

# Time Division Multiplexed Transmission System for Digital Picture Codes and Additional Data Using Optical Fibers

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Nowadays, digital moving picture transmission systems are becoming popular in the markets of consumer electronics and industrial applications. This paper proposes two types of inexpensive digital-picture optical-fiber transmission systems in which one transmits digital pictures of reduced bit and sampling rates, and the other transmits multiplexed digital audio and data packets together with a bandwidth-reduced digital pictures.

The transmission system has been constructed on the basis of the subjective evaluation in order to reduce the frequency bandwidth of digital NTSC picture codes transmission. So that, a minimum sampling frequency of  $2.28 \times f_{sc}$  ( $f_{sc}$ : color subcarrier frequency of 3.58 MHz) and minimum quantizing level of 5 bits could give satisfactory picture quality for visual applications. Using these parameters, 68% of digital NTSC picture information was reduced. A new serial picture code transmission system based on the subjective evaluation was constructed using the digitizing parameters of  $2.33 \times f_{sc}$  and 5 bits. So that, the transmission rate was reduced to 50 Mbps from 114 Mbps. A new multiplexing method of digital audio signal and auxiliary data to digital pictures using horizontal sync pulses of the digital picture signal was proposed. So that, the system has been constructed to transmit eighteen kinds of digital audio signals inserted into horizontal sync pulse. Four kinds of industry application systems and consumer electronics were composed using this new technique.