



## ARRL Periodicals Archive – Search Results

### A membership benefit of ARRL and the ARRL Technical Information Service

**ARRL Members:** You may print a copy for personal use. Any other use of the information requires permission (see Copyright/Reprint Notice below).

**Need a higher quality reprint or scan?** Some of the scans contained within the periodical archive were produced with older imaging technology. If you require a higher quality reprint or scan, please contact the ARRL Technical Information Service for assistance. Photocopies are \$3 for ARRL members, \$5 for nonmembers. For members, TIS can send the photocopies immediately and include an invoice. Nonmembers must prepay. Details are available at [www.arrl.org/tis](http://www.arrl.org/tis) or email [photocopy@arrl.org](mailto:photocopy@arrl.org).

**QST on CD-ROM:** Annual CD-ROMs are available for recent publication years. For details and ordering information, visit [www.arrl.org/qst](http://www.arrl.org/qst).

**Non-Members:** Get access to the ARRL Periodicals Archive when you join ARRL today at [www.arrl.org/join](http://www.arrl.org/join). For a complete list of membership benefits, visit [www.arrl.org/benefits](http://www.arrl.org/benefits).

### Copyright/Reprint Notice

In general, all ARRL content is copyrighted. ARRL articles, pages, or documents--printed and online--are not in the public domain. Therefore, they may not be freely distributed or copied. Additionally, no part of this document may be copied, sold to third parties, or otherwise commercially exploited without the explicit prior written consent of ARRL. You cannot post this document to a Web site or otherwise distribute it to others through any electronic medium.

For permission to quote or reprint material from ARRL, send a request including the issue date, a description of the material requested, and a description of where you intend to use the reprinted material to the ARRL Editorial & Production Department: [permission@arrl.org](mailto:permission@arrl.org).

**QST Issue:** Aug 1982

**Title:** QRP Person's VSWR Indicator

**Author:** Doug DeMaw, W1FB

[Click Here to Report a Problem with this File](#)



## 2010 ARRL Periodicals on CD-ROM

ARRL's popular journals are available on a compact, fully-searchable CD-ROM. Every word and photo published throughout 2010 is included!

- **QST** The official membership journal of ARRL
- **NCJ** National Contest Journal
- **QEX** Forum for Communications Experimenters

**SEARCH** the full text of every article by entering titles, call signs, names—almost any word. **SEE** every word, photo (including color images), drawing and table in technical and general-interest features, columns and product reviews, plus all advertisements. **PRINT** what you see, or copy it into other applications.

**System Requirements:** Microsoft Windows™ and Macintosh systems, using the industry standard Adobe® Acrobat® Reader® software. The Acrobat Reader is a free download at [www.adobe.com](http://www.adobe.com).

### 2010 ARRL Periodicals on CD-ROM

ARRL Order No. 2001

**Only \$24.95\***

\*plus shipping and handling

Additional sets available:

2009 Ed., ARRL Order No. 1486, \$24.95  
 2008 Ed., ARRL Order No. 9406, \$24.95  
 2007 Ed., ARRL Order No. 1204, \$19.95  
 2006 Ed., ARRL Order No. 9841, \$19.95  
 2005 Ed., ARRL Order No. 9574, \$19.95  
 2004 Ed., ARRL Order No. 9396, \$19.95  
 2003 Ed., ARRL Order No. 9124, \$19.95  
 2002 Ed., ARRL Order No. 8802, \$19.95  
 2001 Ed., ARRL Order No. 8632, \$19.95



**ARRL** The national association for AMATEUR RADIO™

SHOP DIRECT or call for a dealer near you.  
 ONLINE [WWW.ARRL.ORG/SHOP](http://WWW.ARRL.ORG/SHOP)  
 ORDER TOLL-FREE 888/277-5289 (US)

### ORP PERSON'S VSWR INDICATOR

\*Assistant Technical Editor

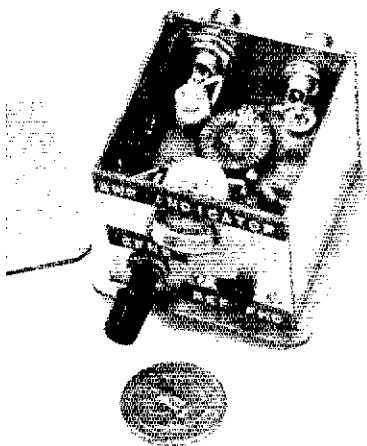


Fig. 1 — Photograph of the assembled VSWR indicator in the homemade po-board material box. A commercial cabinet or a Minibox can be used to obtain a more professional effect.

The circuit (Fig. 2) is fashioned after the classic Walter Bruene model that was described some years ago in *QST* and revisited by W1FB in a 1969 *QST* article.<sup>2</sup> The principal difference in this circuit from some other ones is that a two-turn link is wound on T1 to increase the low-power sensitivity of the instrument. Normally, a single wire is passed through the center hole of the toroidal transformer for sampling the 50-ohm transmission line.

Most of the components I used were garnered at hamfest flea markets. A miniature fm tuning meter is used at M1. It has a 100- $\mu$ A movement, but microampere meters of other full-scale characteristics will work nicely in this circuit. A miniature slide switch is used for S1, while nulling trimmers C1 and C2 are surplus pc-mount trimmers. Piston trimmers can be used in place of the units shown for C1 and C2. The type chosen should be mechanically stable and capable of withstanding at least 87 volts rms (typical maximum voltage for 150 watts at 50 ohms). Greater voltages may be present in a mismatched system. Use care in choosing the capacitors, with special attention to the *minimum capacitance* available. Only 2 or 3 pF of capacitance should be needed when the bridge is nulled for 50-ohm use.

<sup>1</sup>W. Bruene, "An Inside Picture of Directional Wattmeters," *QST*, April 1959, p. 24.

<sup>2</sup>D. DeMaw, "In-Line RF Power Metering," *QST*, Dec. 1969, p. 11.

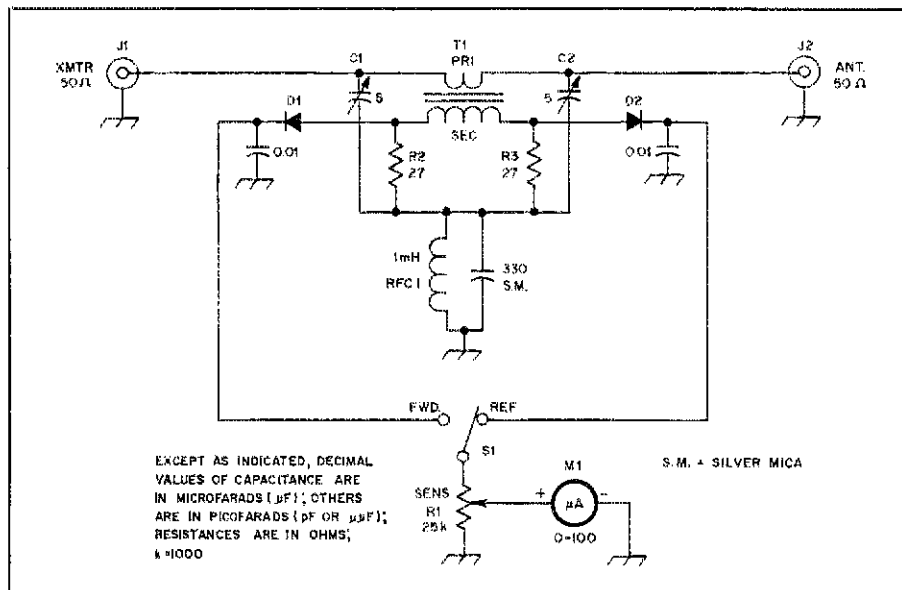


Fig. 2 — Schematic diagram of the VSWR Indicator. Fixed-value capacitors are disc ceramic except those marked with S.M., which are silver mica. R2 and R3 are 1/4-watt carbon-composition units.

D1, D2 — Silicon switching diode, 1N914 type, matched for equivalent forward resistance (use an ohmmeter).

M1 — Miniature 50- or 100- $\mu$ A dc meter (see text).

T1 — Toroidal transformer. Secondary: 60 turns no. 30 enam. wire on an Amidon, Radiokit or Palomar T68-2 powdered-iron core. Primary is two turns over secondary winding.

I supported the pc board<sup>1</sup> in the box by means of a single standoff post, directly under T1. The rear edge of the pc board butts firmly against the back wall, as shown in the photograph. Be sure to connect the ground foil of the pc board to the box walls. I used two short lengths of bus wire for the purpose. A glob of noncorrosive RTV sealant is placed in the center hole of T1 to keep the transformer in position. Similarly, I glued M1 to the front panel by means of quick-drying contact cement. Four adhesive-backed plastic feet are attached to the bottom plate of the instrument. I used Dymo<sup>®</sup> tape labels to identify the controls and the input/output jacks on the rear of the box.

Adjustment is done by connecting a 50-ohm resistive termination to the antenna jack, applying rf energy to the transmitter jack and adjusting R1 for a full-scale reading (S1 in the FWD position). Next, switch S1 to REF and adjust the trimmer that causes the meter reading to change (one of the trimmers will be unresponsive in this setting). Set the trimmer for minimum meter deflection. It should read zero. Next, reverse the cables at J1 and J2. Put S1 in the REF position. Apply rf energy. The meter should read full scale. Switch S1 to FWD and adjust the remaining trimmer for minimum meter reading (again, it should fall to zero). The bridge has now been balanced for 50 ohms. This set of adjustments should be done on 20 or 15 meters to ensure proper high-range performance.

When using the instrument, always adjust RI for a full-scale reading with S1 in the FWD mode. Adjust the antenna or antenna-matching network for the lowest reading attainable with S1 in the REF position. A zero reading in REF will be equivalent to a VSWR of 1:1.

My tests show the instrument is suitable from approximately 1 watt to 150 watts. It is not designed for power levels in excess of 150 watts. It will function properly from 1.8 to 30 MHz. It may look ugly, but it's small! — *Doug DeMaw, W1FB, ARRL Ha.*

## A BROADBAND 80-METER INVERTED V

☐ I have a solution to the problem of constructing a broadband antenna for 75 and 80 meters. My antenna consists of two inverted Vs, connected to a single 50-ohm coaxial-cable feed line. My version uses one antenna cut to resonance at 3512 kHz and another at 3790 kHz.

I have experimented with different angles between the two Vs, and the optimum broadband condition seems to occur at maximum

<sup>1</sup>Pc boards for the VSWR meter are available from Circuit Board Specialists, P.O. Box 969, Pueblo, CO 81001. The ARRL and QST in no way warrant this offer.