NEW DEVELOPMENTS IN SATELLITE TELEVISION SCRAMBLING

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ABSTRACT

Satellite delivery of television signals to cable affiliates is now the industry norm. To protect these signals from unauthorized reception, an extremely secure scrambling system is needed that provides high quality audio and video at an affordable cost. In fact, the need for such a scrambling system has increased significantly with the dramatic growth in private TVRO installations.

M/A-COM is meeting this need with its line of VideoCipher[tm] satellite television scrambling systems. VideoCipher systems use the Data Encryption Standard (DES) algorithm of the National Bureau of Standards for the highest level of security protection. VideoCipher produces a descrambled signal that is indistinguishable from the original, even at low C/N. Stereo digital audio, as well as reliable, flexible addressing and control of large numbers of descramblers in seconds, are also key features. Since the audio and control information is transmitted during the horizontal sync interval, the need for subcarriers with their accompanying degradation is eliminated. VideoCipher descramblers interface easily to existing CATV satellite receivers. A single spare descrambler can serve as a backup for multiple VideoCipher scrambled television feeds. The system is extremely robust and reliable, and can be configured as fully redundant with automatic switchover to hot spares.

VideoCipher I descramblers are designed with discrete components for use in CATV headends. They are currently in production and are being extensively tested over satellite. This deployment is fully proving the basic technology in the VideoCipher product line.

VideoCipher II is a direct extension of the initial VideoCipher I system and uses the same stereo digital audio and DES encryption. VideoCipher II descramblers use custom LSI circuit components and high volume manufacturing techniques to significantly reduce their cost. By the end of 1984, production versions will be available for both CATV and private TVRO applications. They will incorporate consumer features not found in VideoCipher I, such as a flexible subscriber interface with an on-screen display, a credit register for impulse pay-per-view, a parental lockout control, and a versatile text capability for messages, program guides, and other information. Of course, since all VideoCipher descramblers must be individually authorized to receive programming, the consumer units will be under the program provider's direct control.

In summary, the VideoCipher II satellite television scrambling system is a natural evolution of field-proven technology. It will give program providers an extremely secure and very high quality system for the controlled delivery of programming to CATV affiliates and/or private individuals, all at a dramatic reduction in cost relative to earlier scrambling systems.