

Instructions for 46672 Baluns

1. DESCRIPTION

The 46672 series of wound Baluns covers each of the following frequency bands:

46672-10	Ten/Eleven meters	(26.96-29.7mc.)
46672-15	Fifteen meters	(21.0-21.45mc.)
46672-20	Twenty meters	(14.0-14.35mc.)
46672-40	Forty meters	(7.0-7.3mc.)
46672-80	Eighty/Seventy-Five meters	(3.5-4.0mc.)

The 46672 wound Balun is an accurate 2-to-1 turns ratio, high Q auto transformer with the residual reactances tuned out and with very tight coupling between the two halves of the total winding. The residual reactances are tuned out by fixed capacitors. The points of series and parallel resonance are selected so that each Balun pro-

vides an accurate 4-to-1 impedance ratio over the entire band of frequencies for which it was designed.

A balanced impedance connected to the terminal posts of the Balun will appear at the co-axial cable connector as an unbalanced impedance equal to one-fourth the impedance connected to the binding posts. The 2-to-1 turns ratio produces a 4-to-1 impedance ratio. For example, a properly-terminated balanced 600-ohm line connected to the binding posts will appear as 150 ohms at the co-axial terminal which is connected between the grounded center-tap and one end of the coil.

2. APPLICATION

The 46672 series of Baluns may be used wherever it is desired to change from a balanced to an unbalanced condition or vice versa as the name Balun indicates. Each Balun should be used only at those frequencies for which it was designed as indicated in section 1 above. The only other limitation on use is the voltage rating of the parallel resonating capacitor. See section 3.

The two chief applications of the 46672 series

of Baluns are:

1. A convenient means of connecting a balanced impedance to the Millen 90672 Antenna Bridge for measurement, and
2. For coupling the unbalanced output from an amateur transmitter to a balanced transmission line.

3. PRECAUTIONS

The parallel resonating capacitors are rated at five hundred volts peak in all 46672 Baluns except for the 46672-80 which is rated at three

hundred volts peak. With a standing wave ratio of 1.0, and with sine wave modulation the following maximum carrier output power ratings apply:

Line Impedance Ohms	46672-80		46672-10-15-20-40	
	AM Carrier	CW	AM Carrier	CW
	Watts	Watts	Watts	Watts
75	306	612	865	1730
100	225	450	630	1260
300	75	150	210	420
500	45	90	126	252
600	37	75	110	210

WHEN APPLYING POWER TO THE BALUN COILS, DO NOT UNDER ANY CIRCUMSTANCES REMOVE THE LOAD OR ALLOW THE LOAD IMPEDANCE TO INCREASE.

When using the Balun coils with an An-

tenna Bridge, do not allow a metal surface other than the Bridge to come within a full coil diameter of the coil.

Arrange the leads from the transmission line so there will be minimum capacitive and inductive coupling to the Balun.

4. USE WITH ANTENNA BRIDGE

The 46672 Baluns were designed expressly for use with the Millen 90672 Antenna Bridge but they may be used with other bridges.

The coaxial connector on the Balun should be plugged into the mating connector on the Antenna Bridge. The balanced impedance to be measured should be connected to the binding post terminals on the Balun, using care to arrange the physical placement of the Balun and the unknown impedance to minimize stray capacitive and inductive coupling between the two. Make the measurement exactly as if the unknown impedance were unbalanced and connected di-

rectly to the Bridge.

The 2-to-1 turns ratio of the Balun produces a 4-to-1 impedance ratio. This means that the readings of the Antenna Bridge must be multiplied by four when using a Balun. Thus the range of the 5—500-ohm 90672 Antenna Bridge becomes 20-2000 ohms for balanced loads. This coincides with the usual higher impedance of balanced lines. Use of a Balun maintains balance during measurement and thus eliminates the wild errors usually encountered when one tries to measure any balanced-line impedance without first converting it to a single-ended load.

5. ACCURACY

The Q of the Millen 46672 Baluns is high, consequently the impedance of the Balun shunted across the unknown impedance will cause very little error. The maximum error will be about

four per cent when reading a 2000-ohm load but will be only one per cent for a 500-ohm load. Errors caused by the Balun are so small as to be practically unreadable when used with a Bridge.

6. BANDWIDTH

Number	Amateur Band	Bandwidth
46672-10	10/11 meters (28,700 KC.)	±1000 KC.
46672-15	15 meters (21,225 KC.)	± 750 KC.
46672-20	20 meters (14,175 KC.)	± 500 KC.
46672-40	40 meters (7,150 KC.)	± 375 KC.
46672-80	80/75 meters (3,750 KC.)	± 250 KC.

7. USE WITH TRANSMITTERS

The 46672 Baluns may be used to couple the unbalanced output from an amateur transmitter to a balanced transmission line, PROVIDED the precautions outlined in section 3 above are observed.

The Millen 90801 Transmitter may be coupled

to a balanced line of any impedance up to 600 ohms by means of a 46672 Balun. The only limitation other than those outlined in section 3 is that the 46672-80 should not be used with a 600-ohm load when amplitude modulation is required.

8. TECHNICAL SUMMARY

Impedance Ratio—4-to-1

Accuracy—±5%

Bandwidth

46672-80	± 250 KC.
46672-40	± 375 KC.
46672-20	± 500 KC.
46672-15	± 750 KC.
46672-10	±1000 KC.

Physical Dimensions

Length	—3 $\frac{3}{8}$ inches including coaxial connector
Width	—2 $\frac{5}{8}$ inches including binding posts
Width	—2 inches not including binding posts
Weight	—5 ounces