

มหาวิทยาลัยเชียงใหม่

ภาคผนวก

Chiang Mai University

ภาคผนวก ก

โปรแกรมภาษาจาวาที่ใช้ทำเวิร์ฟเฟด และ ไฟล์ HTML

1. EsMainPanel.java

```
//EsMainPanel.java
import java.io.*;
import java.util.*;
import javax.servlet.*;
import jess.*;

// displays a query
public class EsMainPanel {
    String query; // query caption
    int items; // nr of query items
    String factComponents[]; // image file names, labels, and assertions
    final String mainUrl = "http://www.phitsa.com/"; //Phitsanulok Radar URL
    EsReteControl reteCon;

    public EsMainPanel(String query, int items, String[] factComponents) {
        this.query = query;
        this.items = items;
        this.factComponents = factComponents;
    }

    public EsMainPanel(String query, int items, String[] factComponents,
        EsReteControl reteCon) {
        this.query = query;
        this.items = items;
        this.factComponents = factComponents;
        sendPanel(reteCon);
    }

    public void sendPanel(EsReteControl reteCon) {
        int rows, cols;
        Hashtable assertions = new Hashtable();
        ServletOutputStream toClient = reteCon.getClient();

        int codeSum = 0; // generate a signature to identify this query
        for (int i=0; i<query.length(); i++)
            codeSum += query.charAt(i);
        String querySignature = Integer.toString(codeSum);
        reteCon.setQuerySignature(querySignature);

        try { // generate HTML for the query page
            toClient.println("<html><head><title>Main Page</title>" +
                "<meta http-equiv=\"Content-Type\" content=\"text/html; " +
                "charset=windows-874\">");

            if (reteCon.getSeqError())
                toClient.println("<FONT FACE=\"Arial,Helvetica\">" +
                    "<B>Starting Over:</B>" +
                    "<BLINK>Please do not use BACK or FORWARD " +
```

```

    "when responding to queries.</BLINK>");
    rows = items / 4 + 1;
    cols = (items <= 2 || items == 4) ? 2 : 3;

    toClient.println("<table width=\"75%\" border=\"0\"
align=\"center\">");
    toClient.println("<tr>");
    toClient.println("<td align=\"center\" height=\"70\" +
    "bgcolor=\"#336699\">");
    toClient.println("<div align=\"left\"><font face=\"Arial, " +
    "Times New Roman, Times, serif\">" +
    "<b><font size=\"5\" color=\"#FFFFFF\">" +
    "Main Page</font></b></font></div>");
    toClient.println("</td>");
    toClient.println("</tr>");
    toClient.println("<tr>");
    toClient.println("<td height=\"259\" valign=\"top\" " +
    "bgcolor=\"#99ccff\">");
    toClient.println("<p align=\"center\"><font face=\"Arial, " +
    "Times New Roman, Times, serif\"><h3 align=\"center\">" +
    query + "</h3></font></p>");
    toClient.println("<FORM name=\"startup\" method=POST " + "action=\""
+ reteCon.getResponse().encodeURL("/servlet/EsServlet")
+ "\">");
    toClient.println("<div align=\"center\">");

    int next = 0;
    for (int r=1; r<=rows; r++) {
        for (int c=1; c <= cols && next < items; c++) {
            toClient.println("<INPUT TYPE=\"submit\" NAME=\"action\"
VALUE=\"" +
            factComponents[next*2+0] + "\"><br>"); // add a button
            assertions.put (factComponents[next*2+0],
factComponents[next*2+1]);
            // link button label and assertion for later use
            next++;
        }
        toClient.println(" <TR>" +
        "<TD BGCOLOR=\"#CCCCCC\"><CENTER>" +
        "<INPUT TYPE=\"submit\" NAME=\"action\"" +
        "VALUE=\"restart\"></CENTER></TD></TR>");

        // link the Restart button with (restart)
        assertions.put("restart", "(restart)");
        toClient.println("</TABLE>"); // end table
        toClient.println("<INPUT type=hidden name=\"querysig\" value=\"" +
        querySignature + "\">"); // embed the query signature in the
form
        toClient.println("</FORM><FONT FACE=\"Arial,Helvetica\">");

        toClient.println("<CENTER><P><A HREF=\"/expert/\">" +
        "Return to the ATCR-33S Expert System startup page</A></CENTER>");
        toClient.println("<P><CENTER><A HREF=\"" + mainUrl +
        "\">Return to Phitsanulok Radar home page</A></CENTER>");
        toClient.println("</FONT></BODY></HTML>");
    } catch (IOException e) {}
    reteCon.setAssertions(assertions); // hand assertions to reteCon
}
}

```

2. EsSelectPanel.java

```

//EsSelectFault.java
import java.io.*;
import java.util.*;
import javax.servlet.*;
import javax.*;

// displays a query
public class EsSelectPanel {
    String query; // query caption
    int items; // nr of query items
    String factComponents[]; // labels, and assertions
    final String mainUrl = "http://www.phitsa.com/"; //Phitsanulok Radar URL
    EsReteControl reteCon;

    public EsSelectPanel(String query, int items, String[] factComponents) {
        this.query = query;
        this.items = items;
        this.factComponents = factComponents;
    }

    public EsSelectPanel(String query, int items, String[] factComponents,
        EsReteControl reteCon) {
        this.query = query;
        this.items = items;
        this.factComponents = factComponents;
        sendPanel (reteCon);
    }

    public void sendPanel(EsReteControl reteCon) {
        int rows, cols;
        Hashtable assertions = new Hashtable();

        ServletOutputStream toClient = reteCon.getClient();

        int codeSum = 0; // generate a signature to identify this query
        for (int i=0; i<query.length(); i++)
            codeSum += query.charAt(i);
        String querySignature = Integer.toString(codeSum);
        reteCon.setQuerySignature(querySignature);

        try { // generate HTML for the query page
            toClient.println("<html><head><title>Question Page</title>" +
                "<meta http-equiv=\"Content-Type\" content=\"text/html;\" +
                "charset=windows-874\">");

            if (reteCon.getSegError())
                toClient.println("<FONT FACE=\"Arial,Helvetica\">" +
                    " <B>Starting Over:</B>" +
                    " <BLINK>Please do not use BACK or FORWARD " +
                    "when responding to queries.</BLINK>");

            rows = items / 4 + 1;
            cols = (items <= 2 || items == 4) ? 2 : 3;

            toClient.println("<table width=\"75%\" border=\"0\"
align=\"center\">");
            toClient.println("<tr>");
            toClient.println("<td align=\"center\" height=\"70\" " +
                "bgcolor=\"#336699\">");
            toClient.println("<div align=\"left\"><font face=\"Arial,\" +
                "Times New Roman, Times, serif\">" +
                "<b><font size=\"5\" color=\"#FFFFFF\">" +
                "Question page</font></b></font></div>");
            toClient.println("</td></tr>");

```

```

toClient.println("<tr><td height=\"259\" valign=\"top\" " +
    "bgcolor=\"#99ccff\">");
toClient.println("<p align=\"center\"><font face=\"Arial, " +
    "Times New Roman, Times, serif\"><h3 align=\"center\">" +
    query + "</h3></font></p>");
toClient.println("<FORM name=\"startup\" method=POST " + "action=\""
    + reteCon.getResponse().encodeURL(@/servlet/EsServlet")
    + "\>");
toClient.println("<div align=\"center\">");
int next = 0;
toClient.println("<select name=\"action\">");
for (int r=1; r<=rows; r++) {
    for (int c=1; c <= cols && next < items; c++) {
        toClient.println("<option VALUE=\"" +
            factComponents[next*2+0] + "\>" +
            factComponents[next*2+0] + "</option>"); // add a selection
list
assertions.put (factComponents [next*2+0] , factComponents [next*2+1]);
// link button label and assertion for later use
next++;
    }
}
toClient.println("</select>");
toClient.println("<INPUT TYPE=\"submit\" NAME=\"action\" " +
    "VALUE=\"submit\">"); // add a button
toClient.println("</TABLE>"); // end table
toClient.println("<INPUT type=hidden name=\"quersig\" value=\"" +
    querySignature + "\>"); // embed the query signature in the
form
toClient.println("</FORM><FONT FACE=\"Arial,Helvetica\">");
toClient.println("<CENTER><P><A HREF=\"/expert/\">" +
    "Return to the ATCR-33S Expert System startup
page</A></CENTER>");
toClient.println("<P><CENTER><A HREF=\"" + mainUrl + "\">" +
    "Return to Phitsanulok Radar home page</A></CENTER>");
toClient.println("</FONT></CENTER></BODY></HTML>");
} catch (IOException e) {}
reteCon.setAssertions(assertions); // hand assertions to reteCon
}
}

```

3. EsQueryPanel.java

```

//EsQueryText.java
import java.io.*;
import java.util.*;
import javax.servlet.*;
import jess.*;

// displays a query
public class EsQueryPanel {
    String query; // query caption
    int items; // nr of query items
    String factComponents[]; // labels, and assertions
    final String mainUrl = "http://www.phitsa.com/"; //Phitsanulok Radar URL
    EsReteControl reteCon;

    public EsQueryPanel(String query, int items, String[] factComponents) {
        this.query = query;
        this.items = items;
        this.factComponents = factComponents;
    }
}

```

```

public EsQueryPanel(String query, int items, String[] factComponents,
    EsReteControl reteCon) {
    this.query = query;
    this.items = items;
    this.factComponents = factComponents;
    sendPanel(reteCon);
}

public void sendPanel(EsReteControl reteCon) {
    int rows, cols;
    Hashtable assertions = new Hashtable();

    ServletOutputStream toClient = reteCon.getClient();

    int codeSum = 0; // generate a signature to identify this query
    for (int i=0; i<query.length(); i++)
        codeSum += query.charAt(i);
    String querySignature = Integer.toString(codeSum);
    reteCon.setQuerySignature(querySignature);

    try { // generate HTML for the query page
        toClient.println("<html><head><title>Question Page</title>" +
            "<meta http-equiv=\"Content-Type\" content=\"text/html; " +
            "charset=windows-874\">");

        if (reteCon.getSeqError())
            toClient.println("<FONT FACE=\"Arial,Helvetica\">" +
                "<B>Starting Over:</B>" +
                "<BLINK>Please do not use BACK or FORWARD " +
                "when responding to queries.</BLINK>");

        rows = items / 4 + 1;
        cols = (items <= 2 || items == 4) ? 2 : 3;

        toClient.println("<table width=\"75%\" border=\"0\"
            align=\"center\">");
        toClient.println("<tr>");
        toClient.println("<td align=\"center\" height=\"70\" " +
            "bgcolor=\"#336699\">");
        toClient.println("<div align=\"left\"><font face=\"Arial, " +
            "Times New Roman, Times, serif\">" +
            "<b><font size=\"5\" color=\"#FFFFFF\">" +
            "Question page</font></b></font></div>");
        toClient.println("</td></tr>");
        toClient.println("<tr><td height=\"259\" valign=\"top\" " +
            "bgcolor=\"#99ccff\">");
        toClient.println("<p align=\"center\"><font face=\"Arial, " +
            "Times New Roman, Times, serif\"><h3 align=\"center\">" +
            query + "</h3></font></p>");
        toClient.println("<FORM name=\"startup\" method=POST " + "action=\"" +
            + reteCon.getResponse().encodeURL("/servlet/EsServlet")
            + "\">");
        toClient.println("<div align=\"center\">");
        int next = 0;
        for (int r=1; r<=rows; r++) {
            for (int c=1; c <= cols && next < items; c++) {
                toClient.println("<INPUT TYPE=\"submit\" NAME=\"action\" " +
                    "VALUE=\"" + factComponents[next*2+0] + "\">"); // add a
                assertions.put (factComponents [next*2+0],
                    factComponents [next*2+1]);
                // link button label and assertion for later use
                next++;
            }
        }
    }
}

```

```

toClient.println( "<TR>" +
    "<TD BGCOLOR=#CCCCCC><CENTER>" +
    "<INPUT TYPE='submit' NAME='action' VALUE='restart'>" +
    "</CENTER></TD></TR>" );
// link the Restart button with (restart)
assertions.put("restart", "(restart)");
toClient.println("</TABLE>"); // end table
toClient.println("<INPUT type=hidden name='querysig' value='" +
    querySignature + "'>"); // embed the query signature in the
form
toClient.println("</FORM><FONT FACE='Arial,Helvetica'>");
toClient.println("<CENTER><P><A HREF='/expert/'>" +
    "Return to the ATCR-33S Expert System startup
page</A></CENTER>");
toClient.println("<P><CENTER><A HREF='" + mainUrl + "'>" +
    "Return to Phitsanulok Radar home page</A></CENTER>");
toClient.println("</FONT></CENTER></BODY></HTML>");
} catch (IOException e) {}
reteCon.setAssertions(assertions); // hand assertions to reteCon
}
}

```

4. EsAnsPanel.java

```

// EsAnsPanel.java
import java.io.*;
import java.util.*;
import javax.servlet.*;
import jess.*;

// sends a conclusion back to the user
public class EsAnsPanel {
    String query; // query caption

    public EsAnsPanel(String query, EsReteControl reteCon) {
        this.query = query;
        sendPanel(reteCon);
    }

    public void sendPanel(EsReteControl reteCon) {
        int rows, cols;
        Hashtable assertions = new Hashtable();

        ServletOutputStream toClient = reteCon.getClient();

        int codeSum = 0; // generate a signature to identify this query
        for (int i=0; i<query.length(); i++)
            codeSum += query.charAt(i);
        String querySignature = Integer.toString(codeSum);
        reteCon.setQuerySignature(querySignature);

        try { // generate HTML for the query page
            toClient.println("<html><head><title>Corrective action
page</title>" +
                "<meta http-equiv='Content-Type' content='text/html; " +
                "charset=windows-874'>");
            toClient.println("</HEAD><BODY BGCOLOR=#B1F3BD'>");

            if (reteCon.getSeqError())
                toClient.println("<FONT FACE='Arial,Helvetica'>" +
                    "<B>Starting Over:</B>" +
                    "<BLINK>Please do not use BACK or FORWARD " +
                    "when responding to queries.</BLINK>");

```

```

        toClient.println("<FORM name=\"startup\" method=POST " +
"action=\""
        + reteCon.getResponse().encodeURL("/servlet/EsServlet")
        + "\">");
        toClient.println("<table width=\"75%\" border=\"0\"
align=\"center\">");
        toClient.println("<tr>");
        toClient.println("<td align=\"center\" height=\"70\" " +
        "bgcolor=\"#336699\">");
        toClient.println("<div align=\"left\"><font face=\"Arial, " +
        "Times New Roman, Times, serif\"> " +
        "<b><font size=\"5\" color=\"#FFFFFF\"> " +
        "Corrective action page</font></b></font></div>");
        toClient.println("</td></tr>");
        toClient.println("<tr><td height=\"259\" valign=\"top\" " +
        "bgcolor=\"#99ccff\">");
        toClient.println("<p align=\"center\"><font face=\"Arial, " +
        "Times New Roman, Times, serif\"><h3 align=\"center\"> " +
        query + "</h3></font></p>");
        toClient.println("<FORM name=\"startup\" method=POST " + "action=\""
        + reteCon.getResponse().encodeURL("/servlet/EsServlet")
        + "\">");
        toClient.println(" <TR> " +
        "<TD BGCOLOR=\"#CCCCCC\"><CENTER> " +
        "<INPUT TYPE=\"submit\" NAME=\"action\" VALUE=\"" +
        "restart\"></CENTER></TD></TR> ");

        // link the Restart button with (restart)
        assertions.put("restart", "{restart}");
        toClient.println("</TABLE>"); // end table
        toClient.println("<INPUT type=hidden name=\"quersig\" value=\"" +
        querySignature + "\">"); // embed the query signature in the
form
        toClient.println("</FORM><FONT FACE=\"Arial,Helvetica\">");

        toClient.println("<CENTER><P><A HREF=\"/expert/\"> " +
        "Return to the ATCR-33S Expert System startup
page</A></CENTER>");
        toClient.println("</FONT></BODY></HTML>");

    } catch (IOException e) {}
    reteCon.setAssertions(assertions); // hand assertions to reteCon
}
}

```

5. EsReteControl.java

```

//EsReteControl.java
import java.util.*;
import java.io.*;
import javax.servlet.http.*;
import javax.servlet.*;
import jess.*;

public class EsReteControl {
    private Rete reteEngine;
    private Jesp jessParse;
    private ServletOutputStream toClient;
    private HttpServletResponse res;
    private boolean firstTime = true, assertion = false;
    private boolean reset=false, seqError=false;
    private String fact, querySignature;
    private Hashtable assertions;

```



```

public EsReteControl(HttpServletRequestResponse res) {
    this.res = res;
    reteEngine = new Rete();
    reteEngine.store("ReteControl", this);
}

public void run() {
    String KBFileName = null;
    if (firstTime) {
        firstTime = false;

        FileReader rulesFile;
        try { // open the CLIPS file
            KBFileName = "c:\\tomcat41\\webapps\\ROOT\\psres.clp";
            //KBFileName = "/home/virtual/site328/fst/var/www/html/psres.clp";
            rulesFile = new FileReader(KBFileName);

        } catch (FileNotFoundException infe) {
            rulesFile = null;
            //System.out.println("EsReteControl: cannot open: " +
KBFileName);
        }

        if (rulesFile != null) { // parse the CLIPS file
            jessParse = new Jesp(rulesFile, reteEngine);
            try {
                jessParse.parse(false);
            } catch (JessException je) {
                //System.out.println("EsReteControl: error in jessParse.parse: " +
je);
            }
            try {
                rulesFile.close();
            } catch (Throwable exc) {}
        }
    }

    if (assertion) {
        assertion = false;
        try {
            reteEngine.executeCommand( "{assert " + fact + "}" );
            reteEngine.run();
        } catch (JessException je) {
            // System.out.println("EsReteControl: error in executeCommand / run: " +
je);
        }
    }

    if (reset) {
        reset = false;
        try {
            reteEngine.reset();
            reteEngine.run();
        } catch (JessException je) {
            //System.out.println("EsReteControl: error in reset / run: " +
je);
        }
    }
}

public void resetRete(ServletOutputStream sos) {
    seqError = false;
    toClient = sos;
    reset = true;
}

```

```

}

public void assertFact(String n_querySignature,
String n_label, ServletOutputStream sos) {
    toClient = sos; // save toClient for response
    if ( !(querySignature.equals(n_querySignature)) ) {
        seqError = true; // start over when a sequence error is detected
        reset = true;
    }
    else {
        seqError = false;
        // find the assertion to match the returned label
        fact = (String) assertions.get(n_label);
        if (fact.equals("restart"))
            reset = true;
        else
            assertion = true;
    }
}

public boolean getSeqError() { return seqError;}
public ServletOutputStream getClient() { return toClient; }
public HttpServletResponse getResponse() { return res; }

public void setAssertions(Hashtable n_a) { assertions = n_a;}
public void setQuerySignature(String qs) { querySignature = qs; }
public void setSession(HttpServletResponse res) {
    this.res = res;
}
}
}

```

6. EsServlet.java

```

// EsServlet.java
import java.io.*;
import java.util.*;
import javax.servlet.*;
import javax.servlet.http.*;

public class EsServlet extends HttpServlet {
    HttpSession session;
    EsReteControl reteCon;

    public void init(ServletConfig Conf) throws ServletException {
        super.init(Conf);
    }

    public void doPost(HttpServletRequest req, HttpServletResponse res)
        throws IOException {
        res.setContentType("text/html"); // declare response type to client
        // find out what the client wants
        String action = req.getParameter("action");
        if (action.equals("start"))
            startNewSession(req, res);
        else if (action.equals("finish")) {
            continueSession(req, res, action);
        }
        else
            continueSession(req, res, action);
    }

    private void startNewSession(HttpServletRequest req, HttpServletResponse
res)
        throws IOException {

```



```

of      Department,<a href="http://www.aerothai.or.th"> Aeronautical Radio
work.   Thailand Co.,Ltd.</a> identify problem encountered during their
</p>
series  <p>After you start the expert system, it will guide you through a
</p>    of questions about the problem and then recommend you a solution.
</p>
<center>
  <form name="startup" method="POST" action="/servlet/EsServlet">
    <input type="hidden" name="action" value="start">
    <input type="submit" value="Start Expert System" name="submit">
  </form>
</center>
  <div align="right"><a href="assist.html"> assistant page </a>
</div>
</td>
</tr>
<tr>
  <td bgcolor="#99ccff">
    <p>Contacts and further information: </p>
    <ul>
      <li> For comments or questions about Primary radar , contact <a
href="http://www.phitsa.com/contact/">
        Phitsanulok radar staff</a> , Surveillance Sytem Engineering
Department.
        , Aeronautical Radio of Thailand .</li>
      <li> For technical questions or comments about design and
programming
of this web site, contact <a href="mailto:g4440159@cm.edu">
developer</a>,
Information Technology and Management, Graduate Study, Chiangmai
University
, Thailand. </li>
    </ul>
  </td>
</tr>
</table>
</center>
<center>
  <applet code="EsApplet.class" height="25" width="300"
bgcolor="#ffffff"></applet>
</center>
<hr width="50%">
<br>
<center>
  <font face="Arial,Helvetica"><font size="-2">@Copyright 2003 bar-
foo.com</font></font>
</center>

</body>
</html>

```

ภาคผนวก ข

ฐานความรู้ของระบบผู้เชี่ยวชาญ

ไฟล์ psres.clp

```
*****
; psres.clp :: Jess-Java Expert System Shell Script
; by g440199@cmu.edu
; ATCR-30S Primary Radar Expert System Knowledge Base
; April 1, 2003
;-----
; Rule Syntax
;=====
;+++ Question / Query Panel +++
;(defrule <rule-name>
;  (<fact-pattern-0>)
;  =>
;  (new <HTMLDisplayClass> <displayMessage> <items>
;    (create$
;      "<user-Choice-1>" *(<fact-pattern-1>)*
;      .
;      .
;      .
;      "<user-Choice-n>" *(<fact-pattern-n>)*)
;    (fetch "ReteControl"))
;)
; where as:
; - <rule-name> name of rule
; - <fact-pattern-0> fact on the LHS-Left hand side
; - <HTMLDisplayClass> Classes for HTML Panel
;   EsMainPanel - Display Main Panel
;   EsSelectPanel - Display Selection Drop-down Lists
;   EsQueryPanel - Display a Query Panel
; - <displayMessage> Information message or question
;   message for the Panel
; - <items> number of facts component for the Panel
; - <user-Choice-item> ... <user-Choice-itemN>
;   user-label for button-n
; - <fact-pattern-item> ... <fact-pattern-itemN>
;   fact-pattern bind to each user-label
;
;++++ Answer Panel ++++
;(defrule <rule-name>
;  (<fact-pattern>)
;  =>
;  (new EsAnsPanel <displayMessage>
;    (fetch "ReteControl"))
;)
; where as:
; - <rule-name> name of rule
; - <fact-pattern> fact on the LHS-Left hand side
; - <displayMessage> Suggestion message for the Panel
;-----
;-----
```

```

; DEFINE TEMPLATE
; FOR
; UN-ORDER FACTS
;*****

(deftemplate codelru
  (slot code)
  (slot card)
  (slot unit)
  (slot section)
  (slot position)
  (slot image
    (default "/images/selogo1.jpg"))
  (multislot cm)
)

(deftemplate node
  (slot name)
  (slot type)
  (slot question)
  (slot yes-node)
  (slot no-node)
  (slot answer)
)

;*****
; Define FACTS for RECEIVER
; DATA PROCESSOR
;*****

(deffacts rx-dp-fact
  (codelru (code 1xcard MPU) (unit DRU) (section DP) (position XA05)
    (image "/images/rx/dp/fig3111.jpg") (cm cm1 cm2 cm24))
  (codelru (code 2xcard PRM) (unit DRU) (section DP) (position XA07)
    (image "/images/rx/dp/fig3111.jpg") (cm cm1 cm2 cm24))
  (codelru (code 3xcard ASU) (unit DRU) (section DP) (position XA06)
    (image "/images/rx/dp/fig3111.jpg") (cm cm1 cm2 cm24))
  (codelru (code 4xcard DPM) (unit DRU) (section DP) (position XA04)
    (image "/images/rx/dp/fig3111.jpg") (cm cm1 cm2 cm24 cm15))
  (codelru (code 5xcard MNI) (unit DRU) (section DP) (position XA08)
    (image "/images/rx/dp/fig3111.jpg") (cm cm1 cm2 cm24))
  (codelru (code 6xcard IMF) (unit DRU) (section DP) (position XA09)
    (image "/images/rx/dp/fig3111.jpg") (cm cm1 cm2 cm24))
  (codelru (code 7xcard PTG) (unit DRU) (section DP)
    (position XA10) (image "/images/rx/dp/fig3111.jpg") (cm cm1 cm2 cm24))
  (codelru (code 8xcard NTMG) (unit DRU) (section DP)
    (position XA11) (image "/images/rx/dp/fig3111.jpg") (cm cm1 cm2 cm24))
  (codelru (code 9xcard PECO) (unit DRU) (section DP)
    (position XA12) (image "/images/rx/dp/fig3111.jpg") (cm cm1 cm2 cm24))
  (codelru (code 10xcard CBIM) (unit DRU) (section RF)
    (position A21) (image "/images/selogo1.jpg") (cm cm1 cm11 cm24))
  (codelru (code 11xcard RXINT) (unit DRU) (section DP) (position XA14)
    (image "/images/rx/dp/fig3111.jpg") (cm cm1 cm2 cm24))
  (codelru (code 12xcard MIO) (unit DRU) (section DP) (position XA16)
    (image "/images/rx/dp/fig3111.jpg") (cm cm1 cm2 cm24))
  (codelru (code 13xcard MIO) (unit DRU) (section DP) (position XA17)
    (image "/images/rx/dp/fig3111.jpg") (cm cm1 cm2 cm24))
  (codelru (code 14xcard DTI) (unit DRU) (section DP) (position XA13)
    (image "/images/rx/dp/fig3111.jpg") (cm cm1 cm2 cm24))
  (codelru (code 15xcard AFS) (unit DRU) (section DP) (position XA11)
    (image "/images/rx/dp/fig3111.jpg") (cm cm1 cm2 cm24))
  (codelru (code 16xcard EDR) (unit DRU) (section DP) (position XA19)
    (image "/images/rx/dp/fig3111.jpg") (cm cm1 cm2 cm24))
)

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(codelru (code 17xcard MPU) (unit DRU) (section DP) (position XA00)
  (image "/images/rx/dp/fig3111.jpg") (cm cm1 cm2 cm24)
(codelru (code 18xcard PRM) (unit DRU) (section DP) (position XA01)
  (image "/images/rx/dp/fig3111.jpg") (cm cm1 cm2 cm24)
(codelru (code 19xcard ASU) (unit DRU) (section DP) (position XA02)
  (image "/images/rx/dp/fig3111.jpg") (cm cm1 cm2 cm24)
(codelru (code 20xcard ASU) (unit DRU) (section DP) (position XA03)
  (image "/images/rx/dp/fig3111.jpg") (cm cm1 cm2 cm24)

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*****
Define FACTS for RECEIVER
SIGNAL PROCESSOR
*****

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(deffacts rx-sp-fact

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(codelru (code 21xcard PE) (unit DRU) (section SP) (position XA04)
  (image "/images/rx/sp/sp_rack.jpg") (cm cm1 cm2 cm24)
(codelru (code 22xcard AGC) (unit DRU) (section SP) (position XA04)
  (image "/images/rx/sp/sp_rack.jpg") (cm cm1 cm2 cm24)
(codelru (code 23xcard MO) (unit DRU) (section SP) (position XA05)
  (image "/images/rx/sp/sp_rack.jpg") (cm cm1 cm2 cm24)
(codelru (code 24xcard ME) (unit DRU) (section SP) (position XA06)
  (image "/images/rx/sp/sp_rack.jpg") (cm cm1 cm2 cm24)
(codelru (code 25xcard MI) (unit DRU) (section SP) (position XA07)
  (image "/images/rx/sp/sp_rack.jpg") (cm cm1 cm2 cm24)
(codelru (code 26xcard MI) (unit DRU) (section SP) (position XA08)
  (image "/images/rx/sp/sp_rack.jpg") (cm cm1 cm2 cm24)
(codelru (code 27xcard FA) (unit DRU) (section SP) (position XA09)
  (image "/images/rx/sp/sp_rack.jpg") (cm cm1 cm2 cm24 cm16)
(codelru (code 28xcard BA) (unit DRU) (section SP) (position XA10)
  (image "/images/rx/sp/sp_rack.jpg") (cm cm1 cm2 cm24)
(codelru (code 29xcard BE) (unit DRU) (section SP) (position XA11)
  (image "/images/rx/sp/sp_rack.jpg") (cm cm1 cm2 cm24)
(codelru (code 30xcard TI) (unit DRU) (section SP) (position XA12)
  (image "/images/rx/sp/sp_rack.jpg") (cm cm1 cm2 cm24)
(codelru (code 31xcard TE) (unit DRU) (section SP) (position XA13)
  (image "/images/rx/sp/sp_rack.jpg") (cm cm1 cm2 cm24)
(codelru (code 32xcard TA) (unit DRU) (section SP) (position XA14)
  (image "/images/rx/sp/sp_rack.jpg") (cm cm1 cm2 cm24)
(codelru (code 33xcard GI) (unit DRU) (section SP) (position XA18)
  (image "/images/rx/sp/sp_rack.jpg") (cm cm1 cm2 cm24)
(codelru (code 34xcard GA) (unit DRU) (section SP) (position XA19)
  (image "/images/rx/sp/sp_rack.jpg") (cm cm1 cm2 cm24)
(codelru (code 35xcard STC) (unit DRU) (section SP) (position XA20)
  (image "/images/rx/sp/sp_rack.jpg") (cm cm1 cm2 cm24 cm17)
(codelru (code 36xcard NI) (unit DRU) (section SP) (position XA21)
  (image "/images/rx/sp/sp_rack.jpg") (cm cm1 cm2 cm24)
(codelru (code 37xcard NE) (unit DRU) (section SP) (position XA22)
  (image "/images/rx/sp/sp_rack.jpg") (cm cm1 cm2 cm24 cm18)
(codelru (code 38xcard MU) (unit DRU) (section SP) (position XA24)
  (image "/images/rx/sp/sp_rack.jpg") (cm cm1 cm2 cm24)
(codelru (code 39xcard AID) (unit DRU) (section SP) (position XA25)
  (image "/images/rx/sp/sp_rack.jpg") (cm cm1 cm2 cm24)
(codelru (code 40xcard ICI) (unit DRU) (section SP) (position XA26)
  (image "/images/rx/sp/sp_rack.jpg") (cm cm1 cm2 cm24)
(codelru (code 41xcard ICI) (unit DRU) (section SP) (position XA27)
  (image "/images/rx/sp/sp_rack.jpg") (cm cm1 cm2 cm24)
(codelru (code 42xcard SLB) (unit DRU) (section SP) (position XA28)
  (image "/images/rx/sp/sp_rack.jpg") (cm cm1 cm2 cm24)
(codelru (code 43xcard CAFEE) (unit DRU) (section SP) (position XA29)
  (image "/images/rx/sp/sp_rack.jpg") (cm cm1 cm2 cm24)

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(codelru {code 4xcard CAFEE} (unit DRU) (section SP) (position XA30)
  (image "/images/rx/sp/sp_rack.jpg") (cm cm1 cm2 cm24))
(codelru {code 5xcard CAFEE} (unit DRU) (section SP) (position XA31)
  (image "/images/rx/sp/sp_rack.jpg") (cm cm1 cm2 cm24))
(codelru {code 6xcard FDM} (unit DRU) (section SP) (position XA32)
  (image "/images/rx/sp/sp_rack.jpg") (cm cm1 cm2 cm24))
(codelru {code 7xcard MA} (unit DRU) (section SP) (position XA33)
  (image "/images/rx/sp/sp_rack.jpg") (cm cm1 cm2 cm24))
(codelru {code 8xcard MA} (unit DRU) (section SP) (position XA36)
  (image "/images/rx/sp/sp_rack.jpg") (cm cm1 cm2 cm24))
(codelru {code 9xcard CO} (unit DRU) (section SP) (position XA35)
  (image "/images/rx/sp/sp_rack.jpg") (cm cm1 cm2 cm3 cm24))
(codelru {code 9xcard CO} (unit DRU) (section SP) (position XA40)
  (image "/images/rx/sp/sp_rack.jpg") (cm cm1 cm2 cm3 cm24))
)

*****
: Define FACTS for RECEIVER
: RF/IF
*****
(deffacts rx-rf-fact
(codelru {code 7xcard COHO} (unit "RF/IF") (section RF) (position "A3-A10,A3-A5")
  (image "/images/rx/rfif/fig512.jpg") (cm cm1 cm4 cm24 pm7))
(codelru {code 8xcard "OSC Group" unit "RF/IF"} (section RF) (position "A3-A5")
  (image "/images/rx/rfif/fig512.jpg") (cm cm1 cm5 cm24 pm8))
(codelru {code 9xcard "OSC Group" unit "RF/IF"} (section RF) (position "A3-A20")
  (image "/images/rx/rfif/fig512.jpg") (cm cm1 cm5 cm24 pm9))
(codelru {code 7xcard "x16 MUL" unit "RF/IF"} (section RF) (position "A3-A14")
  (image "/images/rx/rfif/fig512.jpg") (cm cm1 cm4 cm24))
(codelru {code 7xcard "x16 MUL" unit "RF/IF"} (section RF) (position "A3-A15")
  (image "/images/rx/rfif/fig512.jpg") (cm cm1 cm4 cm24))
(codelru {code 7xcard "MPA (STALO)" unit "RF/IF"} (section Exciter) (position "A3-A13")
  (image "/images/rx/rfif/fig512.jpg") (cm cm1 cm6 cm24))
(codelru {code 8xcard "MPA (STALO)" unit "RF/IF"} (section Exciter) (position "A3-A17")
  (image "/images/rx/rfif/fig512.jpg") (cm cm1 cm6 cm24))
(codelru {code 8xcard "64000MKz"} (unit "RF/IF") (section RF) (position "A3-A4,A3-A19")
  (image "/images/rx/rfif/fig512.jpg") (cm cm1 cm4 cm24 pm6))
(codelru {code 8xcard "64000MHz"} (unit "RF/IF") (section RF) (position "A3-A4,A3-A20")
  (image "/images/rx/rfif/fig512.jpg") (cm cm1 cm4 cm24 pm5))
(codelru {code 8xcard "MPA"} (unit "RF/IF") (section Exciter) (position "A3-A10,A3-A11")
  (image "/images/rx/rfif/fig512.jpg") (cm cm1 cm6 cm24 pm9))
(codelru {code 8xcard "HPA"} (unit "RF/IF") (section Exciter) (position "A3-A1,A3-A3")
  (image "/images/rx/rfif/fig512.jpg") (cm cm1 cm6 cm24 pm9))
(codelru {code 8xcard "LNA" unit "RFPG"} (section FER) (position "A3-A2")
  (image "/images/rx/rfif/fig511.jpg") (cm cm1 cm7 cm24 cm27))
(codelru {code 8xcard "LNA" unit "RFPG"} (section FER) (position "A3-A7")
  (image "/images/rx/rfif/fig511.jpg") (cm cm1 cm7 cm24 cm27))
(codelru {code 8xcard "LNA" unit "RFPG"} (section FER) (position "A3-A5")
  (image "/images/rx/rfif/fig511.jpg") (cm cm1 cm7 cm24 cm27))
(codelru {code 9xcard "SAW Expander"} (unit "RF/IF") (section RF) (position "A3-A12,A3-A11")
  (image "/images/rx/rfif/fig512.jpg") (cm cm1 cm4 cm24 pm11))
(codelru {code 9xcard "WG TR SW"} (unit "RFPG") (section FER) (position "SW")
  (image "/images/rx/rfif/fig511.jpg") (cm cm1 cm9 cm24 pm4))
(codelru {code 9xcard "SPDT SW"} (unit "RF/IF") (section RF) (position "A3-A7")
  (image "/images/rx/rfif/fig512.jpg") (cm cm1 cm6 cm24))
(codelru {code 10xcard "PIF-IF(MAIN)"} (unit "RF/IF") (section IF) (position "A3-A7")
  (image "/images/rx/rfif/fig512.jpg") (cm cm1 cm4 cm24 cm27))
(codelru {code 10xcard "PIF-IF(AUX)"} (unit "RF/IF") (section IF) (position "A3-A14")
  (image "/images/rx/rfif/fig512.jpg") (cm cm1 cm4 cm24 cm27))
(codelru {code 10xcard "PIF-IF(WEA)"} (unit "RF/IF") (section IF) (position "A3-A1")
  (image "/images/rx/rfif/fig512.jpg") (cm cm1 cm4 cm24 cm27))
(codelru {code 10xcard "SAW(MAIN)"} (unit "RF/IF") (section IF) (position "A3-A7")

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        (image "/images/rx/rfif/figs12.jpg") (cm cm1 cm4 cm24 cm27 pm10)
(codelru (code 106xcard "SAW(AUX)") (unit "RF/IF") (section IF) (position "A3-A17")
        (image "/images/rx/rfif/figs12.jpg") (cm cm1 cm4 cm24 cm27 pm10)
(codelru (code 107xcard "SAW(WEA)") (unit "RF/IF") (section IF) (position "A4-A7")
        (image "/images/rx/rfif/figs12.jpg") (cm cm1 cm4 cm24 cm27 pm10)
(codelru (code 110xcard "PHASE DET.(T.C.)") (unit "RF/IF") (section IF) (position "A3-A3")
        (image "/images/rx/rfif/figs12.jpg") (cm cm1 cm4 cm24 cm27)
(codelru (code 111xcard "PHASE DET.(T.C.)") (unit "RF/IF") (section IF) (position "A3-A18")
        (image "/images/rx/rfif/figs12.jpg") (cm cm1 cm4 cm24 cm27)
(codelru (code 114xcard "PHASE DET.(WEA)") (unit "RF/IF") (section IF) (position "A4-A7")
        (image "/images/rx/rfif/figs12.jpg") (cm cm1 cm4 cm24 cm27)
(codelru (code 115xcard "PHASE DET.(WEA)") (unit "RF/IF") (section IF) (position "A4-A7")
        (image "/images/rx/rfif/figs12.jpg") (cm cm1 cm4 cm24 cm27)
)

;*****
; Define FACTS for RECEIVER
; POWER SUPPLY
;*****
(defaults rx-ps-fact
(codelru (code 51xcard "P.S. +5V/+28V") (unit DRU-A) (section PS)
        (cm cm1 cm12 cm24)
(codelru (code 52xcard "P.S. +/- 5V,15V") (unit DRU-A) (section PS)
        (cm cm1 cm12 cm24)
(codelru (code 53xcard "P.S. +5V/+28V") (unit DRU-B) (section PS)
        (cm cm1 cm12 cm24)
(codelru (code 54xcard "P.S. +/- 5V,15V") (unit DRU-B) (section PS)
        (cm cm1 cm12 cm24)
(codelru (code 55xcard "Multi-Volt Power Supply") (unit RFPG) (section PS)
        (cm cm1 cm13 cm24)
(codelru (code 56xcard "Multi-Volt Power Supply") (unit RF-IF) (section PS)
        (cm cm1 cm14 cm24)
)

;*****
; Define FACTS for
; TEMPERATURE & FANS
;*****
(defaults rx-tf-fact
(codelru (code 58xcard "THERMO SWITCH") (unit DRU-A) (section TF) (cm cm19)
(codelru (code 59xcard "THERMO SWITCH") (unit DRU-B) (section TF) (cm cm19)
(codelru (code 60xcard "THERMO SWITCH") (unit RFPG) (section TF) (cm cm20)
(codelru (code 61xcard "THERMO SWITCH") (unit RFIF) (section TF) (cm cm21)
(codelru (code 62xcard "FAN CONTROL BITE") (unit RFPG) (section TF) (cm cm20)
(codelru (code 63xcard "FAN CONTROL BITE") (unit RFIF) (section TF) (cm cm21)
(codelru (code 64xcard "FAN CONTROL BITE") (unit DRU-A) (section TF) (cm cm19)
(codelru (code 65xcard "FAN CONTROL BITE") (unit DRU-B) (section TF) (cm cm19)
)

;*****
; Define FACTS for
; TRANSMITTER
;*****
(defaults tx-facts

;:Problem (MCA(Main Control Assy) Failure
        (node (name tx1)type decision) (question "On Local Control Panel:<br>
        Press MAIN Pushbutton to get the<br>
        Transmitter Maintenance Mode.<br>
        Is the System Operating?") (yes-node tx11)no-node tx12)
        (node (name tx1)type decision) (question "Probable Failure on a redundated
module:<br>
        Select the Setting Display Page and verify which is NOT<br>

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the Operating Channel.<br>
Replace the IONT Card and verify that the TX Control Panel WARNING
Alarm?")
  (yes-node tx11)(no-node tx12)
  (mode (name tx12)(type decision)(question "Proable Failure on the NOT
Redundated Card (MUX).<br>
Set MCA PWS Breaker to OFF.<br>
Replace the MUX Card and verify that the TX Control Panel WARNING
Alarm?")
  (yes-node tx11)(no-node tx12))
  (mode (name tx11)(type decision)(question "Replace the IONT Card and verify
that<br>
the TX Control Panel WARNING Alarm?") (yes-node tx11)(no-node tx12))
  (mode (name tx11)(type answer)(answer "The IONT card is Faulty."))
  (mode (name tx12)(type answer)(answer "The MUX card is Faulty."))
  (mode (name tx11)(type answer)(answer "Replace the PRU Card."))

;;Problem 2:Lack of RF Power Output
  (mode (name tx1)(type decision)(question "Disconnected Cable W289 from J1
Connector <br>
and by POWER METER verify the RF-Signal at the Applied Power <br>
(Maximum value is +31 dBm).<br>
POWER Level Correct?") (yes-node tx11)(no-node tx12))
  (mode (name tx11)(type decision)(question "Replace the TX-Control Panel.<br>
Does Alarm Exist?") (yes-node tx11)(no-node tx12))
  (mode (name tx11)(type decision)(question "By means of Power Meter verify
that each <br>
HPA Module is delivering the expected Power.<br>
(+31 dBm Nominal Level)<br>
Does Present Power?") (yes-node tx21)(no-node tx22))
  (mode (name tx21)(type answer)(answer "Replace the RF Combiner Module."))
  (mode (name tx22)(type answer)(answer "Inspect the RF Paths
between the RF Combiner and the RF Power Sensor."))
  (mode (name tx11)(type answer)(answer "The Tx-Control Panel is GOOD.<br>
But the MCA is Failure."))
  (mode (name tx11)(type answer)(answer "The Tx-Control Panel Failure."))

;;Problem 3:RF Driver Fault
  (mode (name tx1)(type decision)(question "Replace the RF Driver Module <br>
and Restore normal Operation by Performing the <br>
RF Driver Adjustment (Procedure CM23)<br>
Does the Alarm Exists?") (yes-node tx11)(no-node tx12))
  (mode (name tx11)(type decision)(question "The RF Module is not faulty.<br>
Switch the status of MUX Card.<br>
Does the Alarm Exists?") (yes-node tx31)(no-node tx32))
  (mode (name tx31)(type decision)(question "Replace the PRU Card.<br>
Does the Alarm still Exists?") (yes-node tx311)(no-node tx312))
  (mode (name tx311)(type answer)(answer "The RF Driver Module is Faulty."))
  (mode (name tx312)(type answer)(answer "The MUX Card is Faulty."))
  (mode (name tx311)(type answer)(answer "Replace the TX-Control Panel(Micro-
Terminal)."))
  (mode (name tx311)(type answer)(answer "The PRU Card is Faulty."))

;;Problem 4:Cannot switch on Local Control Panel
  (mode (name tx1)(type decision)(question "Remove P111 Connector from A4-LCP-
J1<br>
and by means of a Multimeter verify presence of 120Vac <br>
across Pins A and B.<br>
Is Power Present?") (yes-node tx41)(no-node tx42))
  (mode (name tx41)(type answer)(answer "Replace the Micro-Terminal"))
  (mode (name tx41)(type decision)(question "Connect mating connector P111 and
verify <br>
presence of 120Vac across Contacts A1,B1,C1 of the K1 Contractor<br>
located on the AC Distribution Panel.<br>

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mode (name rhp1xtype decision)(question "Check INPUT LINE STATUS TABLE
and <br>
OUTPUT LINE STATUS TABLE
on Console Terminal VT220<br>
Is LINE STATUS TABLE all ON?")(yes-node rhp1xno-node rhp12)
mode (name rhp1xtype decision)(question "On RCMS : The RADAR-LINE Status
is RED?")
(yes-node rhp11xno-node rhp12)
mode (name rhp1xtype decision)(question "Change RADAR-LINE to other
channel.<br>
On RCMS menu : select System/Select Radar Line then click apply.<br>
RADAR-LINE status change to GREEN?")(yes-node rhp1xno-node rhp12)
mode (name rhp1xtype decision)(question "Remove the DIA-Card Position ;
on DIA Basket.<br>
And Install it again.<br>
Do you see NUMBER of TRACK occur in the TABLE?")(yes-node rhp11xno-node
rhp12)
mode (name rhp1xtype decision)(question "Enter IST ON command for INPUT
LINE STATUS.<br>
or OST ON for OUTPUT LINE STATUS.<br>
Do you see NUMBER of TRACK occur in the TABLE?")(yes-node rhp12xno-node
rhp12)
mode (name rhp1xtype answer)(answer "The Problem is a signal Conflict
<br>
inside the DIA card.")
mode (name rhp12xtype answer)(answer "Check the Hardware of the
MULTIPLEXER Cabinet.")
;;Problem 2:Cannot Record Radar Data
mode (name rhp2xtype decision)(question "First,try to change the ROLE
STATUS of the node.<br>
Check RECORD STATUS by 'REC SHO REC' Command<br>
REC STATUS is ON?")(yes-node rhp2xno-node rhp22)
mode (name rhp2xtype answer)(answer "The problem is a bug in Application
Software.<br>
My Recommendation is you have to RESTART other Node now.")
mode (name rhp2xtype decision)(question "Shutdown both SERVER and Restart
Only One Server.<br>
REC STATUS is ON?")(yes-node rhp2xno-node rhp22)
mode (name rhp2xtype answer)(answer "Re-install Application
Software.<br>
(See Phitsanulok Radar Software Installation Manual.)")
;;Problem 3:Network Problem
mode (name rhp3xtype decision)(question "On Console Terminal: Enter
Command F14 <br>
to exit from OPERAMODE to DEBUG MODE.<br>
Perform 'ping' command follow by its own IP Address.<br>
Can you see a message Reply from IP-Address?")(yes-node rhp3xno-node
rhp32)
mode (name rhp3xtype decision)(question "Ping other IP-address inside
network.<br>
Can you see a message Replay from Destination IP address?")(yes-node
rhp3xno-node rhp32)
mode (name rhp3xtype answer)(answer "Change Network card.<br>
And Perform netsetup command ,
as explained in Software Installation Manual.")
mode (name rhp3xtype answer)(answer "Perform netsetup command ,
as explained in Software Installation Manual.")
mode (name rhp3xtype answer)(answer "The network is not Failure.<br>
My recommendation is you have to <br>
try to Restart the node again.")
;;Problem 4:Boot Problem

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mode (name rhp xtype decision) (question "Verify that your system
recognizes the boot device, <br>
using the SHOW DEVICE command on Console mode prompt (<<<<).<br>
Check that the boot device environment variable <br>
correctly identifies the boot device DKA<br>
Do you see the Boot Device DKA ?") (yes-node rhp xno-node rhp<
mode (name rhp xtype answer) (answer "Type 'b dka' follow by enter
key."))
mode (name rhp xtype answer) (answer "Replace Harddisk RZ:CC-KA."))
)
;*****
; Define FACTS for
; DISPLAY SYSTEM
;*****
(defacts display-facts

;;Problem 1:No Graphic representation on display monitor
mode (name display xtype decision) (question "Bring a Terminal VT<
connect to COM< of Workstation.<br>
Restart a Workstation.<br>
Do you see a system message on a Terminal?")
yes-node dis xno-node dis<
mode (name dis xtype answer) (answer "Wait about 3 minute.<br>
If you cannot see a LOGIN Window,<br> Replace a AGX<D-PD PCB with
spare one!."))
mode (name dis xtype answer) (answer "Change Harddisk RZ:CC-KA."))

;;Problem 2:No Moving Target on display monitor
mode (name display xtype decision) (question "Make sure that there is a
radar track
display in INPUT STATISTICAL TABLE (IST).<br>
Try to change a current DISSIMINATOR Node to other.<br>
(On RCMS Menu - click Configuration / Dissiminator Change)<br>
Is there a Target on Display Monitor?") (yes-node dis xno-node dis<
mode (name dis xtype answer) (answer "Restart the old Dissiminator
node."))
mode (name dis xtype answer) (answer "Check a OUTPUT STATISTICAL TABLE on
the Console Terminal of the Server."))

;;Problem 3:Slow graphic response
mode (name display xtype decision) (question "Shutdown and Restart the
Workstation.<br>
Wait untill Login Window occure, then login to the system.<br>
Is the Graphic still Slow?") (yes-node dis xno-node dis<
mode (name dis xtype answer) (answer "Defragmentation all domain file
system of the workstation<br>
as explained in Defragmentation Procedure."))
mode (name dis xtype answer) (answer "The problem is too much temporary
files.<br>
However, when you restart a system, temporary file has gone."))
)
;*****
; RULE SECTION
; FOR
; DECITION TREE
;*****
(defrule ask-decision-node-question
?node<- (current-node ?name)
mode (name ?name)
(type decision)
(question ?question))
not (answer ?)
->

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new EsQueryPanel ?question 1
  (create$ "YES" "(answer yes)"
    "NO" "(answer no)")
  (fetch "ReteControl"))
)

(defrule proceed-to-yes-branch
  ?node <- (current-node ?name)
  mode (name ?name)
  (type decision)
  (yes-node ?yes-branch))
  ?answer <- (answer yes)
  ->
  (retract ?node ?answer)
  (assert (current-node ?yes-branch))
)

(defrule proceed-to-no-branch
  ?node <- (current-node ?name)
  mode (name ?name)
  (type decision)
  (no-node ?no-branch))
  ?answer <- (answer no)
  ->
  (retract ?node ?answer)
  (assert (current-node ?no-branch))
)

(defrule proceed-to-answer-node
  ?node <- (current-node ?name)
  mode (name ?name) (type answer)
  (answer ?value))
  (not (answer ?))
  ->
  (new EsAnsPanel ?value
    (fetch "ReteControl"))
)

;*****
;          MAIN SECTION
;*****
(defrule first-query
  (initial-fact)
  ->
  (new EsMainPanel "What type of Problem?" s
    (create$
      "Antenna" "(equip antenna)"
      "Transmitter" "(equip tx)"
      "Receiver" "(equip rx)"
      "Radar Head Processing" "(equip rhp)"
      "Display System" "(equip display)")
    (fetch "ReteControl"))
  )

;*****
;          RULES SECTION
;          FOR
;          ANTENNA
;*****

(defrule equip-antenna
  (equip antenna)
  ->
  (new EsSelectPanel "Select problem?" s

```

```

(create$
  ~Encoder 1 Fault" "(lru 66)
  ~Encoder 2 Fault" "(lru 67)
  ~Azimuth motor driver unit fault" "(lru 68)
  ~Tilt assy fault" "(lru 69)
  ~Antena Oil level LOW alarm"
    (ant-oil-low-alarm)")
(fetch "ReteControl"))
)

(defrule lru-66-67
  (or (lru 66)(lru 67))
  ->
  (new EsQueryPanel "Open the PLD/AS Cabinet door and
    on the EDR with the fail LED lit<br>
    verify if at least one of the two LED em em is lit" :
    (create$
      ~OK" "(edr-fail-ok)"
      ~NOT OK" "(edr-fail-nok)"
      (fetch "ReteControl"))
  )

(defrule edr-fail-nok
  (edr-fail-nok)
  ->
  (new EsQueryPanel "How many encoder are installed?" :
    (create$
      ~One" "(one-encoder)"
      ~Two" "(two-encoder)")
    (fetch "ReteControl"))
  )

(defrule one-encoder
  (one-encoder)
  ->
  (new EsQueryPanel "Check presence of ACP1 and NRP1
    on TP J1-14 and J1-11 respectively" :
    (create$
      ~OK" "(edr-fail-ok)" ;; replace the card
      ~NOT OK" "(acp-nrp-nok)"
      (fetch "ReteControl"))
  )

(defrule two-encoder
  (two-encoder)
  ->
  (new EsQueryPanel "Check presence of ACP1,NRP1,ACP2 and NRP2
    on TP J1-14 J1-11 J1-10 and J1-13 respectively" :
    (create$
      ~OK" "(edr-fail-ok)" ;;replace the card
      ~NOT OK" "(acp-nrp-nok-two-cable)"
      (fetch "ReteControl"))
  )

(defrule acp-nrp-nok
  (acp-nrp-nok)
  ->
  (new EsQueryPanel "Install EDR on extender and
    check ACP and NRP on relavant pins" :
    (create$
      ~OK" "(edr-fail-ok)"
      ~NOT OK" "(no-signal)")
  )

```

```

    (fetch "ReteControl"))
)

(defrule acp-nrp-nok-two-cable
  (acp-nrp-nok-two-cable)
  =>
  (new EsQueryPanel "Install EDR on extender
    and check ACPD and NRPD on relavant pins" 1
    (create$
      -OK" "(edr-fail-ok)"
      -NOT OK" "(no-signal-two)")
    (fetch "ReteControl")))
)

(defrule no-signal-two
  (no-signal-two)
  =>
  (new EsQueryPanel "Inspect the cable between
    PLD/AS and Antenna" 1
    (create$
      -OK" "(cable-ok)"
      -NOT OK" "(cable-nok)")
    (fetch "ReteControl")))
)

(defrule lru-68
  (lru 68)
  =>
  (new EsQueryPanel "Press the RESTORE pushbutton
    on the RELAY-K1 <br> in the AMDU Unit<br>
    and then Restart the ANTENNA Rotation.<br>
    Does the ANTENNA Rotate?" 1
    (create$
      -YES" "(ant-rotate)"
      -NO" "(ant-not-rotate)")
    (fetch "ReteControl")))
)

(defrule lru-68-1
  (ant-rotate)
  =>
  (new EsAnsPanel "Restore the operative condition."
    (fetch "ReteControl")))
)

(defrule lru-68-0
  (ant-not-rotate)
  =>
  (new EsQueryPanel "Check the MOTOR current load compare
    this value with the used MOTOR.<br>
    Is it correct?" 1
    (create$ "YES" "(current-yes)"
      -NO" "(current-not)")
    (fetch "ReteControl")))
)

(defrule lru-68-11-0
  (current-not)
  =>
  (new EsAnsPanel "Replace the ANTENNA MOTOR."
    (fetch "ReteControl")))
)

```



```

(defrule lru-6811-11
  (current-yes)
  ->
  (new EsAnsPanel "Replace RELAY-Kr.
    (fetch "ReteControl")
  )

(defrule ant-oil-low-alarm
  (ant-oil-low-alarm)
  ->
  (new EsQueryPanel "Oil Level Failure LED lit on the ICP.<br>
    STOP the Antenna Rotation.<br>
    Activate the SAFETY Switch on the AMDU.<br>
    Then CHECK the Antenna Base OIL Level." :
    (create$ "OK" "(oil-ok)"
      "NOT OK" "(oil-nok)")
    (fetch "ReteControl"))
  )

(defrule ant-base-oil-nok
  (oil-nok)
  ->
  (new EsAnsPanel "Fill oil up to the correct level and verify<br>
    alarm is extinguished<br>
    Restore the Operative Condition"
    (fetch "ReteControl"))
  )

(defrule ant-base-oil-ok
  (oil-ok)
  ->
  (new EsQueryPanel "Verify if the Connector on
    the antenna base is well tyied.<br>
    Is the alarm still present?" :
    (create$ "YES" "(still-alarm)"
      "NO" "(alarm-gone)")
    (fetch "ReteControl"))
  )

(defrule alarm-gone
  (alarm-gone)
  ->
  (new EsAnsPanel "Restore the Operative Condition"
    (fetch "ReteControl"))
  )

(defrule still-alarm
  (still-alarm)
  ->
  (new EsQueryPanel "Disconnect the cable
    and verify by mean of an OHMMETER<br>
    that the oil level Switch contact are open" :
    (create$ "OK" "(contact-ok)"
      "NOT OK" "(contact-nok)")
    (fetch "ReteControl"))
  )

(defrule contact-ok
  (contact-ok)
  ->
  (new EsAnsPanel "Replace the PAC PCB. ၁၅၀၅-၂၁ <br>
    Position XA-၀ of the ASC Basket.<br>

```

```

        <p>Restore the Operative Condition."
        (fetch "ReteControl"))
    }

(defrule contact-nok
  (contact-nok)
  ->
  (new EsAnsPanel "Replace the Level Switch.<br>
    <br>Restore the Operative Condition."
    (fetch "ReteControl"))
)

;*****
;          RULES SECTION
;          FOR
;          TRANSMITTER-TX
;*****

(defrule equip-tx
  (equip tx)
  ->
  (new EsSelectPanel "Select problem?" s
  (create$
    "MCA (Main Control Assy) Failure" "(current-node tx)"
    "Lack of RF Power Output" "(current-node tx)"
    "RF Driver fault" "(current-node tx)"
    "Final & Driver Low Output Power Alarm" "(current-node tx)"
    "Cannot Switch On the Transmitter!" "(current-node tx)"
    "Cannot Switch On TX-Control Panel" "(current-node tx)"
  (fetch "ReteControl"))
)

;*****
;          RULES SECTION
;          FOR
;          RECEIVER-RX
;*****

(defrule equip-rx
  (equip rx)
  ->
  (new EsSelectPanel "Select sub-problem for Receiver?" s
  (create$
    "Data Processor" "(sect dp)"
    "Signal Processor" "(sect sp)"
    "RF/IF" "(sect rf)"
    "Power Supply" "(sect ps)"
    "Temperature and Fan" "(sect tf)"
  )
  (fetch "ReteControl")
)

)

(defrule sub-rx-dp
  (sect dp)
  ->
  (new EsSelectPanel "Select LRU code" 19
  (create$
    "1:XA05 MPU board fault" "(lru 1)"
    "2:XA07 PRM board fault" "(lru 2)"
    "3:XA06 ASU board fault" "(lru 3)"
    "4:XA04 DPM board fault" "(lru 4)"
    "5:XA08 MNI board fault" "(lru 5)"
  )
  (fetch "ReteControl")
)

```

```

6.XA9 IMF board fault" "(lru 6)"
7.XA10 PTG board fault" "(lru 7)"
8.XA11 NTMG board fault" "(lru 8)"
9.XA12 PECO board fault" "(lru 9)"
10.CBIM board fault" "(lru 10)"
11.XA14 RX INT board fault" "(lru 11)"
12.XA16 MI0 board fault" "(lru 12)"
13.XA17 MI2 board fault" "(lru 13)"
14.XA13 DTI board fault" "(lru 14)"
15.XA11 AFS board fault" "(lru 15)"
16.XA19 EDR board fault" "(lru 16)"
17.XA03 MPU2 board fault" "(lru 17)"
18.XA01 PRM2 board fault" "(lru 18)"
19.XA02 ASU2 board fault" "(lru 19)"
20.Other data processor fault" "(lru 20)"
(fetch "ReteControl")
}

(defrule sub-rx-sp
  (sect sp)
  ->
  new EsSelectPanel "Select fault" 30
  (create$
    21.XA01 PE board fault" "(lru 21)"
    22.XA04 AGC board fault" "(lru 22)"
    23.XA05 MO board fault" "(lru 23)"
    24.XA06 ME board fault" "(lru 24)"
    25.XA07 MI EVEN board fault" "(lru 25)"
    26.XA08 MI ODD board fault" "(lru 26)"
    27.XA09 FA board fault" "(lru 27)"
    28.XA10 BA board fault" "(lru 28)"
    29.XA11 BE board fault" "(lru 29)"
    30.XA12 TI board fault" "(lru 30)"
    31.XA13 TE board fault" "(lru 31)"
    32.XA14 TA board fault" "(lru 32)"
    33.XA18 GI board fault" "(lru 33)"
    34.XA19 GA board fault" "(lru 34)"
    35.XA20 STC board fault" "(lru 35)"
    36.XA21 NI board fault" "(lru 36)"
    37.XA22 NE board fault" "(lru 37)"
    38.XA24 MU board fault" "(lru 38)"
    39.XA25 AID board fault" "(lru 39)"
    40.XA26 ICI EVEN board fault" "(lru 40)"
    41.XA27 ICI ODD board fault" "(lru 41)"
    42.XA28 SLB board fault" "(lru 42)"
    43.XA29 CAPFE WEA board fault" "(lru 43)"
    44.XA30 CAPFE EVEN board fault" "(lru 44)"
    45.XA31 CAPFE ODD board fault" "(lru 45)"
    46.XA32 FDM board fault" "(lru 46)"
    47.XA35 MA Weather board fault" "(lru 47)"
    48.XA36 MA Target board fault" "(lru 48)"
    49.XA39 A/D converter Weather channel" "(lru 49)"
    50.XA40 A/D converter Target channel" "(lru 50)"
    (fetch "ReteControl"))
}

(defrule sub-rx-rf
  (sect rf)
  ->
  new EsSelectPanel "Select fault" 30
  (create$

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```

*10:CBIM board fault" "(lru 107"
*11:COHO fault" "(lru 108"
*12:Oscillator group 1 fault" "(lru 109"
*13:Oscillator group 2 fault" "(lru 110"
*14:X16 multiplier 1 fault" "(lru 111"
*15:X16 multiplier 2 fault" "(lru 112"
*16:STALO medium power amplifier 1 fault" "(lru 113"
*17:STALO medium power amplifier 2 fault" "(lru 114"
*18:670 MHz generator fault" "(lru 115"
*19:640 MHz generator fault" "(lru 116"
*20:Medium power driver amplifier fault" "(lru 117"
*21:High power driver amplifier fault" "(lru 118"
*22:LNA failure front end receiver MAIN" "(lru 119"
;
*23:TR failure front end receiver MAIN" "(lru 120"
*24:LNA failure front end receiver AUX" "(lru 121"
;
*25:TR failure front end receiver AUX" "(lru 122"
*26:LNA failure front end receiver Weather" "(lru 123"
;
*27:TR failure front end receiver Weather" "(lru 124"
*28:SAW Expander fault" "(lru 125"
*29:Waveguide Transfer switch fault" "(lru 126"
*30:SPDT Switch fault" "(lru 127"
;
*31:Test target generator fault" "(lru 128"
*32:IF receiver MAIN" "(lru 129"
*33:IF receiver AUX" "(lru 130"
*34:IF receiver WEATHER" "(lru 131"
*35:SAW Compressor MAIN" "(lru 132"
*36:SAW Compressor AUX" "(lru 133"
*37:SAW Compressor WEATHER" "(lru 134"
*38:Phase detector target channel-A fault" "(lru 135"
*39:Phase detector target channel-B fault" "(lru 136"
*40:Phase detector weather channel-A fault" "(lru 137"
*41:Phase detector weather channel-B fault" "(lru 138"
(fetch "ReteControl")
)

(defrule sub-rx-ps
(sect ps)
->
new EsSelectPanel "Select fault" #
(create$
*51:Linear power supply REC-A fault" "(lru 139"
*52:Switching power supply REC-A fault" "(lru 140"
*53:Linear power supply REC-B fault" "(lru 141"
*54:Switching power supply REC-B fault" "(lru 142"
*55:Power supply RF Plumbing fault" "(lru 143"
*56:Power supply RF/IF fault" "(lru 144"
(fetch "ReteControl"))
)

(defrule sub-rx-tf
(sect tf)
->
new EsSelectPanel "Select fault" #
(create$
*58:High temperature on DRU-A cabinet" "(lru 145"
*59:High temperature on DRU-B cabinet" "(lru 146"
*60:FAN fault on RFPG cabinet" "(lru 147"
*61:FAN fault on RF/IF cabinet" "(lru 148"
*62:FAN fault on DRU-A cabinet" "(lru 149"
*63:FAN fault on DRU-B cabinet" "(lru 150"
*64:High temperature on RFPG cabinet" "(lru 151"

```

```

High temperature on RF/IF cabinet" "(lru ?lru)
(fetch "ReteControl"))
)

;*****
;          RULES SECTION
;          FOR
;          RX/TEMPERATURE & FANS
;*****
(defrule ex
  (lru ?lru)
  (code?lru (code ?lru) (card ?card) (section TF) (unit ?unit))
->
  (new EsAnsPanel "TEST!"
    (new EsQueryPanel (str-cat "Open the " ?unit " Cabinet.<br>"
      "Check the LED indication on the LED Control Bite Assy.<br><br>"
      "Is there a FAULT indication?") :
      (create$ "YES" "(fault-led-yes)"
        "NO" "(fault-led-no)")
      (fetch "ReteControl"))
  )
)

(defrule rx-tf-temp-01
  (lru ?lru)
  (code?lru (code ?lru) (card ?card) (section TF) (unit ?unit))
  (fault-led-no)
->
  (new EsQueryPanel (str-cat "Switch of the ATCR-33S Receiver as explained
in <a href=\"/procedure/corrective/cm1.html\"> Procedure CM1.</a><br>"
  "Replace the " ?card " as explained in <a
href=\"/procedure/corrective/cm2.html\"> Procedure CM2.</a><br>"
  "Switch on the ATCR-33S Receiver as explained in <a
href=\"/procedure/corrective/cm3.html\"> Procedure CM3.</a><br>"
  "Then reset the BITE alarm (Press RESET pushbutton on the LCP menu<br>
(PSR FAULT / MONITOR / TEMP&FANS / DIAGNOSIS / RESET) <br><br>"
  "Is the Diagnosis still present?") :
  (create$ "YES" "(fault-led-no-still)"
    "NO" "(fault-led-no-gone)")
  (fetch "ReteControl"))
)

(defrule rx-tf-temp-02
  (lru ?lru)
  (code?lru (code ?lru) (card ?card) (section TF) (unit ?unit) (cm ?cm))
  (fault-led-yes)
->
  (new EsQueryPanel (str-cat "Switch of the ATCR-33S Receiver as explained
in <a href=\"/procedure/corrective/cm1.html\"> Procedure CM1.</a><br>"
  "Replace the BLOWER fault as explained in <a
href=\"/procedure/corrective/\" ?cm ".html"> Procedure " (upcase ?cm) "</a><br>"
  "Switch on the ATCR-33S Receiver as explained in <a
href=\"/procedure/corrective/cm2.html\"> Procedure CM2.</a><br>"
  "Then reset the BITE alarm (Press RESET pushbutton on the LCP menu<br>
(PSR FAULT / MONITOR / TEMP&FANS / DIAGNOSIS / RESET) <br><br>"
  "Is the Diagnosis still present?") :
  (create$ "YES" "(fault-led-no)"
    "NO" "(fault-led-no-gone)")
  (fetch "ReteControl"))
)

;*****
;          RULES SECTION

```

```

;          FOR
;          RADAR HEAD PROCESSING-RHP
;          *****

(defrule equip-rhp
  (equip rhp)
  ->
  (new EsSelectPanel "Select Fault" &
   (create$
    "No MOVING TARGET on Console Terminal" "(current-node rhp)"
    "Can not RECORD Radar Data" "(current-node rhp)"
    "Network Problem" "(current-node rhp)"
    "Boot Problem" "(current-node rhp)"
    (fetch "ReteControl")))
  )

;          *****
;          RULES SECTION
;          FOR
;          DISPLAY SUB-SYSTEM
;          *****

(defrule equip-display
  (equip display)
  ->
  (new EsSelectPanel "Select Fault" &
   (create$
    "No graphic presentation on Display Monitor" "(current-node display)"
    "No Moving Target on Display Monitor" "(current-node display)"
    "Slow Graphic Response" "(current-node display)"
    (fetch "ReteControl")))
  )

;          -----
;          ANTENNA SECTION
;          Final
;          -----

(defrule edr-fail-ok
  (edr-fail-ok)
  ->
  (new EsAnsPanel "Replace the concerned EDR pcb."
   (fetch "ReteControl"))
  )

(defrule no-signal
  (no-signal)
  ->
  (new EsAnsPanel "Replace the ENCODER and
   then perform NORTH alignment."
   (fetch "ReteControl"))
  )

(defrule cable-ok
  (cable-ok)
  ->
  (new EsAnsPanel "Replace the ENCODER and
   then perform NORTH alignment."
   (fetch "ReteControl"))
  )

(defrule cable-nok
  (cable-nok)

```

```

->
new EsAnsPanel "Refix the correct operation of the cable,"
  (fetch "ReteControl"))
)

(defrule lru-69-final
  (lru 69)
  ->
  (new EsAnsPanel "See G-15 Antenna Manual,"
    (fetch "ReteControl")))
)
;-----
;          RECEIVER
;DATA PROCESSOR - Final
;
;-----
(defrule dp-cm1-24
  (lru ?lru)
  (code?lru (code ?lru) (card ?card) (unit ?unit) (section DP)
    (position ?position) (image ?image) (cm cm1 cm2 cm3))
  ->
  (new EsAnsPanel (str-cat "Involve Hardware : " ?card "<br>"
    "Unit : " ?unit "<br>"
    "Section : Data Processor<br>"
    "Position : <a href=" ?image ">" ?position "</a><br>"
    "Switch off the ATCR-15 DRU cabinet as explained in
      <a href=""/procedures/corrective/cm1.html">Procedure CM1</a><br>"
    "Replace " ?card " PCB as explained in
      <a href=""/procedures/corrective/cm2.html">Procedure CM2</a><br>"
    "Switch on the ATCR-15 DRU cabinet as explained in
      <a href=""/procedures/corrective/cm3.html">Procedure CM3</a><br>"
    "Restore the operative condition.<br>")
    (fetch "ReteControl")))
)
;-----
;          RECEIVER
;SIGNAL PROCESSOR - Final
;
;-----
(defrule sp-cm1-24
  (lru ?lru)
  (code?lru (code ?lru) (card ?card) (unit ?unit) (section SP)
    (position ?position) (image ?image) (cm cm1 cm2 cm3))
  ->
  (new EsAnsPanel (str-cat "Involve Hardware : " ?card "<br>"
    "Unit : " ?unit "<br>"
    "Section : Signal Processor<br>"
    "Position : <a href=" ?image ">" ?position "</a><br>"
    "Switch off the ATCR-15 DRU cabinet as explained in
      <a href=""/procedures/corrective/cm1.html">Procedure CM1</a><br>"
    "Replace " ?card " PCB as explained in
      <a href=""/procedures/corrective/cm2.html">Procedure CM2</a><br>"
    "Switch on the ATCR-15 DRU cabinet as explained in
      <a href=""/procedures/corrective/cm3.html">Procedure CM3</a><br>"
    "Restore the operative condition.<br>" )
    (fetch "ReteControl")))
)
)

(defrule sp-cm1-24-xx
  (lru ?lru)

```

```

(codelru (code ?lru) (card ?card) (unit ?unit) (section SP)
  position ?position) (image ?image) (cm cm1 cm2 cm3 ?xx))
->
new EsAnsPanel (str-cat "Involve Hardware : " ?card "<br>"
  "Unit : " ?unit "<br>"
  "Section : Signal Processor<br>"
  "Position : <a href=" ?image ">" ?position "</a><br>"
  "Switch off the ATCR-NS DRU cabinet as explained in
  <a href="/procedures/corrective/cm1.html">Procedure CM1</a><br>"
  "Replace " ?card " PCB as explained in
  <a href="/procedures/corrective/cm2.html">Procedure CM2</a><br>"
  "Switch on the ATCR-NS DRU cabinet as explained in
  <a href="/procedures/corrective/cm3.html">Procedure CM3</a><br>"
  "Perform <a href="/procedures/corrective/" ?xx ".html">
  Procedure " (upcase ?xx) "</a><br>"
  "Restore the operative condition.<br>" )
  (fetch "ReteControl"))
)

(defrule sp-cm1-xx-24
  (lru ?lru)
  (codelru (code ?lru) (card ?card) (unit ?unit) (section SP)
    position ?position) (image ?image) (cm cm1 cm2 ?xx cm24))
->
new EsAnsPanel (str-cat "Involve Hardware : " ?card "<br>"
  "Unit : " ?unit "<br>"
  "Section : Signal Processor<br>"
  "Position : <a href=" ?image ">" ?position "</a><br>"
  "Switch off the ATCR-NS DRU cabinet as explained in
  <a href="/procedures/corrective/cm1.html">Procedure CM1</a><br>"
  "Replace " ?card " PCB as explained in
  <a href="/procedures/corrective/cm2.html">Procedure CM2</a><br>"
  "Set A/D converter as shown in
  <a href="/procedures/corrective/" ?xx ".html">
  Procedure " (upcase ?xx) "</a><br>"
  "Switch on the ATCR-NS DRU cabinet as explained in
  <a href="/procedures/corrective/cm3.html">Procedure CM3</a><br>"
  "Restore the operative condition.<br>" )
  (fetch "ReteControl"))
)

;-----
; RECEIVER
; RF/IP - Final
;
;-----
(defrule rf-cm1-xx-24
  (lru ?lru)
  (codelru (code ?lru) (card ?card) (unit ?unit) (section RF)
    position ?position) (image ?image) (cm cm1 ?xx cm24))
->
new EsAnsPanel (str-cat "Involve Hardware : " ?card "<br>"
  "Unit : " ?unit "<br>"
  "Section : RF<br>"
  "Position : <a href=" ?image ">" ?position "</a><br>"
  "Switch off the ATCR-NS DRU cabinet as explained in
  <a href="/procedures/corrective/cm1.html">Procedure CM1</a><br>"
  "Replace " ?card " strip as explained in
  <a href="/procedures/corrective/" ?xx ".html">
  Procedure " (upcase ?xx) "</a><br>"
  "Switch on the ATCR-NS DRU cabinet as explained in
  <a href="/procedures/corrective/cm2.html">Procedure CM2</a><br>"
  "Restore the operative condition.<br>" )
)

```



```

(fetch "ReteControl"))
)

(defrule rf-cm-xx-2-xx-01
  (lru ?lru)
  (codelru (code ?lru) (card ?card) (unit ?unit) (section RF)
            (position ?position) (image ?image) (cm cm1 ?cm cm2 ?pm))
  ->
  (new EsAnsPanel (str-cat "Involve Hardware : " ?card "<br>"
    "Unit : " ?unit "<br>"
    "Section : RF<br>"
    "Position : <a href=" ?image ">" ?position "</a><br>"
    "Switch off the ATCR-NS DRU cabinet as explained in
      <a href="/procedures/corrective/cm1.html">Procedure CM1</a><br>"
    "Replace " ?card " strip as explained in
      <a href="/procedures/corrective/" ?cm ".html">
        Procedure " (upcase ?cm) "</a><br>"
    "Perform <a href="/procedures/corrective/" ?pm ".html">
        Procedure " (upcase ?pm) "</a><br>"
    "Switch on the ATCR-NS DRU cabinet as explained in
      <a href="/procedures/corrective/cm2.html">Procedure CM2</a><br>"
    "Restore the operative condition.<br>" )
    (fetch "ReteControl"))
)

(defrule rf-cm-xx-2-xx-02
  (lru ?lru)
  (codelru (code ?lru) (card ?card) (unit ?unit) (section FER)
            (position ?position) (image ?image) (cm cm1 ?cm cm2 ?pm))
  ->
  (new EsAnsPanel (str-cat "Involve Hardware : " ?card "<br>"
    "Unit : " ?unit "<br>"
    "Section : Front-end Receiver<br>"
    "Position : <a href=" ?image ">" ?position "</a><br>"
    "Switch off the ATCR-NS DRU cabinet as explained in
      <a href="/procedures/corrective/cm1.html">Procedure CM1</a><br>"
    "Replace " ?card " strip as explained in
      <a href="/procedures/corrective/" ?cm ".html">
        Procedure " (upcase ?cm) "</a><br>"
    "Perform <a href="/procedures/corrective/" ?pm ".html">
        Procedure " (upcase ?pm) "</a><br>"
    "Switch on the ATCR-NS DRU cabinet as explained in
      <a href="/procedures/corrective/cm2.html">Procedure CM2</a><br>"
    "Restore the operative condition.<br>" )
    (fetch "ReteControl"))
)

(defrule rf-cm-xx-2-xx-03
  (lru ?lru)
  (codelru (code ?lru) (card ?card) (unit ?unit) (section Exciter)
            (position ?position) (image ?image) (cm cm1 ?cm cm2 ?pm))
  ->
  (new EsAnsPanel (str-cat "Involve Hardware : " ?card "<br>"
    "Unit : " ?unit "<br>"
    "Section : Exciter<br>"
    "Position : <a href=" ?image ">" ?position "</a><br>"
    "Switch off the ATCR-NS DRU cabinet as explained in
      <a href="/procedures/corrective/cm1.html">Procedure CM1</a><br>"
    "Replace " ?card " strip as explained in
      <a href="/procedures/corrective/" ?cm ".html">
        Procedure " (upcase ?cm) "</a><br>"
    "Perform <a href="/procedures/corrective/" ?pm ".html">
        Procedure " (upcase ?pm) "</a><br>"

```

```

*Switch on the ATCR-NS DRU cabinet as explained in
  <a href="/procedures/corrective/cm1.html">Procedure CM1</a><br>"
*Restore the operative condition.<br>" )
  (fetch "ReteControl"))
)

(defrule rf-cm1-cm4-24-cm27)
(lru ?lru)
(codelru (code ?lru) (card ?card) (unit ?unit) (section IF)
  (position ?position) (image ?image) (cm cm1 cm4 cm24 cm27))
->
(new EsAnsPanel (str-cat "Involve Hardware : " ?card "<br>"
  "Unit : " ?unit "<br>"
  "Section : IF<br>"
  "Position : <a href=?image "> ?position "</a><br>"
  "Switch off the ATCR-NS DRU cabinet as explained in
    <a href="/procedures/corrective/cm1.html">Procedure CM1</a><br>"
  "Replace " ?card " strip as explained in
    <a href="/procedures/corrective/cm4.html">
    Procedure CM4</a>.<br>"
  "Switch on the ATCR-NS DRU cabinet as explained in
    <a href="/procedures/corrective/cm24.html">Procedure CM24</a><br>"
  "Perform <a href="/procedure/corrective/cm27.html">Procedure CM27 </a><br>"
  "Restore the operative condition.<br>" )
  (fetch "ReteControl"))
)

(defrule rf-cm1-cm4-cm24-cm27-pm10)
(lru ?lru)
(codelru (code ?lru) (card ?card) (unit ?unit) (section IF)
  (position ?position) (image ?image) (cm cm1 cm4 cm24 cm27 pm10))
->
(new EsAnsPanel (str-cat "Involve Hardware : " ?card "<br>"
  "Unit : " ?unit "<br>"
  "Section : IF<br>"
  "Position : <a href=?image "> ?position "</a><br>"
  "Switch off the ATCR-NS DRU cabinet as explained in
    <a href="/procedures/corrective/cm1.html">Procedure CM1</a><br>"
  "Replace " ?card " strip as explained in
    <a href="/procedures/corrective/cm4.html">
    Procedure CM4</a>.<br>"
  "Switch on the ATCR-NS DRU cabinet as explained in
    <a href="/procedures/corrective/cm24.html">Procedure CM24</a><br>"
  "Perform <a href="/procedure/corrective/cm27.html">Procedure CM27 </a> and
    <a href="/procedure/preventive/pm10.html">Procedure PM10 </a><br>"
  "Restore the operative condition.<br>" )
  (fetch "ReteControl"))
)

;-----
; RECEIVER
; POWER SUPPLY - Final
;
;-----

(defrule ps-cm1-xx-24)
(lru ?lru)
(codelru (code ?lru) (card ?card) (unit ?unit) (section PS) (cm cm1 ?xx cm24))
->
(new EsAnsPanel (str-cat "Involve Hardware : " ?card "<br>"
  "Unit : " ?unit "<br>"
  "Switch off the ATCR-NS DRU cabinet as explained in
    <a href="/procedures/corrective/cm1.html">Procedure CM1</a><br>"
  "Replace " ?card " as explained in

```

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      <a href="/procedures/corrective/" ?xx ".html">Procedure" (upcase ?xx)
    "</a><br>"
    -Switch on the ATCR-115 DRU cabinet as explained in
      <a href="/procedures/corrective/cm.html">Procedure CM</a><br>"
    -Restore the operative condition.<br>" )
    (fetch "ReteControl"))
  }

;-----
; RECEIVER
; TEMPERATURE & FANS - Final
;-----
(defrule rx-tf-temp-final)
  (fault-led-no-gone)
  ->
  (new EsAnsPanel "Restore the Operative Condition"
    (fetch "ReteControl"))
)

(defrule rx-tf-temp-final)
  (fault-led-no-still)
  ->
  (new EsAnsPanel (str-cat "Check the Interconnection.<br><br>"
    -Restore the Operative Condition")
    (fetch "ReteControl"))
)

```

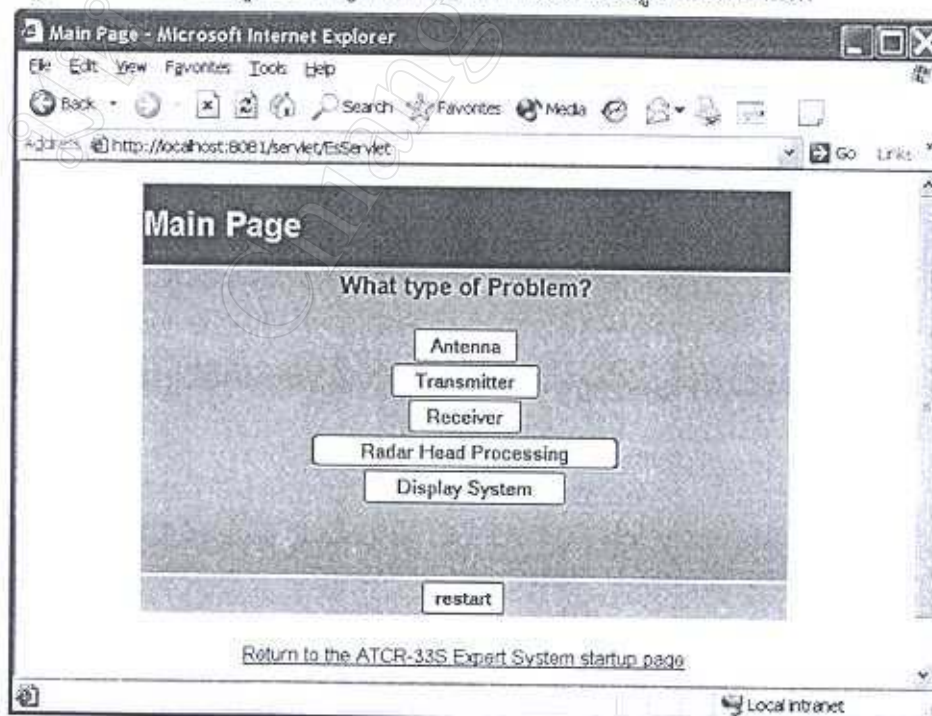
ภาคผนวก ก

ตัวอย่างการใช้งานระบบผู้เชี่ยวชาญ

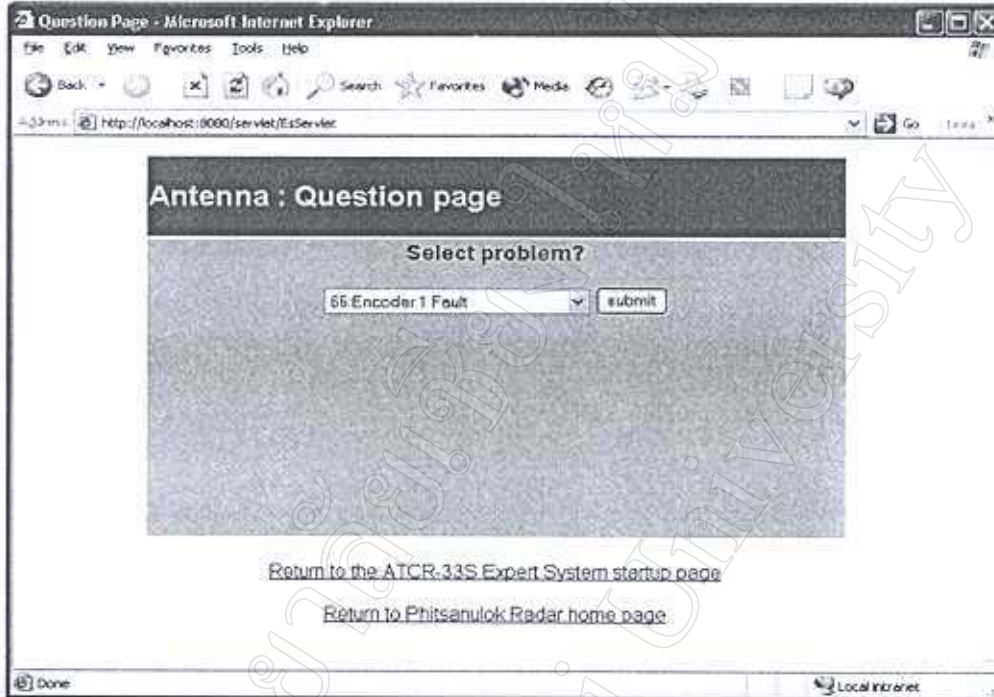
ตัวอย่างต่อไปนี้เป็นการใช้งานระบบผู้เชี่ยวชาญ ในการแก้ไขปัญหาข้อขัดข้องของระบบสายอากาศ ซึ่งใช้ทดสอบการทำงานจริงของระบบผู้เชี่ยวชาญ ที่ได้ทำการพัฒนาขึ้นในหัวข้อการค้นคว้าแบบอิสระนี้ ขั้นตอนการทำงานจะเริ่มจากการที่ผู้ใช้งานพบว่ามีสัญญาณแจ้งข้อขัดข้องที่จอกควบคุมการทำงานของระบบเรดาร์ ในส่วนของระบบสายอากาศ โดยมีรหัสของการแจ้งข้อขัดข้อง คือหมายเลข 66 ซึ่งมีความหมายว่า "Encoder 1 Fault"

ในขั้นตอนต่อไป ผู้ปฏิบัติงานจะต้องนำรหัสแจ้งข้อขัดข้องนี้ ไปขอคำแนะนำจากระบบผู้เชี่ยวชาญ โดยมีวิธีการ ดังนี้

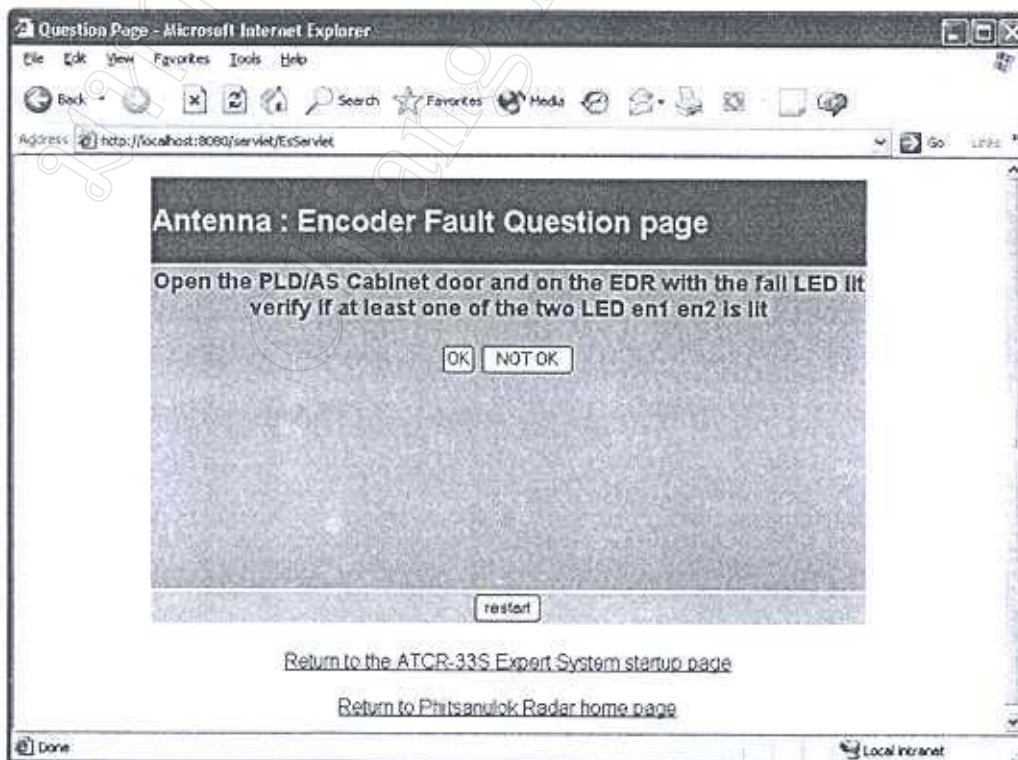
1. เข้าสู่การใช้งานระบบผู้เชี่ยวชาญ จากคอมพิวเตอร์ที่ต่ออยู่กับอินเทอร์เน็ต



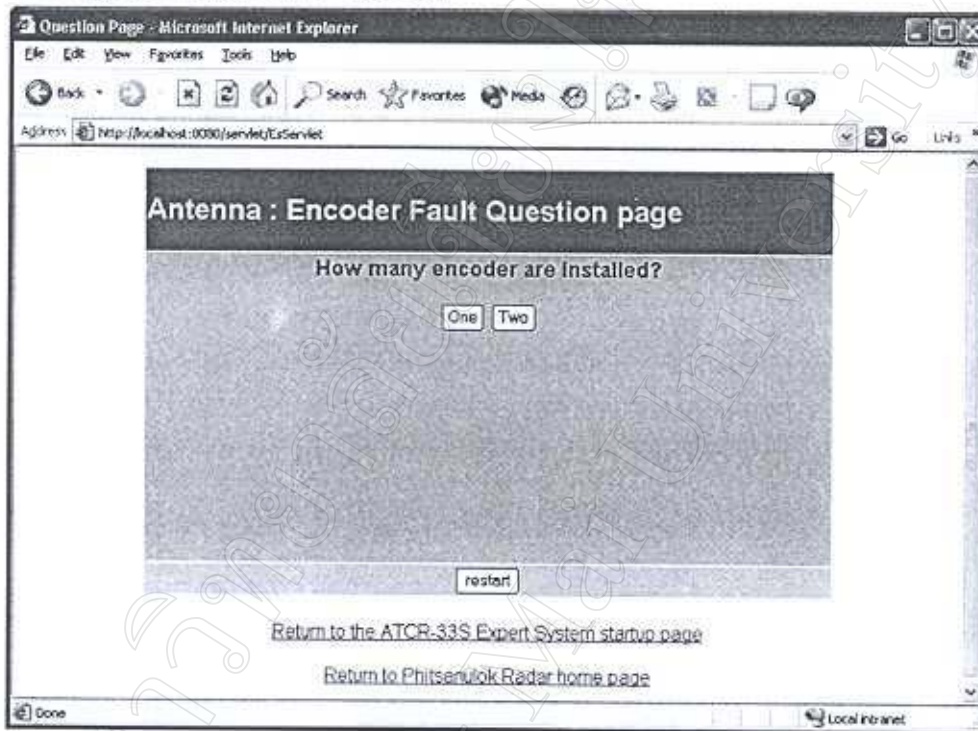
2. ผู้ปฏิบัติงานกดเลือกชนิดของปัญหาที่ระบบสายอากาศ (Antenna)



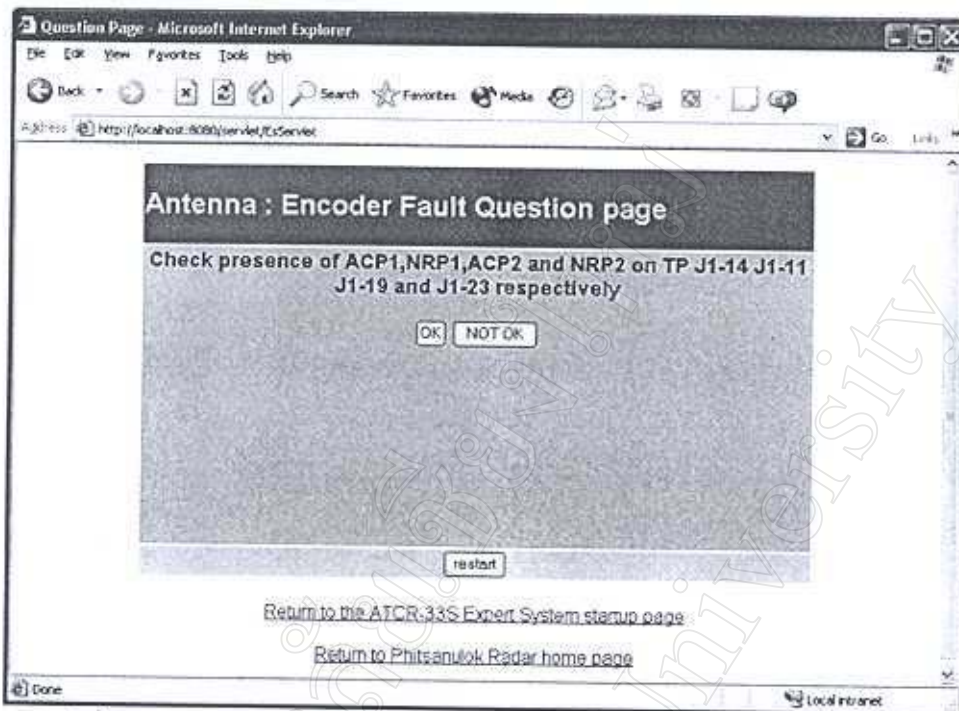
3. เลือกปัญหาที่พบ ในที่นี้ให้เลือกรหัสการแจ้งข้อขัดข้องของ 66 จากนั้น กด submit



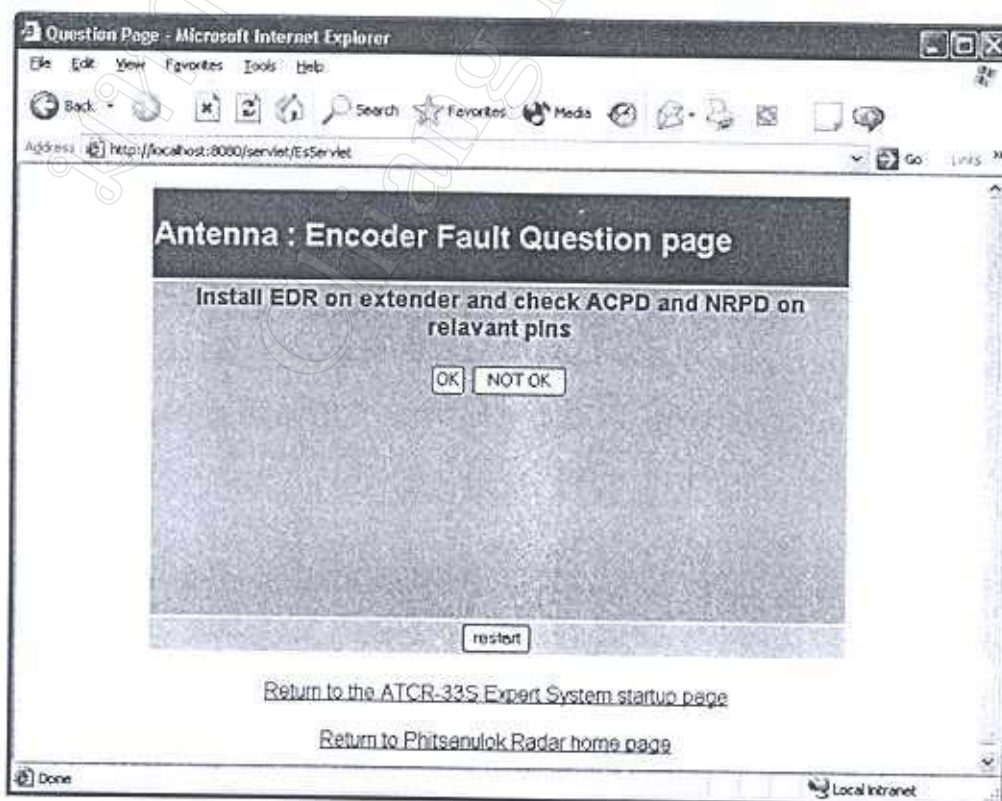
4. ระบบผู้เชี่ยวชาญฯ จะให้ผู้ใช้งานไปตรวจสอบที่อุปกรณ์ในส่วนของระบบสายอากาศ ในตู้ AMDU (Antenna Motor Distributor Unit) และถามคำถามว่า มี LED อย่างน้อยหนึ่งดวงสว่างขึ้นที่ตำแหน่ง EN1 หรือ EN2 ใช่หรือไม่
5. ผู้ปฏิบัติงานตรวจสอบตามคำแนะนำ พบว่ามี LED สว่างขึ้นเพียงหนึ่งดวงที่ตำแหน่ง EN1 ดังนั้น ผู้ปฏิบัติงานต้องกดที่ "NOT OK"



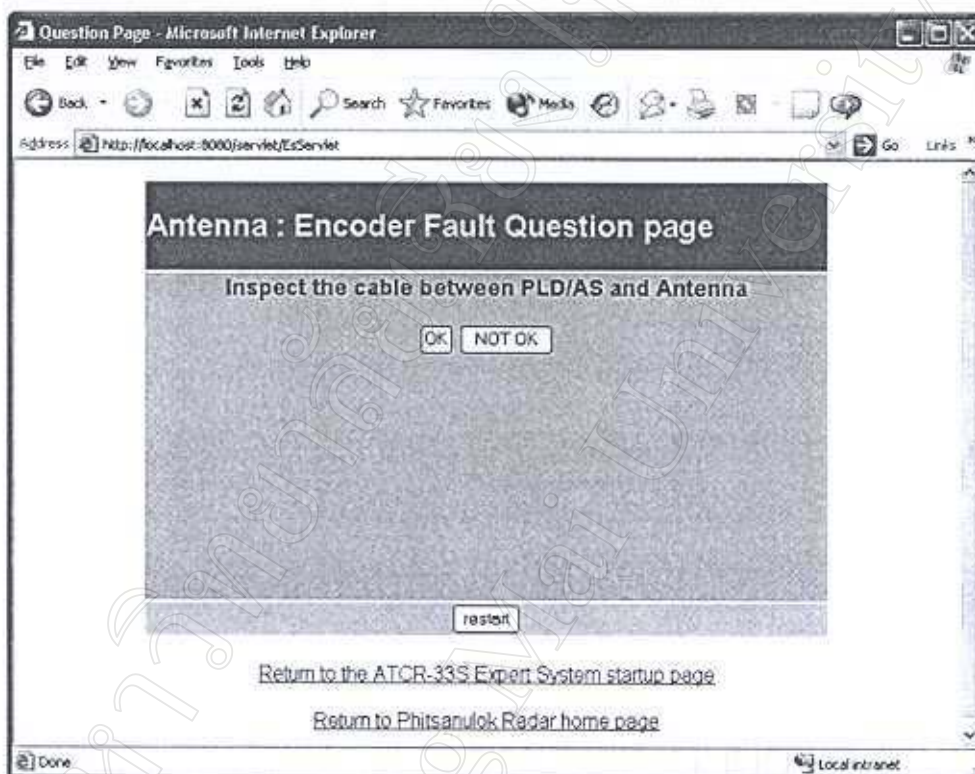
6. ระบบผู้เชี่ยวชาญฯ จะถามคำถามต่อไปอีกว่า มี ENCODER (อุปกรณ์นับมุมในแนวราบของสายอากาศ) ติดตั้งอยู่เป็นจำนวนเท่าใด
7. เติร์ป้รุมภูมิที่ใช้งานอยู่มี ENCODER 2 ตัว(ตามมาตรฐาน) ผู้ปฏิบัติงาน กด "TWO"



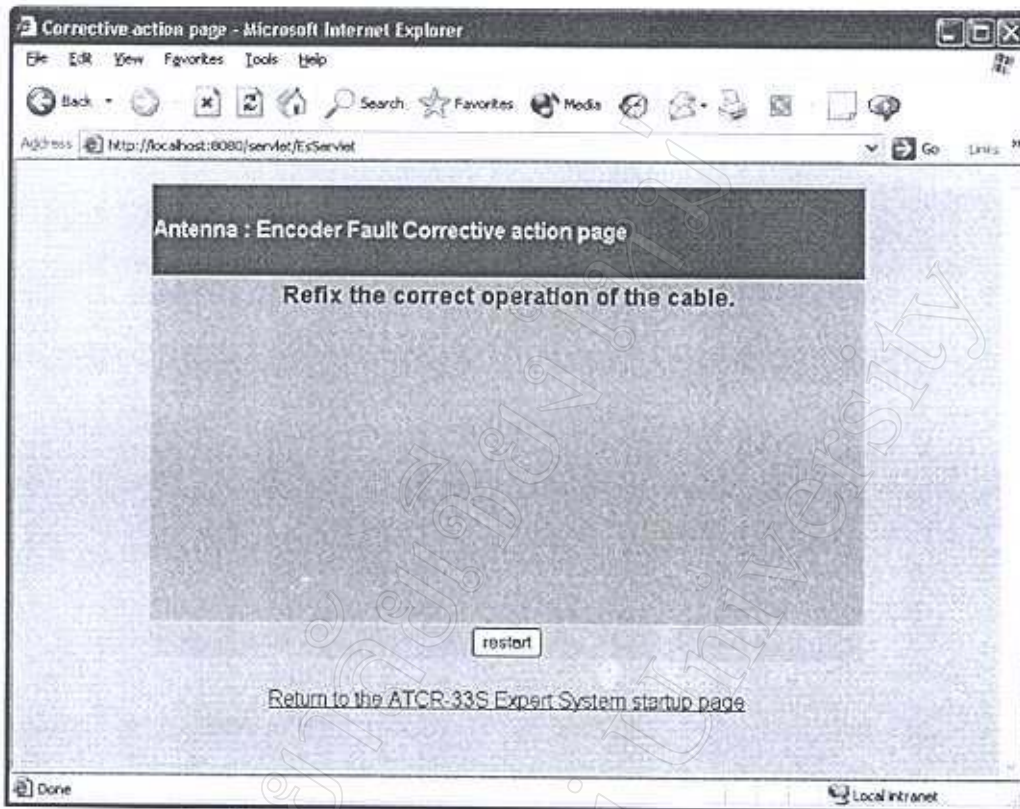
8. ระบบผู้เชี่ยวชาญแนะนำให้ผู้ปฏิบัติงานตรวจสอบสัญญาณที่จุดทดสอบ 4 จุด คือ ACP1 ที่ตำแหน่ง JP-14 ACP2 ที่ตำแหน่ง JP-11 NRP1 ที่ตำแหน่ง JP-19 และ NRP2 ที่ตำแหน่ง JP-23
9. ผู้ปฏิบัติงานนำเครื่องมือวัดสัญญาณ (Oscilloscope) มาตรวจจับสัญญาณที่จุดทดสอบ พบว่าไม่มีสัญญาณใดๆ ที่จุดทดสอบทั้งหมด ผู้ปฏิบัติงานกดเลือก "NOT OK"



10. ระบบผู้เชี่ยวชาญฯ แนะนำให้ผู้ปฏิบัติงานติดตั้งบอร์ดเพิ่มขยาย เพื่อทำการวัดสัญญาณ ACPD และ NRPD ภายในบอร์ด EDR
11. ผู้ปฏิบัติงานทำการตรวจวัดสัญญาณ ACPD และ NRPD แต่ไม่พบสัญญาณใด ๆ กดเลือก "NOT OK"



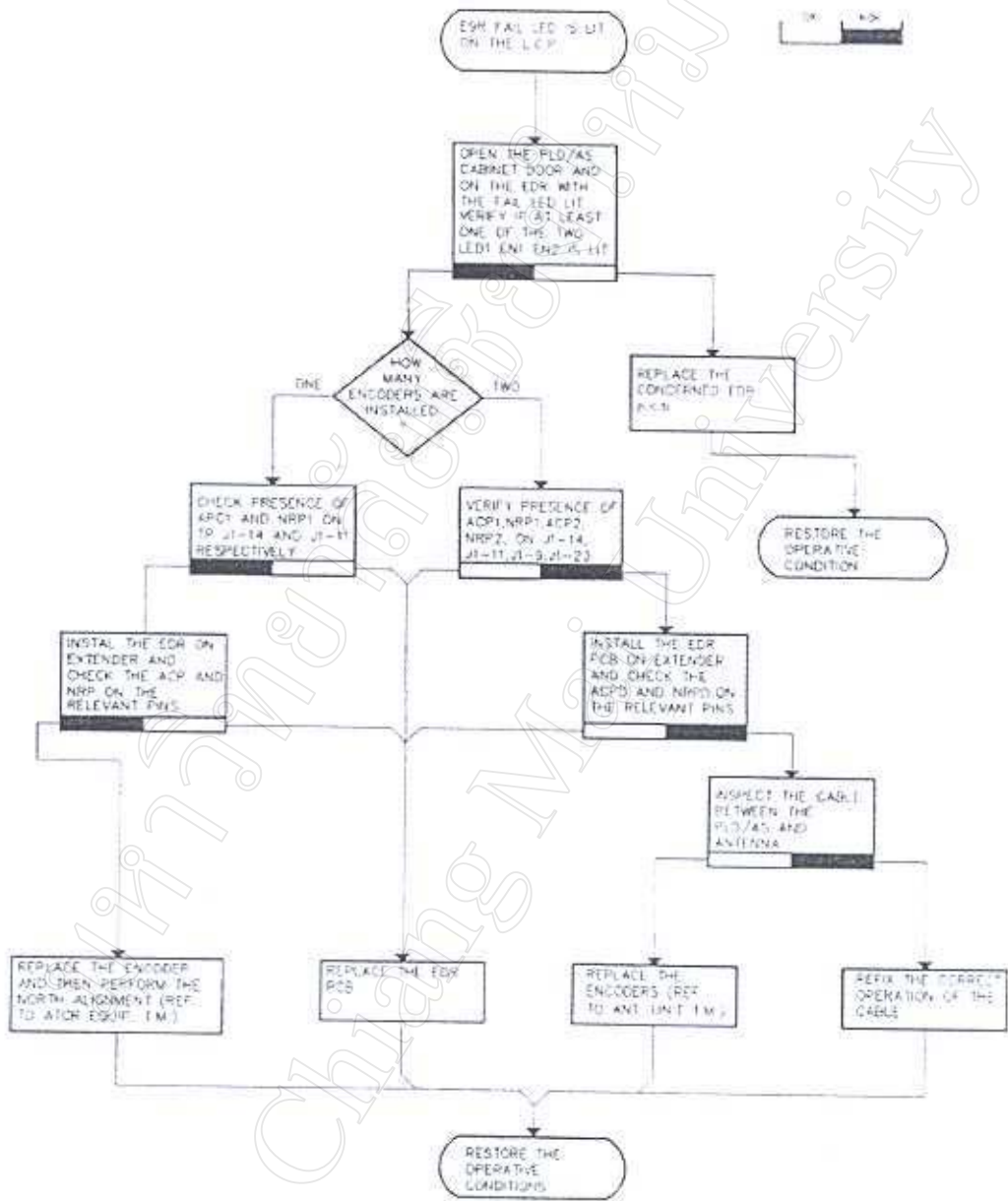
12. ระบบผู้เชี่ยวชาญฯ แนะนำให้ตรวจสอบสายนำสัญญาณระหว่าง PLD/AS (Power Line Distributor and Antenna Starter) กับ สายอากาศ
13. ผู้ปฏิบัติงานตรวจสอบแล้วพบสายนำสัญญาณขาดที่ PLD/AS ที่หน้าจอนี้ ผู้ปฏิบัติงานกดเลือก "NOT OK"



14. คำแนะนำสุดท้ายที่ผู้ปฏิบัติงาน ได้รับจากระบบผู้เชี่ยวชาญ คือ ให้แก้ไขสายนำสัญญาณให้กลับสู่สภาวะปกติ
15. สิ้นสุดขั้นตอนการปฏิบัติงาน

รูปที่ ค.1 ที่แสดงในหน้าถัดไป แสดงให้เห็นถึงวิธีการแก้ปัญหา Encoder fault ที่คัดลอกมาจากคู่มือการใช้งาน

Table 5-3-5.
EDR FAILURE



รูป ค.1 วิธีการแก้ปัญหาที่คัดลอกจากเอกสารคู่มือการใช้งานเรดาร์

ภาคผนวก ง

หนังสือขอสิทธิในการใช้เปลี่ยนระบบผู้เชี่ยวชาญบนอวาตารแพลตฟอร์ม
เพื่อการศึกษา

มหาวิทยาลัยเชียงใหม่
Chiang Mai University



Sandia National Laboratories
Jess™ Software Academic Institution Profile

Ver. 09/25/2001

May we use your University technical contact (email correspondence only) on our reference list for other potential Jess Software licensees? Yes _____ No _____			
In Part 1.0, please provide a corporate address for our long-term records and communications with your company.			
1.0	Company Name: Chiangmai University		
	Express Mail Address: Huay-Graw Road T.Suthep A.Muang		
	City: Chiangmai		
	Zip/Postal Code: 50000	State: -	Country THAILAND
	Company Email Address:	Area Code/Phone:	Area Code/FAX:
	Parent Company (if applicable):	Web site: http://www.chiangmai.ac.th	
2.0	In Part 2, please provide specific points of contact within your company. Provide relevant information, only if different from Part 1.0.		
2.1	Please provide the technical point of contact within your company with whom our technical staff will be working.		
	Name: WISUT SIRISOMPORN		
	Express Mail Address: AERCHAI PHITSANOLCK	Email: wisut@ksc.th.cm	
	City: Phitsanolk	State: -	Country: THAILAND
	Zip/Postal Code: 65000	Area Code/Phone: 665-5248426	Area Code/FAX: 66-5525-3017
2.2	This agreement may involve the negotiation of business terms and conditions between your company and Sandia. Please provide the point of contact within your company who will negotiate these business issues.		
	Name:		
	Express Mail Address:	Email:	
	City:	State:	Country:
	Zip/Postal Code:	Area Code/Phone:	Area Code/FAX:
2.3	Please provide the name of your corporate attorney, if any, we should contact regarding legal issues.		
	Name:		
	Express Mail Address:	Email:	
	City:	State:	Country:
	Zip/Postal Code:	Area Code/Phone:	Area Code/FAX:
2.4	This agreement may involve financial billing by Sandia. Please provide your company's point of contact for billing issues.		
	Name:		
	Billing Address:	Email:	
	City:	State:	Country:
	Zip/Postal Code:	Area Code/Phone:	Area Code/FAX:
2.5	Which party above should we use as our primary point of contact?	<input type="checkbox"/> Technical	<input type="checkbox"/> Business <input type="checkbox"/> Legal
3.0	Are any employees of the company listed in Part 1.0 above, who are involved in negotiating this agreement, either current or former ("former" means within the last two years):		
3.1	Sandia employees?	Current <input type="checkbox"/>	Former <input type="checkbox"/> <input type="checkbox"/> No
3.2	Sandia consultants or contractors?	Current <input type="checkbox"/>	Former <input type="checkbox"/> <input type="checkbox"/> No
3.3	Lockheed Martin employees?	Current <input type="checkbox"/>	Former <input type="checkbox"/> <input type="checkbox"/> No
3.4	Department of Energy employees?	Current <input type="checkbox"/>	Former <input type="checkbox"/> <input type="checkbox"/> No
	Name the individual(s) and associations, if any, on an attachment.		

Company Profile (03/01/01)

4.0 The company listed in Part 1.0 is (check all that apply):	
4.1 <input type="checkbox"/> A small business (less than 500 employees) pursuant to 13 C.F.R. Part 121, Small Business Regulations	4.12 <input type="checkbox"/> An institution of higher education (specify below)
4.2 <input type="checkbox"/> A large business (500 or more employees)	<input type="checkbox"/> A state-chartered institution
4.3 <input type="checkbox"/> A non-profit organization or business under the Internal Revenue Code Sections 501 or 503	<input type="checkbox"/> A private institution
4.4 <input type="checkbox"/> A consortium or member of a consortium or partnership under the potential agreement Formed as a joint venture	4.13 <input type="checkbox"/> An historically Black college or university
4.5 <input type="checkbox"/> A trade association	4.14 <input type="checkbox"/> A certified 8A firm
4.6 <input type="checkbox"/> A Lockheed Martin company	4.15 <input type="checkbox"/> A disadvantaged business
4.7 <input type="checkbox"/> A local government entity	4.16 <input type="checkbox"/> A woman-owned business
4.8 <input type="checkbox"/> A state government entity	4.17 <input type="checkbox"/> A minority-owned business
4.9 <input type="checkbox"/> A U.S. government agency	4.18 <input type="checkbox"/> A Native American-owned business
4.10 <input type="checkbox"/> A contractor to a U.S. government agency	4.19 <input type="checkbox"/> An Hispanic-owned business
4.11 <input type="checkbox"/> requesting access to Sandia intellectual property for use on behalf of the U.S. Government	4.20 <input type="checkbox"/> An African American-owned business
	4.21 <input type="checkbox"/> An Asian-owned business
	4.22 <input type="checkbox"/> None of the above (Explain on separate sheet)

If 4.4, 4.5, or 4.6 is checked, is the signatory to this document authorized to bind all the members of the consortium, partnership, joint venture, or trade association to the terms and conditions in the proposed agreement? YES NO

If 4.11 is checked:

U.S. government agency: _____ Federal contract number: _____

5.0 The company listed in Part 1.0 is (check at least one; more than one, if applicable):	
5.1 <input type="checkbox"/> A U.S.-owned business	5.1 <input type="checkbox"/> A U.S.-controlled business
5.2 <input type="checkbox"/> A non U.S.-owned business	5.2 <input type="checkbox"/> Controlled by a non U.S. entity
5.3 <input type="checkbox"/> A multi-national company (i.e., U.S.-owned with foreign research and/or manufacturing facilities) Does the company have operations in the United States? YES <input type="checkbox"/> NO <input type="checkbox"/>	
5.0 Will any products, processes, or services for use or sale in the United States that result from inventions or other intellectual property arising from the performance of the anticipated agreement be substantially manufactured in the United States? YES <input type="checkbox"/> NO <input type="checkbox"/>	
7.0 Within the company (or subcontractors to the company) listed in Part 1.0, is the recipient(s) of the information or intellectual property contemplated under an license agreement with Sandia a U.S. citizen? YES <input type="checkbox"/> NO <input type="checkbox"/>	
7.1 If 7.0 is NO, of what country(s) is the recipient(s) a citizen?	U.S. immigration status:

I hereby represent that the above information may be relied upon for purposes of entering into the proposed agreement

Name: _____ Signature: _____

Signature
 Dept of Information Technology and Management
 Graduate School
 Army State University
 1000 Army Ave, Ft. Belvoir, IL



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WHEREAS, LICENSEE desires to obtain a license restricted to R&D use of the Software under SANDIA's rights in such Software;

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- 6.3 The U.S. Government is neither a party to nor assumes any liability for activities of the Contractor in connection with this license.

7. Indemnity

If LICENSEE, its assignees or licensees, makes, uses or sells a product, process or service that includes Jess Software, LICENSEE shall indemnify SANDIA and the U.S. Government for all damages, costs, and expenses, including attorneys' fees, arising from personal injury or property damage occurring as a result of making, using or selling the product or process.

8. Export Control Notice

- 8.1 The export of articles and information from the U.S. may require a government license; violators subject to criminal penalties.

9. Notices

- 9.1 All notices and reports shall be in writing and addressed to Mr. Craig A. Smith at the address given below.
- 9.2 All notices and reports shall be deemed to have been given, if mailed first class, postage prepaid, by the U.S. Postal Service to the other party at its above address or at such other later address as designated in writing by the other party, in accordance with the provisions of this section.

10. No Waivers

- 10.1 The failure of SANDIA, at any time, to exercise any right or remedy of this Agreement shall not be construed to be a waiver of such right or remedy nor preclude SANDIA from exercising such right and remedy thereafter.

11. Controlling Law

- 11.1 This Agreement shall be construed according to the laws of the State of California and the United States of America.

BY SIGNING BELOW AS LICENSEE'S AUTHORIZED REPRESENTATIVE, LICENSEE AGREES TO THE TERMS AND CONDITIONS OF THIS LICENSE AGREEMENT.

LICENSEE: *R. Na Lamphun*

PRINT NAME: Assoc. Prof. Ratana Na Lamphun

TITLE: Chairperson

DATE: August 1, 2002

PRINT A COPY OF THIS LICENSE AGREEMENT, HAVE IT SIGNED BY AN OFFICER OF THE LICENSEE, AND FAX SIGNED LICENSE AGREEMENT TO:

MR. CRAIG A. SMITH
MAIL STOP 9017
SANDIA NATIONAL LABORATORIES
PO BOX 969,
LIVERMORE, CA 94551
Fax: (925) 294-1339

ATTACHMENT A

i. Jess Software

Jess™ is a Sandia Corporation copyrighted software, SCR #348, that enables the creation of highly portable rule-based expert systems. Jess is comprised of a set of Java™ classes that make up a package named Jess.

ii. Term of Agreement

The term of this Agreement shall be for three (3) years from the effective date of this Agreement.

iv. Jess Support:

LICENSEE may access current version of Jess Software through the Jess website at <http://herzberg.ca.sandia.gov/jess>. Sandia maintains sole discretion and control over development of Jess Software. Future revisions of Jess software will be posted on the website and will be available for licensed users.

มหาวิทยาลัยเชียงใหม่
Chiang Mai University

ภาคผนวก จ

คู่มือการติดตั้งระบบผู้เชี่ยวชาญการวินิจฉัยหาสาเหตุขัดข้อง ของระบบเรดาร์ปฐมภูมิ รุ่น ATCR-33S

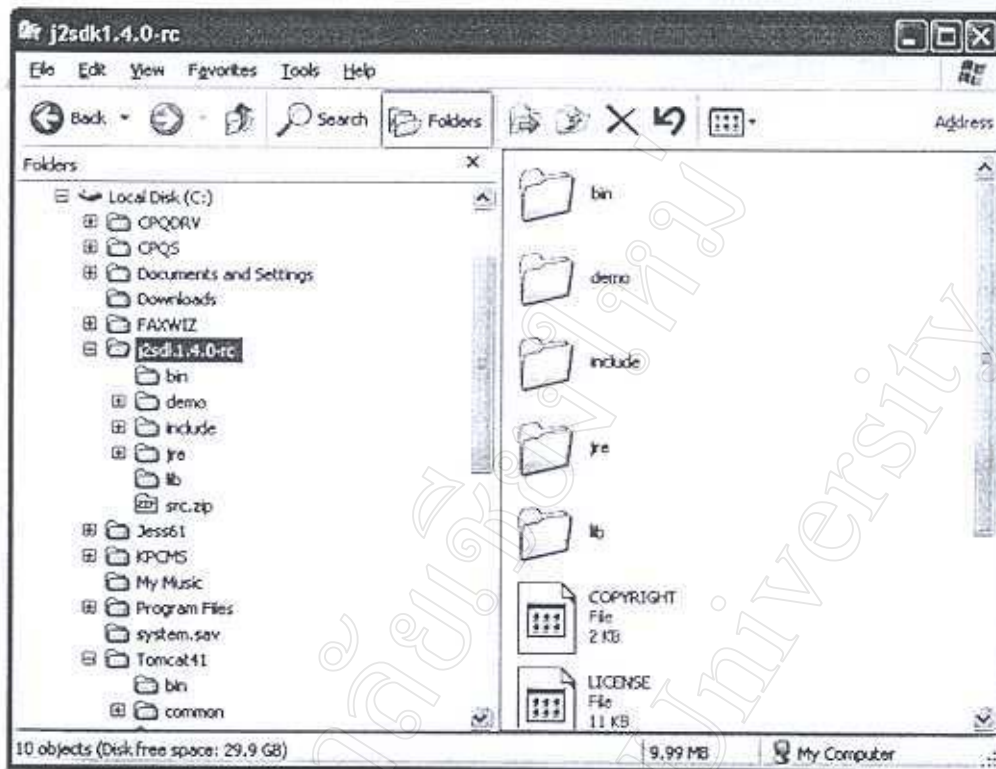
ซอฟต์แวร์สำหรับการติดตั้ง ระบบผู้เชี่ยวชาญการวินิจฉัยหาสาเหตุขัดข้องของระบบเรดาร์ปฐมภูมิ รุ่น ATCR-33S ทำงานบนระบบปฏิบัติการ Microsoft Windows XP ประกอบด้วยซอฟต์แวร์ต่าง ๆ ดังนี้

1. ชุดเครื่องมือสำหรับการพัฒนาโปรแกรมด้วยภาษาจาวา เวอร์ชัน 1.4.0 (Java 2 Development Kits Version 1.4.0)
2. ซอฟต์แวร์สำหรับติดตั้งทอมแคทเซิร์ฟเวอร์ เวอร์ชัน 4.1.18 (Tomcat Server Version 4.1.18)
3. ไฟล์บีบอัดข้อมูล โปรแกรมที่ได้ทำการพัฒนาขึ้นสำหรับการค้นคว้าในหัวข้อนี้

ซอฟต์แวร์ทั้งหมดนี้ได้ถูกนำมารวบรวมไว้ในแผ่นคอมแพคดิสก์ ที่แนบมาพร้อมกับเอกสารการค้นคว้าแบบอิสระนี้ การติดตั้งระบบ จะต้องติดตั้งเรียงลำดับกันไป ดังจะกล่าวต่อไปนี้

การติดตั้งชุดเครื่องมือสำหรับการพัฒนาโปรแกรมภาษาจาวา

ซอฟต์แวร์สำหรับการติดตั้งเครื่องมือสำหรับการพัฒนาโปรแกรมภาษาจาวา ใช้ชื่อว่า j2sdk-1.4.0-rc-win.exe เป็นโปรแกรมที่จะทำการติดตั้งชุด โปรแกรมสำหรับการพัฒนาโดยอัตโนมัติเมื่อทำการเรียกใช้โปรแกรม โปรแกรมจะถามถึงตำแหน่งไดเรกทอรีที่ต้องการติดตั้ง ให้ระบุตำแหน่งไดเรกทอรี เป็น c:\j2sdk1.4.0-rc ดังรูป จ.1



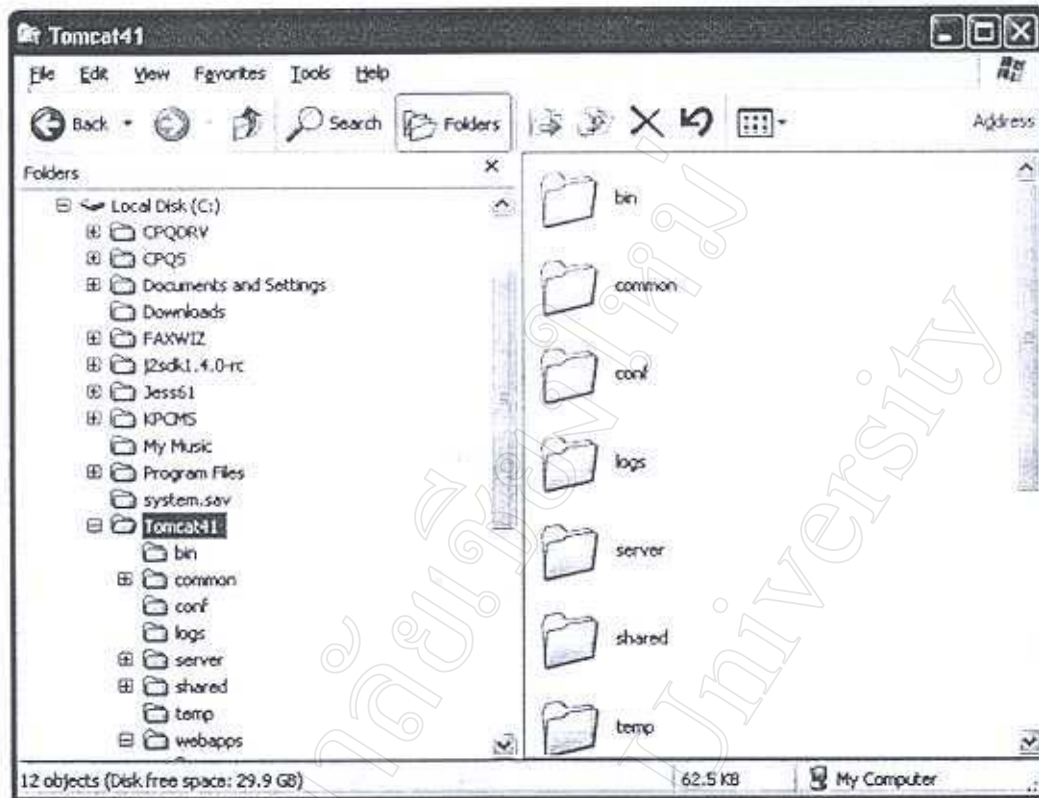
รูป จ.1 แสดงตำแหน่งไดเรกทอรีที่ทำการติดตั้ง J2SDK

เมื่อผู้ใช้งาน ได้ทำการติดตั้งชุดสำหรับการพัฒนาเรียบร้อยแล้ว ให้ทำการตั้งค่าตัวแปรแวดล้อม (Environment Variables) สำหรับการใช้งาน โดยเพิ่มค่าตัวแปรแวดล้อม CLASSPATH ให้กับชุดการพัฒนา ซึ่งสามารถทำได้โดยการเพิ่มคำสั่ง set CLASSPATH ในไฟล์ autoexec.bat ดังนี้

```
set CLASSPATH=.;c:\j2sdk1.4.0-rc\src.jar
```

การติดตั้งทอมแคทเซิร์ฟเวอร์

ซอฟต์แวร์สำหรับติดตั้งทอมแคทเซิร์ฟเวอร์ ใช้ชื่อว่า tomcat-4.1.18.exe ซึ่งจะทำการติดตั้งชุดซอฟต์แวร์ที่จำเป็น สำหรับการใช้งานทั้งหมดให้โดยอัตโนมัติเมื่อผู้ใช้งานทำการเรียกใช้ ผู้ใช้งานจะต้องระบุตำแหน่งไดเรกทอรีที่ต้องการติดตั้ง สำหรับตำแหน่งไดเรกทอรีสำหรับหัวข้อการค้นคว้าแบบอิสระนี้ให้ติดตั้งทอมแคทไว้ที่ ไดเรกทอรี c:\tomcat41 ดังรูป จ.2

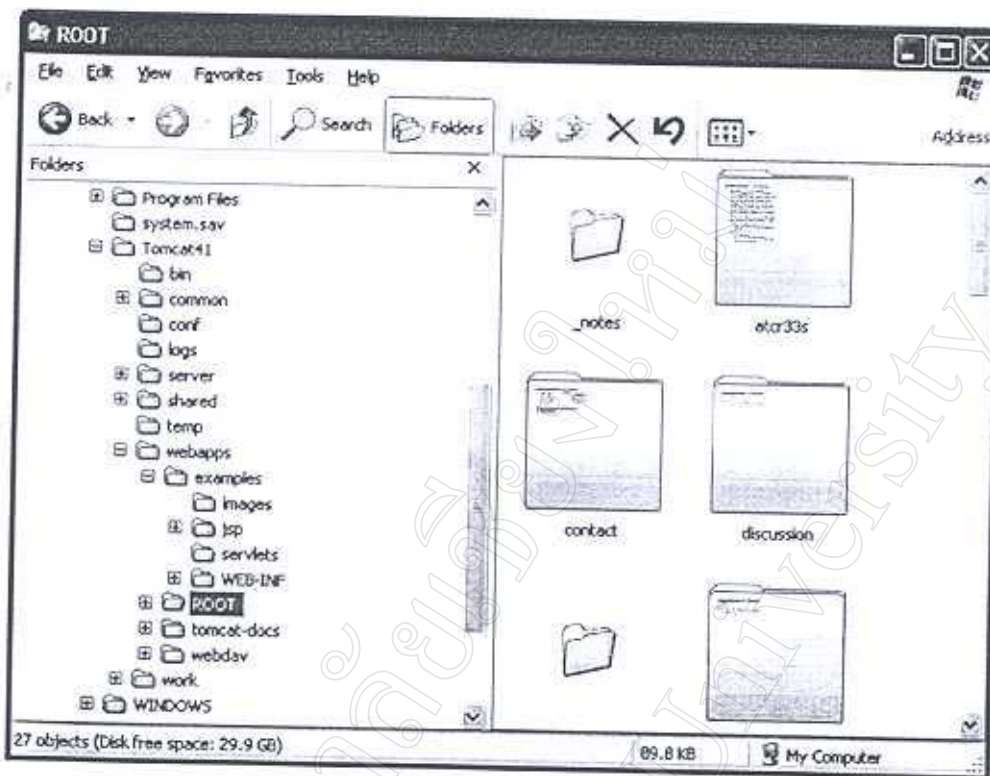


รูป จ.2 แสดงตำแหน่งไดเรกทอรีที่ทำการติดตั้งทอมแคทเจอร์ฟเวอร์

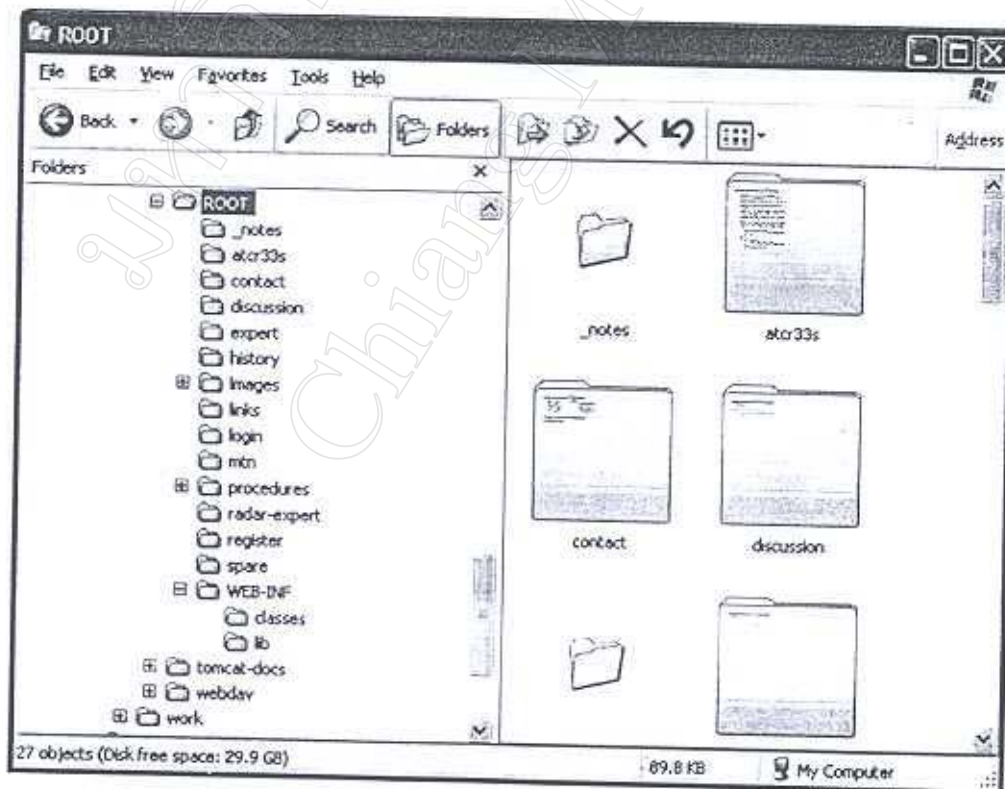
การติดตั้งโปรแกรมที่ได้ทำการพัฒนา

โปรแกรมที่ได้ทำการพัฒนาขึ้นสำหรับการค้นหาแบบอิสระในหัวข้อนี้ รวมถึงไฟล์ psres.clp ซึ่งเป็นไฟล์ฐานความรู้ของระบบผู้เชี่ยวชาญการวินิจฉัยภาษาเหตุผลของระบบเรคาร์ปฐมภูมิ รุ่น ATCR-33S และเปลือกระบบผู้เชี่ยวชาญบนจาวาแพลตฟอร์ม ได้ถูกนำมาบีบอัดรวมกันไว้เป็นไฟล์ที่ใช้ชื่อว่า psres.zip

การคลายการบีบอัด ให้ผู้ที่ทำการติดตั้งเรียกใช้โปรแกรม winzip เพื่อทำการคลายการบีบอัด และ ให้คลายการบีบอัดไปไว้ที่ตำแหน่งไดเรกทอรี c:\tomcat41\webapps\ROOT ดังรูป จ.3



รูป จ.3 แสดงตำแหน่งไดเรกทอรีที่อยู่ของชุดโปรแกรมที่ทำการพัฒนา



รูป จ.4 แสดงไดเรกทอรีย่อยของ ROOT

รูปที่ จ.4 เป็นการแสดงไดเรกทอรีย่อยของ ROOT ซึ่งเป็นที่เก็บไฟล์ต่าง ๆ ของระบบผู้เชี่ยวชาญฯ ไฟล์ index.html ซึ่งเป็นไฟล์แรกที่ถูกเรียกใช้เมื่อผู้ใช้งานเข้าสู่ระบบ ถูกเก็บไว้ภายในไดเรกทอรีนี้ รวมทั้งไฟล์ฐานความรู้ psres.clp ด้วย ส่วนไฟล์ที่ทำหน้าที่เป็นเซิร์ฟเลททั้งหมดถูกเก็บไว้ที่ตำแหน่ง WEB-INF\classes และไฟล์เปลี่ยนระบบผู้เชี่ยวชาญบนจาวาแพลตฟอร์ม (Jess) เก็บไว้ที่ตำแหน่ง WEB-INF\ib

เมื่อได้ทำการติดตั้งซอฟต์แวร์ต่าง ๆ เป็นที่เรียบร้อยแล้ว ก่อนที่จะทำการเรียกใช้งานระบบผู้เชี่ยวชาญฯ ผู้ใช้งานจะต้องสั่งให้ทอมแคทเซิร์ฟเวอร์เริ่มทำงานก่อน (ในกรณีที่ทอมแคทเซิร์ฟเวอร์ยังไม่ทำงาน) โดยการคลิกที่ Program / Apache Tomcat 4.1 / Start Tomcat จากนั้นเรียกใช้เวบเบราว์เซอร์ เพื่อใช้งานระบบผู้เชี่ยวชาญฯ โดยระบุตำแหน่งยูอาร์แอล (URL-Uniform Resource Locator) ที่ <http://localhost:8080>

การหยุดการทำงานทอมแคทเซิร์ฟเวอร์ คลิกที่ Program / Apache Tomcat 4.1 / Stop Tomcat

ประวัติผู้เขียน

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ประสบการณ์	พ.ศ. 2531 - 2532 ตำแหน่ง นายช่างเทคนิค 2 ภาควิชาวิศวกรรมไฟฟ้า คณะวิศวกรรมศาสตร์ มหาวิทยาลัยเชียงใหม่ พ.ศ. 2532 - 2537 ตำแหน่ง วิศวกรระบบ ศูนย์ควบคุมการบินเชียงใหม่ บริษัท วิทยุการบินแห่งประเทศไทย จำกัด พ.ศ. 2537 - 2544 ตำแหน่ง วิศวกรระบบอาวุโส กองวิศวกรรมระบบติดตามอากาศยาน บริษัท วิทยุการบินแห่งประเทศไทย จำกัด พ.ศ. 2544 - ปัจจุบัน ตำแหน่ง วิศวกรบริหารระบบ ศูนย์ควบคุมการบินพิษณุโลก บริษัท วิทยุการบินแห่งประเทศไทย จำกัด