

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

In this study the interconnection between two organizations with different frequencies and infrastructure is applied without the need to change the characteristics of neither organization using a relay control circuit linking the two organizations radio by sending the audio signal from the first organization through the relay circuit to the transmitter of the other organization and the operation goes conversely.

5.2 Recommendations

the problem with this design that there will be a new switching system each time an organization is added It is recommended to accomplish two way radio interconnection by using the microcontroller to decrease the hardware crowd and the ease of software upgrading instead off relay.

REFERENCES

- [1] Maldonado, David, et al. "Cognitive radio applications to dynamic spectrum allocation: a discussion and an illustrative example." First IEEE International Symposium on New Frontiers in Dynamic Spectrum Access Networks, 2005. DySPAN 2005. IEEE, 2005.
- [2] ITU-R Recommendation V.431: Nomenclature of the frequency and wavelength bands used in telecommunications. International Telecommunication Union, Geneva. IEEE Standard 521-2002: Standard Letter Designations for Radar-Frequency Bands.
- [3] ITU Radio Regulations, Volume 1, Article 2; Edition of 2008.
- [4] ECM Frequency Authorizations, IEEE Standard 521-2002: Standard Letter Designations for Radar-Frequency Bands.
- [5] Kim, Hyoung-Gook, and Thomas Sikora. "Comparison of MPEG-7 audio spectrum projection features and MFCC applied to speaker recognition, sound classification and audio segmentation." Acoustics, Speech, and Signal Processing, 2004. Proceedings.(ICASSP'04). IEEE International Conference on. Vol. 5. IEEE, 2004.
- [6] <http://www.councilcomm.org>
- [7] Understanding two-way radio <http://www.about2wayradio.com>, Rozin, Alexander. "Two-way radio-based electronic toll collection

method and system for highway." U.S. Patent No. 6,342,844. 29 Jan. 2002, Knopp, Raymond. "Two-way radio networks with a star topology." Communications, 2006 International Zurich Seminar on. IEEE, 2006.

[8] Bassirat, Farhad. "RF Repeater with delay to improve hard handoff performance." U.S. Patent No. 6,507,741. 14 Jan. 2003.

[9] Derrenge, Charles L., and Marcella M. Tucker. "Voice guard digital voter for multiple site PST RF trunking system." U.S. Patent No. 5,131,010. 14 Jul. 1992.

[10] Cutler, C. C., R. Kompfner, and L. C. Tillotson. "A Self-Steering Array Repeater." *Bell System Technical Journal* 42.5 (1963): 2013-2032.

[11] Rankov, Boris, and Armin Wittneben. "Spectral efficient protocols for half-duplex fading relay channels." *IEEE Journal on Selected Areas in Communications* 25.2 (2007): 379-389.

[12] Hasan, M. S., et al. "Designing the joint tactical radio system (JTRS) handheld, manpack, and small form fit (HMS) radios for interoperable networking and waveform applications." MILCOM 2007-IEEE Military Communications Conference. IEEE, 2007.

[13] Bourdena, Athina, et al. "A spectrum aware routing protocol for public safety applications over cognitive radio networks." Telecommunications and Multimedia (TEMU), 2012 International Conference on. IEEE, 2012.

[14] Gorcin, Ali, and Huseyin Arslan. "Public safety and emergency case communications: Opportunities from the aspect of cognitive radio." *New Frontiers in Dynamic Spectrum Access Networks*, 2008. DySPAN 2008. 3rd IEEE Symposium on. IEEE, 2008.

[15] Miller, H. Gilbert, et al. "Toward interoperable first response." *IT professional* 7.1 (2005): 13-20.

[16] KAVANAGH, Donald. "Project 16 A: 900MHz trunked communications system functional requirements development." Washington/DC: APCO (1978).

[17] Powell, J. "APCO Project 25." *Police Chief* 61 (1994): 21-21.

[18] Clark, Sandy, et al. "Security weaknesses in the APCO Project 25 two-way radio system." (2010).

[19] Stavroulakis, Peter. *Terrestrial trunked radio-TETRA: a global security tool*. Springer Science & Business Media, 2007.

[20] Salkintzis, Apostolis K. "Evolving public safety communication systems by integrating WLAN and TETRA networks." *IEEE Communications Magazine* 44.1 (2006): 38-46.

[21] <http://www.explainthatstuff.com>

Appendix