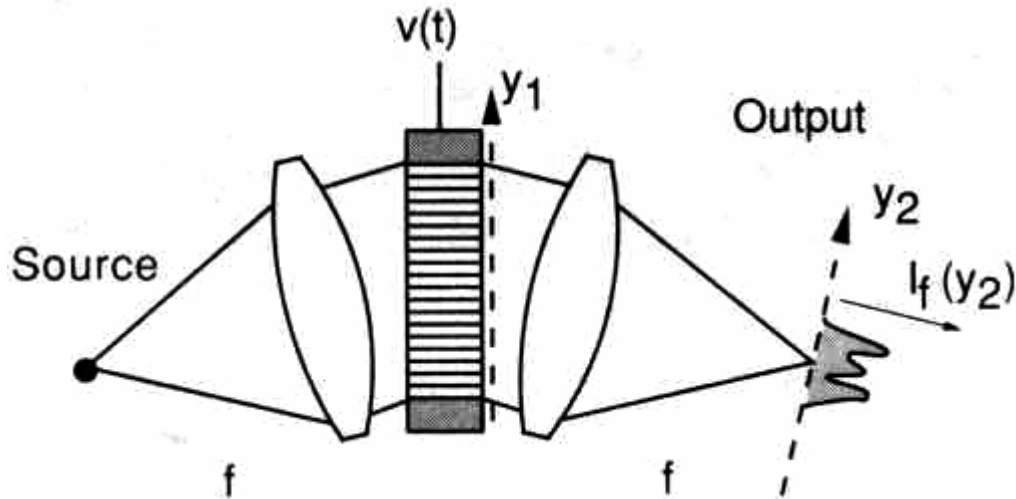


11. Acousto-Optic Signal Processing



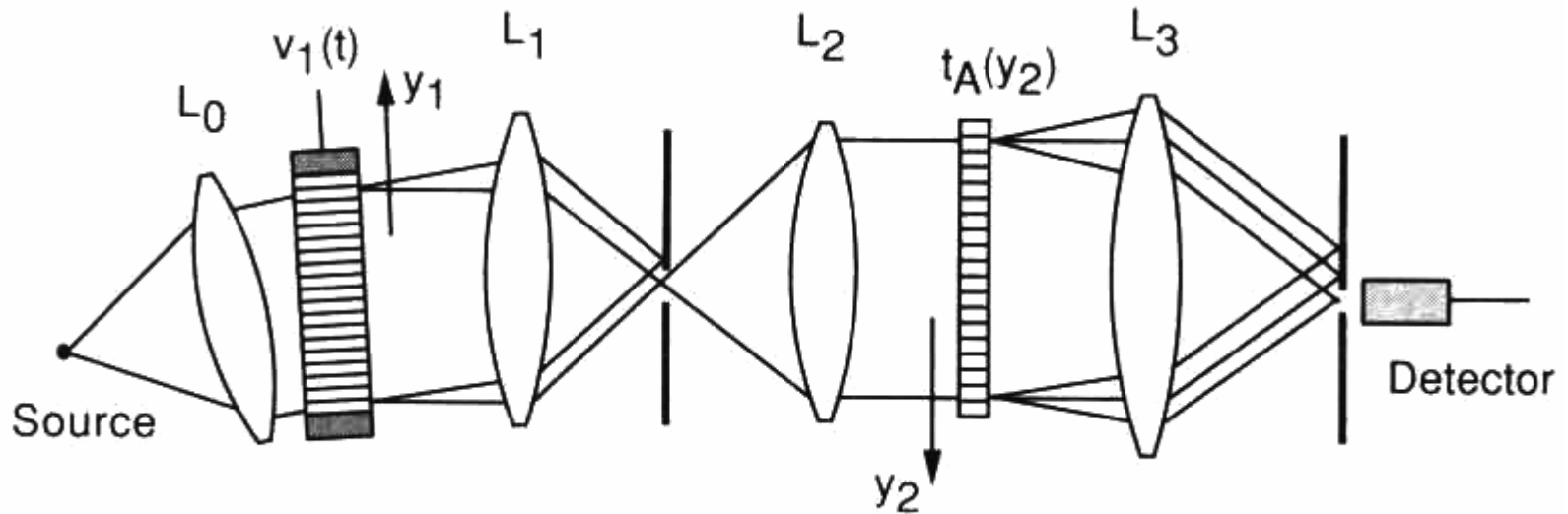
Bragg Cell Spectrum Analyzer



$$U_f(y_2; t) = C' \int_{-\infty}^{\infty} s\left(\frac{y_1 + Vt - V\tau_0}{V}\right) \text{rect} \frac{y_1}{L} \exp\left(-j \frac{2\pi y_1 y_2}{\lambda f}\right) dy_1$$

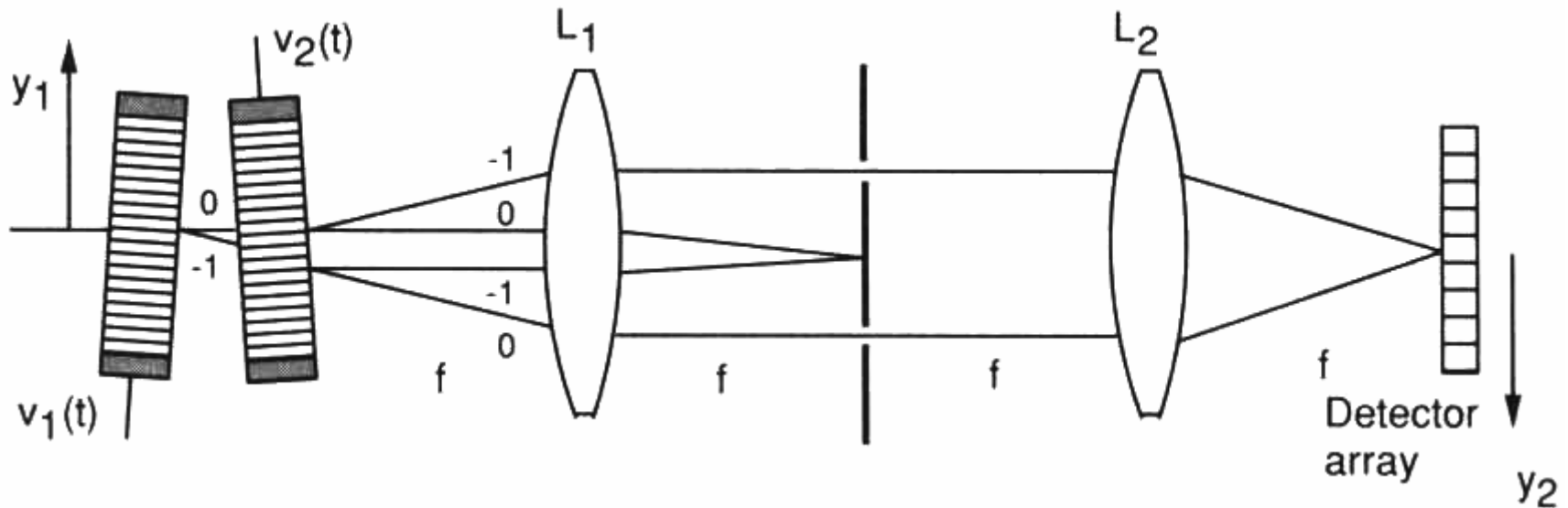
$$I_f(y_2) = \left| S\left(\frac{Vy_2}{\lambda f}\right) \exp\left[j \frac{2\pi}{\lambda f} Vy_2 (t - \tau_0)\right] \right|^2 = \left| S\left(\frac{Vy_2}{\lambda f}\right) \right|^2$$

Space-Integrating Correlator



$$i_d(t) = \left| \int_{-\infty}^{\infty} s_1 \left(\frac{y_2 + Vt - V\tau_0}{V} \right) s_2^*(y_2) \text{rect} \frac{y_2}{L} dy_2 \right|^2$$

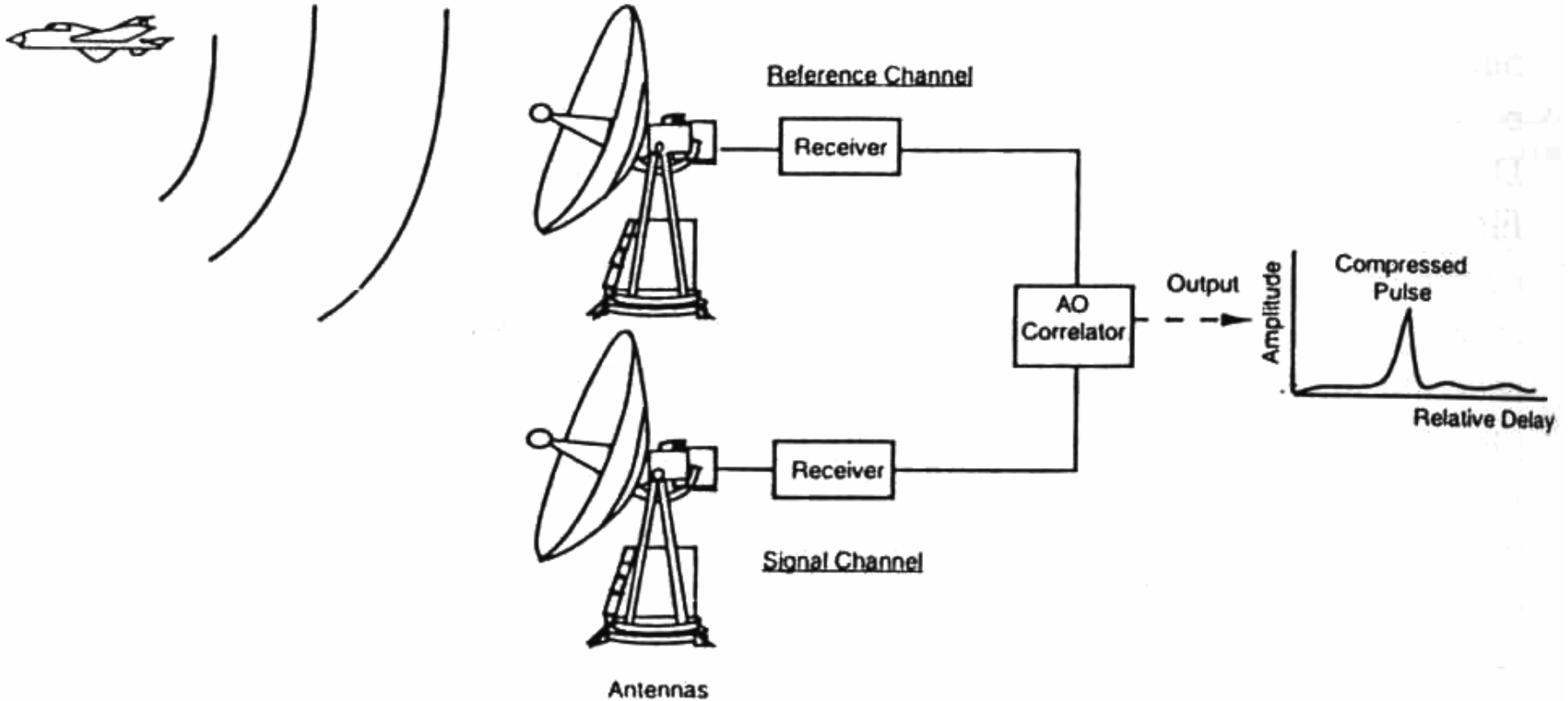
Time-Integrating Correlator



$$c(\tau) = \int_{\Delta T'} s_1(t') s_2^*(t'+\tau) dt' = |c(\tau)| e^{j\phi(\tau)}$$

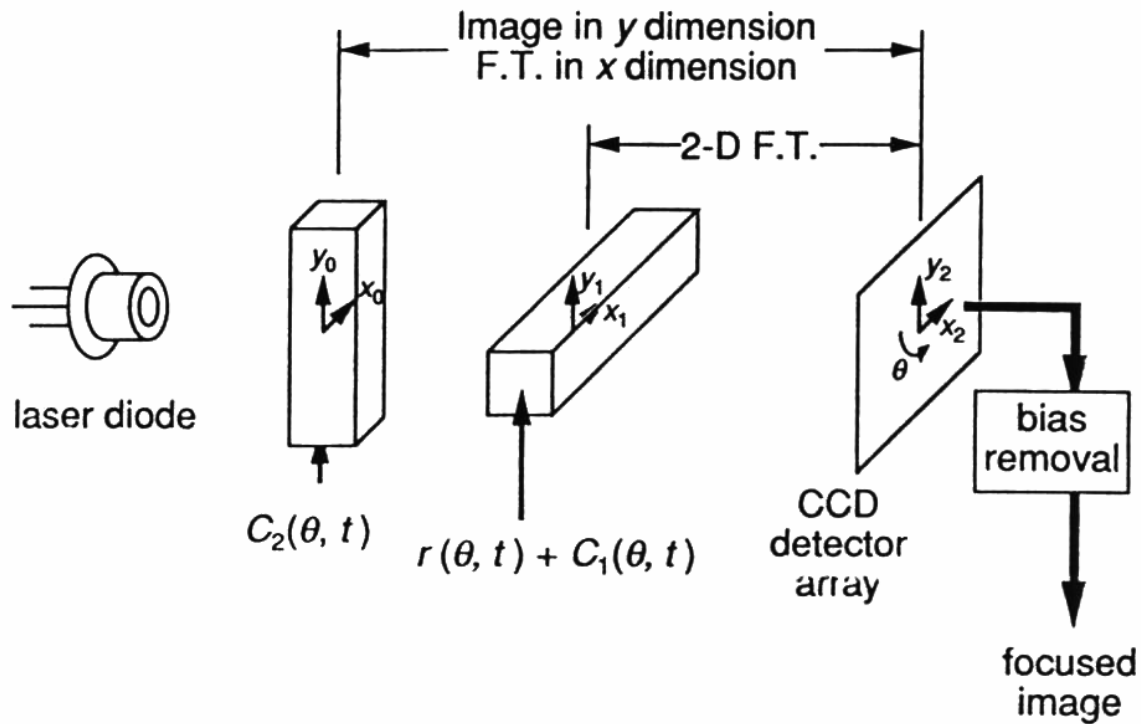


Intercept Receiver using AO Correlator

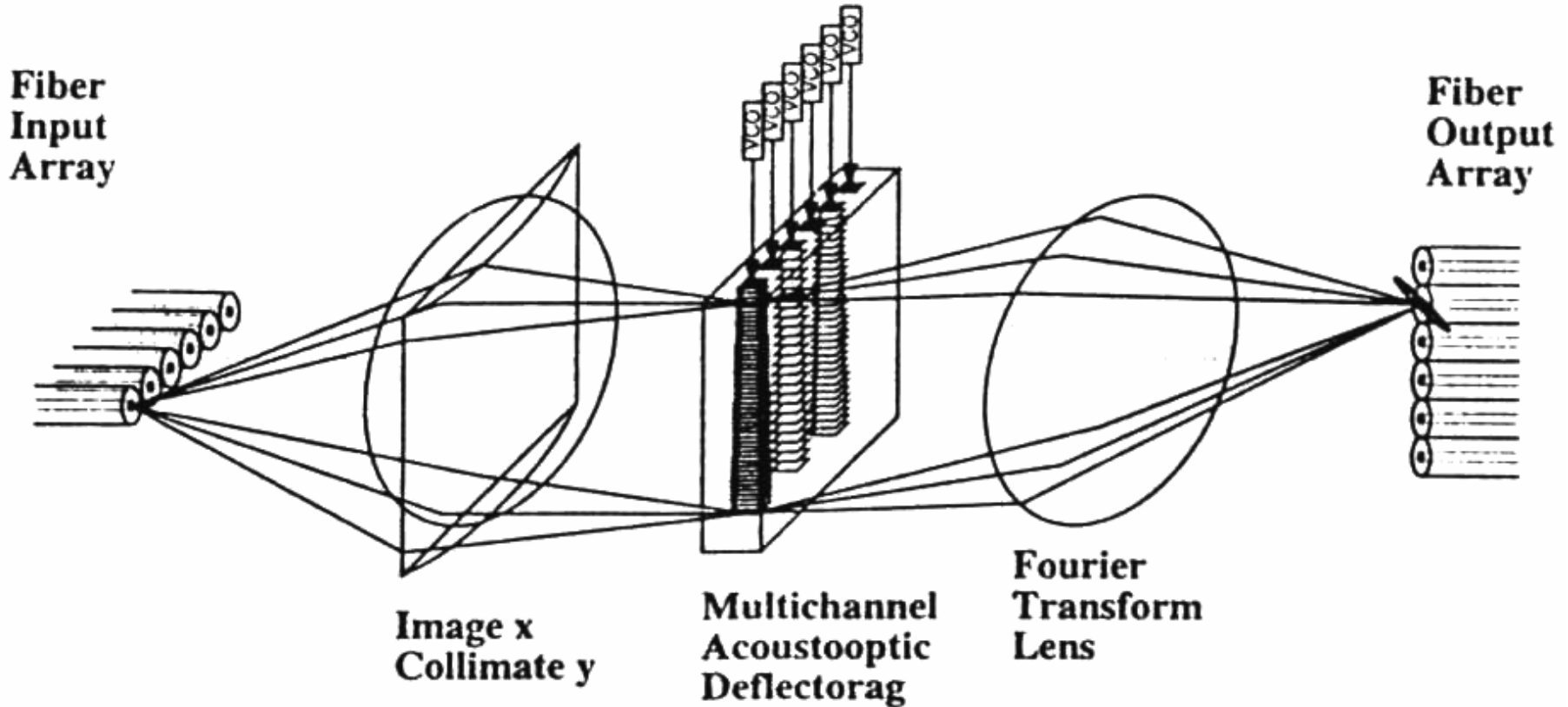


RAPID SAR

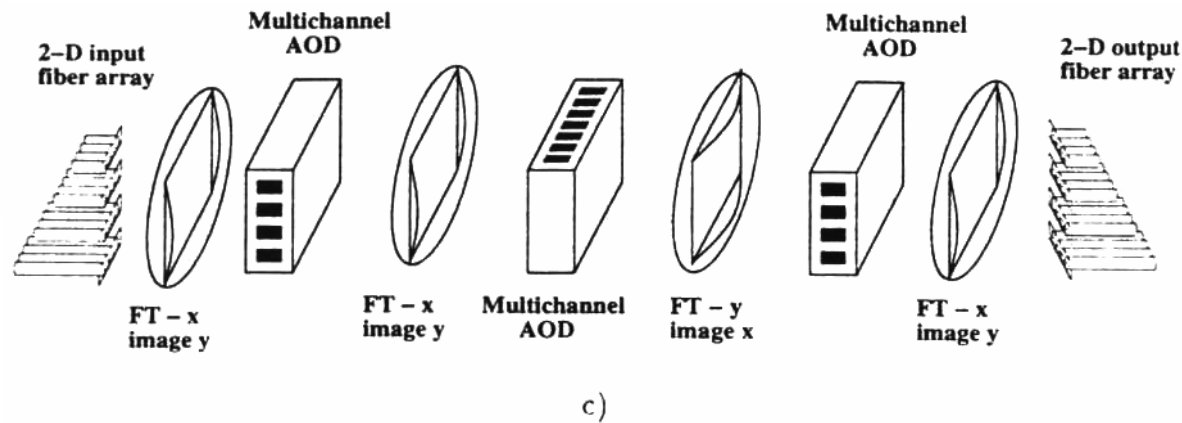
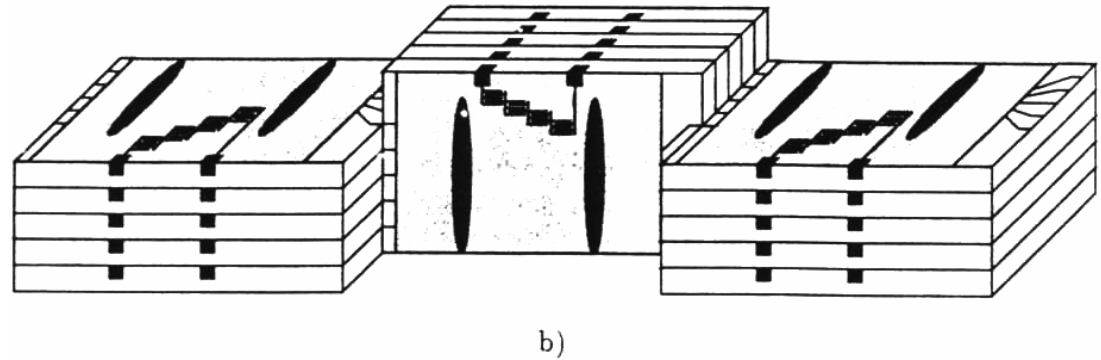
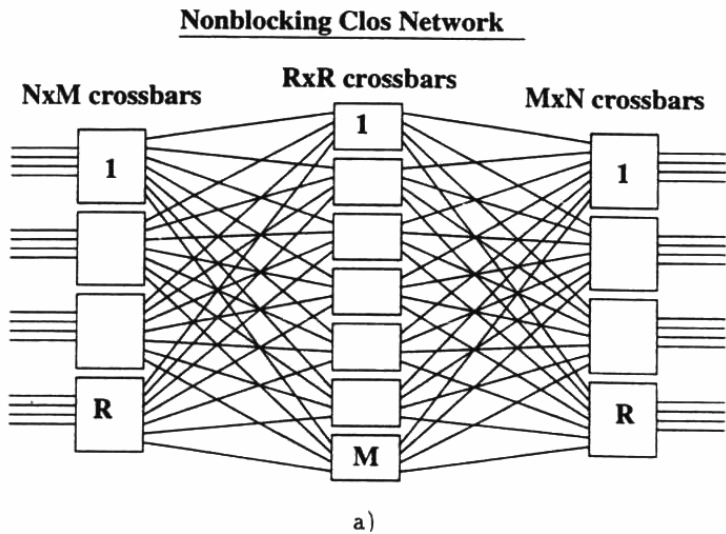
- Real-time Acousto-optic Programmable Imaging and Display for SAR using AOD



Photonic Switch using AO (I)



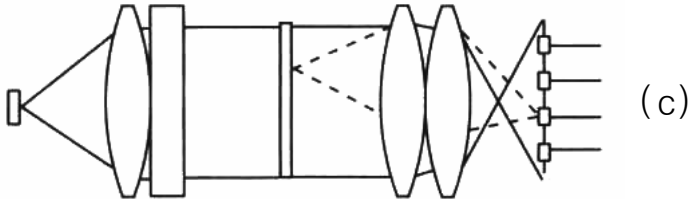
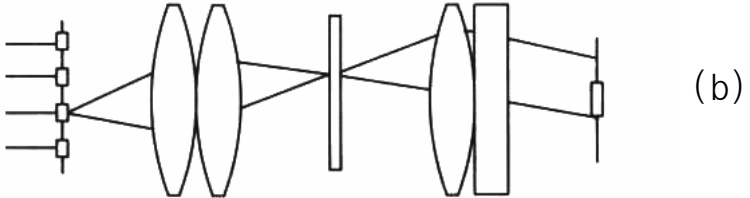
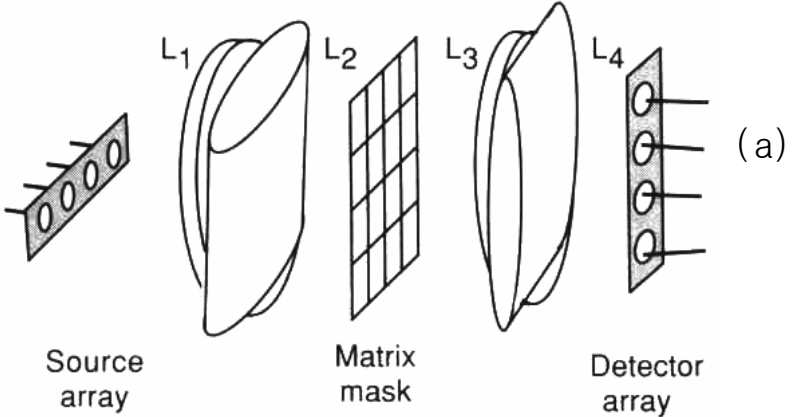
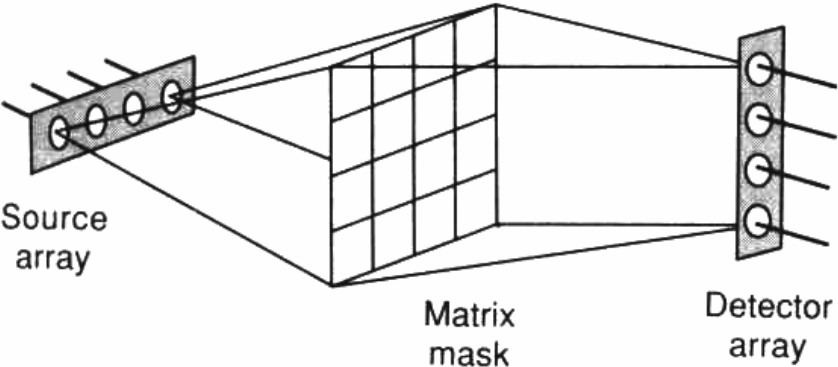
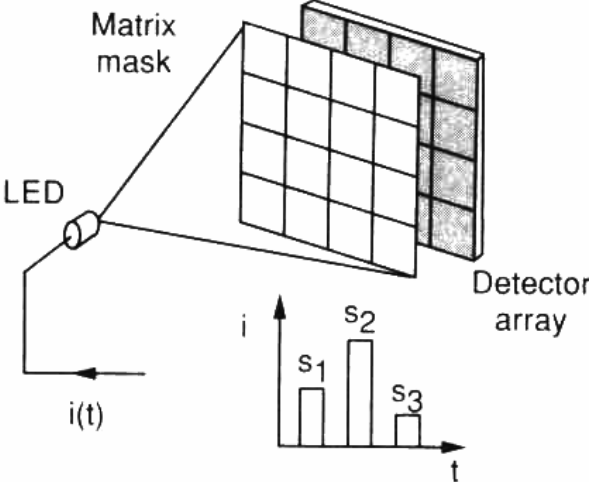
Photonic Switch using AO (II)



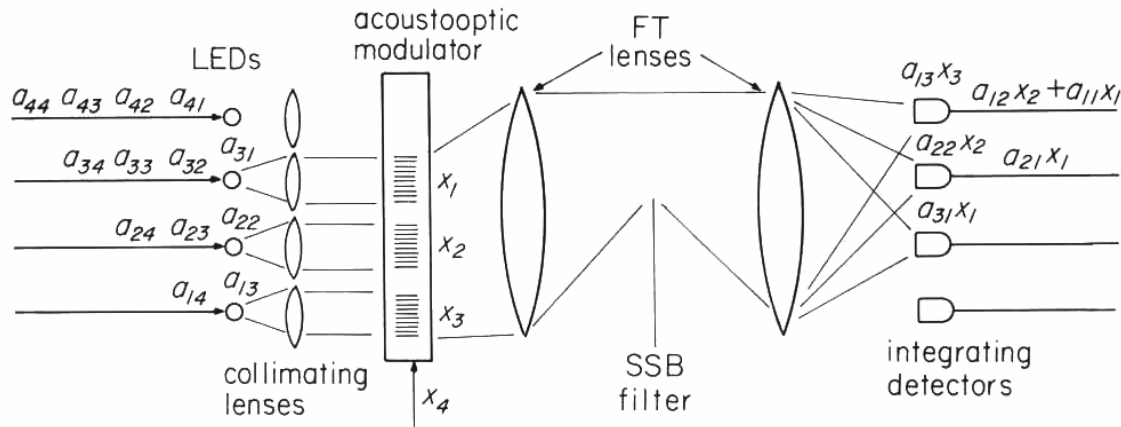
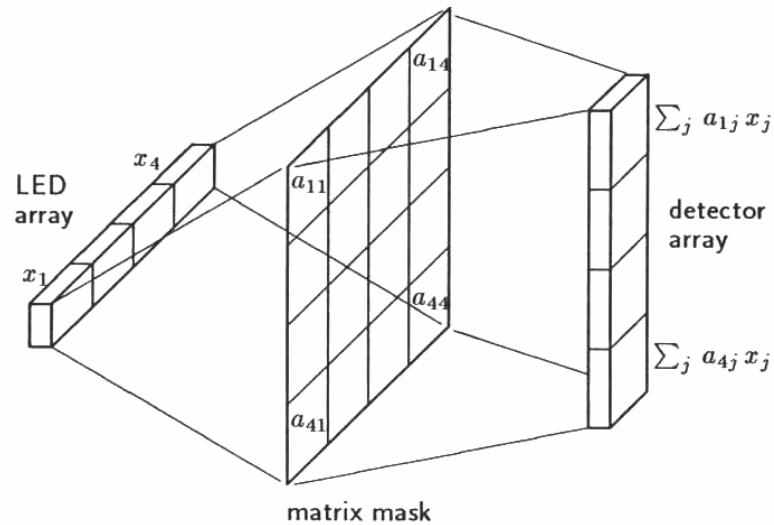
12. Optical Computing



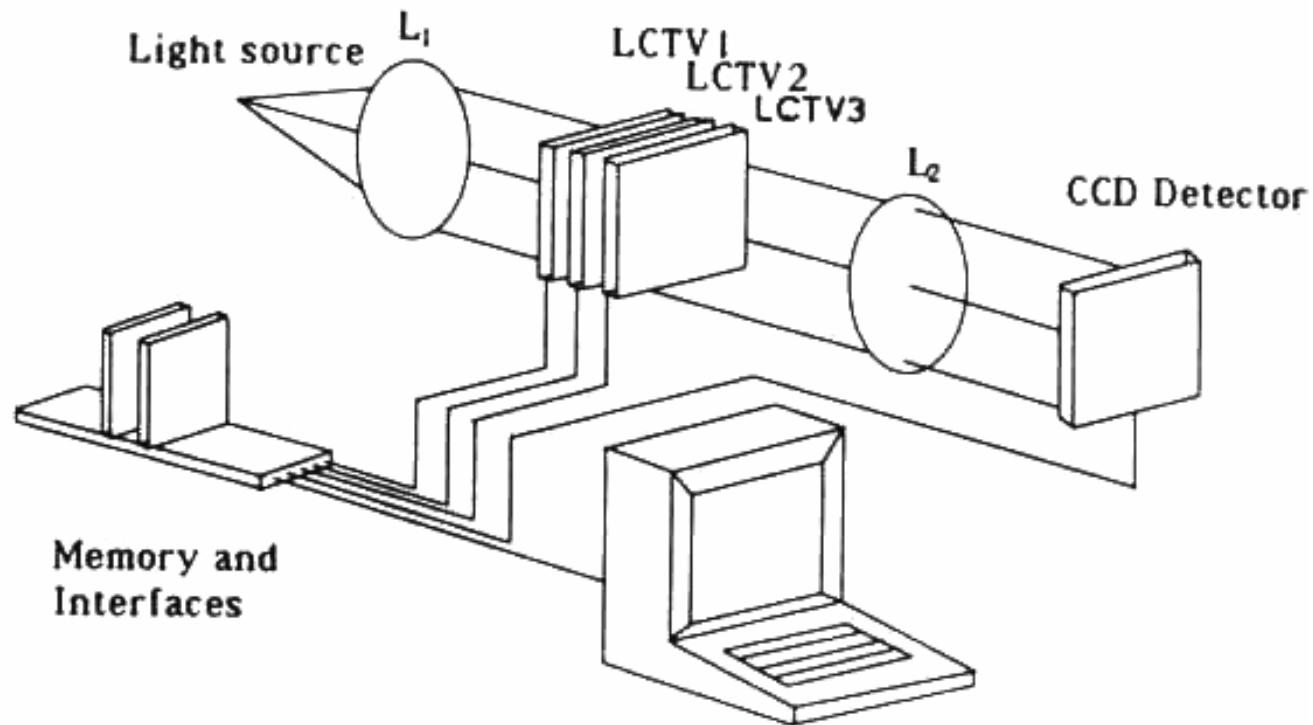
Optical Computing (I)



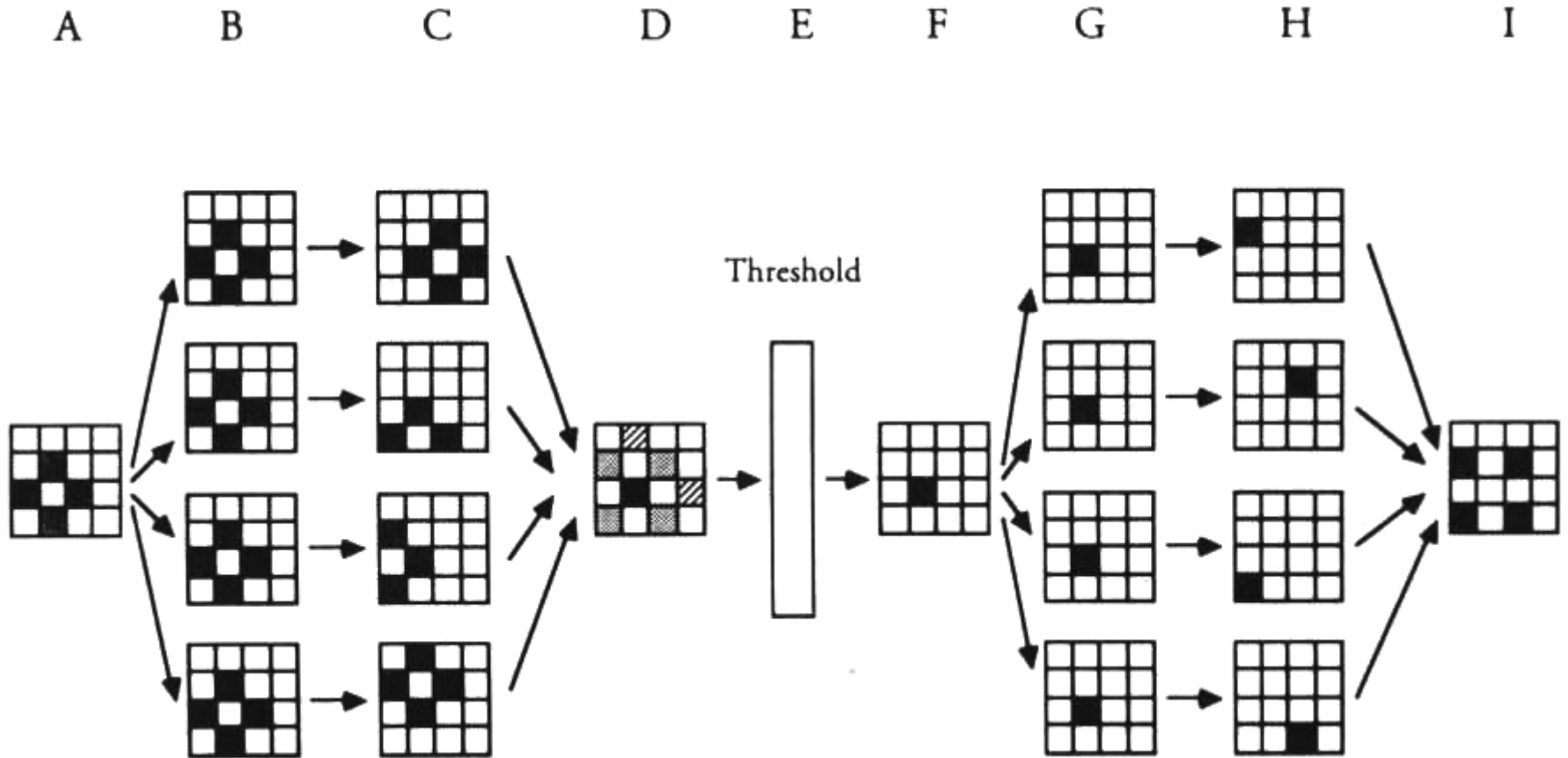
Optical Computing (II)



Shadow-casting Logic Processor



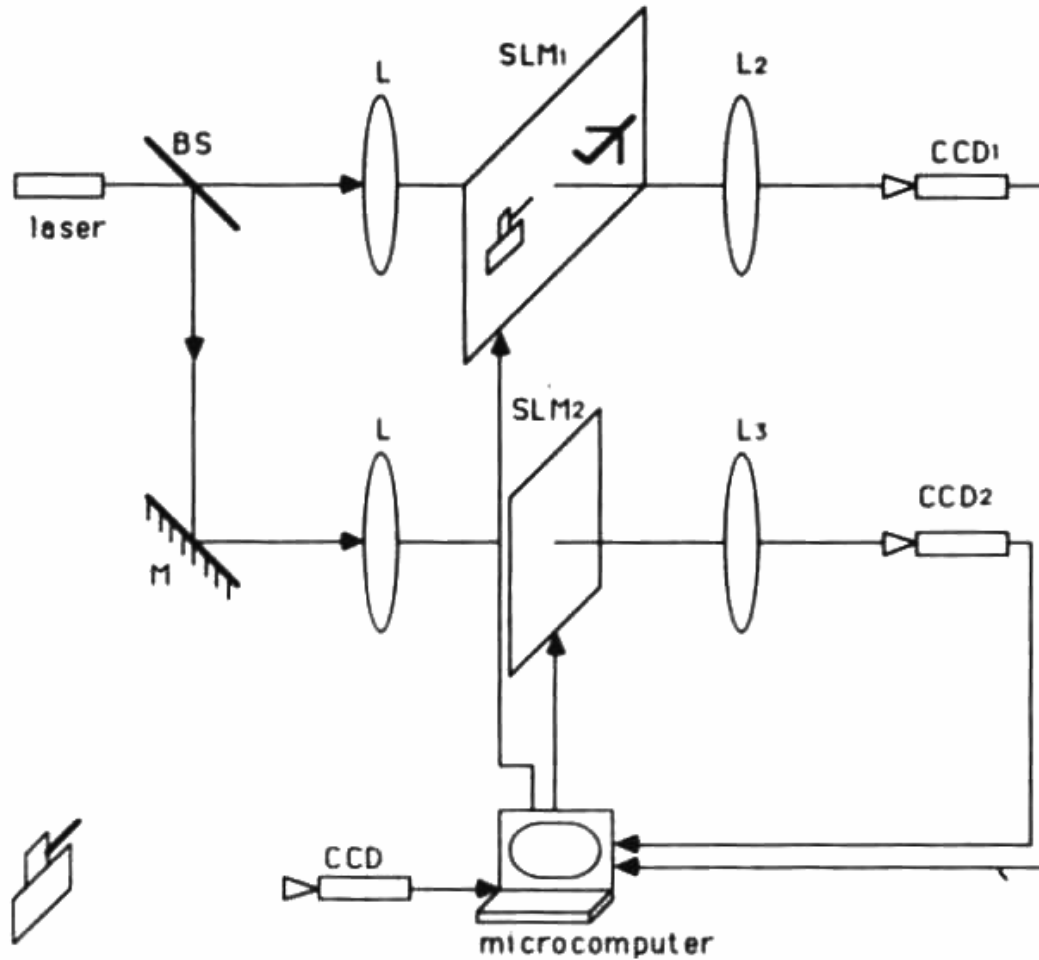
Symbolic Substitution



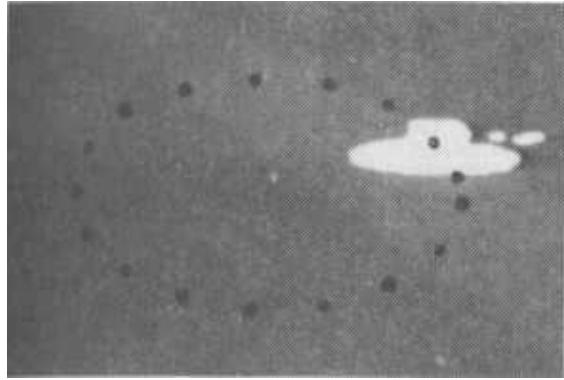
13. Hybrid-Optic Signal Processing



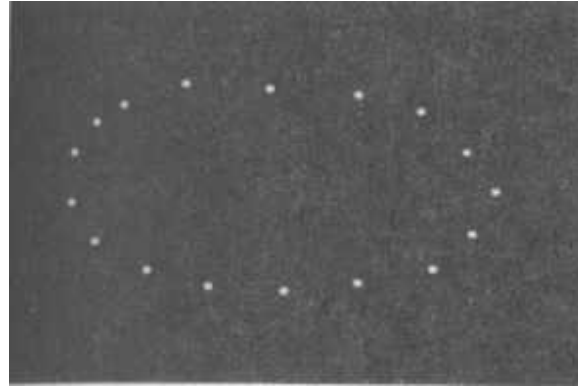
Computer-based JTC (I)



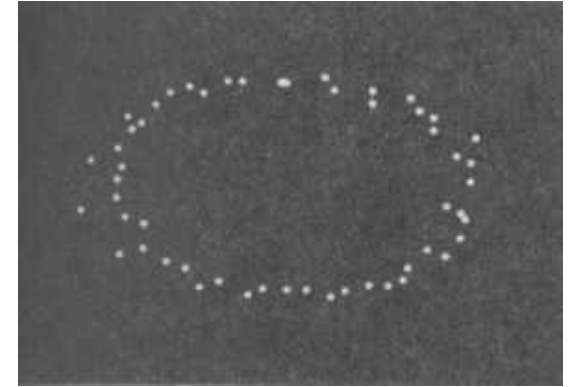
Computer-based JTC (II)



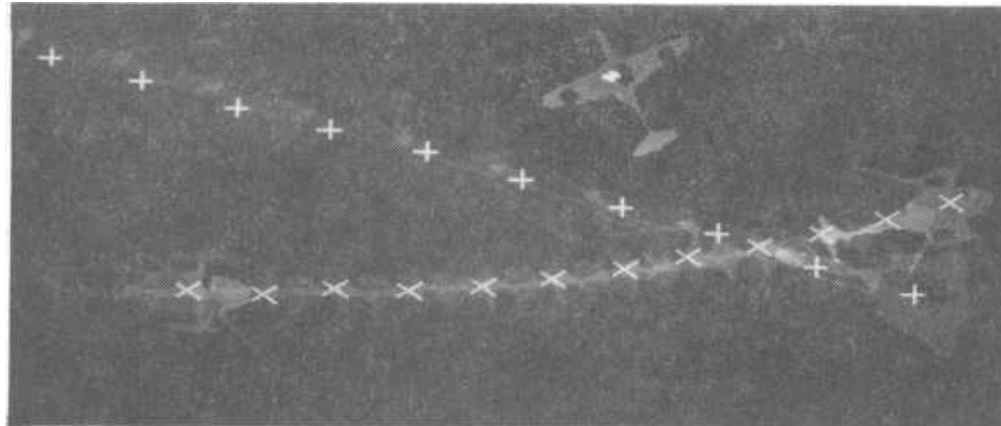
(a)



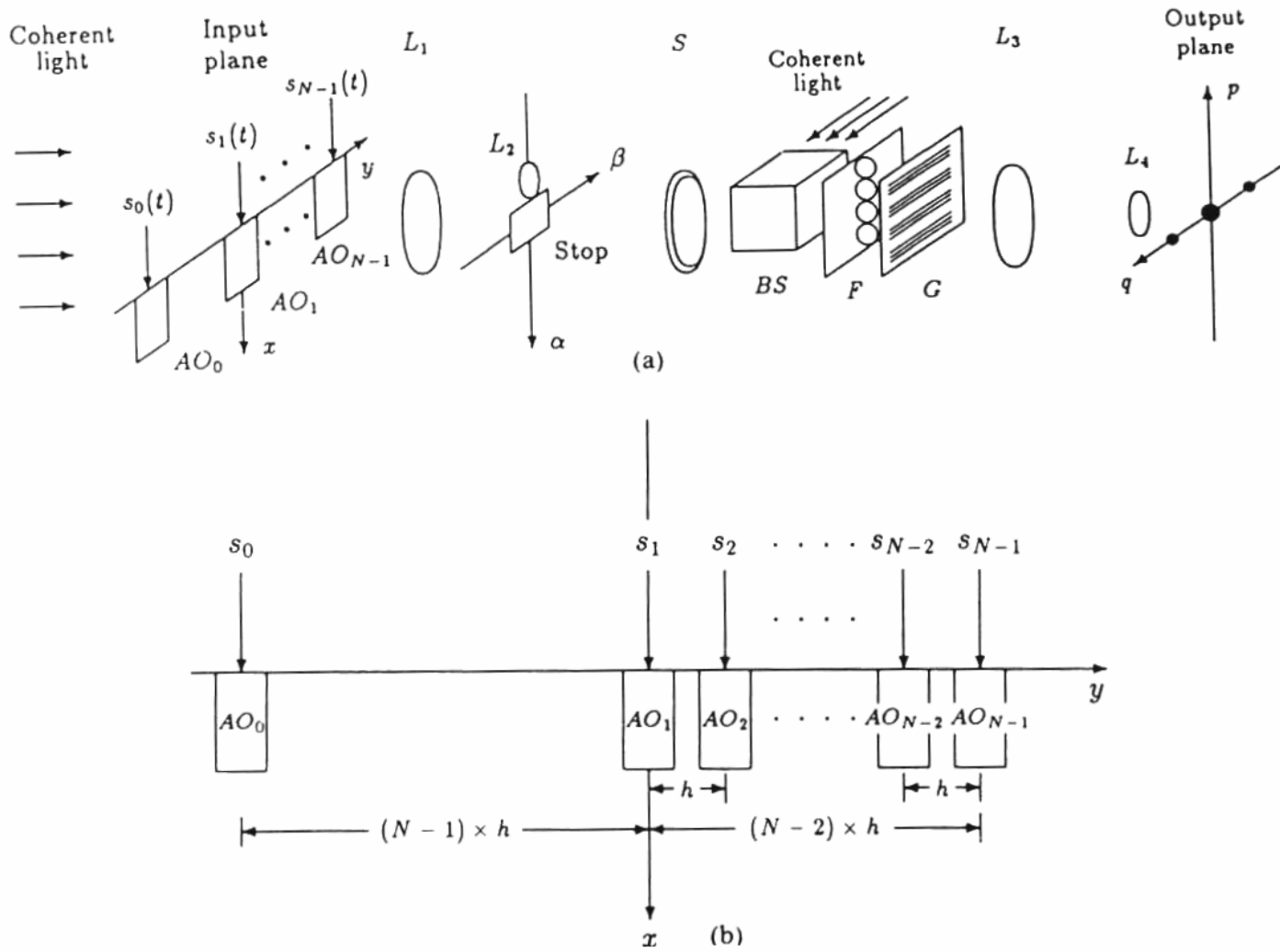
(b)



(c)



AO JTC



AO Frequency-hopping Signal Receiver

