ATB - 7300NG

Avionics NAV Bench Test Set

Operations Manual

22147865 Rev. 002

VIAVI

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Patents

This product is covered by the following patent(s):

(6,653,844 B2)

Warranty Information

Warranty information for this product is available on the VIAVI website at https://www.viavisolutions.com/en-us/literature/viavi-manufacturer-warranty-avionics-communications-and-synthetic-test-monitoring-and-control-en.pdf.

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Federal Communications Commission (FCC) Notice

This product was tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This product generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this product in a residential area is likely to cause harmful interference, in which case you will be required to correct the interference at your own expense.

The authority to operate this product is conditioned by the requirements that no modifications be made to the equipment unless the changes or modifications are expressly approved by VIAVI.

NEBS compliance

This device complies with the applicable NEBS requirements.

Industry Canada Requirements

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

EMC Directive Compliance

This product was tested and conforms to the EMC Directive, 89/336/EEC as amended by 92/31/EEC and 93/68/EEC for electromagnetic compatibility. A copy of the Declaration of Conformity is provided with this manual.

Declaration of Conformity

VIAVI recommends keeping a copy of the Declaration of Conformity that shipped with the unit with the device at all times.

Low Voltage Directive Compliance

This product was tested and conforms to the Low Voltage Directive, 73/23/EEC as amended by 93/68/EEC. Conformity with this directive is based upon compliance with the harmonized safety standard, EN60950.

WEEE and Battery Directive Compliance

This product, and the batteries used to power the product, should not be disposed of as unsorted municipal waste and should be collected separately and disposed of according to your national regulations.

VIAVI has established a take-back processes in compliance with the EU Waste Electrical and Electronic Equipment (WEEE) Directive, 2012/19/EU, and the EU Battery Directive, 2006/66/EC.

Information and instructions for returning waste equipment and batteries to VIAVI can be found on the VIAV website in the WEEE section of the VIAVI Standards and Policies web page at: https://www.viavisolutions.com/en-us/corporate/legal/policies-standards#sustain.

CA Proposition 65

California Proposition 65, officially known as the Safe Drinking Water and Toxic Enforcement Act of 1986, was enacted in November 1986 with the aim of protecting individuals in the state of California and the state's drinking water and environment from excessive exposure to chemicals known to the state to cause cancer, birth defects or other reproductive harm.

VIAVI's position statement on the use of Proposition 65 chemicals in VIAVI products can be found in the Hazardous Substance Control section of the VIAVI Standards and Policies web page at:
https://www.viavisolutions.com/en-us/corporate/legal/policies-standards#sustain.

Ordering information

This guide is a product of the VIAVI Technical Publications Department, issued as part of the Product Name/Model Number.

- The material number associated with this manual is Document Num. 22147865/Rev. 002. This manual is available on the VIAVI website in PDF format.
- The part number for a published guide in CD format is CD Manual Number.

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Safety and Compliance Information

Symbols and Markings

The following symbols and markings are found on the instrument and in product documentation:

Table 1 Symbols and Markings

	This symbol indicates a note that includes important supplemental information or tips related to the main text.
	**Attention Symbol** This symbol represents a general hazard. It may be associated with either a DANGER, WARNING, CAUTION, or ALERT message. See Table 2 for more information.
	**ESD Sensitive** Indicates item is static sensitive. Item should only be handled by Qualified Service Personnel.
	**Voltage Symbol** This symbol represents hazardous voltages. It may be associated with either a DANGER, WARNING, CAUTION, or ALERT message. See Table 2 for more information.
	**Hot Surface Symbol** This symbol represents a risk of a hot surface. It may be associated with either a DANGER, WARNING, CAUTION, or ALERT message. See Table 2 for more information.
	**WEEE Symbol** This symbol, located on the equipment, battery, or the packaging indicates that the equipment or battery must not be disposed of in a land-fill site or as municipal waste, and should be disposed of according to your national regulations.
	**CE Compliant** CE Label indicates item meets the requirements of the applicable European Directives.
	**Fuse Symbol** Indicates a fuse location (AC or DC).
	**Toxic Symbol** Indicates a toxic hazard. Item should only be handled by Qualified Service Personnel. Dispose of item in accordance with local regulations.

Safety Definitions

This Type of Manual uses the following terms to indicate conditions or activities which are potential safety hazards:

Table 2 Safety Definitions

Term	Definition
CAUTION	Identifies conditions or activities that, if ignored, can result in equipment or property damage, e.g., Fire.
Mise en Garde	Identifiez les conditions ou les activités qui, si ignorées, peuvent entraîner des dommages à l'équipement ou aux biens, p. ex. un incendie.
WARNING	Identifies conditions or activities that, if ignored, can result in personal injury or death.
Avertissement	Identifiez les conditions ou les activités qui, si ignorées, peuvent entraîner des blessures personnelles voire mortelles.

Typographical Conventions

This Type of Manual uses the following typographical conventions:

Table 3 Text formatting and other typographical conventions

Item(s)	Example(s)
Buttons, keys, or switches that you press or flip on a physical device.	Press the **On** button. – Press the **Enter** key. – Flip the **Power** switch to the on position.
Buttons, links, menus, menu options, tabs, or fields on a PC-based or Web-based user interface that you click, select, or type information into.	Click **Start**. – Click **File > Properties**. – Click the **Properties** tab. – Type the name of the probe in the **Probe Name** field.
Directory names, file names, and code and output messages that appear in a command line interface or in some graphical user interfaces (GUIs).	`$NANGT_DATA_DIR/results` (directory) – `test_products/users/defaultUser.xml` (file name) – `All results okay.` (output message)
Text you must type exactly as shown into a command line interface, text file, or a GUI text field.	– Restart the applications on the server using the following command: **`$BASEDIR/startup/npiu_init restart`** Type: **`a:\set.exe`** in the dialog box.

Table 3 Text formatting and other typographical conventions (Continued)

Item(s)	Example(s)
References to guides, books, and other publications appear in *this typeface*.	Refer to *Newton's Telecom Dictionary.*
Command line option separators.	`platform [a|b|e]`
Optional arguments (text variables in code).	`login [platform name]`
Required arguments (text variables in code).	`<password>`

Safety Hazards

Toxic Hazards

WARNING

Some of the components used in this device may include resins and other materials which give off toxic fumes if incinerated. Dispose of such items appropriately.

Avertissement

Certains des composants utilisés dans cet appareil peuvent comprendre des résines et d'autres matériaux qui produisent des émanations toxiques lorsqu'ils sont incinérés. Éliminez adéquatement de tels éléments.

Beryllia

Beryllia (beryllium oxide) is used in the construction of some of the components in this equipment.

This material, when in the form of fine dust or vapor and inhaled into the lungs, can cause a respiratory disease. In its solid form, as used here, it can be handled safely, however, avoid handling conditions which promote dust formation by surface abrasion.

Use care when removing and disposing of these components. Do not put them in the general industrial or domestic waste or dispatch them by post. They should be separately and securely packed and clearly identified to show the nature of the hazard and then disposed of in a safe manner by an authorized toxic waste contractor.

Beryllium Copper

CAUTION

Some mechanical components within this instrument are manufactured from beryllium copper. Beryllium copper represents no risk in normal use. The material should not be machined, welded or subjected to any process where heat is involved.

Beryllium copper must NOT be disposed of by incineration. Beryllium copper must be disposed of as “special waste” per local regulations.

Lithium

A Lithium battery is used in this device. Lithium is a toxic substance so the battery should in no circumstances be crushed, incinerated or disposed of in normal waste.

Do not attempt to recharge this type of battery.

Do not short circuit or force discharge since this might cause the battery to vent, overheat or explode.

CAUTION

This device contains a Lithium Battery and may require special packaging and external labeling when shipping. Contact Customer Service for packaging and labeling instructions.

Mise en Garde

Cet appareil contient une batterie au lithium et peut nécessiter un conditionnement spécial et un étiquetage externe lors de l’expédition. Communiquez avec le service à la clientèle pour les instructions d’emballage et d’étiquetage.

Electrical Hazards

Fuse Replacement

CAUTION

Only use fuses specifically recommended for the Device. Refer to product Safety and Compliance Specifications or the product data sheet for recommended fuse current and voltage ratings.

Mise en Garde

Utilisez seulement des fusibles spécialement recommandés pour l'Artifice. Faites allusion aux Spécifications d'Acquiescement et de Sécurité de produit ou au drap de données de produit pour le courant de fusible recommandé et les estimations de voltage.

Grounding the Instrument

The instrument is provided with a protective grounding lead that conforms with IEC Safety Class I. The supply lead must always be connected to the power supply via a grounded contact in order to maintain the grounding protection. The instrument must be properly grounded to prevent damage to the device from electrostatic discharge (ESD).

WARNING

Improper grounding of equipment can result in electrical shock. To ensure proper grounding, this device should only be connected to a grounded AC Power Source.

Avertissement

La mise à la terre inadéquate de l’équipement peut entraîner un choc électrique. Pour s'assurer d’une mise à la terre adéquate, cet appareil doit seulement être branché à une alimentation électrique CA mise à la terre.

Residual Current

WARNING

The supply filter contains capacitors that may remain charged after the instrument is disconnected from the power supply. The residual energy is within the approved safety requirements, however, a slight shock may be felt if the plug pins are touched immediately after removal.

Avertissement

Le filtre d’alimentation contient des condensateurs qui peuvent rester chargés une fois l’appareil débranché de l'alimentation électrique. L’énergie résiduelle est dans les limites des exigences de sécurité approuvées. Par contre, un léger choc électrique peut être ressenti si l’on touche les broches de la prise immédiatement après son débranchement.

Input Overload

Refer to product labeling and safety documentation for maximum input ratings.

CAUTION

Do not overload input connectors. Refer to product Safety and Compliance Specifications or the product data sheet for maximum input ratings.

Mise en Garde

Identifiez les conditions ou les activités qui, si ignorées, peuvent entraîner des dommages à l’équipement ou aux biens, p. ex. un incendie.

Power Cord

CAUTION

Do not use the power cord if it is damaged or frayed. Replace damaged power cords with cable of the same ratings.

Do not position the power cord in a manner that makes it difficult to disconnect from the main voltage.

Do not allow anything to rest on the power cord.

Do not locate the product where persons can walk on or trip over the power cord.

Mise en Garde

N'utilisez pas la corde de pouvoir s'il est nui ou usé. Remplacez des cordes de pouvoir nuies avec le câble des mêmes estimations.

Ne placez pas la corde de pouvoir dans une manière qui rend difficile de débrancher du voltage principal.

Ne permettez à rien de reposer sur la corde de pouvoir.

Ne trouvez pas le produit où les personnes peuvent marcher sur ou trébucher la corde de pouvoir.

AC Adapter/Charger

CAUTION

Only use the AC Adapter/Charger supplied with the instrument.

The replacement part number:

22037493: Adapter Cord NAmerica

Do not use the AC Adapter/Charger outdoors or in a wet or damp location.

Only connect the AC Adapter/Charger to the correct mains voltage indicated on the ratings label.

Mise en Garde

Utilisez seulement l'Adaptateur/Chargeur de courant alternatif fourni l'instrument.

Le nombre de pièce détachée: Indiquez le nombre de pièce détachée correct; exemple ci-dessous:

22037493: Corde d'Adaptateur NAmerica

N'utilisez pas l'Adaptateur/Chargeur de courant alternatif dehors ou dans un mouillé ou humectez l'endroit.

Raccordez seulement l'Adaptateur/Chargeur de courant alternatif au voltage de conduite principale correct indiqué sur l'étiquette d'estimations.

Equipment Usage

This device is designed and tested to comply with the requirements of 'IEC/EN 61010-1, 3rd Edition Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use' for Class I portable equipment and is for use in a pollution degree 2 environment..

WARNING

Operating this device in a manner not specified in accompanying documentation may impair the safety protection built into the device.

Avertissement

Utiliser cet appareil de manière non spécifiée dans la documentation d'accompagnement peut nuire au dispositif de protection de sécurité intégré dans l'appareil.

Electrostatic Discharge (ESD)

CAUTION

Internal components are ESD sensitive and should only be installed, removed and/or serviced by Qualified Service Personnel.

Mise en Garde

Les composants internes sont sensibles au DES et ne doivent être installés, retirés ou entretenus que par du personnel de maintenance qualifié.

Case/Cover Removal

Do not operate this device with the case or covers removed.

CAUTION

This device does not contain user serviceable parts. Servicing should only be performed by Qualified Service Personnel.

Mise en Garde

Cet appareil ne contient pas de pièces pouvant être entretenues par l'utilisateur. L'entretien doit seulement être effectué par du personnel de service qualifié.

Electromagnetic Interference (EMI)

This product complies with Part 15 of the FCC Rules for a Class A device. Operation is subject to the following two conditions: (1) this product may not cause harmful interferences, and (2) this product must accept any interferences received, including interference that may cause undesired operation.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This product generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this product does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Use properly shielded and grounded cables and connectors in order to meet FCC emission limits.

CAUTION

Signal generators can be a source of Electromagnetic Interference (EMI) to communication receivers. Some transmitted signals can cause disruption and interference to communication services out to a distance of several miles. Users of this equipment should scrutinize any operation that results in radiation of a signal (directly or indirectly) and should take necessary precautions to avoid potential communication interference problems.

Mise en Garde

Les générateurs de signaux peuvent constituer une source d'interférences électromagnétiques (IME) pour les récepteurs radio. Certains signaux émis peuvent provoquer des interférences et des interruptions des communications sur une distance de plusieurs kilometres. Les utilisateurs de cet équipment doivent examiner soigneusement tout fonctionnement provoquant le rayonnement d'un signal (direct ou indirect) et ils doivent prendre les dispositions nécessaires afin d'eviter des problémes potentiels d'interferénces sur les communications.

Ventilation Requirements

The instrument is cooled by internal fans. Failure to provide proper ventilation may result in damage to the instrument. Observe the following precautions when operating the instrument:

CAUTION

Do not obstruct air flow to the air vents.

Do not place the instrument on or close to other heat-generating equipment.

Mise en Garde

N’obstruez pas l’écoulement d’air vers les évents.

Ne placez pas l'instrument sur ou près de tout autre équipement générant de la chaleur.

About this Manual

This preface explains how to use this manual. Topics discussed include the following:

- Organization ii
- Purpose and Scope iii
- Product Nomenclature Cross Reference iii
- Intended Audience iii
- Contact Information iii

Organization

This manual is composed of the following chapters:

Chapter 1 - Overview

Provides an introduction and an overview of Test Set functions and features. Unpacking, installation, and controls and connectors are also included.

Chapter 2 - Test Set Operation

Provides Power On and Power Off procedures. Provides functional description of Graphic User Interface (GUI) components. Provides instructions for defining Test Set parameters.

Chapter 3 - Care and Maintenance

Provides Test Set care, specifications, and environmental requirements.

Appendix A - US/Metric Conversion Table

Provides conversion data details and formula for US standard of measures to metric.

Appendix B - Pin-Out Diagrams

Provides detailed pin-out data for plug-ins.

Appendix C - Remote Control Interface (RCI)

Provides commands for remote control interface capabilities.

Appendix D - Specifications

Provides component specification datum.

Purpose and Scope

The purpose of this manual is to help users successfully use the ATB-7300NG features and capabilities. This manual includes task-based instructions that describe how to install, configure, use and troubleshoot the ATB-7300NG.

Type of Manual	Operations and Maintenance
Equipment Name and Model Number	ATB-7300NG Avionics NAV Test Set
Equipment Use	Avionics Navigation Testing

Product Nomenclature Cross Reference

Official Nomenclature	ATB-7300NG Avionics NAV Bench Test Set
Common Name	Avionics Test Bench, Product Acronym

Intended Audience

This manual is intended for personnel who are familiar with radio test systems and associated equipment and terminology. This manual is intended for novice, intermediate, and experienced users who want to use the ATB-7300NG effectively and efficiently.

Contact Information

Contact VIAVI Customer Service for technical support or with any questions regarding this or any other VIAVI products.

VIAVI
Customer Service Department
10200 West York Street
Wichita, KS 67215
Telephone: 800-835-2350
Fax: 316-529-5330
email: AvComm.Service@viavisolutions.com

International customers please refer to the VIAVI website link below for a service location in your area.

http://www.viavisolutions.com/en/services-and-support/support/technical-assistance.

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Glossary

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1

Introduction to the ATB-7300NG

This chapter provides a general description of the ATB-7300NG. Topics discussed in this chapter include the following:

- ATB-7300NG Overview 1-2
- ATB-7300NG Features and Capabilities 1-2
- ATB-7300NG Controls and Connectors. 1-3
- ATB-7300NG Rear Panel Connectors 1-5

1.1 ATB-7300NG Overview

This manual contains operating instructions for the ATB-7300NG Avionics NAV Bench Test Set. The purpose of this manual is to help technicians successfully use the ATB-7300NG features and capabilities. This manual includes task-based instructions that describe how to install, configure, and use the ATB-7300NG. It is strongly recommended that personnel be thoroughly familiar with the contents of this manual before attempting to operate this equipment.

1.1.1 Description

The ATB-7300NG Avionics NAV Bench Test Set is a comprehensive, configurable test platform for navigation and communications systems and component testing. The test set provides a wealth of RF test functions via a full remote control capability. Applications include R&D, manufacturing, troubleshooting and return to service testing. The Test Set offers unparalleled flexibility for OEM's and repair facilities to adapt to their own unique needs.

Figure 1-1 ATB-7300NG Avionics NAV Test Set

1.2 ATB-7300NG Features and Capabilities

1.2.1 Standard Features

The following are standard ATB-7300NG features and functions.

- **VHF Generator** - Provides control of modulation frequency, modulation depth (up to 3 sources), SELCAL tones, frequency and tone sequences
- **ILS Localizer Generator** - Provides control of 90 Hz and 150 Hz tone frequencies, modulation depths, left/right DDM and ident settings, including Morse code
- **ILS Glide Slope Generator** - Provides control of 90 Hz and 150 Hz tone frequencies, modulation depths, up/down DDM
- **VOR Generator** - Provides control of 30 Hz Var/Ref and 9960 Hz tone frequencies, modulation depths, 9960 Hz deviation, VOR bearing, to/from and ident settings

- **ADF Generator** - Provides control of modulation frequency, modulation depth and ident settings
- **Marker Beacon Generator** - Provides selection of Outer, Middle and Inner marker beacon tones and control of tone frequencies, modulation depth and IDENT settings.

1.2.2 Capabilities and Functions

The following are standard ATB-7300NG features and functions.

- The ATB offers an Ethernet remote control interface.
- Commands set compatibility for legacy products.

1.3 ATB-7300NG Controls and Connectors

1.3.1 ATB-7300NG Front Panel Control and Connectors

The controls and connectors described in this section are located on the ATB-7300NG base unit.

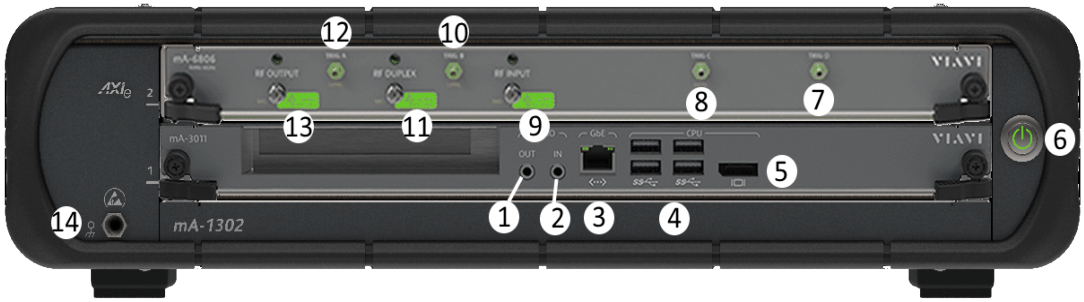

Figure 1-2 ATB-7300NG Front Controls and Connectors

Table 1-1 Front Panel Controls and Connectors

Item	Control/ Connector	Description
1	**Audio Out**	The Audio Output Connector is a 3.5 mm output jack that provides single-ended L/R stereo output. Audio Output circuitry provides DC coupled stereo output and gain stage buffering that compensates for signal loss during filtering.

Table 1-1 Front Panel Controls and Connectors (Continued)

Item	Control/ Connector	Description
2	**Audio In**	The Audio Input Connector is a 3.5 mm input jack that provides for single-ended L/R stereo input with a 100 kOhm resistor to ground. Audio Input circuitry provides ESD protection and a unity gain stage buffer to the stereo L/R signals.
3	**Gigabit Ethernet** 	The RJ45 Gigabit Ethernet (GbE) Connector provides 10/100/10000 Base-T Ethernet connectivity between the COM Express Module and the shelf base fabric. The GbE Connectors should be used to connect peripheral equipment to the ATB-7300NG Module; the Chassis's rear panel Ethernet connector should be used to establish a wired network connection.
4	**USB** 	The ATB-7300NG USB Connectors are Type-A, USB 3.0 ports which provide connections for peripheral equipment and devices (i.e., USB keyboard, USB Mouse, USB adapters).
5	**DisplayPort** 	The DisplayPort Connector is a high resolution, digital interface connector that supports high-definition video and audio.
	 **CAUTION** Do not place tension on a cable that is attached to the DisplayPort Connector; doing so may damage the connector.	
	 **NOTE** Commercially available display port adapters may need to be used to interface to a specific monitor. Typical connections would be DCI-D, S-Video, or VGA.	
6	**Power On/Standby Button** 	The On/Standby Button is located on the Chassis Front Panel. The On/Standby Button is used to initiate the Chassis power on and off sequences. The Chassis should be powered down using the On/Standby Button before the Chassis is disconnected from the AC Power Source. **OFF** The Chassis is off and has been disconnected from an AC Power Supply; the On/Standby Button LED is not illuminated.

Table 1-1 Front Panel Controls and Connectors (Continued)

Item	Control/ Connector	Description
		**ON Mode** The Chassis is powered ON and ready for use; the ON/STANDBY Button is illuminated in a constant green LED.
		**Standby Mode** The Chassis is powered off, but is still connected to an AC power supply: the On/Standby Button is amber. The On/Standby Button LED flashes amber during the power down process.
7	**TRIG D**	Not Available. Reserved for future development.
8	**TRIG C**	Not Available. Reserved for future development.
9	**RF Input**	The RF Input SMA connector is the Test Set's dedicated RF Input connector. This connector provides the maximum receiver sensitivity for the receiver.
10	**TRIG B**	Not Available. Reserved for future development.
11	**RF Duplex**	Not Available. Reserved for future development.
12	**TRIG A**	Not Available. Reserved for future development.
13	**RF Output**	The RF Output SMA connector is the Test Set's dedicated RF Output connector. This connector provides the maximum RF output from the RF Generator.
14	**Chassis Ground**	The Chassis Ground Connector is used to connect an ESD wrist strap to the Chassis to provide ESD protection.

1.4 ATB-7300NG Rear Panel Connectors

This section identifies ATB-7300NG rear panel connectors.

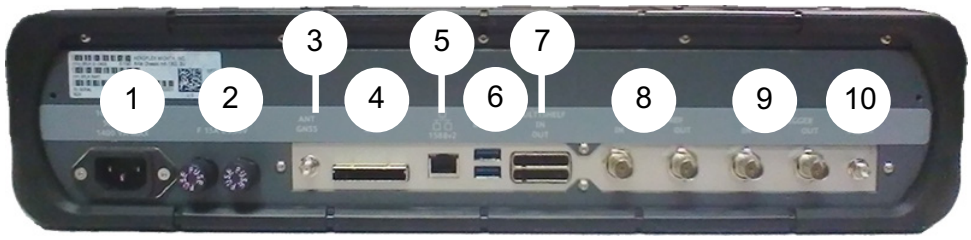

Figure 1-3 ATB-7300NG Rear Panel Connectors

Table 1-2 Rear Panel Connectors

Item	Connector	Description
1	**AC Power Input**	This connector is used to connect the Chassis to a grounded AC Power Source.
	NOTE The Test Set should only be connected to a grounded AC Power Source. Refer to the section titled “Grounding the Instrument” for important safety information.	
2	**Fuse Holder**	The Fuse Holder is located on the Chassis Rear Panel. Fuses should only be replaced by qualified personnel. See “Fuse Replacement”, in the “Safety and Compliance Information” section for important information about fuse replacement.
3	**ANT GNSS**	The ANT GNSS Connector is used to lock to a Global Networking Satellite System for timing and synchronization of the Test Set’s internal frequency reference. Not available. Reserved for future implementation.
4	**PCIe**	A PCIe Connection between the Test Set and External Host Controller is recommended for tasks that require high speed data transfers between the Test Set and External Host Controller. Establishing a PCIe Connection between the Test Set and External Host Controller requires one of the following: • External Host Controller with an operating system capable of PCIe slot enumeration. • A Computer fitted with a PCIe Adapter card and PCIe cable. • A Laptop fitted with a PCIe ExpressCard Adapter and PCIe Adapter Cable. Not available. Reserved for future implementation.

Table 1-2 Rear Panel Connectors (Continued)

Item	Connector	Description
5	**Ethernet 1588v2**	This is the main connection for the remote operation of the ATB-7300NG. The Ethernet Connector is used for basic network connectivity and other functions such as Wake-on-LAN, Wake-on-Frame and timing synchronization. The Ethernet Connection is sufficient to perform low speed data transfers and system communication functions between the Chassis and Host Controller. The Rear Panel Ethernet signal is routed using the Chassis Software Interface.
	NOTE The Chassis identifies and configures LAN connections during the Power Up process. Reconfiguring LAN connections after the Chassis has been powered on may result in the Chassis not being able to locate external devices and network connections. Establish LAN connections before powering on the Chassis.	
6	**USB**	The USB Connectors are 3.0, Type A connectors which can be used to perform high speed data transfers to and from the Chassis System Module.
7	**Multi-Shelf IN OUT**	Reserved for Future Implementation.
8	**10/100 MHz REF IN OUT**	The Frequency Reference Input Connector is used to connect the Chassis to an external frequency reference. The Frequency Reference Output Connector allows the Chassis to be used as a frequency reference by another device. The Chassis Frequency Reference Input/Output signals are routed and configured using the Chassis Web Browser User Interface
9	**System Trigger IN OUT**	Reserved for Future Implementation.
10	**ANT 802.11**	The WiFi Antenna is available to establish a wireless connection to the Chassis when a LAN connection is not available. A WiFi Connection is sufficient to perform low speed data transfers and system communication functions between the Chassis and Host Controller. WiFi connectivity is controlled by the embedded web-server; WiFi activity can also be controlled using an Embedded Host Module. Not available. Reserved for future implementation.

2

Installation, Control and Operation

This chapter describes how to install and operate the ATB-7300NG. The topics discussed in this chapter are as follows:

This section contains installation, control and operating instructions for the Test Set.

- Upon Receipt 2-2
- Installation 2-3
- Powering the Device 2-5
- Turning the Device On/Off 2-6
- Verify Device Operation 2-7
- Control and Operation 2-7
- Managing System IP Address 2-7
- Menu and Toolbar 2-13
- Common Generator Control 2-15
- ADF Generator 2-18
- Localizer Generator 2-18
- Glideslope Generator 2-20
- VOR Generator 2-21
- MKR Generator 2-23
- VHF Generator 2-24
- SELCAL Generator 2-26
- Remote Operation 2-27
- Ethernet Remote Operation 2-28

2.1 Upon Receipt

This section describes tasks that should be completed when a ATB-7300NG is received from the factory.

2.1.1 Unpacking the Device

Special-design packing material inside the shipping carton provides maximum protection for the Test Set. Avoid damaging the carton and packing material during equipment unpacking. Use the following steps for unpacking the Test Set.

1. Cut and remove sealing tape on top of shipping container.
2. Open shipping container. Remove the foam inserts containing the instrument from the shipping container.
3. Remove the device from between foam inserts.
4. Store packing material and shipping container for possible future use.

NOTE

Refer to Packing Procedure for information and instructions for shipping the module.

2.1.2 Verifying Shipment Contents

Verify the shipment is complete according to the items listed on the packing list. Report any discrepancies to VIAVI Customer Service.

2.1.2.1 Standard Hardware Accessories

The following item is included with the ATB-7300NG:

Table 2-1 Standard Accessories

Part Number	Description	Qty
142759	ATB-7300NG Avionics NAV Bench Test Set	1

2.1.2.2 Optional Accessories

A Rack Mount Kit (139910) and other optional accessories are available for the ATB-7300NG. Contact VIAVI Customer Service or visit www.viavisolutions.com for the most current a list of available optional accessories.

2.1.3 Inspect the Device

Inspect the device for any possible damage that may have occurred during shipment. Report any damage to VIAVI Customer Service.

2.2 Installation

2.2.1 General

The following is a general installation process for the Test Set.

1. Place the Test Set on a suitable flat, clean and dry surface.
2. If the Test Set is to be mounted in an equipment cabinet, attach provided instrument rack mountings.
3. With equipment mounted or on bench top, attach interface cables to the appropriate RF ports.
4. For remote operation, connect a standard Ethernet cable to the Chassis Rear Panel Ethernet connector. Attach the other end of the Ethernet cable to the control computer Ethernet port.
5. Furnish electrical power to the Test Set. Connect AC power cable to rear power input. Apply 100 to 240 VAC at 50 to 60 Hz.

2.2.2 Safety Precautions

Listed are several safety precautions which must be observed during installation and operation. Viavi assumes no liability for failure to comply with any safety precautions outlined in this manual.

2.2.2.1 Complying with Instructions

Installation/operating personnel should not attempt to install or operate the Test Set without reading and complying with all instructions contained in this manual.

2.2.2.2 Grounding Requirements

To minimize shock hazard, all equipment chassis and cabinets must be connected to electrical ground. All Viavi test sets are equipped with a standard three-prong power cable which must be connected to a properly grounded three-prong wall receptacle.

It is the customer's responsibility to:

- Have a qualified electrician check wall receptacle(s) for proper grounding.
- Replace any standard two-prong wall receptacle(s) with properly grounded three prong receptacle(s).

WARNING

DO NOT USE A THREE PRONG TO TWO-PRONG ADAPTER PLUG. DOING SO CREATES A SHOCK HAZARD BETWEEN THE CHASSIS AND EARTHGROUND.

Avertissement

N'UTILISEZ PAS DE TROIS DENT À LA PRISE DE COURANT D'ADAPTATEUR DE DEUX DENTS. L'ACTION CRÉE AINSI UN HASARD DE CHOC ENTRE LES CHÂSSIS ET EARTHGROUND.

2.2.2.3 Operating Safety

Due to the presence of potentially lethal voltages within the Test Set, operating personnel should not remove the cover with power applied.

CAUTION

Do not overload apply any signals to the test set other than those defined in the operating instructions.

Mise en Garde

Ne surchargez pas font une demande n'importe quels signaux au jeu d'essai autre que ceux ont défini dans les instructions opérantes.

CAUTION

Do not operate LCD Display with excessive intensity or in direct sunlight.

Mise en Garde

Ne faites pas marcher d'Étalage de LCD avec l'intensité excessive ou dans la lumière du soleil directe.

CAUTION

Do not apply RF SOURCE to RF OUT Connector.

Mise en Garde

N'appliquez pas de SOURCE RF à RF du Connecteur.

CAUTION

To provide maximum protection of non-volatile internal memory, do not rapidly cycle power on and off. Allow a minimum of one second between ON/OFF cycles.

Mise en Garde

Pour fournir la protection maximum de mémoire intérieure non volatile, ne faites pas rapidement de pouvoir de cycle sur et de. Permettez un minimum d'une seconde entre SUR/DE les cycles.

2.3 Powering the Device

The ATB-7300NG is designed to be powered by an external AC power source. Please read this section in it’s entirety before powering on the device.

To Connect to AC Power Source

1. Connect the AC power cord to the AC Power Input Connector.
2. Make sure that AC power cord is plugged into a power source suitable to operate the device.

2.4 Turning the Device On/Off

2.4.1 Powering On

To Turn On the Test Set

1. Press the Front Panel Power On button to power on the test system.
2. Wait approximately 60 seconds while the test system completes boot-up processing.

NOTE

After cycling power, wait at least 60 seconds before establishing communication or manually operating the test set to ensure adequate time for completing system boot up.

2.4.2 Powering Off

During standard power-down sequence (documented below) the test system automatically stores test system settings and data that are active when the power-down sequence is initiated.

To Turn Off the Test Set

1. Press Front Panel Power On/Standby Button to initiate power-down sequence.
2. At prompt confirm test system shutdown.
3. Wait while test system completes power down sequence.

2.4.3 Error Indicators

The On/Standby Button LED turns red when an error has occurred during the power on sequence.

The On/Standby Button LED flashes red when the Chassis requires attention such as in the event of a thermal shutdown.

2.5 Verify Device Operation

NOTE

The following procedure is used to verify that the ATB-7300NG is operating properly; the procedure is not intended to verify that the ATB-7300NG is operating to specified performance parameters.

When the ATB-7300NG is received from the factory, perform the following before using the device for the first time:

1. Apply power to the ATB-7300NG and press the front panel power button.
2. After power has been supplied, wait at least 60 seconds before operating the test set to insure adequate time for completing system boot up.
3. If user has a compatible computer monitor connected to the test set, the ATB-7300NG Graphical User Interface (GUI) should be visible.

2.6 Control and Operation

The ATB-7300NG can be controlled and operated using a external visual display and remote programming language.

Standard default operation is remote.

If using the ATB-7300NG remotely, wait 60 seconds after power is applied in order to start using the remote Ethernet connection, located on the rear panel of the chassis.

If you need to tailor the IP address of the ATB-7300NG to your network configuration, refer to “Managing System IP Address” on page 2-7.

If you are using the ATB-7300NG from the ATB-7300BG System Application GUI, it will automatically come up after power is applied and it has completed its initialization of the instruments. Connecting a monitor, USB mouse and keyboard is required to use the GUI.

2.7 Managing System IP Address

Remote communication to the ATB-7300NG is done through the Ethernet connection using TCP/IP. To communicate to the ATB-7300NG using a computer, both the user computer and the ATB-7300NG must be configured correctly on the same network.

The ATB-7300NG has three separate IP addresses that should all be configured on the same subnet. The IP addresses are for the Chassis, the computer module, and the Transceiver module.

This section provides instructions for locating and resetting system IP Addresses, if required.

2.7.1 Locate Test Set IP Addresses

To Locate Test Set IP addresses

1. Connect the ATB-7300NG System to the network you intend to operate on.
2. Connect a monitor, keyboard, and mouse to the ATB-7300NG System.
3. Power on the ATB-7300NG System.
4. Open a web browser window on the ATB-7300NG System.
5. Enter “localhost” into the web browser URL field. This will display the Embedded Host Module Web Browser User Interface (Web UI).

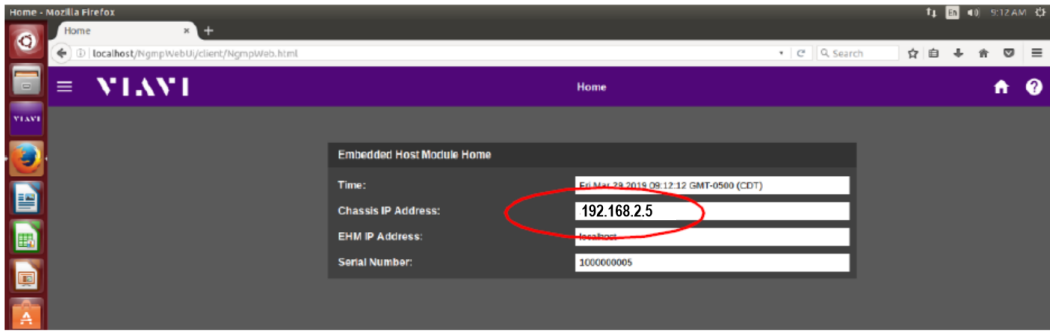

Figure 2-1 Local Host Homepage

6. Enter the Chassis IP address (192.168.2.5) in the web browser URL field on the ATB-7300NG.

7. The Chassis Web UI Homepage will be displayed. The Homepage should resemble the example shown in Figure 2-2.

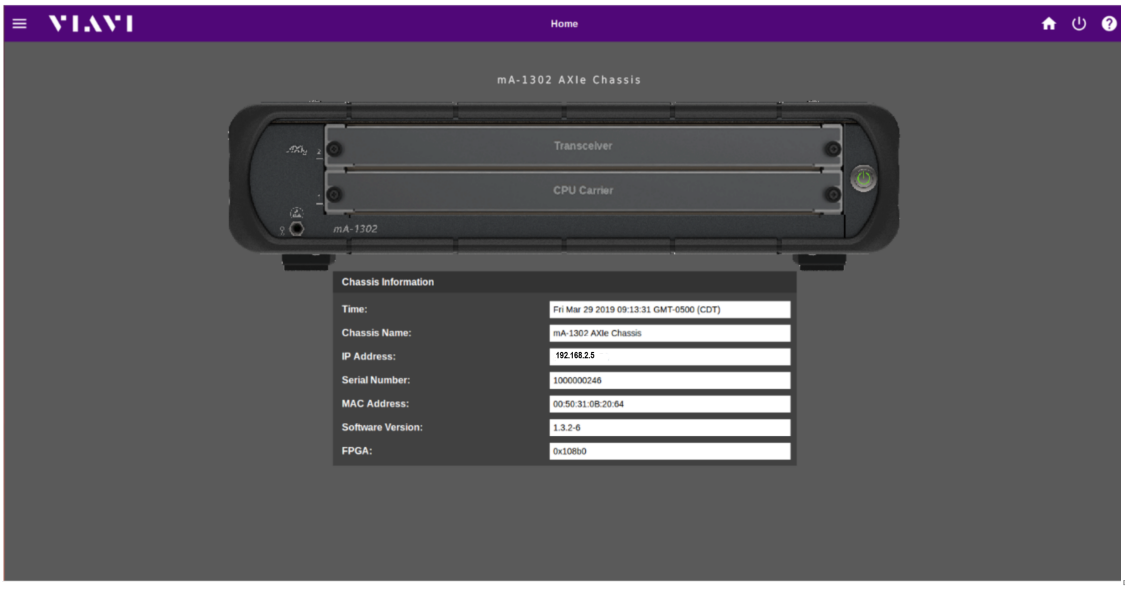

Figure 2-2 Chassis Web UI Homepage

8. From the Chassis Web home page, open the Main Menu and select the Chassis Networking button.

The Chassis Networking page displays the IP address for the chassis and each module in the system. The ATB-7300NG has two modules:

- computer module
- Vector-Signal Transceiver

9. To change the IP address of the remote interface on the ATB-7300NG:

a Set Network Mode to “Static.”

b Enter the new IP address into the IP Address field of the computer module device (BHL6).

Please make sure that the correct “Netmask” is used for the new IP address (example IP: 192.168.2.6 and Netmask: 255.255.255.0).

10. Ensure the IP Address of the Chassis, the top of the web page interface, and Transceiver, bottom of the page, is in the same IP address range as the BHL6 set in Step 9 (example: BHL6 IP: 192.168.2.6., Chassis IP: 192.168.2.5, Transceiver IP: 192.168.2.4).

11. Select the Apply button.

12. Restart the system by cycling power.

13. The ATB-7300NG System Application GUI appears.

14. Follow steps outlined in “Ethernet Remote Operation” on page 2-28.

2.7.2 Configure Devices Dialog

The **Configure Devices Dialog** can be opened by going to the **File** menu and selecting **Configure Devices**. Figure 2-3 shows the **Configure Devices** dialog.

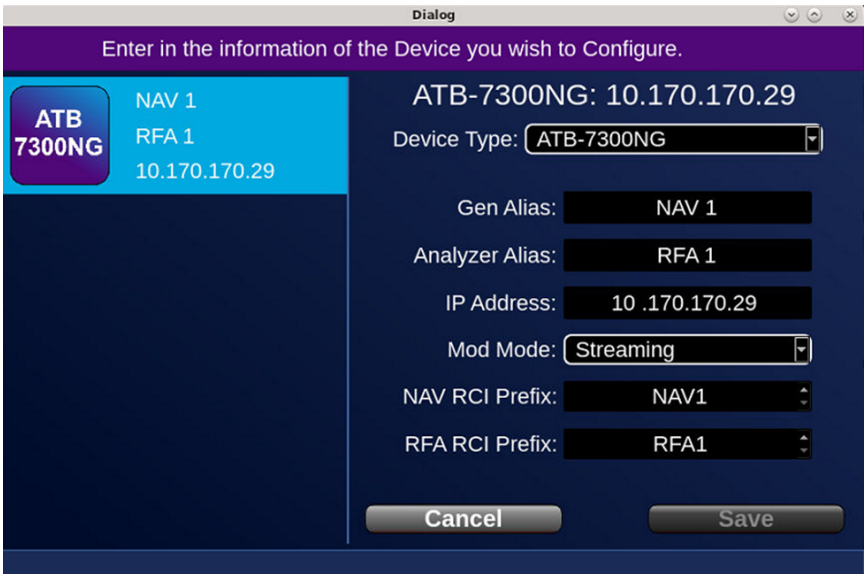

Figure 2-3 Configure Device dialog

Table 2-2 describes the fields.

Table 2-2 Device Configuration

Field	Description
Device Type	Specifies the type of device to be configured. The options are: – ATB-7300NG – Simulated Generator Configuration settings only take affect after the restart of the GUI.
ATB-7300NG Device Configuration	
Gen Alias	Specifies the name of the Generator, as displayed in the GUI.
Analyzer Alias	The name of the Analyzer. This field is not currently supported.
IP Address	Specifies the IP of the Vector Signal Transceiver (VST).
Mod Mode	Specifies whether modulation is streamed or placed in a a file. Only Streaming is currently supported.
NAV RCI Prefix	Specifies the prefix for all NAV commands.
RFA RCI Prefix	Specifies the prefix for all RFA commands
Simulated Generator Configuration	
Gen Alias	Specifies the name of the Generator, as displayed in the GUI.
NAV RCI Prefix	Specifies the prefix for all NAV commands.

2.7.3 Configure Remote Dialog

The **Configure Remote Interface Dialog** can be opened by going to the **File** menu and selecting **Configure Remote Interface.**

Figure 2-4 shows the **Configure Remote Interface Dialog**.

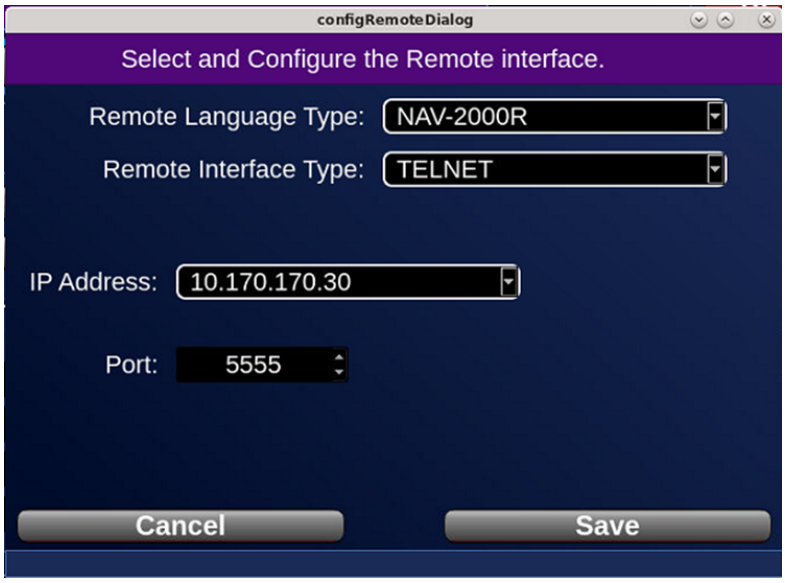

Figure 2-4 Configure Remote Interface dialog

Table 2-3 describes the fields.

Table 2-3 Remote Interface Configuration

Field	Description
Remote Language Type	Specifies the remote language type. The options are: – ATB-7300: The accepted remote commands are the legacy ATB-7300 command set. Only the NAV commands are currently supported. – NAV-2000R: The accepted remote commands are the legacy NAV-2000R commands only. – Collins 479S-6A: The accepted commands are the legacy Collins 479S commands only.
Remote Interface Type	Specifies the Remote Interface Type. Currently only TELNET is supported. TELNET allows a remote computer to connect to the ATB-7300NG instrument and send remote commands over Telnet. Changes to Telnet settings only take affect after the GUI is restarted.
IP Address	Specifies the ATB-7300NG computer module IP address that the computer uses to listen for a remote Telnet connection.
Port	Specifies the port that the ATB-7300NG uses to listen for an incoming Telnet connection.

2.8 Menu and Toolbar

The following sections describe the Menu system, and the Toolbar and Device buttons.

2.8.1 Menu System

Table 2-4 describes the Menu system.

Table 2-4 Menu System

Menu	Description
File	
Configure Devices	Opens the **Configure Devices** dialog. See “Configure Devices Dialog” on page 2-10 for more information.
Configure Remote Interface	Opens the Configure Remote Interface. See “Configure Remote Dialog” on page 2-11 for more information.
Generators	
Reset All	Resets all Open Generators to the default off state and settings.
View	
Remote Command Log	Specifies whether the remote command log window is displayed or not.
Help	
About	Displays a window containing information regarding the software title and version information.

2.8.2 Toolbar and Instrument Menu Buttons

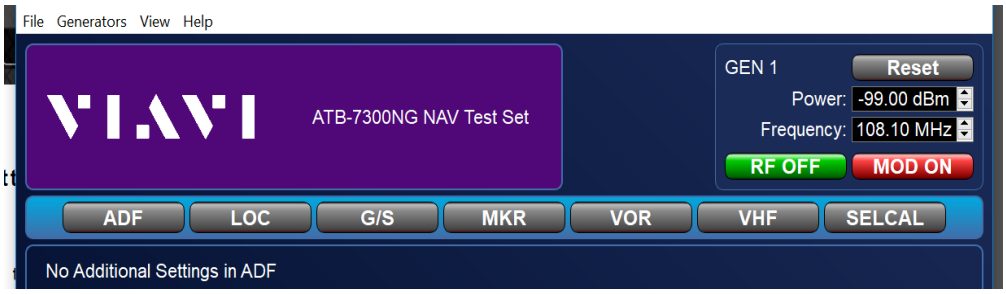

Figure 2-5 GUI Toolbar and Instrument Menu Buttons

Table 2-5 Toolbar and Instrument Menu Buttons

Generator	Description
ADF	Select ADF generator operation mode.
LOC	Select ILS Localizer generator operation mode.
G/S	Select ILS Glideslope generator operation mode.
MKR	Select Marker generator operation mode.
VOR	Select VHF Omni-directional Range generator operation mode.
VHF	Select Very High Frequency generator operation mode.
SELCAL	Select SELCAL generator operation mode.
RF ON/OFF	Select Radio Frequency On/Off
MOD ON/OFF	Select MOD On/Off
RESET	Resets the settings for all instruments to default settings and sets the RF Output state to OFF.

2.9 Common Generator Control

2.9.1 Select Instrument Bar

The Generator can be set to simulate either ADF, LOC, G/S, MKR, VOR, VHF, or SELCAL. Upon selection of one of these instruments, configuration of that instrument is shown in the panel underneath it.

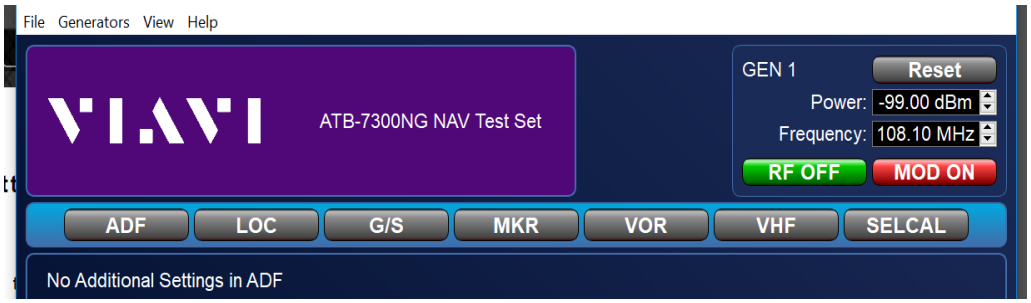

Figure 2-6 GUI Toolbar Generator Buttons Menu

2.9.2 Carrier Settings and Generator Reset

The Generator carrier frequency, power, and modulation toggle settings are common for any selected instrument.

Figure shows the Common Generator Control Window.

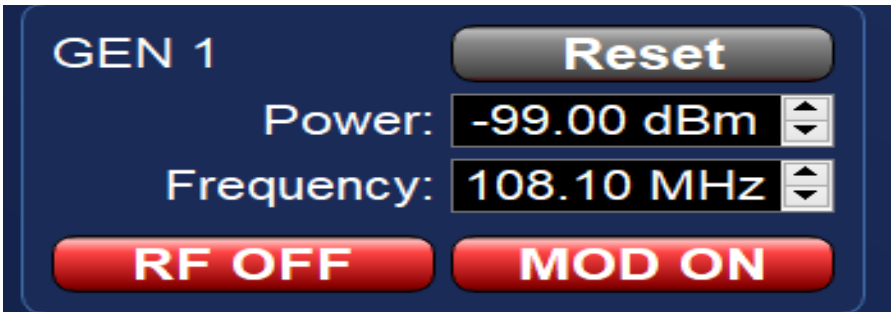

Figure 2-7 Common Generator (GUI) Control Window

2.9.2.1 Frequency Data Field:

Displays or sets the generator carrier Frequency. The selectable frequency range is 150 kHz to 6 GHz.

2.9.2.2 RF Level Data:

Displays or sets the generator RF (output) Level. The selectable RF Level is -125 dBm to +4 dBm.

2.9.2.3 RF (ON/OFF) Button:

Indicates the RF output status of the ATB-7300NG generator. Can be toggled between RF OFF and RF ON. When RF OFF is indicated, the RF Output of the AXIe generator card is disabled. When RF ON is indicated, the RF Output of the AXIe generator card is enabled.

2.9.2.4 MOD (ON/OFF) Button

Indicates the modulation status of the ATB-7300NG generator. Can be toggled between MOD OFF and MOD ON. When MOD OFF is indicated, the generator card carrier frequency modulation is disabled. When MOD ON is indicated, the generator card carrier frequency modulation is enabled.

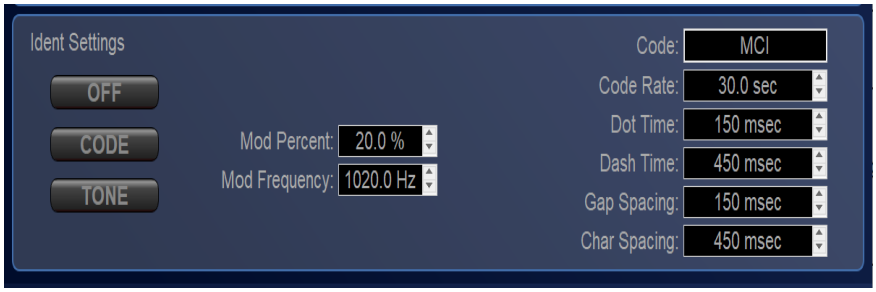

Figure 2-8 IDENT Settings (GUI) ADF, ILS LOC, VOR

2.9.3 Ident Settings GUI (ADF, ILS LOC, VOR)

Table 2-6 describes the **Ident Settings** GUI.

Table 2-6 Ident Settings GUI

Output Field	Description
Code Data Field:	Displays or sets the character set of the IDENT (Morse) Code to be generated.
Code Rate:	Displays or sets the repetition Rate (in Seconds) of the Ident Code. Valid rates are instant to 1 hour repetition.
Dot Time:	Displays or sets the tone modulation ON time representing a Morse code 'Dot '. Valid range is 50 to 250 ms.
Dash Time:	Displays or sets the tone modulation ON time representing a Morse code 'Dash'. Valid range is 150 to 750 ms.
Gap Spacing:	Displays or sets the tone modulation OFF time or 'gap' separating each Morse code 'Dot 'or 'Dash'. Valid range is 50 to 250 ms.
Character Spacing:	Displays or sets the tone modulation OFF time or 'spacing' separating each Morse code character. Valid range is 150 to 750 ms.
OFF Button:	Disables Ident Code and test Tone modulation
Tone Button:	Enables constant Tone modulation on the generator carrier frequency (using the Frequency and Modulation settings).
Code Button:	Enables Ident Code modulation on the generator carrier frequency (using the Dot, Gap, Dash, Spacing, Rate, Frequency and Modulation settings).

2.10 ADF Generator

ADF Non Directional Beacons operate in a carrier frequency range of 190 kHz to 1750 kHz, typically with either a 400 Hz or 1020 Hz AM modulated tone.

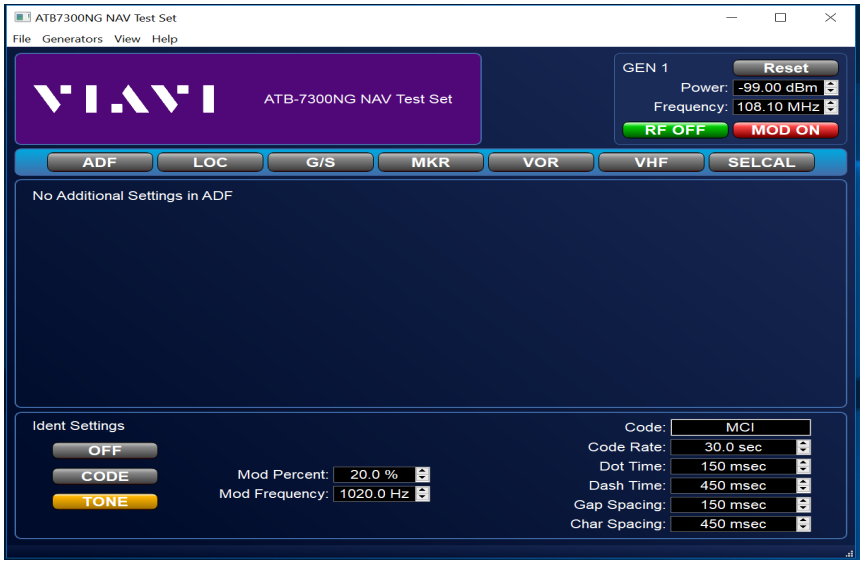

Figure 2-9 ADF Generator Instrument

Control of the modulated tone is done through the Ident settings panel at the bottom. See “Ident Settings GUI (ADF, ILS LOC, VOR)” on page 2-17 for more information.
Control of the carrier is done through the Settings Tab of the generator. See “Carrier Settings and Generator Reset” on page 2-15 for more information.

2.11 Localizer Generator

The Localizer is comprised of two AM tones, one at 90 Hz and the other at 150 Hz. These tones are modulated onto the carrier, usually at frequencies from 108.10 MHz to 111.95 MHz. The Difference in the Depth of Modulation (DDM) is the difference in the modulation of these two tones. The DDM indicates the deviation from the correct landing path of the aircraft, with 0 DDM being no deviation.

An Ident tone can be optionally added to the Localizer signal using the Ident Settings Panel at the bottom of the GUI. See “Ident Settings GUI (ADF, ILS LOC, VOR)” on page 2-17 for more information.

Control of the carrier is done through the **Carrier Settings Tab** of the Generator. See “Carrier Settings and Generator Reset” on page 2-15 for more information.

Two tones, one at 90 Hz, the other at 150 Hz, are AM modulated on a carrier frequency range of 108.10 MHz to 111.95 MHz. The Difference in the Depth of Modulation (DDM) of the 90 Hz and 150 Hz signals indicates position from centerline (Localizer) or desired altitude (Glideslope). ILS Generator controls and functions are divided into two separate GUIs. One for LOCalizer functions and another for GlideSlope functions. The following control descriptions are applicable to both GUIs unless otherwise noted. Only The Localizer function provides settings for modulating a Morse code identifier.

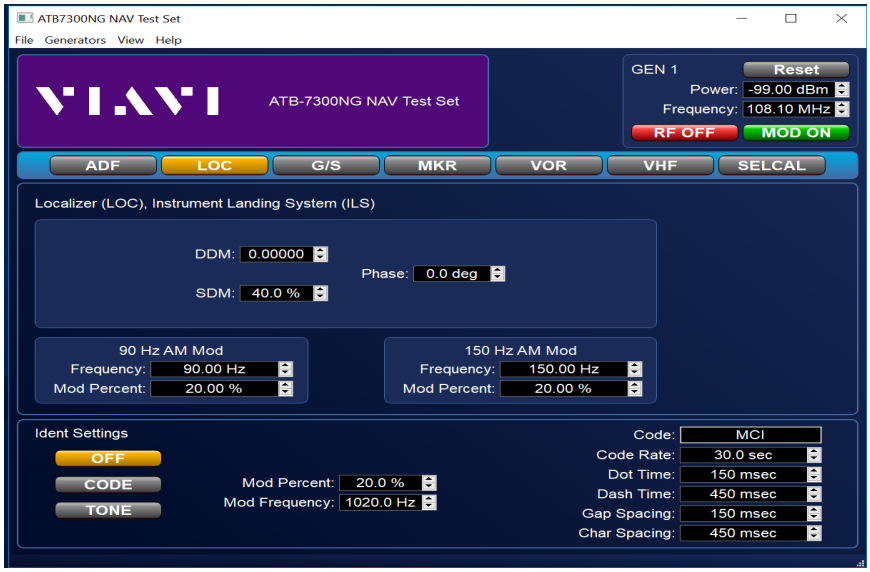

Figure 2-10 Localizer Generator (GUI)

2.11.1 DDM Panel

- **DDM:** Displays or sets the difference in depth of modulation between the 150 Hz and 90 Hz tones.
- **SDM:** Displays or sets the sum of the depth of modulation of the 150 Hz and 90 Hz tones.
- **Phase:** Displays or sets the setting of the 90 & 150Hz Phase relation.

2.11.2 90 Hz:

- **Frequency:** (72 Hz to 108 Hz)

  Displays or sets the setting of the 90 Hz tone Frequency.
- **Mod Percent:** (0 to 99%)

  Displays or sets the setting of the 90 Hz tone percent Modulation level. Total modulation not to exceed 99%

2.11.3 150 Hz:

- **Frequency:** (120 Hz to 180 Hz)

  Displays or sets the setting of the 150 Hz tone Frequency.
- **Mod percent:** (0 to 99%)

  Displays or sets the setting of the 150 Hz tone percent Modulation level. Total modulation not to exceed 99%.

2.12 Glideslope Generator

Glideslope is comprised of two AM tones: one at 90 Hz and the other at 150 Hz. These tones are modulated onto the carrier, usually at frequencies from 330.95 MHz to 334.7 MHz. The Difference in the Depth of Modulation (DDM) is the difference in the modulation of these two tones. The DDM indicates the deviation from the correct landing path of the aircraft, with 0 DDM being no deviation.

Glideslope does not support an ident tone, and the Ident Settings Panel is disabled when the generator is set to the Glideslope instrument.

Control of the carrier is done through the Carrier Settings Tab of the Generator. See "Carrier Settings and Generator Reset" on page 2-15 for more information.

2.12.1 DDM panel

- **DDM:** Displays or sets the difference in depth of the modulation between 150 Hz and 90 Hz tones.
- **SDM**: Displays or sets the sum of the depth of modulation of the 150 Hz and 90 Hz tones in percent.
- **Phase**: Displays or sets the phase of the offset of the 90 and 150 Hz tones.

2.12.2 90 Hz Panel

- **Frequency:** (72 Hz to 108 Hz)

  Displays or sets the setting of the 90 Hz tone frequency
- **Mod Percent:** (0 to 99%)

  Displays or sets the setting of the 90 Hz tone percent modulation level. Total modulation not to exceed 99%.

2.12.3 150 Hz Panel

- **Frequency:** (120 Hz to 180 Hz)

  Displays or sets the setting of the 150 Hz tone frequency

- **Mod Percent:** (0 to 99%)

  Displays or sets the setting of the 150 Hz tone percent modulation level. Total modulation not to exceed 99%.

2.13 VOR Generator

VOR operates on a carrier frequency range of 108.0 MHz to 117.95 MHz (with 50 kHz spacing) and encodes azimuth as the phase relationship of a 30Hz Var tone and a 30 Hz Ref tone. The 30 Hz REF tone is modulated on a 9960 Hz sub-carrier.

The 30Hz VAR tone phase angle is user settable through a Bearing data field. The phase angle by which the 30 Hz VAR tone lags the 30 Hz Ref tone is equal to the direction in degrees from the station and is called the “radial.”

Control of the carrier is done through the **Carrier Settings Tab** of the generator. See “Carrier Settings and Generator Reset” on page 2-15 for more information.

An Ident tone can optionally be added to the localizer signal using the Ident Settings Panel at the bottom of the GUI. See “Ident Settings GUI (ADF, ILS LOC, VOR)” on page 2-17 for more information.

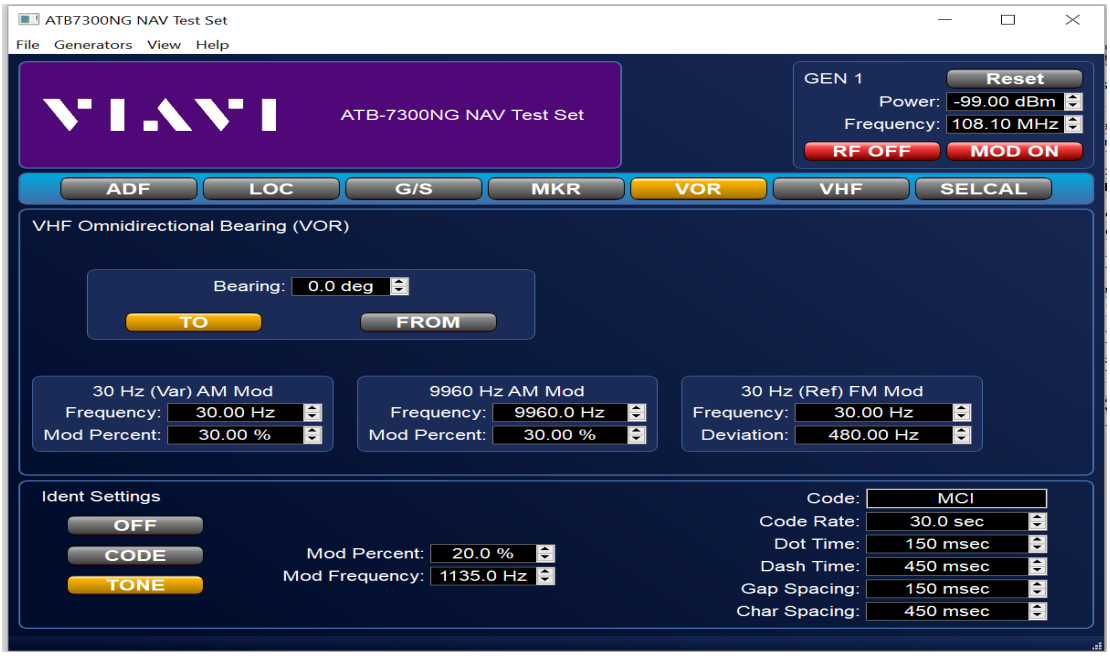

Figure 2-11 VOR Generator (GUI)

2.13.1 Bearing Panel

- **Bearing data field:** (0.0 to 360.00°)

  Displays or sets the setting of the VOR radial bearing in degrees.
- **TO and FROM Button(s)**:

  Mutually exclusive. Sets the VOR radial bearing as either a "TO" condition or a "FROM" condition as it applies to VOR.
- **30 VAR Freq. data field:** (20 to 40 Hz)

  Displays or sets the Frequency setting of the 30 Hz Variable tone.
- **30 VAR MOD data field:** (0 to 99%)

  Displays or sets the percent of modulation setting of the 30 Hz Variable tone. Total modulation not to exceed 99%.
- **30 REF Freq data field:** (20 to 40 Hz)

  Displays or sets the Frequency setting of the 30 Hz Reference tone modulated on the 9960 Hz sub-carrier.
- **Freq Dev data field:** (0.00 to 540.00 Hz)

  Displays or sets the Frequency Deviation setting for the 9960 Hz sub-carrier.
- **9960 Freq data field:** (6640 to 13280 Hz)

  Displays or sets the Frequency setting of the 9960 Hz sub-carrier on which the 30 Hz Reference tone is modulated.
- **9960 MOD data field:** (0 to 99%)

  Displays or sets the percent of modulation setting of the 9660 Hz sub-carrier. Total modulation not to exceed 99%.

2.14 MKR Generator

Figure 2-12 shows the MKR Generator.

Figure 2-12 MKR Generator

2.14.1 Beacon Settings

The following describes the **OUTER/MIDDLE/INNER** options.

- **Frequency Data field:** (10 to 18000 Hz).
  Displays or sets the tone frequency for the selected marker option:
  - **OUTER** (400 Hz)
  - **MIDDLE** (1300 Hz)
  - **INNER** (3000 Hz)
- **Mod Percent:** (0 to 99%)
  Displays or sets the tone frequency modulation level for the selected maker beacon.

2.14.2 Morse Code Settings

Provides for changing the timing of the Morse code like ‘Dots’ and ‘Dashes’ of the selected marker option.

Table 2-7 Ident GUI Fields

Dot data field:[1] (50 to 250 mS)	Displays or sets the tone modulation ON time representing a Morse code like 'Dot'
Dash field:[1] (150 to 750 mS)	Displays or sets the tone modulation ON time representing a Morse code like 'Dash'.
Gap field: (50 to 250 mS)	Displays or sets the tone modulation OFF time or 'gap' separating each Morse code like 'Dot' or 'Dash'.
TONE button:	Enables a constant modulated Tone on the generator carrier frequency using the Tone settings.
CODE button:	Enables a series of modulated Morse code like 'Dots' and/or 'Dashes' depending on the Tone settings, Ident settings and selected Marker option:

1. **Outer** - Only Dashes are modulated; **Middle** - both Dots and Dashes are modulated; **Inner** - only Dots are modulated. The Dash field is not settable.

2.15 VHF Generator

The VHF generator can generate up to three independent AM tones on the RF Carrier. Each tone has its own modulation frequency and modulation percent.

Control of the carrier is done through the Carrier Settings Tab of the generator, as described in “Carrier Settings and Generator Reset” on page 2-15.

VHF does not use Ident, and the Ident settings panel is disabled when the generator is set to the VHF instrument.

2.15.1 Tone Settings

Opens an **AM Settings** window providing the user to change the frequency and modulation levels of up to three AM tones for modulation on the generator carrier frequency.

Figure 2-13 VHF Tone Settings window

Table 2-8 describes the VHF Settings window.

Table 2-8 VHF Tone Settings window

Data Field	Description
Frequency data fields: (10 to 18000Hz)	Displays or sets the Frequency setting of the associated AM tone to be modulated on the virtual generator carrier frequency.
Modulation data fields: (0 to 99%)	Displays or sets the Modulation level of the associated AM tone. Total modulation not to exceed 99%.
Enable buttons:	Enables (**ON**) or disables (**OFF**) modulation of the associated Tone.

2.16 SELCAL Generator

Opens a **SELCAL Generator Settings** window to for setting various Selective Calling parameters. Control of the carrier is done through the Carrier Settings Tab of the generator, as described in "Carrier Settings and Generator Reset" on page 2-15.

SELCAL does not support an Ident tone. The Ident settings Panel is displayed when in SELCAL mode.

2.16.1 SELCAL Settings Window

Code data field:

Displays or sets the codes that are modulated during SELCAL operation. Any two (2) valid characters (A through H, J through M, or P through S) must be entered. The associated Tone 1 and Tone 2 data fields will automatically update to the corresponding frequency values of the entered code characters. No change will be made if an invalid character is entered.

- **P1 Tone 1 data field:** (0 to 10000 Hz)

  Displays or sets the frequency of the first P1 Code character.
- **P1 Tone 2 data field:** (0 to 10000 Hz)

  Displays or sets the frequency of the second P1 Code character.
- **P2 Tone 1 data field:** (0 to 10000 Hz)

  Displays or sets the frequency of the first P2 Code character.
- **P2 Tone 2 data field:** (0 to 10000 Hz)

  Displays or sets the frequency of the second P2 Code character.
- **Pulse MOD data field:** (0 to 99%)

  Displays or sets the Modulation level of the SELCAL P1/P2 Pulses and Test Tone Pulse.
- I**nitiate button:**

  Initiates the SELCAL pulse chirp. The button is disabled for the duration of the SELCAL pulse chirp.

Figure 2-14 VHF Gen SELCAL Tone Settings (GUI)

2.16.2 Test Tone panel

- **Test Tone Enable button**:

  When displaying “OFF”, no test tone is generated. When displaying “ON”, a test tone plays after the two SELCAL pulses. Press the button to toggle the state.
- **Freq data field:** (10 to 18000 Hz)

  Displays or sets the Test Tone Frequency.
- **MOD data field:** (0 to 99%)

  Displays or sets the percent of modulation applied to the P1/P2 Pulses and Test Tone Pulse.

2.17 Remote Operation

The Test Set may be operated remotely via Ethernet TELNET interface standards. The command syntax and style is compliant with SCPI (Standard Commands for Programmable Instruments). Several SCPI features have been implemented in the Test Set to facilitate system integration.

These features include the extended status reporting structure, the error numbering scheme, the command mnemonic derivation rules (i.e. long and short form) and many of the frequently used commands. Some of the features included in the Test Set are not defined by the SCPI standard; but, the Test Set does meet the basic form and function to be compliant with SCPI requirements.

2.18 Ethernet Remote Operation

1. Go to the Toolbar Menu.
2. Click on File, then Configure Remote Interface.

A dialog box should appear. This configures the remote interface. Initially the software will only support a Telnet Interface.

3. Select from the list of usable IP addresses that the Telnet server will listen for client connections on.

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3

ATB-7300NG Care and Maintenance

This chapter reviews care and maintenance procedures for the ATB-7300NG. This chapter reviews the following topics:

- Software Installed 3-2
- Shipping Instructions 3-2
- Repacking Procedure 3-3
- Storage 3-3
- Operator Level Maintenance 3-4

3.1 Software Installed

3.1.1 General

The following software installed in the ATB-7300NG prior to shipment from the factory:

Table 3-1 Software Installed

Part Number	Description
22146671	ATB7300NG System Software

3.2 Shipping Instructions

Any device returned to the factory for calibration, service or repair must be repackaged and shipped subject to the following conditions:

3.2.1 Return Material Authorization (RMA)

Request a Return Material Authorization (RMA) number. Do not return any products to the factory without prior authorization from VIAVI Customer Service.

Refer to the following links for relevant information:

To request an RMA

https://www.viavisolutions.com/en-us/support/customer-care/return-material-authorization-rma-requesRF Duplexma-request-avionics-radio-test-us

For general shipping information

https://www.viavisolutions.com/en-us/general-shipping-instructions-avionics-radio-test-rmas

3.2.2 Tagging the Equipment

All items shipped to VIAVI must be tagged with:

- Owner's Identification and contact information
- Nature of service or repair needed
- Model Number and Serial Number
- Return Authorization (RA) Number

3.2.3 Shipping Containers

Devices must be repackaged in original shipping containers using VIAVI packing materials. If original shipping containers and materials are not available, contact VIAVI Customer Service for shipping instructions.

3.2.4 Freight Costs

All freight costs on non-warranty shipments are assumed by the customer. VIAVI recommends that customers obtain freight insurance with the freight carrier when shipping the Device. VIAVI is not responsible for cost of repairs for damages that occur during shipment on warranty or non-warranty items.

3.3 Repacking Procedure

1. Make sure bottom packing mold is seated on floor of shipping container.
2. Carefully wrap the Test Set with polyethylene sheeting.
3. Place the Test Set into shipping container, making sure Test Set is securely seated in bottom packing mold.
4. Place top packing mold over top of the Test Set and press down until top packing mold rests solidly on Test Set.
5. Close shipping container lids and seal with shipping tape or an industrial stapler.
6. Tie all sides of container with break resistant rope, twine or equivalent.

3.4 Storage

Whenever the Test Set is stored for an extended period, always disconnect the Test Set from any electrical power source. If you put the Test Set into storage, ensure that the following conditions are not exceeded.

- Temperature range: -20 to +70°C (-4 to +158°F).
- Humidity: 5 to 95%, non-condensing.

3.5 Operator Level Maintenance

The following procedures may be performed by the Operator. All other service must be performed by Qualified Service Personnel.

CAUTION

This Device does not contain user serviceable parts. Servicing should only be performed by Qualified Service Personnel.

Do not operate this Device with the case/cover open. Opening the case/cover exposes the operator to electrical hazards which can result in electrical shock or damage to the Device.

Mise en Garde

Cet appareil ne contient pas de pièces pouvant être entretenues par l'utilisateur. L'entretien doit seulement être effectué par du personnel de service qualifié.

N'utilisez pas cet appareil avec le boîtier/couvercle ouvert. L'ouverture du boîtier/couvercle expose l'utilisateur à des risques électriques qui peuvent entraîner un choc électrique ou des dommages à l'appareil.

3.5.1 Visual Inspections

Visual inspections should be performed periodically depending on operating environment, maintenance and use.

- Verify Test Set has been installed in accordance with the instructions provided (e.g., that ventilation is adequate, supply wiring is adequate and properly routed).
- Ensure that AC Power Cord and supply connector are in good condition.
- Check for presence and condition of all warning labels and markings and supplied safety information.
- Inspect connectors for dirt, dust, corrosion or rust.
- Inspect the device and accessories for damage. Do not use if there is damage to the exterior of the unit or power accessories.
- Examine the stability and condition of covers, handles and carry straps when used.

3.5.2 External Cleaning

The following contains routine instructions for cleaning the outside of the ATB-7300NG. The following should be performed by the operator on a routine basis:

- Remove grease, fungus and ground-in dirt from surfaces with soft lint-free cloth dampened (not soaked) with isotropy alcohol.
- Clean cables with soft lint-free cloth.
- Remove dust and dirt from connectors with soft-bristled brush.
- When not in use, cover the connectors with suitable dust cover to prevent tarnishing of connector contacts.

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A

US/Metric Conversion Table

This appendix contains information for conversion of US to Metric conversion formulas:

- US/Metric Conversion Table A-2

A.1 US/Metric Conversion Table

Table A-1 Conversion Table

To Convert	INTO:	Multiply BY:
cm	feet	0.03281
cm	inches	0.3937
feet	cm	30.48
feet	meters	0.3048
ft/sec	km/hr	1.097
ft/sec	knots	0.5921
ft/sec	miles/hr	0.6818
ft/sec2	cm/sec2	30.48
ft/sec2	m/sec2	0.3048
grams	ounces	0.03527
inches	cm	2.54
kg	pounds	2.205
kg/cm2	psi	0.0703
km	feet	3281
km	miles	0.6214
km	nmi	0.5396
km/hr	ft/sec	0.9113
km/hr	knots	0.5396
km/hr	miles/hr	0.6214
knots	ft/sec	1.689
knots	km/hr	1.8532
knots	miles/hr	1.1516
meters	feet	3.281
meters	inches	39.37
m/sec	ft/sec	3.281
m/sec	km/hr	3.6
m/sec	miles/hr	2.237
miles	feet	5280
miles	km	1.609
miles	meters	1609
miles	nmi	0.8684
miles/hr	ft/sec	1.467

Table A-1 Conversion Table (Continued)

To Convert	INTO:	Multiply BY:
miles/hr	km/hr	1.609
miles/hr	knots	0.8684
nmi	feet	6080.27
nmi	km	1.8532
nmi	meters	1853.2
nmi	miles	1.1516
ounces	grams	28.3495
pounds	kg	0.4536
psi	kg/cm	20.0703
100 ft	km	3.048
100 ft	miles	1.894
100 ft	nmi	1.645

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B

Pin-Out Tables and Diagrams

This appendix contains connector pin-out tables and diagrams for the following ATB-7300NG connectors:

- Connector (USB) B-2
- Universal Serial Bus. B-3

B.1 Connector (USB)

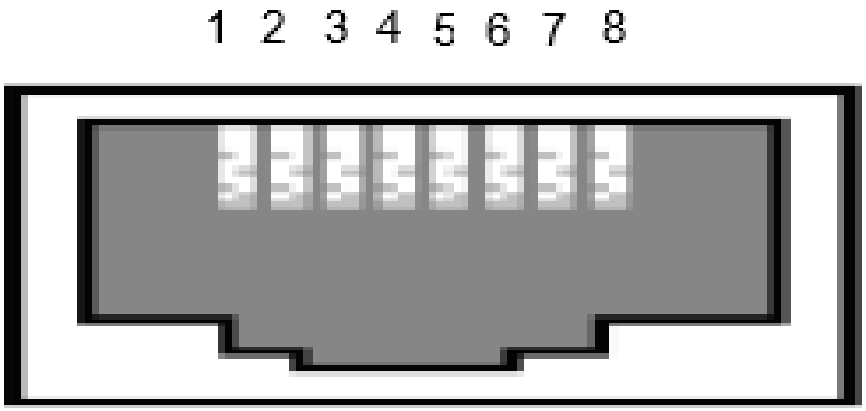

Figure B-1 USB Pin-Out

Table B-1 USB Connector Pin-out Table

Pin Number	Signal Name	Signal Description
1	TX +	Transmit (+)
2	TX-	Transmit (-)
3	RX+	Receive (+)
4	NC	
5	NC	
6	RX-	Receive (-)
7	NC	
8	NC	

B.2 Universal Serial Bus

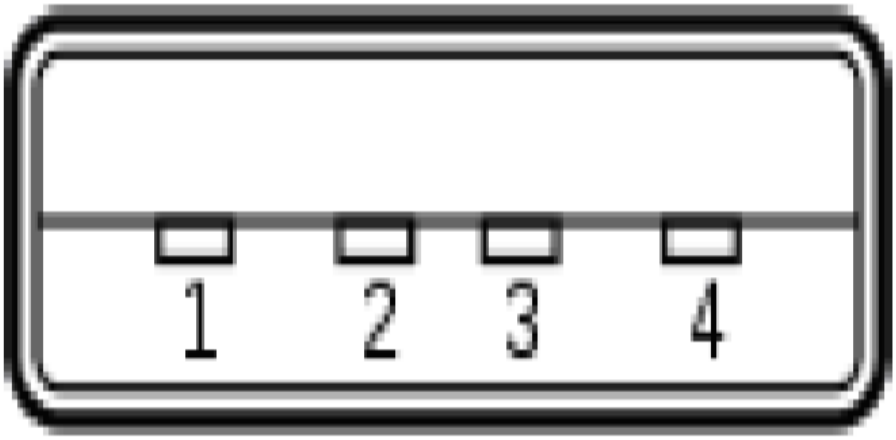

Figure B-2 Universal Serial Bus

Table B-2 Universal Serial Bus

Part Number	Functional Description	Signal Description
1	VCC	+5 VDC
2	D-	Data (-)
3	D+	Data (+)
4	GND	

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C

Remote Command Interface

This appendix contains commands for remote interface instruction:

- Remote Command Quick Reference for Legacy NAV-2000R Commands C-2
- Remote Command Interface for the Legacy Collins 479S-6A Commands C-17
- Remote Command Quick Reference for the Legacy ATB-7300 Commands. . . . C-21

C.1 Remote Command Quick Reference for Legacy NAV-2000R Commands

This Appendix is for quick reference commands when using the ATB-7300NG Avionics NAV Bench Test Set for the Legacy NAV-2000R Commands.

C.1.1 General Commands

C.1.1.1 STATUS

Command: STAT?

C.1.1.2 SET MODE

Command: MODE=

Values: VOR, LOC, G/S, ADF, MKR, COM

C.1.1.3 WHAT MODE

Command: MODE?

Values: VOR, LOC, G/S, ADF, MKR, COM

C.1.1.4 LOCAL

Command: LOCAL

C.1.1.5 SET DEFAULTS

Command: DEFAULT

C.1.1.6 REVERSE POWER PROTECTION RESET

Command: RPP RESET

C.1.1.7 RF LEVEL

Command: RF LEVEL=

dBm Values: -125 dBm to +4 dBm

Default: -120.0 dBm

C.1.1.8 RF OUTPUT

Command: RF OUTPUT=

Values: ON, OFF

Default: ON

C.1.1.9 RF FREQUENCY

Command: RF FREQ=

Values: 1.0 MHz to 450.000 MHz (0.00001 MHz steps)

C.1.2 VOR

C.1.2.1 RF LEVEL

Command: RF LEVEL=

dBm Values: -125 dBm to +4 dBm

Default: -120.0 dBm

C.1.2.2 BEARING

Command: BEARING=

Values: 0.00 to 359.99 degrees (0.01 degree steps)

Default: 0.00 degrees

C.1.2.3 TO / FROM REFERENCE

Command: VOR REF=

Values: TO, FROM

Default: FROM

C.1.2.4 30 Hz PERCENT MODULATION

Command: 30HZ %MOD=

Values: 0 to 99% (0.01% steps)

Default: 30.00%

C.1.2.5 9960 Hz PERCENT MODULATION

Command: 9960HZ %MOD=

Values: 0 to 99% (0.01% steps)

Default: 30.00%

C.1.2.6 1020 Hz PERCENT MODULATION

Command: 1020HZ %MOD=

Values: 0 to 99% (0.01% steps)

Default: 00.00%

C.1.2.7 TOTAL PERCENT MODULATION

Command: TOTAL %MOD=

Values: 0 to 99% (0.01% steps)

Default: 60.00%

C.1.2.8 30 Hz FREQUENCY

Command: 30HZ=

Values: 20.0 to 40.0 Hz (0.1 Hz steps)

Default: 30.0 Hz

C.1.2.9 9960 Hz FREQUENCY

Command: 9960HZ=

Values: 9000 Hz to 12000 Hz (0.1 Hz steps)

Default: 9960.0 Hz

C.1.2.10 1020 Hz FREQUENCY

Command: 1020HZ=

Values: 10 Hz to 18000 Hz (0.1 Hz steps)

Default: 1020.0 Hz

C.1.2.11 IDENTIFICATION MODE

Command: IDENT MODE=

Values: OFF, TONE, CODE

Default: OFF

C.1.2.12 IDENTIFICATION CODE

Command: IDENT CODE=

Values: 6 characters of A through Z, 0 through 9

Default: JcAir

C.1.2.13 DOT TIME

Command: DOT TIME=

Values: 50 mS to 250 mS (1 mS steps)

Default: 150 mS

C.1.2.14 DASH TIME

Command: DASH TIME=

Values: 150 mS to 750 mS (1 mS steps)

Default: 450 mS

C.1.2.15 DOT / DASH SPACE TIME

Command: DOT DASH SPACE=

Values: 50 mS to 250 mS (1 mS steps)

Default: 150 mS

C.1.2.16 CHARACTER SPACING TIME

Command: CHAR SPACE=

Values: 150 mS to 750 mS (1 mS steps)

Default: 450 mS

C.1.2.17 WORD RATE

Command: WORD RATE=

Values: 1.0 to 65.0 seconds (.1 second steps)

Default: 30.0 seconds

C.1.3 LOCALIZER

C.1.3.1 RF LEVEL

Command: RF LEVEL=dBm

Values: -125 dBm to +4 dBm

Default: -120.0 dBm

C.1.3.2 DDM

Command: DDM=

Values: .000 to .400 (.001 steps)

Default: .000

C.1.3.3 LEFT / RIGHT

Command: LOC REF=

Values: LEFT, RIGHT

Default: LEFT

C.1.3.4 AUDIO CONTROL MODE SELECTION

Command: MODE= LOCa

Values: n/a

Default: n/a

C.1.3.5 90 Hz PERCENT MODULATION

Command: 90HZ %MOD=

Values: 0.00 to 40.0% (0.01% steps)

Default: 20.00%

C.1.3.6 150 Hz PERCENT MODULATION

Command: 150HZ %MOD=

Values: 0.00 to 40.00% (0.01% steps)

Default: 20.00%

C.1.3.7 1020 Hz PERCENT MODULATION

Command: 1020HZ %MOD=

Values: 0.00 to 99.00% (0.01% steps)

Default: 30.00%

C.1.3.8 TOTAL PERCENT MODULATION

Command: TOTAL% MOD=

Values: 0 to 99% (0.01% steps)

Default: 40.00%

C.1.3.9 90 Hz FREQUENCY

Command: 90HZ=

Values: 80.0 Hz to 100.0 Hz (0.1 Hz steps)

Default: 90.0 Hz

C.1.3.10 150 Hz FREQUENCY

Command: 150HZ=

Values: 135.0 Hz to 165.0 Hz (0.1 Hz steps)

Default: 150.0 Hz

C.1.3.11 1020 Hz FREQUENCY

Command: 1020HZ=

Values: 10 Hz to 18000.0 Hz (0.1 Hz steps)

Default: 1020.0 Hz

C.1.3.12 90 / 150 Hz PHASE SHIFT

Command: PHASE=

Values: 0 to 359.99 degrees (0.01 degrees)

Default: 0

C.1.3.13 IDENTIFICATION MODE

Command: IDENT MODE=

Values: OFF, TONE, CODE

Default: OFF

C.1.3.14 IDENTIFICATION CODE

Command: IDENT CODE=

Values: 6 characters of A through Z, 0 through 9

Default: JcAir

C.1.3.15 DOT TIME

Command: DOT TIME=

Values: 50 mS to 250 mS (1 mS steps)

Default: 150 mS

C.1.3.16 DASH TIME

Command: DASH TIME=

Values: 150 mS to 750 mS (1 mS steps)

Default: 450 mS

C.1.3.17 DOT / DASH SPACE TIME

Command: DOT DASH SPACE=

Values: 50 mS to 250 mS (1 mS steps)

Default: 150 mS

C.1.3.18 CHARACTER SPACING TIME

Command: CHAR SPACE=

Values: 150 mS to 750 mS (1 mS steps)

Default: 450 mS

C.1.3.19 WORD RATE

Command: WORD RATE=

Values: 1.0 to 65.0 seconds (.1 second steps)

Default: 30.0 seconds

C.1.4 GLIDESLOPE

C.1.4.1 RF LEVEL

Command: RF LEVEL=

dBm Values: -125 dBm to +4 dBm

Default: -120.0 dBm

C.1.4.2 DDM

Command: DDM=

Values: .000 to .800 (.001 DDM steps)

Default: .000

C.1.4.3 UP / DOWN

Command: G/S REF=

Values: UP, DOWN

Default: UP

C.1.4.4 90 Hz PERCENT MODULATION

Command: 90HZ %MOD=

Values: 0.00 to 99.00% (0.01% steps)

Default: 40.00%

C.1.4.5 150 Hz PERCENT MODULATION

Command: 150HZ %MOD=

Values: 0.00 to 99.00% (0.01% steps)

Default: 40.00%

C.1.4.6 TOTAL PERCENT MODULATION

Command: TOTAL% MOD=

Values: 0 to 99.00% (0.01% steps)

Default: 80.00%

C.1.4.7 90 Hz FREQUENCY

Command: 90HZ=

Values: 80.0 Hz to 100.0 Hz (0.1 Hz steps)

Default: 90.0 Hz

C.1.4.8 150 Hz FREQUENCY

Command: 150HZ=

Values: 135.0 Hz to 165.0 Hz (0.1 Hz steps)

Default: 150.0 Hz

C.1.4.9 90 / 150 Hz PHASE SHIFT

Command: PHASE=

Values: 0 to 359.99 degrees (0.01 degrees)

Default: 0

C.1.5 ADF

C.1.5.1 RF LEVEL

Command: RF LEVEL=

dBm Values: -125 dBm to +4 dBm

Default: -120.0 dBm

C.1.5.2 IDENTIFICATION MODE

Command: IDENT MODE=

Values: OFF, TONE, CODE, INT_RF

Default: TONE

C.1.5.3 INTERRUPTED CARRIER KEYING

Command: ADF INIT=

Values: ACTIVE, INACTIVE

Default: INACTIVE

C.1.5.4 MODULATION PERCENT

Command: ADF %MOD=

Values: 0.00% T0 99.00% (0.01% steps)

Default: 95.00%

C.1.5.5 MODULATION FREQUENCY

Command: ADF FREQ=

Values: 10.0 Hz to 18000.0 Hz (0.1 Hz steps)

Default: 1000.0 Hz

C.1.5.6 INDENTIFICATION CODE

Command: IDENT CODE=

Values: 6 characters of A through Z, 0 through 9

Default: JcAir

C.1.5.7 DOT TIME

Command: DOT TIME=

Values: 50 mS to 750 mS (1 mS steps)

Default: 150 mS

C.1.5.8 DASH TIME

Command: DASH TIME=

Values: 150 mS to 750 mS (1 mS steps)

Default: 450 mS

C.1.5.9 DOT / DASH SPACE TIME

Command: DOT DASH TIME=

Values: 50 mS to 250 mS (1 mS steps)

Default: 150 mS

C.1.5.10 CHARACTER SPACING TIME

Command: CHAR SPACE=

Values: 150 mS to 750 mS (1 mS steps)

Default: 450 mS

C.1.5.11 WORD RATE

Command: WORD RATE=

Values: 1.0 to 65 seconds (.1 second steps)

Default: 30 seconds

C.1.6 MARKER BEACON

C.1.6.1 RF LEVEL

Command: RF LEVEL=

dBm Values: -125 dBm to +4 dBm

Default: -120.0 dBm

C.1.6.2 MARKER BEACON MODE

Command: MKR MODE=

Values: OUTER, MIDDLE, INNER

Default: OUTER

C.1.6.3 MODULATION MODE

Command: IDENT MODE=

Values: CODE, TONE, OFF

Default: TONE

C.1.6.4 MODULATION PERCENT (OUTER MARKER)

Command: MKR %MOD=

Values: 0 T0 99.00% (0.01% steps)

Default: 95.00%

C.1.6.5 MODULATION FREQUENCY

Command: MKR FREQ=

Values: 10 Hz to 18000.0 Hz (0.1 Hz steps)

(outer) Default: 400.0 Hz (pulsed: 2 dashes / second)

(middle) Default: 1300.0 Hz (Pulsed: 95 dot-dash / minute)

(inner) Default: 3000.0 Hz (Pulsed: 6 dots / second)

C.1.7 COMMUNICATION

C.1.7.1 RF LEVEL

Command: RF LEVEL=

dBm Values: -125 dBm to +4 dBm

uV Values: .224 uV to 987 uV (to nearest .1 dBm)

mV Values: 1.00 mV to 501 mV (to nearest .1 dBm)

Default: -120.0 dBm

C.1.7.2 TONE #1 PERCENT MODULATION

Command: COM %MOD1=

Values: 0 to 99.00% (0.01% steps)

Default: 30.00%

C.1.7.3 TONE #2 PERCENT MODULATION

Command: COM %MOD2=

Values: 0 to 99.00% (0.01% steps)

Default: 00.00%

C.1.7.4 TOTAL PERCENT MODULATION

Command: TOTAL %MOD=

Values: 0 to 99.00% (0.01% steps)

Default: 30.00%

C.1.7.5 TONE #1 FREQUENCY

Command: COM FREQ1=

Values: 10 Hz to 18000.0 Hz (.1 Hz steps)

Default: 1000.0 Hz

C.1.7.6 TONE #2 FREQUENCY

Command: COM FREQ2=

Values: 10 Hz to 18000.0 Hz (.1 Hz steps)

Default: 2000.0 Hz

C.1.8 SELCAL

C.1.8.1 RF LEVEL

Command: RF LEVEL=

dBm Values: -125 dBm to +4 dBm

Default: -120.0 dBm

C.1.8.2 RF ON/OFF

Command: SCL RF KEY=

Values: ON, OFF

Default: OFF

C.1.8.3 SELECTIVE CALLING INITIATE

Command: SCL INIT=

Values: ACTIVE, INACTIVE

Default: INACTIVE

C.1.8.4 PULSE PERCENT MODULATION

Command: SCL %MOD=

Values: 0 to 99.00% (0.01% steps)

Default: 30.00%

C.1.8.5 TONE AMPLITUDE DIFFERENCE

Command: SCL DIFF=

Values: -40 to +40 dB (1 dB steps)

Default: 0 dB

C.1.8.6 PULSE #1 CODE

Command: SCL 1 CODE=

Values: AA - SS

Default: AB

C.1.8.7 PULSE #2 CODE

Command: SCL 2 CODE=

Values: AA - SS

Default: CD

C.1.8.8 PULSE #1 TONE #1 FREQUENCY

Command: SCL 1 TONE 1=

Values: 100 to 9999.9 Hz (0.1 Hz steps)

C.1.8.9 PULSE #1 TONE #2 FREQUENCY

Command: SCL 1 TONE 2=

Values: 100 to 9999.9 Hz (0.1 Hz steps)

C.1.8.10 PULSE #2 TONE #1 FREQUENCY

Command: SCL 2 TONE 1=

Values: 100 to 9999.9 Hz (0.1 Hz steps)

C.1.8.11 PULSE #2 TONE #2 FREQUENCY

Command: SCL 2 TONE 2=

Values: 100 to 9999.9 Hz (0.1 Hz steps)

C.1.8.12 PULSE #1 TIME

Command: SCL 1 TIME=

Values: 0 to 2.000 S (0.001 S steps)

Default: 1 S

C.1.8.13 PULSE #2 TIME

Command: SCL 2 TIME=

Values: 0 to 2.000 S (0.001 S steps)

Default: 1 S

C.1.8.14 GAP TIME

Command: SCL GAP TIME=

Values: 0 to 999 mS (1 mS steps)

Default: 500 mS

C.1.8.15 TEST FREQUENCY

Command: SCL TEST FREQ=

Values: 10 Hz to 18000.0 Hz (.1 Hz steps)

Default: 1000.0 Hz

C.1.8.16 TEST TONE PERCENT MODULATION

Command: SCL TEST%MOD=

Values: 0 to 99.00% (0.01% steps)

Default: 00.00%

C.2 Remote Command Interface for the Legacy Collins 479S-6A Commands

C.2.1 General Commands

C.2.1.1 T/F, U/L, D/R

COMMAND: /

C.2.1.2 SELF TEST

COMMAND: :

C.2.1.3 VAR FREQ

COMMAND: ;

C.2.1.4 RCL

COMMAND: <ddE

RANGE:0 - 49

C.2.1.5 DELTA F

COMMAND: =

C.2.1.6 STO

COMMAND: >ddE

RANGE: 1 - 49

C.2.1.7 f

COMMAND: ?d

RANGE: 0 - 9 and

C.2.1.8 STD

COMMAND: @

C.2.1.9 rf level

COMMAND

Addd[.d]

Addd[.d]B

RANGE: -125 dBm to +4 dBm

C.2.1.10 dBmW/uV

COMMAND: B

C.2.1.11 CLEAR

COMMAND: C

C.2.1.12 RDL/DDM

COMMAND: D

ddd[.dd]E

D.dddE

RANGE: VOR BEARING: 0.00 - 359.99° (.01° increments)

LOC DDM: .000 - .400 DDM (.001 DDM increments)

G/S DDM: .000 - .800 DDM (.001 DDM increments)

C.2.1.13 ENTER

COMMAND: E

C.2.1.14 RF RFEQ

COMMAND: F

Fddd [.ddd] E

RANGE: 108.000 - 117.950 Mhz (.05 MHz increments)

329.000 - 335.000 Mhz (.15 MHz increments)

74.600 - 75.4000 Mhz (.025 MHz increments)

118.000 - 151.975 Mhz (.025 Mhz increments)

C.2.1.15 30Hz VAR

COMMAND: G

Gddd[dd]E

RANGE: % MOD: 5.00 - 35.00 % (.01 % increments)

FREQUENCY:24.0 - 36.0 Hz (.01 % increments)

C.2.1.16 9960 FM

COMMAND: H

Hdd[.dd]E

RANGE: % MOD: 5.00 - 35.00 % (.01 % increments)

C.2.1.17 9960 Hz

COMMAND: I

C.2.1.18 1020/AUX

COMMAND: J

Jddddd[.d]E

RANGE: 10.0 - 18000.0 Hz (.1 Hz increments)

C.2.1.19 90Hz

COMMAND: K

Kddd[dd]E

RANGE: % MOD: 0.00 - 99.00 % 0.01 % increments)

FREQUENCY: 120.00 - 180.0 Hz (.1 Hz increments)

C.2.1.20 150 Hz

COMMAND: L

Lddd [.dd]E

RANGE: % MOD: 0.00 - 99.00 % (.01 % increments)

FREQUENCY: 120.0 - 180.0 Hz (.01 % increments)

C.2.1.21 %MOD

COMMAND: M

RANGE: 0.00 - 99.00 % (.01 % increments)

C.2.1.22 400 Hz

COMMAND: N

C.2.1.23 RF ON/OFF

COMMAND: O

C.2.1.24 1300 Hz

COMMAND: P

C.2.1.25 3000 Hz

COMMAND: Q

C.3 Remote Command Quick Reference for the Legacy ATB-7300 Commands

C.3.1 Introduction

This section is an introduction to the remote operation of the ATB-7300NG Test Set using an external controller and summarizes the SCPI (Standard Commands for Programmable Instruments) commands available to program the test set.

You should be familiar with the operation of the ATB-7300NG Test Set capabilities and features before attempting remote control via the Ethernet interface. This section is not intended to teach programming or to discuss Ethernet theory except at an introductory level.

Any programming examples that demonstrate the remote operation of the test set are documented in APPENDIX C.

C.3.2 RF Signal Generator Commands

This section describes the RF Signal Generator Commands supported by the ATB-7300NG.

Each command begins with :RFG [1]<X>, where X any integer 1-9.

C.3.3 Remote Command Descriptions

Each remote command in this manual will contain the following basic data items describing the command us age and proper formatting.

Command:	Shows proper syntax of the command or query.
Description:	Describes the functionality of the command or query.
Parameters:	Describes values passed by type and valid range.
Query Data:	Describes the data type and data format.
Query Response:	Describes returned data format from the device query including the data type (i.e. VDC, Amps, Hz, etc.).
Query Example:	Gives an example of returned data in proper format

C.3.4 Long and Short Forms

In the example below, the short form is marked by upper case letters; the long form corresponds to the complete word. Uppercase and lowercase serve to differentiate the

short and long form of the query.

Commands are able to be concatenated by using a semi-colon as the separator between commands. Example: ":NAV1:OUT :STAT 1;:NAV:OUT:MOD:STAT 1"

Example:

:CONFigure	:OFF Set :ANALyzer :ENABle
:FETCh	:RF :FREQuency? is interpreted the same as
CONF:	:OFFS :ANAL :ENAB
:FETC	:RF :FREQ?

NOTE
When sending a command or query to the actual the Test Set, it does not make any distinction between upper and lowercase commands.

C.3.5 Numeric Representation

All commonly used decimal representations of numbers including optional signs; decimal points and scientific notation are allowed.

C.3.6 Bracketed Elements

Square Brackets []
Elements within the compound common program command structure enclosed within square brackets are optional and may be omitted; the instrument processes the command in the same manner whether or not the bracketed element is included.

Example:

[AAA:]BBB[:CCC][:DDD] is interpreted the same as BB B

This formatting also applies to parameters. The ability to recognize the full command length ensures that the instrument complies with the SCPI standard in t his respect.

Braces { }

Parameters included within curly brackets may be included numerous times or not at all .

Arrow Brackets <xxxx>
Text within arrow brackets represents an actual value that needs to be inserted. F or example, <freq> indicates a frequency value must be inserted in the command at this point. These values generally represent alpha-numeric character strings for example: Auto, On, Off, 150, 1012.7, 1.98e3, etc.

C.3.7 Choice Indicator

The vertical bar (|) separates a choice of parameters or commands. For example, 0 | 1 means 0 or 1. '

C.3.8 Common RF Commands

C.3.9 RF Output State

Command:	RFG [1] | <X>:Output:STATe <On Off>
	RFG [1] | <X>:Output:STATe?
Description:	Set command controls the ON/OFF output state of the RF generator.
	Query command returns the current output state of the RF generator (i.e On or OFF).
Parameters:	<On/Off> =OFF | ON.
Query Data:	ASCII response data, boolean format.
Query Responses:	A ON or OFF indicating ON/OFF state of the generator.
Query Example:	OFF

C.3.10 RF Level

Command:	RFG[1] | <X>:OUTput:LEVel <dBmLevel>
	RFG[1] | <X>:OUTput:LEVel?
Description:	Set command adjusts output of generator to specified RF level (in dBm).
	Query command returns the current set output level of the RF generator.
Parameters:	<level> = -125.0 to +4.0 dBm in 0.1 dBm steps
Default:	-125.0
Query Data:	ASCII response data, decimal format
Query Response:	RF output level in dBm.
Query Example:	-42.8

C.3.11 RF Level Maximum

Command:	RFG[1] | <X>:OUTput:MAXimum:LEVel?
Description:	Query command returns the maximum RF output level (in dBm) for the RF signal generator installed.
Parameters:	None
Query Data:	ASCII response data, decimal format
Query Response:	Maximum RF level in dBm.
Query Example:	5.0

C.3.12 RF Frequency

Command:	RFG[1] | <X>:OUTput:FREQuency <freqOut>
	RFG[1] | <X>:OUTput:FREQuency?
Description:	Set command adjusts the frequency (in Hz) of the RF signal generator. This operation is only available if the RF Operation Mode has been set. Query command returns the current RF frequency setting.
Parameters:	<freqOut> = 100.0e6 (1.0 MHz) to 6000.0e6 (6 GHz) in 1 Hz steps (Below 3.0 GHz) in 2 Hz steps (At or Above 3.0 GHz) Default: 2000.0e6
Query Data:	ASCII response data, decimal format
Query Response:	RF frequency in hertz.
Query Example:	123000981

C.3.13 RF Frequency Maximum

Command:	RFG[1] | <X> :OUTput :MAXimum :FREQuency?
Description:	Query command returns the maximum RF frequency (in Hz) for the RF signal generator installed.
Parameters:	None
Query Data:	ASCII response data, decimal format
Query Response:	Maximum RF frequency in Hz.
Query Example:	6000.0e6

C.3.14 AM RF Commands

C.3.15 Modulation Depth

Command:	RFG[1] | <X>:AM:MODulation:DEPTH <depth>
	RFG[1] | <X>:AM:MODulation:DEPTH?
Description:	Set command sets the AM modulation depth (in %) used when RF Operation Mode is set to AM
	Query command returns the current AM modulation depth.
Parameters:	<depth> = 0 to 99 Default: 0
Query Data:	ASCII response data, long integer format
Query Response:	Modulation depth in percent (%).
Query Example:	50

C.3.16 Modulation Rate

Command:	RFG[1] | <X>:AM :MODulation :RATE <rate>
	RFG[1] | <X>:AM: MODulation :RATE?
Description:	Set command sets the AM modulation depth (in %) used when RF Operation Mode is set to AM.
	Query command returns the current AM modulation rate.
Parameters:	<depth> = 1000 to 50000 Default: 1000
Query Data:	ASCII response data, long integer format
Query Response:	Modulation rate in hertz (Hz).
Query Example:	1000

C.3.17 NAV Generator Commands

This section describes the RF NAV Generator Remote Commands supported by the ATB-7300NG. Each command begins with :NAV[1]|<X>, where X is any integer 1-9.

C.3.18 Signal Generator Control

C.3.19 RF Enable

Command:	NAV[1] | <X>:OUTput:STATe <OnOff>
	NAV[1] | <X>:OUTput:STATe?
Description:	Set command controls the ON / OFF output state of the RF generator.
	Query command returns the current output state of the RF generator (i.e. ON or OFF).
Parameters:	<OnOff> = OFF | ON
Query Data:	ASCII response data
Query Response:	A ON or OFF indicating ON/OFF state of the generator.
Query Example:	ON

C.3.20 Modulation Enable

Command:	NAV[1] | <X>:OUTput:MODulation:STATe <OnOff>
	NAV[1] | <X>:OUTput:MODulation:STATe?
Description:	Set command controls the ON / OFF modulation state of the RF generator.
	Query command returns the current modulation state of the RF generator (i.e. ON or OFF).
Parameters:	<OnOff> = OFF | ON
Query Data:	ASCII response data
Query Response:	A ON or OFF indicating ON/OFF state of the modulation
Query Example:	ON

C.3.21 Center Frequency

Command:	NAV[1] | <X>:VOR:MOD9960 <mod>
	NAV[1] | <X>:VOR:MOD9960?
Description:	Sets the modulation % for the variable 9960 Hz tone Query command returns the 9960 Hz tone's modulation
Parameters:	<mod> = the new modulation, in %
Query Data:	ASCII response data, decimal format
Query Response:	The current 9960 Hz tone's modulation, in %
Query Example:	15.0

C.3.22 RF Level

Command:	NAV[1] | <X>: OUTput: LEVel <level>
	NAV[1] | <X>: OUTput: LEVel?
Description:	Sets the RF level for the generator Query command returns the current RF level (dBm)
Parameters:	<level> = the new rf level, in dBm
Query Data:	ASCII response data, decimal format
Query Response:	RF Power level, in dBm
Query Example:	-10.0

C.3.23 NAV Mode of Operation

Command:	NAV[1] | <X>:MODE <mode>
	NAV[1] | <X>:MODE?
Description:	Sets the NAV generator's mode of operation Query command returns thecurrent mode of operation.
Parameters:	<mode> = NONE | ADF | DME | ILS | MKR | VDB | VHF | VOR
Query Data:	ASCII response data
Query Response:	the current mode of operation
Query Example:	ILS

C.3.24 Total Modulation

Command:	NAV[1] | <X>:OUTput:MODulation <percentMod>
	NAV[1] | <X>:OUTput: MODulation?
Description:	Sets the total modulation percent for the current mode Query command returns the current total modulation
Parameters:	<percentMod> = the new total modulation, the ratio of each tone compared to the others is maintained
Query Data:	ASCII response data, decimal format
Query Response:	the current total modulation, in %
Query Example:	80.0

C.3.25 Tone Select

Command:	NAV[1] | <X>:ILS :TONE :SELect <tone>
	NAV[1] | <X>:ILS :TONE :SELect?
Description:	Sets the tone to Left, Right, Up, or Down Query command returns the current tone direction
Parameters:	<tone> = LEFT | RIGHT | UP | DOWN
Query Data:	ASCII response data
Query Response:	The current ILS Tone type, LEFT | RIGHT | UP | DOWN
Query Example:	DOWN

C.3.26 DDM

Command:	NAV[1] | <X>:ILS:DDM <ddm>
	NAV[1] | <X>:ILS:DDM?
Description:	Sets the current DDM
	Query command returns the current DDM
Parameters:	<ddm> = the new ddm
Query Data:	ASCII response data, decimal format
Query Response:	The current DDM value
Query Example:	0.153

C.3.27 SDM

Command:	NAV[1] | <X>:ILS:SDM <sdm>
	NAV[1] | <X>:ILS:SDM?
Description:	Sets the current SDM
	Query command returns the current SDM
Parameters:	<sdm> = the new sdm
Query Data:	ASCII response data, decimal format
Query Response:	The current SDM value
Query Example:	0.400

C.3.28 Phase Shift

Command:	NAV[1] | <X>:ILS :PHASE <phase>
	NAV[1] | <X>:ILS :PHASE?
Description:	Sets the current phase shift between the 90 Hz and 150 Hz
	Query command returns the current phase shift
Parameters:	<phase> = the new phase shift, in degrees
Query Data:	ASCII response data, decimal format
Query Response:	The current phase shift, in degrees
Query Example:	120.0

C.3.29 90 Hz Modulation

Command:	NAV[1] | <X>:ILS :MOD90 <mod>
	NAV[1] | <X>:ILS :MOD90?
Description:	Sets the modulation % for the 90Hz tone
	Query command returns current 90Hz modulation
Parameters:	<mod> = the new 90Hz modulation, in %
Query Data:	ASCII response data, decimal format
Query Response:	The current 90Hz modulation, in %
Query Example:	20.0

C.3.30 150 Hz Modulation

Command:	NAV[1] | <X>:ILS:MOD150 <mod>
	NAV[1] | <X>:ILS:MOD150?
Description:	Sets the modulation % for the 150Hz tone
	Query command returns current 150Hz modulation
Parameters:	<mod> = the new 150Hz modulation, in %
Query Data:	ASCII response data, decimal format
Query Response:	The current 150Hz modulation, in %
Query Example:	20.0

C.3.31 90 Hz Frequency

Command:	NAV[1] | <X>:ILS:FREQ90 <freq>
	NAV[1] | <X>:ILS:FREQ90?
Description:	Sets the frequency for the 90Hz tone
	Query command returns current 90Hz frequency
Parameters:	<mod> = the new 90Hz frequency, in Hz
Query Data:	ASCII response data, decimal format
Query Response:	The current 90Hz frequency, in Hz
Query Example:	90.0

C.3.32 150 Hz Modulation

Command:	NAV[1] | <X>:ILS:FREQ150 <freq>
	NAV[1] | <X>:ILS:FREQ150?
Description:	Sets the frequency for the 150Hz tone
	Query command returns current 150Hz frequency
Parameters:	<mod> = the new 150Hz frequency, in Hz
Query Data:	ASCII response data, decimal format
Query Response:	The current 150Hz frequency, in Hz
Query Example:	150.0

C.3.33 VOR Configuration

C.3.34 To - From Select

Command:	NAV[1] | <X>:VOR:TO FROM :SELect <tofrom>
	NAV[1] | <X>:VOR:TO FROM :SELect?
Description:	Sets the To/From selection
	Query command returns the current to/from selection
Parameters:	<to from> = TO | FROM
Query Data:	ASCII response data
Query Response:	The current to/from selection, either TO or FROM
Query Example:	FROM

C.3.35 Bearing

Command:	NAV[1] | <X>:VOR:BEARing <bearing>
	NAV[1] | <X>:VOR:BEARing?
Description:	Sets the current bearing
	Query command returns the current bearing
Parameters:	<bearing> = the new VOR bearing, in degrees
Query Data:	ASCII response data, decimal format
Query Response:	The current VOR bearing in degrees
Query Example:	135.0

C.3.36 30 Hz Variable Modulation

Command:	NAV[1] | <X>:VOR:MOD30:VAR <mod>
	NAV[1] | <X>:VOR:MOD30:VAR?
Description:	Sets the modulation % for the variable 30 Hz tone
	Query command returns the variable 30 Hz tone's modulation
Parameters:	<mod> = the new modulation, in %
Query Data:	ASCII response data, decimal format
Query Response:	The current 30 Hz tone's modulation, in %
Query Example:	15.0

C.3.37 9960 Hz Tone Modulation

Command:	NAV[1] | <X>:VOR:MOD9960 <mod>
	NAV[1] | <X>:VOR:MOD9960?
Description:	Sets the modulation % for the variable 9960 Hz tone
	Query command returns the 9960 Hz tone's modulation
Parameters:	<mod> = the new modulation, in %
Query Data:	ASCII response data, decimal format
Query Response:	The current 9960 Hz tone's modulation, in %
Query Example:	15.0

C.3.38 30 Hz Variable Frequency

Command:	NAV[1] | <X>:VOR:FREQ30:REF <freq>
	NAV[1] | <X>:VOR:FREQ30:REF?
Description:	Sets the frequency of the reference 30 Hz tone
	Query command returns the 30 Hz tone's frequency
Parameters:	<freq> = the new frequency, in Hz
Query Data:	ASCII response data, integer format
Query Response:	The current 30 Hz tones frequency, in Hz
Query Example:	30

C.3.39 30 Hz Reference Frequency

Command:	NAV[1] | <X>:VOR:FREQ30:REF <freq>
	NAV[1] | <X>:VOR:FREQ30:REF?
Description:	Sets the frequency of the reference 30 Hz tone
	Query command returns the 30 Hz tone's frequency
Parameters:	<freq> = the new frequency, in Hz
Query Data:	ASCII response data, integer format
Query Response:	The current 30 Hz tones frequency, in Hz
Query Example:	30

C.3.40 9960 Hz Tone Frequency

Command:	NAV[1] | <X>:VOR:FREQ9960 <freq>
	NAV[1] | <X>:VOR:FREQ9960?
Description:	Sets the frequency of the 9960 Hz tone
	Query command returns the 9960 Hz tone's frequency
Parameters:	<freq> = the new frequency, in Hz
Query Data:	ASCII response data, integer format
Query Response:	The current 9960 Hz tones frequency, in Hz
Query Example:	9960

C.3.41 30 Hz Frequency Deviation

Command:	NAV[1] | <X>:VOR:FREQ30:DEViation <dev>
	NAV[1] | <X>:VOR:FREQ30:DEViation?
Description:	Sets the frequency deviation of the 30 Hz tone
	Query command returns the 30 Hz deviation
Parameters:	<dev> = the new deviation, in Hz
Query Data:	ASCII response data, decimal format
Query Response:	The current deviation, in Hz
Query Example:	30

C.3.42 Marker Beacon Configuration

C.3.43 Beacon Location

Command:	:NAV[1] | <X>:MKR :LOCation <loc>
	:NAV[1] | <X>:MKR :LOCation?
Description:	Sets the beacon Query command returns the current beacon
Parameters:	<loc> = OUTER | MIDDLE | INNER
Query Data:	ASCII response data
Query Response:	The current beacon, either OUTER, MIDDLE, or INNER
Query Example:	INNER

C.3.44 Beacon Frequency

Command:	:NAV[1] | <X>:MKR:<loc>:FREQuency <freq>
	:NAV[1] | <X>:MKR:<loc>:FREQuency?
Description:	Sets the selected beacon's frequency
	Query command returns the current beacon frequency
Parameters:	<freq> = the new beacon frequency in Hz <loc> = OUTER | MIDDLE | INNER
Query Data:	ASCII response datam decimal format
Query Response:	The current beacon frequency, in Hz
Query Example:	400.0

C.3.45 Beacon Modulation

Command:	NAV[1] | <X>:MKR:MODulation <mod>
	NAV[1] | <X>:MKR:MODulation?
Description:	Sets the current beacon modulation
	Query command returns the current beacon modulation
Parameters:	<mod> = the new beacon modulation, in %
Query Data:	ASCII response datam decimal format
Query Response:	The current beacon frequency, in %
Query Example:	80.0

C.3.46 Beacon Ident Dot Time

Command:	NAV[1] | <X>:MKR:IDENT:<loc>:DOT <time>
	NAV[1] | <X>:MKR:IDENT:<loc>:DOT?
Description:	Sets the dot time for the ident
	Query command returns the selected dot time
Parameters:	<time> = the new dot time for the ident, in ms <loc> = OUTER | MIDDLE | INNER
Query Data:	ASCII response datam decimal format
Query Response:	The current dot-time in ms
Query Example:	100

C.3.47 Beacon Ident Dash Time

Command:	NAV[1] | <X>:MKR:IDENT:<loc>:DASH <time>
	NAV[1] | <X>:MKR:IDENT:<loc>:DASH?
Description:	Sets the dash time for the ident
	Query command returns the selected dash time
Parameters:	<time> = the new dash time for the ident, in ms <loc> = OUTER | MIDDLE | INNER
Query Data:	ASCII response datam decimal format
Query Response:	The current dash-time in ms
Query Example:	175

C.3.48 Beacon Ident Gap Spacing

Command:	NAV[1] | <X>:MKR:IDENT:<loc>:GAP <time>
	NAV[1] | <X>:MKR:IDENT:<loc>:GAP?
Description:	Sets the gap spacing for the ident
	Query command returns the current gap spacing
Parameters:	<time> = the new gap spacing for the ident, in ms <loc> = OUTER | MIDDLE | INNER
Query Data:	ASCII response datam decimal format
Query Response:	The current gap spacing in ms
Query Example:	300

C.3.49 VHF Configuration

C.3.50 Number of Actual Tones

Command:	NAV[1] | <X>:VHF:TONE:NUM?
Description:	Returns the number of active Comm tones
Parameters:	None
Query Data:	ASCII response data, integer format
Query Response:	The number of active tones
Query Example:	2

C.3.51 Activate Tone

Command:	NAV[1] | <X>:VHF:TONE:ACTivate <tone_num>
Description:	Activates a tone
Parameters:	<tone_num> = the tone to activate

C.3.52 Deactivate Tone

Command:	NAV[1] | <X>:VHF:TONE:DEACTivate <tone_num>
Description:	Turns off a tone
Parameters:	<tone_num> = the tone to deactivate

C.3.53 Tone State

Command:	NAV[1] | <X>:VHF:TONE? <tone_num>
Description:	Returns the state of the tone
Parameters:	<tone_num> = the tone to query
Query Data:	ASCII response data
Query Response:	The state of the specified tone, either ON | OFF
Query Example:	OFF

C.3.54 Tone Frequency

Command:	NAV[1] | <X>:VHF:TONE:FREQ <tone_num>, <freq> NAV[1] | <X>:VHF:TONE:FREQ? <tone_num>
Description:	Sets the frequency of the specified tone. Query command returns the current frequency for the tone.
Parameters:	<tone_num> = the tone to query <freq> = the freq of the modulation tone, in Hz.
Query Data:	ASCII response data, decimal format.
Query Response:	The frequency of the modulated tone, in Hz.
Query Example:	1020

C.3.55 Tone Modulation

Command:	NAV[1] | <X>:VHF:TONE:MOD <tone_num>, <mod>
	NAV[1] | <X>:VHF:TONE:MOD? <tone_num>
Description	Sets the modulation % of the specified tone
	Query command returns the modulation % for the tone
Parameters:	<tone_num> = the tone to query <mod> = the modulation % of the tone, in %
Query Data:	ASCII response data, decimal format
Query Response:	The mod percent of the specified tone, in
Query Example:	20.0

C.3.56 SELCAL Pulse Modulation

Command:	NAV[1] | <X>:VHF:SELCAL:MOD <mod>
	NAV[1] | <X>:VHF:SELCAL:MOD?
Description:	Sets the modulation % of the SELCAL tone pulses
	Query returns the modulation % of the SELCAL tone pulses
Parameters:	<mod> = the modulation % of the tones
Query Data:	ASCII response data, decimal format
Query Response:	The mod percent of the SELCAL pulses
Query Example:	20.0

C.3.57 SELCAL Codes

Command:	NAV[1] | <X>:VHF:SELCAL:CODE <code>
	NAV[1] | <X>:VHF:SELCAL:CODE?
Description:	Sets the SELCAL P1 & P2 tone codes
	Query returns the SELCAL code of P1 & P2
Parameters:	<code> = the 4 character string containing codes P1 & P2
Query Data:	ASCII response data, 4 character string
Query Response:	The 4 character string containing the codes for P1 & P2
Query Example:	AAAA

C.3.58 SELCAL Pulse Tone Frequency

Command:	NAV[1] | <X>:VHF:SELCAL:PULse:FREQ <pulse>, <tone>, <freq>
	NAV[1] | <X>:VHF:SELCAL:PULse:FREQ? <pulse, <tone>
Description:	Sets the pulse tone frequency of interest
	Query returns the pulse tone frequency of interest
Parameters:	<pulse> = The desired pulse to set frequency on <tone> = The desired tone to set frequency on <freq> = The new pulse tone frequency
Query Data:	ASCII response data, decimal format
Query Response:	The pulse tone frequency
Query Example:	5000

C.3.59 SELCAL Pulse Time

Command:	:NAV[1] | <X>:VHF:SELCAL:PULse:TIME <pulse>, <time>
	:NAV[1] | <X>:VHF:SELCAL:PULse:TIME? <pulse>
Description:	Sets the length of time for the desired pulse
	Query returns the length of time for the desired pulse
Parameters:	<pulse> = Selects which pulse to set the time length of <time> = The new pulse time in seconds
Query Data:	ASCII response data, decimal format
Query Response:	The current length of the selected pulse, in seconds
Query Example:	1.0

C.3.60 SELCAL Gap Time

Command:	NAV[1] | <X>:VHF:SELCAL:PULse:GAP <time>
	NAV[1] | <X>:VHF:SELCAL:PULse:GAP?
Description:	Sets the time gap between pulses P1 and P2
	Query returns time gap between pulses P1 and P2
Parameters:	<time> = The gap time in seconds
Query Data:	ASCII response data, decimal format
Query Response:	The current gap time, in seconds
Query Example:	0.5

C.3.61 SELCAL Test Tone Enable

Command:	NAV[1] | <X>:VHF:SELCAL :TEST:STATe <is_enabled>
	NAV[1] | <X>:VHF: SELCAL :TEST:STATe?
Description:	Sets whether the test tone is to play following the SELCAL pulses
	Query returns whether the test tone is enabled to follow the SELCAL pulses
Parameters:	<is_enabled> = 1 if enabled, 0 otherwise
Query Data:	ASCII response data, integer format
Query Response:	The current state of the Test tone, 1 if enabled, 0 otherwise
Query Example:	0

C.3.62 SELCAL Test Tone Frequency

Command:	NAV[1] | <X>:VHF:SELCAL:TEST:FREQ <freq>
	NAV[1] | <X>:VHF:SELCAL:TEST:FREQ?
Description:	Sets the frequency of the test tone
	Query returns the frequency of the test tone
Parameters:	<freq > = the desired test tone frequency
Query Data:	ASCII response data, decimal format
Query Response:	The current test tone frequency
Query Example:	12000

C.3.63 SELCAL Test Tone Modulation

Command:	NAV[1] | <X>:VHF:SELCAL:TEST:MOD <mod>
	NAV[1] | <X>:VHF:SELCAL:TEST:MOD?
Description:	Sets the modulation percentage of the test tone
	Query returns the mod % of the test tone
Parameters:	<mod > = the percent modulation, in %
Query Data:	ASCII response data, decimal format
Query Response:	20

C.3.64 Initiate SELCAL Test

Command:	NAV[1] | <X>:VHF:SELCAL:STARt
Description:	Initiates a SELCAL burst
Parameters:	None

C.3.65 Ident Configuration

C.3.66 Ident Mode

Command:	NAV[1] | <X>:IDENT:MODE <mode>
	NAV[1] | <X>:IDENT:MODE?
Description:	Sets the ident mode
	Query command returns the current Ident mode
Parameters:	<mode> = The ident mode to set, either OFF | TONE | CODE
Query Data:	ASCII response data
Query Response:	The current Ident Mode, OFF | TONE | CODE
Query Example:	CODE

C.3.67 Ident Code

Command:	NAV[1] | <X>:IDENT:CODE <code>
	NAV[1] | <X>:IDENT:CODE?
Description:	Sets the current Ident code
	Query command returns the current Ident code
Parameters:	<code> = The ident code to set
Query Data:	ASCII response data
Query Response:	The current Ident Mode code
Query Example:	AAAA

C.3.68 Ident Modulation

Command:	NAV[1] | <X>:IDENT:FREQuency <freq>
	NAV[1] | <X>:IDENT:FREQuency?
Description:	Sets the frequency of the ident modulation
	Query returns the frequency of the ident modulation
Parameters:	<freq > = the frequency to set the ident tone
Query Data:	ASCII response data, decimal format
Query Response:	The ident frequency
Query Example:	1020

C.3.69 Ident Frequency

Command:	:NAV[1] | <X>:IDENT:MOD <mod>
	:NAV[1] | <X>:IDENT:MOD?
Description:	Sets the modulation percentage of the ident
	Query returns the mod % of the ident
Parameters:	<mod > = the percent modulation, in %
Query Data:	ASCII response data, decimal format
Query Response:	The ident modulation percentage
Query Example:	20

C.3.70 Ident Rate

Command:	:NAV[1] | <X>:IDENT:RATE <rate>
	:NAV[1] | <X>:IDENT:RATE?
Description:	Sets the repetition rate for the ident, in seconds
	Query returns the repetition rate for the ident
Parameters:	<freq > = the rate to set the ident, in seconds
Query Data:	ASCII response data, integer format
Query Response:	The ident rate, in seconds
Query Example:	6

C.3.71 Ident Dot Time

Command:	:NAV[1] | <X>:IDENT:DOT <time>
	:NAV[1] | <X>:IDENT:DOT?
Description:	Sets the dot time for the ident, in ms
	Query returns the current dot time
Parameters:	<time > = the dot time, in ms
Query Data:	ASCII response data, integer format
Query Response:	The ident's dot time, in ms
Query Example:	100

C.3.72 Ident Dash Time

Command:	NAV[1] | <X>:IDENT:DASH <time>
	NAV[1] | <X>:IDENT:DASH?
Description:	Sets the dash time for the ident, in ms
	Query returns the current dash time
Parameters:	<time > = the dash time, in ms
Query Data:	ASCII response data, integer format
Query Response:	The ident's dash time, in ms
Query Example:	200

C.3.73 Ident Gap Spacing

Command:	NAV[1] | <X>:IDENT:GAP <time>
	NAV[1] | <X>:IDENT:GAP?
Description:	Sets the gap spacing for the ident, in ms
	Query returns the current gap spacing
Parameters:	<time > = the gap spacing, in ms
Query Data:	ASCII response data, integer format
Query Response:	The ident's gap spacing, in ms
Query Example:	300

C.3.74 Ident Character Spacing

Command:	:NAV[1] | <X>:IDENT:CHAR <time>
	:NAV[1] | <X>:IDENT:CHAR?
Description:	Sets the character spacing for the ident, in ms
	Query returns the current character spacing
Parameters:	<time > = the character spacing, in ms
Query Data:	ASCII response data, integer format
Query Response:	The ident's character spacing, in ms
Query Example:	300

C.3.75 Minimum Ident Rate

Command:	NAV[1] | <X>:IDENT:RATE:MIN?
Description:	Returns the minimum possible ident rate for the current settings

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D

Test Set Specifications

This appendix contains the ATB-7300NG Avionics NAV Bench Test Set specifications. Specifications are grouped as follows:

- Unit Specifications D-2
- Operating Specifications D-8
- Electrical Specifications D-9

D.1 Unit Specifications

Unit specific data can be found in this section:

Table D-1 Dimensions and Weight Specifications

Parameter	Specifications
Height	88mm (H)
Width	432mm (W)
Depth	435mm (D)
Weight	10.5Kg (23.1 lbs)
Rack Units	mA1302: 2U x 19”
Acoustic Emissions	78 LWA dB (Max), 63 LWA dB (Typical)

Table D-2 Storage Environment

Parameter	Specifications
Storage Temperature	-40° to 71° F (-40° to 60° C)
Humidity	95% to 40° C

Table D-3 Performance Specifications

Parameter	Specifications
Signal Generator	
Frequency Range	1 MHz to 6 GHz
Frequency Accuracy	±0.1 ppm
RF Level	
RF Output Port	1 MHz to 400 MHz ±1.2 dB (-125 dBm to +4 dBm) 400 MHz to 3 GHz ±0.9 dB (-125 dBm to +4 dBm) 3 GHz to 6 GHz ±1.6 dB(-125 dBm to +4 dBm)
Spurious	
Phase Noise	-114 dBc/Hz at 10kHz offset
Harmonics	<-35 dBc
Non-Harmonics	<-50 dBc
MKR Generator	

Table D-3 Performance Specifications

Parameter	Specifications
Tone Settings	
Frequency Range	30 Hz to 7,400 Hz
Resolution	1 Hz
Default	
Outer	400 Hz
Middle	1.300 Hz
Inner	3.000 Hz
% Modulation	
Range	0-99%
Resolution	1%
Default	95%
IDENT	
Outer	
Dot Time	0 ms, fixed
Gap Time	
Range	50 ms to 250 ms
Resolution	1 ms
Default	125 ms
Dash Time	
Range	150 ms to 750 ms
Resolution	1 ms
Default	375 ms
Middle	
Dot Time	125 ms, fixed
Gap Time	125 ms, fixed
Dash Time	375 ms, fixed
INNER	
Dot Time	83 ms, fixed
Gap Time	83 ms, fixed
Dash Time	0 ms, fixed
ILS Generator	
Settings	
Phase Shift	

Table D-3 Performance Specifications

Parameter	Specifications
Range	0.0 to 359.9°
Resolution	0.1°
Default	0.0°
Total MOD	Not to exceed 99% LOC includes 1, 020 Hz IDENT modulation See SPECIFIC DATA
DDM Settings	
Range	
(Glideslope)	0.000 to 0.800 DDM
(Localizer)	0.000 to 0.400 DDM
Resolution	0.001 DDM
Default	0.000DDM
Total System Error (Glideslope)	±0.001 DDM from 0.000 to 0.045 DDM ±2% of setting from 0.000 to 0.045 to 0.400 DDM
Localizer	±0.001 DDM from 0.000 to 0.045 DDM ±2% of setting from 0.045 to 0.200 DDM
Glideslope and Localizer Tone Settings	
Frequency	
Range	90 Hz setting range: 72 Hz to 108 Hz 150 Hz setting range: 120z to 180 Hz
Resolution	1 Hz
Accuracy	±0.01%
Distortion	<0.40% THD
Modulation	90 and 150 Hz
Default	20%
Overall Accuracy	±2% for 5% to 90% AM
VOR Generator	
Direction	
Bearing	
Range	000.0° to 359.9°
Resolution	0.1°
Radial Accuracy	±0.05°
Tone Settings	

Table D-3 Performance Specifications

Parameter	Specifications
Frequencies	30 VAR and 30 REF Freq
Range	20 Hz to 40 Hz
Resolution	1 Hz
9960 Frequency	
Range	9 kHz to 11 kHz
Resolution	1 Hz
Default	9,960 Hz
Frequency Deviation	
Range	240 Hz to 540 Hz
Resolution	1 Hz
Default	480 Hz
Accuracy	±2% of setting
Distortion	<0.40% THD
Modulation	30 VAR and 9,960 MOD
Range	Total % MOD not to exceed 99% Includes 1, 020 Hz IDENT Modulation See *IDENT SPECIFIC DATA*
Default	30%
Overall Accuracy	±2% for 5% to 90% AM
***IDENT (ADF, ILS LOC and VOR)**	
IDENT Code	
Valid Characters	A-Z, 0-9
Length	1 to 5 Characters
Default	IDENT
Word Rate	
Range	1 sed. to 65 sec.
Default	10 sec.
Resolution	1 sec.
Frequency	
Range	10 Hz to 18 kHz
Resolution	1 Hz
Default	1, 020 Hz
Accuracy	±0.01%

Table D-3 Performance Specifications

Parameter	Specifications
Distortion	<0.40% THD
Modulation	
Range	Total % MOD not to exceed 99%
Resolution	0.01%
Default	0.00%
Overall Accuracy	±2% for 5% to 90% AM
Dot Time	
Range	50 ms to 250 max
Resolution	1 ms
Default	0.00%
Gap (Dot/Dash) Time	
Range	50 ms to 250 ms
Resolution	1 ms
Default	150 ms
Dash Time	
Range	50 ms
Resolution	1 ms
Default	150 ms
Character Spacing	
Range	150 ms to 750 ms
Default	450 ms
Resolution	1 ms
VHF Comm Generator	
Modes ***AM Mode*** Modulation	
Frequency Range (per Tone)	30 Hz to 18 kHz
Default	1 kHz
Resolution	1 Hz
Accuracy	± 1% from 10% to 90%
Range	Total % MOD not to exceed 99%
Default (Per Tone)	30%

Table D-3 Performance Specifications

Parameter	Specifications
Overall Accuracy	±2% of setting for 5% to 90% AM
Distortion	<0.40% THD
SELCAL Mode user selectable tone set with programmable tone periods.	
SELCAL Settings	
P1 and P2 Codes	
Range	2 characters
Valid Characters	A through H, J through M, P through S
P1 and P2 Tones	
Frequencies	
Range	Set from code, 312.6 Hz to 1, 479.1 Hz
Pulse Mode	
Range	0.00% to 99% Applies to ALL pulses including test tone
Resolution	0.01%
Default	90.00%
Timing	
P1 and P2 Time	
Range	0.000 to 2.000 sec.
Resolution	0.001 sec.
Default	1.000 sec.
Gap Time	
Range	0 to 999 ms
Resolution	1 ms
Default	200 ms
Test Tone	
Frequency	
Range	10 Hz to 18 Hz
Resolution	1 ms
Default	1020 Hz
MOD	
Range	10 Hz to 18 kHz
Resolution	0.01%

Table D-3 Performance Specifications

Parameter	Specifications
Default	30.00%
Enable	**ON** (Checked) or **OFF** (Unchecked)
AM	0 to 99%, ±3.0%
General Information	
Regulatory	
Safety compliance IEC/EN 61010-1	
EMC compliance IEC/EN 61326-1	
IEC/EN 61000-3-2	
IEC/EN 61000-3-3	
MIL-PRF-28800F Class 3	
Mechanical	
Rack units mA-1302: 2U x19”	
Dimensions mA-1302: 432 mm (W) x 88 mm (H) x 435 mm (D)	
Weight	
Acoustic emissions 78 LWA db (max), 63 LWA dB (typical)	
Ordering Information	
142759	ATB-7300NG Avionics NAV Test Bench
139910	Rack Mount Kit (2U)

D.2 Operating Specifications

Operating specific data can be found in this section.

Table D-4 Cooling fans

Parameter	Specification
Power Supply Fan	27 CFM, 1 each
Card Cage	45 CFM, 2 each
Intake Filter	30 ppi, open Cell, Polyfoam, SIF ‘Z’ 8.20 x 4.50 x 0.25 inches

Table D-5 Remote Control Interface

Parameter	Specification
Remote Control Interface	Ethernet

D.3 Electrical Specifications

Table D-6 Power supply

Parameter	Specification
Input	VAC, 50/60 Hz, Switch Selectable
Input Current	5 A @ 115 VAC, 3 A @ 230 VAC
Maximum Output‘	+5 VDC @ 25 A +12 VDC @ 9.5/14 A Peak -5 VDC @ 1 A -12 VDC @ 1 A
Current Protection	Short circuit protected with automatic recovery.
Minimum Load	3.0 A @ +5 V 0.5 A @ +12 V
Aux Output Receptacle	1 A @ 115 VAC 0.5 A @ 230 VAC

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Glossary

A

A — Amperes

AC — Alternating Current

AM — Amplitude Modulation

ANT — Antenna

AP — Address Parity

ASCII — American Standard Code for Information Interchange

API — Application Programming Interface

ATTN — Attention

AUTO — Automatic

AUX — Auxiliary

B

BCH — Bose, Chaudhuri, and Hocquenghem (developers of BCH error-correcting codes)

Bps — Bits per Second

BRG — Bearing

C

C — Celsius

CAL — Calibration

CCW — Counter Clockwise

CDI — Course Deviation Indication

CHNL — Channel

cm — Centimeter (1² Meters)

COMM — Communication

CMP — Configurable Modular Platform

Cont — Continued

cw — Clockwise

D

DAC — Digital to Analog Converter

dB — decibel

dBm — Decibels Above one Milliwatt

DC — Direct Current

DDM — Difference in Depth Modulation

Definition — Description of a Word

Deg — Degree

DEL — Delete

DEV — Deviation

DHCP — Dynamic Host Configuration Protocol

definition — Description of a word

DHCP — Dynamic Host Configuration Protocol

E

ELT — Emergency Locator Transmitter

EMC — Electromagnetic Capability

EMI — Electromagnetic Interference

ESD — Electrostatic Discharge

EXT — External

FM — Frequency Modulation

FREQ — Frequency

Ft — Feet/Foot

G

GAL — Galileo

GB — gigabyte

GbE — Gigabit Ethernet

GEN — Generator

GHZ — gigahertz

GND — Ground

GPS — Global Positioning System

G/S — Glideslope

GUI — Graphical User Interface

H-K

Hr — Hour

Hrs — Hours

H/W — Hardware

Hz — Hertz

ICM — Instrument Carrier Module

IF — Intermediate Frequency

IPMB — Intelligent Platform Management Bus

IMPC — Intelligent Platform Management Controller (IPMC)

Kg — Kilogram

KHz — Kilohertz

km — Kilometer

Kt — Knots (Velocity)

L

LAN — Local Area Network

LCD — Liquid Crystal Display

LED — Light Emitting Diode

LOC — LOCalizer

LO — Local Oscillator

LRU — Line Replaceable Unit

LSB — Least Significant Bit Lower Sideband

LVDS — Low-voltage Differential Signaling

M - O

M — Meters

MAX — Maximum

MHz — megahertz

Min — Minutes

M MOD — Master Modulation

ms — Millisecond (10^{-3} Seconds)

MSB — Most Significant Bit

mW — Milliwatt

N/A — Not Applicable

NAV — Navigation

Nmi — Nautical Miles

ns — Nano-Second (10 - 9 seconds)

OUT — Output

P

Para — Paragraph

PARAM — Parameters

PC — Personal Computer

PCIe — Peripheral Component Interconnect Express

PEM — Power Entry Module

PPM — Parts per Million

PREV — Previous

PSI — Pounds per Square Inch

PWR — Power

R

RA — Return Authorization

RAM — Random Access Memory

RCVR — Receiver

RES — Resolution

RF — Radio Frequency

RFA — Radio Frequency Analyzer

RFG — Radio Frequency Generator

RX — Receive

RF — Radio Frequency

S

SCPI. Standard Command for Programmable Instruments

SEC. Seconds

SELCAL. Selective Calling

ShMC — Shelf Management Controller

SoC — System-on-Chip

SP — Spacing

SPI — Serial Peripheral Interface

SPM — Scans per Minute

SPR — Synchronous Phase Reversal

SQTR — Squitter

SRQ — Service Request

SRS — Segment Request Subfield

SSR — Secondary Surveillance Radar

STD — Standard

SV — Satellite/Space Vehicle

SWP — Sweep

SWR — Standing Wave Radio

SYNC — Synchronous Recovered Ethernet Clock

T - U

TX — Transmit

UI — User Interface

UHF — Ultra High Frequency

USB — Upper Sideband

UUT — Unit Under Test

V - Z

V — Volt

VAC — Volts, Alternating Current

VAR — Variable

VHF — Very High Frequency

VOR — Very High Frequency Omni-Directional Radio Range

Vrms — Volts Root Mean Square

VSWR — Voltage Standing Wave Radio

W — Watt

XMIT — Transmit

XMTR — Transmitter

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