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QST Issue: Jul 1982

Title: New, More Versatile Transmatch, A

Author: Claude Frantz, F5FC/DJ0OT

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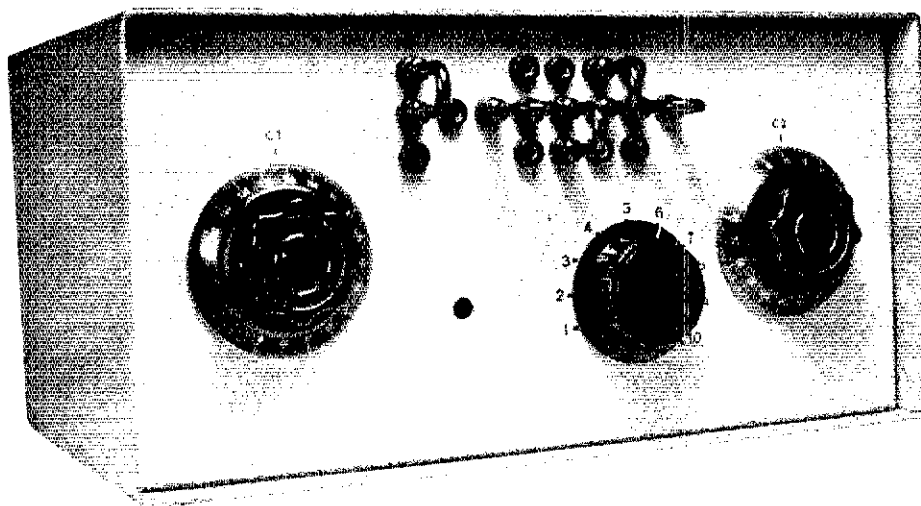
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A New, More Versatile Transmatch



Another Transmatch? This one is different! It “jumps” to match your every need.

By Claude L. Frantz,* F5FC/DJØOT

Technical articles show an increasing interest in impedance matching between the transmitter and antenna systems. This is amplified by the fact that more modern equipment uses solid-state final amplifiers with a fixed-value output impedance.

The matching problem can be resolved in an elegant manner if a tube PA (power amplifier) and a well designed Pi-L matching network are used. Unfortunately, only a few articles have been published on Pi-L matching-network designs with wide-range matching capabilities. The usual approach, using a given intermediate impedance between the Pi and the L sections, is not adequate for matching widely varying load impedances.

This article describes a matching device that can be used between any receiver,

transmitter or transceiver and an antenna system having unbalanced connections. The unit will provide a matching range that is much broader than the range of most similar devices. Despite these

capabilities, it remains simple and inexpensive.

The main feature is an ability to vary the structure of the matching network in a simple manner. Any L, Pi or T network

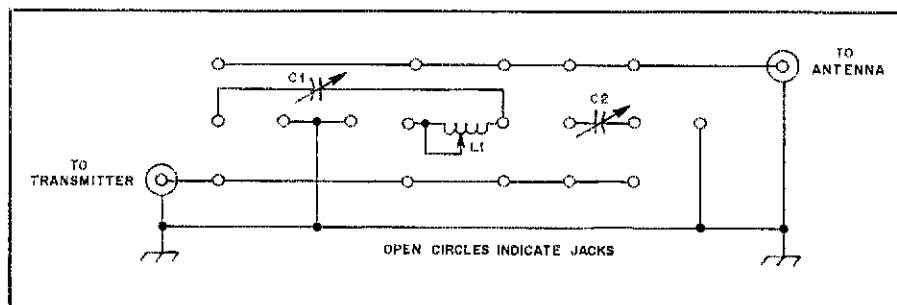


Fig. 1 — Schematic diagram of the Transmatch used at DJØOT. Jacks for the wire jumpers are shown as circles. Any desired configuration can be wired by inserting jumpers at the appropriate points. C1 and C2 are air variable capacitors, 200 pF, with a large plate spacing. L1 is a 25- μ H inductor (E. F. Johnson 229-203 or similar).

*Hauserstr. 43, 8035 Gauting-Königswiesen, West Germany

Table 1
Basic L Network

Configuration	Jumper Location	Main Usage
		$R < 50 \Omega$ $X < 0$
		$R > 50 \Omega$ $X > 25 \Omega$
		$R > 50 \Omega$ $X < 25 \Omega$
		$R < 50 \Omega$ $X > 0$
		$R < 50 \Omega$ $X > 25 \Omega$
		$R < 50 \Omega$ $X > 25 \Omega$

Table 2
PI and T Networks

Configuration	Jumper Location

that can be built with three components (two capacitors and one inductor) is realized easily with this device. Component values are not critical. The inductor can be a roller coil or one with switched tap points (Fig. 1). In my Transmatch, jumpers are used to make the interconnections, so any configuration can be wired quickly. I prefer this method of interconnection because it is simple and economical. Expensive switches capable of handling large current or voltage, depending on the network used, are not required. Further, the required space is

smaller. A maximum of five jumpers is required to make all interconnections. Tables 1, 2, 3 and 4 show possible networks; the location of the jumpers is given for each one.

I used variable capacitors that have ceramic-insulated supports and insulated shaft couplers. The inductor is a 25- μ H tapped coil, but a larger inductance will be needed if you plan to use the Transmatch on 160 meters. A roller inductor will provide continuous matching capability. Banana jacks are used for front-panel connections. The jumpers can be made

from pieces of heavy insulated wire with banana plugs on each end.

The adjustment can be made experimentally while using an SWR indicator in a manner similar to that of most matching devices. There is no explicit limitation on the antenna to be used. I have a multiband dipole for use between 80 and 10 meters. This device has worked well at my station. I was able to achieve DXCC, DUF 4 and DNF, using only 100 watts. All components are available from Radio-Kit, P.O. Box 429, Hollis, NH 03049.

Table 3
L-Network Variations

Configuration	Jumper Location

Table 4
Simple Series Networks

Configuration	Jumper Location

QST

Strays

QST congratulates . . .

☐ Astronaut Owen Garriott, W5LFL, who has been named mission specialist for NASA's Space Shuttle Mission 9 flight, scheduled for September 1983.

☐ Linsley M. Hamilton, KD6AU, of Hawthorne, California, who was recently named Configuration Management Administrator for the Space and Communications Division of Hughes Aircraft Corp.

I would like to get in touch with . . .

☐ anyone who has an interest in the Collins KW1 as a museum piece or for regular communications. Howard A. Miller, W2WLZ, 163 Hoover Rd., Rochester, NY 14617.

☐ someone with a book or diagram for an Eico 427 oscilloscope. Dan Eggers, N7DE/5, 1219 Westover, College Station, TX 77840.

☐ other hams who are interested in exchanging programming/interface ideas for the Motorola 6800 series MPU, particularly for Amateur Radio applications. Tom Winfield, WA9LKD, 543 Redwood, Bolinbrook, IL 60439.

☐ anyone who knew T. R. McElroy, world champion radio telegrapher. B. Neal McEwen, K5RN, 1128 Midway, Richardson, TX 75081.