



TOWN OF BARRINGTON NH RADIO SYSTEM UPGRADE RESPONSE

All-Comm Technologies, Inc.

Paul Boudreau, President ALLCOMM

Delvis Javier, Technical Supervisor & Principle ALLCOMM

Steve Sullivan, Project Manager ALLCOMM

ALLCOMM
Technologies Inc.

ALLCOMM

Technologies Inc.

www.allcommtechnologies.com



Our mission

Our mission is to provide effective wireless communication solutions that meet or exceed the needs and expectations of our customers. We will continue to incorporate the latest innovative technologies into our offerings to ensure that our customers have access to anything and everything they need to continuously enhance and improve their systems. We will strive to provide services that surpass the market demands for cost, down time and unparalleled quality.



Since 1982, ALL-COMM Technologies, Inc. has offered services in the sale, service, rental and installation of wireless communications systems and vehicle warning equipment. ALL-COMM provides extensive services in communications such as custom system design and engineering, as well as maintenance and repair of products we offer.

We pride ourselves on our ability to offer customers the best solution for their needs. With almost forty years of experience, ALL-COMM is well-practiced in handling the wireless communications needs of any industry. We have the capacity and the ability to tailor our offerings to meet the needs of your project, no matter what line of work you're in. From government agencies and municipalities, to schools and hospitals, we can provide scalable coverage, a range of compatible products and equipment, and versatility in all of our services. And our team of highly-trained and dedicated employees are on call 24/7 to answer all your questions and provide you with the best possible customer experience.



SYSTEM DESIGN & ENGINEERING

When it comes to your communications, applications, one size does not fit all. The ALL-COMM Technologies, Inc. team evaluates your specific situation and tailors a system to fit your exact communications needs. We have a variety of equipment that is customizable from design to installation so that you can operate the way that you want. Installations Services ALL-COMM's experienced, trained staff offers professional installation and service of communications, alerting and warning equipment in many types of vehicles as well as fixed infrastructure and emergency operations centers. We are able to customize any installation so that it fits your unique needs. We seek to meet our customers' expectations on even the most advanced installation applications by including them in the process for a successful outcome.

SYSTEM MAINTENANCE

At ALL-COMM, we understand that your equipment not working is not an option. We not only offer the latest equipment, but also make sure that it is always in working order. We have a team of dedicated technicians that will repair any piece of equipment that we sell. In addition to one-time repairs, ALL-COMM also offers regular maintenance and 365/24/7 emergency service for mission critical communication systems.

SYSTEM UPGRADES

ALL-COMM Technologies, Inc. offers cost effective upgrades designed specifically to fit your needs. We provide upgrade solutions for all of our products. If you have existing equipment, we will utilize it in order to minimize cost to you and provide the best upgrades for your unique needs.

RADIO & DEVICE REPAIR

ALL-COMM Technologies, Inc. offers a variety of radio and wireless communication devices. We not only offer the latest versions, but also provide repair services for legacy equipment. Our team of dedicated, factory-certified technicians will service the equipment in a timely, professional manner.

INSTALLATION SERVICES

ALL-COMM's experienced, trained staff offers professional installation and service of communications, alerting and warning equipment in many types of vehicles as well as fixed infrastructure and emergency operations centers. We are able to customize any installation so that it fits your unique needs. We seek to meet our customers' expectations on even the most advanced installation applications by including them in the process for a successful outcome.

ONEVOICE NETWORK

OneVoice, LLC. is the Northeast's largest-spanning, digitally trunked radio network and leading provider of effective, mobile group-communications.

OneVoice's wide-area dispatch network and Connect Plus protocol is specifically designed for operations-critical users with mobile fleets. Its robust system design and centralized command allow for easy group dispatch and reliable coordination among your workforce.

TOWER NETWORKING DIVISION

ALL-COMM Tower Networking Division specializes in our digitally trunked MOTOTRBO Connect and Capacity Plus two-way radio systems. Our expansive coverage range spans over six states, providing users with crystal clear digital audio. We also offer a variety of radio accessories and applications, such as the Wave 3000.

FIRSTNET™

Available - Broadband LTE network supports voice, data, video, images and text and addresses concerns about network congestion with available priority and preemption.

Operable - Access to critical information in times of need and enhanced situational awareness with improved information sharing across agencies, disciplines and jurisdictions.



Innovative - Fosters an ecosystem of innovation, using advanced technologies, applications and devices.



FirstNet, First Responder Network Authority, and FirstNet logo are registered trademarks and service marks of the First Responder Network Authority, an independent authority within the U.S. Department of Commerce. All other marks are the property of their respective owners.



WE PARTNER WITH

 David Clark COMPANY INCORPORATED	
 FEDERAL SIGNAL CORPORATION	
 Hytera	
 L3HARRIS	
 Selex ES A Finmeccanica Company	
 tessco	
	

AND MANY OTHERS...

OUR PRODUCTS

We have a variety of highly-trained employees dedicated to the service of our customers. Our service technicians and installers have attended factory-training courses provided by Motorola, Harris, Tait, ZETRON, and Kenwood, as well as many others.

ALL-COMM Technologies is a factory authorized full line dealer for MOTOROLA, Motorola Authorized Radio System Specialist as well as Preferred Service Provider and authorized warranty station. We are also proud to be a factory-authorized dealer for L3Harris, Tait, Zetron, Telex/Bosch, Hytera, KENWOOD, Pyramid, TC Communications, JPS, Whelen, Federal Signal, Havis-Shields, and many others.

SATELLITE PHONES

At ALL-COMM Technologies, we seek to provide our customers the most innovative and effective products on the market. Globalstar, a leader in the global satellite communications field, also shares these same beliefs. They strive to create the most efficient products so that basic communications should never be a challenge. Whether it be a local fishery or charitable efforts in an impoverished country, Globalstar provides extensive services so that the world keeps running.

ALL-COMM partners with Globalstar on such events as the Boston Marathon, so that not only can the city of Boston enjoy a longstanding tradition, but be safe as well. If you would like to try one of these products, please contact us.

MOBILE COMMAND CENTER

ALL-COMM Technologies, Inc. maintains a sophisticated, state of the art Mobile Communications trailer available for rapid deployment to any location within our area. The Mobile Communications trailer is equipped with the latest in communications technology for operation on all land mobile bands as well as satellite phone, video and IP connectivity.

The mobile command center is available for communications based support during an outdoor event. Whether it is during the summer or winter, we make sure that all of our clients can comfortably and effectively operate in a scheduled or emergency deployment.



5 Whitmore Road, Revere, MA 02151 | (781) 289-3000 | info@allcomm1.com

www.allcommtechnologies.com



@allcommtech



Town of Barrington Radio System Upgrade

11-8-21

On behalf of All-Comm Technologies we would like to thank you for this opportunity to submit a proposal for replacing the Town's Radio System for the Fire department and DPW

Our proposal is for a Tait TB9400 100-watt repeater for the Fire Department and a Tait TB7300 50-watt repeater for the DPW. Combined with Kenwood NX1200 DMR/Analog radios.

Both repeaters are IP ready and capable of future expansion. The fire department repeater can be upgraded to digital P25 operation at anytime with a software license. The DPW repeater comes standard with DMR or analog operation.

For the fire repeater we have included a Tait TN9100 console gateway. This console gateway can be used today with the leased copper line to connect to UNH dispatch. In the future the same console gateway can also work across an IP network to connect to UNH dispatch.

This allows the TB9400 repeater to be backwards compatible with the analog JPS comparator at UNH dispatch. Its also future ready for when a time comes that the copper line is replaced with an IP circuit.

The TB9400 repeater also supports every available LMR protocol. Including simulcast operation. The current SSCFD system in use today consists of two repeaters connected to a JPS comparator. Both repeaters have the same input frequency but different output frequencies. This outdated design could be replaced by a Tait channel group by replacing the 2nd repeater with a TB9400 as well. Ip connectivity would be used to create the Tait channel group. This design would allow to retire the JPS comparator and remove the current single point of failure.

This design can also support simulcast, which would be much more efficient than the current multicast setup. There is possibility to leverage available IP connectivity in Durham.

At All-Comm Technologies we pride ourselves on exceeding customers' expectations. Therefore, we are flexible and can work within any customer's budget and requirements.

Rest assured that the Tait TB series of repeaters can meet the Town of Barrington's current requirements as well as meet and exceed all future requirements and expansions.

A handwritten signature in cursive script that reads 'delvis javier'.

Respectfully,

Delvis Javier

All-Comm Technologies, Inc.

Revere MA 781-588-1163

781-983-1699

Section 1

Contact Information

Customer Response Team list Contact Information

Title	Name	Contact Information
President/CEO	Paul Boudreau	Extension: x103 pboudreau@allcomm1.com
Director of Operations	Christian Laquidara	Extension: x105 claquidara@allcomm1.com
General Manager	Brendon Lynch	Extension: x113 blynch@allcomm1.com
Technical Supervisor	Delvis Javier	Extension: x114 djavier@allcomm1.com
Project Manager	Stephan Sullivan	Extension: x116 ssullivan@allcomm1.com
Administration/Office Manager	Susan Spadafora	Extension: x101 sspadafora@allcomm1.com
Customer Service Coordinator	Joan LeClair	Extension: x121 jleclair@allcomm1.com

Section 2

References

References

Lakes Region Mutual Fire Aid

Chief Coordinator Jon Goldman

(603) 528 9111

jgoldman@lrmfa.org

11 sites 4 channel of Tait P25 and ASIP System- 1 Mountain Top Microwave Link



Lakes Region Mutual Fire Aid

Plymouth Police Department

Alexander Hutchins

Chief of Police

(603) 536-1804 ext 104

ahutchins@plymouthpd-nh.org

4 sites of Tait P25 Simulcast, 1 Microwave Link



Plymouth Police Department

University of New Hampshire

Mary P Sylvia

Assistant Director of Public Safety Technology and Emergency Communications

University of New Hampshire Police Department

603-862-1392

2 Sites 2 channels of Tait P25 and ASIP System

Mary.Sylvia@unh.edu



University of New Hampshire

List of Similar Communication Solutions recently installed By All-Comm Technologies

Norfolk County Fire Mutual Aid	• 13 Sites of Tait P25 and ASIP System- 14 Microwave Links
South Shore Regional Communication Center	• 6 Sites 2 channels of Tait P25 and ASIP System- 7 Microwave Links
Weston Fire Department	• 9 Sites 2 channels of Tait P25 and ASIP System
Plymouth NH, Police Department	• 4 Mountain top sites of Tait P25, 1 Microwave Link
Lakes Region Mutual Fire Aid	• 11 Mountain top sites 4 channel of Tait P25 and ASIP System- 1 Microwave Link
Tewksbury Fire Department	• 5 Sites of Tait P25 and ASIP System
Brockton Fire Department	• 5 Sites of Tait P25 and ASIP System- 2 Microwave Links
Boxborough Public Safety	• 3 Sites of Tait P25 and ASIP System
Lawrence Police Department	• 3 Sites 2 channels of Tait P25 and ASIP System with AES Encryption- 2 Microwave Links
Malden Police Department	• 5 Sites of Tait P25 System- 5 Microwave Links
Hull Public Safety	• 3 Sites of Tait P25 and ASIP System- 1 Microwave Link
Tilton NH Police Department	• 3 Sites of Tait P25 System- 1 Microwave Link
Bedford Fire Department	• 5 Sites 2 Channels of Tait P25 System
Wilmington Public Safety	• 4 Sites 4 Channels of Tait P25 and ASIP System (Under Construction)
University of New Hampshire Police Department	• 2 Sites 2 channels of Tait P25 and ASIP System

Section 3

Town Requirements

Town Requirements

- Provide suitable dedicated 20A circuit for each repeater
- Provide access to sites
- Assign a point of contact for each department
- Provide connectivity to UNH dispatch
- Provide space for equipment cabinet at equipment shelter
- Provide suitable electrical circuit for DPW control station
- Provide suitable location to place DPW control station
- Provide central location for programming FD subscribers
- Coordinate new DPW frequency

Section 4

Equipment List

ALL-COMM

Technologies, Inc.

5 Whitmore Rd. Revere, MA 02151 P (781) 289-3000 F (781) 289-7300 www.allcomm1.com

Town of Barrington NH Radio System Equipment Replacement

ATTN: Conner McIver
Barrington Town Administrator
11/8/2021

Fire Department				
Qty	Nomenclature	Description	Unit Price	Total Price
Tait TB9400 100w VHF Repeater				
1	TB9435S-100T	TB9400 Single 100Watts Chassis Assembly	\$ 1,035.18	\$ 1,035.18
	T01-01103-DAAA			
1		TB9400 Reciter 148-174MHz	\$ 2,090.61	\$ 2,090.61
	T01-01121-BBBA			
1		TB94 Linear PA 136-174MHz 100Watts	\$ 1,651.59	\$ 1,651.59
1	TBA30A1-1100	TB9000 Power Management Unit ACDC12volts with Aux12volts	\$ 2,025.81	\$ 2,025.81
1	219-01561-00	Cable cord 2m USA/CAD IEC black	\$ 10.53	\$ 10.53
1	472684	Sinclair 144-165 MHz Pass Reject Duplexer	\$ 1,876.50	\$ 1,876.50
1	550379	Sinclair 155-174 MHz Preselector	\$ 390.00	\$ 390.00
1	86020	132-174 MHz Intermod Panel	\$ 1,300.50	\$ 1,300.50
1	217727	3' RG-142U Jumper w/ N Male to BNC Male connectors	\$ 57.80	\$ 57.80
1	448902	3' RG142P Jumper BNCM - BNCM	\$ 58.43	\$ 58.43
1	324975	3' DAS jumper using RG-142 plenum cable N M;N M	\$ 37.24	\$ 37.24
1	TBA50H2-PAC1	TN9100 P25 Console Gateway Reciter	\$ 4,479.30	\$ 4,479.30
1	533434	Battery Charger, 15A-UL Listed	\$ 168.84	\$ 168.84
1	590758	12 VDC 100 Ah Front Terminal SLA Battery	\$ 540.00	\$ 540.00
1	CAB24	INDOOR CABINET 24 Rack Units	\$ 870.80	\$ 870.80
1	CABGND	Cabinet Grounding	\$ 500.00	\$ 500.00
VOIP Voting License				
1	TBAS061	Central Voter	\$ 3,909.06	\$ 3,909.06
Installation-Cost			\$ 4,340.00	
Equipment Sub-Total				\$ 21,002.19
DPW				
Qty	Nomenclature	Description	Unit Price	Total Price
Tait TB7300 50w VHF Repeater				
1	TB7310-B1B0-0000-A400-10	DMR Analog 50Watts 136-174MHz AC	\$ 3,188.16	\$ 3,188.16
1	TBAS304	DMR Conventional Tier II with TDMA	\$ 188.73	\$ 188.73
1	535986	Sinclair 148-160 MHz Notch Reject Mobile Duplexer	\$ 612.00	\$ 612.00
1	550379	Sinclair 155-174 MHz Preselector	\$ 390.00	\$ 390.00
1	86020	132-174 MHz Intermod Panel	\$ 1,300.50	\$ 1,300.50
1	217727	3' RG-142U Jumper w/ N Male to BNC Male connectors	\$ 57.80	\$ 57.80
1	448902	3' RG142P Jumper BNCM - BNCM	\$ 58.43	\$ 58.43
1	324975	3' DAS jumper using RG-142 plenum cable N M;N M	\$ 37.24	\$ 37.24
1	353073	4' DAS jumper using RG-142 plenum cable N M;N M	\$ 40.30	\$ 40.30
1	STHDWR	Equipment Grounding	\$ 150.00	\$ 150.00
Installation-Cost			\$ 1,350.00	
Equipment Sub-Total				\$ 6,023.16

Qty	Nomenclature	Description	Unit Price	Total Price
Fire Department Antenna System-Ramsdell Road Tower				
1	COL54-160	OMNI, MEANDER COLLINEAR, 6DBD, 150-160MHZ, PIM RATED	\$ 1,920.51	\$ 1,920.51
200	300401	RFS 7/8" Foam CELLFLEX Cable	\$ 3.19	\$ 638.00
2	328730	OMNI FIT Premium 7/16 DIN Female LCF78-50	\$ 30.34	\$ 60.68
1	350367	VHF Combiner Arrestor,D/M - D/F	\$ 143.15	\$ 143.15
50	430174	FSJ4-50B 1/2" 50 OHM	\$ 4.10	\$ 205.00
1	452194	7-16 DIN FEMALE FOR 1/2 IN FSJ4-50B CABLE	\$ 24.84	\$ 24.84
1	364165	1/2" Superflex - NMale Right Angle	\$ 45.95	\$ 45.95
1	HDWR	Tower Hardware	\$ 950.00	\$ 950.00
Installation-Cost			\$ 2,850.00	
Equipment Sub-Total				\$ 3,988.13

Qty	Nomenclature	Description	Unit Price	Total Price
DPW Antenna System-Ramsdell Road Tower				
1	COL54-160	OMNI, MEANDER COLLINEAR, 6DBD, 150-160MHZ, PIM RATED	\$ 1,920.51	\$ 1,920.51
200	300401	RFS 7/8" Foam CELLFLEX Cable	\$ 3.19	\$ 638.00
2	328730	OMNI FIT Premium 7/16 DIN Female LCF78-50	\$ 30.34	\$ 60.68
1	350367	VHF Combiner Arrestor,D/M - D/F	\$ 143.15	\$ 143.15
50	430174	FSJ4-50B 1/2" 50 OHM	\$ 4.10	\$ 205.00
1	452194	7-16 DIN FEMALE FOR 1/2 IN FSJ4-50B CABLE	\$ 24.84	\$ 24.84
1	364165	1/2" Superflex - NMale Right Angle	\$ 45.95	\$ 45.95
1	HDWR	Tower Hardware	\$ 950.00	\$ 950.00
Installation-Cost			\$ 2,850.00	
Equipment Sub-Total				\$ 3,988.13

Qty	Nomenclature	Description	Unit Price	Total Price
1	SST-ANL	Tower Structural Analysis Structural Analysis Per Tower	\$ 4,000.00	

Qty	Nomenclature	Description	Unit Price	Total Price
DPW Control Station with Outdoor Antenna and External Speaker				
1	NX-3720HGK	Kenwood VHF (136-174MHz), 50 Watts, 512 CH, 128 Zones	\$ 510.65	\$ 510.65
1	KMB-34	Control Station Mounting Case for KPS-15 Power Supply and Mobiles	\$ 40.39	\$ 40.39
1	KPS-15	DC Switching Power Supply (117/230 VAC; 23A max. continuous, 25A peak)	\$ 129.50	\$ 129.50
Control Station Desktop Microphone (8-pin mod. plug) Note: Compatible with FDMA (analog / NXDN) and TDMA (DMR) Operation				
1	KMC-59C		\$ 142.80	\$ 142.80
1	KCT-60M	DB15-to-15pin Molex Adapter Cable	\$ 21.56	\$ 21.56
1	KES-5A	External speaker, 40W max input	\$ 44.94	\$ 44.94
150	59520	3/8 in LMR400 Coaxial Cable	\$ 1.13	\$ 169.50
1	552447	Bulkhead and flange mount Arrestor, N/F	\$ 58.50	\$ 58.50
3	338985	N Male Hex/Knurled Combo No Braid Trim LMR400	\$ 13.30	\$ 39.90
1	419089	UHF Male LMR-400	\$ 18.73	\$ 18.73
1	310778	Ground Kit for LMR-400	\$ 26.46	\$ 26.46
1	288079	148-174 MHz Omni Fiberglass Antenna, 5.1 dBi, N-F	\$ 722.16	\$ 722.16
1	HDWR	Installation Hardware	\$ 500.00	\$ 500.00
1	GND	Grounding	\$ 500.00	\$ 500.00
Installation-Cost			\$ 2,850.00	
Equipment Sub-Total				\$ 2,925.09

Qty	Nomenclature	Description	Unit Price	Total Price
Subscriber Reprogramming				
10	SVC2021	Reprogram Police Department radios for DPW Channel- Mobiles	\$ 54.25	\$ 542.50
20	SVC2021	Reprogram Police Department radios for DPW Channel- Portables	\$ 54.25	\$ 1,085.00
Sub-Total				\$ 1,627.50

Qty	Nomenclature	Description	Unit Price	Total Price
DPW Subscribers- Mobiles				
13	NX-3720HGK	Kenwood VHF (136-174MHz), 50 Watts, 512 CH, 128 Zones	\$ 510.65	\$ 6,638.45
13	KCT-18	Ignition sense cable (requires KCT-60M Acc. Cable Option)	\$ 14.70	\$ 191.10
13	KCT-60M	DB15-to-15pin Molex Adapter Cable	\$ 21.56	\$ 280.28
13	KMC-65M	MIL-SPEC Standard electret mobile microphone (8-pin mod. plug)	\$ 39.06	\$ 507.78
13	KES-5A	External speaker, 40W max input	\$ 44.94	\$ 584.22
13	INST-1	Mobile Install Kit	\$ 160.00	\$ 2,080.00
13	SVC2021	Programming	\$ 54.25	\$ 705.25

Installation-Cost \$ 3,526.25

Equipment Sub-Total **\$ 10,987.08**

Qty	Nomenclature	Description	Unit Price	Total Price
DPW Subscribers- Portables				
4	NX-1200DVK3	VHF (136-174MHz), 5W, 260 CH, Full Keypad Model, DMR/Analog	\$ 342.09	\$ 1,368.36
4	KMC-21A	Compact speaker microphone	\$ 38.50	\$ 154.00
4	KBH-8DS	Leather swivel belt loop with portable D-Ring attachment	\$ 19.74	\$ 78.96
4	SVC2021	Programming	\$ 54.25	\$ 217.00

Equipment Sub-Total **\$ 1,818.32**

Installation-Total **\$ 23,393.75**

Equipment-Total **\$ 50,732.10**

Project-Total **\$ 74,125.85**

Manufacturers warranty applies.
Pricing is valid for 90 days from above date

Options

Qty	Nomenclature	Description	Unit Price	Total Price
11Ghz Licensed Microwave Link- 4-4096QAM				
1	AP2-11-H-LNK	ALFO Plus2 11 GHz, 300 Mbps full-duplex capacity, Dual Carrier,software upgradeable to 1500 Mbps-3' Dishes with Stabilizer Arms.		\$ 34,093.00
Sub-Total				\$ 34,093.00

Section 5

Equipment Data Sheets

NX-1200DV/1300DU K3/K6

MULTI-PROTOCOL DIGITAL & ANALOG PORTABLE RADIOS

A SINGULAR SOLUTION

If you are thinking of harnessing the latest digital protocols – NXDN or DMR – to enhance business efficiency or FM analog for its simplicity, the NEXEDGE NX-1200DV/1300DU radios have you covered. Our singular solution offers the widest selection of two-way radios for everyday use. The model offers full keypad, a high-contrast backlit LCD, and IEC 60529 - IP67 waterproof. Other features include a 7-color LED indicator and the popular KENWOOD 2-pin audio accessory connector. Plus, mixed-mode operation ensures seamless integration with legacy radios while smoothing the onward migration path to digital. But whatever your specific needs, audio quality is what determines clear voice communications – which is why KENWOOD radios are used under the most grueling conditions, like the cockpit of a racing car. Thanks to our extensive experience with professional systems, reliability is second to none. So whatever your radio requirements, KENWOOD's NEXEDGE NX-1200DV/1300DU radios offer a single platform that's right for you.

Features

Multi-protocol digital radio: Designed to operate under NXDN or DMR digital and FM analog protocols

Direct and intuitive LCD with a full keypad enclosure

Easy visible Display: 8-digit LCD models featuring high-contrast, white backlit LCD

Large 7-Color LED indicator on the top panel

- Selective Power-on LED

- Selective Call Alert LED

- Battery Level Indication

- Multi-status function indication

RF output power 5W both on VHF/UHF

Mixed Zone - analog and digital

Renowned KENWOOD Audio Quality: TX/RX audio profile with optimizable digital processor

- Audio Equalizer: Flat, High, Low

- Auto Gain Control: On, High, Low, Off

- Noise Suppressor

- Microphone type settings

Multiple Scan Functions; Dual Priority, Single Priority, Single Zone, Multi, Normal Scan

VOX & PTT –triggered Semi- VOX, Voice-operated TX

Emergency Function: Customizable Emergency Profile

Lone Worker

Max / Min Volume setting & Volume control

Voice Announcement

Remote Stun / Kill / Check

Front Panel Programming Mode

Electronic Serial Number (ESN)

MIL-STD-810 C/D/E/F/G

IEC 60529 - IP54/55/67*

*Radio must be installed with KNB-84LA

NXDN® **DMR** **DMR Auto Slot Select** **FleetSync**



Full Keypad Model

Digital – DMR Mode

TDMA 2-slot 12.5 kHz bandwidth equivalent to 6.25 kHz very narrow bandwidth

DMR Tier II Conventional Operation

Site Roaming

DMR Auto Slot Select

Dual Slot Direct Mode

Digital / Analog Mixed mode

Call Interruption

Group / Individual Call

Status / Short data, Paging Call

Remote Stun / Kill, Monitor, Check & Control

Enhanced Encryption (ARC4)

Digital Bit Scrambler

Late Entry

Over-the-Air Alias (OAA)

Analog – FM

FM Conventional Operation

FleetSync: PTT ID, Stun/Revive, Talk back, Selcall

MDC1200: PTT ID, Radio Inhibit/Uninhibit, Radio check, Emergency

QT / DQT, DTMF, 2-tone

Built-in Programmable Voice Inversion Scrambler (per channel)

Built-in Compander (per channel)

Digital – NXDN® Mode (Optional)

FDMA – Very narrow 6.25 kHz & narrow 12.5 kHz bandwidths

NXDN Conventional Operation

Site Roaming

NXDN Type-D Trunking Option

Digital / Analog Mixed mode

Group / Individual Call

Status / Short data, Paging Call

Remote Stun / Kill, Monitor, Check & Control

Digital Bit Scrambler

Late Entry

Over-the-Air Alias (OAA)

Accessories

All accessories may not be available in all markets.
Contact an authorized Kenwood dealer for details and complete list of all accessories.

KNB-45L
2,000mAh/7.4V
Li-Ion Battery Pack



KSC-35SK
Fast Charger
For the KNB-45L/69L
84LA (3-Hour)



KRA-22/23
VHF/UHF Low Profile
Helical Antenna



KMC-45D
Speaker Microphone



KHS-31C
C-Ring PTT Ear
Hanger Headset



KNB-69L
2,550mAh/7.4V
Li-Ion Battery Pack



KSC-43K
Dual Chemistry
Fast Charger
For the KNB 29N/45L/69L/84LA



KRA-26/ 27
VHF Helical Antenna
UHF Whip Antenna



KHS-26
Earbud In-line
PTT Headset



KBH-10
Belt Clip



KNB-84LA
1,900mAh/7.4V
Li-Ion Battery Pack



KVC-22
DC Vehicular
Charger Adapter



KRA-41/42
VHF/UHF
Stubby Antenna



KHS-27A
D-Ring In-line
PTT Headset



Specifications

General	NX-1200DV	NX-1300DU
Pre-set Frequencies		
Type 1	136-174 MHz	450-520 MHz
Type 2		400-470 MHz
Max. Channels per Radio	260	
Number of Zones	128	
Max. Channels per Zone	250	
Channel Spacing		
Analog	30" / 25" / 15 / 12.5 kHz	
Digital	12.5 / 6.25 kHz	
Power Supply	7.5 VDC ±20 %	
Battery Life		
KNB-45L/84LA (2000/1900mAh)	DMR Approx. 14.5 hours	Analog/NXDN Approx. 11 hours
KNB-69L (2550mAh)	Approx. 19 hours	Approx. 14 hours
Operating Temperature(Radio only)*2	-22°F to +140°F (-30°C to +60°C)	
Frequency Stability (-30 to +60°C; +25°C Ref.)	±0.5 ppm	
Antenna Impedance	50 Ω	
Dimensions	(W x H x D) Projections Not Included	
Radio with KNB-45L/84LA	213 x 484 x 132 in (54 x 123 x 33.5 mm)	
Radio with KNB-69L	213 x 484 x 148 in (54 x 123 x 37.5 mm)	
Weight		
Radio Only	6.35 oz (180 g)	
Radio with KNB-45L/84LA	10.58 oz (300 g)	
Radio with KNB-69L	11.11 oz (315 g)	
FCC ID		
Type 1	K44501001	K44501103
Type 2		K44501102
IC Certification	282F-501001	282F-501102

*1 25 / 30 kHz in VHF/UHF Bands excluding T-Band are not included in the models sold in the USA or US territories.
*2 Operating temperature specification for a Li-Ion battery is -10°C to +60°C [14°F to +140°F].

Analog measurements made per TIA603. Specifications are measured according to applicable standards.
Specifications shown are typical and subject to change without notice, due to advancements in technology.

Receiver	NX-1200DV	NX-1300DU
Sensitivity		
NXDN* @ 6.25 kHz Digital (3% BER)	0.18 µV	
NXDN* @ 12.5 kHz Digital (3% BER)	0.22 µV	
DMR @ 12.5 kHz Digital (1% BER)	0.25 µV	
DMR @ 12.5 kHz Digital (5% BER)	0.18 µV	
Analog @ 12.5/25 kHz (12 dB SINAD)	0.20 µV / 0.24 µV	
Selectivity		
Analog @ 12.5 / 25 kHz	68 dB / 74 dB	
Intermodulation Distortion	70 dB	
Spurious Rejection	70 dB	
Audio Distortion	7%	
Audio Output Power	1 W / 12 Ω (Internal Output)	
Transmitter	NX-1200DV	NX-1300DU
RF Power Output (High / Low)	5 W / 4 W / 1 W	
Spurious Emission	-70 dB	
FM Hum & Noise		
Analog @ 12.5 / 25 kHz	40 dB / 45 dB	
Audio Distortion	2%	
DMR Digital Protocol	ETSI TS 102 361-1, -2, -3	
Emission Designator	16K0F3E, 11K0F3E, 8K30F1E, 8K30F1D, 8K30F7W, 4K00F1E, 4K00F1D, 4K00F7W, 4K00F2D, 7K60FXD, 7K60FXE	

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MIL-STD & IP

MIL Standard	MIL 810C Methods/Procedures	MIL 810D Methods/Procedures	MIL 810E Methods/Procedures	MIL 810F Methods/Procedures	MIL 810G Methods/Procedures
Low Pressure	5001/Procedure I	500.2/Procedure I, II	500.3/Procedure I, II	500.4/Procedure I, II	500.5/Procedure I, II
High Temperature	5011/Procedure I, II	501.2/Procedure I, II	501.3/Procedure I, II	501.4/Procedure I, II	501.5/Procedure I, II
Low Temperature	5021/Procedure I	502.2/Procedure I, II	502.3/Procedure I, II	502.4/Procedure I, II	502.5/Procedure I, II
Temperature Shock	5031/Procedure I	503.2/Procedure I	503.3/Procedure I	503.4/Procedure I, II	503.5/Procedure I
Solar Radiation	5051/Procedure I	505.2/Procedure I	505.3/Procedure I	505.4/Procedure I	505.5/Procedure I
Rain*	5061/Procedure I, II	506.2/Procedure I, II	506.3/Procedure I, II	506.4/Procedure I, III	506.5/Procedure I, III
Humidity	5071/Procedure I, II	507.2/Procedure II, III	507.3/Procedure II, III	507.4	507.5/Procedure II
Salt Fog	5091/Procedure I	509.2/Procedure I	509.3/Procedure I	509.4	509.5
Dust	5101/Procedure I	510.2/Procedure I	510.3/Procedure I	510.4/Procedure I, III	510.5/Procedure I
Vibration	514.2/Procedure VIII, X	514.3/Procedure I	514.4/Procedure I	514.5/Procedure I	514.6/Procedure I
Shock	516.2/Procedure I, II, V	516.3/Procedure I, IV	516.4/Procedure I, IV	516.5/Procedure I, IV	516.6/Procedure I, IV
International Protection Standard					

Dust & Water Protection*

IEC 60529 - IP54/55/67**

*To meet MIL Standard and IEC 60529 spec, the 2-pin connector has to be fully sealed with supplied connector cover

** IEC 60529 IP67 is only applicable when radio is equipped with KNB-84LA.

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ISO9001 Registered
Communications Systems Business Unit
JVCケンWOOD Corporation

ADS#24721 Print in USA.

NX-3720HG/3820HG NX-3920G/3921G

NXDN® **DMR**



GPS **FleetSync®**



MULTI-PROTOCOL DIGITAL & ANALOG MOBILE RADIOS

This adaptable mobile radio supports both NXDN® and DMR digital protocols as well as mixed digital/FM analog operation, enabling it to serve with distinction in a wide range of enterprise and operation-critical applications. Designed with flexibility in mind, it's packed with convenient features like Bluetooth® for hands-free operation and built-in GPS. This model offers greater freedom of installation, the radio's front panel can be used as a remote control head (this requires an optional upgrade, to be available in the future). Additionally, for expansion capability a software license certification system facilitates extensive customization.



Features

Multi-protocol digital radio: Designed to operate under NXDN® or DMR digital, and FM analog protocols

NXDN Conventional and Type-C & Gen2 Trunking

DMR Tier 2 Conventional & Site Roaming

DMR Auto Slot Select

DMR Tier 3 Trunking

Mixed Digital & FM Analog Operation allows gradual migration at your own pace

4-Line Basic Frame (2-Line Main/Sub-LCD, icon & key guide) / 14 Characters

4-Line Text Message Frame (2 Lines of Text, icon & key guide)

7-color LED Bar Indicator

Remote Control Head (Option)

Optional DES and AES Encryption

External and Internal Speaker Switching

Built-in Bluetooth® for hands-free operation for IoT applications - Applicable Bluetooth profiles: HSP (Headset Profile) and SPP (Serial Port Profile)

Renowned KENWOOD Audio Quality achieved with Active Noise Reduction (ANR) that utilizes built-in DSP

Built-In GPS Receiver for effective fleet and incident management

IP54 and MIL-STD-810 C/D/E/F/G

4 Watts Audio Output Power

512 CH/128 Zones

1000 Channel option

Paging Call

Emergency Call

Status/Text Message

Remote Stun/Kill/Check

Digital – NXDN® Mode

NXDN Conventional	Remote Monitor
NXDN Type-C & Gen2 Trunking	All Group Call
6.25 & 12.5 kHz Channels	Over-the-Air Alias (OAA)
Advanced GPS	Over-the-Air Programming (OTAP)

Digital – DMR Mode

Two-slot TDMA in 12.5kHz channels	Call Interruption
DMR Tier 2 Conventional / Site Roaming	Dual-slot Direct Mode
DMR Auto Slot Select	Optional ARC4 Encryption
S-Trunking (Ver. UP) DMR Tier 3 Trunking	

Analog – FM Mode

Conventional & LTR Trunking	MDC-1200: PTT ID ANI / Caller ID
FleetSync/II: PTT ID ANI / Caller ID Display,	Display, Emergency, Radio Check /Inhibit
Selective Group Call, Emergency Status	QT / DQT, DTMF, 2-Tone
Text Messages	Built-in Voice Inversion Scrambler



Multi-Protocol

Unsurpassed interoperability for Enterprise radio users with the freedom to migrate at your own pace.



Gen2

Scalable server-based system architecture for management of NEXEDGE wide area digital communications systems.



Klarity

The ultimate level of sound clarity technology combining Optimization, advanced Sound Analysis and Active Noise Reduction.

Accessories

All accessories may not be available in all markets.
Contact an authorized Kenwood dealer for details and complete list of all accessories.

KMC-9C/59C
Desktop Microphone



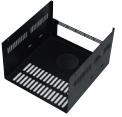
KCT-23
DC Power Cable
M: 10ft (3m) / M3: 23ft (7m)



KLF-2
Line Filter



KMB-34
Mounting Case
for KPS-15



KMC-65M
Microphone



KCT-60
Connection Cable
(D-sub 15 to Molex
15 Pin Connector)



KMB-10
Key Lock Adapter



KPG-180AP
OTAP Manager



KMC-66M
Keypad Microphone



KCT-71
Remote Control Cablr
(M2: 17ft M3: 25ft M4: 16ft)



KRA-40G
GPS Active Antenna



KRK-18HM
Interface Kit for a
Control Head



KCT-18
Ignition Sense Cable
(Requires KCT-60)



KCT-72
External Accessory
Connection Cable
for KRK-18HM



KPS-15
DC Power Supply
(23A max)



KRK-19BM
Interface Kit for
an RF Deck



Specifications

General	NX-3720HG	NX-3820HG	NX-3920G	NX-3921G
Frequency Range	136-174 MHz	Type 1 450-520 MHz Type 2 400-470 MHz	TX/RX: 851-870 MHz TX: 806-825 MHz	TX/RX: 935-941 MHz TX: 896-902 MHz
Max. Channels Per Radio	Up to 1000 CH with option			
Number of Channels	512			
Number of Zones	128			
Channel Spacing				
Analog	12.5/15/25*/30* kHz	12.5/25* kHz	12.5/25 kHz	12.5 kHz
Digital	6.25 kHz/12.5 kHz	6.25 kHz/12.5 kHz	6.25 kHz/12.5 kHz	6.25 kHz/12.5 kHz
Power Supply	13.6 V DC ±15%			
Current Drain				
Standby			0.45 A	
RX			2.3 A	
TX			12 A	
Operating Temperature	-22°F to +140°F (-30°C to +60°C)			
Frequency Stability	± 0.5 ppm			
Dimensions	(W x H x D) Projections Not Included			
Radio with Control Head	6.30 x 1.69 x 6.30 in (160 x 43 x 160 mm)			
Weight Radio				
Radio with Control Head	2.65 lbs (1.2 kg)			
FCC ID				
Type 1	K44479200	K44479300	K44502600	K44502601
Type 2		K44479301		
IC Certification				
Type 1	282F-479200			282F-502601
Type 2		282F-479301	282F-502600	

*25/30 kHz in VHF/UHF Bands (except T-Band) are not included in the models sold in the USA or US territories.
** NX-3920G only
Analog measurements made per TIA603. Specifications are measured according to applicable standards.
Specifications shown are typical and subject to change without notice, due to advancements in technology.

Receiver	NX-3720HG	NX-3820HG	NX-3920G	NX-3921G
Sensitivity				
NXDN® 6.25 kHz Digital (3% BER)		0.20 µV		
NXDN® 12.5 kHz Digital (3% BER)		0.25 µV		
DMR 12.5 KHz Digital (5% BER)		0.30 µV		
DMR 12.5 KHz Digital (1% BER)		0.45 µV		
Analog (12dB SINAD)		0.25 µV		
Selectivity				
Analog @ 12.5kHz		70 dB		60 dB
Analog @ 25kHz		80 dB		70 dB
Intermodulation			70 dB	
Spurious Rejection			80 dB	
Audio Distortion			2%	
Audio Output Power			4 W/4 Ω	

Transmitter	NX-3720HG	NX-3820HG	NX-3920G	NX-3921G
RF Power Output (High / Mid / Low)	50 W / 30 W / 5 W	45 W / 30 W / 5 W		15 W / 5 W
Spurious Emission	73 dB	75 dB		-70 dB
FM Hum & Noise				
Analog @ 12.5kHz			40 dB	
Analog @ 25kHz			45 dB	
Audio Distortion			2%	
Digital Protocol			ETSI TS 102 361-1, -2, -3, -4	
Emission Designator			16K0F3E*, 14K0F3E**, 11K0F3E, 8K30F1E, 8K30F1D, 8K30F7W, 7K60FXD, 7K60FXE, 4K00F1E, 4K00F1D, 4K00F7W, 4K00F2D	

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MIL-STD & IP

MIL Standard	MIL 810C Methods/Procedures	MIL 810D Methods/Procedures	MIL 810E Methods/Procedures	MIL 810F Methods/Procedures	MIL 810G Methods/Procedures
Low Pressure	5001/Procedure I	5002/Procedure I, II	5003/Procedure I, II	5004/Procedure I, II	5005/Procedure I, II
High Temperature	5011/Procedure I, II	5012/Procedure I, II	5013/Procedure I, II	5014/Procedure I, II	5015/Procedure I, II
Low Temperature	5021/Procedure I	5022/Procedure I, II	5023/Procedure I, II	5024/Procedure I, II	5025/Procedure I, II
Temperature Shock	5031/Procedure I	5032/Procedure I	5033/Procedure I	5034/Procedure I, II	5035/Procedure I
Solar Radiation	5051/Procedure I	5052/Procedure I	5053/Procedure I	5054/Procedure I	5055/Procedure I
Rain	5061/Procedure I, II	5062/Procedure I, II	5063/Procedure I, II	5064/Procedure I, III	5065/Procedure I, III
Humidity	5071/Procedure I, II	5072/Procedure II, III	5073/Procedure II, III	5074	5075/Procedure II
Salt Fog	5091/Procedure I	5092/Procedure I	5093/Procedure I	5094	5095
Dust	5101/Procedure I	5102/Procedure I	5103/Procedure I	5104/Procedure I, III	5105/Procedure I
Vibration	5142/Procedure VIII, X	5143/Procedure I	5144/Procedure I	5145/Procedure I	5146/Procedure I
Shock	5162/Procedure I, II, V	5163/Procedure I, IV, V	5164/Procedure I, IV, V	5165/Procedure I, IV, V	5166/Procedure I, IV, V

International Protection Standard

Dust & Water Protection*

IP54, IP55**

* Applicable microphone must be connected to the radio, and all accessory connectors must be covered. ** IP54: RF Deck; IP55: Remote Control Head.

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KENWOOD Communications
Global Website



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JVC KENWOOD Corporation

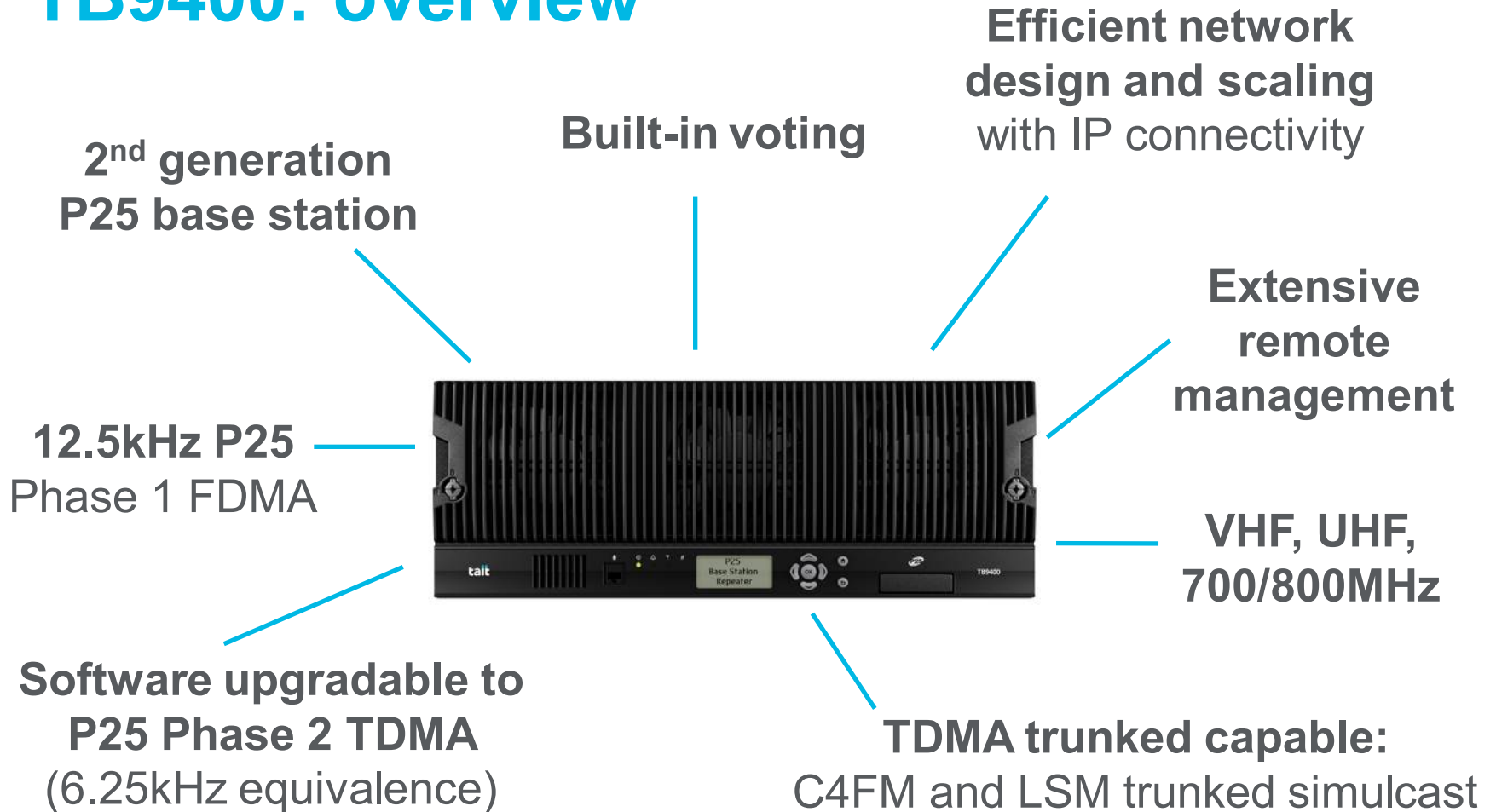
ADS#18119 Print in U.S.A.

Tait P25 Solution Element – TB9400

TAIT P25 BASE STATION



TB9400: overview





TB9400: detailed capabilities

Robust design

- MIL-STD designed and tested for reliability
- Efficient heat sinks and 3-fan front-to-rear cooling
- Continuous rating at full output power
- On-going communications during an outage with failsoft

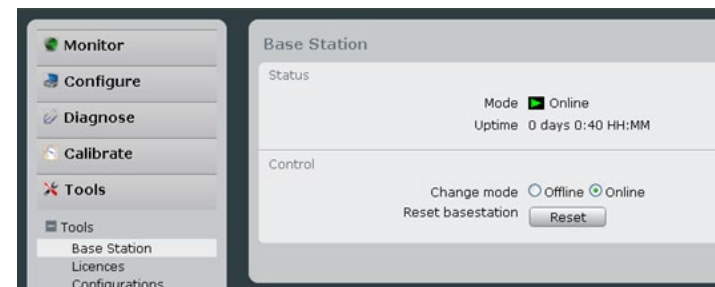
Interfaces and input/outputs

- Ethernet
- Digital I/O: Input - E.g. door and external system failure alarms; *Future: Digital output and analog input*

Key differences to 9100? TDMA & FDMA Hardware, LSM, No analog, No conventional.

TB9400: extensive management

- **Supports two base station software versions for swift roll-back**
- **Software configurable:** <1,000 preconfigured channel profiles
- **SNMP (v1, v2, v3) built-in**
- **Remote:** access, diagnosis and software download, monitoring and alarm logging via IP
- **TB9400s:** Centralised Authentication by RADIUS/LLDP
- **Detailed alarm reporting:** monitors over 50 key base station parameters
- **Inbuilt diagnostics:** remotely confirm optimal operation



Web server built into the TB9400

TB9400: simulcast

- **Fully integrated base station for efficient deployment**
 - Comprehensive device management
 - Integrated comparator for voting
 - Integrated Linear Simulcast Modulation (LSM)
 - Allows better performance in the crossover zones of a simulcast system. This performance improvement allows the sites to have a greater separation, which in turn means fewer sites, which means less cost.
 - Same 4U packaging and modular design as TB9100



TB7300 AND TB9400 INTRODUCTION

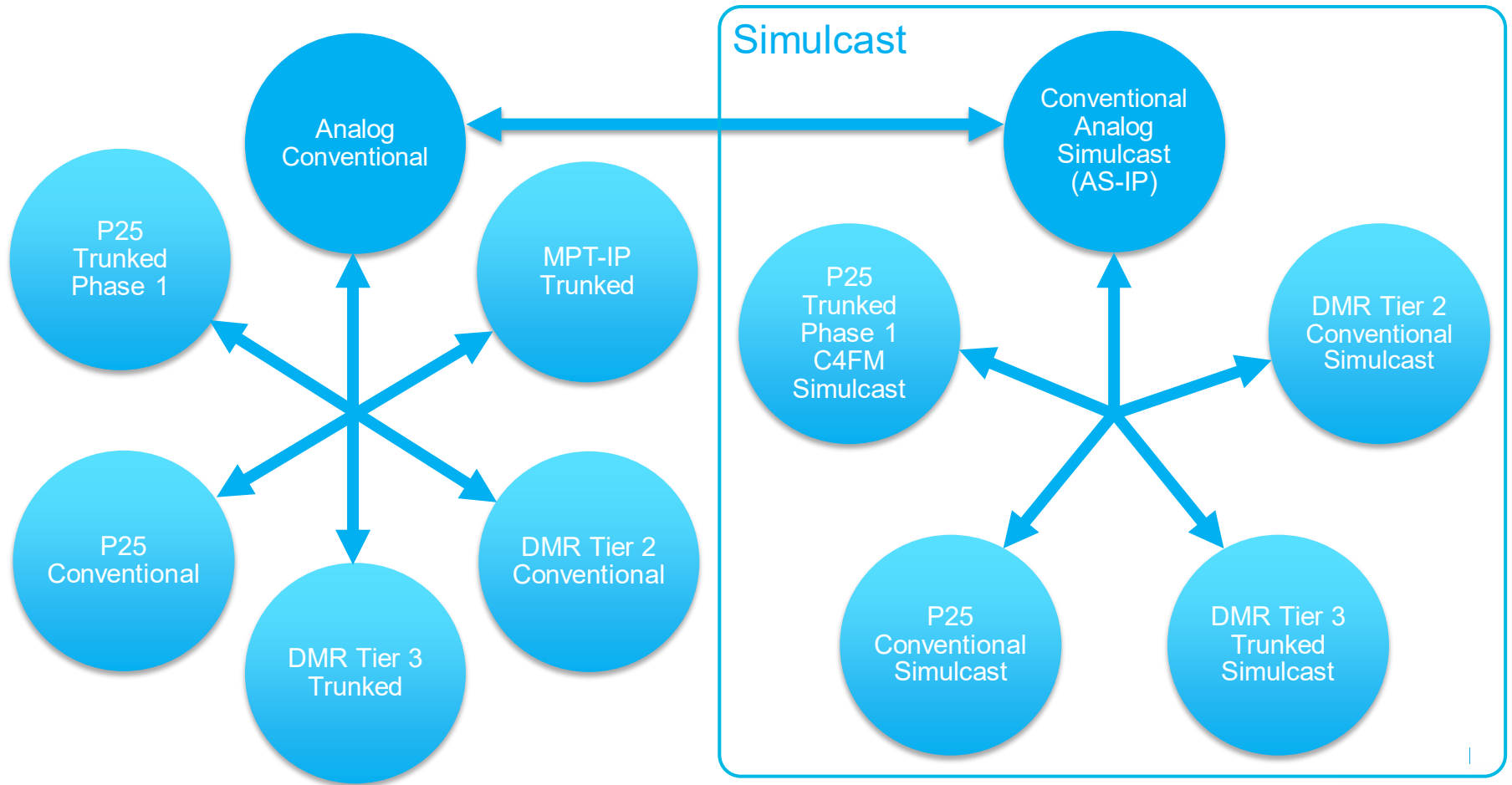
TB7300 and TB9400 Multimode Analog / DMR / P25



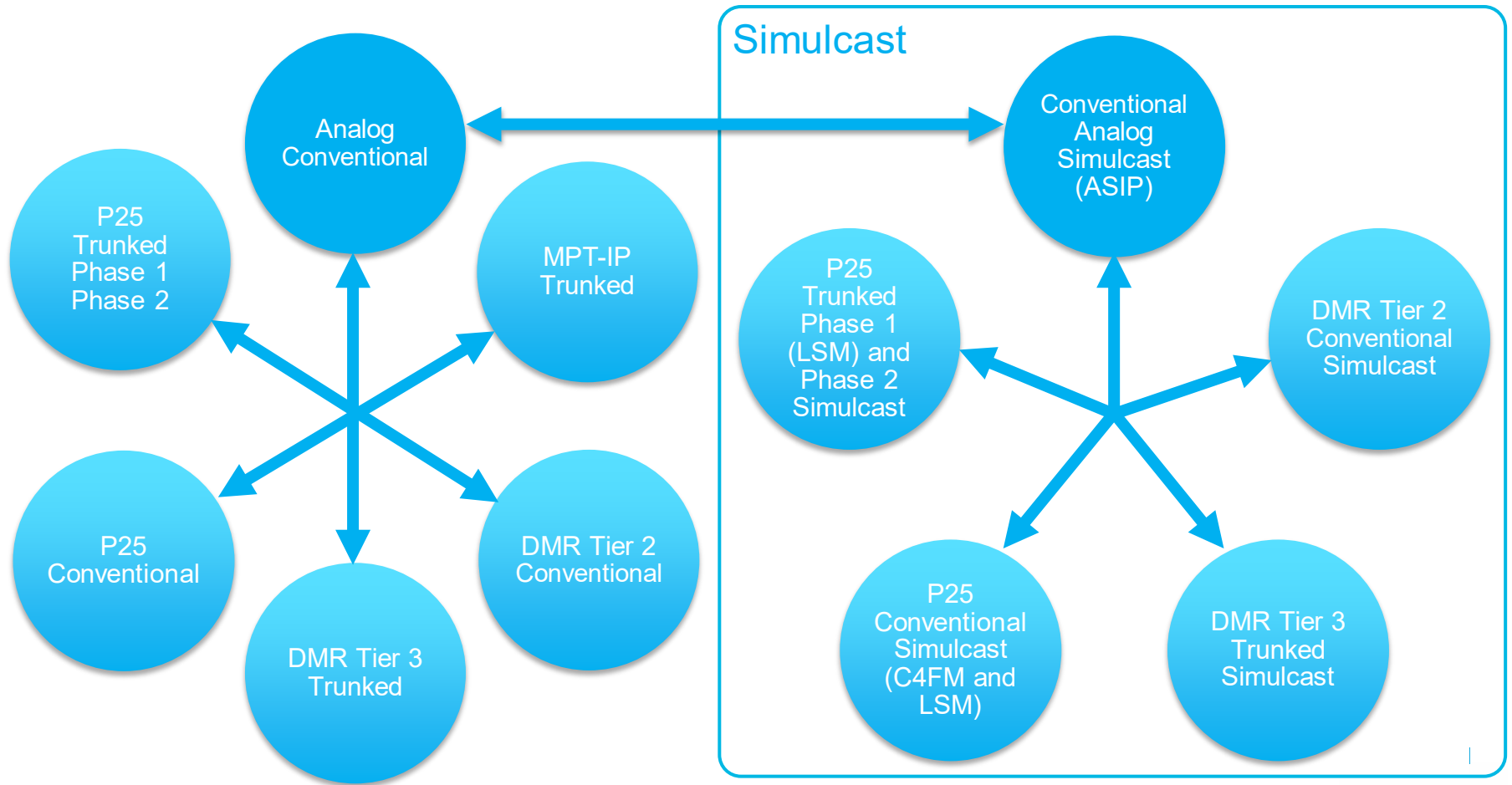
HIGHLY FLEXIBLE TAIT SYSTEM SOFTWARE

Tait Systems			Standard Modes Supported		
			Analog	Digital	
				DMR	P25
System Types	Conventional	Non-Simulcast	TB9400, TB7300	TB9400, TB7300 DMR Tier 2	TB9400, TB7300
		Simulcast	TB9400, TB7300 AS-IP	TB9400, TB7300 DMR Tier 2 Simulcast	TB9400, TB7300 C4FM Simulcast TB9400 Linear Simulcast Modulation (LSM)
	Trunked	Non-Simulcast	TB9400, TB7300 MPT-IP	TB7300 DMR Tier 3 (Access, Express6, Express20)	*TB7300 P25 Phase 1 (Access, Express6)
				TB9400 DMR Tier 3 (Access, Express6, Express20, Full)	TB9400 P25 Phase 1 and Phase 2 (Access, Express6, Full)
		Simulcast	N/A	TB7300 DMR Tier 3 Simulcast (Access, Express6, Express20)	TB7300 P25 Phase 1 C4FM Simulcast (Access, Express6)
				TB9400 DMR Tier 3 Simulcast (Access, Express6, Express20, Full)	TB9400, P25 Phase 1 LSM, and Phase 2 Simulcast (Access, Express6, Full)

TAIT BASE STATIONS SUPPORTED MODES



TB7300 – HIGHLY FLEXIBLE MIGRATION PATHS



TB9400 – MAXIMUM MIGRATION FLEXIBILITY

TB7300

Frequency	Range	Tait Band	Configuration
B band	148 - 174MHz	B3	50W
H band	400 - 470MHz* 470 - 520MHz**	H5 H3	40W 40W

* TB7300 specific

** Please contact Tait if P25 Mode is required in H3 Band ('T-Band'), for compliance

TB9400

Frequency	Range	Tait Band	Configuration
VHF	135 - 156MHz	B2	50W & 100W
	148 - 174MHz	B3	50W & 100W
UHF	378 - 420MHz	HH	50W & 100W
	400 - 440MHz	H1	50W & 100W
	440 - 480MHz	H2	50W & 100W
	470 - 520MHz	H3	50W & 100W
700/800MHz	Tx: 762 - 870MHz*, Rx: 794 - 824MHz	K4	50W & 100W

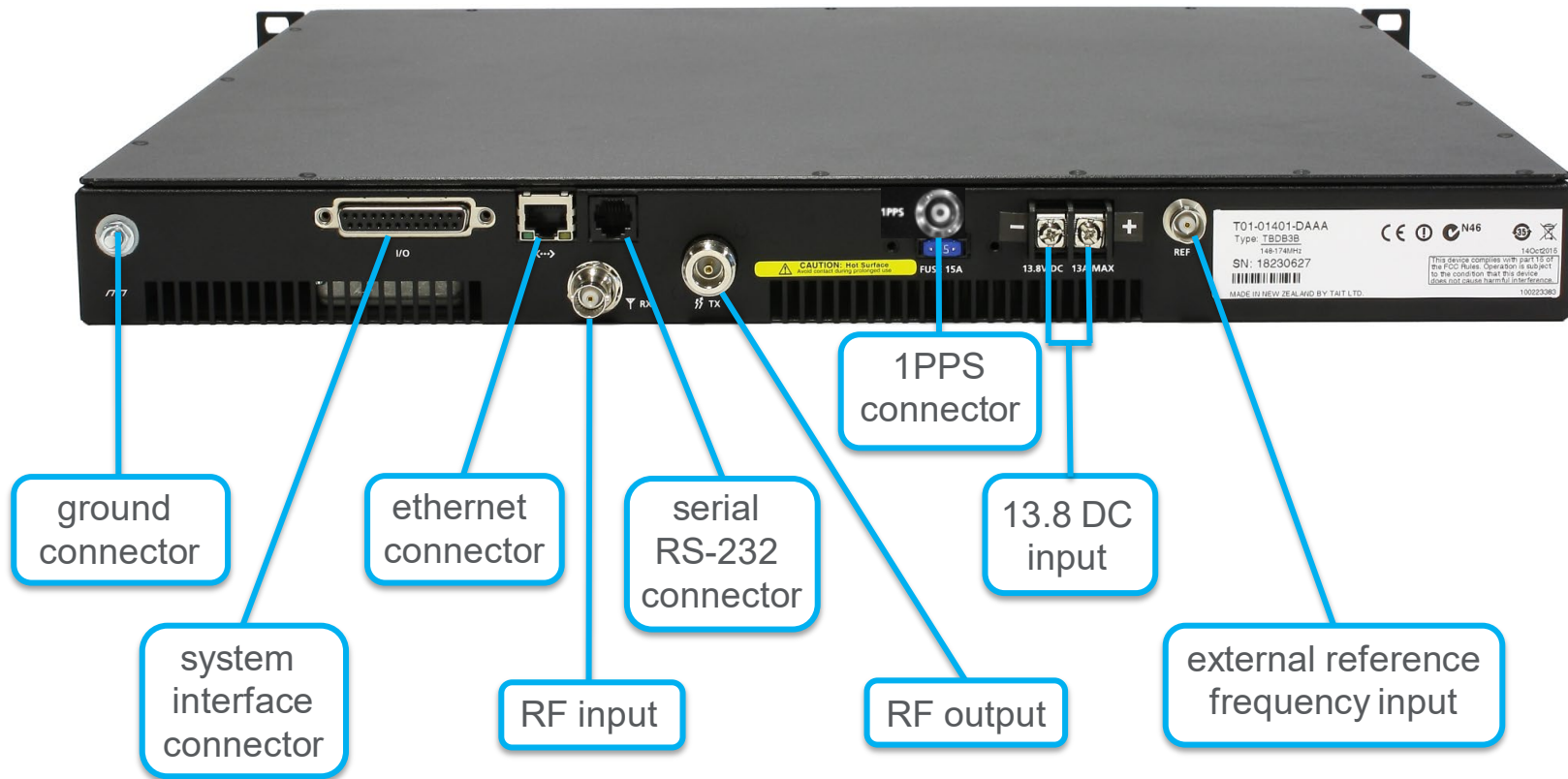
*The actual Rx frequency coverage in this band is 762-776MHz, and 850-870MHz

FREQUENCY BANDS COVERED

- Compact 19", 1U form factor - significantly smaller and lighter than the TB9300
- Triple fans allow operation up to +140 °F (+60 °C) ambient temperature at 100% transmit duty cycle.
- Front panel indicators for power, alarms, receive and transmit



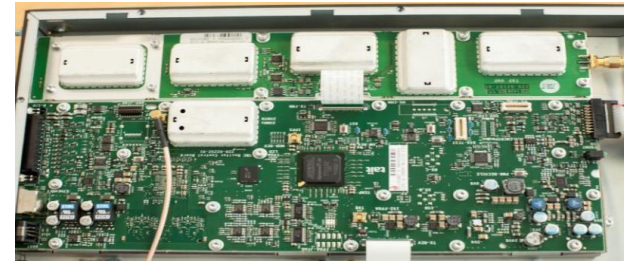
TB7300 RACK AND FRONT PANEL



TB7300 INTERFACES

Exceptional receiver performance (TB9400 vs TB7300):

- -122 dBm for 5% bit error vs. -120 dBm
(sensitivity → range)
- 85 dB(VHF) and 83 dB(UHF) vs. 63 dB
(selectivity → reduces adjacent channel issues)
- 80 dB vs. 73 dB
(intermodulation rejection → less susceptible to mixes)
- 113 dB vs. 90 dB
(blocking protection → less risk of overload)
- Customer driven



TB7300 RECEIVER

- Output power at +140 °F (+60 °C) ambient temperature and 100% duty cycle
 - VHF: 50 W
 - UHF: 40 W
- Forced cooling and basic conduction better than TB7100
- Power is adjustable down to 2 W



TB7300 TRANSMITTER

- Reduced standby power consumption 11 W (0.8 A)
- Fans-off power consumption 10 W (0.7 A)
- 13.8 VDC input (*11 - 16 VDC range*)



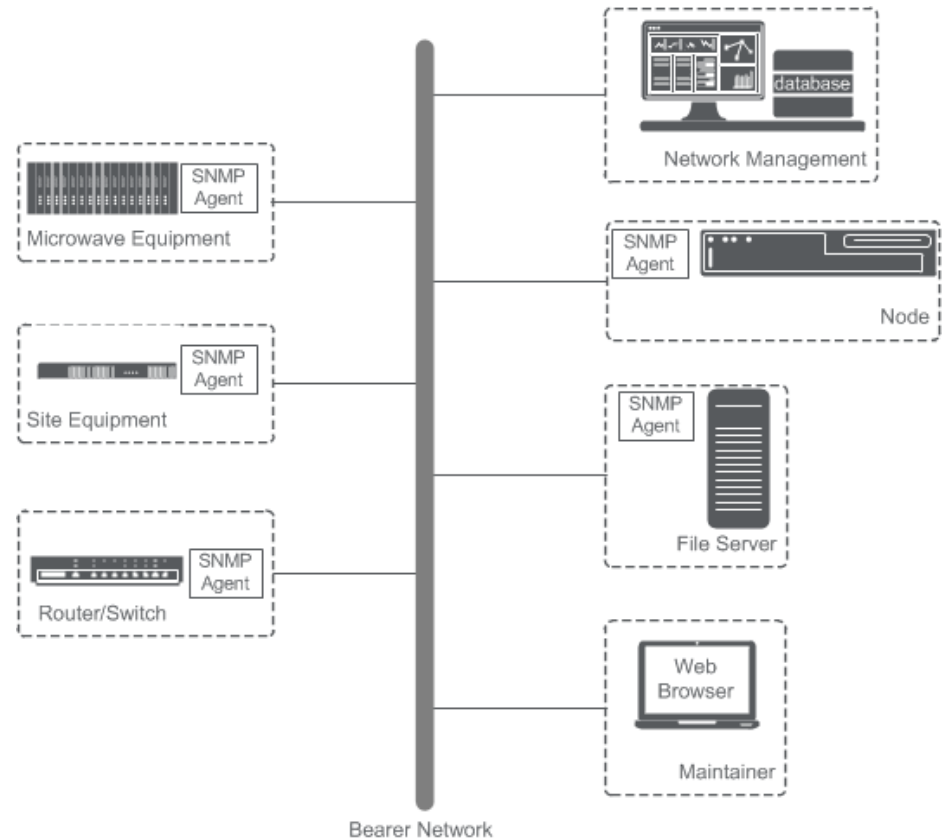
TB7300 POWER SUPPLY

- Browser-based web interface Comprehensive Online Help

The screenshot displays the BaseStation web interface. At the top, the 'tait' logo is on the left, 'BaseStation' is in the center, and 'admin (Administrator) | Log Out | About | Help' is on the right. Below this, a status bar shows 'System Status: ✔' and 'Mode: ⚠ Offline'. The left sidebar contains a menu with categories: Monitor (Alarms, Interfaces, Channel Group, Synchronization, Network, Modules), Identity, Configure, Diagnose, Calibrate, Tools (Settings, Files, Firmware), and a 'Settings' section. The main content area is titled 'Settings' and has tabs for 'Base station', 'Licenses', 'Local users', 'Web certificate', 'Authentication' (selected), and 'Secure shell'. Under the 'Authentication' tab, there are sections for 'Local' (Always enabled) and 'Remote' (None). Below these are 'LDAP server' and 'RADIUS server' configuration sections. The LDAP section includes fields for IP address (0.0.0.0), Port (389), Secure with StartTLS (checkbox), CA certificate (None), Search base (empty), Blind DN (Anonymous), Access levels (Administrator), and Group member attribute (empty). Each of these fields has an 'Edit' button. The RADIUS section includes fields for IP address (0.0.0.0), Port (1812), Shared secret (masked with asterisks), and Access level from class attribute (checkbox). A 'Save' button is at the bottom of the form.

CONFIGURATION AND MONITORING

- MIB in the TB7300 and TB9400 allows remote monitoring using SNMP manager (such as Tait EnableMonitor)



MONITORING WITH SNMP MANAGER

Purchase required licenses and choose active firmware and then chose the mode of operation!

Firmware Option – ASIP/P25	Firmware Option – MPT/DMR
Analog Air Interface	Analog Air Interface
ASIP – Analog Simulcast IP	MPT Trunked
P25 Conventional	DMR Tier 2 Conventional
P25 Conventional Simulcast	DMR Tier 2 Conventional Simulcast
P25 Trunked Phase 1	DMR Tier 3 Trunked
P25 Trunked Phase 1 Simulcast	DMR Tier 3 Trunked Simulcast
Dual Mode – Analog / P25	
P25 Trunked Ph2 (TB9400 only)	
P25 Trunked Ph2 Simulcast (TB94 Only)	

Please note:

- 1) firmware release 3.05 or greater is required
- 2) firmware can be changed remotely, reset is required when changing active firmware
- 3) please refer to TB7300 / TB9400 product catalog for detailed SFE licenses & rules
- 4) In a single simulcast channel group, you can mix TB73/93 with a TB9400 b/stn

SOFTWARE FEATURE LICENSES

Feature	TB7300 – Mid	TB9400 – High	TB9300 – High
Frequency bands	B3, H5 (VHF & UHF)	B2, B3, HH, H1, H2, H3, K4	B2, B3, C1, C3, G4, H1, H2, H3, H4, H5 (50W only), K4, K8, L2
Power supply range	External 13.8V VDC (11-16 VDC Range)	100 to 250 VAC, 12 V, 24 V, 48 VDC with PMU	100 to 250 VAC, 12 V, 24 V, 48 VDC with PMU
RF power output	VHF: 50 W UHF: 40W	50 W and 100 W options in most bands	50 W and 100 W options in most bands
Modularity	No (single unit only)	Yes (aids repair-ability)	Yes (aids repair-ability)
Height	1U (44 mm)	4U (177 mm)	4U (177 mm)
Weight	14.8 lbs (6.7 kg)	43.2 lbs (19.6 kg) (single 50 W PA with PMU)	47.4 lbs (21.5 kg) (single 50 W PA with PMU)
Standby Power consumption	11 W, 0.8 A (13.8 V)	24 W, 2 A (13.8 V)	22 W, 1.8 A (13.8 V)
RX Only	S/W Supported	S/W and H/W Supported	S/W Supported
P25 Trunked Ph2 LSM	N/A	Supported	N/A

TB7300 / TB9300 / TB9400 COMPARISON

High performing, multi-mode base stations for mission critical networks.

The Tait TB9400 "High level" base station is a multi-mode platform for analog conventional, MPT, DMR and P25 systems.

It provides both digital frequency and time division multiple access for FDMA and TDMA operations.

The TB9400 offers a spectrally efficient solution, enabling migration path between modes, with greater capacity and thus future proof your investment. It delivers operational efficiency through features such as internal voter capability, Linear Simulcast Modulation (LSM) and remote network management.



KEY FEATURES

- Multi-mode platform supporting Analog Conventional, AS-IP (Analog Simulcast over IP), MPT, DMR Conventional and Trunking, P25 Conventional and P25 Trunking modes
- Simple change of mode through the web interface, or program complex operations with TaskBuilder
- Dual mode automatic switching between Analog and P25 conventional
- P25 and analog conventional simplex and DFSI support for ease of migration
- Adherence to P25 standards Phase1 and Phase2 (ultra-narrowband 6.25 kHz) for interoperability
- Tait DMR Access and Express solution compatible
- Simulcast and Voting in AS-IP, DMR and P25 networks
- DMR fallback into single site operation
- Linear Simulcast Modulation (LSM) to increase P25 coverage efficiency
- Migration capability from Tait AS-IP to P25 Conventional network, with dual mode, simplex and DFSI capabilities or to Tait DMR simulcast
- Analog line (supporting 4 wire E&M) in analog mode for RF linking connection and local console support
- Efficient system infrastructure scalability based on IP network connectivity
- Extensive range of remote management and monitoring capabilities with a security focus
- Built-in basic spectrum analyzer provides on-site diagnostics
- Modular structure offers variety of build options to satisfy serviceability or space constraints
- Designed to military standard MIL-STD-810G

FEATURES AND BENEFITS

Delivering on operational needs

- Flexible network design through IP connectivity and linking
- TB9100 channel group compatibility mode
- Transfer data and voice across a packet-switched infrastructure using standard IP communications
- Robust design provides mission-critical voice communications
- P25/DMR Voice over IP (VoIP) support
- Cornerstone of a Tait P25 software-upgradable system
- Quality of Service (QoS) assignments for voice and signalling to allow optimal network packet routing
- Simulcast and Voting solutions for analog conventional, DMR Tier 2 and Tier 3, P25 conventional and trunking systems
- Built-in optional central voting facility selects the best quality signal for transmission
- LSM support means digital P25 simulcast networks require fewer sites
- C4FM simulcast operation
- Multi-DFS support with full control or audio connectivity only in P25 and analog conventional modes
- Simplex support with antenna relay management in P25 and analog conventional modes
- Analog line support in analog conventional mode for console and system connectivity as well as relay and RF linking configurations
- Built-in Continuous Wave Identification (CWID) generation meets FCC call-sign requirements
- Remote software downloads with no impact to operations
- Built-in basic spectrum analyzer provides on-site diagnostics, by way of plotting signal level
- Control, customize, and enhance base station operations with TaskBuilder, by creating rules that extend the functionality of the base station. Rules can control channel changes, digital outputs, timers, and alarms, based on events and external signals

Resiliency to manage risk and enhance safety in challenging environments

- Dual software image support for fast rollback
- Dual diversity not required due to Simulcast and automatic macro diversity
- Integrated Web https secured application to remotely monitor, diagnose and configure
- Tait smart power supply with auto change from AC to DC for easy battery back-up
- Rated for continuous full output power
- Rugged construction with efficient heatsinks and front-to-rear fan-forced cooling
- Meets relevant MIL-STD-810G test methods

Designed to support effective deployment

- Compact modular design to minimize rack space and improve serviceability
- Migration paths between analog/ P25 conventional/ P25 trunked networks with extensive re-use
- Migration paths from analog/ MPT networks to DMR with extensive re-use
- Front panel user interface to set device IP address, where required

Delivers on Public Safety

- Benefit from the spectral efficiency, multi-vendor interoperability, security, migration and data capability demanded by P25 standards
- Designed and tested with the DMR Tier 2 Conventional and Tier 3 Trunking standards to provide customers with choice of vendor and equipment
- 6.25 kHz equivalent 2-slot TDMA for both voice and data offers spectral efficiency operation
- Ongoing communications during an outage with failsoft
- Tested using the CAP certification program, providing confidence of multi-vendor interoperability

Efficient management with a focus on security

- Remote network management utilizing built-in secure https web server and SNMP V3 support
- Detailed alarm monitoring and reporting of critical base station/repeater parameters
- 12 digital inputs to monitor external equipment
- Inbuilt diagnostics to allow technicians to remotely confirm optimal operation and identify network faults
- Enhanced security through password protection and access level control on web server
- Multiple user accounts
- System logs to provide audit records
- Ability to configure 1,000 channels to allow single configuration across sites

Future-proofed to protect your investment

- Software configurable, including mode and feature upgrades through software licenses as required
- Software upgradeable to add new features and functionality to ensure that your analog/P25 solution is maintained and updated with the ever-changing needs of your market and environment

Wide range of configuration options available

- Configurable as a single channel 100W or 50W unit, or a dual channel 50W unit, with a range of DC and AC power supply options

FREQUENCY BANDS

Frequency	Range	Tait Band	Configuration
VHF	136-156MHz	B2	50W & 100W
	148-174MHz	B3	50W & 100W
UHF	378-420MHz	HH	50W & 100W
	400-440MHz	H1	50W & 100W
	440-480MHz	H2	50W & 100W
	470-520MHz	H3	50W & 100W
700/800MHz	Tx: 762-870MHz*, Rx: 794-824MHz	K4	50W & 100W

* The actual Tx frequency coverage in this band is 762-776MHz, and 850-870MHz

REGULATORY

	P25, Analog FM	DMR
USA (CFR 47)	B2, B3, HH, H1, H2, H3, K4	B3, H1, H2, H3, K4
Canada (RSS-119)	B2, B3, HH, H1, H2, K4	B3, H1, H2, K4
Europe (EN300-113, EN300-086, EN301-489)	B2 ¹ , B3 ^{1, 2} , H1, H2 ¹ , H3	B3 ^{1, 2} , H1, H2 ¹ , H3
Australia/New Zealand (AS/NZS4768)	B2 ¹ , B3 ^{1, 2} , H1, H2 ¹ , H3	B3 ^{1, 2} , H1, H2 ¹ , H3

¹ CE EN300086 Wideband Approved

² EN301929 Marine Wideband Approved on 100W B3 model

GENERAL

Radio specifications

Frequency stability	±0.5 ppm
Channels	1,000
Channel spacing	12.5 kHz and 25kHz** in analog Phase 1 - FDMA channel is 12.5kHz, and Phase 2 - 2 TDMA voice channels is 6.25 kHz equivalent in P25
Frequency increment/channel step	VHF 2.5kHz/3.125kHz, UHF 5kHz/6.25kHz, 700/800MHz 5kHz/6.25kHz
External frequency reference	10 MHz/12.8 MHz (auto detect)
Packet data	Repeated on P25 Phase 1 channels

Physical specifications

Dimensions (HxWxD)	7 x 19 x 15.8 in (177 x 483 x 400 mm) 4U rack space
Weight	Single 100 W: 46.5 lb (21.1 kg) Dual 50W : 54.7lb (24.8kg) Single 50W 43.2lb (19.6kg)
Operating temperature	-22°F to +140°F (-30°C to +60°C)

Power specifications

Power Supply	
DC	12V, 24V, 48V; PMU (+ve or -ve earth)
AC	88-264V (with Power Factor Correction)
ESD rating	+/-4kV contact discharge and +/-8kV air discharge

Power consumption* (UHF)	120VAC	230VAC	12VDC	24VDC	48VDC
Standby (Single 50 and 100 W)	0.370A, 30W	0.510A, 31W	2A, 24W	0.975A, 23W	0.480A, 23W
Tx @ 50W Single	1.9A, 235W	1.1A, 220W	18A, 216W	9A, 216W	4.2A, 202W
Tx @ 100W	3.3A, 395W	1.7A, 375W	32A, 385W	15.5A, 370W	7.4A, 355W

* Note Transmitter: These figures are specific to UHF, for other bands consult the product specification manual.

** When P25/AS-IP capable firmware is loaded (not available with DMR/Analog firmware)

MILITARY STANDARDS 810G

Applicable MIL-STD	Method	Procedure
Low pressure (Altitude 15000ft (4572m))	500.5	2
Humidity	507.5	2
Vibration	514.6	1
Shock	516.6	1

ANALOG LINE

	Input	Output
Audio interfaces	600Ω Balanced	600Ω Balanced
Audio interface level	-30dBm to 0dBm nominal (300Hz to 2,550Hz)	-30dBm to 0dBm nominal (300 to 2,550Hz)
Frequency response	+0.5/-2.0dB rel. 1kHz (300Hz to 3,000Hz)	
Passband ripple	-3 ~ +1dB	-3 ~ +1dB
Audio distortion	<3% typical (line to RF)	<3% typical (RF to line)

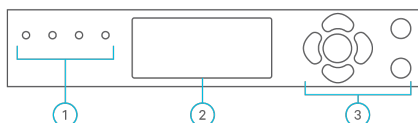
TRANSMITTER

Modulation types	FM, C4FM, LSM, H-DQPSK, FFSK, 4FSK
P25 Modulation fidelity (TIA-102)	<2%
Adjacent channel power	-60dBc (ETSI) and -67dBc (TIA-102)
Conducted spurious emissions	
VHF	<-36dBm 9kHz to 1GHz and <-30dBm 1GHz to 4GHz
UHF	<-36dBm 30MHz to 1GHz and <-30dBm 1GHz to 4GHz/12.75GHz
700/800/900MHz	<-20dBm to 9GHz
Output power	
50W	Programmable 5-50W
100W	Programmable 10-100W
Duty cycle	100%

RECEIVER

Modulation types	C4FM, H-CPM, Analog FM, FFSK, 4FSK
Radiated spurious emissions	<-57dBm EIRP to 1GHz
Conducted spurious emissions	<-90 dBm to 1GHz
P25 (TIA102)	
Sensitivity	0.22 μ V (-120 dBm) @ 5% BER
Intermodulation response attenuation	85dB
Adjacent channel rejection	60dB
Co-channel rejection	9dB
DMR	
Unfaded sensitivity ETS 300 113	
Typical	-122dBm (0.18 μ V) @ 5% BER
Guaranteed	-120dBm (0.22 μ V) @ 5% BER
Selectivity ETS 300 113	
@ 1% BER	\geq 82dB (VHF), \geq 79dB (UHF)
Intermodulation response attenuation	\geq 78dB @ 1% BER unfaded
Blocking rejection	
> 1MHz	100dB @ 1% BER
Analog	
Sensitivity	-119dBm @ 12dB SINAD (0.25pV)
Selectivity (EIA-603)	85dB (VHF & UHF), 79dB (700/800MHz)
Intermodulation	80dB
Spurious response attenuation	\geq 100dB (ANSI/TIA) and \geq 90dB (ETSI)
FM hum and noise	
VHF/UHF	45dB (ANSI/TIA), 50dB (ETSI)
700/800/900MHz	43dB (ANSI/TIA)

FRONT PANEL



1. Status LEDs
2. 20-character 4-row LCD Display
3. Keypad
4. Flow through ventilation fans x 3 (not pictured)

TAIT NETWORK SOLUTIONS

Backed up by our proven radio network expertise, the TB7300 is part of our larger network offering. The Tait network solution consists of radio units, infrastructure, applications, services and integration with third party interfaces to ensure that your organization can reap all the benefits of the DMR or P25 standard in a mission critical environment.

Tait has taken every care in compiling this specification sheet, but we're always innovating and therefore changes to our models, designs, technical specification, visuals and other information included in this specification sheet could occur. For the most up-to-date information and for a copy of our terms and conditions please visit our website www.taitradio.com.

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Authorized Partners



Quality Management
ISO 9001



Environment Management
ISO 14001:2015



Occupational Health & Safety
Management
ISO 45001:2018



High performing, multi-mode, 1U slimline base station/repeater.

The Tait TB7300 base station is a multi-mode platform for analog conventional, MPT, DMR and P25 conventional, with AC or 13.8V DC powered options.

In DMR, the TB7300 provides a TDMA 6.25kHz equivalent operation and is fully compliant with DMR Tier 2 and Tier 3 standards.

In P25, the TB7300 provides dual mode analog/P25, Phase 1 P25 trunking, and P25 conventional operation with DFSI interface.

Simulcast is supported in the following LMR modes: analog AS-IP, DMR Tier 2 and Tier 3, and P25 conventional.



This rugged slim, 1U design, IP connected base station offers a spectrally efficient solution.

The TB7300 provides a solution for small to medium radio networks, and can also operate as a simple repeater.

KEY FEATURES

- Multi-mode platform supporting Analog Conventional, AS-IP (Analog Simulcast over IP), MPT, DMR Conventional, DMR Trunking and P25 Conventional modes
- Simple change of mode through the web interface, or program complex operations with TaskBuilder
- Ultra-narrowband 6.25kHz equivalent technology for DMR modes (2 x TDMA channels in one 12.5kHz channel)
- Adherence to the DMR Tier 2 & Tier 3 standards
- Tait DMR Access and Express solution compatible
- Simulcast and Voting in AS-IP, DMR and P25 Conventional networks
- DMR fallback into single site operation
- Migration capability from Tait MPT to DMR Tier 3 trunked network
- MPT fallback into MPT single site operation or Analog conventional channel
- Migration capability from Tait AS-IP to P25 Conventional network, with dual mode, simplex and DFSI capabilities or to Tait DMR simulcast
- Analog line (supporting 4 wire E&M) in analog mode for RF linking connection and local console support
- Efficient system infrastructure scalability based on IP network connectivity
- Extensive range of remote management and monitoring capabilities with a security focus
- Built-in basic spectrum analyzer provides on-site diagnostics
- 1U slimline design with 13.8V DC or AC mains power supply options
- High performance receiver covers full frequency range with no manual adjustment

FEATURES AND BENEFITS

Delivering on operational needs

- Flexible network design through IP connectivity and linking
- Transfer data and voice across a packet-switched infrastructure using standard IP communications
- P25/DMR Voice over IP (VoIP) support
- Quality of Service (QoS) assignments for voice and signalling to allow optimal network packet routing
- Simulcast and Voting solutions for analog conventional, DMR Tier 2 and Tier 3, and P25 conventional systems
- Remote software downloads with no impact to operations
- Built-in basic spectrum analyzer provides on-site diagnostics, by way of plotting signal level
- In a DMR network, the TB7300 is compatible with TB9300 bases. In analog and P25 the TB7300 is compatible with the TB9400. Also, a TB7300 Transportable version is available for incident management
- Control, customize, and enhance base station operations with TaskBuilder, by creating rules that extend the functionality of the base station. Rules can control channel changes, digital outputs, timers, and alarms, based on events and external signals

Integrated solution component

- The heart of single site trunking system with integrated node controller forming the Tait DMR Access solution
- Part of the Tait DMR Express solution with the TN9300 Node controller for small to medium DMR trunking networks
- Compatible with the TB9300 series to create mixed sites or systems

Resiliency to manage risk and enhance safety in challenging environments

- Dual software image support for fast rollback
- Dual diversity not required due to Simulcast and automatic voting efficiency
- Integrated Web https secured application to monitor, diagnose and configure
- Rugged design meeting relevant MIL-STD-810G 516.6 Shock

Developed for compact effectiveness

- Slim 1U base station easy to transport and install
- Economical solution with real estate savings, an ideal choice when space for RF equipment is limited

Using the best of Tait base station to complement the Tait offering

- In DMR, base station/repeater with TB9300 Base Station receiver performance
- Output power selection from 2W to the maximum transmit power 40W/50W depending on the frequency band

Designed to support effective deployment

- Analog line supporting RF linking, repeater relay and local console connection
- Multi-DFS support with full control or audio connectivity only in P25 and analog conventional modes
- Simplex support with antenna relay management in P25 and analog conventional modes
- Migration paths between analog/ P25 conventional networks with dual mode capability
- Migration paths from analog/ MPT networks to DMR with extensive re-use

Delivers on the benefits of the LMR standards

- Designed and tested with the DMR Tier 2 Conventional and Tier 3 Trunking standards to provide customers with choice of vendor and equipment
- 6.25kHz equivalent 2-slot TDMA for both voice and data offers spectral efficiency
- Tested using the IOP certification program developed by the DMR Association, providing confidence of multi-vendor interoperability
- Designed to the P25 Standards

Efficient management with a focus on security

- Remote network management utilizing built-in secure https web server and SNMP V3 support
- Detailed alarm monitoring and reporting of critical base station/repeater parameters
- 12 digital inputs to monitor external equipment
- Inbuilt diagnostics to allow technicians to remotely confirm optimal operation and identify network faults
- Enhanced security through password protection and access level control on web server
- Multiple user accounts
- System logs to provide audit records
- Ability to configure 1,000 channels to allow single configuration across sites

Future-proofed to protect your investment

- Software configurable, including feature upgrades through software licenses
- Software upgradeable to add new features and functionality to ensure that your DMR solution is maintained and updated with the ever-changing needs of your market and environment

FREQUENCY BANDS

Frequency	Range	Tait Band	Configuration
VHF	136-174MHz ¹	B1 ¹	50W*
	148-174MHz	B3	50W*
UHF	400-470MHz	H5	40W*
	470-520MHz	H3	40W*

* Note: please check the specification manual for the exact value tolerance

¹ Future release (May 2021), compliances pending

REGULATORY

	DMR, MPT, AS-IP, Analog FM	P25
USA (CFR 47)	B1 ¹ , B3, H5, H3*	B1 ¹ , B3, H5, H3*
Canada (RSS-119)	B1 ¹ , B3, H5	B1 ¹ , B3, H5
Europe (EN300-113, EN300-086, EN301-489)	B1 ¹ , B3, H5**, H3**	B1 ¹ , B3, H5**, H3**
Australia/New Zealand (AS/NZS4768)	B1 ¹ , B3, H5**, H3**	B1 ¹ , B3, H5**, H3**

* FCC Approved

** CE Approved

¹ Future release (May 2021), compliances pending

GENERAL

Radio specifications

Frequency stability	+/- 0.5 ppm
Channels	1,000
Channel spacing	12.5 kHz and 25kHz** in analog Phase 1 - FDMA channel is 12.5kHz, and Phase 2 - 2 TDMA voice channels is 6.25 kHz equivalent in P25
Frequency increment/channel step	VHF 2.5/3.125kHz (or multiples of), UHF 5/6.25kHz
External frequency reference	10MHz/12.8MHz (auto detect)
DMR Packet data	1/2 Rate, 3/4 Rate, Full rate, Single Slot

Physical specifications

Dimensions (HxWxD)	1.7 x 19 x 15.8in (44 x 483 x 400mm) 1U Rack Space
Weight	AC: 17.2lb (7.8kg), DC: 14.8lb (6.7kg),
Operating temperature	-22° to +140°F (-30° to +60°C)

Power specifications

Power Supply AC	120V to 230V AC 50/60Hz***
Power Supply DC	13.8V Typical (11 - 15 VDC range)*
ESD rating	+/-4kV contact discharge and +/-8kV air discharge

Output power

VHF	Programmable 2-50W
UHF	Programmable 2-40W

Connectors

Transmitter	N-type female
Receiver	BNC female
External reference frequency input	BNC female
1 PPS input	BNC female
Network ethernet port	RJ45
Serial port	RJ12
Analog line and I/O connector	25-way D-range
AC input	IEC connector
DC input	Screw terminal
Power Supply Input Block	

* Note: please check the specification manual for the exact value tolerance

**When P25/AS-IP capable firmware is loaded (not available with DMR/Analog firmware)

***Note: For AC powered, TB7300 screw terminals are a 13.5V at 1Amp auxiliary output

MILITARY STANDARDS 810G

Applicable MIL-STD	Method	Procedure
Shock	516.6	1

ANALOG LINE

	Input	Output
Audio interfaces	600Ω Balanced	600Ω Balanced
Audio interface level	-30dBm to 0dBm nominal (300Hz to 2,550Hz)	-30dBm to 0dBm nominal (300 to 2,550Hz)
Frequency response	+0.5/-2.0dB rel. 1kHz (300Hz to 3,000Hz)	
Passband ripple	-3 to +1dB	-3 to +1dB
Audio distortion	<3% typical (line to RF)	<3% typical (RF to line)
Rx Gate	-	Logic state: active low
Tx Key	Logic state: active low	-

TRANSMITTER

Modulation types	4FSK, FM, C4FM	
P25 Modulation fidelity (TIA-102)	<2%	
Adjacent channel power 12.5kHz static	60dB, complies with EN 300 113 v2.2.1 (DMR)	
Conducted spurious emissions		
VHF	<-36dBm 9kHz to 1GHz and <-30dBm 1GHz to 4GHz	
UHF	<-36dBm 30MHz to 1GHz and <-30dBm 1GHz to 4GHz/12.75GHz	
Duty Cycle	100%	
Power Consumption		
Standby	DC: 0.83A, 11.5W @ 13.8V	AC 20W @ 120/230V
Tx @ 50W	DC: 9.6A, 133W @ 13.8V	AC 200W @ 120/230V

RECEIVER

Modulation types	4FSK, FM, C4FM
Radiated spurious emissions EIA-603-D	<-57dBm EIRP to 1GHz
Conducted spurious emissions	<-90dBm to 2GHz
P25 (TIA102)	
Sensitivity	0.22μV (-120 dBm) @ 5% BER
Intermodulation response attenuation	85dB
Adjacent channel rejection	60dB
Co-channel rejection	9dB
DMR	
Unfaded sensitivity ETS 300 113	
Typical	-122dBm (0.18μV) @ 5% BER
Guaranteed	-120dBm (0.22μV) @ 5% BER
Selectivity ETS 300 113	
@ 1% BER	≥82dB (VHF), ≥79dB (UHF)
Intermodulation response attenuation	≥78dB @ 1% BER unfaded
Blocking rejection	
> 1MHz	100dB @ 1% BER
Analog	
Sensitivity	<-119dBm (0.25μV) (12dB SINAD, centre of switching range) at 25°C (de-emphasized response)
Selectivity (EIA-603)	85dB (VHF & UHF)
Intermodulation	80dB (ETSI)
Spurious response attenuation	≥100dB (ANSI/TIA) and ≥90dB (ETSI)
FM hum and noise	
VHF/UHF	45dB (ANSI/TIA), 50dB (ETSI)

TAIT NETWORK SOLUTIONS

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Tait has taken every care in compiling this specification sheet, but we're always innovating and therefore changes to our models, designs, technical specification, visuals and other information included in this specification sheet could occur. For the most up-to-date information and for a copy of our terms and conditions please visit our website www.taitradio.com.

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www.taitradio.com

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Authorized Partners



Quality Management
ISO 9001



Environment Management
ISO 14001:2015



Occupational Health & Safety
Management
ISO 45001:2018



COL54 Series

VHF Meander™ Collinear

145-174 MHz



This range of Meander™ collinear antennas have been specifically designed for VHF applications requiring high performance, strong bandwidth and exceptional PIM specifications.

The patented Meander™ collinear element design allows multiple half wave elements to be stacked without the variations in cable lengths and mechanical joints which have typified the construction techniques in high gain collinear antennas. With each dipole element being printed on a single sided PCB the susceptibility to passive intermodulation is practically eliminated. Placing the elements on a board not only controls PIM but also removes manufacturing variations so that each and every antenna will provide the same pattern, tilt and VSWR characteristics over it's operating bandwidth. Consistency is guaranteed and a cost effective, reliable, high performance, low PIM antenna results.

The radome and mounting tube support this high performance antenna in a truly rugged package. Everything about these Meander™ collinears reflects the new demand for unquestioned performance electrically and physically in the most demanding public safety and industrial applications, where nothing can be left to chance.

The antenna has set frequency bands with the common bands generally available in stock.

- Strong Bandwidth
- Internally DC grounded for lightning protection and reduction of precipitation noise
- Tightly controlled radiation patterns for optimum coverage
- Patented PCB design for optimum RF pattern stability
- Full band coverage
- **Industry leading PIM ratings (-150dBc) providing low IM and low noise characteristics for optimum performance.**

USA Patent: 6909403B

European Patent: 1411588

Australian Patent: 2003255049

China 200310100548.5 / India 844/CHE/2003



RFI
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Twinsburg, OH 44087
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COL54 Series

VHF Meander™ Collinear

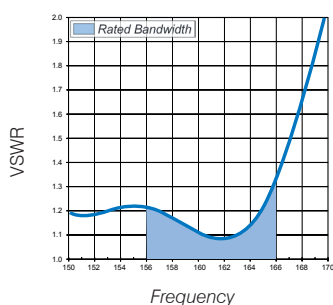
145-174 MHz



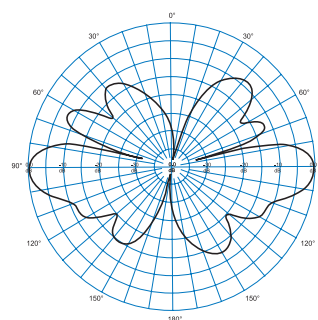
Electrical Specifications				
Model Number	COL54-155	COL54-160	COL54-166	COL54-174
Nominal Gain <i>dBd (dBi)</i>	6 (8.1)			
Frequency <i>MHz</i>	145 - 155	150 - 160	156 - 166	162 - 174
Tuned Bandwidth <i>MHz</i>	10	10	10	12
VSWR	<1.5 :1			
Nominal Impedance Ω	50			
Vertical Beamwidth°	17			
Horizontal Beamwidth°	Omni +/- 0.5dB			
Input Power <i>Watts</i>	400	350		
Passive IM 3rd order (2x20W) <i>dBc</i>	-150			
Peak Instantaneous Power <i>kW</i>	25			

Mechanical Specifications					
Model Number		COL54-155	COL54-160	COL54-166	COL54-174
Construction		Composite fiberglass sky blue radome, aluminum mounting tube			
Length <i>inches</i>		260	256	249	239
Radome Diameter <i>inches</i>		3			
Weight lbs		50.7	46	44	42
Shipping Weight <i>lbs</i>		66.2	99	97	95
Shipping Dimensions <i>inches</i>	H	5.9	6		
	W	5.9	6		
	L	275.6	261	256	247
Termination		Bulkhead mounted 7/16 DIN	7/16" DIN fixed female		
Mounting Area <i>inches</i>		30" x 3.5" diam. aluminum			
Suggested Clamps (not included)		UC1143			
Projected area <i>ft²</i>	No ice	6.4	6.3	6.1	5.8
	with ice	8.0	7.9	7.7	7.4
Lateral (Thrust) @ 100mph <i>lbs</i>		157	155	151	145
Wind Gust Rating <i>mph</i>		135	> 150		
Torque @ 100mph <i>ft-lbs</i>		1524	1296	1212	1105

Typical VSWR Response (COL54-166)



COL54-160 - E Plane



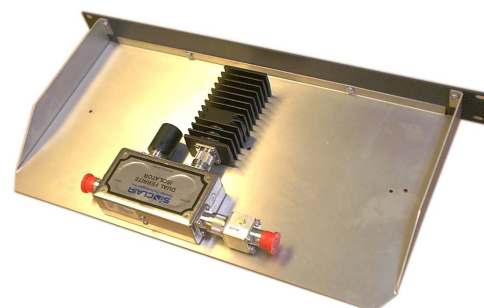
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Fax: 330 486 0705

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PC2213 I.M. Suppression panel, rack mount, dual stage isolator, 30+60 Watt loads, 132-174 MHz

- Dual stage isolator with 30+60 Watt load provides 75 dB (typ) isolation
- Can be tuned over the 132-174 MHz band and comes with built-in harmonic filters
- Compact design shipped precisely tuned to customer specified frequency

Sinclair's PC series panels incorporate high performance single- or dual-stage isolators with various load terminations and Sinclair-built harmonic filters. These compact units offer optimum intermodulation control in a 19-inch rack mounted configuration. They are shipped precisely tuned to customer specified frequency, and exhibit 35 dB or 75 dB isolation when equipped with single- or dual-stage isolators respectively. Various load configurations are available depending on system power level and VSWR protection required.



Region	United States	Europe, Middle East and Africa	Caribbean and Latin America	Canada and rest of the world
Telephone	USA: 1 800 263 3275	International: +44 (0) 1487 84 28 19	International: +1 905 726 7676	Canada: 1 800 263 3275 International: +1 905 727 0165
E-mail	salesusa@sinctech.com	salesuk@sinctech.com	salesla@sinctech.com	salescan@sinctech.com

Electrical Specifications

Frequency Range	MHz	132 to 174
Bandwidth	MHz	4.6
VSWR (max)		1.25:1
Isolation (typ)	dB	75
Average Power Input (max)	W	125
Connectors		N-Female
Insertion Loss (typ) Tx to Ant	dB	0.7
Insertion Loss (max) Tx to Ant	dB	1
Isolation (min)	dB	50

Notes

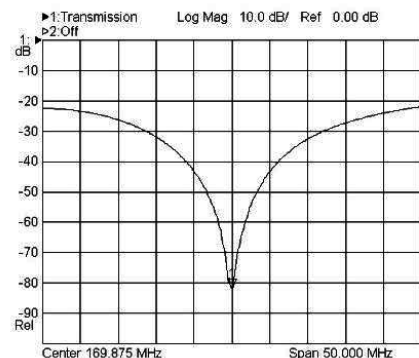
*1 : 3% of Center Frequency

Mechanical Specifications

Width	in (mm)	19 (483)
Depth	in (mm)	9.13 (232)
Length/ Height	in (mm)	1.75 (44)
Actual shipping weight	lbs (kg)	20 (9.08)
Shipping dimensions	in (mm)	19x26x7 (483x660x178)

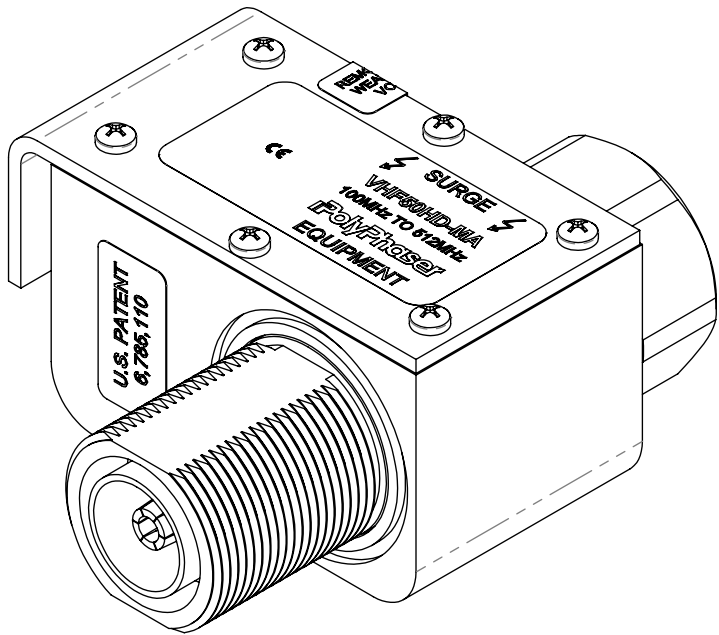
Environmental Specifications

Temperature range	°F (°C)	-22 to +140 (-30 to +60)
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Isolation

Region	United States	Europe, Middle East and Africa	Caribbean and Latin America	Canada and rest of the world
Telephone	USA: 1 800 263 3275	International: +44 (0) 1487 84 28 19	International: +1 905 726 7676	Canada: 1 800 263 3275 International: +1 905 727 0165
E-mail	salesusa@sinctech.com	salesuk@sinctech.com	salesla@sinctech.com	salescan@sinctech.com



HARDWARE KIT INCLUDES:

QTY	DESCRIPTION
1	WASHER 1.15ID FLAT SST TYPE 304
1	NUT M29 X 1.5 SST DIN
1	O-RING 027 SILICONE
1	SCREW CAP M8X1.25X10MM
1	WASHER 5/16 EXT 18-8 SS

MAXIMUM CHARACTERISTICS

APPLICATION:
WEATHERIZED, FLANGE OR BULKHEAD MOUNT

FREQUENCY RANGE:
100MHz TO 512MHz

VSWR:
≤1.1:1 OVER FREQUENCY RANGE

INSERTION LOSS:
≤0.1dB OVER FREQUENCY RANGE

POWER:
750W RMS AVERAGE

MAX. SURGE:
20kA IEC 61000-4-5 8/20μs WAVEFORM

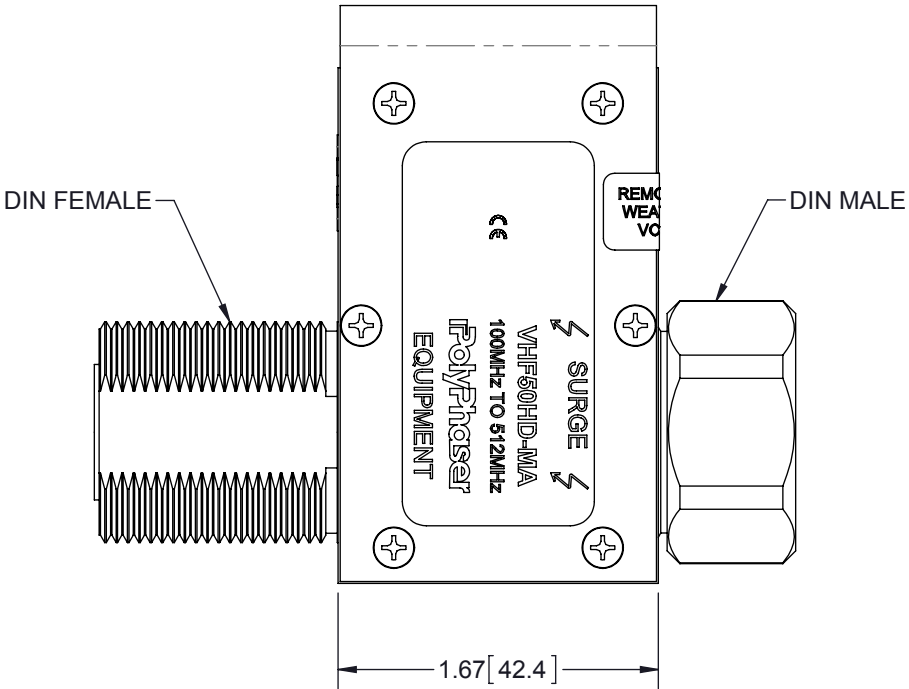
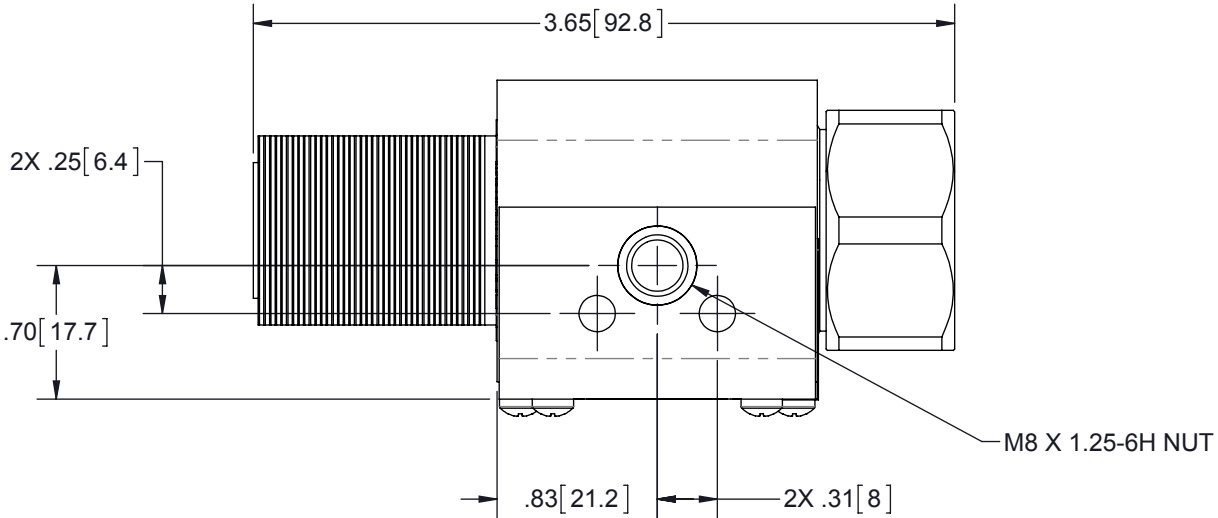
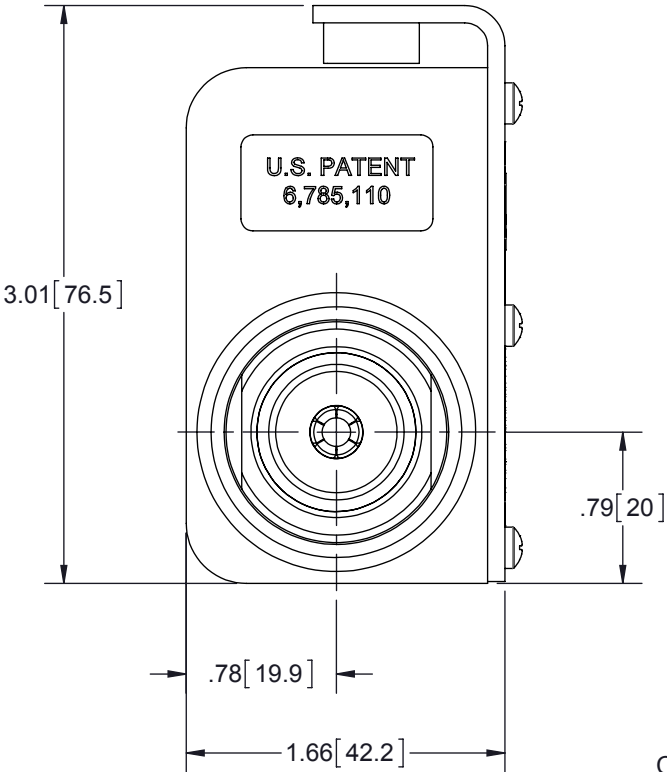
THROUGHPUT ENERGY:
≤500nJ FOR 3kA, 8/20μs WAVEFORM

RELATIVE HUMIDITY:
TO 95%

ENVIRONMENTAL:
MEETS IEC 60529 IP67
MEETS BELLCORE #TA-NWT-000487
PROCEDURE 4.11, WIND DRIVEN (120MPH)
RAIN INTRUSION TEST.

TEMPERATURE:
-50°C TO +85°C STORAGE/OPERATING

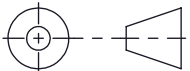
CE COMPLIANT
RoHS COMPLIANT



CUSTOMER APPROVAL: _____ DATE: _____

ALL DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.

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UNLESS OTHERWISE SPECIFIED LEADING DIMENSIONS ARE INCHES DIMENSIONS IN [] ARE MILLIMETERS	DRAWN		DATE		<div><div></div><div>PolyPhaser</div></div> <div>TITLE</div> <div>100-512MHz COMB 750W FEM DIN MALE DIN PRESSFIT</div> <div>CUSTOMER SPECIFICATION</div>			
	SH		6/20/03					
	RCD		6/27/03					
	PRODUCT MGR		6/26/03					
TOLERANCES: FRACTIONS=± 1/32 .XX=± .03 ANGLES=± 1 ° .XXX=± .010	NT		6/26/03		SIZE			
	MARKETING APPD		SJD					
MATERIAL	SJD		6/27/03		CAGE		PART NUMBER	
	PROJECT NO.				B		61114	
THIRD-ANGLE PROJECTION			NOTICE: THE INFORMATION AND DESIGN IN THIS DOCUMENT IS THE PROPERTY OF TRANSECTOR SYSTEMS. ALL RIGHTS RESERVED.		SCALE		PROD CAT	
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				VHF50HD-MA-C		1		
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7/8" CELLFLEX® Premium Attenuation Low-Loss Foam-Dielectric Coaxial Cable

Product Description

CELLFLEX® 7/8" premium attenuation low loss flexible cable

Application: Main feed line



7/8" CELLFLEX® Low-Loss Foam Dielectric Coaxial Cable

Features/Benefits

- Ultra Low Attenuation**
 The further reduced attenuation of CELLFLEX® premium attenuation coaxial cable results in extremely efficient signal transfer in your RF system, especially at high frequencies.
- Complete Shielding**
 The solid outer conductor of CELLFLEX® coaxial cable creates a continuous RFI/EMI shield that minimizes system interference.
- Low VSWR**
 Special low VSWR versions of CELLFLEX® coaxial cables contribute to low system noise.
- Outstanding Intermodulation Performance**
 CELLFLEX® coaxial cable's solid inner and outer conductors virtually eliminate intermods. Intermodulation performance is also confirmed with state-of-the-art equipment at the RFS factory.
- High Power Rating**
 Due to their low attenuation, outstanding heat transfer properties and temperature stabilized dielectric materials, CELLFLEX® cable provides safe long term operating life at high transmit power levels.
- Wide Range of Application**
 Typical areas of application are: feedlines for broadcast and terrestrial microwave antennas, wireless cellular, PCS and ESMR base stations, cabling of antenna arrays, and radio equipment interconnects.

Frequency [MHz]	Attenuation [dB/100m] [dB/100ft]		Power [kW]
0.5	0.0780	0.0238	85.0
1.0	0.110	0.0336	85.0
1.5	0.135	0.0412	73.6
2.0	0.156	0.0476	63.7
10	0.351	0.107	28.3
20	0.498	0.152	20.0
30	0.612	0.186	16.2
50	0.793	0.242	12.5
88	1.06	0.323	9.38
100	1.13	0.345	8.80
108	1.18	0.358	8.42
150	1.39	0.425	7.15
174	1.50	0.458	6.63
200	1.62	0.493	6.14
300	2.0	0.608	4.97
400	2.32	0.707	4.28
450	2.47	0.753	4.02
500	2.61	0.796	3.81
512	2.64	0.806	3.77
600	2.88	0.876	3.45
700	3.12	0.951	3.19
750	3.24	0.987	3.07
800	3.35	1.02	2.97
824	3.41	1.04	2.91
894	3.56	1.08	2.79
900	3.57	1.09	2.78
925	3.62	1.10	2.75
960	3.70	1.13	2.69
1000	3.78	1.15	2.63
1250	4.27	1.30	2.33
1400	4.54	1.38	2.19
1500	4.71	1.44	2.11
1700	5.05	1.54	1.97
1800	5.21	1.59	1.91
2000	5.52	1.68	1.80
2100	5.67	1.73	1.75
2200	5.82	1.77	1.71
2400	6.11	1.86	1.63
2500	6.25	1.91	1.59
2600	6.39	1.95	1.56
2700	6.53	1.99	1.52
3000	6.93	2.11	1.43
3500	7.56	2.30	1.31
4000	8.16	2.49	1.22
4900	9.17	2.80	1.08
5000	9.28	2.83	1.07

Attenuation at 20°C (68°F) cable temperature
Mean power rating at 40°C (104°F) ambient temperature

Technical Features

Structure

Inner conductor:	Copper Tube	[mm (in)]	9.32 (0.37)
Dielectric:	Foam Polyethylene	[mm (in)]	22.4 (0.88)
Outer conductor:	Corrugated Copper	[mm (in)]	25.2 (0.99)
Jacket:	Polyethylene, PE	[mm (in)]	27.8 (1.09)

Mechanical Properties

Weight, approximately	[kg/m (lb/ft)]	0.41 (0.28)
Minimum bending radius, single bending	[mm (in)]	120 (5)
Minimum bending radius, repeated bending	[mm (in)]	250 (10)
Bending moment	[Nm (lb-ft)]	13 (9.6)
Max. tensile force	[N (lb)]	1440 (324)
Recommended / maximum clamp spacing	[m (ft)]	0.8 / 1 (2.75 / 3.25)

Electrical Properties

Characteristic impedance	[Ω]	50 +/- 1
Relative propagation velocity	[%]	90
Capacitance	[pF/m (pF/ft)]	74 (22.5)
Inductance	[μH/m (μH/ft)]	0.185 (0.056)
Max. operating frequency	[GHz]	5
Jacket spark test RMS	[V]	8000
Peak power rating	[kW]	85
RF Peak voltage rating	[V]	2920
DC-resistance inner conductor	[Ω/km (Ω/1000ft)]	1.54 (0.47)
DC-resistance outer conductor	[Ω/km (Ω/1000ft)]	1.55 (0.47)

Recommended Temperature Range

Storage temperature	[°C (°F)]	-70 to 85 (-94 to 185)
Installation temperature	[°C (°F)]	-40 to 60 (-40 to 140)
Operation temperature	[°C (°F)]	-50 to 85 (-58 to 185)

Other Characteristics

Fire Performance: Halogene Free

VSWR Performance: Premium for 698 - 794, 824 - 960, 1710 - 1755, 1850 - 1990, 2110 - 2155 MHz 24 (1.135)

Other Options: Phase stabilized and phase matched cables and assemblies are available upon request.

COMMANDER Omni Fiberglass Antenna, 148-174 MHz, 5.1 dBi, N Female

Please visit us on the internet at <http://www.commandertech.com>
Product Description

Commander VHF base Station Antennas incorporate the design features of broadband capability, superior lightning protection and true omnidirectional gain in excess of 3 dBd. All copper and brass connections are soldered, reducing intermodulation. Mounting hardware is included.


Features/Benefits

Fiberglass construction protects radiating elements in corrosive environments. DC grounded - affords lightning protection
 Copper radiating elements minimize possibility of intermod generation

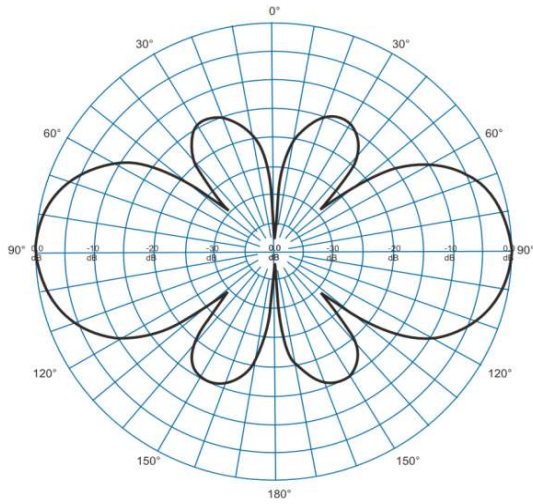
Technical Specifications

Frequency Band	25-299.9 MHz
Horizontal Pattern	Omni Directional
Antenna Type	Fiberglass Omni
Electrical Down Tilt Option	Fixed
Gain, dBi (dBd)	5.1 (3)
Frequency Range, MHz	148- 174
Connector Type	N Female
Connector Location	Bottom
Mounting Type	Fixed
Electrical Down Tilt, deg	0
Orientation	Upright
Mounting Hardware	46-1 Clamp Set
Rated Wind Speed, km/h (mph)	282 (175)
Gain (Omni), dBi (dBd)	5.15 (3)
VSWR	< 1.5 : 1
Vertical Beamwidth, deg	35
Polarization	Vertical
Maximum Power Input, W	500
Lightning Protection	Direct Ground
3rd Order IMP @ 2 x 43 dBm, dBc	-130
Impedance, Ohms	50
Overall Length, m (in)	1.524 (60)
Element Housing Length, m (in)	1.245 (49)
Mounting Pipe Diameter, m (in)	0.07 (2.75)
Support Pipe Length, m (in)	0.28 (11)
Weight, kg (lb)	4 (8.5)
Radiating Element Material	Copper
Element Housing Material	Fiberglass
Support Pipe Material	Aluminum Alloy
Max Wind Loading Area m ² (ft ²)	0.116 (1.245)
Survival Wind Speed, km/h (mph)	322 (200)
Bend Mom @ Rated Wind 1" Below Top of Mt Pipe, N m (ft lbf)	174 (128)
Wind Load - Side @ Rated Wind, N (lbf)	199 (44.8)
Shipping Weight, kg (lb)	10.4 (23)
Packing Dimensions, HxWxD mm (in)	2,159 x 100 x 100 (85 X 3.94 X 3.94)
Packing Dimensions, HxWxD, m (ft)	2.16 x 0.1 x 0.1 (7.08 x 0.33 x 0.33)
Shipping Dimensions of Accessory, HxWxD, m (ft)	Packed with Antenna
Shipping Mode	UPS Shippable

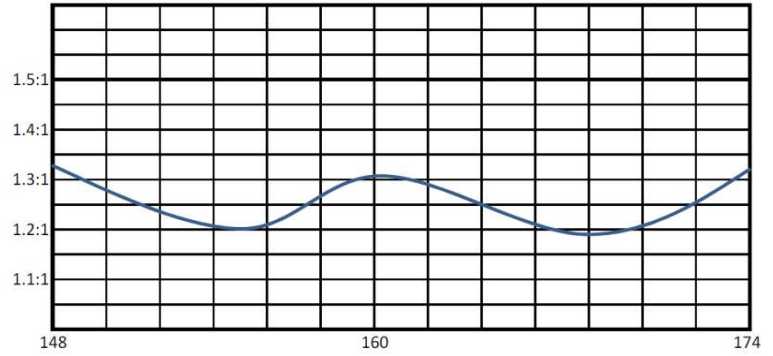
Notes

All information contained in this datasheet is subject to confirmation at time of ordering

COMMANDER Omni Fiberglass Antenna, 148-174 MHz, 5.1 dBi, N Female

Please visit us on the internet at <http://www.commandertech.com>
Other Documentation


Vertical Pattern



Typical VSWR Results

All information contained in this datasheet is subject to confirmation at time of ordering

Section 6

Exceptions

No Exceptions

Section 7

Certificate of Insurance

Section 8

Project Schedule

Project Schedule after Award

(Based on current manufacturer's lead times)

Week 1

- Project kickoff meeting
 - Meet with all project stake holders, set all goals and expectations.
 - Introduce project team
 - Determine customer's point of contact
 - Establish communication channel with all involved parties.
 - Discuss and determine customer's timeframe
 - Complete walkthrough of sites
 - Sweep existing antenna system
 - PM existing FD repeater
 - Review order
 - Determine permit requirements
 - Determine access schedule
 - Order all equipment approved by customer

Week 2

- Schedule technician to work with project manager
 - Coordinate with DPW to review all mobile installs
 - Coordinate with DPW to review control station installation

- Create detailed scope of work for each mobile installation
- Coordinate with Police department to read existing subscribers, save all codeplugs to customer file
- Coordinate with Fire department to read existing subscribers, save all codeplugs to customer file
- Create detailed scope of work per site
- Coordinate structural analysis schedule with customer.
- Schedule structural analysis

Week 3

- Update equipment shipping schedule
- Perform polite drive coverage test of existing system
- Plot repeater coverage

Week 4

- Review structural analysis
- Determine tower loading percentage
- Schedule antenna system installs

Week 5-6

- Begin antenna system installs
- Connect new FD antenna system to existing repeater
- Update site grounding per order

Week 8-12

- Assemble equipment cabinet
- Install Battery Backup
- Update equipment shipping schedule
- Coordinate sample installation with DPW

Week 13-15

- Coordinate with DPW on subscriber programming
- Coordinate with FD on subscriber programming
- Complete new subscriber programming

Week 16-18

- Configure and tune new repeaters
- Install new repeaters in cabinet
- Deliver cabinet and install on site
- Coordinate with UNH and connect new repeater to the Zetron MAX dispatch console
- Perform sample installation for DPW
- Proceed with remaining installations
- Install DPW control station
- Test all system features with new subscribers

Week 19-20

- Perform 2nd polite drive coverage test on FD channel
- Perform polite drive coverage test on new DPW channel
- Complete system acceptance

- Complete system documentation
- Sign off on system completion

Section 9

Cost Proposal

8 PRICING SHEET

Tower Structural Analysis \$ 4,000

Fire Department Repeater, Duplexer
Antenna and Transmission Line; Installed \$ 32,180.32

Public Works Repeater, Duplexer
Antenna and Transmission Line; Installed \$ 14,211.29

Public Works Mobile Radio, Antenna; Installed \$ 14,513.33
Unit Cost: \$ 1,116.41

Public Works Portable Radio, Antenna; Installed \$ 1,818.32
Unit Cost: \$ 454.58

Public Works Control Station, Antenna; Installed \$ 5,775.09
Unit Cost: \$

Police Subscriber Reprogramming \$ 1,627.50
Mobile Unit Cost: \$ 54.25
Portable Unit Cost: \$ 54.25

Warranty \$ Included
Repeaters: \$ Included
Subscribers: \$ Included

Applicable Discounts \$ 19%-30% taken off MSRP

GRAND TOTAL \$ 74,125.85

OPTIONS

] Option-1: Microwave Radio Single Hop; Installed \$ 34,093.00
Microwave Warranty \$ 2,550

Option-2: IP Gateways; Installed \$ Not Required

Please identify per unit cost for the following subscriber radio function and features

ANALOG / DMR FEATURES	PORTABLE	MOBILE
High Capacity Li-ion battery [12-hours; 10/10/80]	58.66	
Spare Antenna	12.25	
Emergency button	Included	Included
12.5 kHz TDMA (6.25e) digital channel bandwidth	Included	Included
Alphanumeric display	Included	Included
Encryption	23.80	23.80
PTT ID	Included	Included
Private Call	Included	Included
All Call	Included	Included
Call Alert	Included	Included
Talk-around	Included	Included
Radio Check	Included	Included
Radio Disable/Enable Remote Monitor	23.80	23.80
16-position channel selector	Included	Included
Group scan	Included	Included
External microphone and speaker connections		Included
Speaker/External Mic	38.50	38.50
Voice Annunciation	Included	Included
Integrated GPS		
Remote Monitor	Included	Included
Auto Site Roaming	Included	Included
Lone Worker/Man Down Mode	Included	Included

INSTALLATION EXAMPLES











