

Ennes Workshop

The Good News
The Bad News

-10 dB

IT'S HERE !

Shively Labs®

Mt. Mansfield, VT
October 10, 2006



Shively Labs®

Mt. Mansfield, VT
Next Morning



Shively Labs®

February 9th 2011



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0 dBm ^{OR} dBm = ?
1 milliwatt

dull

Boring

monotonous

So pay attention

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IBOC Today -20 dB injection

Single Station

What do you do if you have;

Low Level Combined

Digital/Analog Transmitter

Check with the transmitter manufacture

Maybe you can up-grade the transmitter Or just buy new!

Either way

Transmitter guy 😊!

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IBOC Today -20 dB injection

Single Station

What do you do if you have;

Low Level Combined

Digital/Analog Transmitter

Existing Antenna system

Check with antenna manufacture about new average and peak power levels

Chances are that you will not have to do anything!

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IBOC Today -20 dB injection

Single Station

What do you do if you have;

High-Level Combining

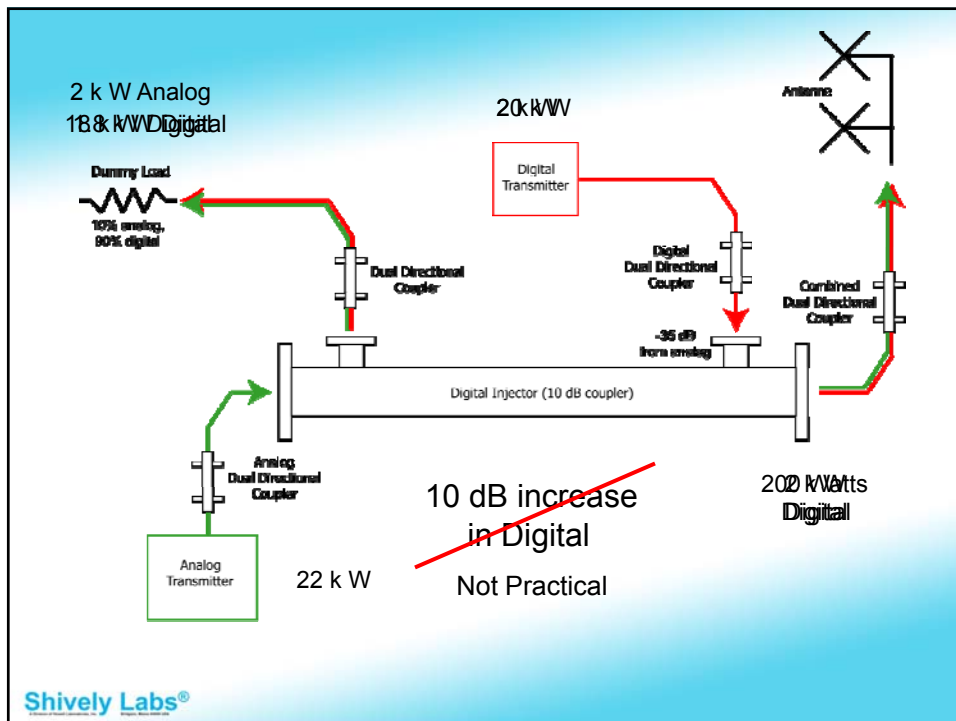
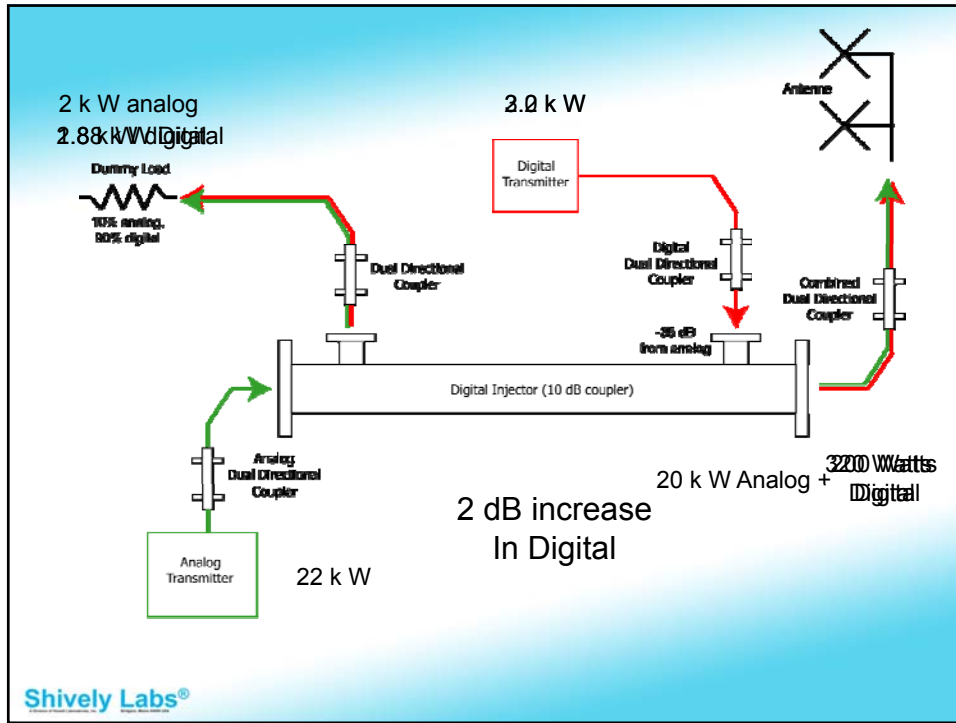
Separate Analog and Digital Transmitters

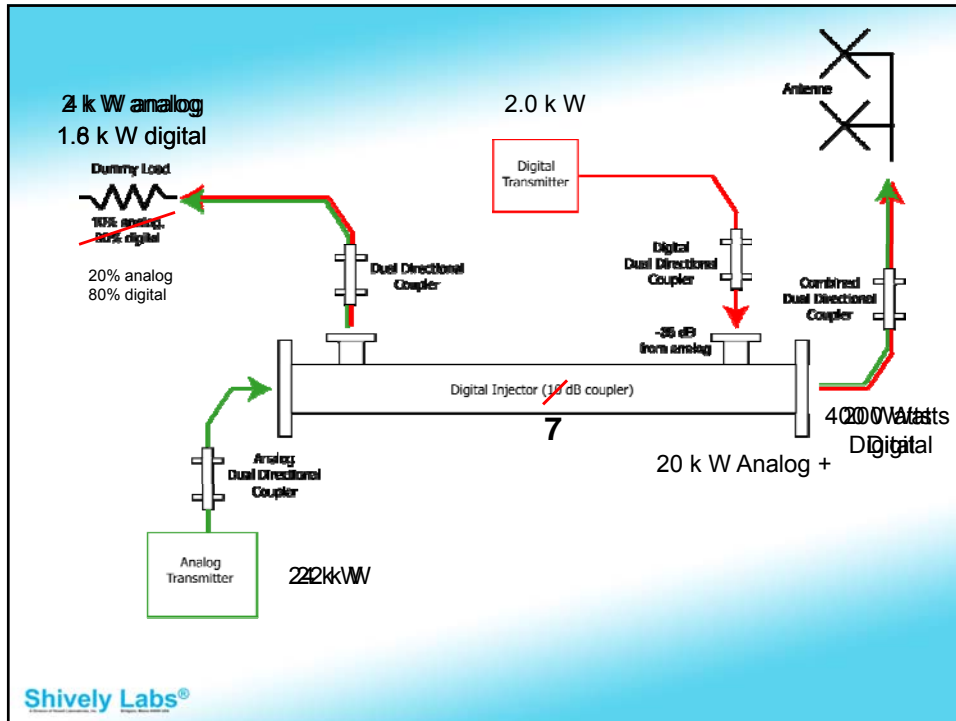
With

10 dB Injector/Combiner

Marginal at best for small increases of 1 or 2 dB

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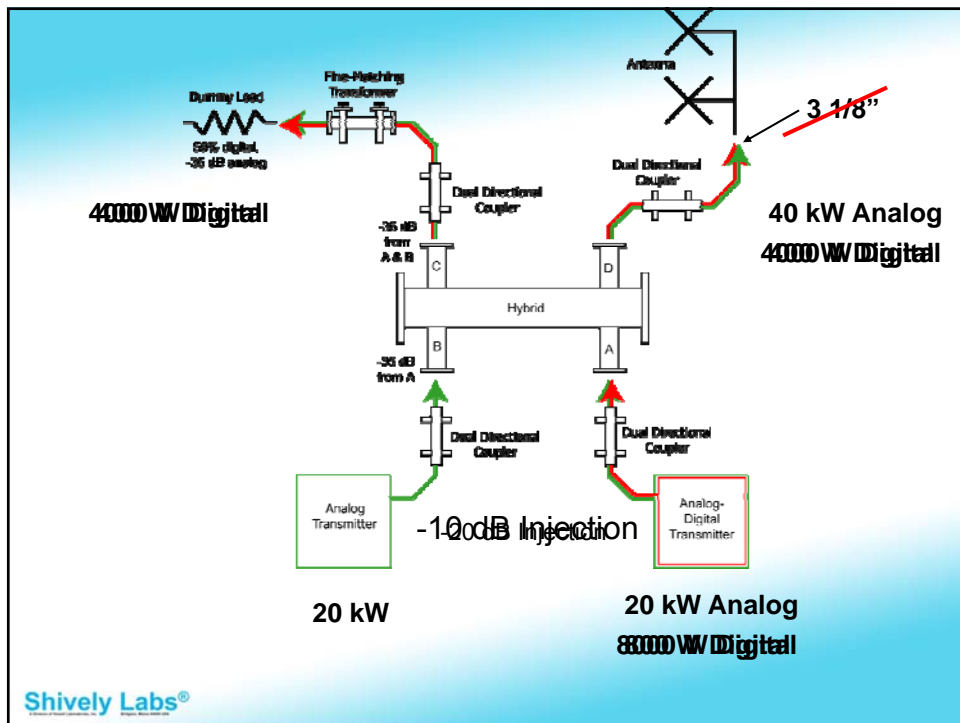
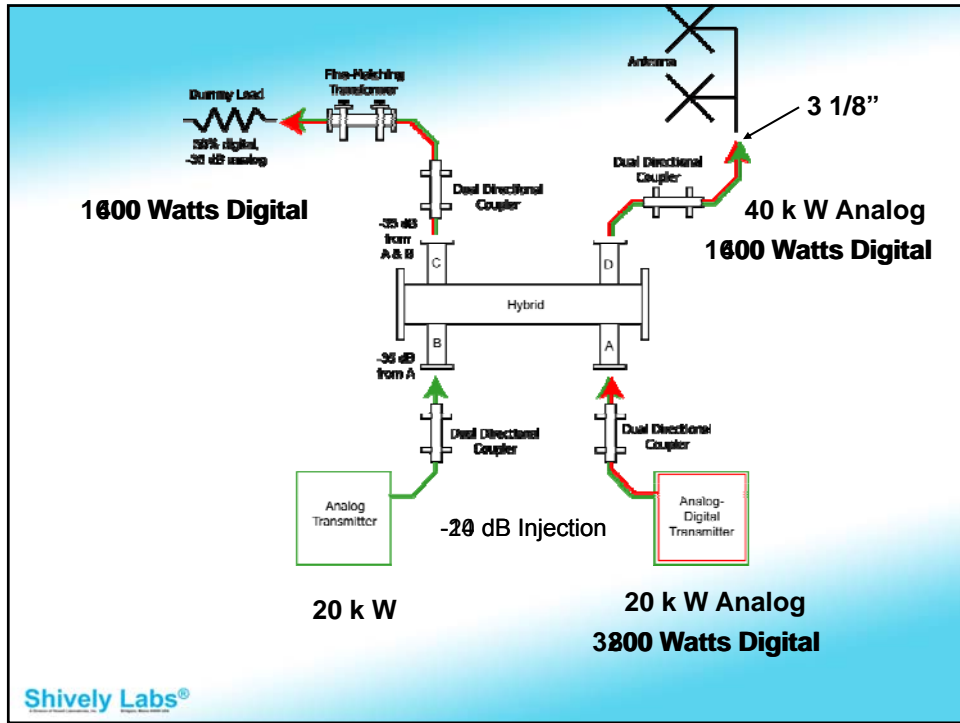


IBOC Today -20 dB injection

Single Station

What do you do if you have;

Mid-Level Combining



IBOC Today -20 dB injection

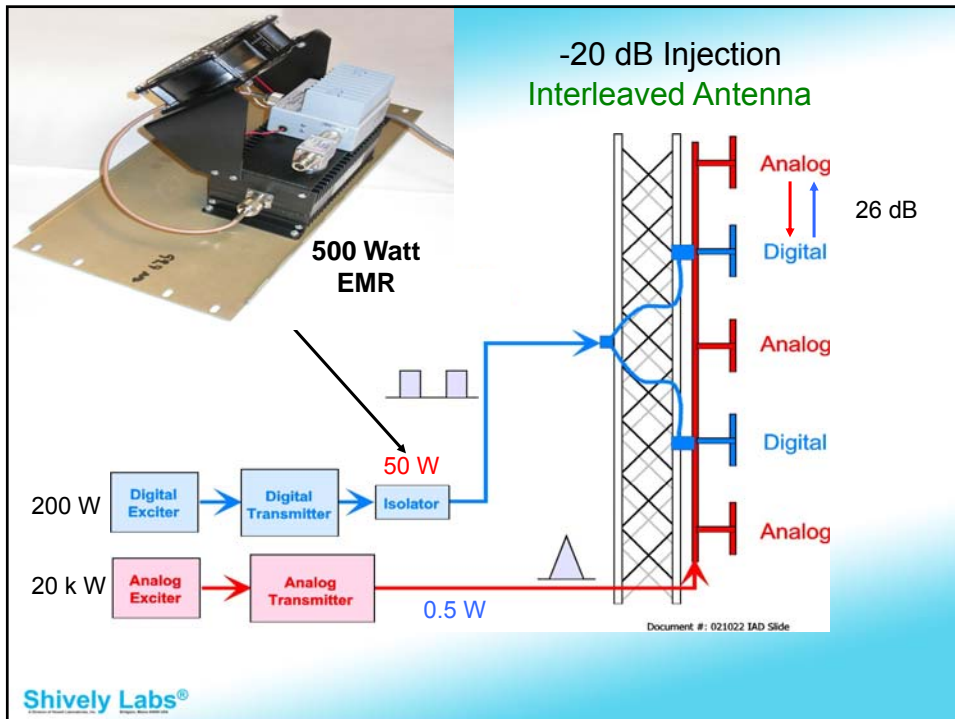
Single Station

What do you do if you have;

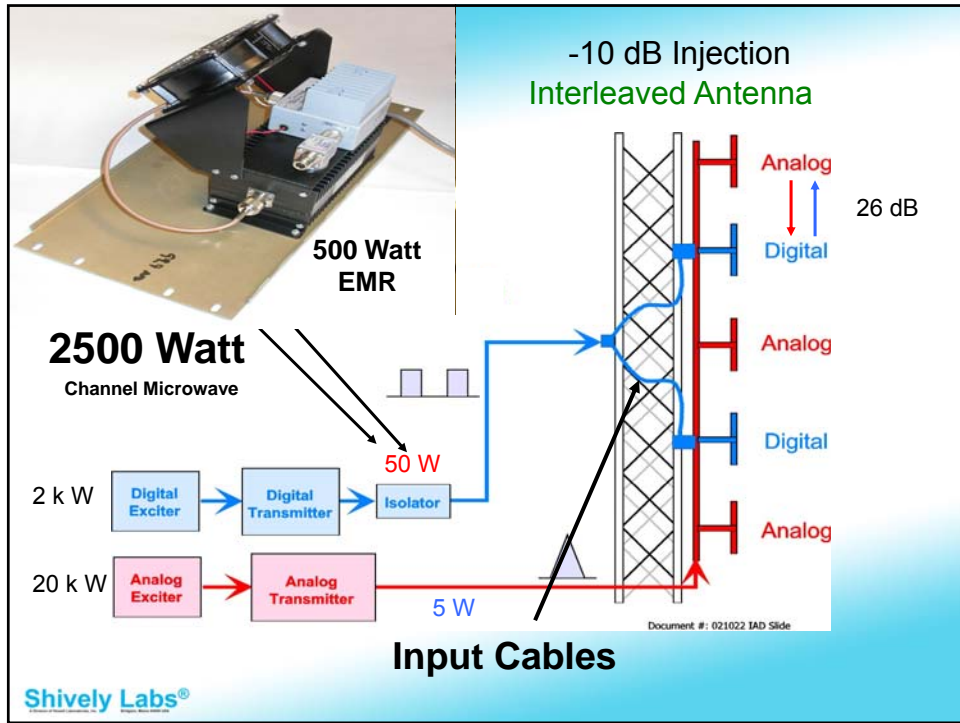
Separate Analog and Digital Transmitters

Inter-leaved Antenna System

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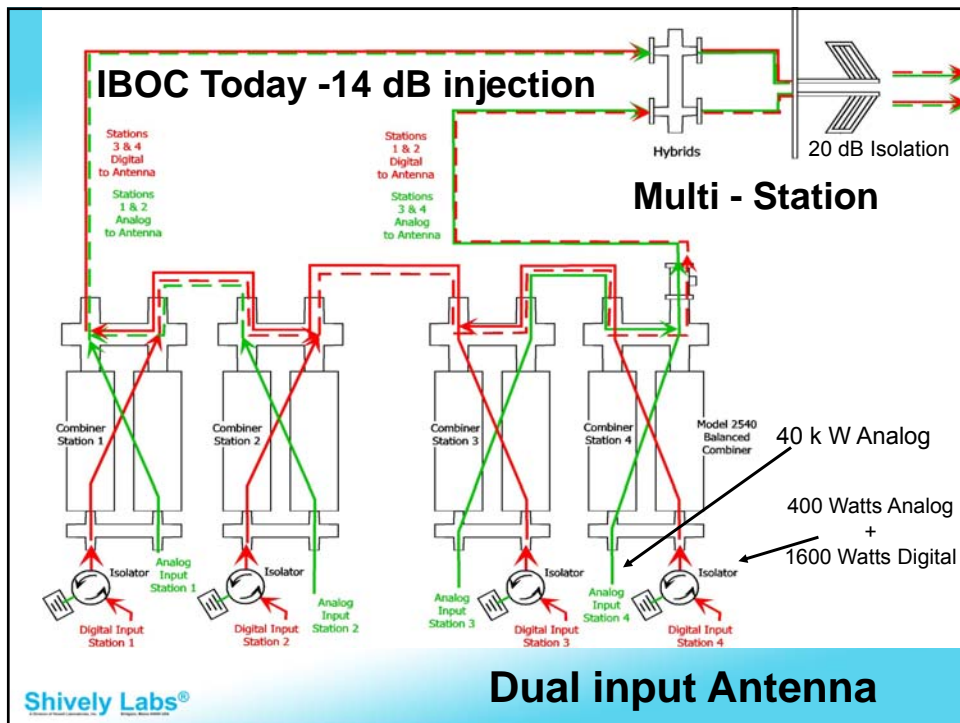
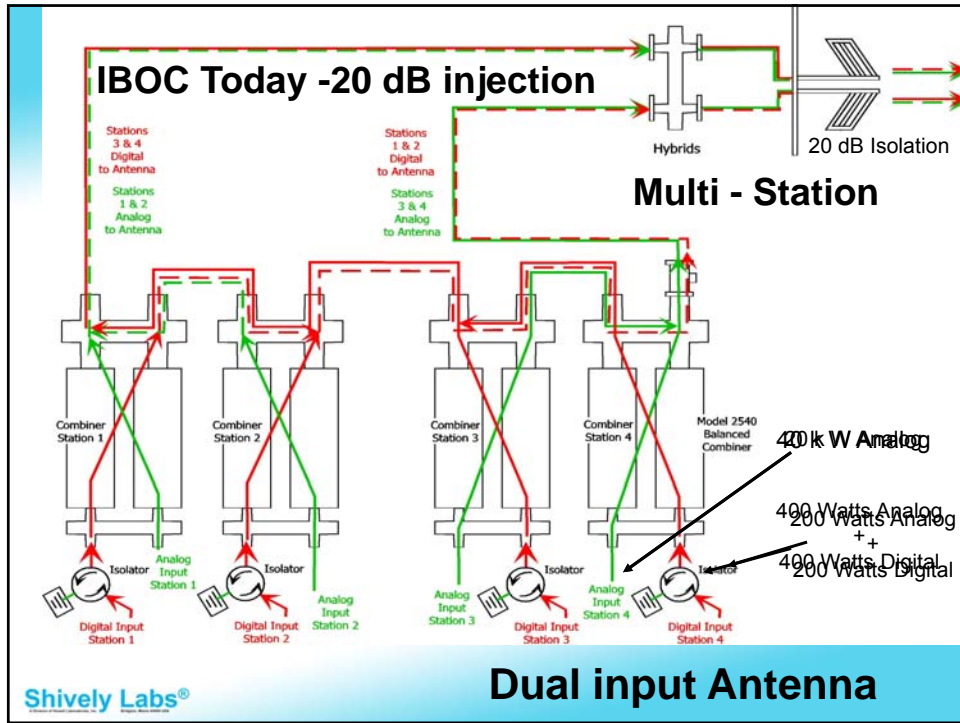
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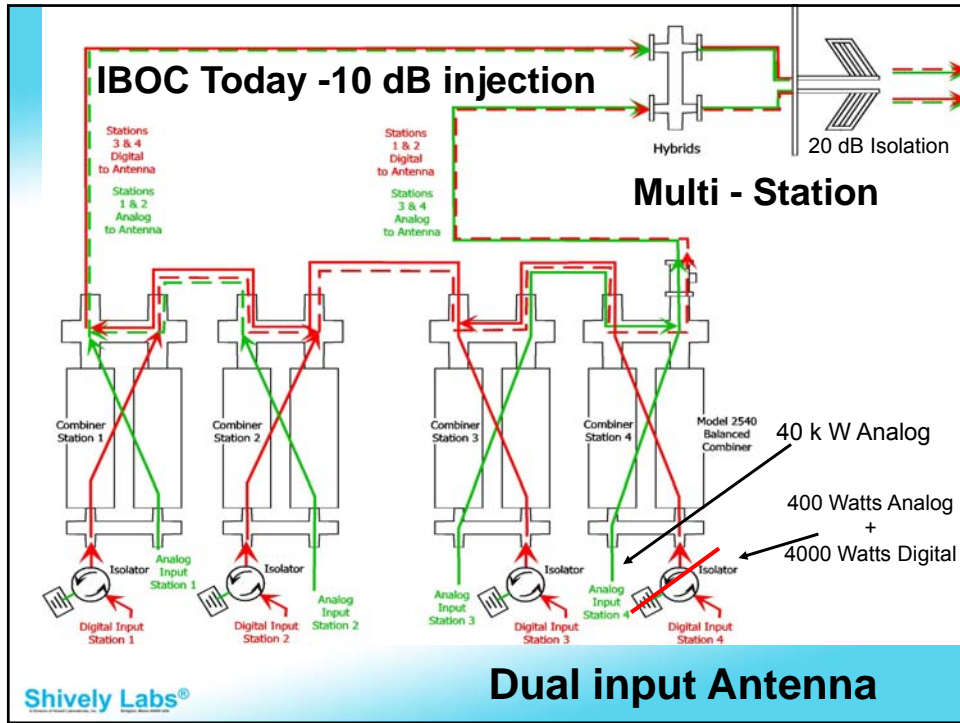


IBOC Today -20 dB injection
Single Station
What do you do if you have;
Separate Analog and Digital Transmitters

Interleaved Antenna Systems

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IBOC Today -20 dB injection

Single Station

What do you do if you have;

Separate Analog and Digital Transmitters

Interleaved Antenna Systems

Dual input Antenna

OR if you have

Separate Antennas

Make sure the feed system can handle the new digital power level

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Questions

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Peak Power Calculation

$$\left(\sqrt{T^1} + \sqrt{T^2} + \sqrt{T^3} + \sqrt{T^n}\right)^2$$

$$\left(\sqrt{30} + \sqrt{30} + \sqrt{30} + \sqrt{30}\right)^2$$

$$\left(4 \sqrt{30}\right)^2$$

$$\left(16 \times 30 = 480 \text{ kW Peak}\right)^2$$

$$= 960 \text{ kW Peak}$$

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20 dB Injection**Average Digital**

$$\left(\sqrt{30} + \sqrt{0.3} + \sqrt{30} + \sqrt{0.3} \right)^2 = 142 \text{ KW}$$

4 X Average

=

Peak Digital

$$\left(\sqrt{30} + \sqrt{1.2} + \sqrt{30} + \sqrt{1.2} \right)^2 = 173 \text{ KW}$$

10 dB Injection Peak Digital

$$\left(\sqrt{30} + \sqrt{12} + \sqrt{30} + \sqrt{12} \right)^2 = 320 \text{ KW}$$

Peak Power Rating of 4 1/16 Transmission Line = ~~710~~ k W

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-20 Injection with 4 X 30 kW Transmitters

4 X 300 for Digital Peak

$$\left(\sqrt{30 \text{ kW}} + \sqrt{30 \text{ kW}} + \sqrt{30 \text{ kW}} + \sqrt{30 \text{ kW}} + \sqrt{1200} + \sqrt{1200} + \sqrt{1200} + \sqrt{1200} \right)^2 = 700 \text{ kW}$$

-10 Injection

$$\left(\sqrt{30 \text{ kW}} + \sqrt{30 \text{ kW}} + \sqrt{30 \text{ kW}} + \sqrt{30 \text{ kW}} + \sqrt{12000} + \sqrt{12000} + \sqrt{12000} + \sqrt{12000} \right)^2 = 1300 \text{ kW}$$

X 2 = 2600 kW Peak

Peak Power Rating of 6 1/8 Transmission Line ?

1500 kW

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CCC Marimar Ennes Workshop

Questions
Thanks you

Bob Surette

Thursday March 10th, 2011

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