Using Open-Wire Line in "Forbidden" Places

w6nbc.com/slides


Where
Open-Wire Line
Has
Never Gone Before

In the Early Years

Open Line was King


Still Used Today
For low Loss

Today we Prefer Coax

What Caused the changeover?


WWII Portable Radios
German Trench Soldiers

1945 QST

Companies like Amphenol began offering COAX to hams


300 Ω TV ribbon


450 Ω Window Line

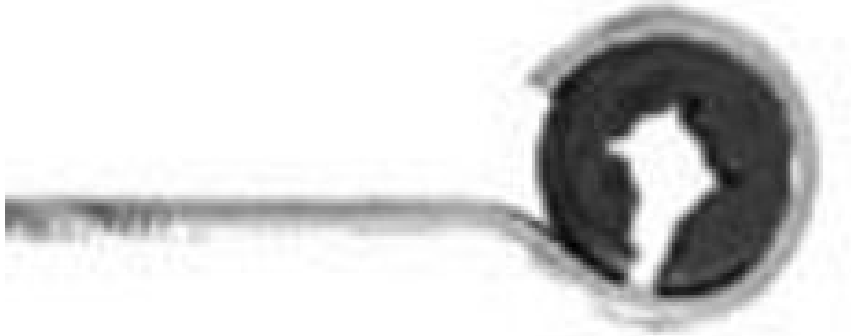

X Ω
Ladder
Line


LadderSnap
LadderSnap

1:1 SWR dB Loss				
100 ft.	80m	10m	2m	70cm
RG58	0.9	2.6	6.7	13.2
RG8	0.3	1	2.4	4.4
LMR400	0.2	0.7	1.5	2.7
300	0.2	0.6	1.3	2.4
450	0.05	0.15	0.4	0.7

Hams are afraid of open-wire line

They think



Or

On standoffs

MUST BE

In the open

WOULD'NT DREAM OF

BUT, Can we Violate this Common Wisdom ?

I set out to
find out
With simple ham
methods

A Novel Approach to Using Window Line

Routing 450 Ω window line through inexpensive polyethylene foam tubing enables its use in places once reserved for coax.

John Portune, W6NBC

Aug 2018 QST

It was obvious from the start that a recent antenna project would have to be fed by low-loss window line, but there was no stealthy way to do so while avoiding often-heard window-line taboos such as laying the line on the ground. After some thought and experimentation, I found that routing 450 Ω window line through widely available polyethylene foam tubing used for hot water pipe insulation would allow it to be used in places once thought to be the sole domain of coax cable.

Coax, which was first widely used by the military during World War II,

The line easily slips through the tubing, which now takes on the role of a linear stand-off insulator. Further, the closed foam protects the line from moisture, a potential enemy of window line. In its protective shroud, the window line can now be deployed much like coax.

In practice, you only need to encase the line for those portions of the run that lie directly on the ground or right against an object — open-air runs require no protection. Where rigidity or mechanical protection is important,

well. Figure 3 shows the curves from 18 – 22 MHz for the four situations. We'll see in a moment why I zeroed in on this smaller range.

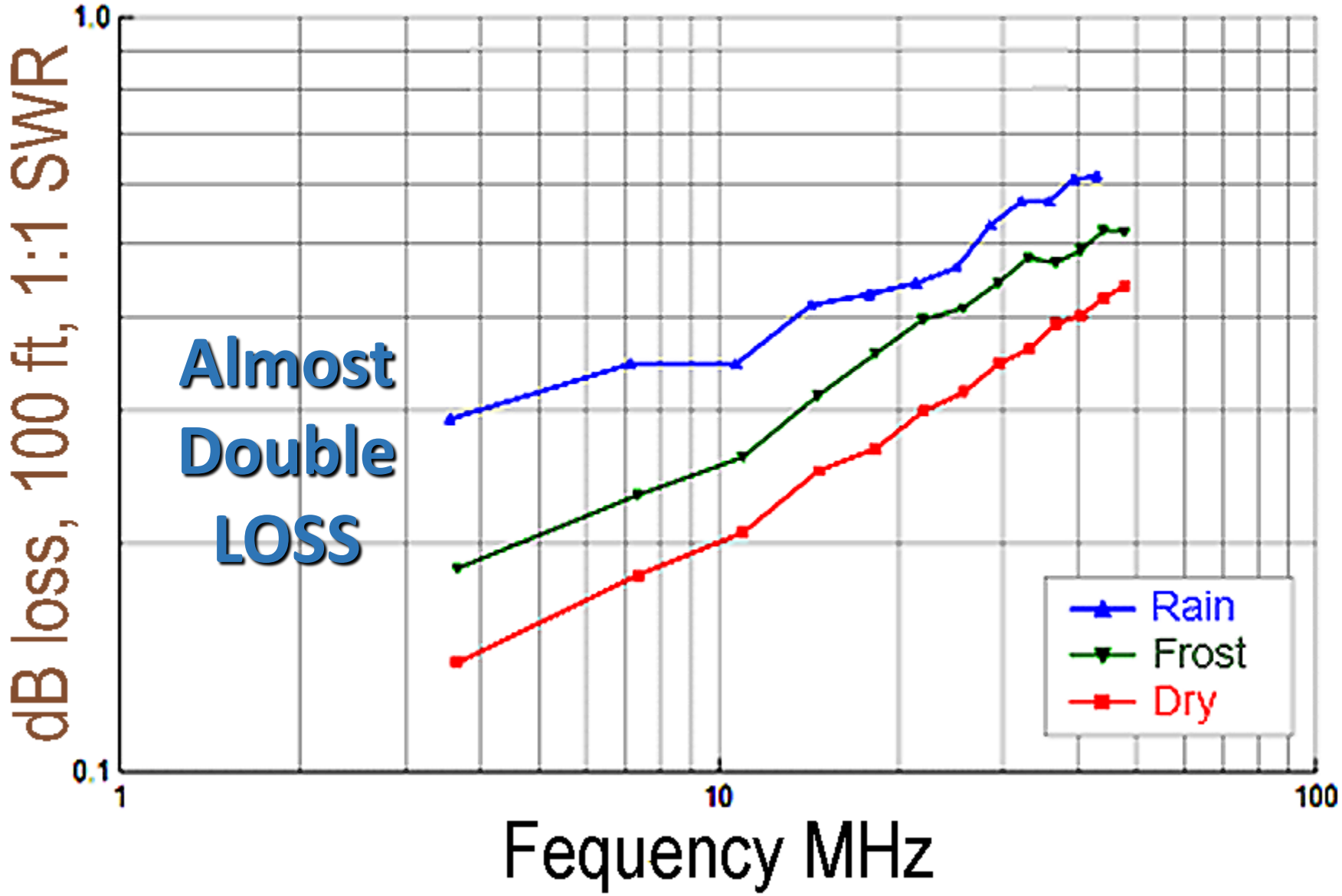
Return loss measurements are made from one end of a line with the other end open. The resulting infinite mismatch at the open end forces the test signal to totally reflect and to make two passes of the line. The loss then is half the measured total.

The reason I selected 19.8 MHz is because of the sudden 180-degree

The ONLY "musts"

- **Keep it out Moisture**
- **Maintain a Minimum Distance**

Moisture on 450 Ohm Window line



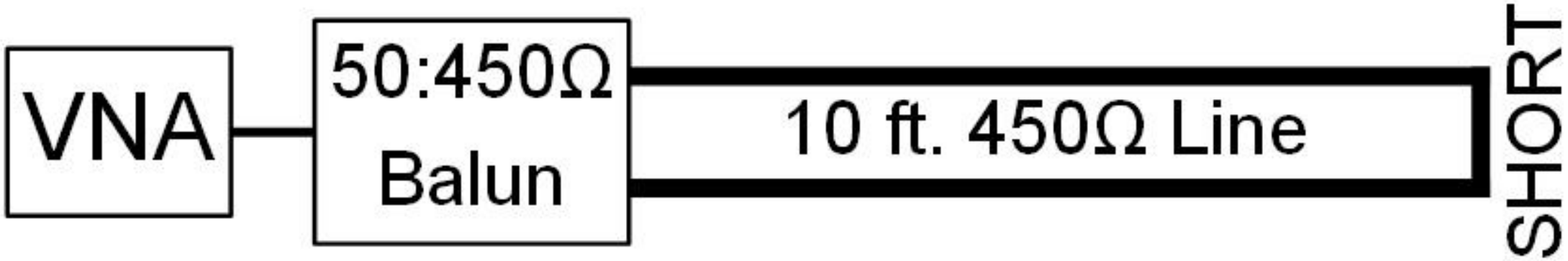
Almost Double LOSS

Solution to Both

Closed-Cell ½ in. water pipe insulating foam wrap


Frost King
MAHWAH NJ 07430 SPARKS NV 89431
Water
Proof Tape

Simple Test Setup Just to Estimate Loss



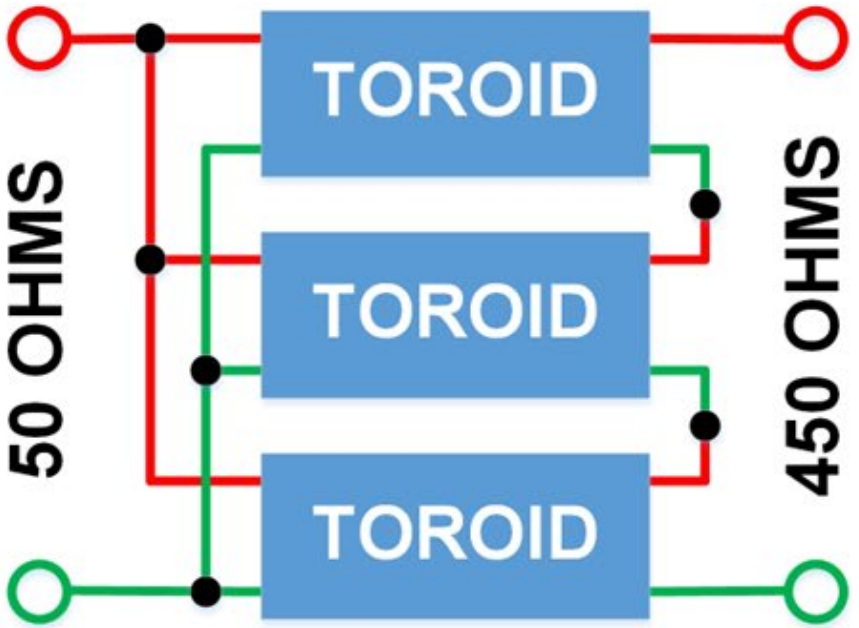
Shorted line,

the test signal is 100% reflected.

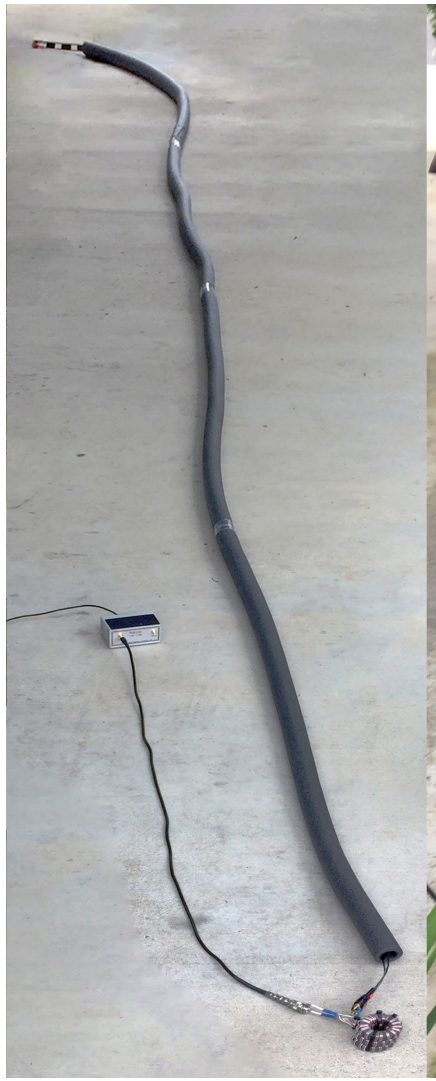
In two passes,

Loss = ½ Return Loss in dB

FT-240-43



9:1 Choke Current Balun



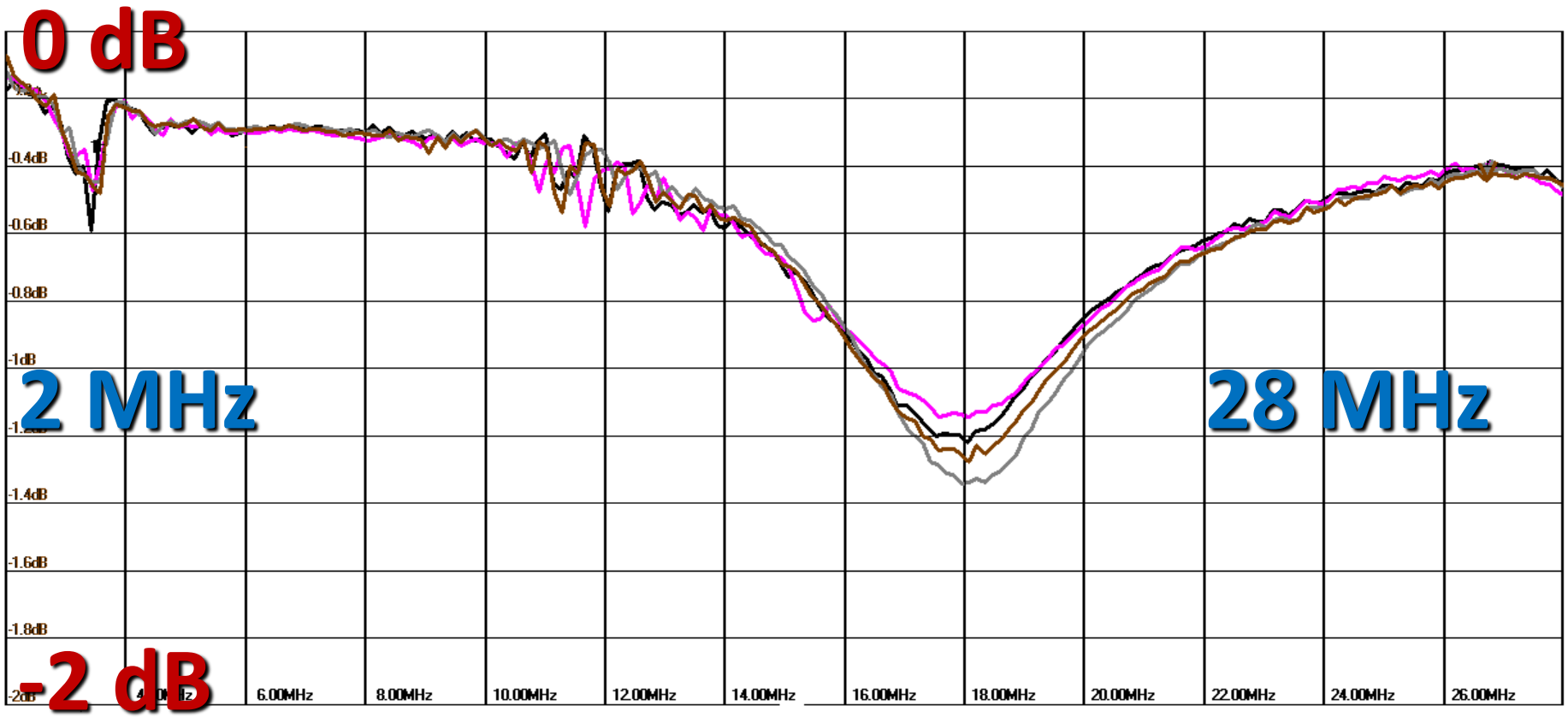
Concrete

Wet Soil

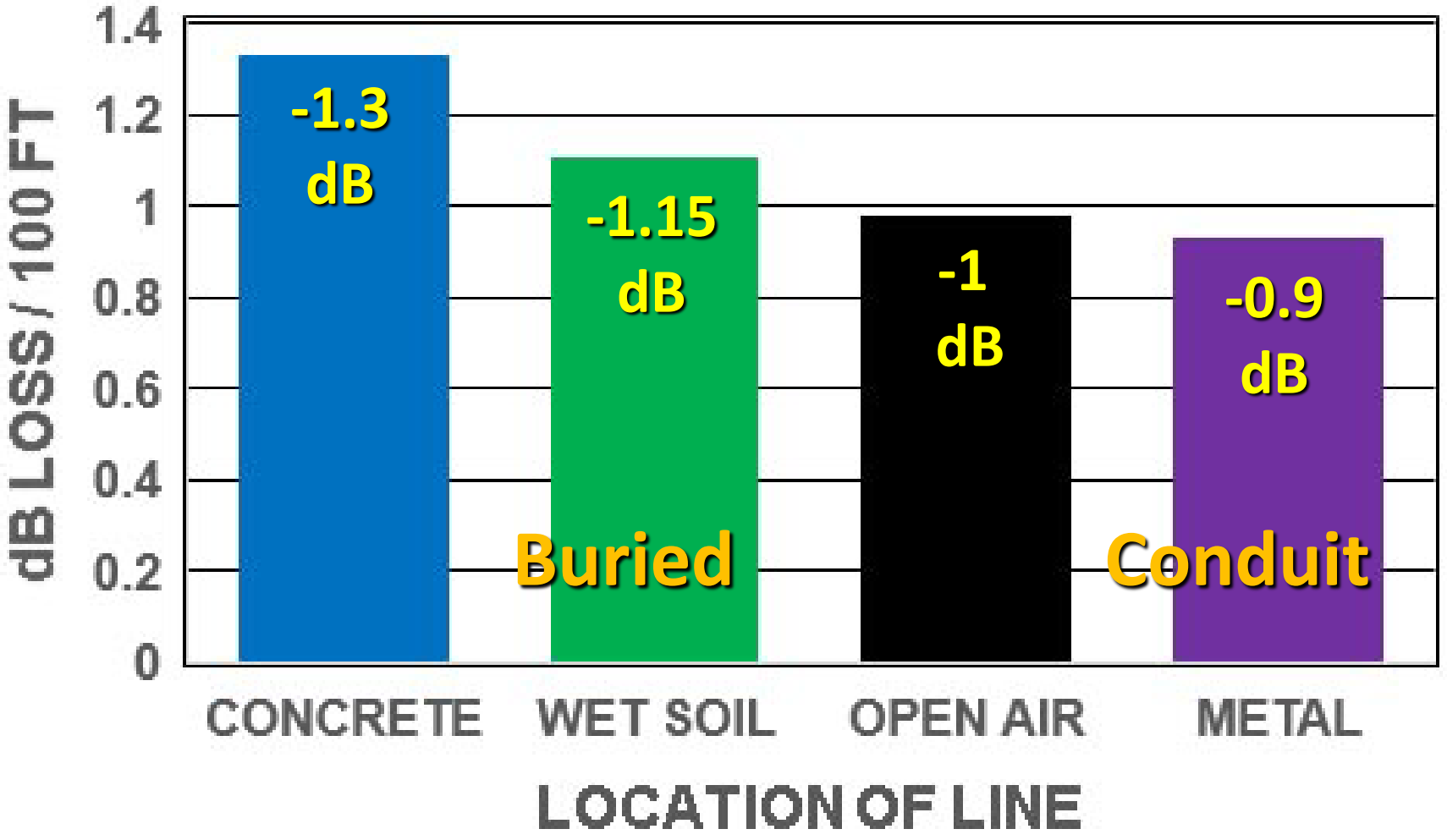
Aluminum Roof

Open Air

Raw Data of
½ Return Losses in dB

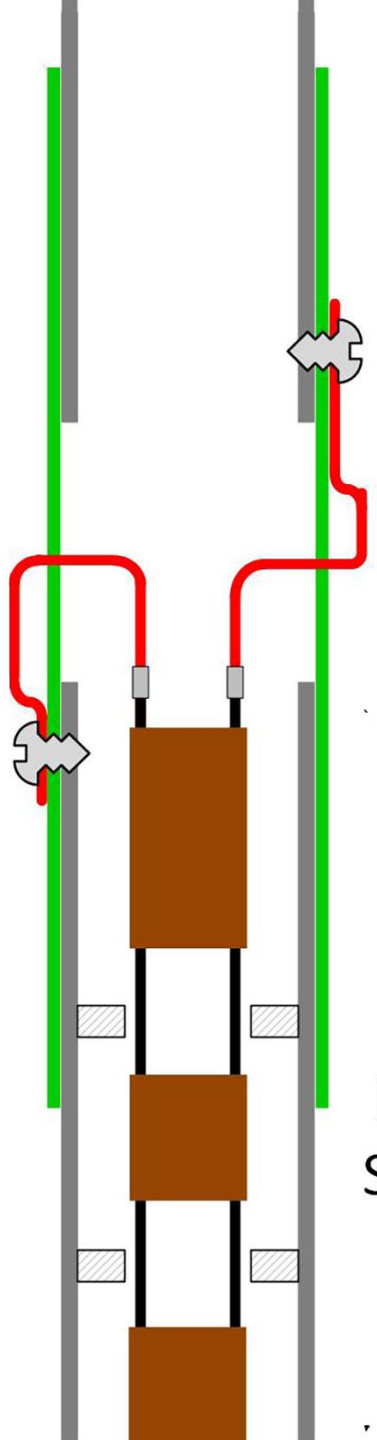


100 ft. of Line

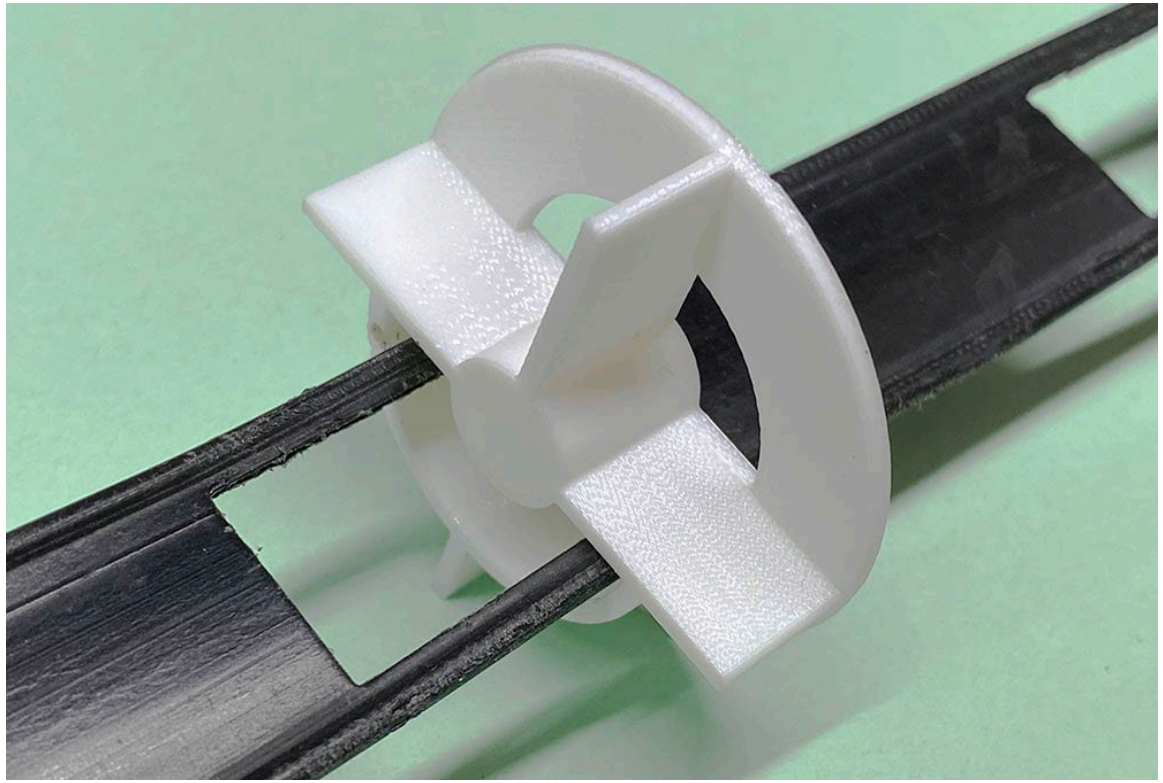


In conduit is is like TWINAX 100 Ohm Twin Coax

OCF Electrical Half Wavelength Flagpole Antenna



PLASTIC
SPACERS



Centered
Minimum Distance

Reader Examples

Closing Extra

Where Open-Line is Still King

KPH Ship-to-Shore
CW Coastal Station
Pt. Reyes


RX
TX
KPH
(KSM)
Point Reyes National Seashore
Pelican Lake
MARIN
SONOMA
Novato
Vallejo
Rodeo
Pinole
Marinwood
San Rafael
San Pablo
Corte Madera
Richmond
El Cerrito
Mill Valley
Tiburon
Albany
Sausalito
Emeryville
Oakland
San Francisco
SAN FRANCISCO
Lake Merced
San Leandro
Daly City
Pacifica
South San Francisco
San Bruno
37
101
1
780

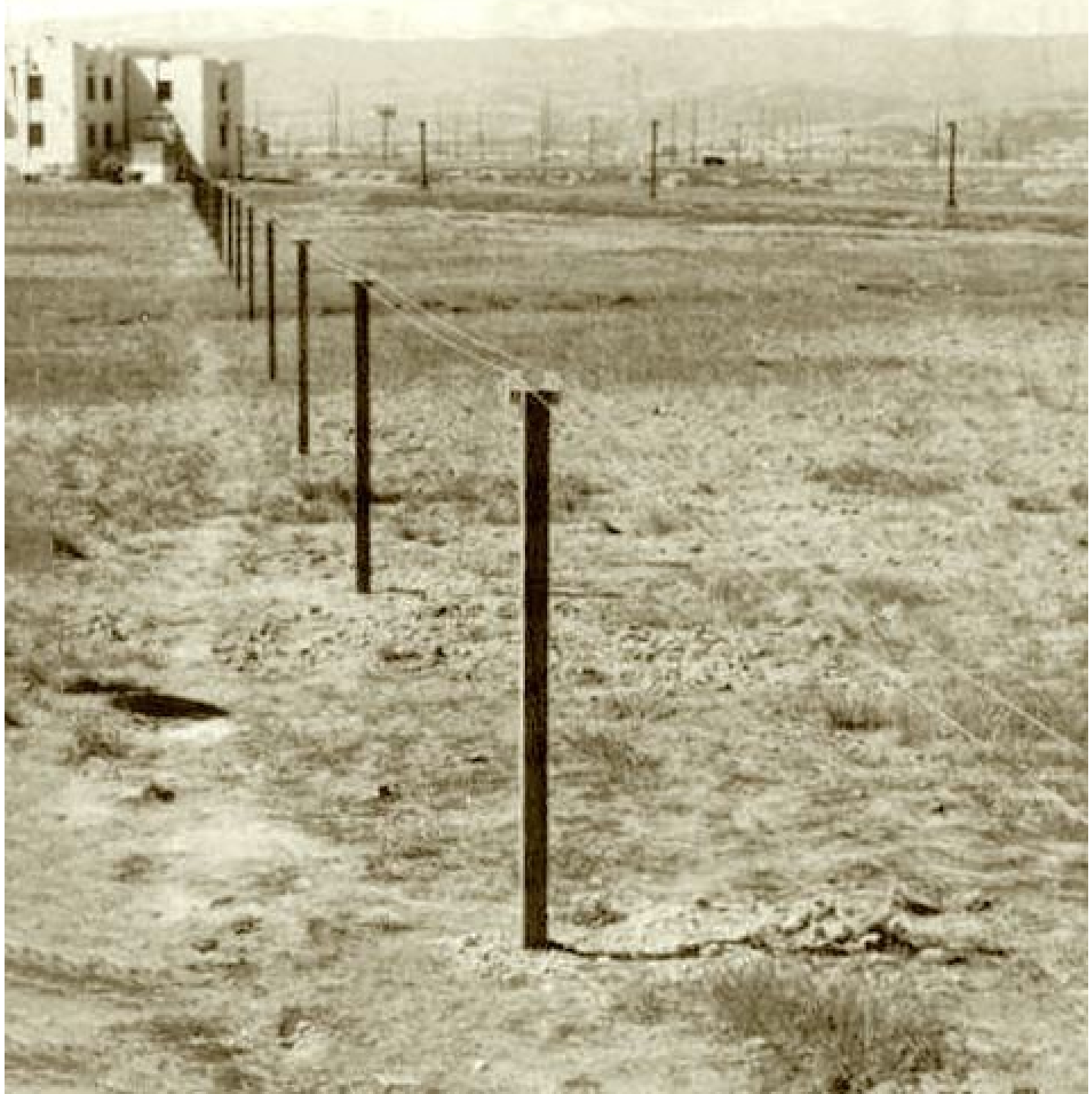
RX Site

TX Site
500 KHZ TX

Joe Peterson
KE6YHI SK

Richard
Dilman

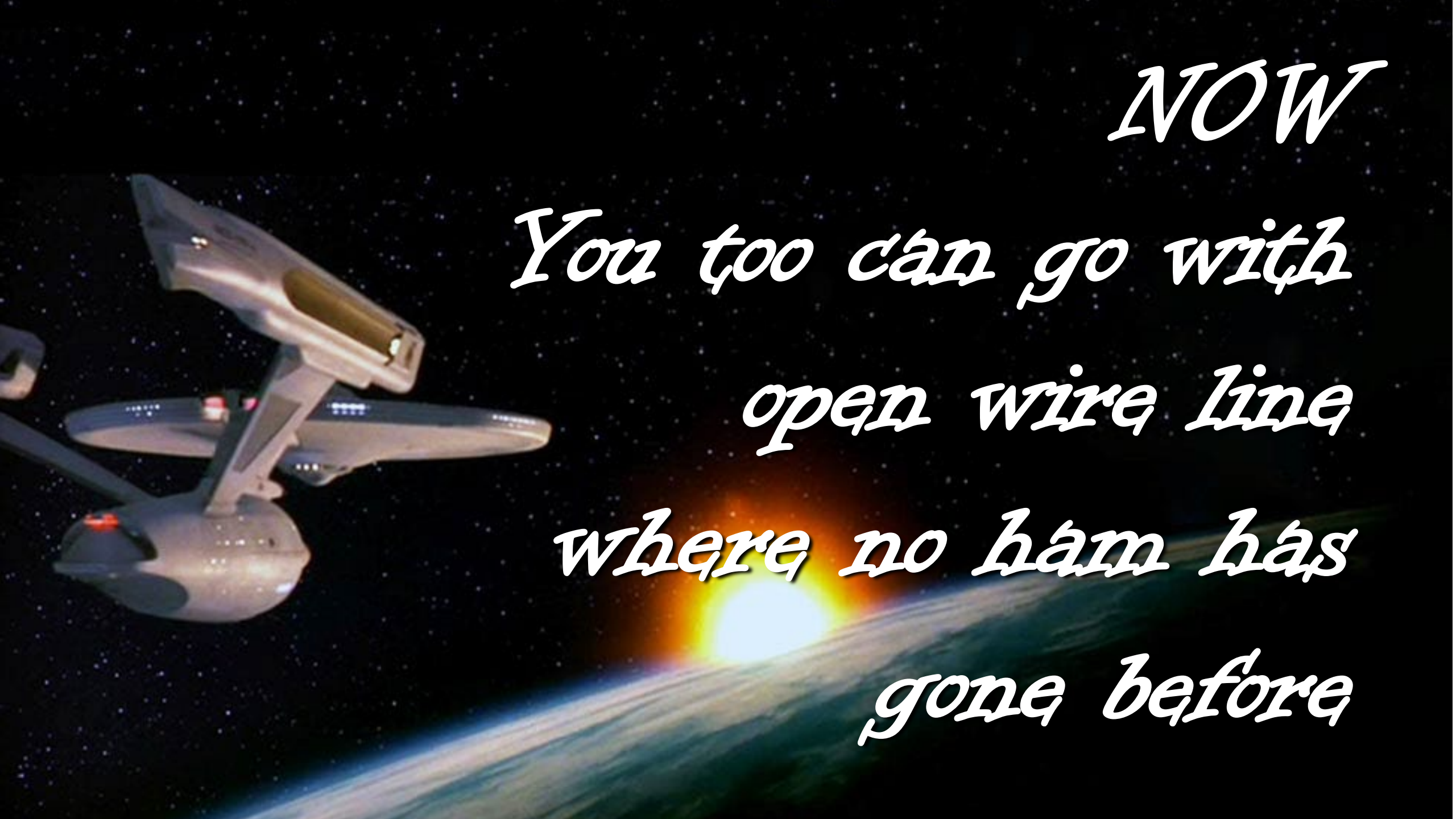

50 Ohm Unbalanced to
600 Ohm Balanced Tuners
DANGER
HIGH
VOLTAGE



The Early Days

Today

Moi
18 KW
CW


NOW
You too can go with
open wire line
where no ham has
gone before

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