4.1 - MODULATION CHARACTERISTICS

4.2 - General

The modulating technique for the EUT is QPSK. Emission Designators are 250K0D1D and 1M0D1D. For the 1M0D1D signal the data rate is 1024 Kilo bits per second. For the 250K0D1D signal the data rate is 256 Kilo Bits per second signal.

The output spectrum was measured using the test setup shown in Figure 3. The spectrum was fully modulated.

An attenuator was used between the KQ9LRU output and Spectrum analyzer input to prevent overloading.

4.3 - Bandwidth Determination

4.31 250K0D1D Integration

Per FCC rule part 90.209 (a) the 99 percent occupied bandwidth was calculated.

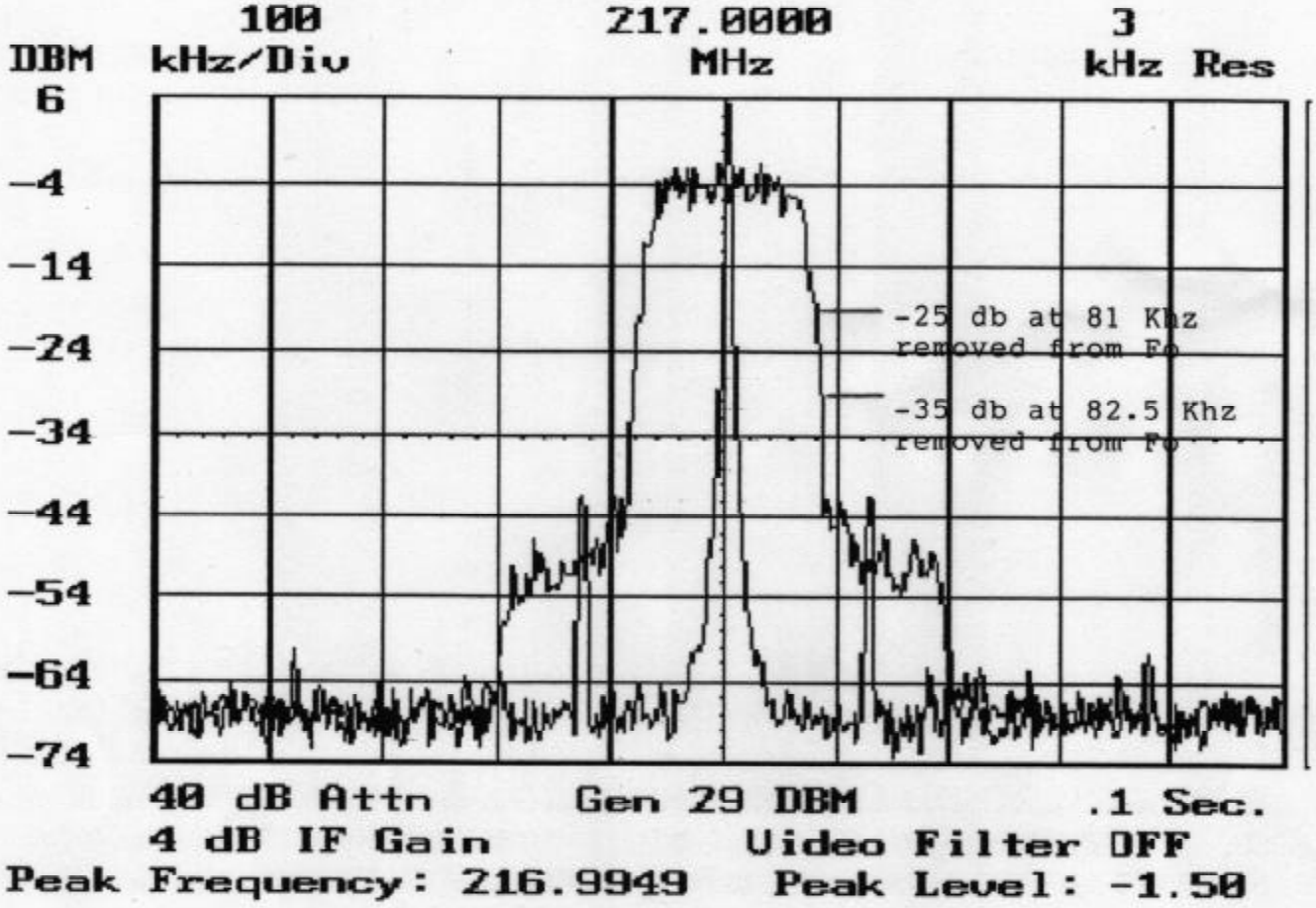
The KQ9LRU 250K0D1D, minus 25 and 35 Db points occurred at 81 Khz and 82.5 Khz, respectively, reference Figure 4 A.

For integration of the 250K0D1D signal one can choose to take thin area slices along the curve or if well within the specification, simply take the area under the curve. From Figures 4 B the 99 percent bandwidth can be approximated by taking by the area of rectangle 1 + rectangle 2 +rectangle 3 - all corners. The integration data is shown in Figure 4 B.

P/N 000022

FIGUIRE 4 A - 250KODiD MINUS 25 & 35 DB POINTS

IFR Systems Inc.
EasySpan Waveform Transfer Utility Package
RECORD NO. 83



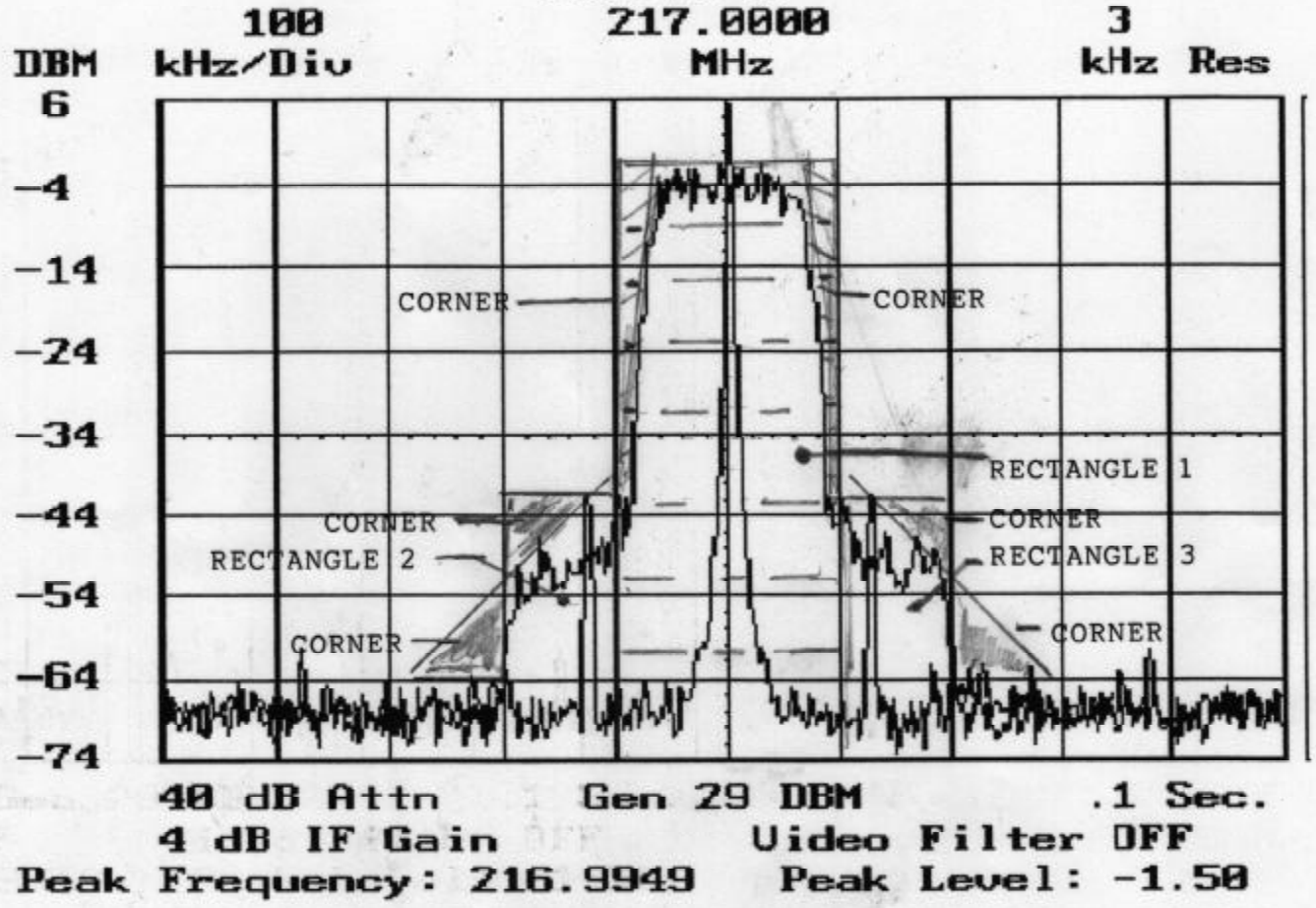
40 dB Attn Gen 29 DBM .1 Sec.
4 dB IF Gain Video Filter OFF
Peak Frequency: 216.9949 Peak Level: -1.50

Label: LRU_256
12/05/2001 21:10:49

P/N 000022

FIGURE 4 A - 250K0D1D INTEGRATION

IFR Systems Inc.
EasySpan Waveform Transfer Utility Package
RECORD NO. 83



Label: LRU_256
12/05/2001 21:10:49

RECTANGLE 1 - 72 dbm*200Khz = 14,400 dbmkhz
Rectangle 2 - 22 dbm*100Khz = 2,200 dbmkhz
Rectangle 3 - 22 dbm*100khz = 2,200 dbmkhz

SUMMATION = 18800 dbmkhz

Since the wave is symetrical; we can double

Corners = (1/2)(2)(12 dbm)(80 khz) =-960 dbm khz
(1/2)(2)(12 dbm)(80 Khz) =-960 dbm khz
(1/2)(2)(34 dbm)(30 khz) =-1020 dbmKhz

Summation = - -2940 dbmkhz

TOTAL" 15860 dbmkhz

15860 dbmkhz/72 dbm =220.27 KHZ
220,27 Khz * .99 - 218,06 Khz

4.32 1M0D1D INTEGRATION

The KQ9LRU 1M0D1D, minus 25 and 35 Db points occurred at 290 Khz and 320 Khz, respectively, reference Figure 5 A.

In the same manner as one can estimate the occupied bandwidth of the 1M0D1D signal.

The 99 percent bandwidth must be less then 1 Mhz as the estimated occupied bandwidth is less than 700 Khz. This is well within the requested 1000 Khz or 1 Mhz bandwidth. Reference Figure 5 B.

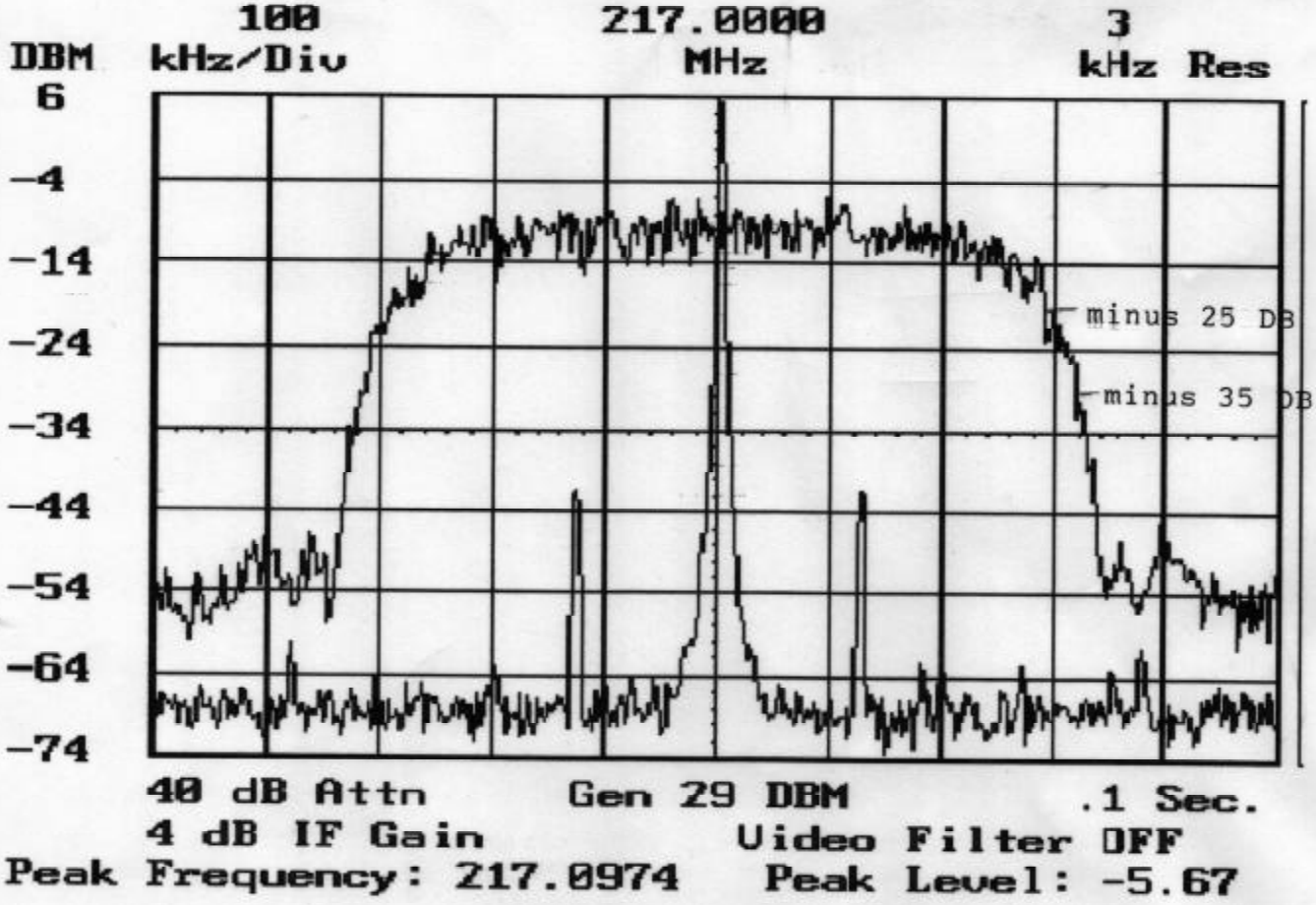
4.4 Effects of Battery End Points on Output Spectrum

No difference was noted in occupied bandwidth between the "battery end point" voltages over -30 to +55 degrees centigrade.

P/N 000025

FIGUIRE 5 A - MINUS 25 & 35 DB POINTS, 1M0D1D

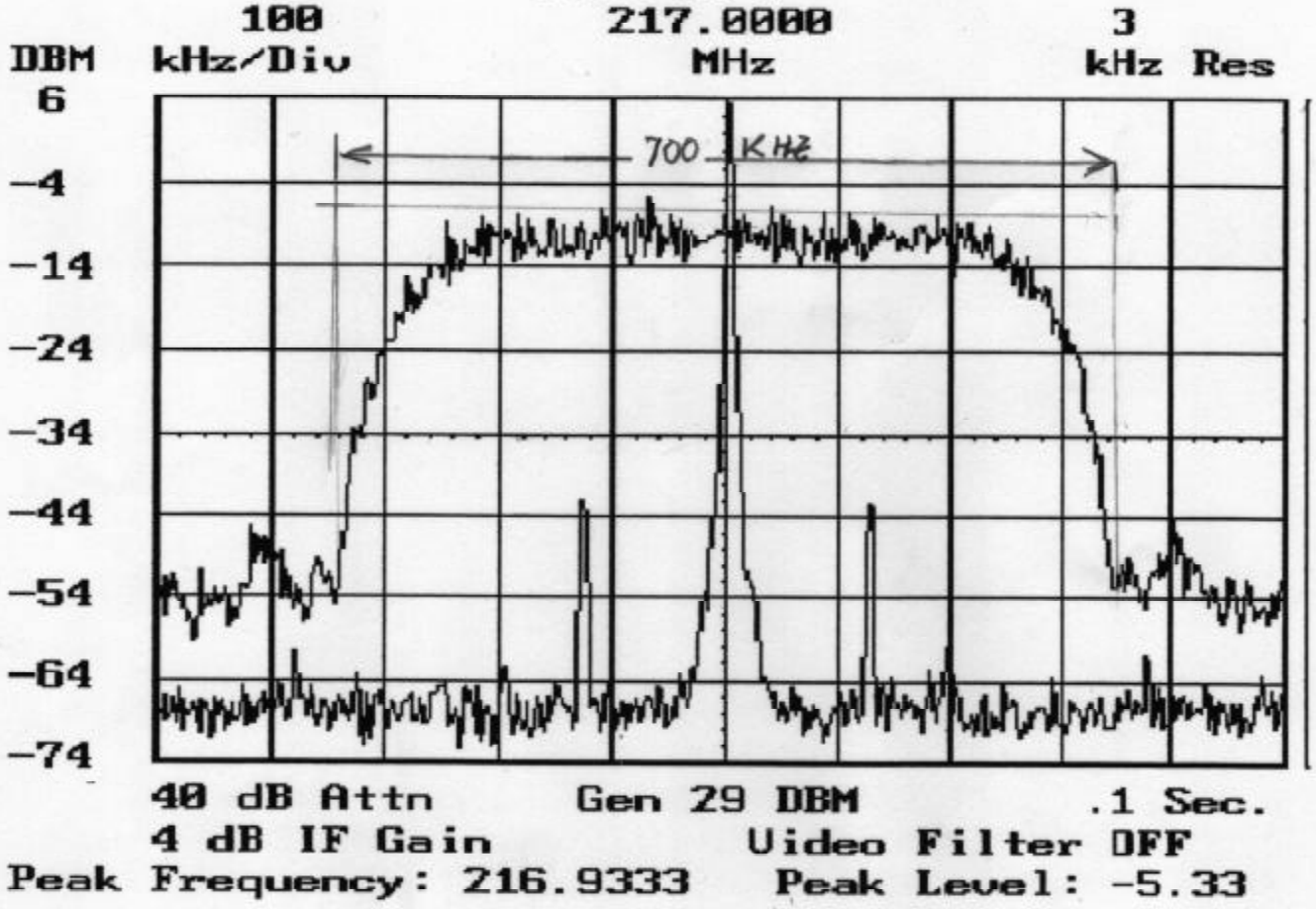
IFR Systems Inc.
EasySpan Waveform Transfer Utility Package



12/05/2001 21:10:49

FIGUIRE 5 B= INTEGATION DATA - 1MOD1D

IFR Systems Inc.
EasySpan Waveform Transfer Utility Package
RECORD NO. 87



Label: LRU_22_1024
12/05/2001 22:48:49