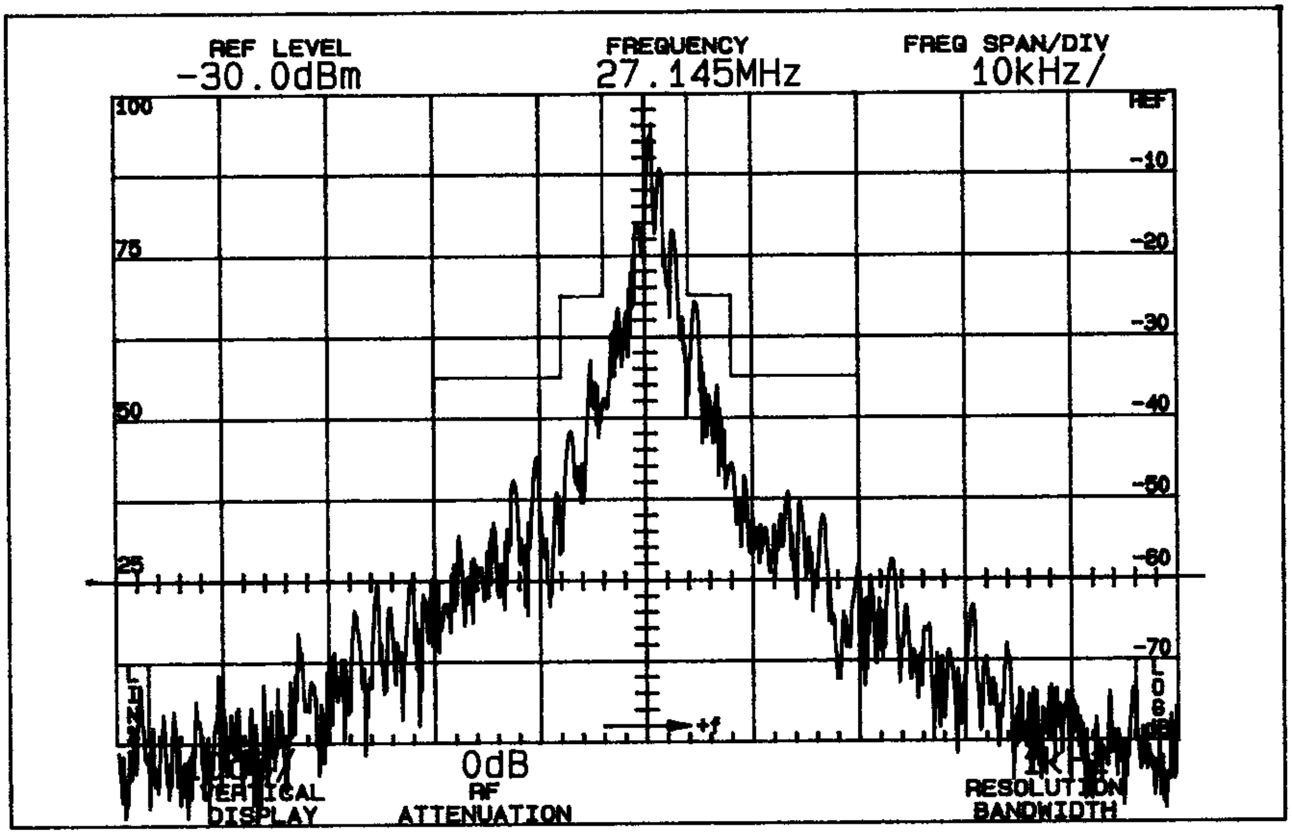
FIGURE 1

OCCUPIED BANDWIDTH



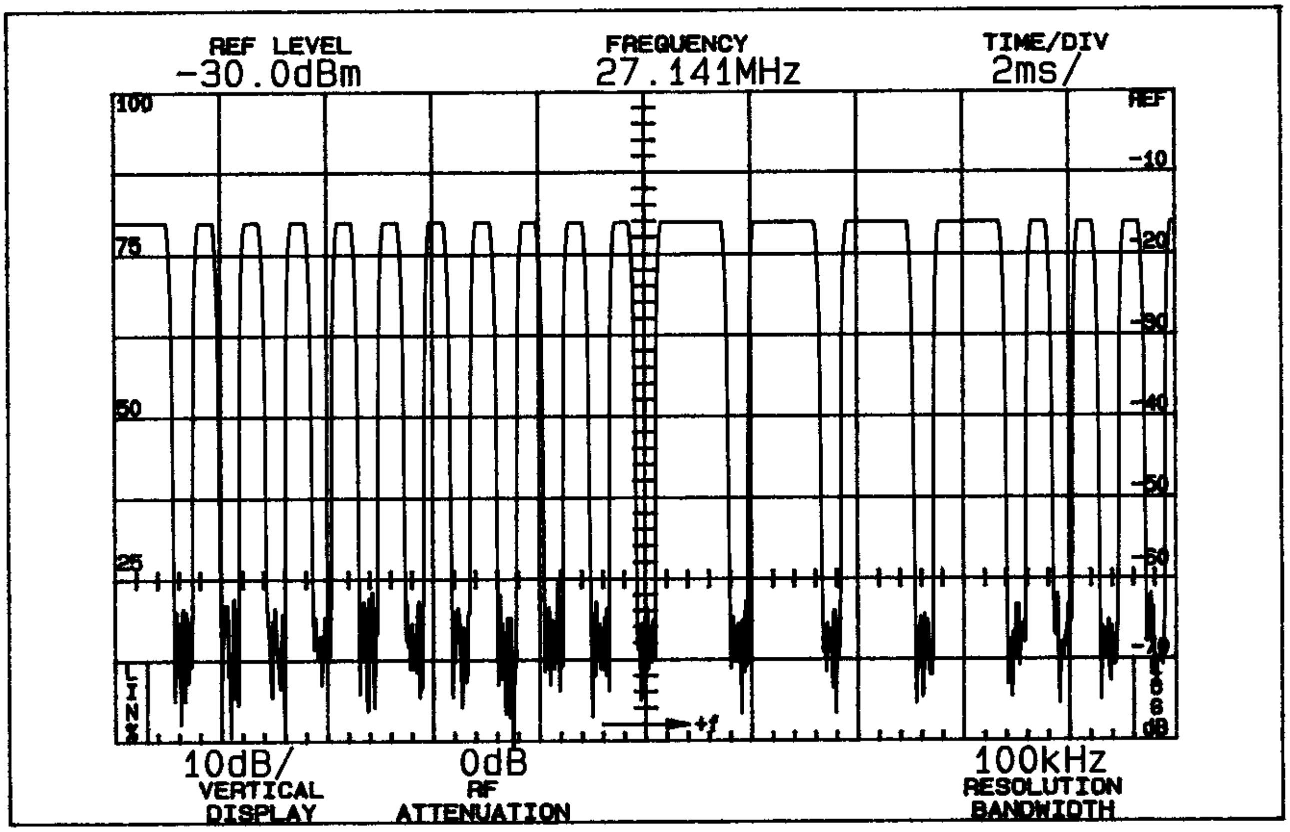
	ATTENUATION IN dB BELOW MEAN OUTPUT POWER Required
On any frequency more than 50% up to and including 100% of the authorized bandwidth, 8 kHz (4-8 kHz)	25
On any frequency more than 100%, up to and including 250% of the authorized bandwidth (8-20 kHz)	35
On any frequency removed from the assigned frequency by more than 250% of the authorized bandwidth (over 20 kHz)	43+10LogP

OCCUPIED BANDWIDTH
FCC ID: M45460219

FIGURE 1

FIGURE 2

MODULATING WAVEFORM
TIME DOMAIN



2 millisecond/division sweep

OCCUPIED BANDWIDTH
(Modulating Waveform)
FCC ID: M45460219

FIGURE 2

D. SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS
(Paragraph 2.991 of the Rules)

Since the Flight Command 460219 transmitter meets FCC Rules 95.645, there are no provisions for antenna terminal output measurements.

Substitution of a suitable matching network and retuning to permit observations at 50 ohms would not be representative of normal operation.

Accordingly data on radiated spurious emissions are included in lieu of antenna terminal conducted spurious emissions.

E. FIELD STRENGTH MEASUREMENTS OF SPURIOUS RADIATION
(Paragraph 2.993(a) (b) (2) of the Rules)

Field intensity measurements of radiated spurious emissions from the Flight Command 460219 were made with a Tektronix 494P spectrum analyzer using EMCO 3121C calibrated test antennas.

The transmitter and its integral vertical antenna were located in an open field 3 meters from the test antenna. Supply voltage was from a fresh battery with a terminal voltage under load of 9 Vdc. The transmitter and test antennas were arranged to maximize pickup. Both vertical and horizontal test antenna polarization were employed.

Reference was measured emission at the carrier frequency, 27.145 MHz, expressed in uV/m @ 3m.

The measurement system was capable of detecting signals 100 dB or more below the reference level. Measurements were made from the lowest frequency generated within the unit, 8 MHz, to 10 times operating frequency. Data after application of antenna factors and line loss corrections are shown in Table 1.

TABLE 1

RADIATED FIELD INTENSITY
Measured at 3 meters
27.145 MHz; 9.0 Vdc; 80uW

Frequency To Which Tuned (MHz)	Frequency of Emission (MHz)	Meter Reading (dBm)	Antenna Factor (dB)	Field Intensity uV/m @ 3m	dBc[1]
27.145	27.146	-24.0	-0.3	14621	Ref
27.145	54.292	-72.8	5.8	100	43V
27.145	81.437	-75.6	9.4	10	42V
27.145	108.582	-86.4	12.0	43	51V
27.145	135.728	-83.2	14.0	62	47V
27.145	162.874	-89.2	15.7	47	50V
27.145	190.018	-80.4	17.1	153	40V
27.145	217.162	-89.6	18.3	61	48V
27.145	244.308	-93.2	19.4	46	50H
27.145	271.452	-85.6	20.4	123	42V

Frequency range of 25 to 272 MHz was scanned. No signals exceeded 200 uV/m @ 3m and all signals 20 uV/m or more @ 3m are shown above.

[1] Worst-case polarization: H = horizontal, V = vertical

F. FREQUENCY STABILITY
(Paragraph 2.995(a) and 95.623(c) of the Rules)

Measurement of frequency stability versus temperature was made at temperatures from -30°C to +50°C. At each temperature, the unit was exposed to test chamber ambient a minimum of 60 minutes after indicated chamber temperature ambient had stabilized to within ±2° of the desired test temperature. Following the 1 hour soak at each temperature, the unit was turned on, keyed and frequency measured within 2 minutes. Test temperature was sequenced in the order shown in Table 2, starting with -30°C.

A Thermotron S1.2 temperature chamber was used. Temperature was monitored with a Keithley 177 DVM and Fluke 150-30 temperature probe. The transmitter output stage was terminated in a dummy load. Primary supply was 9.0 volts. Frequency was measured with a HP 5385A digital frequency counter connected to the transmitter through a power attenuator. Measurements were made at 27.145 MHz. No transient keying effects were observed.

TABLE 2

FREQUENCY STABILITY vs. TEMPERATURE
27.145 MHz; 9.0 Vdc

Temperature, °C	Output Frequency, MHz
-29.2	27.144704
-20.0	27.144978
- 9.8	27.145170
0.2	27.145295
9.7	27.145393
19.9	27.145486
30.4	27.145562
40.4	27.145643
50.1	27.145763
Maximum frequency error:	27.145763
	27.145000
	+ .000763 MHz

Rule 95.623(c) specifies **0.005%** or a maximum of ±0.001357 MHz, which corresponds to:

High Limit	27.146357 MHz
Low Limit	27.143643 MHz

G. FREQUENCY STABILITY AS A FUNCTION OF SUPPLY VOLTAGE (Paragraph 2.995(d)(2) of the Rules)

Oscillator frequency as a function of power supply voltage was measured with an HP 5385A digital frequency counter as supply voltage provided by an HP 6264B variable dc power supply was varied ±15% from the nominal 9.0 volt rating. A Keithley 197 digital voltmeter was used to measure supply voltage at transmitter primary input terminals. Measurements were made at 20°C ambient.

TABLE 3

FREQUENCY STABILITY vs. SUPPLY VOLTAGE
27.145 MHz; 9.0 Vdc

Supply Voltage	Output Frequency, MHz
10.35	27.145711
9.90	27.145662
9.45	27.145574
9.00	27.145486
8.55	27.145406
8.10	27.145330
7.65*	27.145270

Maximum frequency error: 27.145711
27.145000

\+ .000711 MHz

* Manufacturer's battery end point is 7.65V.

FCC Rule 95.623(c) specifies **0.005%** or a maximum of ±0.001357 MHz, corresponding to:

High Limit	27.146357 MHz
Low Limit	27.143643 MHz