APPENDIX C
(Continued)

Cross Modulation

Cross Modulation Channel (n+2)

Weak Desired Signal (-55 dBm):

U/D = 10 dB (Protects 99% of represented population)
U/D = 17 dB (Protects 90% of represented population)
U/D = 20 dB (Protects 80% of represented population)
U/D = 25 dB (Protects 50% of represented population)

Moderate Desired Signal (-35 dBm):

U/D = 0 dB (Protects 99% of represented population)
U/D = 8 dB (Protects 90% of represented population)
U/D = 11 dB (Protects 80% of represented population)
U/D = 17 dB (Protects 50% of represented population)

Strong Desired Signal (-15 dBm): Conditionally normal, population U/D expected to be better than below since one data point > 15 dB was not used.

U/D = -9 dB (Protects 99% of represented population)
U/D = -4 dB (Protects 90% of represented population)
U/D = -2 dB (Protects 80% of represented population)
U/D = 3 dB (Protects 50% of represented population)

Cross Modulation Channel (n-2)

Weak Desired Signal (-55 dBm):

U/D = 17 dB (Protects 99% of represented population)
U/D = 21 dB (Protects 90% of represented population)
U/D = 23 dB (Protects 80% of represented population)
U/D = 27 dB (Protects 50% of represented population)

Moderate Desired Signal (-35 dBm):

U/D = 7 dB (Protects 99% of represented population)
U/D = 13 dB (Protects 90% of represented population)
U/D = 16 dB (Protects 80% of represented population)
U/D = 20 dB (Protects 50% of represented population)

Strong Desired Signal (-15 dBm):

The data were not normalizable. The results above for n+2, strong desired signal, will be used for purposes of illustration. The sample statistics indicate somewhat poorer receiver immunities for n+2.

APPENDIX C
(Continued)

Cross Modulation

Cross Modulation Channel (n-4)

Weak Desired Signal (-55 dBm):

U/D = 22 dB (Protects 99% of represented population)
U/D = 30 dB (Protects 90% of represented population)
U/D = 31 dB (Protects 80% of represented population)
U/D = 36 dB (Protects 50% of represented population)

Moderate and Strong Desired Signals (-35 and -15 dBm):

Neither of these data sets were normalizable. The sample statistics show increased receiver immunities compared to the n+2 and n-2 cross modulation channel separations. Results for n+2 will be used for purposes of illustration.

Half-IF (n+4)

Weak Desired Signal (-55 dBm):

The data were not normalizable. The results above for n+2; n+4, weak desired signal, may be used for purposes of illustration. The sample statistics indicate that the receiver immunities are similar.

Moderate Desired Signal (-35 dBm):

U/D = -7 dB (Protects 99% of represented population)
U/D = -1 dB (Protects 90% of represented population)
U/D = 2 dB (Protects 80% of represented population)
U/D = 7 dB (Protects 50% of represented population)

Strong Desired Signal (-15 dBm): Conditionally normal, population U/D expected to be better than below since one data point > 15 dB was not used.

U/D = -11 dB (Protects 99% of represented population)
U/D = -5 dB (Protects 90% of represented population)
U/D = -3 dB (Protects 80% of represented population)
U/D = 1 dB (Protects 50% of represented population)

APPENDIX C
(Continued)

IF Beat

IF Beat Channel (n+7)

Weak Desired Signal (-55 dBm):

U/D = -2 dB (Protects 99% of represented population)
U/D = 10 dB (Protects 90% of represented population)
U/D = 14 dB (Protects 80% of represented population)
U/D = 23 dB (Protects 50% of represented population)

Moderate Desired Signal (-35 dBm): Conditionally normal, population U/D expected to be better than below since one data point > 35 dB was not used.

U/D = -24 dB (Protects 99% of represented population)
U/D = -8 dB (Protects 90% of represented population)
U/D = -2 dB (Protects 80% of represented population)
U/D = 10 dB (Protects 50% of represented population)

Strong Desired Signal (-15 dBm): Conditionally normal, population U/D expected to be better than below since two data points > 15 dB were not used.

U/D = -26 dB (Protects 99% of represented population)
U/D = -14 dB (Protects 90% of represented population)
U/D = -11 dB (Protects 80% of represented population)
U/D = 0 dB (Protects 50% of represented population)

IF Beat Channel (n-7)

Weak Desired Signal (-55 dBm):

U/D = -6 dB (Protects 99% of represented population)
U/D = 6 dB (Protects 90% of represented population)
U/D = 12 dB (Protects 80% of represented population)
U/D = 22 dB (Protects 50% of represented population)

Moderate Desired Signal (-35 dBm): Conditionally normal, population U/D expected to be better than below since one data point > 35 dB was not used.

U/D = -15 dB (Protects 99% of represented population)
U/D = -2 dB (Protects 90% of represented population)
U/D = 3 dB (Protects 80% of represented population)

U/D = 13 dB (Protects 50% of represented population)

IF Beat Channel (n-7) (continued)

Strong Desired Signal (-15 dBm): Conditionally normal, population U/D expected to be better than below since two data points > 15 dB were not used.

U/D = -24 dB (Protects 99% of represented population)
U/D = -12 dB (Protects 90% of represented population)
U/D = -8 dB (Protects 80% of represented population)
U/D = 2 dB (Protects 50% of represented population)

IF Beat Channel (n+8)

Weak Desired Signal (-55 dBm): Conditionally

U/D = -29 dB (Protects 99% of represented population)
U/D = -5 dB (Protects 90% of represented population)
U/D = 4 dB (Protects 80% of represented population)
U/D = 21 dB (Protects 50% of represented population)

Moderate Desired Signal (-35 dBm): Conditionally

U/D = -38 dB (Protects 99% of represented population)
U/D = -17 dB (Protects 90% of represented population)
U/D = -8 dB (Protects 80% of represented population)
U/D = 9 dB (Protects 50% of represented population)

Strong Desired Signal (-15 dBm): Conditionally normal, population U/D expected to be better than below since two data points > 15 dB were not used.

U/D = -30 dB (Protects 99% of represented population)
U/D = -17 dB (Protects 90% of represented population)
U/D = -12 dB (Protects 80% of represented population)
U/D = -2 dB (Protects 50% of represented population)

IF Beat Channel (n-8)

Weak Desired Signal (-55 dBm):

U/D = -11 dB (Protects 99% of represented population)
U/D = 4 dB (Protects 90% of represented population)
U/D = 10 dB (Protects 80% of represented population)
U/D = 21 dB (Protects 50% of represented population)

Moderate Desired Signal (-35 dBm): Conditionally normal, population U/D expected to be better than below since one data point > 35 dB was not used.

U/D = -20 dB (Protects 99% of represented population)
U/D = -5 dB (Protects 90% of represented population)
U/D = 1 dB (Protects 80% of represented population)
U/D = 13 dB (Protects 50% of represented population)

Strong Desired Signal (-15 dBm): Conditionally normal, population U/D expected to be better than below since three data points > 15 dB were not used.

U/D = -19 dB (Protects 99% of represented population)
U/D = -10 dB (Protects 90% of represented population)
U/D = -6 dB (Protects 80% of represented population)
U/D = 2 dB (Protects 50% of represented population)

APPENDIX C
(Continued)

Image Channels

Sound Image Channel (n+14)

Weak Desired Signal (-55 dBm):

U/D = -12 dB (Protects 99% of represented population)
U/D = -1 dB (Protects 90% of represented population)
U/D = 4 dB (Protects 80% of represented population)
U/D = 13 dB (Protects 50% of represented population)

Moderate Desired Signal (-35 dBm):

U/D = -11 dB (Protects 99% of represented population)
U/D = -2 dB (Protects 90% of represented population)
U/D = 1 dB (Protects 80% of represented population)
U/D = 8 dB (Protects 50% of represented population)

Strong Desired Signal (-15 dBm):

U/D = -12 dB (Protects 99% of represented population)
U/D = -6 dB (Protects 90% of represented population)
U/D = -3 dB (Protects 80% of represented population)
U/D = 2 dB (Protects 50% of represented population)

Picture Image Channel (n+15)

Weak Desired Signal (-55 dBm):

U/D = -31 dB (Protects 99% of represented population)
U/D = -20 dB (Protects 90% of represented population)
U/D = -15 dB (Protects 80% of represented population)
U/D = -7 dB (Protects 50% of represented population)

Moderate Desired Signal (-35 dBm):

U/D = -22 dB (Protects 99% of represented population)
U/D = -17 dB (Protects 90% of represented population)
U/D = -14 dB (Protects 80% of represented population)
U/D = -10 dB (Protects 50% of represented population)

Strong Desired Signal (-15 dBm):

U/D = -31 dB (Protects 99% of represented population)
U/D = -26 dB (Protects 90% of represented population)

U/D = -24 dB (Protects 80% of represented population)
U/D = -19 dB (Protects 50% of represented population)

Notes about the UHF Taboos and ATV

Adjacent Channels (n+1 or n-1):

Television receivers typically incorporate features for specific rejection of adjacent carrier frequencies. The U/D ratios found probably reflect specific rejection of the carrier frequencies of conventional NTSC television signals, the upper adjacent visual carrier and the lower adjacent aural carrier. Also, the data were obtained with the aural carrier at a level ten decibels below the level of the visual carrier. The undesired signal level is that of the undesired channel's visual carrier, further complicating extrapolation to an undesired ATV signal.

Intermodulation Channels (e.g. n-2 along with n-4):

Intermodulation channel U/D ratios may be of some academic interest, but the data base is based on combinations of two undesired channels. Two collocated intermodulation combinations may not be likely for ATV. Also, the intermodulation test conditions typically produce interference from the combination of two conventional television visual carrier frequencies, not likely in ATV.

Cross Modulation Channels (n+2 or -2 or +3 or -3 or -4 or +5 or -5):

These channels seem to have favorable U/D ratios. It should be noted that the typical interference effect is due to the amplitude modulation from the undesired visual carrier.

Half-IF Channel (n+4):

Half-IF channels may be useful, but nonlinear behavior would be expected. The interference phenomenon observed is related to the amplitude of the visual carrier of the undesired channel.

IF Beat Channels (n+7 or -7 or +8 or -8):

The IF beat channels have relatively large standard deviations. Estimates of interference using the mean or median could be misleading.

The taboo for seven channel separations is not based on the IF beat phenomenon. It is based on oscillator radiation from conventional TV receivers at a frequency that is cochannel to channel n+7 above a tuned channel n. Emissions from these receiver oscillators could be cochannel to ATV augmentation on channel n+7. This is of some interest, for example, in communities having UHF channels at the typical six channel interval. If channel n+7 were collocated for ATV augmentation, it could be assumed that conventional receivers would be tuned to channel n with the possibility of

cochannel interference to reception of ATV augmentation on channel n+7. Such oscillator interference could occur throughout the primary ATV service area. The present oscillator taboo assumes that channels n and n+7 are sufficiently separated so that interference will affect only a part of the service area of a full power channel n+7.

Image Channels (n+14 or +15):

The sound image channel (n+14) seems to have more favorable U/D ratios than the picture image channel (n+15). It should be kept in mind that the interfering frequency for the sound image is that of the aural carrier of channel n+14. Since the channel level is described by that of the visual carrier, the sound image has an advantage of ten decibels over the picture image, for which the visual carrier frequency is the interfering frequency. (The undesired channel's visual to aural carrier ratio was set to ten decibels.) Also, the aural carrier of the sound image channel is at a less vulnerable receiver image frequency than the visual carrier of the picture image channel. Simply looking at the data leads to the conclusion that the picture image channel appears to have unfavorable U/D ratios, but the circumstances may not pertain to ATV.

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