SIGNAL EQUIPMENT AUTOMATED TRAINING SYSTEM

By

Major Salman Khan

Captain Muhammad Iftikhar

Captain Kamran Taj(TE-52A)

CHAPTER # 1
INTRODUCTION

1.1 Introduction

The main theme of this project is to easily access and understand the different highly cosl modules of corps of signal which functionality and usage are very complicated. It has to be implemented down level for practical manifestation in training institutions and at various formation level training cadres. SEAT is primarily a defence purpose project of signal directorate to digitize and automate the learning of signal equipment by using GUI based module. It will comprise of front panel of all signal communication equipments with complete hands on training without any presence of equipment/instructor. This project will not only work as a training Aid but also provide an opportunity to the defence personal as a simulator. This project is GUI SEATS which will have various signal equipments having vast usage in a field in the form of API supported by GUI which will be very economical, user friendly and having no complication

1.2 Background of the SEATS

Previous work done on this project was a GUI based SEATS made by one signal unit. An SEATS comprised of one signal equipment with only basic modalities. Concept has been provoked from that work and now finally decided by the signal directorate to prepare an SEATS which should be user friendly and comprising of all the details of signal equipments which are mandatory to operate in a battle field.

1.3 Objectives of the SEATS

Seats project is primarily be focusing on the training of soldiers to understand the concept of various signal equipment, configuration, communication and simulation. It will not only allow the soldiers to gain the knowledge of equipments but will allow them to pace with the modern technology like other modern armies in the world. It will also help soldiers to understand the concept of web based SEATS which is otherwise very useful for the modern soldier.

1.4 Significance of the SEATS

End goal objective is to create such web based SEATS which should be user friendly easy to understand and comprising of all those necessary signal equipments which soldiers need to handle practically on ground without any difficulty. As these equipment maintenance, handling is a demanding job and having limited quantity being costly is also a big challenge in a way of learning hence this SEATS will provide a ultimate platform for overcoming all these challenges.

CHAPTER # 2

REQUIREMENT ANALYSIS

2.1 Introduction

SEATS is primarily a defence purpose project of signal directorate to digitize and automate the learning of signal equipment by using GUI based module. It will comprise of front panel of all signal communication equipment with complete hands on training without any presence of equipment/instructor. This project will not only work as a training Aid but also provide an opportunity to the defence personal as a simulator. This project is GUI based SEATS which will have various signal equipment having vast usage in a field in the form of API supported by GUI which will be very economical, user friendly and having no complication

2.2 Scope

Purpose of SEATS project is primarily be focusing on the training of soldiers to understand the concept of various signal equipment, configuration, communication and simulation. It will not only allow the soldiers to gain the knowledge of equipment but will allow them to pace with the modern technology like other modern armies in the world. It will also help soldiers to understand the concept of GUI based SEATS which is otherwise very useful for the modern soldier.

2.3 Definitions, Acronyms and Abbreviations

SEATS	Signal Equipment Automated Training system
Sml	Simulator
SQL	Sequential query language
Sigs	Signals
Auto	Automated

2.4 Document Conventions

- Text of document is to be written in Times New Roman 12.

- Text is single spaced and maintain the 1.5” margins.
- Main Headings of each chapter are in Times New Roman with font size 14 bold.

- The Software Requirements Specification (SRS) document is created for the following stake holders.

- **Project Supervisor:** To aid in project and assisting in a beffiting manner..
- **Development Team:** To aid in improvement of SEATS for functional requirements.
- **Testing Team:** To aid the testing for better comprehension and removing constraints.
- **Users:** The prospective stakeholders of the SEATS, including the users and Telecommunication Providers.
- **UG Project Evaluation Team:** To help the evaluation board in for guaging the progress of SEATS.

2.5 Project Scope

It is a defence offered project related to the field of communication with various signal equipment. It will be used as a training aid in signal units and training institutions. It will not only act as training aid but work like Training simulator. It covers the details of various radio communication aspects (SDR, HARRIS, NGPATCOM and M3TR). This SEATS will be developed in C sharp code. This sml will allow the user to login and enter credentials which will help the SEATS suits to maintain the Database of users.

2.6 Overall Descriptions

2.6.1 SEATS Perspective

This SEATS can be useful in following perspective:

- For training in various school of instructions..
- Easily accessible to all intended users which were lacking due to deficiency and highly costly equipment

- It can be helpful for maintain the database and becoming proficient in acquiring skills on SEATS module

2.6.2 Functionalities

Followings are the Functional Requirements:

- Design database interface
- User login and authentication for access
- In case of three un successful attempt sml will be blocked
- Show the main user interface after login
- Various set will be visible in order to access anyone select to proceed further
- Record keeping of various users
- Test to check the proficiency of learning at the end
-

Non Functional Requirements:

- SEATS is easy to understand
- SEATS is easily integrated with all modules of SEATS.
- Sys must be able to display data with all desired actions.
- SEATS is to be password protected.
- SEATS need to store the credentials of users that is record keeping Database.

2.6.3 Users and Characteristics

- The end users of SEATS are restricted to defense personal which can be subdivided into the main category of users and SEATS up gradation for further integration according the requirement..

- Users who has to take over the sml after login this credentials and to operate so he is the general user also. Since the usage is only restricted to the soldiers of corps of signals so the users category is also restricted and not available in open market

2.6.4 Operating Environment

This is GUI app based on clients. Clients are the users that use the app that is developed who is also responsible for understanding and analysing the conduct modalities of sml and to generate results at the end on the performance based.

The software and languages used are mentioned below

- Visual studio
- Languages: C SHARP
- Coral draw
- Operating SEATS window 7 or 8.
- Adobe Captive

2.6.5 Design and Implementation Constraints

The main intent of this project is to make sml of signal eqpts which soldier can access it while sitting in their own organization and can access it easily. It design includes

- Login page
- Interface of different modules
- Basics events handlers for user friendly and easy to understand
- Multiple events addition side by side

2.6.6 DEVELOPING:

The first and important module in this project is GUI based interface of all signal equipments which are included in this project subsequently adding events which is developed using coral draw and over all prepared in visual basic.

- **Key Features:**

1. This SEATS can be monitored from any location.
2. It can support minimum window 7 with at least 4 GB RAM processor.

3. Multiple assistance is added like cursor, voice enabling and step wise step can make user to understand from all directions.

2.7 User Documentation

Guidelines and user manual at the end is included as part of thesis..

2.7.1 Assumptions and Dependencies

- Here assumption will be only that it's an actual communication set which is being operated in field.
- Since it is a stand-alone GUI Based SEATS so it can operate in any independent environment.
- It can easily operate in exi file as well.
- It does not require any Wi-Fi or internet access.

Requirements of SEATS

2.8 External Interface Requirements

2.8.1 User Interfaces:

The interfaces available to the users are main front panel after login which can be handled after taking subsequent actions.

2.8.2 Hardware Interfaces

There will an interface drawn for each panel of module designed in coral. For each module data base functionalities will be available. User of SEATS can navigate and select the desired functionalities available on interface.

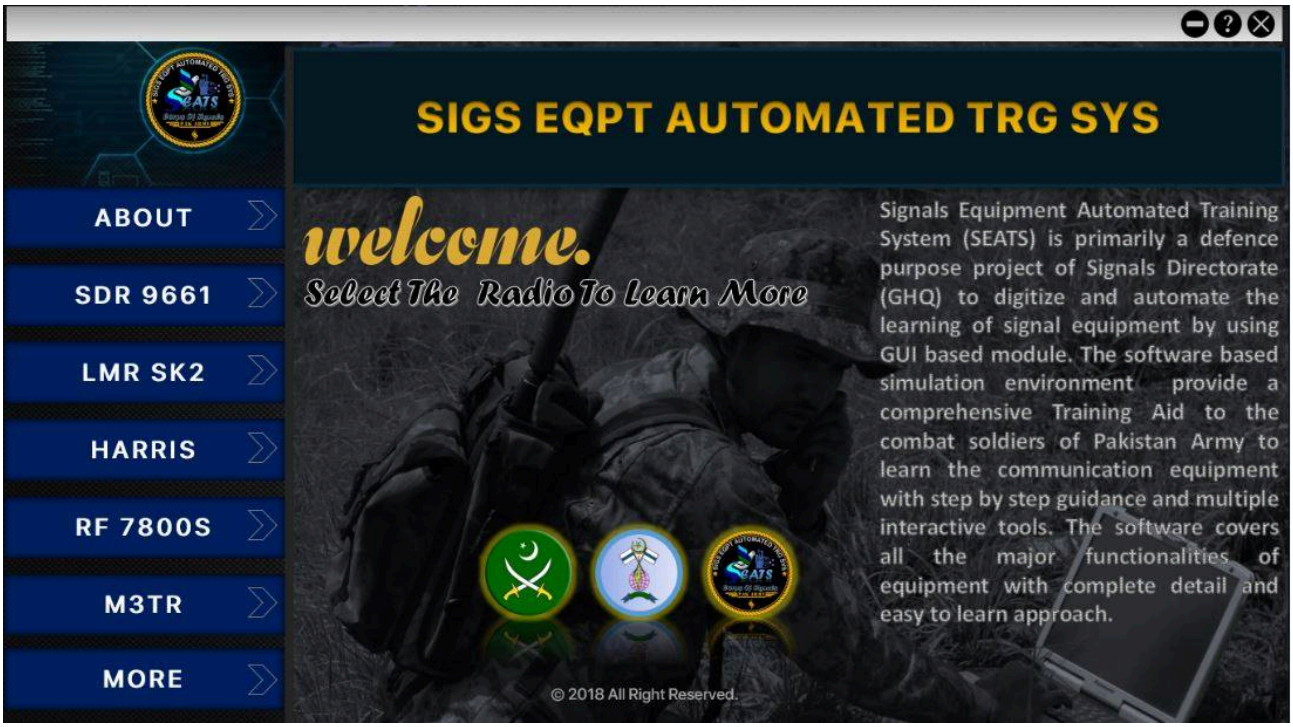
2.8.3 Software Interfaces

Following software will be used in this project

- Visual studio
- SQL
- Adobe captive
- Adobe Photoshop
- Macromedia director
- Adobe after effects
- Adobe XD
- Coral draw

2.9 SEATS Features

Our project is mostly based on two main modules. One is authentication and second is access of all sub modules (SDR,HARRIS,NGPATCOM and M3TR).



2.9.1 Sub SEATS Features:

- After authentication the users are required to select any set out of the given and then follow the subsequent learning parameter which will be assisted by voice command and instruction indication by cursor. These are all the real time command which are available in the communication set and follow the exact guidelines which is needed to be proficiently required to have full command over the set.
- This SEATS files once downloaded on any PC can be made functional.
- Since it is GUI based so it does not depend on any external communication channel like WIFI so once it is downloaded it is functional.

Non-functional Requirements

2.9.2 Performance Requirements

Following are the performance requirements for the SEATS:

1. User must have PC available.
2. SEATS must be at least with 4GB processor.
3. Window7 and above

2.9.3 Safety and Security Requirements.

- Since it is defence related project so security is important consideration to cater for.
- Password authentication is important aspects.
- SEATS sml is required be shared with the organisation who should have their own security mechanism to avoid any un authorize access to the SEATS.
- Since data is very important so it needs to be kept in external hard drive and to be run in a private access area.

2.9.4 Software Quality Attributes

- SEATS is easy to use.
- SEATS is easy to understand
- SEATS is reliable that it will work on a device which meets its minimum requirement.
- SEATS have attractive User interface.

CHAPTER # 3
SEATS DESIGN

3.1 Introduction

The design document captures all functional-requirements and shows how they interact with each other conceptually. The depth level design also shows as to how it SEATS is going to be implemented. The document is envisaged for the end users who are part of corps of signals. This

document will help the developer in implementation and making functionalities more smoothly to understand.

3.2 Definitions, Acronyms and Abbreviations

SEATS	Signal Equipment Automated Training system
App	SEATS
Sml	Simulator
UML	Unified modeling language
GUI	Graphical user interface
HARRIS	One of the communication set integrated in Simulator
SDR	One of the communication set integrated in Simulator
NGPATCOM	One of the communication set integrated in Simulator
M3TR	One of the communication set integrated in Simulator

3.3 Purpose

The purpose of SEATS Software Design Document is to envisage the design of SEATS fully functionality of suit having all intended modules for putting in one platform for better clarity of concept which will enable the end user with the proof of concept. This section provides knowledge for the Descriptions of the details for the software and SEATS. It will elaborate the purpose and functions of the SEATS, and front-end of the SEATS, how SEATS will behave, its detail working, the constraints under which SEATS must function and how it will react to inputs and what will be its corresponding outputs.

3.4 Document Conventions

Document Text	Font-Times New Roman	Size-12pt	Not bold
Level 1 Main Headings	Font-Times New Roman	Size-18pt	Bold
Level 2 Headings	Font-Times New Roman	Size-16pt	Bold
Level 3 Headings	Font-Times New Roman	Size-14pt	Bold
Level 4 Headings	Font-Times New Roman	Size-12pt	Bold
Level 5 Headings	Font-Times New Roman	Size-12pt	Bold

3.5 Intended Audience and Reading Suggestions

The Software Design Specification (SDS) document is meant for the following stake holders.

- **Project Supervisor:** To help out in project supervision &leading the project in smooth way.
- **Development Team:** To aid in development of SEATS and trace-back of functional requirements.
- **Testing Team:** To assist the testing members to understand and locating constraints.
- **Users:** The prospective stakeholders of the SEATS, including the users and Telecommunication Providers.

- **UG Project Evaluation Team:** To aid the evaluation board in evaluation progress of UG Projects.

3.6 Project Scope

The Scope of SEATS is firstly to understand the functionalities of different simulators which are being added in SEATS. Further it will be then converted to GUI based SEATS having same external surface and to be acted like a real Signal simulator. It will be manually operated by the users for every intended functions. All functionalities of simulators will be tagged and will be displayed on the front panel and user can easily choose the desired actions installed in data base. So enable the users to understand the scope of SEATS.

3.7 References and Acknowledgments

- 2014, Software Engineering Standards Committee of "IEEE Recommended Practice for Software Design Descriptionss", IEEE Std 1016-1998.
- http://www.ebookdirectory.com
- http://www.ebookdirectory.com
- UML Distilled:Brief Guide to the Standard Object Modeling Language by Martin Fowler" available from:
- http://www.ebookdirectory.com/
- Learning UML 2.0 by Russ Miles" available from:
- https://www.scribd.com/
- The Unified Modeling Language User Guide by Grady Booch " available from:
- https://www.scribd.com/
- https://books.google.com/?hl=en
- www.w3schools.com

3.8 Overview of Document

The Software Design Specification shows a depth view of structure of each part of SEATS and linkage between the end-user and the SEATS and will focuses on detailing a basic

view of tiny component of the software and how the modules communicate with each other. The purpose is to provide a meticulous structure for the project of each part interaction with the related boundaries and encircled parameter. The concept for which this SEATS has to build with its final shape with all modules and their interaction and to describe its focus. It shows working of all main parts and their function with each other and their dependencies which enable them to form the design of that SEATS.

3.8.1 SEATS Architecture Descriptions

In this section, the overall architecture of the SEATS is discussed, including the introduction of various components and subSEATSs. It is mainly supported by SEATS Architecture diagram which shows an insider's perspective of the SEATS by describing the high level software components that perform the major functions to make the SEATS operational.

3.8.2 Structure and relationships

This section ponders upon the interrelationships and dependencies among various components. It is mainly described by a diagram which is further augmented by explanatory text. UML Class diagram also helps us understanding the SEATS structure.

3.8.3 UML Class diagram

UML Class diagram further manifests the Descriptions of low level components of the software that include data storage and state details, thus making the SEATS adequately comprehensible.

3.8.4 User Interface Issues

This section presents the main principles of the SEATS's user interface. Not touching about the technical details, the section is described by an overall diagram which is also augmented by explanatory text. Moreover, Activity diagrams, Sequence diagrams, and UI Design diagrams also elaborate the User Interface issues in a more intelligible manner.

3.8.5 Activity diagrams

Activity Diagrams follow a workflow-based loom to make the concept for overall functioning . They are a very good means to see how various steps are involved in major tasks inside a SEATS using a flow chart pattern without getting into the technical details.

3.8.6 Sequence diagrams

Sequence diagrams show how different objects are involved in the completion of a functionality of the SEATS. They have a unique format that allows the reader to see how many objects are used vis-à-vis their duration; for the completion of a SEATS requirement.

3.9 Detailed Descriptions of components

This section contains in depth working of all the major components of the SEATS in a structured pattern (table), comprising of 10 x rows. The pattern (table) maintains symmetry in the document structure; and therefore it is followed for each of the components. Each part/row of the table is identified by a *label*, explaining the purpose of each point. The Descriptions of each point vis-à-vis the component being discussed, ponders upon the detailed account of it in the SEATS.

3.9.1 Reusability and relationships to other SEATSs

This section focuses upon the Reusability aspects of the various components of the SEATS. Since the project in hand is all new and doesn't carry out any enhancement work in the already existing SEATS, so Reusability is just a recommended strategy to be employed while organizing various SEATS components.

3.9.2 Design decisions and tradeoffs

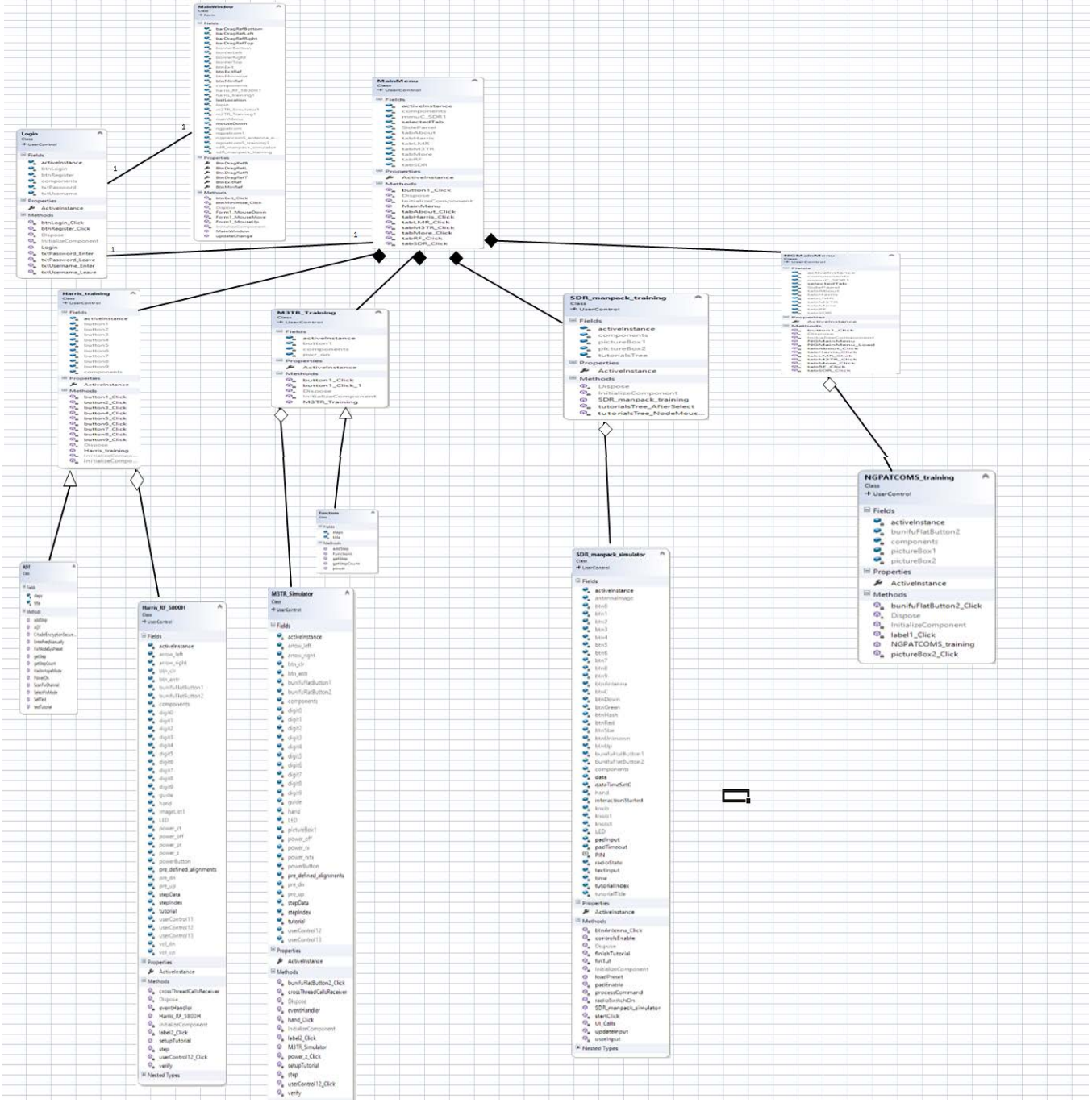
this document describes the priority design for understanding the concepts and to trdae off between the functions with the perfomance and security parametere as it leads to over all efficacy.

3.10 SEATS Architecture Descriptions

In this section, the overall architecture of the SEATS is discussed, including the introduction of various components and subSEATSs. It is mainly supported by SEATS Architecture diagram which shows an insider's perspective of the SEATS by describing the high level software components that perform the major functions to make the SEATS operational. Purpose of SEATS project is primarily be focusing on the training of soldiers to understand the concept of various signal equipment, configuration, communication and simulation. It will not only allow the soldiers to gain the knowledge of equipment but will allow them to pace with the modern technology like other modern armies in the world. It will also help soldiers to understand the concept of GUI based SEATS which is otherwise very useful for the modern soldier.

3.10.1 Over view of the model – Class Diagram

This section ponders upon the interrelationships and dependencies among various components. It is mainly described by a diagram which is further augmented by explanatory text. UML Class diagram also helps us understanding the SEATS structure.(needs working)



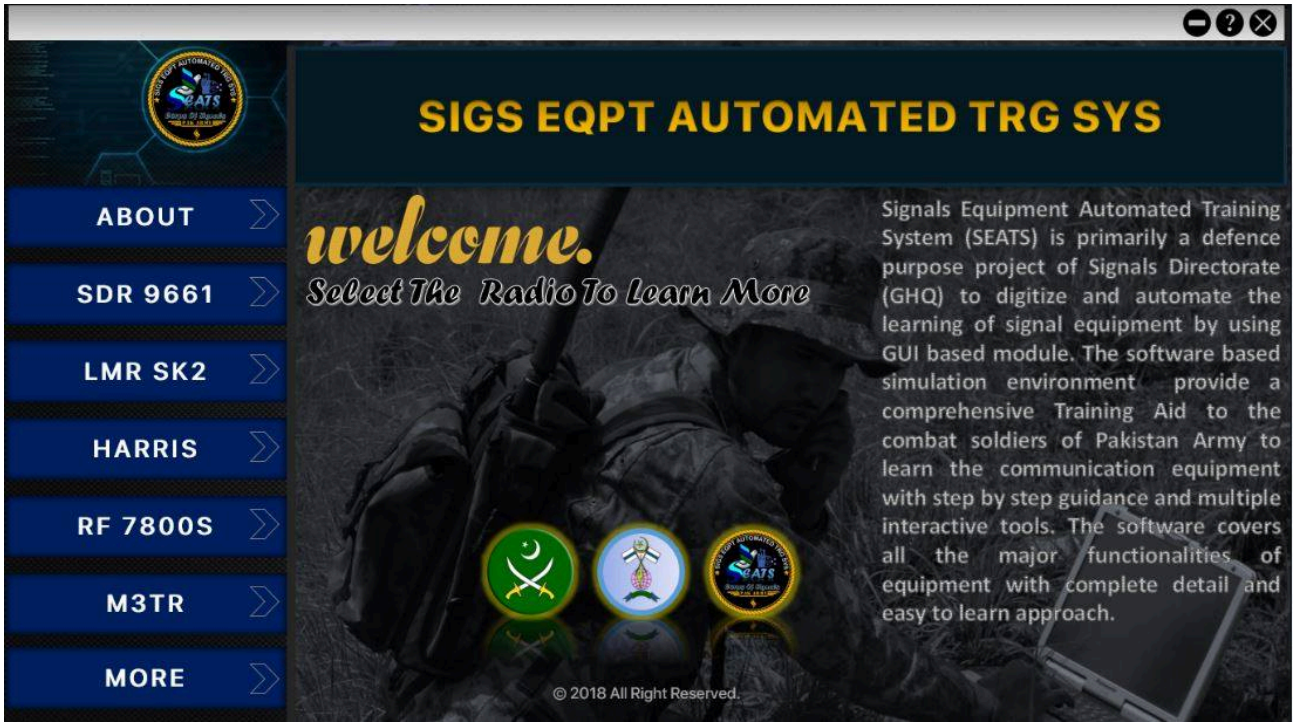
3.10.2 Explanation of Block Diagram

The SEATS architecture will mainly be in five basic modules "User", "SEATS", "database server" "authentication", "integrated module ". Block diagram provides an overview of the SEATS. User accessing the SEATS through the laptop/PC hardware will access the SEATS.

Once the login is succesfull then user has acces of all modules and their sub modules. The sub-modules of the Block diagram are further explained as under.

3.10.3 Selection of Module from Integrated Module

Our project is mostly based on two main modules. One is authentication and second is access of all sub modules (SDR,HARRIS,NGPATCOM and M3TR).



User uses the SEATS app and then chooses functionality according to their requirement. Users consist of anyone who accesses the SEATS.

3.10.4 SEATS Administrator

Since SEATS administrator is the one who is interacting so while having access and keeping his credentials secure can store all the relevant information and handle the SEATS SEATS.

3.10.5 Local Database server

A database stores all the data about the SEATS, users records, and performance measures.

3.10.6 Integrated modules

Since it is a combination of multiple equipments so all the modules (SDR,HARRIS,NGPATCOM and M3TR) will be available and further their functions are incorporated with all available information how to interacts with them.

Class Name	Descriptions
Main window	App class contains all the interface information related to SEATS sml to its adjustment and movement and placing of multiple function(border & bar left right up and down
Login	Class contains active instances and methods of login register password and username for proving legitimate user
Main Menu	Class contains all the activities a user that he has to perform after selecting desired set.
SDR –Manpack-simulator	It includes the active instances used in sml and the function which are being performed in sml like on of antenna fixing, user input and radio switch on etc.
SDR-Manpack Training	It contains all the information of active instances of components and tutorials along pictures and the method which we are going to perform after selecting these functions.
HARRIS_RF_5800H	It includes the active instances used in sml (LED,power,tutorial,guide,components) and the function which are being performed in sml like on of

	antenna fixing, user input and radio switch on etc.
NGPATCOM_training	It includes the active instances of different compnonets and its pictures and desired function on clicking those pictures
NGPATCOM_antenna	It contains instances of antenna fixing and the communication with the ground switch.
NGMainMenue	It includes the active instances used in sml (LED,power,tutorial,guide,components) and the function which are being performed in sml like on of antenna fixing, user input and radio switch on etc.
Harris_training	It represents functionalities of buttons of all relevant function used in HARRIS set.
ADT	It describes the main features of all functions which are included in set which is performed in all sets and can be integrated like add setup, encryption citedal scan fixing, self test etc
M3TR_training	It includes the active instances used in sml and the function which are being performed in sml like on of antenna fixing, user input and radio switch on etc.

3.11 SEATS Architecture

Layered Architecture **3-Tiers** will be used to implement SEATS. This will be composed of multiple processes, followed by different steps. Conceptually, the services can be seen as

components of the overall solution. However, internally, each service is made up of software components, for amalgamation of all these layers for linking into one another layers.

3.11.1 Layers Details

3.11.1.1 Presentation Layer

It provides a data representation layers for acquiring inout and accept and displayit is logical working apart and when login is granted after credentials then its woking is applied. It forms data to the end- user.

3.11.1.2 Logic Layer

When an access is granted it comes to logical layer SEATS which provides functioning assistance with manifestation is widely applied when different approaches are integrated and form an suit SEATS for subsequent one by one function at run time.

3.11.1.3 Data Access Layer

it receives request from the Service layers and responds according to the desired functions.

3.12 STRUCTURE AND REALTIONSHSIPS

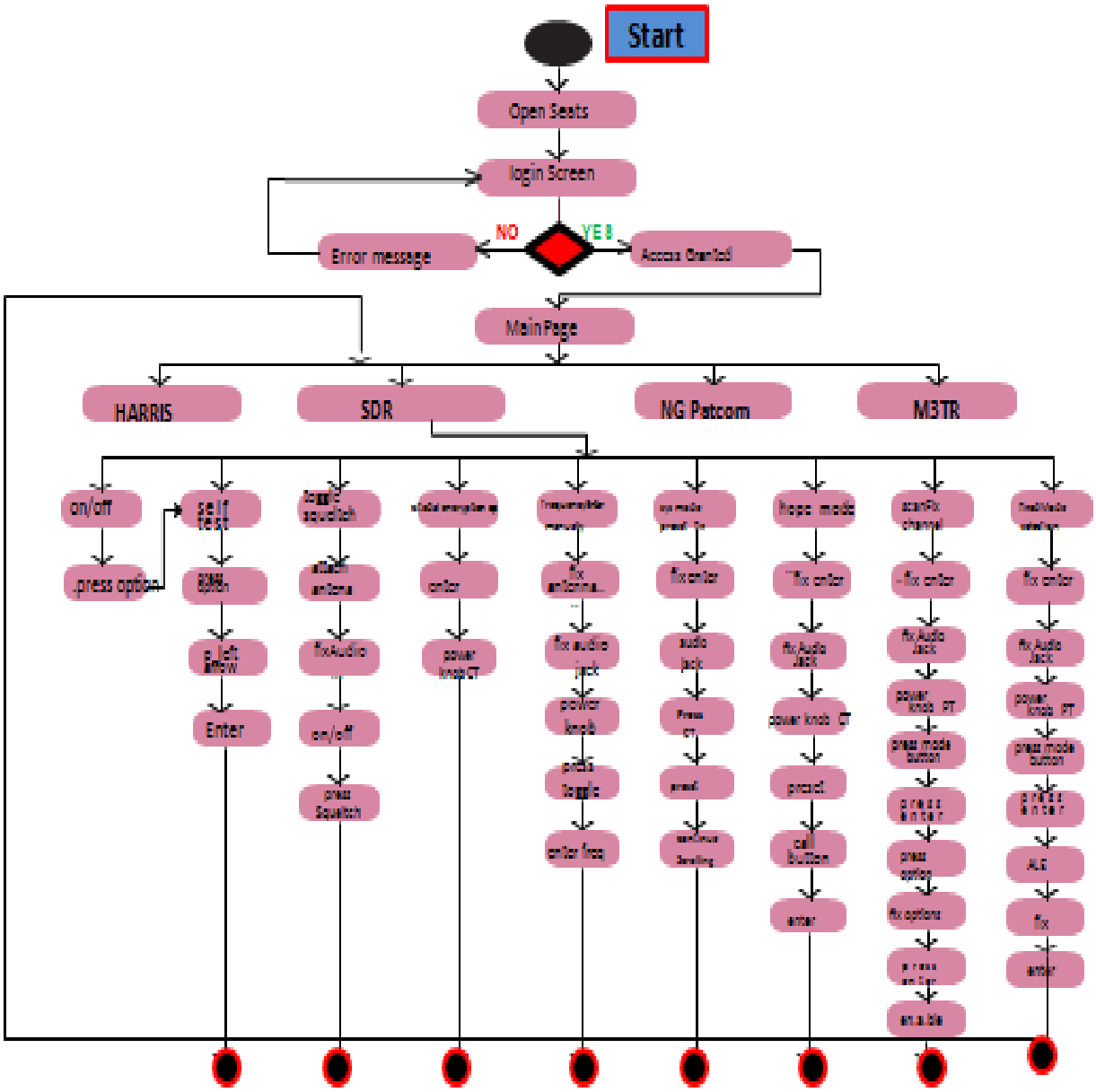
Focusing upon the internal structure of the SEATS, this section ponders upon the interrelationships and dependencies among various components

3.12.1 Overall logical view of the SEATS

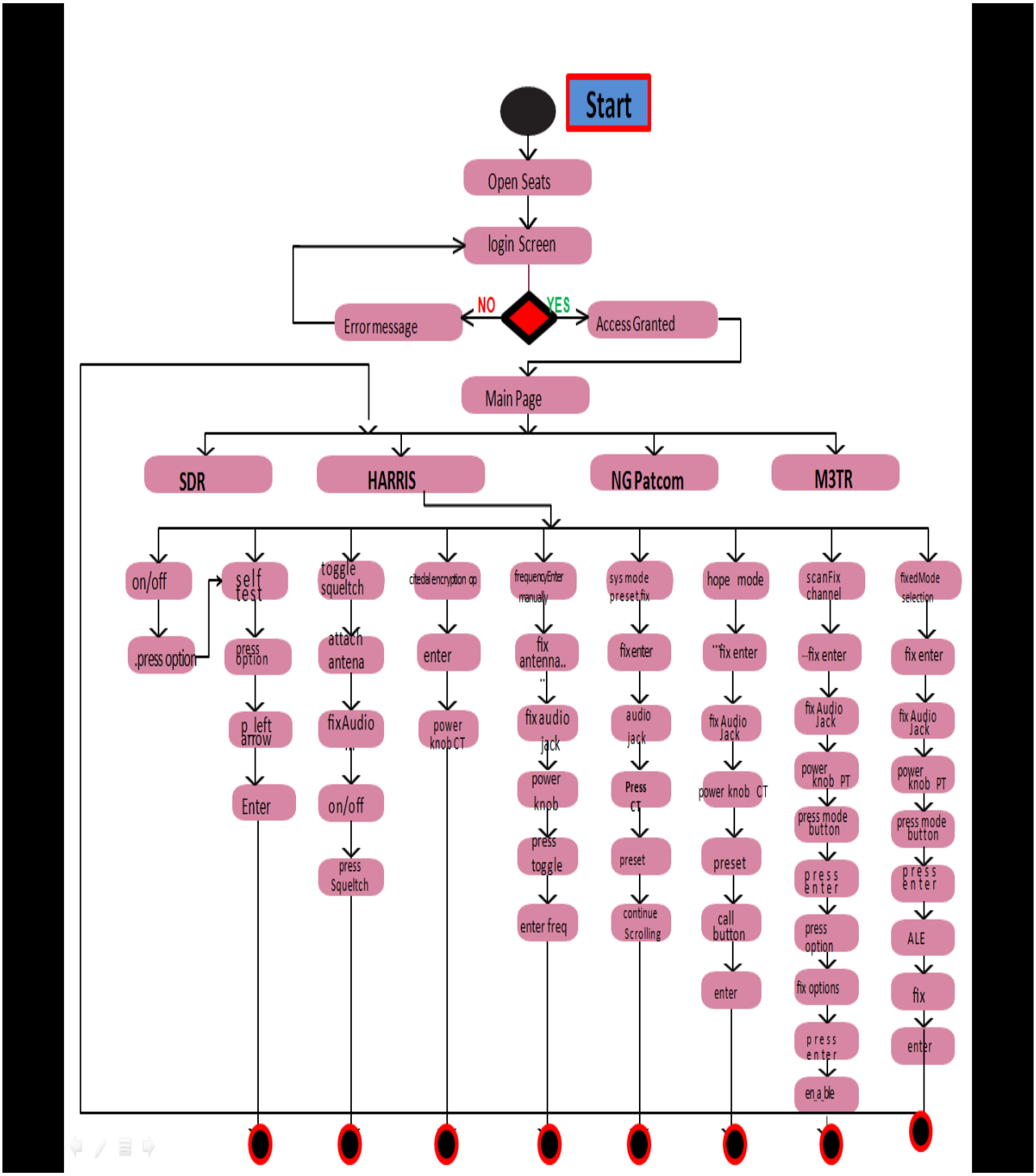
3.12.1.1 Activity Diagrams

The activity diagram below defines all the stream of activities a user can execute. A user need to login to use the SEATS.

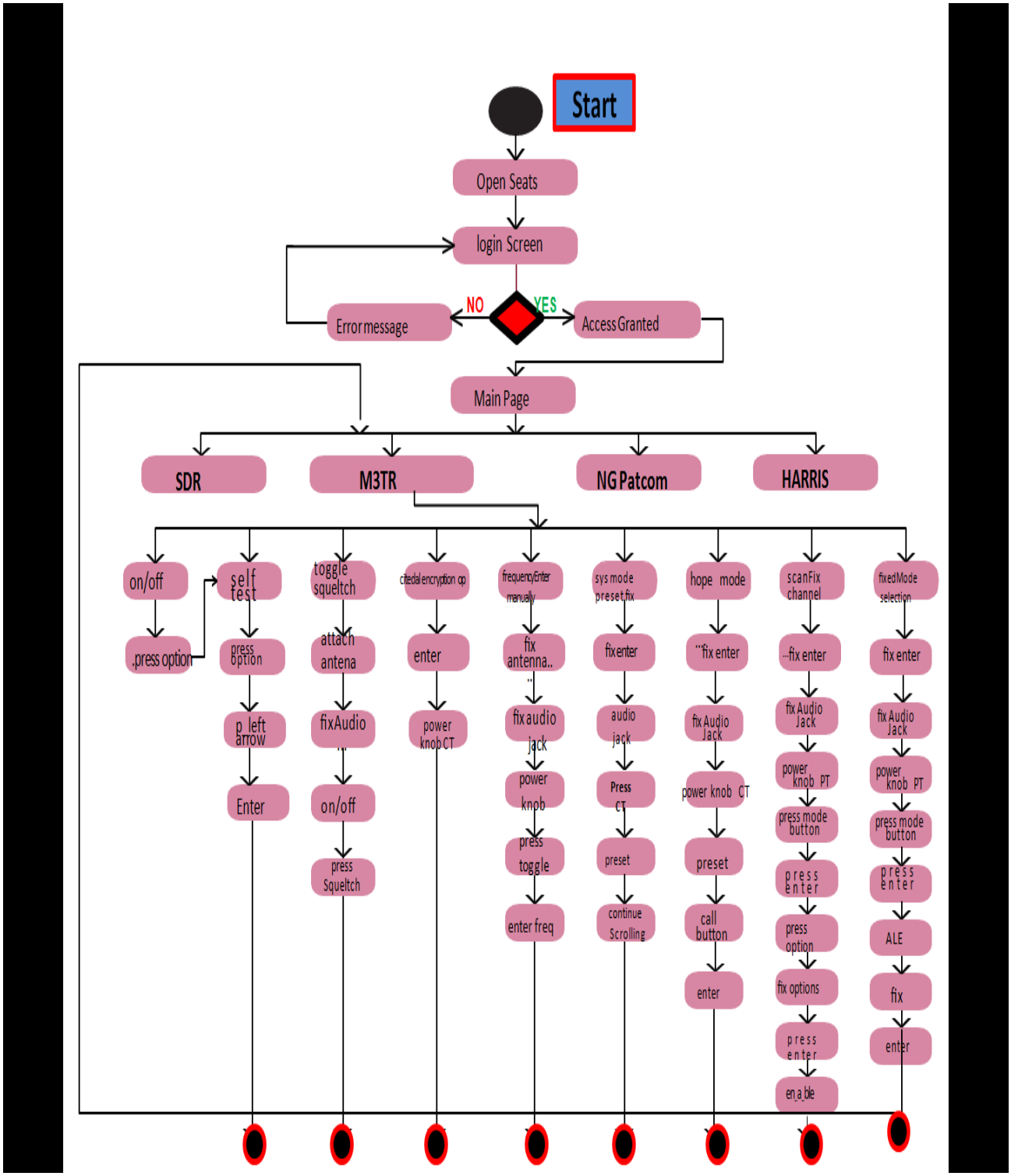
Activity diagram-SDR



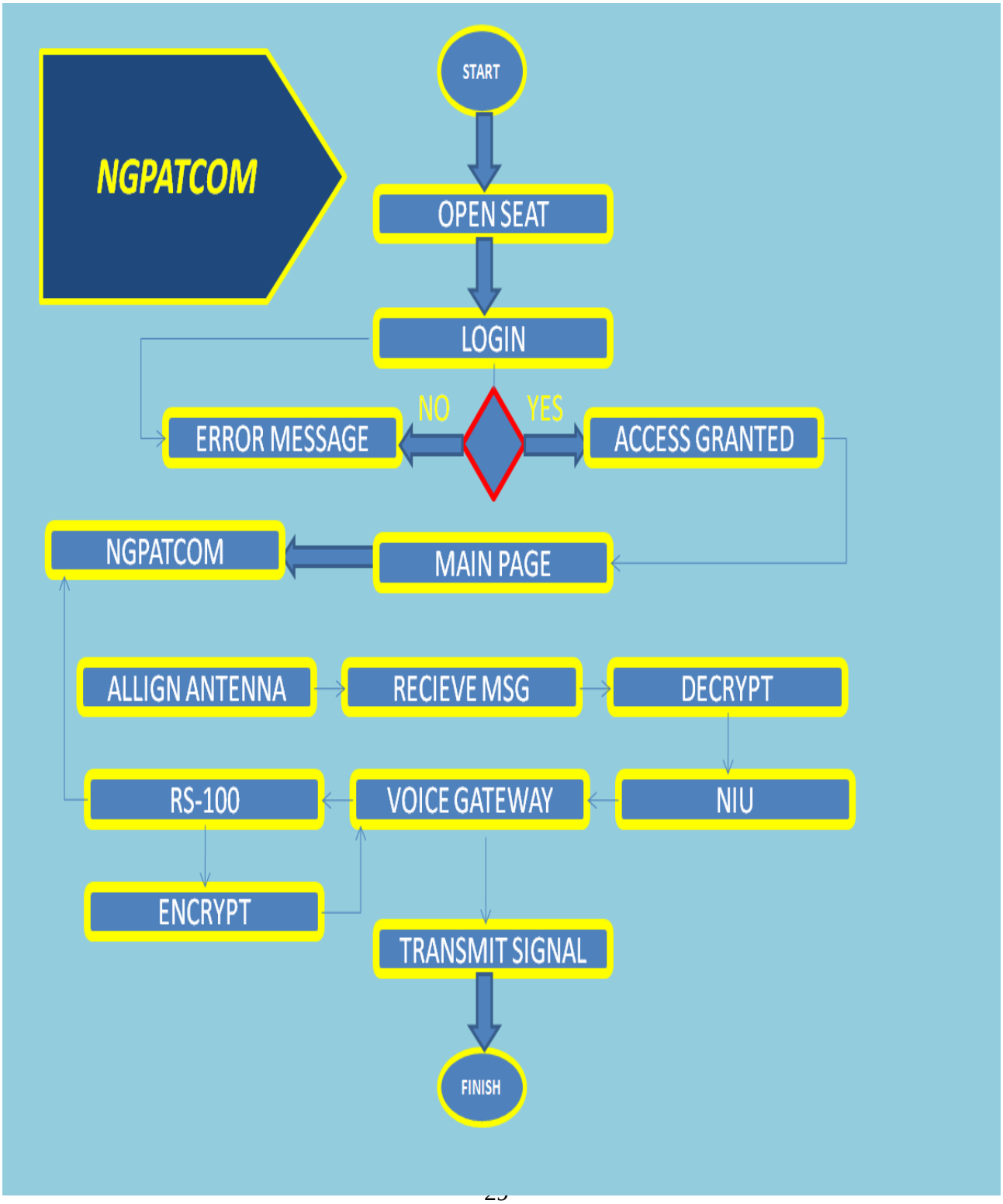
Activity Diagram-HARRIS



Activity Diagram-M3TR



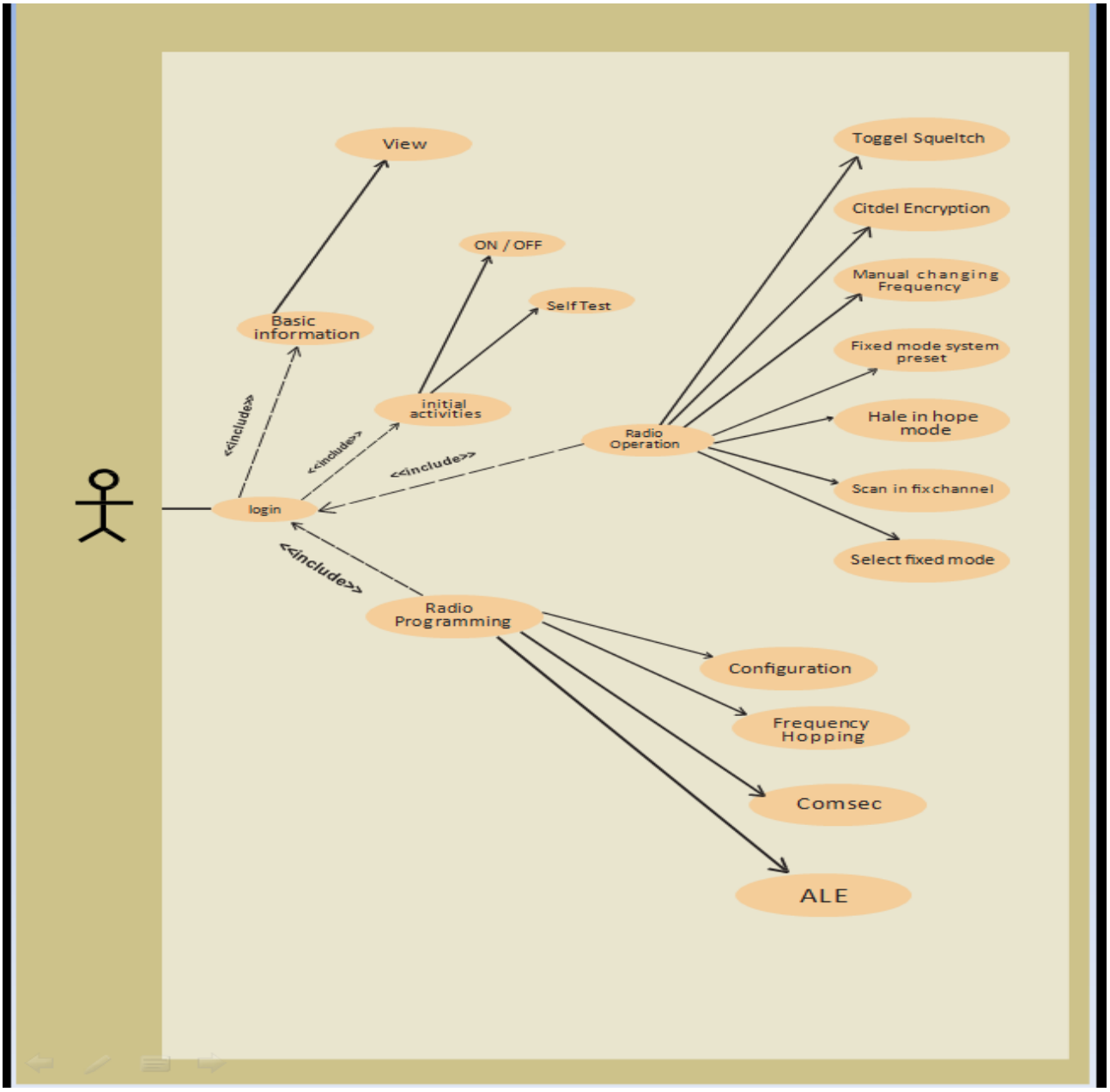
Activity Diagram- NGPATCOM



3.12.1.2 Use-case Diagrams

Use-cases describe the Actors of the SEATS and their actions. It gives the overview about how the factors outside the SEATS interact and what actions they perform on the SEATS.

Use-case Diagrams for SDR



Actors	Use-cases
User	1. Login 2. On/off 3. Self test 4. Toggle squelch 5. Frequency enter 6. Hop mode 7. Scan channel 8. Fixed scan mode 9. Citedal encryption

Use-case Descriptions

Login

Use-case ID:	1		
Use-case Name:	Login		
Actors:	User		
Created-By:	Salman	Last_Updated_By:	Salman
Date-Created:	17/11/2018	Date Last-Updated:	20/11/2018
Descriptions:	The user logins to the SEATS by entering credentials		
Preconditions:	The user has to start the app and open the login page first.		
Post conditions:	If the use case is successful, the user is now logged into the SEATS. If not the SEATS state remains unchanged.		
Normal Flow (primary scenario):	This use-case starts when user wishes to log into the SEATS. The SEATS requests that the user enter his/her name and		

	password. The administrator enters his/her name and password. The SEATS verifies the entered name and password from the database and logs the user into the SEATS.
Alternative Flows:	If the actor enters an invalid name and/or password, the SEATS displays an error message. The user remains on the login page.

On/Off

Use-case ID	2		
Use-case Name	On/off		
Actors	User		
Created-By	Salman	**Last_Updated_By**	Group Members
Date-Created	19/11/2018	**Last-Updated**	19/11/2018
Descriptions	The actor opens the on/off SEATS.		
Pre_Conditions	The actor has to open the SEATS on PC.		
Post_Conditions	If the use-case is successful the actor will be able to on and off , otherwise, the state remains unchanged.		
Normal Flow(Primary	The use-case starts when an actor opens SEATS. The actor opens the SEATS and on the set.		

Scenario)	

Self test

Use-case ID	3		
Use-case Name	Self test		
Actors	User		
Created-By	Group Members	**Last_Updated_By**	Group Members
Date-Created	19/11/2018	**Last-Updated**	19/11/2018
Descriptions	The actor opens the SEATS on PC		
Pre_Conditions	The actor has to open the SEATS on mobile first.		
Post_Conditions	If the use-case is successful for entering option of enter.		
Normal Flow(Primary Scenario)	The use-case starts when an actor opens the SEATS. ☐The actor opens the SEATS and enter opion is stored.		

Toggle Squeltch

Use-case ID	4
Use-case Name	Toggle squeltch

Actors	SEATS user		
Created-By	Group Members	**Last_Updated_By**	Group Members
Date-Created	19/11/2018	**Last-Updated**	19/11/2018
Descriptions	The actor opens the SEATS on PC.		
Pre_Conditions	The actor has to open the SEATS on PC .		
Post_Conditions	If the use-case is successful it will be able to fix antena and ready for on otherwise, the state remains unchanged.		
Normal Flow(Primary Scenario)	The use-case starts when an actor opens the SEATS. ☐The actor opens the SEATS and it will fix antena and press option of on/off		
Alternative Flows	The use-case starts when an actor opens SEATS. ☐The actor opens the SEATS and it will get the options wrt sml ☐If antena not fixed the toggle squelth press option will show to previous action.		

Citedal Encryption

Use-case ID	5
Use-case Name	Citedal encryption

Actors	User		
Created-By	Group Members	**Last_Updated_By**	Group Members
Date-Created	19/11/2018	**Last-Updated**	19/11/2018
Descriptions	The actor opens the SEATS on PC.		
Pre_Conditions	The actor has to open the SEATS on PC first and get front panel after login for encyption mode.		
Post_Conditions	If the use case is successful it will show succesfull encryption mode for communication if it is otherwise, the state remains as default.		
Normal Flow(Primary Scenario)	Use-case starts upon an actor opens the SEATS. ☐The actor opens the SEATS and it will get the succefull messgae displayed for encryption mode.		

Frequency outer

Use-case ID	6		
Use-case Name	Frequency enter		
Actors	SEATS user		
Created-By	Group Members	**Last_Updated_By**	Group Members
Date-Created	19/11/2018	**Last-Updated**	19/11/2018

Descriptions	The actor opens the SEATS on PC.
Pre_Conditions	The actor has to open the SEATS on PC after login for access first and go topanels.
Post_Conditions	If the use-case is successful it will provide the options of entering frequency for transmission.
Normal Flow(Primary Scenario)	The use-case starts when an actor opens the SEATS. With panel ☐The actor opens the SEATS and it will get the mode of entering frequency.

Hope mode

Use-case ID	7		
Use-case Name	Hope Mode		
Actors	SEATS user		
Created-By	Group Members	**Last_Updated_By**	Group Members
Date-Created	19/11/2018	**Last-Updated**	19/11/2018
Descriptions	The actor opens the SEATS on PC.		
Pre_Conditions	The actor has to open the SEATS on PC after login for access first and go to panels.		
Post_Conditions	If the use case is successful it will provide the options of hope mod for transmission.		

Normal Flow(Primary Scenario)	The use-case starts when an actor opens the SEATS. With panel ☐The actor opens the SEATS and it will get the modehope options.

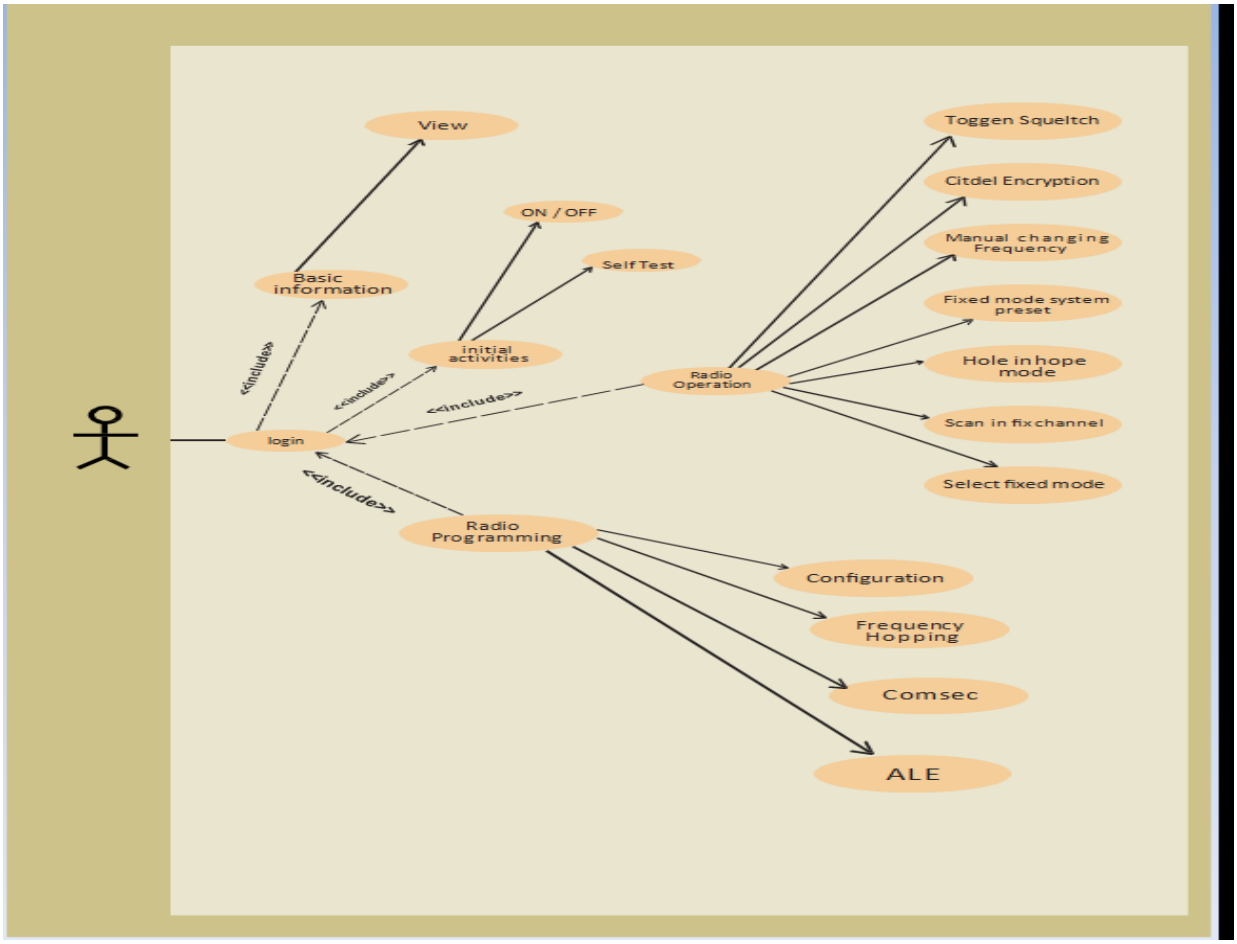
Scan for channel

Use-case ID	8		
Use-case Name	Scan fix channel		
Actors	SEATS user		
Created-By	Group Members	**Last_Updated_By**	Group Members
Date-Created	19/11/2018	**Last-Updated**	19/11/2018
Descriptions	The actor opens the SEATS on PC.		
Pre_Conditions	The actor has to open the SEATS on PC after login for access first and go to panels.		
Post_Conditions	If the use case is successful it will provide the options of scan mode for transmission.		
Normal Flow(Primary Scenario)	The use-case starts when an actor opens the SEATS. With panel ☐The actor opens the SEATS and it will get the scan mode options.		

Scan for fix

Use-case ID	9		
Use-case Name	Scan fix channel		
Actors	SEATS user		
Created-By	Group Members	**Last_Updated_By**	Group Members
Date-Created	19/11/2018	**Last-Updated**	19/11/2018
Descriptions	The actor opens the SEATS on PC.		
Pre_Conditions	The actor has to open the SEATS on PC after login for access first and go to panels.		
Post_Conditions	If the use case is successful it will provide the options of scan fix channel for transmission.		
Normal Flow(Primary Scenario)	The use-case starts when an actor opens the SEATS. With panel ☐The actor opens the SEATS and it will get the scan fix options.		

Use-case Diagrams for HARRIS



Actors	Use-cases
User	Login On/off Self test Toggle squelch Frequency enter

	Hope mode Scan channel Fixed scan mode Citedal encryption

Use-case Descriptions

Login

Use-case ID:	1		
Use-case Name:	Login		
Actors:	User		
Created-By:	Salman	Last_Updated_By:	Salman
Date-Created:	17/11/2018	Date Last-Updated:	20/11/2018
Descriptions:	The user logins to the SEATS by entering credentials		
Preconditions:	The user has to start the app and open the login page first.		
Post conditions:	If the use case was successful, the user is now logged into the SEATS. If not the SEATS state remains unchanged.		
Normal Flow (primary scenario):	This use-case starts when user wishes to log into the SEATS. The SEATS requests that the user enter his/her name and password. The administrator enters his/her name and password. The SEATS verifies the entered name and password from the database and logs the user into the SEATS.		

Alternative Flows:	If the actor enters an invalid name and/or password, the SEATS displays an error message. The user remains on the login page.

On/Off

Use-case ID	2		
Use-case Name	On/off		
Actors	User		
Created-By	Salman	**Last_Updated_By**	Group Members
Date-Created	19/11/2018	**Last-Updated**	19/11/2018
Descriptions	The actor opens the on/off SEATS.		
Pre_Conditions	The actor has to open the SEATS on PC.		
Post_Conditions	If the use-case is successful the actor will be able to on and off , otherwise, the state remains unchanged.		
Normal Flow(Primary Scenario)	The use-case starts when an actor opens SEATS. ☐ The actor opens the SEATS and on the set.		

Self Test

Use-case ID	3		
Use-case Name	Self test		
Actors	Mobile SEATS		
Created-By	Group Members	**Last_Updated_By**	Group Members
Date-Created	19/11/2018	**Last-Updated**	19/11/2018
Descriptions	The actor opens the SEATS on PC		
Pre_Conditions	The actor has to open the SEATS on mobile first.		
Post_Conditions	If the use-case is successful for entering option of enter.		
Normal Flow(Primary Scenario)	The use case starts when an actor opens the SEATS. The actor opens the SEATS and enter opion is stored.		

Toggle Squeltch

Use-case ID	4
Use-case Name	Toggle squeltch
Actors	Mobile SEATS user

Created-By	Group Members	**Last_Updated_By**	Group Members
Date-Created	19/11/2018	**Last-Updated**	19/11/2018
Descriptions	The actor opens the SEATS on PC.		
Pre_Conditions	The actor has to open the SEATS on PC .		
Post_Conditions	If the use-case is successful it will be able to fix antena and ready for on otherwise, the state remains unchanged.		
Normal Flow(Primary Scenario)	The use-case starts when an actor opens the SEATS. ☐ The actor opens the SEATS and it will fix antena and press option of on/off		
Alternative Flows	The use-case starts when an actor opens SEATS. ☐ The actor opens the SEATS and it will get the options wrt sml ☐ If antena not fixed the toggle squelth press option will show to previous action.		

Citedal Encryption

Use-case ID	5
Use-case Name	Citedal encryption
Actors	User

Created-By	Group Members	**Last_Updated_By**	Group Members
Date-Created	19/11/2018	**Last-Updated**	19/11/2018
Descriptions	The actor opens the SEATS on PC.		
Pre_Conditions	The actor has to open the SEATS on PC first and get front panel after login for encyption mode.		
Post_Conditions	If the use-case is successful it will show succesfull encryption mode for communication if it is otherwise, the state remains unchanged.		
Normal Flow(Primary Scenario)	The use-case starts when an actor opens the SEATS. ☐The actor opens the SEATS and it will get the succefull messgae displayed for encryption mode.		

Enter Frequency

Use-case ID	6		
Use-case Name	Frequency enter		
Actors	SEATS user		
Created-By	Group Members	**Last_Updated_By**	Group Members
Date-Created	19/11/2018	**Last-Updated**	19/11/2018
Descriptions	The actor opens the SEATS on PC.		

Pre_Conditions	The actor has to open the SEATS on PC after login for access first and go topanels.
Post_Conditions	If the use-case is successful it will provide the options of entering frequency for transmission.
Normal Flow(Primary Scenario)	The use-case starts when an actor opens the SEATS. With panel ☐The actor opens the SEATS and it will get the mode of entering frequency.

Hope Mode

Use-case ID	7		
Use-case Name	Hope Mode		
Actors	SEATS user		
Created-By	Group Members	**Last_Updated_By**	Group Members
Date-Created	19/11/2018	**Last-Updated**	19/11/2018
Descriptions	The actor opens the SEATS on PC.		
Pre_Conditions	The actor has to open the SEATS on PC after login for access first and go to panels.		
Post_Conditions	If the use-case is successful it will provide the options of hope mod for transmission.		
Normal	The use-case starts when an actor opens the SEATS. With panel		

Flow(Primary Scenario)	☐The actor opens the SEATS and it will get the modehope options.

Scan Channel

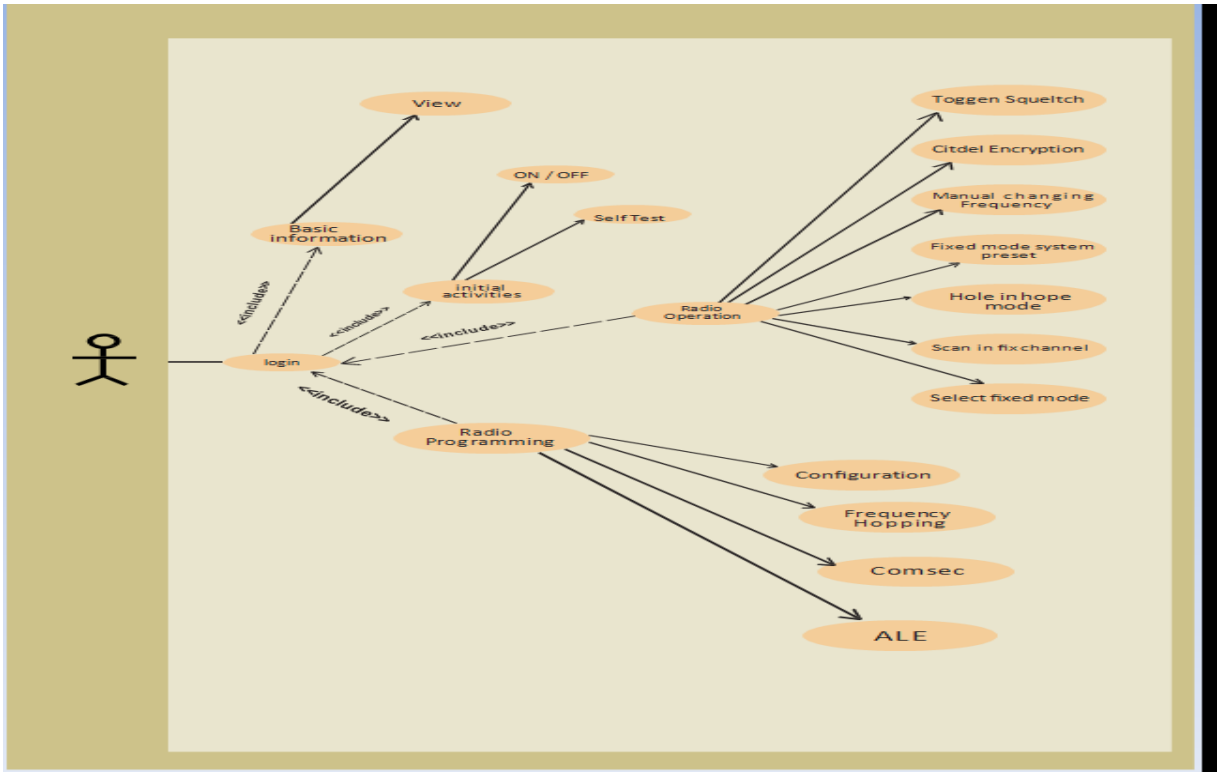
Use-case ID	8		
Use-case Name	Scan fix channel		
Actors	SEATS user		
Created-By	Group Members	**Last_Updated_By**	Group Members
Date-Created	19/11/2018	**Last-Updated**	19/11/2018
Descriptions	The actor opens the SEATS on PC.		
Pre_Conditions	The actor has to open the SEATS on PC after login for access first and go to panels.		
Post_Conditions	If the use-case is successful it will provide the options of scan mode for transmission.		
Normal Flow(Primary Scenario)	The use-case starts when an actor opens the SEATS. With panel ☐The actor opens the SEATS and it will get the scan mode options.		

Scan Channel

Use-case ID	9

Use-case Name	Scan fix channel		
Actors	SEATS user		
Created-By	Group Members	**Last_Updated_By**	Group Members
Date-Created	19/11/2018	**Last-Updated**	19/11/2018
Descriptions	The actor opens the SEATS on PC.		
Pre_Conditions	The actor has to open the SEATS on PC after login for access first and go to panels.		
Post_Conditions	If the use-case is successful it will provide the options of scan fix channel for transmission.		
Normal Flow(Primary Scenario)	The use-case starts when an actor opens the SEATS. With panel ☐The actor opens the SEATS and it will get the scan fix options.		

Use-case Diagrams for M3TR



Actors	Use-cases
User	10. Login 11. On/off 12. Self test 13. Toggle squelch 14. Frequency enter 15. Hope mode 16. Scan channel 17. Fixed scan mode 18. Citedal encryption

Use-case Descriptions

Login

Use-case ID:	1		
Use-case Name:	Login		
Actors:	User		
Created-By:	Salman	Last_Updated_By:	Salman
Date-Created:	17/11/2018	Date Last-Updated:	20/11/2018
Descriptions:	The user logins to the SEATS by entering credentials		
Preconditions:	The user has to start the app and open the login page first.		
Post conditions:	If the use-case was successful, the user is now logged into the SEATS. If not the SEATS state remains unchanged.		
Normal Flow (primary scenario):	This use-case starts when user wishes to log into the SEATS. The SEATS requests that the user enter his/her name and password. The administrator enters his/her name and password. The SEATS verifies the entered name and password from the database and logs the user into the SEATS.		
Alternative Flows:	If the actor enters an invalid name and/or password, the SEATS displays an error message. The user remains on the login page.		

ON/Off

Use-case ID	2		
Use-case Name	On/off		
Actors	User		
Created-By	Salman	**Last_Updated_By**	Group Members
Date-Created	19/11/2018	**Last-Updated**	19/11/2018
Descriptions	The actor opens the on/off SEATS.		
Pre_Conditions	The actor has to open the SEATS on PC.		
Post_Conditions	If the use-case is successful the actor will be able to on and off , otherwise, the state remains unchanged.		
Normal Flow(Primary Scenario)	The use-case starts when an actor opens SEATS. ☐The actor opens the SEATS and on the set.		

Self/Test

Use-case ID	3
Use-case Name	Self test

Actors	Mobile SEATS		
Created-By	Group Members	**Last_Updated_By**	Group Members
Date-Created	19/11/2018	**Last-Updated**	19/11/2018
Descriptions	The actor opens the SEATS on PC		
Pre_Conditions	The actor has to open the SEATS on mobile first.		
Post_Conditions	If the use-case is successful for entering option of enter.		
Normal Flow(Primary Scenario)	The use-case starts when an actor opens the SEATS. ☐The actor opens the SEATS and enter opion is stored.		

Toggle Squeltch

Use-case ID	4		
Use-case Name	Toggle squeltch		
Actors	Mobile SEATS user		
Created-By	Group Members	**Last_Updated_By**	Group Members
Date-Created	19/11/2018	**Last-Updated**	19/11/2018
Descriptions	The actor opens the SEATS on PC.		
Pre_Conditions	The actor has to open the SEATS on PC .		

Post_Conditions	If the use-case is successful it will be able to fix antena and ready for on otherwise, the state remains unchanged.
Normal Flow(Primary Scenario)	The use-case starts when an actor opens the SEATS. ☐The actor opens the SEATS and it will fix antena and press option of on/off
Alternative Flows	The use-case starts when an actor opens SEATS. ☐The actor opens the SEATS and it will get the options wrt sml ☐If antena not fixed the toggle squelth press option will show to previous action.

Citedal Encryption

Use-case ID	5		
Use-case Name	Citedal encryption		
Actors	User		
Created-By	Group Members	**Last_Updated_By**	Group Members
Date-Created	19/11/2018	**Last-Updated**	19/11/2018
Descriptions	The actor opens the SEATS on PC.		
Pre_Conditions	The actor has to open the SEATS on PC first and get front panel after login		

	for encyption mode.
Post_Conditions	If the use-case is successful it will show succesfull encryption mode for communication if it is otherwise, the state remains unchanged.
Normal Flow(Primary Scenario)	The use-case starts when an actor opens the SEATS. ☐The actor opens the SEATS and it will get the succefull messgae displayed for encryption mode.

Enter Frequency

Use-case ID	6		
Use-case Name	Frequency enter		
Actors	SEATS user		
Created-By	Group Members	**Last_Updated_By**	Group Members
Date-Created	19/11/2018	**Last-Updated**	19/11/2018
Descriptions	The actor opens the SEATS on PC.		
Pre_Conditions	The actor has to open the SEATS on PC after login for access first and go topanels.		
Post_Conditions	If the use-case is successful it will provide the options of entering frequency for transmission.		
Normal	The use-case starts when an actor opens the SEATS. With panel		

Flow(Primary Scenario)	☐The actor opens the SEATS and it will get the mode of entering frequency.

Hope Mode

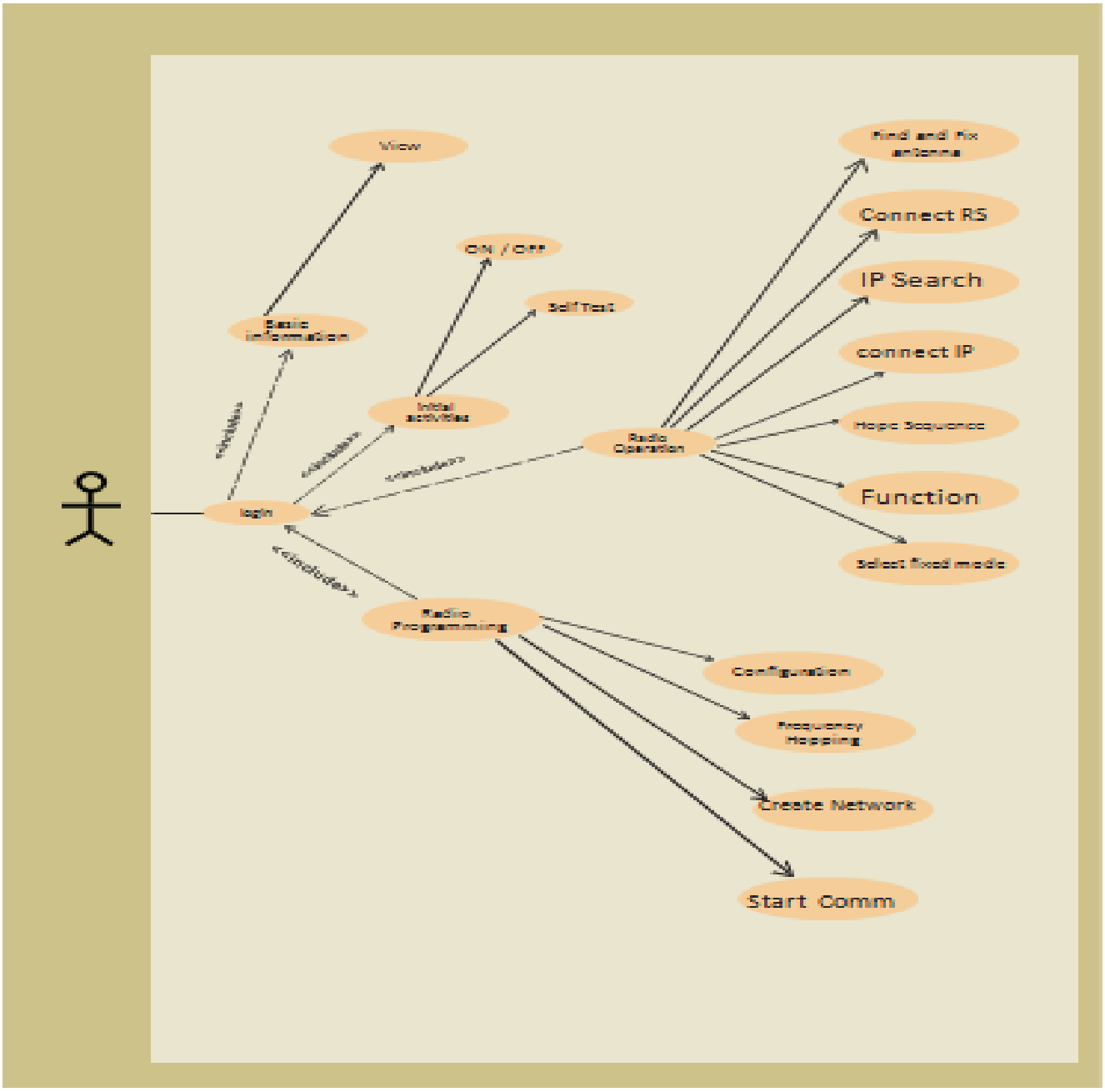
Use-case ID	7		
Use-case Name	Hope Mode		
Actors	SEATS user		
Created-By	Group Members	**Last_Updated_By**	Group Members
Date-Created	19/11/2018	**Last-Updated**	19/11/2018
Descriptions	The actor opens the SEATS on PC.		
Pre_Conditions	The actor has to open the SEATS on PC after login for access first and go to panels.		
Post_Conditions	If the use-case is successful it will provide the options of hope mod for transmission.		
Normal Flow(Primary Scenario)	The use-case starts when an actor opens the SEATS. With panel ☐The actor opens the SEATS and it will get the modehope options.		

Scan Fix

Use-case ID	8

Use-case Name	Scan fix channel		
Actors	SEATS user		
Created-By	Group Members	**Last_Updated_By**	Group Members
Date-Created	19/11/2018	**Last-Updated**	19/11/2018
Descriptions	The actor opens the SEATS on PC.		
Pre_Conditions	The actor has to open the SEATS on PC after login for access first and go to panels.		
Post_Conditions	If the use-case is successful it will provide the options of scan mode for transmission.		
Normal Flow(Primary Scenario)	The use-case starts when an actor opens the SEATS. With panel ☐The actor opens the SEATS and it will get the scan mode options.		

Use-case Diagrams for NGPATCOM



Actors	Use-cases
User	19. Login 20. On/off 21. Find and Fix Antenna 22. Connect RS(Radio Switch) 23. IP Search 24. Connect IP 25. Create Network 26. Create function 27. Hoping sequence 28. Start communication 29. Configuration

Use-case Descriptions

Login

Use-case ID:	1		
Use-case Name:	Login		
Actors:	User		
Created-By:	Salman	Last_Updated_By:	Salman
Date-Created:	17/11/2018	Date Last-Updated:	20/11/2018
Descriptions:	The user logins to the SEATS by entering credentials		
Preconditions:	The user has to start the app and open the login page first.		
Post conditions:	If the use-case was successful, the user is now logged into the SEATS. If not the SEATS state remains unchanged.		
Normal Flow	This use-case starts when user wishes to log into the SEATS.		

(primary scenario):	The SEATS requests that the user enter his/her name and password. The administrator enters his/her name and password. The SEATS verifies the entered name and password from the database and logs the user into the SEATS.
Alternative Flows:	If the actor enters an invalid name and/or password, the SEATS displays an error message. The user remains on the login page.

ON/Off

Use-case ID	2		
Use-case Name	On/off		
Actors	User		
Created-By	Salman	**Last_Updated_By**	Group Members
Date-Created	19/11/2018	**Last-Updated**	19/11/2018
Descriptions	The actor opens the on/off SEATS.		
Pre_Conditions	The actor has to open the SEATS on PC.		
Post_Conditions	If the use-case is successful the actor will be able to on and off , otherwise, the state remains unchanged.		
Normal **Flow(Primary**	The use-case starts when an actor opens SEATS. ☐The actor opens the SEATS and on the set.		

Scenario)	

Find & Fix Antenna

Use-case ID	3		
Use-case Name	Find & Fix Antenna		
Actors	Mobile SEATS		
Created-By	Group Members	**Last_Updated_By**	Group Members
Date-Created	19/11/2018	**Last-Updated**	19/11/2018
Descriptions	The actor opens the SEATS on PC		
Pre_Conditions	The actor has to open the SEATS on mobile first.		
Post_Conditions	If the use-case is successful for entering option of enter.		
Normal Flow(Primary Scenario)	The use-case starts when an actor opens the SEATS. ☐The actor opens the SEATS and enter opion is stored.		

Connect RS

Use-case ID	4

Use-case Name	Connect RS		
Actors	Mobile SEATS user		
Created-By	Group Members	**Last_Updated_By**	Group Members
Date-Created	19/11/2018	**Last-Updated**	19/11/2018
Descriptions	The actor opens the SEATS on PC.		
Pre_Conditions	The actor has to open the SEATS on PC .		
Post_Conditions	If the use-case is successful it will be able to fix antena and ready for on otherwise, the state remains unchanged.		
Normal Flow(Primary Scenario)	The use-case starts when an actor opens the SEATS. ☐The actor opens the SEATS and it will fix antena and press option of on/off		
Alternative Flows	The use-case starts when an actor opens SEATS. ☐The actor opens the SEATS and it will get the options wrt sml ☐If antena not fixed the toggle squelth press option will show to previous action.		

IP Search

Use-case ID	5

Use-case Name	IP Search		
Actors	User		
Created-By	Group Members	**Last_Updated_By**	Group Members
Date-Created	19/11/2018	**Last-Updated**	19/11/2018
Descriptions	The actor opens the SEATS on PC.		
Pre_Conditions	The actor has to open the SEATS on PC first and get front panel after login for encyption mode.		
Post_Conditions	If the use-case is successful it will show succesfull encryption mode for communication if it is otherwise, the state remains unchanged.		
Normal Flow(Primary Scenario)	The use-case starts when an actor opens the SEATS. ☐The actor opens the SEATS and it will get the succefull messgae displayed for encryption mode.		

Connect IP

Use-case ID	6		
Use-case Name	Connect IP		
Actors	SEATS user		
Created-By	Group Members	**Last_Updated_By**	Group Members

Date-Created	19/11/2018	**Last-Updated**	19/11/2018
Descriptions	The actor opens the SEATS on PC.		
Pre_Conditions	The actor has to open the SEATS on PC after login for access first and go topanels.		
Post_Conditions	If the use-case is successful it will provide the options of entering frequency for transmission.		
Normal Flow(Primary Scenario)	The use-case starts when an actor opens the SEATS. With panel ☐The actor opens the SEATS and it will get the mode of entering frequency.		

Create Network

Use-case ID	7		
Use-case Name	Create Network		
Actors	SEATS user		
Created-By	Group Members	**Last_Updated_By**	Group Members
Date-Created	19/11/2018	**Last-Updated**	19/11/2018
Descriptions	The actor opens the SEATS on PC.		
Pre_Conditions	The actor has to open the SEATS on PC after login for access first and go to panels.		

Post_Conditions	If the use-case is successful it will provide the options of hope mod for transmission.
Normal Flow(Primary Scenario)	The use-case starts when an actor opens the SEATS. With panel ☐The actor opens the SEATS and it will get the modehope options.

Create Function

Use-case ID	8		
Use-case Name	Create Function		
Actors	SEATS user		
Created-By	Group Members	**Last_Updated_By**	Group Members
Date-Created	19/11/2018	**Last-Updated**	19/11/2018
Descriptions	The actor opens the SEATS on PC.		
Pre_Conditions	The actor has to open the SEATS on PC after login for access first and go to panels.		
Post_Conditions	If the use-case is successful it will provide the options of scan mode for transmission.		
Normal Flow(Primary	The use-case starts when an actor opens the SEATS. With panel ☐The actor opens the SEATS and it will get the scan mode options.		

Scenario)	

Hoping Sequence

Use-case ID	9		
Use-case Name	Hopping Sequnce		
Actors	SEATS user		
Created-By	Group Members	**Last_Updated_By**	Group Members
Date-Created	19/11/2018	**Last-Updated**	19/11/2018
Descriptions	The actor opens the SEATS on PC.		
Pre_Conditions	The actor has to open the SEATS on PC after login for access first and go to panels.		
Post_Conditions	If the use-case is successful it will provide the options of scan fix channel for transmission.		
Normal Flow(Primary Scenario)	The use-case starts when an actor opens the SEATS. With panel ☐The actor opens the SEATS and it will get the scan fix options.		

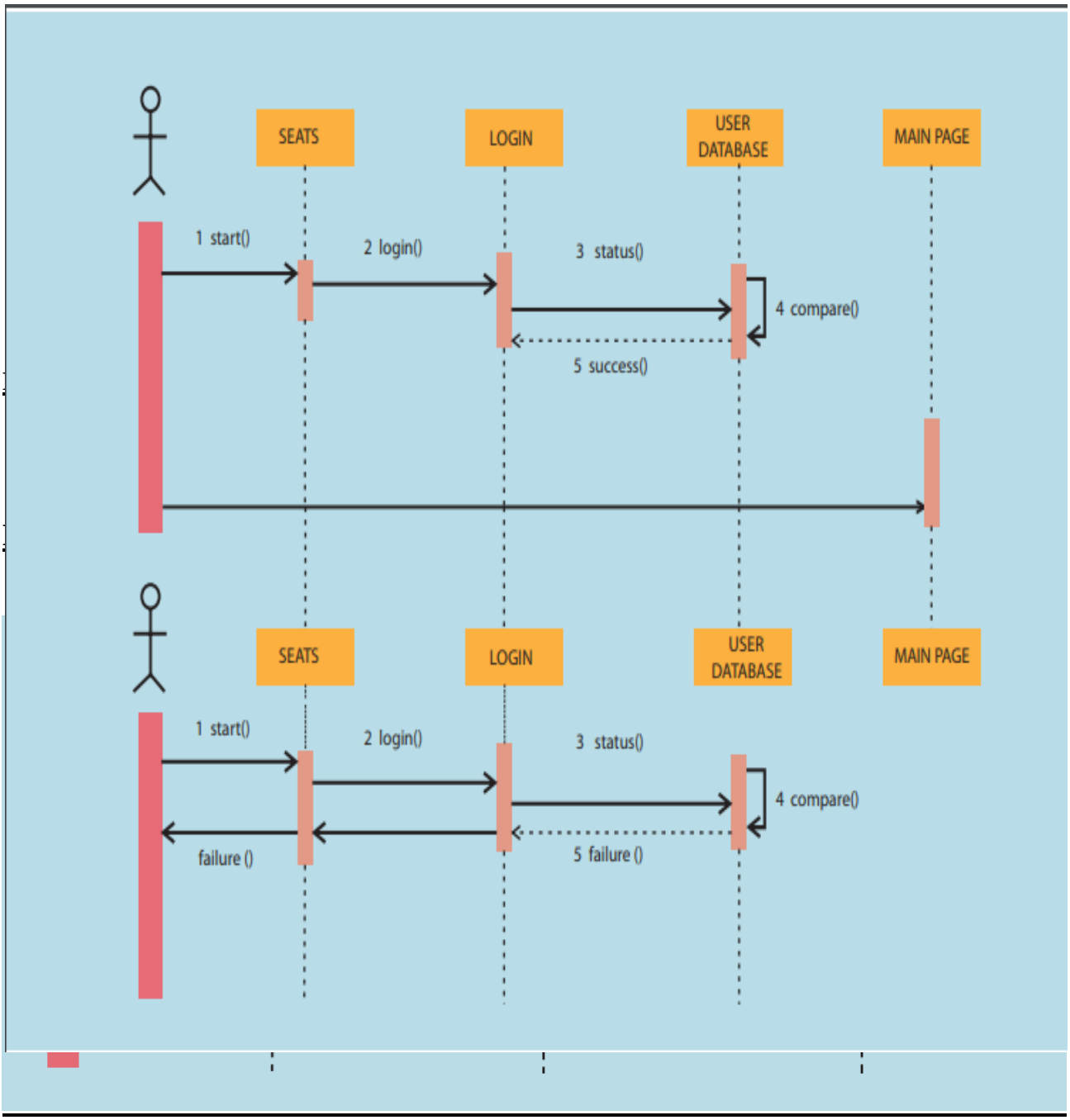
2.5.1 Start communication

Use-case ID	10
Use-case Name	Start Communication

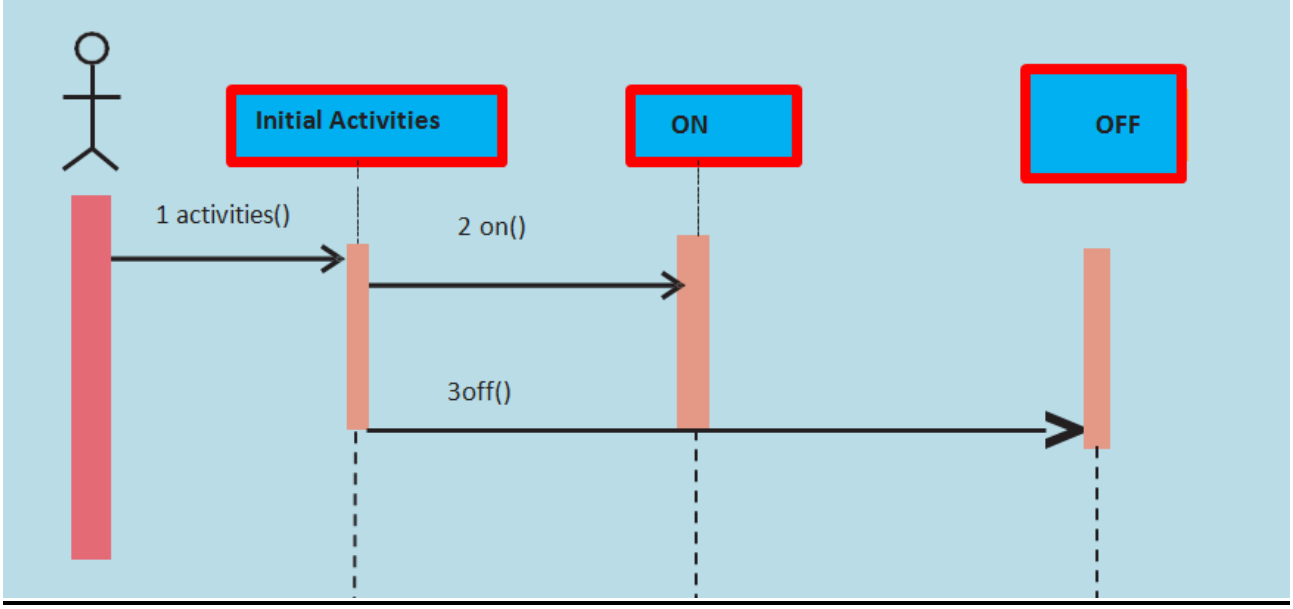
Actors	SEATS user		
Created-By	Group Members	**Last_Updated_By**	Group Members
Date-Created	19/11/2018	**Last-Updated**	19/11/2018
Descriptions	The actor opens the SEATS to communicate via Date or voice communication.		
Pre_Conditions	The actor has to open the SEATS on PC after login for access first and go topanels.		
Post_Conditions	If the use-case is successful it will provide the options of entering for transmission.		
Normal Flow(Primary Scenario)	The use-case starts when an actor opens the SEATS. With panel ☐ The actor opens the SEATS and it will get the mode of entering IP		

3.13.1 Dynamic View - Sequence Diagram

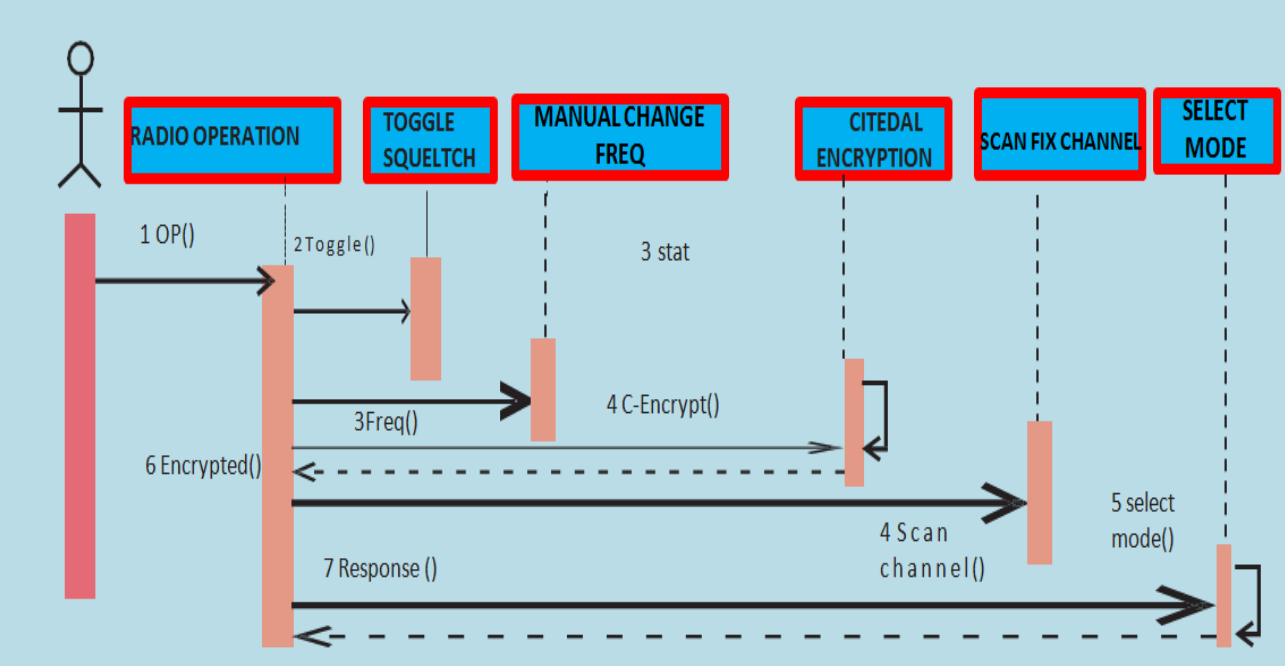
3.13.1.1 Login-Success & Failure



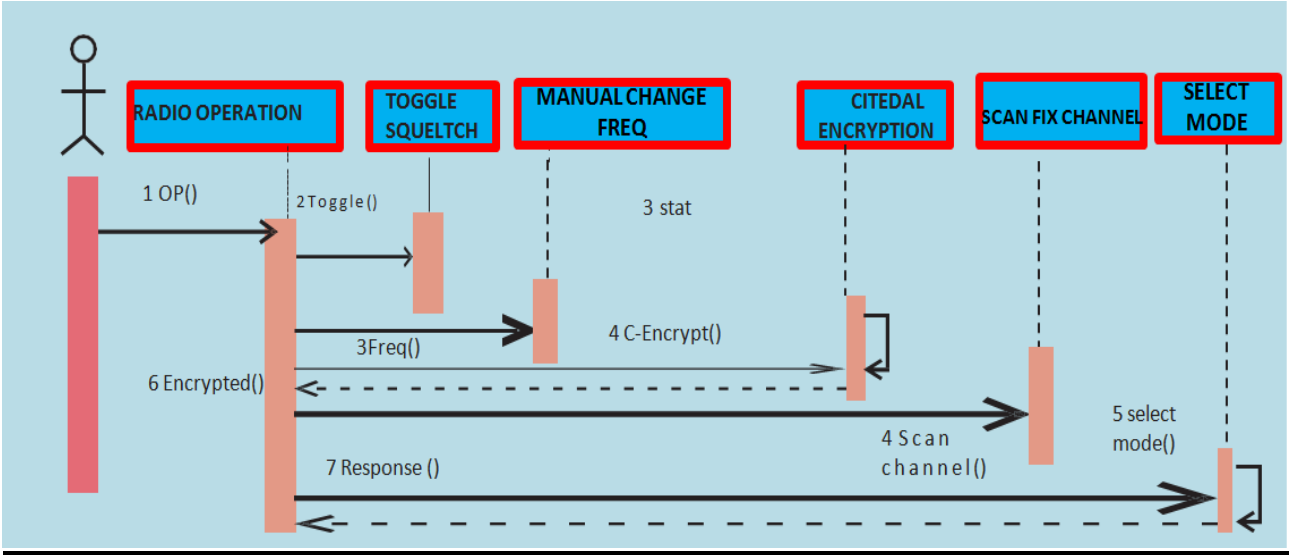
3.13.1.2 Initial Activities



3.13.1.3 Radio Operation

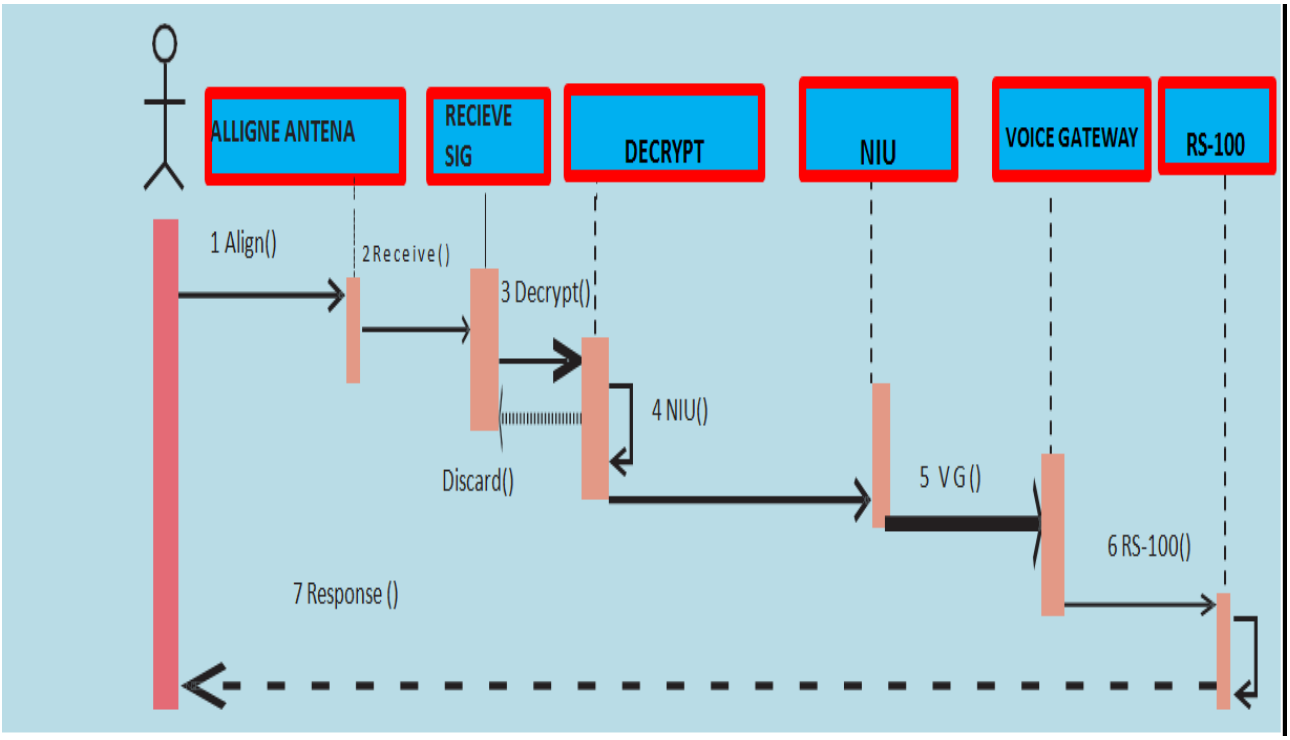


3.13.1.4 Radio Programming

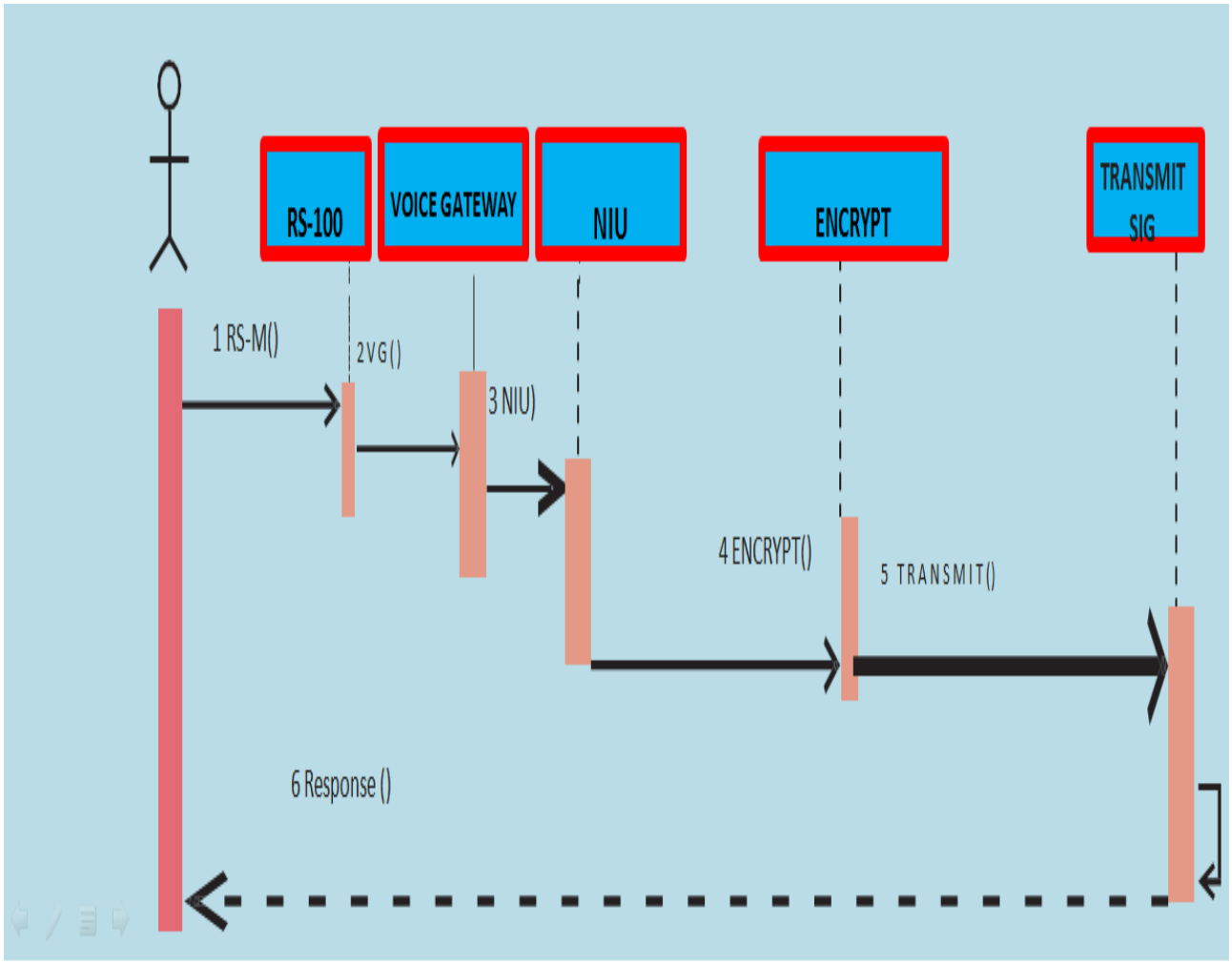


3.14.1 SEQUENCE DIAGRAME OF NGPATCOM

3.14.1.1 Receive Operation of NGPATCOM



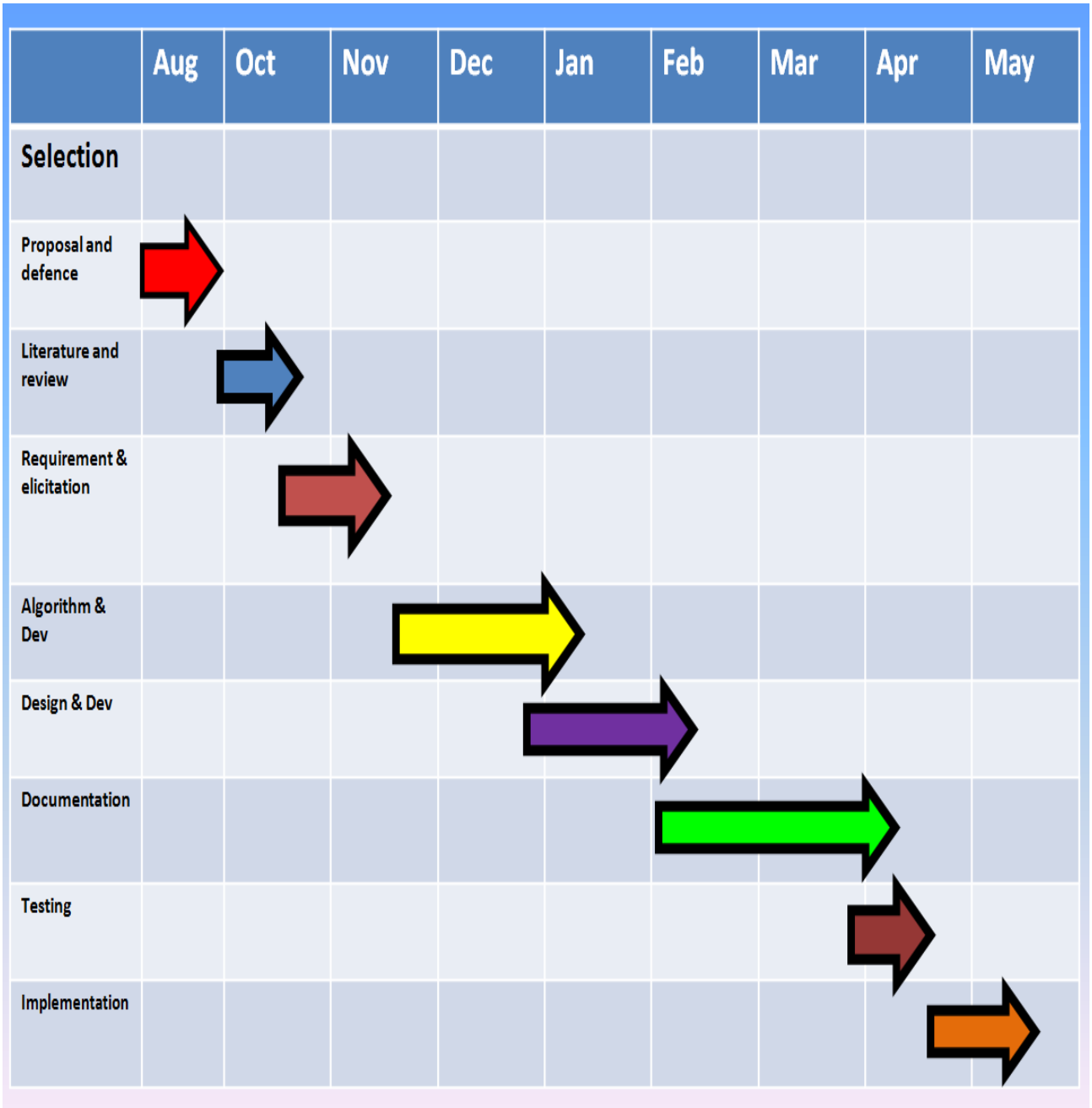
3.14.1.2 Transmit Operation of NGPATCOM



3.15 Reuse and Relationship to other SEATSs

This project will be reused in many other arms as well like wise firstly implemented on corps of signal only but with further it can be implemented in other arms on various sets under usage

3.16 Development plan



CHAPTER # 4

QUALITY ASSURANCE

4.1 Introduction

The planning of mentioned document describes the numerous methods, process and methodologieswhich are needed to execute and manage testing of the “Signal equipment automated training Systm (SEATS) " GUI based SEATS. The test plan will ensure the SEATS requirement and standards meets the end-users requirements at an desired level.

Manual Testing will be followed which includes testing a SEATS manually without using any automated tool. Each Unit will be tested separately and then will be integrated with other units; therefore, Unit Testing and Integration testing will be followed. For each unit, Black box Testing is done and for combined units Acceptance Testing is done.

The testing includes all functional, SEATS performance and use-cases requirements listed in the document. Software testing. desired effort to be made in such a manner that if any pasrt is required to be integrated at last level it shall be liable to add with minimal effort.

This document includes the plan, scope, approach and procedure the testing of “Signal equipment automated training system” SEATS. The pass/fail criteria of the method also cleared. The document target the required knowledge which very precisely used for SEATS.

4.2 Test Items

- Develop test cases.
- Execute tests based on manufactured use-cases for the software.
- described errors from the running test cases if found.
- Provide detailed test report.
- Incorporate or manages alterations in later time frame of the project.

4.3 Features required to be Tested

Following Features are tested:

- SEATS will be able to login from any selected stand-alone pc after logging secret password.

- SEATS will be able to demonstrate the SDR output display.
- SEATS will be able to show the HARRIS output display.
- SEATS will be able to preview the NGPATCOM output display.
- SEATS will be able to pop-up the M3TR output display.
- SEATS need to display the desired output for all these modules.
- SEATS will be integrated and run as one Suit.

4.4 Test Approaches

Acceptance test has to be relying upon based on this acceptance test . when this test is over then desired report is mentioned which demonstrate the simulator for accepting the suit or not:.

- **Unit test**. software developer are directed for integration and testing at single unit-level
- **Integration test**. when unit-test is completed then software developer is responsible for integration of all modules based on black or white-box-testing into one complete suit.
- **Positive and negative testing design technique**. after the both abvove mentioned tests then both tests are amalgamated and tested in real time scenarios for positive and real time scenarios.

4.5 Item Pass/ Fail Criteria

complete required details are incorporated and then following are the desired condition which has to be met for successful and failure criteria:-

- Pre-conditions are fulfilled
- In-puts are inserted as required
- The out-put is if matching requirement then output => Pass
- The SEATS is not coming to desired out-put => Fail.

4.6 Suspension Criteria and Resumption Requirements

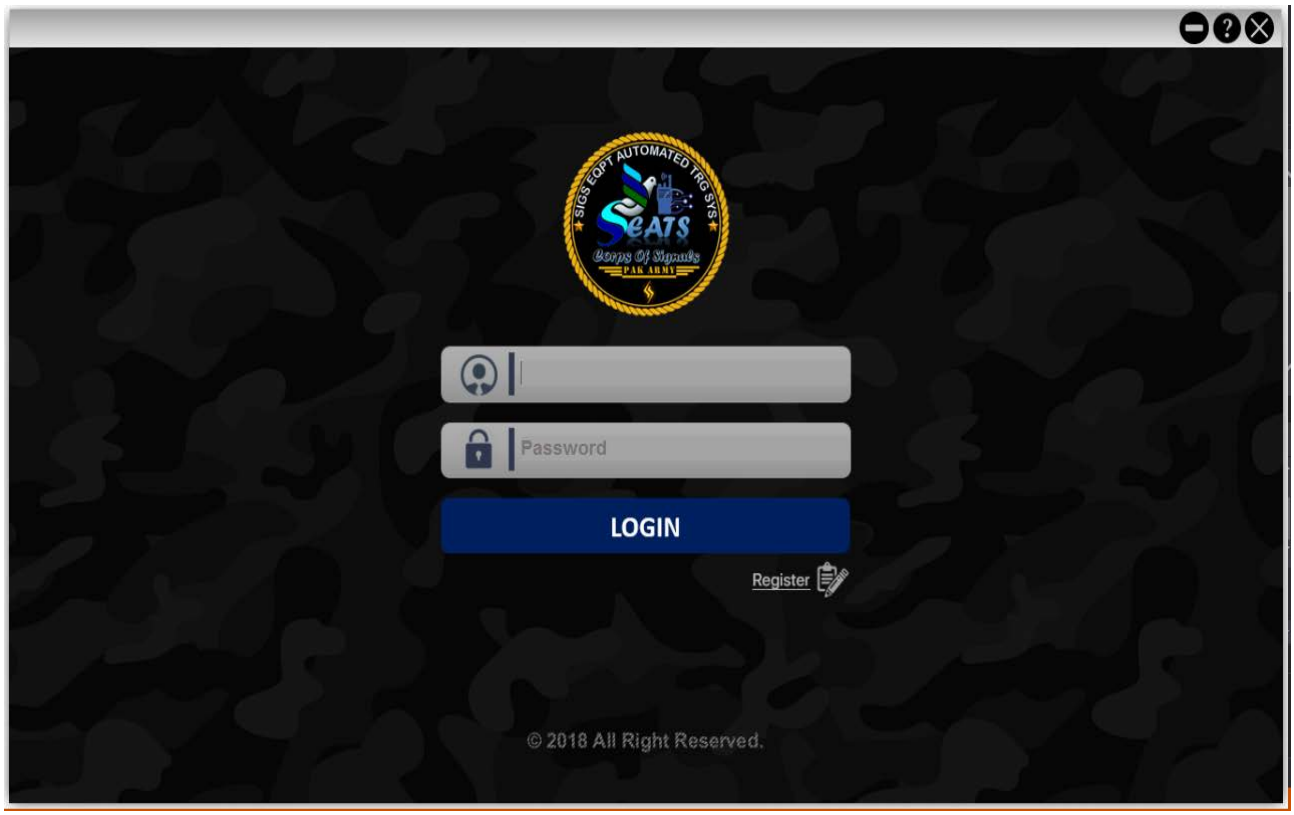
Any bugs found can be fixed by developers quickly and no need to start the testing process from the beginning. However, when major bugs will block some test cases as they are interdependent and the testing has to be paused.

4.7 Test Deliverables

Following are the Test Cases:

4.4 User Interface Testing:

Test-Case #	01
Test-Case Name	Open SEATS
Descriptions	Testing SEATS whether it runs on PC or not.
Testing Technique	Unit testing, Black Box Testing
Preconditions	SEATS must be installed on PC with windows 7 or higher and .NET framework 4.5 or above
Input Values	User name and password
Steps	• Click on seats icon. • Enter username and password. • Click login button.
Expected output	SEATS main menu will open.
Actual output	Main menu opened showing different modules added.
Status	Test-Case passed successfully.


SIGS EQPT AUTOMATED TRG SYS
SeATS
Corps Of Signals
PAK ARMY
Password
LOGIN
Register
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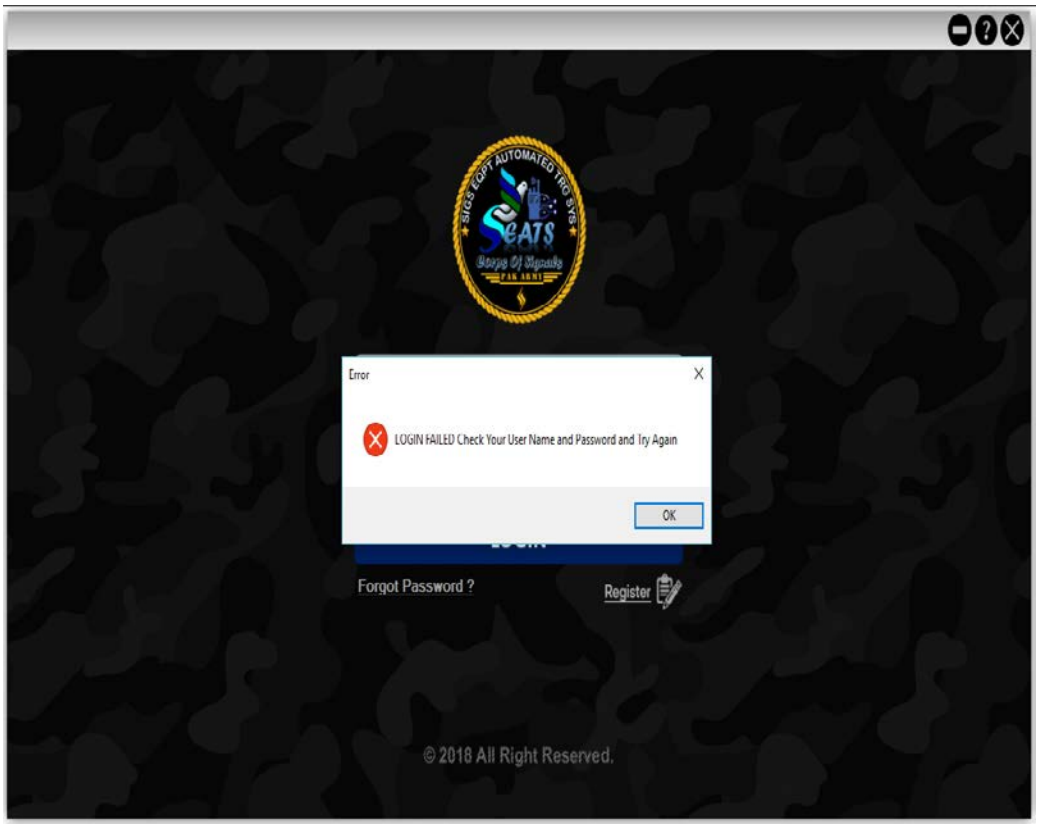
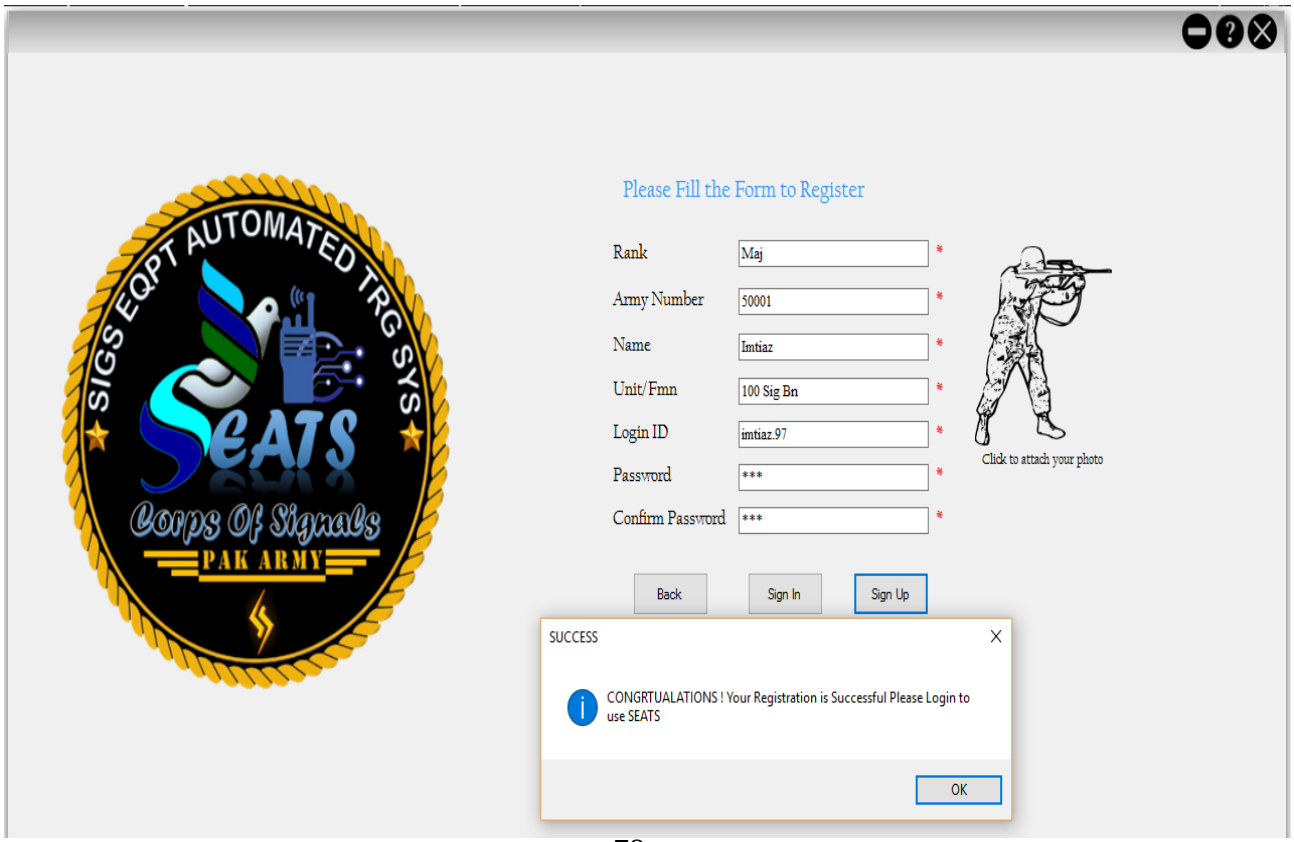
SIGS EQPT AUTOMATED TRG SYS
M3TR
HARRIS
SDR-9661
NGPATCOM HCLOS
NGPATCOM PCU
NGPATCOM NIU
NGPATCOM RS-100
NGPATCOM VG-100
NGPATCOM CUCM
ABOUT
welcome.
Select The Radio To Learn More
Signals Equipment Automated Training System (SEATS) is primarily a defence purpose project of Signals Directorate (GHQ) to digitize and automate the learning of signal equipment by using GUI based module. The software based simulation environment provide a comprehensive Training Aid to the combat soldiers of Pakistan Army to learn the communication equipment with step by step guidance and multiple interactive tools. The software covers all the major functionalities of equipment with complete detail and easy to learn approach.
© 2018 All Right Reserved.

Test-Case #	02
Test-Case Name	Open SEATS
Descriptions	Testing SEATS whether it runs on PC or not.
Testing Technique	Unit testing, Black Box Testing
Preconditions	SEATS must be installed on PC with windows 7 or higher and .NET framework 4.5 or above
Input Values	Incorrect User name/ password
Steps	• Click on seats icon. • Enter username and password. • Click login button.
Expected output	SEATS main menu will not open.
Actual output	Error message generated.
Status	Test-Case passed successfully.

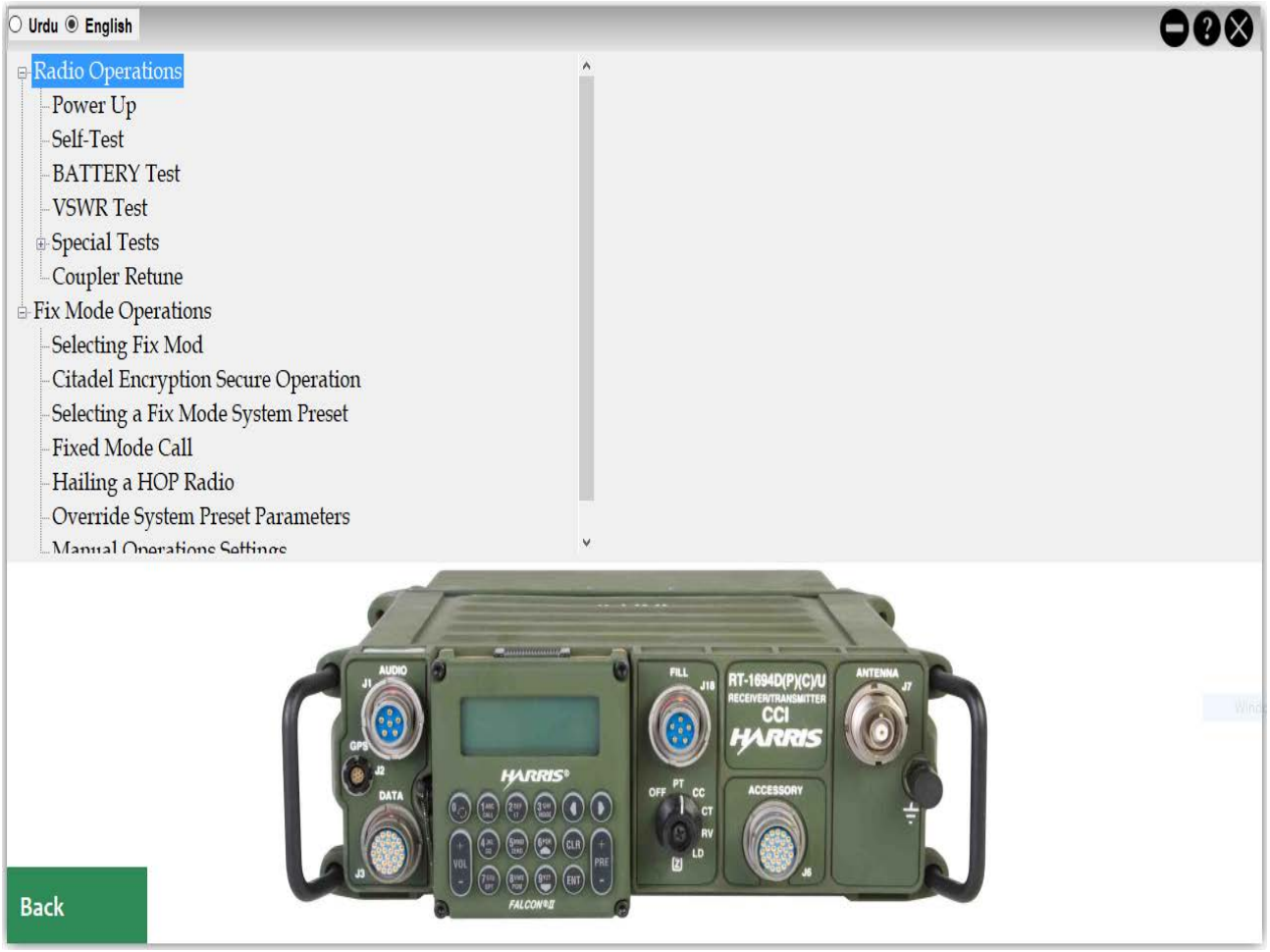


Test-Case #	03
Test-Case Name	Database test case
Descriptions	Testing function by Maintaining/Registering database of users.
Testing Technique	Unit testing, Black Box Testing
Preconditions	SEATS must be installed on PC with windows 7 or higher and .NET framework 4.5 or above
Input Values	Service number, Name ,Unit, Formation, Age
Steps	• Click on seats icon. • Click on register. • Enter particulars. • Save particulars
Expected output	Interface should be displayed with successful message .
Actual output	Message displayed successfully
Status	Test-Case passed successfully.



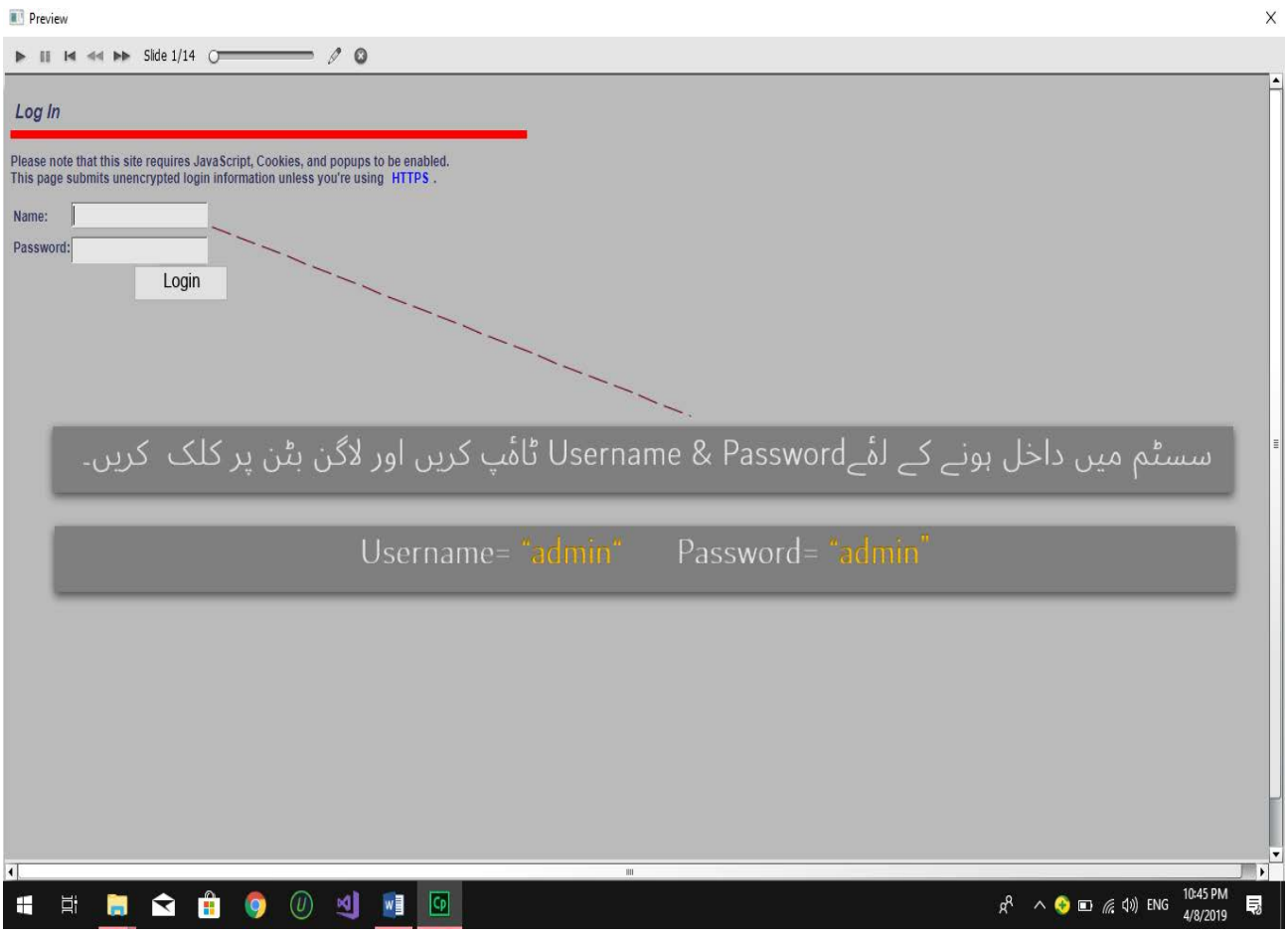
Test-Case #	04
Test-Case Name	SDR module
Descriptions	Press SDR button to for display of SDR module
Testing Technique	Unit testing, Black Box Testing
Preconditions	SEATS is running with authentic login
Input Values	Click on " SDR " Button
Steps	• Run the SEATS • Login page is open. • Enter password. • Click on SDR button.
Expected output	SDR page is displayed.
Actual output	Page displayed with SDR functionalities.
Status	Test-Case passed successfully.

Test-Case #	05
Test-Case Name	HARRIS module
Descriptions	Press HARRIS button to for display of SDR module
Testing Technique	Unit testing, Black Box Testing
Preconditions	SEATS is running with authentic login
Input Values	Click on " HARRIS " Button
Steps	• Run the SEATS • Login page is open. • Enter password. • Click on HARRIS button.
Expected output	HARRIS page is displayed.
Actual output	Page displayed with sub SEATSs.
Status	Test-Case passed successfully.

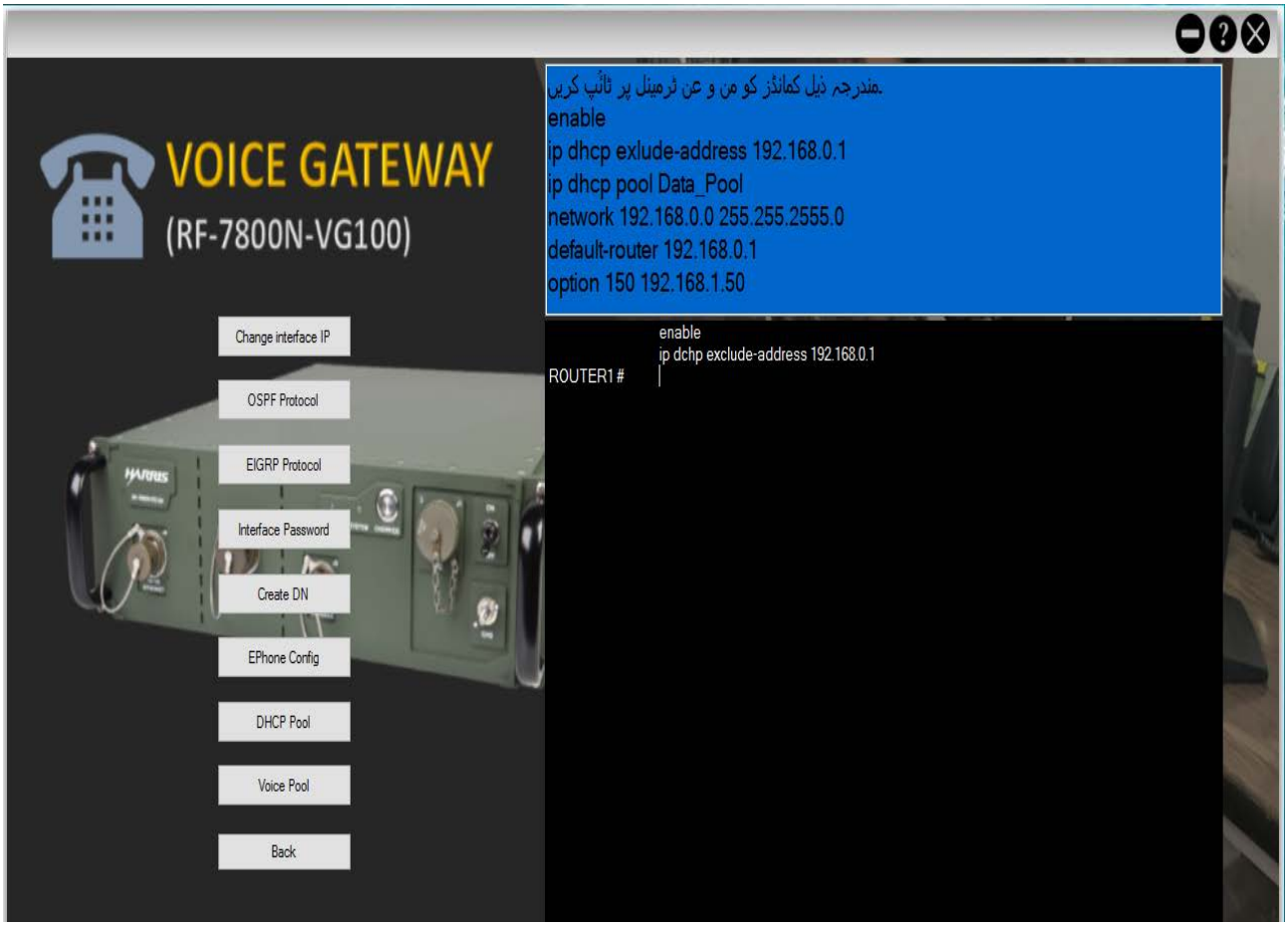


Test-Case #	06
Test-Case Name	M3TR module
Descriptions	Press M3TR button to for display of M3TR module
Testing Technique	Unit testing, Black Box Testing
Preconditions	SEATS is running with authentic login
Input Values	Click on " M3TR " Button
Steps	• Run the SEATS • Login page is open. • Enter password. • Click on M3TR button.
Expected output	M3TR page is displayed.
Actual output	Page displayed with sub SEATSs.
Status	Test-Case passed successfully.

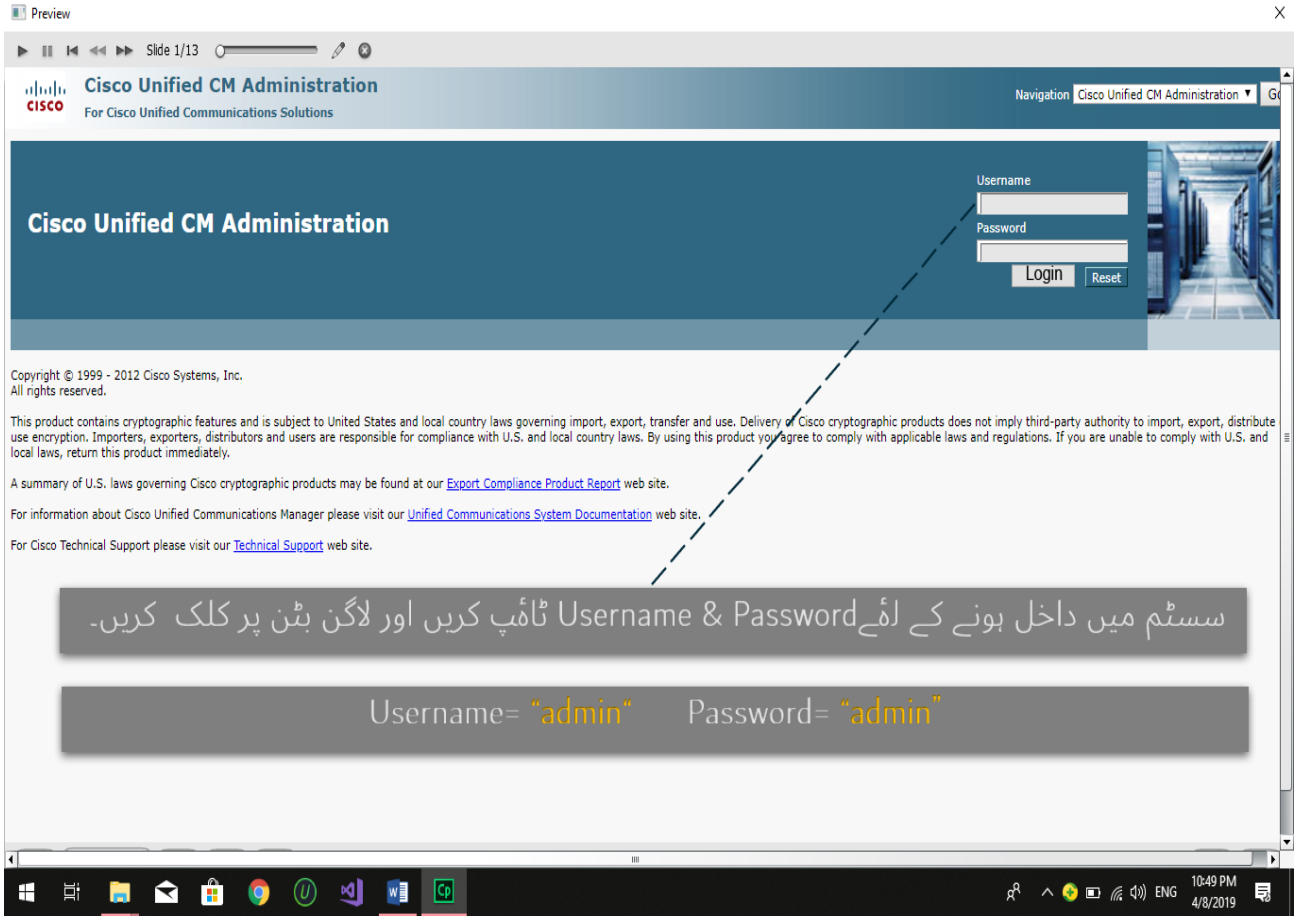
Test-Case #	07
Test-Case Name	NGPATCOM – NIU module
Descriptions	Press NIU button display of NIU Tutorial module
Testing Technique	Unit testing, Black Box Testing
Preconditions	SEATS is running with authentic login
Input Values	Click on " NIU " Button
Steps	• Run the SEATS • Login page is open. • Enter password. • Click on NIU button • Enter IP address of NIU.
Expected output	NIU page should be displayed.
Actual output	Page displayed
Status	Test-Case passed successfully.



Test-Case Name	NGPATCOM – VG-100 module
Descriptions	Press HCLOS button display of VG-100 Tutorial module
Testing Technique	Unit testing, Black Box Testing
Preconditions	SEATS is running with authentic login
Input Values	Click on " VG-100 " Button
Steps	• Run the SEATS • Login page is open. • Enter password. • Click on VG-100 button.
Expected output	Tutorial page should be displayed.
Actual output	Tutorial Page displayed with VG-100 tutorial.
Status	Test-Case passed successfully.

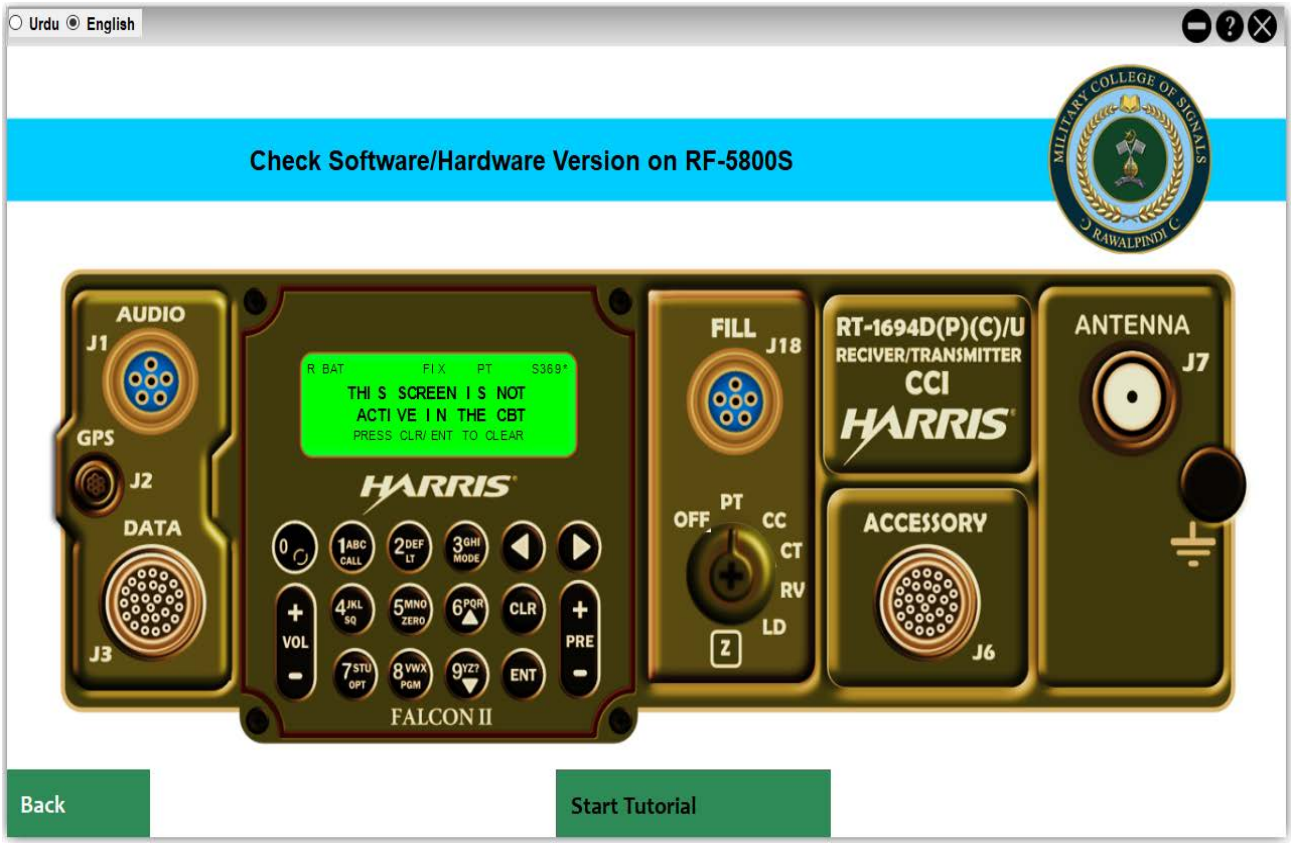


Test-Case #	09
Test-Case Name	NGPATCOM – CUCM module
Descriptions	Press CUCMbutton displaying of CUCM module
Testing Technique	Unit testing, Black Box Testing
Preconditions	SEATS is running with authentic login
Input Values	Click on " CUCM " Button
Steps	• Run the SEATS • Login page is open. • Enter password. • Click on CUCM button.
Expected output	Tutorial page should be displayed.
Actual output	Tutorial Page displayed with CUCM tutorial.
Status	Test-Case passed successfully.



Test-Case #	10
Test-Case Name	Output –SDR
Descriptions	SDR module will display output for desired action related to functioning of module which is based on random testing of SDR functions.
Testing Technique	Unit testing, Random testing Black Box Testing
Preconditions	SEATS is running with authentic login
Input Values	Click on SDR button
Steps	• Run the SEATS • Login page is open. • Enter password. • Click on SDR button. • Click on send message
Expected output	SDR should be displayed with message tutorial.
Actual output	SDR message displayed with tutorial.
Status	Test-Case passed successfully.

Test-Case #	11
Test-Case Name	Output –HARRIS
Descriptions	HARRIS module will display output for desired action related to functioning of module which is based on random testing of SDR .
Testing Technique	Unit testing, random testing, Black Box Testing
Preconditions	SEATS is running with authentic login
Input Values	Click on HARRIS button
Steps	• Run the SEATS • Login page is open. • Enter password. • Click on HARRIS button. • Click on check hardware version of RF-5800 • Click next button on module • Click enter
Expected output	Screen should display with RF-5800
Actual output	Screen displayed.
Status	Test-Case passed successfully.

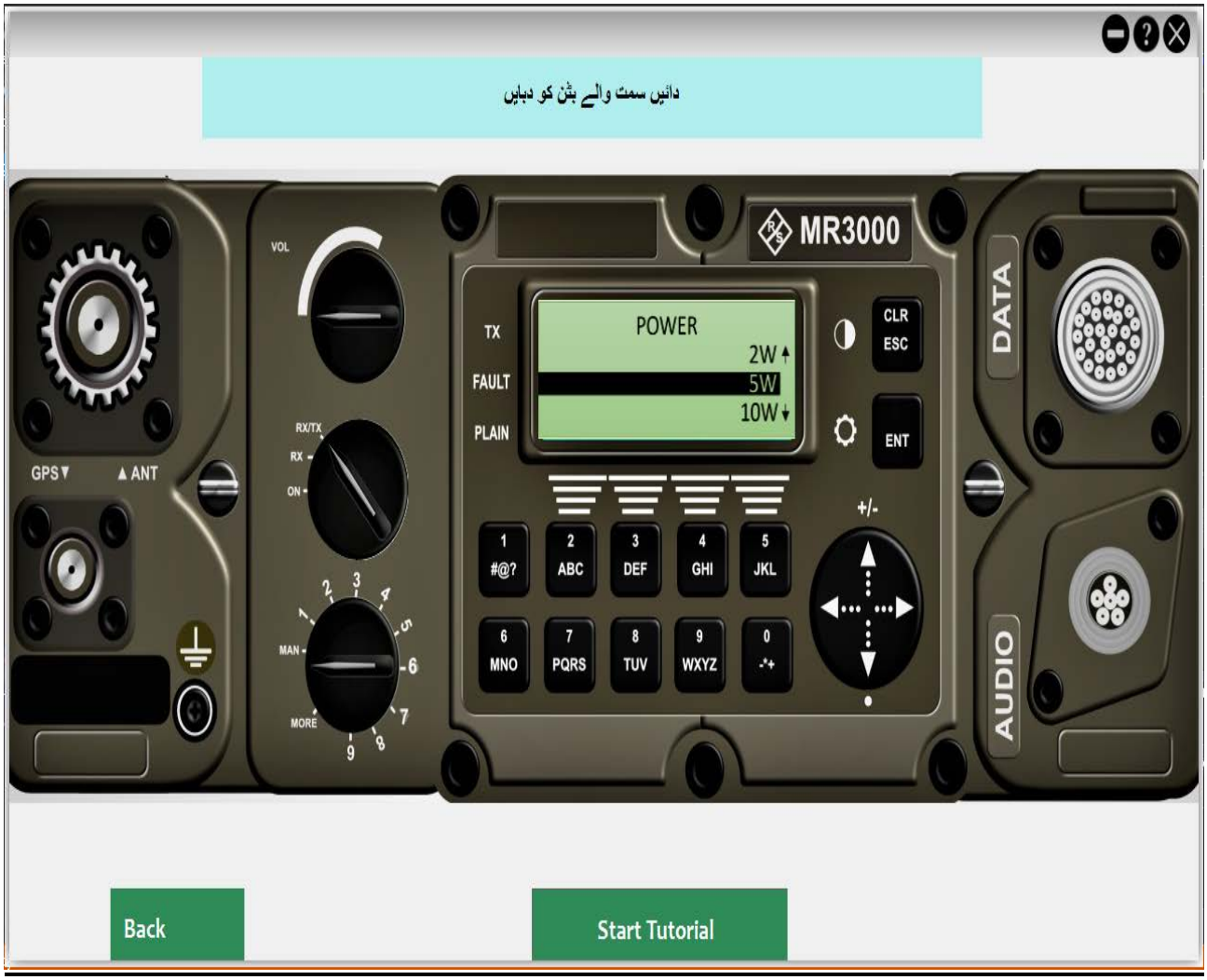


Test-Case #	12
Test-Case Name	Output –HARRIS
Descriptions	HARRIS module will display output for desired action related to functioning of module which is based on random testing of SDR .
Testing Technique	Unit testing, random testing, Black Box Testing
Preconditions	SEATS is running with authentic login
Input Values	Click on HARRIS button
Steps	• Run the SEATS • Login page is open. • Enter password. • Click on HARRIS button. • Click on Hope Radio Function • Click on audio to fix Antenna
Expected output	Screen should display the fixture of Antenna

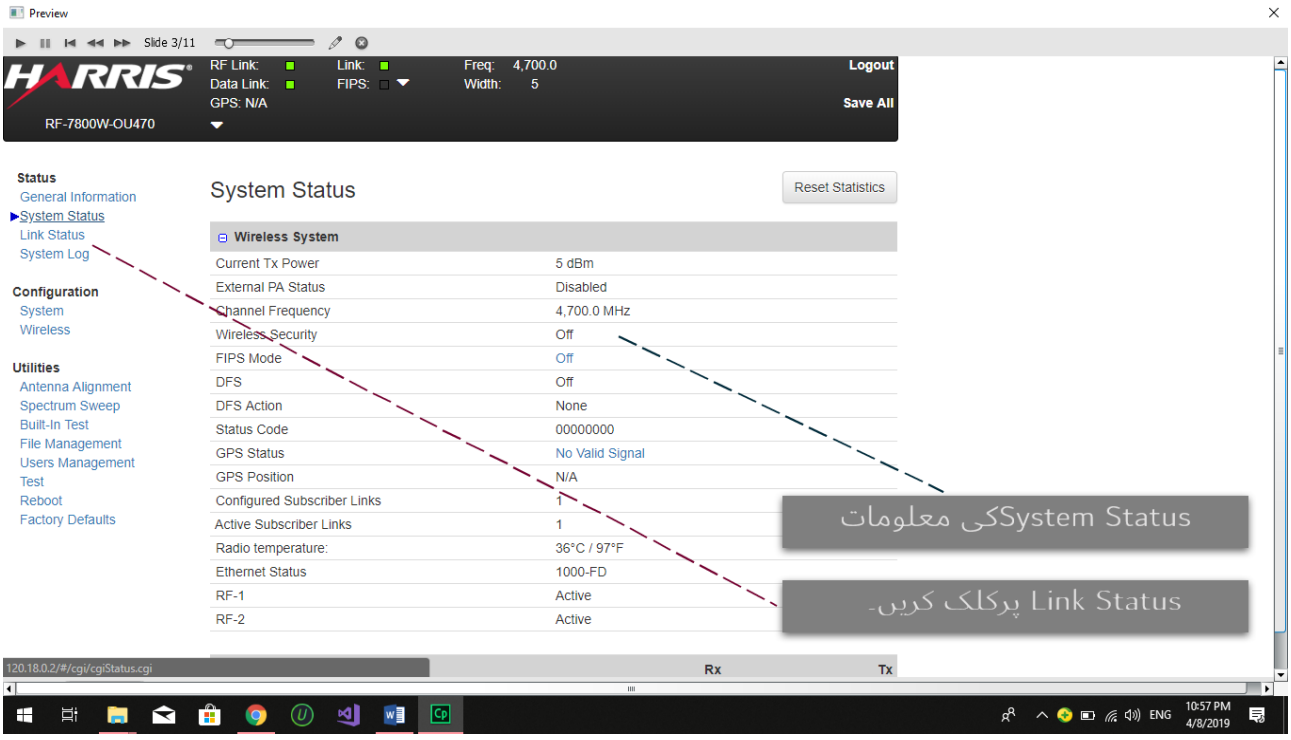
Actual output	Screen displayed.
Status	Test-Case passed successfully.

Test-Case #	13
Test-Case Name	Output –M3TR
Descriptions	M3TR module will display output for desired action related to functioning of module which is based on random testing of SDR functions.
Testing Technique	Unit testing, random testing, Black Box Testing
Preconditions	SEATS is running with authentic login
Input Values	Click on M3TR button
Steps	• Run the SEATS • Login page is open. • Enter password.

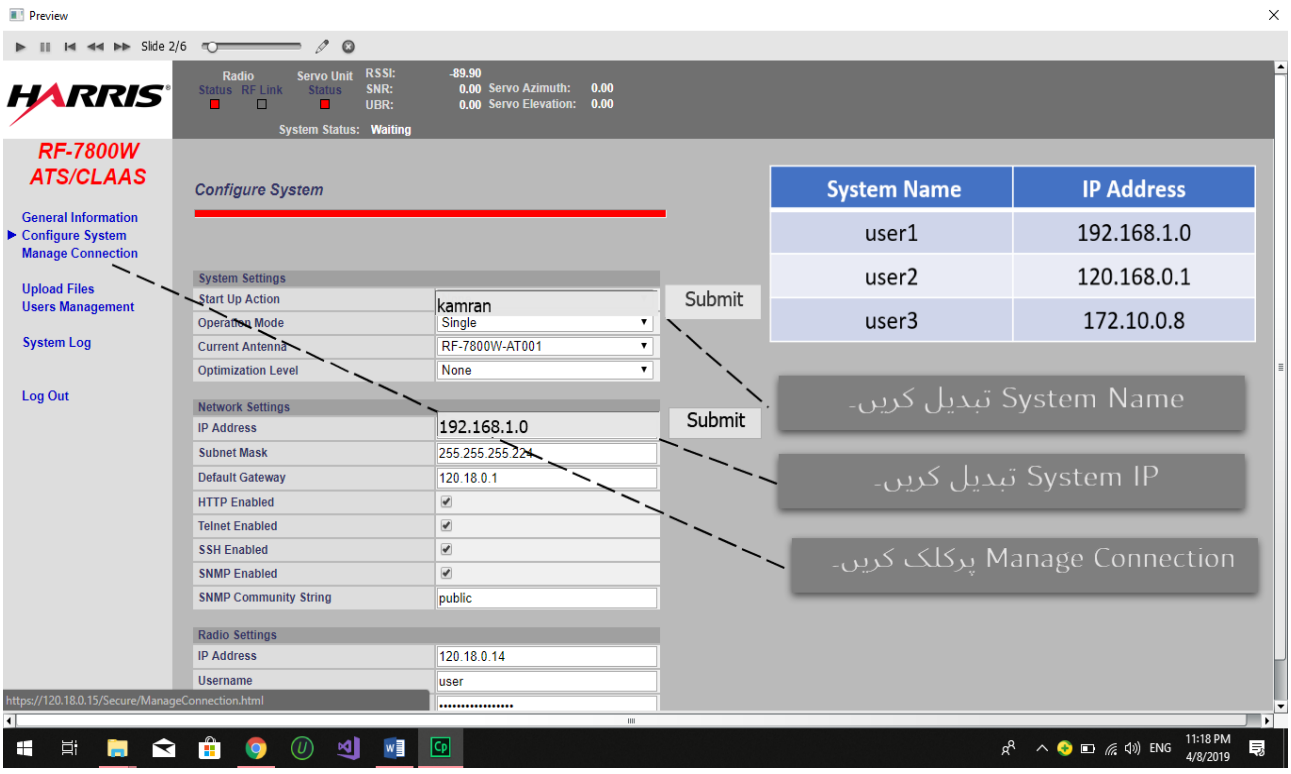
	• Click on M3TR button. • Click on adjust power.
Expected output	Screen should be displayed with adjust power tutorial.
Actual output	Adjust Power tutorial opened.
Status	Test-Case passed successfully.



Test-Case #	14
Test-Case Name	Output –NGPATCOM-HCLOS
Descriptions	HCLOS module will display output for desired action related to functioning of module which is based on random testing
Testing Technique	Unit testing, random testing, Black Box Testing
Preconditions	SEATS is running with authentic login
Input Values	Click on HCLOS button
Steps	• Run the SEATS • Login page is open. • Enter password. • Click on HCLOS button. • Enter HCLOS Login credentials • Click on SEATS status
Expected output	Screen should display SEATS information
Actual output	Output displayed
Status	Test-Case passed successfully.

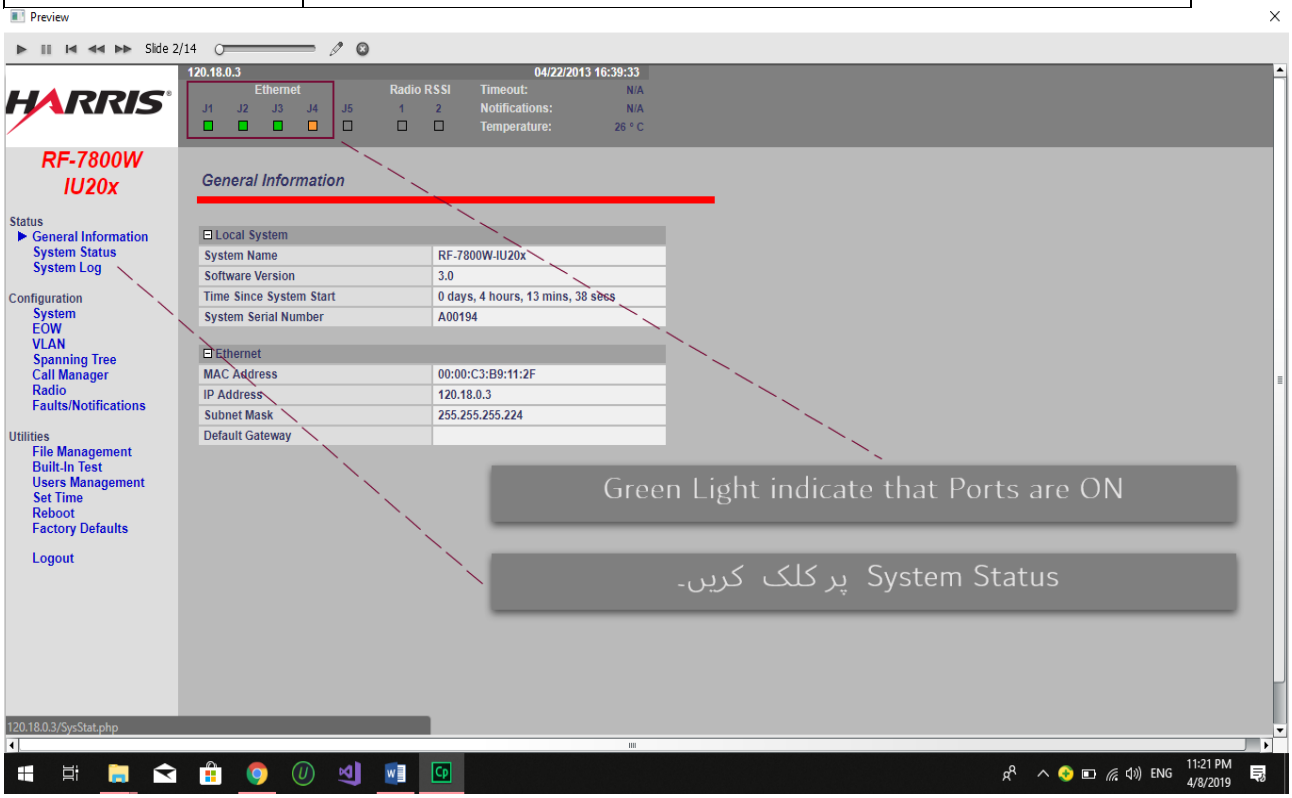


Test-Case #	15
Test-Case Name	Output –NGPATCOM-PCU
Descriptions	PCU module will display output for desired action related to functioning of module which is based on random testing
Testing Technique	Unit testing, random testing, Black Box Testing
Preconditions	SEATS is running with authentic login
Input Values	Click on PCU button
Steps	• Run the SEATS • Login page is open. • Enter password. • Click on PCU button. • Enter Login Credentials. • Click stepwise subsequent functions
Expected output	Screen should display the web interface of PCU with all functions.
Actual output	PCU web interface opened
Status	Test-Case passed successfully.



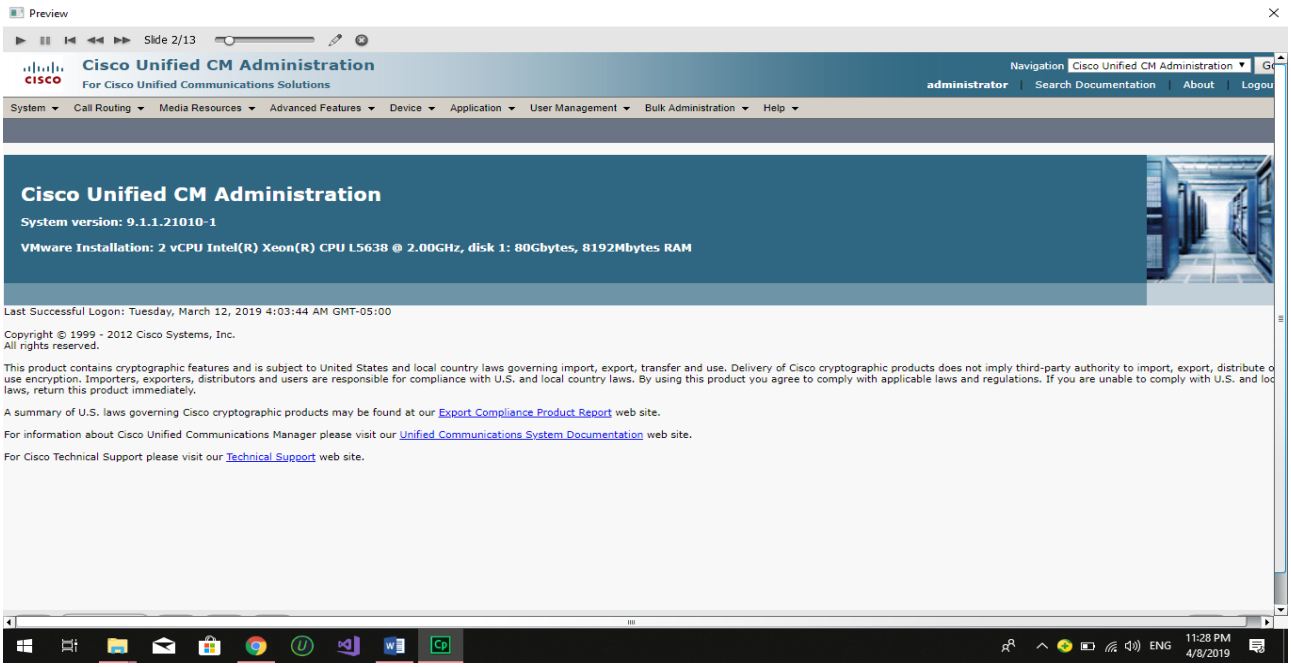
Test-Case #	16
Test-Case Name	Output –NGPATCOM-PCU
Descriptions	PCU module will display output for desired action related to functioning of module which is based on random testing
Testing Technique	Unit testing, random testing, Black Box Testing
Preconditions	SEATS is running with authentic login
Input Values	Click on PCU button
Steps	• Run the SEATS • Login page is open. • Enter password. • Click on PCU button. • Enter incorrect Login Credentials.
Expected output	Screen should not display the web interface of PCU
Actual output	PCU web interface did not open
Status	Test-Case passed successfully.

Test-Case #	17
Test-Case Name	Output –NGPATCOM-NIU
Descriptions	NIU module will display output for desired action related to functioning of module which is based on unit testing.
Testing Technique	Unit testing, Black Box Testing
Preconditions	SEATS is running with authentic login
Input Values	Click on NIU button
Steps	• Run the SEATS • Login page is open. • Enter password. • Click on NIU button. • Enter Login Credentials. • Click stepwise subsequent functions
Expected output	Screen should display the web interface of NIU with further subsequent functions.
Actual output	NIU web interface opened
Status	Test-Case passed successfully.



Test-Case #	18
Test-Case Name	Output –NGPATCOM-NIU
Descriptions	NIU module will display output for desired action related to functioning of module which is based on random testing
Testing Technique	Unit testing, random testing, Black Box Testing
Preconditions	SEATS is running with authentic login
Input Values	Click on NIU button
Steps	• Run the SEATS • Login page is open. • Enter password. • Click on NIU button. • Click on practice. • Enter incorrect address(120.18.0.20)
Expected output	Screen should not display the web interface of NIU.
Actual output	NIU web interface not opened
Status	Test-Case passed successfully.

Test-Case #	19
Test-Case Name	Output –NGPATCOM-CUCM
Descriptions	CUCM module will display output for desired action related to functioning of module which is based on unit testing
Testing Technique	Unit testing, Black Box Testing
Preconditions	SEATS is running with authentic login
Input Values	Click on CUCM button
Steps	• Run the SEATS • Login page is open. • Enter password. • Click on CUCM button • Enter Login Credentials. • Click stepwise subsequent functions
Expected output	Screen should display CUCMinterface with stepwise subsequent functions.
Actual output	CUCMinterface opened.
Status	Test-Case passed successfully.



Responsibilities, Staffing and Training Needs

4.6 Responsibilities:

All developers of the project are responsible for the completion of all components testing and integration testing tasks.

4.7 Staffing and Training Needs:

Basics knowledge of testing strategies and techniques is needed for the testing of the project.

Techniques such as Black Box testing, integration testing should be known to developers.

All the developers will be testing each other's work and will be actively participating in the development and testing of the project simultaneously.

Schedule

4.8 Important Dates

- Unit testing and integration testing will be finished by the start of first week of April 2019.
- Acceptance Testing will be performed right after the Development process completed i.e. 2nd week of April 2019.

Risk and Contingencies

4.9 Schedule Risk:

The project might get behind schedule so in order to complete the project in time we will need to increase the hours/day that the project is being worked on.

4.10 Operational Risks:

Operational risks will be eliminated by Scheduling daily meetings and regular deadlines to meet the goals of the project as well as provide proper communication within the group.

4.11 Technical risks:

Technical risks will be eliminated by keeping the once defined requirements constant.

4.12 Programmatic Risks:

In case of a programmatic risk the scope of the project will be limited in order to stay inside the constraints of the project.

CHAPTER # 5

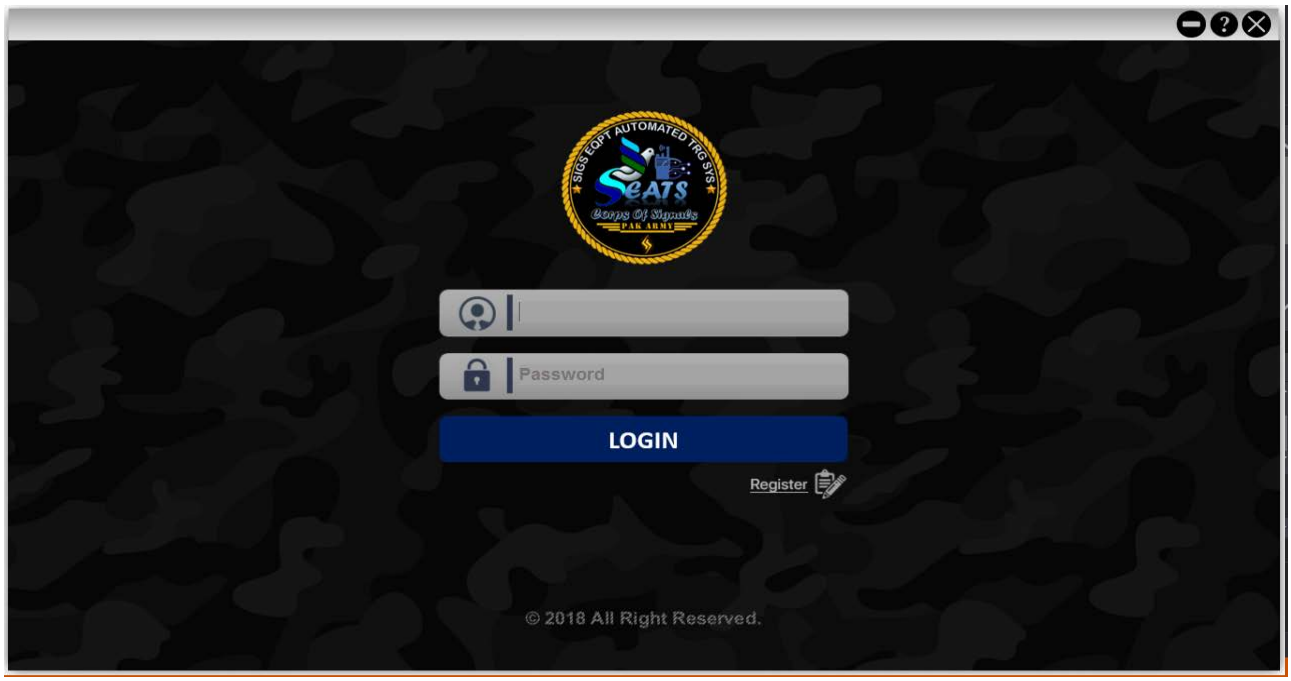
USER MANUAL

5.1 Introduction

The user-guide will give complete metaphors of all the platforms and utensils used and how to install the software's needed to develop the SEATS. The main_tools used are visual_studio 2015 and adobe captive.

5.2 Installation and usage Guide

- Before running SEATS software you need to have visual studio software in your laptop or PC with window 7 & above.
- Once you have it then click on run SEATS to launch the SEATS and it will run after compiling the code.
- It is recommended you need to have SSD built in or externally installed as it is a very heavy code with multiple video and user graphics so normal configuration laptop take time delay and usually perform very slow.
- After running normal login page will be displayed in which you have to enter your login details if you are the new users then you need to first register yourself and set your password so that your details are added into that which helps to maintain the data base of the users.


SIGS EQPT AUTOMATED TRG SYS
SEATS
Corps Of Signals
PAK ARMY
Password
LOGIN
Register
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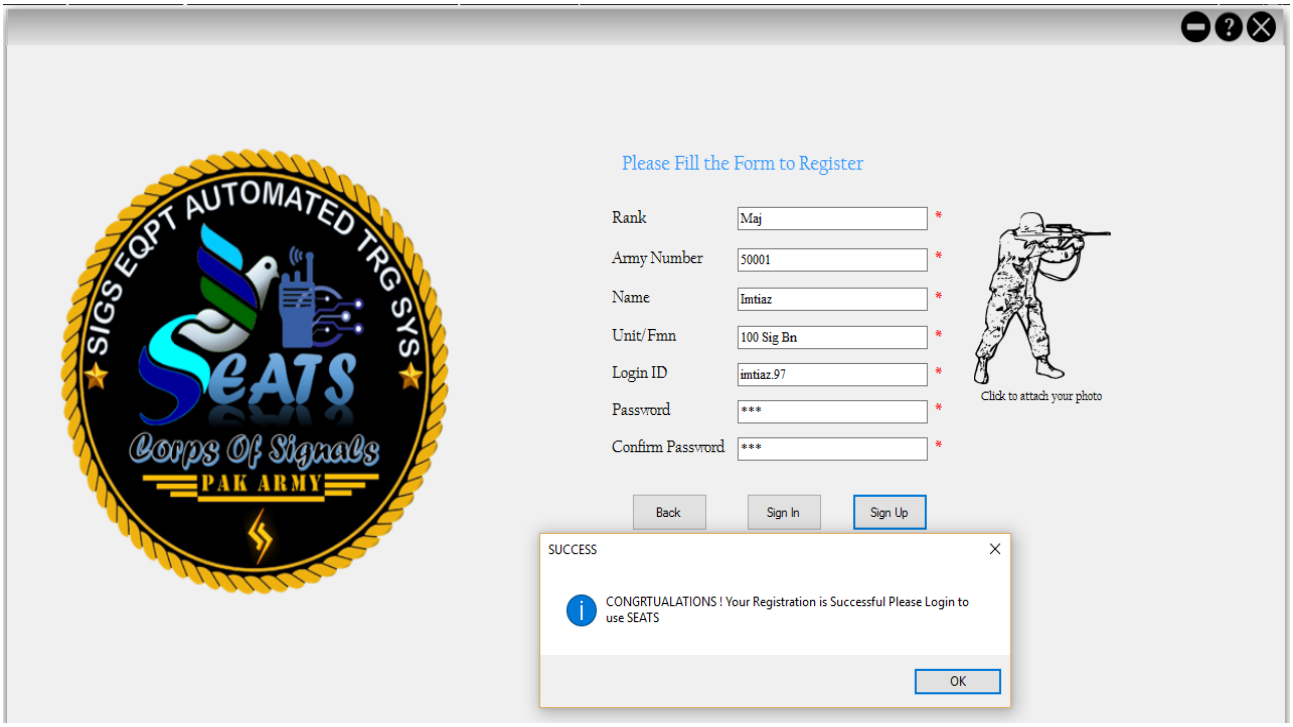
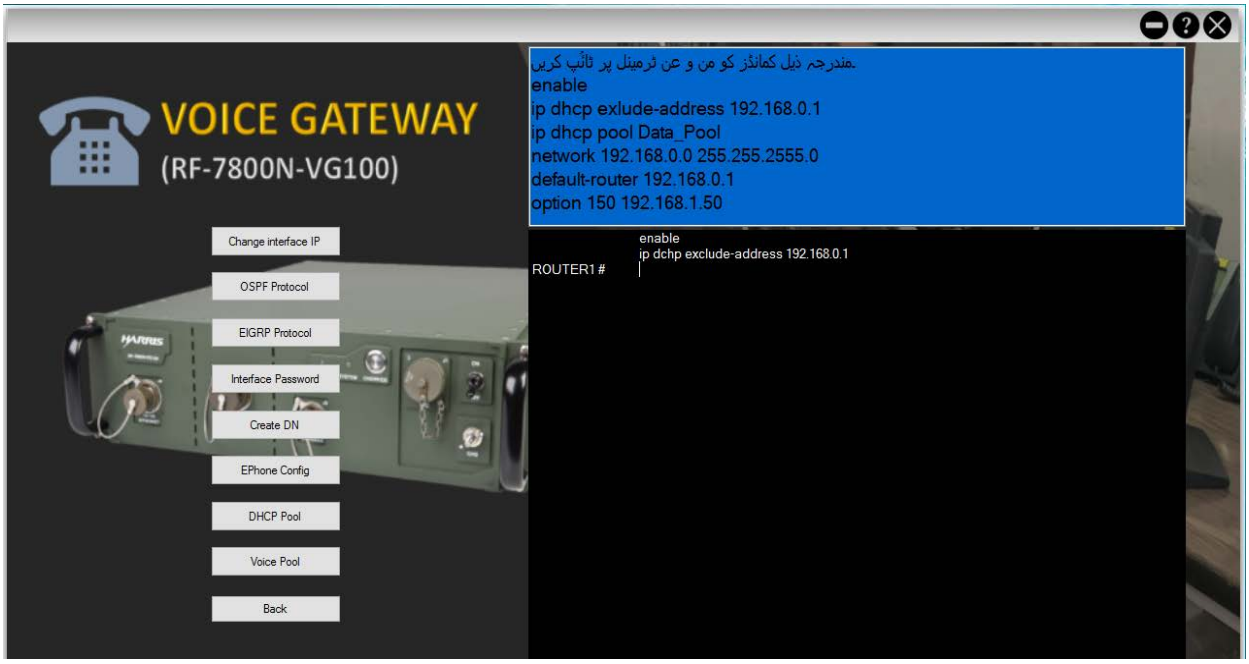

SIGS EQPT AUTOMATED TRG SYS
SEATS
Corps Of Signals
PAK ARMY
Please Fill the Form to Register
Rank
Maj
Army Number
50001
Name
Imtiaz
Unit/Fmn
100 Sig Bn
Login ID
imtiaz.97
Password
***
Confirm Password
***
Click to attach your photo
Back
Sign In
Sign Up
SUCCESS
CONGRTUALATIONS ! Your Registration is Successful Please Login to use SEATS
OK

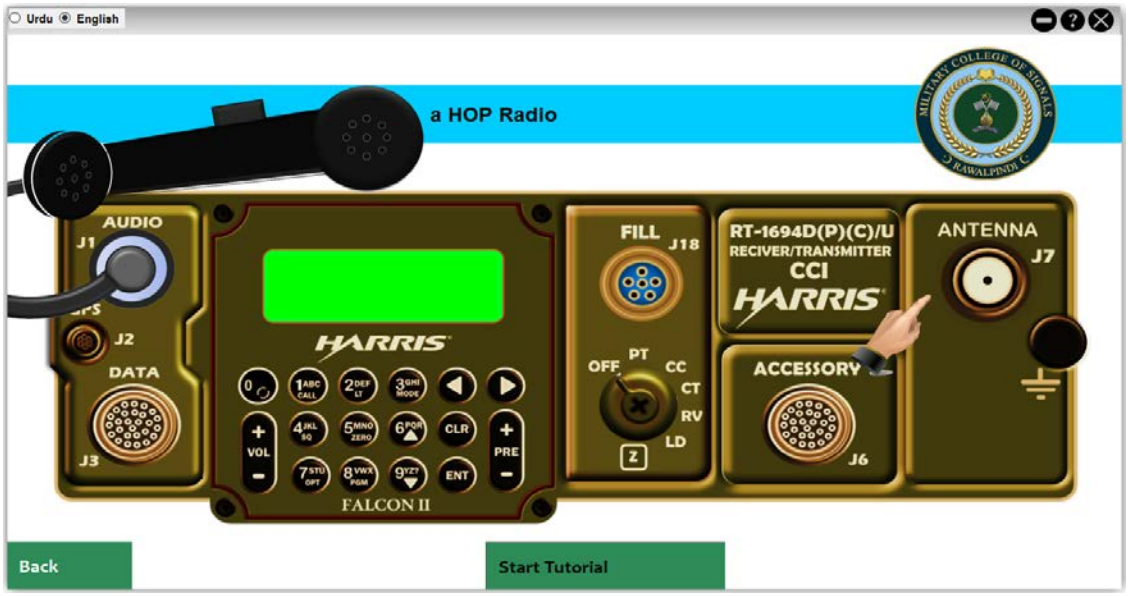
- After login the main page is displayed which consist of modules incorporated in SEATS.

- Click on any desired modules which you want to learn if you click on any modules it will guide you automatically which steps you need to follow to learn that particular module.

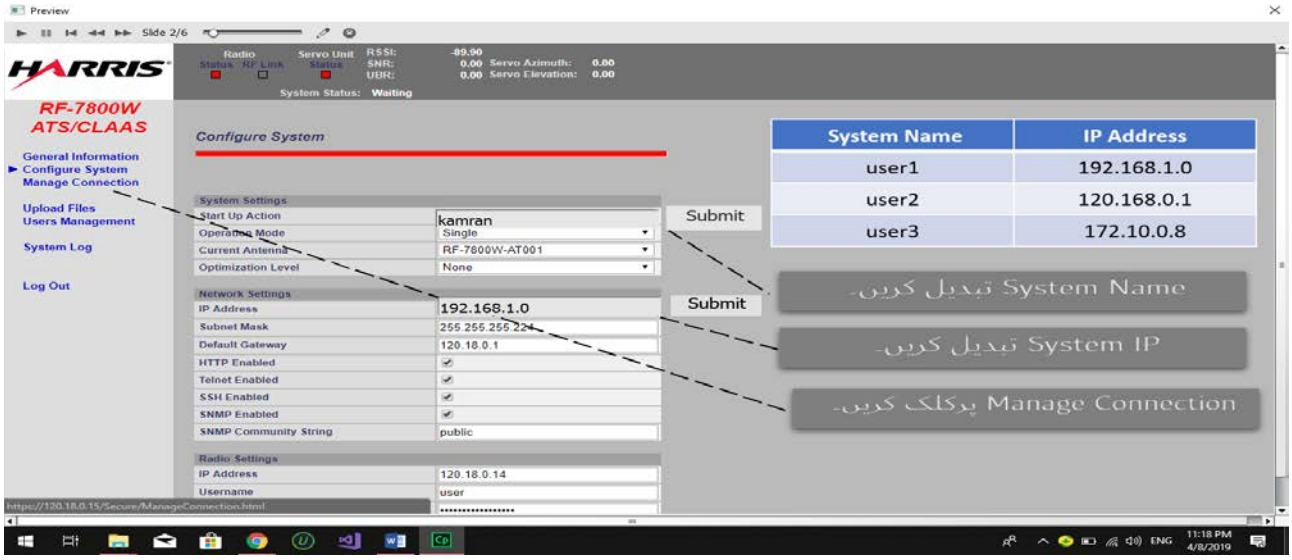
- For ease of users the language option is also enabled whether it is used by officers or soldiers.



- Voice command is also enabled for further guidance for each steps.
- Mouse options are also included where you need to perform that particular action.



- For NGPATCOM module follow the steps describe by cursor and the voice command.



- Videos are also incorporated to understand the working of these modules which gives more clarity for practical usage of this suit

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