REW 14/15

High Power Russian RF Relays

The REW 14 & 15 relays are rated to 650 MHz and handle over 2 KW at 432 MHz. The 27VDC coils operate nicely at 24 VDC. The REW 14 is specified as "50 Ohms" and the REW 15 as "75 Ohms" because of the type of connectors installed on otherwise apparently identical relay structures. Typical insertion loss for both is apparently well under the 0.2dB specification, with values <0.05dB having been measured at 2M. The isolation for the REW 14 has been measured at about 45dB on 2M and 35dB on 70cM. It is not unreasonable to expect at least these levels for the REW 15, as well. The author hopes to test both in the near future for both through-loss and isolation to verify the values others have measured. The REW 14 is pictured **HERE**, while a write-up on the REW 15 (with pictures) is provided below to assuage any fears about using a 75 Ohm relay for T/R purposes in a "50 Ohm" PA. Considering the low cost and ready availability from sources such as UR4LL one might use two in series for the output T/R function at the output of a VERY high power PA to increase isolation. More pictures and data are provided by **UR5LX** (thanks to G0ORY for providing this link!).

For instructions regarding the installation of Russian 50 Ohm connectors on coaxial cable, see the pictoral how-to on the **CP-50** page.

Technical Data

PARAMETER	SPECIFICATION
Power handling capability (used at >2KW @ 432MHz)	1500 W PEP
Insertion loss	<0,2 dB to 650 MHz
Isolation (measured: ~45dB @ 2M, ~35dB @ 70cM)	>30 dB to 650 MHZ
Coil voltage	24 V
Coil current	120 mA

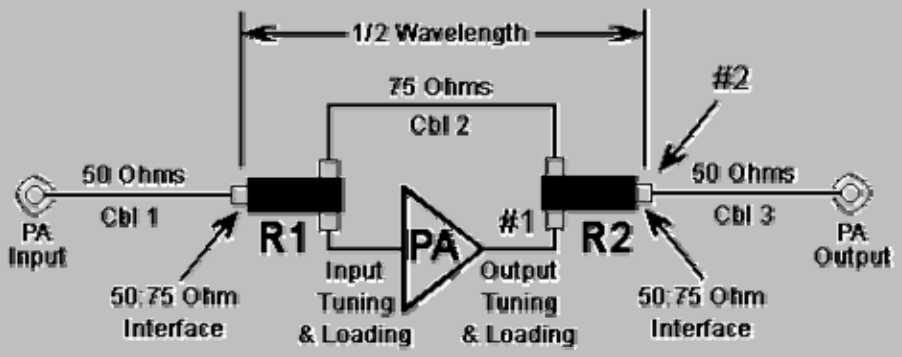
Note that a Transco "Y" relay is rated for 700+W at 70cM due to power handling limitations of the "N" connector (which decreases as frequency increases). We've ALL used transco "Y" coaxial switches for full legal limit on antenna systems exhibiting low SWR. The Russian connector is good for a full 1.5KW across its entire rated range. It is quite reasonable to accept reports of REW relay used for well over

2KW at 70cM, especially considering the conservative nature of Russian specifications in general.

Using the 75 Ohm REW 15 Relay for T/R in High-powered Linears:

Because of it's connectors, the REW 15 is rated at 75 ohm impedance. For relays installed inside a Linear amplifier immediately adjacent to the tuned input and output circuitry, however, this is "no big thing!" "No Way!" you say? "Yes Way!" read on!

On transmit, tune the PA input for minimum SWR; tune the output for maximum output. This effectively "tunes out" the reactance differences on transmit. If a random length 75 ohm cable (e.g., RG-59) link is used between input and output relays, there is 0.354 dB loss through the system on receive because of the 0.177 mismatch loss at each 50:75 ohm interface (Cbl 2 in figure below). This loss is easily overcome by a preamp anywhere between the PA and the antenna. If you're a purist, as this author tends to be, get your buddy (the one with all the test equipment) to whip you up a 75 ohm cable "jumper" to install on the input and output relays which makes the electrical length of the T/R system, connector to connector (including relays), "exactly" 1/2 wavelength (Cbl 2 plus relays in figure below). This makes the system appear to be 50 ohms on receive.



Connectors #1 and #2, at PA output, must be type "CP-75-167" to facilitate use of larger diameter cable to handle the high PA output power levels (see below). The other four may be any of the "75 Ohm" type, depending on connector availability.

Connectors type "CP-75-154" and "BP-154" (see picture) are both for smaller coaxial cable, the size of RG-59 or RG-8X. The type "CP-75-167" connector at the top of the picture is for larger coaxial cable the size of RG-8, RG-213 or RG-11 (to handle higher power). Formal specifications for this relay will be posted on this page when they are found! New relays and new connectors of each type are available from Dr Alex Gavva, UR4LL

I will eventually add a table of APPROXIMATE "Cbl 2" jumper lengths for 2m, 135cm & 70cm, but it's been my sad experience that one cannot trust the published velocity factors for coaxial cable, even that made by known manufacturers. I've also found that the velocity factor varies from roll to roll, even for the same coax type made by the same manufacturer. Heck, I've even found that the velocity factor changes enough from the beginning of a 500' roll to the end of that same roll to make several inches difference in physical length per electrical wavelength at 2m! C'est la Vie!