said first mirror, second mirror and optical modulator/optical amplifier assembly comprising a comb-generating cavity;

a beam source directing a single frequency beam through said first mirror and into said comb-generating cavity;

said comb-generating cavity operating on said single frequency beam and generating a multi-frequency comb that exits said comb-generating cavity by way of said second mirror;

a third mirror spaced from said second mirror along said beam propagation axis;

said second mirror and said third mirror comprising an output bandpass filter cavity;

said output bandpass filter cavity operating on said multi-frequency comb and generating an output beam that comprises having at least one frequency that is within said multi-frequency comb;

said output beam being a function of a bandpass characteristic of said bandpass filter cavity;

said output frequency beam exiting said bandpass filter cavity by way of said third mirror; and

a fourth mirror physically positioned on said propagation axis intermediate said beam source and said first mirror;

said fourth mirror and said first mirror comprising an input bandpass filter cavity.

49. The apparatus claim **48** wherein said first mirror is a movable mirror, and including:

first control means associated with said first mirror and operable to control a position of said first mirror along said propagation axis to provide a propagation length of said comb-generating cavity in accordance with said single frequency beam.

50. The apparatus of claim **49** wherein said third mirror is a movable mirror, and including:

second control means associated with said third mirror and operable to control a position of said third mirror along said propagation axis to provide a propagation length of said output bandpass filter cavity in accordance with a desired output beam.

51. The apparatus of claim **50** wherein said fourth mirror is a movable mirror, and including:

third control means associated with said fourth mirror and operable to control a position of said fourth mirror along said propagation axis in accordance with said single frequency beam.

52. The apparatus of claim **51** wherein said beam source is a laser, wherein said optical modulator is an electro-optic modulator, and including:

a modulation signal source connected to said electro-optic modulator.

53. The apparatus of claim **52** wherein said optical amplifier is an optical parametric optical amplifier.

54. The apparatus of claim **53** wherein said electro-optic modulator comprises a $MgO:LiNbO_3$ crystal, and wherein said optical parametric amplifier comprises a $MgO:LiNbO_3$ crystal.

55. The apparatus of claim **54** wherein said electro-optic modulator and optical parametric amplifier comprise a unitary device.

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