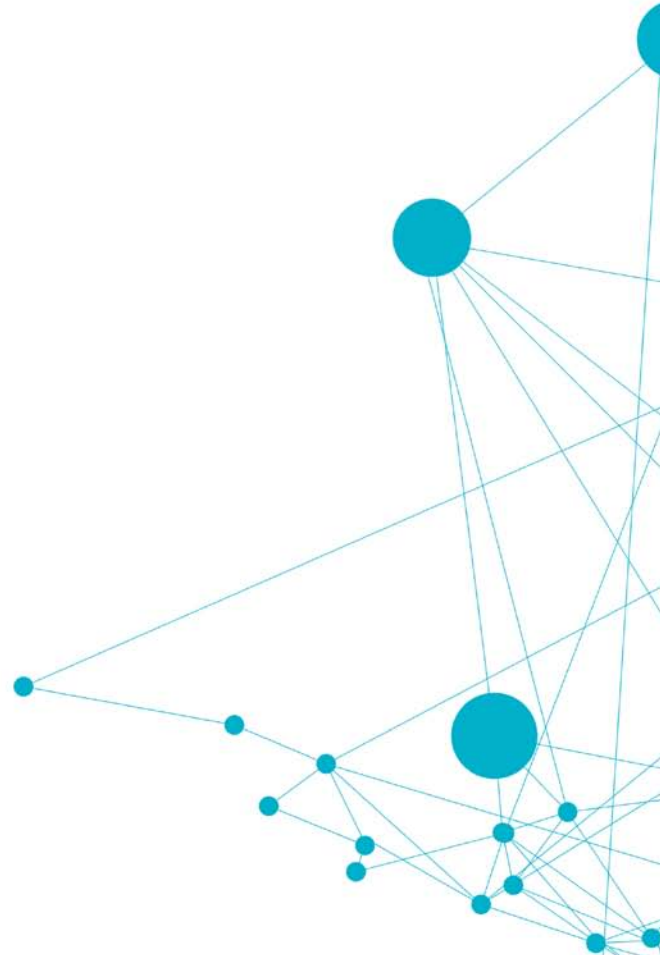SECURITY AND DEFENITY

GROUND SUPPORT EQUIPMENTS

GSE Solutions

1. INTRODUCTION

Indra designs, develops and delivers a wide range of electronic warfare systems. That includes products such as self protection systems, Electronic intelligence systems (ESM/ELINT), communication intelligence systems (COMINT), Signal Intelligence Systems (SIGINT), Counter-Measures Systems, etc.

All of these Indra products are developed to be integrated in any type of platform (Air, surface, Subsurface, etc...) and provide them with electronic warfare capabilities. The systems include the necessary mechanisms to capture, process, analyze and present to the operator all the information about the existing signals in the mission scenario.

Indra also has a significant Customer Support area that offers to the customers the necessary Integrated Logistic Support to ensure the operability of their systems during the entire life cycle of its products.

The complete Logistic Support includes, among others, the provision of Ground Support Equipment. Indra considers these types of equipments as an important tool as they play a basic role in the system life cycle. They suppose a key help for the maintenance operators in their objective to keep the systems fully operative.

Indra has a wide experience in the development and delivery of GSE products maintaining a catalogue that contains units that are especially useful to test a huge range of systems and operative equipments.

1.1. SCOPE

This document contains the list of Ground Support Equipments.

Every unit, option, accessory, etc. will be exposed with a brief description of their functionality, technical data , etc.

In addition some predefined configurations will be shown with all the main performances and technical data in a specific chapter.

The majority of the equipments that are included in this catalogue will have application for the Indra's Electronic Warfare Systems:

- Radar Warning Receiver (RWR) ALR400
- ESM/ELINT Systems
- COMINT Systems.
- Counter Measures Systems, etc.

Even though they are mainly used to test Indra Systems, they can be used as signal generator for test any other Electronic Warfare systems from any other manufacturers.

In addition, under the scope of this catalogue, there are some others Indra's GSE units that provides maintenance and test solutions for different parts or systems that has not been manufactured by Indra, such as TACAN, Radio altimeter, Missiles Warning Systems (MWS), Laser Warning Systems (LWS), etc.

1.2.   DOCUMENT STRUCTURE

The document will be divided in four different chapters:

Chapter 1: INTRODUCTION

This chapter contains a brief introduction about the scope and how is going to be structured the document.

Chapter 2: GROUND SUPPORT EQUIPMENTS

This chapter will contain a brief functionality description of all the units, options, external accessories, etc that are available to be acquired individually or to be included in a specific ad-hoc configuration.

The GSEs will be classified depending on their application and on the product family they belong to.

Chapter 3: PREDEFINED CONFIGURATION
This chapter will contain predefined configurations that cover up the specific request or needs indicated by the customers.

2. GROUND SUPPORT EQUIPMENTS

This section contains the list of Ground Support Equipments designed by Indra.

The range of products includes tools to support both operation of systems and the different maintenance levels.

Based in this criterion and depending on what are they used for, Indra classifies the Ground Support Equipments into two different groups: One focused on the operation support and another one focused on support the maintenance tasks.

2.1. Operational GSEs

The correct operation of an EW system in a platform is basic to guarantee the success of the mission. For this reason, GSEs are extremely important for the operators as they provide them the necessary aid to ensure that success.

This type of Ground Support Equipments will group all the equipments that are considered useful to support the system operation during a mission. In this sense, the operation term should include: the pre-flight issues, the operation itself, data gathering and, of course, the post-flight analysis.

2.2. Maintenance GSEs

Indra has a large experience in the after sale support providing its customer with any maintenance or support services that they may need.

In addition, the customer support has became in one of the key point to be reinforced from the first stages of any program to the end of their life cycle. With this philosophy Indra pretend to reach the maximum satisfaction of its customer during the complete cycle of any system delivered.

Following this idea, we have put all of our large experience in maintenance and systems support at the customer service by offering a wide range of Ground Support Equipment. All of these units will help the operator to carry out the basic maintenance tasks quickly and easily. With the continuous and correct use of these tools the users can ensure that their electronic warfare systems work in the defined specifications.

The Maintenance GSEs that Indra offers to its customer cover the main maintenance levels both in flight line and off-aircraft.

All of them have been designed following these premises:

- **Easy to transport and use**: Equipments used in flight line or On-Aircraft maintenance are especially ergonomic. They are designed to be easy to transport and to have a short deployment time.

- **Easy to operate**: All units are easy to operate. They have an intuitive and simple HMI.

- **Everyone can launch a test**. No expert operators are needed. The majority of GSEs have assisted test that guide the users along the system test procedure.

- **All the units are in the state of the art**: The units have been designed using the latest technology available and they evolve with it.

- **The equipments have been intensely tested and used in operation**: The functionality of the units is guaranteed as they are used daily by Indra's technicians.

- **Reduce maintenance times and improve test reliability**: All the units are designed in order to enhance the maintenance times and test reliability.

- **Reduce the acquiring and/or extension costs**: With the modular philosophy, the customer only acquires the functionality that they need.

- **All in one philosophy**: Maintenance operators can test a wide range of equipments (MWS, LWS, RWR, TACAN, sonobuoys receptor, etc.) using only one unit. The customer can expand easily the functionality of a unit.

The Maintenance GSEs has been classified in three groups depending on their functionality:

- **EWE8000 Family**: It includes the complete family of signal emulators used to stimulates the units.

- **Maintenances Racks and tools**: Groups all the racks and tools used to perform maintenance tasks over individual units (LRUs)

- **Specific Tools**: Includes all the specific tools developed for special applications.

2.2.1. EWE8000 Family

Indra has unified the previous EWE series (1000, 2000, 3500, etc) and has recently launched the EWE8000 emulator series, which is focused on training and the analysis, diagnosis and validation of Electronic Warfare Systems, including ESM and ESM/RWR.

EWE-8000 Series

The basic function of EWE8000 family is the Generation, Reception and multi-emission of any RF complex signals, from low frequencies up to 40GHz. This generation includes signals generated by radar systems, communication systems, sonobuoys, TACAN, radio altimeters, inhibition systems, eco radar emulation, etc. In addition the family also includes modules to generate IR and UV signals.

The main characteristics of this family are:

- **Modularity**: The architecture of the EWE8000 series is based in a series of high-end units developed around a central core that can be expanded using both internal trays and external front-ends. It makes the EWE8000 family especially suitable for be used in any scenario (field, hangar, laboratory, etc).

- **Configurable**: One of the main concept of this family is provide the customer only with the functionality needed by allowing them the construction of their own equipment configuration by the selection of the desired trays and/or front-end.

- **Scalable**: This scalability also permits the customers to add new functionality to their EWE8000 units by acquiring and installing new optional trays and/or front ends. It involves an important save in costs.

An EWE8000 family unit will be composed by

- Core units that can be selected depending on the current or future needs.
- Internal options (Optional)
- External options (Optional)
- Control units (Optional)
- Additional accessories (Optional)

The matrix configuration is shown below.

SETUPS	PORTABLE UNIT	BASIC UNIT	ADVANCED UNIT
INTERNAL OPTIONS (TRAYS)			
C/D Downconverter Tray	-	●	●
E/J Upconverter Tray	-	●	●
K Upconverter Tray	-	●	●
DOAs Tray	-	●	●
Receiver Tray	-	●	●
EXTERNAL OPTIONS (FRONT-ENDS)			
TACAN	-	●	●
Radar Low Distance	●	●	●
IR Stimulator	●	●	●
UV Stimulator	●	●	●
Cable Tester	●	●	●
Communication	-	●	●
Sonobuoy	-	-	●
Autonomous Mobile Unit	-	-	●
End To End Accessories	-	-	●
CONTROL UNITS			
Tablet EWE8000	●	●	●
Ruggedized Tablet EWE8000	●	●	●
Ruggedized Laptop EWE8000	●	● ✖	● ✖

During the following section a brief description of the functionality of all accessories and options will be exposed. The main objective is that the customer understands how an EWE8000 equipment can be configured depending on the exactly needed.

The technical characteristics and features will be exposed in the chapter 3

2.2.1.1. CORE UNITS

They are the core of any EWE8000 family equipment. It will be the basic unit around which any external or internal options can be mounted.

They contain the processor core with which all the functionality of any EWE8000 unit configuration will be controlled.

These core units include the RF emission source of any EWE8000 unit. This is the part of the equipment in charge of generates the RF signal that will be treated subsequently by the internal trays or external front-ends in order to be injected or radiated to the EW Systems under test.

There are three different configurations for this type of units, the main differences between them lie in the scalability, the functionality they may support. So the core unit to be chosen will depend on the number of internal options needed and the desired scalability.

All type of core unit count with an embedded software that allows the user to control all the equipment functionality installed through its touch display. Therefore no additional external devices are needed to configure parameters or control the unit.

In addition these units can also be operated remotely through optional control units. This important feature allows only one operator to perform test without any type of additional resource.

The three available core units are shown in the following table.

PN	DESCRIPTION
0141811002400	Portable Unit
0141811000200	Basic Unit
0141811001400	Advanced Unit

PORTABLE UNIT
PN: 0141811002400

Description

It is the portable core of the family. It has been specially designed taking in consideration the concepts of ergonomic, easy transport, easy use, etc.

With a folded size of 20 x 30 x 60 cm, a weight less than 10 Kg and it all-terrain wheels system it is especially useful to perform Go-NoGo test in hangar and/or flight line environments.

Equipped with a high performances battery, it can be working continuously up to 4 hours and can be in the stand-by mode more than 16 hours. In addition, the unit can be fully charged in only 2 hours.

Accessories/Options

In order to give functionality to the core unit, it can be equipped with the following external accessories or Front-Ends (at least one is necessary):

PN	EXTERNAL OPTIONS (FRONT-ENDS)
0141811002000	Radar Low Distance (Built-in)
0141811001800	IR Stimulator (Built-in)
0141811001900	UV Stimulator (Built-in)
--	Cable Tester (Depend on platform)

In addition to the embedded control, the following remote control units can be used with this core unit.

PN	CONTROL UNITS
0141861000100	Tablet EWE8000
0141861000200	Ruggedized Tablet EWE8000
0141861000300	Ruggedized Laptop EWE8000

The following external accessories are compatible with the portable core unit.

PN	ACCESSORIES
0141821002700	Pack Battery – PTG
0141821002900	External Charger – PTG

BASIC UNIT
PN: 0141811000200

Description

It is the smaller element of the non portable core unit. It can only be equipped with external options, so it is especially useful for equipments that are going to have a specific application and which functionality is not going to be increased later.

The mechanical assembly has been designed to meet to IP64 standard of protection, so the unit will be appropriate to work on-field and under adverse weather conditions.

Accessories/Options

In order to add functionality to the core unit, it can be equipped with the following external accessories or Front-Ends:

PN	EXTERNAL OPTIONS (FRONT-ENDS)
0141811002000	Radar Low Distance (Built-in)
0141811001800	IR Stimulator (Built-in)
0141811001900	UV Stimulator (Built-in)
0141811001600	TACAN Front-End
0141811001700	Communication
0141811000400	Sonobuoy Front-End
--	Cable Tester (depend on platform)
--	End to End Accessories (depend on platform)

In addition to the embedded control, the following remote control units can be used with this core unit.

PN	CONTROL UNITS
0141861000100	Tablet EWE8000
0141861000200	Ruggedized Tablet EWE8000
0141861000300	Ruggedized Laptop EWE8000

The following external accessories are compatible with the portable core unit.

PN	ACCESSORIES
7991500590100	Transport Trolley (Basic Unit)
0141821002800	Tripod and Pointing System

ADVANCED UNIT
PN: 0141811001400

Description

It is the most complete element of the non portable core unit. It can be equipped with up to six free internal trays. It is the core needed to configure complex applications that need more than one tray and/or they are going to be increased lately

Designed to meet the most discerning requirements, it can integrate all features of the EWE8000 series in an IP65 assembly that is prepared to work under the most adverse weather conditions.

Since it has a special temperature control system that keeps it stable inside the unit, the negative effects caused by the temperature variation are eliminated improving the accuracy of the unit significantly.

This is the only unit that supports a scalable configuration, with both internal (trays) and external options. It can be configured with all available Front-Ends and accessories

Accessories/Options

In order to give functionality to the core unit, it can be equipped with the following internal options:

PN	INTERNAL OPTIONS (TRAYS)
0141821002400	C/D Downconverter Tray
0141821002200	E/J Upconverter Tray
0141821002300	K Upconverter Tray
0141821001600	DOAs Tray
0141821001700	Receiver Tray

In order to add more functionality to the core unit, it can be equipped with the following external accessories or Front-Ends:

PN	EXTERNAL OPTIONS (FRONT-ENDS)
0141811002000	Radar Low Distance (Built-in)
0141811001800	IR Stimulator (Built-in)
0141811001900	UV Stimulator (Built-in)
0141811001600	TACAN Front-End
0141811001700	Communication
0141811000400	Sonobuoy Front-End
--	Cable Tester (depend on platform)
--	End to End Accessories (depend on platform)
--	Mobile Unit

In addition to the embedded control, the following remote control units can be used with this core unit.

PN	CONTROL UNITS
0141861000100	Tablet EWE8000
0141861000200	Ruggedized Tablet EWE8000
0141861000300	Ruggedized Laptop EWE8000

The following external accessories are compatible with the portable core unit.

PN	ACCESSORIES
7991500590200	Transport Trolley (Basic Unit)
0141821002800	Tripod and Pointing System

2.2.1.2. INTERNAL OPTIONS

The internal options are the elements that add functionality to the EWE8000 core units.

They should be integrated inside the advanced unit giving to the complete configuration the desired capabilities.

All the available internal options are shown in the following table.

PN	INTERNAL OPTIONS (TRAYS)
0141821002400	C/D Downconverter Tray
0141821002200	E/J Upconverter Tray
0141821002300	K Upconverter Tray
0141821001600	DOAs Tray
0141821001700	Receiver Tray

These trays can be also used to add new functionality to a previous EWE8000 configuration, so it can be acquired individually.

The following pages will show a brief description of the functionality of each internal option.

C/D DOWNCONVERTER TRAY
PN: 0141821002400

Description

It is an optional tray that assembled into an Advanced Unit provides to the equipment with the capability to generate any radar signals in the C/D Band (0,5 – 2 GHz).

As the main RF signals are generated in the core unit, this tray contains all the means necessary to convert the radar signal into the C/D band.

This optional tray is necessary when the EWE8000 equipment is going to be used to test electronic warfare system that work in this frequency range.

Compatibility

This tray can be integrated in the following core units.

PN	DESCRIPTION
0141811001400	Advanced Unit

Note: The image does not correspond with the reality. For confidentiality reasons it is only a rendering.

E/J UPCONVERTER TRAY
PN: 0141821002200

Description

It is an optional tray that assembled into an Advanced Unit, provides to the equipment with the capability to generate any radar signals in the E/J Band (2 – 18 GHz).

As the main RF signals are generated in the core unit, this tray contains all the means necessary to convert the radar signal into the E/J band.

This optional tray is necessary when the EWE8000 equipment is going to be used to test electronic warfare system that work in this frequency range.

Compatibility

This tray can be integrated in the following core units.

PN	DESCRIPTION
0141811001400	Advanced Unit

Note: The image does not correspond with the reality. For confidentiality reasons it is only a rendering.

K UPCONVERTER TRAY
PN: 0141821002300

Description

It is an optional tray that assembled into an Advanced Unit, provides to the equipment with the capability to generate any radar signals in the K Band (18 – 36 GHz).

As the main RF signals are generated in the core unit, this tray contains all the means necessary to convert the radar signal into the K band.

This optional tray is necessary when the EWE8000 equipment is going to be used to test electronic warfare system that work in this frequency range.

Compatibility

This tray can be integrated in the following core units.

PN	DESCRIPTION
0141811001400	Advanced Unit

Note: The image does not correspond with the reality. For confidentiality reasons it is only a rendering.

DOAS TRAY
PN: 0141821001600

indra

Description

It is optional tray that assembled into an Advanced Unit, adds four additional RF out to the equipment per band. This tray gives to the EWE8000 equipment the capability to emit RF signal from different points, one per RF out.

This tray is the perfect option for carry out intensive and detailed test and validation because its four additional RF outs permit to stimulate each channel of an EW systems independently.

This option is also very useful and recommendable for evaluate how the EW systems is working in a multi emitter mobile scenario. In addition the EWE8000 software allows the user to configure these complex scenarios where some mobile and fixed emitter systems are illuminating the platform under test while it is moving in simulated trajectory.

As a difference with the previous exposed trays, this one, upon connected into the core unit, presents the RF out connectors in the front side making it more accessible for the operators. This feature makes the unit suitable to be also used in laboratory as the RF stimulator for maintenance racks or workbenches.
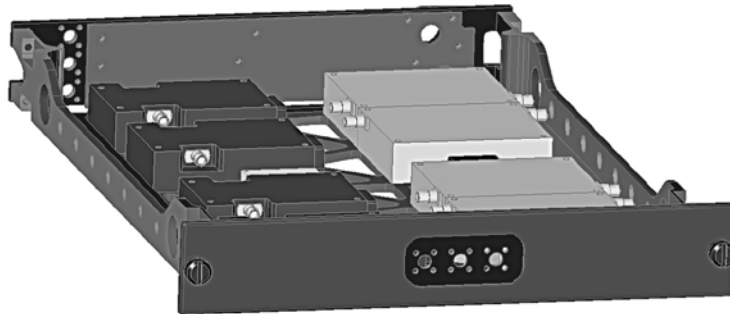
Compatibility

This tray can be integrated in the following core units.

PN	DESCRIPTION
0141811001400	Advanced Unit

Note: The image does not correspond with the reality. For confidentiality reasons it is only a rendering.

EWE8000.CBG / V.1.0

RECEIVER TRAY
PN: 0141821001700

Description

Assembled into an Advanced Unit, it provides to the equipment with the capability to receive and treat signals in the C/D, E/J or K bands (0,5 – 40 GHz).

It is integrated when the user wants to test and evaluate the electronic counter measures in the complete Radar signal Band (0,5 – 40 GHz).

Compatibility

This tray can be integrated in the following core units.

PN	DESCRIPTION
0141811001400	Advanced Unit

Note: The image does not correspond with the reality. For confidentiality reasons it is only a rendering.

2.2.1.3. External option or Front-Ends

These external options add functionality to all types of EWE8000 core units (portable, basic and advanced).

As they are external options they do not need any additional installation but they are connected using the appropriated wiring to the correspond port of the core unit.

In all cases the type of connection is Plug & Play so once the front-end is connected and recognized by the core unit, the equipment will be auto configured launching automatically the SW application needed to operate the external front-end.

All the available external options or front-ends are shown in the following table.

PN	EXTERNAL OPTIONS (FRONT-ENDS)
0141811002000	Radar Low Distance (Built-in)
0141811001800	IR Stimulator (Built-in)
0141811001900	UV Stimulator (Built-in)
0141811001600	TACAN Front-End
0141811001700	Communication
0141811000400	Sonobuoy Front-End
--	Cable Tester (depend on platform)
--	End to End Accessories (depend on platform)

These external options can be also used to add new functionality to a previous EWE8000 configuration, so it can be acquired individually.

The following pages will show a brief description of the main function of each front-end.

TACAN
PN: 0141811001600

Description

It is the external accessory used to test TACAN BEACON Navigation systems.

It contains all the necessary means to transmit and receive the RF signal used in the validation of this type of systems.

It is delivered with the specific wiring to connect it to the EWE8000 core unit.

Compatibility

This front-end can be integrated in the following core units.

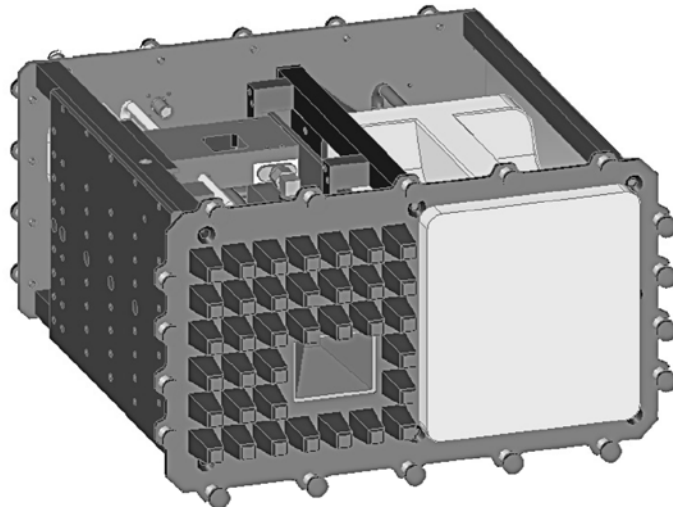| PN	DESCRIPTION
0141811000200	Basic Unit
0141811001400	Advanced Unit

Optionally this front end can be delivered with the following accessories:

PN	DESCRIPTION
0141821002800	Tripod and pointing set

Note: The image does not correspond with the reality. For confidentiality reasons it is only a rendering.

RADAR LOW DISTANCE
PN: 0141811002000

Description

It is the external accessory used to radiate any Radar signal generated by the EWE8000. It is integrated in an external head (Container Full Front-End – PN:0141821002600) especially designed to contain this radar front-end and other ones such as IR, UV, etc.

It includes all the necessary means to transmit the RF radar signal used in the validation of the electronic warfare systems (RWR, ESM/ELINT, etc.)

It is delivered with the specific wiring to connect it to the EWE8000 core unit.

Compatibility

This front-end can be integrated in the following core units.

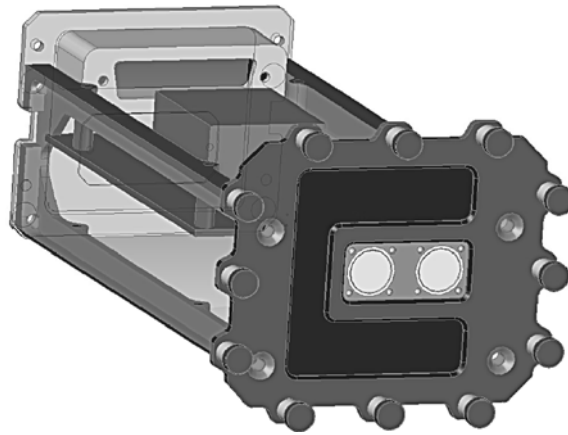| PN	DESCRIPTION
0141811002400	Portable Unit
0141811001400	Advanced Unit

Optionally this front end can be delivered with the following accessories:

PN	DESCRIPTION
0141821002800	Tripod and pointing set

Note: The image does not correspond with the reality. For confidentiality reasons it is only a rendering.

IR STIMULATOR
PN: 0141811001800

Description

It is the external accessory that provides the EWE8000 core unit with the capability to generate IR signal with the EWE8000. It is integrated in an external head especially designed to contain this IR front-end and other ones such as Radar, UV, etc.

It includes all the necessary means used in the validation of the Missile Warning Systems.

It is delivered with the specific wiring to connect it to the EWE8000 core unit.

Compatibility

This front-end can be integrated in the following core units.

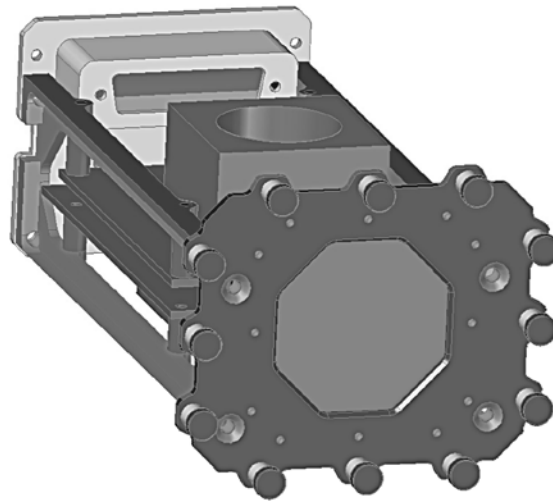| PN	DESCRIPTION
0141811002400	Portable Unit
0141811001400	Advanced Unit

Optionally this front end can be delivered with the following accessories:

PN	DESCRIPTION
0141821002800	Tripod and pointing set

Note: The image does not correspond with the reality. For confidentiality reasons it is only a rendering.

UV STIMULATOR
PN: 0141811001900

Description

It is the external accessory that provides the EWE8000 core unit with the capability to generate UV signal with the EWE8000. It is integrated in an external head especially designed to contain this UV front-end and other ones such as Radar, IR, etc.

It includes all the necessary means used in the validation of the LASER Warning Systems.

It is delivered with the specific wiring to connect it to the EWE8000 core unit.

Compatibility

This front-end can be integrated in the following core units.

PN	DESCRIPTION
0141811002400	Portable Unit
0141811001400	Advanced Unit

Optionally this front end can be delivered with the following accessories:

PN	DESCRIPTION
0141821002800	Tripod and pointing set

Note: The image does not correspond with the reality. For confidentiality reasons it is only a rendering.

CABLE TESTER
PN: TBD (Depend on the set of cable to test)

Description

It is the external accessory that can be used to test cable being especially useful to perform platform reflectometries.

As there are multiple types of cables and platform installation, the accessory will change depending on the cable to test and how it should be tested.

Compatibility

This front-end can be integrated in the following core units.

PN	DESCRIPTION
0141811002400	Portable Unit
0141811000200	Basic Unit
0141811001400	Advanced Unit

Note: The image does not correspond with the reality. It is subject to changes depending on the type of cable, platform, etc.

COMMUNICATION BAND
PN: 0141811001700

Description

It is the external accessory used to radiate any communication signal generated by the EWE8000.

It allows the unit to emit in a range from 2 MHz to 2500 MHz in any type of modulation both analogical and digital of any frequency, transmission time, etc.

It contains all the necessary means to transmit the RF communication signal used in the validation of the communication intelligence systems (COMINT). It is delivered with the specific wiring to connect it to the EWE8000 core unit.

Compatibility

PN	DESCRIPTION
0141811000200	Basic Unit
0141811001400	Advanced Unit

Note: The image can not correspond with the reality.

SONOBUOYS
PN: 0141811001600

Description

It is the external accessory used to test sonobuoys receptors or acoustics systems (ACINT)

It contains all the necessary means to transmit the sonobuoy signal generated by the EWE8000. It permits validate all the RF reception chain.

The unit allows the user to test any type of sonobuoy (DIFAR, LOFAR, VLAD, etc.)

Compatibility

This front-end can be integrated in the following core units.

PN	DESCRIPTION
0141811000200	Basic Unit
0141811001400	Advanced Unit

Optionally this front end can be delivered with the following accessories:

PN	DESCRIPTION
0141821002800	Tripod and pointing set

Note: The image does not correspond with the reality. For confidentiality reasons it is only a rendering.

END TO END ACCESSORIES
PN: TBD (depend on the platform)

Description

It is an external accessory that permits the EWE8000 core unit to perform End to End test over a specific EW System helping the user to isolate failures at the LRU level.

It contains all the means to radiate radar signals in a very controlled environment. This option with the appropriated SW also adds to the EWE8000 the capability to guide the maintenance operator through a complete test procedure allowing the validation of "Systems On The Loop" platforms.

The type of kit needed depends on the platform and EW system, so there are some different configurations available. In addition it is possible to fit any configuration to the specific requirements of any customer.

Compatibility

This front-end can be integrated in the following core units.

PN	DESCRIPTION
0141811001400	Advanced Unit

2.2.1.4. ADDITIONAL CONTROL UNITS

All the core units of the EWE8000 family contain an embedded control that allows the user to operate the complete unit. Nevertheless the EWE8000 family offers as an option the possibility to control the units remotely by using external devices.

There are some types of control unit available. All of them are supplied with the correspond SW license.

PN	CONTROL UNITS
0141861000100	Tablet EWE8000
0141861000200	Ruggedized Tablet EWE8000
0141861000300	Ruggedized Laptop EWE8000

The following pages will show a brief description of the additional control units.

TABLET OR RUGGEDIZED TABLET
PN: 0141861000100 and 0141861000200

Description

These complements are based in Android devices with the SW license and the SW application installed and preconfigured.

All the functionality of the EWE8000 can be operated through this device using WIFI, GPRS/3G/4G, etc.

Compatibility

This device can be used with the following core units.

PN	DESCRIPTION
0141811002400	Portable Unit
0141811000200	Basic Unit
0141811001400	Advanced Unit

Note: Tablet or ruggedized tablet models are subject to change without prior notice.

RUGGEDIZED LAPTOP
PN: 0141861000300

Description

This complement is based in a ruggedized laptop with the SW license and the SW application preconfigured.

All the functionality of the EWE8000 can be operated through this device using WIFI, GPRS/3G/4G, etc.

Compatibility

This device can be used with the following core units.

PN	DESCRIPTION
0141811002400	Portable Unit
0141811000200	Basic Unit
0141811001400	Advanced Unit

Note: Laptop model is subject to change without prior notice.

2.2.1.5.   OTHER ACCESORIES

As an extra option there are some accessories available that can be acquired with the EWE8000 family products.

They suppose a group of elements that make easier and more comfortable the operation to the user.

PN	ACCESSORIES
7991500590100	Transport Trolley (Basic Unit)
7991500590200	Transport Trolley (Advanced Unit)
0141821002800	Tripod and Pointing System
0141821002700	Pack Battery – PTG
0141821002900	External Charger – PTG

Transport Trolleys

They consist in special cases with ergonomic transport systems (wheels, handles, etc.) that help the user to move the equipments. They are especially useful when the units are not going to be used only in a laboratory but they are also be used in field (flight line, hangar, docks, etc.) It adds an additional protection when they should be transported or shipped.

Tripod

It is an adjustable three-legged stand that is used to support external front-ends.

It is suitable for the cases in which the platform test requires a continuous radiation as it avoids the user to be charging the front-end.

It also has mechanisms that help the operator to aim the platform under test permitting to lock the front-end in a fixed position once the best aiming has been reached.

Additional Battery

This option is an extra battery for the EWE8000 portable unit.

The battery of the portable unit can be replaced by the user so this extra option can be useful for:
- Replace the battery when it has a failure.
- Increase the unit operation time. If a user has two fully loaded batteries the time to perform the test will increase significantly. It helps to minimize the risk of postpone evaluations because of a run out of battery problem.
- Spare: The EWE8000 portable unit can continue operating while the other one is charging.

External charger

This option is used to charge the battery of a EWE8000 portable unit without the need of use the equipment.

2.2.1.6. SOFTWARE

The EWE8000 family units are controlled and operated through SW applications that contain an intuitive and easy to use user interface.

There are two different types of software application in the EWE8000 family. The main differences lie in the list of capabilities of each one and the type of device in which it can be installed.
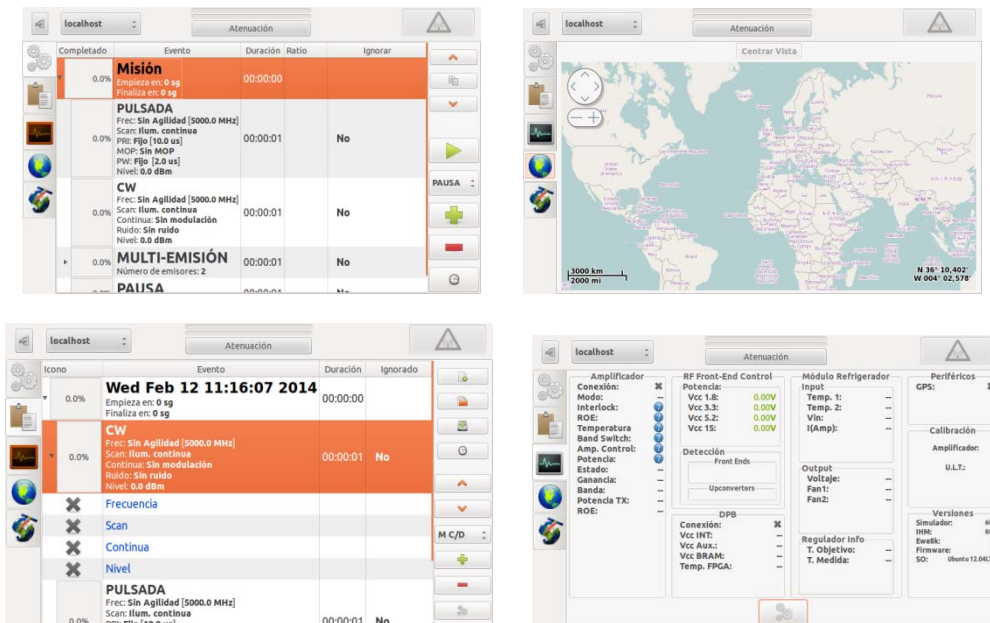
There available SW licenses are:

PN	CONTROL UNITS
0141891000300	Embedded Software
0141891000100	Advanced Software

The following pages will show a brief description of the capabilities.

EWE8000 EMBEDDED SOFTWARE
PN: 0141891000300

Description

The embedded software supplied with every EWE8000 equipments allows local access to all control functions. It also allows local monitoring of alarms and system status.

The structure of the application allows quick access to editing emitters and status information giving the user a complete and efficient system control.

The software is fully integrated with all of the accessories, front-end, trays, etc available. This characteristic involves the automatically detection of an installed accessory once it is plugged adapting the SW interface to the detected item. It avoids the user to perform a manual configuration settings.

The application has been designed to provide a local control through its touch display:

- Creation, modification and/or deletion of emitters
- Control of transmission times.
- Display of percentages of transmitted pulses.
- Continuous monitoring of active emissions.
- Complete monitoring of alarms and equipment status.
- Display of equipment position (GPS).

EWE8000 ADVANCED SOFTWARE
PN: 0141891000100
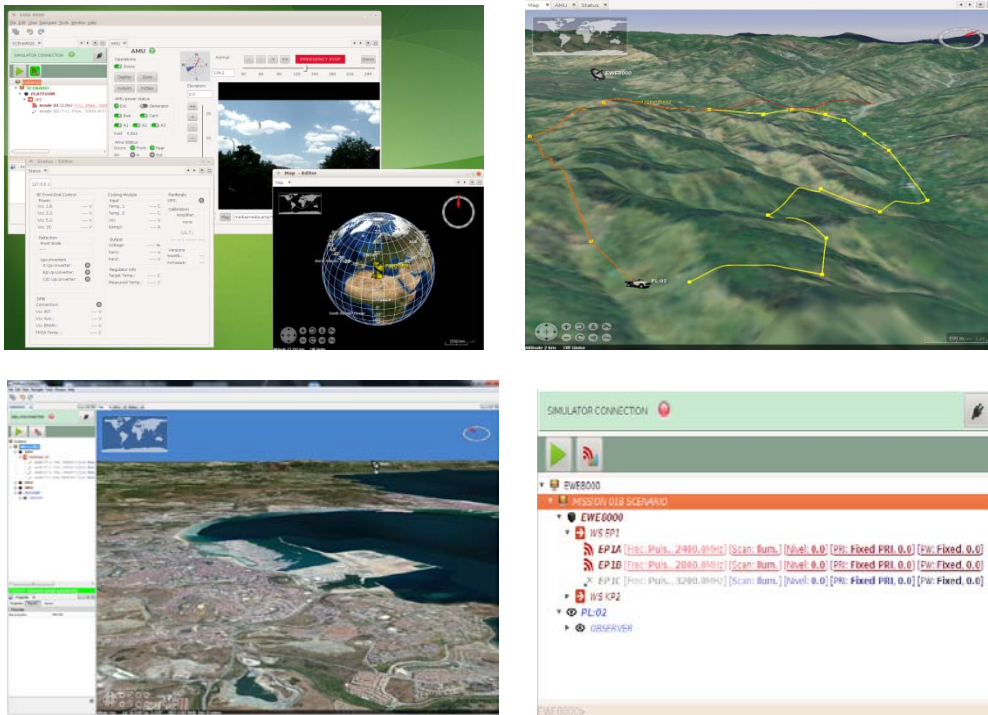
Description

The advanced software permits the user to control remotely from an external device any EWE8000 family unit; this control includes supervision, monitoring, operation, etc.

The SW is multiplatform, so there are versions available for Linux, Windows and Android systems. It ensures that the SW can operate in any laptop or any mobile device[1].

It adds a large of additional functionality to the basic embedded software version:

- **Remote Control**: Provides a common interface for remote control and remote supervision of any EWE8000 family equipment.
    - Creation / modification / deletion of emissions.
    - Control of transmission times.
    - Loading and execution of advanced dynamic scenarios.
    - Display of percentages of transmitted pulses.
    - Continuous monitoring of active emissions.
    - Complete monitoring of alarms and equipment status.
    - Display of equipment position (GPS).

- **Edition of dynamic scenarios**: Helps test design. Includes the following functions**:**
    - The configuration of the emitters list can be made by editing dynamic scenarios on digital mapping, which helps the test design, allowing the

definition of missions with the highest level of detail, including the simulation of virtual platforms.

- o Edition of platforms and observation points.
- o Edition of weapon systems (to group sets of multi-emissions or emissions).
- o Validation of equipment settings.
- o Edition of paths and virtual platforms.
- o Execution of dynamic scenarios.
- o Allows saving complete scenarios or weapon systems to file, for later retrieval or use in the edition of new scenarios.

- **Maps**[2]**:**

  - o Map Viewer: interactive and 3D.
  - o Web Map Services: Allows to load maps from web map servers (WMS-1.3.0 Open Geospatial Consortium)
  - o Local Maps: Allows the unit to import custom maps (CADRG) and terrain elevation data (DTED).
  - o Utilities: graphical terrain profiles, sight lines, graphical edition of trajectories.
  - o Display platforms, observation points, sight lines and trajectories on map.

This advanced software adds to the control and operation of the EWE8000 units a wide range of additional capabilities that makes the units very useful to:

- To simulate complex scenarios. It avoids carrying out real missions to validate the EW systems. That involves an important save on costs as it is not necessary to move neither the platform under test neither additional platforms.
- Simulate real scenarios in order to train the EW operators avoiding real missions to have the crew well trained.

HW Requirements and recommendations

Remote Control and dynamic edition of scenarios.

In order to run this part of the SW is necessary a device with at least the following characteristics:

- SO: Windows /Linux /Android
- Processor: 1GHz
- RAM memory: 256 MB
- Java 1.7 / OpenJDK 7

The optional control units compatible are:

PN	CONTROL UNITS
0141861000100	Tablet EWE8000
0141861000200	Ruggedized Tablet EWE8000
0141861000300	Ruggedized Laptop EWE8000

<u>Maps</u>.

This part of software needs additional HW requirements and It does not run in android.

- SO: Windows /Linux
- Video memory/resolution: 32 MB/ 800x600
- Graphics Acceleration (DirectX/OpenGl).

The optional control unit compatible to this part of software is:

PN	CONTROL UNITS
0141861000300	Ruggedized Laptop EWE8000

2.2.1.7. Configuration

The EWE8000 family is completely configurable so using the compatibility tables indicated in the previous paragraphs, the customer can configure its own EWE8000 units containing its desired application.

In order to configure an equipment, the following steps should be followed:
1. Select what type of core units is needed. The decision will depend on the number of internal trays are going to be integrated.
2. Select all the necessary internal trays (Optional)
3. Select all the Front-ends needed (Optional)
4. Select the extra accessories (Optional)
5. Select an additional remote control device (Optional).

Once all of these step have been taken, the user will have its particular EWE8000 unit.

Even though each customer can create one different configuration, there are some predefined ones that will be exposed in the next chapter. They have been configured taking in consideration the most common application requested and they will be very useful for test and validate the majority of systems and platforms.

2.2.2. Maintenance racks and workbenches

This section groups all racks and workbenches specially designed to perform maintenance tasks over the units at a LRU level. They will permit to carry out unitary test over the LRUs, that expressly means there is no necessary any additional system unit.

The racks will be controlled by a central console which contains an specific software that will guide the operator during the test procedure. This software also provides to the user the necessary tools to control and operate the complete workbench. It will also generate report with the test results that will be extremely useful for the workshops.

The use of this tools will reduce dramatically the No Failure Found rate as it can evaluate the suspicious unit before it is sent to the repair center. In addition it also save maintenance times and costs as it can test and validate the units before it is installed in the platform.

The following maintenance racks are available.

	MAINTENANCE RACKS
0141803700100	RWR MAINTENANCE RACK
0141803800100	EW SUITE RACK
0864620020000	STM BASIC WORKBENCH
0146200020000	ESM BASIC WORKBENCH

2.2.3. Specifics equipments

This section groups all the Ground Support Equipment that has been designed for specific applications.

They are units or equipment kits that has been requested by specific customers and Indra has developed for them

The following specific equipment is available.

MAINTENANCE RACKS	
0141822100100	SOFTWARE LOAD KIT

2.2.4. Engineering capabilities

Even though the product range is wide and the flexibility allows the customer to create a lot of different configuration covering up a huge range of functionality, Indra can also offers its customer the option to make specific particularization of any of the product in order to fit the final product with their requirements or needs.

In the cases in which even a particularization of an already developed product meet the customer requirements, Indra has an important engineering department that can discuss with the customer about the special needs in order to reach a solution that fits in time and in costs with the customer requirements.

Indra has an important experience in the develop of maintenance workbenches for test among others avionic equipments. Therefore Indra can also offer its engineering expertise to develop Ground Support Equipment solutions even though they are not directly related with the current Indra's GSE product range.

3. PREDEFINED CONFIGURATIONS

This Chapter will show a list of available predefined configuration. It contains the more common configurations for cover the maintenance of the Electronic Warfare systems (RWR, ESM, etc.)

EWE8000PTG-R

Portable Threat Generator – Radar
PN: 0141811001500

Description

The EWE8000PTG-R is a Portable Radar Thread Generator designed to perform Go-NoGo test of the EW Systems (RWR, ESM/ELINT, etc.) on the flight line. It generates any type of radar signal complex or simple in the band of (1-36 GHz) covering the complete typical band and subbands in which the EW Systems works.

The EWE8000PTG has a long life batteries that allow the unit to be working continuously more than 4 hours and keep in a stand-by mode more than 16 hours. The complete recharge time is less than 2 hours. The equipment also counts with a very simple battery replacement mechanism that can be made by the user.

For the typical sensibility of the EW systems the amplifiers included in the EWE8000PTG permits the user to perform test from distances even higher than 120 m. This feature is especially useful to test the AOAs calculation mechanism.

The user can control and operate the unit through the embedded software using the touch display of the equipment. This performance gives the user the capability to manage on-site the emitters list which means that no additional HW or SW components (i.e. laptops) are needed. This management involves creating new emitters or modify any parameter (frequency, PRI, PW, Power, etc) of an existing one.

As an option the EWE8000PTG can be operated remotely by an external laptop or tablet. This option allows the users to perform test with only one maintenance operator.

All of these previous features together with its portability, ease of operation and its flexibility make this unit a powerful tool to help user to perform flight line test saving maintenance time and costs.

Technical Specifications

Configuration

This configuration is composed by the following modules.

- **Core Unit: Portable Unit (0141811002400)**
- **Front-End Radar Low Distance (0141811002000)**
- **Accessories/Options**
  - Front-End UV Stimulator (optional)
  - Front-End IR Stimulator (optional)
  - Remote control (Laptop, tablet o hand held) (optional)
  - Additional Batteries (optional)
  - External Battery charger (optional)

Operative Specifications

Test and Validations:
- Checks RWR functionality in band C/D, E/J and K
- Checks sensibility of the RWR system.
- Checks AOA.

BIT (Built in Test):
- All of the equipment elements are checked in details (voltages, transmissions, automatically accessories connections, etc.). The unit reports any fault detected.

Software:
- **Embedded software:** Control and operation of the unit through the basic included software.
- **Assisted configuration:** It allows no expert operators to configure emitters easily using the touch screen interface.

Technical Specifications

RF TX characteristics:
- **Frequency range:** 1-36GHz
- **Modulation:**
  - CW (1-36GHz)
  - Pulsed
    - AM
    - SWEEP
- **PRI:** 1us-1s (45ns of resolution)
- **PW:** 20ns-10ms (1ns de resolution)
- **Number of simultaneous emitters:** 1
- **Dynamic Range:** 60dB
- **Dynamic range accuracy:** ±1dB
- **Harmonics: -20dBc**
- **Spurious: -40dBc**
- **Phase noise: -80dBc/Hz**
- **Wave types:**
  - Continuous wave or pulsed Radar.
  - Scan: circulars, sectorials (horizontals and verticals), helicoidals, spirals, raster, conics, palmer helicoidals, palmer spirals and palmer raster, etc.)
  - PRI: fixed or agile (uniform Jitter, Gaussians, jitter, stagger, senoidals, sliding, etc.)
  - PW Fixed or agile (maximum of 8 positions and 10 pulses per position)

Battery:

- Operation: Up to 4 fours
- Stand-by Mode: Up to 16 hours
- Charging time (100 %): 2 hours

Power supply Characteristics:
- Power: 115/230 VCC (90-132/184-264), 47-440 Hz
- Consumption: < 150w

Attributes:
- Operation temperature range: -20 ºC to +50 ºC
- Dimensions: 390x210x637mm
- Weight: 10 Kg
- Transport: MILD-STD 810
- Storage: MILD-STD 810

Main applications

- Validation of Electronic Warfare systems (RWR, ESM, ELINT, etc).
- Preflight test (Go-NoGo)
- Maintenance tasks (ML0)

Note: Specifications are subject to change without notice

EWE8000PTG-RIU

Portable Threat Generator – Radar, IR and UV
PN: 0141801000801

Description

The EWE8000PTG–RIU is a Portable Radar, IR and UV Thread Generator designed to perform Go-NoGo test of the EW Systems (RWR, ESM/ELINT, MWS, LWS, etc.) on the flight line. It generates any type of radar signal complex or simple in the band of (1-36 GHz) covering the complete typical band and subbands in which the EW Systems works. In addition this configuration is also capable to generate IR and UV signals.

The EWE8000PTG has a long life batteries that allow the unit to be working continuously more than 4 hours and keep in a stand-by mode more than 16 hours. The complete recharge time is less than 2 hours. The equipment also counts with a very simple battery replacement mechanism that can be made by the user.

For the typical sensibility of EW systems the amplifiers included in the EWE8000PTG permits the user to perform test over the RWR and ESM systems from distances even higher than 120 m. This feature is especially useful to test the AOAs calculation mechanism.

The user can control and operate the unit through the embedded software using the touch display of the equipment. This performance gives the user the capability to manage on-site the emitters list which means that no additional HW or SW components (i.e. laptops) are needed. This management involves creating new emitters or modify any parameter (frequency, PRI, PW, Power, etc) of an existing one (Radar, IR or UV).

As an option the EWE8000PTG can be operated remotely by an external laptop or tablet. This option allows the user to perform test with only one maintenance operator.

All of these previous features together with its portability, ease of operation and its flexibility make this unit a powerful tool to help user to perform flight line test saving maintenance time and costs.

Technical Specifications

Configuration

This configuration is composed by the following modules.
- **Core Unit: Portable Unit (0141811002400)**
- **Front-end Radar Low Distance (0141811002000)**
- **Front end IR Stimulator (0141811001800)**
- **Front end UV Stimulator (0141811001900)**
- **Accessories/Options (not included)**
  - Remote control (Laptop, tablet o hand held)
  - Additional Battery
  - External Battery charger

Operative Specifications

Test and Validations:
- Checks RWR functionality in band C/D, E/J and K
- Checks sensibility of the RWR system.
- Checks AOA.

BIT (Built in Test):
- All of the equipment elements are checked in details (voltages, transmissions, automatically accessories connections, etc.). The unit reports any fault detected.

Software:
- **Embedded software:** Control and operation of the unit through the basic included software.
- **Assisted configuration:** It allows no expert operators to configure emitters easily using the touch screen interface.

Technical Specifications

RF TX characteristics:
- **Frequency range:** 1-36GHz
- **Modulation:**
  - CW (1-36GHz)
  - Pulsed
  - AM
  - SWEEP
- **PRI:** 1us-1s (45ns of resolution)
- **PW:** 20ns-10ms (1ns de resolution)
- **Number of simultaneous emitters:** 1
- **Dynamic Range:** 60dB

- **Dynamic range accuracy:** ±1dB
- **Harmonics: -20dBc**
- **Spurious: -40dBc**
- **Phase noise: -80dBc/Hz**
- Wave types:
  - Continuous wave or pulsed Radar.
  - Scan: circulars, sectorials (horizontals and verticals), helicoidals, spirals, raster, conics, palmer helicoidals, palmer spirals and palmer raster, etc.)
  - PRI: fixed or agile (uniform Jitter, Gaussians, jitter, stagger, senoidals, sliding, etc.)
  - PW Fixed or agile (maximum of 8 positions and 10 pulses per position)

UV TX characteristics:
- **Spectrum:** Solar blind.
- **Firms store capability.**

IR laser TX characteristics:
- **Wavelength:** 635nm, 980nm. (configurable in factory)
- **Types of Laser: 1, 2, 3R.**
- **Modulation:**
  - CW
  - Pulsed:
    - PRI: 18us - 2s
    - PW: 10ns-10ms

Battery:

- Operation: Up to 4 fours
- Stand-by Mode: Up to 16 hours
- Charging time (100 %): 2 hours

Power supply Characteristics:
- Power: 115/230 VCC (90-132/184-264), 47-440 Hz
- Consumption: < 150w

Attributes:
- Operation temperature range: -20 ºC to +50 ºC
- Dimensions: 390x210x637mm
- Weight: 10 Kg
- Transport: MILD-STD 810
- Storage: MILD-STD 810

Main applications

- Validation of Electronic Warfare systems (RWR, ESM, ELINT, MILDS, LWS etc).
- Preflight test (Go-NoGo)
- Maintenance tasks (ML0)

Note: Specifications are subject to change without notice

Description

The EWE8000RTG–T2 is a high performances Radar Threat generator in the C/D and E/J band (0,5 to 18 GHz) used to verify and validate all the functionality of ESM and RWR systems.

It generates any type of radar signal, complex (including intrapulse modulation) or simple, in the band from 0,5 to 18 GHz.

The equipment can generate up 32 simultaneous emitters simulating even its trajectories. The direction and/or speed of the simulated platform can be changed and it is possible to consider in the simulation even the geographical data (including height). All of these features make possible to simulate the operation scenario of a mission before it starts. Therefore the EWE8000RTG is useful not only for maintenance but for training issues as well.

The user can control and operate the unit through the embedded software using the touch display of the equipment. This performance gives the user the capability to manage on-site the emitters list which means that no additional HW or SW components (i.e. laptops) are needed. This management involves creating new emitters or modify any parameter (frequency, PRI, PW, Power, etc) of an existing one.

As an option the EWE8000RTG can be operated remotely by an external laptop or tablet. This option allows the user to perform test with only one maintenance operator.

Designed to meet the most discerning requirements, it can integrate all features of the EWE8000 series in an IP65 assembly that is prepared to work under the most adverse weather conditions.

Since it has a special temperature control system that keeps it stable inside the unit, the negative effects caused by the temperature variation are eliminated improving the accuracy of the unit significantly.

Technical Features

Configuration

This configuration is composed by the following modules.
- **Core Unit: Advanced Unit (**0141811001400**)**
- **C/D Downconverter V2** (0141821002400).
- **E/J Upconverter V2** (0141821002200).
- **DOAS Tray (PN:** 0141821001600).
- **Accessories/Options (not included)**
  - Remote control (Laptop, tablet o hand held)
  - Radar Low Distance Front-end
  - End To End Accessories
  - K UPCONVERTER tray.
  - Trolley for transport

Features

Test and Validations:
- Ability to generate real radar signals to validate/verify operation of the ELINT, ESM and RWR systems.
- Pulsed signals multi-emission over the whole frequency range.

BIT (Built in Test):
- All of the equipment elements are checked in details (voltages, transmissions, automatically accessories connections, etc.). The unit reports any fault detected.
- Full system BIT (Build in test) at radiofrequency level (it checks the operating status of the RF transmitter and receiver) and digital level.

Software:
- **Embedded software:** Control and operation of the unit through the basic included software.
- **Assisted configuration:** It allows no expert operators to configure emitters easily using the touch screen interface.
- **Worldwide maps** are integrated with a tactile control and associated to a GPS receptor which shows the exact position of each element of the system in real time.

Technical Specifications

RF TX characteristics:

- Number of RF outputs: 4 DOA outputs (+1 omnidirectional output per band)
- Number of simultaneous emitters: up to 32 of pulsed wave emitters (extendable to 128) or 1 continuous wave emitter.
- Dynamic range of the carrier: +0 dBm -60 dBm.
- Dynamic range accuracy: ± 1 dB.
- Working frequency:
  - 0.5 - 2 GHz.
  - 2 - 18 GHz
- Spurious signals/harmonics: -40 dBc.
- Phase noise: -80dBc/Hz (Multi-emitter) -90dBc/Hz (Continuous wave mode).
- Instantaneous bandwidth: 150 MHz.
- Frequency Change speed: 1us for +/1 MHz in bands C/D and E/J.
- PRI range: 1us - 1sg (45ns resolution).
- PW range: 1nsg - 10msg (1ns resolution).
- AM dynamic range: 60 dB.

Wave Shapes:
- Continuous or pulsed radar.
- Frequency with agility (random uniform, Gaussian random, sweeps, used per pulse and user per time) or without agility.
- SCAN (circular, sectoral (horizontal and vertical), helicoidal, spiral, raster, conical, palmer helicoidal, palmer spiral and palmer raster).
- Fixed or agile PRI (uniform jitter and Gaussian jitter).
- Fixed or agile PW (maximum of 8 positions and 10 pulses per position).
- Modulation on pulse: chirp (ascending, descending, in V and in A), Barker, Frank Huffman and pseudo-random. Optional configuration.

Power supply Characteristics:
- Power supply: 115/230 VCC (90-132/184-264), 47-440 Hz
- Consumption: < 100w

Attributes:
- Operating temperature: from -10 ºC to +50 ºC
- Dimensions: 609.60X398.78X566.42" (HALF-RACK)
- IP65
- Transport: MILD-STD 810
- Storage: MILD-STD 810

Main applications

- Validation ELINT or ESM / RWR systems (0.5 to 2 GHz / 2 to 18 GHz) mounted on platform.
- Certification preflight.
- Maintenance Operations levels (ML1 - ML2).

Note: Specifications are subject to change without notice

EWE8000ETE

End To End

PN: TBD – Depending on type of platform

Description

The EWE8000ETE is a specific extension of the EWE8000RTG (see datasheet). This new configuration includes the accessories and the necessary software application to perform acceptance test at LRU level. It means that with the help of this equipment the operator will be able to validate the EW systems without removing any LRU of the platform and isolating any possible failure at the faulty LRU.

The ETE Software guides the user during the complete procedure of validation, therefore it is not necessary an intense training for the operators neither an expert operator to carry out the test. In addition, this guide helps to minimize the possible human fails during the complete procedure.

The EWE8000ETE is designed to gather information of the maintenance data interfaces and of the avionic or EW buses correlating it with the data expected depending on the radar signal injected or radiated.

The systems will generate reports with all the test results.

The ETE unit will increase the reliability and help the user to save cost because it eliminates unnecessary removals and also isolate the failures locating them in the installation or in any LRU of the system.

The unit will have auto diagnostics tools that will report to the user any problem that can exists in the EWE8000ETE.

As each type of EW Systems works in a different way, this external accessory or front-end will be designed depending on the system and on the type of platform

Technical Features

Configuration

This configuration is composed by the following modules.
- **EWE8000RTG – T2 (0141801000401) composed by:**
  o Advanced Unit (0141811001400)
  o C/D Downconverter V2 (0141821002400).
  o E/J Upconverter V2 (0141821002200).
  o DOAS Tray (PN: 0141821001600).
- **End To End Accessories (PN: depend on platform)**
- **Accessories/Options (not included)**
  o Remote control (Laptop, tablet o hand held)
  o K UPCONVERTER tray.
  o Trolley for transport

Features

Test and Validations:
- Ability to generate real radar signals to validate/verify operation of the RWR systems.
- Pulsed signals multi-emission over the whole frequency range.
- It isolates the failures at LRU level (ML1)

BIT (Built in Test):
- All of the equipment elements are checked in details (voltages, transmissions, automatically accessories connections, etc.). The unit reports any fault detected.
- Full system BIT (Build in test) at radiofrequency level (it checks the operating status of the RF transmitter and receiver) and digital level.

Software:
- **Embedded software:** Control and operation of the unit through the basic included software.
- **Assisted configuration:** It allows no expert operators to configure emitters easily using the touch screen interface.
- **Assisted test execution:** It guides the user during the complete validation procedure.
- **Worldwide maps** are integrated with a tactile control and associated to a GPS receptor which shows the exact position of each element of the system in real time.
- **Reports:** It generates a complete report of the test results that helps the user to take decisions.

Technical Specifications

RF TX characteristics:
- Number of RF outputs: 4 DOA outputs (+1 omnidirectional output per band)
- Number of simultaneous emitters: up to 32 of pulsed wave emitters (extendable to 128) or 1 continuous wave emitter.
- Dynamic range of the carrier: +0 dBm -60 dBm.
- Dynamic range accuracy: ± 1 dB.
- Working frequency:
  o 0.5 - 2 GHz.
  o 2 - 18 GHz
- Spurious signals/harmonics: -40 dBc.
- Phase noise: -80dBc/Hz (Multi-emitter) -90dBc/Hz (Continuous wave mode).
- Instantaneous bandwidth: 150 MHz.
- Frequency Change speed: 1us for +/1 MHz in bands C/D and E/J.
- PRI range: 1us - 1sg (45ns resolution).
- PW range: 1nsg - 10msg (1ns resolution).
- AM dynamic range: 60 dB.

Wave Shapes:
- Continuous or pulsed radar.
- Frequency with agility (random uniform, Gaussian random, sweeps, used per pulse and user per time) or without agility.
- SCAN (circular, sectoral (horizontal and vertical), helicoidal, spiral, raster, conical, palmer helicoidal, palmer spiral and palmer raster).
- Fixed or agile PRI (uniform jitter and Gaussian jitter).
- Fixed or agile PW (maximum of 8 positions and 10 pulses per position).
- Modulation on pulse: chirp (ascending, descending, in V and in A), Barker, Frank Huffman and pseudo-random. Optional configuration.

Power supply Characteristics:
- Power supply: 115/230 VCC (90-132/184-264), 47-440 Hz
- Consumption: < 100w

Attributes:
- Operating temperature: from -10 ºC to +50 ºC
- Dimensions: 609.60X398.78X566.42" (HALF-RACK)
- IP65
- Transport: MILD-STD 810
- Storage: MILD-STD 810

Main applications

- Validation of RWR systems (0.5 to 2 GHz / 2 to 18 GHz) mounted on platform.
- Certification preflight.
- Maintenance Operations levels (ML1 - ML2).

Note: Specifications are subject to change without notice

EWE8000SRV

Sonobuoy Receptor Validator
PN: 0141801001001

Description

The EWE8000SRV emulates the sonobuoys RF signal so it permits to verify the acoustic systems or sonobuoy system receiver installed in a naval or air platform. It emulates the DIFAR sonobuoy but can simulate the signal of any other type by updating the Software and Firmware of the unit.

The EWE8000SRV is capable to transmit FM the information of a DIFAR or any other type of sonobuoy. The user can select as well the channel and can load test or prerecorded signals to be transmitted.

It can emulate up to 32 simultaneous signals. This feature permits to simulate sonobuoy search patterns in order to test the functionality of the acoustic systems in a real scenario. In addition, it can be also used for training issued.

The user can control and operate the unit through the embedded software using the touch display of the equipment. This performance gives the user the capability to manage on-site the emitters list which means that no additional HW or SW components (i.e. laptops) are needed.

As an option the EWE8000SRV can be operated remotely by an external laptop or tablet. This option allows the user to perform test with only one maintenance operator.

Technical Details

Configuration

This configuration is composed by the following modules.

- **Core Unit: Basic Unit (0141811000200)**
- **Sonobuoy Front-End (0141811000400)**
- **Tripod and pointing set (0141821002800)**
- **Accessories/Options (not included)**
  - o Remote control (Laptop, tablet o hand held)
  - o Tripod.
  - o Trolley for transport

Features

Test and Validations:

- Allows the FM transmission of a DIFAR type sonobuoy gathered information.
- User selectable transmission channel.
- Preloaded test signal. The user can load new test signals.
- Extendable for testing different types of sonobuoys (DICAS, VLAD, LOFAR, HIDAR, BARRA; ADAR,…) by means of a software and firmware update.

BIT (Built in Test):

- All of the equipment elements are checked in details (voltages, transmissions, automatically accessories connections, etc.). The unit reports any fault detected.
- Full system BIT (Build in test) at radiofrequency level (it checks the operating status of the RF transmitter and receiver) and digital level.

Software:

- **Embedded software:** Control and operation of the unit through the basic included software
- **Assisted configuration** will permit to the most inexpert operator to configure the transmission by means of a user friendly human machine interface.
- **Worldwide maps** are integrated with a tactile control and associated to a GPS receptor which shows the exact position of each element of the system in real time.

Technical Specifications

RF TX characteristics:

- Frequency range: 136 – 173.125 MHz
- FM transmission with frequency deviation configurable
- Spurious/harmonics: -50 dBc
- EIRP: > -10 dBm

Power supply Characteristics:

- Power supply: 115/230 VCC (90-132/184-264), 47-440 Hz
- Consumption: < 100w

Attributes:

- Operating temperature: -10 ºC a +50 ºC
- Dimensions: 157x303x350 (HALF-RACK)
- IP 64
- Transport: MILD-STD 810
- Storage: MILD-STD 810

Main applications

- DIFAR type sonobuoy receiver systems on platform validation.
- Prior to mission functional testing.
- Maintenance operations

Note: Specifications are subject to change without notice

EWE8000CBG
Communications Band Generator

Description

The EWE8000CBG is a generator of communication signals designed to verify and validate COMINT systems in the frequency range from 2 MHz to 2500 MHz.

It can transmit any type of communication signal of any type of modulation (analogical and/or digital).

The equipment can generate up 32 simultaneous signals. So the user can create missions that groups emitters with some types of modulation, with different parameters and times, etc. In addition the system can simulate frequency hopping with changes since 25 µsg

The user can control and operate the unit through the embedded software using the touch display of the equipment. This performance gives the user the capability to manage on-site the emitters list which means that no additional HW or SW components (i.e. laptops) are needed. This management involves creating new signal or modifies any parameter (frequency, Modulation, hopping, power, bit rate, etc.) of an existing one.

As an option the EWE8000CBG can be operated remotely by an external laptop or tablet. This option allows the user to perform test with only one maintenance operator.

Technical Details

Configuration

This configuration is composed by the following modules.

- **Core Unit: Basic Unit (**0141811000200**)**
- **Communication Band Front-End (**0141811001700**)**
- **Accessories/Options (not included)**
  - Remote control (Laptop, tablet o hand held)
  - Trolley for transport

Features

Test and Validations:

- Ability to transmit both analogical and digital modulations.
- Configurable transmission features: output power, bit rate, etc.
- **MISSION** mode provides self operation capacity sequentially transmitting a list of previously scheduled broadcasts.

BIT (Built in Test):

- All of the equipment elements are checked in details (voltages, transmissions, automatically accessories connections, etc.). The unit reports any fault detected.
- Full system BIT (Build in test) at radiofrequency level (it checks the operating status of the RF transmitter and receiver) and digital level.

Software:

- **Embedded software:** Control and operation of the unit through the basic included software
- **Assisted configuration** will permit to the most inexpert operator to configure the transmission by means of a user friendly human machine interface.

Main applications

- Validation and functional testing of COMINT.
- Maintenance operations (ML1 – ML2).

- **Worldwide maps** are integrated with a tactile control and associated to a GPS receptor which shows the exact position of each element of the system in real time.

Technical Specifications

RF TX characteristics:

- Frequency range: 3 - 3000 MHz
- Output power: 0 dBm
- Dynamic range: >60 dB
- Spurious: >-40 dBc
- Signal types**:** CW, noise, analogical modulations (AM, DSB, USB, LSB, FM) and digital modulations (ASK, FSK, PSK, 8PSK, 16PSK, QAM, 16QAM).
- Frequency hopping generation with digital modulations

Power supply Characteristics:

- Power supply: 115/230 VCC (90-132/184-264), 47-440 Hz
- Consumption: < 150w

Attributes:

- Operating temperature: -10 ºC a +50 ºC
- Dimensions: 157x303x350 (HALF-RACK)
- IP 64
- Transport: MILD-STD 810
- Storage: MILD-STD 810

Note: Specifications are subject to change without notice

EWE8000TBV

Tacan Beacon Validator
PN: 0141801001101

Description

The EWE8000TBV has been designed to verify and validate the functionalities of a TACAN BEACON system (check of the transmitted signal and answer to DME polls). It generates the RF signals that take part in the communication protocol.

The EWE8000TBV has been developed to work with the Device under Test installed in its original position therefore it is not necessary to remove the unit to be validated saving time and costs in the maintenance tasks.

This makes the EWE8000TBV the market leading equipment for testing and validating any TACAN BEACON system, making it trivial afterwards to pass any certification process.

To let the user interact with the EWE8000TBV a extremely easy to use interface is provide with the unit. With this local interface the user can configure any parameter of the SW application used to control and operate the equipment.

As an option the EWE8000TBV can be operated remotely by an external laptop or tablet via wired (LAN) or wireless networks (Wifi/GPRS/3G/4G). This option allows the user to perform test with only one maintenance operator. In this way, it is possible to remotely control every single element of the test procedure while having a clear vision of the geographic position of the operator in the user interface.

Technical Details

Configuration

This configuration is composed by the following modules.

- **Core Unit: Basic Unit (0141811000200)**
- **TACAN Beacon Front-End (0141811001600)**
- **Tripod and pointing set (0141821002800)**
- **Accessories/Options (not included)**
  - F.E. SRV – 0141811001600
  - Remote control (Laptop, tablet o hand held)

Features

Test and Validations:

- **Bearing delay:** measures are referenced automatically to the magnetic north.
- **Distance measure:** checking the system delay and the efficiency of the answer by measuring the received answers to sent polls ratio.
- **Number of pulses:** of the main burst, the auxiliary burst and the squitter pulses.
- **Modulation accuracy:** detecting breakdown of the antenna or other auxiliary devices.
- **Identification:** of the beacon with Morse signal reception.

Reports:

- **Statistic reports** include the possibility to analyze (even record the data for a second analysis afterwords) the mean deviation in real time and compare it with the standard one.
- **Signal envelope in real time**: it is possible to visualize the signal envelope by separating the 15Hz and 135Hz modulation signals to visually detect any error that may occur due to broken elements in the antenna, thus with no need to dismantle it.
- **Storing the results** strictly correlated with the statistic measurements offers the possibility to make an exhaustive analysis of them.

BIT (Built In Test)

- All of the equipment elements are checked in details (voltages, transmissions, automatically accessories connections, etc.). The unit reports any fault detected.
- Full system BIT (Build in test) at radiofrequency level (it checks the operating status of the RF transmitter and receiver) and digital level.

Software:

- **Embedded software:** Control and operation of the unit through the basic included software
- **Assisted configuration** will permit to the most inexpert operator to configure the channel, eliminate ambient noise and correct the geographical position thanks to a touch screen and a user friendly HMI.
- **Worldwide maps** are integrated with a tactile control and associated to a GPS receptor which shows the
- Exact position of each element of the system in real time.

Technical Specifications

RF TX characteristics:

- DME poll in a 1Km range mínimum
- Working frequency: 960 - 1215 MHz
- Spurius/harmonics: -50 dBc
- EIRP: > 1W

RF RX characteristics:

- Working frequency: 960 - 1215 MHz
- Dynamic range: +10 dBm -60 dBm
- Dynamic range accuracy: ± 1 dB
- Automatic Gain Control.
- Noise cancelation.

Power supply Characteristics:

- Power supply: 115/230 VCC (90-132/184-264), 47-440 Hz
- Power consumption: < 100w

Environmental and mechanical attributes:

- Operating temperature: from -10 ºC to +50 ºC
- Dimensions: 157x303x350 (HALF-RACK)
- Transport: MILD-STD 810
- Storage: MILD-STD 810

Main applications

- Validation of the TACAN BEACON system installed on platform.
- Prior to mission functional testing.
- Maintenance operations (ML1 – ML2)

Note: Specifications are subject to change without notice

EWE8000AMU
Advanced Mobile Unit

Description

EWE8000.AMU is developed as a platform for autonomous mobile validation that integrates all the functionalities of the EW8000 family. It allows ground or flight check for all electronic warfare systems making it trivial afterwards to pass any certification process.

The EWE8000.AMU can be remotely controlled using a rugged portable computer or tablet which let the user perform all major actions and see where the antennas are pointing to, thanks to a high definition camera located at the top of the mast.

EWE8000.AMU is capable to check the complete platform system, validating it is properly working for the mission and certifying the whole functionality of electronic warfare systems.

The EWE8000AMU operates autonomously, turning it in a essential diagnostic tool for systems in hard access locations. It has an advanced fully automatically deployment system that permits the user to deploy and start to operate in a very short time (less than 3 minutes) just using the laptop or tablet remote control.

EWE8000.AMU is fully configurable and it can be adapted to the systems integrated on the platform under test, and may include the necessary equipment from the EWE8000 family. You have the possibility to control it miles away, through a GPRS/3G/4G connection.

EWE8000.AMU can certify performance of electronic warfare systems and, thanks to the possibility of simulating a real warfare environment, it can be used to train operators for ESM/RWR systems.

Technical Details

Configuration

This configuration is composed by the following modules.
- **EWE8000RTG – T2 (0141801000401) composed by:**
  - Advanced Unit (0141811001400)
  - C/D Downconverter V2 (0141821002400).
  - E/J Upconverter V2 (0141821002200).
  - DOAS Tray (PN: 0141821001600).
- Pick-up vehicle
- **Remote control** (Laptop, tablet o hand held)
- **Accessories and extensions**: This configuration can be extended with any internal or external accessory of the EWE8000 family.

* Features

Test and Validations:
- **Test EW systems:** This mobile unit can be used to test and certify any EW systems boarded in a platform.
- **Test on ground or in operation**: Due it high output power it can test systems on both scenarios reaching distance of more than 4 km (it can be extended) with the default amplifier.
- **Portable in VW Amarok:** All the GSE system is integrated in a mobile vehicle.
-

BIT (Built In Test)
- All of the equipment elements are checked in details (voltages, transmissions, automatically accessories connections, etc.). The unit reports any fault detected.
- Full system BIT (Build in test) at radiofrequency level (it checks the operating status of the RF transmitter and receiver) and digital level.

Reports
- **Statistic reports** include the possibility to analyze (even record the data for a second analysis afterwords) the mean deviation in real time and compare it with the standard one.
- **Signal envelope in real time**: it is possible to visualize the signal envelope by separating the 15Hz and 135Hz modulation signals to visually detect any error that may occur due to broken elements in the antenna, thus with no need to dismantle it.
- **Storing the results** strictly correlated with the statistic measurements offers the possibility to make an exhaustive analysis of them.

Software:
- Control Interface : Linux, Windows 7/8, Android

- Control of pointing capabilities and pointing camera
- Advanced all-in-one design to control all radiation parameters and visualization and control of EWE8000.AMU (doors, pointing signal and camera, generator)
- **World Maps:** World maps with touch control and GPS position.

Technical Specifications

RF TX characteristics:
- Simultaneous emitters: 1-32 Pulsed (expandable) or 1 CW
- Dynamic Range: +0 dBm -60 dBm.
- Dynamic Range Variation: ± 1 dB.
- Working Frequency:
  - 0.5 - 2 GHz
  - 2 - 18 GHz (ext to 20 Ghz)
- Espur/Arm: -40 dBc.
- Phase Noise:
  - -80dBc/Hz (Multiem)
  - -90dBc/Hz (CW).
- Instantaneous Bandwidth: 150 MHz
- Frequency hopping time : 1us +/-1 MHz (C/D & E/J)
- PRI: 1us - 1s (45ns resol)
- PW: 1ns - 10ms (1ns resol)
- AM Dynamic Range: 60 dB.
- Antenna Gain C/D::>4dBi
- Antenna Gain E/J ,2-7 GHZ :18-32 dBi
- Antenna Gain E/J:7-18GHZ:32-35 dBi
- 5KVA Generator
- Output Power:
  - C/D: 50 Watios@1db Comp.
  - E/J: 2-7 GHz: >20W in CW and >60W in Pulsed. 7-18 GHZ:>20W CW and >60W Pulsed
- E/J Band Reception sensibility: -60dBm

Pointing Features:
- Pointing Mast
- Azimut pointing features: 0-210 º from home position
- Elevation pointing features: 5-15 º from the horizontal line
- BeamWidth E/J(1-18 GHZ) : 31.6-1.6 º

Power supply Characteristics:
- Gasoil Generator: 220 VCA (84-264), 47-440 Hz or Mains 220VCA
- Consumption: < 4000W

Main applications

- RWR / ESM / ELINT on-platform (on ground or operating) systems validation.
- Working tests before Certification flight.
- Manteinance operations (ML1 level)

Note: Specifications are subject to change without notice

ALR400 Maintenance Rack
PN: 0141803700100

Description

The ALR 400 maintenance rack is a workbench designed to test and validate any equipment of the ALR 400 Radar Warning Receiver.

As it emulates the complete installation of the ALR400 systems, the rack provides the user with tools to carry out acceptance test out of the platform.

In addition this maintenance rack is capable to diagnose and make single test isolating failures at the LRU level (ML1). This advantage permits:
- o Reduce the No Failure Found Rate.
- o Save maintenance time as the unit is verified before to be installed.

The rack is controlled and operated from a central console. It contains an specific Software with an intuitive and easy to use interface.

The software is designed to assist the users during the test procedures allowing even the most inexperienced operator to perform the validation easily. In addition, it generates reports with the results of every test performed.

The Rack configuration includes an EWE8000RTG unit (see correspond EWE8000 datasheet) with Radar signal generators capability.

TECHNICAL SPECIFICATIONS

Configuration

Units supplied and recommended:
- 1 industrial 19" Racks with electrical and mechanical interfaces for RWR ALR400 Units
- Rack Set of process:
    - Laptop including Bus 1553
    - Control and reporting SW
- EWE8000 unit with the following configuration:
    - Advanced core unit
    - Radar generation capability

Operating specifications

Test and Validations:
- The maintenance rack can test the following units:
    - Antennas
    - EJ Receiver Units
    - CD receiver Unit
    - Electronic Warfare Processor
    - Hubs USB
    - Azimuth Displays
    - UCA, etc.
- Test and validation out of platform
- **"End to End":** Performance tests by stimulating all subsystem sensors
- **Complex Radar threat simulation:** Verification of Radar Warning Characteristics (RWR)
- **AOA Measure Verification:** Detection of Antenna or angle of arrival (AOA) failures.
- **Sensibility:** It can check the sensibility of a system.

- **Library generation and flight report extraction**
- **Reports generation.** The system will generate reports with the test results.

BIT (Built In Test)
- **PBIT-CBIT:** Status of each system LRU (Go/NO Go)
- **BIT (Built In Test):** Ensuring properly operation of system to prevent false alarms

HMI:
- **Assisted configuration** will permit to the most inexperienced operator to configure the rack and to carry out any test in a easily way.
- **IHM:** Advanced interface to operate complete system in an intuitive way

Technical Specifications

Signal Generation:
- See EWE8000 Technical Specs

Electrical Specifications:
- Power Supply: 115/230 VCA (90-132/184-264), 47-440 Hz

Attributes:
- Operational Temperature: -10 ºC a +50 ºC
- Dimensions: 1 industrial 19" Racks: LxWxH - 1200 x 800 x 2050)
- Weight: 110 Kg

Main applications

- Validation of the ALR400 RWR systems
- Validation of the ALR400 RWR units
- Functional testing prior to installation and certification flight
- Maintenance operations levels (ML1)

Note: Specifications are subject to change without notice

EWS-STTE

EWS **S**pecial to **T**ype **T**est Equipment
PN: 0141803800100

Description

EWS-STTE system is an maintenance rack designed to test and validate any equipment of the complete suite of Electronic Warfare including RWR, MWS, LWS, Chaff & Flare Dispenser, etc.

It emulates the complete installation of the platform so the user can carry out test out of it.

The EWS-STTE is capable to diagnose and make single test isolating failures at the LRU level (ML1). This advantage permits to reduce the No Failure Found Rate and save maintenance time as the unit is verified before to be installed.

The rack is controlled and operated from a central console. It contains an specific Software with an intuitive and easy to use interface.

The software is designed to assist the users during the test procedures allowing even the most inexperienced operator to perform the validation easily. In addition, it generates reports with the results of every test performed.

The EWS-STTE presents a modular structure which permits customers to extend and/or adapt the capabilities desired according to their specific needs.

The Rack configuration includes an EWE8000 unit (see correspond EWE8000 datasheet) with Radar, IR and UV signal generators capability.

TECHNICAL SPECIFICATIONS

Configuration

Units supplied and recommended:
- 2 industrial 19" Racks with electrical and mechanical interfaces for EWS Units
- 2 integrated power supplies to feed all EWS subsystem equipment
- Payload Simulators
- EWS-STTE Set of process:
    - Laptop including Bus 1553
    - Control and reporting SW
- EWE8000 unit with the following configuration:
    - Advanced core unit
    - Radar generation capability
    - UV generation capability
    - IR generation capability
    - Counter measures reception capabilities

Operating specifications

Test and Validations:
- The maintenance rack can test the following units**:**
    - Antennas
    - Radar Receiver Units
    - Laser Sensor Units
    - Missile Detection Units
    - Chaff & Flare Dispensers Subsystem
    - Electronic Warfare Processor
    - Electronic Warfare Datamodule, etc.
- Test and validation out of platform
- **"End to End":** Performance tests by stimulating all subsystem sensors
- **Complex Radar threat simulation:** Verification of Radar Warning Characteristics (RWR)
- **AOA Measure Verification:** Detection of Antenna or angle of arrival (AOA) failures.

- **Library generation and flight report extraction**
- **Reports generation.** The system will generate reports with the test results.

BIT (Built In Test)
- **PBIT-CBIT:** Status of each system LRU (Go/NO Go)
- **BIT (Built In Test):** Ensuring properly operation of system to prevent false alarms

HMI:
- **Assisted configuration** will permit to the most inexperienced operator to configure the rack and to carry out any test in a easily way.
- **IHM:** Advanced interface to operate complete system in an intuitive way

Technical Specifications

Signal Generation:
- See EWE8000 Technical Specs

Signal reception
- See EWE8000 Technical Specs

Electrical Specifications:
- Power Supply: 115/230 VCA (90-132/184-264), 47-440 Hz

Attributes:
- Operational Temperature: -10 ºC a +50 ºC
- Dimensions: 2 industrial 19" Racks: LxWxH - 1200 x 800 x 2050)
- Weight: 220 Kg

Main applications

- Validation of EWS warfare system
- Functional testing prior to installation and certification flight
- Maintenance operations levels (ML1)

Note: Specifications are subject to change without notice