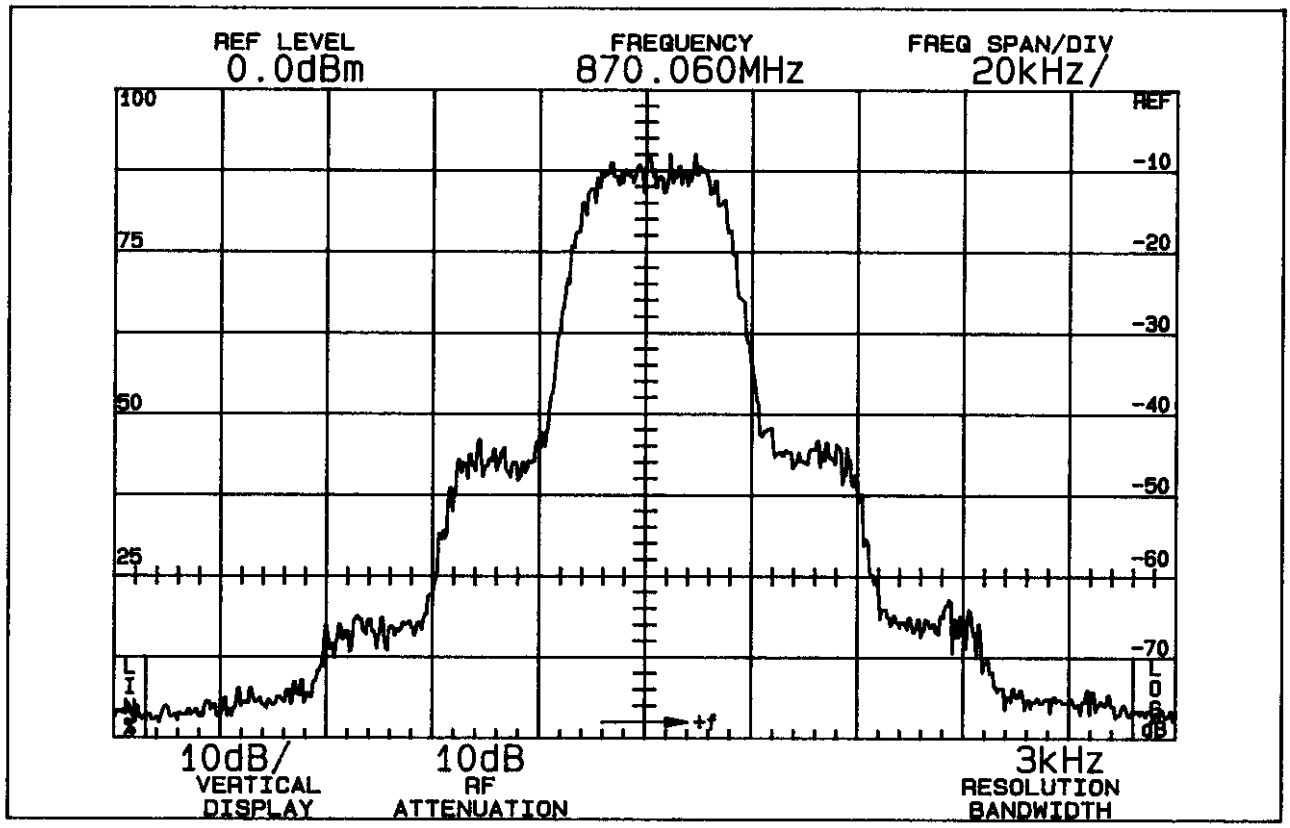
A:\ABTRPNBA.OBN

FIGURE 1



Attenuation in dB Below
Mean Output Power
Required

On any frequency removed from the carrier frequency by greater than 20 kHz up to and including 45 kHz	26
On any frequency removed from the carrier frequency by greater than 45 kHz	43+10LogP=31 (P=0.061W)

OCCUPIED BANDWIDTH
FCC ID: D8T800MTDMABASE

FIGURE 1

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

The FS-466F transmitter was tested for spurious emissions at the antenna terminals while the equipment was internally modulated with a pn9 TDMA signal.

Measurements were made with a Tektronix 494P spectrum analyzer coupled to the transmitter output terminals through a HP 8491B 50 ohm power attenuator. A wave trap was used at the junction of the attenuator output and spectrum analyzer input to provide a 35 dB attenuation of the carrier test frequency, 870.060 MHz. (The wave trap was used to improve the dynamic range of the spectrum analyzer.) During the tests, the transmitter was terminated in the attenuator. Supply was 48 Vdc throughout the tests.

Spurious emissions were measured throughout the RF spectrum from 14.4 MHz (lowest frequency generated in the transmitter) to 8.8 GHz. Any emissions that were between the required attenuation and the noise floor of the spectrum analyzer were recorded. Data are shown in Table 2 and are corrected for the effect of the wavetrap.

TABLE 2
TRANSMITTER CONDUCTED SPURIOUS
870.060 MHz, 48 Vdc

Spurious Frequency, MHz	dB below carrier reference for highest and lowest power	
	0.061W	96.7uW
1740.120	89	>80
2610.180	79	>80
3480.240	94	>80
4350.300	95	>80
5220.360	>102	>80
6090.420	>100	>80
6960.480	>102	>80
7830.540	>100	>76
8700.600	>96	>75
Required: 43+10Log(P)	31	2.9

F. FIELD STRENGTH MEASUREMENTS

Reference level for the spurious radiation was taken as an ideal dipole excited by 0.061 watts, the maximum average output power of the transmitter according to the following relationship:*

$$E = \frac{(49.2P_t)^{1/2}}{R}$$

Where E = electric field intensity in volts/meter

P_t = transmitter power in watts

R = distance in meters

for the case $E = \frac{(49.2 \times 0.061)^{1/2}}{3} = 0.6$ V/M

Since the spectrum analyzer is calibrated in decibels above one milliwatt (dBm), a conversion, for convenience, was made from dBu to dBm:

0.6 volts/meter = 0.6×10^6 uV/M

dBu/m = $20 \text{ Log}_{10}(0.6 \times 10^6)$

= 115 dBu/m

Since 1 uV/m = -107 dBm, the reference becomes:

115 - 107 = 8 dBm

The measurement system was capable of detecting signals 70 dB or more below the reference level. Measurements were made from 10 MHz to 8.8 GHz.

Measurements were made from 10 MHz, to 10 times operating frequency, 8.8 GHz. Data after application of antenna factors and line loss corrections are shown in Table 3.

*Reference Data for Radio Engineers, Fourth Edition, International Telephone and Telegraph Corp., p. 676.

F. FIELD STRENGTH MEASUREMENTS...(Continued)

TABLE 3

TRANSMITTER RADIATED SPURIOUS
870.060 MHz; 48 Vdc; 0.061 watts

Spurious Frequency, MHz	dB Below[1] Carrier Reference
1740.120	89V*
2610.180	>90**
3480.240	>90**
4350.300	>80**
5220.360	>73**
6090.420	>71**
6960.480	>72**
7830.540	>74**
8700.600	>76**

Required: 43+10Log(00.061) = 31

1. Worst-case polarization, H-horizontal, V-vertical.

* Reference data; more than 20 dB below FCC limit.
** Reference data; noise floor

All other spurious from 10 - 8800 MHz were 20 dB or more below FCC limit.

G. FREQUENCY STABILITY
(Paragraph 2.995(a)(1) and 22.101 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 4, starting with -30°C.

A Thermotron S1.2 temperature chamber was used. Temperature was monitored with a Keithley 871 digital temperature probe. The transmitter output stage was terminated in a HP 8491B power attenuator. Primary supply was 48 volts. Frequency was measured with a HP 5385A (0.1 ppm) digital frequency counter connected to the transmitter through a power attenuator. Measurements were made at 870.060 MHz. No transient keying effects were observed.

G. FREQUENCY STABILITY (continued)

TABLE 4
FREQUENCY STABILITY vs. TEMPERATURE
870.060 MHz, 48 Vdc, 0.061 watts

Temperature, °C	Output Frequency, MHz	p.p.m.
-29.4	870.059880	-0.14
-19.7	870.059919	-0.09
- 9.4	870.059945	-0.06
- 0.1	870.059970	-0.03
9.9	870.059993	-0.01
20.0	870.060017	0.02
30.1	870.060039	0.04
39.7	870.060049	0.06
50.1	870.060055	0.06

Maximum frequency error: 870.059880
870.060000

- .000120 MHz

Rule 22.101(a) specifies .00015% a maximum of ±.001305 MHz, which corresponds to:

High Limit	870.061305 MHz
Low Limit	870.058695 MHz

H. 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 a HP 5385A digital frequency counter as supply voltage provided by a HP 6296A variable dc power supply was varied ±15% from the nominal 48 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.

H. FREQUENCY STABILITY AS A FUNCTION OF SUPPLY VOLTAGE (cont'd)

TABLE 5

FREQUENCY STABILITY vs. SUPPLY VOLTAGE
870.060 MHz, 48 Vdc, 0.061 watts

Supply Voltage		Output Frequency, MHz	p.p.m.
55.20	(115%)	870.060018	0.2
52.80	(110%)	870.060017	0.2
50.40	(105%)	870.060017	0.2
48.00	(RATED)	870.060017	0.2
45.60	(95%)	870.060018	0.2
43.20	(90%)	870.060019	0.2
40.80	(85%)	870.060019	0.2

Maximum frequency error:

870.060019
870.060000
\+ .000019 MHz

FCC Rule 22.101(a) specifies .00015% or a maximum of ±.001305 MHz, corresponding to:

High Limit	870.061305 MHz
Low Limit	870.058695 MHz