BDA Bi-Directional Amplifier

General

NOTIFIER offers all the components required for design and installation of the Emergency Radio Communication Enhancement Systems (ERCES): signal boosters/bi-directional amplifiers (BDA), batteries and battery enclosures, donor antennas, Distributed Antenna Systems (DAS), coaxial cables, connectors and lightning arrestors, power dividers and hybrid couplers, design services and training.

Signal Boosters / Bi-Directional Amplifiers (BDA)

NOTIFIER Class B BDAs are high gain, high power band-selective signal boosters/bi-directional amplifiers that can be designed and customized to meet all public safety frequency band ranges. It is intended to provide reliable two-way radio signal coverage inside buildings, tunnels and other structures. The band selective design delivers a reliable performance in even the most challenging RF environments.



BDA



Annunciator

Features & Benefits

- All public safety frequency bands supported, various models available for:
  - UHF: NF-BDA400-1B, NF-BDA400-2B
  - VHF: NF-BDA150-1B
  - 800 MHz: NF-BDA800-1B
  - 700 MHz: NF-BDA700-1B
  - 700MHz and 800MHz: NF-BDA7800-2B
- UL, CSFM, NFPA, IFC compliance:
  - All-inclusive and fully-integrated signal booster / BDA with UL2524 In-building 2-Way Emergency Radio Communication Enhancement Systems Listing, CSFM Listing, NFPA 72 2010 Edition, NFPA 1221 2016 Edition and IFC 2018 compliance.
  - Does not require external DC power supplies, chargers or alarm interfaces or feeds.
  - Integrated dual power supply system with two independent AC circuit breakers.
  - Integrated battery charger function with built in intelligent battery monitoring and diagnostics with automatic load testing.
  - 24 hour battery backup with the standard battery backup package.
  - Ability to connect to NOTIFIER's SLC loop for monitoring of the BDA at the FACP.
  - Six alarm relay outputs for the supervised BDA monitoring Panel / Annunciator.
  - Dedicated supervised Annunciator to provide status on AC power, antenna, charger and low battery. Annunciator mounts in a standard electrical 2-gang box.
  - On board Diagnostics
  - Donor antenna line monitored for integrity.
  - Event history logging that can be exported.
  - Optional Auxiliary Alarm.
  - LCD displays BDA system status.
- High Reliability
  - Two high-efficiency power supplies are included for redundancy.
  - Each module has an internal microcontroller that continuously monitors its operation and measures the voltage, temperature, current, and other parameters.
  - RF power overload and RF interference prevention.
  - Oscillation Detection Circuit prevents amplifier feedback.
  - Automatic Uplink Squelch: Completely eliminates uplink noise from the BDA eliminating risk of interrupting public safety radio network.
- Excellent RF Performance:
  - Band/Channel-Selective modules provide high rejection of unwanted, interfering signals. Multiple channels/bands are possible within the same amplifier.
  - High performance bandpass cavity-type duplexers minimize out of band interference.
  - High Gain of up to 92dB on both uplink and downlink.
  - High Power – capable of producing up to 32dBm of RF power.
  - High Linearity Amplifiers deliver signals with very low distortion and low IM products.
  - Highly Resilient to strong RF inputs – ensures optimal, intermod-free performance.
  - Reliable performance even in high RF environments with signals as strong as -20dBm.
  - Very low signal delay of <9us means no delay-produced RF distortion in the signal overlap areas.
  - Optimized not only for FM and phase 1 P25 but also for TDMA and phase 2 P25 modulations.
  - Adjustable RF gain on both LNA and ALC modules.
  - Adjustable maximum power level.
  - Multiple ALC/OLC circuits maintain the set power limit and prevent the power amplifier overload.
  - Built-in EOL resistors are selectable with the DIP-switch.
- Serviceability:
  - Modular Design with easy to swap and easy to test modules.
  - Each module has a status indication LED light for easy troubleshooting and status monitoring.

– Easy to use gain and power settings.
– LED indication of signal strength.
– Convenient quick-disconnect terminals.
– Easily accessible RF connectors.

- Expandability:
  – Modular Design allows for easy updates and frequency band changes.
  – Multiple boosters can be combined on the same antenna system for multi-band operation.

Electrical Specifications

Specification	NF-BDA400-1B, NF-BDA400-2B	NF-BDA150-1B	NF-BDA800-1B	NF-BDA700-1B	NF-BDA7800-2B
Frequency Range	450-490MHz UHF	150-174MHz VHF	806-815MHz Uplink 851-860MHz Downlink	793-805 MHz Uplink 763-775 MHz Downlink	793-815MHz Uplink 851-860MHz & 763-775 MHz Downlink
Passband	100KHz -3MHz[1]	-	-	-	-
Maximum Bandwidth, each band	3MHz	-	-	-	-
Maximum Gain (adjustable)	92dB max. (90dB typ.)	92dB max. (90dB typ.)	92dB (Typ)		
Gain Adjustment, 1 dB attenuator increments	50dB to 92dB = 42dB total adjustment range				
Maximum Composite Output Power (i.e. single carrier max. power)	32dBm	30dBm	30dBm	30dBm	28dBm
Power Limiter Adjustment, 1 dB attenuator increments	32dBm to 18dBm	30dBm to 16dBm	30dBm to 16dBm	30dBm to 16dBm	28dBm to 14dBm
Impedance	50 Ohm				
Maximum RF Signal Input Level for FCC spurious limits compliance	-20dBm				
Absolute Maximum Input RF Signal Level	0dBm continuous, +10dBm peak				
Noise Figure	<6.5dB typ.8dB max.	<6.5dB typ.8dB max.	<6.5dB typ.8dB max.	<6.5dB typ.8dB max.	<6.0dB typ. 7dB max.
Trouble indications	Two Form C relays for each of the troubles: AC Power Status, Charger Status, Low Battery Capacity, BDA Trouble, Antenna Trouble and Aux Alarm. Second relay contact set provided for a LED annunciator panel.				
Event Logger	Standard SD Card up to 16GB. Mini SD with adapter. Real time clock time stamp included.				
AC Power Supply	Two independent power supplies with 110-240VAC/2.1A 50/60Hz each.				
Power Supply Efficiency	91% (Typ.)				
DC Power Supply	Requires two (2) 75Ah 12V AGM Sealed L.A. batteries in series for Secondary power. Maximum Current Draw: 2.5A @24VDC				
Run Time with standard 2x75Ah 60% de-rated Battery Backup	24 Hours under full load				
Battery Charging with the Built-in Charger[2]	Charging Current Limited to 5A max.				
Operating Temperature[3]	-4°F to +77°F (-20°C to + 25°C)				
FCC ID	2AHVPSB400M1A 2AHVPSB400M2A	2AHVPSB150M2A	2AHVPSB800M2A	2AHVPSB700M2A	2AHVPSB7800M2A
FCC Certifications	FCC Title 47 Part 90, FCC Title 47 Part 15b				

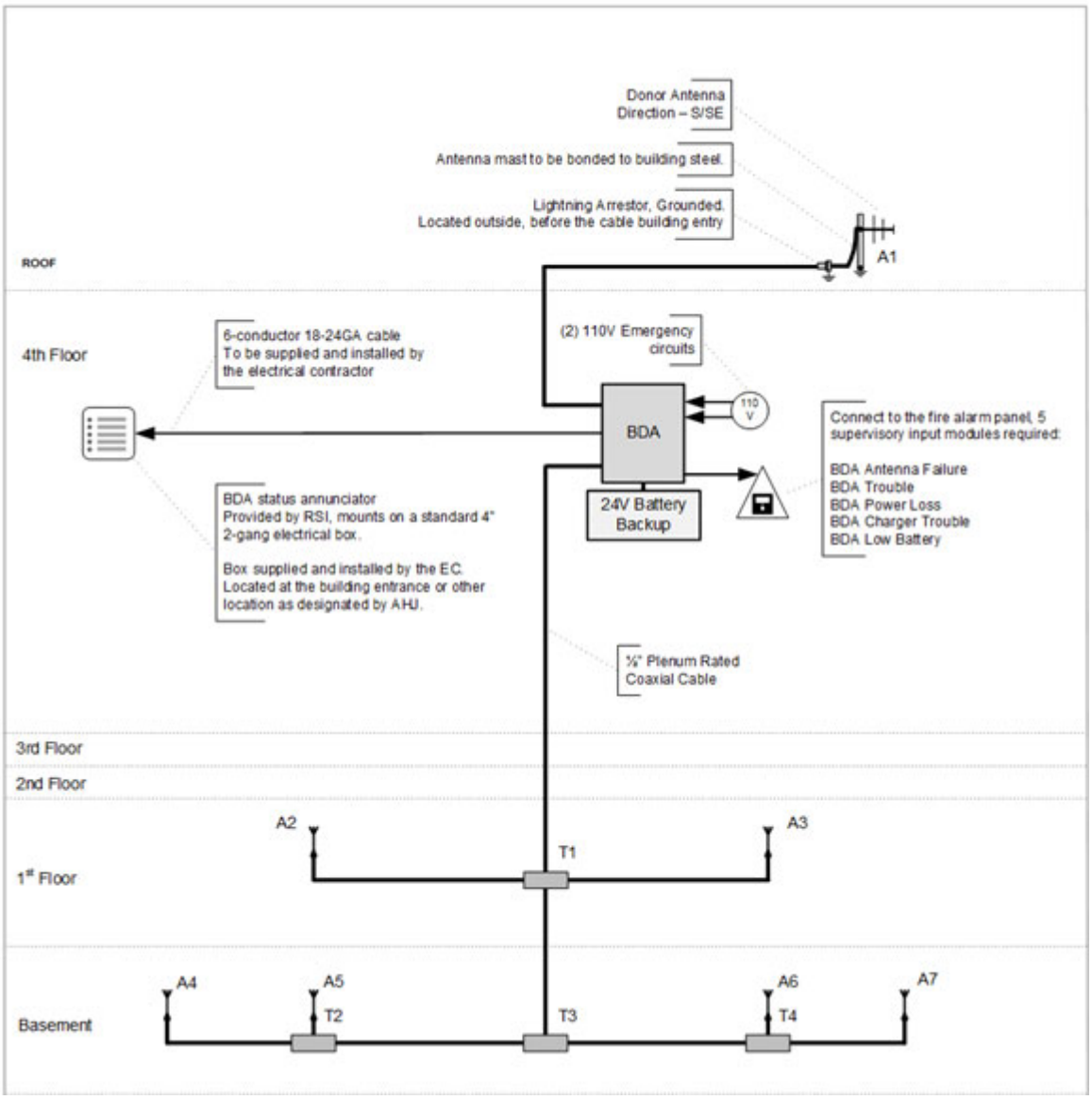
[1]Multiple channels can be combined within the 3MHZ duplexer band-pass. Multiple bands can be combined in the same enclosure. Other channel bandwidths may be available, please inquire with your specific requirements.

[2]Only use approved lead-acid batteries supplied by NOTIFIER along with the Signal Booster.

[3]This system meets NFPA requirements for operation at -20 to 25º C / -4 to 77º F and at a relative humidity. However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a normal room temperature of 15-25º C/60-77º F.

Mechanical Specifications

Dimensions	Main Enclosure: 20.55”Wx24”Hx8.32”D Overall Width Including Heatsinks: 23.23” Overall Height Including Mounting Tabs: 26.22”
Signal Booster Enclosure Type	Red, NEMA-4 Type (UL Type-4) approved aluminum enclosure
Weight – Standard Enclosure, Single Band Configuration, NFPA Compliant Version with two power supplies	~59lbs
RF Connectors	N-Female
Backup Battery Enclosure	Red, NEMA-3R Type (UL Type-3R) approved, steel vented enclosure, holds two 75Ah batteries. 23"W X 13"H X 8.3"D



Typical BDA System Riser Diagram

AGENCY LISTINGS AND APPROVALS

These listings and approvals apply to the modules specified in this document. In some cases, certain modules or applications may not be listed by certain approval agencies, or listing may be in process. Consult factory for latest listing status.

- UL2524: S36081.
- CSFM: 7300-0028:0508.
- NFPA 72 Compliance, NFPA 1221 Compliance.
- IFC Compliance.
- FCC Title 47 Part 90, FCC Title 47 Part 15b.

Ordering Information

SIGNAL BOOSTERS / BI-DIRECTIONAL AMPLIFIERS (BDA)

NF-BDA400-1B: 450-490MHz,Single UHF sub-band, Class B BDA, NOTIFIER

NF-BDA400-2B: 450-490MHz,Dual UHF sub-band, Class B BDA, NOTIFIER

NF-BDA150-1B: 150-174MHz,Single VHF sub-band, Class B BDA, NOTIFIER

NF-BDA800-1B: Full 800 MHz Public Safety Band, Class B BDA, NOTIFIER

NF-BDA7800-2B: Full 700 & 800MHz PS,Dual band, Class B BDA, NOTIFIER

NF-BDA700-1B: Full 700 MHz Public Safety Band, Class B BDA, NOTIFIER

BATTERIES AND BATTERY ENCLOSURE

BDA-BENCL-10-UL3R: NEMA-3R, UL Listed, Battery Enclosure for 2 x 75Ah Batteries. Steel with Red powder coat finish. Vented.

BDA-BB-75-10: Battery, 12V/75Ah each. (two are required for each BDA/signal booster).

BDA-SBR-10-UL3R: Seismic bracket kit for BDA battery enclosure. Includes a pair of brackets for two 75Ah batteries and the mounting hardware.

CABLE, CONNECTORS, AND LIGHTNING ARRESTORS

BDA-CABLE-10A-250: 250 ft. Cable, Red Jacket, Imprinted, 1/2" Corrugated Alum Plenum Air Dielectric, 50 Ohm Coaxial.

BDA-CABLE-10A-500: 500 ft. Cable, Red Jacket, Imprinted,1/2" Corrugated Alum Plenum Air Dielectric, 50 Ohm Coaxial.

BDA-CABLE-15A-250: 250 ft. Cable - Black Jacket,Imprinted,1/4" Corrugated Copper Foam Dielectric, 50 Ohm Coaxial.

BDA-CABLE-15A-500: 500 ft. Cable - Black Jacket,Imprinted,1/4" Corrugated Copper Foam Dielectric, 50 Ohm Coaxial.

BDA-NMC-10: N-Male Connector for 1/2" cable.

BDA-NFC-11: N-Female Connector for 1/2" cable.

BDA-NMC-20: N-Male Connector for 1/2" cable, RFS Omni-fit.

BDA-NFC-21: N-Female Connector for 1/2" cable, RFS Omni-fit.

BDA-NMC-30A: N-Male connector for 1/4" Cable, Commscope.

BDA-NFC-31A: N-Female connector for 1/4" Cable, Commscope.

BDA-NMC-40A: N-Male connector for 1/4" Cable.

BDA-NFC-41A: N-Female connector for 1/4" Cable.

BDA-EOL-10: Antenna Sensor / End of the line termination.

BDA-JMPRG-10: Coaxial Cable Jumper NM-NM RG58, 18" long.

BDA-JMPRG-11: Coaxial Cable Jumper NM-NM RG58, 37" long.

BDA-LA-P8AX-6G: Coaxial surge protector, UL listed.

BDA-JMPRG-12: Coaxial Cable Jumper NM-NM Flexible RG8, 24" long, For Donor Antenna.

BDA-ADP-RA-1: Right Angle N Male to N Female Adapter.

BDA-GKCK-10: Coaxial Cable Grounding Kit.

POWER DIVIDERS AND HYBRID COUPLERS

BDA-PD2-4588-1: 2-way power divider/combiner, 450-880MHz, 50W, Wilkinson type.

BDA-PD3-4588-1: 3-way power divider/combiner, 450-880MHz, 50W, Wilkinson type.

BDA-PD4-4588-1: 4-way power divider/combiner, 450-880MHz, 50W, Wilkinson type.

BDA-PD2-1552-1: 2-way power divider/combiner,150-520MHz, 50W, Wilkinson type.

BDA-PD3-1552-1: 3-way power divider/combiner,150-520MHz, 50W, Wilkinson type.

BDA-PD4-1552-1: 4-way power divider/combiner,150-520MHz, 50W, Wilkinson type.

BDA-DC6-3588-1: Directional Coupler 6dB, 350-880MHz

BDA-DC10-3588-1: Directional Coupler 10dB, 350-880MHz

BDA-DC15-3588-1: Directional Coupler 15dB, 350-880MHz

BDA-DC20-3588-1: Directional Coupler 20dB, 350-880MHz

BDA-DC6-1317-1: Directional Coupler 6dB, 136-174MHz

BDA-DC10-1317-1: Directional Coupler 10dB, 136-174MHz

BDA-DC15-1317-1: Directional Coupler 15dB, 136-174MHz

DAS ANTENNAS

BDA-FA-450470-1: DAS Antenna, Fiberglass 450-470MHz

BDA-FA-465490-1: DAS Antenna, Fiberglass 470-490MHz

BDA-FA-150175-1: DAS Antenna, Fiberglass 150-175MHz

BDA-FA-700-1: DAS Antenna, Fiberglass 763-805MHz

BDA-FA-800-1: DAS Antenna, Fiberglass 806-869MHz

BDA-FA-7800-1: DAS Antenna, Fiberglass 763-869MHz

BDA-FA-7800-2: DAS Antenna, Fiberglass 763-869MHz

BDA-LPA-4502700-1: DAS Antenna, Low Profile, Ultra Broadband 450-2700MHz

BDA-LPA-150175-1: DAS Antenna, Low Profile 150-175MHz

BDA-LPA-7800-1: DAS Antenna, Low Profile 763-869MHz

BDA-DP-7800-2: DAS Antenna, Directional Panel 763-869MHz

BDA-DP-400-2: DAS Antenna, Directional Panel UHF

DONOR ANTENNAS

BDA-DA-450470-1: Donor Antenna, Yagi Directional 450-470MHz

BDA-DA-465490-1: Donor Antenna, Yagi Directional 470-490MHz

BDA-DA-150175-1: Donor Antenna, Yagi Directional 150-175MHz

BDA-DA-800-1: Donor Antenna, Yagi Directional 806-869MHz

BDA-DA-700-1: Donor Antenna, Yagi Directional 763-805MHz

BDA-DA-7800-1: Donor Antenna, Yagi Directional 763-869MHz

BDA-DA-LP582700-1: Donor Antenna, Log-Periodic Directional Broadband 580-2700MHz, High FB Ratio

SERVICES

BDA-SVC-10: BDA System Design, Drawings, BOM (Unit Ea.)

BDA-SVC-11: AHJ Requirements Review, Project management (Unit Ea.)

BDA-TRAINING-1DAY: BDA Training, 1 DAY Unit

BDA-SVC-IBWAVE: BDA System - iBwave Services (Unit Ea.)

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ISO 9001 CERTIFIED
ENGINEERING & MANUFACTURING
QUALITY SYSTEMS

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