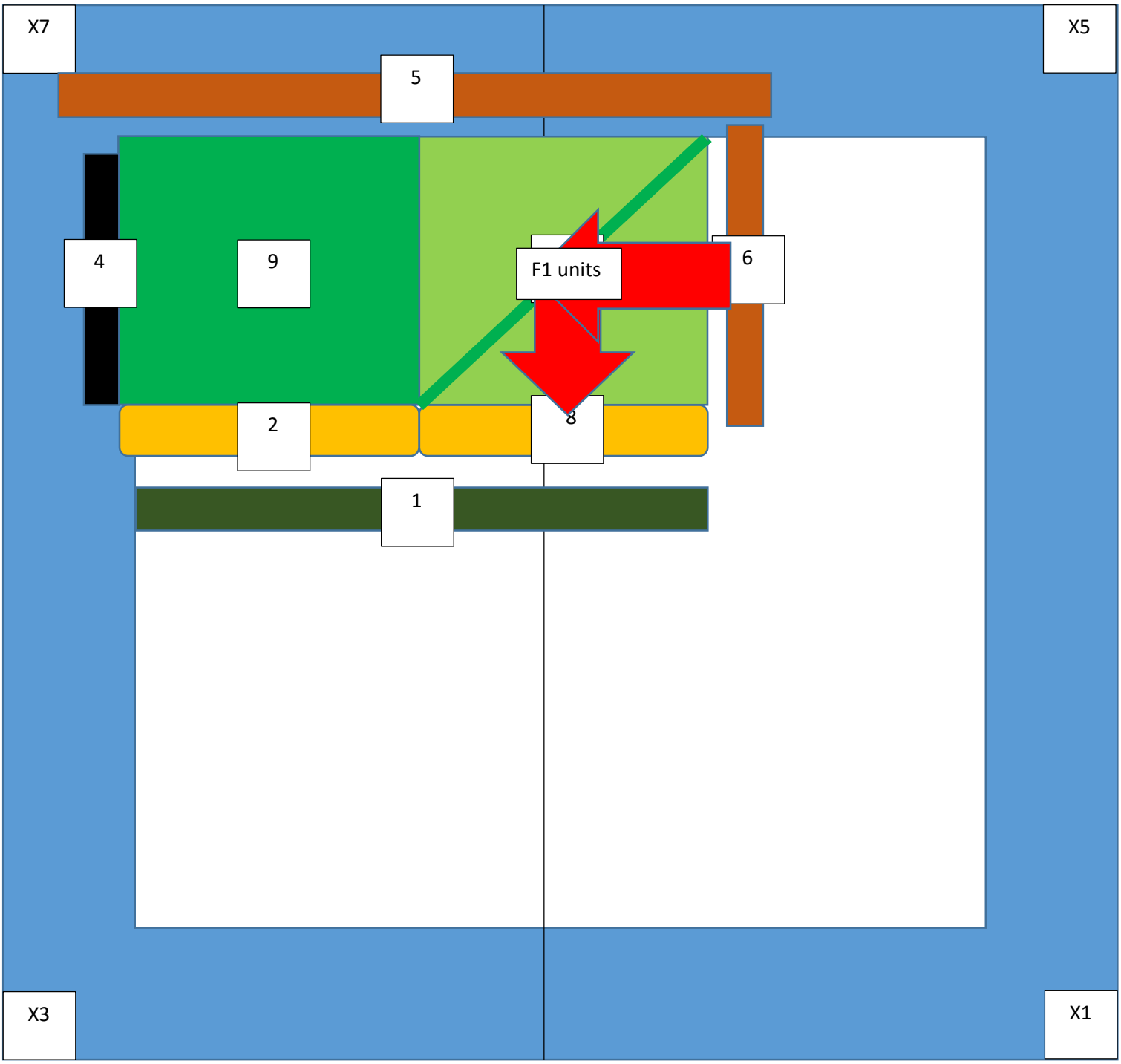
The diagrammatic description of the left view of the front projection unit where the beam splitters are not occluded will be provided below, for the positional configuration of the convex lens stack number 2 and the large video display.



The diagrammatic description of the left view of the front projection unit where the beam splitters are not occluded will be provided below, for the positional configuration of the projection viewing plane and the small video display number 2.



The diagrammatic description of the left view of the front projection unit where the beam splitters are not occluded will be provided below, for the positional configuration of the convex lens stack number 2 and the small video display number 2.



The image formation capabilities of the above 3 diagrammatic descriptions which involves the convex lens stacks will be provided below.

The image formation capabilities of the positional configuration of the convex lens stack number 1 and the large video display:

As mentioned before, the large video display will be positioned at a distance of F units away from the convex lens stack number 1, in front of the convex lens stack number 1. And the distance of F units will be equivalent to the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 1. Therefore, the images of the projections projected from the large video display, will be formed at infinity.

The image formation capabilities of the positional configuration of the convex lens stack number 2 and the large video display:

As mentioned before, the large video display will be positioned at a distance of F units away from the convex lens stack number 2, in front of the convex lens stack number 2. And the distance of F units will be equivalent to the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 2. Therefore, the images of the projections projected from the large video display, will be formed at infinity.

The image formation capabilities of the positional configuration of the convex lens stack number 2 and the small video display number 2.

As mentioned before, the convex lens stack number 2 and the small video display number 2 are positioned in a perpendicular positional configuration with each other. The distance the projection which will originate from the small video display number 2, will take to reach the convex lens stack number 2, will be equivalent to F1 units. And the distance of F1 units will be lesser than the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 2. Therefore, the images of the projections projected from the small video display number 2, will be virtual and will be formed in front of the convex lens stack number 2.

The components included in the side projection unit will be provided below.

Component number 1:

The convex lens stack number 1.

The convex lens stack number 1, consists of 2 square shaped convex lenses which are arranged in the stack configuration. The 2 square shaped convex lenses are of identical size. Each side of each square sized lens will be equivalents to A1 units. And the combined effective focal length of the 2 convex lenses arranged in the stack configuration will be equivalent to F units.

Component number 2:

The convex lens stack number 2.

The convex lens stack number 2, consists of 2 square shaped convex lenses which are arranged in the stack configuration. The 2 square shaped convex lenses are of identical size. Each side of each square sized lens will be equivalents to A1 units. And the combined effective focal length of the 2 convex lenses arranged in the stack configuration will be equivalent to F units.

Component number 3:

The convex lens stack number 3.

The convex lens stack number 3, consists of 2 square shaped convex lenses which are arranged in the stack configuration. The 2 square shaped convex lenses are of identical size. Each side of each square sized lens will be equivalents to A1 units. And the combined effective focal length of the 2 convex lenses arranged in the stack configuration will be equivalent to F units.

Component number 4:

The convex lens stack number 4.

The convex lens stack number 4, consists of 2 square shaped convex lenses which are arranged in the stack configuration. The 2 square shaped convex lenses are of identical size. Each side of each square sized lens will be equivalent to A1 units. And the combined effective focal length of the 2 convex lenses arranged in the stack configuration will be equivalent to F units.

Component number 5:

The small video display number 1.

The small video display number 1, is a square shaped video display. Each side of the square shaped small video display will be equivalent to A2 units. And the small video display number 1 have a resolution of R.

Component number 6:

The small video display number 2.

The small video display number 2, is a square shaped video display. Each side of the square shaped small video display will be equivalent to A2 units. And the small video display number 2 have a resolution of R.

Component number 7:

The small video display number 3.

The small video display number 3, is a square shaped video display. Each side of the square shaped small video display will be equivalent to A2 units. And the small video display number 3 have a resolution of R.

Component number 8:

The small video display number 4.

The small video display number 4, is a square shaped video display. Each side of the square shaped small video display will be equivalent to A2 units. And the small video display number 4 have a resolution of R.

Component number 9:

The beam splitter number 1.

The beam splitter number 1, is a 50:50 ratio beam splitter.

Component number 10:

The beam splitter number 2.

The beam splitter number 2, is a 50:50 ratio beam splitter.

Component number 11:

The beam splitter number 3.

The beam splitter number 3, is a 50:50 ratio beam splitter.

Component number 12:

The beam splitter number 4.

The beam splitter number 4, is a 50:50 ratio beam splitter.

Component number 13:

The light blocking part number 1.

The light blocking part number 1, is a square shaped light blocking part. The side of this square shaped light blocking part will be equivalent to A3 units.

Component number 14:

The light blocking part number 2.

The light blocking part number 2, is a square shaped light blocking part. The side of this square shaped light blocking part will be equivalent to A3 units.

Component number 15:

The light blocking part number 3.

The light blocking part number 3, is a square shaped light blocking part. The side of this square shaped light blocking part will be equivalent to A3 units.

Component number 16:

The light blocking part number 4.

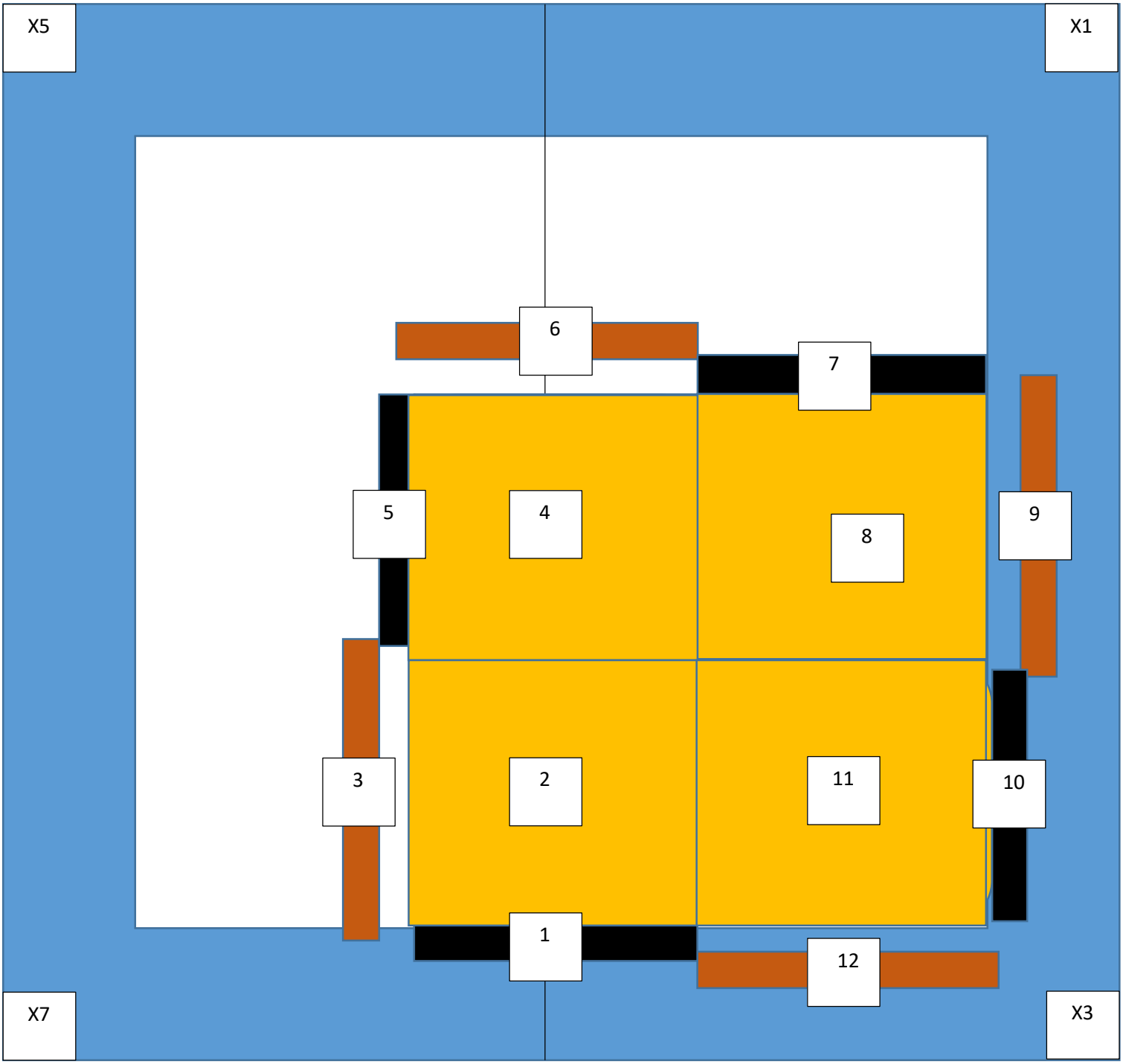
The light blocking part number 4, is a square shaped light blocking part. The side of this square shaped light blocking part will be equivalent to A3 units.

Component number 17:

The large video display.

The large video display, is a square shaped video display. Each side of the square shaped large video display will be equivalent to A4 units. And the large video display have a resolution of 4R.

The diagrammatic description of the **rear view** of the **side projection** unit will be provided below.



- The description of the labelled parts

The part labelled as number 1:

The light blocking part number 2

The part labelled as number 2:

The convex lens stack number 1

The part labelled as number 3:

The small video display number 1

The part labelled as number 4:

The convex lens stack number 2

The part labelled as number 5:

The light blocking part number 3

The part labelled as number 6:

The small video display number 2

The part labelled as number 7:

The light blocking part number 4

The part labelled as number 8:

The convex lens stack number 3

The part labelled as number 9:

The small video display number 3

The part labelled as number 10:

The light blocking part number 1

The part labelled as number 11:

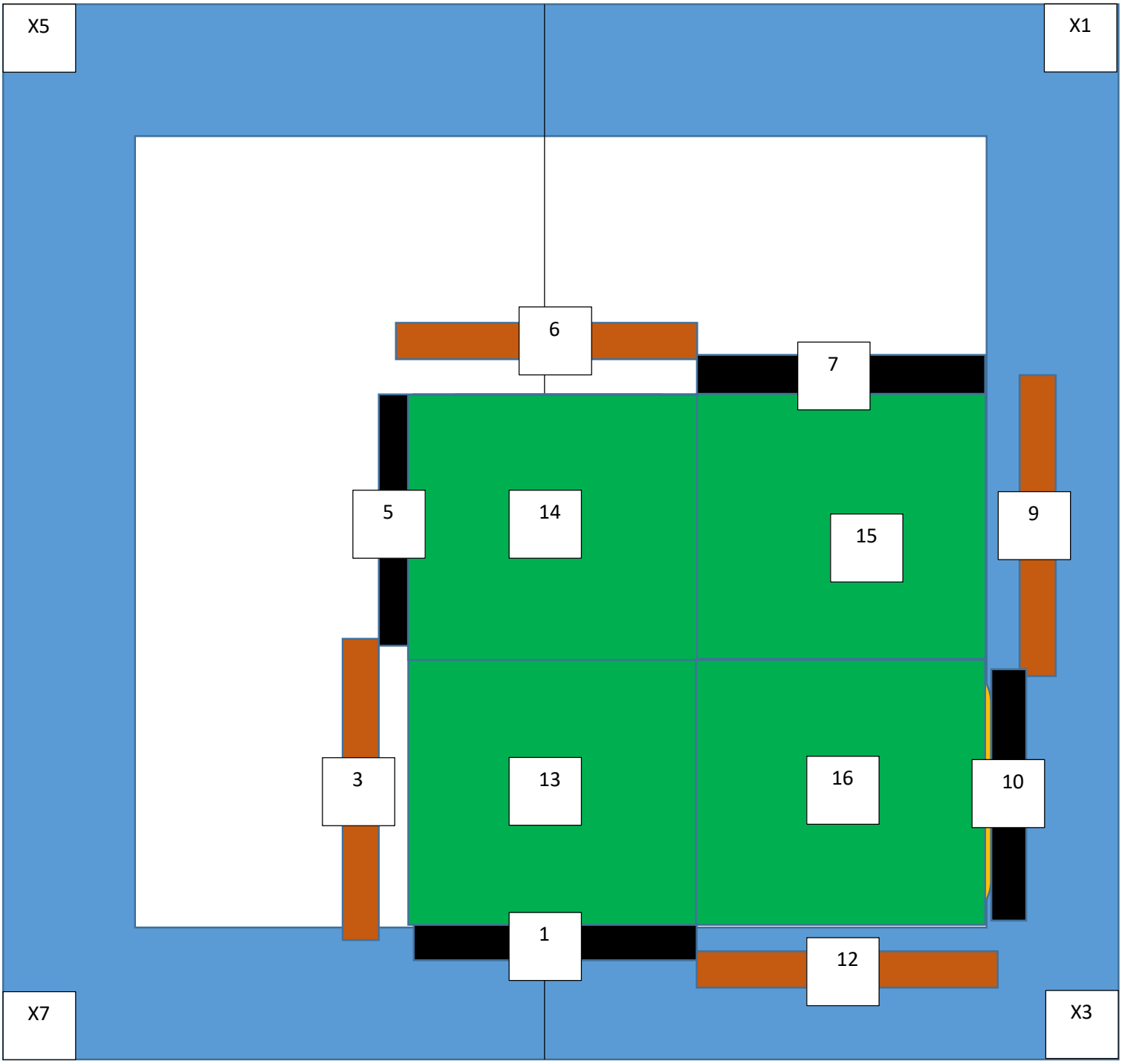
The convex lens stack number 4

The part labelled as number 12:

The small video display number 4

In the above diagram, the 4 convex lens stacks will occlude the 4 cyclically arranged beam splitters.

The diagrammatic description of the rear view of the side projection unit where the 4 convex lens stacks will not occlude the 4 cyclically arranged beam splitters will be provided below.



- The description of the labelled parts

The part labelled as number 13:

The beam splitter number 1.

The part labelled as number 14:

The beam splitter number 2.

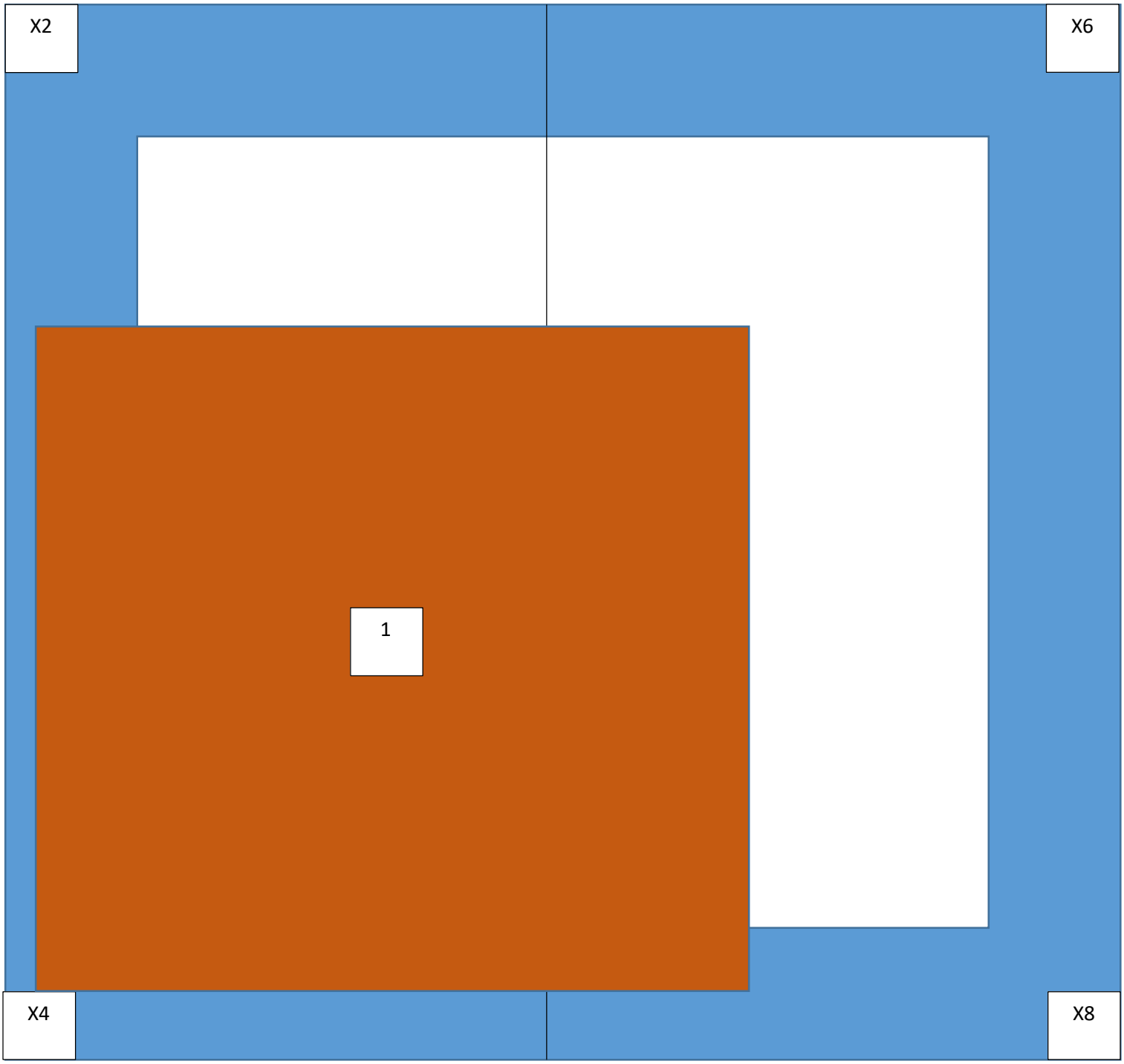
The part labelled as number 15:

The beam splitter number 3.

The part labelled as number 16:

The beam splitter number 4.

The diagrammatic description of the front view of the side projection unit will be provided below.

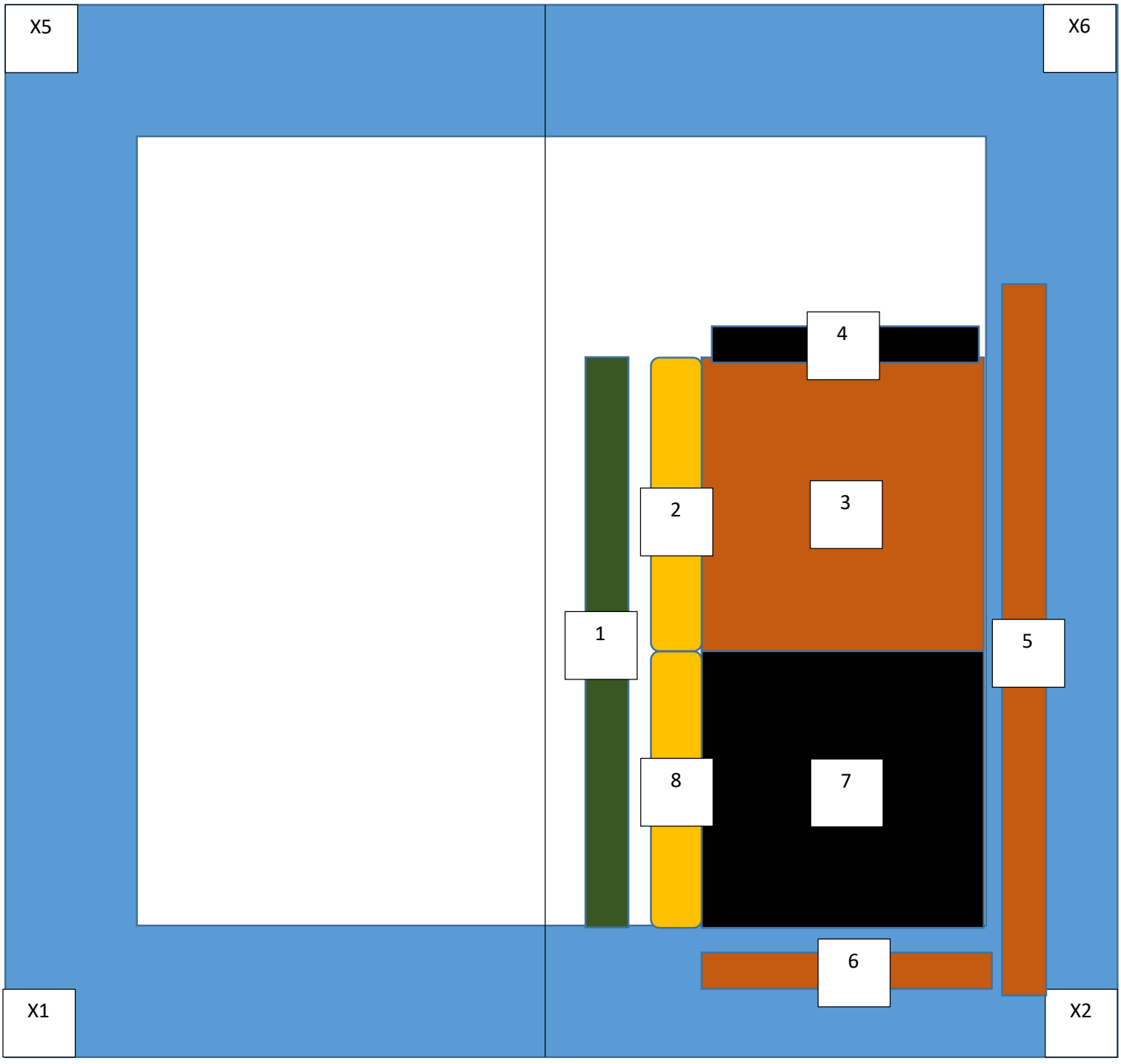


The description of the labelled parts

The part labelled as number 1:

The large video display

The diagrammatic description of the top view of the side projection unit will be provided below.



- The description of the labelled parts

The part labelled as number 1:

The projection viewing plane

The part labelled as number 2:

The convex lens stack number 2

The part labelled as number 3:

The small video display number 2

The part labelled as number 4:

The light blocking part number 3

The part labelled as number 5:

The large video display

The part labelled as number 6:

The small video display number 3

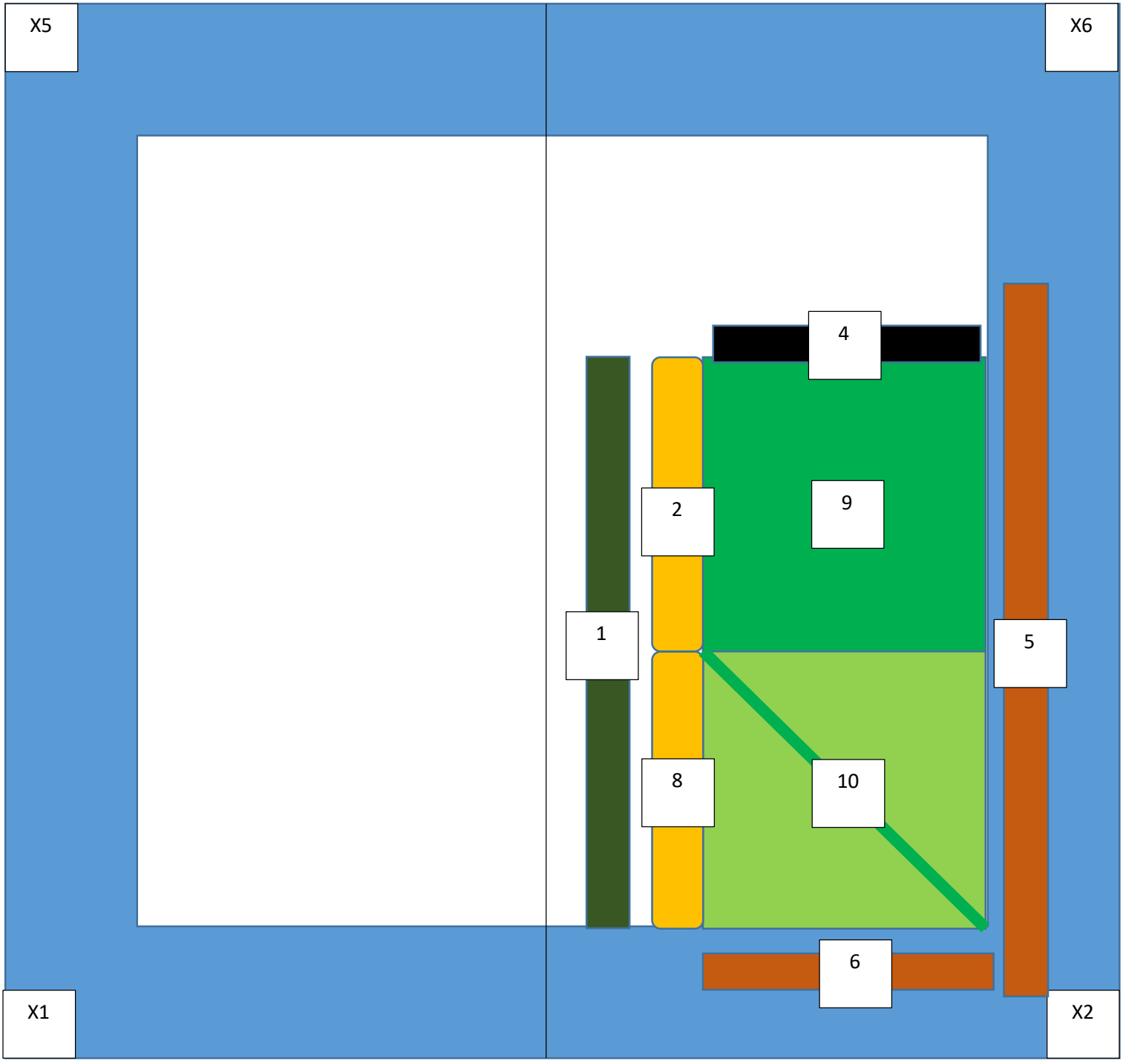
The part labelled as number 7:

The light blocking part number 4

The part labelled as number 8:

The convex lens stack number 3

The diagrammatic description of the top view of the side projection unit where the beam splitters are not occluded will be provided below.



- The description of the labelled parts

The part labelled as number 1:

The beam splitter number 2

The part labelled as number 2:

The beam splitter number 3

The positional configuration of the convex lens stack number 2 and the large video display:

The large video display will be positioned at a distance of F2 units away from the convex lens stack number 2, in front of the convex lens stack number 2. And the distance of F2 units will be lesser than the distance of F1 units, which was the distance between the perpendicularly positioned small video display number 3 and the lens stack number 3 of the “front projection unit”.

The positional configuration of the convex lens stack number 3 and the large video display:

The large video display will be positioned at a distance of F2 units away from the convex lens stack number 3, in front of the convex lens stack number 2. And the distance of F2 units will be lesser than the distance of F1 units, which was the distance between the perpendicularly positioned small video display number 3 and the lens stack number 3 of the “front projection unit”.

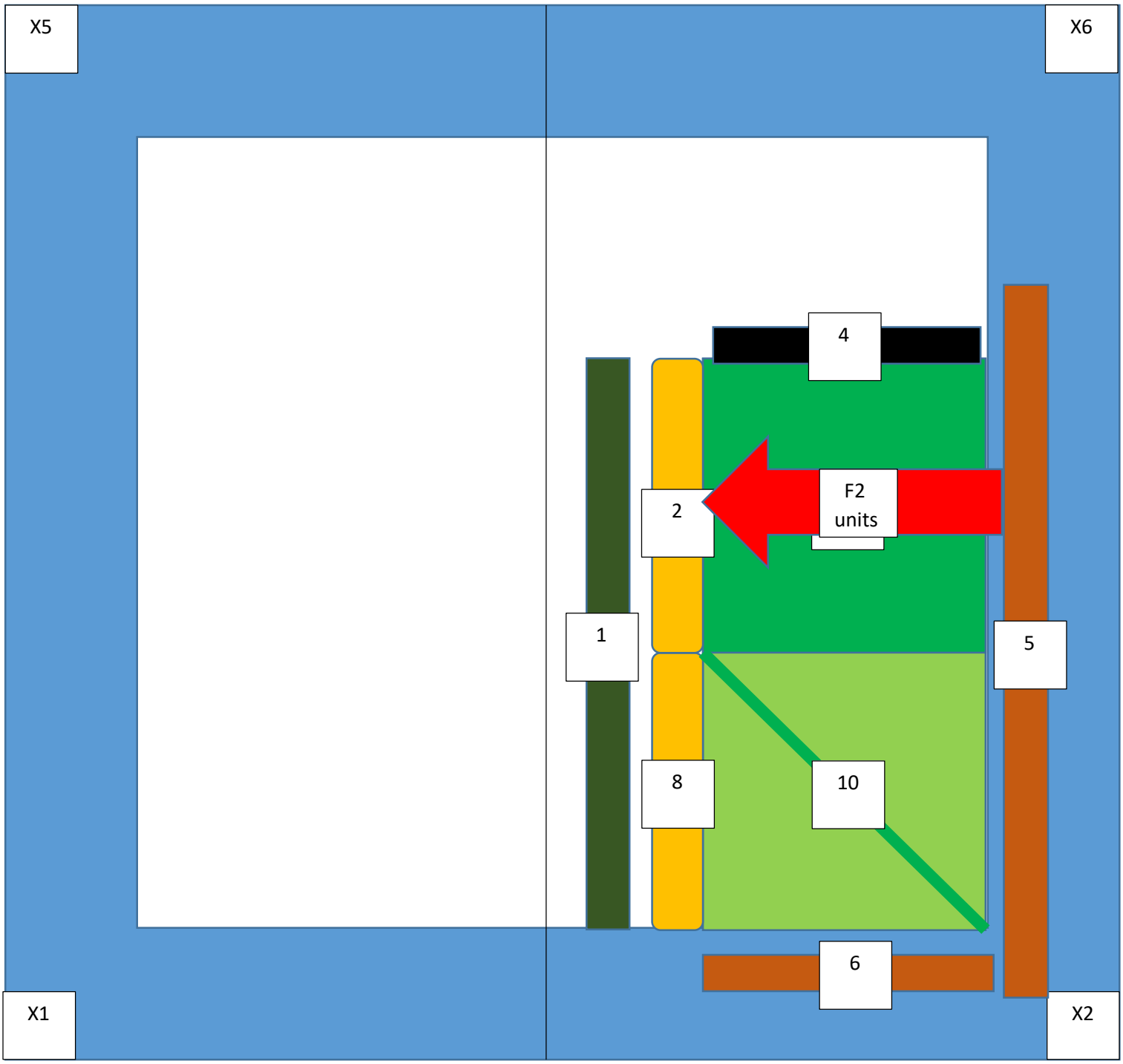
The positional configuration of the convex lens stack number 3 and the small video display number 3:

The convex lens stack number 3 and the small video display number 3 are positioned in a perpendicular positional configuration with each other. The distance the projection which will originate from the small video display number 3, will take to reach the convex lens stack number 3, will be equivalent to F3 units. And the distance of F3 units will be lesser than the distance of F2 units.

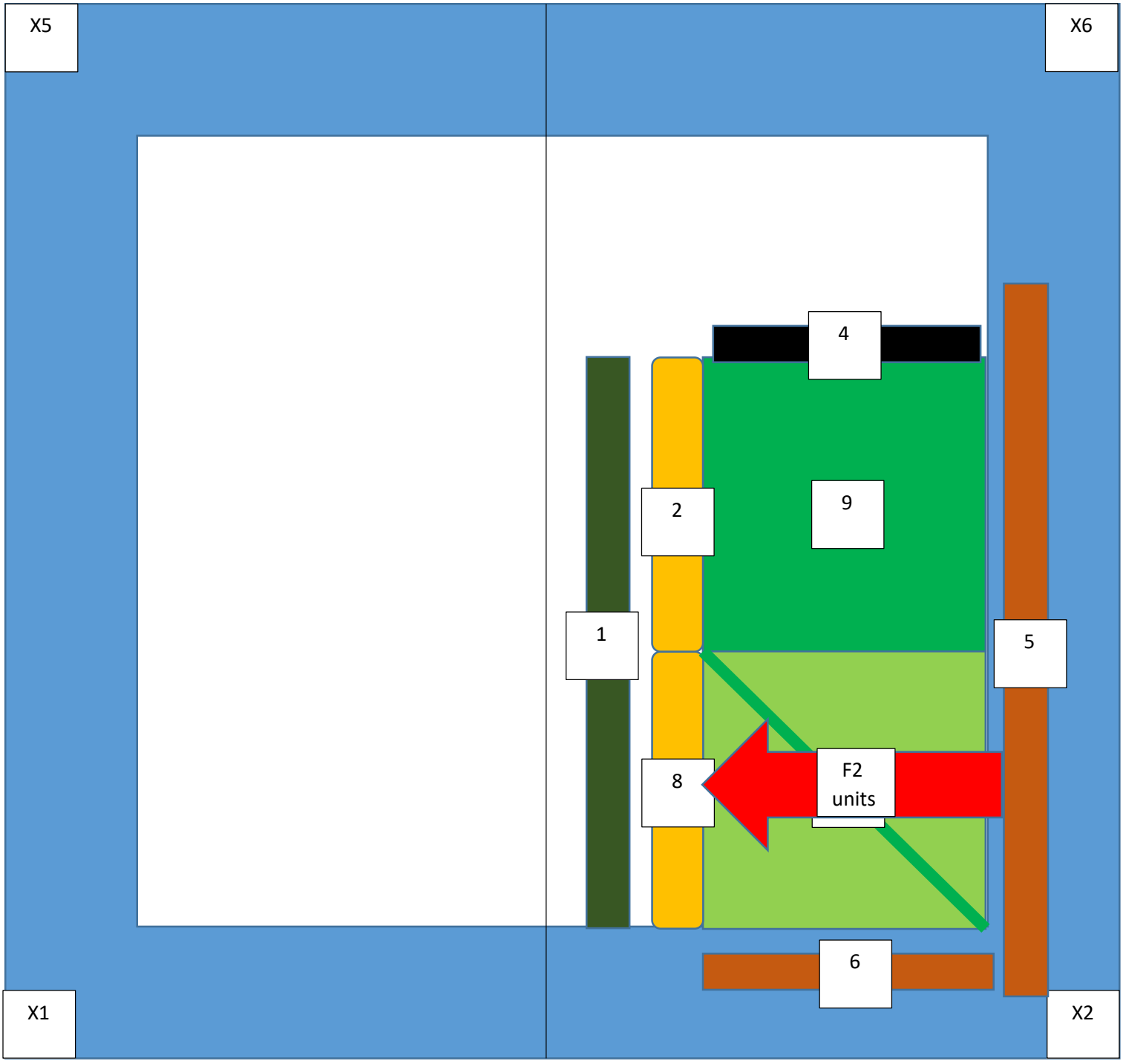
The diagrammatic descriptions of the positional configuration of the convex lens stack number 2 and the large video display, the positional configuration of the convex lens stack number 3 and the large video display and the positional configuration of the convex lens stack number 3 and the small video display

number 3 will be provided below, in the context of the distances the projections originated will take to reach each described component.

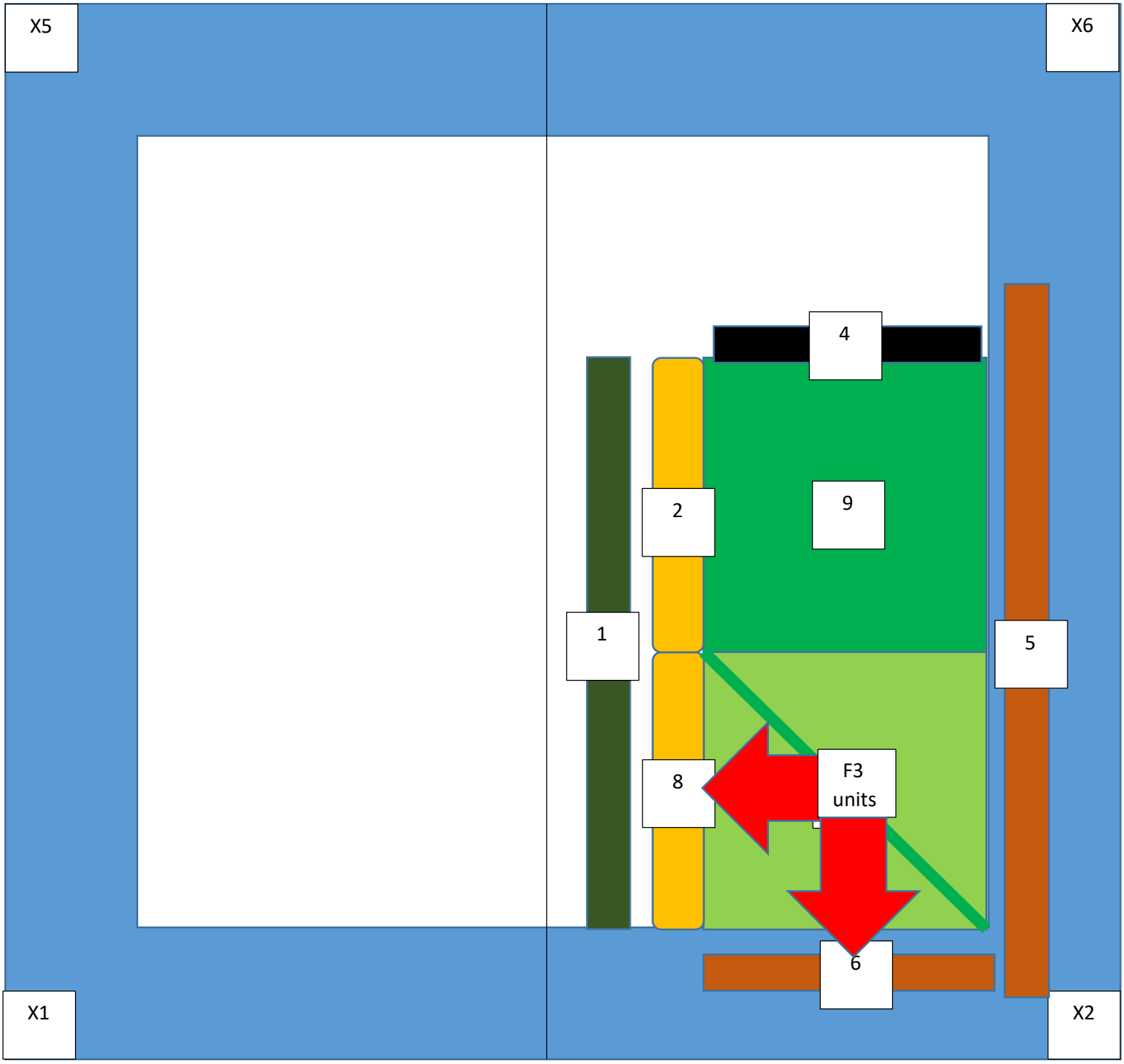
The diagrammatic description of the top view of the side projection unit where the beam splitters are not occluded will be provided below, for the positional configuration of the convex lens stack number 2 and the large video display.



The diagrammatic description of the top view of the side projection unit where the beam splitters are not occluded will be provided below, for the positional configuration of the convex lens stack number 3 and the large video display.



The diagrammatic description of the top view of the side projection unit where the beam splitters are not occluded will be provided below, for the positional configuration of the convex lens stack number 3 and the small video display number 3.



The image formation capabilities of the above 3 diagrammatic descriptions which involves the convex lens stacks will be provided below.

The image formation capabilities of the positional configuration of the convex lens stack number 2 and the large video display.

As mentioned before, the large video display will be positioned at a distance of F2 units away from the convex lens stack number 2, in front of the convex lens stack number 2. And the distance of F2 units will be lesser than the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 2.

In addition to that, the distance of F2 units will be lesser than the distance of F1 units, which was the distance between the perpendicularly positioned small video display number 3 and the lens stack number 3 of the “front projection unit”.

Therefore, the images of the projections projected from the large video display, will be virtual and will be formed in front of the convex lens stack number 2.

The image formation capabilities of the positional configuration of the convex lens stack number 3 and the large video display.

As mentioned before, the large video display will be positioned at a distance of F2 units away from the convex lens stack number 3, in front of the convex lens stack number 3. And the distance of F2 units will be lesser than the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 3.

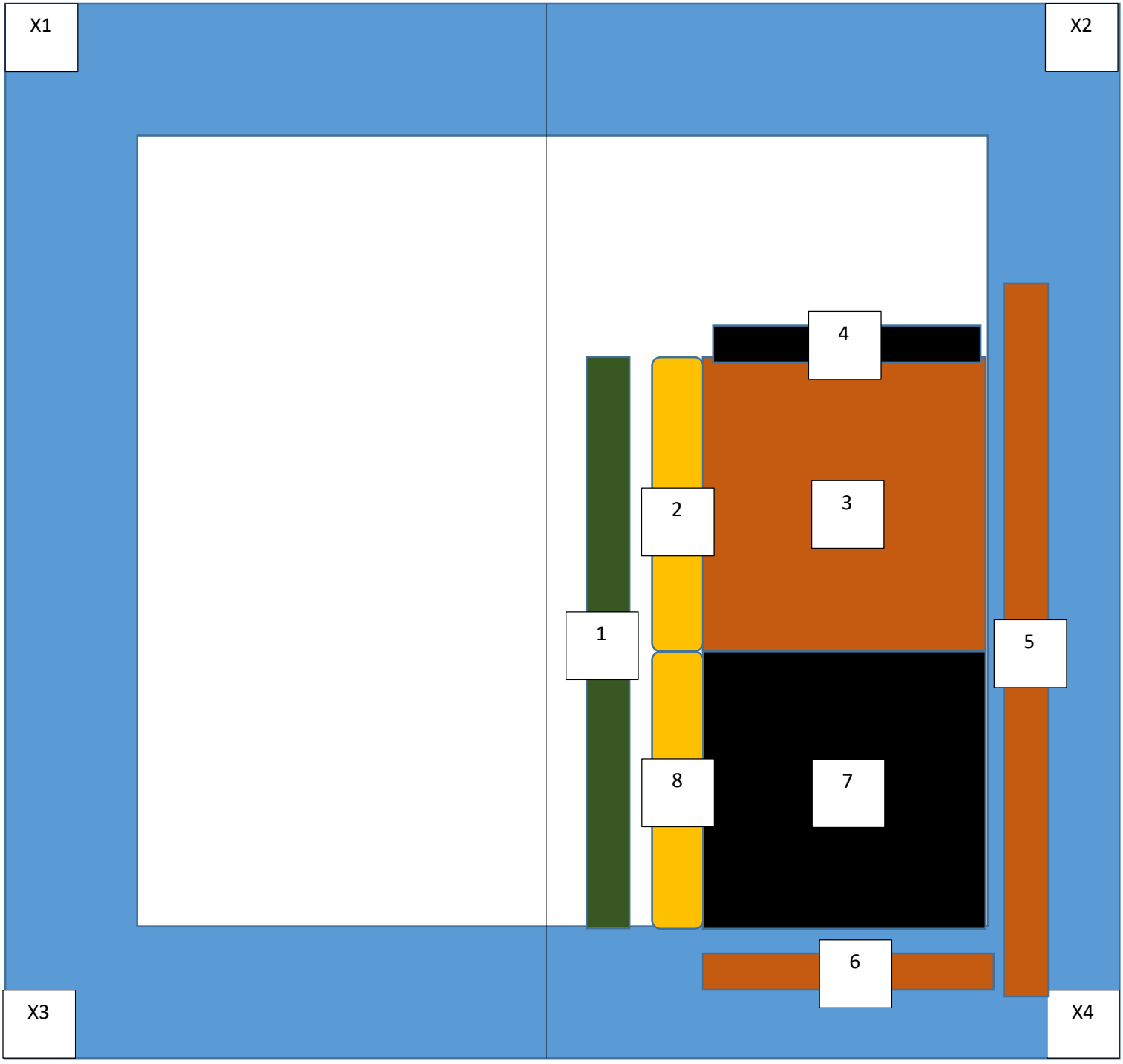
In addition to that, the distance of F2 units will be lesser than the distance of F1 units, which was the distance between the perpendicularly positioned small video display number 3 and the lens stack number 3 of the “front projection unit”.

Therefore, the images of the projections projected from the large video display, will be virtual and will be formed in front of the convex lens stack number 3.

The image formation capabilities of the positional configuration of the convex lens stack number 3 and the small video display number 3.

As mentioned before, the convex lens stack number 3 and the small video display number 3 are positioned in a perpendicular positional configuration with each other. The distance the projection which will originate from the small video display number 3, will take to reach the convex lens stack number 3, will be equivalent to F3 units. And the distance of F3 units will be lesser than the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 3. Therefore, the images of the projections projected from the small video display number 3, will be virtual and will be formed in front of the convex lens stack number 3.

The diagrammatic description of the right side view of the side projection unit will be provided below.



- The description of the labelled parts

The part labelled as number 1:

The projection viewing plane

The part labelled as number 2:

The convex lens stack number 3

The part labelled as number 3:

The small video display number 3

The part labelled as number 4:

The light blocking part number 4

The part labelled as number 5:

The large video display

The part labelled as number 6:

The small video display number 4

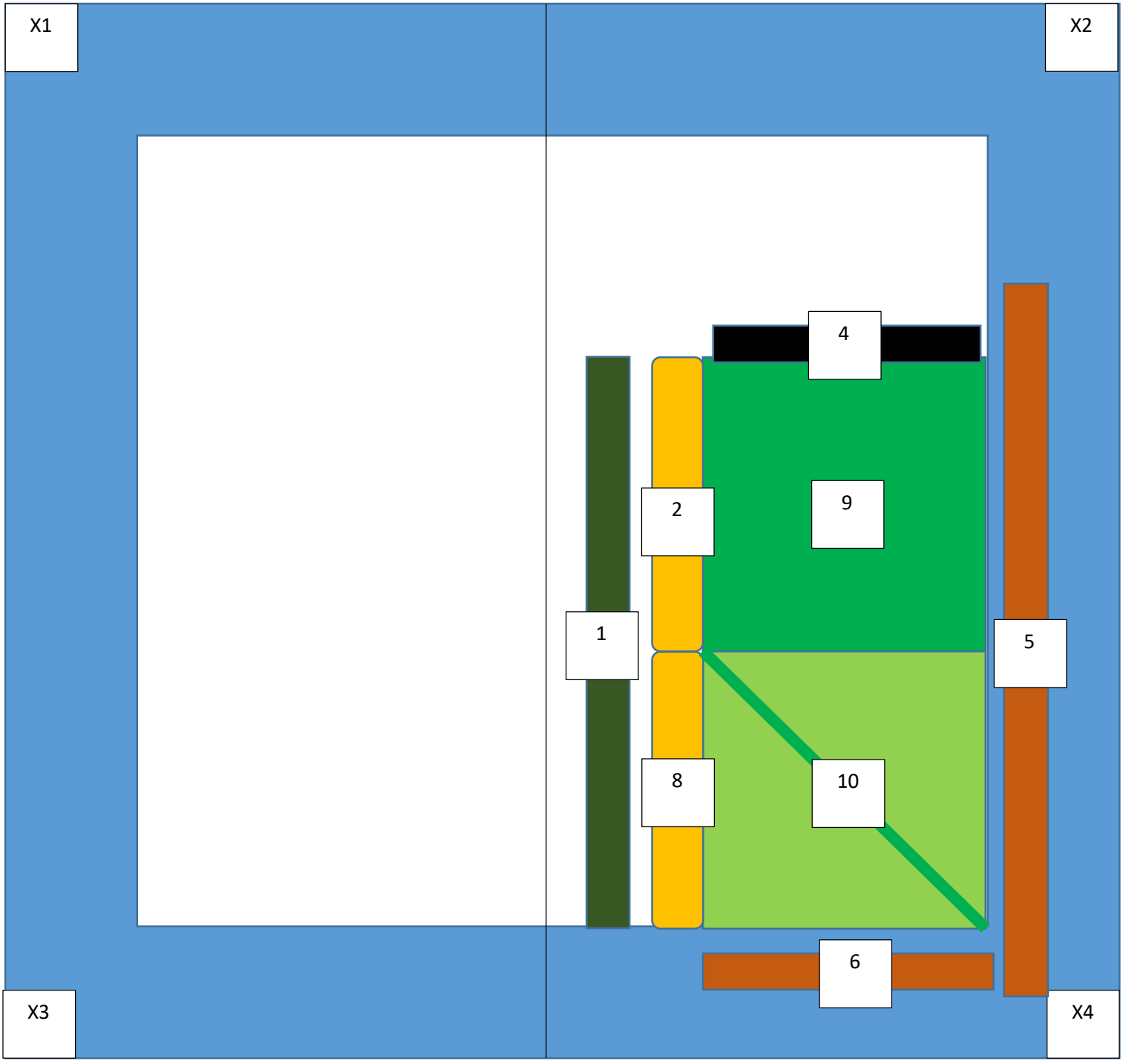
The part labelled as number 7:

The light blocking part number 1

The part labelled as number 8:

The convex lens stack number 4

The diagrammatic description of the right side view of the side projection unit where the beam splitters are not occluded will be provided below.



- The description of the labelled parts

The part labelled as number 1:

The beam splitter number 3

The part labelled as number 2:

The beam splitter number 4

The positional configuration of the convex lens stack number 3 and the large video display:

The large video display will be positioned at a distance of F2 units away from the convex lens stack number 3, in front of the convex lens stack number 3. And the distance of F2 units will be lesser than the distance of F1 units, which was the distance between the perpendicularly positioned small video display number 3 and the lens stack number 3 of the “front projection unit”.

The positional configuration of the convex lens stack number 4 and the large video display:

The large video display will be positioned at a distance of F2 units away from the convex lens stack number 4, in front of the convex lens stack number 4. And the distance of F2 units will be lesser than the distance of F1 units, which was the distance between the perpendicularly positioned small video display number 3 and the lens stack number 3 of the “front projection unit”.

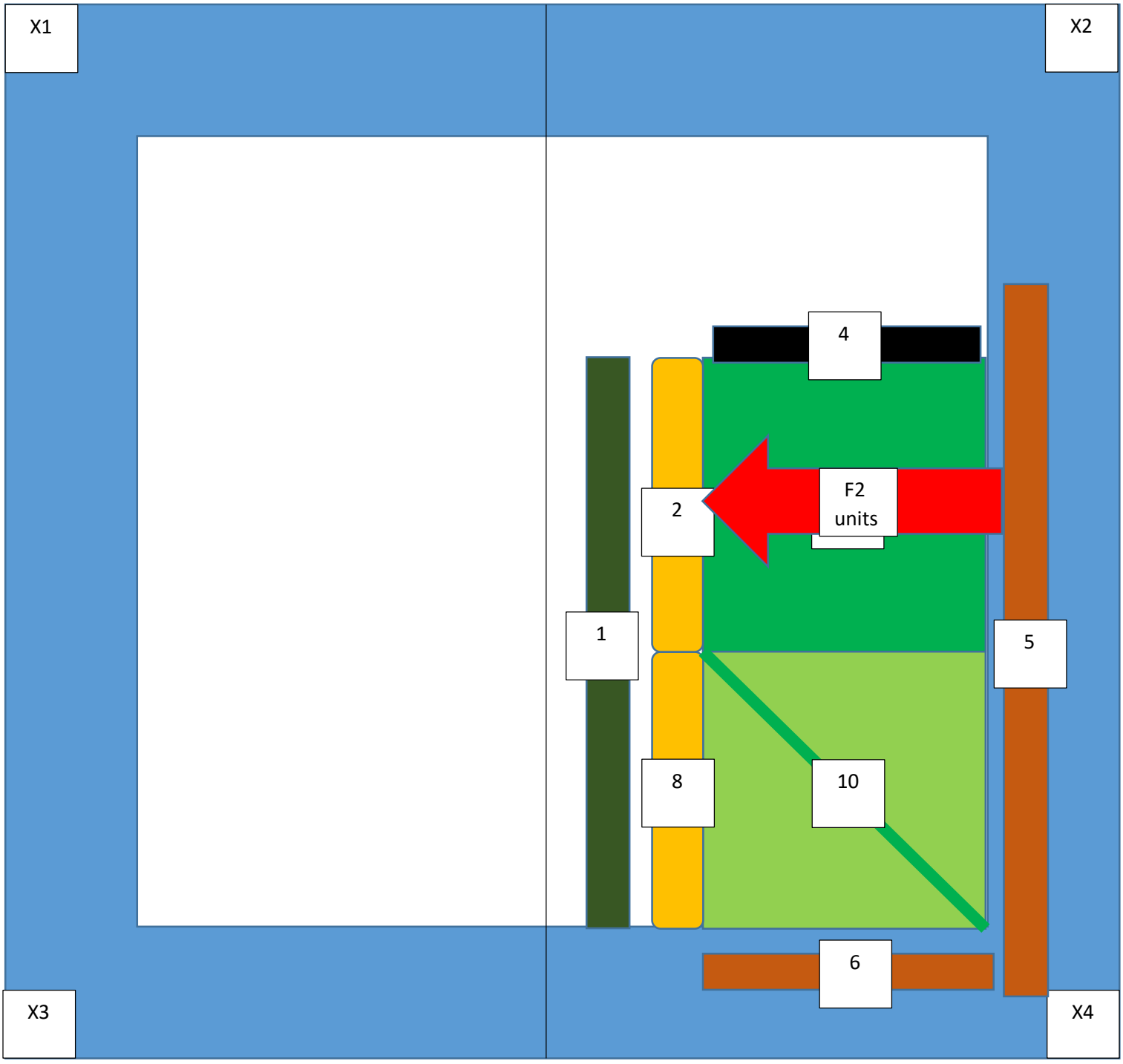
The positional configuration of the convex lens stack number 4 and the small video display number 4:

The convex lens stack number 4 and the small video display number 4 are positioned in a perpendicular positional configuration with each other. The distance the projection which will originate from the small video display number 4, will take to reach the convex lens stack number 4, will be equivalent to F3 units. And the distance of F3 units will be lesser than the distance of F2 units.

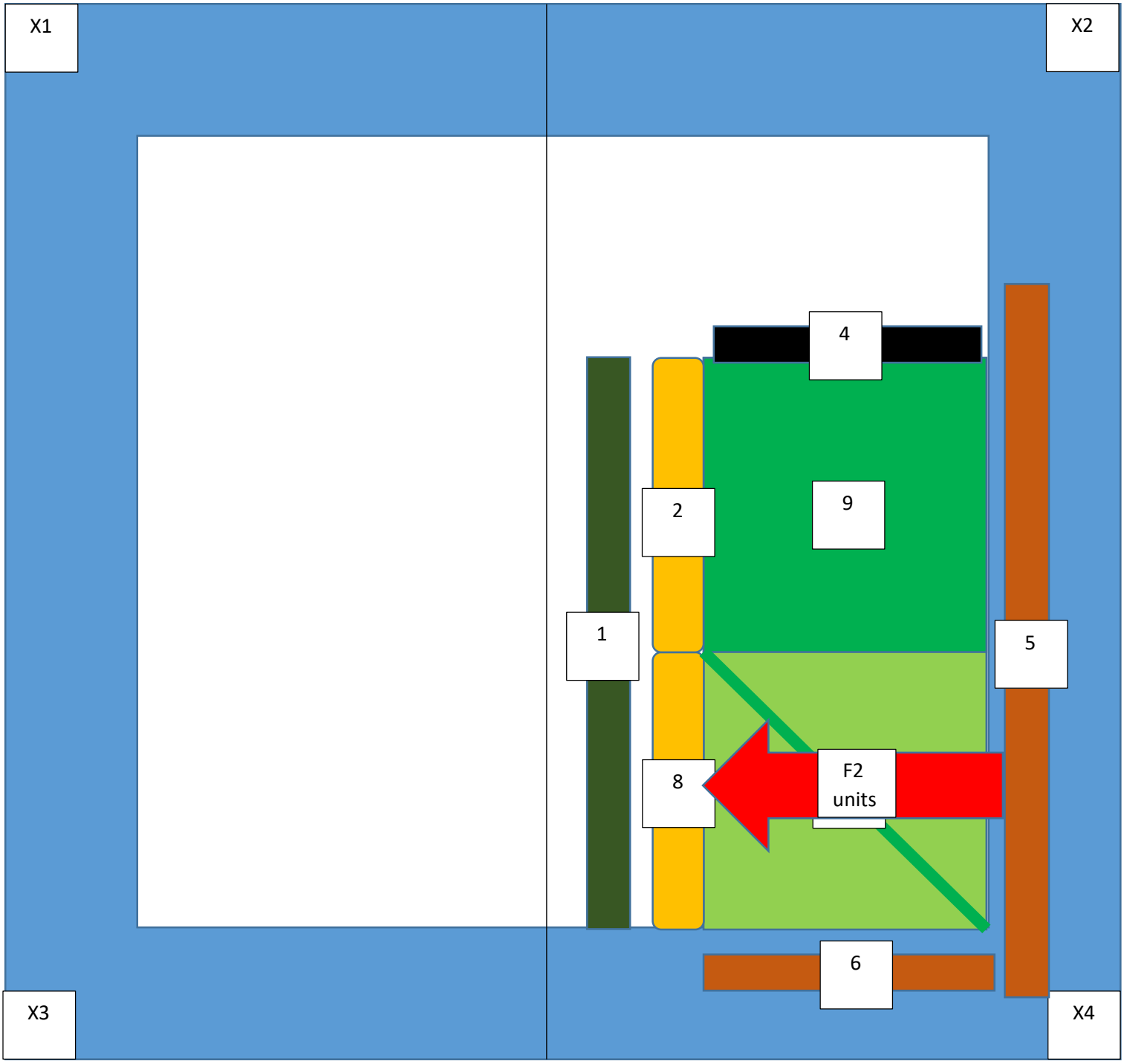
The diagrammatic descriptions of the positional configuration of the convex lens stack number 3 and the large video display, the positional configuration of the convex lens stack number 4 and the large video display and the positional configuration of the convex lens stack number 4 and the small video display

number 4 will be provided below, in the context of the distances the projections originated will take to reach each described component.

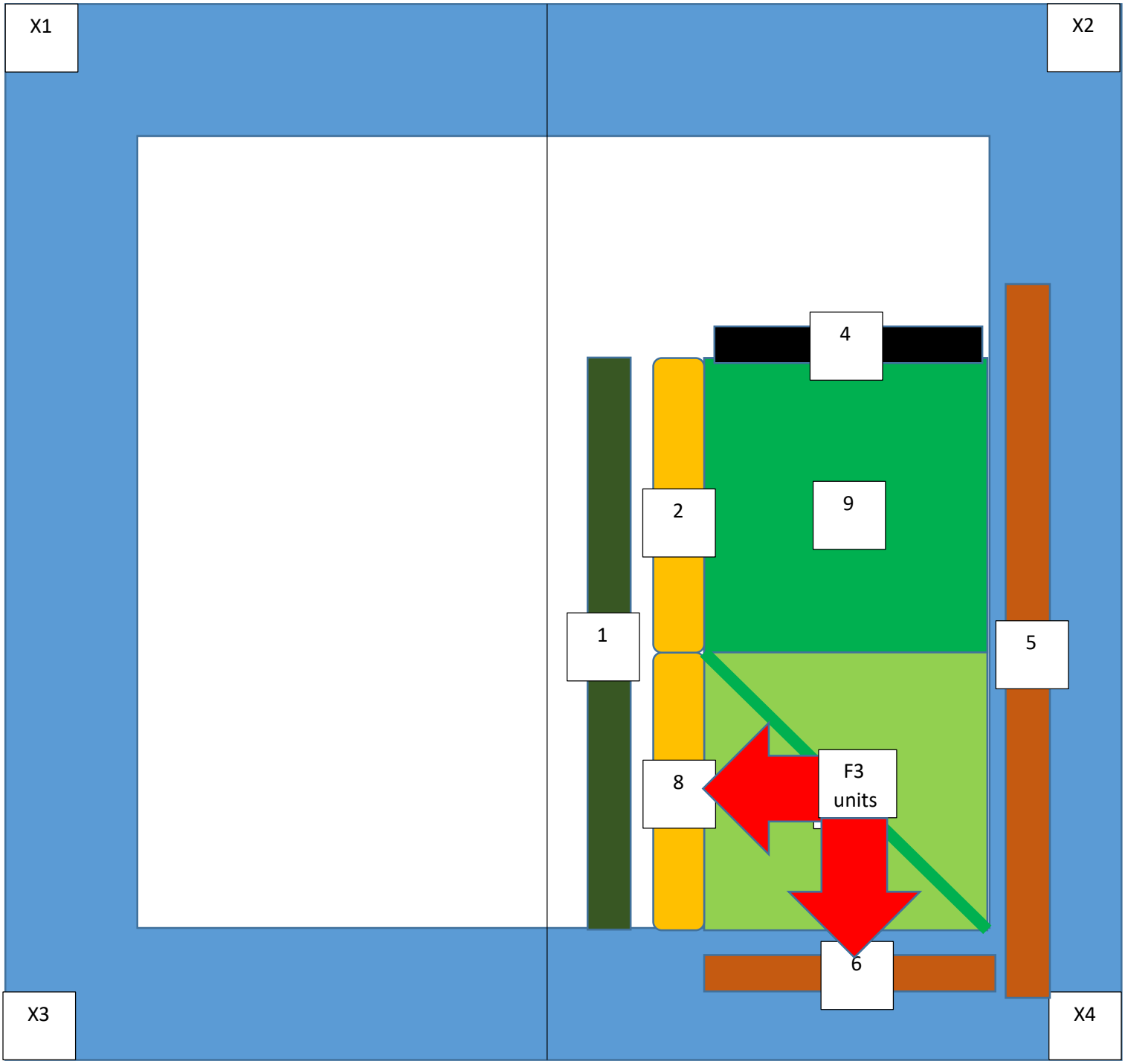
The diagrammatic description of the right side view of the side projection unit where the beam splitters are not occluded will be provided below, for the positional configuration of the convex lens stack number 3 and the large video display.



The diagrammatic description of the right side view of the side projection unit where the beam splitters are not occluded will be provided below, for the positional configuration of the convex lens stack number 4 and the large video display.



The diagrammatic description of the right side view of the side projection unit where the beam splitters are not occluded will be provided below, for the positional configuration of the convex lens stack number 4 and the small video display number 4.



The image formation capabilities of the above 3 diagrammatic descriptions which involves the convex lens stacks will be provided below.

The image formation capabilities of the positional configuration of the convex lens stack number 3 and the large video display.

As mentioned before, the large video display will be positioned at a distance of F2 units away from the convex lens stack number 3, in front of the convex lens stack number 3. And the distance of F2 units will be lesser than the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 3.

In addition to that, the distance of F2 units will be lesser than the distance of F1 units, which was the distance between the perpendicularly positioned small video display number 3 and the lens stack number 3 of the “front projection unit”.

Therefore, the images of the projections projected from the large video display, will be virtual and will be formed in front of the convex lens stack number 3.

The image formation capabilities of the positional configuration of the convex lens stack number 4 and the large video display.

As mentioned before, the large video display will be positioned at a distance of F2 units away from the convex lens stack number 4, in front of the convex lens stack number 4. And the distance of F2 units will be lesser than the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 4.

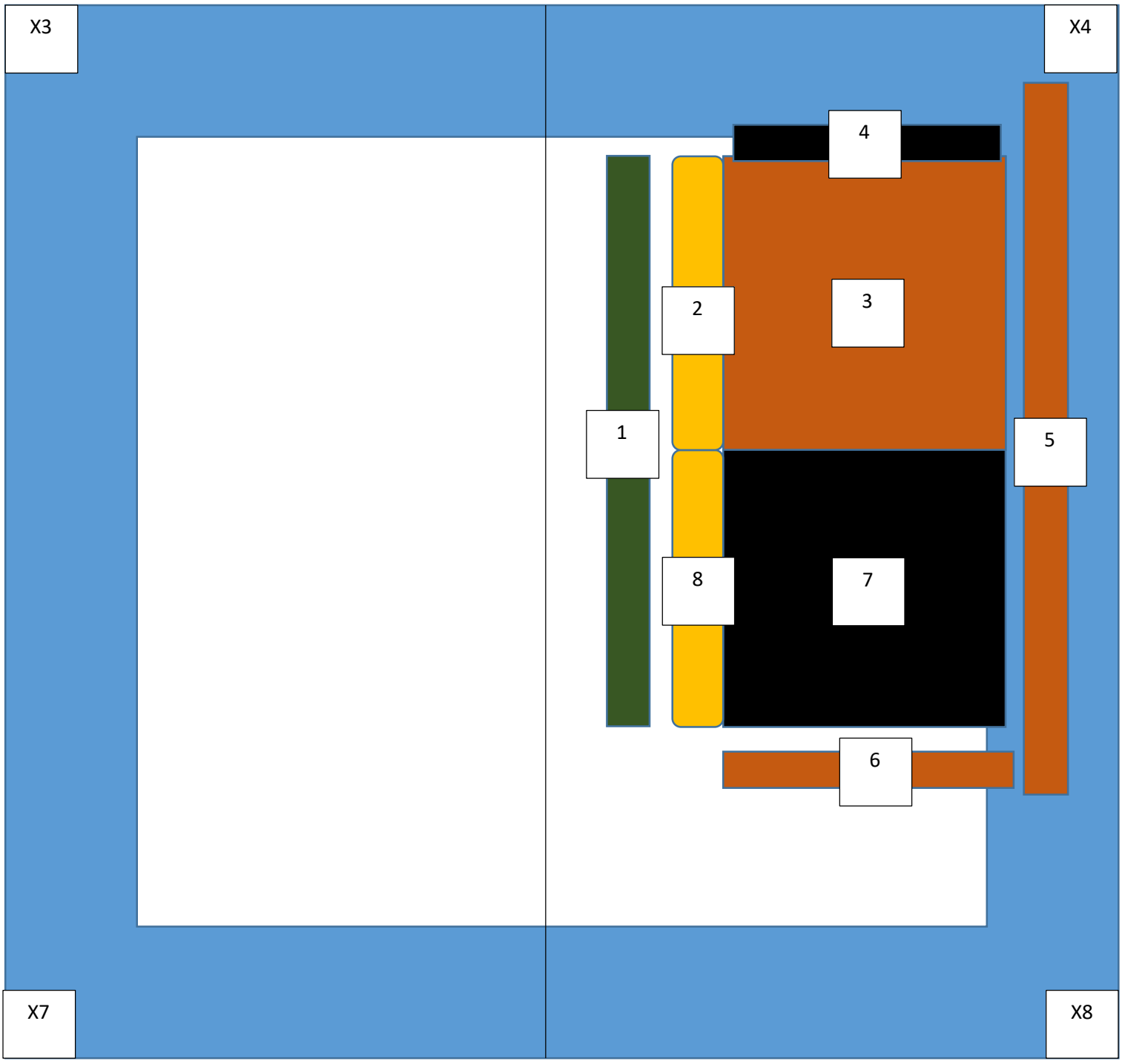
In addition to that, the distance of F2 units will be lesser than the distance of F1 units, which was the distance between the perpendicularly positioned small video display number 3 and the lens stack number 3 of the “front projection unit”.

Therefore, the images of the projections projected from the large video display, will be virtual and will be formed in front of the convex lens stack number 4.

The image formation capabilities of the positional configuration of the convex lens stack number 4 and the small video display number 4.

As mentioned before, the convex lens stack number 4 and the small video display number 4 are positioned in a perpendicular positional configuration with each other. The distance the projection which will originate from the small video display number 4, will take to reach the convex lens stack number 4, will be equivalent to F3 units. And the distance of F3 units will be lesser than the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 4. Therefore, the images of the projections projected from the small video display number 4, will be virtual and will be formed in front of the convex lens stack number 4.

The diagrammatic description of the bottom side view of the side projection unit will be provided below.



- The description of the labelled parts

The part labelled as number 1:

The projection viewing plane

The part labelled as number 2:

The convex lens stack number 4

The part labelled as number 3:

The small video display number 4

The part labelled as number 4:

The light blocking part number 1

The part labelled as number 5:

The large video display

The part labelled as number 6:

The small video display number 1

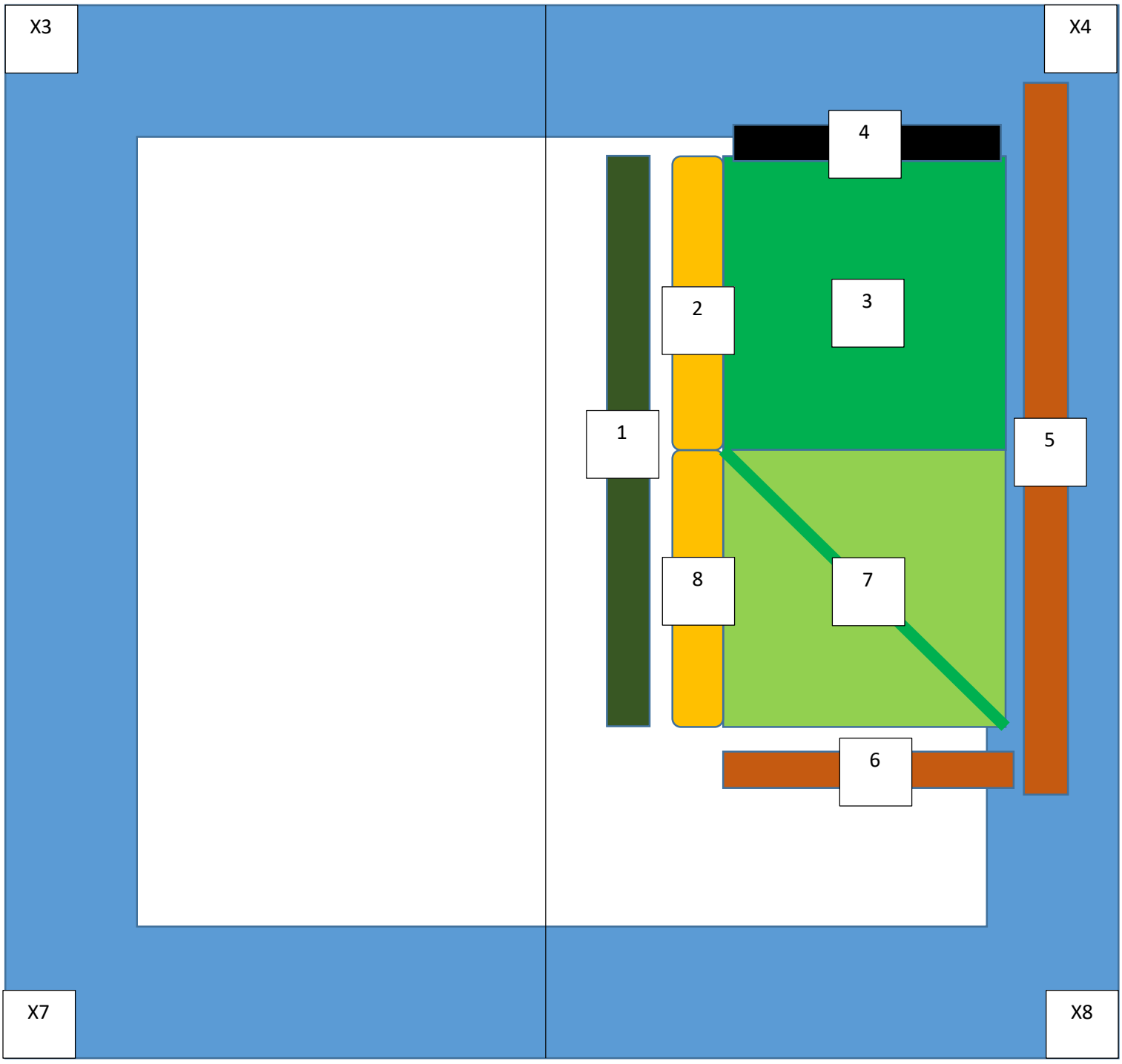
The part labelled as number 7:

The light blocking part number 2

The part labelled as number 8:

The convex lens stack number 1

The diagrammatic description of the bottom side view of the side projection unit where the beam splitters are not occluded will be provided below.



- The description of the labelled parts

The part labelled as number 1:

The beam splitter number 4

The part labelled as number 2:

The beam splitter number 1

The positional configuration of the convex lens stack number 4 and the large video display:

The large video display will be positioned at a distance of F2 units away from the convex lens stack number 4, in front of the convex lens stack number 4. And the distance of F2 units will be lesser than the distance of F1 units, which was the distance between the perpendicularly positioned small video display number 3 and the lens stack number 3 of the “front projection unit”.

The positional configuration of the convex lens stack number 1 and the large video display:

The large video display will be positioned at a distance of F2 units away from the convex lens stack number 1, in front of the convex lens stack number 1. And the distance of F2 units will be lesser than the distance of F1 units, which was the distance between the perpendicularly positioned small video display number 3 and the lens stack number 3 of the “front projection unit”.

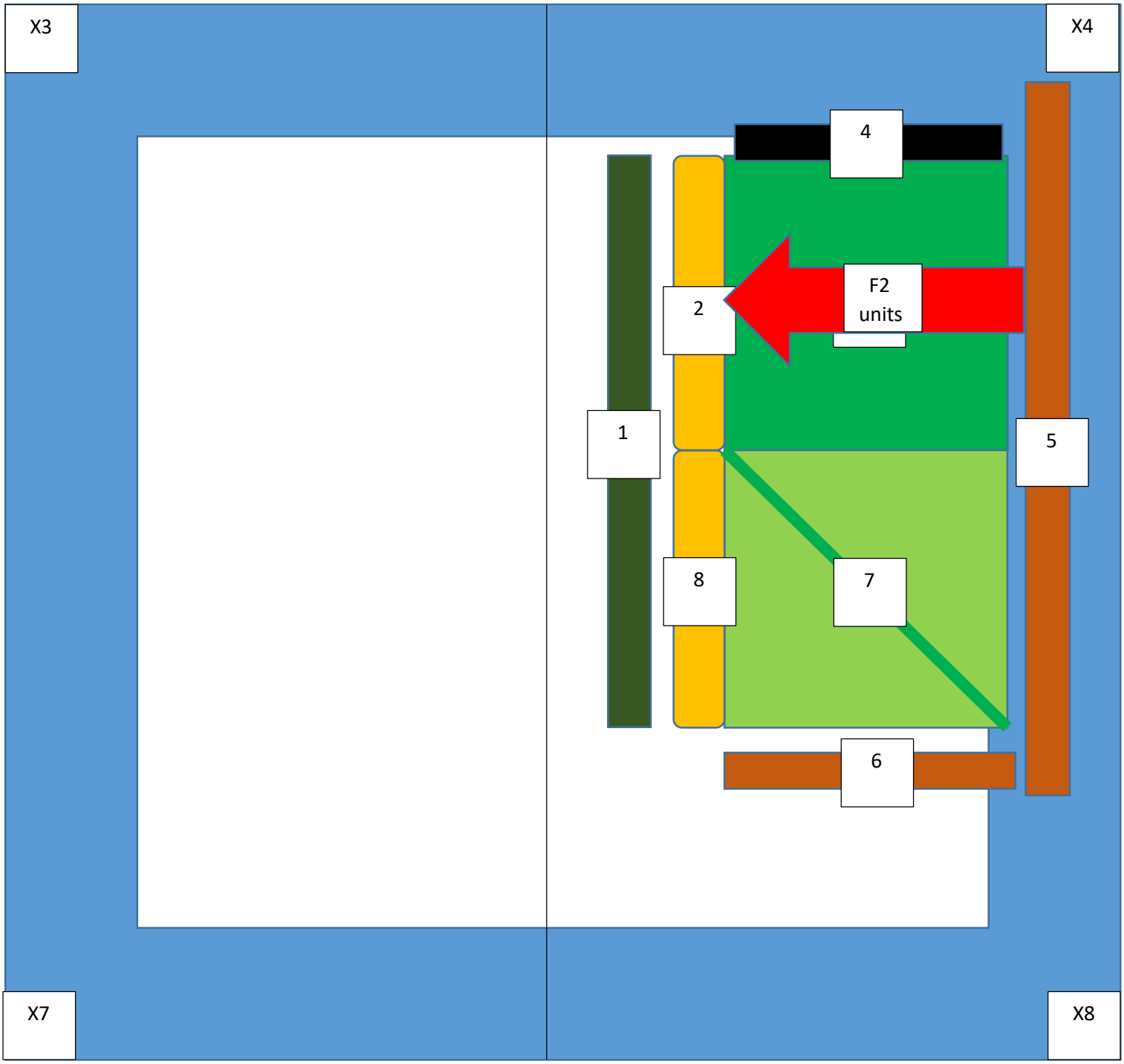
The positional configuration of the convex lens stack number 1 and the small video display number 1:

The convex lens stack number 1 and the small video display number 1 are positioned in a perpendicular positional configuration with each other. The distance the projection which will originate from the small video display number 1, will take to reach the convex lens stack number 1, will be equivalent to F3 units. And the distance of F3 units will be lesser than the distance of F2 units.

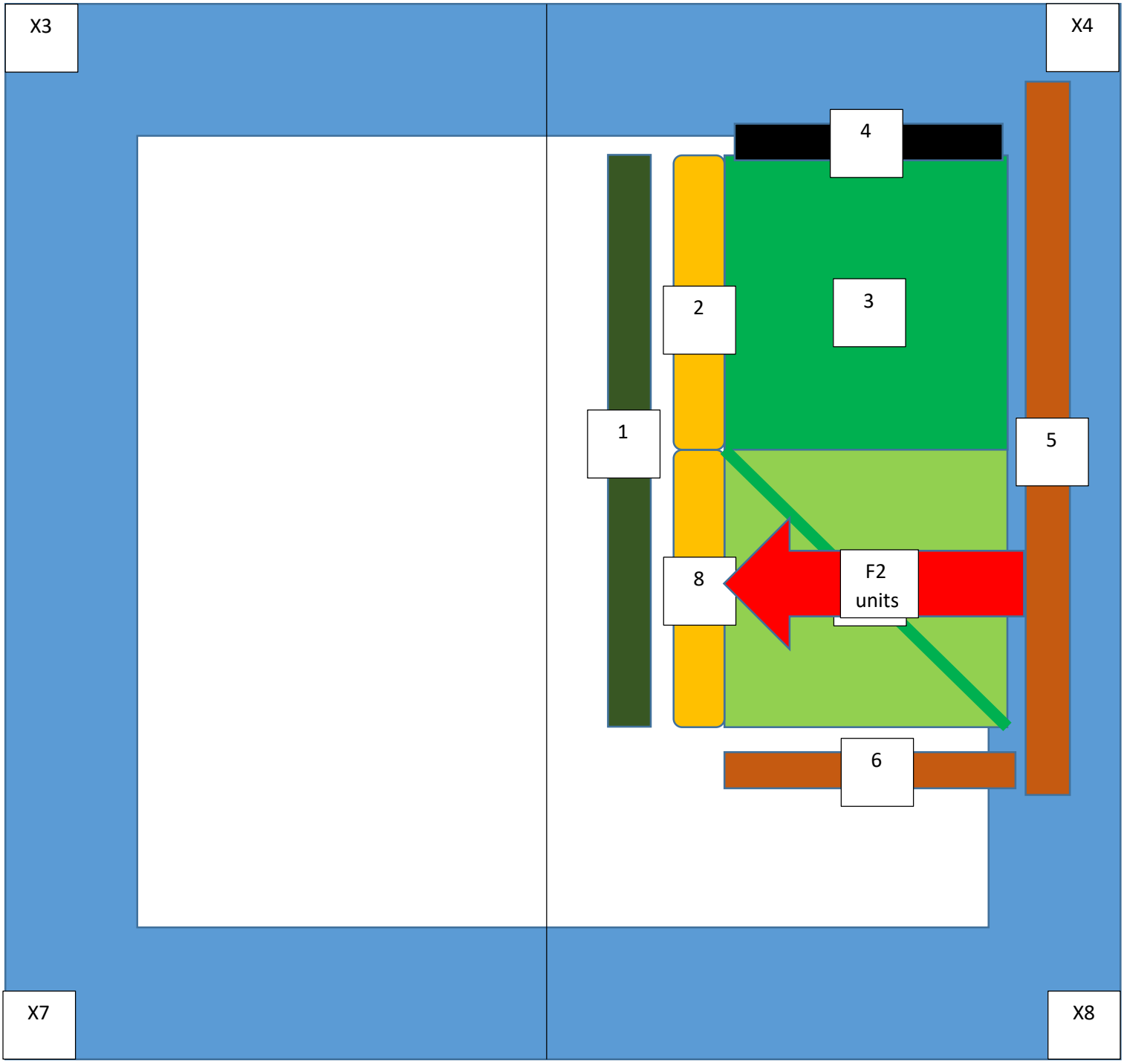
The diagrammatic descriptions of the positional configuration of the convex lens stack number 4 and the large video display, the positional configuration of the convex lens stack number 1 and the large video display and the positional configuration of the convex lens stack number 1 and the small video display

number 1 will be provided below, in the context of the distances the projections originated will take to reach each described component.

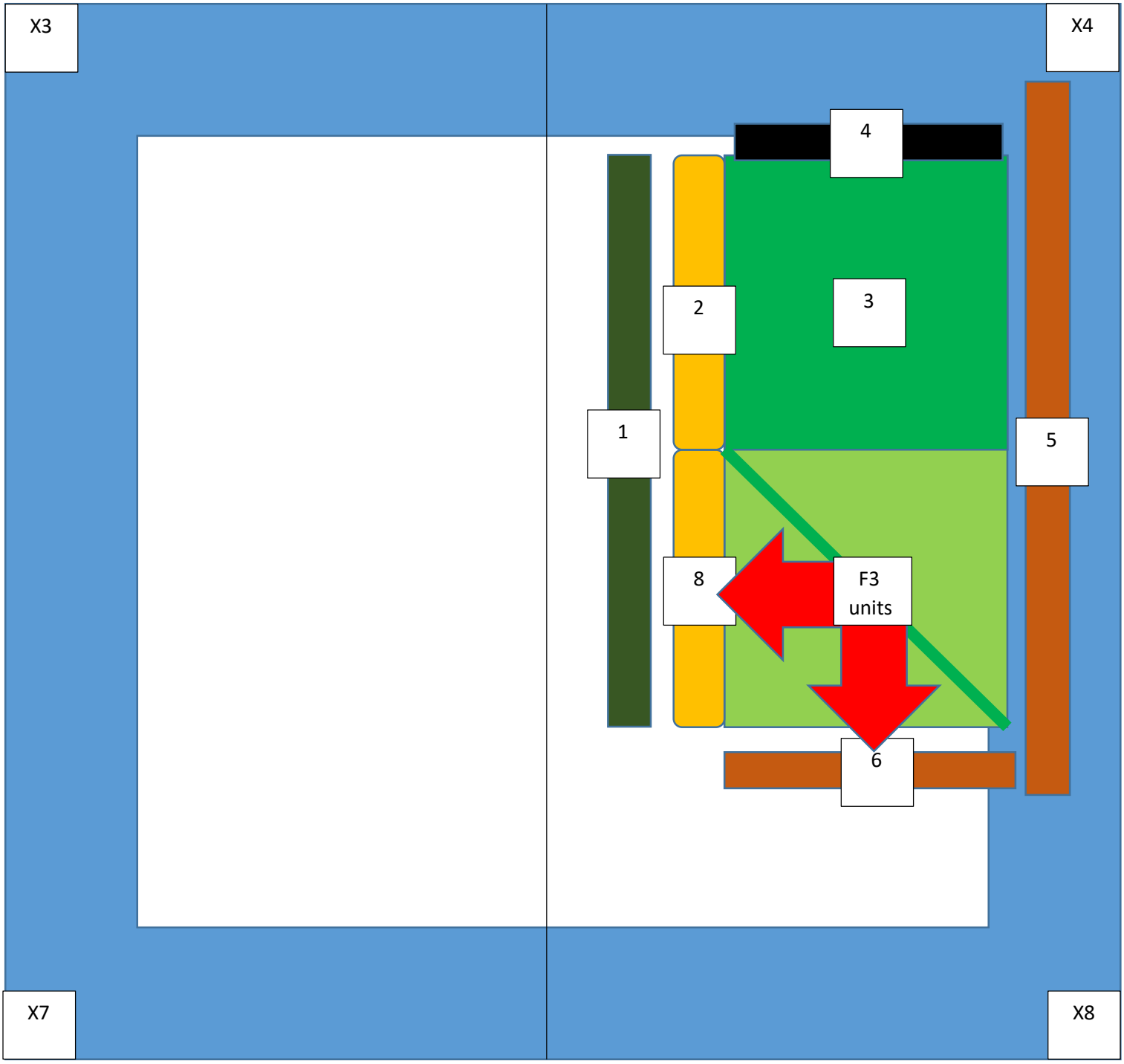
The diagrammatic description of the bottom side view of the side projection unit where the beam splitters are not occluded will be provided below, for the positional configuration of the convex lens stack number 4 and the large video display.



The diagrammatic description of the bottom side view of the side projection unit where the beam splitters are not occluded will be provided below, for the positional configuration of the convex lens stack number 1 and the large video display.



The diagrammatic description of the bottom side view of the side projection unit where the beam splitters are not occluded will be provided below, for the positional configuration of the convex lens stack number 1 and the small video display number 1.



The image formation capabilities of the above 3 diagrammatic descriptions which involves the convex lens stacks will be provided below.

The image formation capabilities of the positional configuration of the convex lens stack number 4 and the large video display.

As mentioned before, the large video display will be positioned at a distance of F2 units away from the convex lens stack number 4, in front of the convex lens stack number 4. And the distance of F2 units will be lesser than the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 4.

In addition to that, the distance of F2 units will be lesser than the distance of F1 units, which was the distance between the perpendicularly positioned small video display number 3 and the lens stack number 3 of the “front projection unit”.

Therefore, the images of the projections projected from the large video display, will be virtual and will be formed in front of the convex lens stack number 4.

The image formation capabilities of the positional configuration of the convex lens stack number 1 and the large video display.

As mentioned before, the large video display will be positioned at a distance of F2 units away from the convex lens stack number 1, in front of the convex lens stack number 1. And the distance of F2 units will be lesser than the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 1.

In addition to that, the distance of F2 units will be lesser than the distance of F1 units, which was the distance between the perpendicularly positioned small video display number 3 and the lens stack number 3 of the “front projection unit”.

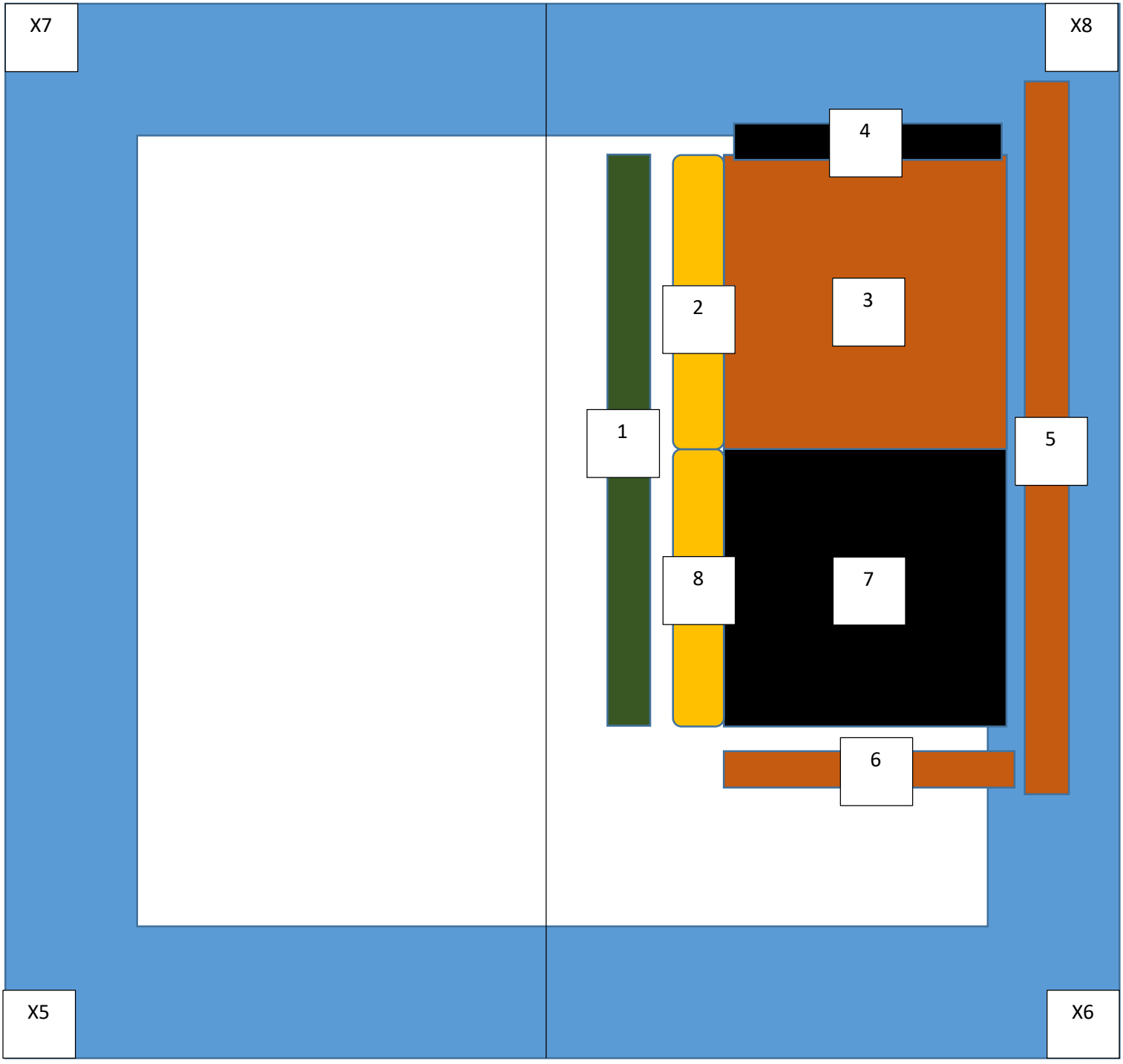
Therefore, the images of the projections projected from the large video display, will be virtual and will be formed in front of the convex lens stack number 1.

The image formation capabilities of the positional configuration of the convex lens stack number 1 and the small video display number 1.

As mentioned before, the convex lens stack number 1 and the small video display number 1 are positioned in a perpendicular positional configuration with each other. The distance the projection which will originate from the small video display number 1, will take to reach the convex lens stack number 1, will be equivalent to F3 units. And the distance of F3 units will be lesser than the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 1. And the distance of F3 units will be lesser than the distance of F2 units.

Therefore, the images of the projections projected from the small video display number 1, will be virtual and will be formed in front of the convex lens stack number 1.

The diagrammatic description of the left side view of the side projection unit will be provided below.



- The description of the labelled parts

The part labelled as number 1:

The projection viewing plane

The part labelled as number 2:

The convex lens stack number 1

The part labelled as number 3:

The small video display number 1

The part labelled as number 4:

The light blocking part number 2

The part labelled as number 5:

The large video display

The part labelled as number 6:

The small video display number 2

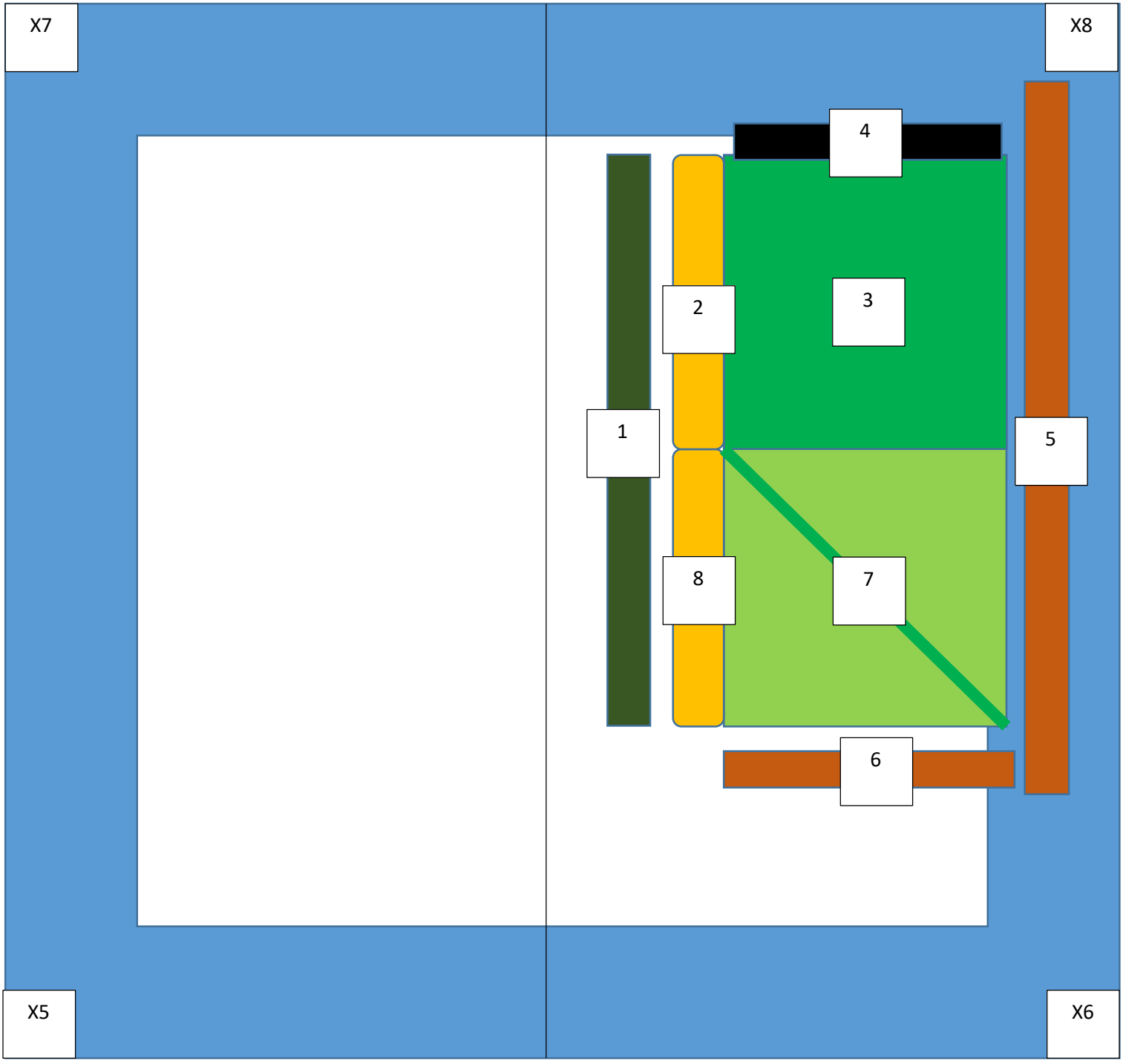
The part labelled as number 7:

The light blocking part number 3

The part labelled as number 8:

The convex lens stack number 2

The diagrammatic description of the left side view of the side projection unit where the beam splitters are not occluded will be provided below.



- The description of the labelled parts

The part labelled as number 1:

The beam splitter number 1

The part labelled as number 2:

The beam splitter number 2

The positional configuration of the convex lens stack number 1 and the large video display:

The large video display will be positioned at a distance of F2 units away from the convex lens stack number 1, in front of the convex lens stack number 1. And the distance of F2 units will be lesser than the distance of F1 units, which was the distance between the perpendicularly positioned small video display number 3 and the lens stack number 3 of the “front projection unit”.

The positional configuration of the convex lens stack number 2 and the large video display:

The large video display will be positioned at a distance of F2 units away from the convex lens stack number 2, in front of the convex lens stack number 2. And the distance of F2 units will be lesser than the distance of F1 units, which was the distance between the perpendicularly positioned small video display number 3 and the lens stack number 3 of the “front projection unit”.

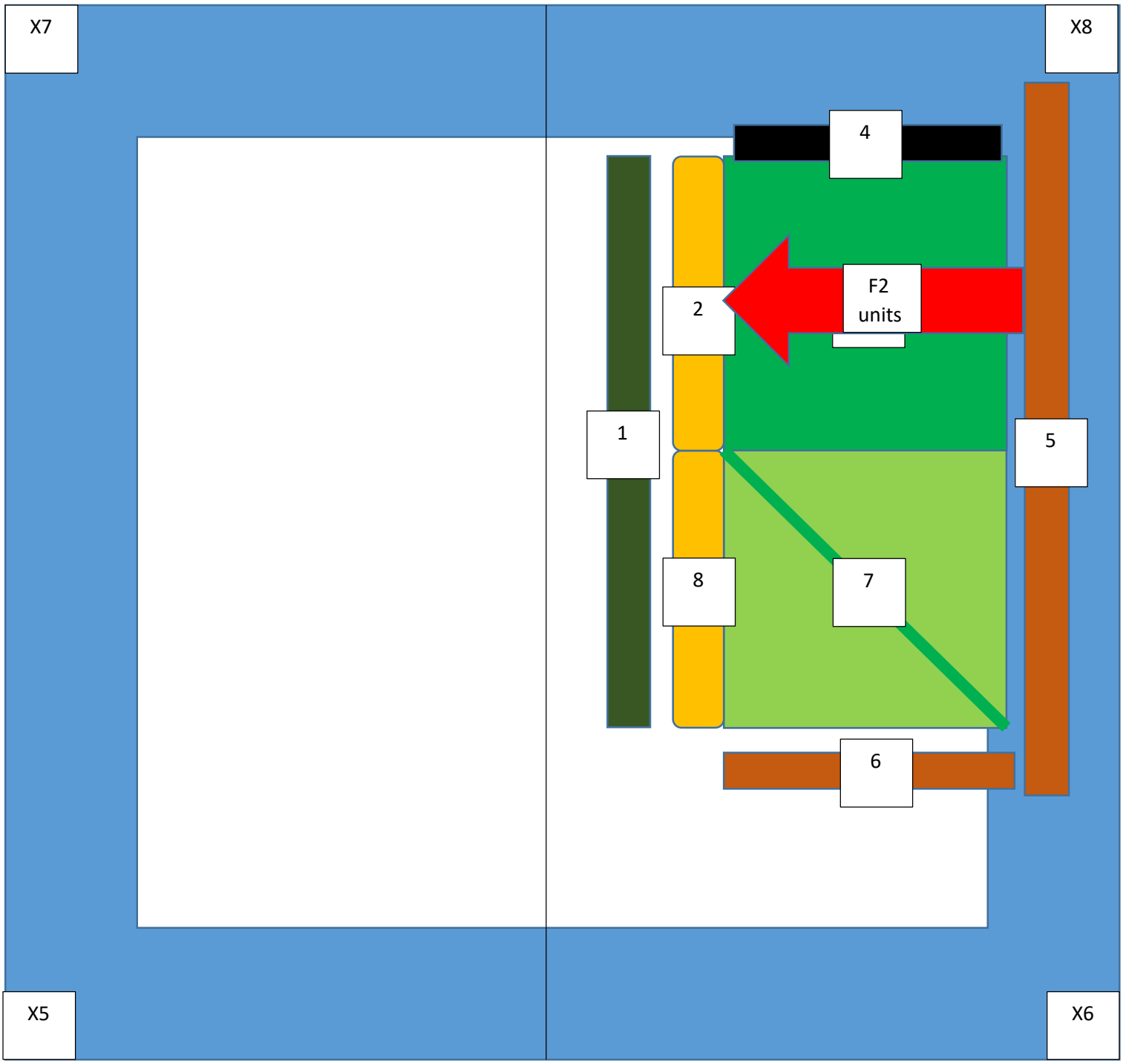
The positional configuration of the convex lens stack number 2 and the small video display number 2:

The convex lens stack number 2 and the small video display number 2 are positioned in a perpendicular positional configuration with each other. The distance the projection which will originate from the small video display number 2, will take to reach the convex lens stack number 2, will be equivalent to F3 units. And the distance of F3 units will be lesser than the distance of F2 units.

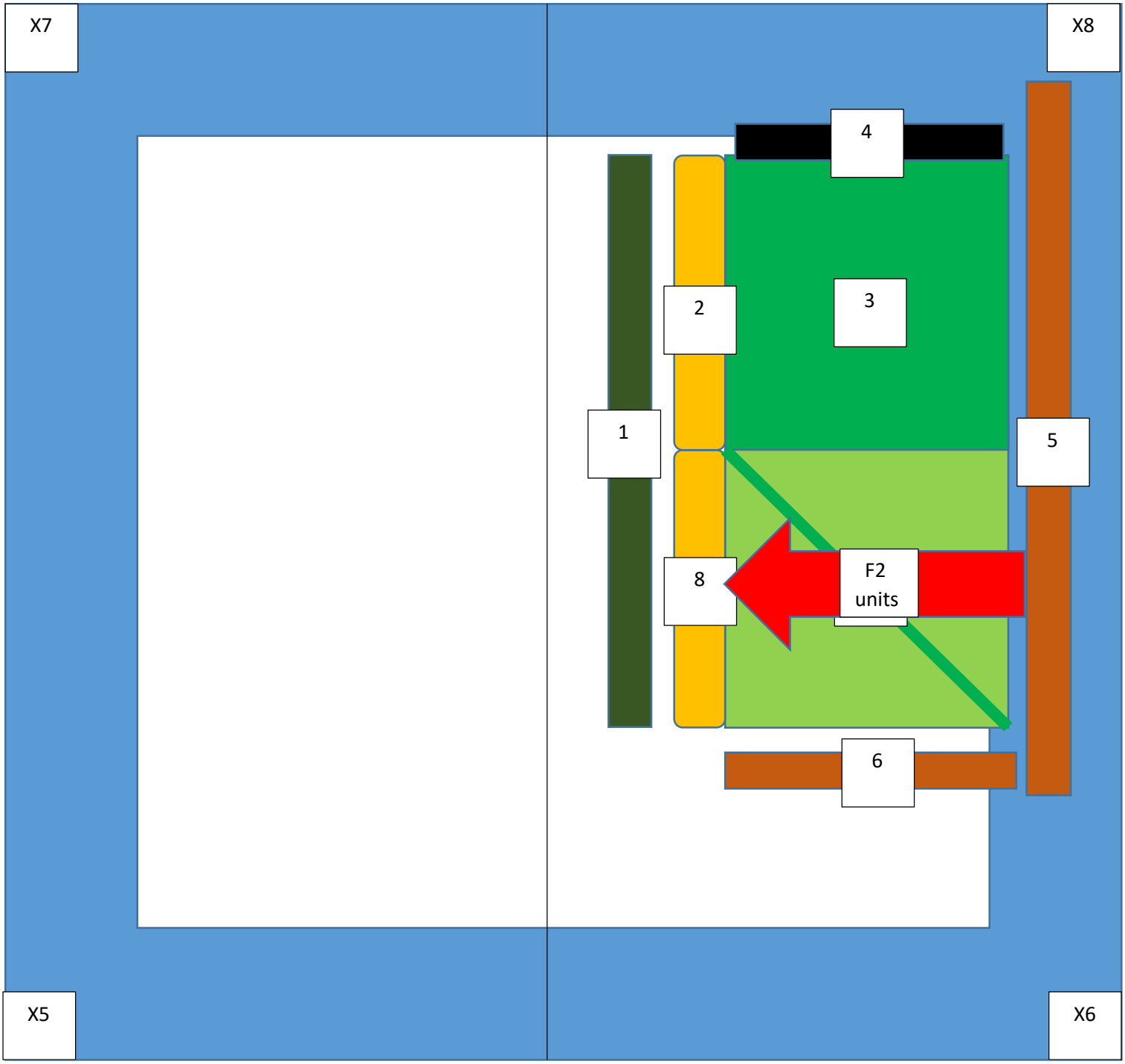
The diagrammatic descriptions of the positional configuration of the convex lens stack number 1 and the large video display, the positional configuration of the convex lens stack number 2 and the large video display and the positional configuration of the convex lens stack number 2 and the small video display

number 2 will be provided below, in the context of the distances the projections originated will take to reach each described component.

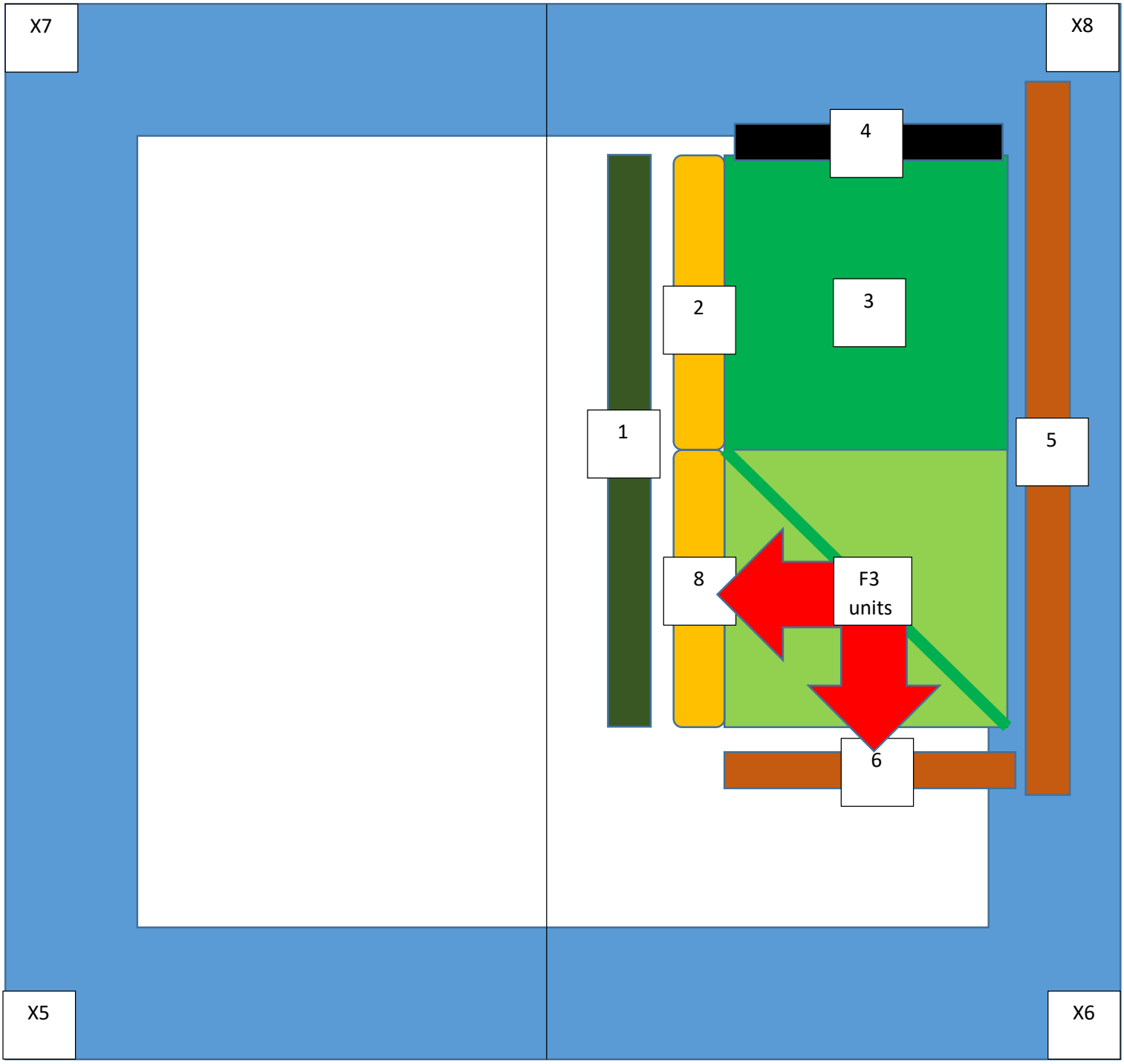
The diagrammatic description of the left side view of the side projection unit where the beam splitters are not occluded will be provided below, for the positional configuration of the convex lens stack number 1 and the large video display.



The diagrammatic description of the left side view of the side projection unit where the beam splitters are not occluded will be provided below, for the positional configuration of the convex lens stack number 2 and the large video display.



The diagrammatic description of the left side view of the side projection unit where the beam splitters are not occluded will be provided below, for the positional configuration of the convex lens stack number 2 and the small video display number 2.



The image formation capabilities of the above 3 diagrammatic descriptions which involves the convex lens stacks will be provided below.

The image formation capabilities of the positional configuration of the convex lens stack number 1 and the large video display.

As mentioned before, the large video display will be positioned at a distance of F2 units away from the convex lens stack number 1, in front of the convex lens stack number 1. And the distance of F2 units will be lesser than the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 1.

In addition to that, the distance of F2 units will be lesser than the distance of F1 units, which was the distance between the perpendicularly positioned small video display number 3 and the lens stack number 3 of the “front projection unit”.

Therefore, the images of the projections projected from the large video display, will be virtual and will be formed in front of the convex lens stack number 1.

The image formation capabilities of the positional configuration of the convex lens stack number 2 and the large video display.

As mentioned before, the large video display will be positioned at a distance of F2 units away from the convex lens stack number 2, in front of the convex lens stack number 2. And the distance of F2 units will be lesser than the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 2.

In addition to that, the distance of F2 units will be lesser than the distance of F1 units, which was the distance between the perpendicularly positioned small video display number 3 and the lens stack number 3 of the “front projection unit”.

Therefore, the images of the projections projected from the large video display, will be virtual and will be formed in front of the convex lens stack number 2.

The image formation capabilities of the positional configuration of the convex lens stack number 2 and the small video display number 2.

As mentioned before, the convex lens stack number 2 and the small video display number 2 are positioned in a perpendicular positional configuration with each other. The distance the projection which will originate from the small video display number 2, will take to reach the convex lens stack number 2, will be equivalent to F3 units. And the distance of F3 units will be lesser than the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 1. And the distance of F3 units will be lesser than the distance of F2 units.

Therefore, the images of the projections projected from the small video display number 2, will be virtual and will be formed in front of the convex lens stack number 2.

The total configuration which consists of the front projection unit and the side projection unit, will altogether have 16 sub projection projecting systems. The 16 sub projection projecting systems are provided below.

The sub projection projecting system number 1:

The configuration of the sub projection projecting system number 1:

The sub projection projecting system number 1 consists of the convex lens stack number 1 of the front projection unit and the large video display of the front projection unit. In this configuration the large video display of the front projection unit, will be positioned in front of the convex lens stack number 1 of the front projection unit, at a distance of F units away from the convex lens stack number 1 of the front projection unit.

In this scenario, the distance of F units will be equivalent to the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 1 of the front projection unit.

The image formation capabilities of the sub projection projecting system number 1:

The images of the projections projected from the large video display, when observed through the convex lens stack number 1 of the front projection unit, will be formed at infinity.

The sub projection projecting system number 2:

The configuration of the sub projection projecting system number 2:

The sub projection projecting system number 2 consists of the convex lens stack number 2 of the front projection unit and the large video display of the front projection unit. In this configuration the large video display of the front projection unit, will be positioned in front of the convex lens stack number 2 of the front projection unit, at a distance of F units away from the convex lens stack number 2 of the front projection unit.

In this scenario, the distance of F units will be equivalent to the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 2 of the front projection unit.

The image formation capabilities of the sub projection projecting system number 2:

The images of the projections projected from the large video display, when observed through the convex lens stack number 2 of the front projection unit, will be formed at infinity.

The sub projection projecting system number 3:

The configuration of the sub projection projecting system number 3:

The sub projection projecting system number 3 consists of the convex lens stack number 3 of the front projection unit and the large video display of the front projection unit. In this configuration the large video display of the front projection unit, will be positioned in front of the convex lens stack number 3 of the front projection unit, at a distance of F units away from the convex lens stack number 3 of the front projection unit.

In this scenario, the distance of F units will be equivalent to the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 3 of the front projection unit.

The image formation capabilities of the sub projection projecting system number 3:

The images of the projections projected from the large video display, when observed through the convex lens stack number 3 of the front projection unit, will be formed at infinity.

The sub projection projecting system number 4:

The configuration of the sub projection projecting system number 4:

The sub projection projecting system number 4 consists of the convex lens stack number 4 of the front projection unit and the large video display of the front projection unit. In this configuration the large video display of the front projection unit, will be positioned in front of the convex lens stack number 4 of the front projection unit, at a distance of F units away from the convex lens stack number 4 of the front projection unit.

In this scenario, the distance of F units will be equivalent to the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 4 of the front projection unit.

The image formation capabilities of the sub projection projecting system number 4:

The images of the projections projected from the large video display, when observed through the convex lens stack number 4 of the front projection unit, will be formed at infinity.

The sub projection projecting system number 5:

The configuration of the sub projection projecting system number 5:

The sub projection projecting system number 5 consists of the convex lens stack number 1 of the front projection unit, the beam splitter number 1 of the front projection unit and the small video display number 1 of the front projection unit.

In this configuration, the small video display number 1 of the front projection unit and the convex lens stack number 1 of the front projection unit are positioned in a perpendicular positional configuration with each other.

The distance the projection which will originate from the small video display number 1 of the front projection unit, will take to reach the convex lens stack number 1 of the front projection unit, will be equivalent to F1 units. And the distance of F1 units will be lesser than the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 1 of the front projection unit.

Therefore, the images of the projections projected from the small video display number 1 of the front projection unit, will be virtual and will be formed in front of the convex lens stack number 1 of the front projection unit.

In this image formation scenario, the distance where the virtual image projections will form in front of the convex lens stack number 1 of the front projection unit, will be referred to as “the virtual image formation distance number 1 of the front projection unit”.

The sub projection projecting system number 6:

The configuration of the sub projection projecting system number 6:

The sub projection projecting system number 6 consists of the convex lens stack number 2 of the front projection unit, the beam splitter number 2 of the front projection unit and the small video display number 2 of the front projection unit.

In this configuration, the small video display number 2 of the front projection unit and the convex lens stack number 2 of the front projection unit are positioned in a perpendicular positional configuration with each other.

The distance the projection which will originate from the small video display number 2 of the front projection unit, will take to reach the convex lens stack number 2 of the front projection unit, will be equivalent to F1 units. And the distance of F1 units will be lesser than the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 2 of the front projection unit.

Therefore, the images of the projections projected from the small video display number 2 of the front projection unit, will be virtual and will be formed in front of the convex lens stack number 2 of the front projection unit.

In this image formation scenario, the distance where the virtual image projections will form in front of the convex lens stack number 2 of the front projection unit, will be referred to as “the virtual image formation distance number 1 of the front projection unit”.

The sub projection projecting system number 7:

The configuration of the sub projection projecting system number 7:

The sub projection projecting system number 7 consists of the convex lens stack number 3 of the front projection unit, the beam splitter number 3 of the front projection unit and the small video display number 3 of the front projection unit.

In this configuration, the small video display number 3 of the front projection unit and the convex lens stack number 3 of the front projection unit are positioned in a perpendicular positional configuration with each other.

The distance the projection which will originate from the small video display number 3 of the front projection unit, will take to reach the convex lens stack number 3 of the front projection unit, will be equivalent to F1 units. And the distance of F1 units will be lesser than the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 3.

Therefore, the images of the projections projected from the small video display number 3 of the front projection unit, will be virtual and will be formed in front of the convex lens stack number 3 of the front projection unit.

In this image formation scenario, the distance where the virtual image projections will form in front of the convex lens stack number 3 of the front projection unit, will be referred to as “the virtual image formation distance number 1 of the front projection unit”.

The sub projection projecting system number 8:

The configuration of the sub projection projecting system number 8:

The sub projection projecting system number 8 consists of the convex lens stack number 4 of the front projection unit, the beam splitter number 4 of the front projection unit and the small video display number 4 of the front projection unit.

In this configuration, the small video display number 4 of the front projection unit and the convex lens stack number 4 of the front projection unit are positioned in a perpendicular positional configuration with each other.

The distance the projection which will originate from the small video display number 4 of the front projection unit, will take to reach the convex lens stack number 4 of the front projection unit, will be equivalent to F1 units. And the distance of F1 units will be lesser than the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 4.

Therefore, the images of the projections projected from the small video display number 4 of the front projection unit, will be virtual and will be formed in front of the convex lens stack number 4 of the front projection unit.

In this image formation scenario, the distance where the virtual image projections will form in front of the convex lens stack number 4 of the front projection unit, will be referred to as “the virtual image formation distance number 1 of the front projection unit”.

The sub projection projecting system number 9:

The configuration of the sub projection projecting system number 9:

The sub projection projecting system number 9 consists of the convex lens stack number 1 of the side projection unit and the large video display of the side projection unit.

In this configuration, the large video display of the side projection unit, will be positioned in front of the convex lens stack number 1 of the side projection unit, at a distance of F2 units away from the convex lens stack number 1 of the side projection unit.

And the distance of F2 units will be lesser than the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 1 of the side projection unit.

In this scenario, the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 1 of the side projection unit, will be equivalent to F units. Therefore, the distance of F2 units will be lesser than the distance of F units.

In addition to that, the distance of F2 units will be lesser than the distance the projection which will originate from each perpendicularly positioned small video display of the front projection unit will take to reach the corresponding perpendicularly positioned convex lens stack of the front projection unit.

In this scenario, the distance the projection which will originate from each perpendicularly positioned small video display of the front projection unit will take to reach the corresponding perpendicularly positioned convex lens stack of the front projection unit, will be equivalent to F1 units.

Therefore, the distance of F2 units will be lesser than the distance of F1 units.

In this configuration scenario, the images of the projections projected from the large video display of the side projection unit, when observed through the convex lens stack number 1 of the side projection unit, will be virtual and will be formed in front of the convex lens stack number 1 of the side projection unit.

In this image formation scenario, the distance where the virtual image projections will form in front of the convex lens stack number 1 of the side projection unit, will be referred to as “the virtual image formation distance number 1 of the side projection unit”.

And “the virtual image formation distance number 1 of the side projection unit” will be lesser than the “the virtual image formation distance number 1 of the front projection unit”.

The sub projection projecting system number 10:

The configuration of the sub projection projecting system number 10:

The sub projection projecting system number 10 consists of the convex lens stack number 2 of the side projection unit and the large video display of the side projection unit.

In this configuration, the large video display of the side projection unit, will be positioned in front of the convex lens stack number 2 of the side projection unit, at a distance of F2 units away from the convex lens stack number 2 of the side projection unit.

And the distance of F2 units will be lesser than the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 2 of the side projection unit.

In this scenario, the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 2 of the side projection unit, will be equivalent to F units. Therefore, the distance of F2 units will be lesser than the distance of F units.

In addition to that, the distance of F2 units will be lesser than the distance the projection which will originate from each perpendicularly positioned small video display of the front projection unit will take to reach the corresponding perpendicularly positioned convex lens stack of the front projection unit.

In this scenario, the distance the projection which will originate from each perpendicularly positioned small video display of the front projection unit will take to reach the corresponding perpendicularly positioned convex lens stack of the front projection unit, will be equivalent to F1 units.

Therefore, the distance of F2 units will be lesser than the distance of F1 units.

In this configuration scenario, the images of the projections projected from the large video display of the side projection unit, when observed through the convex lens stack number 2 of the side projection unit, will be virtual and will be formed in front of the convex lens stack number 2 of the side projection unit.

In this image formation scenario, the distance where the virtual image projections will form in front of the convex lens stack number 2 of the side projection unit, will be referred to as “the virtual image formation distance number 1 of the side projection unit”.

And “the virtual image formation distance number 1 of the side projection unit” will be lesser than the “the virtual image formation distance number 1 of the front projection unit”.

The sub projection projecting system number 11:

The configuration of the sub projection projecting system number 11:

The sub projection projecting system number 11 consists of the convex lens stack number 3 of the side projection unit and the large video display of the side projection unit.

In this configuration, the large video display of the side projection unit, will be positioned in front of the convex lens stack number 3 of the side projection unit, at

a distance of F2 units away from the convex lens stack number 2 of the side projection unit.

And the distance of F2 units will be lesser than the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 3 of the side projection unit.

In this scenario, the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 3 of the side projection unit, will be equivalent to F units. Therefore, the distance of F2 units will be lesser than the distance of F units.

In addition to that, the distance of F2 units will be lesser than the distance the projection which will originate from each perpendicularly positioned small video display of the front projection unit will take to reach the corresponding perpendicularly positioned convex lens stack of the front projection unit.

In this scenario, the distance the projection which will originate from each perpendicularly positioned small video display of the front projection unit will take to reach the corresponding perpendicularly positioned convex lens stack of the front projection unit, will be equivalent to F1 units.

Therefore, the distance of F2 units will be lesser than the distance of F1 units.

In this configuration scenario, the images of the projections projected from the large video display of the side projection unit, when observed through the convex lens stack number 3 of the side projection unit, will be virtual and will be formed in front of the convex lens stack number 3 of the side projection unit.

In this image formation scenario, the distance where the virtual image projections will form in front of the convex lens stack number 3 of the side projection unit, will be referred to as “the virtual image formation distance number 1 of the side projection unit”.

And “the virtual image formation distance number 1 of the side projection unit” will be lesser than the “the virtual image formation distance number 1 of the front projection unit”.

The sub projection projecting system number 12:

The configuration of the sub projection projecting system number 12:

The sub projection projecting system number 12 consists of the convex lens stack number 4 of the side projection unit and the large video display of the side projection unit.

In this configuration, the large video display of the side projection unit, will be positioned in front of the convex lens stack number 4 of the side projection unit, at a distance of F2 units away from the convex lens stack number 4 of the side projection unit.

And the distance of F2 units will be lesser than the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 1 of the side projection unit.

In this scenario, the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 4 of the side projection unit, will be equivalent to F units. Therefore, the distance of F2 units will be lesser than the distance of F units.

In addition to that, the distance of F2 units will be lesser than the distance the projection which will originate from each perpendicularly positioned small video display of the front projection unit will take to reach the corresponding perpendicularly positioned convex lens stack of the front projection unit.

In this scenario, the distance the projection which will originate from each perpendicularly positioned small video display of the front projection unit will take to reach the corresponding perpendicularly positioned convex lens stack of the front projection unit, will be equivalent to F1 units.

Therefore, the distance of F2 units will be lesser than the distance of F1 units.

In this configuration scenario, the images of the projections projected from the large video display of the side projection unit, when observed through the convex lens stack number 4 of the side projection unit, will be virtual and will be formed in front of the convex lens stack number 4 of the side projection unit**.**

In this image formation scenario, the distance where the virtual image projections will form in front of the convex lens stack number 4 of the side projection unit, will be referred to as “the virtual image formation distance number 1 of the side projection unit”.

And “the virtual image formation distance number 1 of the side projection unit” will be lesser than the “the virtual image formation distance number 1 of the front projection unit”.

The sub projection projecting system number 13:

The configuration of the sub projection projecting system number 13:

The sub projection projecting system number 13 consists of the convex lens stack number 1 of the side projection unit, the beam splitter number 1 of the side projection unit and the small video display number 1 of the side projection unit.

In this configuration, the small video display number 1 of the side projection unit and the convex lens stack number 1 of the side projection unit are positioned in a perpendicular positional configuration with each other.

The distance the projection which will originate from the small video display number 1 of the side projection unit, will take to reach the convex lens stack number 1 of the side projection unit, will be equivalent to F3 units.

And the distance of F3 units will be lesser than the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 1 of the side projection unit**.**

In this scenario, the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 1 of the side projection unit, will be equivalent to F units.

Therefore, the distance of F3 units will be lesser than the distance of F units.

In addition to that, the distance of F3 units will be lesser than the distance the projection which will originate from each perpendicularly positioned small video display of the front projection unit will take to reach the corresponding perpendicularly positioned convex lens stack of the front projection unit.

In this scenario, the distance the projection which will originate from each perpendicularly positioned small video display of the front projection unit will take to reach the corresponding perpendicularly positioned convex lens stack of the front projection unit, will be equivalent to F1 units.

Therefore, the distance of F3 units will be lesser than the distance of F1 units.

Furthermore, the distance of F3 units will be lesser than the distance the projections which will originate from the large video display of the side projection unit, will take to reach each convex lens stack of the side projection unit.

In this scenario, the distance the projections which will originate from the large video display of the side projection unit, will take to reach each convex lens stack of the side projection unit, will be equivalent to F2 units.

Therefore, the distance of F3 units will be lesser than the distance of F2 units.

The images of the projections projected from the small video display number 1 of the side projection unit, when observed through the convex lens stack number 1 of the side projection unit, will be virtual and will be formed in front of the convex lens stack number 1 of the side projection unit**.**

In this image formation scenario, the distance where the virtual image projections will form in front of the convex lens stack number 1 of the side projection unit, will be referred to as “the virtual image formation distance number 2 of the side projection unit”.

And “the virtual image formation distance number 2 of the side projection unit” will be lesser than the “the virtual image formation distance number 1 of the side projection unit”.

In addition to that, the virtual image formation distance number 2 of the side projection unit” will be lesser than the “the virtual image formation distance number 1 of the front projection unit”.

The sub projection projecting system number 14:

The configuration of the sub projection projecting system number 14:

The sub projection projecting system number 14 consists of the convex lens stack number 2 of the side projection unit, the beam splitter number 2 of the side projection unit and the small video display number 2 of the side projection unit.

In this configuration, the small video display number 2 of the side projection unit and the convex lens stack number 2 of the side projection unit are positioned in a perpendicular positional configuration with each other.

The distance the projection which will originate from the small video display number 2 of the side projection unit, will take to reach the convex lens stack number 2 of the side projection unit, will be equivalent to F3 units.

And the distance of F3 units will be lesser than the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 2 of the side projection unit**.**

In this scenario, the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 2 of the side projection unit, will be equivalent to F units.

Therefore, the distance of F3 units will be lesser than the distance of F units.

In addition to that, the distance of F3 units will be lesser than the distance the projection which will originate from each perpendicularly positioned small video display of the front projection unit will take to reach the corresponding perpendicularly positioned convex lens stack of the front projection unit.

In this scenario, the distance the projection which will originate from each perpendicularly positioned small video display of the front projection unit will take to reach the corresponding perpendicularly positioned convex lens stack of the front projection unit, will be equivalent to F1 units.

Therefore, the distance of F3 units will be lesser than the distance of F1 units.

Furthermore, the distance of F3 units will be lesser than the distance the projections which will originate from the large video display of the side projection unit, will take to reach each convex lens stack of the side projection unit.

In this scenario, the distance the projections which will originate from the large video display of the side projection unit, will take to reach each convex lens stack of the side projection unit, will be equivalent to F2 units.

Therefore, the distance of F3 units will be lesser than the distance of F2 units.

The images of the projections projected from the small video display number 2 of the side projection unit, when observed through the convex lens stack number 2 of the side projection unit, will be virtual and will be formed in front of the convex lens stack number 2 of the side projection unit.

In this image formation scenario, the distance where the virtual image projections will form in front of the convex lens stack number 2 of the side projection unit, will be referred to as “the virtual image formation distance number 2 of the side projection unit”.

And “the virtual image formation distance number 2 of the side projection unit” will be lesser than the “the virtual image formation distance number 1 of the side projection unit”.

In addition to that, the virtual image formation distance number 2 of the side projection unit” will be lesser than the “the virtual image formation distance number 1 of the front projection unit”.

The sub projection projecting system number 15:

The configuration of the sub projection projecting system number 15:

The sub projection projecting system number 15 consists of the convex lens stack number 3 of the side projection unit, the beam splitter number 3 of the side projection unit and the small video display number 3 of the side projection unit.

In this configuration, the small video display number 3 of the side projection unit and the convex lens stack number 3 of the side projection unit are positioned in a perpendicular positional configuration with each other.

The distance the projection which will originate from the small video display number 3 of the side projection unit, will take to reach the convex lens stack number 3 of the side projection unit, will be equivalent to F3 units.

And the distance of F3 units will be lesser than the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 3 of the side projection unit**.**

In this scenario, the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 3 of the side projection unit, will be equivalent to F units.

Therefore, the distance of F3 units will be lesser than the distance of F units.

In addition to that, the distance of F3 units will be lesser than the distance the projection which will originate from each perpendicularly positioned small video display of the front projection unit will take to reach the corresponding perpendicularly positioned convex lens stack of the front projection unit.

In this scenario, the distance the projection which will originate from each perpendicularly positioned small video display of the front projection unit will take to reach the corresponding perpendicularly positioned convex lens stack of the front projection unit, will be equivalent to F1 units.

Therefore, the distance of F3 units will be lesser than the distance of F1 units.

Furthermore, the distance of F3 units will be lesser than the distance the projections which will originate from the large video display of the side projection unit, will take to reach each convex lens stack of the side projection unit.

In this scenario, the distance the projections which will originate from the large video display of the side projection unit, will take to reach each convex lens stack of the side projection unit, will be equivalent to F2 units.

Therefore, the distance of F3 units will be lesser than the distance of F2 units.

The images of the projections projected from the small video display number 3 of the side projection unit, when observed through the convex lens stack number 3 of the side projection unit, will be virtual and will be formed in front of the convex lens stack number 3 of the side projection unit.

In this image formation scenario, the distance where the virtual image projections will form in front of the convex lens stack number 3 of the side projection unit, will be referred to as “the virtual image formation distance number 2 of the side projection unit”.

And “the virtual image formation distance number 2 of the side projection unit” will be lesser than the “the virtual image formation distance number 1 of the side projection unit”.

In addition to that, the virtual image formation distance number 2 of the side projection unit” will be lesser than the “the virtual image formation distance number 1 of the front projection unit”.

The sub projection projecting system number 16:

The configuration of the sub projection projecting system number 16:

The sub projection projecting system number 16 consists of the convex lens stack number 4 of the side projection unit, the beam splitter number 4 of the side projection unit and the small video display number 4 of the side projection unit.

In this configuration, the small video display number 4 of the side projection unit and the convex lens stack number 4 of the side projection unit are positioned in a perpendicular positional configuration with each other.

The distance the projection which will originate from the small video display number 4 of the side projection unit, will take to reach the convex lens stack number 4 of the side projection unit, will be equivalent to F3 units.

And the distance of F3 units will be lesser than the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 4 of the side projection unit.

In this scenario, the combined effective focal length of the 2 convex lenses arranged in the stack configuration of the convex lens stack number 4 of the side projection unit, will be equivalent to F units.

Therefore, the distance of F3 units will be lesser than the distance of F units.

In addition to that, the distance of F3 units will be lesser than the distance the projection which will originate from each perpendicularly positioned small video display of the front projection unit will take to reach the corresponding perpendicularly positioned convex lens stack of the front projection unit.

In this scenario, the distance the projection which will originate from each perpendicularly positioned small video display of the front projection unit will take to reach the corresponding perpendicularly positioned convex lens stack of the front projection unit, will be equivalent to F1 units.

Therefore, the distance of F3 units will be lesser than the distance of F1 units.

Furthermore, the distance of F3 units will be lesser than the distance the projections which will originate from the large video display of the side projection unit, will take to reach each convex lens stack of the side projection unit.

In this scenario, the distance the projections which will originate from the large video display of the side projection unit, will take to reach each convex lens stack of the side projection unit, will be equivalent to F2 units.

Therefore, the distance of F3 units will be lesser than the distance of F2 units.

The images of the projections projected from the small video display number 4 of the side projection unit, when observed through the convex lens stack number 4 of the side projection unit, will be virtual and will be formed in front of the convex lens stack number 4 of the side projection unit.

In this image formation scenario, the distance where the virtual image projections will form in front of the convex lens stack number 4 of the side projection unit, will be referred to as “the virtual image formation distance number 2 of the side projection unit”.

And “the virtual image formation distance number 2 of the side projection unit” will be lesser than the “the virtual image formation distance number 1 of the side projection unit”.

In addition to that, the virtual image formation distance number 2 of the side projection unit” will be lesser than the “the virtual image formation distance number 1 of the front projection unit”.

The total configuration which consists of the front projection unit and the side projection unit will have the capability to project images that will exist in 4 image formation planes. These 4 image formation planes will be provided below.

The image formation plane number 1:

The images projected will form at infinity.

The image formation plane number 2:

The images projected will be virtual and when observed through the convex lens stack array will form in front of the convex lens stack array.

And in this scenario, the distance where the virtual image projections will form in front of the convex lens stack array will be equivalent to “the virtual image formation distance number 1 of the front projection unit”.

The image formation plane number 3:

The images projected will be virtual and when observed through the convex lens stack array will form in front of the convex lens stack array.

And in this scenario, the distance where the virtual image projections will form in front of the convex lens stack array will be equivalent to “the virtual image formation distance number 1 of the side projection unit”.

In addition to that, “the virtual image formation distance number 1 of the side projection unit” will be lesser than the “the virtual image formation distance number 1 of the front projection unit”.

The image formation plane number 4:

The images projected will be virtual and when observed through the convex lens stack array will form in front of the convex lens stack array.

And in this scenario, the distance where the virtual image projections will form in front of the convex lens stack array will be equivalent to “the virtual image formation distance number 2 of the side projection unit”.

In addition to that, “the virtual image formation distance number 2 of the side projection unit” will be lesser than the “the virtual image formation distance number 1 of the side projection unit”.

Furthermore, “the virtual image formation distance number 2 of the side projection unit” will be lesser than the “the virtual image formation distance number 1 of the front projection unit”.

The capability of the total configuration to project imagery simultaneously

The convex lens stack array of the front projection unit and the large video display of the front projection unit, when functioning as a projection system, will have the capability to project images that will form at infinity.

And the convex lens stack array of the front projection unit and the cyclically arranged 4 small video displays of the front projection unit which utilizes the cyclically arranged 4 beam splitters of the front projection unit, when functioning as a projection system, will have the capability to project virtual images that will form in front of the convex lens stack array of the front projection unit. And in this image projection scenario, the virtual images that will form in front of the convex lens stack array of the front projection unit will form at a distance equivalent to “the virtual image formation distance number 1 of the front projection unit”.

In addition to that, the convex lens stack array of the side projection unit and the large video display of the side projection unit, when functioning as a projection system, will have the capability to project images that will form in front of the convex lens stack array of the side projection unit. And in this image projection scenario, the virtual images that will form in front of the convex lens stack array of the side projection unit will form at a distance equivalent to “the virtual image formation distance number 1 of the side projection unit”.

Furthermore, the convex lens stack array of the side projection unit and the cyclically arranged 4 small video displays of the side projection unit which utilizes the cyclically arranged 4 beam splitters of the side projection unit, when functioning as a projection system, will have the capability to project virtual images that will form in front of the convex lens stack array of the side projection unit.

And in this image projection scenario, the virtual images that will form in front of the convex lens stack array of the side projection unit will form at a distance equivalent to “the virtual image formation distance number 2 of the side projection unit”.

The total configuration which consists of the front projection unit and the side projection unit, utilizing the front projection unit and the side projection unit collectively, will have the capability to simultaneously project images into the 4 image formation planes mentioned above.

Stated another way, the 16 sub projection systems of the total configuration, when functioning collectively, will have the capability to simultaneously project images into the 4 image formation planes mentioned above.

In addition to that, the total configuration which consists of the front projection unit and the side projection unit, utilizing the front projection unit and the side projection unit collectively, will have the capability to simultaneously project images into the 4 image formation planes mentioned above, which can be utilized to project virtual imagery into the field of view of the user of the total configuration.

Stated another way, the 16 sub projection systems of the total configuration, when functioning collectively, will have the capability to simultaneously project images into the 4 image formation planes mentioned above, which can be utilized to project virtual imagery into the field of view of the user of the total configuration.

The total configuration, utilizing the capabilities mentioned above, can display footages of virtual sceneries which contains virtual imagery in the field of view of the user of the total configuration.

The capability of the total configuration to organize the simultaneously projecting image projections into multiple image formation planes.

The total configuration will have the capability to organize the simultaneously projecting image projections into multiple image formation planes. Stated another way, the total configuration will have the capability to determine the specific image formation plane that each specific imagery included in the scene in the virtual field of view should be projected into.

Example scenario for the organization of simultaneously projecting image projections into multiple image formation planes.

The scenario of a virtual video footage, that should be visible in the field of view of the user of the total configuration, contains the following 8 virtual objects.

Virtual object number 1:

The distance mountain that should be visible in the center of the field of view of the user.

Virtual object number 2:

The building

Virtual object number 3:

The truck

Virtual object number 4:

The bridge

Virtual object number 5:

The car

Virtual object number 6:

The tree

Virtual object number 7:

The human number 1

Virtual object number 8:

The human number 2

The above mentioned 8 virtual objects of the scenario of a virtual video footage, will be organized into the 4 types of image formation planes. In this organization scenario, each virtual object will be organized into a single image formation plane. The organization of the 8 virtual objects will be provided below.

Virtual object number 1:

The distance mountain that should be visible in the center of the field of view of the user.

The image plane the virtual object should be projected into:

The image formation plane number1.

When the virtual object is projected into this image formation plane, the virtual image of the distance mountain that should be visible in the center of the field of view of the user, will be formed at infinity.

Virtual object number 2:

The building

The image plane the virtual object should be projected into:

The image formation plane number 2.

When the virtual object is projected into the image formation plane number 2, the virtual image of the building will be formed at a distance equivalent to “the virtual image formation distance number 1 of the front projection unit”, in front of the convex lens stack array.

Virtual object number 3:

The truck

The image plane the virtual object should be projected into:

The image formation plane number 3.

When the virtual object is projected into the image formation plane number 3, the virtual image of the truck will be formed at a distance equivalent to “the virtual image formation distance number 1 of the side projection unit”, in front of the convex lens stack array.

Virtual object number 4:

The bridge

The image plane the virtual object should be projected into:

The image formation plane number 3.

When the virtual object is projected into the image formation plane number 3, the virtual image of the bridge will be formed at a distance equivalent to “the virtual image formation distance number 1 of the side projection unit”, in front of the convex lens stack array.

Virtual object number 5:

The car

The image plane the virtual object should be projected into:

The image formation plane number 3.

When the virtual object is projected into the image formation plane number 3, the virtual image of the car will be formed at a distance equivalent to “the virtual image formation distance number 1 of the side projection unit”, in front of the convex lens stack array.

Virtual object number 6:

The tree

The image plane the virtual object should be projected into:

The image formation plane number 3.

When the virtual object is projected into the image formation plane number 3, the virtual image of the tree will be formed at a distance equivalent to “the virtual image formation distance number 1 of the side projection unit”, in front of the convex lens stack array.

Virtual object number 7:

The human number 1

The image plane the virtual object should be projected into:

The image formation plane number 4.

When the virtual object is projected into the image formation plane number 4, the virtual image of the human number 1 will be formed at a distance equivalent to “the virtual image formation distance number 2 of the side projection unit”, in front of the convex lens stack array.

Virtual object number 8:

The human number 2

The image plane the virtual object should be projected into:

The image formation plane number 4.

When the virtual object is projected into the image formation plane number 4, the virtual image of the human number 2 will be formed at a distance equivalent to “the virtual image formation distance number 2 of the side projection unit”, in front of the convex lens stack array.

As described above, the total configuration will have the capability to organize the simultaneously projecting image projections into multiple image formation planes. Stated another way, the total configuration will have the capability to determine the specific image formation plane that each specific imagery included in the scene in the virtual field of view should be projected into.

And during the procedure of projecting a particular virtual object into the required image formation plane, it will required to activate the required image formation plane and at the same time, it will required to deactivate all the other 3 image formation planes.

The methodology of activating the required image formation plane for a particular virtual image while deactivating all the other 3 image formation planes will be described below.

The projection requirement of the example scenario:

It will be required to project the virtual image of the distance mountain that should be visible in the center of the field of view of the user, into the image formation plane number 1, in order to let the image form at infinity.

In this projection scenario, it will be required to activate the required image formation plane, and at the same time deactivating all the other 3 image formation planes. And in this particular example scenario. The required projection plane is the image formation plane number 1. Therefore, it will be required to activate the image formation plane number 1, and at the same time it will be required to deactivate all the other 3 image formation planes.

The methodology of activating the required image formation plane. (Activating the image formation plane number 1).

The description of the 4 sub projection systems that are required to activate the image formation plane number 1:

The convex lens stack array of the front projection unit and the large video display of the front projection unit, when functioning as a projection system, will have the capability to project images that will form at infinity. This composite projection system, will contain the 4 sub projection systems which will be required to activate the image formation plane number 1.

The activation procedure of the image formation plane number 1:

Utilizing the video displaying capability of this composite projection system, the image of the distance mountain that should be visible in the center of the field of view of the user, will be generated. The image generation procedure will be achieved by generating the image of the distance mountain utilizing the pixels of the large video display. This image should be generated in a way that, once generated, the image of the distance mountain that should be visible in the center of the large video display. Once the image of the generated distance mountain is projected utilizing the composite projection system, it will be projected into the

image formation plane number 1. As the result of this projection procedure, the image of the distance mountain that will be visible in the center of the field of view of the user, and will be formed at infinity.

The methodology of deactivating the non-required image formation plane number 1. (Deactivating the image formation plane number 2).

The description of the 4 sub projection systems that are required to deactivate the image formation plane number 2:

The convex lens stack array of the front projection unit and the cyclically arranged 4 small video displays of the front projection unit which utilizes the cyclically arranged 4 beam splitters of the front projection unit, when functioning as a projection system, will have the capability to project virtual images that will form in front of the convex lens stack array of the front projection unit. And in this image projection scenario, the virtual images that will form in front of the convex lens stack array of the front projection unit will form at a distance equivalent to “the virtual image formation distance number 1 of the front projection unit”. This composite projection system, will contain the 4 sub projection systems which will be required to deactivate the image formation plane number 2.

The deactivation procedure of the image formation plane number 2:

Utilizing the video displaying capability of this composite projection system, the image of the distance mountain that should be visible in the center of the field of view of the user, will be generated. And the entire image of the distance mountain generated, should be entirely generated utilizing only the black color. The black colored image generation procedure will be achieved by generating the image of the distance mountain, entirely in black color, utilizing the pixels of the composite projection system. In this scenario, the cyclically arranged 4 small video displays of the front projection unit will collectively generate the black colored image of the distance mountain.

This black colored image should be generated in a way that, once generated, the image of the distance mountain that should be visible in the center of the collective video display area of the cyclically arranged 4 small video displays of the front projection unit.

Once the black colored image of the generated distance mountain is projected utilizing the composite projection system, it will be projected into the image formation plane number 2. As the result of this projection procedure, the black colored image of the distance mountain will be visible in the center of the field of view of the user, and will be formed at a distance equivalent to “the virtual image formation distance number 1 of the front projection unit”, in front of the convex lens stack array of this composite projection system.

In addition to that, the black colored image of the distance mountain that will be visible in the center of the field of view of the user, which was projected onto the field of view utilizing the composite projection system, which project the imagery that will form at a distance equivalent to “the virtual image formation distance number 1 of the front projection unit”, in front of the convex lens stack array of this composite projection system, should be able to completely superimpose the actual image of the distance mountain that will be visible in the center of the field of view of the user, which was projected onto the field of view utilizing the composite projection system, which projects the imagery that will form at infinity.

In this image superimposing scenario, due to the reason that the entire black colored virtual image of the entire distance mountain is entirely in black color, the black colored image of the distance mountain itself as a projection, will not have the capability to actively superimpose the actual image of the distance mountain that will be visible in the center of the field of view of the user, which was projected onto the field of view utilizing the composite projection system, which projects the imagery that will form at infinity.

The methodology of deactivating the non-required image formation plane number 2. (Deactivating the image formation plane number 3).

The description of the 4 sub projection systems that are required to deactivate the image formation plane number 3:

The convex lens stack array of the side projection unit and the large video display of the side projection unit, when functioning as a projection system, will have the capability to project images that will form in front of the convex lens stack array of the side projection unit. And in this image projection scenario, the virtual images that will form in front of the convex lens stack array of the side projection unit will form at a distance equivalent to “the virtual image formation distance number 1 of the side projection unit”. This composite projection system, will contain the 4 sub projection systems which will be required to deactivate the image formation plane number 3.

The deactivation procedure of the image formation plane number 3:

Utilizing the video displaying capability of this composite projection system, the image of the distance mountain that should be visible in the center of the field of view of the user, will be generated. And the entire image of the distance mountain generated, should be entirely generated utilizing only the black color. The black colored image generation procedure will be achieved by generating the image of the distance mountain, entirely in black color, utilizing the pixels of the composite projection system.

This black colored image should be generated in a way that, once generated, the image of the distance mountain that should be visible in the center of the video display area of the large video display of the side projection unit.

Once the black colored image of the generated distance mountain is projected utilizing the composite projection system, it will be projected into the image formation plane number 3. As the result of this projection procedure, the black colored image of the distance mountain will be visible in the center of the field of view of the user, and will be formed at a distance equivalent to “the virtual image formation distance number 1 of the side projection unit”, in front of the convex lens stack array of this composite projection system.

In addition to that, the black colored image of the distance mountain that will be visible in the center of the field of view of the user, which was projected onto the field of view utilizing the composite projection system, which project the imagery that will form at a distance equivalent to “the virtual image formation distance number 1 of the side projection unit”, in front of the convex lens stack array of this composite projection system, should be able to completely superimpose the actual image of the distance mountain that will be visible in the center of the field of view of the user, which was projected onto the field of view utilizing the composite projection system, which projects the imagery that will form at infinity.

In this image superimposing scenario, due to the reason that the entire black colored virtual image of the entire distance mountain is entirely in black color, the black colored image of the distance mountain itself as a projection, will not have the capability to actively superimpose the actual image of the distance mountain that will be visible in the center of the field of view of the user, which was projected onto the field of view utilizing the composite projection system, which projects the imagery that will form at infinity.

<u>The methodology of deactivating the non-required image formation plane number 3. (Deactivating the image formation plane number 4).</u>

The description of the 4 sub projection systems that are required to deactivate the image formation plane number 4:

The convex lens stack array of the side projection unit and the cyclically arranged 4 small video displays of the front projection unit which utilizes the cyclically arranged 4 beam splitters of the side projection unit, when functioning as a projection system, will have the capability to project virtual images that will form in front of the convex lens stack array of the side projection unit. And in this image projection scenario, the virtual images that will form in front of the convex lens stack array of the side projection unit will form at a distance equivalent to “the virtual image formation distance number 2 of the side projection unit”. This composite projection system, will contain the 4 sub projection systems which will be required to deactivate the image formation plane number 4.

The deactivation procedure of the image formation plane number 4:

Utilizing the video displaying capability of this composite projection system, the image of the distance mountain that should be visible in the center of the field of view of the user, will be generated. And the entire image of the distance mountain generated, should be entirely generated utilizing only the black color. The black colored image generation procedure will be achieved by generating the image of the distance mountain, entirely in black color, utilizing the pixels of the composite projection system. In this scenario, the cyclically arranged 4 small video displays of the side projection unit will collectively generate the black colored image of the distance mountain.

This black colored image should be generated in a way that, once generated, the image of the distance mountain that should be visible in the center of the collective video display area of the cyclically arranged 4 small video displays of the side projection unit.

Once the black colored image of the generated distance mountain is projected utilizing the composite projection system, it will be projected into the image formation plane number 4. As the result of this projection procedure, the black colored image of the distance mountain will be visible in the center of the field of view of the user, and will be formed at a distance equivalent to “the virtual image formation distance number 2 of the side projection unit”, in front of the convex lens stack array of this composite projection system.

In addition to that, the black colored image of the distance mountain that will be visible in the center of the field of view of the user, which was projected onto the field of view utilizing the composite projection system, which project the imagery that will form at a distance equivalent to “the virtual image formation distance number 2 of the side projection unit”, in front of the convex lens stack array of this composite projection system, should be able to completely superimpose the actual image of the distance mountain that will be visible in the center of the field of view of the user, which was projected onto the field of view utilizing the composite projection system, which projects the imagery that will form at infinity.

In this image superimposing scenario, due to the reason that the entire black colored virtual image of the entire distance mountain is entirely in black color, the black colored image of the distance mountain itself as a projection, will not have

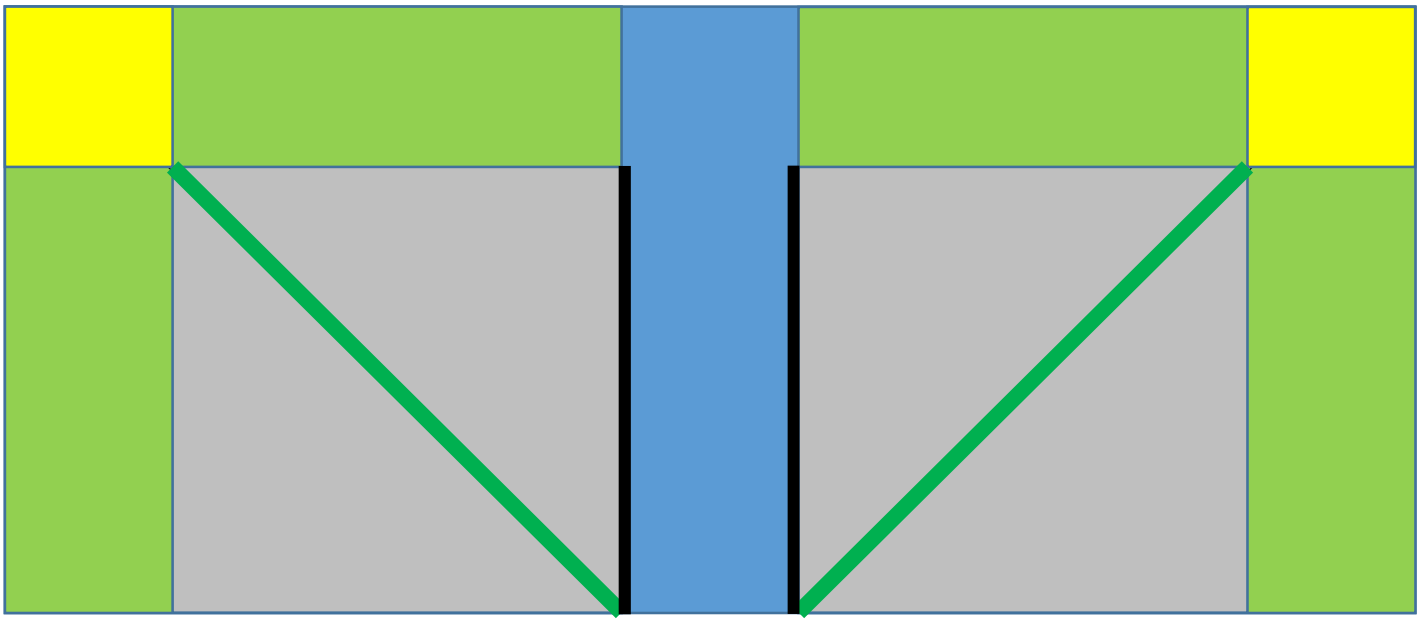
the capability to actively superimpose the actual image of the distance mountain that will be visible in the center of the field of view of the user, which was projected onto the field of view utilizing the composite projection system, which projects the imagery that will form at infinity.

As the result of the above described methodology of activating the required image formation plane for a particular virtual image while deactivating all the other 3 image formation planes will enable the user of the total configuration to experience the desired virtual image projected on the desired image formation plane.

And in the context of the example scenario, as the result of activating the image formation plane number 1 and deactivating all the other 3 image formation planes will enable the user of the total configuration to experience the view of the distance mountain in his or her field of view, being projected onto the image formation plane number 1, which will display the image formed at infinity.

The application of the total configuration:

The total configuration which consists of the front projection unit and the side projection unit, can be utilized in dual configuration, as a virtual imagery and virtual video footage viewing device. The diagram of the dual configuration arrangement will be provided below.



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