Internal Correspondence

David Sarnoff Research Center
Subsidiary of SRI International

To: D. Raychaudhuri   Location: S-209A   Date: August 1, 1990

From: H. E. White   Location: N-202   Telephone: 2631

Subject : Outline of RF Modem Project Plans

The following milestones are listed for the RF Modem project.

1. Achieve error free transmission for QPSK and 16 QAM without added noise over TV channel 3 using balanced modulators, off-the-shelf filters and other readily available components to translate the signal from a 5 Mhz intermediate frequency.

2. Measure bit error rate versus signal-to-noise ratio for transmission over TV channel 3 and compare results to theory and error rates measured at the 5 Mhz intermediate frequency.

3. Measure QPSK and 16 QAM error rates as a function of the amplitude of a co-channel NTSC television signal. Determine the effect of modest spectrum shaping of the QAM signal on error rates and the visibility of QAM interference in the NTSC picture.

4. Develop a simulation model of the QPSK/16 QAM modem that will be used to verify operation of the hardware and then can be used to evaluate enhancements or try experiments without the need to build or modify hardware. The simulation model must be an exact copy of the hardware such that in the absence of noise the same sample sequences will be obtained in the model as in the hardware.

5. Develop circuits for symbol clock extraction and carrier recovery for the QPSK and 16 QAM signals.

6. Develop a TV type of front end for the QPSK/16 QAM reciever that will provide the selectivity, sensitivity and automatic gain control required for over-the-air testing.

7. Examine the error statisitics for QPSK/16 QAM signals with co-channel NTSC interference and select the error correction codes that will provide best performance with this interference.

8. Experimentally evaluate the performance of off-the-shelf error correction coder/decoders chips with the QPSK/16 QAM modem.

9. Extend the operation of the QAM modem to 64 QAM operation.

xc:
G. A. Reitmeier
K. Jonnalagadda