Commonwealth of Virginia
Virginia Information Technologies Agency

RADIO & TELECOMMUNICATIONS EQUIPMENT, ANTENNAS & ACCESSORY ITEMS

Mandatory Use Contract for State Agencies & Institutions (over $100)

Date: June 21, 2005

Contract #: VA-000815-CNER

Authorized User: State Agencies, Institutions and Political Subdivisions as defined in the Code of Virginia.

Contractors: M/A-COM, INC.
221 Jefferson Ridge Parkway
PO Box 2000
Lynchburg, VA 24501

FIN# 65-0916944

Contact: Contact: Jane P. Wargo
Phone: 804-330-0562
Fax: 804-330-0878
Email: wargoja@tycoelectronics.com

Term: June 30, 2005 – December 31, 2005

F.O.B.: Destination (Orders over $100)

Delivery: 60 Days ARO

Payment: Net 30 days

For Additional Information, Please Contact:

Virginia Information Technologies Agency
Supply Chain Management

Joe Parr
Senior Technology Procurement Engineer
Phone: 804-371-5991
E-Mail: joe.parr@vita.virginia.gov

Doug Leslie
Technology Procurement Engineer
Phone: 804-371-5213
E-Mail: doug.leslie@vita.virginia.gov

Fax: 804-371-5969

NOTES: Individual Commonwealth of Virginia employees are not authorized to purchase equipment or services for their personal use from this Contract.

For updates, please visit our Website at http://www.vita.virginia.gov/procurement/contracts.cfm

VIRGINIA INFORMATION TECHNOLOGIES AGENCY (VITA): Prior review and approval by VITA for purchases in excess of $100,000.00 is required for State Agencies and Institutions only.

VA-000815-CNER

CONTRACT CHANGE LOG

Change No.	Description of Change	Effective Date	
1	Updates supplier's local VA representative	2/28/02	
2	Extends contract term	8/15/02	
3	Updates supplier's name change	2/4/03	
4	Extends contract term	8/15/03	
5	Extends contract name and changes DIT to VITA	8/15/04	
6	Extends contract for 6 months	8/15/05	

MODIFICATION # 6
TO
CONTRACT NUMBER VA-000815-CNER
BETWEEN THE
COMMONWEALTH OF VIRGINIA
AND
M/A-COM, INC.
(FORMERLY M/A-COM PRIVATE RADIO SYSTEMS, INC.)

This MODIFICATION # 6 is an agreement between the Commonwealth of Virginia, hereinafter referred to as "State" or "Commonwealth" or "VITA" (Virginia Information Technologies Agency), and M/A-COM, Inc., hereinafter referred to as "Contractor", relating to Contract VA-000815-CNER dated August 15, 2000, as amended, hereinafter referred to as the "Contract" or "Agreement". This Modification # 6 is hereby incorporated into and made an integral part of the Agreement.

Both of the above referenced parties agree to the following:

Reference: Page C-5 of C-15, Paragraph 16 entitled "Term":

The term of Contract VA-000815-CNER shall be extended from August 15, 2005 through February 28, 2006, or until such time as a replacement Contract is awarded, whichever event occurs sooner.

The foregoing is the complete and final expression of the parties' agreement to modify Contract VA-000815-CNER and cannot be modified, except by a writing signed by duly authorized representatives of both parties.

ALL OTHER TERMS AND CONDITIONS REMAIN UNCHANGED.

PERSONS SIGNING THIS CONTRACT ARE AUTHORIZED REPRESENTATIVES OF EACH PARTY TO THIS CONTRACT AND ACKNOWLEDGE THAT EACH PARTY AGREES TO BE BOUND BY THE TERMS AND CONDITIONS OF THE CONTRACT.

M/A-COM, INC.	COMMONWEALTH OF VIRGINIA
BY: Jane P. Wards	BY: Joe A Parr
NAME: JANE P. WARDS	NAME: Joe A. Parr
TITLE: Regional Sales Manager	TITLE: Tech Contracts Manager
DATE: 6-12-05	DATE: 6/16/05

MODIFICATION # 5
TO
CONTRACT NUMBER VA-000815-CNER
BETWEEN THE
COMMONWEALTH OF VIRGINIA
AND
M/A-COM, INC.
(FORMERLY M/A-COM PRIVATE RADIO SYSTEMS, INC.)

This MODIFICATION # 5 is an agreement between the Commonwealth of Virginia, hereinafter referred to as "State" or "Commonwealth" or "VITA" (Virginia Information Technologies Agency), and M/A-COM, Inc., hereinafter referred to as "Contractor", relating to Contract VA-000815-CNER dated August 15, 2000, as amended, hereinafter referred to as the "Contract" or "Agreement". This Modification # 5 is hereby incorporated into and made an integral part of the Agreement.

Both of the above referenced parties agree to the following:

Reference: Page C-5 of C-15, Paragraph 16 entitled "Term":

The term of Contract VA-000815-CNER shall be extended from August 15, 2004 through August 14, 2005.

Reference: Page C-4 of C-15, Paragraph 13 entitled, "Modifications":

The Virginia General Assembly passed legislation that abolished the Department of Information Technology (DIT) as of July 1, 2003. All activities and functions of DIT have been consolidated into a new agency that is the Virginia Information Technologies Agency (VITA). Therefore, for purposes of this Contract ("Agreement") all references to either the Commonwealth, or DIT, or VITA, shall have the same meaning.

The foregoing is the complete and final expression of the parties' agreement to modify Contract VA-000815-CNER and cannot be modified, except by a writing signed by duly authorized representatives of both parties.

ALL OTHER TERMS AND CONDITIONS REMAIN UNCHANGED.

PERSONS SIGNING THIS CONTRACT ARE AUTHORIZED REPRESENTATIVES OF EACH PARTY TO THIS CONTRACT AND ACKNOWLEDGE THAT EACH PARTY AGREES TO BE BOUND BY THE TERMS AND CONDITIONS OF THE CONTRACT.

M/A-COM, INC.	COMMONWEALTH OF VIRGINIA
BY: Janet. Wargo	BY: Joe A Parr
NAME: Regional Systems Mgr. JANE P. WARGO	NAME: Joe A. Parr
TITLE: Regional Systems Mgr.	TITLE: Tech Contracts Manager
DATE: 7/2/2004	DATE: 7/13/04

MODIFICATION # 4
TO
CONTRACT NUMBER VA-000815-CNER
BETWEEN THE
COMMONWEALTH OF VIRGINIA
AND
M/A-COM, INC.
(FORMERLY M/A-COM PRIVATE RADIO SYSTEMS, INC.)

This MODIFICATION # 4 is an agreement between the Commonwealth of Virginia, hereinafter referred to as "State" or "Commonwealth" or "DIT" (Department of Information Technology), and M/A-COM, Inc., hereinafter referred to as "Contractor", relating to Contract VA-000815-CNER dated August 15, 2000, as amended, hereinafter referred to as the "Contract" or "Agreement". This Modification # 4 is hereby incorporated into and made an integral part of the Agreement.

Both of the above referenced parties agree to the following:

Reference: Page C-5 of C-15, Paragraph 16 entitled "Term":

The term of Contract VA-000815-CNER shall be extended from August 15, 2003 through August 14, 2004.

The foregoing is the complete and final expression of the parties' agreement to modify Contract VA-000815-CNER and cannot be modified, except by a writing signed by duly authorized representatives of both parties.

ALL OTHER TERMS AND CONDITIONS REMAIN UNCHANGED.

PERSONS SIGNING THIS CONTRACT ARE AUTHORIZED REPRESENTATIVES OF EACH PARTY TO THIS CONTRACT AND ACKNOWLEDGE THAT EACH PARTY AGREES TO BE BOUND BY THE TERMS AND CONDITIONS OF THE CONTRACT.

M/A-COM, INC.

BY: Janet P. Stanley

NAME: Janet P. Stanley

TITLE: Regional Mgr. Sales

DATE: 6/15/03

COMMONWEALTH OF VIRGINIA

BY: Joe A Parr

NAME: Joe A. Parr

TITLE: Tech Contracts Manager

DATE: D.I.T. 6/19/03

MODIFICATION # 3
TO
CONTRACT NUMBER VA-000815-CNER
BETWEEN THE
COMMONWEALTH OF VIRGINIA
AND
M/A-COM, INC.
(FORMERLY M/A-COM PRIVATE RADIO SYSTEMS, INC.)

This MODIFICATION # 3 is an agreement between the Commonwealth of Virginia, hereinafter referred to as "State" or "Commonwealth" or "DIT" (Department of Information Technology), and M/A-COM Private Radio Systems, Inc., hereinafter referred to as "Contractor", relating to Contract VA-000815-CNER dated August 15, 2000, as amended, hereinafter referred to as the "Contract" or "Agreement". This Modification # 3 is hereby incorporated into and made an integral part of the Agreement.

The purpose of this Modification # 3 is to document the new name used by "Contractor" under the above referenced Agreement. All obligations identified in Contract VA-000815-CNER will not change as the Contractor begins using the new name.

Contractor represents that M/A-COM Private Radio Systems, Inc. has been legally merged into M/A-COM, Inc., and has ceased to exist as a separate legal entity. References to M/A-COM, Inc. shall be construed to refer to the Contractor, whether such references are in the Contract or in any correspondence or any document relating thereto.

Both above referenced parties hereby agree that, henceforth, the above referenced Contract shall be referred to as Contract VA-000815-CNER, between the Commonwealth of Virginia and M/A-COM, Inc. (Contractor). All contractual documents and this Agreement, which formerly referred to M/A-COM Private Radio Systems, Inc. shall now indicate M/A-COM, Inc. The Contractor's Federal Employer Identification Number (FEIN) has changed to 65-0916944. Point of contact information remains the same.

The foregoing is the complete and final expression of the parties' agreement to modify Contract VA-000815-CNER and cannot be modified, except by a writing signed by duly authorized representatives of both parties.

ALL OTHER TERMS AND CONDITIONS REMAIN UNCHANGED.

PERSONS SIGNING THIS CONTRACT ARE AUTHORIZED REPRESENTATIVES OF EACH PARTY TO THIS CONTRACT AND ACKNOWLEDGE THAT EACH PARTY AGREES TO BE BOUND BY THE TERMS AND CONDITIONS OF THE CONTRACT.

M/A-COM, INC.	COMMONWEALTH OF VIRGINIA
BY: Janet P. Stanley	BY: Joe A Parr
NAME: Jane P. Stanley	NAME: Joe A. Parr
TITLE: Regional Mgr. Sales	TITLE: Tech Contracts Manager
DATE: 2/10/03	DATE: 2/14/03 D.I.T.

02 JUN 24 PM 4:05

MODIFICATION # 2
TO
CONTRACT NUMBER VA-000815-CNER
BETWEEN THE
COMMONWEALTH OF VIRGINIA
AND
M/A-COM PRIVATE RADIO SYSTEMS, INC.
(FORMERLY COM-NET ERICSSON)

This MODIFICATION # 2 is an agreement between the Commonwealth of Virginia, hereinafter referred to as "State" or "Commonwealth" or "DIT" (Department of Information Technology), and M/A-COM Private Radio Systems, Inc , hereinafter referred to as "Contractor", relating to Contract VA-000815-CNER dated August 15, 2000, hereinafter referred to as the "Contract" or "Agreement". This Modification # 2 is hereby incorporated into and made an integral part of the Agreement.

Both of the above referenced parties agree to the following:

Reference: Page C-5 of C-15, Paragraph 16 entitled "Term":

The term of Contract VA-000815-CNER shall be extended from August 15, 2002 through August 14, 2003.

The foregoing is the complete and final expression of the parties' agreement to modify Contract VA-000815-CNER and cannot be modified, except by a writing signed by duly authorized representatives of both parties.

ALL OTHER TERMS AND CONDITIONS REMAIN UNCHANGED.PERSONS SIGNING THIS CONTRACT ARE AUTHORIZED REPRESENTATIVES OF EACH PARTY TO THIS CONTRACT AND ACKNOWLEDGE THAT EACH PARTY AGREES TO BE BOUND BY THE TERMS AND CONDITIONS OF THE CONTRACT.

M/A-COM PRIVATE RADIO SYSTEMS, INC.	COMMONWEALTH OF VIRGINIA
BY: Jane P. Stanley	BY: Joe A Parr
NAME: Jane P. Stanley	NAME: Joe A. Parr
TITLE: Regional Systems Manager	TITLE: Contracts Engineer
DATE: 6/21/02	DATE: D.I.T. 6/17/02

MODIFICATION # 1
TO
CONTRACT NUMBER VA-000815-CNER 02 FEB 26 PM 2:49
BETWEEN THE
COMMONWEALTH OF VIRGINIA
AND
M/A-COM PRIVATE RADIO SYSTEMS, INC.
(FORMERLY COM-NET ERICSSON)

This MODIFICATION # 1 is an agreement between the Commonwealth of Virginia, hereinafter referred to as "State" or "Commonwealth" or "DIT" (Department of Information Technology), and M/A-COM Private Radio Systems, Inc , hereinafter referred to as "Contractor", relating to Contract VA-000815-CNER dated August 15, 2000, hereinafter referred to as the "Contract" or "Agreement". This Modification # 1 is hereby incorporated into and made an integral part of the Agreement.

The purpose of this Modification # 1 is to designate a new point of contact for the Contractor's local Virginia Representative and to document the new name used by "Contractor" under the above referenced Agreement. All obligations identified in Contract VA-000815-CNER will not change as the Contractor begins using the new name.

Both above referenced parties agree to designate the following individual as the Contractor's local Virginia Representative:

Jane P. Stanley
M/A-COM Private Radio Systems
8206 Spring Meadow Road
Richmond, VA 23235
Phone (804) 330-0562
Fax (804) 330-0878
Email stanleyja@tycoelectronics.com

The Contractor further represents that Com-Net Ericsson Critical Radio Systems, Inc. has been acquired by Tyco International, Ltd., and is now a wholly owned subsidiary of the same and renamed M/A-COM Private Radio Systems, Inc. References to M/A-COM Private Radio Systems, Inc. shall be construed to refer to the Contractor, whether such references are in the Contract or in any correspondence or any document relating thereto.

Both above referenced parties hereby agree that, henceforth, the above referenced Contract shall be referred to as Contract VA-000815-CNER, between the Commonwealth of Virginia and M/A-COM Private Radio Systems, Inc. (Contractor). All contractual documents and this Agreement, which formerly referred to Com-Net Ericsson Critical Radio Systems, Inc. shall now indicate M/A-COM Private Radio Systems, Inc. The Contractor's Federal Employer Identification Number (FEIN) 25-1849837 and point of contact information remain the same.

The foregoing is the complete and final expression of the parties' agreement to modify Contract VA-000815-CNER and cannot be modified, except by a writing signed by duly authorized representatives of both parties.

ALL OTHER TERMS AND CONDITIONS REMAIN UNCHANGED.PERSONS SIGNING THIS CONTRACT ARE AUTHORIZED REPRESENTATIVES OF EACH PARTY TO THIS CONTRACT AND ACKNOWLEDGE THAT EACH PARTY AGREES TO BE BOUND BY THE TERMS AND CONDITIONS OF THE CONTRACT.

M/A-COM PRIVATE RADIO SYSTEMS, INC.	COMMONWEALTH OF VIRGINIA
BY: Jane P. Stanley	BY: Joe A Parr
NAME: Jane P. Stanley	NAME: Joe A. Parr
TITLE: Regional Systems Mgr	TITLE: Contracts Engineer
DATE: 2/21/02	DATE: 2/28/02

NOTE:

DIT's Industrial Fund Adjustment (IFA) of 2% has been included in each line item of our quotation.

COMMONWEALTH OF VIRGINIA Department of Information Technology

SOLICITATION, OFFER AND AWARD
DATA PROCESSING / TELECOMMUNICATIONS

FIN: 25-1849837

1. Contract No:	2. IFB No:	3. Date Issued:	Date Due:	4. APR	5. Approval No:
VA-000815-CNER	2000-037	Jul 7, 2000	Aug 1, 2000	45	B-62

For Information Call: David Butler (804) 371-5521

6. ISSUING OFFICE:	7. SHIP TO:
Department of Information Technology Acquisition Services Division 110 S. 7th Street, Lobby Floor Richmond, Va. 23219-9300 ATTN: Bid Section	Locations as Specified on the Individual Orders

SOLICITATION

8. Sealed bid(s) for furnishing the Products and Services set forth in the schedule, will be returned to the Issuing Office identified in block 6 above. Please provide an original and 0 copies. If hand carried, deliver to the ASD receptionist located on the Lobby Floor of the address listed in Block 6. Bids must be received prior to 2:00 p.m. local time Aug 1, 2000.

CAUTION - LATE OFFERS: See Paragraph 3 of the Solicitation Instructions

This is an advertised solicitation which consists of (1) the schedule of Products and Services, pages 2 thru 9; (2) the solicitation instructions pages S-1 thru S-3; (3) The Contract Terms and Conditions page C-1 thru C-15; and (4) other provisions, representations, certifications or specifications as are attached or incorporated herein by reference.

Offers will be publicly opened at: 2:10 p.m. local time Aug 1, 2000, in the ASD Conference Room, 110 South 7th Street, Lobby Floor.

All offers are subject to the terms and conditions set forth in the above referenced sections of this solicitation.

Paul H. Dodson, Director
Acquisition Services

P H Dodson
Signature

OFFER

In compliance with the terms and conditions set forth in the solicitation, the undersigned agrees, if this offer is accepted within 90 calendar days from the date of receipt of offers, to furnish any or all items awarded at the prices offered in the schedule, delivered to the address in block 7, within the time specified in the schedule.

9. CONTRACTOR: COM-NET ERICSSON	10: BILL TO:
Company Name: COM-NET ERICSSON Address: 3315 OLD FOREST RD. City, State: LYNCHBURG, VA Signature: Chris Fauser Name (Typed): CHRIS FAUSER Title: REGIONAL MANAGER Phone: 804-385-2345	Locations as Specified on the Order Forms

AWARD

11. Accepted as to Item Numbers:	12. Amount:	13. Award Date:
ALL	$ per order	08/15/00

14. Name of Contracting Officer:	15. COMMONWEALTH OF VIRGINIA	PAGES:
Jeff Davis Contracts Manager	By:	1 of 9

FORM 62 Rev. 07/02/99

DIT-62A	SCHEDULE	IFB NO.	Page:
01/15/91		00-037	2 of 9

NAME OF CONTRACTOR	REQUIRED DELIVERY DATE:	INITIALS
	(RDD) 60 DAYS ARO	

ITEM NO	DESCRIPTION	QTY	UNIT	UNIT PRICE	EXTEND PRICE
	The Virginia Department of Information Technology (DIT) desires to establish a statewide term contract with one or more manufacturers to provide, on as needed basis, Radio and Telecommunications Equipment, Antennas and Accessory items necessary to extend or enhance requested items to Governmental Entities of the Commonwealth of Virginia. Governmental Entities are defined as: State Agencies, Institutions and other public bodies including political subdivisions as defined in the Code of Virginia, Section 8.01-385(3)iii. For the purposes of this solicitation this includes all Virginia counties, cities, towns, boroughs and local school divisions under the authority of the Virginia Board of Education, and all schools under the supervision of the Virginia school boards constituted under Title 22.1 of the Code of Virginia and will be hereinafter referred to as governmental entities. (See Appendix A for the 6 Lots of equipment required). NOTES: 1. All prices submitted shall include DIT's Industrial Fund Adjustments (IFA). 2. Installation will only be required on mobile radios and vehicular repeaters. All items requiring installation will be marked with an asterisk on the Table of Contents of Appendix A and further indicated on the individual specification and bid sheet in Appendix A.				

NAME OF CONTRACTOR	REQUIRED DELIVERY DATE:	INITIALS
	(RDD) 60 DAYS ARO	

1. The Department of Information Technology (DIT) desires to establish a statewide term contract with one or more manufacturers to provide, on an as needed basis, radio and telecommunications equipment, accessories and antennas (but not replacement batteries, parts, kits and test equipment), for the Commonwealth of Virginia (COV) governmental entities. Use of the contract will be mandatory for COV state agencies and institutions and optional for localities and other public bodies.

2. The Commonwealth reserves the right to authorize exceptions for the use of the mandatory contract on a case by case basis and to conduct separate procurements whenever it is deemed to be in the best interest of the Commonwealth.

3. SPECIFICATIONS:

   A. Equipment, antennas and accessories: This IFB includes Low Band, High Band, UHF and 800 MHZ radio and telecommunications equipment.

      Bids will be accepted from Radio Manufacturers or authorized resellers for either Kenwood, Bendix/King, E.F. Johnson, ComNet Ericsson, Midland, Motorola or an approved equal. Purchases from this IFB will be for initial start up and complete replacement of existing equipment or any additions/replacements to same during the contract period and for complete replacement of existing equipment.

   B. All products furnished shall be new and in current production. New radio and telecommunications products released during the term of this contract shall be offered at the same price awarded for that brand.

   C. When requested by the ordering entity on the purchase order, equipment purchased shall be installed by the contractor at the installation price bid not later than 60 days after request as mutually agreed upon by vendor and user. Product demonstrations, when requested, shall be provided at no additional cost.

4. In order to be considered for selection, Bidders may bid on one or more lots, but must submit product literature for each brand offered.

5. An award, if made, will be made to the responsive and responsible vendor with the lowest total cost for those items listed for each individual lot identified as "Award based on Total for Lot #?".

6. This is to be a Department of Information Technology (DIT) contract. The term of the contract will be for a period of two (2) years and the Commonwealth reserves the right to renew the contract for three (3) additional twelve (12) month periods at its sole discretion. The Commonwealth will notify the contractor at least 30 days prior to expiration of the current term of its intent to review the contract for additional periods.

NAME OF CONTRACTOR	REQUIRED DELIVERY DATE:	INITIALS
	(RDD) 60 DAYS ARO	

7. Delays in award, beyond the anticipated starting date, may result in a change in the contract period indicated in the solicitation. If this situation occurs, the Commonwealth reserves the right to award a contract covering a period equal to or less than the initial term indicated in this solicitation.

8. It is anticipated that the COV Governmental entities will purchase approximately $1 million annually in radios under the resulting contracts. This estimate is given only as a guideline for preparing your bid and should not be construed as representing actual amounts to be purchased under the contract. This is an indefinite quantity, indefinite delivery type requirements contract and the successful bidders shall supply, at the bid prices actual quantities of items ordered.

9. The Commonwealth reserves the right to request any bidder to submit information missing from its bid, to clarify its bid, and to submit additional information which the Commonwealth deems necessary to evaluate the bidders offer.

10. Bidders shall clearly and specifically identify the product(s) being offered and enclose the complete and detailed descriptive literature, catalog cuts and specifications with the bid to enable the Commonwealth to determine if the product(s) offered meets the specifications requirements of this solicitation. FAILURE TO DO SO MAY CAUSE THE BID TO BE CONSIDERED NON-RESPONSIVE.

11. The Contractor shall provide with each piece of equipment an operations and maintenance manual with wiring diagrams and parts list.

12. At a minimum the vendor shall provide a warranty on all products for a period of one year or the manufacturer's warranty length, whichever is greater. Warranty shall begin on date of acceptance by the user. The vendor shall repair or replace all equipment returned for repair within 7 days of receipt. For on-site warranty, the vendor guarantees that the user will not be out of service for more than 24 hours. The vendor may replace, repair or loan the end-user similar equipment to meet this requirement. For any equipment loaned to the user, the contractor assumes all risk of loss or damage at all times.

13. The Contractor shall provide necessary preventive maintenance, required testing and inspection, calibration and/or other work necessary to maintain the equipment in operational condition during the warranty period.

14. Contractor and/or service facilities shall grant permission for a representative of the Commonwealth to inspect their facilities at any time during normal business hours both prior to and after award.

NAME OF CONTRACTOR	REQUIRED DELIVERY DATE:	INITIALS
	(RDD) 60 DAYS ARO	

15. Delivery of all requested contract items shall be made within 60 calendar days after receipt of a valid purchase order referencing any contract awarded as a result of this solicitation/contract. Contractor shall carry an adequate stock of equipment to insure such delivery for the duration of the contract. State your earliest firm delivery date as follows: 45 DAYS Days After Receipt of Order.

16. Except when otherwise specified herein, all items shall be F.O.B. delivered any point within the Commonwealth of Virginia as directed by ordering Governmental entities.

17. Each Bidder shall have an organized network of franchised service providers strategically located throughout the Commonwealth of Virginia. Two-way radio service must be the primary business of these providers with qualified technicians (either licensed by FCC, APCO or NABER). Each Bidder shall state their service providers and local Virginia representative(s). Furthermore, if bidding on an item that includes service and installation, each Bidder shall indicate their service providers within the Commonwealth of Virginia.

    These service providers must provide warranty backup and daily routine maintenance. Service providers must be capable of "system" maintenance as well as hardware maintenance.

    Service providers must be backed by the manufacturer with a complete line of parts. All parts for the equipment furnished must be available for a period of at least five (5) years from the date of contract termination. All parts used in the repair of radio equipment furnished under this contract must be the exact replacement part specified and supplied by the manufacturer. Any exception necessary because of part unavailability or other unusual situation must have prior approval of the DIT radio engineer in the case of COV state agencies and institutions or the purchaser in the case of other Governmental entities.

    Each Bidder must demonstrate, when requested, to the Commonwealth of Virginia that their service personnel are being consistently trained in the function and maintenance of all new products as well as standard products by providing updates of personnel certification on these products.

18. The successful Bidder shall provide to the Department of Information Technology, Division of Telecommunications a current copy of the instruction/ maintenance manual or microfiche for each type of equipment sold to State Agencies. The manual or microfiche shall be sent to:

    Mr. Paul Hoppes
    Department of Information Technology
    ATTN: Communications Engineer Manager
    110 South 7th Street, 1st Floor
    Richmond, Virginia 23219

    The instruction/maintenance manual, CD or microfiche shall be kept up-to-date, with each addendum sent to the above address.

NAME OF CONTRACTOR	REQUIRED DELIVERY DATE:	INITIALS
	(RDD) 60 DAYS ARO	

Each ordering agency shall be furnished an instruction/maintenance manual for each type of equipment including accessories provided.

Manuals for equipment purchased by political subdivisions shall be sent directly to the address furnished by them.

19. BID SAMPLES: Upon request from DIT/ASD, the bidder(s) shall submit bid samples for each product offered within ten (10) calendar days. FAILURE ON THE PART OF THE BIDDER TO PROVIDE SUCH SAMPLES WITHIN THE SPECIFIED TIME FRAME OR TO COMPLY WITH THESE INSTRUCTIONS MAY BE CAUSE TO CONSIDER THE BID AS NON-RESPONSIVE.

    Bid samples shall be an exact and true representative sample of the actual material offered. Each bid sample shall be properly tagged or labeled with the name of the bidder and manufacturer, the bid opening date, the requisition or inquiry number and the specific commodity or item number. Bid samples shall be provided at no additional costs to the Commonwealth. Bid samples will be handled and disposed of in accordance with paragraph 5.8 of the Vendors Manual.

    Submit bid samples to: Acquisition Services Division
    Dept. of Information Technology
    110 South 7th Street, East Lobby
    Richmond, Virginia 23219

20. Any bid in response to this solicitation shall be valid for 90 days. At the end of the 90 days the bid may be withdrawn at the written request of the Bidder. If the bid is not withdrawn at that time it remains in effect until an award is made or the solicitation is canceled.

21. The purchasing agency reserves the right to cancel and terminate any resulting contract, in part or in whole, without penalty, upon 60 days written notice to the Contractor. Any contract cancellation notice shall not relieve the Contractor of the obligation to deliver and/or perform on all outstanding orders issued prior to the effective date of cancellation. Cancellation of Purchase Orders shall be made in accordance with Section 7.15 of the COV Vendors Manual dated December 1998.

22. By signing this solicitation, the offeror accepts DIT's Industry Fund Adjustment (IFA) provisions, to include the Contractor's Report of Sale, as stated in the attached Terms and Conditions.

23. By signing this solicitation, the offeror agrees that the invoice price to the Commonwealth for any contract item shall be the best price available which includes the IFA to any governmental entity located in the Commonwealth of Virginia for the duration of the contract. In the event that, during the term of the contract the offeror has delivered the products or services proposed at a lower cost, the Commonwealth will be entitled to the lump sum difference in pricing for all products or services purchased from the date of the infraction.

NAME OF CONTRACTOR	REQUIRED DELIVERY DATE:	INITIALS
	(RDD) 60 DAYS ARO	

24. Price adjustments may be permitted only for changes in the Contractor's cost of materials. The Producer's Price Index, for Radio and Communication Equipment, Table 5, Industry Code 3663, 3663-1, 3663-133, 3663-145, 3663-148, 3663-15202 and 3663-15209 will be used as a guide to determine increase or decrease. No price increases will be authorized for 365 calendar days after the effective date of each contract. Price escalation may be permitted only at the end of this period and each 180 days thereafter and only where verified to the satisfaction of the Contracts Manager, DIT. However, "across the board price decreases are subject to implementation at any time and shall be immediately conveyed to the Commonwealth.

    Contractor shall provide 30 days advance written notice of any price increase to the purchasing office for the cost of materials. Any approved price changes will be effective only at the beginning of the calendar month following the end of the full 30 day notification period. The Contractor shall document the amount and proposed effective date of any general change in the price of materials. Documentation shall be supplied with the Contractor's request for increase which will: (1) verify that the requested price increase is general in scope and not applicable just to the Commonwealth of Virginia; and (2) verify the amount or percentage of increase which is being passed on to the Contractor by the Contractor's suppliers. The purchasing office will notify the using agencies and Contractor in writing of the effective date of any increase which it approves. However, the Contractor shall fill all purchase orders received prior to the effective date of the price adjustment at the old contract prices. The Contractor is further advised that decreases which affect the cost of materials are required to be communicated immediately to the purchasing office.

25. No materials or supplies for the work shall be purchased by the Contractor or any Subcontractor subject to any chattel mortgage or under sales or other agreement by which an interest is retained by the seller. The Contractor warrants that he has clear title to all materials and supplies for which he invoices for payment.

26. ORDERS: Applicable departments, institutions and agencies of the Commonwealth may order by one of the following methods:

    A. Issuing Agency Purchase Order, Form DGS-41-001.

    B. Verbal order (for orders valued under $2,000): Local control number must be provided by the authorized ordering official which must also appear on invoice.

    C. Charge card: An ordering and payment process under contract with American Express (AMEX). Each order must not exceed $5,000 - payment will be made to contractor by AMEX within three business days. Contractor is encouraged to accept this method of receiving orders.

    D. A Delivery Order issued by the Acquisition Services Division, DIT.

NAME OF CONTRACTOR	REQUIRED DELIVERY DATE:	INITIALS
	(RDD) 60 DAYS ARO	

Contact AMEX directly, (800) 686-5493 Ext. 101, for sign-up details.

Bidder will_____will not_X__accept the American Express Card.

27. SPECIAL OR EDUCATIONAL DISCOUNTS:

A. During the contract period, if the Contractor offers promotional discounts as a general practice or offers educational discounts to schools and institutions of higher education for items under this contract, with the result that those prices are lower than the prices available under this contract, then the promotional discounts shall be made available to all schools and institutions of higher education eligible to place orders against this contract.

B. The effective date for price changes/discounts will be the date that the lower prices/discounts are made available to the Contractor's customers generally or to schools and institutions of higher education as applicable.

C. If the Contractor does not sell to purchasers eligible to place orders against this state contract at the lower prices/discounts required by subsection A above, it shall owe a rebate to each affected purchaser which is equal to the amount of the overcharge. Said rebate shall be made within 30 days after the purchaser requests the rebate whichever comes first.

28. Minimum orders will be $100.00 for F.O.B. delivery to ordering agencies within the Commonwealth of Virginia. For orders of less than $100.00, the Contractor will be permitted to add actual transportation cost (prepaid) to invoice for payment, or the agency may purchase such order off contract from other sources. Partial shipments of less than the minimum order value which are made at the option of the Contractor shall be made F.O.B. Destination with no transportation charges added. If at the agency's request shipments are below the minimum order value, the Contractor may add actual transportation cost to invoice for payment.

29. The bid price shall be for complete installation ready for the Commonwealth's use, and shall include all applicable freight and installation charges and the IFA. Extra charges will NOT be allowed.

30. NAME OF MANUFACTURER AND SHIPPING POINT: Each Bidder shall supply in the space below the name and address of the manufacturer of each item offered and the shipping point.

ITEM NUMBER(S): LOTS 1 - 6
MANUFACTURER: COM-NET ERICSSON
ADDRESS: 3315 OLD FOREST RD.
SHIPPING POINT: LYNCHBURG, VA.

NAME OF CONTRACTOR	REQUIRED DELIVERY DATE: (RDD) 60 DAYS ARO	INITIALS

31. IDENTIFICATION OF BID: Contractor shall submit signed bids in a sealed envelope or package identified as follows:

From: _____
Name of Bidder Due Date Time

_____
Street or Box Number IFB Number

_____
City, State, Zip Code IFB Title
Name of Contract Officer_____

The envelope should be addressed as directed in block #6, page 1 of the solicitation. Bids may be hand delivered to the designated location in the office issuing the solicitation.

32. By responding, the offeror agrees that the only terms and conditions governing acquisition under this solicitation/contract are the verbatim Terms and Conditions attached to this solicitation. Any terms and conditions, clarifications and/or additions thereof contained in the vendor response or supplementary material provided with or subsequent to the bid will not apply to any transaction under the contract.

33. Questions concerning this solicitation must be submitted, in writing, to Dave Butler at the address listed in Block 6, page 1, no later than July 21, 2000. No response will be furnished to telephone calls. Please mark the outside of your envelope "QUESTIONS CONCERNING IFB 00-37."

34. Results of this solicitation will not be given out by telephone. Vendors wishing a copy of the bid results must include a self-addressed, stamped envelope along with their bid. The envelope should be marked with the words "Bid Results" and the IFB number. Results will be made available as soon as a decision is made.

35. The Acquisition Services Division of DIT maintains a web site with a URL of http://asd.state.va.us. This web site provides information about ASD and acquistions conducted by ASD for Information Technology related items. Vendorsare invited to check this site regularly.

36. BIDS WILL NOT BE CONSIDERED IF THE VENDOR IS NOT REGISTERED WITH THE DEPARTMENT OF INFORMATION TECHNOLOGY (DIT). A registration form may be obtained by calling (804) 371-5900 or by contacting the Acquisition Services Division web site, at the above URL. The completed form must be received by DIT not later than the award date in order for the bid to be considered.

37. Bidder's attention is directed to Section 2.b, page S-1, of the solicitation Instructions concerning the requirement for Federal Identification Numbers (FIN) to be placed on page 1 of the Invitation For Bids. Please place this number in the space provided on page 1. PLEASE NOTE THAT FAILURE TO SUPPLY THIS NUMBER MAY RESULT IN OUR INABILITY TO VERIFY YOUR REGISTRATION AND YOUR BID BEING RULED NON-RESPONSIVE.

Appendix A

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SOLICITATION INSTRUCTIONS
REV. 07/05/00

1. EXPLANATION TO VENDORS

Any explanation desired by a vendor regarding this solicitation/invitation for bid must be requested in writing and with sufficient time allowed for a reply to reach the vendor before the submission of their bids. PRIOR TO SUBMISSION OF A BID, VENDORS ARE REQUIRED TO READ THESE INSTRUCTIONS, REVIEW THE SCHEDULE, READ ALL TERMS AND CONDITIONS AND CHECK THE ACQUISITION SERVICE DIVISION'S (ASD'S) WEB PAGE AT (HTTP://ASD.STATE.VA.US) FOR ANY AMENDMENTS OR CHANGES. THIS SOLICITATION IS SUBJECT TO THE PROVISIONS OF THE COMMONWEALTH OF VIRGINIA VENDOR'S MANUAL WHICH WAS REVISED IN DECEMBER 1998 AND ANY REVISIONS THERETO, WHICH ARE HEREBY INCORPORATED INTO THIS CONTRACT IN THEIR ENTIRETY. A copy of the manual is available for review at the purchasing office, and can be obtained by calling the Division of Purchases and Supply (804) 786-3842, or by accessing the Department of General Services (DGS), Division of Purchases and Supply (DPS) Internet Home Page (www.dgs.state.va.us/dps). Any interpretation required by the State will be in the form of an amendment to the solicitation; SEE PARAGRAPH 11 BELOW. Oral explanations or instructions given before the award of the contract will not be binding. In any conflict arising between this solicitation and the Vendors' Manual, this solicitation shall prevail.

2. PREPARATION OF SOLICITATION

A. Bids shall be submitted on the forms furnished, and must bear an original signature by an individual authorized to bind the company submitting the bid. If erasures or other changes appear on the form, each erasure or change must be initialed by the person signing the bid. Telegraphic or facsimile bids will not be considered. Vendors may not submit multiple bids in a single envelope.

B. Vendors are required to enter their Federal Identification Number [FIN] in the upper right hand corner on Page 1, DIT Form 62. This number must correspond with the FIN number shown on Page 1 of the DIT Vendor Application For Registration Form submitted by a principal or officer of the firm submitting the bid. Failure to enter a number in the space provided or to provide a correct FIN number may delay award or result in DIT determining that the vendor is not registered to conduct business with DIT. It is the vendor's responsibility to provide the correct FIN number and to keep DIT updated as to any changes in vendor's status.

C. The bid form may provide for submission of a price or prices for one or more items. All prices shall be entered in the schedule; DIT Form 62A or 62B. Where the bid form explicitly requires that the vendor bid on all items (e.g., an all or none requirement), failure to do so will disqualify the bid. When submission of a price on all items is not required, vendor should insert the words "no bid" in the space provided for any item on which no price is submitted.

D. Additional bids may be submitted, when in the vendor's judgment they can provide more than one solution which meets the required specifications of the procurement. Additional bids shall be submitted on either a duplicate copy of the bid document or on plain paper and shall be clearly identified with the words "ADDITIONAL BID" written or printed on the face of each additional bid. Additional bids shall not be considered unless detailed specifications or descriptions sufficient to establish quality, utility and merit accompany the bid.

VENDORS SUBMITTING ADDITIONAL BIDS ARE REMINDED THAT THE TERMS AND CONDITIONS WHICH APPLY TO THE ORIGINAL BID SHALL ALSO APPLY TO THE ADDITIONAL BID AND ANY MODIFICATION TO TERMS AND CONDITIONS OF A SOLICITATION OR THE ADDITION OF RESTRICTIVE PROVISIONS BY A BIDDER SHALL BE CAUSE FOR REJECTION OF THE BID.

E. Modification of bids already submitted will be considered if received at the office designated in the invitation for bids before the time set for opening of bids.

3. SUBMISSION OF BIDS

TO BE CONSIDERED, THE BID MUST BE RECEIVED AT THE ADDRESS GIVEN IN BLOCK #6 OF THE SOLICITATION ON OR BEFORE THE DATE AND HOUR DESIGNATED. Vendors must pay particular attention to ensure that the bid is properly addressed. The State is not responsible if the bid is not properly addressed. The State is not responsible if the bid does not reach the destination specified by the date and time identified in block #8 page 1 of the Bid. Sealed bids received after the date and hour identified in block #8 are automatically disqualified, and will not be considered. All bids must be sealed, marked and addressed, to the address shown in block #6 of the Solicitation, and marked on the outside of the vendor's envelope as in the example below. Failure to do so may result in a premature opening of, or a failure to open, the bid.

From: Name of Vendor
Street or Box Number
City, State, Zip Code
Due Date Time
IFB No.

4. SPECIFICATIONS AND USE OF BRAND NAMES

Unless otherwise provided in the solicitation, the name of a certain brand, make or manufacturer does not restrict bids to the specific brand, make or manufacturer named. Any item which the State at its sole discretion determines to be the equal of that specified as defined in the Schedule, will be accepted. The award will be made to the lowest responsive and responsible bidder or offeror offering the functional equivalent to the brand name described in the specification. Thus, equivalent products of other manufacturers will be considered only if proof of equivalency is contained in or accompanies the bid.

5. LATE BIDS, MODIFICATIONS OF BIDS OR WITHDRAWALS OF BIDS

A. Any bids received at the office designated in block #6 of the Solicitation after the exact time specified for receipt will not be considered for award. (See Paragraph 4.10 of the Vendor's Manual for further discussion.)

B. A bid may be amended and/or withdrawn by a vendor if the office issuing the bid receives the request in writing before the date and hour set forth in the bid form. The request must be signed by a person authorized to represent the person or firm that submitted the bid. Submission of a subsequent bid shall normally constitute the withdrawal of any prior bid submitted by the same bidder or offeror on the same IFB.

6. PUBLIC OPENING OF BIDS

Bids will be publicly opened at the time and date specified on page 1 of the Solicitation document. The content of these solicitations will be made public in accordance with Paragraphs 1.9 and 2.4 of the Vendor's Manual. Bids will not normally be evaluated at the bid opening meeting. All bids will be opened at the location shown on page 1 of the solicitation.

7. SOLICITATION TERMS AND CONDITIONS

This solicitation/invitation for bid contains terms and conditions which shall govern the duties and responsibilities of both parties to any agreement which may be executed as a result of this solicitation/invitation for bid.

The terms and conditions contained herein are considered mandatory. ANY MODIFICATION, ADDITION, CLARIFICATION, OR CHANGE TO THESE TERMS AND CONDITIONS BY THE BIDDER SHALL CAUSE THE BID TO BE REJECTED.

8. AWARD OF CONTRACT

Bids shall be evaluated and the responsive and responsible bidder offering the lowest price will be awarded the Contract. The State reserves the right to reject any and all bids in whole or in part and to waive any informality in the bids.

9. AWARD NOTICES

Upon the completion of evaluation, the State will either post a NOTICE OF AWARD (NOA) or a NOTICE OF INTENT TO AWARD (NOITA). If a NOITA is used, the notice will be publicly posted ten days prior to the actual award date of the contract. All award notices will be posted on ASD's Web Page (HTTP://ASD.STATE.VA.US) and posted in ASD's lobby in written format.

A NOTICE OF INTENT TO AWARD OR A NOTICE OF AWARD will be mailed to any bidder submitting a self-addressed, stamped envelope with their bid.

NOTICES OF INTENT TO AWARD OR NOTICES OF AWARD will be posted in accordance with paragraph 6.3 of the Vendor's Manual.

TELEPHONIC REQUESTS FOR BID RESULTS WILL NOT BE HONORED.

10. FAILURE TO DELIVER

Failure to comply with the terms and conditions of the IFB or to deliver equipment, software or services identified in the solicitation at the price quoted may result in cancellation or rescission of the award/contract by the Commonwealth and may subject the Contractor to removal from DIT's Vendor Registration file and ruled ineligible to participate in DIT's (and other agencies and institutions information technology) procurements for a period of 12 months.

11. AMENDMENT OF SOLICITATION

Any amendment or change to this solicitation will be issued in writing and will identify the changes to be made in the bid. All amendments will be posted to the ASD's Web page at (http://asd.state.va.us) and posted in ASD's lobby in written format.

If the bid opening date is extended the new date and time will be clearly shown on the face of the amendment.

Bidders will be required to sign and return a copy of the amendment with their bid to indicate that they have received the document and are aware of the changes made.

12. ANTI-COLLUSION CERTIFICATION

By Bidder's signature on the face of this bid, Bidder certifies that this bid is made without prior understanding, agreement, or connection with any corporation, firm, or person submitting a bid for the same equipment, software, or services, and is in all respects fair and without collusion or fraud. Vendor understands collusive bidding is a violation of the Virginia Governmental Frauds Act and Federal Law and can result in fines, prison sentences, and civil damage awards. Bidder agrees to abide by all conditions of this bid and certifies that he or she is authorized to sign this bid for the bidder' firm.

13. DEMONSTRATIONS

The State reserves the right to require the Bidder to demonstrate to the satisfaction of the State, that the products offered will perform in a completely acceptable manner and to meet or exceed the specifications referenced in the solicitation. The demonstration site and time is subject to agreement between the State and Bidder. A Bidder refusing to demonstrate his products bid after determination that he is the apparent low responsive and responsible bidder may be removed from DIT's vendor registration file and ruled ineligible to participate in DIT's (and other agencies and institutions information technology) procurements for a period of 12 months.

14. PROTESTS OF AWARDS

All protests of awards shall be conducted in accordance with Chapter 9 of the Vendors Manual.

15. VENDOR REGISTRATION

AN AWARD WILL NOT BE MADE TO ANY BIDDER NOT REGISTERED WITH THE DEPARTMENT OF INFORMATION TECHNOLOGY (DIT). A completed registration form must be on file or received by DIT (Acquisition Services Division) not later than the award date. Call (804) 371-5900 to request a registration form.

16. CONTRACT

Any contract which is awarded as a result of this solicitation, offer and award shall be between DIT and the Contractor. No other agency, institution or public body may negotiate in any way with the vendor concerning the items identified in the schedule or any terms and conditions of the contract. All problems associated with the resulting contract shall be brought to the attention of the Contracts Manger, DIT.

Specifications - Any comments or questions concerning the specifications, terms and conditions or any note contained in this solicitation shall be submitted, in writing to the issuing office (See Block #6 DIT Form #62) at least ten (10) days prior to the closing date.

17. DRUG FREE WORKPLACE

Each of the following acts is prohibited by the Contractor or his/her employees performing service under the terms of a contract resulting from this solicitation.

a. Unlawful or unauthorized manufacture, distribution dispensing, possession or use of alcohol or other drugs at the workplace.

b. Impairment or incapacitation in the workplace for the use of alcohol or other drugs (except the use of drugs for legitimate medical purposes).

By submitting their bids, bidders certify that they understand these prohibitions, and if awarded a contract as the result of this solicitation, they will comply. They also understand that a violation of these prohibitions is a breach of contract and can result in default action.

18. TRADE SECRETS OR PROPRIETARY INFORMATION

Trade secrets or proprietary information submitted by a bidder in connection with a procurement transaction shall not be subject to public disclosure under the Virginia Freedom of Information Act; however, the bidder must invoke the protections of *Code of Virginia*, Section 11-52D, prior to or upon submission of the data or other materials, and must identify the data or other materials to be protected and state the reason why protection is necessary. **The proprietary or trade secret material submitted must be identified by some distinct method such as highlighting or underlining and must indicate only the specific words, figures, or paragraphs that constitute trade secret or proprietary information. The classification of an entire bid document, line item prices and/or total bid prices as proprietary or trade secrets is not acceptable and will result in rejection of the bid.**

CONTRACTUAL TERMS AND CONDITIONS
INVITATION FOR BID (IFB) #00-037

GENERAL PROVISIONS

1. SCOPE OF CONTRACT

The following paragraphs contain the Contractual terms and conditions which shall govern the sale of *radio and telecommunications equipment and antennas and accessory items*, (Hardware or Equipment) and Services identified in the Schedule herein, from the Contractor identified in block #9, page 1 of the Solicitation. All Hardware includes any software or firmware inherent to its operation. This Contract, or Agreement between the "Commonwealth", "State", or "DIT" and the Contractor may be used by "Governmental Entities" as described herein.

2. CONTRACTOR COMMITMENTS, WARRANTIES AND REPRESENTATIONS

Any commitment made by the Contractor within the scope of this Contract shall be binding upon Contractor. For the purposes of this Contract, a commitment by the Contractor includes:

a. Prices and options committed to remain in force over a specified period(s) of time;

b. Any written warranty or representation made by the Contractor in this solicitation as to hardware, or other physical design or functional characteristics of that which is offered;

3. INSTALLATION DATES

a. The Contractor shall deliver/install the requested Equipment, or Services ready for use, by the installation date (day, month, year) identified as the required delivery date (RDD) in the Schedule which is further defined as 60 days ARO.

b. Any amendment by the State to this Contract or any part thereof, may require the establishment of a new mutually agreed to required delivery date. The State may delay the installation date by notifying the Contractor at least ten (10) days before the required installation date.

c. If the Equipment or Services is not delivered/installed within the time specified in the Schedule, the State reserves the right to cancel the award of this Contract and/or terminate this Contract for default without further obligation, and award the solicitation to the next responsive and responsible bidder. Contractors are cautioned that failure to deliver/install the proposed Equipment as stated in response to a solicitation document may result in removal from DIT's Vendor Registration File as per Section 7.20 of the Division of Purchases and Supply's Vendor's Manual dated December 1998.

d. Neither the Contractor nor the State shall be responsible for delays resulting from acts beyond the control of each party. These include, but are not limited to, acts of God, riots, acts of war, fire, earthquakes, epidemics, or disasters.

4. RISK OF LOSS OR DAMAGE

The State is relieved from all risks of loss or damage until clear and unrestricted title is transferred to the Commonwealth of Virginia pursuant to Section 14 of this Contract.

5. TAXES - FEDERAL, STATE AND LOCAL

The Commonwealth of Virginia is exempt from Federal excise and all State and Local taxes; such taxes shall not be included in Contract prices. Tax exemption certificates will be furnished if requested by the Contractor.

6. NEW EQUIPMENT AND SUBSTITUTE EQUIPMENT

Unless otherwise specifically requested in the Schedule, all Equipment furnished under this Contract shall be new equipment and in current production

During the term of this Contract, the vendor is not authorized to substitute any item for that Equipment identified in the Schedule without the written permission of the Director, Acquisition Services Division, DIT. Violation of this condition shall be considered grounds for termination of the Contract.

7. PATENT/COPYRIGHT PROTECTION

Contractor, at its own expense, shall defend any suit brought against the Commonwealth for the infringement of patents, copyrights or trade secrets enforceable in the United States if the claim of infringement is alleged to relate to or arise from the Contractor's or Commonwealth's use of any equipment, software, materials or information prepared, developed or delivered in connection with performance of this Agreement. In such suit, Contractor shall indemnify the Commonwealth, its agents, officers and employees for any loss, liability or expense incurred as a result of such suit.

The purchasing agency shall notify the Contractor of such suit within a reasonable time after learning of it and shall give the Contractor the full right and opportunity to conduct the defense of the suit, subject however to the requirements of Section 2.1-122 and Section 2.1-127 of the Code of Virginia or any successor statute. If principles of governmental or public law are involved, the Commonwealth may, at its option and expense, participate in the defense of the suit.

The Contractor shall not be required to indemnify the Commonwealth for liability arising solely out of the Commonwealth's own specifications or design or solely from the combination of equipment or software furnished hereunder with any equipment or software not supplied by the Contractor.

If, any Product or Service becomes, or in the Contractor's opinion, is likely to become, the subject of a claim of infringement, Contractor may, at its option, provide noninfringing substitutes that are satisfactory to the Commonwealth, or at Contractor's option and expense, may obtain the right for the Commonwealth to continue the use of such Product or Service.

If the use of such equipment or software by the Commonwealth is prevented by permanent injunction or by Contractor's failure to procure the right for the Commonwealth to continue using the software, the Contractor agrees to take back the infringing equipment, software, materials or information and refund the total amount the Commonwealth has paid Contractor under this Agreement, less one half (1/2%) percent of the total paid for each month of use by the Commonwealth. This obligation is in addition to the obligations cited in the first four subparagraphs of paragraph 7. above.

8. NON-APPROPRIATION

All funds for payment of Equipment, or Services ordered under this Contract are subject to the availability of legislative appropriation for this purpose. In the event of nonappropriation of funds by the Legislature for the items under this Contract, the Commonwealth will terminate this Contract for those goods or Services for which funds have not been appropriated. Written notice will be provided to the Contractor as soon as possible after legislative action is completed.

If any purchases are to be supported by federal funding, and such funding is not made available, the Commonwealth may terminate this Contract for goods or services dependent on such federal funds without further obligation.

9. ASSIGNMENT

To the fullest extent permitted by law, the parties agree that Contractor's rights under this Agreement shall not be assignable, in whole or in part, to any other party without the Department of Information Technology's (DIT's) written consent, and that any purported assignment or transfer without such consent shall be null and void. If any law limits the right of the parties to prohibit assignment or nonconsensual assignments, the effective date of the assignment shall be as follows. The Contractor shall give the Contracts Manager, DIT prompt written notice of the assignment, signed by authorized representatives of both the Contractor and the assignee. This written notice shall be on DIT's "Assignment Notice / Payment Instruction" form and shall provide all information requested on that form. Copies of the form may be obtained from the Contracts Manager DIT. Upon DIT's acknowledgment of receipt of the properly executed form, the Assignee shall notify the Governmental Entity of the assignment and shall supply the affected party with a copy of the properly executed form. Any payments made prior to DIT's receipt of such notification and form shall not be covered by this assignment.

In the event DIT receives any notice from a third party claiming to be an assignee of any rights of the Contractor under this Agreement, Contractor agrees that payment or other performance in respect of those rights shall not be due until at least thirty days after the DIT's receipt of the notice required by the above paragraph or receipt of a similarly executed notice confirming the absence or revocation of the purported assignment. The Acquisition Services Division of DIT shall promptly notify the Contractor of any assignment notice it receives.

10. GOVERNING LAW

This Contract and any disputes arising hereunder shall be governed in accordance with the laws of the Commonwealth of Virginia and shall be deemed to have been executed and entered into within the Commonwealth of Virginia. Any litigation arising in connection with this Agreement shall be brought in the courts of the Commonwealth of Virginia. The Contractor shall comply with all applicable federal, state and local laws, rules and regulations.

If any term or provision of this Contract shall be found to be illegal or unenforceable, then, notwithstanding such provision, the remainder of this Contract shall remain in full force and effect, and such term or provision shall be deemed null and void.

11. HEADINGS NOT CONTROLLING

Headings used in this Contract are for reference purposes only and shall not be considered to be a substantive part of this Contract.

12. ENTIRE AGREEMENT

This Contract, the solicitation, bid response, solicitation instructions and all Equipment specifically listed in the Schedule, and the notes in the Schedule and all executed Orders, constitute the entire Agreement between the parties with respect to the subject matter of this Contract. All prior agreements, representations, statements, negotiations and undertakings are hereby superseded with respect to equipment acquired by the State under the terms and conditions of this Contract.

13. MODIFICATIONS

This Contract maybe modified in accordance with Section 11-55 of the Code of Virginia. Such modifications may only be made by the representatives noted below. No modifications to this Contract shall be effective unless it is in writing and signed by the duly authorized representative of both parties. No term or provision hereof shall be deemed waived and no breach excused unless such waiver or consent to breach is in writing. For purposes of the Contract, the only authorized representative for the Commonwealth shall be the individual identified in block #14 of this solicitation or his duly designated alternate, and for the Contractor the person identified in block #9 of the solicitation or his designee. Any Contract issued on a firm fixed price basis may not be increased more than twenty five percent (25%) or $10,000.00 whichever is greater, without the approval of the Governor of the Commonwealth of Virginia or his authorized designee.

14. TITLE

Clear and unrestricted title for any item of equipment purchased under this Contract shall pass to the Commonwealth of Virginia whenever the agreed to purchase price is paid.

15. PRICE PROTECTION/ADJUSTMENTS

All pricing as identified in the Schedule shall be honored for the first year of the Contract. All pricing increases shall be effective on a quarterly thereafter. All price increases are limited to a 6% cap annually. All price increases shall be reduced to a writing as a Modification to the Contract and executed by both parties.

The State will not pay any additional costs above those costs provided for in the Schedule identified herein. In no event may the amount of any Contract, without adequate consideration, be increased for any purpose.

Any price decrease effectuated during the Contract period by reason of market change shall be passed on to the Commonwealth of Virginia. This decrease will be effective on the date the price decrease is announced to the general public.

16. TERM

The initial Term of this Contract shall be from the date of award and continue for two (2) years. The Commonwealth may renew the Contract for three (3) additional one (1) year periods, at its sole discretion. The Commonwealth will notify the Contractor at least 30 days prior to expiration of the current term of its intent to review the Contract for additional periods.

17. VIRGINIA PUBLIC PROCUREMENT ACT

Employment Discrimination by Contractor Prohibited (Section 11-51, Code of Virginia).

a. During the performance of this Contract, the Contractor agrees as follows:

1) The Contractor will not discriminate against employee or applicant for employment because of race, religion, color, sex or national origin, or disabilities except where religion, sex or national origin is a bona fide occupational qualification reasonably necessary to the normal operation of the Contractor. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.

2) The Contractor, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, will state such Contractor is an equal opportunity employer.

3) Notices, advertisements and solicitations placed in accordance with federal law, rule or regulation shall be deemed sufficient for the purpose of meeting the requirements of this section.

b. The Contractor will include the provision of the foregoing paragraphs a.1, a.2 and a.3 in every subcontract or purchase order of over $10,000 so that the provisions will be binding upon each subcontractor or vendor.

18. ADDITIONAL CERTIFICATIONS

Contractor hereby certifies its compliance with the following:

a. Virginia Fair Employment Contracting Act.

b. Virginia Governmental Frauds Act.

c. Virginia Public Procurement Act.

d. Federal Immigration Reform and Control Act of 1986.

e. Virginians with Disabilities Act.

f. Americans with Disabilities Act.

g. Federal Civil Rights Act of 1964.

19. INVENTIONS AND COPYRIGHTS

The Contractor is prohibited from copyrighting any papers, reports, forms or other materials, and from obtaining any patent on any invention or other discovery resulting solely from its performance under the terms and conditions of this Contract.

20. CONTRACTUAL RECORDS

All Contractual books, records and other documents related to matters under this Contract shall be made available by Contractor to the State and its designated agents for a period of five (5) years after final payment for purposes of audit and examination.

Contractual records are hereby further defined as this Contract and all delivery/purchase orders, invoices or correspondence directly relating to this Agreement.

21. LIABILITY

Contractor shall maintain such personal injury and property damage liability insurance as necessary to protect itself from claims arising out of the performance of this Contract. The Contractor shall indemnify and hold harmless the State, its agencies, employees and designated representatives from any and all claims, suits, actions, liabilities and cost of any kind, including attorney's fees, for personal injury and damage to real or personal property arising from the acts or omissions of the Contractor, its agents, officers, employees or subcontractors. Nothing contained herein shall be deemed as an express or implied waiver of the sovereign immunity of the State, or pledge of the full faith and credit of the State.

Except as stated in this provision, in no event shall either party be liable to the other party for any indirect, special or consequential damages arising out of any breach of its obligations under this Agreement.

22. CONTINGENT FEE WARRANTY

The Contractor warrants that he/it has not employed or retained any person or persons not generally associated with Contractor for the purpose of soliciting or securing this agreement. The Contractor further warrants that he/it has not paid or agreed to pay any company or person any fee, commission, percentage, brokerage fee, gift, or any other consideration contingent upon the award or making of this agreement. For breach of one or both of the foregoing warranties, the Commonwealth shall have the right to terminate this agreement without liability, or in its discretion, to deduct from the agreed fee, payment or consideration, or otherwise recover, the full amount of said prohibited fee, commission, percentage, brokerage fee, gift, or contingent fee.

23. SITE PREPARATION

a. Equipment environmental specifications, if required, for the equipment to be delivered under this Contract shall be furnished in writing by the Contractor upon award. These specifications shall be in such detail to ensure that the equipment to be installed shall operate efficiently from the point of view of environment.

b. The State shall prepare the site at its own expense and in accordance with the equipment environmental specifications provided by the Contractor.

24. ACCEPTANCE, TESTING AND COMPLIANCE WITH SPECIFICATIONS

All materials, Equipment and Services are subject to inspection and testing by the State, and any which do not meet or exceed the specifications or other requirements of the Contract may be rejected. The State shall be given thirty (30) days from the completion of installation by the Contractor (or thirty (30) days after delivery if customer installed) to test, evaluate and accept the materials, Equipment and/or Services delivered or furnished under this Contract (provided that the using agency, in its sole discretion, may accept the same prior to expiration to the thirty (30) day period). If the Contractors materials, Equipment and/or Services fail to meet the Contract specifications or other requirements, including the specifications of the brand name (see paragraph 4 of the Solicitation Instructions), or those required by the Contractor's own technical documentation, then the same may be rejected and returned to the vendor. Such rejection will terminate this Contract and exempt the State from all costs incurred by the Contractor.

Acceptance shall be effective for the purpose of determining title to that which is delivered and for making payment, however, acceptance by the State following testing and evaluation during the thirty (30) day period shall not be conclusive that the materials, Equipment and/or Services conform in all respects to the Contract specifications and other requirements. In the event that nonconformance therewith is discovered by the State after acceptance, whether due to a latent defect or otherwise, the Contractor shall take whatever action is necessary to conform the materials, Equipment and/or Services to the Contract specifications and other requirements, including but not

limited to modification or replacement of the same. The Contractor's failure to do so shall constitute breach of Contract for which the State may exercise the remedies provided in the section herein entitled "Termination and Cancellation," in addition to and not in lieu of any other remedies available under Virginia law.

25. FIELD MODIFICATIONS AND/OR ENGINEERING CHANGES

Contractor sponsored modifications and/or engineering changes shall be made with the consent of the State at no additional charge for a period of one (1) year from the date of installation. The State reserves the right at all times to schedule these Contractor sponsored modifications and/or changes to minimize the impact on the daily operations of the State.

26. SUPPLIES

Authorized charges do not include operational supplies (e.g., paper, tape, etc.) unless such supplies are specifically identified in the Schedule. All supplies used by the State shall conform to the Contractor's published specifications provided to State at time of equipment installation. The State reserves the right to acquire such supplies from any Contractor of its choice.

27. WARRANTY

The Contractor is required to provide two types of Warranty Service. For all Handheld and Mobile Equipment complete with sundries and accessories, the Contractor shall provide depot (return to vendor) warranty services. For all other types of Equipment, the Contractor shall provide On-Site Warranty service.

a. ***For Handheld and Mobile Equipment***:
Contractor will provide depot warranty services (labor and parts) for a period of not less than twelve (12) months or such greater period as may be provided in the Schedule, beginning on the date of acceptance, at no cost to the State. Contractor shall act as sole point of contact for all units repaired under warranty. The Commonwealth shall send the Equipment to the Contractor, postage paid, and the Contractor shall repair or replace the Equipment and return to the Commonwealth, postage paid, within 7 days of receipt.

b. ***For all other Equipment – not Handheld and Mobile:***
Contractor will provide On-Site warranty (labor, travel and parts) for a period of not less than twelve (12) months or such greater period as may be provided in the Schedule, beginning on the date of acceptance, at no cost to the State. Contractor shall act as sole point of contact for all units repaired under warranty. All warranty services shall be provided during the Principal Period of Maintenance which is hereby defined as 8 a.m. to 5 p.m. Monday through Friday, State holidays excluded. The Contractor shall respond to all requests for warranty service and repair or replace the Equipment to a restored operation within twenty-four (24) hours after notification that a failure has occurred.

Prior to the expiration of the warranty period, whenever Equipment is shipped for mechanical repair or replacement purposes, the Contractor will bear all costs associated with returning the Equipment to the Contractor's repair facility. When repair of the Equipment is completed the Contractor shall

bear all costs associated with returning the Equipment to the State's original point of shipment. Cost of shipping includes but is not limited to, costs of packing, transportation, rigging, drayage and insurance for damage or loss. Contractor shall repair the Equipment or provide an interim replacement product, within 24 hours of notification that a malfunction exists. Any interim product(s) will be provided at no additional cost to State, until the original product is returned, in good working condition.

All parts used under this agreement must be new parts or refurbished parts certifiable as new. Parts which have been replaced shall become the property of the Contractor.

28. TERMINATION AND CANCELLATION

The Commonwealth shall have the unilateral right to terminate this Contract for Default, in the event that any one or more of the following events of default occur or continue during the term of this Agreement, (a) the vendor shall fail to deliver the Equipment or Services required by this Contract or (b) the vendor shall repeatedly fail to respond to requests for maintenance or other Services within the time limits set forth in the Contract or (c) the vendor shall breach any of the other terms set forth within this Agreement or (d) the vendor shall fail to cure any breach after receiving a "Show Cause Notice" identifying the failure, and providing the vendor ten (10) days to cure the failure/ nonperformance. If the vendor fails to answer the cure notice, or does not correct the deficiencies noted, the State may immediately terminate this Agreement or any individual Order for Default.

In such event the Commonwealth will only be liable for cost incurred to the date of termination. All costs of deinstallation and return of the equipment will be the vendor's expense.

The Commonwealth's failure to exercise its right to terminate for default under this provision shall not be construed as a waiver of its right to terminate, rescind or revoke this Contract in the event of any subsequent breach of any provisions of this Agreement.

29 FAILURE TO DELIVER

In the event the Contractor fails for any reason to deliver in a timely manner or according to Contract terms the items set forth in the Schedule, Commonwealth may, in its own discretion, give Contractor oral or written notice of such breach. Once notice by State is sent or given, State may immediately procure the items from another source. Once State has effected a purchase from an alternate source (in accordance with the Virginia Public Procurement Act) the parties agree that the State may charge-back Contractor, in which case Contractor agrees to reimburse State for any difference in cost between the original Contract price and the State's cost to cover from the alternate source. In no event shall State be held to pay Contractor any costs incurred by Contractor, including but not limited to ordering, marketing, manufacturing, or delivering the item(s) which are subject of the State's notice of breach. This remedy is in addition to and not in lieu of any other remedy the Commonwealth may have under this agreement and the laws of the Commonwealth of Virginia.

30. DISPUTES

Contractual claims whether for money or other relief, shall be submitted in writing no later than sixty (60) days after final payment; however, written notice of the Contractor's intention to file such a claim must be given at the time of the occurrence or beginning of the work upon which the claim is based. Nothing herein shall preclude a Contract from requiring submission of an invoice for final payment within a certain time after completion and acceptance of the work or acceptance of the goods. Pendency of claims shall not delay payment of amounts agreed due in the final payment. The public body will render a final decision in writing within thirty (30) days after its receipt of the Contractor's written claim.

A Contractor may not institute legal action prior to receipt of the purchasing agency's decision on the claim, unless that Agency fails to render such decision within thirty (30) days. The decision of the purchasing agency shall be final and conclusive unless the Contractor, within six (6) months of the date of the final decision on the claim, invokes appropriate action under Section 11-70, Code of Virginia or Administrative Appeals Procedure Section 11-71, Code of Virginia.

Any dispute, claim or cause of action filed by Contractor (or any party making such claim on behalf of or under the rights of Contractor, his agents or any subcontractor) shall be governed by Sections 11-69, 11-70, 11-71, Code of Virginia (1950), as amended, and any period of limitation set forth therein.

31. INVOICES

All invoices shall be rendered promptly after all Equipment covered by the invoice have been accepted. Invoices for Equipment maintenance shall be paid monthly in arrears. No invoice may include any costs other than those identified in the Schedule. Invoices shall provide at a minimum:

1 Type and description of the equipment or software;

2. Serial number, if any; 3. Charge for each item;

4. This Contract Number, and;

5. Contractor's Federal Identification Number (FIN);

32. PROMPT PAYMENT

Payment shall be due within thirty (30) days after (1) acceptance of all Equipment, (2) receipt of a correct invoice for such payment, and (3) when applicable, receipt of the payment instruction form referenced in the paragraph entitled ("Assignments"), whichever is latest. Where payment is made by mail, the date of postmark shall be deemed to be the date of payment. Any amounts due the Commonwealth under the terms of this Contract may be applied against Contractor's invoices with appropriate information attached.

In accordance with the Virginia Public Procurement Act, all proper charges for which payment is more than seven (7) days overdue shall accrue interest as provided in Sections 11-62.1 through 11-62.9 of the Code of Virginia. The rate of interest shall be determined in accordance with Section 11-62.5 of the Code of Virginia. In no event shall any interest penalty accrue, however, when payment is delayed because of a disagreement between the Commonwealth and the Contractor regarding the quantity, quality or time of delivery of any Product or Service or the accuracy or correctness of any invoice. The Contractor shall notify the fiscal officer of the Governmental Entity of all invoices that are in excess of thirty (30) days old.

33. PAYMENTS TO SUBCONTRACTORS

In accordance with Section 11-62.11 of the Code of Virginia, within seven days after receipt of amounts paid to the Contractor by the Commonwealth for work performed by a subcontractor, the Contractor shall

a. Pay the subcontractor for the proportionate share of the total payment received from the agency attributable to the work performed by the subcontractor, or

b. Notify the agency and subcontractor, in writing, of the Contractor's intention to withhold all or a part of the subcontractor's payment with the reason for nonpayment.

The Contractor shall pay interest to the subcontractor on all amounts owed by the Contractor that remain unpaid after seven days following receipt by the Contractor of payment from the Commonwealth for work performed by the subcontractor, except for amounts withheld as allowed in (b) above. The Contractor shall provide its federal employer identification number (or social security number, if Contractor is an individual) to the Commonwealth as required by Section 11-62.11 (2) of the Code of Virginia. Unless otherwise provided under the terms of this Contract, interest shall accrue at the rate of one percent per month. The Contractor shall include in each of its subcontracts a provision requiring each subcontractor to be subject to the same payment and interest requirements with respect to each lower-tier subcontractor. Nothing in this paragraph shall be construed as creating any obligation on the part of the Commonwealth or as authorizing any additional charge to the Commonwealth.

34. THIRD PARTY BILLING

All goods or services provided under this Contract, that are to be paid for with public funds, shall be billed by the Contractor at the Contract price, regardless of which Commonwealth Entity is being billed.

35. CREDITS

Any credits due the State under the terms of this Contract may be applied against Contractor's invoices with appropriate information attached.

36. TRANSPORTATION AND PACKING OF EQUIPMENT

All shipments to the Commonwealth Entity's site(s) shall be made at the Contractor's expense. The Contractor shall make all arrangements for transportation and shall notify the receiving agency or institution upon shipment.

37. SOFTWARE/FIRMWARE

For any software/firmware that is included in any Equipment or Hardware supplied by the Contractor, the Contractor represents and warrants that it is the sole owner of the software/firmware product or, if not the owner, has received all proper authorizations from the owner to license the software/firmware product, and has the full right and power to grant the rights contained in this Contract. Contractor further warrants and represents that the software/firmware product is of original development, and that the package and its use will not violate or infringe upon any patent, copyright, trade secret or other property right of any other person.

38. TERM OF LICENSE

For any software/firmware that is included in any Equipment or Hardware supplied by the Contractor, the license(s) are supplied on a perpetual license basis and shall continue in perpetuity until canceled by the State or unless terminated in accordance with the provisions of this Contract. The license(s) granted to the State are for the use of the software/firmware product at the using agency's computing facilities (site) and on the Equipment or for the purpose identified in the Schedule.

39. TERMS OF USE

The State's rights in computer software/firmware developed at private expense may be restricted by the Contractor in accordance with this Contract. As a minimum, however, the State shall have:

a. Unlimited use of such software/firmware on the equipment for which it is acquired and any future upgrades of such equipment;

b. Use of such software/firmware with a backup system if the system(s) for which or with which it was acquired is inoperative because of a malfunction, or during an emergency, or the performance or engineering changes or changes in features or model;

c. The right to use such software/firmware at any state installation to which the computer(s) may be transferred by the State;

d. The right to copy such computer programs for safekeeping (archives) or backup purposes;

40. EQUIPMENT REPLACEMENT

In the event that the Equipment furnished under this Agreement experiences continual maintenance downtime, while under maintenance and as a result the total system is inoperative in excess of 5% of total time available for daily service (e.g., 45 hours per week, 180 hours per month, 5% = 9 hours per month) for three consecutive calendar months, the State reserves the right to require the Contractor to replace the machine at no cost to the State. The replacement machine/device shall be installed no later than thirty (30) days after the State requests the Contractor to provide a replacement.

41. REPAIR PARTS

All parts used under this agreement must be new parts or refurbished parts certifiable as new. Parts, which have been replaced, shall become the property of the Contractor.

42. RECONDITIONING

Contractor stipulates that the equipment provided under this agreement will not require reconditioning when such equipment has been under warranty or constant maintenance agreement since the initial date of installation.

43. MALFUNCTION REPORTS

The Contractor shall furnish a signed malfunction report to the user upon completion of each maintenance call. The report will list as a minimum all corrective action taken, parts used, and number of hours required to repair the equipment.

44. CONTRACTOR'S REPORT OF SALES

The Contractor must report the quarterly dollar value, in U.S. dollars and rounded to the nearest whole dollar, of all sales under this Contract by calendar quarter; i.e., January through March, April though June, July through September, and October through December. The dollar value of a sale is the price paid by the user for products and services on a Contract order as recorded by the Contractor. The reported Contract sales value must include the Industrial Funding Adjustment, as delineated in paragraph entitled "Industrial Funding Adjustment". The Contractor shall provide this report in hard copy to the Controller, DIT, and a copy of the report to the Contracts Manager, DIT, both within 30 days after the end of each quarterly reporting period as defined herein. The report must show each individual item and quantities purchased and the purchaser. The report is required to be hard copy. DIT may at a later time, agree to an electronic version of the report, however, in lieu of any express agreement by both parties as to the electronic format, the Commonwealth will only accept a hardcopy version. The Contractor shall define "sale" prior to the first reporting period and then shall maintain that definition through out the term of this Agreement. Sale may be defined as; 1) when the Commonwealth pays the purchase price, or 2) when the Commonwealth accepts the Products or 3) other as defined by the Contractor.

45. INDUSTRIAL FUNDING ADJUSTMENT

The Contractor must pay DIT, an Industrial Funding Adjustment (IFA). The Contractor must remit the IFA within 30 days after the end of each quarterly reporting period as established in the clause entitled "Contractor's Report of Sales". The IFA equals two percent (2%) of the total quarterly sales reported. Contractor shall remit the IFA together with a copy of the Contractor's Report of Sales as delineated in the above paragraph. The IFA reimburses the Commonwealth and defrays the costs for IT procurement and the administration of the subsequent awards. The IFA amount due must be paid by check with identification of "Contract number", "report amounts", and "report period", on either the check stub or other remittance material. DIT may at its discretion, agree to an electronic funds transfer, in lieu of a check, however in the absence of an express written agreement from DIT that validates agreement, then the payment shall be made by check as described herein made payable to the Controller, DIT.

If the full amount of the IFA is not paid within 30 calendar days after the end of the applicable reporting period, it shall constitute a Contract debt to the Commonwealth of Virginia, and the State may exercise all rights and remedies available under law. Failure to submit sales reports, falsification of sales reports, and or failure to pay the IFA in a timely manner may result in termination or cancellation of this Contract. Willful failure or refusal to furnish the required reports, falsification of sales reports, or failure to make timely payment of the IFA constitutes sufficient cause for terminating this Contract for default.

It is the intent of the Commonwealth to capture 2% of all sales, including temporary reduced pricing, fire sales, one time sales, trade ins, promotional items that have been marked down and all sales to the Commonwealth under this Agreement.

46. NONVISUAL ACCESS TO TECHNOLOGY:

All information technology which, pursuant to this Agreement, is purchased or upgraded by or for the use of any State agency or institution or political subdivision of the Commonwealth (the "Technology") shall comply with the following nonvisual access standards from the date of purchase or upgrade until the expiration of this Agreement:

(i) effective, interactive control and use of the Technology shall be readily achievable by nonvisual means;

(ii) the Technology equipped for nonvisual access shall be compatible with information technology used by other individuals with whom any blind or visually impaired user of the Technology interacts;

(iii) nonvisual access technology shall be integrated into any networks used to share communications among employees, program participants or the public: and

(iv) the technology for nonvisual access shall have the capability of providing equivalent access by nonvisual means to telecommunications or other interconnected network services used by persons who are not blind or visually impaired.

Compliance with the foregoing nonvisual access standards shall not be required if the head of the using agency, institution or political subdivision determines that (I) the Technology is not available with nonvisual access because the essential elements of the Technology are visual and (ii) nonvisual equivalence is not available.

Installation of hardware, software, or peripheral devices used for nonvisual access is not required when the Technology is being used exclusively by individuals who are not blind or visually impaired, but applications programs and underlying operating systems (including the format of the data) used for the manipulation and presentation of information shall permit the installation and effective use of nonvisual access software and peripheral devices.

If requested, the Contractor must provide a detailed explanation of how compliance with the foregoing nonvisual access standards is achieved and a validation of concept demonstration.

The requirements of this Section (55) shall be construed to achieve full compliance with the Information Technology Access Act, 2.1-807 through 2.1-811 of the Code of Virginia.

LOT 1
RADIOS, TWO WAY
HIGH BAND, BASE STATION, REMOTE
100 WATTS, TONE CONTROLLED
SPECIFICATION AND BID SHEET

Item 1. Radio, two-way, VHF (15O-174 MHz), remote. Base station, tone controlled, min. R.F. power output 1OO watts, two-channel capability with channel 1 active. Purchase order to specify frequency. Channel 2 blank or as specified on purchase order. Shall have continuous tone control squelch at a frequency to be specified on purchase order, continuous tone control squelch monitor function. Shall have intercom, AC line surge protection, phone line surge protection and shall be housed in an indoor floor type of cabinet. Unit shall have a frequency stability on both transmit and receive of ±.OOO5% (-3O C. + 6O C.) unit must have time out timer. Unit to be capable of both 30 and 15 Khz (11KOF3E) operation. Ericsson GE Mastr III, Motorola QUANTAR, Midland Tech III or approved equal.

State Manufacturer: COM-NET ERICSSON

Model SXHQC1 $ 5943.03 /each

Required Additional Features:

Item 2. - Transmitter frequency determining device for each additional channel.

Model INCLUDED $ N/C /each

Item 3. - Receiver frequency determining device for each additional channel.

Model INCLUDED $ N/C /each

Item 4. - Antenna groundplane, unity gain, omnidirectional with mounting clamps. Decibel Product DB-201 or approved equal.

Model 7557 $ 243.78 /each

Item 5. - Antenna, coaxial, omnidirectional with mounting clamps. Decibel Product DB-205 or approved equal.

Model 7596 $ 423.30 /each

Item 6. - Antenna, omnidirectional, 6dB gain. Decibel Product DB-224 or approved equal.

Model 7567 $603.84 /each

Item 7. - Antenna, 5dB gain with mounting clamps. Celwave PD200 or approved equal.

Model PD200 $ 561.00 /each

Item 8. - Cable, 1/2", jacketed heliax type copper inner and outer conductors

Model 7722 $ 3.69 PER FOOT /each

Item 9. - Connector kit for use with above heliax cable.

Model 7723/24 $ 75.48 /each

Item 10.- Ground strap kit.

Model 7740 $ 23.46 /each

Item 11.- Receiver, second unit, to be single frequency, have volume control, squelch and be identical in all performance specifications to the above station receiver, unit to have antenna matching device. Receiver includes notch filter, line response compensator and squelch operated relay.

A. Tone Squelch

Model SRHN01 $ 2002.77 /each

B. Carrier Squelch

Model INCLUDED $ N/C /each

Item 12. - Console, remote, tone controlled, 1TX-1RX, for use with above base station and with volume control, continuous tone control line and power line surge protection.

Model 24-66H $ 1103.64 /each

A. Intercom	$ N/C	/each
B. 2Tx - 2Rx Control	$ N/C	/each
C. 12/24 Hour Clock	$ 166.26	/each
D. Parallel Transmit Indicator with Notch Filter	$ 155.04	/each
E. Supervisor Control	$ 78.54	/each
F. Wall mount Bracket	$ 59.16	/each
G. DTMF encoder with Keypad	$ 281.52	/each

Item 13. - Furnish outdoor pole mounted cabinet in lieu of indoor floor mount cabinet.

Model SXCA1X $ 1292.34 /each
*NOTE: HOUSES MIII ONLY, NO SPACE FOR AUX RCVR.

Item 14. - Warranty, one year parts and labor, at locality/agency.

Base Station	$ N/C	/yr.
Console, remote, tone controlled	$ N/C	/yr.
Deskset, remote, tone controlled	$ N/C	/yr.

Item 15. - I.D., automatic, CW

Model INCLUDED $ N/C /each

Item 16. - Test speaker and microphone.

Model SXMC3B $ 46.41 /each

Item 17. - Deskset, tone controlled, for use with above station. Unit to have volume control, handset, power line and phone line surge protection.

Model 24-66H $ 1103.64 /each

1. Notch filter	$ 155.04	/each
2. Parallel Transmit Light	$ N/C	/each

Item 18. - DTMF decoder

Model D2MC5N $ 124.95 /each

Item 19. - Digital CTCSS

Model INCLUDED $ N/C /each

Award based on Items 1-19 $ 14,446.89

OPTIONAL FEATURES:

Item 20. – Metering panel or kit with meter(s).

Model NO BID $ /each

LOT 2
RADIOS, TWO-WAY REPEATERS, HIGH BAND 100 WATTS
SPECIFICATION AND BID SHEET

Item 1. Radio, two-way, repeater, VHF (150-174 MHz), min. R.F. power output 100 Watts, single duplex channel. Frequency to be specified on purchase order. Shall have continuous tone control squelch frequency to be specified on purchase order. Shall be mounted in an indoor floor mounted cabinet min. 37" high and shall also house the Duplexer, space permitting. Unit shall have a frequency stability on both transmit and receive of ±.OOO5% (-3OC. +6OC.), unit to have time out timer. Unit to be capable of both 30 and 15 Khz (11KOF3E) operation. Ericsson GE Mastr III, Motorola QUANTAR, Midland Tech III or approved equal.

State Manufacturer: COM-NET ERICSSON

Model SXHMCX $ 5304.00 /each

Required Additional Features:

Item 2. - Antenna, omnidirectional, unity gain, with mounting clamps. Decibel Product DB-201 or approved equal.

Model 7557 $ 243.78 /each

Item 3. - Antenna, coaxial, omnidirectional with mounting clamps. Decibel Product DB-205 or approved equal.

Model 7596 $ 423.30 /each

Item 4. - Antenna, omnidirectional, 6.OdB gain, with mounting clamps. Decibel Product DB-224 or approved equal.

Model 7567 $ 603.84 /each

Item 5. - Antenna, 5dB gain with mounting clamps. Celwave PD200 or approved equal.

Model PD200 $ 561.00 /each

Item 6. - Duplexer for use with above repeater, 150-174 MHz bandpass, suitable for transmit-receive frequency separation of three (3) MHz or greater.

Model SXDU1J $ 1830.90 /each

Item 7. - Cable, 1/2" jacketed heliax type, 5O Ohms impedance, copper inner and outer conductors.

Model 7722 $ 3.69 / per foot

Item 8. - Connector, kit for use with above heliax cable.
Model 7723/24 $ 75.48 /each

Item 9. - Ground, strap kit.

Model 7740 $ 23.46 /each

Item 10. - Timer deletion.

Model INCLUDED $ N/C /each

Item 11.- Console, remote, tone, controlled, for use with above station if equipped with remote panel, console to have volume control, continuous tone control squelch monitor switch, desk microphone, and control line and power line surge protection.

Model 24-66H $ 1103.64 /each

A. Intercom	$N/C	/each
B. Repeater On-Off Control	$N/C	/each
C. 12/24 Hour Clock	$166.26	/each
D. Parallel Transmit Indicator	$155.04	/each
E. Supervisor Control	$78.54	/each
F. Wall mount Bracket	$59.16	/each
G. DTMF encoder with keypad	$281.52	/each

Item 12. - Deskset, tone controlled, for use with above station. Unit to have volume control, handset, power line and phone line surge protection.

Model 24-66H $ 1103.64 /each

1. Notch filter	$ 155.04	/each
2. Parallel Transmit Light	$ N/C	/each

Item 13. - Panel, remote, tone controlled for above repeater with continuous tone control squelch monitor function, repeater disable function, intercom, and phone line surge protection.

Model INCLUDED $ N/C /each

Item 14. - Deletion of continuous tone control squelch (Credit).

Model INCLUDED $ N/C /each

Item 15. - Warranty, one-year parts and labor. at locality/agency:

Repeater with duplexer $ N/C /yr.
Console, remote, tone controlled $ N/C /yr.
Deskset, remote, tone controlled $ N/C /yr.

Item 16. - I.D., automatic, CW

Model INCLUDED $ N/C /each

Item 17. - Test speaker and microphone.

Model SXMC3B $ 66.03 /each

Item 18. - DTMF decoder.

Model D2MC5N $ 124.95 /each

Item 19. - Digital CTCSS

Model INCLUDED $ N/C /each

Item 20. - Duplexer, 150-174 MHz bandpass-reject, suitable for transmit-receive frequency separation of three hundred (300) KHz or greater.

MODEL DB4062/W $2306.48

Award based on Items 1-20 $14,670.02

OPTIONAL FEATURES:

Item 21.- Metering panel or kit with meter(s)

Model NO BID $ /each

Item 22. - High power option, increase 100 watt repeater to 250 watts or greater RF power output.

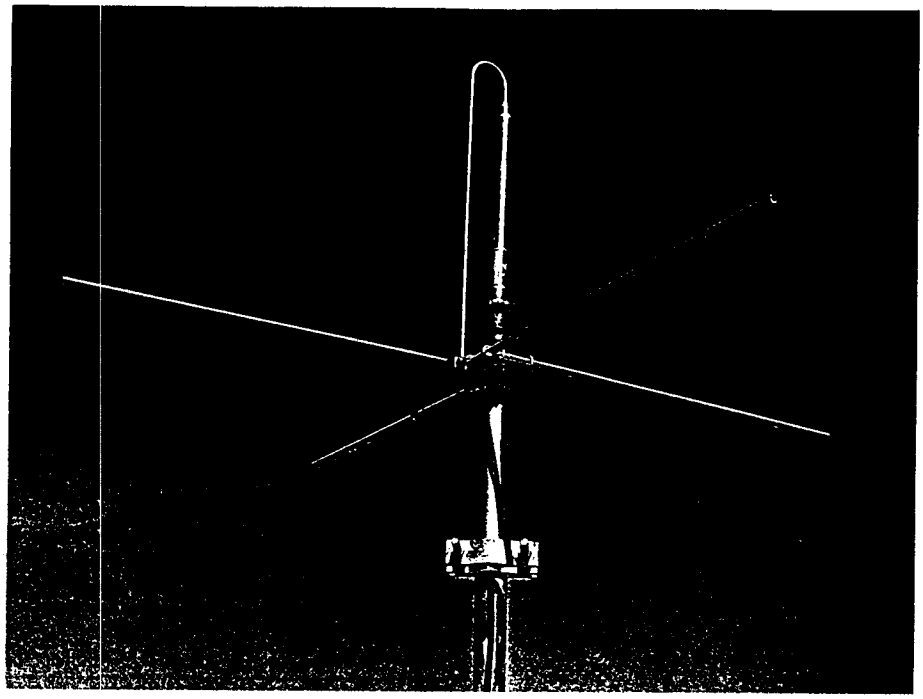
Model NO BID $ /each

Award based on Total for Lot 15 $

DB2U1 GROUND PLANE OMNI ANTENNA UNITY GAIN, 30-174 and 220-512 MHz

- **Very popular** - Heavy duty, light weight antenna is one of our most widely used.
- **Unique Design** - Features a new approach to the feeding of the insulated portion of the radiator.
- **Moisture Resistant** - 50-ohm feed-through connector is encapsulated in a moisture and corrosion proof molded epoxy insulator.
- **Cut and Tested** - The radiating element and ground radials are cut to frequency and tested at the factory for minimum VSWR. Uncut models for 30-50, 144-174 and 406-512 MHz are optional. Cutting chart is included.
- **Lightning Resistant** - Constructed of metal with all elements operating at DC ground.
- **Protected Lead** - A male-to-female connection is weather protected but can be replaced if necessary.
- **New** - 30-50 MHz models have galvanized steel support pipe.
- **Easy Mounting** - Galvanized steel DB365-OS Mount is furnished for mounting atop a tower, pole or building

Ordering Information - Use model number or correct frequency or specify uncut model and frequency range, also termination if non-standard. Order jumper cable separately, if desired.

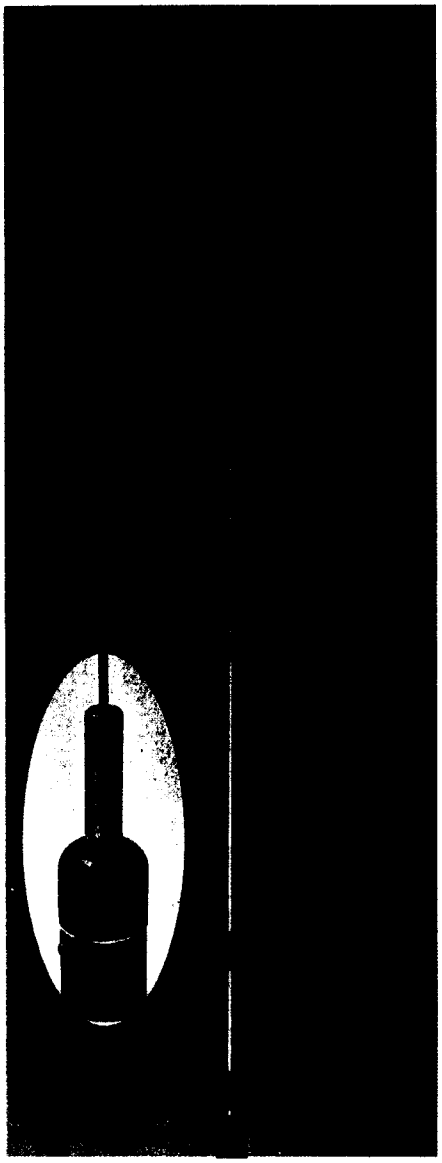


Electrical Data	
Frequency Ranges – MHz A = 30-33, B = 33-37, C = 37-42, D = 42-50, E = 60-88, F = 100-144, G = 144-150, H = 150-174, J = 225-406, JJ = 220-222, K = 406-512	Uncut models: L = 30-50, M = 144-174, N = 406-512
Bandwidth	2% of frequency
VSWR	1.5 to 1 or less
Nominal impedance – ohms	50
Gain (over half-wave dipole) – dB	Unity
Maximum power input – watts	500
Vertical beamwidth (half power points)	78°
Lightning protection	Direct ground
Standard Termination: Captive Type N-male to end of flexible lead. Other fittings are available on special order. If UHF connector is required, an adapter is provided.	

144-512 MHz antennas can be shipped by UPS.

Mechanical Data				
	35 MHz	50 MHz	150 MHz	450 MHz
Radiator (aluminum) – in. (mm)	.875 (22.23) OD with .125 (3.18) wall & .375 (9.35) OD solid rod	.875 (22.23) OD with .125 (3.18) wall & .375 (9.35) OD solid rod	.875 (22.23) OD with .125 (3.18) wall & .375 (9.35) OD solid rod	.875 (22.23) OD with .125 (3.18) wall & .375 (9.35) OD solid rod
Ground rods (aluminum) – in. (mm)	.5 (12.7) OD solid rod tapered to .250 (6.35) OD	.5 (12.7) OD solid rod tapered to .250 (6.35) OD	.5 (12.7) OD solid rod	.5 (12.7) OD solid rod
Support pipe – in. (mm)	1.31 (33.34) OD, 24 (609.6) length	1.31 (33.34) OD, 24 (609.6) length	1.31 (33.34) OD, 12 (304.8) length	1.31 (33.34) OD, 12 (304.8) length
Maximum exposed area (flat plate equivalent) – ft² (m²)	1.1 (.102)	0.8 (.074)	.4 (.037)	.3 (.028)
Wind rating:				
Survival without ice – mph (km/hr)	93 (150)	122 (196)	over 125 (201)	over 125 (201)
Survival with .5" (12.7 mm) radial ice – mph (km/hr)	51 (82)	65 (105)	over 125 (201)	over 125 (201)
Lateral thrust at 100 mph (161 km/hr) – lbf (N)	44 (195.7)	32 (142.3)	16 (71.2)	12 (53.4)
Overall length – in. (mm)	101 (2.57)	78 (1.98)	30 (.76)	19 (.48)
Height (above base plate) – in. (m)	77 (1.96)	54 (1.37)	18 (.45)	6.5 (.17)
Maximum width (horizontal) – in. (m)	216 (5.49)	151 (3.84)	49 (1.24)	15 (.381)
Net weight (w/clamps) – lbs. (kg)	25 (11.34)	23 (10.43)	10 (4.54)	6 (.152)
Shipping weight (w/clamps) – lbs. (kg)	35 (15.88)	31 (14.06)	14 (6.35)	9 (.229)
Mounting clamps (Galvanized steel)	DB365-OS	DB365-OS	DB365-OS	DB365-OS

DB205 COAXIAL ANTENNA UNITY GAIN, 33-174 MHz

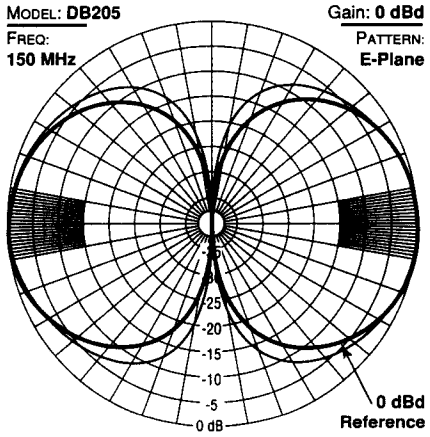


An excellent performer in extreme conditions, the DB205 is a heavy-duty unity gain omni antenna for 33-174 MHz. Models are cut to frequency and tested at the factory; however, uncut models are available.

- **Rugged** - Absorbs severe vibration and withstands rough handling; ideal for oil well drilling and similar applications.
- **Effective Design** - Includes a coaxial half-wave dipole antenna with an upper quarter-wave whip radiator, a center insulator and lower quarter-wave skirt radiator, isolated from the antenna support pipe.
- **Tough Insulator** - Molded of durable epoxy and virtually unbreakable.
- **Moisture Resistant** - A feed-through connector and top mounting stud are molded into the insulator, which also simplifies the replacement of the radiator or feeder cable.
- **Enduring Metals** - The upper radiating element is spring-tempered stainless steel, the lower skirt is non-corroding brass.
- **Easy Mounting** - Galvanized steel DB365-OS Mount is furnished for mounting atop a tower, pole or building.

Ordering Information - Use model number for correct frequency and specify termination if non-standard. Order jumper cable separately, if desired.

Models F and M are UPS Shippable.



Electrical Data	
Frequency Ranges – MHz	A = 33-50, B = 50-72, C = 72-88, E = 100-144, F = 144-175
	Uncut models: L = 33-50, M = 150-174
Bandwidth	2% of frequency
VSWR	1.5 to 1 or less
Nominal impedance – ohms	50
Gain (over half-wave dipole) – dB	Unity
Maximum power input – watts	500
Vertical beamwidth (half power points)	78°
Lightning protection	Direct ground
Standard Termination: Captive Type N-Male attached to end of flexible lead. Other fittings are available on special order. If UHF connector is required, an adapter is provided.	

Mechanical Data	35 MHz	50 MHz	75 MHz	160 MHz
Whip radiator	17-7 PH stainless steel rod	17-7 PH stainless steel rod	17-7 PH stainless steel rod	17-7 PH stainless steel rod
Whip insulator	Molded epoxy	Molded epoxy	Molded epoxy	Molded epoxy
Skirt – in. (mm)	Brass, 2 (50.8) diameter	Brass, 2 (50.8) diameter	Brass, 2 (50.8) diameter	Brass, 2 (50.8) diameter
Support pipe – in. (mm)	Galvanized steel, 1 (25.4) dia., 24 (609.6) or more available for mounting	Galvanized steel, 1 (25.4) dia., 24 (609.6) or more available for mounting	Aluminum, 1 (25.4) dia., 24 (609.6) or more available for mounting	Aluminum, 1 (25.4) dia., 24 (609.6) or more available for mounting
Maximum exposed area (flat plate equivalent) – ft² (m²)	1.2 (.11)	1.0 (.09)	0.7 (.07)	.3 (.03)
Lateral thrust at 100 mph (161 km/hr) – lbf (N)	48 (213.5)	40 (180)	28 (124.5)	12 (53.4)
Bending moment, 12' (3.66 m) below skirt, at 100 mph (161 km/hr) – ft. lbs. (kg m)	188 (26.02)	135 (18.68)	50 (6.92)	19 (2.63)
Wind rating:				
Survival without ice – mph (km/hr)	over 110 (177)	over 125 (201)	over 125 (201)	over 125 (201)
Survival with .5" (12.7 mm) radial ice – mph (km/hr)	110 (177)	over 125 (201)	over 125 (201)	over 125 (201)
Overall length – in. (mm)	217 (5511.8)	206 (5232.4)	119 (3022.6)	71 (1803.4)
Net weight (w/clamps) – lbs. (kg)	38 (17.24)	36 (16.33)	27 (12.25)	19 (8.62)
Shipping weight (w/clamps) – lbs. (kg)	52 (23.59)	50 (22.68)	35 (15.88)	26 (11.79)
Mounting clamps (Galvanized steel)	DB365-OS	DB365-OS	DB365-OS	DB365-OS

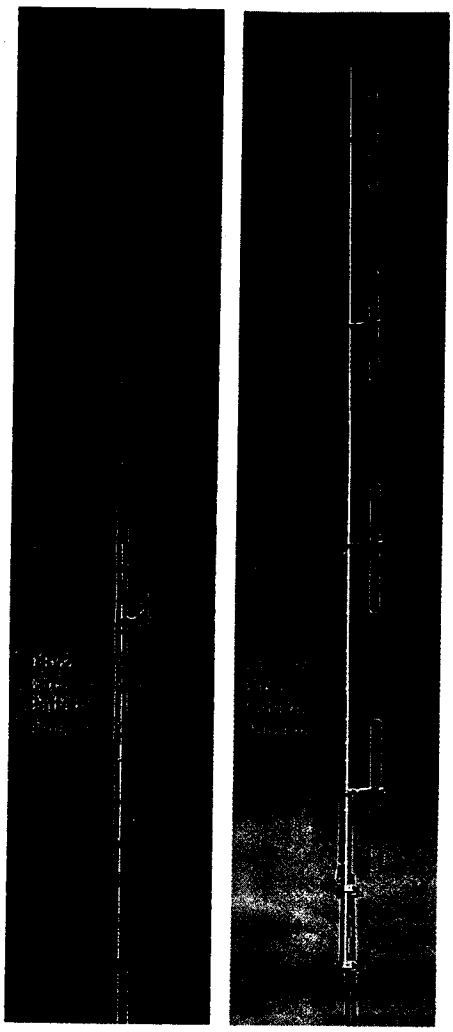
DB22[illegible] BROAD BAND ANTENNA
6 or 9 dB GAIN, 138-174 and 220-222 MHz

This popular antenna is available with four folded dipoles for high gain and broad bandwidth.

Broad Response - 10 MHz bandwidth provides optimum performance in single or multi-frequency systems, on both transmit and receive.

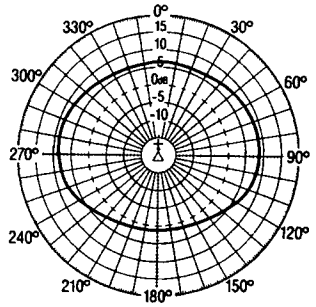
- **Circular Pattern** - DB224 has four elements positioned evenly, every 90 degrees around the mast, for omni pattern.
- **Offset Pattern** - DB224E comes with four elements aligned collinearly on the same side of the mast for maximum directional gain.
- **Dual Version** - Two antennas on the same mast are fed and operated separately, providing 3 dB omni or 6 dB directional patterns.
- **Two-Piece Mast** - For ease of shipment and handling, the mast is made in two sections. A unique center splice assures proper alignment.
- **Lightning-Resistant** - The radiators operate at DC ground, and the aluminum mast with its pointed cap provides a low resistant discharge path to the tower or ground system.
- **For Air Shipment** - Model DB224X has a shortened mast, 124" (3150 mm).

Ordering Information - Use model number for correct frequency and specify termination if non-standard. Add E for offset pattern, S for dual omni or ES for dual offset pattern. DB365-OS Mounting Clamps are included. For side mounting order DB5001 Side Mount Kit. For Stabilizer Kit, order 12088 (four required). For shortened mast, order DB224X. Order jumper cable separately, if desired.

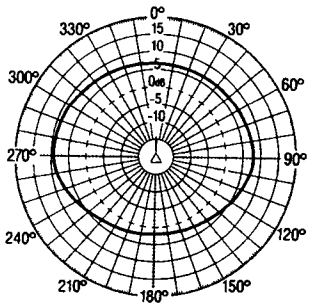


Side Mounting

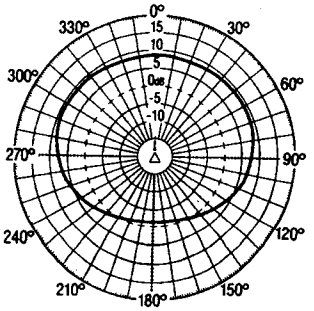
The patterns indicate the typical pattern shape of the antenna side mounted on a tower with an 18" to 24" (457.2 to 609.6 mm) face.



DB224 (omni) mounted on side of tower

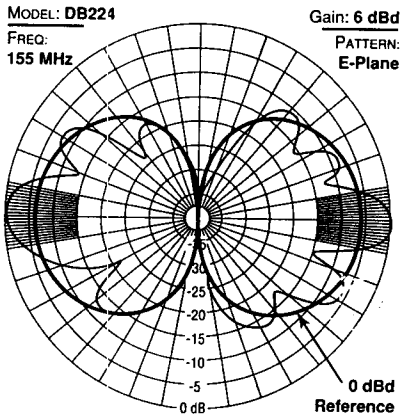


DB224E elements pointed toward the tower



DB224E elements pointed away from the tower

DB224 Vertical Pattern



Electrical Data	
Frequency Ranges* – MHz	A = 150-160, B = 155-165, C = 164-174, E = 138-150, J = 276-285, JJ = 220-222
Bandwidth (150-174 MHz) – MHz	10
VSWR	1.5 to 1 or less
Nominal impedance – ohms	50
Gain (over half-wave dipole)	
Omni pattern – dB	6.0
Offset pattern – dB	9.0
Maximum power input – watts	500
Vertical beamwidth (half power points)	16°
Decoupling between antennas (split models) – dB	35 minimum
Lightning protection	Direct ground
Standard Termination: Captive Type N-Male attached to end of flexible lead. Other fittings can be supplied on special order. If UHF connector is required, an adapter is provided.	

*Special frequencies are available; contact factory for details.

Mechanical Data	
Mast – upper (aluminum) – in. (mm)	1.75 (44.45) OD with .062 to .125 (1.57 to 3.18) wall
Mast – lower (aluminum) – in. (mm)	2 (50.8) OD with .125 to .187 (3.18 to 4.75) wall
Radiating elements (aluminum) – in. (mm)	.5 (12.7) OD with .058 (1.47) wall
Maximum exposed area (flat plate equivalent) – ft² (m²)	3.15 (.292)
Lateral thrust at 100 mph (161 km/hr) – lbf (N)	126 (560.5)
Wind rating:*	
Survival w/o ice – mph (km/hr)	100 (161)
Survival with .5" (12.7 mm) radial ice – mph (km/hr)	74 (119)
Overall length (150-174 MHz) – in. (mm)	255 (6477)
Shipping length – in. (mm)	148 (3759)
Net weight (w/clamps)– lbs. (kg)	32 (14.51)
Shipping weight (w/clamps) – lbs. (kg)	48 (21.77)
Mounting clamps (Galv. steel)	DB365-OS

*Top mounted antenna. Wind rating is greatly increased when antenna is side mounted.

Fiberglass Collinear Antenna

PD200*

5.8 dBd Gain Stationmaster™

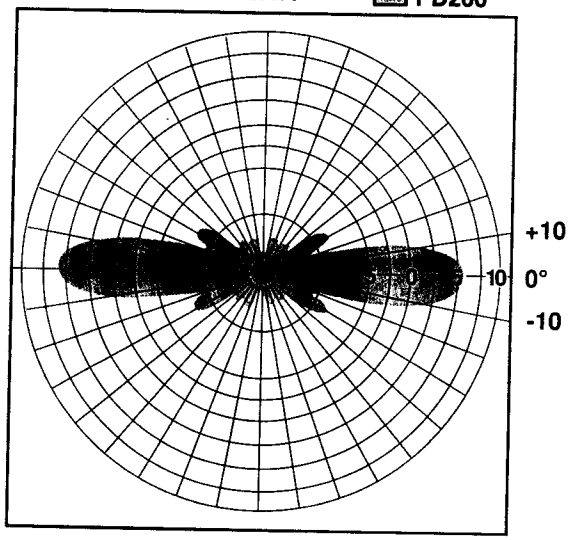
***Specify exact frequency.**

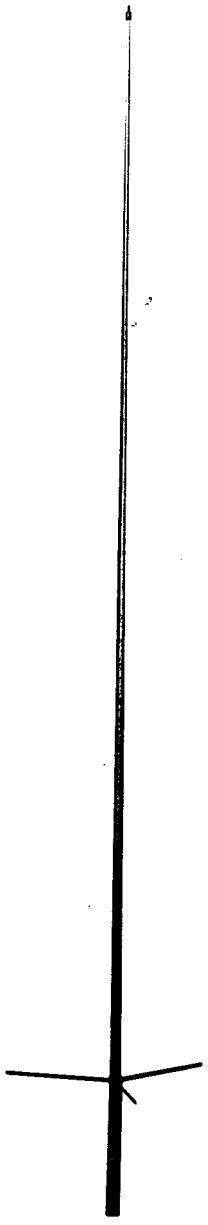
The antennas in this internationally known series are ideal for multiple antenna installations. Each feature multiple collinear radiating copper elements fed in phase and enclosed in a weatherproof fiberglass housing. Able to withstand winds of at least 100 mph, these antennas are equipped with a Teflon® insulated connector at the base of the support pipe, a flexible extension cable with a captive pin N-male connector and a Neoprene weathershield. The PD200 has been specifically designed for simplex systems, dispatch and paging applications in the 120-174 MHz frequency range. Specify center frequency when ordering.

- **Fiberglass construction** — Protects radiating elements in corrosive environments.
- **Copper radiating elements** — Minimizes the possibility of intermod generation.
- **High strength, low cross section** — Withstands winds of at least 100 mph.

Teflon® is a registered trademark of Du Pont.

VERTICAL PATTERN PD200





PD200

CELWAVE®
DIVISION OF RADIO FREQUENCY SYSTEMS INC.

2 Ryan Road, Marlboro, NJ 07746-1899 • **1(800) CELWAVE** • (908)462-1880

Model Number Configuration Charts

All db TransTelecom model numbers are descriptive. The charts below depict the various configurations for your specific application. Not all configurations are available. Ask your sales representative about your special requirements.

CABLES

Sample Model Number

DBC 012 F 5 P - □

- **DBC** — Decibel Cable
- **012** — Cable Size
  - 014 = 1/4 inch
  - 012 = 1/2 inch
  - 038 = 3/8 inch
  - 078 = 7/8 inch
  - 114 = 1-1/4 inch
  - 158 = 1-5/8 inch
- **F** — Cable Type
  - F = db TransFoam™
  - X = db TransFlex™
  - A = db TransAir™
  - R = db TransFill™
- **5** — Impedance
  - 5 = 50 ohms
  - 7 = 75 ohms
- **P** — Jacket
  - P = Polyethelene
  - T = Fire Retardant
- **□** — Optional
  - D = Swept (Low VSWR)

JUMPERS

Sample Model Number

DBJ 012 03 05 - □

- **DBJ** — Decibel Jumper
- **012** — Cable Size
  - X14 = 1/4 Super Flexible
  - X12 = 1/2 Super Flexible
  - 012 = 1/2 Foam Cable
  - 038 = 3/8 Foam Cable
  - 078 = 7/8 Foam Cable
  - 114 = 1-1/4 Foam Cable
  - 158 = 1-5/8 Foam Cable
- **03** — Length
  - 03 = 3 foot
  - 06 = 6 foot
  - 08 = 8 foot
  - 10 = 10 foot
- **05** — Connector
  - 01 - N-Male/N-Male
  - 02 - N-Male/N-Male (plated)
  - 03 - N-Female/N-Male
  - 04 - N-Male/N-R Angle (plated)
  - 05 - DIN Male/DIN Male
  - 06 - DIN Male/DIN Male R Angle
  - 07 - DIN Male/N-Male (plated)
  - 08 - DIN Male/DIN Female
  - 09 - DIN Female/DIN Male R Angle
- **□** — Optional
  - D = Swept (Low VSWR)

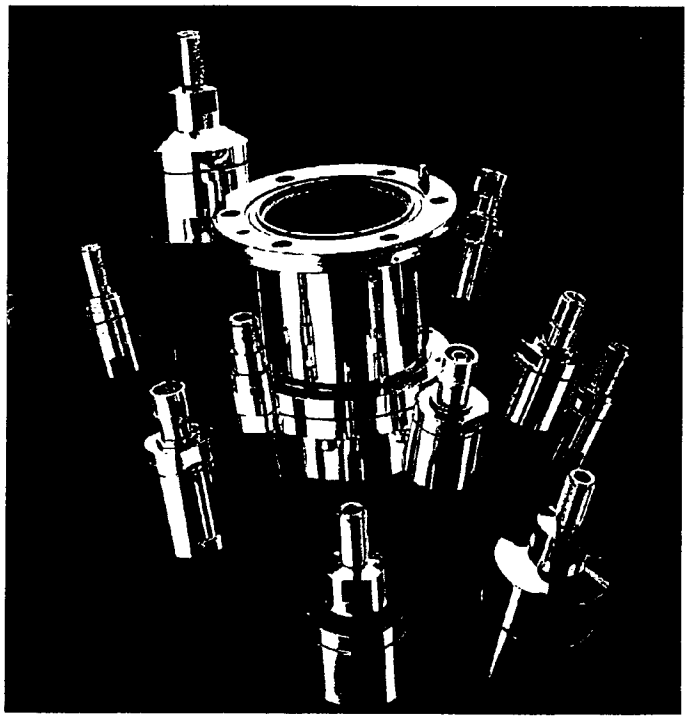
Plated = Silver plated body and gold plated pin

CONNECTORS

Sample Model Number

DBK 012 P 1 N - B F

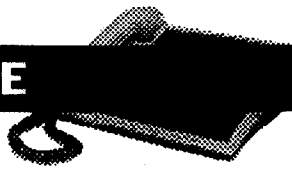
- **DBK** — Decibel Connector
- **012** — Connector Size
  - X14 = 1/4 db TransFlex
  - X12 = 1/2 db TransFlex
  - 012 = 1/2 db TransFoam
  - 038 = 3/8 db TransFoam
  - 078 = 7/8 db TransFoam
  - 114 = 1 1/4 db TransFoam
  - 158 = 1 5/8 db TransFoam
  - A - - = Air Cable
    - 03 = 1/2"
    - 06 = 7/8"
    - 08 = 1 5/8"
- **P** — Material
  - B = Brass/Silver
  - N = Nickel/Gold
  - P = Silver/Gold
  - S = Silver/Silver
- **1** — Angle
  - 1 = Straight
  - 2 = R-Angle
- **N** — Type
  - E = 7/16 DIN
  - F = Flange
  - L = L/C
  - M = Mini DIN
  - N = N Type
  - U = UHF
- **B** — Pin Attachment
  - S = Solder
  - B = Basket
  - T = Threaded
- **F** — Gender
  - M = Male
  - F = Female



ACCESSORIES BREAKDOWN

Model Number	Description	Model Number	Description	Model Number	Description
DBSPLICE_ _ _	Connector Splice with Cable Size	DBTIERNYL	Tie Wrap-Nylon	DBHDWKT01	Hardware Kit 3/8" x 1"
DBGRNDKT_ _ _	Grounding Kit with Cable Size	DBTIERCTD	Coated Copper Tie Wire	DBCOLDSHRK01	7/8 - 1/2 Cold Shrink Kit
DBCABFT_ _ _	Cable Wall Feed Thru with Cable Size	DBSSRAPLK	Stainless Steel Wrap Lock	DBCOLDSHRK02	1-1/4 - 1/2 Cold Shrink Kit
DBHNGKT_ _ _	Hanger Kit with Cable Size	DBANGLADPT	Kit of 10 Angle Adaptors	DBCOLDSHRK03	1/2 - 1/2 Cold Shrink Kit
DBSIHNGKT_ _ _	Snap In Hanger Kit with Cable Size	DBANGLADPTG	Kit of 10 Angle Adaptors Galvanized	DBCOLDSHRK04	7/8 - 7/8 Cold Shrink Kit
DBCABLEBT_ _ _	Cable Boot with Cable Size	DBBURKT	Burial Kit One Size Fits All		

MODEL 24-66 TONE REMOTE

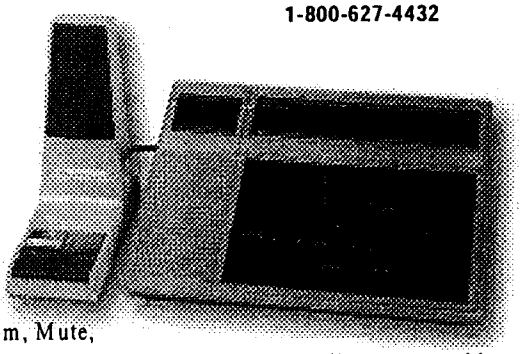


IDA CORPORATION
1-800-627-4432

Features

- Field Programmable by PC
- Control & display up to eight channels
- Monitor *(latched or momentary)*
- Intercom
- Mute *(latched or momentary)*
- Alert Tone
- Programmable Auxiliaries
- 30db of Compression and 3 Watts of speaker audio

Benefits



As your communications needs grow and change the 24-66 will keep up. Standard features that are not needed now can be activated with simple programming done in the field. Monitor, Intercom, Mute, Alert Tone, Number of Channels, and the Auxiliaries are all programmable.

With multiple remotes installed in parallel the audio levels remain consistent. Even in a noisy environment you will be heard loud and clear.

Cost Options

Option 610 – Clock and VU Meter
Large easy to read LED display gives TIME and TX level at a glance. *(Field programmable as Military or Standard time)*

Option 611 – Four Wire
Programmable for full duplex or separate pairs for TX and RX.

Option 612 – Supervisory / Alternate Line
Programmed as Supervisory this option allows one deskset remote to control access to the base station by other remotes. Programmed as Alternate Line allows the deskset to switch to a different base station radio with the push of a button.

Option 613 – Parallel TX Indicator and Notch Filter
Provides visual indication of transmit by another remote and prevents the 2175 Hz guard tone from being heard through the speaker.

Programmable features:

"Mute on Parallel TX" allows two or more desksets to be located in the same room without causing feedback.

"Parallel Override" allows command tones to be sent even when another remote is off hook.

"Parallel Update" changes the display of all the desksets when selecting a new channel.

Option 614 – 12 VDC Power Cable
Prewired power cable makes installing battery backup quick and easy.

Option 615 – 2nd Line with Summed Audio
Control two base stations with the same deskset remote. RX audio from both lines is summed and heard on the deskset's speaker. The operator can TX and change channels on which ever line is selected. Audio from the "Unselected" line is at a lower volume than audio from the "Selected" line. The relative volume of the unselected audio is dealer adjustable.
(Not available with Option 611 – Four Wire)

Option 616 – One Touch TX
Transmit with the touch of a button on the faceplate. A small condenser mic hidden on the front edge of the unit picks up your voice. Great for short quick responses.

continued next page

MODEL 24-66 ADDITIONAL PROGRAMMABLE FEATURES

Tones can be programmed for whichever function is desired. Available tones: 2050 Hz, 1950 Hz, 1850 Hz, 1750 Hz, 1650 Hz, 1550 Hz, 1450 Hz, 1350 Hz, 1250 Hz, 1150 Hz, 1050 Hz.

Disable of ON HOOK MONITOR (handset only)

Momentary F2 (always returns to F1)

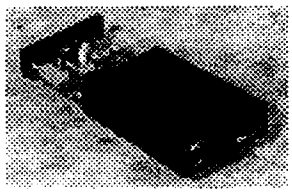
Momentary Intercom

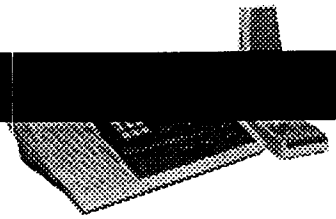
Remote Update (updates display of 24-66 when base station radio changes channels due to SCAN or in trunking applications, available for several popular radios, Option 613 and Model 20-27 Tone Termination Panel required)

OTHER 24-66 & 24-46 OPTIONS:
RBC-001 Wall Mounting Bracket
RBC-002 External Encode/Decode Cable
RBC-003 Programming Cable and Software

MODEL 20-27 TONE TERMINATION PANEL

The world's most powerful Tone Remotes deserve the most powerful Tone panel. The Model 20-27 is field programmable just like the remotes. Offering standard features such as 99 Channels, Local mic jack, LTR and ESAS trunking format, Binary output, and Remote Update of 24-66s. Direct control including SCAN, System /Group is standard for popular EF Johnson, Uniden, Kenwood, and SEA. Plug and play cabling available for a wide variety of radios.





IDA CORPORATION
1-800-627-4432

Cost Options continued from previous page

Option RBC-617 - 99 Channel Capability
Provides up to 99 channels to be controlled and displayed. By using a pair of function tones, 128 different commands are possible. The desired channel is selected by toggling up or down and shown on the LED display. Included with option RBC-617 are options RBC-610 (clock) and RBC-613 (notch filter). Momentary time display is via the CLOCK button.

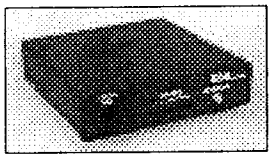
Option RBC-618 - 99 Channel Capability with DTMF
Similar to option RBC-617, this option provides up to 99 channels to be controlled and displayed. Direct access to the desired channel and DTMF encode are added features. A 12 button keypad is mounted on the faceplate of the deskset. Included with option RBC-618 are options RBC-610 (clock) and RBC-613 (notch filter). Momentary time display is via the CLOCK button.

Option RBC-619 - Alpha-Numeric Display
Displays channel selections with name/number of the operator's preference. Programmable up to 16 characters, the option includes clock and VU meter.

Option RBC-620 - Alpha-Numeric Display
Displays channel selections with name/number of the operator's preference. Programmable up to 32 characters, the option includes clock and VU meter.

Option RBC-621 - Digital Signaling
Fast and efficient digital signaling in a proprietary MSK format. When used along with Model 20-28 Remote Termination Panel, option RBC-621 provides the high speed switching and communication required for demanding trunking applications. Options RBC-610 (clock) and RBC-613 (notch filter) are included. Option RBC-611 (four wire) is recommended for use in most trunking applications.

Option RBC-622 - DTMF Encode
12 button DTMF encoder with keypad mounted on deskset.



MODEL 20-28 REMOTE TERMINATION PANEL

The 20-28 is a programmable termination panel for use with IDA Model 24-66 desk top controllers equipped with digital signaling. By decoding the proper digital signals the 20-28 can control remotely located base stations or repeaters. In addition to providing a two-way path for audio the unit also provides update information back to the desk top controllers. This update information allows the operator immediate information as to the remote radios status, such as channel, in or out of scan, or the current System & Group if a trunking application.

MSK SIGNALING

The 20-28 is field programmable via IBM compatible PC and features digital signaling in a proprietary MSK format. When used along with Model 24-66 remotes equipped with MSK signaling (Option RBC-621) the 20-28 provides the high speed switching and communication required for demanding trunking applications.

PROGRAMMABLE OUTPUTS

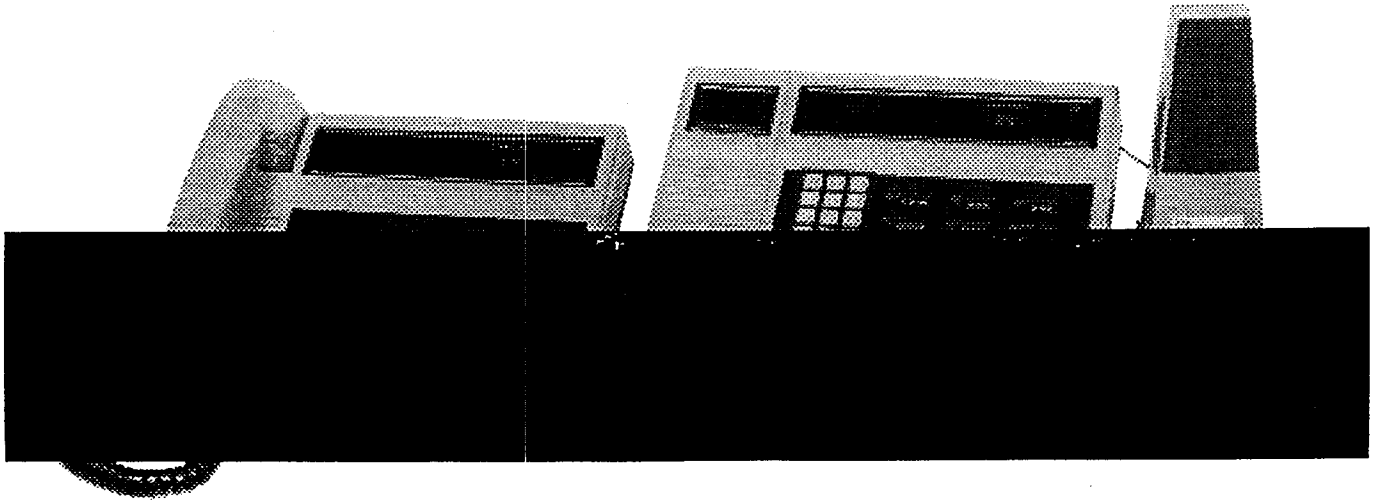
To meet the requirements of various manufacturers base stations the 20-28 can be programmed for a wide variety of outputs. For stations that are capable of receiving external serial commands the 20-28 can be programmed to provide the proper command set. In addition the unit can be programmed for Binary output.

This method of communicating with the radio's microprocessor in much the same way that it's own faceplate display does offers virtually total remote control. Advanced features such as SCAN, Lockout, Selective calling, Priority SCAN, and others become possible. When programming the 20-28, up to 8 of the outputs can be selected as inputs.

LOCAL OPERATION

For installations where local operation of the base station is desired the 20-28 is available with a desk microphone, speaker jack, and volume control (Option RTM-604).

TRC-8/98



TECHNICAL SPECIFICATIONS

	DC REMOTES	TONE REMOTES	
	24-46	24-66	20-88
Input Voltage	117/230 VAC + -20% 50/60Hz	117/230 VAC + -20% 50/60Hz	117/230 VAC 50/60Hz
Standby Voltage Standby current	----- -----	12-15VDC 287mA (TX) 620mA (RX) (STBY)	250mA (MAX)
Input power (max)	17W (TX) 24W (RX) 4W (STBY)	8.5W (TX) 20W (RX) 8.5W (STBY)	
Temperature range	-30 deg to +60 deg C	-30 deg to +60 deg C	0° C to +70° C
Relative humidity	90% at 50 deg C	90% at 50 deg C	
Line impedance (1KHz)	600 ohms (TX) 600 or 5k ohms (RX)	600 ohms (TX) 600 or 5k ohms (RX)	600 ohms @ 1 KHz
Line audio output (600 ohm load)	-20 to +10dbm	-20 to +10dbm	-20dbm to +10dbm
TX hum & noise (ref +11dbm)	-55db	-55db	
Threshold of compression (line to speaker audio)	-20dbm adjustable	-20dbm adjustable	-20dbm
Speaker audio output RMS	3W into 4 ohms	3W into 4 ohms	3.5W into 4 ohms
Distortion (at rated speaker output)	Less than 3%	Less than 3%	Less than 5%
RX hum & noise	-55db	-49db	-55db
Frequency response (300 to 3,000Hz)	+1, -3db	+1, -3db except at notch frequency	300Hz to 3KHz
RX compression	With an audio increase of 30db beyond the start of compression the output increases less than 3db	With an audio increase of 30db beyond the start of compression the output increases less than 3db	
TX compression	With an audio increase of 30db beyond the start of compression the output increases 15 to 16db	With an audio increase of 30db beyond the start of compression the output increases 15 to 16db	
Line control	2 or 4 wire audio	2 or 4 wire audio	2 or 4 wire
Notch filter depth	N/A	-45db (RX) -25db (TX)	40db (RX)
Weight	4lbs 15oz	4lbs 15oz	4lbs 8oz
Dimensions	4.75" (H) x 10" (W) x 8" (D)	4.75" (H) x 10" (W) x 8" (D)	2.4" (H) x 10" (W) x 9.4" (D)

IDA CORPORATION

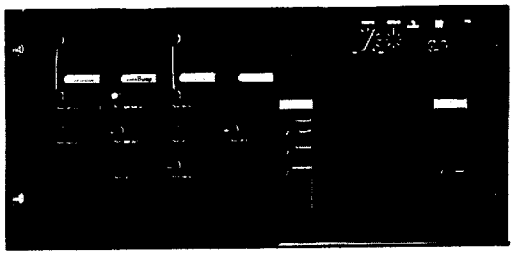
1345 Main Ave, Fargo, ND 58103

800-627-4432 / FAX 218-233-1886 / 701-280-1122

sales@idaco.com

Conventional
MASTR® III Stations VHF, UHF, 800 MHz

The MASTR III, built on the tradition of the popular MASTR series of repeaters, is an industry leader in performance, flexibility, and reliability. The MASTR III provides innovations such as fully shielded and removable modules, front-mounted controls, and remote diagnostics. The MASTR III features the latest in digital signal processing technology, which provides a comprehensive array of control capabilities for system design flexibility.



Product Overview

The MASTR III provides the flexibility to change system setup as necessary. Whether users are designing a system, programming radio functions, or arranging an installation site, MASTR III keeps pace with their needs.

Flexible, Efficient Design

The microprocessor-controlled, PC programmable options provide flexibility, simplified setup, and easy field upgrades. The fully synthesized design of the MASTR III Base Station allows the user to make frequency changes quickly, easily, and affordably. In addition, the MASTR III operates on both wideband (25 kHz) and narrowband (12.5 kHz) channels.

The modular design of the MASTR III Base Station makes maintenance and servicing simple and fast. Each module furnishes easy-to-read indications of proper operation.

A 69-inch cabinet houses three stations or ancillary equipment. The cabinet design also increases reliability through its cooling capacity for the equipment housed within it.

MASTR III also features optional Aegis™ digital or Voice Guard® encryption with the addition of a digital control shelf.

Backward Compatible

The MASTR III Base Station can be used in combination with MASTR II or IIe stations. The MASTR III is readily upgradable through software revisions.

For More Information

For more information about this or any other Com-Net Ericsson Critical Radio Systems product, call 1-800-431-2345 in the U.S. From outside the U.S. call +1-804-592-6100.

Com-Net Ericsson
CRITICAL RADIO SYSTEMS

Technical specifications are subject to change. This product is subject to U.S. export control for national security reasons.

General Specifications

Cabinet	INDOOR CABINET (Floor Mount) 37 inches (CNV)	69 inches
Size [in. (mm)]		
Height	37.0 (940)	69.1 (1750)
Width	21.5 (550)	23.1 (590)
Depth	18.25 (460)	21.0 (533)
Weight (min) [(lb (kg)]		
Continuous Duty	150 (68)	520 (236)
Packed, Domestic Shipping	165 (75)	550 (250)
Number of Rack Units	17	33
Max. Units w/Power Supply	1	3
w/o Power Supply	1	4

NOTE: One rack unit equals 1.75 inches. Stations occupy 8 rack units of cabinet space.

Service Speaker:	**1W @ 8Ω**
Service Microphone:	**Transistorized Dynamic**
Duty Cycle (EIA) Continuous:	**Transmit/Receive - 100%**
Ambient Temperature (or full spec performance per EIA):	**-22 to +140°F (-30 to +60°C)**
Humidity (EIA):	**90% @ 122°F (50°C)**
Input Power Source:	**120 VAC (±20%)**
Optional Input Power Source:	**230 VAC (±15%), 50 Hz**
Standby Battery Source:	**13.8 VDC, 100 AH (min.)**
Antenna Connections:	**Type N**
Length of AC Power Cable:	**10 ft (3048 mm)**
Metering:	**Provided through Handset or TQ0619 Utility Software**
Altitude:	
Operable:	**Up to 15,000 ft (4,570 m)**
Shippable:	**Up to 50,000 ft (15,250 m)**
Mean Time Between Failure (MTBF)	**11,227 hours**

Source Power Drain		VHF		UHF					800
Frequency Range (MHz)		136-150.8	150.8-174	403-430	425-450	450-470	470-494	492-512	851-870 Tx 806-825 Rx
AC Input Power		5A @ 120 VAC or 3A @ 230 VAC							
DC Input Power (A)	VDC								
Tx (full/half power)	13.8	33/25	33/25	33/25	33/25	33/25	33/25	33/25	2/2
Rx only	13.8	2	2	2	2	2	2	2	2
Tx (full/half power)	26.4								12/8
Rx only	26.4								0.5
EDACS Applications	13.8	2	2	2	2	2	2	2	2

Transmitter

	VHF		UHF					800
Frequency Range (MHz)	136-150.8	150.8-174	403-430	425-450	450-470	470-494	494-512	851-870
Rated Power Output (W)	110	110	90	90	100	90	90	100
RF Output Impedance (Ω)	50	50	50	50	50	50	50	50
Conducted Spurious and Harmonic Emission (dBm)	-36	-36	-36	-36	-36	-36	-36	-36
Frequency Stability (ppm)	±1.5	±1.5	±1.0	±1.0	±1.0	±1.0	±1.0	±1.0
Modulation Deviation (kHz)								
Wideband	0 to ±5	0 to ±5	0 to ±5	0 to ±5	0 to ±5	0 to ±5	0 to ±5	0 to ±5
15K0F1D, 15K0F1E								
16K0F1D, 16K0F1E, 16K0F3E								
Narrowband	0 to ±2.5	0 to ±2.5			0 to ±2.5			
11K0F3E								
NPSPAC								0 to ±5
14K0F3E								
FM Noise (dB)	-55	-55	-55	-55	-55	-55	-55	-55
Channel Spacing (kHz)	12.5/25/30	12.5/25/30	12.5/25	12.5/25	12.5/25	12.5/25	12.5/25	25 12.5 (NPSPAC)
Frequency Spread Full Spec (MHz)	8	12	27	25	20	24	20	1.0

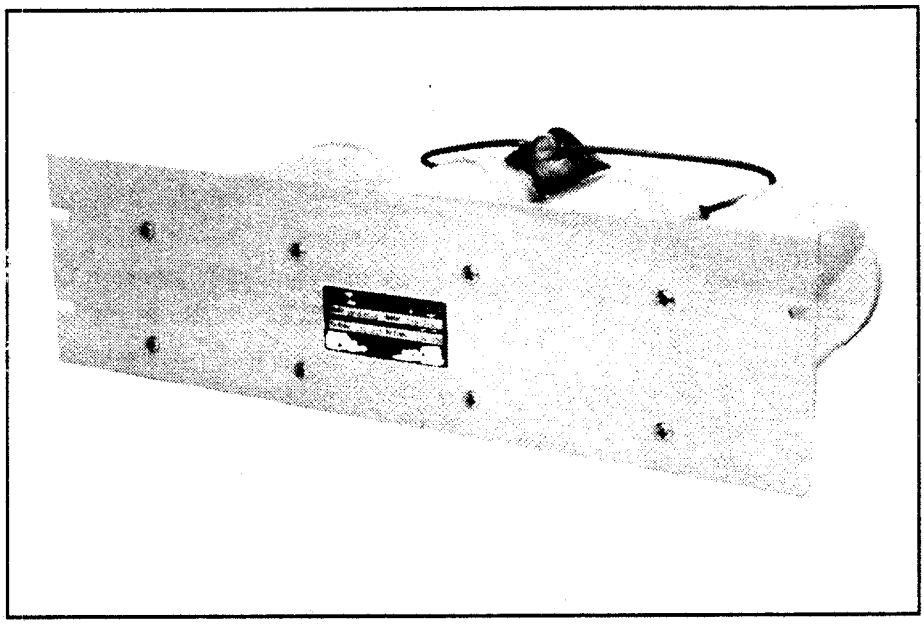
Audio Distortion (@ 1 kHz): **Less than 3%**
Number of Channels (Conventional): **Up to 16**
Audio Response (pre-emphasis): **Within +1/-3 dB of 6 dB/octave, 300 to 3000 Hz per EIA**
NOTE: Rated power output is measured at the transmitter power amplifier output connector per FCC Type Acceptance filing information. Any customer-required optional items such as power measuring devices and/or duplexers will introduce loss between the transmitter output connector and the station cabinet output connector. This loss will reduce the available power at the station connector.

Receiver

	VHF		UHF					800
Frequency Range (MHz)	136-150.8	150.8-174	403-430	425-450	450-470	470-494	492-512	806-825
RF Input Impedance (Ω)	50	50	50	50	50	50	50	50
Channel Spacing (kHz)	12.5/25/30	12.5/25/30	12.5/25	12.5/25	12.5/25	12.5/25	12.5/25	25 12.5 (NPSPAC)
Sensitivity (dBm) EIA 12 dB SINAD	-116 (0.35 µV)	-116 (0.35 µV)	-116 (0.35 µV)	-116 (0.35 µV)	-116 (0.35 µV)	-116 (0.35 µV)	-116 (0.35 µV)	-119 (0.25 µV)
Threshold Squelch (dBm)	-119 (0.25 µV)	-119 (0.25 µV)	-119 (0.25 µV)	-119 (0.25 µV)	-119 (0.25 µV)	-119 (0.25 µV)	-119 (0.25 µV)	-122 (0.18 µV)
Selectivity EIA 2-Signal (dB)								
12.5 kHz	80	80	80	80	80	80	80	20 (NPSPAC)
25 kHz	95	95	90	90	90	90	90	90
30 kHz	100	100						
Frequency Stability (ppm)	±1.5	±1.5	±1.0	±1.0	±1.0	±1.0	±1.0	±1.0
Signal Displacement Bandwidth (kHz)	±2	±2	±2	±2	±2	±2	±2	±2
Intermodulation (dB)								
12.5 kHz	75	75	75	75	75	75	75	
25 kHz	90	90	85	85	85	85	85	85
30 kHz	90	90						
Spurious and Image Rejection (dB)	100	100	100	100	100	100	100	100
Frequency Spread								
Full Specs. (MHz)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.5
3 dB Degradation in Sensitivity (MHz)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	N/A

Audio Response (de-emphasis): **Within +2/-8 dB of 6 dB/octave (@ Local Speaker), 300 to 3000 Hz per EIA**
Within +1/-3 dB of 6 dB/octave (@ Line Output), 300 to 3000 Hz per EIA
Audio Output: **1 Watt at less than 3% distortion @ 1000 Hz, 25/30 kHz Channel**

MASTR®III
Duplexer Systems



General

The elegance of MASTR III Duplexer Systems is demonstrated in its band pass/band reject design. It gives superior performance by providing Tx/Rx isolation and rejection from other transmitter signals. The four cavity design has two cavities for Tx and two cavities for Rx. This allows for smaller frequency separation.

The MASTR III Duplexer Systems can be mounted in standard nineteen inch EIA racks. The compact size saves valuable floor space. It is also factory tuned and installed, which ensures optimum performance.

ERICSSON

General Specifications

Description:
Band pass/band reject rack mountable duplexer designed using helical coaxial cavities at VHF and quarter-wave cavities at UHF.

Duty Cycle:
100%

Dimensions (HxWxD)
5.25" x 19" x 12.5" (11.0" UHF)
(13.34 x 48.26 x 31.75 cm
depth 27.94 cm UHF)

Mounting:
19 in. (EIA)

Number of Rack Units:
3

Weight:
20 lbs. (9.07 kg)

Ambient Temperature:
-22° F to + 140° F
(-30°C to +60°C)

Relative Humidity (EIA):
90% @ 122°F (50°C)

Altitude:
Up to 15,000 ft. (4,570 M)

Termination:
Type N Female, silver plated.

Electrical

	SXDU1J	SXDU1K	SXDU1M
Frequency Range			
Receiver:	150-162	162-174	440-470
Transmitter:	150-162	162-174	440-470
Minimum Frequency Separation:	2 MHz	2 MHz	5 MHz
Maximum Input Power:	132 Watts	132 Watts	240 Watts
Maximum Insertion Loss Tx to Antenna:	1.5 dB	1.5 dB	1.2 dB
Maximum Insertion Loss Antenna to Rx:	1.5 dB	1.5 dB	1.2 dB
Minimum Transmitter Noise Suppression at Rx Frequency:	75 dB	75 dB	85 dB
Minimum Rx Isolation at Tx Frequency:	75 dB	75 dB	85 dB
Transmitter Bandwidth:	±100 kHz	±100 kHz	±250 kHz
Receiver Bandwidth:	±100 kHz	±100 kHz	±250 kHz
Maximum VSWR at Tx or Rx Port (50 ohm Ref.):	1.5:1	1.5:1	1.3:1
Minimum Rejection @ $\frac{(Tx\&Rx)}{2}$:	50 dB	50 dB	60 dB

Ericsson Inc.
Private Radio Systems
Mountain View Road
Lynchburg, Virginia 24502
Phone: 1-800-431-2345

E-ECR-4737A

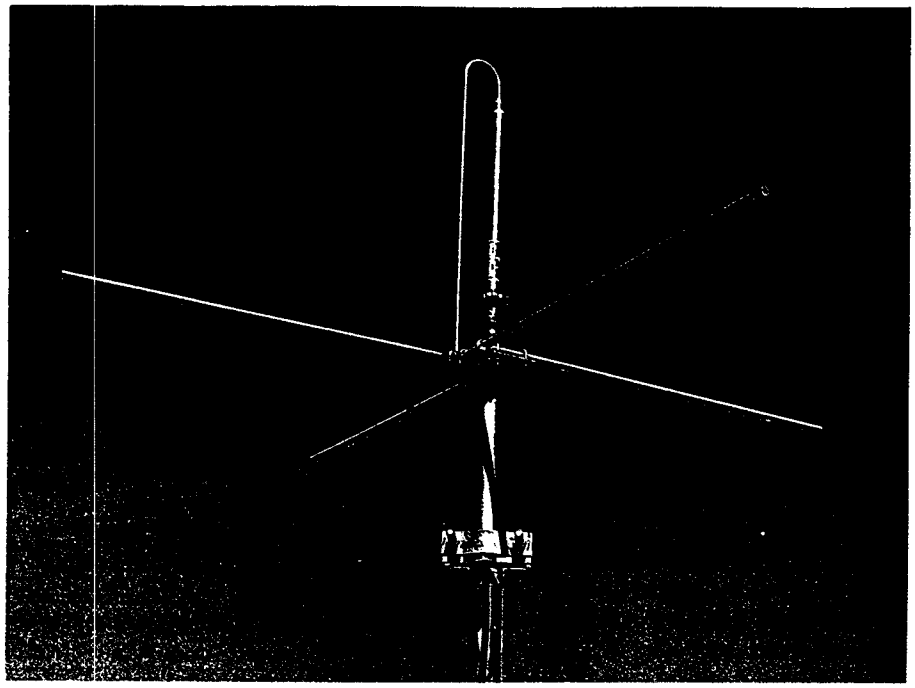
4/95 Printed in U.S.A.

DB2[illegible]1 GROUND PLANE OMNI ANTENNA UNITY GAIN, 30-174 and 220-512 Mh_

- **Very popular** - Heavy duty, light weight antenna is one of our most widely used.
- **Unique Design** - Features a new approach to the feeding of the insulated portion of the radiator.
- **Moisture Resistant** - 50-ohm feed-through connector is encapsulated in a moisture and corrosion proof molded epoxy insulator.
- **Cut and Tested** - The radiating element and ground radials are cut to frequency and tested at the factory for minimum VSWR. Uncut models for 30-50, 144-174 and 406-512 MHz are optional. Cutting chart is included.
- **Lightning Resistant** - Constructed of metal with all elements operating at DC ground.
- **Protected Lead** - A male-to-female connection is weather protected but can be replaced if necessary.
- **New** - 30-50 MHz models have galvanized steel support pipe.
- Easy **Mounting** - Galvanized steel DB365-OS Mount is furnished for mounting atop a tower, pole or building

Ordering Information - Use model number for correct frequency or specify uncut model and frequency range, also termination if non-standard. Order jumper cable separately, if desired.

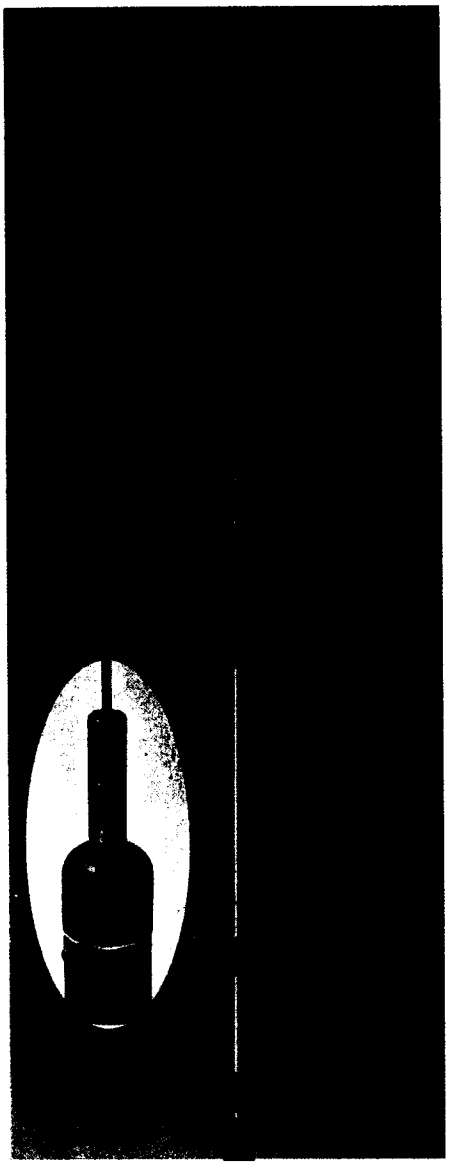
144-512 MHz antennas can be shipped by UPS.



Electrical Data	
Frequency Ranges – MHz A = 30-33, B = 33-37, C = 37-42, D = 42-50, E = 60-88, F = 100-144, G = 144-150, H = 150-174, J = 225-406, JJ = 220-222, K = 406-512	Uncut models: L = 30-50, M = 144-174, N = 406-512
Bandwidth	2% of frequency
VSWR	1.5 to 1 or less
Nominal impedance – ohms	50
Gain (over half-wave dipole) – dB	Unity
Maximum power input – watts	500
Vertical beamwidth (half power points)	78°
Lightning protection	Direct ground
Standard Termination: Captive Type N-male to end of flexible lead. Other fittings are available on special order. If UHF connector is required, an adapter is provided.	

Mechanical Data				
	35 MHz	50 MHz	150 MHz	450 MHz
Radiator (aluminum) – in. (mm)	.875 (22.23) OD with .125 (3.18) wall & .375 (9.35) OD solid rod	.875 (22.23) OD with .125 (3.18) wall & .375 (9.35) OD solid rod	.875 (22.23) OD with .125 (3.18) wall & .375 (9.35) OD solid rod	.875 (22.23) OD with .125 (3.18) wall & .375 (9.35) OD solid rod
Ground rods (aluminum) – in. (mm)	.5 (12.7) OD solid rod tapered to .250 (6.35) OD	.5 (12.7) OD solid rod tapered to .250 (6.35) OD	.5 (12.7) OD solid rod	.5 (12.7) OD solid rod
Support pipe – in. (mm)	1.31 (33.34) OD, 24 (609.6) length	1.31 (33.34) OD, 24 (609.6) length	1.31 (33.34) OD, 12 (304.8) length	1.31 (33.34) OD, 12 (304.8) length
Maximum exposed area (flat plate equivalent) – ft² (m²)	1.1 (.102)	0.8 (.074)	.4 (.037)	.3 (.028)
Wind rating:				
Survival without ice – mph (km/hr)	93 (150)	122 (196)	over 125 (201)	over 125 (201)
Survival with .5" (12.7 mm) radial ice – mph (km/hr)	51 (82)	65 (105)	over 125 (201)	over 125 (201)
Lateral thrust at 100 mph (161 km/hr) – lbf (N)	44 (195.7)	32 (142.3)	16 (71.2)	12 (53.4)
Overall length – in. (mm)	101 (2.57)	78 (1.98)	30 (.76)	19 (.48)
Height (above base plate) – in. (m)	77 (1.96)	54 (1.37)	18 (.45)	6.5 (.17)
Maximum width (horizontal) – in. (m)	216 (5.49)	151 (3.84)	49 (1.24)	15 (.381)
[illegible]t weight (w/clamps) – lbs. (kg)	25 (11.34)	23 (10.43)	10 (4.54)	6 (.152)
Shipping weight (w/clamps) – lbs. (kg)	35 (15.88)	31 (14.06)	14 (6.35)	9 (.229)
Mounting clamps (Galvanized steel)	DB365-OS	DB365-OS	DB365-OS	DB365-OS

DB205 COAXIAL ANTENNA UNITY GAIN, 33-174 MHz

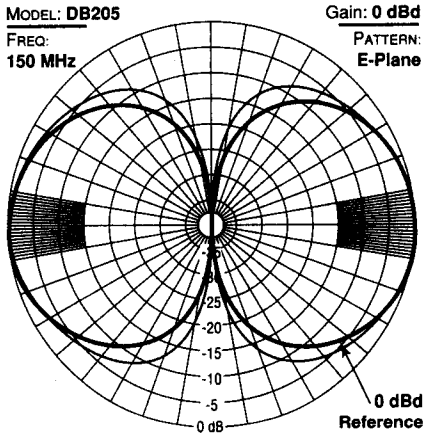


An excellent performer in extreme conditions, the DB205 is a heavy-duty unity gain omni antenna for 33-174 MHz. Models are cut to frequency and tested at the factory; however, uncut models are available.

- **Rugged** - Absorbs severe vibration and withstands rough handling; ideal for oil well drilling and similar applications.
- **Effective Design** - Includes a coaxial half-wave dipole antenna with an upper quarter-wave whip radiator, a center insulator and lower quarter-wave skirt radiator, isolated from the antenna support pipe.
- **Tough Insulator** - Molded of durable epoxy and virtually unbreakable.
- **Moisture Resistant** - A feed-through connector and top mounting stud are molded into the insulator, which also simplifies the replacement of the radiator or feeder cable.
- **Enduring Metals** - The upper radiating element is spring-tempered stainless steel, the lower skirt is non-corroding brass.
- **Easy Mounting** - Galvanized steel DB365-OS Mount is furnished for mounting atop a tower, pole or building.

Ordering Information - Use model number for correct frequency and specify termination if non-standard. Order jumper cable separately, if desired.

Models F and M are UPS Shippable.



Electrical Data	
Frequency Ranges – MHz	A = 33-50, B = 50-72, C = 72-88, E = 100-144, F = 144-175
	Uncut models: L = 33-50, M = 150-174
Bandwidth	2% of frequency
VSWR	1.5 to 1 or less
Nominal impedance – ohms	50
Gain (over half-wave dipole) – dB	Unity
Maximum power input – watts	500
Vertical beamwidth (half power points)	78°
Lightning protection	Direct ground
Standard Termination: Captive Type N-Male attached to end of flexible lead. Other fittings are available on special order. If UHF connector is required, an adapter is provided.	

Mechanical Data	35 MHz	50 MHz	75 MHz	160 MHz
Whip radiator	17-7 PH stainless steel rod	17-7 PH stainless steel rod	17-7 PH stainless steel rod	17-7 PH stainless steel rod
Whip insulator	Molded epoxy	Molded epoxy	Molded epoxy	Molded epoxy
Skirt – in. (mm)	Brass, 2 (50.8) diameter	Brass, 2 (50.8) diameter	Brass, 2 (50.8) diameter	Brass, 2 (50.8) diameter
Support pipe – in. (mm)	Galvanized steel, 1 (25.4) dia., 24 (609.6) or more available for mounting	Galvanized steel, 1 (25.4) dia., 24 (609.6) or more available for mounting	Aluminum, 1 (25.4) dia., 24 (609.6) or more available for mounting	Aluminum, 1 (25.4) dia., 24 (609.6) or more available for mounting
Maximum exposed area (flat plate equivalent) – ft² (m²)	1.2 (.11)	1.0 (.09)	0.7 (.07)	.3 (.03)
Lateral thrust at 100 mph (161 km/hr) – lbf (N)	48 (213.5)	40 (180)	28 (124.5)	12 (53.4)
Bending moment, 12' (3.66 m) below skirt, at 100 mph (161 km/hr) – ft. lbs. (kg m)	188 (26.02)	135 (18.68)	50 (6.92)	19 (2.63)
Wind rating:				
Survival without ice – mph (km/hr)	over 110 (177)	over 125 (201)	over 125 (201)	over 125 (201)
Survival with .5" (12.7 mm) radial ice – mph (km/hr)	110 (177)	over 125 (201)	over 125 (201)	over 125 (201)
Overall length – in. (mm)	217 (5511.8)	206 (5232.4)	119 (3022.6)	71 (1803.4)
Net weight (w/clamps) – lbs. (kg)	38 (17.24)	36 (16.33)	27 (12.25)	19 (8.62)
Shipping weight (w/clamps) – lbs. (kg)	52 (23.59)	50 (22.68)	35 (15.88)	26 (11.79)
Mounting clamps (Galvanized steel)	DB365-OS	DB365-OS	DB365-OS	DB365-OS

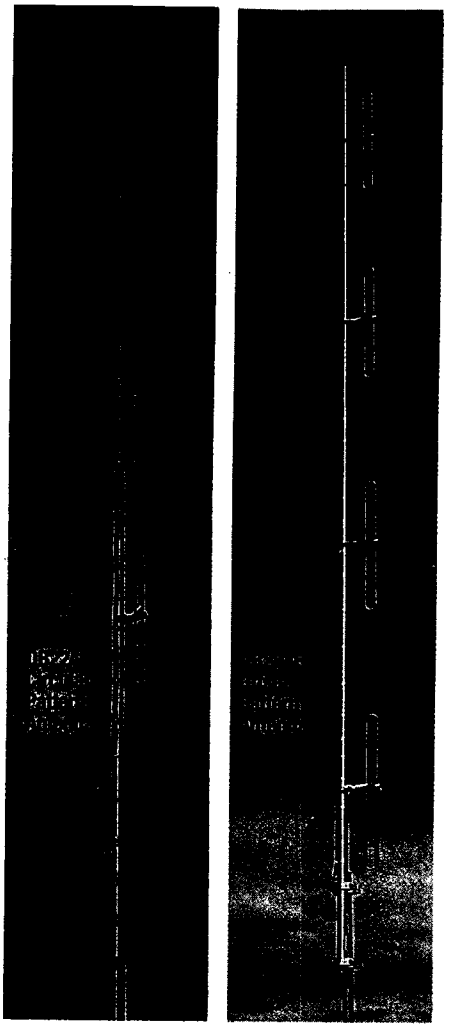
DB22 _ BROAD BAND ANTENNA
6 or 9 dB GAIN, 138-174 and 220-222 MHz

This popular antenna is available with four folded dipoles for high gain and broad bandwidth.

Broad Response - 10 MHz bandwidth provides optimum performance in single or multi-frequency systems, on both transmit and receive.

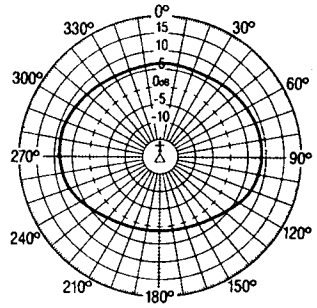
- **Circular Pattern** - DB224 has four elements positioned evenly, every 90 degrees around the mast, for omni pattern.
- **Offset Pattern** - DB224E comes with four elements aligned collinearly on the same side of the mast for maximum directional gain.
- **Dual Version** - Two antennas on the same mast are fed and operated separately, providing 3 dB omni or 6 dB directional patterns.
- **Two-Piece Mast** - For ease of shipment and handling, the mast is made in two sections. A unique center splice assures proper alignment.
- **Lightning-Resistant** - The radiators operate at DC ground, and the aluminum mast with its pointed cap provides a low resistant discharge path to the tower or ground system.
- **For Air Shipment** - Model DB224X has a shortened mast, 124" (3150 mm).

Ordering Information - Use model number for correct frequency and specify termination if non-standard. Add E for offset pattern, S for dual omni or ES for dual offset pattern. DB365-OS Mounting Clamps are included. For side mounting order DB5001 Side Mount Kit. For Stabilizer Kit, order 12088 (four required). For shortened mast, order DB224X. Order jumper cable separately, if desired.

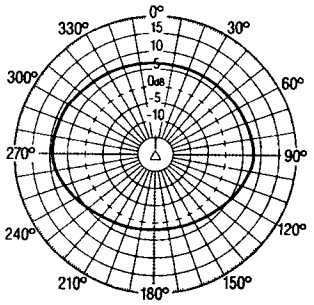


Side Mounting

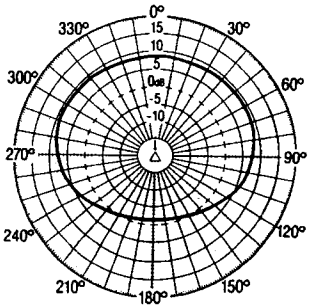
The patterns indicate the typical pattern shape of the antenna side mounted on a tower with an 18" to 24" (457.2 to 609.6 mm) face.



DB224 (omni) mounted on side of tower

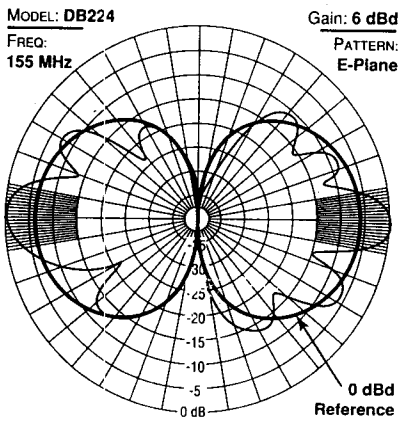


DB224E elements pointed toward the tower



DB224E elements pointed away from the tower

DB224 Vertical Pattern



Electrical Data	
Frequency Ranges* – MHz	A = 150-160, B = 155-165, C = 164-174, E = 138-150, J = 276-285, JJ = 220-222
Bandwidth (150-174 MHz) – MHz	10
VSWR	1.5 to 1 or less
Nominal impedance – ohms	50
Gain (over half-wave dipole)	
Omni pattern – dB	6.0
Offset pattern – dB	9.0
Maximum power input – watts	500
Vertical beamwidth (half power points)	16°
Decoupling between antennas (split models) – dB	35 minimum
Lightning protection	Direct ground
Standard Termination: Captive Type N-Male attached to end of flexible lead. Other fittings can be supplied on special order. If UHF connector is required, an adapter is provided.	

*Special frequencies are available; contact factory for details.

Mechanical Data	
Mast – upper (aluminum) – in. (mm)	1.75 (44.45) OD with .062 to .125 (1.57 to 3.18) wall
Mast – lower (aluminum) – in. (mm)	2 (50.8) OD with .125 to .187 (3.18 to 4.75) wall
Radiating elements (aluminum) – in. (mm)	.5 (12.7) OD with .058 (1.47) wall
Maximum exposed area (flat plate equivalent) – ft² (m²)	3.15 (.292)
Lateral thrust at 100 mph (161 km/hr) – lbf (N)	126 (560.5)
Wind rating:*	
Survival w/o ice – mph (km/hr)	100 (161)
Survival with .5" (12.7 mm) radial ice – mph (km/hr)	74 (119)
Overall length (150-174 MHz) – in. (mm)	255 (6477)
Shipping length – in. (mm)	148 (3759)
Net weight (w/clamps)– lbs. (kg)	32 (14.51)
Shipping weight (w/clamps) – lbs. (kg)	48 (21.77)
Mounting clamps (Galv. steel)	DB365-OS

*Top mounted antenna. Wind rating is greatly increased when antenna is side mounted.

Fiberglass Collinear Antenna

PD200* **5.8 dBd Gain Stationmaster™**

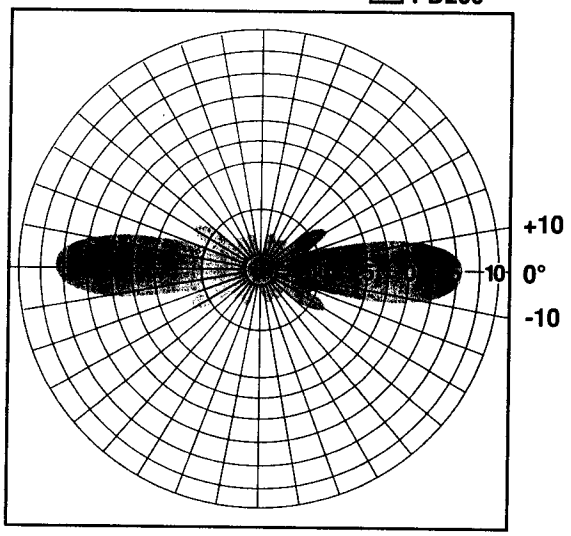
***Specify exact frequency.**

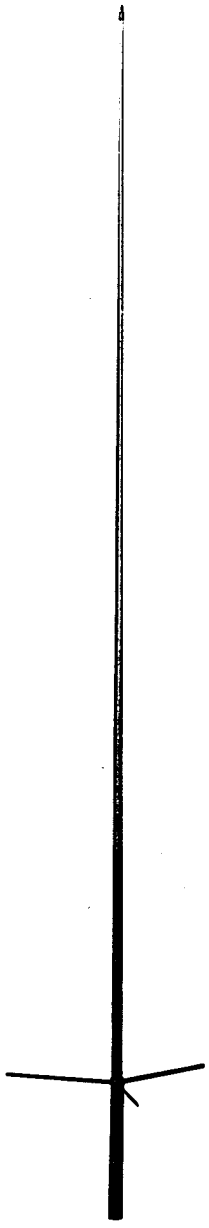
The antennas in this internationally known series are ideal for multiple antenna installations. Each feature multiple collinear radiating copper elements fed in phase and enclosed in a weatherproof fiberglass housing. Able to withstand winds of at least 100 mph, these antennas are equipped with a Teflon® insulated connector at the base of the support pipe, a flexible extension cable with a captive pin N-male connector and a Neoprene weathershield. The PD200 has been specifically designed for simplex systems, dispatch and paging applications in the 120-174 MHz frequency range. Specify center frequency when ordering.

- **Fiberglass construction** — Protects radiating elements in corrosive environments.
- **Copper radiating elements** — Minimizes the possibility of intermod generation.
- **High strength, low cross section** — Withstands winds of at least 100 mph.

Teflon® is a registered trademark of Du Pont.

VERTICAL PATTERN PD200





PD200

CELWAVE®
DIVISION OF RADIO FREQUENCY SYSTEMS INC.

2 Ryan Road, Marlboro, NJ 07746-1899 • **1(800) CELWAVE** • (908)462-1880

Model Number Configuration Charts

All db TransTelecom model numbers are descriptive. The charts below depict the various configurations for your specific application. Not all configurations are available. Ask your sales representative about your special requirements.

CABLES

Sample Model Number

DBC 012 F 5 P - □

- DBC — Decibel Cable
- 012 — Cable Size
  - 014 = 1/4 inch
  - 012 = 1/2 inch
  - 038 = 3/8 inch
  - 078 = 7/8 inch
  - 114 = 1-1/4 inch
  - 158 = 1-5/8 inch
- F — Cable Type
  - F = db TransFoam™
  - X = db TransFlex™
  - A = db TransAir™
  - R = db TransFill™
- 5 — Impedance
  - 5 = 50 ohms
  - 7 = 75 ohms
- P — Jacket
  - P = Polyethelene
  - T = Fire Retardant
- □ — Optional
  - D = Swept (Low VSWR)

JUMPERS

Sample Model Number

DBJ 012 03 05 - □

- DBJ — Decibel Jumper
- 012 — Cable Size
  - X14 = 1/4 Super Flexible
  - X12 = 1/2 Super Flexible
  - 012 = 1/2 Foam Cable
  - 038 = 3/8 Foam Cable
  - 078 = 7/8 Foam Cable
  - 114 = 1-1/4 Foam Cable
  - 158 = 1-5/8 Foam Cable
- 03 — Length
  - 03 = 3 foot
  - 06 = 6 foot
  - 08 = 8 foot
  - 10 = 10 foot
- 05 — Connector
  - 01 - N-Male/N-Male
  - 02 - N-Male/N-Male (plated)
  - 03 - N-Female/N-Male
  - 04 - N-Male/N-R Angle (plated)
  - 05 - DIN Male/DIN Male
  - 06 - DIN Male/DIN Male R Angle
  - 07 - DIN Male/N-Male (plated)
  - 08 - DIN Male/DIN Female
  - 09 - DIN Female/DIN Male R Angle

  Plated = Silver plated body and gold plated pin
- □ — Optional
  - D = Swept (Low VSWR)

CONNECTORS

Sample Model Number

DBK 012 P 1 N - B F

- DBK — Decibel Connector
- 012 — Connector Size
  - X14 = 1/4 db TransFlex
  - X12 = 1/2 db TransFlex
  - 012 = 1/2 db TransFoam
  - 038 = 3/8 db TransFoam
  - 078 = 7/8 db TransFoam
  - 114 = 1 1/4 db TransFoam
  - 158 = 1 5/8 db TransFoam
  - A - - = Air Cable
    - 03 = 1/2"
    - 06 = 7/8"
    - 08 = 1 5/8"
- P — Material
  - B = Brass/Silver
  - N = Nickel/Gold
  - P = Silver/Gold
  - S = Silver/Silver
- 1 — Angle
  - 1 = Straight
  - 2 = R-Angle
- N — Type
  - E = 7/16 DIN
  - F = Flange
  - L = L/C
  - M = Mini DIN
  - N = N Type
  - U = UHF
- B — Pin Attachment
  - S = Solder
  - B = Basket
  - T = Threaded
- F — Gender
  - M = Male
  - F = Female

ACCESSORIES BREAKDOWN

Model Number	Description	Model Number	Description	Model Number	Description
DBSPLICE___	Connector Splice with Cable Size	DBTIERPNYL	Tie Wrap-Nylon	DBHDWKT01	Hardware Kit 3/8" x 1"
DBGRNDKT___	Grounding Kit with Cable Size	DBTIERPCTD	Coated Copper Tie Wire	DBCOLDSHRK01	7/8 - 1/2 Cold Shrink Kit
DBCABFT___	Cable Wall Feed Thru with Cable Size	DBSSRAPLK	Stainless Steel Wrap Lock	DBCOLDSHRK02	1-1/4 - 1/2 Cold Shrink Kit
DBHNGKT___	Hanger Kit with Cable Size	DBANGLADPT	Kit of 10 Angle Adaptors	DBCOLDSHRK03	1/2 - 1/2 Cold Shrink Kit
DBSIHNGKT___	Snap In Hanger Kit with Cable Size	DBANGLADPTG	Kit of 10 Angle Adaptors Galvanized	DBCOLDSHRK04	7/8 - 7/8 Cold Shrink Kit
DBCABLEBT___	Cable Boot with Cable Size	DBBURKT	Burial Kit One Size Fits All		

MODEL 24-66 TONE REMOTE

IDA CORPORATION
1-800-627-4432

Features

- Field Programmable by PC
- Control & display up to eight channels
- Monitor *(latched or momentary)*
- Intercom
- Mute *(latched or momentary)*
- Alert Tone
- Programmable Auxiliaries
- 30db of Compression and 3 Watts of speaker audio

Benefits

As your communications needs grow and change the 24-66 will keep up. Standard features that are not needed now can be activated with simple programming done in the field. Monitor, Intercom, Mute, Alert Tone, Number of Channels, and the Auxiliaries are all programmable.

With multiple remotes installed in parallel the audio levels remain consistent. Even in a noisy environment you will be heard loud and clear.

Cost Options

Option 610 – Clock and VU Meter
Large easy to read LED display gives TIME and TX level at a glance. *(Field programmable as Military or Standard time)*

Option 611 – Four Wire
Programmable for full duplex or separate pairs for TX and RX.

Option 612 – Supervisory / Alternate Line
Programmed as Supervisory this option allows one deskset remote to control access to the base station by other remotes. Programmed as Alternate Line allows the deskset to switch to a different base station radio with the push of a button.

Option 613 – Parallel TX Indicator and Notch Filter
Provides visual indication of transmit by another remote and prevents the 2175 Hz guard tone from being heard through the speaker.

Programmable features:

"Mute on Parallel TX" allows two or more desksets to be located in the same room without causing feedback.

"Parallel Override" allows command tones to be sent even when another remote is off hook.

"Parallel Update" changes the display of all the desksets when selecting a new channel.

Option 614 – 12 VDC Power Cable
Prewired power cable makes installing battery backup quick and easy.

Option 615 – 2nd Line with Summed Audio
Control two base stations with the same deskset remote. RX audio from both lines is summed and heard on the deskset's speaker. The operator can TX and change channels on which ever line is selected. Audio from the "Unselected" line is at a lower volume than audio from the "Selected" line. The relative volume of the unselected audio is dealer adjustable.
(Not available with Option 611 – Four Wire)

Option 616 – One Touch TX
Transmit with the touch of a button on the faceplate. A small condenser mic hidden on the front edge of the unit picks up your voice. Great for short quick responses.

continued next page

MODEL 24-66 ADDITIONAL PROGRAMMABLE FEATURES

Tones can be programmed for whichever function is desired. Available tones: 2050 Hz, 1950 Hz, 1850 Hz, 1750 Hz, 1650 Hz, 1550 Hz, 1450 Hz, 1350 Hz, 1250 Hz, 1150 Hz, 1050 Hz.

Disable of ON HOOK MONITOR (handset only)

Momentary F2 (always returns to F1)

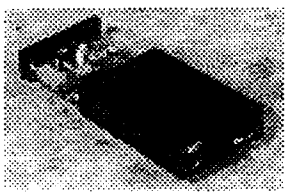
Momentary Intercom

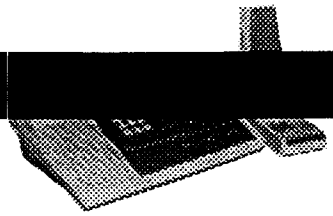
Remote Update (updates display of 24-66 when base station radio changes channels due to SCAN or in trunking applications, available for several popular radios, Option 613 and Model 20-27 Tone Termination Panel required)

OTHER 24-66 & 24-46 OPTIONS:
RBC-001 Wall Mounting Bracket
RBC-002 External Encode/Decode Cable
RBC-003 Programming Cable and Software

MODEL 20-27 TONE TERMINATION PANEL

The world's most powerful Tone Remotes deserve the most powerful Tone panel. The Model 20-27 is field programmable just like the remotes. Offering standard features such as 99 Channels, Local mic jack, LTR and ESAS trunking format, Binary output, and Remote Update of 24-66s. Direct control including SCAN, System /Group is standard for popular EF Johnson, Uniden, Kenwood, and SEA. Plug and play cabling available for a wide variety of radios.





IDA CORPORATION
1-800-627-4432

Cost Options continued from previous page

Option RBC-617 - 99 Channel Capability
Provides up to 99 channels to be controlled and displayed. By using a pair of function tones, 128 different commands are possible. The desired channel is selected by toggling up or down and shown on the LED display. Included with option RBC-617 are options RBC-610 (clock) and RBC-613 (notch filter). Momentary time display is via the CLOCK button.

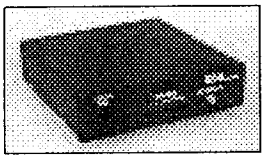
Option RBC-618 - 99 Channel Capability with DTMF
Similar to option RBC-617, this option provides up to 99 channels to be controlled and displayed. Direct access to the desired channel and DTMF encode are added features. A 12 button keypad is mounted on the faceplate of the deskset. Included with option RBC-618 are options RBC-610 (clock) and RBC-613 (notch filter). Momentary time display is via the CLOCK button.

Option RBC-619 - Alpha-Numeric Display
Displays channel selections with name/number of the operator's preference. Programmable up to 16 characters, the option includes clock and VU meter.

Option RBC-620 - Alpha-Numeric Display
Displays channel selections with name/number of the operator's preference. Programmable up to 32 characters, the option includes clock and VU meter.

Option RBC-621 - Digital Signaling
Fast and efficient digital signaling in a proprietary MSK format. When used along with Model 20-28 Remote Termination Panel, option RBC-621 provides the high speed switching and communication required for demanding trunking applications. Options RBC-610 (clock) and RBC-613 (notch filter) are included. Option RBC-611 (four wire) is recommended for use in most trunking applications.

Option RBC-622 - DTMF Encode
12 button DTMF encoder with keypad mounted on deskset.



MODEL 20-28 REMOTE TERMINATION PANEL

The 20-28 is a programmable termination panel for use with IDA Model 24-66 desk top controllers equipped with digital signaling. By decoding the proper digital signals the 20-28 can control remotely located base stations or repeaters. In addition to providing a two-way path for audio the unit also provides update information back to the desk top controllers. This update information allows the operator immediate information as to the remote radios status, such as channel, in or out of scan, or the current System & Group if a trunking application.

MSK SIGNALING

The 20-28 is field programmable via IBM compatible PC and features digital signaling in a proprietary MSK format. When used along with Model 24-66 remotes equipped with MSK signaling (Option RBC-621) the 20-28 provides the high speed switching and communication required for demanding trunking applications.

PROGRAMMABLE OUTPUTS

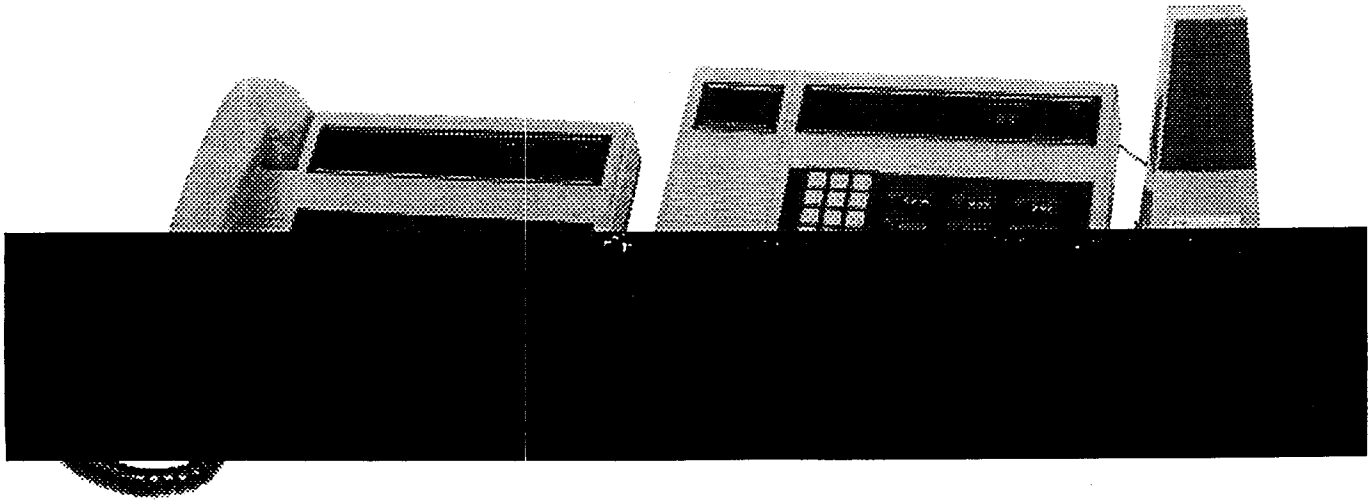
To meet the requirements of various manufacturers base stations the 20-28 can be programmed for a wide variety of outputs. For stations that are capable of receiving external serial commands the 20-28 can be programmed to provide the proper command set. In addition the unit can be programmed for Binary output.

This method of communicating with the radio's microprocessor in much the same way that it's own faceplate display does offers virtually total remote control. Advanced features such as SCAN, Lockout, Selective calling, Priority SCAN, and others become possible. When programming the 20-28, up to 8 of the outputs can be selected as inputs.

LOCAL OPERATION

For installations where local operation of the base station is desired the 20-28 is available with a desk microphone, speaker jack, and volume control (Option RTM-604).

TRC-8/98



TECHNICAL SPECIFICATIONS

	DC REMOTES		TONE REMOTES
	24-46	24-66	20-88
Input Voltage	117/230 VAC + -20% 50/60Hz	117/230 VAC + -20% 50/60Hz	117/230 VAC 50/60Hz
Standby Voltage Standby current	----- -----	12-15VDC 287mA (TX) 620mA (RX) (STBY)	250mA (MAX)
Input power (max)	17W (TX) 24W (RX) 4W (STBY)	8.5W (TX) 20W (RX) 8.5W (STBY)	
Temperature range	-30 deg to +60 deg C	-30 deg to +60 deg C	0° C to +70° C
Relative humidity	90% at 50 deg C	90% at 50 deg C	
Line impedance (1KHz)	600 ohms (TX) 600 or 5k ohms (RX)	600 ohms (TX) 600 or 5k ohms (RX)	600 ohms @ 1 KHz
Line audio output (600 ohm load)	-20 to +10dbm	-20 to +10dbm	-20dbm to +10dbm
TX hum & noise (ref +11dbm)	-55db	-55db	
Threshold of compression (line to speaker audio)	-20dbm adjustable	-20dbm adjustable	-20dbm
Speaker audio output RMS	3W into 4 ohms	3W into 4 ohms	3.5W into 4 ohms
Distortion (at rated speaker output)	Less than 3%	Less than 3%	Less than 5%
RX hum & noise	-55db	-49db	-55db
Frequency response (300 to 3,000Hz)	+1, -3db	+1, -3db except at notch frequency	300Hz to 3KHz
RX compression	With an audio increase of 30db beyond the start of compression the output increases less than 3db	With an audio increase of 30db beyond the start of compression the output increases less than 3db	
TX compression	With an audio increase of 30db beyond the start of compression the output increases 15 to 16db	With an audio increase of 30db beyond the start of compression the output increases 15 to 16db	
Line control	2 or 4 wire audio	2 or 4 wire audio	2 or 4 wire
Notch filter depth	N/A	-45db (RX) -25db (TX)	40db (RX)
Weight	4lbs 15oz	4lbs 15oz	4lbs 8oz
Dimensions	4.75" (H) x 10" (W) x 8" (D)	4.75" (H) x 10" (W) x 8" (D)	2.4" (H) x 10" (W) x 9.4" (D)

IDA CORPORATION

1345 Main Ave, Fargo, ND 58103

800-627-4432 / FAX 218-233-1886 / 701-280-1122

sales@idaco.com

LOT 3
RADIOS, TWO-WAY
BASE STATION, REMOTE
UHF, TONE CONTROLLED, 100 WATTS
SPECIFICATION AND BID SHEET

Item 1. Radio, two-way, UHF (450-470 MHz), remote, base station, tone controlled, min. R.F. power output 100 watts, two-channel capability with channel 1 active. Purchase order to specify frequency. Channel 2 blank or as specified on purchase order. Shall have continuous tone control squelch at a frequency to be specified on purchase order and continuous tone control squelch monitor function. Shall have intercom, AC line surge protection and phone line surge protection. Shall be mounted in a floor mount indoor type or cabinet. Unit shall have a frequency stability on both transmit and receive of ±.0002% (-30C. + 60C.), unit to have time out timer. Unit to be capable of both 25 and 12.5 Khz operation. Shall be Motorola Quantar, Motorola MTR-2000, Ericsson Mastr III or approved equal.

State Manufacturer: COM-NET ERICSSON

Model SXUQC1 $6949.77 /each

Required Additional Features:

Item 2. - Transmitter frequency determining device for each additional channel.

Model INCLUDED $ N/C /each

Item 3. - Receiver frequency determining device for each additional channel.

Model INCLUDED $ N/C /each

Item 4. - Antenna, unity gain, omnidirectional, with mounting clamps. Decibel Product DB-201 or approved equal.

Model DB201 $ 346.80 /each

Item 5. - Antenna, omnidirectional, 10dB gain with mounting clamps. Celwave PD-455 or approved equal.

Model PD455 $ 688.50 /each

Item 6. - Antenna, Yagi, 10dB gain with mounting clamps. Decibel Product DB-436 or approved equal.

Model 7287 $ 239.70 /each

Item 7. - Cable, 7/8", jacketed heliax type, copper inner and outer conductors, 50 Ohms impedance.
Model 7775 $ 6.30 / per foot

Item 8. - Connection kit for use with above heliax cable.

Model 7776/77 $ 154.02 /each

Item 9. - Ground strap kit.

Model 7741 $ 29.58 /each

Item 10.- Receiver, second unit, to be single frequency and have volume and squelch control and be identical in all performance specifications to the above station receiver, antenna matching device. Receiver includes notch filter, line response compensator, and squelch operated relay.

A. Tone Squelch
Model SRUN01 $ 2216.97 /each

B. Carrier Squelch
Model INCLUDED $ N/C /each

Item 11.- Console, remote, tone controlled, 1TX-1RX, for use with above base station and with volume control, continuous tone control squelch monitor switch, desk microphone, and control line and power line surge protection.

Model 24-66H $ 1103.64 /each

A. Intercom	$ N/C	/each
B. 2Tx - 2Rx Control	$ N/C	/each
C. 12/24 Hour Clock	$ 166.26	/each
D. Parallel Transmit Indicator with Notch Filter	$ 155.04	/each
E. Supervisor Control	$ 78.54	/each
F. Wall mount Bracket	$ 59.16	/each
G. DTMF encoder with keypad	$ 281.52	/each

Item 12. - Deskset, tone controlled, for use with above station. Unit to have volume control, handset, power line and phone line surge protection.

Model 24-66H $ 1103.64 /each

1. Notch filter $ 155.04 /each
2. Parallel Transmit Light $ N/C /each

Item 13. - Furnish outdoor pole-mounted cabinet in lieu of indoor floor mounted cabinet

Model SXCA1X $ 1292.34 /each

*NOTE; HOUSES MIII ONLY,NO SPACE FOR AUX RCVR.

Item 14. - Warranty, one year parts and labor, at locality/agency.

Base Station	$ N/C	/yr.
Console, remote, tone controlled	$ N/C	/yr.
Deskset, remote, tone controlled	$ N/C	/yr.

Item 15. - I.D., automatic, CW.

Model INCLUDED $ N/C /each

Item 16 - Test speaker and microphone.

Model SXMC3B $ 46.41 /each

Item 17 - DTMF decoder

Model D2MC5N $ 124.95 /each

Item 18. - Digital CTCSS

Model INCLUDED $ N/C /each

Award based on Items 1-18 $ 15,198.18

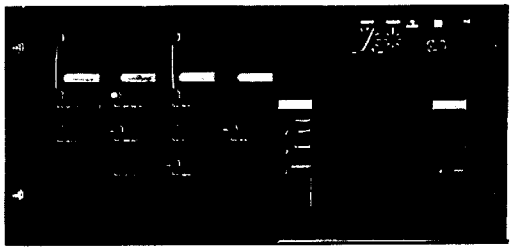
OPTIONAL FEATURES:

Item 19. – Metering panel or kit with meter(s)

Model NO BID $ _____ /each

Conventional
MASTR® III Stations VHF, UHF, 800 MHz

The MASTR III, built on the tradition of the popular MASTR series of repeaters, is an industry leader in performance, flexibility, and reliability. The MASTR III provides innovations such as fully shielded and removable modules, front-mounted controls, and remote diagnostics. The MASTR III features the latest in digital signal processing technology, which provides a comprehensive array of control capabilities for system design flexibility.



Product Overview

The MASTR III provides the flexibility to change system setup as necessary. Whether users are designing a system, programming radio functions, or arranging an installation site, MASTR III keeps pace with their needs.

Flexible, Efficient Design

The microprocessor-controlled, PC programmable options provide flexibility, simplified setup, and easy field upgrades. The fully synthesized design of the MASTR III Base Station allows the user to make frequency changes quickly, easily, and affordably. In addition, the MASTR III operates on both wideband (25 kHz) and narrowband (12.5 kHz) channels.

The modular design of the MASTR III Base Station makes maintenance and servicing simple and fast. Each module furnishes easy-to-read indications of proper operation.

A 69-inch cabinet houses three stations or ancillary equipment. The cabinet design also increases reliability through its cooling capacity for the equipment housed within it.

MASTR III also features optional Aegis™ digital or Voice Guard® encryption with the addition of a digital control shelf.

Backward Compatible

The MASTR III Base Station can be used in combination with MASTR II or IIe stations. The MASTR III is readily upgradable through software revisions.

For More Information

For more information about this or any other Com-Net Ericsson Critical Radio Systems product, call 1-800-431-2345 in the U.S. From outside the U.S. call +1-804-592-6100.

ComNet Ericsson
CRITICAL RADIO SYSTEMS

Conventional Options and Accessories

Programmable Options

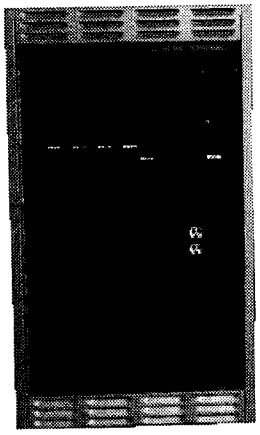
- Transmit Frequencies
- Receive Frequencies
- Channel Guard Digital and Tone
- Channel Guard Disable
- Repeater Disable
- Intercom Function
- Type 90
- DTMF Decode
- Morse Code ID
- Squelch Tail Elimination (STE)
- Carrier Control Timer
- Station Control
- DC Control
- Tone Control
- Repeater
- DC/Repeat
- Tone/Repeat
- 2- or 4-Wire Audio
- Scan

Additional Options

- Service Microphone
- Antenna Multicoupler
- 50 Hz Power Supply
- Duplexer
- Antenna Relay (VHF/UHF)
- Combiner
- Isolator
- Squelch-Operated Relay
- Remote Controllers
- Battery Standby (VHF/UHF)
- Battery Charger (VHF/UHF)
- Gel Cell Battery (VHF/UHF)
- Voice Guard Encryption
- Aegis Digital
- Switchable Channel Spacing

Conventional Tone and DC Remote Controlled Stations

Audio (Line to Transmitter)	
Line Terminating Impedance:	600 Ω
Line Level (Adjustable):	-20 to +7 dBm
Frequency Response:	±3 dB @ 300-3000 Hz
Tone Control	
Function Tones:	1050,1150,1250,1350,1450, 1550,1650, 1750,1850,1950 and 2050 Hz
Secur-it Tone and Transmit Tone:	2175 Hz
Transmitted 2175 Hz Tone Level:	20 dB Below Voice
Permissible Control Line Loss @2175 Hz:	30 dB
Audio (Receiver to Line)	
Audio Amplifier Input Impedance:	10 KΩ
Input Level:	1 V RMS (for 5 kHz Deviation)
Output Impedance to Line:	600 Ω
Output Level to Line Voice (1 kHz ref):	+7 dBm (Adjustable)
Tone (1 kHz ref):	+7 dBm (Reference 7 dBm)
Frequency Response:	+1 and -3 dB @ 300-3000 Hz
Hum and Noise, Noise Squelch:	-55 dB (Reference 7 dBm)
Tone Squelch:	-30 dB (Reference 7 dBm)
DC Control Control Currents:	-2.5, ±6, and ±11 mA
Line Loop Resistance (maximum):	11 KΩ (Includes 3K Termination)



One Conventional Channel

Regulatory Data

Frequency Range (MHz)	Power Output (Adjustable) (W)	FCC Type Acceptance Number	Applicable FCC Rules	Industry Canada Certification Number	Applicable Industry Canada Rules	CE Marking
136-150.8	55-110	AXATR-197-A2	22, 90, 80, 74	TR-197	RSS-119	All VHF and UHF bandsplits meet the following: ETS 300 086 ETS 300 219 ETS 300 113
150.8-174	55-110	AXATR-197-A2	22, 90, 80, 74	TR-197	RSS-119	
403-430	45-90	AXATR-307-A	90	TR-307	RSS-119	
425-450	45-90	AXATR-307-A2	90	TR-307	RSS-119	
450-470	50-100	AXATR-307-B2	22, 90, 80, 74	TR-307	RSS-119	
470-494	45-90	AXATR-307-C2	90	N/A	N/A	
492-512	45-90	AXATR-307-D2	90	N/A	N/A	
800	10-100	AXATR-307-A2	90	TR-329	RSS-119	N/A

Technical specifications are subject to change. This product is subject to U.S. export control for national security reasons.

General Specifications

Cabinet	INDOOR CABINET (Floor Mount) 37 inches (CNV)	69 inches
Size [in. (mm)]		
Height	37.0 (940)	69.1 (1750)
Width	21.5 (550)	23.1 (590)
Depth	18.25 (460)	21.0 (533)
Weight (min) [(lb (kg)]		
Continuous Duty	150 (68)	520 (236)
Packed, Domestic Shipping	165 (75)	550 (250)
Number of Rack Units	17	33
Max. Units w/Power Supply	1	3
w/o Power Supply	1	4

NOTE: One rack unit equals 1.75 inches. Stations occupy 8 rack units of cabinet space.

Service Speaker:	1W @ 8Ω
Service Microphone:	Transistorized Dynamic
Duty Cycle (EIA) Continuous:	Transmit/Receive - 100%
Ambient Temperature (or full spec performance per EIA):	-22 to +140°F (-30 to +60°C)
Humidity (EIA):	90% @ 122°F (50°C)
Input Power Source:	120 VAC (±20%)
Optional Input Power Source:	230 VAC (±15%), 50 Hz
Standby Battery Source:	13.8 VDC, 100 AH (min.)
Antenna Connections:	Type N
Length of AC Power Cable:	10 ft (3048 mm)
Metering:	Provided through Handset or TQ0619 Utility Software
Altitude:	
Operable:	Up to 15,000 ft (4,570 m)
Shippable:	Up to 50,000 ft (15,250 m)
Mean Time Between Failure (MTBF)	11,227 hours

Source Power Drain		VHF		UHF					800
Frequency Range (MHz)		136-150.8	150.8-174	403-430	425-450	450-470	470-494	492-512	851-870 Tx 806-825 Rx
AC Input Power		5A @ 120 VAC or 3A @ 230 VAC							
DC Input Power (A)	VDC								
Tx (full/half power)	13.8	33/25	33/25	33/25	33/25	33/25	33/25	33/25	2/2
Rx only	13.8	2	2	2	2	2	2	2	2
Tx (full/half power)	26.4								12/8
Rx only	26.4								0.5
EDACS Applications	13.8	2	2	2	2	2	2	2	2

Transmitter

	VHF		UHF					800
Frequency Range (MHz)	136-150.8	150.8-174	403-430	425-450	450-470	470-494	494-512	851-870
Rated Power Output (W)	110	110	90	90	100	90	90	100
RF Output Impedance (Ω)	50	50	50	50	50	50	50	50
Conducted Spurious and Harmonic Emission (dBm)	-36	-36	-36	-36	-36	-36	-36	-36
Frequency Stability (ppm)	±1.5	±1.5	±1.0	±1.0	±1.0	±1.0	±1.0	±1.0
Modulation Deviation (kHz)								
Wideband	0 to ±5	0 to ±5	0 to ±5	0 to ±5	0 to ±5	0 to ±5	0 to ±5	0 to ±5
15K0F1D, 15K0F1E								
16K0F1D, 16K0F1E, 16K0F3E	0 to ±2.5	0 to ±2.5			0 to ±2.5			
Narrowband								0 to ±5
11K0F3E								
NPSPAC								
14K0F3E								-55
FM Noise (dB)	-55	-55	-55	-55	-55	-55	-55	25
Channel Spacing (kHz)	12.5/25/30	12.5/25/30	12.5/25	12.5/25	12.5/25	12.5/25	12.5/25	12.5 (NPSPAC)
Frequency Spread Full Spec (MHz)	8	12	27	25	20	24	20	1.0

Audio Distortion (@ 1 kHz): Less than 3%
Number of Channels (Conventional): Up to 16
Audio Response (pre-emphasis): Within +1/-3 dB of 6 dB/octave, 300 to 3000 Hz per EIA
NOTE: Rated power output is measured at the transmitter power amplifier output connector per FCC Type Acceptance filing information. Any customer-required optional items such as power measuring devices and/or duplexers will introduce loss between the transmitter output connector and the station cabinet output connector. This loss will reduce the available power at the station connector.

Receiver

	VHF		UHF					800
Frequency Range (MHz)	136-150.8	150.8-174	403-430	425-450	450-470	470-494	492-512	806-825
RF Input Impedance (Ω)	50	50	50	50	50	50	50	50
Channel Spacing (kHz)	12.5/25/30	12.5/25/30	12.5/25	12.5/25	12.5/25	12.5/25	12.5/25	25 12.5 (NPSPAC)
Sensitivity (dBm) EIA 12 dB SINAD	-116 (0.35 µV)	-116 (0.35 µV)	-116 (0.35 µV)	-116 (0.35 µV)	-116 (0.35 µV)	-116 (0.35 µV)	-116 (0.35 µV)	-119 (0.25 µV)
Threshold Squelch (dBm)	-119 (0.25 µV)	-119 (0.25 µV)	-119 (0.25 µV)	-119 (0.25 µV)	-119 (0.25 µV)	-119 (0.25 µV)	-119 (0.25 µV)	-122 (0.18 µV)
Selectivity EIA 2-Signal (dB)								20 (NPSPAC)
12.5 kHz	80	80	80	80	80	80	80	90
25 kHz	95	95	90	90	90	90	90	
30 kHz	100	100						
Frequency Stability (ppm)	±1.5	±1.5	±1.0	±1.0	±1.0	±1.0	±1.0	±1.0
Signal Displacement Bandwidth (kHz)	±2	±2	±2	±2	±2	±2	±2	±2
Intermodulation (dB)								
12.5 kHz	75	75	75	75	75	75	75	85
25 kHz	90	90	85	85	85	85	85	
30 kHz	90	90						
Spurious and Image Rejection (dB)	100	100	100	100	100	100	100	100
Frequency Spread								1.5
Full Specs. (MHz)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	N/A
3 dB Degradation in Sensitivity (MHz)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	

Audio Response (de-emphasis): Within +2/-8 dB of 6 dB/octave (@ Local Speaker), 300 to 3000 Hz per EIA
Within +1/-3 dB of 6 dB/octave (@ Line Output), 300 to 3000 Hz per EIA
Audio Output: 1 Watt at less than 3% distortion @ 1000 Hz, 25/30 kHz Channel

Com-Net Ericsson Critical Radio Systems, Inc.
P. O. Box 2000
Lynchburg, Virginia 24501
Phone: 1-800-431-2345
+1-804-592-6100
www.com-netericsson.com

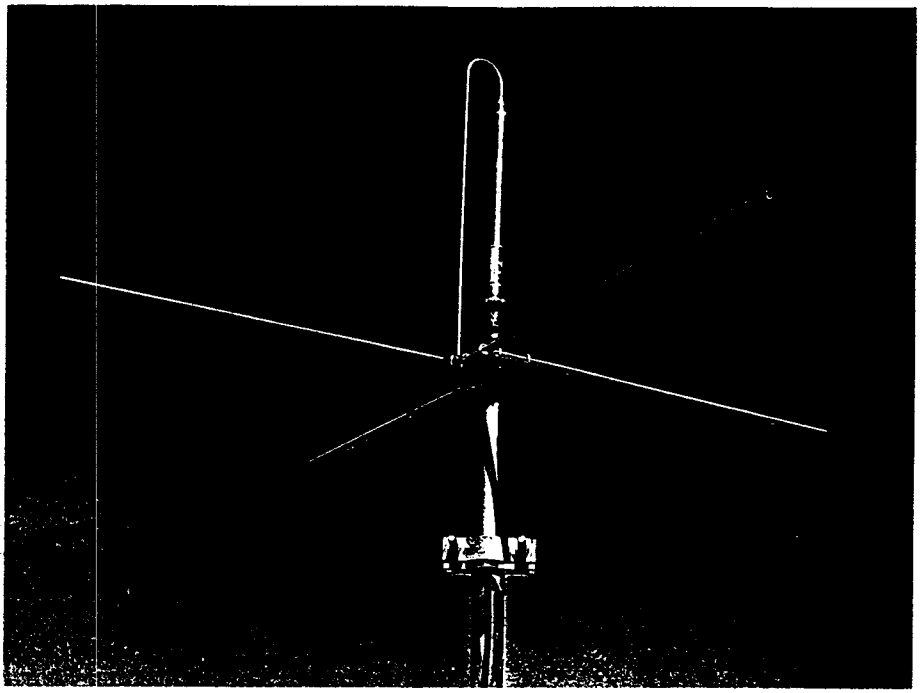
ECR-5778C

3/00 Printed in U.S.A.

DB2U1 GROUND PLANE OMNI ANTENNA UNITY GAIN, 30-174 and 220-512 MHz

- **Very popular** - Heavy duty, light weight antenna is one of our most widely used.
- **Unique Design** - Features a new approach to the feeding of the insulated portion of the radiator.
- **Moisture Resistant** - 50-ohm feed-through connector is encapsulated in a moisture and corrosion proof molded epoxy insulator.
- **Cut and Tested** - The radiating element and ground radials are cut to frequency and tested at the factory for minimum VSWR. Uncut models for 30-50, 144-174 and 406-512 MHz are optional. Cutting chart is included.
- **Lightning Resistant** - Constructed of metal with all elements operating at DC ground.
- **Protected Lead** - A male-to-female connection is weather protected but can be replaced if necessary.
- **New** - 30-50 MHz models have galvanized steel support pipe.
- **Easy Mounting** - Galvanized steel DB365-OS Mount is furnished for mounting atop a tower, pole or building

Ordering Information - Use model number correct frequency or specify uncut model id frequency range, also termination if non-standard. Order jumper cable separately, if desired.



Electrical Data	
Frequency Ranges – MHz A = 30-33, B = 33-37, C = 37-42, D = 42-50, E = 60-88, F = 100-144, G=144-150, H=150-174, J=225-406, JJ=220-222, K = 406-512	Uncut models: L = 30-50, M = 144-174, N = 406-512
Bandwidth	2% of frequency
VSWR	1.5 to 1 or less
Nominal impedance – ohms	50
Gain (over half-wave dipole) – dB	Unity
Maximum power input – watts	500
Vertical beamwidth (half power points)	78°
Lightning protection	Direct ground
Standard Termination: Captive Type N-male to end of flexible lead. Other fittings are available on special order. If UHF connector is required, an adapter is provided.	

144-512 MHz antennas can be shipped by UPS.

Mechanical Data				
	35 MHz	50 MHz	150 MHz	450 MHz
Radiator (aluminum) – in. (mm)	.875 (22.23) OD with .125 (3.18) wall & .375 (9.35) OD solid rod	.875 (22.23) OD with .125 (3.18) wall & .375 (9.35) OD solid rod	.875 (22.23) OD with .125 (3.18) wall & .375 (9.35) OD solid rod	.875 (22.23) OD with .125 (3.18) wall & .375 (9.35) OD solid rod
Ground rods (aluminum) – in. (mm)	.5 (12.7) OD solid rod tapered to .250 (6.35) OD	.5 (12.7) OD solid rod tapered to .250 (6.35) OD	.5 (12.7) OD solid rod	.5 (12.7) OD solid rod
Support pipe – in. (mm)	1.31 (33.34) OD, 24 (609.6) length	1.31 (33.34) OD, 24 (609.6) length	1.31 (33.34) OD, 12 (304.8) length	1.31 (33.34) OD, 12 (304.8) length
Maximum exposed area (flat plate equivalent) – ft² (m²)	1.1 (.102)	0.8 (.074)	.4 (.037)	.3 (.028)
Wind rating:				
Survival without ice – mph (km/hr)	93 (150)	122 (196)	over 125 (201)	over 125 (201)
Survival with .5" (12.7 mm) radial ice – mph (km/hr)	51 (82)	65 (105)	over 125 (201)	over 125 (201)
Lateral thrust at 100 mph (161 km/hr) – lbf (N)	44 (195.7)	32 (142.3)	16 (71.2)	12 (53.4)
Overall length – in. (mm)	101 (2.57)	78 (1.98)	30 (.76)	19 (.48)
Height (above base plate) – in. (m)	77 (1.96)	54 (1.37)	18 (.45)	6.5 (.17)
Maximum width (horizontal) – in. (m)	216 (5.49)	151 (3.84)	49 (1.24)	15 (.381)
Net weight (w/clamps) – lbs. (kg)	25 (11.34)	23 (10.43)	10 (4.54)	6 (.152)
Shipping weight (w/clamps) – lbs. (kg)	35 (15.88)	31 (14.06)	14 (6.35)	9 (.229)
Mounting clamps (Galvanized steel)	DB365-OS	DB365-OS	DB365-OS	DB365-OS

Fiberglass Collinear Antennas

PD455 **10 dBd Super Stationmaster™**

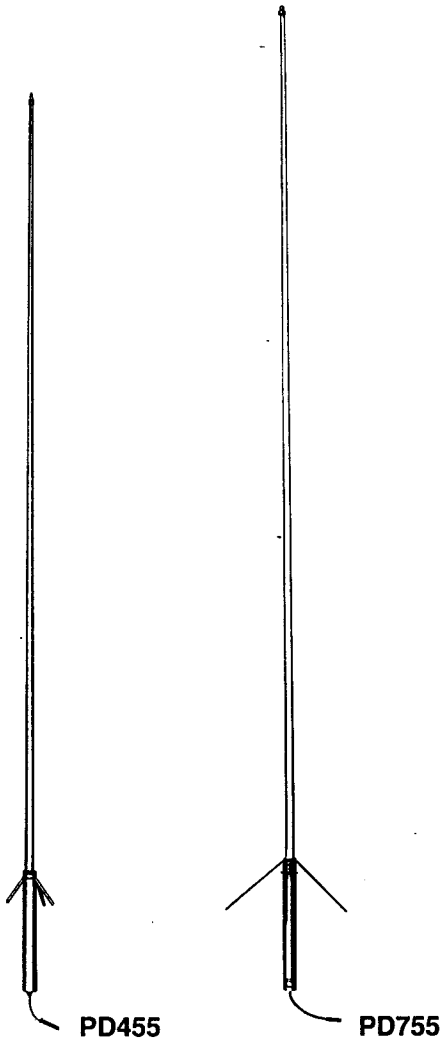
PD755 **10 dBd Heavy Duty Super Stationmaster™**

These Super Stationmaster UHF base station antennas incorporate design enhancements not normally available in other fiberglass collinear antennas of comparable size. Due to their broadband characteristics, only six versions are required to cover the 450-512 MHz band.

The PD455 combines full 10 MHz bandwidth capability and improved lightning protection with 10 dBd omni-directional gain while preserving the desirable light-weight characteristic found in all Stationmaster antennas. The PD755 is electrically equivalent to the PD455 but represents an extra-rugged version with specially strengthened housing and support pipe. It is designed for use in very severe weather environments. The PD568 reflector assembly is available for the PD455. See page 59 on Special Radiation Patterns for details.

The PD455DT and PD755DT may be ordered with either 3° or 6° downtilt. Note: Operational gain and bandwidth are lessened with downtilt; specify exact frequency when ordering DT model.

- **Fiberglass construction** — Protects radiating elements in corrosive environments.
- **Copper radiating elements** — Minimizes possibility of intermod generation.
- **Full 10 dB gain** — Provides maximum on horizon coverage.



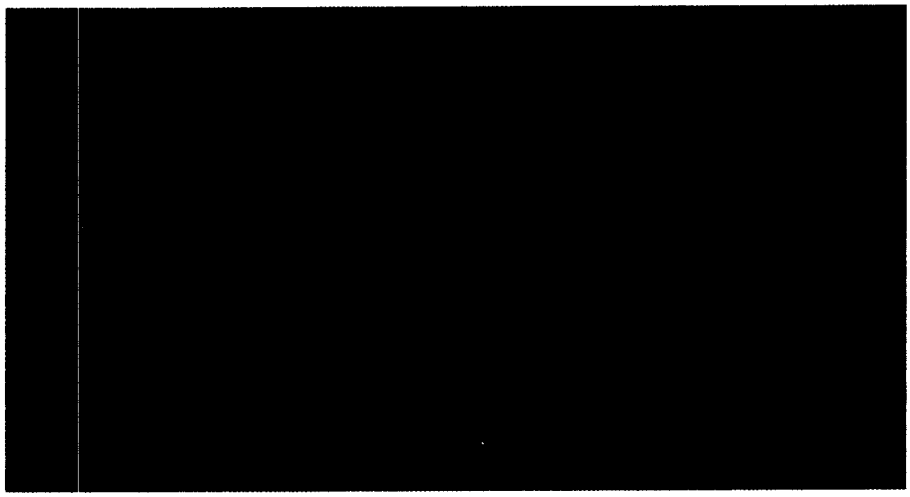
Ordering Information (Specify DT for Downtilt Option)

Item Number	Frequency Range - MHz	Item Number	Frequency Range - MHz
PD455-1	406-413	PD755-1	406-413
PD455-2	412-420	PD755-2	412-420
PD455-3	420-430	PD755-3	420-430
PD455-4	430-440	PD755-4	430-440
PD455-5	440-450	PD755-5	440-450
PD455-6	450-460	PD755-6	450-460
PD455-7	460-470	PD755-7	460-470
PD455-8	470-482	PD755-8	470-482
PD455-9	480-490	PD755-9	482-494
PD455-10	494-506	PD755-10	494-506
PD455-11	500-512	PD755-11	500-512

CELWAVE®
DIVISION OF RADIO FREQUENCY SYSTEMS INC.

2 Ryan Road, Marlboro, NJ 07746-1899 • **1(800) CELWAVE** • (908)462-1880

DB436, DB437, DB438 DIRECTIONAL YAGI ANTENNAS 10 dB GAIN, 406-512 MHz



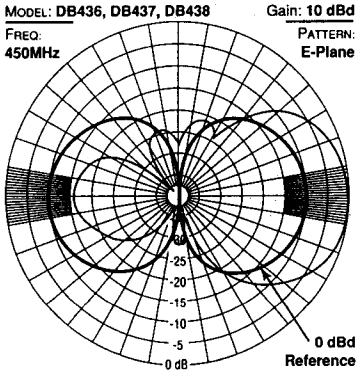
These three heavy duty Yagis give highly directional coverage and good front-to-back ratios.

- **Sturdy Construction** - All three are made of high strength welded aluminum alloys. DB437 and DB438 have a gold anodized finish. On DB438 the connector is an N-Female boom mounted, while the others have N-Male pigtails.
- **Stacked Arrays** - Two antennas provide 13 dB gain and four antennas 16 dB gain. Polarization can be vertical or horizontal, and the antennas can be mounted side-by-side or vertically. One wavelength of vertical separation is recommended.
- **Bi-directional Pattern** - Antennas can be mounted on opposite sides of the tower if desired.
- **Lightning Resistant** - Protection provided by direct ground.

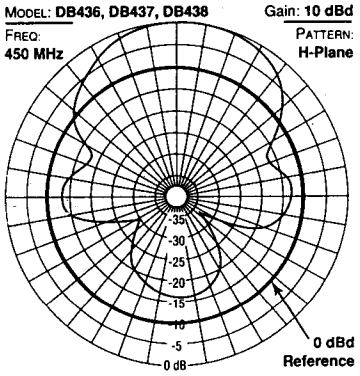
Ordering Information - Use model number for correct frequency. Mounting clamps are included. Order DB5009 for side-by-side mounting, DB5018 for quad. Other size clamps can be special ordered. **Example:** DB436-A for 406-420 MHz. Order jumper cable separately, if desired.

Gain	Order	Order
10 dB	1 ea. DB436, DB437, or	1 ea. DB438 Antenna
13 dB	2 ea. DB436, DB437, or 1 ea. 14436/7-2 Dual Harness	2 ea. DB438 Antenna 1 ea. 14438-2 Dual Harness
16 dB	4 ea. DB436, DB437, or 2 ea. 14436/7-2 Dual Harness 1 ea. 14436/7-4 Quad Harness	4 ea. DB438 1 ea. 15438-4 complete one piece Quad Harness

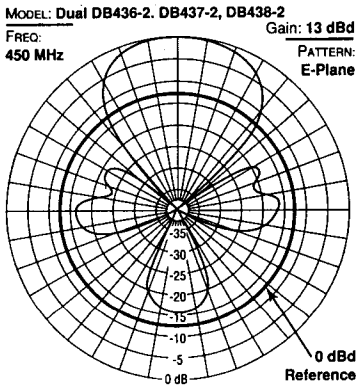
DB436, DB437, DB438 Vertical Pattern



DB436, DB437, DB438 Horizontal Pattern



Dual DB436-2, DB437-2, DB438-2 Horizontal Pattern



Electrical Data	
Frequency Ranges – MHz	A = 406-420, B = 425-445, C = 450-470, D = 470-494, E = 488-512
Bandwidth – MHz	Same as above
VSWR	1.5 to 1 or less
Nominal impedance – ohms	50
Forward gain (over half-wave dipole) – dB	10
Polarization	Vertical or horizontal
Maximum power input – watts	250
Vertical beamwidth (half power)	44°
Horizontal beamwidth (half power)	60°
Front-to-back ratio – dB	16
Lightning protection	Direct ground
Standard Termination: Captive Type N-Female on DB438. DB436 and DB437 have Type N-Male. If UHF connector is required, an adapter is provided.	

Can be shipped by UPS.

Mechanical Data	
Support boom (aluminum) – in. (mm)	1 (25.4) OD with .083 (2.108) wall
Elements	Aluminum
Mounting brackets	Galvanized steel
Maximum exposed area (flat plate equivalent) – ft² (m²)	.45 (.042) single, .90 (.084)-2, 1.8 (.167)-4
Lateral thrust at 100 mph (161 km/hr) – lbf (N)	18 (80.7) single, 36 (160.1)-2, 72 (320.3)-4
Wind rating:	
Survival without ice – mph (km/hr)	125 (201)
Survival with .5" (12.7 mm) radial ice – mph (km/hr)	90 (145)
Dimensions (HxL) – in. (mm)	14.5 (368.3)x35 (889) single, 40 (101.6)x35 (889)-2, 90 (2,286)x35 (889)-4
Net weight – lbs. (kg)	7 (3.18) single, 15 (6.8)-2, 30 (13.61)-4
Shipping weight – lbs. (kg)	9 (4.08) single, 18 (8.16)-2, 40 (18.14)-4
Mounting clamps	Stainless steel V-bolts

Model Number Configuration Charts

All db TransTelecom model numbers are descriptive. The charts below depict the various configurations for your specific application. Not all configurations are available. Ask your sales representative about your special requirements.

CABLES

Sample Model Number

DBC 012 F 5 P - □

- **DBC** — Decibel Cable
- **012** — Cable Size
  - 014 = 1/4 inch
  - 012 = 1/2 inch
  - 038 = 3/8 inch
  - 078 = 7/8 inch
  - 114 = 1-1/4 inch
  - 158 = 1-5/8 inch
- **F** — Cable Type
  - F = db TransFoam™
  - X = db TransFlex™
  - A = db TransAir™
  - R = db TransFill™
- **5** — Impedance
  - 5 = 50 ohms
  - 7 = 75 ohms
- **P** — Jacket
  - P = Polyethelene
  - T = Fire Retardant
- **□** — Optional
  - D = Swept (Low VSWR)

JUMPERS

Sample Model Number

DBJ 012 03 05 - □

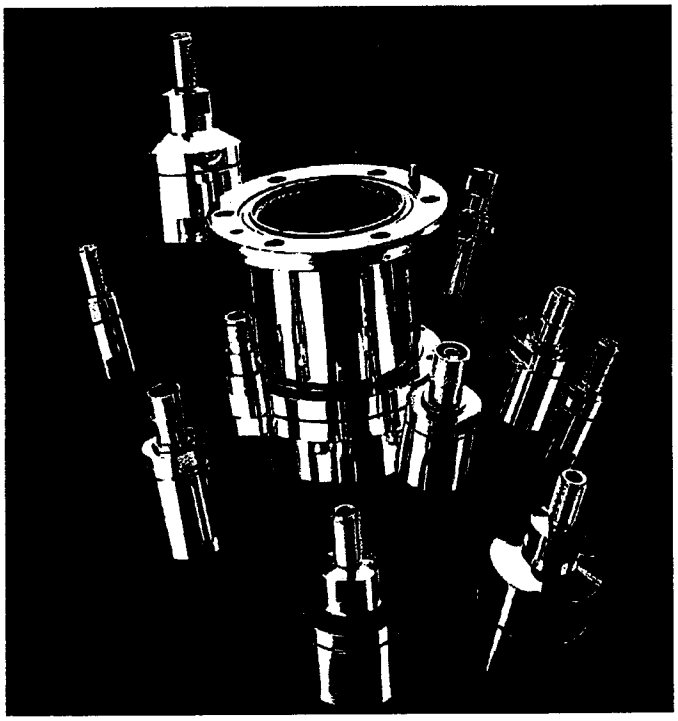
- **DBJ** — Decibel Jumper
- **012** — Cable Size
  - X14 = 1/4 Super Flexible
  - X12 = 1/2 Super Flexible
  - 012 = 1/2 Foam Cable
  - 038 = 3/8 Foam Cable
  - 078 = 7/8 Foam Cable
  - 114 = 1-1/4 Foam Cable
  - 158 = 1-5/8 Foam Cable
- **03** — Length
  - 03 = 3 foot
  - 06 = 6 foot
  - 08 = 8 foot
  - 10 = 10 foot
- **05** — Connector
  - 01 - N-Male/N-Male
  - 02 - N-Male/N-Male (plated)
  - 03 - N-Female/N-Male
  - 04 - N-Male/N-R Angle (plated)
  - 05 - DIN Male/DIN Male
  - 06 - DIN Male/DIN Male R Angle
  - 07 - DIN Male/N-Male (plated)
  - 08 - DIN Male/DIN Female
  - 09 - DIN Female/DIN Male R Angle
  - Plated = Silver plated body and gold plated pin
- **□** — Optional
  - D = Swept (Low VSWR)

CONNECTORS

Sample Model Number

DBK 012 P 1 N - B F

- **DBK** — Decibel Connector
- **012** — Connector Size
  - X14 = 1/4 db TransFlex
  - X12 = 1/2 db TransFlex
  - 012 = 1/2 db TransFoam
  - 038 = 3/8 db TransFoam
  - 078 = 7/8 db TransFoam
  - 114 = 1 1/4 db TransFoam
  - 158 = 1 5/8 db TransFoam
  - A - - = Air Cable
    - 03 = 1/2"
    - 06 = 7/8"
    - 08 = 1 5/8"
- **P** — Material
  - B = Brass/Silver
  - N = Nickel/Gold
  - P = Silver/Gold
  - S = Silver/Silver
- **1** — Angle
  - 1 = Straight
  - 2 = R-Angle
- **N** — Type
  - E = 7/16 DIN
  - F = Flange
  - L = L/C
  - M = Mini DIN
  - N = N Type
  - U = UHF
- **B** — Pin Attachment
  - S = Solder
  - B = Basket
  - T = Threaded
- **F** — Gender
  - M = Male
  - F = Female



ACCESSORIES BREAKDOWN

Model Number	Description	Model Number	Description	Model Number	Description
DBSPLICE___	Connector Splice with Cable Size	DBTIERPNYL	Tie Wrap-Nylon	DBHDWKT01	Hardware Kit 3/8" x 1"
DBGRNDKT___	Grounding Kit with Cable Size	DBTIERPCTD	Coated Copper Tie Wire	DBCOLDSHRK01	7/8 - 1/2 Cold Shrink Kit
DBCABFT___	Cable Wall Feed Thru with Cable Size	DBSSRAPLK	Stainless Steel Wrap Lock	DBCOLDSHRK02	1-1/4 - 1/2 Cold Shrink Kit
DBHNGKT___	Hanger Kit with Cable Size	DBANGLADPT	Kit of 10 Angle Adaptors	DBCOLDSHRK03	1/2 - 1/2 Cold Shrink Kit
DBSNHNGKT___	Snap In Hanger Kit with Cable Size	DBANGLADPTG	Kit of 10 Angle Adaptors Galvanized	DBCOLDSHRK04	7/8 - 7/8 Cold Shrink Kit
DBCABLEBT___	Cable Boot with Cable Size	DBBURKT	Burial Kit One Size Fits All		

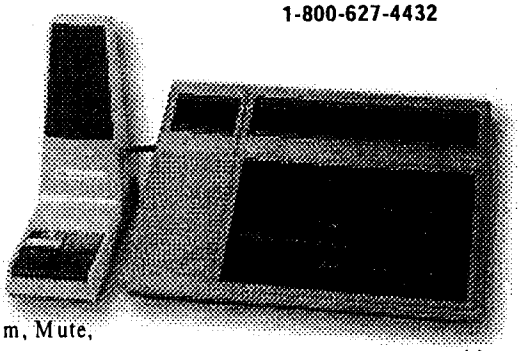
MODEL 24-66 TONE REMOTE

IDA CORPORATION
1-800-627-4432

Features

- Field Programmable by PC
- Control & display up to eight channels
- Monitor *(latched or momentary)*
- Intercom
- Mute *(latched or momentary)*
- Alert Tone
- Programmable Auxiliaries
- 30db of Compression and 3 Watts of speaker audio

Benefits



As your communications needs grow and change the 24-66 will keep up. Standard features that are not needed now can be activated with simple programming done in the field. Monitor, Intercom, Mute, Alert Tone, Number of Channels, and the Auxiliaries are all programmable.

With multiple remotes installed in parallel the audio levels remain consistent. Even in a noisy environment you will be heard loud and clear.

Cost Options

Option 610 – Clock and VU Meter
Large easy to read LED display gives TIME and TX level at a glance. *(Field programmable as Military or Standard time)*

Option 611 – Four Wire
Programmable for full duplex or separate pairs for TX and RX.

Option 612 – Supervisory / Alternate Line
Programmed as Supervisory this option allows one deskset remote to control access to the base station by other remotes. Programmed as Alternate Line allows the deskset to switch to a different base station radio with the push of a button.

Option 613 – Parallel TX Indicator and Notch Filter
Provides visual indication of transmit by another remote and prevents the 2175 Hz guard tone from being heard through the speaker.

Programmable features:

"Mute on Parallel TX" allows two or more desksets to be located in the same room without causing feedback.

"Parallel Override" allows command tones to be sent even when another remote is off hook.

"Parallel Update" changes the display of all the desksets when selecting a new channel.

Option 614 – 12 VDC Power Cable
Prewired power cable makes installing battery backup quick and easy.

Option 615 – 2nd Line with Summed Audio
Control two base stations with the same deskset remote. RX audio from both lines is summed and heard on the deskset's speaker. The operator can TX and change channels on which ever line is selected. Audio from the "Unselected" line is at a lower volume than audio from the "Selected" line. The relative volume of the unselected audio is dealer adjustable.
(Not available with Option 611 – Four Wire)

Option 616 – One Touch TX
Transmit with the touch of a button on the faceplate. A small condenser mic hidden on the front edge of the unit picks up your voice. Great for short quick responses.

continued next page

MODEL 24-66 ADDITIONAL PROGRAMMABLE FEATURES

Tones can be programmed for whichever function is desired. Available tones: 2050 Hz, 1950 Hz, 1850 Hz, 1750 Hz, 1650 Hz, 1550 Hz, 1450 Hz, 1350 Hz, 1250 Hz, 1150 Hz, 1050 Hz.

Disable of ON HOOK MONITOR (handset only)

Momentary F2 (always returns to F1)

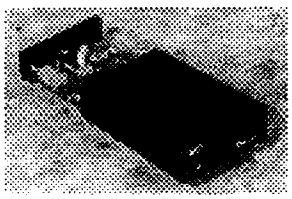
Momentary Intercom

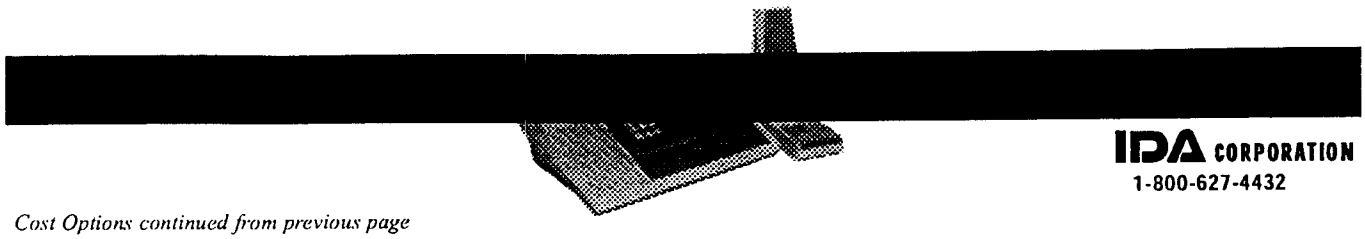
Remote Update (updates display of 24-66 when base station radio changes channels due to SCAN or in trunking applications, available for several popular radios, Option 613 and Model 20-27 Tone Termination Panel required)

OTHER 24-66 & 24-46 OPTIONS:
RBC-001 Wall Mounting Bracket
RBC-002 External Encode/Decode Cable
RBC-003 Programming Cable and Software

MODEL 20-27 TONE TERMINATION PANEL

The world's most powerful Tone Remotes deserve the most powerful Tone panel. The Model 20-27 is field programmable just like the remotes. Offering standard features such as 99 Channels, Local mic jack, LTR and ESAS trunking format, Binary output, and Remote Update of 24-66s. Direct control including SCAN, System /Group is standard for popular EF Johnson, Uniden, Kenwood, and SEA. Plug and play cabling available for a wide variety of radios.





Cost Options continued from previous page

Option RBC-617 - 99 Channel Capability
Provides up to 99 channels to be controlled and displayed. By using a pair of function tones, 128 different commands are possible. The desired channel is selected by toggling up or down and shown on the LED display. Included with option RBC-617 are options RBC-610 (clock) and RBC-613 (notch filter). Momentary time display is via the CLOCK button.

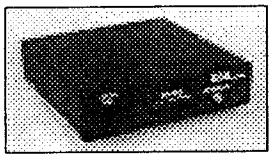
Option RBC-618 - 99 Channel Capability with DTMF
Similar to option RBC-617, this option provides up to 99 channels to be controlled and displayed. Direct access to the desired channel and DTMF encode are added features. A 12 button keypad is mounted on the faceplate of the deskset. Included with option RBC-618 are options RBC-610 (clock) and RBC-613 (notch filter). Momentary time display is via the CLOCK button.

Option RBC-619 - Alpha-Numeric Display
Displays channel selections with name/number of the operator's preference. Programmable up to 16 characters, the option includes clock and VU meter.

Option RBC-620 - Alpha-Numeric Display
Displays channel selections with name/number of the operator's preference. Programmable up to 32 characters, the option includes clock and VU meter.

Option RBC-621 - Digital Signaling
Fast and efficient digital signaling in a proprietary MSK format. When used along with Model 20-28 Remote Termination Panel, option RBC-621 provides the high speed switching and communication required for demanding trunking applications. Options RBC-610 (clock) and RBC-613 (notch filter) are included. Option RBC-611 (four wire) is recommended for use in most trunking applications.

Option RBC-622 - DTMF Encode
12 button DTMF encoder with keypad mounted on deskset.



MODEL 20-28 REMOTE TERMINATION PANEL

The 20-28 is a programmable termination panel for use with IDA Model 24-66 desk top controllers equipped with digital signaling. By decoding the proper digital signals the 20-28 can control remotely located base stations or repeaters. In addition to providing a two-way path for audio the unit also provides update information back to the desk top controllers. This update information allows the operator immediate information as to the remote radios status, such as channel, in or out of scan, or the current System & Group if a trunking application.

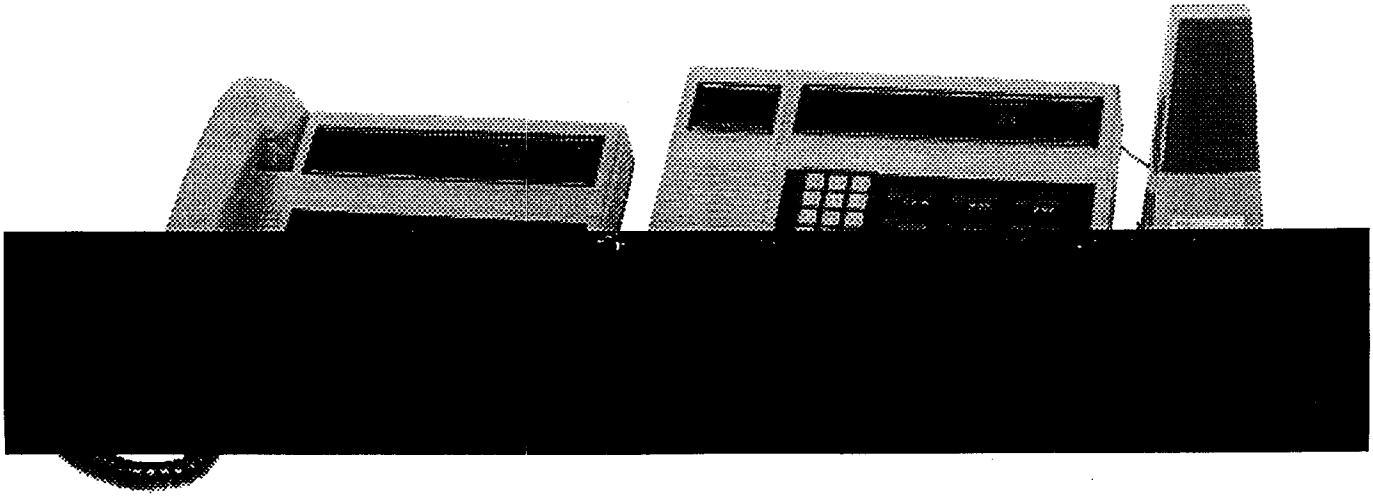
MSK SIGNALING
The 20-28 is field programmable via IBM compatible PC and features digital signaling in a proprietary MSK format. When used along with Model 24-66 remotes equipped with MSK signaling (Option RBC-621) the 20-28 provides the high speed switching and communication required for demanding trunking applications.

PROGRAMMABLE OUTPUTS
To meet the requirements of various manufacturers base stations the 20-28 can be programmed for a wide variety of outputs. For stations that are capable of receiving external serial commands the 20-28 can be programmed to provide the proper command set. In addition the unit can be programmed for Binary output.

This method of communicating with the radio's microprocessor in much the same way that it's own faceplate display does offers virtually total remote control. Advanced features such as SCAN, Lockout, Selective calling, Priority SCAN, and others become possible. When programming the 20-28, up to 8 of the outputs can be selected as inputs.

LOCAL OPERATION
For installations where local operation of the base station is desired the 20-28 is available with a desk microphone, speaker jack, and volume control (Option RTM-604).

TRC-8/98



TECHNICAL SPECIFICATIONS

	DC REMOTES	TONE REMOTES	
	24-46	**24-66**	**20-88**
Input Voltage	117/230 VAC + -20% 50/60Hz	117/230 VAC + -20% 50/60Hz	117/230 VAC 50/60Hz
Standby Voltage Standby current	----- -----	12-15VDC 287mA (TX) 620mA (RX) (STBY)	250mA (MAX)
Input power (max)	17W (TX) 24W (RX) 4W (STBY)	8.5W (TX) 20W (RX) 8.5W (STBY)	
Temperature range	-30 deg to +60 deg C	-30 deg to +60 deg C	0° C to +70° C
Relative humidity	90% at 50 deg C	90% at 50 deg C	
Line Impedance (1KHz)	600 ohms (TX) 600 or 5k ohms (RX)	600 ohms (TX) 600 or 5k ohms (RX)	600 ohms @ 1 KHz
Line audio output (600 ohm load)	-20 to +10dbm	-20 to +10dbm	-20dbm to +10dbm
TX hum & noise (ref +11dbm)	-55db	-55db	
Threshold of compression (line to speaker audio)	-20dbm adjustable	-20dbm adjustable	-20dbm
Speaker audio output RMS	3W into 4 ohms	3W into 4 ohms	3.5W into 4 ohms
Distortion (at rated speaker output)	Less than 3%	Less than 3%	Less than 5%
RX hum & noise	-55db	-49db	-55db
Frequency response (300 to 3,000Hz)	+1, -3db	+1, -3db except at notch frequency	300Hz to 3KHz
RX compression	With an audio increase of 30db beyond the start of compression the output increases less than 3db	With an audio increase of 30db beyond the start of compression the output increases less than 3db	
TX compression	With an audio increase of 30db beyond the start of compression the output increases 15 to 16db	With an audio increase of 30db beyond the start of compression the output increases 15 to 16db	
Line control	2 or 4 wire audio	2 or 4 wire audio	2 or 4 wire
Notch filter depth	N/A	-45db (RX) -25db (TX)	40db (RX)
Weight	4lbs 15oz	4lbs 15oz	4lbs 8oz
Dimensions	4.75" (H) x 10" (W) x 8" (D)	4.75" (H) x 10" (W) x 8" (D)	2.4" (H) x 10" (W) x 9.4" (D)

IDA CORPORATION

1345 Main Ave, Fargo, ND 58103

800-627-4432 / FAX 218-233-1886 / 701-280-1122

sales@idaco.com

LOT 4
RADIOS, TWO-WAY
REPEATER, UHF
100 WATTS
SPECIFICATION AND BID SHEET

Item 1. Radio, two-way, UHF (45O-47O MHz). Repeater, min. R.F. power output 1OO Watts. Single duplex channel. Purchase order to specify frequency. Shall have continuous tone control squelch at a frequency to be specified on purchase order. Shall have AC line surge protection, test speaker and microphone. Shall be mounted in an indoor floor mounted cabinet min. 37" high and shall also house the Duplexer, space permitting. Unit shall have a frequency stability on both transmit and receive of ±.OOO2% (-3OC.+ 6OC.), unit to have time out timer. Unit to be capable of both 25 and 12.5 Khz operation. Ericsson Mastr III, Motorola Quantar, Motorola MTR-2000 or approved equal.

State Manufacturer: COM-NET ERICSSON

Model SXUMCX $ 6053.70 /each

Required Additional Features:

Item 2. - Antenna, omnidirectional, unity gain with mounting clamps. Decibel Product DB-201 or approved equal.

Model DB201 $ 346.80 /each

Item 3. - Antenna, omnidirectional, 1OdB gain, Collinear with mounting clamps. Celwave PD-455 or approved equal.

Model PD455 $ 688.50 /each

Item 4. - Duplexer for use with above repeater. (5 MHz frequency separation)

Model SXDU1M $ 1422.90 /each

Item 5. - Cable, 7/8" jacketed heliax type, 5O Ohms impedance, copper inner and outer conductors.

Model 7775 $ 6.30 / per foot

Item 6. - Connector, kit for use with above heliax cable.

Model 7776/77 $ 154.02 /each

Item 7. - Ground, strap kit.

Model 7741 $ 29.58 /each

Item 8. - Console, remote, tone controlled, for use with above station if equipped with remote panel. Console to have volume control, continuous tone control squelch monitor switch, desk microphone, and control line and power line surge protection.

Model 24-66H $ 1103.64 /each

A. Intercom	$ N/C	/each
B. Repeater, On-Off Control	$ N/C	/each
C. 12/24 Hour Clock	$ 166.26	/each
D. Parallel Transmit Indicator with Notch Filter	$ 155.04	/each
E. Supervisor Control	$ 78.54	/each
F. Wall mount Bracket	$ 59.16	/each
G. DTMF encoder with keypad	$ 281.52	/each

Item 9.- Panel, remote, tone controlled, for above repeater with continuous tone control squelch monitor function, repeater disable function, intercom, and phone line surge protection.

Model INCLUDED $ N/C /each

Item 10. - Deletion of tone squelch

Model INCLUDED $ N/C /each

Item 11.- Warranty, one-year parts and labor. at locality/agency:

A. Repeater with duplexer	$ N/C	/yr
B. Console, remote, tone controlled	$ N/C	/yr.
C. Deskset, remote, tone controlled	$ N/C	/yr.

Item 12.- Deletion of time out timer.

Model INCLUDED $ N/C /each

Item 13.- I.D., automatic, CW.

Model INCLUDED $ N/C /each

Item 14.- Test speaker and microphone.

Model SXMC3B $ 46.41 /each

Item 15. Deskset, tone controlled, for use with above station. Unit to have volume control, handset, power line and phone line surge protection.

Model 24-66H $ 1103.64 /each

1. Notch filter $ 155.04 /each
2. Parallel Transmit Light $ N/C /each

Item 16. DTMF decoder

Model D2MC5N $ 124.95 /each

Item 17. - Digital CTCSS

Model INCLUDED $ N/C /each

Award based on Items 1-17 $ 11,976.00

OPTIONAL FEATURES:

Item 18. - High Power option, increase 100 watt repeater to 225 watts or greater

Model NO BID $ /each

Item 19. – Metering panel or kit with meter(s).

Model NO BID $ /each

Conventional
MASTR® III Stations VHF, UHF, 800 MHz

The MASTR III, built on the tradition of the popular MASTR series of repeaters, is an industry leader in performance, flexibility, and reliability. The MASTR III provides innovations such as fully shielded and removable modules, front-mounted controls, and remote diagnostics. The MASTR III features the latest in digital signal processing technology, which provides a comprehensive array of control capabilities for system design flexibility.

Product Overview

The MASTR III provides the flexibility to change system setup as necessary. Whether users are designing a system, programming radio functions, or arranging an installation site, MASTR III keeps pace with their needs.

Flexible, Efficient Design

The microprocessor-controlled, PC programmable options provide flexibility, simplified setup, and easy field upgrades. The fully synthesized design of the MASTR III Base Station allows the user to make frequency changes quickly, easily, and affordably. In addition, the MASTR III operates on both wideband (25 kHz) and narrowband (12.5 kHz) channels.

The modular design of the MASTR III Base Station makes maintenance and servicing simple and fast. Each module furnishes easy-to-read indications of proper operation.

A 69-inch cabinet houses three stations or ancillary equipment. The cabinet design also increases reliability through its cooling capacity for the equipment housed within it.

MASTR III also features optional Aegis™ digital or Voice Guard® encryption with the addition of a digital control shelf.

Backward Compatible

The MASTR III Base Station can be used in combination with MASTR II or IIe stations. The MASTR III is readily upgradable through software revisions.

For More Information

For more information about this or any other Com-Net Ericsson Critical Radio Systems product, call 1-800-431-2345 in the U.S. From outside the U.S. call +1-804-592-6100.

ComNet Ericsson
CRITICAL RADIO SYSTEMS

Conventional Options and Accessories

Programmable Options

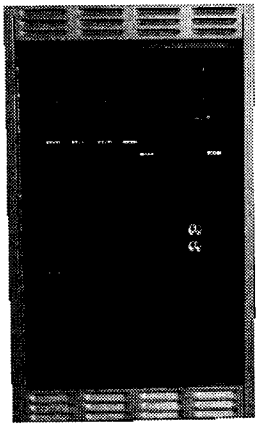
- Transmit Frequencies
- Receive Frequencies
- Channel Guard Digital and Tone
- Channel Guard Disable
- Repeater Disable
- Intercom Function
- Type 90
- DTMF Decode
- Morse Code ID
- Squelch Tail Elimination (STE)
- Carrier Control Timer
- Station Control
- DC Control
- Tone Control
- Repeater
- DC/Repeat
- Tone/Repeat
- 2- or 4-Wire Audio
- Scan

Additional Options

- Service Microphone
- Antenna Multicoupler
- 50 Hz Power Supply
- Duplexer
- Antenna Relay (VHF/UHF)
- Combiner
- Isolator
- Squelch-Operated Relay
- Remote Controllers
- Battery Standby (VHF/UHF)
- Battery Charger (VHF/UHF)
- Gel Cell Battery (VHF/UHF)
- Voice Guard Encryption
- Aegis Digital
- Switchable Channel Spacing

Conventional Tone and DC Remote Controlled Stations

Audio (Line to Transmitter)	
Line Terminating Impedance:	600 Ω
Line Level (Adjustable):	-20 to +7 dBm
Frequency Response:	±3 dB @ 300-3000 Hz
Tone Control	
Function Tones:	1050,1150,1250,1350,1450, 1550,1650, 1750,1850,1950 and 2050 Hz
Secur-it Tone and Transmit Tone:	2175 Hz
Transmitted 2175 Hz Tone Level:	20 dB Below Voice
Permissible Control Line Loss @2175 Hz:	30 dB
Audio (Receiver to Line)	
Audio Amplifier Input Impedance:	10 KΩ
Input Level:	1 V RMS (for 5 kHz Deviation)
Output Impedance to Line:	600 Ω
Output Level to Line Voice (1 kHz ref):	+7 dBm (Adjustable)
Tone (1 kHz ref):	+7 dBm (Reference 7 dBm)
Frequency Response:	+1 and -3 dB @ 300-3000 Hz
Hum and Noise, Noise Squelch:	-55 dB (Reference 7 dBm)
Tone Squelch:	-30 dB (Reference 7 dBm)
DC Control Control Currents:	-2.5, ±6, and ±11 mA
Line Loop Resistance (maximum):	11 KΩ (Includes 3K Termination)



One Conventional Channel

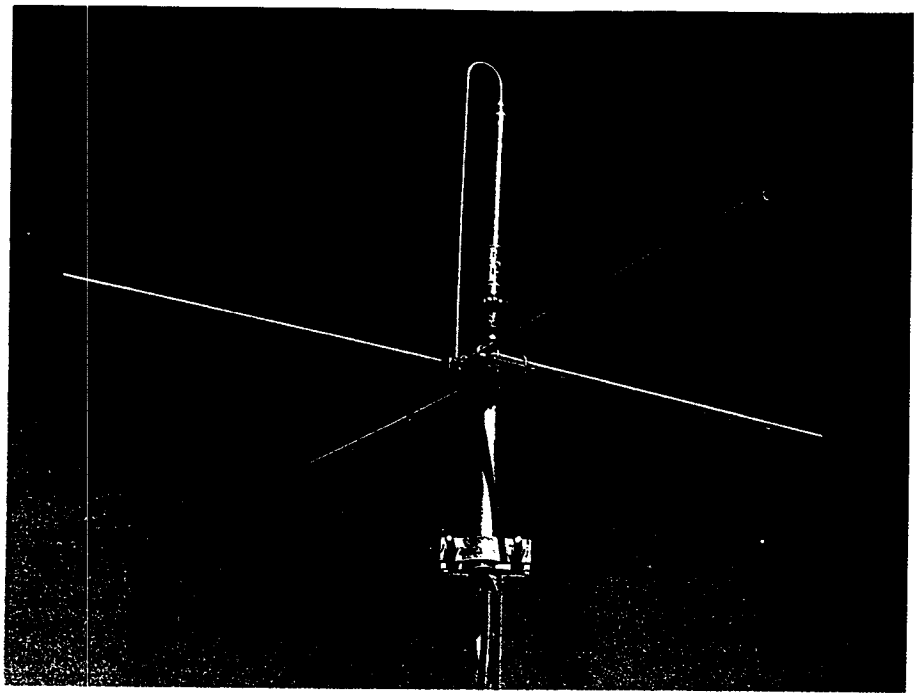
Regulatory Data

Frequency Range (MHz)	Power Output (Adjustable) (W)	FCC Type Acceptance Number	Applicable FCC Rules	Industry Canada Certification Number	Applicable Industry Canada Rules	CE Marking
136-150.8	55-110	AXATR-197-A2	22, 90, 80, 74	TR-197	RSS-119	All VHF and UHF bandsplits meet the following: ETS 300 086 ETS 300 219 ETS 300 113
150.8-174	55-110	AXATR-197-A2	22, 90, 80, 74	TR-197	RSS-119	
403-430	45-90	AXATR-307-A	90	TR-307	RSS-119	
425-450	45-90	AXATR-307-A2	90	TR-307	RSS-119	
450-470	50-100	AXATR-307-B2	22, 90, 80, 74	TR-307	RSS-119	
470-494	45-90	AXATR-307-C2	90	N/A	N/A	
492-512	45-90	AXATR-307-D2	90	N/A	N/A	
800	10-100	AXATR-307-A2	90	TR-329	RSS-119	N/A

DB201 GROUND PLANE OMNI ANTENNA UNITY GAIN, 30-174 and 220-512 M...

- **Very popular** - Heavy duty, light weight antenna is one of our most widely used.
- **Unique Design** - Features a new approach to the feeding of the insulated portion of the radiator.
- **Moisture Resistant** - 50-ohm feed-through connector is encapsulated in a moisture and corrosion proof molded epoxy insulator.
- **Cut and Tested** - The radiating element and ground radials are cut to frequency and tested at the factory for minimum VSWR. Uncut models for 30-50, 144-174 and 406-512 MHz are optional. Cutting chart is included.
- **Lightning Resistant** - Constructed of metal with all elements operating at DC ground.
- **Protected Lead** - A male-to-female connection is weather protected but can be replaced if necessary.
- **New** - 30-50 MHz models have galvanized steel support pipe.
- **Easy Mounting** - Galvanized steel DB365-OS Mount is furnished for mounting atop a tower, pole or building

Ordering Information - Use model number for correct frequency or specify uncut model and frequency range, also termination non-standard. Order jumper cable separately, if desired.



Electrical Data

Frequency Ranges – MHz A = 30-33, B = 33-37, C = 37-42, D = 42-50, E = 60-88, F = 100-144, G = 144-150, H = 150-174, J = 225-406, JJ = 220-222, K = 406-512	Uncut models: L = 30-50, M = 144-174, N = 406-512
Bandwidth	2% of frequency
VSWR	1.5 to 1 or less
Nominal impedance – ohms	50
Gain (over half-wave dipole) – dB	Unity
Maximum power input – watts	500
Vertical beamwidth (half power points)	78°
Lightning protection	Direct ground

Standard Termination: Captive Type N-male to end of flexible lead. Other fittings are available on special order. If UHF connector is required, an adapter is provided.

144-512 MHz antennas can be shipped by UPS.

Mechanical Data

	35 MHz	50 MHz	150 MHz	450 MHz
Radiator (aluminum) – in. (mm)	.875 (22.23) OD with .125 (3.18) wall & .375 (9.35) OD solid rod	.875 (22.23) OD with .125 (3.18) wall & .375 (9.35) OD solid rod	.875 (22.23) OD with .125 (3.18) wall & .375 (9.35) OD solid rod	.875 (22.23) OD with .125 (3.18) wall & .375 (9.35) OD solid rod
Ground rods (aluminum) – in. (mm)	.5 (12.7) OD solid rod tapered to .250 (6.35) OD	.5 (12.7) OD solid rod tapered to .250 (6.35) OD	.5 (12.7) OD solid rod	.5 (12.7) OD solid rod
Support pipe – in. (mm)	1.31 (33.34) OD, 24 (609.6) length	1.31 (33.34) OD, 24 (609.6) length	1.31 (33.34) OD, 12 (304.8) length	1.31 (33.34) OD, 12 (304.8) length
Maximum exposed area (flat plate equivalent) – ft² (m²)	1.1 (.102)	0.8 (.074)	.4 (.037)	.3 (.028)
Wind rating:				
Survival without ice – mph (km/hr)	93 (150)	122 (196)	over 125 (201)	over 125 (201)
Survival with .5" (12.7 mm) radial ice – mph (km/hr)	51 (82)	65 (105)	over 125 (201)	over 125 (201)
Lateral thrust at 100 mph (161 km/hr) – lbf (N)	44 (195.7)	32 (142.3)	16 (71.2)	12 (53.4)
Overall length – in. (mm)	101 (2.57)	78 (1.98)	30 (.76)	19 (.48)
Height (above base plate) – in. (m)	77 (1.96)	54 (1.37)	18 (.45)	6.5 (.17)
Maximum width (horizontal) – in. (m)	216 (5.49)	151 (3.84)	49 (1.24)	15 (.381)
Net weight (w/clamps) – lbs. (kg)	25 (11.34)	23 (10.43)	10 (4.54)	6 (.152)
Shipping weight (w/clamps) – lbs. (kg)	35 (15.88)	31 (14.06)	14 (6.35)	9 (.229)
Mounting clamps (Galvanized steel)	DB365-OS	DB365-OS	DB365-OS	DB365-OS

Fiberglass Collinear Antennas

PD455 **10 dBd Super Stationmaster™**

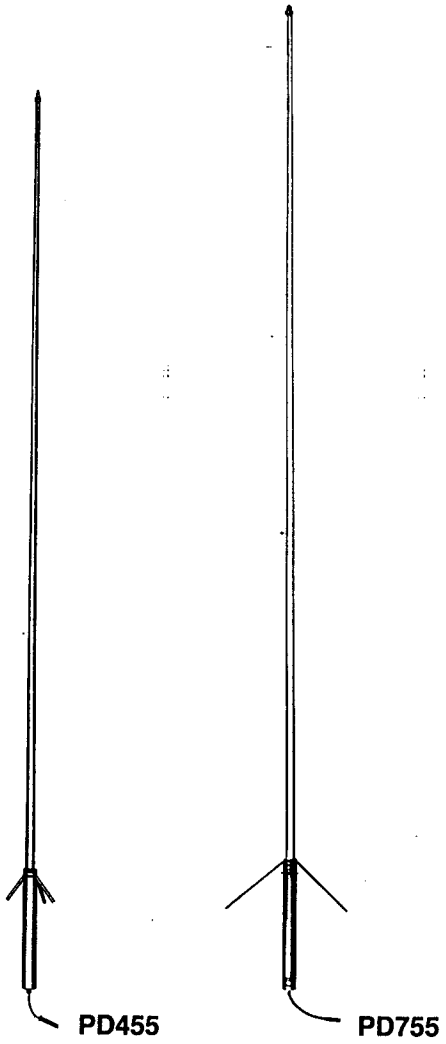
PD755 **10 dBd Heavy Duty Super Stationmaster™**

These Super Stationmaster UHF base station antennas incorporate design enhancements not normally available in other fiberglass collinear antennas of comparable size. Due to their broadband characteristics, only six versions are required to cover the 450-512 MHz band.

The PD455 combines full 10 MHz bandwidth capability and improved lightning protection with 10 dBd omni-directional gain while preserving the desirable light-weight characteristic found in all Stationmaster antennas. The PD755 is electrically equivalent to the PD455 but represents an extra-rugged version with specially strengthened housing and support pipe. It is designed for use in very severe weather environments. The PD568 reflector assembly is available for the PD455. See page 59 on Special Radiation Patterns for details.

The PD455DT and PD755DT may be ordered with either 3° or 6° downtilt. Note: Operational gain and bandwidth are lessened with downtilt; specify exact frequency when ordering DT model.

- **Fiberglass construction** — Protects radiating elements in corrosive environments.
- **Copper radiating elements** — Minimizes possibility of intermod generation.
- **Full 10 dB gain** — Provides maximum on horizon coverage.



Ordering Information (Specify DT for Downtilt Option)

Item Number	Frequency Range - MHz	Item Number	Frequency Range - MHz
PD455-1	406-413	PD755-1	406-413
PD455-2	412-420	PD755-2	412-420
PD455-3	420-430	PD755-3	420-430
PD455-4	430-440	PD755-4	430-440
PD455-5	440-450	PD755-5	440-450
PD455-6	450-460	PD755-6	450-460
PD455-7	460-470	PD755-7	460-470
PD455-8	470-482	PD755-8	470-482
PD455-9	480-490	PD755-9	482-494
PD455-10	494-506	PD755-10	494-506
PD455-11	500-512	PD755-11	500-512

CELWAVE®
DIVISION OF RADIO FREQUENCY SYSTEMS INC.

2 Ryan Road, Marlboro, NJ 07746-1899 • **1(800) CELWAVE** • (908)462-1880

Model Number Configuration Charts

All db TransTelecom model numbers are descriptive. The charts below depict the various configurations for your specific application. Not all configurations are available. Ask your sales representative about your special requirements.

CABLES

Sample Model Number

DBC 012 F 5 P - □

- **DBC** — Decibel Cable
- **012** — Cable Size
  - 014 = 1/4 inch
  - 012 = 1/2 inch
  - 038 = 3/8 inch
  - 078 = 7/8 inch
  - 114 = 1-1/4 inch
  - 158 = 1-5/8 inch
- **F** — Cable Type
  - F = db TransFoam™
  - X = db TransFlex™
  - A = db TransAir™
  - R = db TransFill™
- **5** — Impedance
  - 5 = 50 ohms
  - 7 = 75 ohms
- **P** — Jacket
  - P = Polyethelene
  - T = Fire Retardant
- **□** — Optional
  - D = Swept (Low VSWR)

JUMPERS

Sample Model Number

DBJ 012 03 05 - □

- **DBJ** — Decibel Jumper
- **012** — Cable Size
  - X14 = 1/4 Super Flexible
  - X12 = 1/2 Super Flexible
  - 012 = 1/2 Foam Cable
  - 038 = 3/8 Foam Cable
  - 078 = 7/8 Foam Cable
  - 114 = 1-1/4 Foam Cable
  - 158 = 1-5/8 Foam Cable
- **03** — Length
  - 03 = 3 foot
  - 06 = 6 foot
  - 08 = 8 foot
  - 10 = 10 foot
- **05** — Connector
  - 01 - N-Male/N-Male
  - 02 - N-Male/N-Male (plated)
  - 03 - N-Female/N-Male
  - 04 - N-Male/N-R Angle (plated)
  - 05 - DIN Male/DIN Male
  - 06 - DIN Male/DIN Male R Angle
  - 07 - DIN Male/N-Male (plated)
  - 08 - DIN Male/DIN Female
  - 09 - DIN Female/DIN Male R Angle
- **□** — Optional
  - D = Swept (Low VSWR)

Plated = Silver plated body and gold plated pin

CONNECTORS

Sample Model Number

DBK 012 P 1 N - B F

- **DBK** — Decibel Connector
- **012** — Connector Size
  - X14 = 1/4 db TransFlex
  - X12 = 1/2 db TransFlex
  - 012 = 1/2 db TransFoam
  - 038 = 3/8 db TransFoam
  - 078 = 7/8 db TransFoam
  - 114 = 1 1/4 db TransFoam
  - 158 = 1 5/8 db TransFoam
  - A - - = Air Cable
    - 03 = 1/2"
    - 06 = 7/8"
    - 08 = 1 5/8"
- **P** — Material
  - B = Brass/Silver
  - N = Nickel/Gold
  - P = Silver/Gold
  - S = Silver/Silver
- **1** — Angle
  - 1 = Straight
  - 2 = R-Angle
- **N** — Type
  - E = 7/16 DIN
  - F = Flange
  - L = L/C
  - M = Mini DIN
  - N = N Type
  - U = UHF
- **B** — Pin Attachment
  - S = Solder
  - B = Basket
  - T = Threaded
- **F** — Gender
  - M = Male
  - F = Female

ACCESSORIES BREAKDOWN

Model Number	Description	Model Number	Description	Model Number	Description
DBSPLICE_ _ _	Connector Splice with Cable Size	DBTIERPNYL	Tie Wrap-Nylon	DBHDWKT01	Hardware Kit 3/8" x 1"
DBGRNDKT_ _ _	Grounding Kit with Cable Size	DBTIERPCTD	Coated Copper Tie Wire	DBCOLDSHRK01	7/8 - 1/2 Cold Shrink Kit
DBCABFT_ _ _	Cable Wall Feed Thru with Cable Size	DBSSRAPLK	Stainless Steel Wrap Lock	DBCOLDSHRK02	1-1/4 - 1/2 Cold Shrink Kit
DBHNGKT_ _ _	Hanger Kit with Cable Size	DBANGLADPT	Kit of 10 Angle Adaptors	DBCOLDSHRK03	1/2 - 1/2 Cold Shrink Kit
DBSIHNGKT_ _ _	Snap In Hanger Kit with Cable Size	DBANGLADPTG	Kit of 10 Angle Adaptors Galvanized	DBCOLDSHRK04	7/8 - 7/8 Cold Shrink Kit
DBCABLEBT_ _ _	Cable Boot with Cable Size	DBBURKT	Burial Kit One Size Fits All		

LOT 5
RADIOS, TWO-WAY
BASE STATION, REMOTE
800 MHz, TONE CONTROLLED, 35 WATTS
SPECIFICATION AND BID SHEET

Item 1. Radio, two-way, 806-824Rx/851-869Tx MHz, remote, base station, tone controlled, min. R.F. power output 35 watts, two-channel capability with channel 1 active. Purchase order to specify frequency. Channel 2 blank or as specified on purchase order. Shall have continuous tone control squelch at a frequency to be specified on purchase order and continuous tone control squelch monitor function. Shall have intercom, AC line surge protection and phone line surge protection. Shall be mounted in a floor mount indoor type or cabinet. Unit shall have a frequency stability on both transmit and receive of ±.OOO2% (-3OC. + 6OC.), unit to have time out timer. Shall be Motorola Quantar, Ericsson Mastr III or approved equal.

State Manufacturer: COM-NET ERICSSON

Model SX8MCX $ 8402.05 /each

Required Additional Features:

Item 2. - Transmitter frequency determining device for each additional channel.

Model INCLUDED $ N/C /each

Item 3. - Receiver frequency determining device for each additional channel.

Model INCLUDED $ N/C /each

Item 4. - Antenna, unity gain, omnidirectional, with mounting clamps. DB-580 or approved equal.

Model DB580 $ 275.40 /each

Item 5. - Antenna, omnidirectional, 6dB gain with mounting clamps. DB-586 or approved equal.

Model DB586 $464.10 /each

Item 6. - Antenna, Yagi, 1OdB gain with mounting clamps. DB-499 or approved equal.

Model DB499 $ 229.50 /each

Item 7. - Cable, 7/8", jacketed heliax type, copper inner and outer conductors, 5O Ohms impedance.

Model 7775 $ 6.30 / per foot

Item 8. - Connection kit for use with above heliax cable.

Model 7776/77 $ 154.02 /each

Item 9. - Ground strap kit.

Model 7741 $ 29.58 /each

Item 10.- Receiver, second unit, to be single frequency and have volume and squelch control and be identical in all performance specifications to the above station receiver, antenna matching device. Receiver includes notch filter, line response compensator, and squelch operated relay.

A. Tone Squelch
Model SR8N01 $ 2502.57 /each

B. Carrier Squelch
Model INCLUDED $ N/C /each

Item 11.- Console, remote, tone controlled, 1TX-1RX, for use with above base station and with volume control, continuous tone control squelch monitor switch, desk microphone, and control line and power line surge protection.

Model 24-66H $ 1103.64 /each

A. Intercom	$ N/C	/each
B. 2Tx - 2Rx Control	$ N/C	/each
C. 12/24 Hour Clock	$ 166.26	/each
D. Parallel Transmit Indicator with Notch Filter	$ 165.06	/each
E. Supervisor Control	$ 138.54	/each
F. Wall mount Bracket	$ 59.16	/each
G. DTMF encoder with keypad	$ 281.52	/each

Item 12. - Deskset, tone controlled, for use with above station. Unit to have volume control, handset, power line and phone line surge protection.

Model 24-66H $ 1103.64 /each

1. Notch filter $ 155.04 /each
2. Parallel Transmit Light $ N/C /each

Item 13. - Furnish outdoor pole-mounted cabinet in lieu of indoor floor mounted cabinet

Model SXCA1X $ 1292.34 /each
*NOTE: HOUSES MIII ONLY, NO SPACE FOR AUX RCVR.

Item 14. - Warranty, one year parts and labor, at locality/agency.

Base Station $ N/C /yr.
Console, remote, tone controlled $ N/C /yr.
Deskset, remote, tone controlled $ N/C /yr.

Item 15. - I.D., automatic, CW.

Model INCLUDED $ N/C /each

Item 16 - Test speaker and microphone.

Model SXMC3B $ 46.41 /each

Item 17 - DTMF decoder

Model D2MC5N $ 124.95 /each

Item 18 - Digital CTCSS

Model INCLUDED $ N/C /each

Award based on Items 1-18 $ 16,630.06

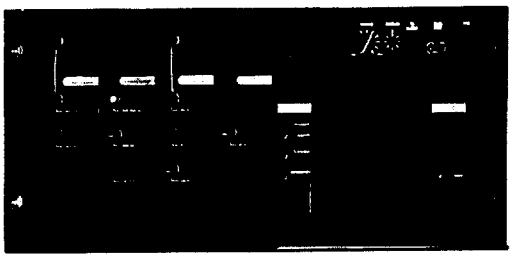
OPTIONAL FEATURES:

Item 19. – Metering panel or kit with meter(s).

Model NO BID $ _____ /each

Conventional
MASTR® III Stations VHF, UHF, 800 MHz

The MASTR III, built on the tradition of the popular MASTR series of repeaters, is an industry leader in performance, flexibility, and reliability. The MASTR III provides innovations such as fully shielded and removable modules, front-mounted controls, and remote diagnostics. The MASTR III features the latest in digital signal processing technology, which provides a comprehensive array of control capabilities for system design flexibility.



Product Overview

The MASTR III provides the flexibility to change system setup as necessary. Whether users are designing a system, programming radio functions, or arranging an installation site, MASTR III keeps pace with their needs.

Flexible, Efficient Design

The microprocessor-controlled, PC programmable options provide flexibility, simplified setup, and easy field upgrades. The fully synthesized design of the MASTR III Base Station allows the user to make frequency changes quickly, easily, and affordably. In addition, the MASTR III operates on both wideband (25 kHz) and narrowband (12.5 kHz) channels.

The modular design of the MASTR III Base Station makes maintenance and servicing simple and fast. Each module furnishes easy-to-read indications of proper operation.

A 69-inch cabinet houses three stations or ancillary equipment. The cabinet design also increases reliability through its cooling capacity for the equipment housed within it.

MASTR III also features optional Aegis™ digital or Voice Guard® encryption with the addition of a digital control shelf.

Backward Compatible

The MASTR III Base Station can be used in combination with MASTR II or IIe stations. The MASTR III is readily upgradable through software revisions.

For More Information

For more information about this or any other Com-Net Ericsson Critical Radio Systems product, call 1-800-431-2345 in the U.S. From outside the U.S. call +1-804-592-6100.

Com-Net Ericsson
CRITICAL RADIO SYSTEMS

Technical specifications are subject to change. This product is subject to U.S. export control for national security reasons.

General Specifications

Cabinet	INDOOR CABINET (Floor Mount) 37 inches (CNV)	69 inches
Size [in. (mm)]		
Height	37.0 (940)	69.1 (1750)
Width	21.5 (550)	23.1 (590)
Depth	18.25 (460)	21.0 (533)
Weight (min) [(lb (kg)]		
Continuous Duty	150 (68)	520 (236)
Packed, Domestic Shipping	165 (75)	550 (250)
Number of Rack Units	17	33
Max. Units w/Power Supply	1	3
w/o Power Supply	1	4

NOTE: One rack unit equals 1.75 inches. Stations occupy 8 rack units of cabinet space.

Service Speaker:	1W @ 8Ω
Service Microphone:	Transistorized Dynamic
Duty Cycle (EIA) Continuous:	Transmit/Receive - 100%
Ambient Temperature (or full spec performance per EIA):	-22 to +140°F (-30 to +60°C)
Humidity (EIA):	90% @ 122°F (50°C)
Input Power Source:	120 VAC (±20%)
Optional Input Power Source:	230 VAC (±15%), 50 Hz
Standby Battery Source:	13.8 VDC, 100 AH (min.)
Antenna Connections:	Type N
Length of AC Power Cable:	10 ft (3048 mm)
Metering:	Provided through Handset or TQ0619 Utility Software
Altitude:	
Operable:	Up to 15,000 ft (4,570 m)
Shippable:	Up to 50,000 ft (15,250 m)
Mean Time Between Failure (MTBF)	11,227 hours

Source Power Drain	VDC	VHF		UHF					800
Frequency Range (MHz)		136-150.8	150.8-174	403-430	425-450	450-470	470-494	492-512	851-870 Tx 806-825 Rx
AC Input Power		5A @ 120 VAC or 3A @ 230 VAC							
DC Input Power (A)									
Tx (full/half power)	13.8	33/25	33/25	33/25	33/25	33/25	33/25	33/25	2/2
Rx only	13.8	2	2	2	2	2	2	2	2
Tx (full/half power)	26.4								12/8
Rx only	26.4								0.5
EDACS Applications	13.8	2	2	2	2	2	2	2	2

Transmitter

	VHF		UHF					800
Frequency Range (MHz)	136-150.8	150.8-174	403-430	425-450	450-470	470-494	494-512	851-870
Rated Power Output (W)	110	110	90	90	100	90	90	100
RF Output Impedance (Ω)	50	50	50	50	50	50	50	50
Conducted Spurious and Harmonic Emission (dBm)	-36	-36	-36	-36	-36	-36	-36	-36
Frequency Stability (ppm)	±1.5	±1.5	±1.0	±1.0	±1.0	±1.0	±1.0	±1.0
Modulation Deviation (kHz)								
Wideband	0 to ±5	0 to ±5	0 to ±5	0 to ±5	0 to ±5	0 to ±5	0 to ±5	0 to ±5
15K0F1D, 15K0F1E								
16K0F1D, 16K0F1E, 16K0F3E								
Narrowband	0 to ±2.5	0 to ±2.5			0 to ±2.5			
11K0F3E								
NPSPAC								0 to ±5
14K0F3E								
FM Noise (dB)	-55	-55	-55	-55	-55	-55	-55	-55
Channel Spacing (kHz)	12.5/25/30	12.5/25/30	12.5/25	12.5/25	12.5/25	12.5/25	12.5/25	25 12.5 (NPSPAC)
Frequency Spread Full Spec (MHz)	8	12	27	25	20	24	20	1.0

Audio Distortion (@ 1 kHz): Less than 3%
Number of Channels (Conventional): Up to 16
Audio Response (pre-emphasis): Within +1/-3 dB of 6 dB/octave, 300 to 3000 Hz per EIA
NOTE: Rated power output is measured at the transmitter power amplifier output connector per FCC Type Acceptance filing information. Any customer-required optional items such as power measuring devices and/or duplexers will introduce loss between the transmitter output connector and the station cabinet output connector. This loss will reduce the available power at the station connector.

Receiver

	VHF		UHF					800
Frequency Range (MHz)	136-150.8	150.8-174	403-430	425-450	450-470	470-494	492-512	806-825
RF Input Impedance (Ω)	50	50	50	50	50	50	50	50
Channel Spacing (kHz)	12.5/25/30	12.5/25/30	12.5/25	12.5/25	12.5/25	12.5/25	12.5/25	25 12.5 (NPSPAC)
Sensitivity (dBm) EIA 12 dB SINAD	-116 (0.35 µV)	-116 (0.35 µV)	-116 (0.35 µV)	-116 (0.35 µV)	-116 (0.35 µV)	-116 (0.35 µV)	-116 (0.35 µV)	-119 (0.25 µV)
Threshold Squelch (dBm)	-119 (0.25 µV)	-119 (0.25 µV)	-119 (0.25 µV)	-119 (0.25 µV)	-119 (0.25 µV)	-119 (0.25 µV)	-119 (0.25 µV)	-122 (0.18 µV)
Selectivity EIA 2-Signal (dB)								
12.5 kHz	80	80	80	80	80	80	80	20 (NPSPAC)
25 kHz	95	95	90	90	90	90	90	90
30 kHz	100	100						
Frequency Stability (ppm)	±1.5	±1.5	±1.0	±1.0	±1.0	±1.0	±1.0	±1.0
Signal Displacement Bandwidth (kHz)	±2	±2	±2	±2	±2	±2	±2	±2
Intermodulation (dB)								
12.5 kHz	75	75	75	75	75	75	75	
25 kHz	90	90	85	85	85	85	85	85
30 kHz	90	90						
Spurious and Image Rejection (dB)	100	100	100	100	100	100	100	100
Frequency Spread								
Full Specs. (MHz)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.5
3 dB Degradation in Sensitivity (MHz)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	N/A

Audio Response (de-emphasis): Within +2/-8 dB of 6 dB/octave (@ Local Speaker), 300 to 3000 Hz per EIA
Within +1/-3 dB of 6 dB/octave (@ Line Output), 300 to 3000 Hz per EIA
Audio Output: 1 Watt at less than 3% distortion @ 1000 Hz, 25/30 kHz Channel

Conventional
MASTR® III Auxiliary Receiver VHF, UHF, 800 MHz

The MASTR III Auxiliary Receiver provides a receive-only configuration of the MASTR III product family for use as a second receiver or for use in a voted system. The MASTR III Auxiliary Receiver is available for analog as well as Aegis™ systems.

Product Overview

Feature Advantages

The MASTR III Auxiliary Receiver is a fully synthesized receiver, thus eliminating the need for crystals and providing multi-channel capability. In addition, the MASTR III Auxiliary Receiver is programmable, which provides greater flexibility in meeting customized requirements. MASTR III receivers have the capability to operate with both wideband (25 kHz) and narrowband (12.5 kHz) channels.

Other MASTR III Auxiliary Receiver features include programmable Channel Guard monitoring, control channel option, and remote programming capabilities.

The MASTR III Auxiliary Receiver utilizes the same receiver and control modules included with the MASTR III Base Station. These components provide the same reliability, superior specifications, and flexibility on the MASTR III Auxiliary Receiver that they demonstrate on the MASTR III Base Station.

For More Information

For more information about this or any other Ericsson Private Radio Systems product, call 1-800-431-2345 in the U.S. From outside the U.S. call +1-804-592-6100.

ERICSSON

TECHNICAL SPECIFICATIONS

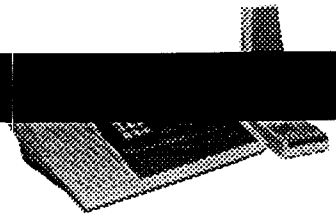
	DC REMOTES	TONE REMOTES	
	24-46	24-66	20-88
Input Voltage	117/230 VAC + -20% 50/60Hz	117/230 VAC + -20% 50/60Hz	117/230 VAC 50/60Hz
Standby Voltage Standby current	----- -----	12-15VDC 287mA (TX) 620mA (RX) (STBY)	250mA (MAX)
Input power (max)	17W (TX) 24W (RX) 4W (STBY)	8.5W (TX) 20W (RX) 8.5W (STBY)	
Temperature range	-30 deg to +60 deg C	-30 deg to +60 deg C	0° C to +70° C
Relative humidity	90% at 50 deg C	90% at 50 deg C	
Line impedance (1KHz)	600 ohms (TX) 600 or 5k ohms (RX)	600 ohms (TX) 600 or 5k ohms (RX)	600 ohms @ 1 KHz
Line audio output (600 ohm load)	-20 to +10dbm	-20 to +10dbm	-20dbm to +10dbm
TX hum & noise (ref +11dbm)	-55db	-55db	
Threshold of compression (line to speaker audio)	-20dbm adjustable	-20dbm adjustable	-20dbm
Speaker audio output RMS	3W into 4 ohms	3W into 4 ohms	3.5W into 4 ohms
Distortion (at rated speaker output)	Less than 3%	Less than 3%	Less than 5%
RX hum & noise	-55db	-49db	-55db
Frequency response (300 to 3,000Hz)	+1, -3db	+1, -3db except at notch frequency	300Hz to 3KHz
RX compression	With an audio increase of 30db beyond the start of compression the output increases less than 3db	With an audio increase of 30db beyond the start of compression the output increases less than 3db	
TX compression	With an audio increase of 30db beyond the start of compression the output increases 15 to 16db	With an audio increase of 30db beyond the start of compression the output increases 15 to 16db	
Line control	2 or 4 wire audio	2 or 4 wire audio	2 or 4 wire
Notch filter depth	N/A	-45db (RX) -25db (TX)	40db (RX)
Weight	4lbs 15oz	4lbs 15oz	4lbs 8oz
Dimensions	4.75" (H) x 10" (W) x 8" (D)	4.75" (H) x 10" (W) x 8" (D)	2.4" (H) x 10" (W) x 9.4" (D)

IDA CORPORATION

1345 Main Ave, Fargo, ND 58103

800-627-4432 / FAX 218-233-1886 / 701-280-1122

sales@idaco.com



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1-800-627-4432

Cost Options continued from previous page

Option RBC-617 - 99 Channel Capability
Provides up to 99 channels to be controlled and displayed. By using a pair of function tones, 128 different commands are possible. The desired channel is selected by toggling up or down and shown on the LED display. Included with option RBC-617 are options RBC-610 (clock) and RBC-613 (notch filter). Momentary time display is via the CLOCK button.

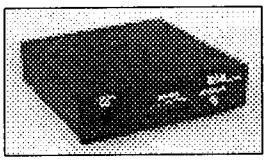
Option RBC-618 - 99 Channel Capability with DTMF
Similar to option RBC-617, this option provides up to 99 channels to be controlled and displayed. Direct access to the desired channel and DTMF encode are added features. A 12 button keypad is mounted on the faceplate of the deskset. Included with option RBC-618 are options RBC-610 (clock) and RBC-613 (notch filter). Momentary time display is via the CLOCK button.

Option RBC-619 - Alpha-Numeric Display
Displays channel selections with name/number of the operator's preference. Programmable up to 16 characters, the option includes clock and VU meter.

Option RBC-620 - Alpha-Numeric Display
Displays channel selections with name/number of the operator's preference. Programmable up to 32 characters, the option includes clock and VU meter.

Option RBC-621 - Digital Signaling
Fast and efficient digital signaling in a proprietary MSK format. When used along with Model 20-28 Remote Termination Panel, option RBC-621 provides the high speed switching and communication required for demanding trunking applications. Options RBC-610 (clock) and RBC-613 (notch filter) are included. Option RBC-611 (four wire) is recommended for use in most trunking applications.

Option RBC-622 - DTMF Encode
12 button DTMF encoder with keypad mounted on deskset.



MODEL 20-28 REMOTE TERMINATION PANEL

The 20-28 is a programmable termination panel for use with IDA Model 24-66 desk top controllers equipped with digital signaling. By decoding the proper digital signals the 20-28 can control remotely located base stations or repeaters. In addition to providing a two-way path for audio the unit also provides update information back to the desk top controllers. This update information allows the operator immediate information as to the remote radios status, such as channel, in or out of scan, or the current System & Group if a trunking application.

MSK SIGNALING

The 20-28 is field programmable via IBM compatible PC and features digital signaling in a proprietary MSK format. When used along with Model 24-66 remotes equipped with MSK signaling (Option RBC-621) the 20-28 provides the high speed switching and communication required for demanding trunking applications.

PROGRAMMABLE OUTPUTS

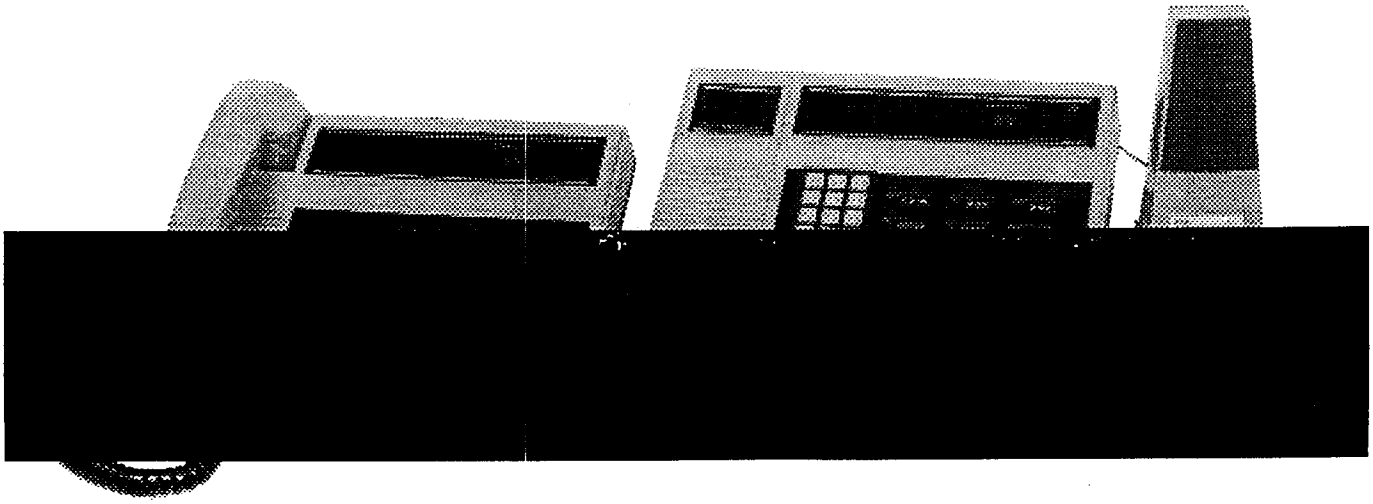
To meet the requirements of various manufacturers base stations the 20-28 can be programmed for a wide variety of outputs. For stations that are capable of receiving external serial commands the 20-28 can be programmed to provide the proper command set. In addition the unit can be programmed for Binary output.

This method of communicating with the radio's microprocessor in much the same way that it's own faceplate display does offers virtually total remote control. Advanced features such as SCAN, Lockout, Selective calling, Priority SCAN, and others become possible. When programming the 20-28, up to 8 of the outputs can be selected as inputs.

LOCAL OPERATION

For installations where local operation of the base station is desired the 20-28 is available with a desk microphone, speaker jack, and volume control (Option RTM-604).

TRC-8/98



MODEL 24-66 TONE REMOTE

IDA CORPORATION
1-800-627-4432

Features

- Field Programmable by PC
- Control & display up to eight channels
- Monitor *(latched or momentary)*
- Intercom
- Mute *(latched or momentary)*
- Alert Tone
- Programmable Auxiliaries
- 30db of Compression and 3 Watts of speaker audio

Benefits

As your communications needs grow and change the 24-66 will keep up. Standard features that are not needed now can be activated with simple programming done in the field. Monitor, Intercom, Mute, Alert Tone, Number of Channels, and the Auxiliaries are all programmable.

With multiple remotes installed in parallel the audio levels remain consistent. Even in a noisy environment you will be heard loud and clear.

Cost Options

Option 610 – Clock and VU Meter
Large easy to read LED display gives TIME and TX level at a glance. *(Field programmable as Military or Standard time)*

Option 611 – Four Wire
Programmable for full duplex or separate pairs for TX and RX.

Option 612 – Supervisory / Alternate Line
Programmed as Supervisory this option allows one deskset remote to control access to the base station by other remotes. Programmed as Alternate Line allows the deskset to switch to a different base station radio with the push of a button.

Option 613 – Parallel TX Indicator and Notch Filter
Provides visual indication of transmit by another remote and prevents the 2175 Hz guard tone from being heard through the speaker.

Programmable features:

"Mute on Parallel TX" allows two or more desksets to be located in the same room without causing feedback.

"Parallel Override" allows command tones to be sent even when another remote is off hook.

"Parallel Update" changes the display of all the desksets when selecting a new channel.

Option 614 – 12 VDC Power Cable
Prewired power cable makes installing battery backup quick and easy.

Option 615 – 2nd Line with Summed Audio
Control two base stations with the same deskset remote. RX audio from both lines is summed and heard on the deskset's speaker. The operator can TX and change channels on which ever line is selected. Audio from the "Unselected" line is at a lower volume than audio from the "Selected" line. The relative volume of the unselected audio is dealer adjustable.
(Not available with Option 611 – Four Wire)

Option 616 – One Touch TX
Transmit with the touch of a button on the faceplate. A small condenser mic hidden on the front edge of the unit picks up your voice. Great for short quick responses.

continued next page

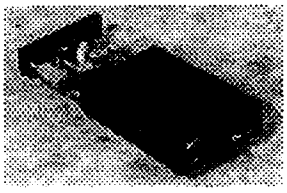
MODEL 24-66 ADDITIONAL PROGRAMMABLE FEATURES

Tones can be programmed for whichever function is desired. Available tones: 2050 Hz, 1950 Hz, 1850 Hz, 1750 Hz, 1650 Hz, 1550 Hz, 1450 Hz, 1350 Hz, 1250 Hz, 1150 Hz, 1050 Hz.
Disable of ON HOOK MONITOR (handset only)
Momentary F2 (always returns to F1)
Momentary Intercom
Remote Update (updates display of 24-66 when base station radio changes channels due to SCAN or in trunking applications, available for several popular radios, Option 613 and Model 20-27 Tone Termination Panel required)

OTHER 24-66 & 24-46 OPTIONS:
RBC-001 Wall Mounting Bracket
RBC-002 External Encode/Decode Cable
RBC-003 Programming Cable and Software

MODEL 20-27 TONE TERMINATION PANEL

The world's most powerful Tone Remotes deserve the most powerful Tone panel. The Model 20-27 is field programmable just like the remotes. Offering standard features such as 99 Channels, Local mic jack, LTR and ESAS trunking format, Binary output, and Remote Update of 24-66s. Direct control including SCAN, System /Group is standard for popular EF Johnson, Uniden, Kenwood, and SEA. Plug and play cabling available for a wide variety of radios.



Model Number Configuration Charts

All db TransTelecom model numbers are descriptive. The charts below depict the various configurations for your specific application. Not all configurations are available. Ask your sales representative about your special requirements.

CABLES

Sample Model Number

DBC 012 F 5 P - □

- **DBC** — Decibel Cable
- **012** — Cable Size
  - 014 = 1/4 inch
  - 012 = 1/2 inch
  - 038 = 3/8 inch
  - 078 = 7/8 inch
  - 114 = 1-1/4 inch
  - 158 = 1-5/8 inch
- **F** — Cable Type
  - F = db TransFoam™
  - X = db TransFlex™
  - A = db TransAir™
  - R = db TransFill™
- **5** — Impedance
  - 5 = 50 ohms
  - 7 = 75 ohms
- **P** — Jacket
  - P = Polyethelene
  - T = Fire Retardant
- **□** — Optional
  - D = Swept (Low VSWR)

JUMPERS

Sample Model Number

DBJ 012 03 05 - □

- **DBJ** — Decibel Jumper
- **012** — Cable Size
  - X14 = 1/4 Super Flexible
  - X12 = 1/2 Super Flexible
  - 012 = 1/2 Foam Cable
  - 038 = 3/8 Foam Cable
  - 078 = 7/8 Foam Cable
  - 114 = 1-1/4 Foam Cable
  - 158 = 1-5/8 Foam Cable
- **03** — Length
  - 03 = 3 foot
  - 06 = 6 foot
  - 08 = 8 foot
  - 10 = 10 foot
- **05** — Connector
  - 01 - N-Male/N-Male
  - 02 - N-Male/N-Male (plated)
  - 03 - N-Female/N-Male
  - 04 - N-Male/N-R Angle (plated)
  - 05 - DIN Male/DIN Male
  - 06 - DIN Male/DIN Male R Angle
  - 07 - DIN Male/N-Male (plated)
  - 08 - DIN Male/DIN Female
  - 09 - DIN Female/DIN Male R Angle
- **□** — Optional
  - D = Swept (Low VSWR)

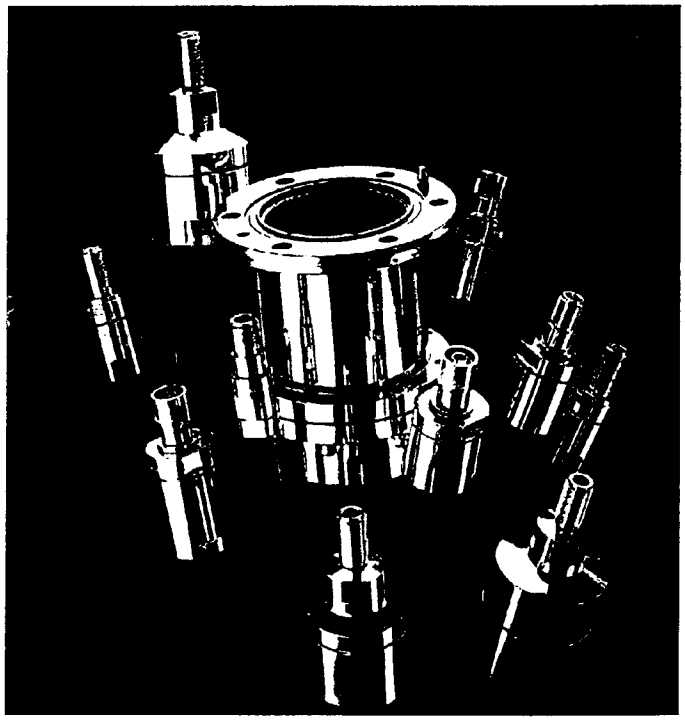
Plated = Silver plated body and gold plated pin

CONNECTORS

Sample Model Number

DBK 012 P 1 N - B F

- **DBK** — Decibel Connector
- **012** — Connector Size
  - X14 = 1/4 db TransFlex
  - X12 = 1/2 db TransFlex
  - 012 = 1/2 db TransFoam
  - 038 = 3/8 db TransFoam
  - 078 = 7/8 db TransFoam
  - 114 = 1 1/4 db TransFoam
  - 158 = 1 5/8 db TransFoam
  - A - - = Air Cable
    - 03 = 1/2"
    - 06 = 7/8"
    - 08 = 1 5/8"
- **P** — Material
  - B = Brass/Silver
  - N = Nickel/Gold
  - P = Silver/Gold
  - S = Silver/Silver
- **1** — Angle
  - 1 = Straight
  - 2 = R-Angle
- **N** — Type
  - E = 7/16 DIN
  - F = Flange
  - L = L/C
  - M = Mini DIN
  - N = N Type
  - U = UHF
- **B** — Pin Attachment
  - S = Solder
  - B = Basket
  - T = Threaded
- **F** — Gender
  - M = Male
  - F = Female



ACCESSORIES BREAKDOWN

Model Number	Description	Model Number	Description	Model Number	Description
DBSPLICE_ _ _	Connector Splice with Cable Size	DBTIERPNYL	Tie Wrap-Nylon	DBHDWKT01	Hardware Kit 3/8" x 1"
DBGRNDKT_ _ _	Grounding Kit with Cable Size	DBTIERPCTD	Coated Copper Tie Wire	DBCOLDSHRK01	7/8 - 1/2 Cold Shrink Kit
DBCABFT_ _ _	Cable Wall Feed Thru with Cable Size	DBSSRAPLK	Stainless Steel Wrap Lock	DBCOLDSHRK02	1-1/4 - 1/2 Cold Shrink Kit
DBHNGKT_ _ _	Hanger Kit with Cable Size	DBANGLADPT	Kit of 10 Angle Adaptors	DBCOLDSHRK03	1/2 - 1/2 Cold Shrink Kit
DBSIHNGKT_ _ _	Snap In Hanger Kit with Cable Size	DBANGLADPTG	Kit of 10 Angle Adaptors Galvanized	DBCOLDSHRK04	7/8 - 7/8 Cold Shrink Kit
DBCABLEBT_ _ _	Cable Boot with Cable Size	DBBURKT	Burial Kit One Size Fits All		

MODEL 24-66 TONE REMOTE

IDA CORPORATION
1-800-627-4432

Features

- Field Programmable by PC
- Control & display up to eight channels
- Monitor *(latched or momentary)*
- Intercom
- Mute *(latched or momentary)*
- Alert Tone
- Programmable Auxiliaries
- 30db of Compression and 3 Watts of speaker audio

Benefits

As your communications needs grow and change the 24-66 will keep up. Standard features that are not needed now can be activated with simple programming done in the field. Monitor, Intercom, Mute, Alert Tone, Number of Channels, and the Auxiliaries are all programmable.

With multiple remotes installed in parallel the audio levels remain consistent. Even in a noisy environment you will be heard loud and clear.

Cost Options

Option 610 – Clock and VU Meter
Large easy to read LED display gives TIME and TX level at a glance. *(Field programmable as Military or Standard time)*

Option 611 – Four Wire
Programmable for full duplex or separate pairs for TX and RX.

Option 612 – Supervisory / Alternate Line
Programmed as Supervisory this option allows one deskset remote to control access to the base station by other remotes. Programmed as Alternate Line allows the deskset to switch to a different base station radio with the push of a button.

Option 613 – Parallel TX Indicator and Notch Filter
Provides visual indication of transmit by another remote and prevents the 2175 Hz guard tone from being heard through the speaker.

Programmable features:

"Mute on Parallel TX" allows two or more desksets to be located in the same room without causing feedback.

"Parallel Override" allows command tones to be sent even when another remote is off hook.

"Parallel Update" changes the display of all the desksets when selecting a new channel.

Option 614 – 12 VDC Power Cable
Prewired power cable makes installing battery backup quick and easy.

Option 615 – 2nd Line with Summed Audio
Control two base stations with the same deskset remote. RX audio from both lines is summed and heard on the deskset's speaker. The operator can TX and change channels on which ever line is selected. Audio from the "Unselected" line is at a lower volume than audio from the "Selected" line. The relative volume of the unselected audio is dealer adjustable.
(Not available with Option 611 – Four Wire)

Option 616 – One Touch TX
Transmit with the touch of a button on the faceplate. A small condenser mic hidden on the front edge of the unit picks up your voice. Great for short quick responses.

continued next page

MODEL 24-66 ADDITIONAL PROGRAMMABLE FEATURES

Tones can be programmed for whichever function is desired. Available tones: 2050 Hz, 1950 Hz, 1850 Hz, 1750 Hz, 1650 Hz, 1550 Hz, 1450 Hz, 1350 Hz, 1250 Hz, 1150 Hz, 1050 Hz.

Disable of ON HOOK MONITOR (handset only)

Momentary F2 (always returns to F1)

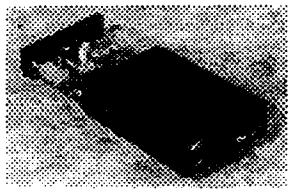
Momentary Intercom

Remote Update (updates display of 24-66 when base station radio changes channels due to SCAN or in trunking applications, available for several popular radios, Option 613 and Model 20-27 Tone Termination Panel required)

OTHER 24-66 & 24-46 OPTIONS:
RBC-001 Wall Mounting Bracket
RBC-002 External Encode/Decode Cable
RBC-003 Programming Cable and Software

MODEL 20-27 TONE TERMINATION PANEL

The world's most powerful Tone Remotes deserve the most powerful Tone panel. The Model 20-27 is field programmable just like the remotes. Offering standard features such as 99 Channels, Local mic jack, LTR and ESAS trunking format, Binary output, and Remote Update of 24-66s. Direct control including SCAN, System /Group is standard for popular EF Johnson, Uniden, Kenwood, and SEA. Plug and play cabling available for a wide variety of radios.



IDA CORPORATION
1-800-627-4432

Cost Options continued from previous page

Option RBC-617 - 99 Channel Capability
Provides up to 99 channels to be controlled and displayed. By using a pair of function tones, 128 different commands are possible. The desired channel is selected by toggling up or down and shown on the LED display. Included with option RBC-617 are options RBC-610 (clock) and RBC-613 (notch filter). Momentary time display is via the CLOCK button.

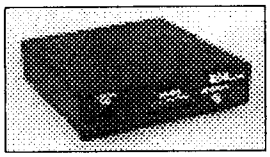
Option RBC-618 - 99 Channel Capability with DTMF
Similar to option RBC-617, this option provides up to 99 channels to be controlled and displayed. Direct access to the desired channel and DTMF encode are added features. A 12 button keypad is mounted on the faceplate of the deskset. Included with option RBC-618 are options RBC-610 (clock) and RBC-613 (notch filter). Momentary time display is via the CLOCK button.

Option RBC-619 - Alpha-Numeric Display
Displays channel selections with name/number of the operator's preference. Programmable up to 16 characters, the option includes clock and VU meter.

Option RBC-620 - Alpha-Numeric Display
Displays channel selections with name/number of the operator's preference. Programmable up to 32 characters, the option includes clock and VU meter.

Option RBC-621 - Digital Signaling
Fast and efficient digital signaling in a proprietary MSK format. When used along with Model 20-28 Remote Termination Panel, option RBC-621 provides the high speed switching and communication required for demanding trunking applications. Options RBC-610 (clock) and RBC-613 (notch filter) are included. Option RBC-611 (four wire) is recommended for use in most trunking applications.

Option RBC-622 - DTMF Encode
12 button DTMF encoder with keypad mounted on deskset.



MODEL 20-28 REMOTE TERMINATION PANEL

The 20-28 is a programmable termination panel for use with IDA Model 24-66 desk top controllers equipped with digital signaling. By decoding the proper digital signals the 20-28 can control remotely located base stations or repeaters. In addition to providing a two-way path for audio the unit also provides update information back to the desk top controllers. This update information allows the operator immediate information as to the remote radios status, such as channel, in or out of scan, or the current System & Group if a trunking application.

MSK SIGNALING

The 20-28 is field programmable via IBM compatible PC and features digital signaling in a proprietary MSK format. When used along with Model 24-66 remotes equipped with MSK signaling (Option RBC-621) the 20-28 provides the high speed switching and communication required for demanding trunking applications.

PROGRAMMABLE OUTPUTS

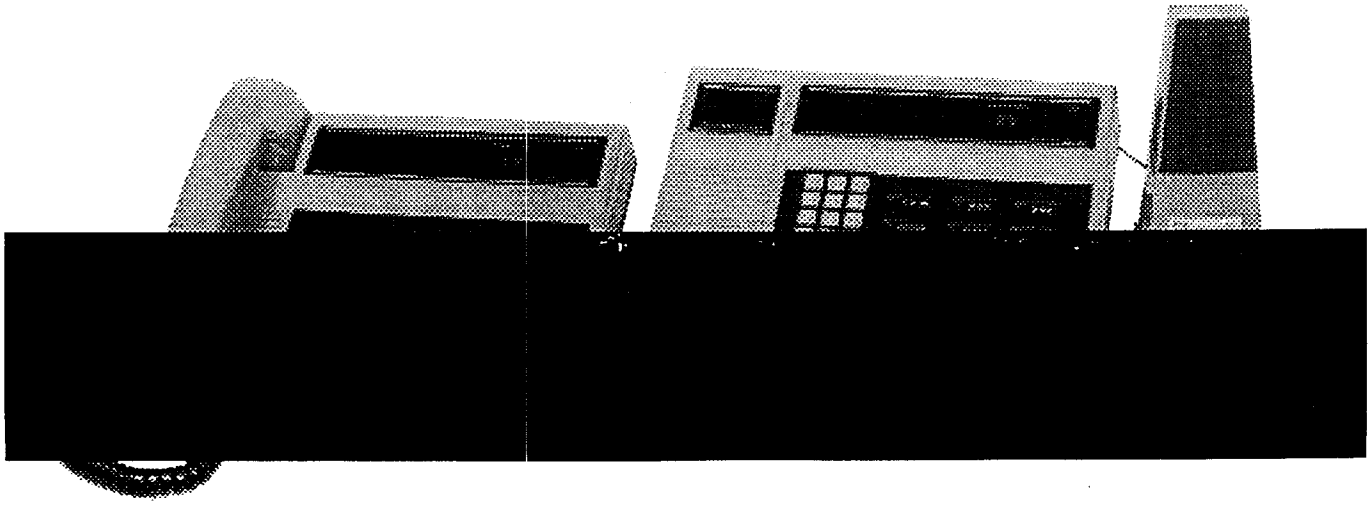
To meet the requirements of various manufacturers base stations the 20-28 can be programmed for a wide variety of outputs. For stations that are capable of receiving external serial commands the 20-28 can be programmed to provide the proper command set. In addition the unit can be programmed for Binary output.

This method of communicating with the radio's microprocessor in much the same way that it's own faceplate display does offers virtually total remote control. Advanced features such as SCAN, Lockout, Selective calling, Priority SCAN, and others become possible. When programming the 20-28, up to 8 of the outputs can be selected as inputs.

LOCAL OPERATION

For installations where local operation of the base station is desired the 20-28 is available with a desk microphone, speaker jack, and volume control (Option RTM-604).

TRC-8/98



TECHNICAL SPECIFICATIONS

	DC REMOTES	TONE REMOTES	
	24-46	24-66	20-88
Input Voltage	117/230 VAC + -20% 50/60Hz	117/230 VAC + -20% 50/60Hz	117/230 VAC 50/60Hz
Standby Voltage Standby current	----- -----	12-15VDC 287mA (TX) 620mA (RX) (STBY)	250mA (MAX)
Input power (max)	17W (TX) 24W (RX) 4W (STBY)	8.5W (TX) 20W (RX) 8.5W (STBY)	
Temperature range	-30 deg to +60 deg C	-30 deg to +60 deg C	0° C to +70° C
Relative humidity	90% at 50 deg C	90% at 50 deg C	
Line impedance (1KHz)	600 ohms (TX) 600 or 5k ohms (RX)	600 ohms (TX) 600 or 5k ohms (RX)	600 ohms @ 1 KHz
Line audio output (600 ohm load)	-20 to +10dbm	-20 to +10dbm	-20dbm to +10dbm
TX hum & noise (ref +11dbm)	-55db	-55db	
Threshold of compression (line to speaker audio)	-20dbm adjustable	-20dbm adjustable	-20dbm
Speaker audio output RMS	3W into 4 ohms	3W into 4 ohms	3.5W into 4 ohms
Distortion (at rated speaker output)	Less than 3%	Less than 3%	Less than 5%
RX hum & noise	-55db	-49db	-55db
Frequency response (300 to 3,000Hz)	+1, -3db	+1, -3db except at notch frequency	300Hz to 3KHz
RX compression	With an audio increase of 30db beyond the start of compression the output increases less than 3db	With an audio increase of 30db beyond the start of compression the output increases less than 3db	
TX compression	With an audio increase of 30db beyond the start of compression the output increases 15 to 16db	With an audio increase of 30db beyond the start of compression the output increases 15 to 16db	
Line control	2 or 4 wire audio	2 or 4 wire audio	2 or 4 wire
Notch filter depth	N/A	-45db (RX) -25db (TX)	40db (RX)
Weight	4lbs 15oz	4lbs 15oz	4lbs 8oz
Dimensions	4.75" (H) x 10" (W) x 8" (D)	4.75" (H) x 10" (W) x 8" (D)	2.4" (H) x 10" (W) x 9.4" (D)

IDA CORPORATION

1345 Main Ave, Fargo, ND 58103

800-627-4432 / FAX 218-233-1886 / 701-280-1122

sales@idaco.com

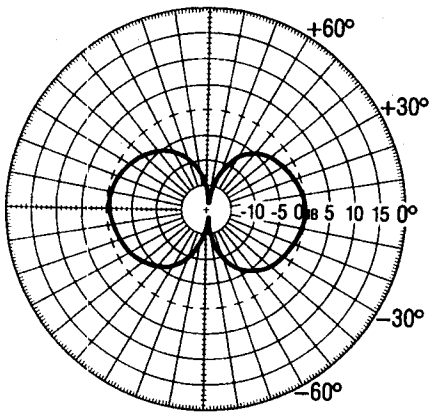
DB580 OMNI MIRAGE™ ANTENNAS
DB583 UNITY and 3 dBd GAIN, 806-960 MHz

The economical DB580 with unity or 0 dBd gain and DB583 with 3 dBd gain are omni-directional antennas for 800/900 MHz applications. Radiators are enclosed in a 1.5" (38.1 mm) OD Horizon Blue™ radome made of Mirage extruded fiberglass.

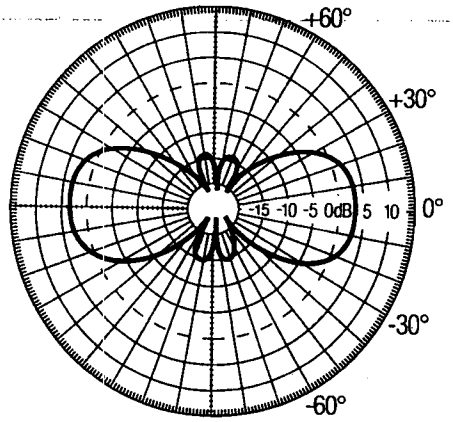
- **Broad Response** - Three models of each are designed for 800/900 MHz conventional, trunked, paging and cellular communications.
- **Dual Purpose Mount** - New integral mount made of cast aluminum alloy mounts to the side or top of a pipe.
- **Reliable** - Each antenna is tested for 500 watts power rating compliance and the absence of intermodulation generators.
- **Moisture Resistant** - The bottom cap has a moisture-sealed bulkhead N-Female connector, and a removable drain plug is located at each end of the antenna.
- **Lightning Resistant** - A DC ground is provided.
- **Ready to Install** - Since the transmission line of any length can be connected directly to the antenna (and dropped through the mounting pipe), no jumper cable is furnished.

Ordering Information - Order DB580 for unity gain and DB583 for 3 dBd gain. Use model number for correct frequency. Order jumper cable separately, if needed.

DB580 Typical Vertical Radiation Pattern

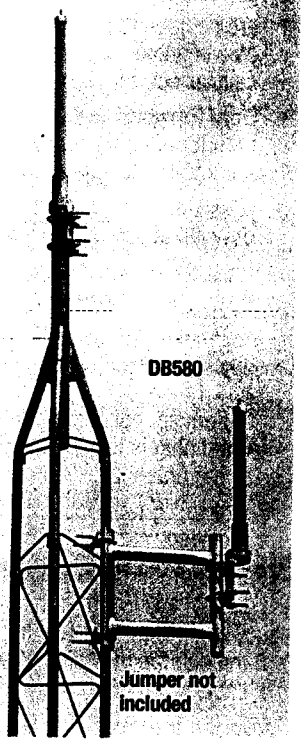


DB583 Typical Vertical Radiation Pattern

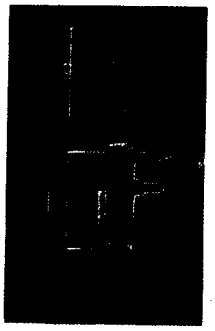


DB583

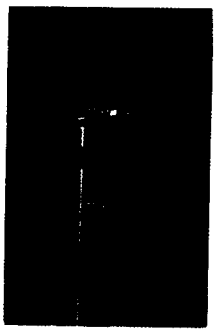
DB580



Side Mounted



Top Mounted



Frequency Ranges Available – MHz	
DB580-XT or DB583-XT	806-869
DB580-XC or DB583-XC	824-896
DB580-Y or DB583-Y	890-960

Both can be shipped by UPS.

Electrical Data		
Frequency Range – MHz	See table	
Bandwidth	See table above	
Gain – dB	DB580 = Unity	DB583 = 3
Beamwidth "E" Plane (half power)	DB580 = 83°	DB583 = 30°
Beamwidth "H" Plane (half power)	Omni	
Maximum power input – watts	400	
ut Impedance – ohms	50	
.SWR	1.5 to 1	
Lightning protection	Direct ground	
Termination	Type N-Female (fixed)	

Mechanical Data		
	DB580	DB583
Radome (diameter = 1.5" [38.1 mm])	Mirage Fiberglass	
Radiators	Brass	
Mounting hardware	Stainless steel	
Lateral thrust at 100 mph (161 km/hr) – lbf (N)	5.25 (23.1)	6.4 (28.5)
Overall length – ft. (m)	2.46 (.75)	2.75 (.84)
Radome length – ft. (m)	1.6 (.49)	1.92 (.59)
Mounting pipe length – in. (mm)	11 (279.4)	11 (279.4)
Maximum exposed area (flat plate equivalent) – ft² (m^2)	.13 (.01)	.16 (.014)
Net weight – lbs. (kg)	3.8 (.17)	6.25 (2.84)
Shipping weight (w/clamps) – lbs. (kg)	6 (27.2)	8 (3.63)
Mount, dual purpose	Cast aluminum alloy	

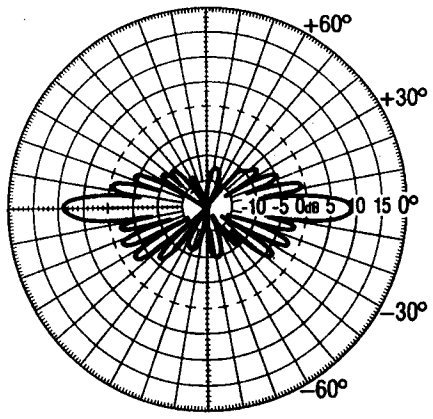
DB586 OMNI MIRAGE™ ANTENNAS
DB589 6 and 9 dBd GAIN, 806-960 MHz

The economical DB586 with 6 dBd gain and DB589 with 9 dBd gain are omnidirectional antennas for 800/900 MHz applications. Radiators are enclosed in a 1.5" (38.1 mm) OD Horizon Blue™ radome made of Mirage extruded fiberglass.

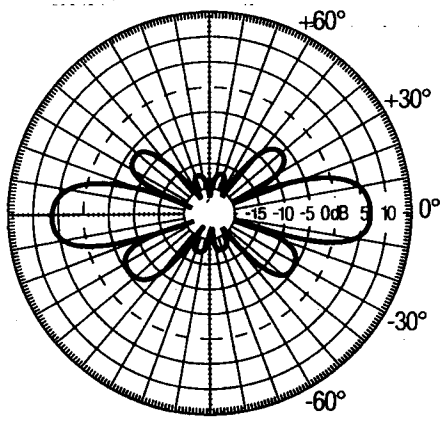
- **Broad Response** - Four models of each are designed for 800/900 MHz conventional, trunked, paging and cellular communications.
- **Dual Purpose Mount** - New integral mount made of cast aluminum alloy mounts to the side or top of a pipe.
- **Beamtilt** - 3° or 6° of electrical downtilt is optional on some models.
- **Reliable** - Each antenna is tested for 500 watts power rating compliance and the absence of intermodulation generators.
- **Moisture Resistant** - The bottom cap has a moisture-sealed bulkhead N-Female connector, and a removable drain plug is located at each end of the antenna.
- **Lightning Resistant** - A DC ground is provided.
- **Ready to Install** - Since the transmission line (of any length) can be connected directly to the antenna (and dropped through the mounting pipe), no jumper cable is furnished.

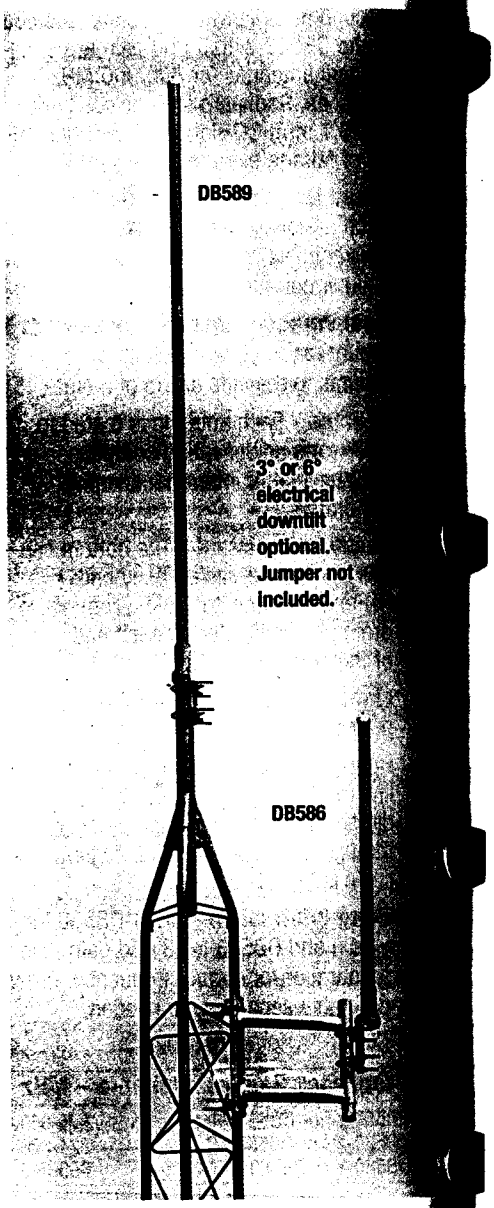
Ordering Information - Order DB586 for 6 dBd gain and DB589 for 9 dBd gain. Use model number for correct frequency. For downtilt add T3 for 3° or T6 for 6°. **Example:** DB586T6-XC. Order jumper cable separately, if needed.

DB589 Typical Vertical Radiation Pattern



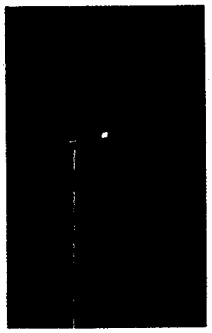
DB586 Typical Vertical Radiation Pattern





Side Mounted

Top Mounted



DB586 can be shipped by UPS.

Frequency Ranges Available – MHz	
DB586-XT or DB589-XT	806-869
DB586-XC or DB589-XC	824-896
DB586-X*	806-901
DB586-Y or DB589-Y	890-960
For downtilt on available models, add T3 for 3°, T6 for 6°. Example: DB586T6-XC.	

Electrical Data		
	DB586	DB589
Frequency Range – MHz	See table	See table
Gain (maximum) – dBd	6	9
Beamwidth "E" Plane (half power)	18°	9°
Beamwidth "H" Plane (half power)	Omni	Omni
Maximum power input – watts	400	400
Input impedance – ohms	50	50
VSWR	1.5 to 1	1.5 to 1
Lightning protection	Direct ground	Direct ground
Termination	Type N-Female (fixed)	Type N-Female (fixed)

*"S" design provides broad bandwidths with a slightly reduced gain.

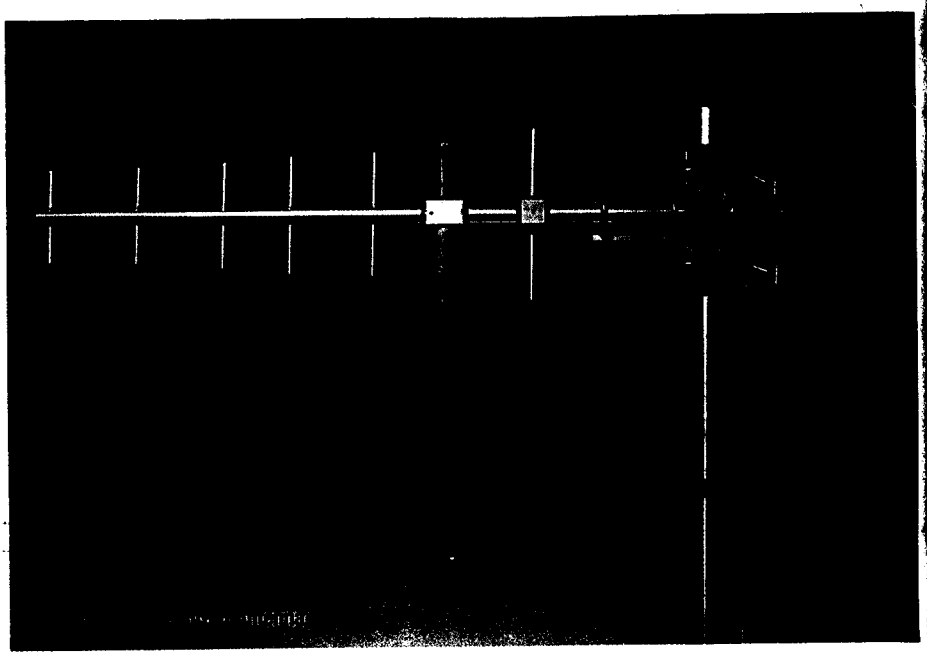
Mechanical Data		
	DB586	DB589
Radome (diameter = 1.5" [38.1 mm])		Mirage Fiberglass
Radiators		Brass
Mounting hardware		Stainless steel
Lateral thrust at 100 mph (161 km/hr) – lbf (N)	13.1 (58.4)	25.26 (112.4)
Overall length – ft. (m)	4.38 (1.34)	8.5 (2.59)
Radome length – ft. (m)	3.5 (1.07)	7.58 (2.31)
Mounting pipe length – in. (mm)	11 (279.4)	11 (279.4)
Maximum exposed area (flat plate equivalent) – ft² (m²)	.328 (.03)	.638 (.06)
Net weight – lbs. (kg)	8.25 (3.74)	11.5 (5.22)
Shipping weight – lbs. (kg)	10 (4.54)	15 (6.80)
Mount, dual purpose (top or parallel)		Cast aluminum alloy

DB499 DIRECTIONAL YAGI ANTENNA
10 dBd GAIN, 20 dB F/B RATIO, 806-960 MHz

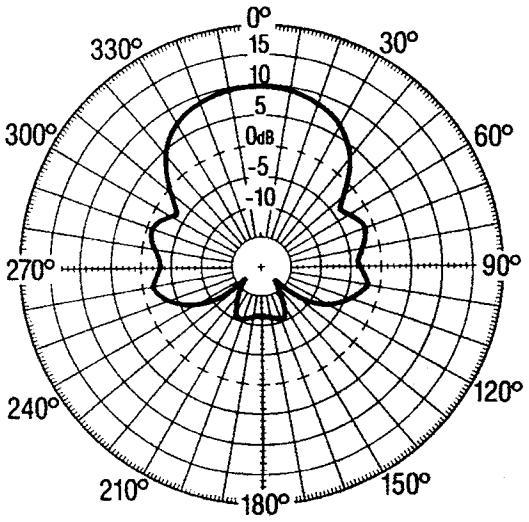
A heavy duty, lightweight Yagi, the DB499 provides 10 dBd directional gain and 20 dB front-to-back ratio.

- **Unique Mount** - Special design permits vertical or horizontal polarization as well as rapid azimuth orientation.
- **Sturdy Construction** - High strength aluminum alloys are protected by a gold anodized finish. Mounting hardware is made of galvanized and stainless steel. Precision welding of the director and reflector elements prevents misalignment during shipping and installation.
- **Weather Resistant** - The ABS radome cover and the unique design of the enclosed feed assure protection from moisture, corrosion and ice build-up. An N-Female connector is mounted in the support boom.
- **Stacked Array** - Two DB499 antennas provide 13 dBd gain.
- **No Field Tuning** - Antenna is assembled and tested for minimum VSWR at the factory.

Ordering Information - Use model number for correct frequency. Mounting hardware is included. Other size clamps can be special ordered. **Examples:** DB499-A for 806-869 MHz; for 806-896 MHz dual, DB499-A (2 ea.), 14499-2-A (1 ea.). Order jumper cable separately, if desired.



DB499 Horizontal Pattern, Vertical Polarization



Gain	Order
10 dBd	1 ea. DB499 Antenna
13 dBd	2 ea. DB499 Antenna 1 ea. 14498/9-2 Dual Harness

Can be shipped by UPS.

Electrical Data	
Frequency Ranges – MHz	A = 806-866, C = 824-896, K = 896-960
Bandwidth – MHz	Same as above
VSWR	1.5 to 1 or less
Nominal impedance – ohms	50
Forward gain (over half-wave dipole) – dBd	10
Polarization	Vertical or horizontal
Maximum power input – watts	150
Vertical beamwidth (half power point)	30°
Horizontal beamwidth (half power point)	60°
Front-to-back ratio – dB	20
Lightning protection	Direct ground
Standard Termination	Captive Type N-Female

Mechanical Data	
Support boom (aluminum) – in. (mm)	.75 (19.05) OD with .083 (2.11) wall
Elements	Aluminum
Mounting brackets	Galvanized steel
Maximum exposed area (flat plate equivalent) – ft² (m²)	0.25 (.023)
Lateral thrust at 100 mph (161 km/hr) – lbf (N)	10 (44.5)
Wind rating:	
Survival without ice – mph (km/hr)	150 (242)
Survival with .5" (12.7 mm) radial ice – mph (km/hr)	100 (161)
Dimensions (HxL) – in. (mm)	6 (152.4)x30 (762)
Net weight – lbs. (kg)	5 (2.27)
Shipping weight – lbs. (kg)	8 (3.63)
Mounting clamps	Stainless steel V-bolts

LOT 6
RADIOS, TWO-WAY
REPEATER, 800 Mhz
35 WATTS
SPECIFICATION AND BID SHEET

Item 1. Radio, two-way, 806-824Rx/851-869Tx MHz. Repeater, min. R.F. power output 35 Watts. Single duplex channel. Purchase order to specify frequency. Shall have continuous tone control squelch at a frequency to be specified on purchase order. Shall have AC line surge protection, test speaker and microphone. Shall be mounted in an indoor floor mounted cabinet min. 3O" high and shall also house the Duplexer, space permitting. Unit shall have a frequency stability on both transmit and receive of ±.OOO2% (-3OC.+ 6OC.), Unit to have time out timer. Motorola Quantar, Ericsson Mastr III or approved equal.

State Manufacturer: COM-NET ERICSSON

Model SX8MCX $8374.20 /each

Required Additional Features:

Item 2. - Antenna, omnidirectional, unity gain with mounting clamps. DB-580 or approved equal.

Model DB580 275.40 /each

Item 3. - Antenna, omnidirectional, 6dB gain, Collinear with mounting clamps. DB-586 or approved equal.

Model DB586 $ 464.10 /each

Item 4. - Duplexer for use with above repeater. (45 Mhz frequency separation)

Model 7660 $ 729.30 /each

Item 5. - Cable, 7/8" jacketed heliax type, 5O Ohms impedance, copper inner and outer conductors.

Model 7775 $ 6.30 / per foot

Item 6. - Connector, kit for use with above heliax cable.

Model 7776/77 $ 154.02 /each

Item 7. - Ground, strap kit.

Model 7741 $ 29.58 /each

Item 8. - Console, remote, tone controlled, for use with above station if equipped with remote panel. Console to have volume control, continuous tone control squelch monitor switch, desk microphone, and control line and power line surge protection.

Model 24-66H $ 1103.64 /each

A. Intercom	$ N/C /each
B. Repeater, On-Off Control	$ N/C /each
C. 12/24 Hour Clock	$ 166.26 /each
D. Parallel Transmit Indicator with Notch Filter	$ 155.04 /each
E. Supervisor Control	$ 78.54 /each
F. Wall mount Bracket	$ 59.16 /each
G. DTMF encoder with keypad	$ 281.52 /each

Item 9.- Panel, remote, tone controlled, for above repeater with continuous tone control squelch monitor function, repeater disable function, intercom, and phone line surge protection.

Model INCLUDED $ N/C /each

Item 10. - Deletion of tone squelch

Model INCLUDED $ N/C /each

Item 11.- Warranty, one-year parts and labor. at locality/agency:

A. Repeater with duplexer	$ N/C /yr.
B. Console, remote, tone controlled	$ N/C /yr.
C. Deskset, remote, tone controlled	$ N/C /yr.

Item 12.- Deletion of time out timer.

Model INCLUDED $ N/C /each

Item 13.- I.D., automatic, CW.

Model INCLUDED $ N/C /each

Item 14.- Test speaker and microphone.

Model SXMC3B $ 46.41 /each

Item 15.- Deskset, tone controlled, for use with above station. Unit to have volume control, handset, power line and phone line surge protection.

Model 24-66H $ 1103.64 /each

1. Notch filter $ 155.04 /each
2. Parallel Transmit Light $ N/C /each

Item 16.- DTMF decoder

Model D2MC5N $ 124.95 /each

Item 17.- Digital CTCSS

Model INCLUDED $ N/C /each

Award based on Items 1-17 $ 13,307.10

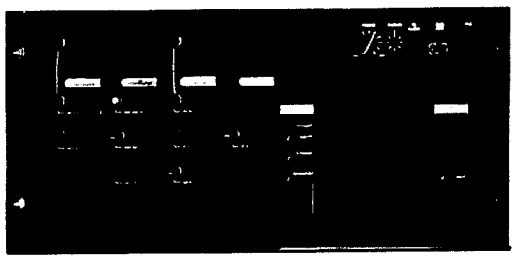
OPTIONAL FEATURES:

Item 18. – Metering panel or kit with meter(s).

Model NO BID $ _____ /each

Conventional
MASTR® III Stations VHF, UHF, 800 MHz

The MASTR III, built on the tradition of the popular MASTR series of repeaters, is an industry leader in performance, flexibility, and reliability. The MASTR III provides innovations such as fully shielded and removable modules, front-mounted controls, and remote diagnostics. The MASTR III features the latest in digital signal processing technology, which provides a comprehensive array of control capabilities for system design flexibility.



Product Overview

The MASTR III provides the flexibility to change system setup as necessary. Whether users are designing a system, programming radio functions, or arranging an installation site, MASTR III keeps pace with their needs.

Flexible, Efficient Design

The microprocessor-controlled, PC programmable options provide flexibility, simplified setup, and easy field upgrades. The fully synthesized design of the MASTR III Base Station allows the user to make frequency changes quickly, easily, and affordably. In addition, the MASTR III operates on both wideband (25 kHz) and narrowband (12.5 kHz) channels.

The modular design of the MASTR III Base Station makes maintenance and servicing simple and fast. Each module furnishes easy-to-read indications of proper operation.

A 69-inch cabinet houses three stations or ancillary equipment. The cabinet design also increases reliability through its cooling capacity for the equipment housed within it.

MASTR III also features optional Aegis™ digital or Voice Guard® encryption with the addition of a digital control shelf.

Backward Compatible

The MASTR III Base Station can be used in combination with MASTR II or IIe stations. The MASTR III is readily upgradable through software revisions.

For More Information

For more information about this or any other Com-Net Ericsson Critical Radio Systems product, call 1-800-431-2345 in the U.S. From outside the U.S. call +1-804-592-6100.

ComNet Ericsson
CRITICAL RADIO SYSTEMS

Technical specifications are subject to change. This product is subject to U.S. export control for national security reasons.

General Specifications

Cabinet	INDOOR CABINET (Floor Mount) 37 inches (CNV)	69 inches
Size [in. (mm)]		
Height	37.0 (940)	69.1 (1750)
Width	21.5 (550)	23.1 (590)
Depth	18.25 (460)	21.0 (533)
Weight (min) [(lb (kg)]		
Continuous Duty	150 (68)	520 (236)
Packed, Domestic Shipping	165 (75)	550 (250)
Number of Rack Units	17	33
Max. Units w/Power Supply	1	3
w/o Power Supply	1	4

NOTE: One rack unit equals 1.75 inches. Stations occupy 8 rack units of cabinet space.

Service Speaker:	1W @ 8Ω
Service Microphone:	Transistorized Dynamic
Duty Cycle (EIA) Continuous:	Transmit/Receive - 100%
Ambient Temperature (or full spec performance per EIA):	-22 to +140°F (-30 to +60°C)
Humidity (EIA):	90% @ 122°F (50°C)
Input Power Source:	120 VAC (±20%)
Optional Input Power Source:	230 VAC (±15%), 50 Hz
Standby Battery Source:	13.8 VDC, 100 AH (min.)
Antenna Connections:	Type N
Length of AC Power Cable:	10 ft (3048 mm)
Metering:	Provided through Handset or TQ0619 Utility Software
Altitude:	
Operable:	Up to 15,000 ft (4,570 m)
Shippable:	Up to 50,000 ft (15,250 m)
Mean Time Between Failure (MTBF)	11,227 hours

Source Power Drain		VHF		UHF					800
Frequency Range (MHz)		136-150.8	150.8-174	403-430	425-450	450-470	470-494	492-512	851-870 Tx 806-825 Rx
AC Input Power		5A @ 120 VAC or 3A @ 230 VAC							
DC Input Power (A)	VDC								
Tx (full/half power)	13.8	33/25	33/25	33/25	33/25	33/25	33/25	33/25	2/2
Rx only	13.8	2	2	2	2	2	2	2	2
Tx (full/half power)	26.4								12/8
Rx only	26.4								0.5
EDACS Applications	13.8	2	2	2	2	2	2	2	2

Transmitter

	VHF		UHF					800
Frequency Range (MHz)	136-150.8	150.8-174	403-430	425-450	450-470	470-494	494-512	851-870
Rated Power Output (W)	110	110	90	90	100	90	90	100
RF Output Impedance (Ω)	50	50	50	50	50	50	50	50
Conducted Spurious and Harmonic Emission (dBm)	-36	-36	-36	-36	-36	-36	-36	-36
Frequency Stability (ppm)	±1.5	±1.5	±1.0	±1.0	±1.0	±1.0	±1.0	±1.0
Modulation Deviation (kHz)								
Wideband	0 to ±5	0 to ±5	0 to ±5	0 to ±5	0 to ±5	0 to ±5	0 to ±5	0 to ±5
15K0F1D, 15K0F1E								
16K0F1D, 16K0F1E, 16K0F3E								
Narrowband	0 to ±2.5	0 to ±2.5			0 to ±2.5			
11K0F3E								0 to ±5
NPSPAC								
14K0F3E								
FM Noise (dB)	-55	-55	-55	-55	-55	-55	-55	-55
Channel Spacing (kHz)	12.5/25/30	12.5/25/30	12.5/25	12.5/25	12.5/25	12.5/25	12.5/25	25 12.5 (NPSPAC)
Frequency Spread Full Spec (MHz)	8	12	27	25	20	24	20	1.0

Audio Distortion (@ 1 kHz): Less than 3%
Number of Channels (Conventional): Up to 16
Audio Response (pre-emphasis): Within +1/-3 dB of 6 dB/octave, 300 to 3000 Hz per EIA

NOTE: Rated power output is measured at the transmitter power amplifier output connector per FCC Type Acceptance filing information. Any customer-required optional items such as power measuring devices and/or duplexers will introduce loss between the transmitter output connector and the station cabinet output connector. This loss will reduce the available power at the station connector.

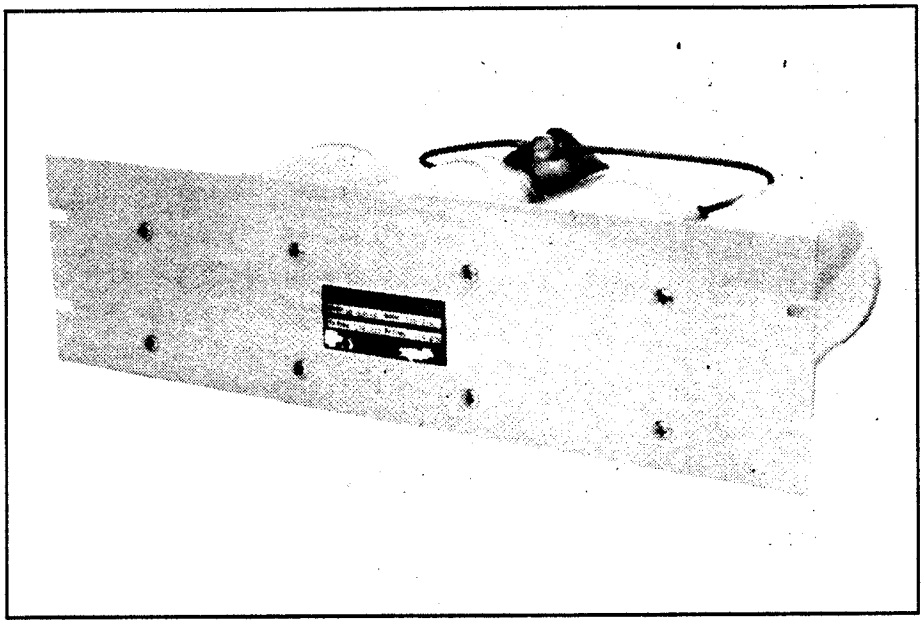
Receiver

	VHF		UHF					800
Frequency Range (MHz)	136-150.8	150.8-174	403-430	425-450	450-470	470-494	492-512	806-825
RF Input Impedance (Ω)	50	50	50	50	50	50	50	50
Channel Spacing (kHz)	12.5/25/30	12.5/25/30	12.5/25	12.5/25	12.5/25	12.5/25	12.5/25	25 12.5 (NPSPAC)
Sensitivity (dBm) EIA 12 dB SINAD	-116 (0.35 µV)	-116 (0.35 µV)	-116 (0.35 µV)	-116 (0.35 µV)	-116 (0.35 µV)	-116 (0.35 µV)	-116 (0.35 µV)	-119 (0.25 µV)
Threshold Squelch (dBm)	-119 (0.25 µV)	-119 (0.25 µV)	-119 (0.25 µV)	-119 (0.25 µV)	-119 (0.25 µV)	-119 (0.25 µV)	-119 (0.25 µV)	-122 (0.18 µV)
Selectivity EIA 2-Signal (dB)								
12.5 kHz	80	80	80	80	80	80	80	20 (NPSPAC)
25 kHz	95	95	90	90	90	90	90	90
30 kHz	100	100						
Frequency Stability (ppm)	±1.5	±1.5	±1.0	±1.0	±1.0	±1.0	±1.0	±1.0
Signal Displacement Bandwidth (kHz)	±2	±2	±2	±2	±2	±2	±2	±2
Intermodulation (dB)								
12.5 kHz	75	75	75	75	75	75	75	
25 kHz	90	90	85	85	85	85	85	85
30 kHz	90	90						
Spurious and Image Rejection (dB)	100	100	100	100	100	100	100	100
Frequency Spread								
Full Specs. (MHz)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.5
3 dB Degradation in Sensitivity (MHz)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	N/A

Audio Response (de-emphasis): Within +2/-8 dB of 6 dB/octave (@ Local Speaker), 300 to 3000 Hz per EIA
Within +1/-3 dB of 6 dB/octave (@ Line Output), 300 to 3000 Hz per EIA

Audio Output: 1 Watt at less than 3% distortion @ 1000 Hz, 25/30 kHz Channel

MASTR®III
Duplexer Systems



General

The elegance of MASTR III Duplexer Systems is demonstrated in its band pass/band reject design. It gives superior performance by providing Tx/Rx isolation and rejection from other transmitter signals. The four cavity design has two cavities for Tx and two cavities for Rx. This allows for smaller frequency separation.

The MASTR III Duplexer Systems can be mounted in standard nineteen inch EIA racks. The compact size saves valuable floor space. It is also factory tuned and installed, which ensures optimum performance.

ERICSSON

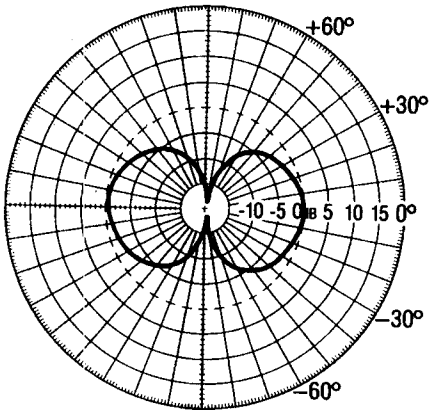
D_80 OMNI MIRAGE™ ANTENNAS
DB583 UNITY and 3 dBd GAIN, 806-960 MHz

The economical DB580 with unity or 0 dBd gain and DB583 with 3 dBd gain are omni-directional antennas for 800/900 MHz applications. Radiators are enclosed in a 1.5" (38.1 mm) OD Horizon Blue™ radome made of Mirage extruded fiberglass.

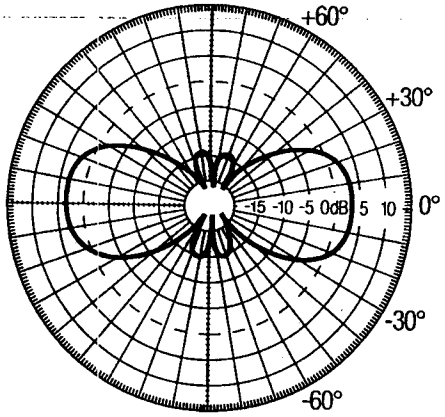
- **Broad Response** - Three models of each are designed for 800/900 MHz conventional, trunked, paging and cellular communications.
- **Dual Purpose Mount** - New integral mount made of cast aluminum alloy mounts to the side or top of a pipe.
- **Reliable** - Each antenna is tested for 500 watts power rating compliance and the absence of intermodulation generators.
- **Moisture Resistant** - The bottom cap has a moisture-sealed bulkhead N-Female connector, and a removable drain plug is located at each end of the antenna.
- **Lightning Resistant** - A DC ground is provided.
- **Ready to Install** - Since the transmission line of any length can be connected directly to the antenna (and dropped through the mounting pipe), no jumper cable is furnished.

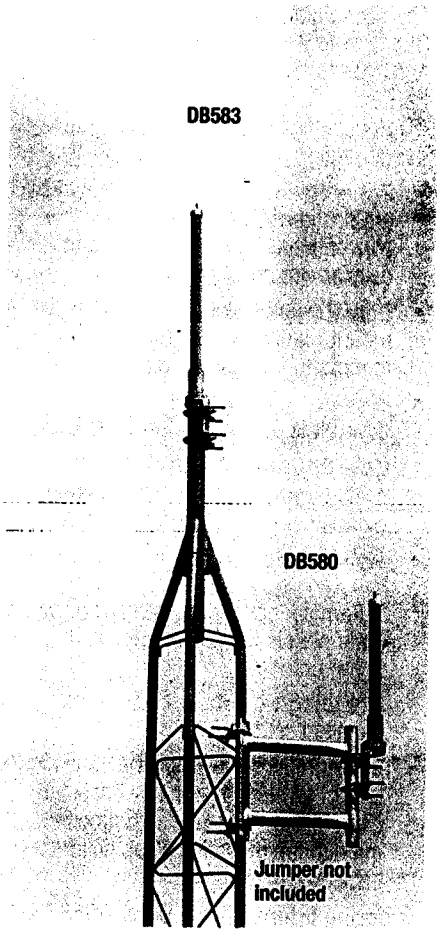
Ordering Information - Order DB580 for unity gain and DB583 for 3 dBd gain. Use model number for correct frequency. Order jumper cable separately, if needed.

DB580 Typical Vertical Radiation Pattern

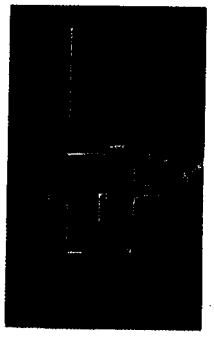


DB583 Typical Vertical Radiation Pattern

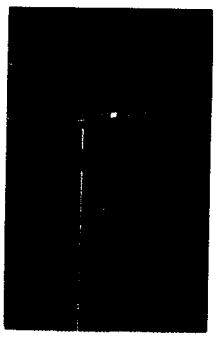




Side Mounted



Top Mounted



Frequency Ranges Available – MHz	
DB580-XT or DB583-XT	806-869
DB580-XC or DB583-XC	824-896
DB580-Y or DB583-Y	890-960

Both can be shipped by UPS.

Electrical Data		
Frequency Range – MHz		See table
Bandwidth		See table above
Gain – dB	DB580 = Unity	DB583 = 3
Beamwidth "E" Plane (half power)	DB580 = 83°	DB583 = 30°
Beamwidth "H" Plane (half power)		Omni
Maximum power input – watts		400
Input Impedance – ohms		50
VSWR		1.5 to 1
Lightning protection		Direct ground
Termination		Type N-Female (fixed)

Mechanical Data		
	DB580	DB583
Radome (diameter = 1.5" [38.1 mm])		Mirage Fiberglass
Radiators		Brass
Mounting hardware		Stainless steel
Lateral thrust at 100 mph (161 km/hr) – lbf (N)	5.25 (23.1)	6.4 (28.5)
Overall length – ft. (m)	2.46 (.75)	2.75 (.84)
Radome length – ft. (m)	1.6 (.49)	1.92 (.59)
Mounting pipe length – in. (mm)	11 (279.4)	11 (279.4)
Maximum exposed area (flat plate equivalent) – ft² (m²)	.13 (.01)	.16 (.014)
Net weight – lbs. (kg)	3.8 (.17)	6.25 (2.84)
Shipping weight (w/clamps) – lbs. (kg)	6 (27.2)	8 (3.63)
Mount, dual purpose		Cast aluminum alloy

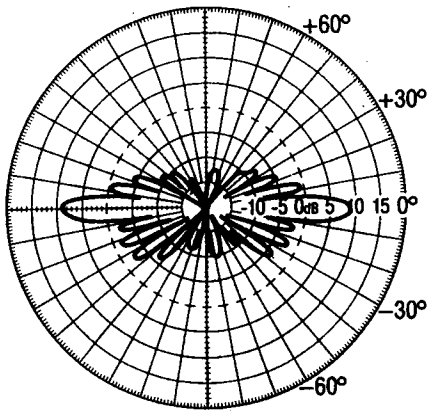
DB586 OMNI MIRAGE™ ANTENNAS
DB589 6 and 9 dBd GAIN, 806-960 MHz

The economical DB586 with 6 dBd gain and DB589 with 9 dBd gain are omnidirectional antennas for 800/900 MHz applications. Radiators are enclosed in a 1.5" (38.1 mm) OD Horizon Blue™ radome made of Mirage extruded fiberglass.

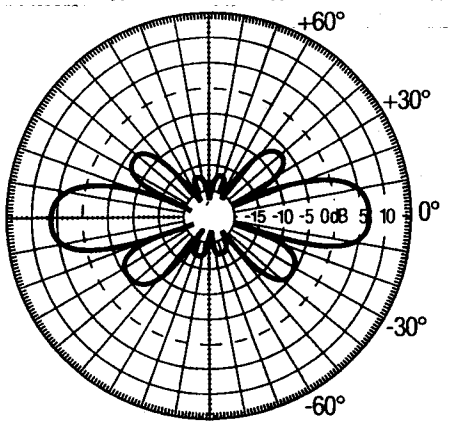
- **Broad Response** - Four models of each are designed for 800/900 MHz conventional, trunked, paging and cellular communications.
- **Dual Purpose Mount** - New integral mount made of cast aluminum alloy mounts to the side or top of a pipe.
- **Beamtilt** - 3° or 6° of electrical downtilt is optional on some models.
- **Reliable** - Each antenna is tested for 500 watts power rating compliance and the absence of intermodulation generators.
- **Moisture Resistant** - The bottom cap has a moisture-sealed bulkhead N-Female connector, and a removable drain plug is located at each end of the antenna.
- **Lightning Resistant** - A DC ground is provided.
- **Ready to Install** - Since the transmission line (of any length) can be connected directly to the antenna (and dropped through the mounting pipe), no jumper cable is furnished.

Ordering Information - Order DB586 for 6 dBd gain and DB589 for 9 dBd gain. Use model number for correct frequency. For downtilt add T3 for 3° or T6 for 6°. **Example:** DB586T6-XC. Order jumper cable separately, if needed.

DB589 Typical Vertical Radiation Pattern

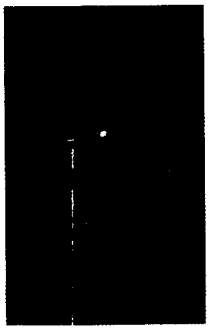


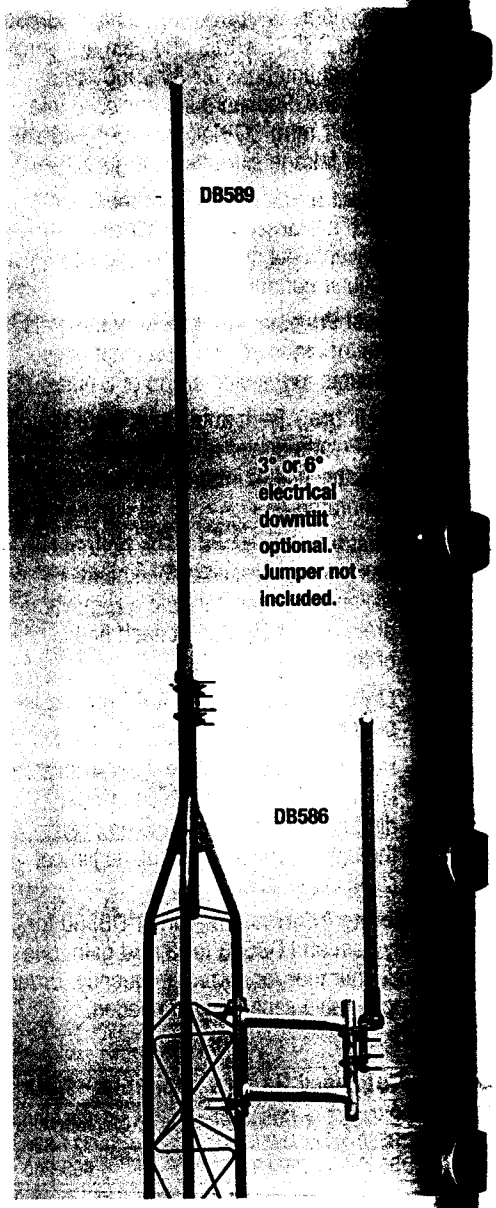
DB586 Typical Vertical Radiation Pattern



Side Mounted

Top Mounted





DB586 can be shipped by UPS.

Frequency Ranges Available – MHz	
DB586-XT or DB589-XT	806-869
DB586-XC or DB589-XC	824-896
DB586-X*	806-901
DB586-Y or DB589-Y	890-960
For downtilt on available models, add T3 for 3°, T6 for 6°. Example: DB586T6-XC.	

Electrical Data		
	DB586	DB589
Frequency Range – MHz	See table	See table
Gain (maximum) – dBd	6	9
Beamwidth "E" Plane (half power)	18°	9°
Beamwidth "H" Plane (half power)	Omni	Omni
Maximum power input – watts	400	400
Input impedance – ohms	50	50
VSWR	1.5 to 1	1.5 to 1
Lightning protection	Direct ground	Direct ground
Termination	Type N-Female (fixed)	Type N-Female (fixed)

*"S" design provides broad bandwidths with a slightly reduced gain.

Mechanical Data		
	DB586	DB589
Radome (diameter = 1.5" [38.1 mm])		Mirage Fiberglass
Radiators		Brass
Mounting hardware		Stainless steel
Lateral thrust at 100 mph (161 km/hr) – lbf (N)	13.1 (58.4)	25.26 (112.4)
Overall length – ft. (m)	4.38 (1.34)	8.5 (2.59)
Radome length – ft. (m)	3.5 (1.07)	7.58 (2.31)
Mounting pipe length – in. (mm)	11 (279.4)	11 (279.4)
Maximum exposed area (flat plate equivalent) – ft² (m²)	.328 (.03)	.638 (.06)
Net weight – lbs. (kg)	8.25 (3.74)	11.5 (5.22)
Shipping weight – lbs. (kg)	10 (4.54)	15 (6.80)
Mount, dual purpose (top or parallel)		Cast aluminum alloy

Model Number Configuration Charts

All db TransTelecom model numbers are descriptive. The charts below depict the various configurations for your specific application. Not all configurations are available. Ask your sales representative about your special requirements.

CABLES

Sample Model Number

DBC 012 F 5 P - □

- **DBC** — Decibel Cable
- **012** — Cable Size
  - 014 = 1/4 inch
  - 012 = 1/2 inch
  - 038 = 3/8 inch
  - 078 = 7/8 inch
  - 114 = 1-1/4 inch
  - 158 = 1-5/8 inch
- **F** — Cable Type
  - F = db TransFoam™
  - X = db TransFlex™
  - A = db TransAir™
  - R = db TransFill™
- **5** — Impedance
  - 5 = 50 ohms
  - 7 = 75 ohms
- **P** — Jacket
  - P = Polyethelene
  - T = Fire Retardant
- **□** — Optional
  - D = Swept (Low VSWR)

JUMPERS

Sample Model Number

DBJ 012 03 05 - □

- **DBJ** — Decibel Jumper
- **012** — Cable Size
  - X14 = 1/4 Super Flexible
  - X12 = 1/2 Super Flexible
  - 012 = 1/2 Foam Cable
  - 038 = 3/8 Foam Cable
  - 078 = 7/8 Foam Cable
  - 114 = 1-1/4 Foam Cable
  - 158 = 1-5/8 Foam Cable
- **03** — Length
  - 03 = 3 foot
  - 06 = 6 foot
  - 08 = 8 foot
  - 10 = 10 foot
- **05** — Connector
  - 01 - N-Male/N-Male
  - 02 - N-Male/N-Male (plated)
  - 03 - N-Female/N-Male
  - 04 - N-Male/N-R Angle (plated)
  - 05 - DIN Male/DIN Male
  - 06 - DIN Male/DIN Male R Angle
  - 07 - DIN Male/N-Male (plated)
  - 08 - DIN Male/DIN Female
  - 09 - DIN Female/DIN Male R Angle
  - Plated = Silver plated body and gold plated pin
- **□** — Optional
  - D = Swept (Low VSWR)

CONNECTORS

Sample Model Number

DBK 012 P 1 N - B F

- **DBK** — Decibel Connector
- **012** — Connector Size
  - X14 = 1/4 db TransFlex
  - X12 = 1/2 db TransFlex
  - 012 = 1/2 db TransFoam
  - 038 = 3/8 db TransFoam
  - 078 = 7/8 db TransFoam
  - 114 = 1 1/4 db TransFoam
  - 158 = 1 5/8 db TransFoam
  - A - - = Air Cable
    - 03 = 1/2"
    - 06 = 7/8"
    - 08 = 1 5/8"
- **P** — Material
  - B = Brass/Silver
  - N = Nickel/Gold
  - P = Silver/Gold
  - S = Silver/Silver
- **1** — Angle
  - 1 = Straight
  - 2 = R-Angle
- **N** — Type
  - E = 7/16 DIN
  - F = Flange
  - L = L/C
  - M = Mini DIN
  - N = N Type
  - U = UHF
- **B** — Pin Attachment
  - S = Solder
  - B = Basket
  - T = Threaded
- **F** — Gender
  - M = Male
  - F = Female

ACCESSORIES BREAKDOWN

Model Number	Description	Model Number	Description	Model Number	Description
DBSPLICE_ _ _	Connector Splice with Cable Size	DBTIERNYL	Tie Wrap-Nylon	DBHDWKT01	Hardware Kit 3/8" x 1"
DBGRNDKT_ _ _	Grounding Kit with Cable Size	DBTIERCTD	Coated Copper Tie Wire	DBCOLDSHRK01	7/8 - 1/2 Cold Shrink Kit
DBCABFT_ _ _	Cable Wall Feed Thru with Cable Size	DBSSRAPLK	Stainless Steel Wrap Lock	DBCOLDSHRK02	1-1/4 - 1/2 Cold Shrink Kit
DBHNGKT_ _ _	Hanger Kit with Cable Size	DBANGLADPT	Kit of 10 Angle Adaptors	DBCOLDSHRK03	1/2 - 1/2 Cold Shrink Kit
DBSNGKT_ _ _	Snap In Hanger Kit with Cable Size	DBANGLADPTG	Kit of 10 Angle Adaptors Galvanized	DBCOLDSHRK04	7/8 - 7/8 Cold Shrink Kit
DBCABLEBT_ _ _	Cable Boot with Cable Size	DBBURKT	Burial Kit One Size Fits All		

MODEL 24-66 TONE REMOTE

IDA CORPORATION
1-800-627-4432

Features

- Field Programmable by PC
- Control & display up to eight channels
- Monitor *(latched or momentary)*
- Intercom
- Mute *(latched or momentary)*
- Alert Tone
- Programmable Auxiliaries
- 30db of Compression and 3 Watts of speaker audio

Benefits

As your communications needs grow and change the 24-66 will keep up. Standard features that are not needed now can be activated with simple programming done in the field. Monitor, Intercom, Mute, Alert Tone, Number of Channels, and the Auxiliaries are all programmable.

With multiple remotes installed in parallel the audio levels remain consistent. Even in a noisy environment you will be heard loud and clear.

Cost Options

Option 610 – Clock and VU Meter
Large easy to read LED display gives TIME and TX level at a glance. *(Field programmable as Military or Standard time)*

Option 611 – Four Wire
Programmable for full duplex or separate pairs for TX and RX.

Option 612 – Supervisory / Alternate Line
Programmed as Supervisory this option allows one deskset remote to control access to the base station by other remotes. Programmed as Alternate Line allows the deskset to switch to a different base station radio with the push of a button.

Option 613 – Parallel TX Indicator and Notch Filter
Provides visual indication of transmit by another remote and prevents the 2175 Hz guard tone from being heard through the speaker.

Programmable features:

"Mute on Parallel TX" allows two or more desksets to be located in the same room without causing feedback.

"Parallel Override" allows command tones to be sent even when another remote is off hook.

"Parallel Update" changes the display of all the desksets when selecting a new channel.

Option 614 – 12 VDC Power Cable
Prewired power cable makes installing battery backup quick and easy.

Option 615 – 2nd Line with Summed Audio
Control two base stations with the same deskset remote. RX audio from both lines is summed and heard on the deskset's speaker. The operator can TX and change channels on which ever line is selected. Audio from the "Unselected" line is at a lower volume than audio from the "Selected" line. The relative volume of the unselected audio is dealer adjustable.
(Not available with Option 611 – Four Wire)

Option 616 – One Touch TX
Transmit with the touch of a button on the faceplate. A small condenser mic hidden on the front edge of the unit picks up your voice. Great for short quick responses.

continued next page

MODEL 24-66 ADDITIONAL PROGRAMMABLE FEATURES

Tones can be programmed for whichever function is desired. Available tones: 2050 Hz, 1950 Hz, 1850 Hz, 1750 Hz, 1650 Hz, 1550 Hz, 1450 Hz, 1350 Hz, 1250 Hz, 1150 Hz, 1050 Hz.

Disable of ON HOOK MONITOR (handset only)

Momentary F2 (always returns to F1)

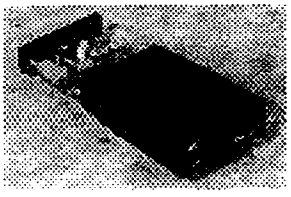
Momentary Intercom

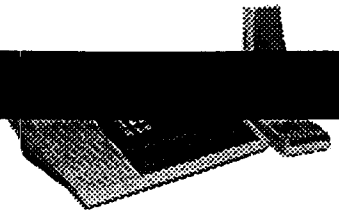
Remote Update (updates display of 24-66 when base station radio changes channels due to SCAN or in trunking applications, available for several popular radios, Option 613 and Model 20-27 Tone Termination Panel required)

OTHER 24-66 & 24-46 OPTIONS:
RBC-001 Wall Mounting Bracket
RBC-002 External Encode/Decode Cable
RBC-003 Programming Cable and Software

MODEL 20-27 TONE TERMINATION PANEL

The world's most powerful Tone Remotes deserve the most powerful Tone panel. The Model 20-27 is field programmable just like the remotes. Offering standard features such as 99 Channels, Local mic jack, LTR and ESAS trunking format, Binary output, and Remote Update of 24-66s. Direct control including SCAN, System /Group is standard for popular EF Johnson, Uniden, Kenwood, and SEA. Plug and play cabling available for a wide variety of radios.





Cost Options continued from previous page

Option RBC-617 - 99 Channel Capability
Provides up to 99 channels to be controlled and displayed. By using a pair of function tones, 128 different commands are possible. The desired channel is selected by toggling up or down and shown on the LED display. Included with option RBC-617 are options RBC-610 (clock) and RBC-613 (notch filter). Momentary time display is via the CLOCK button.

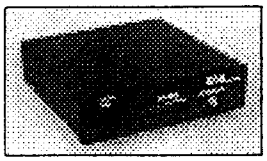
Option RBC-618 - 99 Channel Capability with DTMF
Similar to option RBC-617, this option provides up to 99 channels to be controlled and displayed. Direct access to the desired channel and DTMF encode are added features. A 12 button keypad is mounted on the faceplate of the deskset. Included with option RBC-618 are options RBC-610 (clock) and RBC-613 (notch filter). Momentary time display is via the CLOCK button.

Option RBC-619 - Alpha-Numeric Display
Displays channel selections with name/number of the operator's preference. Programmable up to 16 characters, the option includes clock and VU meter.

Option RBC-620 - Alpha-Numeric Display
Displays channel selections with name/number of the operator's preference. Programmable up to 32 characters, the option includes clock and VU meter.

Option RBC-621 - Digital Signaling
Fast and efficient digital signaling in a proprietary MSK format. When used along with Model 20-28 Remote Termination Panel, option RBC-621 provides the high speed switching and communication required for demanding trunking applications. Options RBC-610 (clock) and RBC-613 (notch filter) are included. Option RBC-611 (four wire) is recommended for use in most trunking applications.

Option RBC-622 - DTMF Encode
12 button DTMF encoder with keypad mounted on deskset.



MODEL 20-28 REMOTE TERMINATION PANEL

The 20-28 is a programmable termination panel for use with IDA Model 24-66 desk top controllers equipped with digital signaling. By decoding the proper digital signals the 20-28 can control remotely located base stations or repeaters. In addition to providing a two-way path for audio the unit also provides update information back to the desk top controllers. This update information allows the operator immediate information as to the remote radios status, such as channel, in or out of scan, or the current System & Group if a trunking application.

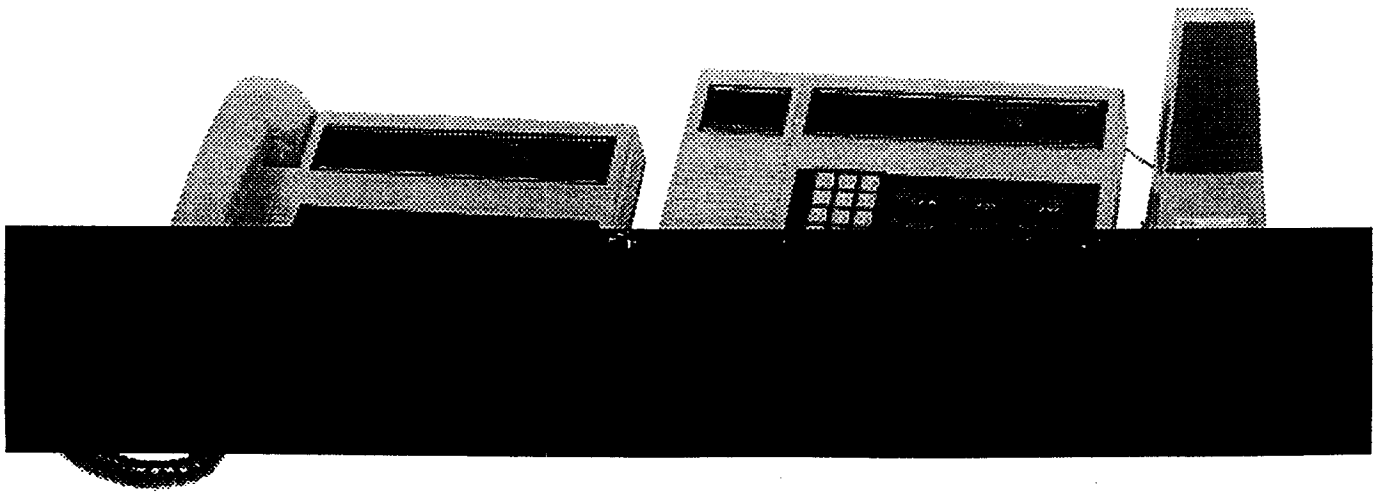
MSK SIGNALING
The 20-28 is field programmable via IBM compatible PC and features digital signaling in a proprietary MSK format. When used along with Model 24-66 remotes equipped with MSK signaling (Option RBC-621) the 20-28 provides the high speed switching and communication required for demanding trunking applications.

PROGRAMMABLE OUTPUTS
To meet the requirements of various manufacturers base stations the 20-28 can be programmed for a wide variety of outputs. For stations that are capable of receiving external serial commands the 20-28 can be programmed to provide the proper command set. In addition the unit can be programmed for Binary output.

This method of communicating with the radio's microprocessor in much the same way that it's own faceplate display does offers virtually total remote control. Advanced features such as SCAN, Lockout, Selective calling, Priority SCAN, and others become possible. When programming the 20-28, up to 8 of the outputs can be selected as inputs.

LOCAL OPERATION
For installations where local operation of the base station is desired the 20-28 is available with a desk microphone, speaker jack, and volume control (Option RTM-604).

TRC-8/98



TECHNICAL SPECIFICATIONS

	DC REMOTES	TONE REMOTES	
	24-46	24-66	20-88
Input Voltage	117/230 VAC + -20% 50/60Hz	117/230 VAC + -20% 50/60Hz	117/230 VAC 50/60Hz
Standby Voltage Standby current	----- -----	12-15VDC 287mA (TX) 620mA (RX) (STBY)	250mA (MAX)
Input power (max)	17W (TX) 24W (RX) 4W (STBY)	8.5W (TX) 20W (RX) 8.5W (STBY)	
Temperature range	-30 deg to +60 deg C	-30 deg to +60 deg C	0° C to +70° C
Relative humidity	90% at 50 deg C	90% at 50 deg C	
Line impedance (1KHz)	600 ohms (TX) 600 or 5k ohms (RX)	600 ohms (TX) 600 or 5k ohms (RX)	600 ohms @ 1 KHz
Line audio output (600 ohm load)	-20 to +10dbm	-20 to +10dbm	-20dbm to +10dbm
TX hum & noise (ref +11dbm)	-55db	-55db	
Threshold of compression (line to speaker audio)	-20dbm adjustable	-20dbm adjustable	-20dbm
Speaker audio output RMS	3W into 4 ohms	3W into 4 ohms	3.5W into 4 ohms
Distortion (at rated speaker output)	Less than 3%	Less than 3%	Less than 5%
RX hum & noise	-55db	-49db	-55db
Frequency response (300 to 3,000Hz)	+1, -3db	+1, -3db except at notch frequency	300Hz to 3KHz
RX compression	With an audio increase of 30db beyond the start of compression the output increases less than 3db	With an audio increase of 30db beyond the start of compression the output increases less than 3db	
TX compression	With an audio increase of 30db beyond the start of compression the output increases 15 to 16db	With an audio increase of 30db beyond the start of compression the output increases 15 to 16db	
Line control	2 or 4 wire audio	2 or 4 wire audio	2 or 4 wire
Notch filter depth	N/A	-45db (RX) -25db (TX)	40db (RX)
Weight	4lbs 15oz	4lbs 15oz	4lbs 8oz
Dimensions	4.75" (H) x 10" (W) x 8" (D)	4.75" (H) x 10" (W) x 8" (D)	2.4" (H) x 10" (W) x 9.4" (D)

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Commercial Communications, Inc.
6306-B Gravel Avenue
Alexandria, VA 22310
703-922-0100

GCS Electronics & Communications
200 Sellars Street
Martinsville, VA 24112
540-632-9700

Kidd Communications Inc.
1199 North Mecklenburg Avenue
South Hill, VA 23970
804-447-3552

Shenandoah Telecommunications Co.
124 S. Main Street
Edinburg, VA 22824
540-984-4141

Valley Communications
231 East 4th Street
Salem, VA 24153
540-389-1918

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