December 1967 Brief 67-10515

NASA TECH BRIEF

Video Synchronization Processor Overcomes Poor Signal-to-Noise Ratio

The problem:

During adverse signal conditions caused by flame attenuation, antenna pattern nulls, and near-horizon tracking, the reception and synchronization of video data from space vehicles for ground station processing has been so difficult that much nonrepeatable data has been entirely lost.

The solution:

A video/sync processor that provides clean video sync regardless of the signal-to-noise quality of the reception.

How it's done:

The video/sync processor is designed to accept video data from an airborne television system and perform the various functions required for synchronization and data processing. The heart of the system is a second-order, phase-locked loop that compares the horizontal sync component of the incoming video to the horizontal sync component of a local sync generator, and thus locks the 31.5 kc voltage-controlled oscillator of the processor to the airborne video system's master oscillator. In this manner, all ground processing equipment is controlled by the airborne master oscillator.

Sync is stripped from the incoming video signal, and clean sync (free of noise) from the local sync generator is substituted. Therefore, so long as horizontal phase lock is maintained, all ground station recording and processing devices are presented video with clean sync regardless of the signal-to-noise ratio of the received signal. The system maintains sync lock far below the point where excessive noise would normally render the video useless.

Notes:

1. This invention should be useful in satellite data reduction, commercial television reception in normally unsatisfactory locales, and in any future aircraft-to-ground applications.
2. Inquiries concerning this invention may be directed to:

   Technology Utilization Officer
   Kennedy Space Center
   Kennedy Space Center, Florida 32899
   Reference: B67-10515

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

Source: Darrow L. Webb
(KSC-10002)

Category 01