Lampiran A

Program Untuk Menampilkan Kalkulator Up-Link

package uplink;
import java.awt.*;
import javax.swing.*;
import java.awt.event.*;
public class Uplink extends JFrame implements ActionListener
{
    private JLabel F_upL,D_upL,Ef_upL, G_upL, P_upL,
    EIRP_upL,RangeL, FSL_upL, Pfd_upL,GperT_upL,CperN_upL;
    private JTextField F_upT,D_upT,Ef_upT, G_upT, P_upT,
    EIRP_upT,RangeT, FSL_upT, Pfd_upT,GperT_upT,CperN_upT;
    private JButton Kalkulasi, Bersihkan;
    private JPanel panel1,panel2,panel3,panel4,panel5,panel6,panel7,
    panel8,panel9,panel10,panel11,panel12;
    public Uplink()
    {
        super("Uplink");
        F_upL = new JLabel("Frekuensi Uplink (GHz)");
        D_upL = new JLabel("diameter antena Uplink (m)");
        Ef_upL = new JLabel("Efesiensi permukaan antena Uplink");
        G_upL = new JLabel("Gain Antena Uplink (dBi)");
        P_upL = new JLabel("Power Antena Uplink (dBW)");
        EIRP_upL = new JLabel("EIRP Uplink (dBW)");
        RangeL = new JLabel("Range (km)");
        FSL_upL = new JLabel("Rugi-rugi Uplink (dB)");
        Pfd_upL = new JLabel("Flux density power uplink satelit (dBw/m2)");
        GperT_upL = new JLabel("G/T satelit (dB/k)");
        CperN_upL = new JLabel("C/N uplink (dB)");
        F_upT = new JTextField();
        D_upT = new JTextField();
        Ef_upT = new JTextField();
        G_upT = new JTextField();
        G_upT.setEditable(false);
        P_upT = new JTextField();
        P_upT.setEditable(false);
        P_upT.setText("10.9");
        EIRP_upT = new JTextField();
        EIRP_upT.setEditable(false);
        RangeT = new JTextField();
        RangeT.setEditable(true);
    }
    public void actionPerformed(ActionEvent e)
    {
        //perhitungan karena itu kotak textnya dibuat
        //non-editable.
        G_upT = new JTextField();
        G_upT.setEditable(false);
        P_upT = new JTextField();
        P_upT.setEditable(false);
        P_upT.setText("10.9");
        EIRP_upT = new JTextField();
        EIRP_upT.setEditable(false);
        RangeT = new JTextField();
        RangeT.setEditable(true);
    }
}

RangeT.setEditable(false);
RangeT.setText("36000");
// Rugi-rugi uplink dan flux density power uplink
// didapat dari perhitungan karena itu kotak teks
// dibuat non-editable.
FSL_upT = new JTextField();
FSL_upT.setEditable(false);
Pfd_upT = new JTextField();
Pfd_upT.setEditable(false);
GperT_upT = new JTextField();
GperT_upT.setEditable(false);
// C/N uplink didapat dari perhitungan karena itu kotak
// teks dibuat non-editable.
CperN_upT = new JTextField();
CperN_upT.setEditable(false);
Kalkulasi = new JButton("Kalkulasi");
Kalkulasi.addActionListener(this);
Bersihkan = new JButton("Bersihkan");
Bersihkan.addActionListener(this);
panel1 = new JPanel();
panel1.setLayout(new GridLayout(1,2));
panel1.add(F_upL);
panel1.add(F_upT);
panel2 = new JPanel();
panel2.setLayout(new GridLayout(1,2));
panel2.add(D_upL);
panel2.add(D_upT);
panel3 = new JPanel();
panel3.setLayout(new GridLayout(1,2));
panel3.add(Ef_upL);
panel3.add(Ef_upT);
panel4 = new JPanel();
panel4.setLayout(new GridLayout(1,2));
panel4.add(G_upL);
panel4.add(G_upT);
panel5 = new JPanel();
panel5.setLayout(new GridLayout(1,2));
panel5.add(P_upL);
panel5.add(P_upT);
panel6 = new JPanel();
panel6.setLayout(new GridLayout(1,2));
panel6.add(EIRP_upL);
panel6.add(EIRP_upT);
panel7 = new JPanel();
panel7.setLayout(new GridLayout(1,2));
panel7.add(RangeL);
panel7.add(RangeT);
panel8 = new JPanel();
panel8.setLayout(new GridLayout(1,2));
panel8.add(FSL_upL);
panel8.add(FSL_upT);
panel9 = new JPanel();
panel9.setLayout(new GridLayout(1,2));
panel9.add(Pfd_upL);
panel9.add(Pfd_upT);
panel10 = new JPanel();
panel10.setLayout(new GridLayout(1,2));
panel10.add(GperT_upL);
panel10.add(GperT_upT);
panel11 = new JPanel();
panel11.setLayout(new GridLayout(1,2));
panel11.add(CperN_upL);
panel11.add(CperN_upT);
panel12 = new JPanel();
panel12.setLayout(new GridLayout(1,2,15,15));
panel12.add(Kalkulasi);
panel12.add(Bersihkan);
Container container = getContentPane();
container.setLayout(new GridLayout(12,1));
container.add(panel1);
container.add(panel2);
container.add(panel3);
container.add(panel4);
container.add(panel5);
container.add(panel6);
container.add(panel7);
container.add(panel8);
container.add(panel9);
container.add(panel10);
container.add(panel11);
container.add(panel12);
this.pack();
this.setVisible(true);
}

public void actionPerformed(ActionEvent event)
{
    double F_upIn, D_upIn, Ef_upIn, GperT_upIn,
    G_up, EIRP_up, FSL_up, Pfd_up, CperN;
    double P_up = 10.9, Range = 36000;
    G_upT.setText("");
    EIRP_upT.setText("");
    FSL_upT.setText("");
Pfd_upT.setText('"');
CperN_upT.setText('"');

if(event.getSource()==Kalkulasi)
{
    try
    {
        // Ambil nilai masukan yang diberikan pengguna
        // pada kotak teks
        F_upIn = Double.parseDouble(F_upT.getText());
        D_upIn = Double.parseDouble(D_upT.getText());
        Ef_upIn = Double.parseDouble(Ef_upT.getText());
        GperT_upIn = Double.parseDouble(GperT_upT.getText());

        // Lakukan perhitungan untuk:
        // Gain antena Uplink (dBi) => G_up
        G_up = 20.4 + (10 * Math.log10(Ef_upIn)) +
                (20 * Math.log10(D_upIn)) +
                (20 * Math.log10(F_upIn));

        // Munculkan Gain antena Uplink
        G_upT.setText(String.valueOf(G_up));

        // Lakukan perhitungan untuk:
        // EIRP uplink (dBW) => EIRP_up
        EIRP_up = P_up + G_up;

        // Munculkan EIRP uplink
        EIRP_upT.setText(String.valueOf(EIRP_up));

        // Lakukan perhitungan untuk:
        // Rugi-rugi uplink (dB) => FSL_up
        FSL_up = 32.44 + (20 * Math.log10(Range) +
                        (20 * Math.log10(F_upIn * 1000));

        // Munculkan FSL_up
        FSL_upT.setText(String.valueOf(FSL_up));

        // Lakukan perhitungan untuk:
        // Flux density power uplink satelit (dBW/m*m) => Pfd_up
        Pfd_up = EIRP_up - FSL_up - 0.3 + 37.36;

        // Munculkan Pfd_up
        Pfd_upT.setText(String.valueOf(Pfd_up));

        // Lakukan perhitungan untuk:
        // C/N Uplink (dB) => CperN
        CperN = EIRP_up - FSL_up - 0.3 + GperT_upIn + 228.6;

        // Munculkan CperN
        CperN_upT.setText(String.valueOf(CperN));
    }
}
catch(Exception e)
{
    JOptionPane.showMessageDialog(this,"Masukkan semua Nilai!");
}
}
else if (event.getSource()==Bersihkan)
{
    // Bersihkan semua teks kecuali Power Uplink dan Range
    F_upT.setText('"");
    D_upT.setText('"");
    Ef_upT.setText('"");
    G_upT.setText('"");
    EIRP_upT.setText('"");
    FSL_upT.setText('"");
    Pfd_upT.setText('"");
    GperT_upT.setText('"");
    CperN_upT.setText('"");
}

public static void main (String args[])
{
    Uplink application = new Uplink();
    application.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
}
}
Lampiran B

Program Untuk Menampilkan Kalkulator Down-Link

```java
import java.awt.*;
import javax.swing.*;
import java.awt.event.*;
public class Downlink extends JFrame implements ActionListener {
    private JLabel F_downL,D_downL,Ef_downL, Temp_downL, Gain_downL, 
    GperT_downL,EIRP_downL, Range_downL, FSL_downL, 
    CperN_downL;
    private JTextField F_downT,D_downT,Ef_downT, Temp_downT, 
    Gain_downT, 
    GperT_downT,EIRP_downT, Range_downT, FSL_downT, 
    CperN_downT;
    private JButton Kalkulasi, Bersihkan;
    private JPanel panel1,panel2,panel3,panel4,panel5,panel6,panel7, 
    panel8,panel9,panel10,panel11;
    public Downlink() {
        super("Downlink");
        F_downL = new JLabel("Frekuensi Downlink (GHz)");
        D_downL = new JLabel("diameter antena penerima Downlink (m)");
        Ef_downL = new JLabel("Efesiensi permukaan antena Downlink");
        Temp_downL = new JLabel("Temperatur sistem Downlink (antena + 
        LNA)");
        Gain_downL = new JLabel("Gain antena penerima downlink (dBi)";
        GperT_downL = new JLabel("G/T antena penerima Downlink (dB/K)";
        EIRP_downL = new JLabel("EIRP Satelit Downlink (dbW)");
        Range_downL = new JLabel("Range (35778-41679) km");
        FSL_downL = new JLabel("FSL Downlink (dB)");
        CperN_downL = new JLabel("C/N Downlink (dB)");
        F_downT = new JTextField();
        D_downT = new JTextField();
        Ef_downT = new JTextField();
        Temp_downT = new JTextField();
        Temp_downT.setEditable(false);
        Gain_downT = new JTextField();
        Gain_downT.setEditable(false);
        GperT_downT = new JTextField();
        GperT_downT.setEditable(false);
        EIRP_downT = new JTextField();
        Range_downT= new JTextField();
        Range_downT.setEditable(false);
        Range_downT.setText("36000");
    }
}
```
FSL_downT = new JTextField();
FSL_downT.setEditable(false);
CperN_downT = new JTextField();
CperN_downT.setEditable(false);
Kalkulasi = new JButton("Kalkulasi");
Kalkulasi.addActionListener(this);
Bersihkan = new JButton("Bersihkan");
Bersihkan.addActionListener(this);
panel1 = new JPanel();
panel1.setLayout(new GridLayout(1,2));
panel1.add(F_downL);
panel1.add(F_downT);
panel2 = new JPanel();
panel2.setLayout(new GridLayout(1,2));
panel2.add(D_downL);
panel2.add(D_downT);
panel3 = new JPanel();
panel3.setLayout(new GridLayout(1,2));
panel3.add(Ef_downL);
panel3.add(Ef_downT);
panel4 = new JPanel();
panel4.setLayout(new GridLayout(1,2));
panel4.add(Temp_downL);
panel4.add(Temp_downT);
panel5 = new JPanel();
panel5.setLayout(new GridLayout(1,2));
panel5.add(Gain_downL);
panel5.add(Gain_downT);
panel6 = new JPanel();
panel6.setLayout(new GridLayout(1,2));
panel6.add(GperT_downL);
panel6.add(GperT_downT);
panel7 = new JPanel();
panel7.setLayout(new GridLayout(1,2));
panel7.add(EIRP_downL);
panel7.add(EIRP_downT);
panel8 = new JPanel();
panel8.setLayout(new GridLayout(1,2));
panel8.add(Range_downL);
panel8.add(Range_downT);
panel9 = new JPanel();
panel9.setLayout(new GridLayout(1,2));
panel9.add(FSL_downL);
panel9.add(FSL_downT);
panel10 = new JPanel();
panel10.setLayout(new GridLayout(1,2));
public void actionPerformed(ActionEvent event)
{
    double F_downIn, D_downIn, Ef_downIn, EIRP_downIn;
    double Temp_down, Gain_down, GperT_down, FSL_down, CperN_down;
    double Range_down = 36000, n = 0.67;
    // Konstanta untuk perhitungan Temperatur System downlink
double Ta = 35, L = 1.01, To = 290,
    T1 = 80, GLNA = 100000, f = 100;
    /*Temp_downT.setText(""");
    Gain_downT.setText(""");
    GperT_downT.setText(""");
    FSL_downT.setText(""");
    CperN_downT.setText(""");
    */
    if(event.getSource()==Kalkulasi)
    {
        try
        {
            // Ambil nilai masukkan yang diberikan pengguna
            // pada kotak teks
            F_downIn = Double.parseDouble(F_downT.getText());
            D_downIn = Double.parseDouble(D_downT.getText());
            Ef_downIn = Double.parseDouble(Ef_downT.getText());
        }
EIRP_downIn = Double.parseDouble(EIRP_downT.getText());

// Lakukan perhitungan untuk:
// Temperatur System downlink (antena + LNA) => Temp_down
// Ta = 35 K (C-band), L = 0.05 dB = 1.01, To = 290 K (standar IEEE)
// T1 = TLNA = 80 K, GLNA = 50 dB = 100000 (C-band)
// f = 20 dB = 100 (C-Band)
// Temp_down = Ta/L + (To(L-1))/L + T1 + To(f-1)/GLNA;
// Munculkan Temperatur System downlink
Temp_downT.setText(String.valueOf(Temp_down));

// Lakukan perhitungan untuk:
// Gain antena penerima downlink (dBi)
Gain_down = 20.4 + (10 * Math.log10(n)) +
            (20 * Math.log10(D_downIn)) + (20 * Math.log10(F_downIn));
// Munculkan Gain antena penerima downlink
Gain_downT.setText(String.valueOf(Gain_down));

// Lakukan perhitungan untuk:
// G/T Antena penerima downlink (dB/k) => GperT_down
GperT_down = Gain_down - L - (10 * Math.log10(Temp_down));
// Munculkan G/T Antena penerima downlink
GperT_downT.setText(String.valueOf(GperT_down));

// Lakukan perhitungan untuk:
// FSL downlink (dB) => FSL_down
FSL_down = 32.44 + (20 * Math.log10(Range_down)) + (20 *
Math.log10(F_downIn * 1000));
// Munculkan FSL downlink
FSL_downT.setText(String.valueOf(FSL_down));

// Lakukan perhitungan untuk:
// C/N downlink (dB) => CperN_down
// Labs = 0.3 dB
//CperN_down = EIRP_downIn - FSL_down - Labs + GperT_down +
// Munculkan C/N downlink
CperN_downT.setText(String.valueOf(CperN_down));
}
catch(Exception e)
{
   JOptionPane.showMessageDialog(this,"Masukkan semua Nilai!");
}
}
else if (event.getSource()==Bersihkan)
{
    // Bersihkan semua teks kecuali Power Uplink dan Range
    F_downT.setText(""");
    D_downT.setText(""');
    Ef_downT.setText(""');
    Temp_downT.setText(""');
    Gain_downT.setText(""');
    GperT_downT.setText(""');
    EIRP_downT.setText(""');
    FSL_downT.setText(""');
    CperN_downT.setText(""');
}

public static void main (String args[])
{
    Downlink application = new Downlink();
    application.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
}
}
Lampiran C

Program Untuk Menampilkan Kalkulator Total Link

```java
package totallink;
import java.awt.*;
import javax.swing.*;
import java.awt.event.*;

public class Totallink extends JFrame implements ActionListener {
    private JLabel CperN_upL, CperIntermodL, CperN_downL, TotalLinkL;
    private JTextField CperN_upT, CperIntermodT, CperN_downT, TotalLinkT;
    private JButton Kalkulasi, Bersihkan;
    private JPanel panel1, panel2, panel3, panel4;

    public Totallink() {
        super("Total Link");
        CperN_upL = new JLabel("C/N Uplink (dB)");
        CperN_downL = new JLabel("C/N Downlink (dB)");
        TotalLinkL = new JLabel("Total link C/N (dB)"神通)
        CperN_upT = new JTextField();
        CperN_downT = new JTextField();
        TotalLinkT = new JTextField();
        TotalLinkT.setEditable(false);
        Kalkulasi = new JButton("Kalkulasi");
        Kalkulasi.addActionListener(this);
        Bersihkan = new JButton("Bersihkan");
        Bersihkan.addActionListener(this);
        panel1 = new JPanel();
        panel1.setLayout(new GridLayout(1,2));
        panel1.add(CperN_upL);
        panel1.add(CperN_upT);
        panel2 = new JPanel();
        panel2.setLayout(new GridLayout(1,2));
        panel2.add(CperN_downL);
        panel2.add(CperN_downT);
        panel3 = new JPanel();
        panel3.setLayout(new GridLayout(1,2));
        panel3.add(TotalLinkL);
        panel3.add(TotalLinkT);
        panel4 = new JPanel();
        panel4.setLayout(new GridLayout(1,2,15,15));
        panel4.add(Kalkulasi);
        panel4.add(Bersihkan);
        Container container = getContentPane();
        container.setLayout(new GridLayout(4,1));
```
public void actionPerformed(ActionEvent event)
{
    double CperN_upIn, CperN_downIn, Total_Link;
    if(event.getSource()==Kalkulasi)
    {
        try
        {
            CperN_upIn = Double.parseDouble(CperN_upT.getText());
            CperN_downIn = Double.parseDouble(CperN_downT.getText());
            // Perhitungan untuk Total link C/N (dB):
            Total_Link = 1/CperN_upIn + 1/CperN_downIn;
            // Munculkan Total link C/N
            TotalLinkT.setText(String.valueOf(Total_Link));
        }
        catch(Exception e)
        {
            JOptionPane.showMessageDialog(this,"Masukkan semua Nilai!");
        }
    }
    else if (event.getSource()==Bersihkan)
    {
        // Bersihkan semua teks kecuali Power Uplink dan Range
        CperN_upT.setText(""s);
        CperN_downT.setText(""s);
        TotalLinkT.setText(""s);
    }
}
public static void main (String args[])
{
    Totallink application = new Totallink();
    application.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
}