**ABSTRACT** 

Natural disasters and non-natural disasters are undesirable events. Earthquakes, terrorism,

fires and other events that occur in a closed room will affect the structure of the building. The

limitation of the human senses to see becomes one of the problems if. Therefore the role of radar

to detect objects behind a barrier or wall is needed to overcome the problem to plan the next step

in overcoming the problem.

Radar must have high accuracy and sensitivity to obtain an overview of the target. To achieve

this, bandwidth must be wide, therefore an X-Band antenna is needed. An X-band antenna is an

antenna that operates at frequencies of 8.0 - 12 GHz for translucent radar according to the

Institute of Electrical and Electronic Engineers (IEEE). For the study, vivaldi microstrip antennas

were conceived or also called arrays to increase greater gain for smaller beamwidths as well as

increase signal to inference plus noise ratio. The selected microstrip antenna is a vivaldi-shaped

microstrip antenna. The vivaldi patch-shaped antenna was chosen because it is effective for

frequencies exceeding 1 GHz. For the selection of antenna substrates selected Rogers Duroid

5880 because it already supports X-Band frequencies.

In this research, design and simulation was carried out using the CST Studio Student Edition

2018 program to implement a microstrip antenna arrangement Vivaldi antipodal x-band for

translucent radar that is expected to meet the specifications of translucent radar. Results obtained

from a series of optimization and analysis, obtained vswr results worth less than 2 dB and return

loss of more than -10 db. While the gain obtained is worth 9.71 dB and the radiation pattern is

unidirectional.

Keywords: Microstrip antenna, Vivaldi, Array, antipodal circular load, VSWR, return loss, gain.