

ACKNOWLEDGE

On this occasion, the author would like to sincerely thanks and grateful to the all parties who have been involved to support and assist in the process of this undergraduate thesis. These expression of gratitude are addressed to:

1. Allah SWT for mercy, guidance, and pouring his infinite grace and always provide the best for His servants
2. For two important people in my life, Ayah dan Ibu. The author wants to say: "*Terima kasih untuk selalu mendoakan, menyayangi, sabar, dan mendukung apapun dengan keputusan dan apa yang telah saya kerjakan.*".
3. Mr. Agus Dwi Prasetyo S.T., M.T., as the first supervisor and Mrs. Trasma Yunita as the second supervisor of the author who always take the time to guide, assist, provide the advice, and motivation to the author in completing this Undergraduate thesis.
4. Nuraulia Mugniza ,as my un-biological sister, the author wants to say: "*Terima kasih telah bersabar menghadapi dan menemani saya selama mengerjakan tugas akhir ini, terima kasih juga atas dukungan dan doa yang diberikan.*".
5. Believa Dyanneley A. and Devina Kristi, the author's friends who accompany the author to do the undergraduate thesis writing. The author wants to say: "*Terima Kasih telah menemani saya mengerjakan penulisan sembari meminum kopi dan menjadi teman yang baik dan pengertian selama perkuliahan yang melelahkan ini.*".
6. Ben Hughie and Ghalib Mahendra, the author 's friends in college. The author wants to say: "*Terima kasih kepada kalian yang telah menemani saya dan menghibur saya ketika saya sedang lelah dan kritis pada saat mengerjakan tugas akhir ini.*".
7. Marita Fauziah, Queen Hesti, Adam Anugeraha, and Rifqi Naufal. The author's friends from TT-40-INT who help the author on the simulation, writing thesis, advice, homework, college's tasks, and good friends in these 3 years of college life.

8. Farhan Edwan, Ahmad Aufa, Kahfi Prasetyo, the author's friends since high school who always care about the author's condition.
9. Antenna Lab and Bang Yuda, Thanks for the help on simulation and measurement the author's undergraduate thesis.
10. Mr. Edwar as lecturer on Telkom University and Ichsan as Assistant Elkom Laboratory that allows the author to do the measurement with the Vector Network Analyzer (VNA).
11. Mr. Ruqman from PT. Radar Telekomunikasi Indonesia (RTI) as an assistant to do the measurements, thanks for the help and guidance on measurements in RTI.

Bandung, March 1st 2020

Abdurrahman Ghifari