

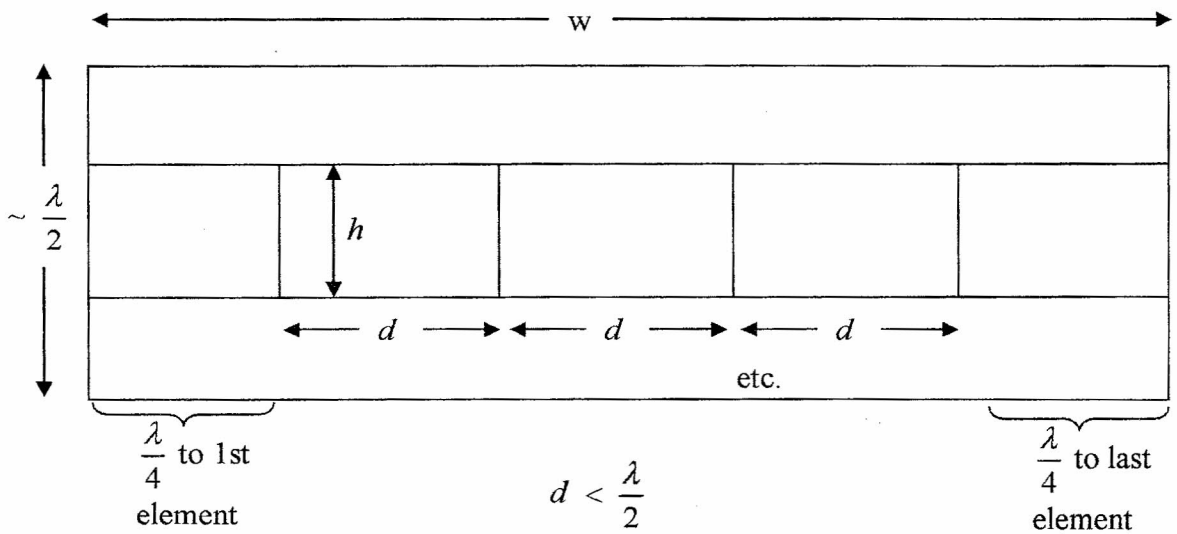
Microwave Memos
Memo 21

Special Array for 200 MHz

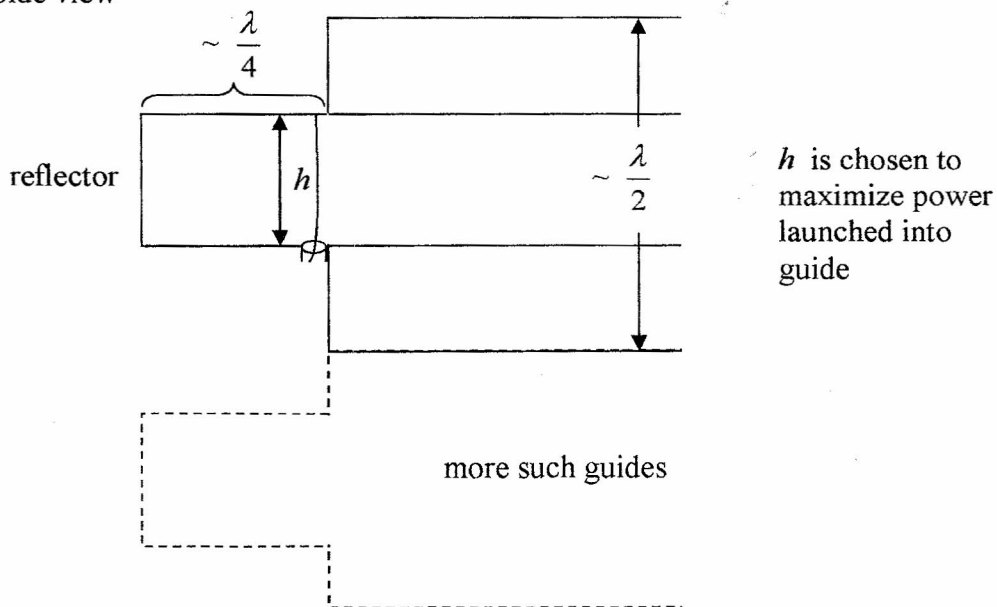
Carl E. Baum
27 November 2003

$$\lambda = 1.5 \text{ m}, \quad \lambda/2 = 0.75 \text{ m}, \quad \lambda/4 = 0.375 \text{ m}$$

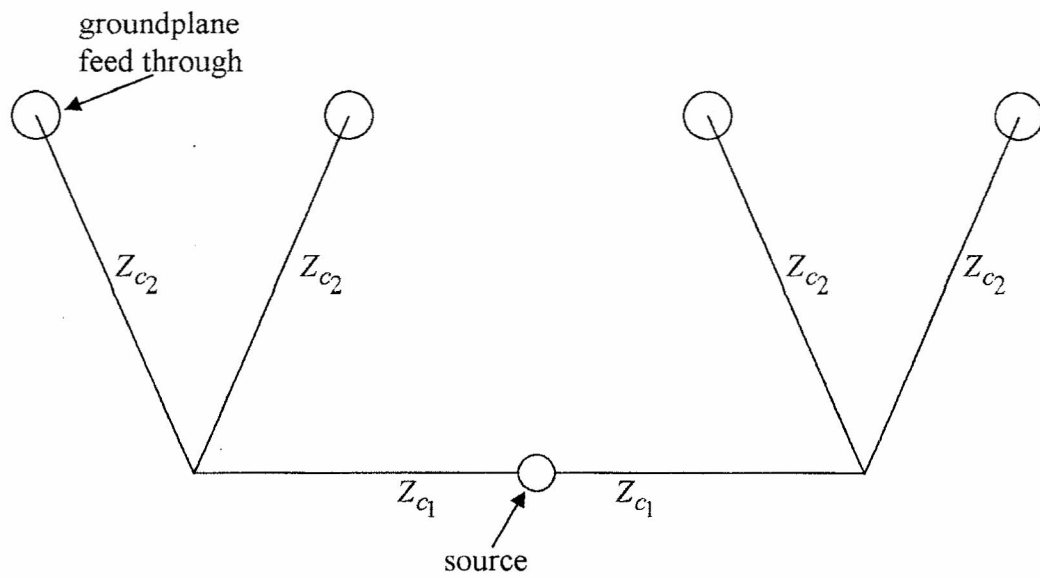
Front view



Side view



Corporate feed for say four elements

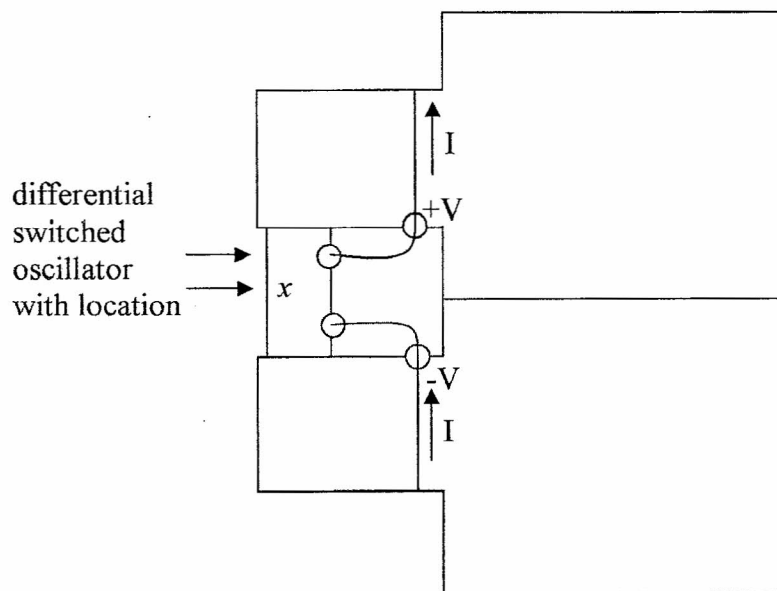


Note equal delays to all elements.

Choose Z_{c1} and Z_{c2} to optimize transfer from source to antenna elements.

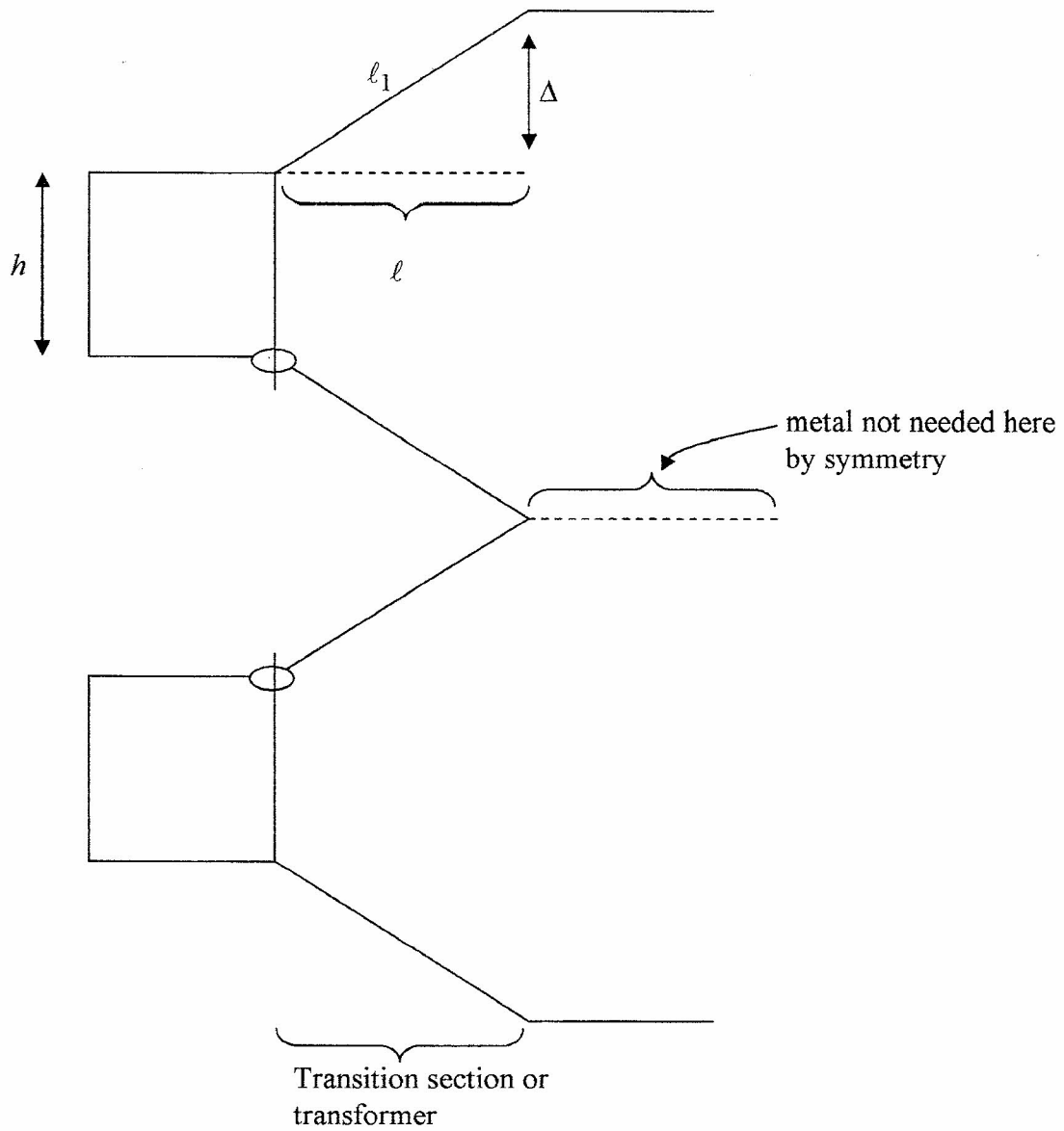
Hmmm! A 2×4 matrix of elements 2 rows, 4 columns

Differential feeding of two guides



Also see Jasik, Ch. 21 for various VHF arrays.

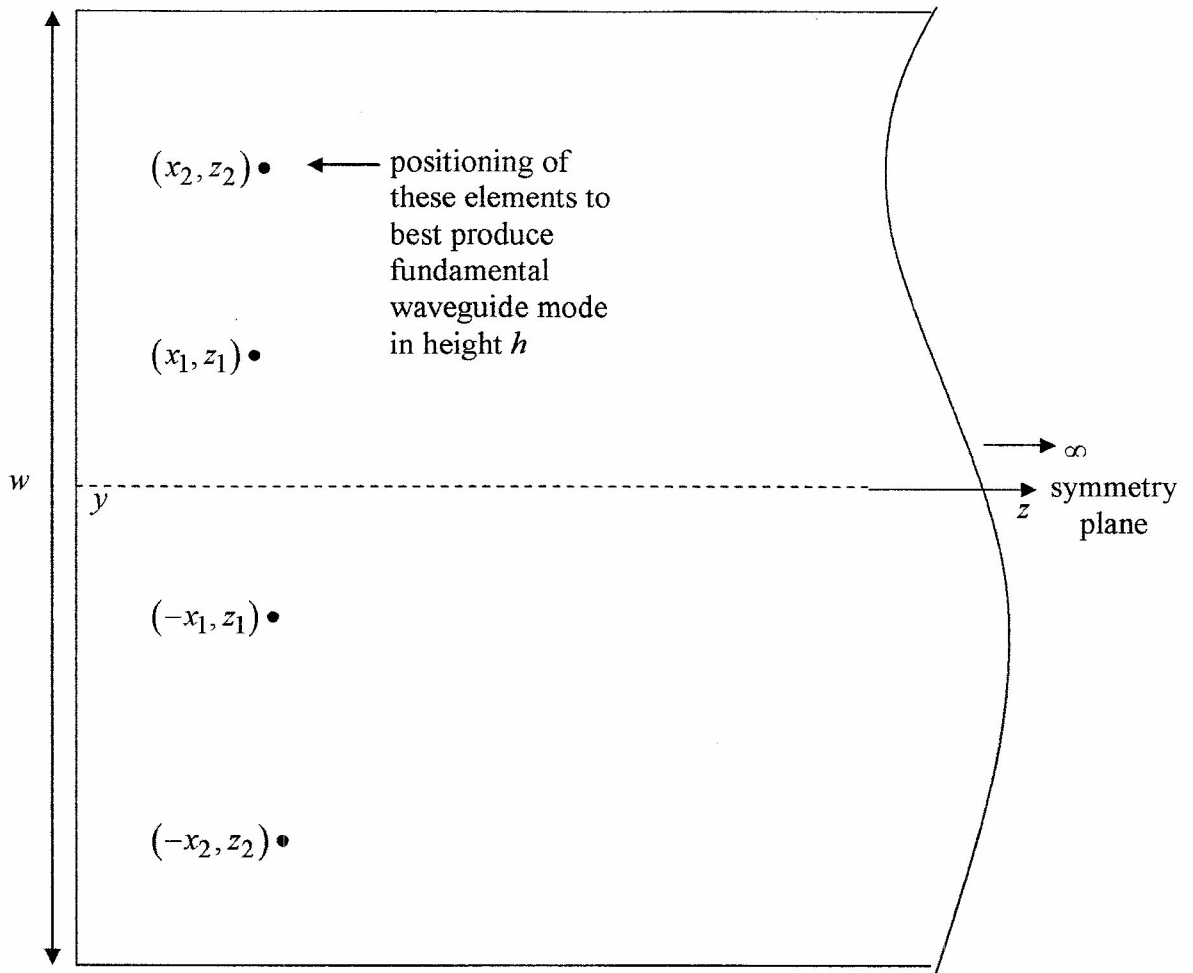
Smoother guide design



Make $l_1 - l = \left[l^2 + \Delta^2 \right]^{1/2} - l_2 \approx \frac{\Delta^2}{2l} \ll \lambda$ to keep wave planarity.

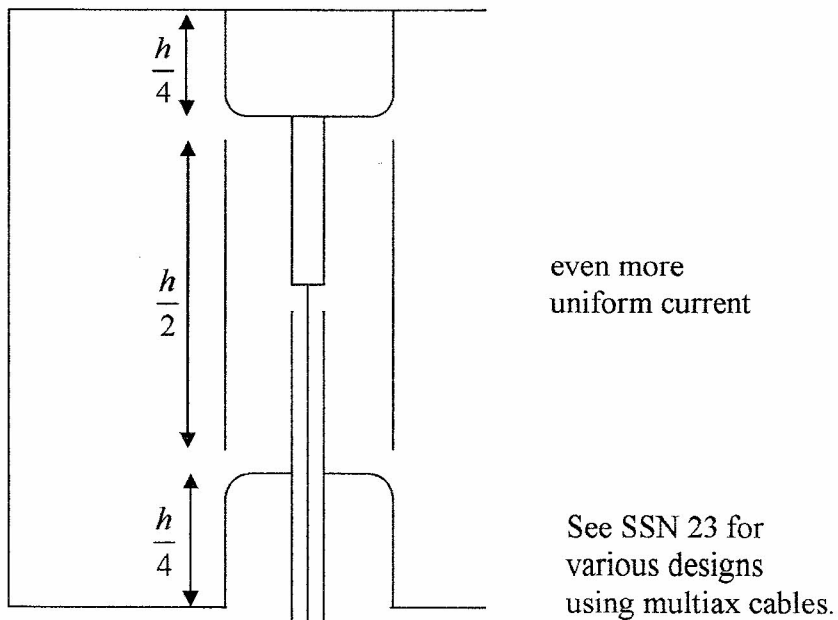
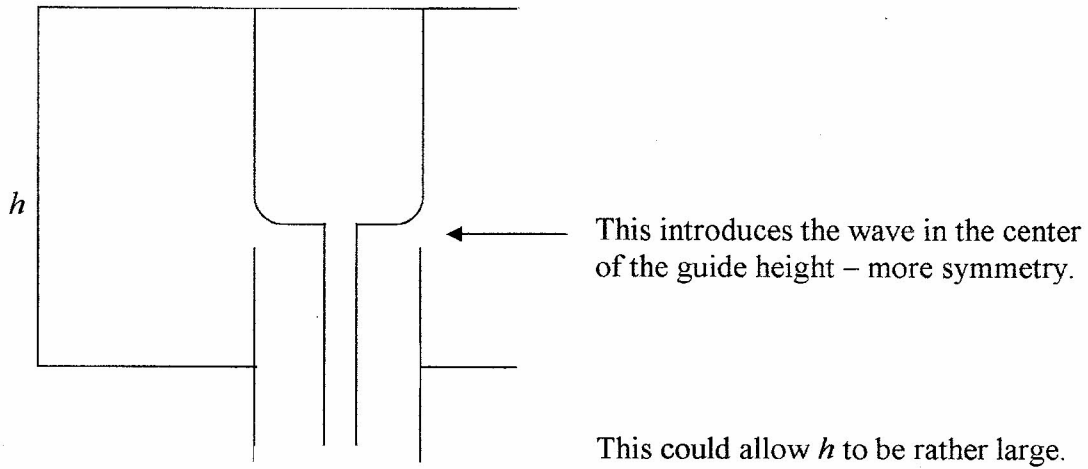
l should also be long enough to minimize reflections back to the array elements.

The canonical problem is then



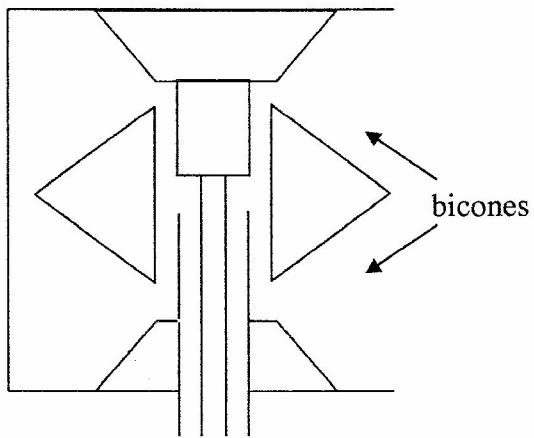
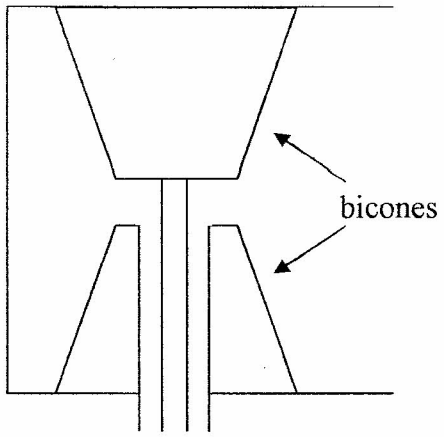
One would like, when driven all in phase, equal currents and voltages on all elements.

Design of individual elements

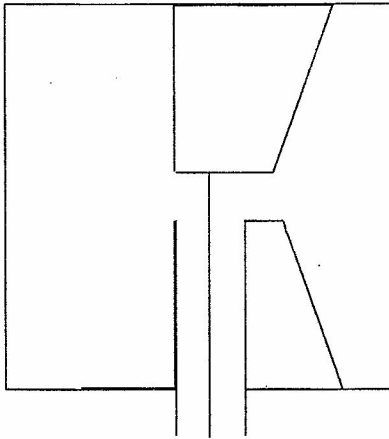


Avoids generating certain higher-order modes.

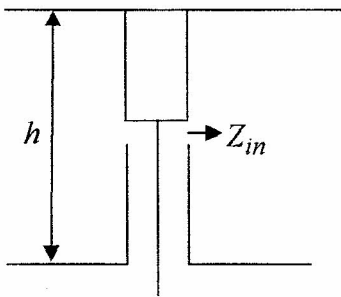
If lower impedances are desired in the elements one could use



Slanted forward bicone



etc.



Is equivalent to

