TFD #1 - Feed Point Analysis

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Test Equipment

Array Solutions VNA-2180 vector network analyzer, S/N 5249
Acer Aspire 5570Z laptop computer
VNA software version 530D

Device Under Test

Buxcomm 16:1 balun, P/N B15C161
Balun #2
Buxcomm 800 Ω resistor, P/N BTRX800
Resistor #2 (Measured at 803 Ω)
TFD Antenna, N-S orientation, top wire height 9'2", 30' length, 8" wire spacing

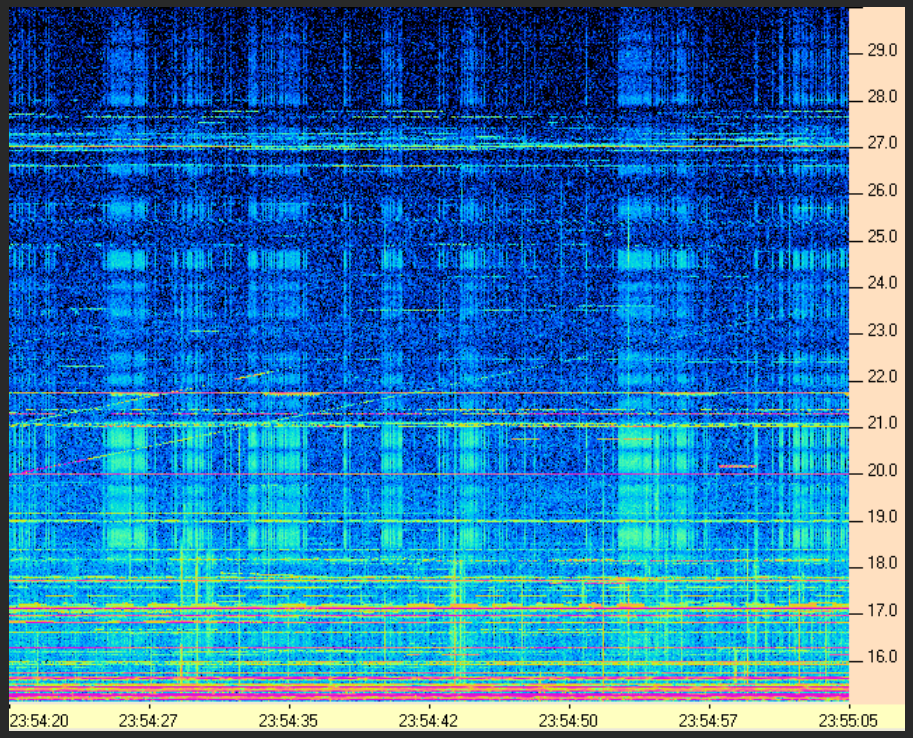
Test Results Directory

Test No.	Date	Calibration File	Data File	Calibration Plane	Notes
1	9/9/12	Cal 27.acal	Cal 27 - End of long RG-58.csv	End of 90' RG-58	Calibration sweep
2	"	"	TFD #1 - at feed point.csv †	"	
3	"	Cal 26.acal	none	VNA Port A	Calibration check sweep
4	"	"	TFD #1 - at end of long RG-58.csv †	"	
5	"	"	TFD #1 - at end of RG-58 & Arrestor & LMR-400.csv †	"	

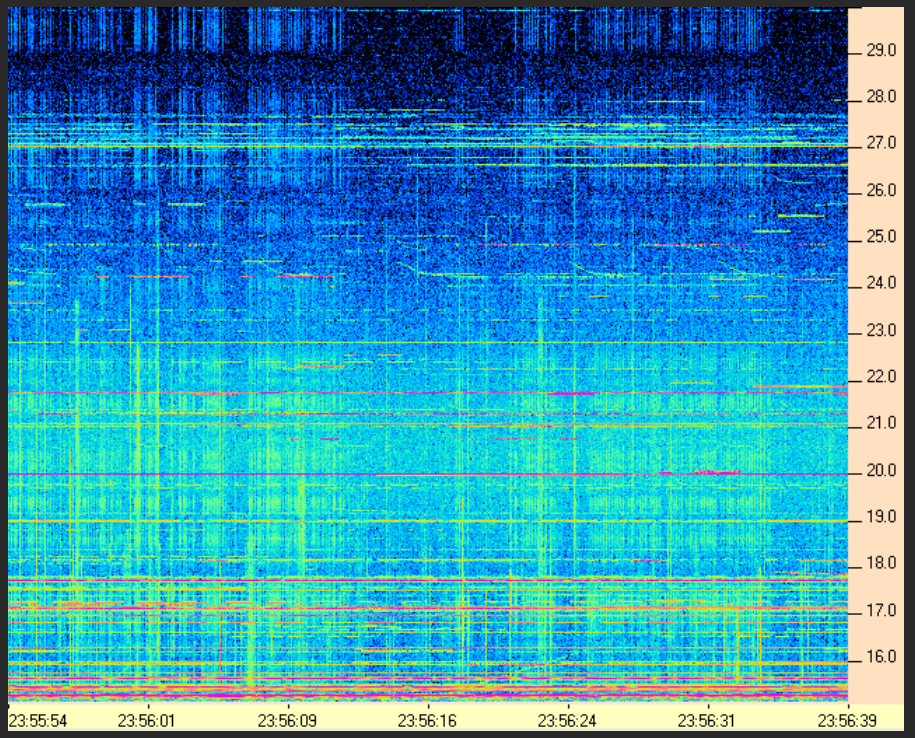
† Indicates data plotted on following pages

TFD Feed point, Balun, and Terminator

Comparison with SuperJove Array
Using SDR-14 Spectrograph

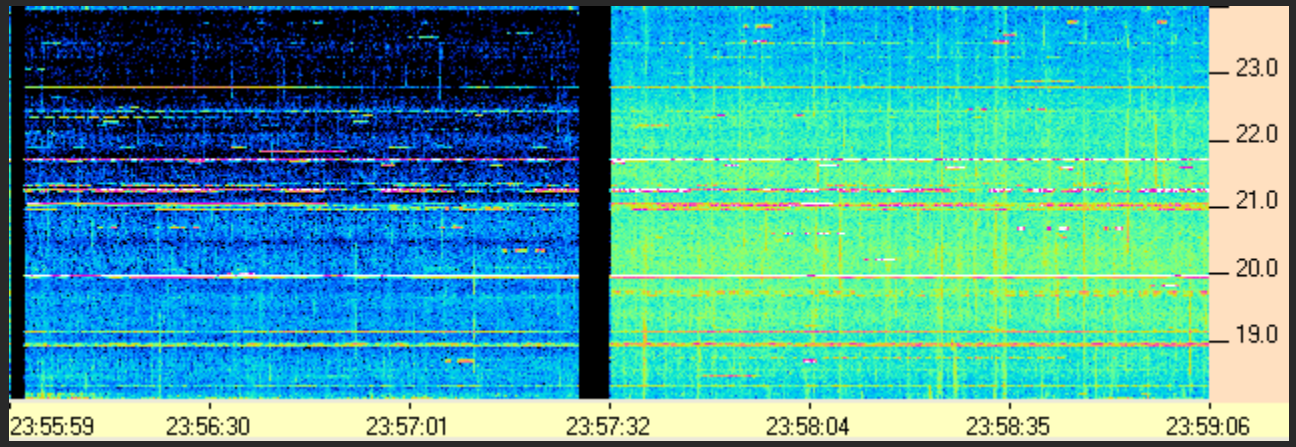


TFD

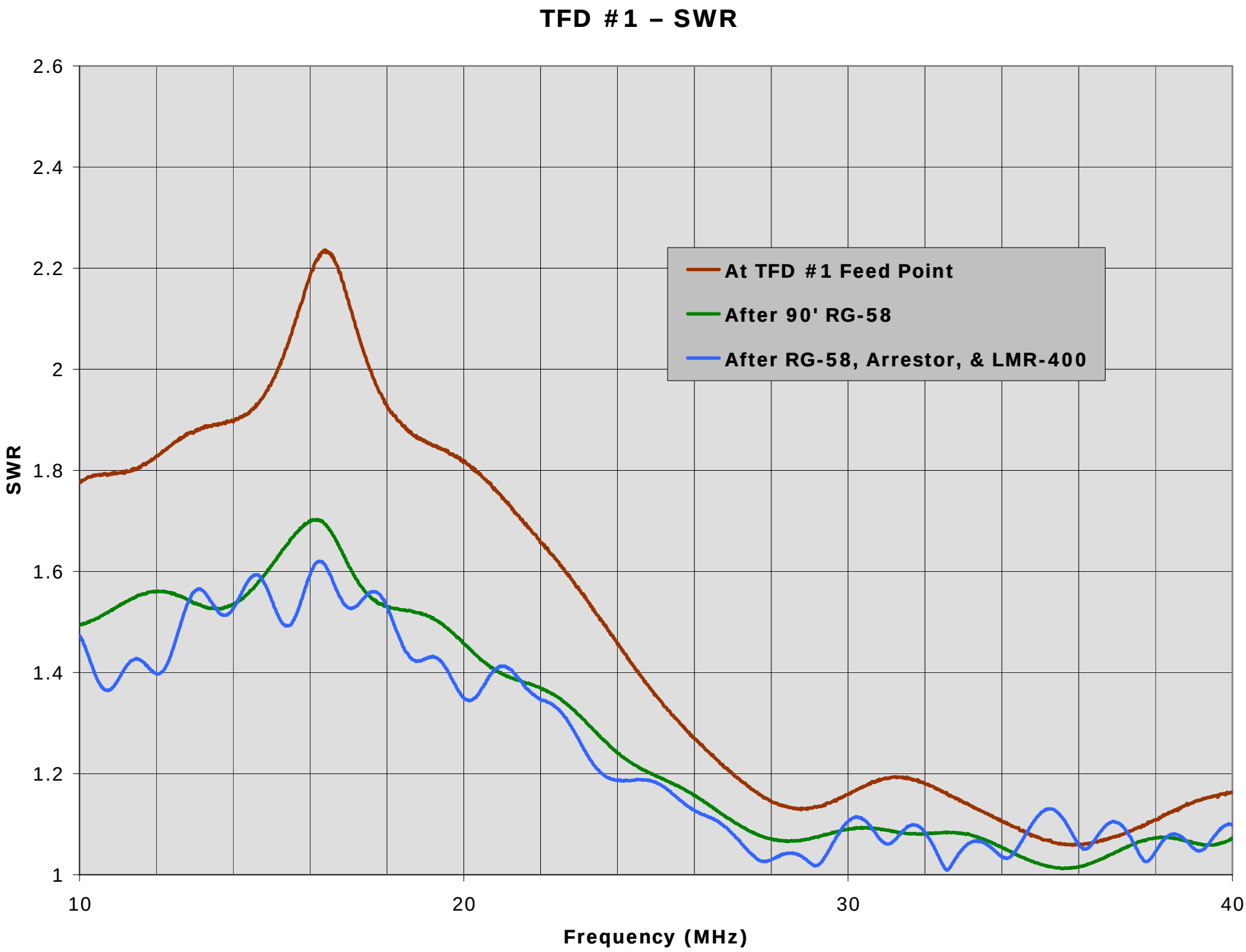


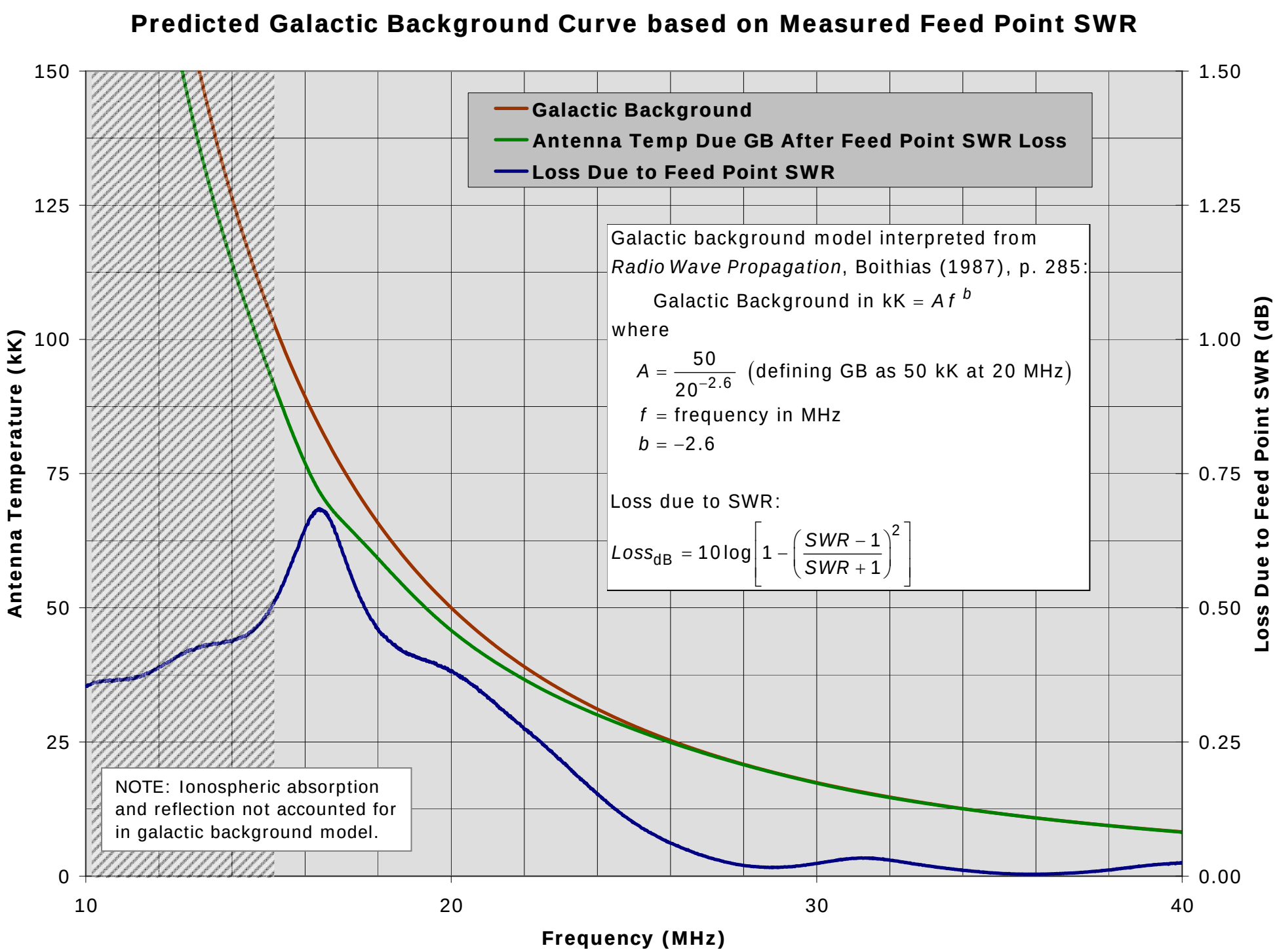
SuperJove array

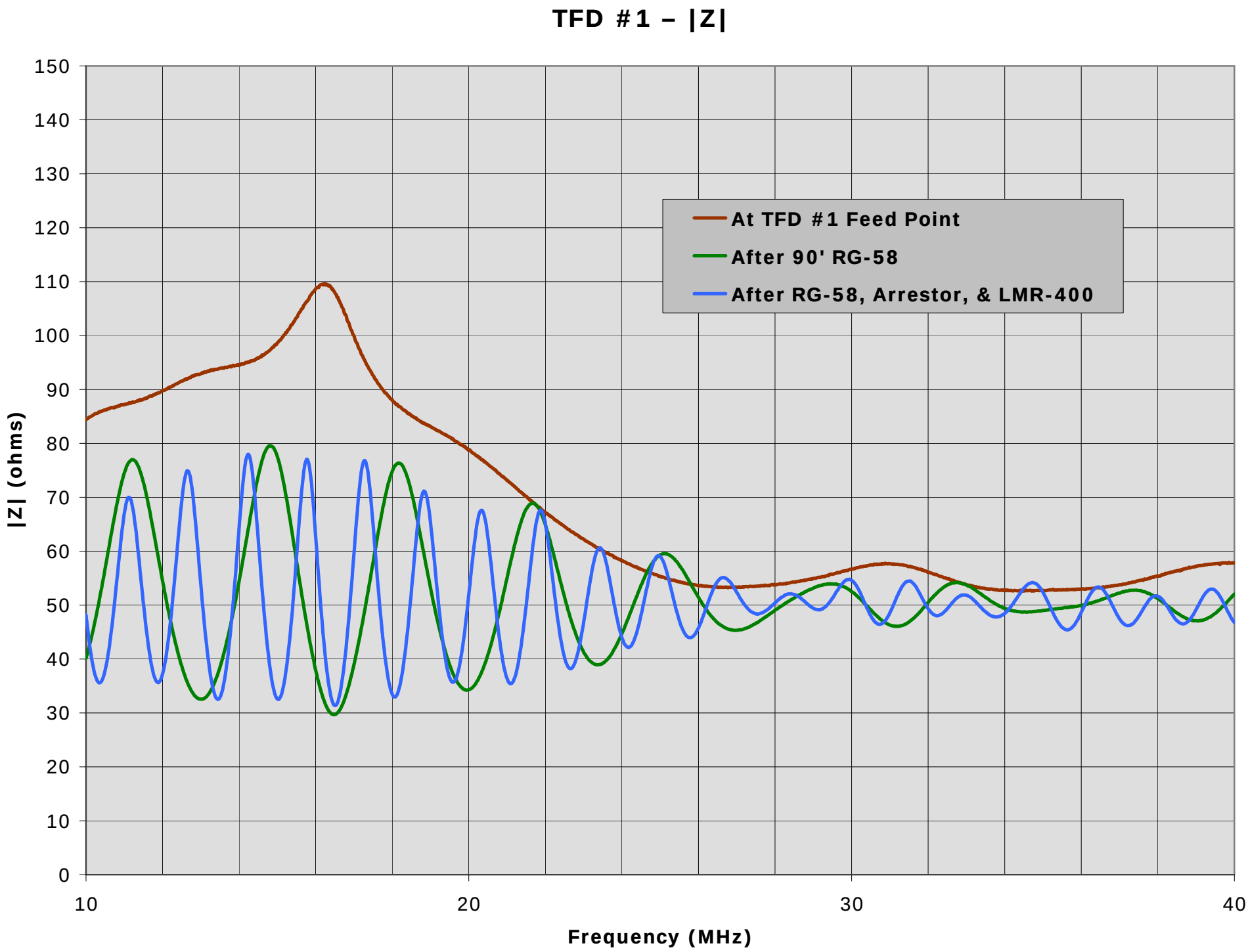
Comparison with SuperJove Array
Using FS-200 Spectrograph



TFD **SuperJove array**


TFD #1 – SWR
2.6
2.4
2.2
2
1.8
1.6
1.4
1.2
1
SWR
10
20
30
40
Frequency (MHz)
At TFD #1 Feed Point
After 90' RG-58
After RG-58, Arrestor, & LMR-400


Predicted Galactic Background Curve based on Measured Feed Point SWR
Galactic Background
Antenna Temp Due GB After Feed Point SWR Loss
Loss Due to Feed Point SWR
Galactic background model interpreted from
Radio Wave Propagation, Boithias (1987), p. 285:
Galactic Background in kK = A f^b
where
A = 50 / 20^-2.6 (defining GB as 50 kK at 20 MHz)
f = frequency in MHz
b = –2.6
Loss due to SWR:
Loss_dB = 10 log [1 – ((SWR – 1)/(SWR + 1))^2]
NOTE: Ionospheric absorption and reflection not accounted for in galactic background model.
Antenna Temperature (kK)
Loss Due to Feed Point SWR (dB)
Frequency (MHz)
150
125
100
75
50
25
0
1.50
1.25
1.00
0.75
0.50
0.25
0.00
10
20
30
40


TFD #1 – |Z|
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
|Z| (ohms)
10
20
30
40
Frequency (MHz)
At TFD #1 Feed Point
After 90' RG-58
After RG-58, Arrestor, & LMR-400