

JAMES MILLEN MANUFACTURING COMPANY, Inc.

150 EXCHANGE STREET, MALDEN, MASS.

Instruction Book for Millen No. 90671

Standing Wave Ratio Bridge

GENERAL:

The No. 90671 Standing Wave Ratio Bridge is designed to indicate the standing wave ratio in a 52 or 75 ohm coaxial transmission line such as RG-8/U, RG-54/U or RG-13/U. It is an r-f bridge (See schematic circuit diagram) in which the resistance of the antenna transmission line and antenna, as seen by the trans-

mitter, is compared to a 51 ohm resistor. An external 0 to 1 ma. meter is used to indicate the amount of deviation from balance. The meter reading is changed to standing wave ratio by using the calibration curve supplied in this manual.

FREQUENCY RANGE:

The No. 90671 is not "frequency critical." The unit as supplied may be used with good accuracy from 1 mc. to 15 mc. and with reduced accuracy to 150 mc. The limiting item is the r-f choke impedance. The r-f choke is needed only to provide a d-c return path for antennas of the "split radiator" type. For folded dipole, "T"-match, or other type of closed radiator, the r-f choke may be eliminated and the 90671 may be used with good accuracy to 150 mc.

The No. 90671 Bridge as supplied is for use with 52 ohm coaxial transmission line. A 75 ohm resistor is soldered to lugs on the inside of the base plate. For use with 75 ohm coaxial transmission line such as RG-13/U or RG-11/U, the 51 ohm resistor, R4, should be replaced by the 75 ohm resistor supplied. Place the 75 ohm resistor in the unit in exactly the same way

(position and leads) as the original 51 ohm resistor. No other change is required.

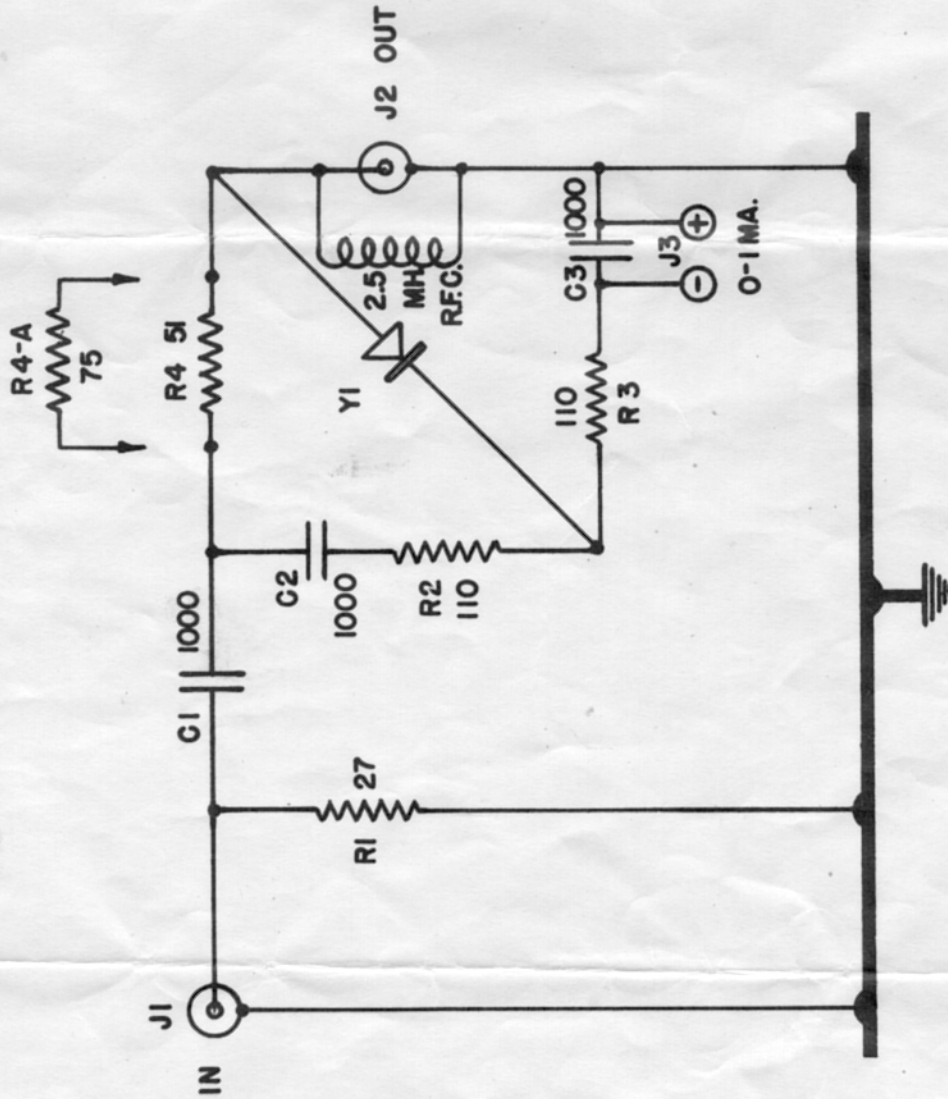
The ratio arms of the r-f bridge are C2 plus R2 and C3 plus R3. C2, C3 and R2, R3 are very accurately matched pairs. The other two arms of the bridge are the transmission line and antenna connected to the "OUT" coaxial connector, and the resistor, R4, to which the line resistance is compared. The rectifier crystal across the bridge is a 1N34. An external 0 to 1 ma. meter, when connected to J3 on the front panel, indicates the bridge unbalance current. The r-f choke is needed only to provide a d-c return when split-radiator antennas are used. C1 is a coupling capacitor and R1 is used to improve the regulation of the r-f power supplied to the bridge. No power source other than a small amount of r-f is required to operate the bridge.

METHOD OF OPERATION:

Connect a low power source of r-f to the "IN" jack, J1. This power must, of course, be at the frequency at which the transmission line and antenna is to be used. Use extreme caution not to apply too much power. Too much power will burn out the elements of the bridge and damage the meter. Use minimum coupling. It may be necessary to lower plate voltage or use a low power driver stage. Adjust the power input for exactly 1 ma. meter reading with the

transmission line disconnected from the "OUT" connector. Connect the transmission line, read the meter, and look up the standing wave ratio on the calibration chart supplied in this manual. If greater accuracy is desired, an individual calibration can be made by terminating the unit in various resistances. The S. W. R. is the terminating resistance divided by the actual measured value of the 51 ohm resistor.

THIRD ANGLE PROJECTION



SCHEMATIC CIRCUIT DIAGRAM

ALL DIMENSIONS UNLESS OTHERWISE NOTED MUST BE HELD TO A TOLERANCE OF

STANDING WAVE RATIO BRIDGE

FIRST MADE FOR

DESIGNED BY _____

DRAWN BY *Y.C.*

CHECKED BY *RAB*

APPROVED _____

JAMES MILLEN MFG. CO., INC.
MALDEN, MASS., U.S.A.

K90671

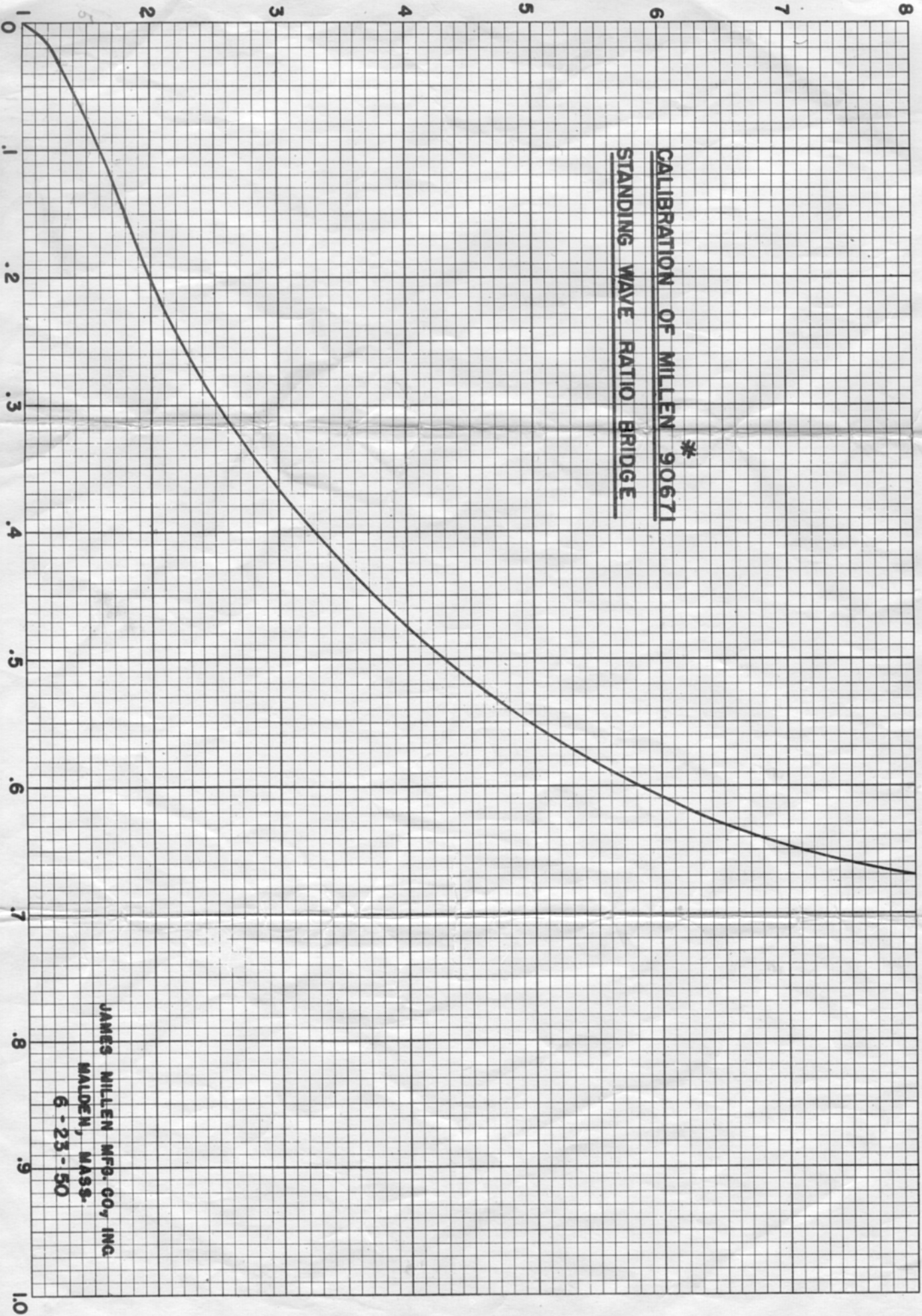
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CALIBRATION OF MILLEN *
STANDING WAVE RATIO BRIDGE



JAMES MILLEN MFG. CO., INC.
MALDEN, MASS.
6-25-50