Unadilla/Reyco
Antenna Trap Wiring Booklet

• *Fixed Frequency Type* •

These tables were computed from the parameters of Unadilla/Reyco traps, and many of these combinations have been verified by users. Some length refinement is usually necessary, depending on your antenna height and objects in the surrounding area.

How to Use the Tables to Find Wire Lengths Between Traps

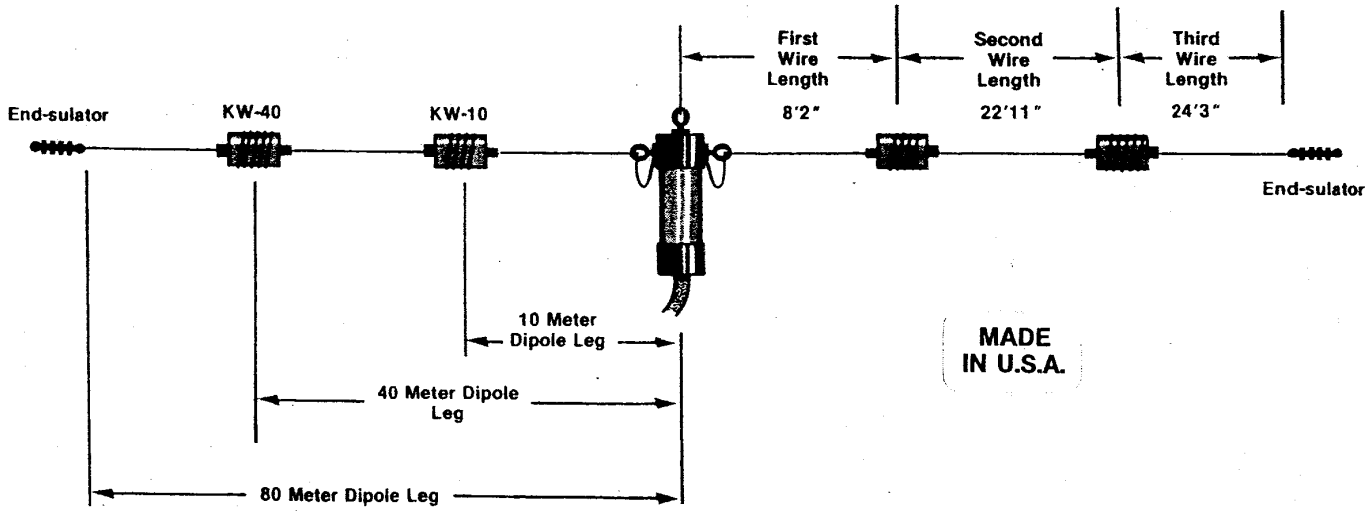
- You will need a pair of traps for each band except the lowest frequency band (largest meters).
- Pick the columns corresponding to your bands.
- Go down the table to the section listing *your* number of bands in the first left hand column.
- Select the line which has numbers *only* in the columns under *your* bands.
- The wire length shown under your highest band is the length from the center of the dipole to the highest frequency trap. All other wire lengths shown are from trap to trap. Finally, the last wire length (under *your* lowest frequency band) is the "outer tip" of the dipole arm.

Example:

You want to build a 10, 40, 80 meter dipole: 3 bands. Going down the table to the 3 band section, we find wire lengths of 8'2", 22'11", 24'3" under the 10, 40, and 80 meter headings, respectively.

- From the dipole center to the 10 meter trap (KW-10) is 8'2"
- From the 10 meter trap to the 40 meter trap (KW-40) is 22'11"
- From the 40 meter trap to the outer tip of the dipole is 24'3"
- Total dipole leg length = 8'2" + 22'11" + 24'3" = 55'4"
- Total dipole length = 55'4" × 2 = 110'8"

www.adurcomms.co.uk/unadilla.htm



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UNADILLA/REYCO/INLINE

Tuning and Adjustment Instructions

The versatility of trapping to simplify the "antenna farm" does not stop at two bands, as for the 40/80 meter dipole (using the 40 meter trap). We can use the same dipole to work more bands at low SWR by inserting additional trap pairs into the legs of the dipole.

Theoretically we can add any number, but as a practical matter, we only need 5 pairs of traps to cover the 7 existing bands (10, 15, 20, 30, 40, 80, 160 meters). Of course, most amateurs work only a few of these bands, so the antenna rarely gets this complex. Note that if we want to work N bands, we only need N−1 pairs of traps: we just add wire beyond the most outboard trap to resonate the lowest frequency band. While it is a simple matter to compute the length of the inboard wires (next to the antenna terminals) = 234"/F_o (MHz), it is not so simple to compute the wire lengths connecting the successive traps and the outboard length. This will depend on the specific combination of bands (and traps) you wish to work, the wire size and other factors. Starting on the next page are tables of these wire lengths for any combination of these bands (for all possible combinations of traps to work from 2 to 7 bands).

These wire lengths must be finalized by test. This adjustment proceeds in a straightforward manner, after wiring the multi-band dipole per the appropriate wire lengths given in the tables. First the inboard legs are adjusted, then the next pair of wires, and so on, working outboard (from highest to lowest frequency):

1) Desired resonant frequency of the inboard (highest frequency) band = F_o. Test SWR for several frequencies above and below this frequency and, of course, at F_o. Plot SWR versus frequency and identify the frequency where SWR is lowest: F_s.

2) Determine the new length for the inboard leg:
Initial length × (F_s/F_o) = new inboard leg length.

3) Go to the next band — whose resonant frequency F_o is the resonant frequency of the second trap out from the antenna terminals, and adjust the wire connecting the first and second trap by testing for frequency of lowest SWR (F_s). Compute the *change* in wire length required:

Change required = (234/F_o) × ((F_s − F_o)/F_o), feet.

4) Continue with the next trapped band and use the same formula as for Step 3 to determine *change* required in wire length.

5) Finally, go to the band corresponding to the outboard wire (lowest frequency band) and determine F_s and wire change by the same formula given in Step 3.

Naturally you will want to test each band for SWR after making its change, before going on to the next band. If on retest the lowest SWR is *not* at F_o, retest and use the formula of Step 3 to make a *second* correction.

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	Trap	KW-10	KW-15	KW-20	KW-30	KW-40	KW-80F	KW-80CW	—
	Meters	10	15	20	30	40	75	80	160
Bands	Freq.	28.85	21.225	14.175	10.125	7.175	3.875	3.675	1.85
2		8'2"	2'4"						
2		8'2"		7'3"					
2		8'2"			13'7"				
2		8'2'				22'11"			
2		8'2"					50'8"		
2		8'2"						53'11"	
2		8'2"							116'9"
2			11'1"	4'3"					
2			11'1'		10'1"				
2			11'1"			19'			
2			11'1"				46'6"		
2			11'1"					49'9"	
2			11'1"						112'7"
2				16'6"	4'7"				
2				16'6"		12'3"			
2				16'6"			38'2"		
2				16'6"				41'4"	
2				16'6"					103'9"
2					23'1"	7'5"			
2					23'1"		32'7"		
2					23'1"			35'9"	
2					23'1"				97'9"
2						32'7"	21'5"		
2						32'7"		24'3"	
2						32'7"			83'8"
2							60'4"		45'10"
2								63'8"	42'1"
3		8'2"	2'4"	3'11"					
3		8'2"	2'4"		9'5"				
3		8'2"	2'4"			18'2"			
3		8'2"	2'4"				45'6"		
3		8'2"	2'4"					48'9"	
3		8'2"	2'4"						111'7"
3		8'2"		7'3"	4'6"				

Trap	KW-10	KW-15	KW-20	KW-30	KW-40	KW-80F	KW-80CW	—
Meters	10	15	20	30	40	75	80	160
Bands **Freq.**	**28.85**	**21.225**	**14.175**	**10.125**	**7.175**	**3.875**	**3.675**	**1.85**
3	8'2"		7'3"		12'			
3	8'2"		7'3"			37'9"		
3	8'2"		7'3"				40'11"	
3	8'2"		7'3"					103'4"
3	8'2"			13'7"	7'4"			
3	8'2"			13'7"		32'6"		
3	8'2"			13'7"			35'7"	
3	8'2"			13'7"				97'8"
3	8'2"				22'11"	21'5"		
3	8'2"				22'11"		24'3"	
3	8'2"				22'11"			83'9"
3	8'2"					50'8"		45'10"
3	8'2"						53'11"	42'1"
3		11'1"	4'3"	4'2"				
3		11'1"	4'3"		11'5"			
3		11'1"	4'3"			36'9"		
3		11'1"	4'3"				38'11"	
3		11'1"	4'3"					102'2"
3		11'1"		10'1"	7'1"			
3		11'1"		10'1"		31'11"		
3		11'1"		10'1"			35'1"	
3		11'1"		10'1"				97'
3		11'1"			19'	21'3"		
3		11'1"			19'		24'1"	
3		11'1"			19'			83'6"
3		11'1"				46'6"		45'10"
3		11'1"					49'9"	42'1"
3			16'6"	4'7"	6'3"			
3			16'6"	4'7"		29'7"		
3			16'6"	4'7"			32'8"	
3			16'6"	4'7"				93'10"
3			16'6"		12'3"	20'3"		
3			16'6"		12'3"		23'	
3			16'6'		12'3"			81'8"

Trap	KW-10	KW-15	KW-20	KW-30	KW-40	KW-80F	KW-80CW	—
Meters	10	15	20	30	40	75	80	160
Bands Freq.	28.85	21.225	14.175	10.125	7.175	3.875	3.675	1.85
3			16'6"			38'2"		45'7"
3			16'6"				41'4"	41'10"
3				23'1"	7'5"	19'10"		
3				23'1"	7'5"		22'6"	
3				23'1"	7'5"			80'8"
3				23'1"		32'7"		45'4"
3				23'1"			35'9"	41'8"
3					32'7"	21'5"		43'9"
3					32'7"		24'3"	40'4"
4	8'2"	2'4"	3'11"	4'				
4	8'2"	2'4"	3'11"		11'1"			
4	8'2"	2'4"	3'11"			36'3"		
4	8'2"	2'4"	3'11"				39'5"	
4	8'2"	2'4"	3'11"					101'8"
4	8'2"	2'4"		9'5"	7'			
4	8'2"	2'4"		9'5"		31'8"		
4	8'2"	2'4"		9'5"			34'9"	
4	8'2"	2'4"		9'5"				96'9"
4	8'2"	2'4"			18'2"	21'2"		
4	8'2"	2'4"			18'2"		24'	
4	8'2"	2'4"			18'2"			83'4"
4	8'2"	2'4"				45'6"		45'10"
4	8'2"	2'4"					48'9"	42'1"
4	8'2"		7'3"	4'5"	6'2"			
4	8'2"		7'3"	4'5"		29'5"		
4	8'2"		7'3"	4'5"			32'5"	
4	8'2"		7'3"	4'5"				93'8"
4	8'2"		7'3"		12'	20'2"		
4	8'2"		7'3"		12'		22'11"	
4	8'2"		7'3"		12'			81'7"
4	8'2"		7'3"			37'9"		45'7"
4	8'2"		7'3"				40'11"	41'10"
4	8'2"			13'7"	7'4"	19'9"		
4	8'2"			13'7"	7'4"		22'6"	

Trap	KW-10	KW-15	KW-20	KW-30	KW-40	KW-80F	KW-80CW	—
Meters	10	15	20	30	40	75	80	160
Bands Freq.	28.85	21.225	14.175	10.125	7.175	3.875	3.675	1.85
4	8'2"			13'7"	7'4"			80'8"
4	8'2"			13'7"		32'6"		45'4"
4	8'2"			13'7"			35'7"	41'8"
4	8'2"				22'11"	21'5"		43'9"
4	8'2"				22'11"		24'3"	40'5"
4		11'1"	4'3"	4'2"	5'11"			
4		11'1"	4'3"	4'2"		28'10"		
4		11'1"	4'3"	4'2"			31'10"	
4		11'1"	4'3"	4'2"				92'10"
4		11'1"	4'3"		11'5"	19'11"		
4		11'1"	4'3"		11'5"		22'8"	
4		11'1"	4'3"		11'5"			81'1"
4		11'1"	4'3"			36'9"		45'6"
4		11'1"	4'3"				39'11"	41'10"
4		11'1"		10'1"	7"1"	19'7"		
4		11'1"		10'1"	7'1"		22'3"	
4		11'1"		10'1"	7'1"			80'4"
4		11'1"		10'1"		31'11"		45'4"
4		11'1"		10'1"			35'1"	41'8"
4		11'1"			19'	21'3"		43'9"
4		11'1"			19'		24'1"	40'4"
4			16'6"	4'7"	6'3"	18'7"		
4			16'6"	4'7"	6'3"		21'2"	
4			16'6"	4'7"	6'3"			78'4"
4			16'6"	4'7"		29'7"		44'10"
4			16'6"	4'7"			32'8"	41'3"
4			16'6"		12'3"	20'3"		43'4"
4			16'6"		12'3"		23'	40'
4				23'1"	7'5"	19'10"		43'
4				23'1"	7'5"		22'6"	39'9"
5	8'2"	2'4"	3'11"	4'	5'10"			
5	8'2"	2'4"	3'11"	4'		28'6"		
5	8'2"	2'4"	3'11"	4'			31'6"	
5	8'2"	2'4"	3'11"	4'				92'5"

	Trap	KW-10	KW-15	KW-20	KW-30	KW-40	KW-80F	KW-80CW	—
	Meters	10	15	20	30	40	75	80	160
Bands	Freq.	28.85	21.225	14.175	10.125	7.175	3.875	3.675	1.85
5		8'2"	2'4"	3'11"		11'1"	19'9"		
5		8'2"	2'4"	3'11"		11'1"		22'6"	
5		8'2"	2'4"	3'11"		11'1"			80'10"
5		8'2"	2'4"	3'11"			36'3"		45'6"
5		8'2"	2'4"	3'11"				39'5"	41'9"
5		8'2"	2'4"		9'5"	7'	19'6"		
5		8'2"	2'4"		9'5"	7'		22'2"	
5		8'2"	2'4"		9'5"	7'			80'2"
5		8'2"	2'4"		9'5"		31'8"		45'3"
5		8'2"	2'4"		9'5"			34'9"	41'8"
5		8'2"	2'4"			18'2"	21'2"		45'2"
5		8'2"	2'4"			18'2"		24'	40'4"
5		8'2"		7'3"	4'5"	6'2"	18'6"		
5		8'2"		7'3"	4'5"	6'2"		21'1"	
5		8'2"		7'3"	4'5"	6'2"			78'2"
5		8'2"		7'3"	4'5"		24'5"		44'10"
5		8'2"		7'3"	4'5"			32'5"	41'3"
5		8'2"		7'3"		12'	20'2"		43'4"
5		8'2"		7'3"		12'		22'11"	40'
5		8'2"			13'7"	7'4"	19'9"		43'
5		8'2"			13'7"	7'4"		22'6"	39'9"
5			11'1"	4'3"	4'2"	5'11"	18'3"		
5			11'1"	4'3"	4'2"	5'11"		20'10"	
5			11'1"	4'3"	4'2"	5'11"			77'8"
5			11'1"	4'3"	4'2"		28'10"		44'8"
5			11'1"	4'3"	4'2"			31'10"	41'2"
5			11'1"	4'3"		11'5"	19'11"		43'2"
5			11'1"	4'3"		11'5"		22'8"	39'10"
5			11'1"		10'1"	7'1"	19'7"		42'11"
5			11'1"		10'1"	7'1"		22'3"	39'8"
5				16'6"	4'7"	6'3"	18'7"		42'4"
5				16'6"	4'7"	6'3"		21'2"	39'2"
6		8'2"	2'4"	3'11"	4'	5'10"	18'1"		
6		8'2"	2'4"	3'11"	4'	5'10"		20'8"	

Tuning and Adjustment Instructions

The versatility of trapping to simplify the "antenna farm" does not stop at two bands, as for the 40/80 meter dipole (using the 40 meter trap). We can use the same dipole to work more bands at low SWR by inserting additional trap pairs into the legs of the dipole.

Theoretically we can add any number, but as a practical matter, we only need 5 pairs of traps to cover the 7 existing bands (10, 15, 20, 30, 40, 80, 160 meters). Of course, most amateurs work only a few of these bands, so the antenna rarely gets this complex. Note that if we want to work N bands, we only need N−1 pairs of traps: we just add wire beyond the most outboard trap to resonate the lowest frequency band. While it is a simple matter to compute the length of the inboard wires (next to the antenna terminals) = 234"/F_o (MHz), it is not so simple to compute the wire lengths connecting the successive traps and the outboard length. This will depend on the specific combination of bands (and traps) you wish to work, the wire size and other factors. Starting on the next page are tables of these wire lengths for any combination of these bands (for all possible combinations of traps to work from 2 to 7 bands).

These wire lengths must be finalized by test. This adjustment proceeds in a straightforward manner, after wiring the multi-band dipole per the appropriate wire lengths given in the tables. First the inboard legs are adjusted, then the next pair of wires, and so on, working outboard (from highest to lowest frequency):

1) Desired resonant frequency of the inboard (highest frequency) band = F_o. Test SWR for several frequencies above and below this frequency and, of course, at F_o. Plot SWR versus frequency and identify the frequency where SWR is lowest: F_s.

2) Determine the new length for the inboard leg:
Initial length × (F_s/F_o) = new inboard leg length.

3) Go to the next band — whose resonant frequency F_o is the resonant frequency of the second trap out from the antenna terminals, and adjust the wire connecting the first and second trap by testing for frequency of lowest SWR (F_s). Compute the *change* in wire length required:

Change required = $(234/F_o) \times ((F_s - F_o)/F_o)$, feet.

4) Continue with the next trapped band and use the same formula as for Step 3 to determine *change* required in wire length.

5) Finally, go to the band corresponding to the outboard wire (lowest frequency band) and determine F_s and wire change by the same formula given in Step 3.

Naturally you will want to test each band for SWR after making its change, before going on to the next band. If on retest the lowest SWR is *not* at F_o, retest and use the formula of Step 3 to make a *second* correction.

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