

Option 5 / MWT-2:  
A Controller for Remotely - Tuned Antennae  
Mark Connelly - WA1ION - 05 JUN 1991

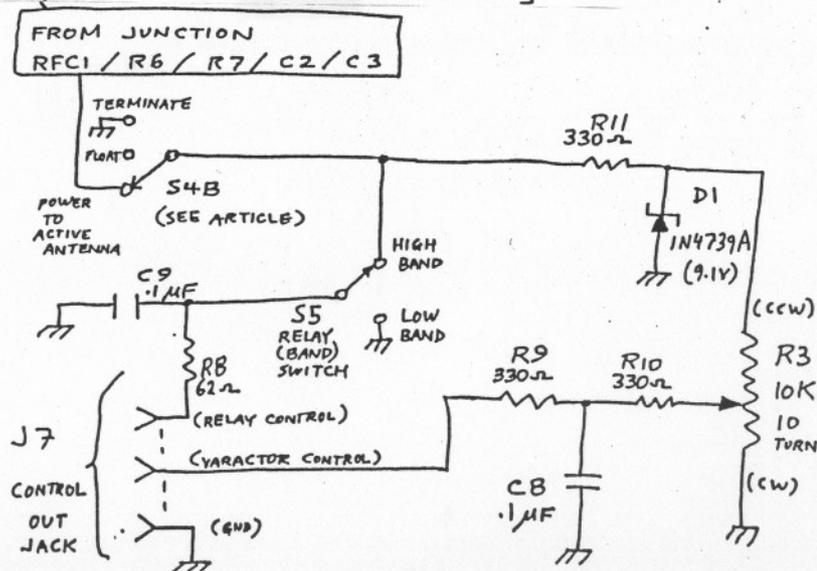
This article presents an option to the MWT-2 Regenerative Tuner which will allow it to control varactor-tuned antenna systems located at remote sites. Option 5 creates an MWT-2 which is compatible with the RTU-1 Remote Tuning Unit. The RTU-1 has been used with a great deal of success on active whips such as MFJ's 1024. Refer to my previous articles on MWT-2 (10 DEC 1990) and RTU-1 (14 MAY 1991) for further background information. The MFJ 1024 / RTU-1 / Option 5 MWT-2 system provides good sensitivity from a travel-ready antenna set-up well suited to use with popular DXpedition portables such as the Sony ICF-2010 and the Radio Shack DX-440. As noted in the RTU-1 article, the tunable active whip offers some operational advantages over typical small loops such as the Palomar Loop and the Radio West "Great Little Loop". Operation from difficult environments such as vehicles and hotel rooms is better suited to the active whip. Of course, a serious DX-minded traveller should pack a compact loop in the suitcase as well. A future project here will combine a remote loop and whip into a single box. This unit will be compatible with the Option 5 equipped MWT-2.

The four previous options for the MWT-2 tuner provided: (1) increased tuning range (added bands), (2) improved ease of regeneration adjustment, (3) increased gain, and (4) an added broadband amplification function.

Option 5, for remote tuner control, provides a variable DC output (0 volts to +9 volts) for varactor control and a switched 0 volt / +12 volt DC output for remote (bandswitching) relay control. These voltages, plus an auxiliary ground, are routed to a stereo headphone jack added to the MWT-2.

FIGURE 1 : OPTION 5 COMPONENTS TO BE ADDED TO THE STANDARD MWT-2

[ SEE FIGURE 1A OF MWT-2 ARTICLE FOR REMAINING CIRCUITRY ]



In addition, because the stock MWT-2 provides transfer of DC power (typically +12V) along the coaxial signal cable, the DC/RF coupler box normally supplied with the MFJ 1024 and similar whips does not have to be used. The MWT-2 replaces it and, in the process, adds the possibilities of regenerative tuning, varactor control, and relay control to the customary power-coupling and attenuation capabilities of the commercially-supplied base-unit box.

Figure 1 illustrates the components added to the original MWT-2 baseline schematic.

Note that the original SPDT toggle switch used for S4 has been replaced by a DPDT type. S4 Section B is the new section (see Figure 1); S4A is equivalent to the original wiring of S4 in the baseline MWT-2.

Table 1: Option 5 parts list

Vendor codes:

RS = Radio Shack / Many locations worldwide

MOU = Mouser Electronics / 11433 Woodside Ave.  
/ Santee, CA 92071  
/ Tel. 1-800-346-6873

Item	Designator	Description/Value	Vendor	Vendor Stock #	QTY
1	C8, C9	capacitor, 0.1 uF	RS	272-109	2
2	D1	zener diode 1N4739A	MOU	333-1N4739A	1
3	J7	stereo headphone jack RS	RS	274-312	1
4	R3	pot., 10K 10-turn	MOU	594-53411103	1
5	R8	resistor, 62 ohm	MOU	295J500-62	1
6	R9, R10, R11	resistor, 330 ohm	RS	271-1315	3
7	S4	switch, DPDT, on-off-on	RS	275-664	1
8	S5	switch, SPDT, on-on	RS	275-326	1

Table 2: Holes added for Option 5 implementation

X = Horizontal distance, in inches, from the vertical centerline (VCL) on the side observed. Negative values of X are left of VCL, positive values of X are right of VCL.

Y = Vertical distance, in inches, from the bottom horizontal edge of the side observed.

D = Hole diameter in inches.

LEFT SIDE

Hole #	Comp. Desig.	Description	X	Y	D
7	S5	Relay switch - shaft	-1.5	0.75	0.25
8	S5	Relay switch - tab	-1.5	0.5	0.144

TOP SIDE

Hole #	Comp. Desig.	Description	X	Y	D
18	J7	Control Cable Out-stereo jack	0.125	3.25	0.375
19	R3	Varactor Control Pot - shaft	1.5	0.625	0.375

### Compatibility of Option 5 with previous MWT-2 options

Option 5 is not meant to be installed with Options 2 through 4. Option 1 can be co-implemented if J7 (external coil) of Option 1 is deleted: it is physically replaced by J7 of Option 5 (which does a different job). S1 position 12 would be outfitted with a twelfth pair of inductors - e. g. 1 uH and 0.22 uH - in lieu of the external coil jack.

### Operating conclusions

Option 5 / MWT-2, as noted earlier, provides a very DX-worthy portable antenna system when used in conjunction with the RTU-1 equipped MFJ 1024 active whip. The ability of the MWT-2 to provide regenerative selectivity-sharpening (in effect, a passband filter with variable center frequency and bandwidth) augments the capabilities of IF filters in receivers such as the Sony ICF-2010. Selectivity-improvement has made the difference between a loud het and clearly-discernable audio on numerous Trans-Atlantic MW DX "splits" logged on afternoon beach DXpeditions.

### APPENDIX

FIGURE 2 : BLOCK DIAGRAM OF DXING SYSTEM FOR MOBILE DXPEDITIONS

