ANTENNA SYSTEM ANALYZER   *Version 1.1   1/15/94*

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Registering ASA

This program is distributed as shareware.   You are free to evaluate it, copy, and share it with others.   If you find the program useful and continue to use it, please register it.   (See <u>License & Warranty</u> or the file *license.wri* for further information).

When you register, you will receive the most recent version of the program.

If you have a printer attached to your system, you can register by selecting Register from the main menu.   Fill out the information requested on the form and press the Print button.   Enclose a check or money order for $20 and mail to:

> **Micro Resources**
> **PO Box 671222**
> **Chugiak, AK   99567-1222**

If you don't have a printer, you can register by sending your name, address, and phone number, along with $20 to the above address.

Overview of the Antenna System Analyzer

Antenna system analyzer allows you to determine the performance of your existing antenna system, as well as aid in designing modifications.   With the "Analyzer", you can determine the effect of changing to an antenna with different gain or changing the feed line.

To use the program, you need to know or be able to measure the characteristics for your system, including transmitter output power, SWR, line loss characteristics, and antenna gain.

ASA can calculate the following:

> SWR at input & load
> dB
> system gain
> total line loss
> effective radiated power

In addition, line loss information for common coax cables is included.

Using the Antenna System Analyzer

Analyzing   (Analyze menu):

Antenna System Analyzer uses one screen to collect the input data and perform calculations for all functions available from the Analyze | Define menu.   You enter the required data in the Define section and select the calculation you want to perform in the Calculate section.

Calculating (Tools menu):

Tools for determining SWR and dB are accessible from the Tools menu.

Other:

A table of line loss for several coax cables can be accessed from the Tools | Coax data menu option.   A graph showing the relative losses for common cables is also provided (Tools | Coax graph)

Define box:
Enter the SWR at the load   and select the *Load* radio button.

Enter the line loss either in dB or dB/100 ft.   If you use dB/100 ft, you must also enter the length of the feed line.

Calculate box:
In   the *Calculate* box, select the *SWR @ input* radio button and press the *Accept* button to perform the calculation.

Define box:

Enter the SWR at the input   and select the *Input* radio button.

Enter the line loss either in dB or dB/100 ft.   If you use dB/100 ft, you must also enter the length of the feed line.

Calculate box:

In   the *Calculate* box, select the *SWR @ load* radio button and press the *Accept* button to perform the calculation.

Input   required: Antenna gain, SWR @ input and line loss.

Define box:

Enter the antenna gain in <u>dBi</u>.

Enter the SWR at the input   and select the *Input* radio button.

Enter the line loss either in dB or dB/100 ft.   If you use dB/100 ft, you must also enter the length of the feed line.

Calculate box:

In   the *Calculate* box, select the *Gain* radio button and press the *Accept* button to perform the calculation.

Define box:

Enter the SWR at the input   and select the *Input* radio button.

Enter the line loss either in dB or dB/100 ft.   If you use dB/100 ft, you must also enter the length of the feed line.

Calculate box:

In   the *Calculate* box, select the *Total loss* radio button and press the *Accept* button to perform the calculation.

Analyzing ERP (Analyze | Define)
Input required: Transmitter output power, antenna gain, SWR @ input and line loss.

Define box:
Enter the transmitter output power in watts.

Enter the antenna gain in dBi.   If your antenna gain is specified in <u>dBd</u> (referenced to dipole), add 2.14 dB to convert to <u>dBi</u> (referenced to isotropic radiator).

Enter the SWR at the input   and select the *Input* radio button.

Enter the line loss either in dB or dB/100 ft.   If you use dB/100 ft, you must also enter the length of the feed line.

Calculate box:
In   the *Calculate* box, select the *ERP* radio button and press the *Accept* button to perform the calculation.

Summary of input requirements

Below are the items required to perform calculations from the Analyze menu.

To calculate	You need to know
SWR at input	SWR at load, line loss
SWR at output	SWR at input, line loss
Gain	SWR at input, antenna gain, line loss
Total line loss	SWR at input, line loss
ERP	SWR at input, line loss, antenna gain, transmitter power

SWR Calculator   (Tools | SWR Calculator)
The SWR calculator determines SWR from forward and reverse power readings.

Enter the measured power levels in the appropriate boxes.   You can adjust the levels up or down through the use of the scroll *up* or *down* controls.

Click on the Calculate button and the SWR will be displayed.

dB Calculator   (Tools | dB Calculator)

The dB calculator determines <u>dB</u> using a reference power level and a new power level.   This is useful for examining the relationship between gain and power levels.

Enter the reference power and the power level you want to compare it with.   The power levels can be adjusted up or down through the use of the scroll *up* or *down* controls.

Press the Calculate button to display gain or loss in dB.   Losses are shown as negative numbers.

Impedance and loss information on common coaxial cables is provided.   Use the *drop-down* box to select the cable of interest.   This information can be used to estimate probable line loss at a given frequency (and can be used in calculations accessible from the Analyze menu).

You can add or modify the data by editing the COAX.PRM file.   See the comments in the file for details. There is a limit of 30 entrys in the file.

Coax chart   (Tools | dB Calculator)

The coax chart shows the relationship between loss (attenuation) and frequency for several common coaxial cables.

Printing results

You can print results of calculations performed from the Analyze | Define menu by selecting the Print button in the results dialog box.   ASA uses the Windows Print Manager to spool the job to your printer.

Results of calculations from the Tools menu can not be printed.

SWR

Standing wave ratio, sometimes referred to as VSWR.   ASA includes a calculator to allow you to determine SWR from forward and reverse power readings.

dB
Means of quantifying a power gain or loss.   dB is calculated by comparing a reference (or existing) power level to a new level.   For example, a change from 10 watts to 100 watts represents a 10 dB gain.   A one dB change is just perceptible to the human ear.

dBi
Gain of an antenna in reference to an isotropic radiator (dBi = 1).

To convert dBi to dBd, subtract 2.14 dB.

To convert dBd to dBi, add 2.14 dB.

dBd
Gain of an antenna in reference to a dipole.

To convert dBd to dBi, add 2.14 dB.

To convert dBi to dBd, subtract 2.14 dB.

Comments & Suggestions

Your comments and suggestions are welcome and encouraged.   Changes and enhancements to the program to meet users needs are important.   You may comment and leave bug reports using Compuserve or by U.S. Mail:

Compuserve: 71001,543

U.S. Mail   Micro Resources
                 PO Box 671222
                 Chugiak, AK   99567

License & Warranty Disclaimer

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Evaluation and <u>Registration</u>

This is not free software.   This license allows you to use this software for evaluation purposes without charge for a period of 30 days.   If you use this software after the 30 day evaluation period, a registration fee of $20 is required

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