



MODULAR™

Mining Systems

April 12, 2001

Dear Sir or Madam:

The following will be added to the User's Manual:

MANDATORY SAFETY INSTRUCTIONS TO INSTALLERS AND END USERS

Use only antennas supplied by Modular Mining Systems or dealer.

- Antenna Minimum Safe Distance: 20 cm
- Antenna Gain: 6 dBi

The Federal Communications Commission (FCC) has adopted a safety standard for human exposure to radio frequency (RF) energy, which is below the Occupational Safety and Health Act (OSHA) limits.

Antenna Mounting. The antenna supplied by Modular Mining Systems or dealer must not be mounted at a location that will allow any person or persons to come closer than the minimum safe distance to the antenna (20 cm) during radio transmission.

To comply with current FCC RF exposure limits, the antenna must be installed at or exceeding the minimum safe distance and in accordance with the requirements of Modular Mining Systems, as follows:

- **Base Station Installation.** The antenna should be fixed mounted on an outdoor permanent structure. RF exposure compliance must be addressed at the time of installation.
- **Mobile Repeater Installation.** The antenna must be mounted on a mast that is 12 feet or higher so that RF exposure compliance is satisfied.
- **Mine Vehicle Installation.** The antenna should be fixed mounted on the vehicle facing away from the vehicle so that a person is not able to move in front of the antenna. RF exposure compliance must be addressed at the time of installation.

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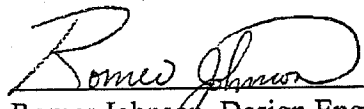
Antenna Substitution. Do not substitute any antenna for the one supplied or recommended by Modular Mining Systems because you may expose persons to harmful RF radiation. You may contact Modular Mining Systems for further instructions.

WARNING

Maintain a distance of at least 20 cm from the antenna during radio transmission.

As the qualified end user of this radio device, you must control the exposure conditions of bystanders to ensure the minimum distance is maintained between the antenna and nearby persons, in compliance with FCC guidelines. The operation of this transmitter must satisfy the work-related requirements of Occupational/Controlled Environment exposure limits. Transmit only when persons are at least the minimum distance from the properly installed, externally mounted antenna.

Sincerely,

 4-12-01
Romer Johnson, Design Eng Supervisor
Modular Mining Systems, Inc.

CW Jamming Margin Test for FCC ID: FJ6-301582

4/18/01

For Compliance with 15-147 (e)

CHANNEL 5: 2432MHz Receiver Passband: +/- 8.5MHz

-7.3	dBm Relative Signal Power S_r (CW Jammer is disabled)
-15.7	Reference CW Jammer Power setting (8.4dB below S_r above)

Note: Signal to Jammer for 8% PER must be < 8.4dB

Table of CW Jammer Levels that cause 8% PER Using 50KHz Steps

CW Jammer Freq	Power Reading	S / J in dB	Pass=1 Fail=0
2423.50	-3.47	-3.83	1
2423.55	-3.66	-3.64	1
2423.60	-4.22	-3.08	1
2423.65	-5.18	-2.12	1
2423.70	-4.88	-2.42	1
2423.75	-5.37	-1.93	1
2423.80	-5.31	-1.99	1
2423.85	-5.64	-1.66	1
2423.90	-5.55	-1.75	1
2423.95	-5.86	-1.44	1
2424.00	-5.90	-1.40	1
2424.05	-6.22	-1.08	1
2424.10	-6.37	-0.93	1
2424.15	-7.28	-0.02	1
2424.20	-7.92	0.62	1
2424.25	-7.46	0.16	1
2424.30	-7.55	0.25	1
2424.35	-7.94	0.64	1
2424.40	-8.52	1.22	1
2424.45	-8.62	1.32	1
2424.50	-8.40	1.10	1
2424.55	-8.66	1.36	1
2424.60	-9.01	1.71	1
2424.65	-10.08	2.78	1
2424.70	-9.52	2.22	1
2424.75	-10.36	3.06	1
2424.80	-9.71	2.41	1
2424.85	-9.99	2.69	1
2424.90	-9.55	2.25	1
2424.95	-9.53	2.23	1
2425.00	-9.12	1.82	1
2425.05	-8.96	1.66	1
2425.10	-8.82	1.52	1
2425.15	-9.12	1.82	1
2425.20	-8.90	1.60	1
2425.25	-8.61	1.31	1

CW Jammer Frequency	Power Reading	S / J in dB	Pass / Fail
2432.00	-7.96	0.66	1
2432.05	-8.80	1.50	1
2432.10	-8.04	0.74	1
2432.15	-8.38	1.08	1
2432.20	-9.60	2.30	1
2432.25	-7.75	0.45	1
2432.30	-8.10	0.80	1
2432.35	-7.67	0.37	1
2432.40	-7.41	0.11	1
2432.45	-7.27	-0.03	1
2432.50	-6.60	-0.70	1
2432.55	-6.37	-0.93	1
2432.60	-6.88	-0.42	1
2432.65	-7.39	0.09	1
2432.70	-6.86	-0.44	1
2432.75	-7.03	-0.27	1
2432.80	-6.74	-0.56	1
2432.85	-6.34	-0.96	1
2432.90	-6.25	-1.05	1
2432.95	-6.17	-1.13	1
2433.00	-6.07	-1.23	1
2433.05	-5.94	-1.36	1
2433.10	-5.61	-1.69	1
2433.15	-5.77	-1.53	1
2433.20	-5.87	-1.43	1
2433.25	-5.44	-1.86	1
2433.30	-5.27	-2.03	1
2433.35	-5.05	-2.25	1
2433.40	-5.39	-1.91	1
2433.45	-5.27	-2.03	1
2433.50	-5.19	-2.11	1
2433.55	-5.38	-1.92	1
2433.60	-5.32	-1.98	1
2433.65	-5.64	-1.66	1
2433.70	-5.67	-1.63	1
2433.75	-5.60	-1.70	1

2425.30	-8.37	1.07	1
2425.35	-8.40	1.10	1
2425.40	-8.62	1.32	1
2425.45	-8.26	0.96	1
2425.50	-8.08	0.78	1
2425.55	-8.22	0.92	1
2425.60	-8.54	1.24	1
2425.65	-9.03	1.73	1
2425.70	-8.97	1.67	1
2425.75	-9.56	2.26	1
2425.80	-9.02	1.72	1
2425.85	-9.21	1.91	1
2425.90	-9.03	1.73	1
2425.95	-8.79	1.49	1
2426.00	-8.51	1.21	1
2426.05	-8.41	1.11	1
2426.10	-8.06	0.76	1
2426.15	-7.87	0.57	1
2426.20	-7.45	0.15	1
2426.25	-7.04	-0.26	1
2426.30	-6.86	-0.44	1
2426.35	-6.61	-0.69	1
2426.40	-6.55	-0.75	1
2426.45	-6.36	-0.94	1
2426.50	-6.42	-0.88	1
2426.55	-6.54	-0.76	1
2426.60	-6.67	-0.63	1
2426.65	-6.75	-0.55	1
2426.70	-7.16	-0.14	1
2426.75	-7.24	-0.06	1
2426.80	-7.45	0.15	1
2426.85	-7.69	0.39	1
2426.90	-7.72	0.42	1
2426.95	-8.03	0.73	1
2427.00	-8.26	0.96	1
2427.05	-8.44	1.14	1
2427.10	-8.77	1.47	1
2427.15	-9.30	2.00	1
2427.20	-9.39	2.09	1
2427.25	-9.42	2.12	1
2427.30	-9.32	2.02	1
2427.35	-9.38	2.08	1
2427.40	-9.77	2.47	1
2427.45	-9.57	2.27	1
2427.50	-9.37	2.07	1
2427.55	-9.23	1.93	1
2427.60	-9.11	1.81	1
2427.65	-9.10	1.80	1
2427.70	-8.91	1.61	1
2427.75	-8.93	1.63	1
2427.80	-8.73	1.43	1
2427.85	-8.87	1.57	1

2433.80	-5.30	-2.00	1
2433.85	-4.94	-2.36	1
2433.90	-4.30	-3.00	1
2433.95	-4.16	-3.14	1
2434.00	-4.13	-3.17	1
2434.05	-3.97	-3.33	1
2434.10	-3.59	-3.71	1
2434.15	-4.13	-3.17	1
2434.20	-4.15	-3.15	1
2434.25	-3.84	-3.46	1
2434.30	-3.72	-3.58	1
2434.35	-3.71	-3.59	1
2434.40	-4.38	-2.92	1
2434.45	-3.94	-3.36	1
2434.50	-4.17	-3.13	1
2434.55	-4.08	-3.22	1
2434.60	-4.25	-3.05	1
2434.65	-6.10	-1.20	1
2434.70	-5.41	-1.89	1
2434.75	-5.64	-1.66	1
2434.80	-4.65	-2.65	1
2434.85	-5.13	-2.17	1
2434.90	-5.34	-1.96	1
2434.95	-5.67	-1.63	1
2435.00	-5.64	-1.66	1
2435.05	-5.58	-1.72	1
2435.10	-5.66	-1.64	1
2435.15	-6.68	-0.62	1
2435.20	-6.37	-0.93	1
2435.25	-6.33	-0.97	1
2435.30	-6.51	-0.79	1
2435.35	-6.64	-0.66	1
2435.40	-7.10	-0.20	1
2435.45	-6.97	-0.33	1
2435.50	-6.78	-0.52	1
2435.55	-6.67	-0.63	1
2435.60	-6.81	-0.49	1
2435.65	-7.50	0.20	1
2435.70	-7.19	-0.11	1
2435.75	-7.24	-0.06	1
2435.80	-6.75	-0.55	1
2435.85	-6.58	-0.72	1
2435.90	-6.20	-1.10	1
2435.95	-5.90	-1.40	1
2436.00	-5.28	-2.02	1
2436.05	-4.72	-2.58	1
2436.10	-4.69	-2.61	1
2436.15	-4.80	-2.50	1
2436.20	-4.27	-3.03	1
2436.25	-3.93	-3.37	1
2436.30	-3.71	-3.59	1
2436.35	-3.44	-3.86	1

2427.90	-8.43	1.13	1
2427.95	-8.49	1.19	1
2428.00	-8.55	1.25	1
2428.05	-9.10	1.80	1
2428.10	-9.12	1.82	1
2428.15	-9.38	2.08	1
2428.20	-9.24	1.94	1
2428.25	-8.91	1.61	1
2428.30	-8.66	1.36	1
2428.35	-8.47	1.17	1
2428.40	-8.51	1.21	1
2428.45	-7.91	0.61	1
2428.50	-7.29	-0.01	1
2428.55	-7.25	-0.05	1
2428.60	-7.70	0.40	1
2428.65	-8.19	0.89	1
2428.70	-7.68	0.38	1
2428.75	-8.48	1.18	1
2428.80	-7.86	0.56	1
2428.85	-7.99	0.69	1
2428.90	-7.86	0.56	1
2428.95	-7.82	0.52	1
2429.00	-7.55	0.25	1
2429.05	-7.77	0.47	1
2429.10	-8.11	0.81	1
2429.15	-9.11	1.81	1
2429.20	-8.81	1.51	1
2429.25	-8.36	1.06	1
2429.30	-8.38	1.08	1
2429.35	-8.33	1.03	1
2429.40	-8.90	1.60	1
2429.45	-8.24	0.94	1
2429.50	-8.33	1.03	1
2429.55	-8.33	1.03	1
2429.60	-8.28	0.98	1
2429.65	-8.90	1.60	1
2429.70	-8.31	1.01	1
2429.75	-8.32	1.02	1
2429.80	-8.27	0.97	1
2429.85	-8.43	1.13	1
2429.90	-8.40	1.10	1
2429.95	-8.61	1.31	1
2430.00	-8.62	1.32	1
2430.05	-8.72	1.42	1
2430.10	-9.08	1.78	1
2430.15	-9.85	2.55	1
2430.20	-10.14	2.84	1
2430.25	-10.15	2.85	1
2430.30	-10.25	2.95	1
2430.35	-10.24	2.94	1
2430.40	-10.33	3.03	1
2430.45	-9.53	2.23	1

2436.40	-3.59	-3.71	1
2436.45	-3.24	-4.06	1
2436.50	-3.04	-4.26	1
2436.55	-3.06	-4.24	1
2436.60	-3.31	-3.99	1
2436.65	-3.64	-3.66	1
2436.70	-3.51	-3.79	1
2436.75	-4.19	-3.11	1
2436.80	-3.53	-3.77	1
2436.85	-3.70	-3.60	1
2436.90	-3.18	-4.12	1
2436.95	-3.13	-4.17	1
2437.00	-2.97	-4.33	1
2437.05	-2.59	-4.71	1
2437.10	-2.00	-5.30	1
2437.15	-2.44	-4.86	1
2437.20	-2.20	-5.10	1
2437.25	-1.32	-5.98	1
2437.30	-1.20	-6.10	1
2437.35	-0.99	-6.31	1
2437.40	-1.17	-6.13	1
2437.45	-0.93	-6.37	1
2437.50	-1.01	-6.29	1
2437.55	-0.86	-6.44	1
2437.60	-0.83	-6.47	1
2437.65	-1.13	-6.17	1
2437.70	-1.09	-6.21	1
2437.75	-1.37	-5.93	1
2437.80	-1.37	-5.93	1
2437.85	-1.88	-5.42	1
2437.90	-1.97	-5.33	1
2437.95	-2.10	-5.20	1
2438.00	-2.40	-4.90	1
2438.05	-2.45	-4.85	1
2438.10	-2.37	-4.93	1
2438.15	-2.94	-4.36	1
2438.20	-3.01	-4.29	1
2438.25	-2.46	-4.84	1
2438.30	-2.08	-5.22	1
2438.35	-1.87	-5.43	1
2438.40	-2.60	-4.70	1
2438.45	-1.51	-5.79	1
2438.50	-0.90	-6.40	1
2438.55	-0.81	-6.49	1
2438.60	-0.38	-6.92	1
2438.65	-0.25	-7.05	1
2438.70	0.11	-7.41	1
2438.75	-0.02	-7.28	1
2438.80	0.89	-8.19	1
2438.85	0.80	-8.10	1
2438.90	1.43	-8.73	1
2438.95	1.60	-8.90	1

2430.50	-9.50	2.20	1
2430.55	-9.19	1.89	1
2430.60	-8.70	1.40	1
2430.65	-9.14	1.84	1
2430.70	-8.49	1.19	1
2430.75	-8.67	1.37	1
2430.80	-8.27	0.97	1
2430.85	-8.18	0.88	1
2430.90	-8.15	0.85	1
2430.95	-8.14	0.84	1
2431.00	-8.10	0.80	1
2431.05	-8.03	0.73	1
2431.10	-8.26	0.96	1
2431.15	-8.54	1.24	1
2431.20	-8.32	1.02	1
2431.25	-7.97	0.67	1
2431.30	-8.07	0.77	1
2431.35	-8.14	0.84	1
2431.40	-8.37	1.07	1
2431.45	-7.91	0.61	1
2431.50	-7.33	0.03	1
2431.55	-7.24	-0.06	1
2431.60	-7.33	0.03	1
2431.65	-7.72	0.42	1
2431.70	-7.99	0.69	1
2431.75	-8.54	1.24	1
2431.80	-8.82	1.52	1
2431.85	-9.31	2.01	1
2431.90	-8.40	1.10	1
2431.95	-8.00	0.70	1

Total Column Fail: 0

2439.00	1.68	-8.98	1
2439.05	1.90	-9.20	1
2439.10	2.05	-9.35	1
2439.15	1.45	-8.75	1
2439.20	1.99	-9.29	1
2439.25	2.66	-9.96	1
2439.30	2.84	-10.14	1
2439.35	3.14	-10.44	1
2439.40	3.52	-10.82	1
2439.45	3.61	-10.91	1
2439.50	4.58	-11.88	1
2439.55	4.58	-11.88	1
2439.60	4.58	-11.88	1
2439.65	4.58	-11.88	1
2439.70	4.58	-11.88	1
2439.75	4.58	-11.88	1
2439.80	4.58	-11.88	1
2439.85	4.58	-11.88	1
2439.90	4.58	-11.88	1
2439.95	4.58	-11.88	1
2440.00	4.58	-11.88	1
2440.05	4.58	-11.88	1
2440.10	4.58	-11.88	1
2440.15	4.58	-11.88	1
2440.20	4.58	-11.88	1
2440.25	4.58	-11.88	1
2440.30	4.58	-11.88	1
2440.35	4.58	-11.88	1
2440.40	4.58	-11.88	1
2440.45	4.58	-11.88	1
2440.50	4.58	-11.88	1

Total Column Fail: 0

Total Measurements: 340
 Total Fail: 0
 Percentage that Fail: 0% SUCCESS! Since < 20%

Note: Test is a success if < 20% fail

