

RAI's Fassio on Italian CFA

Former Project Manager Details the Installation and Performance of a CFA in San Remo, Italy

Crossed-field antenna installations can be found in other parts of the world, including Italy, the United Kingdom, Brazil and Egypt.

Dr. Alberto Fassio of Radiotelevisione Italiana, the national public service radio, television and telex broadcaster for Italy, worked closely on the installation and testing of a CFA antenna near San Remo in northern Italy.

Fassio was responsible for RAI's AM department and was CFA project manager until May of 1999. He then changed his responsibilities to TV, FM, digital video broadcasting and Eureka 147 DAB installations.

Installed last year, the San Remo CFA is being tested and operated.

RW Technical Adviser Thomas R. McGinley conducted an e-mail interview with Fassio regarding his experiences with this CFA antenna.

RW: You were closely involved with the successful installation of a CFA antenna. Tell us more about it. Where exactly is it and who owns it and/or paid for the installation? What frequency and power input are used?

Fassio: I discovered the CFA while reading Wireless World in 1994. I then contacted Mr. Hateley and asked him how to

contact Mr. Kabbary in Egypt. I went to Cairo, Egypt, in January 1995 to visit the Tanta installation where I evaluated the behavior of their 6 kW CFA.

(Ed. note: Maurice Hateley and Fathi Kabbary are two of the inventors of the antenna.)

Due to the fact that this CFA was a very small structure, it seemed a very good solution for many of our AM transmission sites. RAI decided to build and test one in Italy. The test site is at San Remo with an old 6 kW transmitter on 1182 kHz.

Even though the contract was awarded in late 1996, RAI and RAI WAY, our new company in charge of RF installations and maintenance, both had problems with the local city council and the Italian laws governing electromagnetic pollution. That stopped the works for about two years until 1999 when the installation began.

RW: Who installed and measured its performance?

Fassio: The installation was handled by Kabbary himself with an Egyptian assistant, according to the terms of the contract. RAI WAY and Kabbary did a lot of measurements in the region around the site with good results.

Field strength values of the CFA measured very close to those radiated by the old 80-m mast, which was removed. (80 meters is 262.4 feet or 0.31 wavelength at 1182 kHz. That is a "tall quarter-wave" tower.)

RW: What did it cost to install? Who created the design?

Fassio: The installation was not expensive. I cannot provide the exact amount. Kabbary designed and installed it as I said before.

Different installation?

RW: Did this CFA antenna replace a conventional vertical antenna with a buried ground system? Does this CFA antenna differ in any significant way from those installed in Egypt?

Fassio: Yes, it did replace the 80-meter vertical mast but for the moment is still under test. Our CFA is similar to the Egyptian CFA, but I cannot comment about their phasor since I was not able to see it at the time of my visit in Tanta.

RW: Were complete "before and after" field measurements of the old antenna and the new CFA taken? What was the average effective ground conductivity of the area around this antenna?

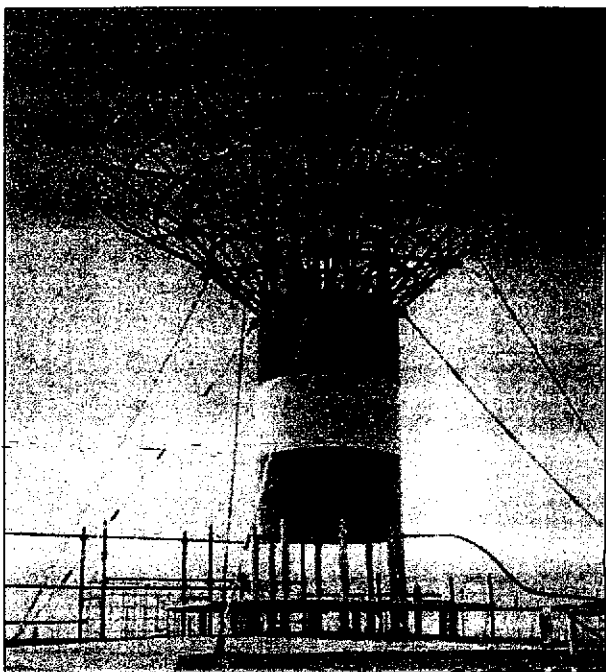
Fassio: The measurements were completed after the time I left the project so I have not seen those papers. The average effective conductivity is low along the coast but it increases to the north of the site towards the mountains. I do not have the data with me.

RW: What specific measurement methods and test equipment were employed to evaluate its performance?

Fassio: Field measurements were made by a portable field intensity receiver. The phasor was tuned up with an HP 8753C

network analyzer.

The RAI AM department is waiting to do other measurements regarding efficiency. I want to point out that for us as broadcasters, it was important to replace



San Remo, Italy CFA Installation

the old mast with a small antenna, due to the laws, as I said before.

It is not our core business to perform specific studies on it. We are not a research center. So all special measurements will be made later, taking into account the free time our AM department will have for that.

RW: Were the measurement results ever made public? If not yet, will they be? Did the achieved performance match your expectations?

Fassio: Yes. The final measurements matched the designer's and our expectations. Further details will be available in the near future.

Tricky modifications

RW: How long did it take to construct and tune up the antenna to achieve the performance it is producing now? What specific problems did you encounter, if any, in getting it to perform properly? Is it hard or "tricky" to get tuned up?

Fassio: The antenna was built in three weeks and the tuneup was tricky. The phasor design was changed due to modifications that were necessary during the assembly of the disc and its distance to ground. So the phasor needed some mods.

RW: Was the antenna intended to deliver any skywave coverage? If so, was skywave performance measured or evaluated?

Fassio: No. No skywave was requested.

RW: Now that this CFA antenna is up

and running and you have 20/20 hindsight, what would you have done differently in its implementation?

Fassio: If any future installations of CFA antennas are done, the work will be done by an Italian installer. The installation was not carried out in the same way as we normally do, requesting a local company. This was an experiment and it was more easily accepted by the authorities that way.

RW: Do you think that the CFA antenna is truly a scientific breakthrough in antenna design?

Fassio: As I said, it is not our business, especially in-AM, to carry out specific studies on antennas. I can say that the CFA solves installation problems and maintenance costs. And it satisfied concerns of Italian authorities regarding electromagnetic pollution. The near field was effectively lower than before.

RW: What applications or situations would be ideal for a CFA antenna and where would be someplace a CFA antenna would not be appropriate, in your opinion?

Fassio: Ideal situations for the CFA for example would be transmitters on top of buildings or where the broadcaster has problems with local authorities gaining permission to erect masts. I cannot say anything about the "not appropriate" situations because the tests we conducted were limited.

RW: Would you recommend the CFA antenna to others?

Fassio: I recommend it for anyone to test. All broadcasters have their own specific problems. For me, it is not important to decide if the Kabbary theory is right or wrong or to push a theory against someone who thinks "Maxwell is Maxwell and his theory cannot be changed."

The important thing, for a company making a business decision, is to find a solution to a problem to possibly reduce the expenses. And the CFA does that. ☺

Antennas

▶ Continued from page 7

that test data is available, it will be furnished to all interested parties." He hopes that EH Antenna Systems will receive its authorization to test soon.

Waiting for data

Broadcasters want hard evidence on the performance of both the CFA and EH antennas before they can believe the manufacturers' claims.

"The FCC and others will almost assuredly not accept anecdotal evidence; they require comprehensive, hard data," said Milford Smith, vice president, engineering for Greater Media Inc.

Carl Gluck, vice president of technical research for Salem Communications Inc., agreed. He wants to see an FCC directional proof of performance conducted.

"If you could turn the thing on and prove that it works, how can you refute hard data?"

Once the single antenna questions are answered, the effect that might be most beneficial to U.S. broadcasters is how these antennas might be used in a directional antenna array.

Cost for both products is unknown. Richer said the CFA will be priced by power requirements with a typical 10 kW antenna going for about \$250,000, installed and tested.

Hart estimates the EH antenna may be priced as low as \$40,000, but prefers to wait to give firm numbers until the tests are complete.