PBAR NOTE 582
PRELIMINARY POWER TESTS ON THE 6 GHZ KICKER

Dave McGinnis

March 26, 1998

DESCRIPTION OF TEST

The narrow band slow wave 6 GHz array used in the pickup tests of April-May of 1997 (see Pbar Notes 564-565) was converted into a kicker and placed in a vacuum tank. Two isolating absorber sections 4.5" long was placed at the ends of the array. The absorbing sections where made from Emerson & Cuming Microwave absorber MF190. The thickness of the absorber was 0.1 inches. Also, the side walls of the array in the slotted section where lined with 0.1 inches thick slabs of MF190. (Note that the design calls for a thickness of 0.040" in the slotted section.)

TWT power was supplied to only one side of the array (the other side coaxial vacuum feed-through was broken in a previous test.) and the input, reflected, and transmitted power was monitored. The RF power was increased at 5 Watt intervals. The vacuum was allowed to equilibrate for at least ½ hour after the power was increased. At each power level the vacuum pressure and RGA spectrum was recorded. This data is shown in Table 1. The vacuum pressure as a function of absorbed power is shown in Figure 1. A data fit gave a pressure doubling every 2.75 Watts of power increase. Figures 2-8 show the RGA spectrum at each power level. RGA spectrum was not obtainable for vacuum pressures greater than 10^{-5} Torr.

Power in Watts	Power out Watts	Power Refl. Watts	Power Abs. Watts	Vacuum 10e-6 Torr
5.35	0.151	0.455	4.744	0.063
10.51	0.294	0.895	9.321	0.078
19.5	0.555	1.559	17.386	0.6
25.4	0.732	2.26	22.408	2.1
30.1	0.873	2.56	26.667	4.1
34.9	1.026	2.75	31.124	6.8
40.1	1.165	3.5	35.435	11
45.1	1.28	4.38	39.44	77
50.8	1.38	5.63	43.79	230

Table 1. Power and Vacuum Levels

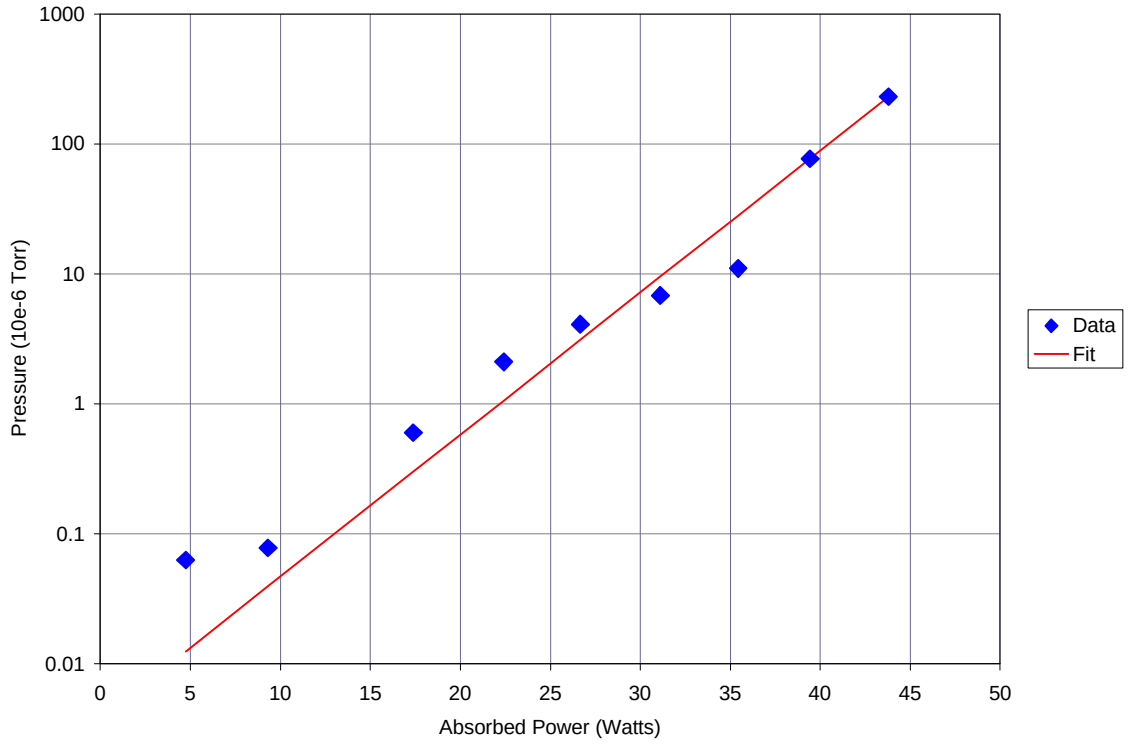

Figure 1. Vacuum pressure versus absorbed power. The vacuum level doubled every 2.75 Watt increase of power.

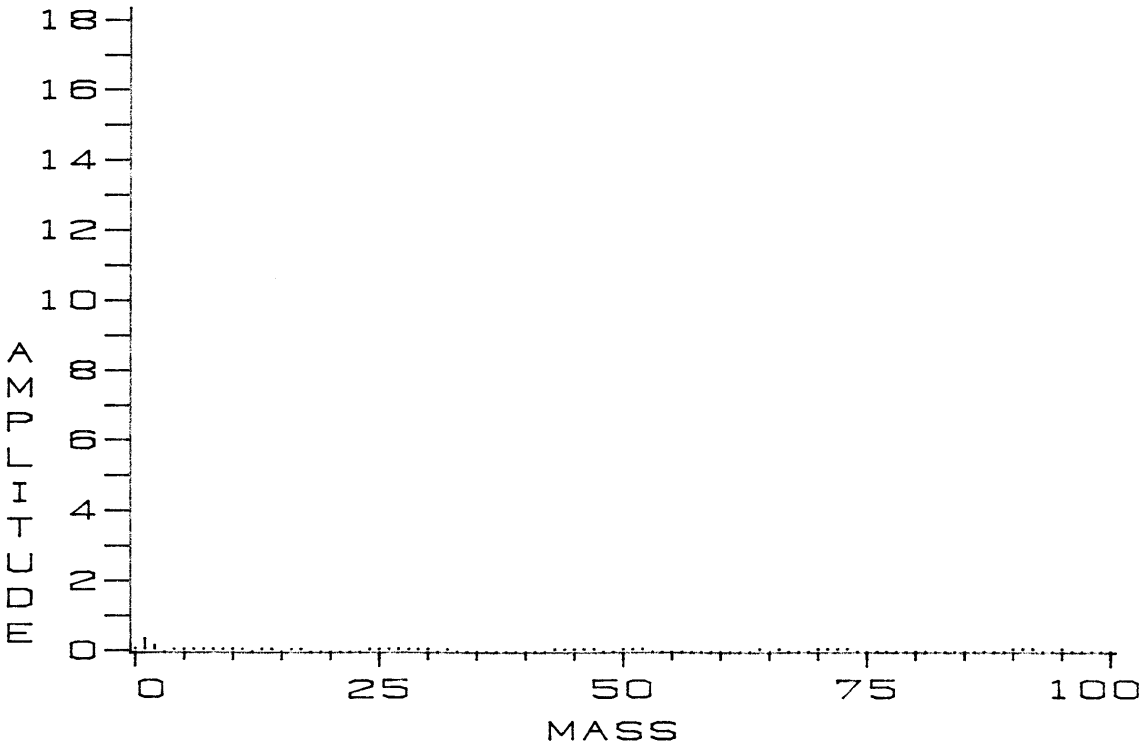

Figure 2. RGA spectrum at 5 Watts of input power.

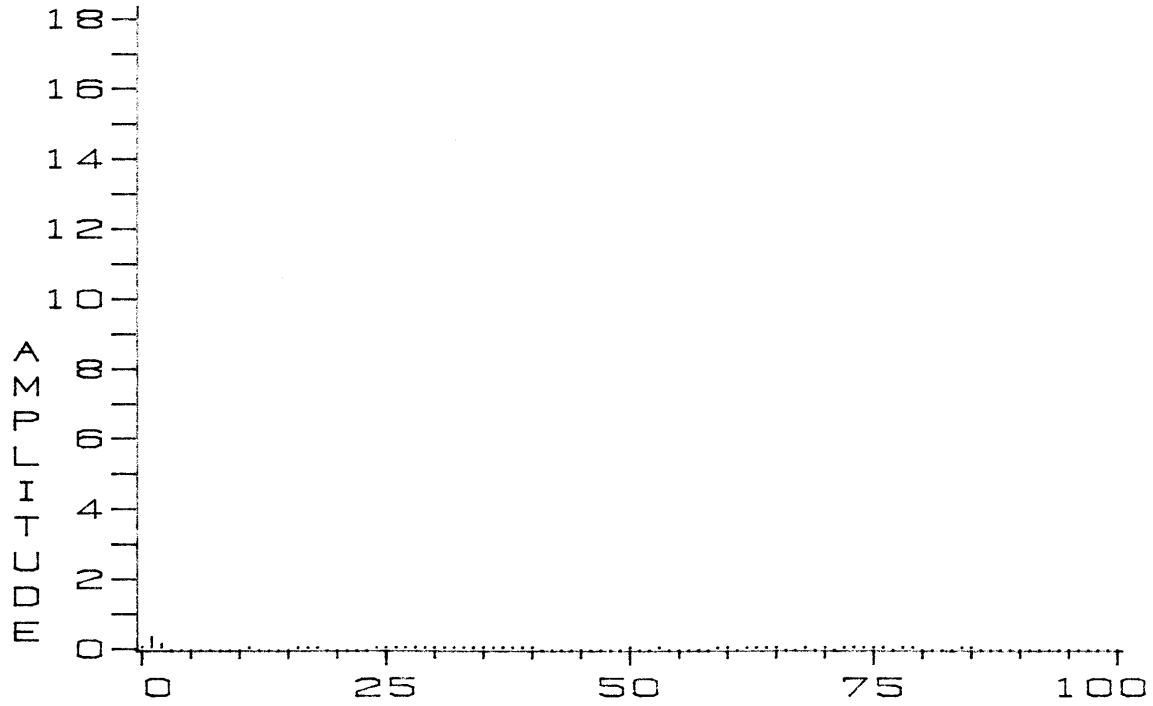

Figure 3. RGA spectrum at 10 Watts of input power.

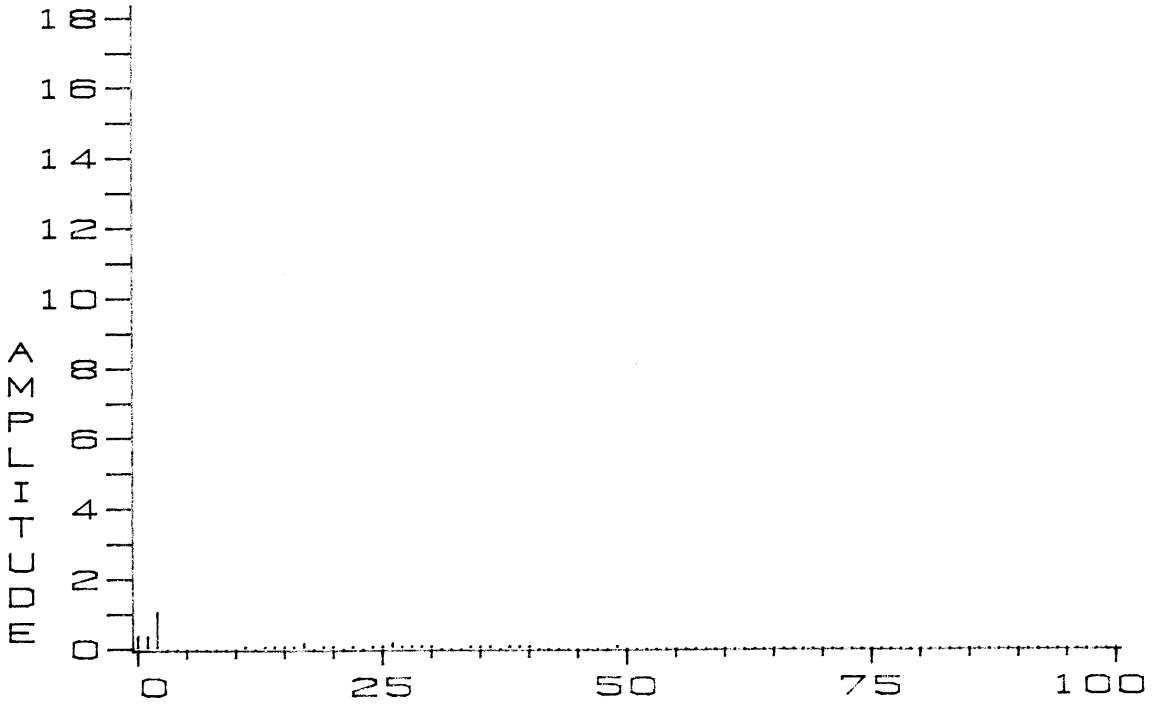

Figure 4. RGA spectrum at 20 Watts of input power.

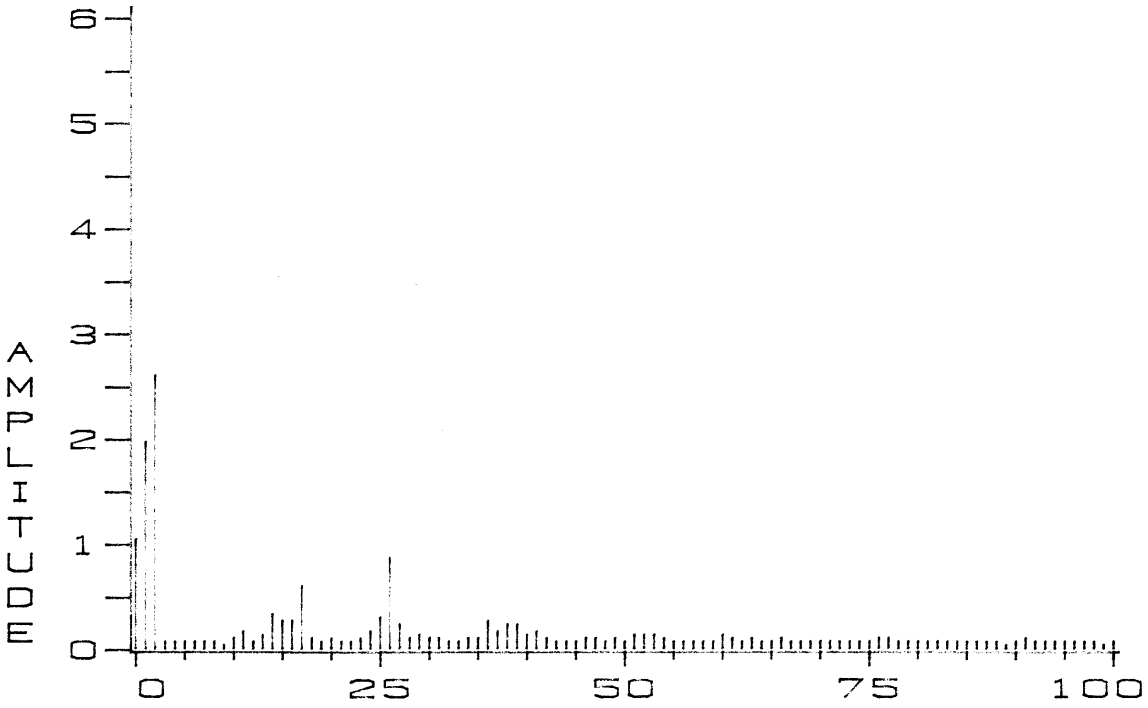

Figure 5. RGA spectrum at 25 Watts of input power.

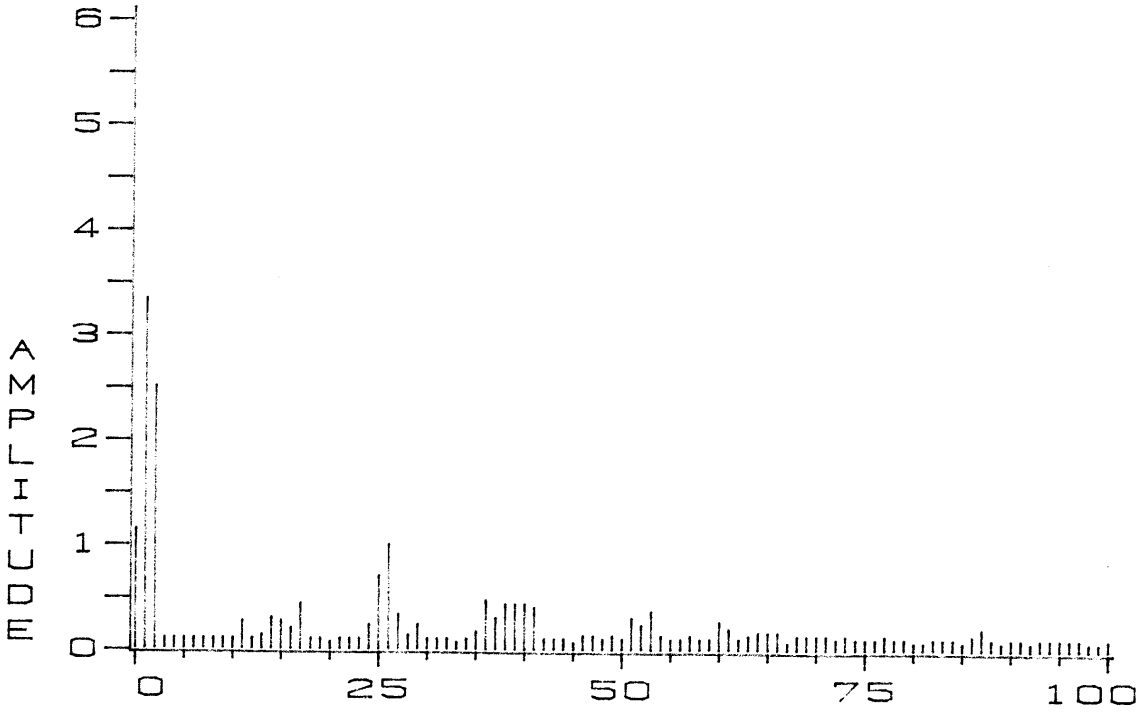

Figure 6. RGA spectrum at 30 Watts of input power.

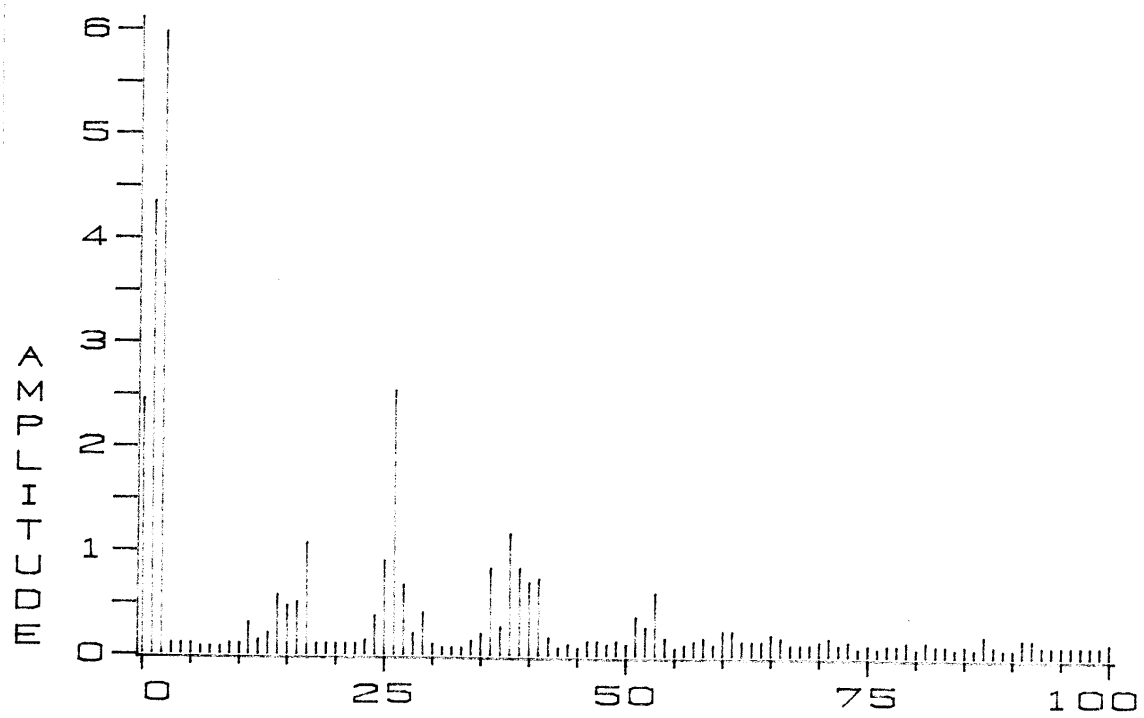

Figure 7. RGA spectrum at 35 Watts of input power.

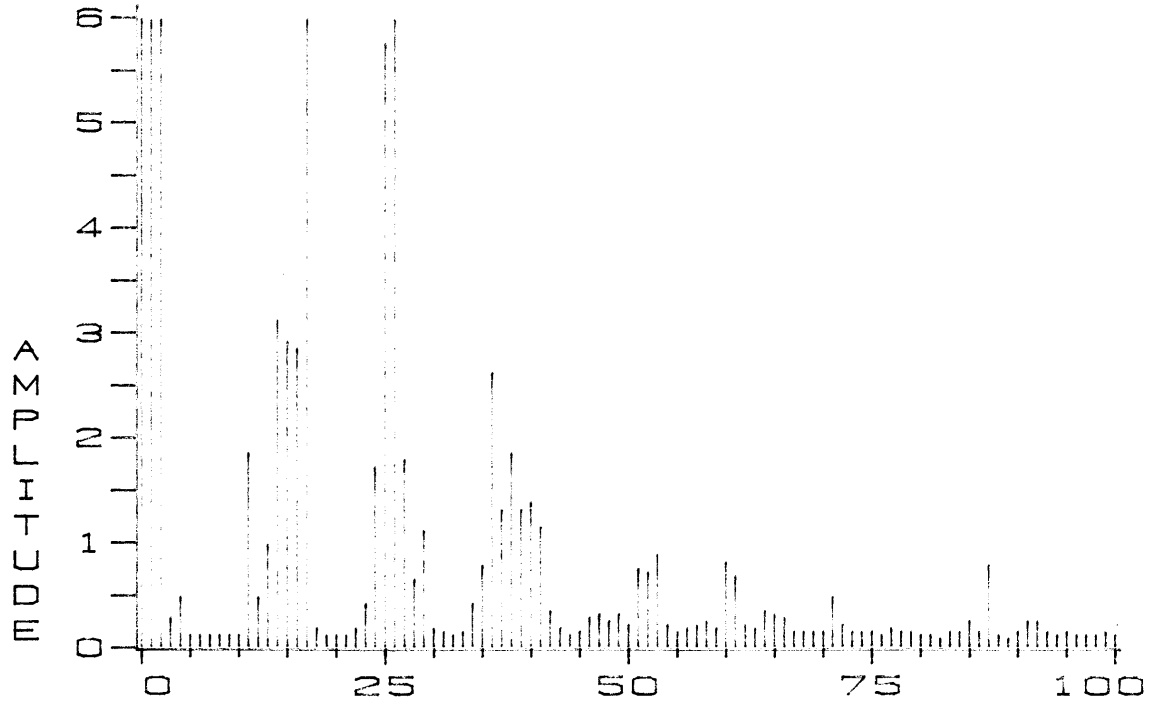

Figure 8. RGA spectrum at 40 Watts of input power.