

4 SQUARE K9AY



Remote Control Box of 4 Square K9AY Array

I've wondered (since 1998) if Computer Modeled 4 Square K9AY Array will really operate on field as computer modeling does predict. After years of Internet "googling" I've wondered also: why nobody has "discovered" such system yet? Now I am sure: it is real and it works!

Many of us are jealous these Hams accessing enough field to install long wires for Receiving Beverage antennas in several directions. But, at the same time, we have to remember, that installing hundreds of meters wire in late Autumn, and dismantling them at early Spring, is a hard work respecting weather conditions.

Thanks to my friends help: Tomek SP3DWQ, Marek SQ3JPM, Marcin SQ3HMM, Wiesiek SP6HEQ, Jurek SP3GEM, Janusz SP6IXF, Staszek SP3HRN after two weeks of „hard battle” on the field we have been assured finally that 4 Square K9AY Array can work as computer model predict: the success has been confirmed when we have connected it to the Receiver antenna jack and have been able listen DX Stations. A good will of all team members was a key factor succeeding that project at last. Thanks them all!!

After two weeks of discovering and correcting different mistakes we've understood why nobody has succeed yet. There are six separate boxes in the system and many connections inside each box. The system is quite complicated and there are many chances to make even one mistake, preventing the whole system to operate properly. I suppose, that after first failure, most of the testers have been disappointed and given up the project. Also, as I remember from Top-band Reflector post, it is quite common to make mistake connecting even single K9AY

antenna. So, connecting particular box with their respective K9AY antenna gives "another chance" to make mistake.

4 Square K9AY Array, as other directive Low Bands antennas, demands some free space (field) to be installed. Also, there is demand of space separation from other Vertically polarized (Transmit) antennas (as far as possible).

And the final statement: this not an alternative for long Beverage antennas. This is a compromise solution when one have not enough field necessary to install 200 meters (or longer) Beverage antennas in several directions.

Some user opinion about 4 square K9AY Array:

Two month ago I've realized that at late Spring and during Summer several DX-Peditions are announced, which I am interesting in to work them on Low Bands. Surrounding fields are busy at that time with farmers machines, destroying my Beverages.

SP3KEY Web-site is one of my favor. I've found on that Web-site a description of interesting Receive set-up, demanding only 30 meter x 30 meter Square for installation. If so, that would be a solution for whole year Receiving antenna!

Designer, Bogdan SP3RBR, has provided already several such set-ups among SP Hams. He has got so positive attitude towards my expectations, that he arrived at my QTH (together with Przemek, SP7VC). Installation, connecting cables and preliminary check has took a little more than 3 hours. At the evening we started to compare a new 4 Square K9AY Array with my 9 Beverages, each 320 meters long and with 4 Square Verticals System by COM-TEK, which is my primary Transmit antenna on 75 / 80 meters band. During 3 evenings, nights and mornings I've compared "a hundreds times" these antennas for their directional capabilities on Receive on Low Bands.

What I've found:

- a) despite 4 Square K9AY Array has been designed originally for 75 / 80 meters band, it is my best Receive antenna on 40 meters band (even better than above mentioned long Beverages),
- b) on 75 / 80 meters Beverages antennas were more "quiet" than 4 Square K9AY Array. 4 Square Verticals was especially susceptible on QRN. A new 4 Square K9AY Array has offered a better directivity on Receive comparing with 4 Square Verticals Summarizing: The Receive prowess of my 4 Square K9AY Array is worth money it costs. I advise to follow me.

Kazik SP2FAX

Since three weeks (April, 2005) I am using a new 4 Square K9AY Array. After that period of observations I can make some comments. As a preliminary test, I've disconnected 3 positions of 4 Square K9AY Array and tried operate on single K9AY antenna. Result: there is a big difference between single K9AY and 4 Square K9AY Array. Any wire longer than 60 meters beats single K9AY antenna.

I've used for K9AY supports fiber-glass fishing poles 8 meters long (they costs each 43PLN). Two highest (and smallest diameter) segments of telescopic fishing poles have been removed and the bottom of each pole has been extended with Aluminium pipe 1.5 meter long and 50mm in outer diameter. Each Aluminium pipe has been buried 0.5 meter in the Ground, functioning also as Grounding point for each K9AY antenna. The central point of new 4 Square K9AY

Array has been situated 65 meters from the nearest Vertical tower. My 4 Square K9AY Array was designed for 75 / 80 meters band. It was a grate surprise when I've discovered its good operation also on 40 meters band. By the way, "good" is not a proper word. I shall rather say: it is REVELATION!! Of course, the version I've bought do not operate on 160 meters band.

Some technical details

4 Square K9AY Array uses 19 relays. Control is made through Coax cable, which I recognize is the best solution (avoids any connecting mistakes). All screws are made from stainless steel, all nuts are wing-nuts (butterfly nuts), also made from stainless steel. I have not seen the schematic diagram (I am not interesting in) but I can see inside Control box some processor and Xtal. In front of Control box there are 4 LED and ON / OFF Switch. The whole system operates reliably. The remote Control (directions switching) is made as small box, which can be put on any free and comfortable place on your desk.

As I've said before: it operates great on two neighboring amateur bands. And even more: I've recognized, that it has directivity also on 20 meters, but in reverse direction. On 75 / 80 meters band I normally use system of 5 Verticals direction switch-able. They are useful also on Receive. Comparing Vertical directional system with long Beverages I prefer to listen on Vertical System. But, sometimes, propagation favors Beverages.

I write this to get you imagination how 4 Square K9AY Array could be useful as efficient Receive set-up on Low Bands. Concerning 40 meters band I've never had a better Receive antenna than my new 4 Square K9AY Array. One time, a F5 station has been loud S9 + 4dB. After changing direction of my 4 Square K9AY Array for opposite direction, that F5 station disappeared at all! And, starting that moment, I was able to listen a weak UA9 station calling CQ DX exactly on the same frequency. On 75 / 80 meters band my new 4 Square K9AY Array operates similarly: the European station are "cut-down" effectively.

So, the final question is: „is a 4 Square K9AY Array substitution for Beverages?”

My answer is: definitely NO, because of lack of very low angles.

During 3 consecutive days I've compared signals from NL7Z via Long Path. I've heard him on 4 Square K9AY Array, but making QSO would be a difficult task. I've better heard him on 5 Verticals Directional System. By the way: what we compare at his moment? A quite cheap 4 Square K9AY Array (only 1.000PLN) with 5 Verticals Directional System (more 15.000PLN).

Summarizing:

I've decided to use that antenna permanently. Now I have to reconsider and change completely all my strategy concerning Receive antennas for Low Bands!

Congratulations to Bogdan SP3RBR with such good design!!!

Phasing K9AY antennas, to make better directional system, is nothing new. SP3RBR has invented a quite new Phasing Networks, appropriate for his 4 Square K9AY Array. The Phase Shift is stable in wide frequency range. Therefore, 4 Square K9AY Array is operating effectively on two neighboring amateur bands (in case of my set-up: 75 / 80 and 40 meters).

Finally, I recognize that SP3RBR project is fully operational and I advise it as one of solutions how to resolve Receive antennas on Low Bands.

Jurek SP3GEM

„This is a Spring & Summer HIT (and not only).“

Andrzej, SP8LBK

Main 4 Square K9AY Array Components (for 80/40m version):

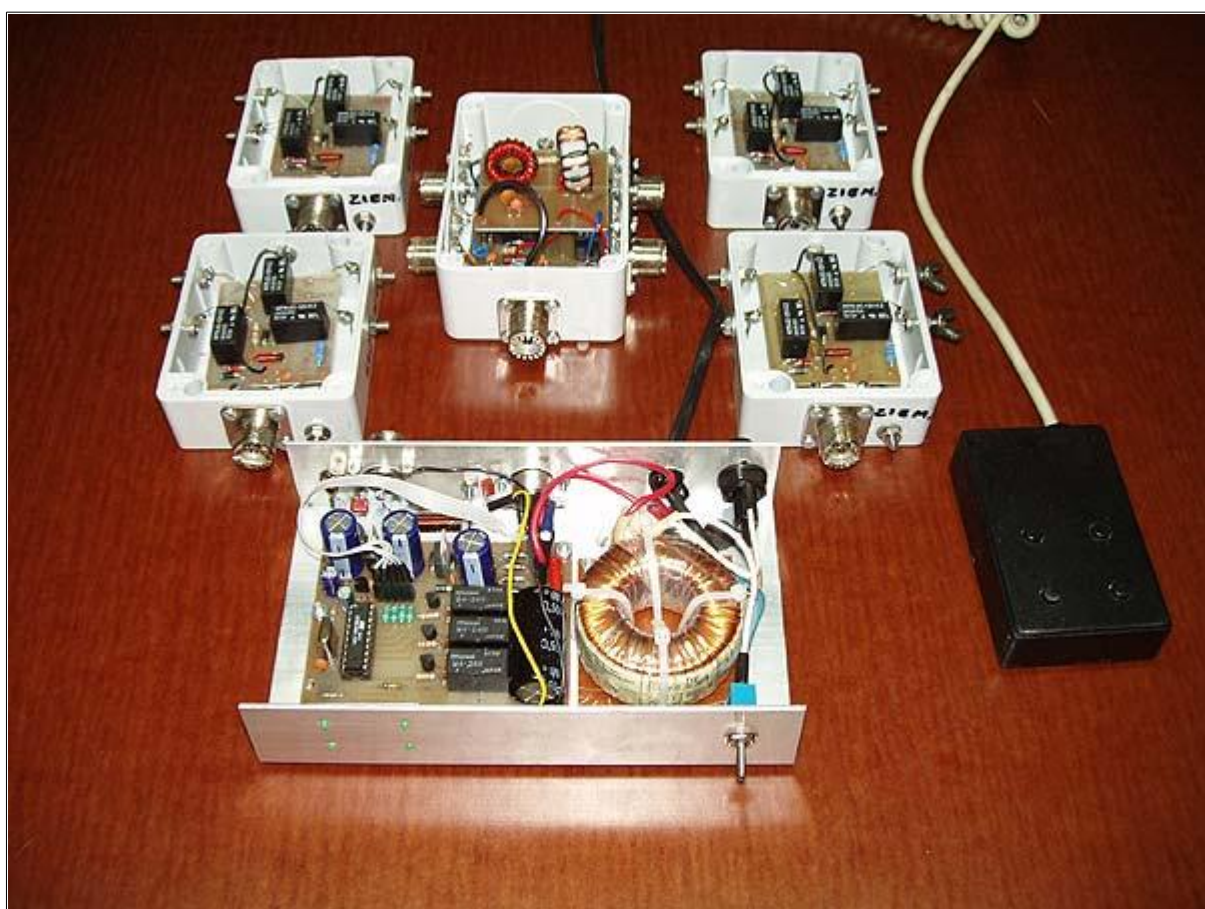
- field sized 30 meters x 30 meters (as minimum),
- four 7 meters high poles to support particular K9AY antennas.
Installed at corners of 20 meters x 20 meters square,
- wire for K9AY Loops: 8 x 24 meters,
- insulated wire for Control: 4 x 15 meters,
- grounding rods: 4 pieces
- four boxes for transformers and relays for direction switching,
- one box for Phasing Networks and Directions Switching,
- Power Supply, Control Box for Directions Switching with RF Diplexer to power the whole system through coax cables,
- main coaxial cable 50 Ohm (longer is better) from station shack to Phasing Networks and Direction switching box,
- four coaxial cables 50 Ohm 15m long to connect Phasing Networks box with 4 K9AY antennas boxes,
- some rope, insulating tape, tie-wraps and lot of Ham Radio enthusiasm.

Bogdan SP3RBR

Translation by Tadeusz SP7HT - tnx



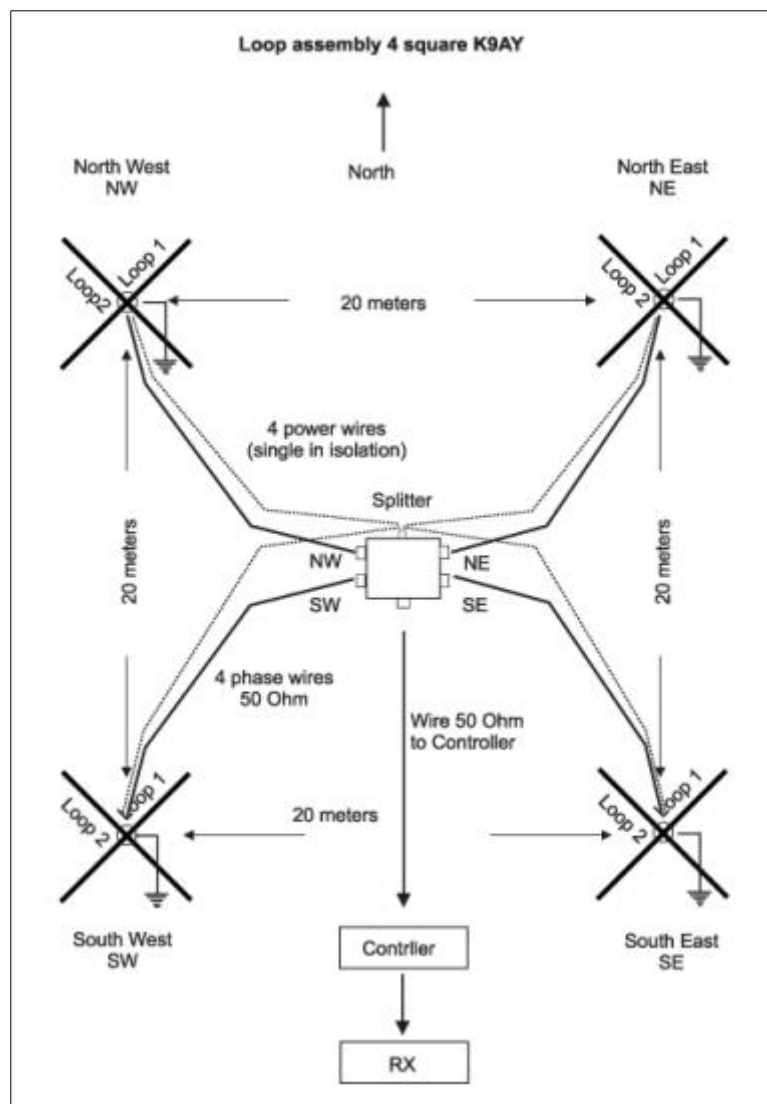
Switching Directions box – back side



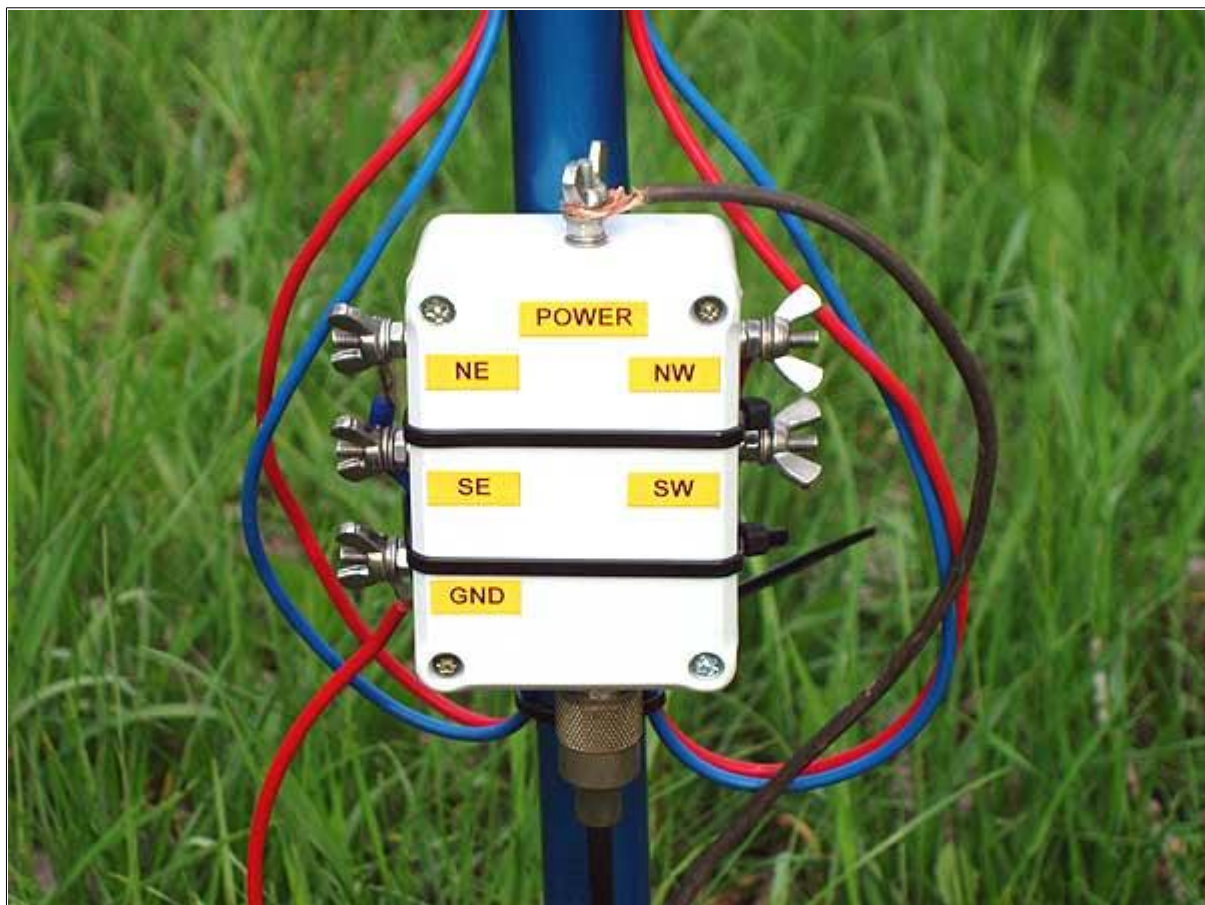
All boxes including Phasing Networks and Switching Directions of 4 Square K9AY Array



4 Square K9AY Array as in Winter Beauty at Marcin, SQ3HMM
.K9AY supports has been made from wood poles.



4 Square K9AY Array layout

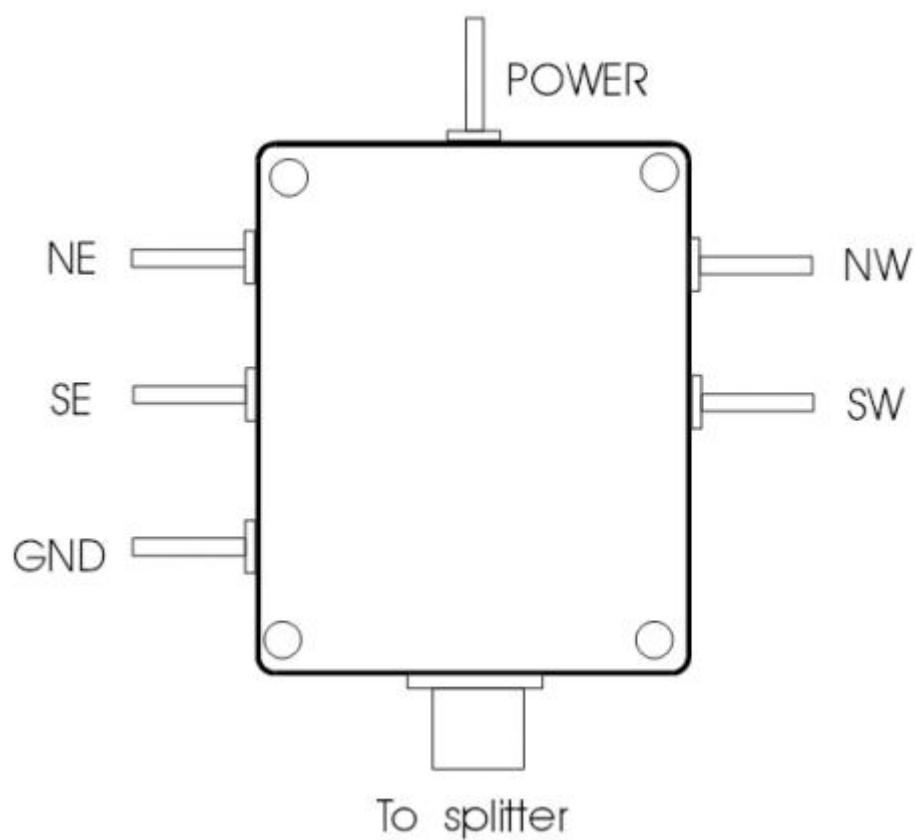


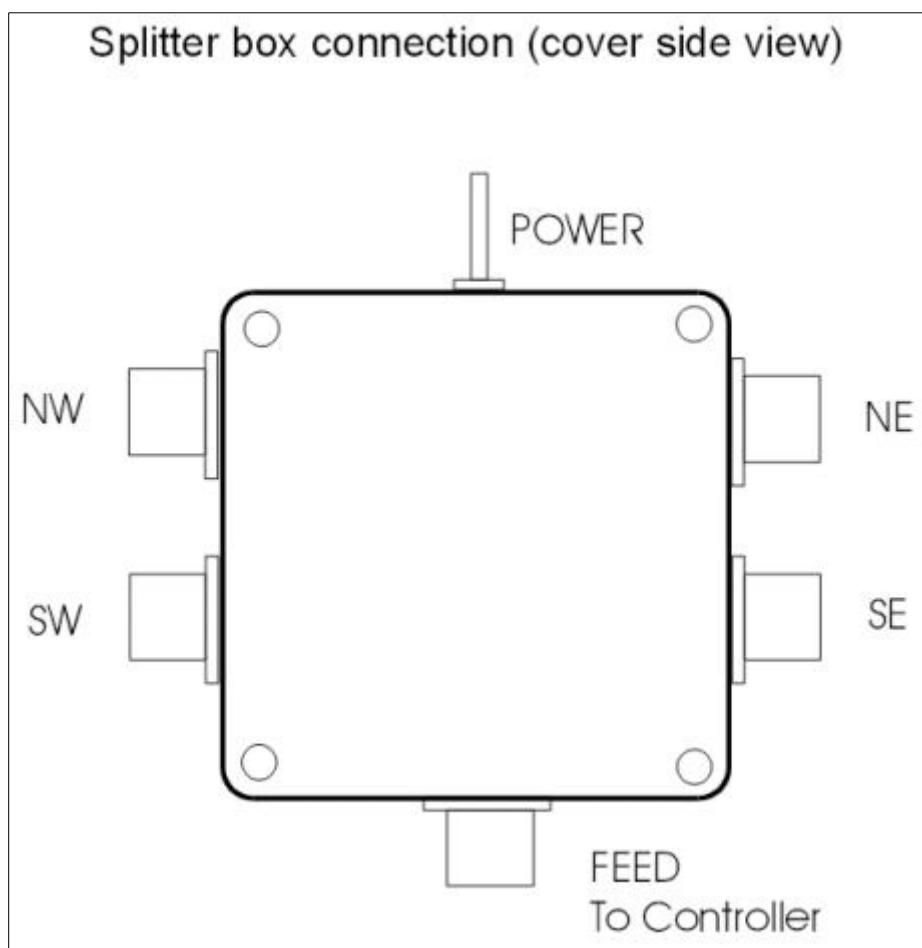
The proper way to connect Loops wires with K9AY box:
each wire is coming towards bottom side of box. That prevents leakage of water and moisture into the box.



Do not forget to make proper grounding of each K9AY antenna.
Supports are made from fiber-glass fishing poles

Antenna box connection (cover side view)





BEST DX!!

SP3KEY Team
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