2017

National Incident Radio Support Cache User's Guide

National Interagency Incident Communications Division
3833 S. Development Ave.
Boise, ID 83705

CDO Phone: (208) 387-5644
FAX: (208) 387-5892
E-mail: nifccdo@fs.fed.us
Web: www.nifc.gov/NIICD

NFES# 000968

National Incident Radio Support Cache (NIRSC) User's Guide:

During the 2016 all-risk season the National Incident Radio Support Cache (NIRSC) supported fires, law enforcement, and forest pest management programs.

While it wasn't the largest season for incident communications resource orders, there were many milestones surpassed. The NIRSC supported:

- 391 incidents with 2135 separate frequency assignments by borrowing over 600 frequencies from other agencies and partners.
- 1930 individual kit boxes were deployed which consisted of over 110 Starter Systems and 13600 handheld radios.
- The personnel in infrared detection and mapping successfully flew 1176 missions totaling over 860 flight hours.

It is extremely important that all personnel involved in incident communications keep themselves updated regarding changes in equipment and technology. Several courses are scheduled for this year to assist with this. I encourage any Communications Unit Leaders (COML) and/or Communications Technicians (COMT) who has not been out for a few years, or who wants first-hand experience with the equipment, to reserve a spot in one of the communications refresher courses being offered this year. For information on courses please contact Kirk Maskalick, Technical Training, at 208-387-5861.

Thank all of you for the work you do in incident communications. Your role is vital and brings together all of the functions in the Incident Command System. You play an important role in ensuring the safety of all personnel on incidents.

If you have any questions for the National Interagency Incident Communications Division, please feel free to call me at 208-387-5856, or you can contact the Communications Duty Officer at 208-387-5644, or toll free at 1-877-775-3451.

E-mail: kmccutchan@fs.fed.us

Sincerely,

/s/ Kim McCutchan

Kim McCutchan
Chief, National Interagency Incident Communications Division

This publication is revised annually by the National Interagency Incident Communications Division, National Interagency Fire Center at Boise, Idaho.

Additional copies of this publication may be ordered from:

National Interagency Fire Center
ATTN: Great Basin Cache Supply Office
3833 S. Development Ave.
Boise, Idaho 83705
Order NFES# 000968

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INTRODUCTION

The National Incident Radio Support Cache (NIRSC) User's Guide is designed to assist communications personnel with reference material and guidelines when ordering and utilizing frequencies and equipment from NIRSC.
The NIRSC User's Guide is available on-line at:
http://www.nifc.gov/NIICD/docs/2017NIRSCUsersGuide.pdf

Copies of the printed version are available in each NFES # 4312 Command Repeater Kit or can be ordered directly through the Great Basin Cache Supply office (GBK) as NFES # 000968.

The policies/guidelines and procedures contained in the NIRSC User's Guide are revised annually by NIRSC personnel based on field updates and/or current management policy/guidelines changes from each department. Please utilize the latest version of the guide when ordering/installing/utilizing NIRSC equipment or frequencies.

To use this guide:

1. Read the descriptions from the "**General Communications Conditions and Solutions**" tab starting on page 27 of this guide. Find the condition that most closely reflects the needs of the incident. The "**Solutions**" provide lists of **recommended** equipment to support the condition.

2. When ordering equipment from the NIRSC, use the National Fire Equipment Supply (NFES) catalog number indicated on the drawings or in the "**NIRSC Equipment Descriptions**" section of this guide.
   All NIRSC equipment is ordered under a resource order. One request number per equipment item.

3. The National Interagency Incident Communications Division Communications Duty Officer (NIICD-CDO) is available 24 hours a day, year-round. CDO personnel provide ordering and planning assistance and are an information resource for field communications personnel. At a minimum, communications personnel should check in with the CDO upon arrival at the incident to provide frequency assignment, equipment location and contact information. All provided information is logged and updated daily.

4. The "**NIRSC Equipment**" tab provides a description and purpose of each piece of equipment issued from the NIRSC.

5. The "**NIRSC Kit Inventories**" tab provides an inventory list for each kit broken down by NFES #.
   Inventory lists are also provided in each kit shipped from NIRSC.

6. The "**NIRSC Installation Instructions**" tab provides step-by-step instructions including diagrams for installing all equipment issued by the NIRSC. Installation instructions are also provided in each kit shipped from NIRSC.

7. Appendix Tabs:
   - Appendix Tab A, contains the Voice Board operating instructions along with wiring diagrams.
   - Appendix Tab B, contains information on NIRSC batteries and configuration diagrams.
   - Appendix Tab C, contains antenna installation instructions including diagrams for quick reference.
   - Appendix Tab D, contains the switch settings for quick reference for each piece of Daniels equipment in normal operation.
   - Appendix Tab E, contains quick reference material on programming of each NIRSC radio.
   - Appendix tabs F and G,tabs contain incident diagrams and communications plans to allow the communications users to document the equipment locations and frequencies needed by the CDO.

Note: Communications personnel not familiar with NIRSC equipment or those who are not experienced are required to contact the CDO for frequency and equipment assistance.
See NIRSC and NIICD contacts on page 4 of this guide for all contact information.

NIICD HOTSHEET/ NEW FOR 2017

New For 2017

All NIRSC VHF-FM and UHF-FM frequencies will continue to be in narrowband analog configuration.

All NIRSC radio passwords will continue to be all zeros for programming.

Incidents will be assigned a tone by the CDO. Incidents will be advised to tone the following:
- All VHF Repeaters (RX & TX)
- All Tactical Channels/Frequencies (RX & TX)

Voice Boards
Voice boards have been installed in some of the command repeaters for test and evaluation. If a repeater has a voice board installed, the user can remotely query the repeater's battery voltage and temperature using the DTMF keypad on a handheld radio. If a solar panel kit is used, the voice board allows the alkaline batteries to be used as a backup power source. ***(See Appendix A for more information)***

Repeater Enclosure Connector Bulkhead ***(will not be implemented until 2018)***
NIRSC will install a connector bulkhead in all repeater enclosures. The connector bulkhead provides a weather proof interface to connect external cables to internal equipment without having to penetrate the side of the enclosure. This reduces moisture and condensation in the enclosure. The bulkhead consists of two RF N-type connectors to connect the VHF and UHF antenna cables, and a mil-spec connector to connect an external power source.

Battery Cover
A removable terminal cover will be installed on the alkaline battery to help prevent batteries from shorting. Please do not throw away, and remember to leave the cover in the kit when disposing the batteries or returning to NIRSC.

NIICD Hotsheet

For up-to-date information on multi-mode (P25) radios, training, infrared operations, incident operations, COMC, new NIRSC equipment and more, visit the National Interagency Incident Communications Division (NIICD) web site.

http://www.nifc.gov/NIICD/hotsheet/hotsheet.html

Visit NIICD's documents page for instructions, forms, and helpful information.
Documents include:
- Avionics Contracts, Forms, and Guides
- Kit Installation Information
- Approved Fire Radio List
- Family Radio Service (FRS)
- ICS Forms (ICS-205)
- Communications Training
- Radio Adapter Information
- Radio Programming Information
- NIRSC User's Guide (Latest)
- Radio Inventory Database (Access)
- Kit Shipping Costs Information
- Fillable Incident Radio System Diagrams
- Multi-mode P25 Radio Purchasing
- Radio/Field Issues

http://www.nifc.gov/NIICD/hotsheet/documents.html

NATIONAL INCIDENT RADIO SUPPORT CACHE

The National Incident Radio Support Cache (NIRSC) is a national resource composed of multi-channel radio systems, frequencies, and speciality radio communications equipment available for supporting complex incident communications. The purpose of NIRSC is to provide portable emergency communication services in a professional, prompt, customer-oriented manner while optimizing resources and minimizing risk.
NIRSC major focus is wildland fire suppression, but NIRSC equipment, personnel, and frequencies have been deployed and utilized on hurricanes, floods, earthquakes, volcanic eruptions, oil spills, and other man-made and natural disasters where federal assistance is required.
The information outlined below must be considered when ordering and using NIRSC equipment. All NIRSC frequencies, both UHF and VHF, must be cleared for use BEFORE shipment is made. All NIRSC frequencies are cleared and assigned by the CDO or COMC if assigned.

NIRSC EQUIPMENT AND FREQUENCY ORDERING PROCESS

All NIRSC equipment and frequency requests shall be processed using the Resource Ordering and Status System (ROSS). Equipment will not be shipped without having a resource order request. All frequencies will not be issued or assigned without having a resource order request started or in the system. NIRSC equipment and frequencies will be requested by the incident and the request sent to NIRSC via the local ordering process. The ordering process consists of the following:
Incident--->Dispatch Center--->GACC--->NICC--->NIRSC

NIRSC STARTER SYSTEMS (NFES# 004390)

The NFES 004390 Starter System is designed to be the initial system issued to support incident communications requirements. The system supplies equipment which will establish immediate communications for command, tactical, logistics, and air operation requirements. A Starter System consists of 10 assorted pieces of equipment with 7 sets of antenna masts, and is ordered as a system. Type I and Type II Interagency Incident Management Teams (IMTs) will typically have a 4390 Starter System as part of the teams pre-order and does not need to be reordered.

Individual kits are available to supplement the Starter System or to provide support for smaller incidents. The CDO or COMC can provide assistance in determining a specific incident's communications requirements. Please contact the CDO before placing a request for a 004390 Starter System.

When ordering a Starter System, appropriate frequency assignments must be obtained by contacting the CDO or, when assigned, the appropriate COMC. To insure proper frequency coordination, please provide the latitude and longitude of the incident to de-conflict with existing incidents or other agency frequency assignments.

Each GACC accommodates up to four (4) Starter Systems in pre-position during their established fire season. This is to provide faster delivery time of the equipment to the incidents located within the GACC. The CDO **must** be contacted when an order for a Starter System is received for an incident. The CDO or COMC will identify which pre-positioned Starter System (if any) will be assigned to the incident, based on availability and frequency conflicts. A replacement (backfill) Starter System may be requested after commitment of a pre-positioned Starter System. Replacement Starter Systems orders may not be filled where congestion of spectrum is an issue. In these instances, special frequency Starter Systems will be built on an as needed basis and shipped directly to the incident.

Note: Not all incidents require a 4390 Starter System to provide incident communications. Contact the CDO or COMC to determine the required and appropriate incident communications needs.

NIRSC radios are synthesized and contain both Forest Service (FS) and Department of Interior (DOI) frequencies that are not "cleared" nationally. Other agencies use these frequencies and in some cases, in very critical and sensitive areas. All frequencies must be approved for the areas where they are intended for use. None of the national frequencies are to be used without prior coordination with the CDO.

In areas with extreme frequency congestion, the CDO or COMC will advise incident COMLs of available frequencies and equipment.

ADDITIONAL FREQUENCIES AND EQUIPMENT

Consult with the CDO (or COMC, if assigned) if additional frequencies or equipment are needed. The CDO/COMC may want to review the system design in order to verify the need. If the CDO/COMC can fill the request, the CDO/COMC will inform the incident COML/COMT of assigned frequencies or equipment. Repeaters and Frequencies are ordered as a single resource item:

- Command Repeater/Link - NFES# 004312
- Logistics Repeater - NFES# 004248
- Air-to-Air FM (California-Specific)
- Air-to-Air AM
- Air-to-Ground FM
- Tactical
- Deck
- Take-Off-Land-Control (TOLC)

EQUIPMENT AND FREQUENCY DEMOBILIZATION

Temporary frequencies and any radio equipment with temporary frequencies must be released first due to licensing requirements. All National Incident Radio Support Cache (NIRSC) communications equipment should be inventoried, sealed and returned to NIRSC at NIFC immediately after the incident is turned over to the local jurisdictional agency. Coordination and approval is required from the CDO or COMC if equipment is to be utilized after the transition.

Assigned incident frequencies should be released immediately after the incident is turned over to the local jurisdictional agency. Coordination and approval is required from the CDO or COMC if frequencies are to be utilized after the transition.

NIRSC communications equipment shall **NOT** be moved from one incident to another without being returned to NIRSC for refurbishment. Unused and red-sealed equipment may be moved, but only upon approval and coordination with the CDO or COMC.

NIRSC assigned frequencies shall **NOT** be moved or transferred from one incident to another without approval and coordination with the CDO or COMC.

FIELD ASSISTANCE:

The CDO is available 24/7 throughout the year. Geographic Area Frequency Managers, COMCs, and/or Communications Unit Leaders (COML)/Communications Technicians (COMT) will coordinate directly with the CDO on all telecommunication issues.

The CDO can be contacted at: Phone: (208) 387-5644
Toll-Free number: (877) 775-3451
FAX: (208)387-5892
E-mail: nifccdo@fs.fed.us

COMMUNICATIONS DUTY OFFICER AND COMMUNICATIONS COORDINATOR DUTIES

National level coordination and assignments for incident frequencies and equipment is the responsibility of the National Interagency Incident Communications Division (NIICD) and is managed by the National Interagency Fire Center Communications Duty Officer (NIFC-CDO).

CDO Duties and Responsibilities include:

- *Determines technical compatibility between proposed incident radio systems and radio frequency assignments for the interagency fire and aviation community, on a national basis.*
- *Coordinates with the Geographic Area Coordination Centers (GACC) in assigning tactical, command and air frequencies.*
- *Resolves incident radio frequency interference issues related to incident radio systems within the United States and coordinates international interference issues with Mexico and Canada.*
- *Tracks all frequencies assigned to GACCs and incident projects.*
- *Coordinates with the USDA-FS, Department of Interior and Federal Aviation Administration Spectrum Managers for temporary frequency assignments.*
- *Maintains and updates a database of all air, tactical, command and logistics frequencies, communications equipment, and personnel (Communications Technicians, Communications Unit Leaders, and Communications Coordinators).*
- *Helps solve incident communications equipment and frequency issues during incidents.*

When communications requirements exceed normal operations, the CDO may request that the GACCs assign a Communications Coordinator (COMC) to facilitate geographic area frequency management. The COMC reports to the CDO and directly supports the assigned geographic area.

COMC Duties and Responsibilities include:

- *Manages the allocation of communications resources at the geographic area level. This includes communications equipment, frequencies, communications personnel, and associated supplies.*
- *Manages the frequency resources for all incidents under assigned jurisdiction.*
- *Maintains an accurate inventory of all communications equipment, frequencies, and personnel assigned to incidents under their control.*
- *Keeps current on the availability of communications resources for future geographic area and national requirements. The COMC should be current on procedures needed to obtain such resources.*
- *Provides problem-solving recommendations and advice on communications issues to the respective Geographic Area Coordinators, Area Command Teams, and/or to Incident Management Teams within a complex or single incident. National, as well as geographic area priorities will be considered when making recommendations and/or providing advice.*
- *Assists incidents with communications system designs and with obtaining specialized communications equipment.*

Note: During complex situations the COMC will request additional qualified personnel to be assigned as field COMCs and roving COMTs. Any situation involving complex air operations will require that the COMC request an Aviation COMC specifically for air operations.

The COMC will not be assigned to specific incidents or to an Area Command Team. Situations may occur when communications coordination is required between multiple geographic areas. Under these circumstances, a COMC may be assigned to a NICC Resource Order to provide overall coordination and support to COMCs assigned to the affected geographic areas.

NIRSC AND NIICD CONTACTS

For assistance, the staff of the National Interagency Incident Communications Division (NIICD) and the National Incident Radio Support cache (NIRSC) may be reached at the numbers listed below.

The CDO is available 24/7 throughout the year. Geographic Area Frequency Managers, COMCs, and/or Communications Unit Leaders (COML)/Incident Communications Technicians (COMT) will coordinate directly with the CDO on all telecommunications issues.

The CDO can be contacted at: Phone: (208) 387-5644
Toll-Free number: (877) 775-3451
FAX: (208)387-5892
E-mail: nifccdo@fs.fed.us

DIVISION BRANCH CONTACTS:	PHONE:	E-MAIL:
Division Chief,		
National Interagency Incident Communications Division:		
Kim McCutchan	(208) 387-5856	kmccutchan@fs.fed.us
Branch of Communications Maintenance:		
Kent Gale	(208) 387-5862	kgale@blm.gov
Branch of Communications Operations:		
Mike Tuominen	(208) 387-5947	mtuominen@fs.fed.us
Jose M. Lopez	(208) 387-5858	joselopez@fs.fed.us
Albert Karnowski	(208) 387-5826	akarnowski@blm.gov
Branch of Engineering and Development:		
Bill Forsyth	(208) 387-5720	bforsyth@fs.fed.us
Bob Dukart	(208) 387-5852	bdukart@blm.gov
Branch of Infrared:		
Woody Smith	(208) 387-5647	woodysmith@fs.fed.us
Charles Kazimir	(208) 387-5647	ckazmir@fs.fed.us
Branch of Avionics:		
Frank Smith	(208) 387-5648	fsmith@fs.fed.us
Branch of Technical Training:		
Kirk Maskalick	(208) 387-5861	kmaskalick@fs.fed.us
Kimberly Albracht	(208) 387-5707	kimberlyaalbracht@fs.fed.us
Communications Duty Officer Coordinator:		
Gary Stewart	(208)387-5718	gstewart@fs.fed.us

NATIONAL FREQUENCY GUIDELINES

These guidelines are intended to clarify the use of the national VHF-FM air frequencies, the VHF-AM (Victor) frequencies, the fire tactical frequencies, and the Government-wide Common User frequencies. Each frequency is authorized for specific uses, even though they are listed as "**National**".

NATIONAL AIR GUARD: 168.6250 MHz

The National Air Guard frequency is used for emergency aviation communications. Continuous monitoring of this frequency is mandatory by interagency dispatch centers, interagency and contracted aircraft assigned to the incident. Transmission on this frequency must include the Continuous Tone Code Squelch System (CTCSS) tone of 110.9 Hz. The National Air Guard frequency is pre-programmed on the last channel of the NIRSC VHF radios.
The National Air Guard Frequency 168.6250 MHz is authorized for:

- *Emergency air-to-air initial communications*
- *Emergency ground-to-air communications*
- *Initial call, recall, and redirection of aircraft when no other frequency is available*

Note: NIICD recommends that all incidents place the National Air Guard frequency in the last channel of the ICS-205 Incident Radio Communications Plan.

NATIONAL FLIGHT FOLLOWING: 168.6500 MHz

The National Flight Following frequency is used to monitor interagency and contract aircraft. This frequency is used for flight following official aircraft flying point-to-point. It is not intended to be used during mission flights or incident operations. All dispatch centers/offices will monitor this frequency at all times. A CTCSS tone of 110.9 Hz must be placed on the transmitter **AND** receiver of the National Flight Following frequency.

The National Flight Following frequency 168.6500 MHz is restricted to the following uses:

- *Flight following, dispatch, and/or re-direction of aircraft*
- *Air-to-Ground and Ground-to-Air administrative traffic*
- *This frequency is NOT authorized for ground-to-ground traffic*

NATIONAL INTERAGENCY AIR TACTICS

The National Interagency Air Tactics frequencies are used to support air-to-air or air-to-ground communications on incidents. The National Interagency Air Tactics are pre-programmed in GROUP 3 of the NIRSC VHF radios. Prior to use, the user MUST contact and coordinate with the CDO to minimize possible interference. These frequencies must be ordered through the established ordering process and are assigned by the CDO or COMC, in coordination with the local unit if an Radio Frequency Assignment (RFA) is in effect.

The Air Tactics frequencies are restricted to the following uses or restrictions:

- *They shall be used only for air-to-air and air-to-ground communications*
- *They are NOT to be used as ground tactical operational frequencies*
- *Transmit power output shall be limited to under 10 Watts*
- *Use of these frequencies in base stations and repeaters is prohibited*
- *Authorized for 20 NM and 3000 ft AGL from incident center point, as per the Radio Frequency Assignment (RFA)*

GOVERNMENT WIDE COMMON USER: 163.1000 MHz and 168.3500 MHz

The Government Wide Common User frequencies are used on a non-interference basis and are not exclusive to any user. These frequencies are not to be used for Air-to-Ground operations and are prohibited by DOI and USDA from use as a frequency during operations involving the protection of life and property.

NATIONAL INTERAGENCY FIRE TACTICAL:

The National Interagency Fire Tactical frequencies are used to support ground tactical operations (line of sight) on incidents. Only six (6) tactical frequencies are available nationally. Prior to use, the user must contact and coordinate with the CDO or COMC to minimize possible interference. These frequencies are pre-programmed in Groups 1 and 2 of all NIRSC VHF radios.

The National Interagency Fire Tactical frequencies are not authorized for:

- *Air-to-Air communications*
- *Air-to-Ground communications*
- *Mobile radios with more than 30 watts output power*
- *Base stations or repeaters*

AM AIR-to-AIR (Victor):

The use of AM frequencies is restricted to Air Operations only. All AM frequency assignments will be authorized and assigned only by the CDO (or COMC, if assigned). It is the responsibility of the incident COML to place requests and ensure immediate release of frequency assignments upon completion of incident. All Victor AM frequency assignments must be requested by the CDO office from the FAA on an incident-specific basis. It is imperative to place requests early in order to have AM frequency assignments available for the next operational period.

The typical service volume for a FAA AM firefighting frequency is 20 NM and 5000 ft AGL.

Note:

- *All aviation frequency orders will be placed through the dispatch ordering system to the CDO.*
- *Any frequency coordinated by the FAA for firefighting should be used only temporarily as the need arises, and*
- *only within the designated operational airspace. If the operational airspace changes due to fire expansion, the*
- *new requirement must be communicated to the NIFC Communications Duty Officer (CDO) who will properly coordinate with the FAA.*
- *As a result, the original frequency provided by the FAA may change to eliminate the possibility of interference to ATC or other firefighting efforts.*

FREQUENCY ORDERING PROCESS:

Dedicated incident Air-to-Air and Air-to-Ground frequencies will be ordered by incidents through the established ordering process. Frequency requests are sent by the GACCs to the National Interagency Coordination Center (NICC), who then forwards the frequency requests to the NIFC-CDO at the National Interagency Incident Communications Division (NIICD). The NIFC-CDO then fills the frequency request in ROSS.
The CDO coordinates all National FS and DOI frequencies, as well as any additional frequencies released by other agencies for wildland fire support. All aviation frequencies are to be ordered on an Aircraft Order as an “A” Request Number in ROSS. The COML will request, assign, and report all frequencies used on the incident to the CDO or COMC. Frequencies will be documented on the ICS-205 Incident Radio Communications Plan and on the ICS-220 Air Operations Summary forms. If additional frequencies are required, the COML will coordinate and order them through the established ordering process (through the GACC and NICC to the CDO or COMC).

Additional frequencies may be available on a temporary basis, and may be requested by the CDO from the Washington Office Spectrum managers when:

- *All NIRSC national frequencies are committed within a specific geographic area*
- *New incidents within a specific complex create a need for additional frequencies*
- *The fire danger rating is extreme and the potential for additional new incidents is high*
- *Frequency congestion is occurring due to significant numbers of incidents in close proximity*

Assigned incident frequencies should be released immediately after the incident is turned over to the local jurisdictional agency. Coordination and approval is required from the CDO or COMC if frequencies are to be utilized after the transition.

NIRSC assigned frequencies shall **NOT** be moved or transferred from one incident to another without approval by and coordination with the CDO or COMC.

NIRSC VHF RADIO CHANNEL PLAN

4381 VHF Command Tactical Radio Kit Channel Plan					
CH	**Group 1**	**Group 2**	**Group 3**	**Group 4**	**Groups 5-25**
1	Tactical 1	Tactical 4	Air-to-Ground	Common Use	Empty
2	Tactical 2	Tactical 5	Air-to-Ground	Common Use	Empty
3	Tactical 3	Tactical 6	Air-to-Ground	Empty	Empty
4	Empty	Empty	Air-to-Ground	Empty	Empty
5	C1 TA	C5 TA	Air-to-Ground	Empty	Empty
6	C1 RPTR	C5 RPTR	Air-to-Ground	Empty	Empty
7	C2 TA	C6 TA	Empty	Empty	Empty
8	C2 RPTR	C6 RPTR	Empty	Empty	Empty
9	C3 TA	Empty	Empty	Empty	Empty
10	C3 RTPR	Empty	Empty	Empty	Empty
11	C4 TA	Empty	Empty	Empty	Empty
12	C4 RPTR	Empty	Empty	Empty	Empty
13	Empty	Empty	Empty	Empty	Empty
14	Empty	Empty	Empty	Empty	Empty
15	Empty	Empty	Empty	Empty	Empty
16	Air Guard	Air Guard	Air Guard	Air Guard	Air Guard
Note: Air Guard frequency is pre-programmed on the last channel of all groups with a transmit tone of 110.9					

Note:

- *All NIRSC frequencies must be cleared through the NIRSC CDO or COMC if assigned before use.*
- *All NIRSC VHF frequencies are narrow band.*
- *Current NIRSC VHF frequency list is located in each 4381 Command/Tactical Radio Kit.*
- *Contact the CDO or COMC if frequency list is missing.*

Groups 1 & 2: Contains the NIRSC command and tactical frequencies and must be coordinated through the CDO or COMC before use.

Group 3: Contains the national air frequencies and must be coordinated and ordered through ROSS from the CDO or COMC.

Group 4: Contains government-wide common use frequencies (to be used on a non-interference basis). Not to used for Air-to-Ground operations.

NIRSC UHF RADIO CHANNEL PLAN

4244 UHF Logistics Radio Kit Channel Plan					
CH	**Group 1**	**Group 2**	**Group 3**	**Group 4**	**Groups 5**
1	L1 TA	L1 TX Simplex	L1 RX Simplex	A/C Link Simplex 1	Camp 1
2	L1 RPTR	L2 TX Simplex	L2 RX Simplex	A/C Link Simplex 2	Camp 2
3	L2 TA	L3 TX Simplex	L3 RX Simplex	A/C Link Simplex 3	Camp 3
4	L2 RPTR	L4 TX Simplex	L4 RX Simplex	A/C Link Simplex 4	Camp 4
5	L3 TA	L5 TX Simplex	L5 RX Simplex	A/C Link Simplex 5	Camp 5
6	L3 RPTR	L6 TX Simplex	L6 RX Simplex	A/C Link Simplex 6	Empty
7	L4 TA	L7 TX Simplex	L7 RX Simplex	A/C Link Simplex 7	Empty
8	L4 RPTR	L1 RPTR Config	Special Use 1	A/C Link Simplex 8	Empty
9	L5 TA	L2 RPTR Config	Special Use 2	L8 TA	Empty
10	L5 RPTR	L3 RPTR Config	Empty	L8 RPTR	Empty
11	L6 TA	L4 RPTR Config	Empty	L9 TA	Empty
12	L6 RPTR	L5 RPTR Config	Empty	L9 RPTR	Empty
13	L7 TA	L6 RPTR Config	Empty	L10 TA	Empty
14	L7 RPTR	L7 RPTR Config	Empty	L10 RPTR	Empty
15	Empty	Empty	Empty	Empty	Empty
16	Empty	Empty	Empty	Empty	Empty
Note: Groups 6 through 25 are empty.					

Note:

- *All NIRSC frequencies must be cleared through the NIRSC CDO or COMC if assigned before use.*
- *All NIRSC UHF frequencies are narrow band.*
- *Current NIRSC UHF frequency list is located in each 4244 Logistics Radio Kit.*
- *Contact the CDO or COMC if frequency list is missing.*

Group 1: Contains the NIRSC Logistics Repeater access and receive simplex frequencies.

Group 2: Contains the NIRSC Logistics Repeater TX Simplex frequencies (Channel 1 - Channel 7).
Contains the NIRSC Logistics Repeater Configuration frequencies (Channel 8 - Channel 14).

Group 3: Contains the NIRSC UHF Link frequencies.

Group 4: Contains the NIRSC UHF Aircraft Link frequencies.
Channel 1 - Channel 8 are simplex UHF.
Channel 9 - Channel 14 are the TA and Duplex frequencies for L8 - L10.

Group 5: Contains NIRSC UHF frequencies that can be used to camp net, security, etc.

NIRSC UHF LINK MODULE CHANNEL PLAN

4312 Command Repeater Tone and UHF Link Module Channel Plan				
Switch A/ Tone Selection	**TX/ RX Tone**		**Switch B/ UHF Channel**	**UHF Channel Assignment**
A-1	TONE 1: 110.9		B-1	L1 Repeater
A-2	TONE 2: 123.0		B-2	L2 Repeater
A-3	TONE 3: 131.8		B-3	L3 Repeater
A-4	TONE 4: 136.5		B-4	L4 Repeater
A-5	TONE 5: 146.2		B-5	L5 Repeater
A-6	TONE 6: 156.7		B-6	L6 Repeater
A-7	TONE 7: 167.9		B-7	L7 Repeater
A-8	TONE 8: 103.5		B-8	L1 Simplex
A-9	TONE 9: 100.0		B-9	L2 Simplex
A-10	TONE 10: 107.2		B-10	L3 Simplex
A-11	TONE 11: 114.8		B-11	L4 Simplex
A-12	TONE 12: 127.3		B-12	L5 Simplex
A-13	TONE 13: 141.3		B-13	L6 Simplex
A-14	TONE 14: 151.4		B-14	L7 Simplex
A-15	TONE 15: 162.2		B-15	Special Use 1
A-16	NO TONE		B-16	Special Use 2

Note:

- *All NIRSC tones and UHF Link frequencies are issued through the NIRSC CDO or COMC if assigned.*
- *All NIRSC UHF Link frequencies are narrow band.*
- *Current NIRSC UHF Link frequency list is located in each 4312 Command Repeater-Link Kit.*
- *Contact the CDO or COMC if frequency list is missing.*

Switch A Ch 1 - 16: Contains the NIRSC available TX/RX Tones for the VHF Command Repeaters.

Switch B Ch 1- 7: Contains the NIRSC UHF Linking Repeater duplex access frequencies.

Switch B Ch 8 - 14: Contains the NIRSC UHF Linking simplex frequencies.

Switch B Ch 15 - 16: Contains the NIRSC UHF Linking special use simplex frequencies.

NIRSC A/C LINK RADIO CHANNEL PLAN

4370 A/C Link AM UHF Link Module Channel Plan				
Switch A/ AM Channel	**AM TX/ RX**		**Switch B/ UHF Channel**	**UHF Channel Assignment**
A-1	Special Use Only		B-1	A/C Simplex 1
A-2	Special Use Only		B-2	A/C Simplex 2
A-3	Special Use Only		B-3	A/C Simplex 3
A-4	Special Use Only		B-4	A/C Simplex 4
A-5	Special Use Only		B-5	A/C Simplex 5
A-6	Not Used		B-6	A/C Simplex 6
A-7	Not Used		B-7	A/C Simplex 7
A-8	Not Used		B-8	A/C Simplex 8
A-9	Not Used		B-9	L8 Simplex
A-10	Not Used		B-10	L8 RPTR
A-11	Not Used		B-11	L9 Simplex
A-12	Not Used		B-12	L9 RPTR
A-13	Not Used		B-13	L10 Simplex
A-14	Not Used		B-14	L10 RPTR
A-15	Not Used		B-15	L11 Simplex
A-16	User Programmable		B-16	L11 RPTR

Note:

- *All AM frequencies are ordered in ROSS and issued by the FAA through the CDO or COMC.*
- *All NIRSC UHF Link frequencies are narrow band.*
- *Current NIRSC UHF A/C Link frequency list is located in each 4370 A/C Link Kit.*
- *Contact the CDO or COMC if frequency list is missing.*

Switch A Ch 1 - 5: Contains the NIRSC available AM Air-to-Air FAA frequencies.

Switch A Ch 16: Contains the only user programmable channel FAA issued Air-to-Air AM frequencies.

Switch B Ch 1 - 8: Contains the NIRSC A/C Link UHF simplex frequencies.

Switch B Ch 9 - 16: Contains the NIRSC A/C Link UHF L8 - L11 simplex and duplex frequencies.

NIRSC EQUIPMENT DESCRIPTIONS

Note: For complete kit content please see NIRSC Kit Inventories tab for each individual kit.

000968 NIRSC USER'S GUIDE

The NFES# 000968 NIRSC User's Guide is designed to assist communications personnel with reference material and guidelines when ordering and utilizing NIRSC frequencies and equipment.
The NIRSC User's Guide is shipped with all Command Repeater/Link Kits (NFES #004312) and can also be ordered through the Great Basin Cache Supply Office (GBK). This guide is published and updated yearly and all COMLs and COMTs should maintain a current copy of the guide as part of their personal COML/COMT kit. The NIRSC User's Guide is available for download on-line at:
http://www.nifc.gov/NIICD/docs/2017NIRSCUsersGuide.pdf

004080 SOLAR PANEL KIT

The NFES# 004080 Solar Panel kit allows NIRSC equipment to operate off a 12 Volt rechargeable battery. It contains a 60 watt flexible solar panel, and a 12 Volt 35 Amp-Hour sealed lead acid battery. The system should power a repeater indefinitely, provided the solar panel is illuminated with full sunlight most of the day. In the event there is no sunlight, the internal battery will give approximately two days backup power (for a repeater under moderate use).

For greater energy reserves, an additional battery can be purchased at the incident and connected to the system (a cable is included in the kit for doing this). The backup battery must be a deep cycle 12V sealed lead acid (preferably gel cell or AGM) of the largest capacity that can be safely maneuvered. Use caution when moving batteries since batteries are heavy, each battery can weigh up to 50 lbs. A fully charged 12 Volt 75 Amp-Hr battery should last at least four days under moderate use.

- *Do not transport a sealed lead acid battery unless it is strapped down so as to be immobile and the terminals are covered to prevent a short circuit.*

- *Using a Solar Panel Kit in conjunction with a Voice Board allows the equipment to run using both the supplied alkaline batteries and the solar panel kit rechargeable battery.*
- *If using both solar and alkaline, the voice board monitors the solar voltage and will automatically switch to alkaline power when the solar voltage falls below 10 Volts. When the solar voltage rises above 12 Volts, it will switch back to solar power. This conserves the alkaline batteries, allowing the equipment to run off one set of batteries for extended periods of time without the need to change them.*

NFES# 004080 Solar Panel Kit Components

004120 JPS ACU-1000

The NFES# 004120 JPS ACU-1000 kit allows wireless communication systems to be combined through each systems baseband audio. It can simultaneously cross-connect different radio systems into multiple systems or branches, and/or connect radio systems to telephone or satellite systems. The NIRSC ACU-1000 is capable of interconnecting a total of six (6) radio networks and two (2) phone/satellite systems.

The ACU-1000 can operate on 115 Volts AC and/or external +12 Volts DC. Batteries are not provided in the kit and must be purchased locally on the incident.

NIRSC will provide a NIRSC technician for proper programming and setup of the equipment. These units are **NOT** to be used for fire operations and are reserved for special FEMA/Military operations. Only three (3) kits are available in the NIRSC inventory. Please contact the CDO before placing order.

Cables are provided for the following radios in each kit:

- *Relm BK DPH, GPH, and KNG*
- *Datron*
- *Racal*
- *Motorola XTS 2500 and XTS 5000 (Radios and cables Included)*
- *EFJ (51xx)*
- *Military 5 and 6 pin (Harris and Sincgars)*

4120 JPS ACU-1000 Kit Components

004240 AIRBASE ACCESSORIES KIT

The NFES# 004240 Airbase Accessories Kit is for aircraft communications by ground personnel at airports and heli-bases. This kit provides a means to communicate with aircraft in noisy environments. The kit comes with five (5) sets of handheld ICOM VHF-AM radios, headsets, and helmet adapters to connect a headset/helmet to the ICOM radio.

4240 Airbase Accessories Kit Components

004244 UHF (LOGISTICS) RADIO KIT

The NFES# 004244 Logistics Radio Kit contains 16 UHF radios for use by incident support personnel (i.e. Plans, Logistics, and Finance). The UHF radio allows tow-way line-of-sight communications utilizing UHF Radio Frequency (RF) propagation. The UHF radios can operate independently or in conjunction with UHF Repeater Kit NFES# 004248.

All NIRSC UHF Logistics radios are multichannel/multi-group-capable. Each radio has 16 channels per group/ zone available for programming user frequencies. All NIRSC UHF radios are front panel programmable via the keypad. They can be operated in either Wide/Narrowband Analog and Digital P25 depending on incident requirements.

The radios are pre-programmed with NIRSC UHF frequencies, including all simplex and repeater pair frequencies, to be compatible with each system in which they are included. Updated frequency sheets are provided in each kit, as well as T-Cards for radio checkout and tracking. The radios in each kit are of the same manufacturer and model.

The NFES # 004244 kit boxes are labeled on the outside to indicate the type of radios contained within, according to the following convention:

- **4244MD - Midland STP404A-G (Example: 4244MD-FCK-xxx)**
- **4244X2 - Motorola XTS2500 (Example: 4244X2-FCK-xxx)**

- *All UHF frequencies must be cleared for use BEFORE shipment.*
- *Call the CDO for assignments for camp, logistics, and link network.*
- *When placing the order do not specify the manufacture using the sub-kit numbers.*
- *Refer to the frequency charts and diagrams provided in each kit for additional information.*
- *NIRSC recommends that users limit the number of scanned channels to no more than three (3) an to use the HIGH POWER TX mode sparingly. These options increase the load on the batteries and will rapidly reduce battery life.*
- *A cloning cable is provided in each UHF radio kit. Please return the cloning cable with each kit.*

4244 UHF Logistics Radio Kit Components

004248 UHF (LOGISTICS) REPEATER

The NFES# 004248 Logistics Repeater is a battery-operated unit used to extend radio coverage in mountainous terrain or where line of sight between portable radios is not possible. The Logistics repeater is used in conjunction with a Logistics Radio Kit, NFES# 004244 or the Remote Kit (NFES# 004330) with an appropriate UHF radio installed.

The Logistics Repeater can also be utilized to link two or more Command Repeater/Links (NFES# 004312) together as a central hub in the command network. When linking multiple Command Repeaters through the Logistics Repeater, all of the linked Command Repeaters must have line of sight back through the Logistics Repeater central hub. Additionally, the Logistics Repeater can be used to expand the flight following network on an incident when linked through an Aircraft Link (NFES# 4370).

The Logistics Repeater can be operated from the supplied alkaline batteries at 15 VDC or from an external 12 VDC power source (i.e. heavy duty car battery, DC power supply, or solar panels). If a 12 VDC power supply is used, it should have a minimum 5 Amp continuous duty capability.

- *NIRSC UHF repeater frequencies must be cleared for use by the CDO.*
- *UHF Logistic Repeaters are delivered pre-programmed from NIRSC and cannot be programmed or tuned in the field.*
- *NIRSC UHF Repeaters are currently NOT CTCSS tone-control capable.*

4248 UHF Logistics Repeater Kit Components

004250 MAFFS TACTICAL RADIO KIT

The NFES# 004250 MAFFS Tactical Radio Kit is a miniature version of the NFES# 004381KD Command Radio Kit. The VHF radio allows tow-way line-of-sight communications utilizing VHF Radio Frequency (RF) propagation. The MAFFS Tactical Radio Kit contains six (6) King VHF-FM DPHX handheld radios and is primary used and reserved for MAFFS activations where VHF tactical line-of-sight communications is required.
All NIRSC VHF Command radios are multichannel/multi-group-compatible. Each radio has 16 channels per group/zone available for programming user frequencies. All NIRSC VHF radios are front panel programmable via the keypad. They can be operated in either Wide/Narrowband Analog and Digital P25 operations, depending on incident requirements.

- *All VHF frequencies must be cleared for use BEFORE shipment. Contact the CDO for all VHF assignments.*

4250 MAFFS Tactical Radio Kit Components

004260 MAFFS LAPTOP KIT

The NFES# 004260 MAFFS Laptop Kit provides a USFS-configured laptop and a standard cell phone. The laptop's Outlook e-mail and the cell phone's contact lists are pre-loaded with the most common contacts used on MAFFS assignments. The incident Communications Specialist will issue the laptop's access password to the user once all required documentation is completed.

A MAFFS laptop shall only be used by one user at a time. The laptop shall not be shared while it is signed out. The MAFFS laptop GSAA Account Manager is the only person authorized to reset the laptop's password.

4260 MAFFS Laptop Kit Components

004300 GROUND VHF-AM BASE STATION KIT

The NFES# 004300 Ground VHF-AM Base Station Kit is a portable 760 Channel VHF-AM base station. This kit cannot be linked. The 4300 kits are used primarily as base stations to contact aircraft on non-fire projects or fire incidents. Base stations transmit at 7 watts, are capable of 10 preset channels, scan, and use 115 VAC or 12 VDC through an automobile accessory plug-in as a power source. Four (4) handheld ICOM VHF-AM radios are included, as well as T-cards for radio checkout. If this kit is to be used as an FAA control tower, the NFES# 004300 order MUST be placed by an incident COML.

4330 Ground VHF-AM Base Station Kit Components

004305 ANTENNA MAST

Antenna masts are automatically issued with several specific pieces of NIRSC equipment to allow the radio antenna to be elevated above the surrounding terrain. Maximum antenna elevation is 15ft with each set of (three) masts. The following kits come with at least one (1) set of three (3) 5ft long mast sections that do not need to be ordered separately:

- **004248 UHF Logistics Repeater Kit**
- **004300 Ground VHF-AM Base Station Kit**
- **004312 VHF Command Repeater/Link Kit (2 sets)**
- **004330 Remote Kit**
- **004370 Ground Aircraft Radio/Link Kit (2 sets)**
- **004390 Starter System (7 sets)**
- **004660 Airbase Kit (2 sets)**

- *Shipping them individually back to NIRSC is not recommended, mast should be returned with thier associated kits*
- *Do not return masts that are bent, squashed, badly out-of-round, or otherwise not readily reusable.*
- *Dispose of them at the incident.*

4305 Antenna Mast Bundle

004312 VHF COMMAND REPEATER/LINK KIT

The NFES# 004312 Command Repeater/Link is a portable unit used to extend radio coverage in mountainous terrain or where line of sight between portable radios is not possible. The Command Repeater is used in conjunction with a Command/Tactical Radio Kit, NFES# 004381 or the Remote Kit (NFES# 004330) with an appropriate VHF radio installed.

The Command Repeater can be used as a stand-alone VHF Command network repeater. Additionally, the Command Repeater can be linked to two or more Command Repeater/Links through the UHF link modules provided in each kit. The UHF Links are used to link UHF-FM and VHF-FM together to extend area coverage for larger incidents. If an additional repeater is necessary to provide coverage, a separate Command Repeater/Link (NFES# 004312) must be ordered. Orders will be filled based on priority needs and frequency availability.

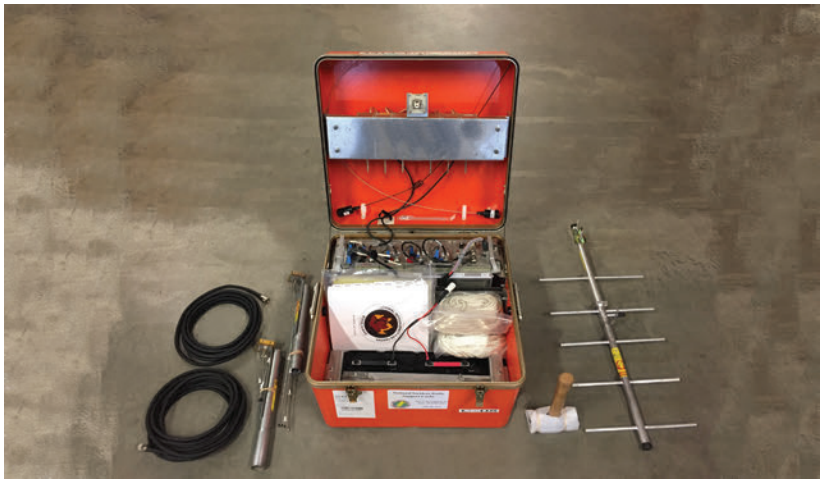
All Command Repeaters are capable of being CTCSS tone-controlled (RX & TX). Call the CDO for more information on tone-control applications. The CDO or COMC if assigned will assign a CTCSS tone to each Starter System when the system is assigned to an incident. The incident will be advised to use this tone on all VHF repeaters and tactical frequencies assigned to the incident.

The Command Repeater can be operated from the supplied alkaline batteries at 15 VDC or from an external 12 VDC power source (i.e. heavy duty car battery, DC power supply, or solar panels). If a 12 VDC power supply is used, it should have a minimum 5 Amp continuous duty capability.
Command Repeaters can be linked by only two methods:

Simplex: Command Repeaters are linked via a simplex UHF frequency. Each Command Repeater in the system must be in line-of-sight with each other.

Duplex: Command Repeaters are linked via a duplex UHF frequency using a Logistics Repeater as a hub. Each Command Repeater in the system must be in line-of-sight with the Logistics Repeater.

- *NIRSC Command Repeater/Link frequencies must be coordinated by the CDO (or COMC if assigned).*
- *Command Repeaters come pre-programmed from NIRSC and can not be programmed or tuned in the field.*
- *UHF Link Modules come pre-programmed from the NIRSC. Contact the CDO for approved link frequency when linking multiple Command repeaters.*
- *A UHF Whip Antenna and a UHF Yagi (directional) Antenna with 20 foot RF cables are included in the Command Repeater/Link (NFES# 4312) kit to accommodate all installation options for linking the Command Repeater.*
- *For detailed antenna installation see the "Antenna Installation Instructions" in Appendix C.*



4312 VHF Command Repeater/Link Kit Components

004320 COML KIT

The NFES# 004320 COML kit assists the COML with cloning of handheld radios. The kit consists of one radio, clamshell and cloning cable for every type of handheld available at NIRSC. This kit does not come with antennas, holsters or any other radio accessories. These radios are not to be swapped out for broken kit radios. The contents of this kit are the responsibility of the COML and must be returned to NIRSC once the incident is transferred to the local unit.

COML Kit contains the following radios with cloning cables:

- **King Relm DPHx, KNG-P150S**
- **Motorola XTS 2500/5000**
- **Midland STP404A (UHF), STP105B (VHF)**

4320 COML Kit Components

004330 REMOTE KIT

The NFES# 004330 Remote Kit is an auxiliary base station used to control either the Command Repeater (4312), UHF Logistics Repeater (4248), Crossband Link (4281), or the Aircraft Link (4370) when direct line of sight is not possible. Use of this kit in conjunction with NIRSC radios, allows a remote base station to be installed up to 1/4 of a mile away from the ICP, camp, heli-base, etc.

The radio, chassis, and battery are enclosed in a steel box which is removable from the shipping container. This allows for placement of the box at the base of the antenna while running only a wire pair to the desk set location. VHF and UHF Radios are included in the chassis box, eliminating the need for multiple interface cables. Kits are labeled on the outside to indicate the type of radios contained within, according to the following convention:

- **4330X2 - Motorola XTS 2500/5000 (Example: 4330X2-FCK-XXX)**
- **4330MD - Midland STP (Example: 4330MD-FCK-XXX)**

4330 Remote Kit Components

004370 GROUND AIRCRAFT RADIO/LINK KIT

The NFES# 004370 Ground Aircraft Radio/Link Kit is a portable, battery-operated, all-in-one, VHF-AM aircraft base station and UHF-FM link used for helibase personnel to communicate or coordinate rotor wing aircraft operations on the incident. All aircraft kits operate as a base station or as a crossband link. There are two (2) sets of antennas (VHF-AM and UHF-FM) for use in the link configuration. All kits include four (4) handheld ICOM VHF-AM programmable radios.

The Ground Aircraft Radio/Link Kit uses a 12 Volt DC power source. The unit can be operated from the supplied alkaline batteries at 15 Volts DC or from an external 12 Volt DC power source (i.e. heavy duty car battery, DC power supply, or solar panels). If a 12 Volt DC power supply is used, it should have a minimum 5 Amp continuous duty capability.

- *Due to airline shipping weight restrictions, this kit will be shipped in two (2) boxes.*
- *Box one will contain the radio equipment and antennas. Box two will contain the remaining accessories and its contents will be listed on a separate inventory sheet.*
- *Additional ICOM radios can ordered if needed. Call the CDO for ordering assistance and availability.*

4370 Ground Aircraft Radio/Link Kit Components

004381 VHF COMMAND TACTICAL RADIO KIT

The NFES# 004381 Command Tactical Radio Kit is designed for supporting the command and tactical operations of an incident to allow direct communications with field personnel that are within line of sight. The VHF radio allows tow-way line-of-sight communications utilizing VHF Radio Frequency (RF) propagation. Each kit contains sixteen (16) VHF handheld radios. All radios are configured with all tactical, command, and National Air frequencies. NIRSC VHF frequencies must be cleared for use by the CDO prior to use. Updated frequency charts are included in each kit, as well as T-cards for radio checkout and tracking. The radios in each kit are of the same manufacturer and model. VHF Command Tactical Radios are programmed by the NIRSC to be compatible with each system in which they are included.

VHF Command Tactical radio kits are labeled on the outside to indicate the type of radios contained within, according to the following convention:

- **4381KD - King DPH** **(Example: 4381KD-FCK-XXX)**
- **4381KP - King KNG** **(Example: 4381KP-FCK-XXX)**

All NIRSC VHF Command radios are multichannel/multi-group-compatible. Each radio has 16 channels per group/zone available for programming user frequencies. All NIRSC VHF radios are front panel programmable via the keypad. They can be operated in either Wide/Narrowband Analog and Digital P25 operations, depending on incident requirements.

- *All VHF frequencies must be cleared for use BEFORE shipment. Call the CDO for Command Repeater, tactical, and air-to-ground network assignments.*
- *When placing the order do not specify the manufacturer using the sub-kit numbers.*
- *Refer to frequency charts and diagrams provided in each kit for additional information.*
- *The NIRSC recommends that users limit the number of scanned channels no more than three (3) and to use the HIGH POWER TX mode sparingly. These options increase the load on the batteries and will rapidly reduce battery life.*
- *A cloning cable is provided in each VHF radio kit. Please return the cloning cable with each kit.*

4381 VHF Command Tactical Radio Kit Components

004390 STARTER SYSTEM - COMMAND/LOGISTICS RADIO SYSTEM

The NFES# 004390 Starter System is designed to be the initial system issued to support incident communications requirements. The system is comprised of equipment which can be used to establish immediate communications for command, tactical, logistical, and air operation requirements. A Starter System consists of 10 boxes of assorted equipment with 7 sets of masts, and is ordered as a system.

The Starter System consists of:

- **1 each- VHF Command Repeater/Link (NFES# 004312)**
- **1 each- UHF Logistics Repeater (NFES# 004248)**
- **3 each- VHF Command Tactical Radio Kits (NFES# 004381) - Total of 48 VHF radios**
- **1 each- UHF Logistics Radio Kit (NFES# 004244) - Total of 16 UHF radios**
- **1 each- Ground Aircraft Radio/Link Kit (NFES# 004370) - 4 ICOM AM radios included**
- **2 each- Remote Kits (NFES# 004330)** *(1 each when NIRSC is low on equipment inventory)*

When ordering a Starter System, appropriate frequency assignments must be obtained by contacting the CDO or, when assigned, the appropriate COMC. To insure proper frequency coordination, please provide the latitude and longitude of the incident to de-conflict with existing incidents or other agency frequency assignments.

4390 Starter System Pallet

004410 PUBLIC ADDRESS KIT

The NFES# 004410 Public Address Kit allows for broadcasting information or paging from a central point and is primarily used at the ICP or in staging areas which house large numbers of personnel. The PA kits contains both wireless and wired microphones for convenience. Each PA unit can operate independently or can be operated together via a wireless transmitter.

The kits can be powered by either AC or DC batteries. The Kit also contains a fresh set of batteries to operate each unit and wireless microphone and transmitter.

4410 Public Address Kit Components

004420 MAFFS PRINTER NETWORK KIT

The NFES# 004420 MAFFS Printer Network Kits are designed to provide a common wireless printer and internet access for MAFFS activations and trainings with personnel from various agencies. This kit may be used on other incidents but only when other incident use will not impact possible MAFFS use. The MAFFS Printer Network Kit comes in two boxes: Network and Accessories. Both boxes are required for system operation. Administrative access is required to load the printer's drivers on agency laptops. Direct connection to the router allows printer use and internet access for those computers lacking wireless capability. The kit comes with a HP printer/scanner/fax, router, bridge, and Verizon MiFi. It also comes with several Ethernet cables, a surge suppressor, spare ink cartridges, two reams of paper and a USB drive.

- *ALL LAPTOPS THAT WILL UTILIZE THE KIT'S PRINTER MUST ARRIVE AT THE INCIDENT WITH*
- *ADMINISTRATIVE ACCESS PRESET.*
- *The process for granting administrative access in the field is very cumbersome, so obtaining access after arrival at the incident is unlikely to occur.*

4420 MAFFS Printer Network Kit Components

004499 AIR ATTACK KIT

The NFES# 004499 Air Attack Kit is built to supplement communications in contracted fixed-wing aircraft for missions ranging from reconnaissance to complex air attack. This kit can fit between the pilot and copilot seats in some aircraft (i.e. Cessna) and slightly behind front seats in other aircraft. This kit creates an interface between the aircraft's existing audio system/radios and the Air Attack Kit radios. All kits have the capability to operate two (2) Technisonic Industries radios. Each kit will have two (2) TDFM-136 radios.

The NFES# 004499 Air Attack Kit has a Dual Audio Control (COM/FM1/FM2/AUX1/AUX2/SC) for the pilot and copilot/ATGS, connectors for two (2) AUX-FM-type portable radio adapters, and two (2) passenger headset adapters. Kit headset jacks are 600-ohm impedance using standard audio and mic-type connectors. The pilot and copilot/ATGS utilize case mounted headsets. Both passengers can operate all radios through the copilot/ATGS's transmitter selector. The "SC" position is simulcast transmissions on both COM (aircraft VHF-AM) and FM1. Each kit includes two (2) passenger headset adapters, two (2) PT-300 PTT adapters, two (2) BNC barrel connectors (for AUX-FM antenna connections), and instructions. Two (2) externally mounted VHF-FM antennas are also required.

The Air Attack kit will ONLY be installed in aircraft meeting National Air Tactical/Reconnaissance Standards and passing an avionics inspection by a qualified Forest Service/AMD Avionics Inspector.

The NFES# 004499 Air Attack Kit AUX-FM portable radio adapter connectors accept the same adapter connections used in all helicopters. Contact the NIICD-CDO for availability of King & Racal AUX-FM adapter cables.

4499 Air Attack Kit Components

004545 Aviation Radio Kit

The NFES# 004545 Aviation Radio Kit contains a Technisonic TDFM-136 or TDFM-136B enclosed in a pelican shipping case. This radio is designed as a slip in unit for Military aircraft to communication with federal assigned aircraft on a VHF band. Units are usually reserved for MAFFS operations. Contact the NIFC-CDO or the Avionics Branch for further information.

4545 Aviation Radio Kit Components

004604 AIR ATTACK TRAINING KIT

The NFES# 004604 Air Attack Training kit contains the necessary equipment to operate an Air Attack (NFES# 004499) in a classroom environment. There is a 12 Volt DC power supply plus adapters and cables to connect an ICOM A3 or A6 portable radio, to simulate an aircraft VHF-AM transceiver, and two headsets. The kit can be connected to two antenna dummy loads (student radio programming training) or two small antennas (student simulations requiring transmissions), depending on classroom needs. The kit also includes a BK/King GPH/DPH headset adapter for sandbox exercises.

4604 Air Attack Training Kit Components

004660 AIRBASE KIT

The NFES# 004660 Airbase Kit is for MAFFS activations and temporary tanker bases. This kit provides a means to communicate with aircraft in noisy environments. It comes with a portable VHF-AM/VHF-FM base station radio, 10 handheld ICOM VHF-AM radios, and eight (8) sets of headsets, helmet adapters, and adapters to connect a headset/helmet to the ICOM radio. The VHF-FM base station can monitor both a main frequency and Air Guard. The base station radio is configured to operate on 115 Volts AC but, when requested, 12 Volts DC or 24 Volts DC power cables can be included for use with a deep cycle automotive/marine battery (Not supplied. Will need to be purchased locally). When additional handheld VHF-AM radios are needed, order the NFES# 004240 Airbase Accessories Kit.

4660 Airbase Kit Components

004670 SATELLITE PHONE KIT

The NFES# 004670 is a Motorola mobile phone that connects audio calls via an Low Earth Orbiting (LEO) satellite network when local cellular service is unavailable or has restricted coverage.
NIRSC has available a limited supply of Motorola Satellite Phones that operate on the Iridium network. These portable handsets run on rechargeable batteries and AC/DC chargers are included.

4670 Satellite Phone Kit Components

GENERAL

COMMUNICATIONS

CONDITIONS AND SOLUTIONS

GENERAL COMMUNICATIONS CONDITIONS AND SOLUTIONS

CONDITIONS	EQUIPMENT SOLUTIONS	NFES #	DRAWING #
A New or growing incident needs communications	**Starter System** Contains sufficient equipment to initially support a new incident which has potential for increasing in size. Starter System includes: CMD Repeater/Link (1 ea) CMD/TAC Radio Kits (3 ea) Ground Aircraft Radio/Link Kit (1 ea) Remote Kit (2 ea) Logistics Repeater (1 ea) Logistics Radio Kit (1 ea) Note: “Short” Starter Systems will be shipped with only 1 Remote.	**004390**	**NA**
Incident areas is not within line-of-sight	**VHF Command Repeater/Link** **VHF CMD/TAC Radio Kit** **Remote Kit** Use of a repeater generally allows more flexibility and gives wider coverage. Remote kit will allow ICP/ICC radio to be installed at a location up to one (1/4) mile away, where line-of-sight exists, but be controlled from the ICP/ICC through a remote desk-set.	**004312** **004381** **004330**	**1**
Logistics areas are not within line-of-sight	**Logistics Radio Kit** **Logistics Repeater Kit** **Remote Kit** To be used to tie logistics areas together if not within line-of-sight.	**004244** **004248** **004330**	**2**
Need to back haul CMD Repeater to reach ICP/ICC due to obstructing terrain	**CMD Repeater/Link** **Logistics Repeater** **Remote Kit** Logistics UHF and CMD VHF are not normally linked. However, terrain obstructions may dictate linking a CMD Repeater via a UHF Link to a Logistics Repeater for the incident operations area to reach the ICP/ICC.	**004312** **004248** **004330**	**3**

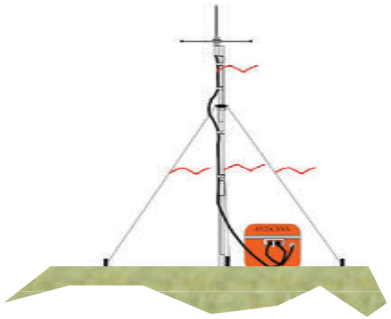
GENERAL COMMUNICATIONS CONDITIONS AND SOLUTIONS

CONDITIONS	EQUIPMENT SOLUTIONS	NFES #	DRAWING #
Need to link two ends of an incident which has considerable linear distance or terrain obstructions	**Two CMD Repeater/Links** **Remote Kit** UHF Links are hard-linked to CMD Repeaters which are located to cover the far ends of the incident. Repeaters are linked via a designated UHF frequency.	**004312** **004330**	**4**
Need to link more than two (2) CMD Repeaters to cover large incidents or multiple small incidents	**Three or more CMD RPTs/Links** **Remote Kit** UHF Links utilize one (1) simplex frequency which allows linking of all CMD Repeaters All UHF Links MUST be in line-of-sight with each other. Each CMD Repeater is on a different frequency. Call the CDO for assistance.	**004312** **004330**	**5**
Need to link two ends of an incident over long distance OR neither CMD Repeater can reach ICP/ICC	**Two CMD Repeater/Links** **Logistics Repeater** **Remote Kit** UHF Repeater links both linked CMD Repeaters to the ICP/ICC or UHF Repeater is needed to link both CMD Repeaters due to terrain and distance. Each CMD Repeater is on a different frequency. Call the CDO for assistance.	**004312** **004248** **004330**	**6**
Need to link more than two (2) CMD Repeater/Links. UHF Links are not within line-of-sight of each other. Needed to link a large incident or multiple small incidents.	**Three or more CMD Repeater/Links** **Logistics Repeater** **Remote Kit** UHF Repeater is the hub which links all CMD Repeaters. All UHF Links MUST be in line-of-sight with the UHF Repeater. ICP/ICC can be tied in through one of the CMD Repeaters or through the UHF Repeater. Each CMD Repeater is on a different frequency. Call the NIICD-CDO for assistance.	**004312** **004248** **004330**	**7**

COMMAND/TACTICAL RADIO KIT AND COMMAND REPEATER KIT WITH REMOTE KIT

SUGGESTED EQUIPMENT:

1 EA 4312 COMMAND REPEATER KIT
1 EA 4381 CMD/TAC RADIO KIT
1 EA 4330 REMOTE KIT



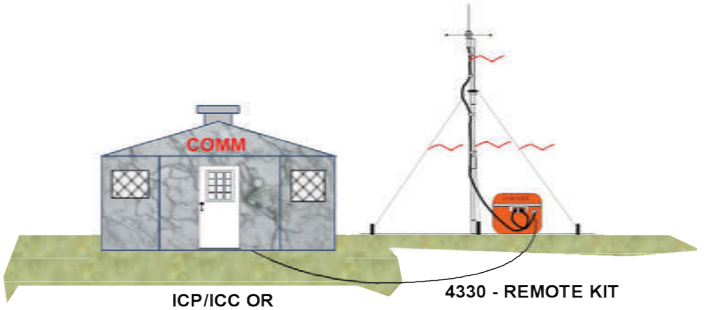
4312 - COMMAND REPEATER/LINK

VHF

VHF

INCIDENT OPERATIONS AREA

A REPEATER IS REQUIRED BECAUSE LINE-OF-SIGHT DOES NOT EXIST OVER THE ENTIRE INCIDENT AREA.



4330 - REMOTE KIT

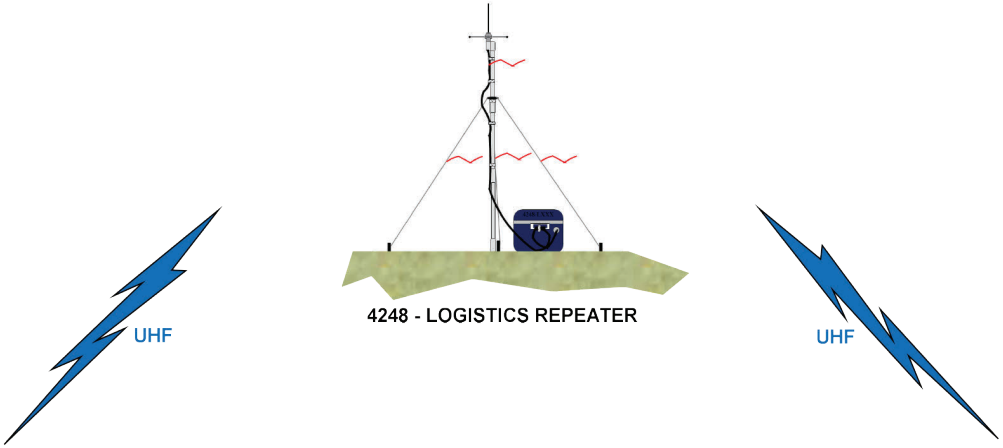
ICP/ICC OR
OTHER INCIDENT
OPERATIONS AREA

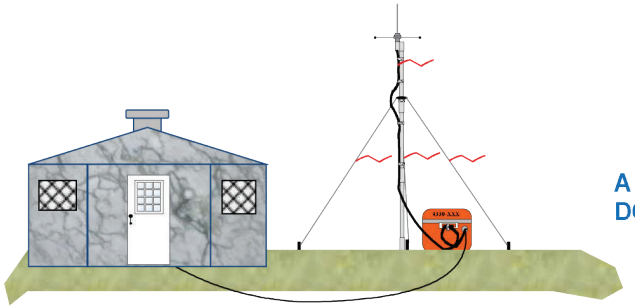
DRAWING 1

UHF LOGISTICS REPEATER WITH UHF LOGISTICS RADIO KIT

SUGGESTED EQUIPMENT:

1 EA 4248 LOGISTICS REPEATER KIT
1 EA 4244 LOGISTICS RADIO KIT
2 EA 4330 REMOTE KIT

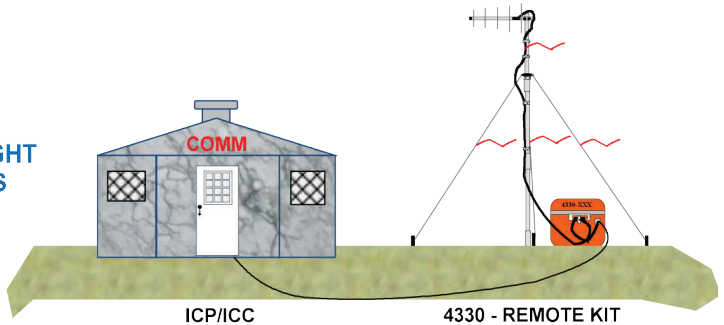




EXPANDED DISPATCH, SPIKE CAMPS, STAGING AREAS, ETC.

4330 - REMOTE KIT (WITH OMNI ANTENNA)

A REPEATER IS REQUIRED BECAUSE LINE-OF-SIGHT DOES NOT EXIST BETWEEN THE TWO LOCATIONS



ICP/ICC

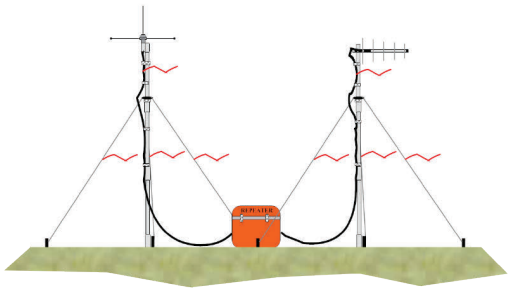
4330 - REMOTE KIT (WITH YAGI ANTENNA)

DRAWING 2

INCIDENT OPERATIONS AREA TO ICP/ICC BACKBONE

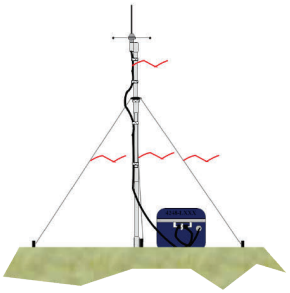
SUGGESTED EQUIPMENT:

1 EA 4312 COMMAND REPEATER KIT
1 EA 4248 LOGISTICS REPEATER KIT
1 EA 4330 REMOTE KIT
1 EA 4381 CMD/TAC RADIO KIT



4312 - COMMAND REPEATER LINK
(WITH YAGI ANTENNA ON THE UHF LINK)

UHF



4248 - LOGISTICS REPEATER

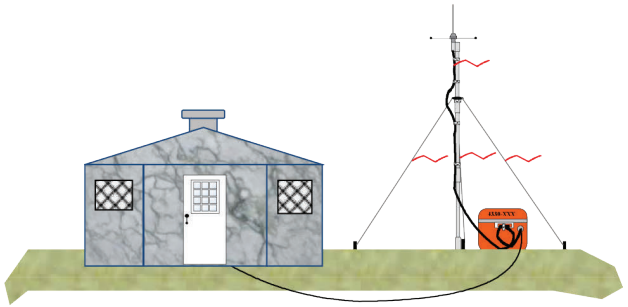
UHF

VHF

INCIDENT OPERATIONS AREA

USE WHEN TERRAIN LIMITS LINE-OF-SIGHT ACCESS TO THE COMMAND REPEATER FROM THE ICP/ICC, AND INSTALLATION OF A REMOTE KIT TO GAIN LINE-OF-SIGHT IS NOT POSSIBLE.

NOTE: FREQUENCY COORDINATION WITH THE COMC OR CDO IS REQUIRED.



ICP/ICC

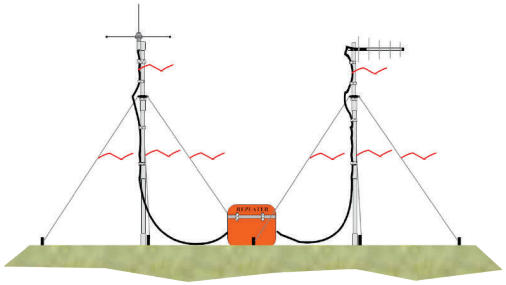
4330 - REMOTE KIT
(WITH OMNI ANTENNA)

DRAWING 3

LARGE INCIDENT OPERATIONS AREA LINKING SYSTEMS

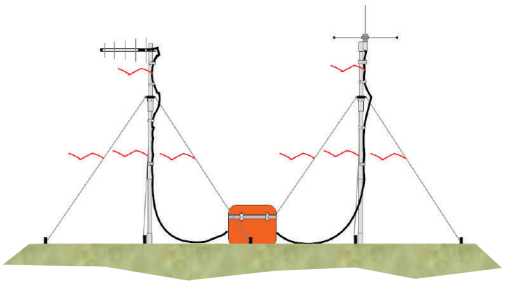
SUGGESTED EQUIPMENT:

2 EA 4312 COMMAND REPEATER KITS
1 EA 4381 CMD/TAC RADIO KIT
1 EA 4330 REMOTE KIT



4312 - COMMAND REPEATER LINK
(WITH YAGI ANTENNA ON THE UHF LINK)

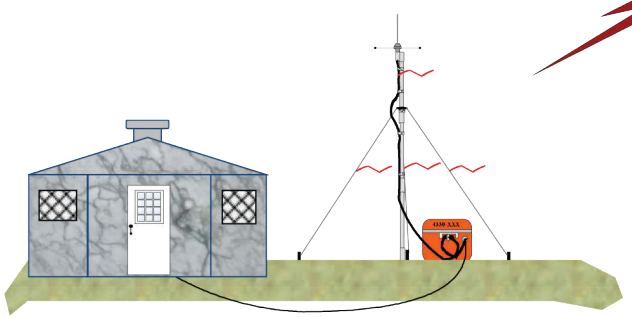
UHF
SIMPLEX



4312 - COMMAND REPEATER LINK
(WITH YAGI ANTENNA ON THE UHF LINK)

VHF

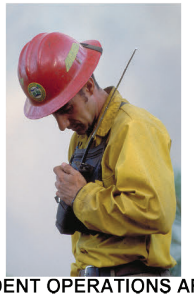
VHF



ICP/ICC

4330 - REMOTE KIT
(WITH OMNI ANTENNA)

VHF



INCIDENT OPERATIONS AREA 1

A SYSTEM OF REPEATERS AND LINKS THAT EXTENDS COMMUNICATIONS COVERAGE FOR AN INCIDENT WHICH HAS A LARGE OPERATIONAL AREA.

NOTE: FREQUENCY COORDINATION WITH COMC OR CDO IS REQUIRED. THIS SYSTEM LINKS TWO (2) DIFFERENT COMMAND FREQUENCY PAIRS TOGETHER.

INCIDENT OPERATIONS AREA 2

DRAWING 4

EXTENDED OR MULTIPLE INCIDENT OPERATIONS AREA LINKING SYSTEM

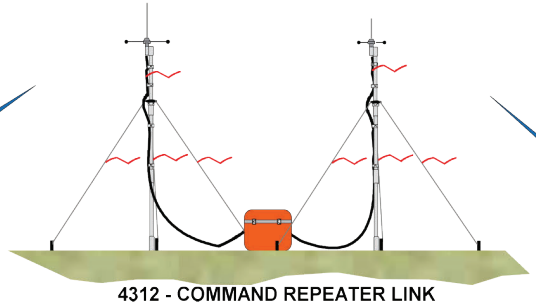
SUGGESTED EQUIPMENT:

3 EA 4312 COMMAND REPEATER KIT
1 EA 4330 REMOTE KIT
1 EA 4381 CMD/TAC RADIO KIT

INCIDENT OPERATIONS AREA 1

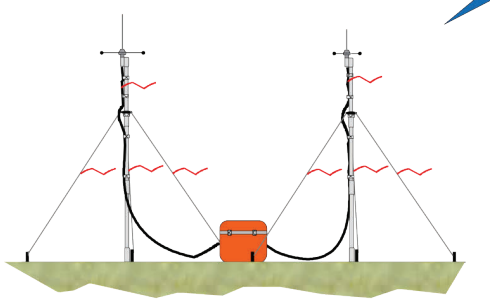
VHF

UHF
(SIMPLEX)



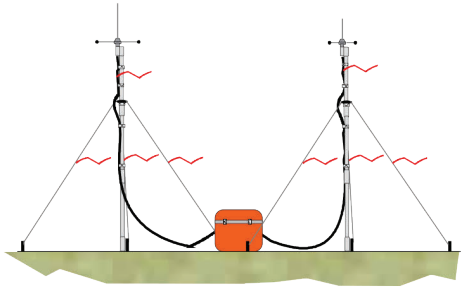
4312 - COMMAND REPEATER LINK
(WITH OMNI ANTENNA ON THE LINK)

UHF
(SIMPLEX)



4312 - COMMAND REPEATER LINK
(WITH OMNI ANTENNA ON THE LINK)

UHF
(SIMPLEX)



4312 - COMMAND REPEATER LINK
(WITH OMNI ANTENNA ON THE LINK)

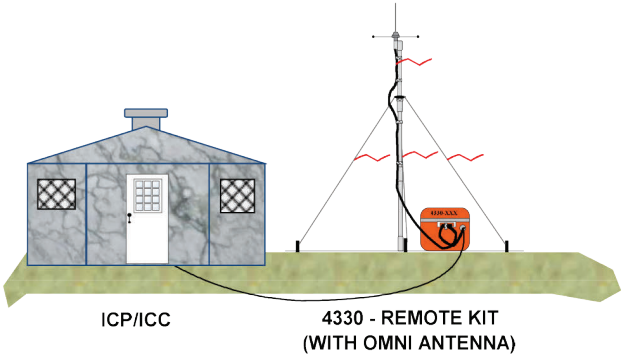
VHF

VHF

VHF

INCIDENT OPERATIONS AREA 2

INCIDENT OPERATIONS AREA 3



ICP/ICC

4330 - REMOTE KIT
(WITH OMNI ANTENNA)

A SERIES OF REPEATER/LINKS THAT EXTENDS COMMUNICATIONS COVERAGE FOR MULTIPLE SMALL INCIDENTS OR FOR AN INCIDENT WHICH HAS AN EXTENDED OPERATIONAL AREA. ADDITIONAL REPEATER/LINKS CAN BE ADDED AS LONG AS THEY ARE WITHIN LINE-OF-SIGHT WITH ALL OTHER REPEATER/LINKS.

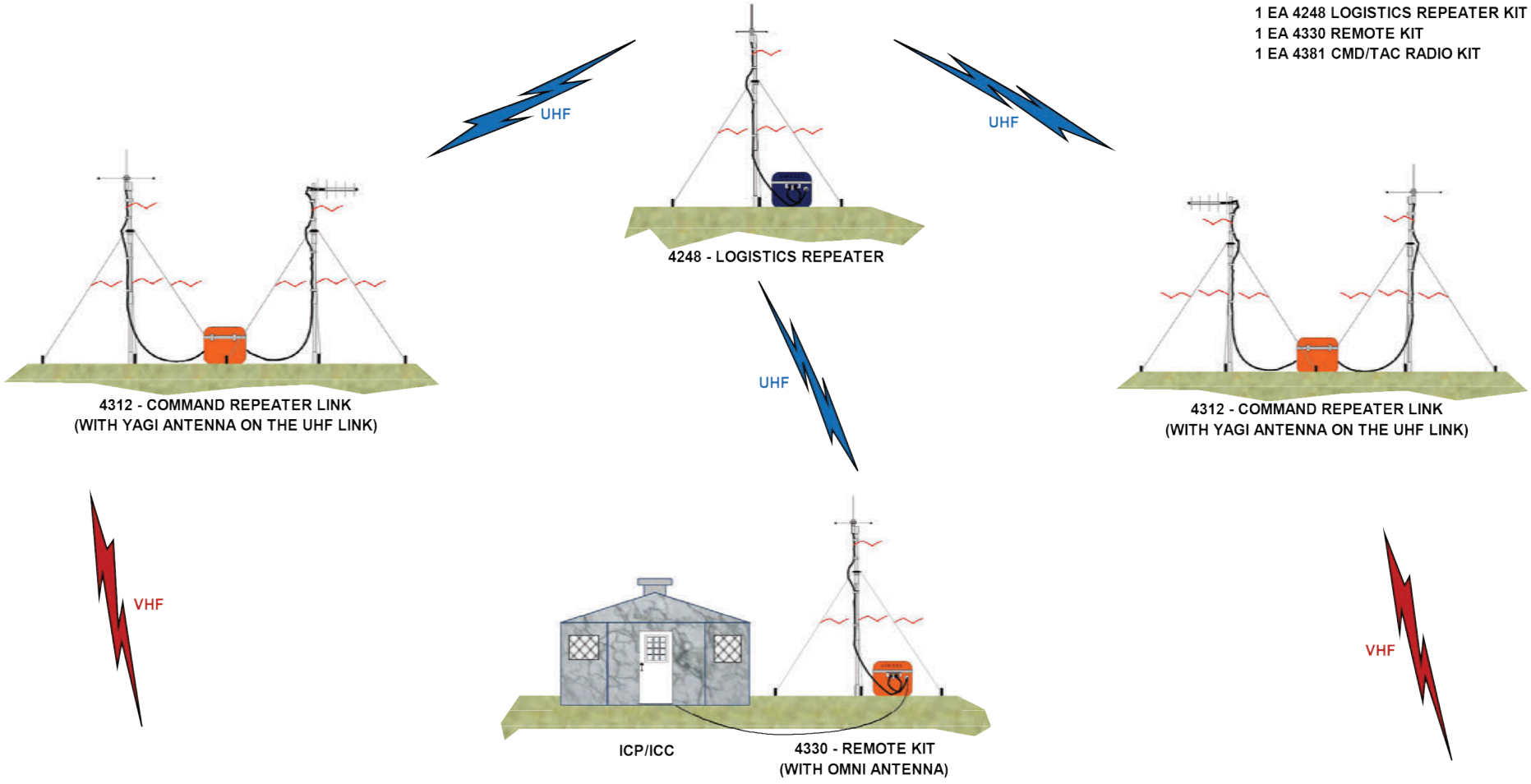
NOTE: FREQUENCY COORDINATION WITH THE CDO OR COMC IS REQUIRED.
EACH VHF COMMAND REPEATER IS A DIFFERENT FREQUENCY PAIR.
UHF LINK MUST BE IN UHF SIMPLEX OPERATION.

DRAWING 5

EXTENDED INCIDENT OPERATIONS AREA LINKING SYSTEM

SUGGESTED EQUIPMENT:

2 EA 4312 COMMAND REPEATER KIT
1 EA 4248 LOGISTICS REPEATER KIT
1 EA 4330 REMOTE KIT
1 EA 4381 CMD/TAC RADIO KIT




INCIDENT OPERATIONS AREA 2

A SERIES OF REPEATER/LINKS THAT EXTENDS COMMUNICATIONS COVERAGE FOR AN INCIDENT WHICH HAS AN EXTENDED OPERATIONAL AREA, OR WHERE NEITHER COMMAND REPEATERS ARE WITHIN LINE-OF-SIGHT TO THE ICP/ICC, BUT CAN BE LINKED USING A LOGISTICS REPEATER AT AN INTERMEDIATE SITE.

NOTE: FREQUENCY COORDINATION WITH THE CDO OR COMC IS REQUIRED. THIS SYSTEM LINKS TWO (2) DIFFERENT VHF COMMAND FREQUENCY PAIRS AND ONE (1) UHF LOGISTICS FREQUENCY PAIR.


INCIDENT OPERATIONS AREA 1

DRAWING 6

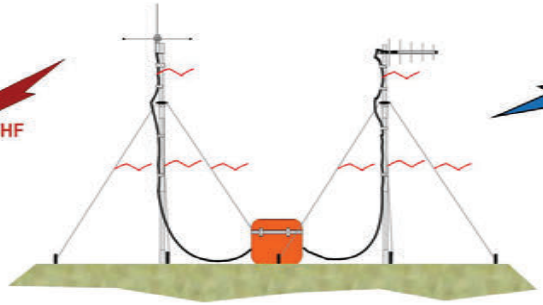
EXTENDED OR MULTIPLE INCIDENT OPERATIONS AREA LINKING SYSTEM

SUGGESTED EQUIPMENT:

3 EA 4312 COMMAND REPEATER KIT
1 EA 4248 LOGISTICS REPEATER KIT
1 EA 4330 REMOTE KIT
1 EA 4381 CMD/TAC RADIO KIT

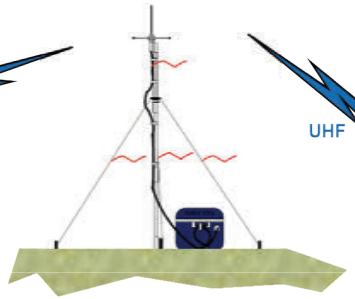
INCIDENT OPERATIONS AREA 3

VHF



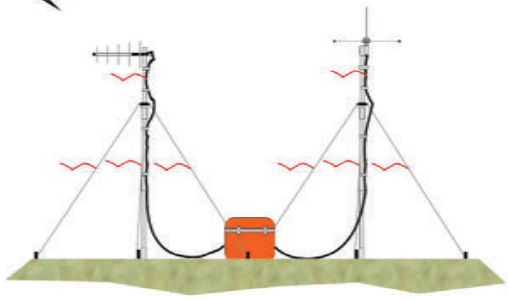
4312 - COMMAND REPEATER LINK
(WITH YAGI ANTENNA ON THE UHF LINK)

UHF



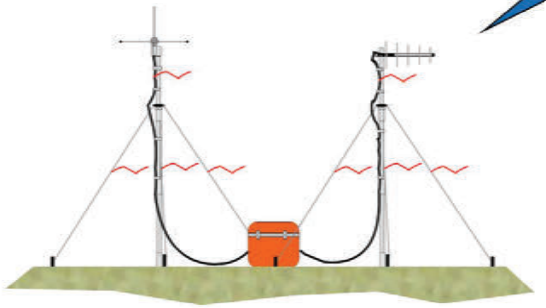
4248 - LOGISTICS REPEATER

UHF



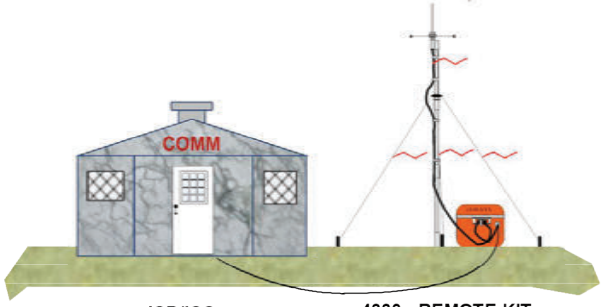
4312 - COMMAND REPEATER LINK
(WITH YAGI ANTENNA ON THE UHF LINK)

UHF



4312 - COMMAND REPEATER LINK
(WITH YAGGI ANTENNA ON THE UHF LINK)

VHF



ICP/ICC

4330 - REMOTE KIT
(WITH OMNI ANTENNA)

VHF

INCIDENT OPERATIONS AREA 1

VHF

INCIDENT OPERATIONS AREA 2

A SERIES OF REPEATER/LINKS THAT EXTENDS COMMUNICATIONS COVERAGE FOR MULTIPLE SMALL INCIDENTS OR FOR AN INCIDENT WHICH HAS AN EXTENDED OPERATIONAL AREA. COMMUNICATIONS WITH THE ICP/ICC MAY BE THROUGH ONE OF THE COMMAND REPEATERS OR THROUGH THE LOGISTICS REPEATER WHICH LINKS THE ENTIRE SYSTEM. ADDITIONAL REPEATER/LINKS CAN BE ADDED, AS LONG AS THEY ARE WITHIN LINE-OF-SIGHT WITH THE LOGISTICS REPEATER.

NOTE: FREQUENCY COORDINATION WITH THE CDO OR COMC IS REQUIRED.
EACH VHF COMMAND REPEATER IS A DIFFERENT FREQUENCY PAIR.

DRAWING 7

AVIATION

COMMUNICATIONS

CONDITIONS AND SOLUTIONS

AVIATION COMMUNICATIONS CONDITIONS AND SOLUTIONS

CONDITIONS	EQUIPMENT SOLUTIONS	NFES#	DWG#
Need Ground-to-Air Communications	**Ground VHF-AM Base Station Kit** Projects and incidents needing VHF-AM base station capabilities. This kit includes four (4) programmable ICOM handheld radios. VHF-AM frequency used in kit must be cleared/authorized.	**004300 or 004370**	**8**
Need helibase/airport ground-to-aircraft communications (VHF-AM).	**Ground to Aircraft Radio/Link Kit** **Base Station Use Only:** Will communicate directly with aircraft, without modification, on VHF-AM frequencies. Dedicated frequency should be ordered/cleared by Expanded Dispatch/RO/NIICD-CDO. All kits include four (4) programmable ICOM radios. (Kit is used as a base station, without the link, in this instance.)	**004300 or 004370**	**8**
Helibase/helispot personnel must communicate with incident aircraft in remote locations as well as flight follow to/from the operations area and the helibase or helispots. (UHF-FM to VHF-AM.)	**Ground to Aircraft Radio/Link Kit (Using Linking)** Allows helispot personnel using VHF-AM ICOM or UHF-FM radios to communicate with aircraft on VHF-AM frequencies. Kit also enables non-contract or military aircraft to communicate with other incident aircraft and helispot personnel via VHF-AM frequencies and helibase personnel via UHF-FM through the link. Dedicated VHF-AM and UHF-FM frequencies must be ordered/cleared by Expanded Dispatch/RO/NIICD-CDO. A VHF-FM radio can be substituted on the link side. Call NIICD-CDO for assistance. Each kit includes four (4) handheld programmable ICOM radios.	**004370**	**9**

AVIATION COMMUNICATIONS CONDITIONS AND SOLUTIONS

CONDITIONS	EQUIPMENT SOLUTIONS	NFES#	DWG#
Extensive flight-following needs require expansion of Radio/Link system utilizing two (2) kits.	**Two Ground Aircraft Radio/Link Kits** By using two (2) Ground Aircraft Radio/Link Kits linked through a UHF-FM repeater frequency, flight-following capabilities can be greatly expanded. This design uses one (1) UHF-FM repeater pair and two (2) VHF-AM frequencies. Helibase must flight-follow using the UHF-FM side of the system through the logistics repeater. Dedicated VHF-AM and UHF-FM frequencies must be ordered through Expanded Dispatch. Each kit includes four (4) handheld programmable ICOM radios.	**004370**	**10**
MAFFS Activation Temporary Tanker Base	**Airbase Kit** **Airbase Accessories Kit** **Tactical Radio Kit** Allows personnel to communicate with aircraft from a VHF-AM/VHF-FM base station and/or via a handheld VHF-AM radio. The NFES# 004660 Airbase Kit comes with 10 handheld Icom VHF-AM radios and eight (8) sets of headsets, helmet adapters, and adapters to connect a headset to the VHF-AM radios. The VHF-FM base station can monitor both a main frequency and Air Guard. For additional radio capabilities, a NFES# 004240 Airbase Accessories Kit and a NFES# 004250 MAFFS Tactical Radio Kit can be ordered. The NFES 4240 Airbase Kit has 5 sets of handheld Icom VHF-AM radios, headsets, helmet adapters, and adapters to connect a headset to the VHF-AM radios. The NFES# 004250 MAFFS Tactical Radio Kit has six (6) handheld King DPH VHF-FM radios. Dedicated VHF-AM and VHF-FM frequencies must be ordered through dispatch. Air Guard (168.6250 MHz) does not need to be ordered.	**004240** **004250** **004660**	**11**

GROUND VHF-AM BASE STATION KIT

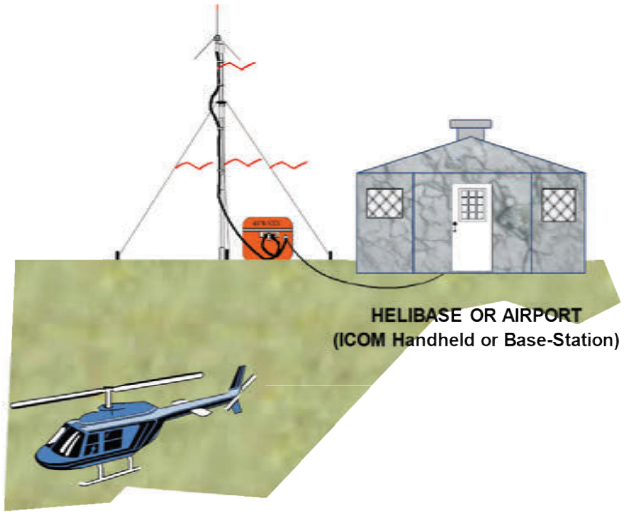
SUGGESTED EQUIPMENT:

1 EA 4370 GROUND AIRCRAFT RADIO LINK KIT
(INCLUDES 4 EA ICOM AM HANDHELD RADIOS)

OR

1 EA 4300 GROUND VHF-AM RADIO/BASE KIT
(INCLUDES 4 EA ICOM AM HANDHELD RADIOS)

VHF-AM
(SIMPLEX)



SYSTEM PROVIDES FLIGHT FOLLOWING AT THE SURROUNDING HELI-BASE.
EXCLUSIVE INCIDENT FAA AM FREQUENCY SHOULD BE
ORDERED THROUGH EXPANDED DISPATCH.

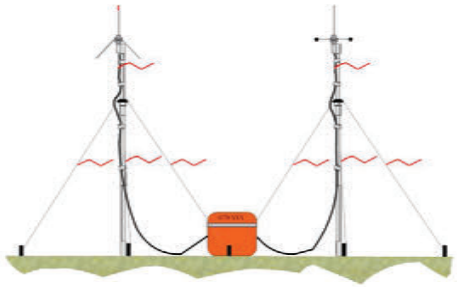
NOTE: FREQUENCY COORDINATION WITH THE CDO OR COMC IS REQUIRED.

DRAWING 8

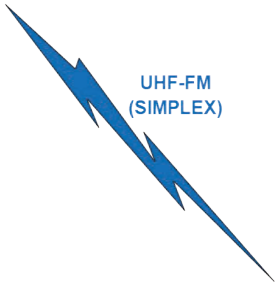
GROUND TO AIRCRAFT RADIO/LINK KIT
(USING LINKING)

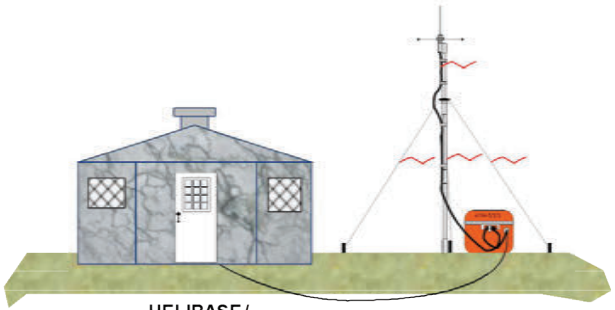
SUGGESTED EQUIPMENT:

1 EA 4370 GROUND AIRCRAFT RADIO LINK KIT
(INCLUDES 4 EA ICOM AM HANDHELD RADIOS
1 EA 4330 REMOTE KIT



4370 - AIRCRAFT LINK IN LINK CONFIGURATION
(WITH OMNI ANTENNA ON THE UHF LINK)





HELIBASE/
AIRPORT

4330 - REMOTE KIT
(WITH OMNI ANTENNA)

THIS SYSTEM EXTENDS FLIGHT FOLLOWING COVERAGE BACK TO THE HELI-BASE WHEN LINE-OF-SIGHT IS NOT POSSIBLE BETWEEN AIRCRAFT AND HELI-BASE.

NOTE: COORDINATION WITH THE CDO OR COMC IS REQUIRED.
EXCLUSIVE INCIDENT FAA AM FREQUENCY SHOULD BE ORDERD THROUGH EXPANDED DISPATCH.

DRAWING 9

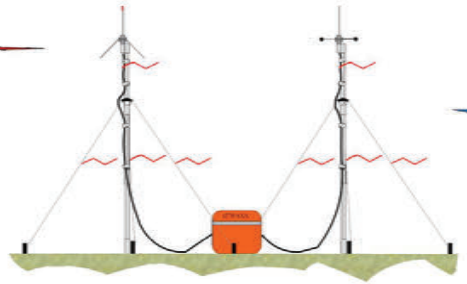
GROUND TO AIRCRAFT RADIO/LINK KIT (USING LINKING)

SUGGESTED EQUIPMENT:

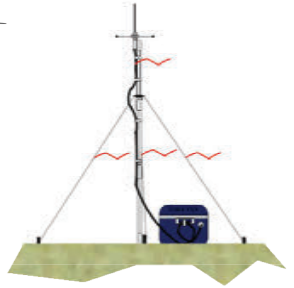
2 EA 4370 GROUND AIRCRAFT RADIO LINK KIT
(INCLUDES 4 EA ICOM AM HANDHELD RADIOS

1 EA 4248 LOGISTICS REPEATER

VHF-AM
(SIMPLEX)



UHF-FM
(Duplex)



4370 - AIRCRAFT LINK IN LINK CONFIGURATION
(WITH OMNI ANTENNA ON THE UHF LINK)

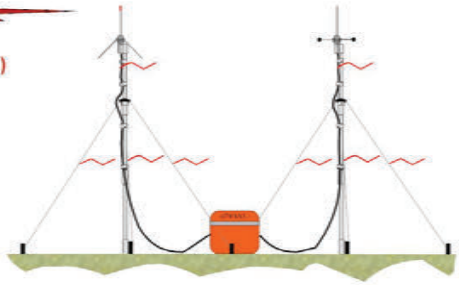
4248 - LOGISTICS REPEATER

HELI-SPOT
(ICOM Handheld)

UHF-FM
(Duplex)

UHF-FM
(Duplex)

VHF-AM
(SIMPLEX)



4370 - AIRCRAFT LINK IN LINK CONFIGURATION
(WITH OMNI ANTENNA ON THE UHF LINK)

HELIBASE OR AIRPORT
(ICOM Handheld or Base Station)

INCIDENT DIVISION
OPERATIONS

USING TWO (2) GROUND AIRCRAFT RADIO/LINK KITS LINKED TOGETHER BY UHF-FM ALLOWS FOR GREATER AREA COVERAGE FOR FLIGHT FOLLOWING.
USES ONLY ONE (1) UHF-FM PAIR AND TWO (2) VHF-AM FREQUENCIES.

NOTE: COORDINATION WITH THE CDO OR COMC IS REQUIRED.
EXCLUSIVE INCIDENT FAA AM FREQUENCIES SHOULD BE ORDERED THROUGH EXPANDED DISPATCH.

DRAWING 10

MAFFS ACTIVATION
&
TEMPORARY TANKER BASE

SUGGESTED EQUIPMENT:

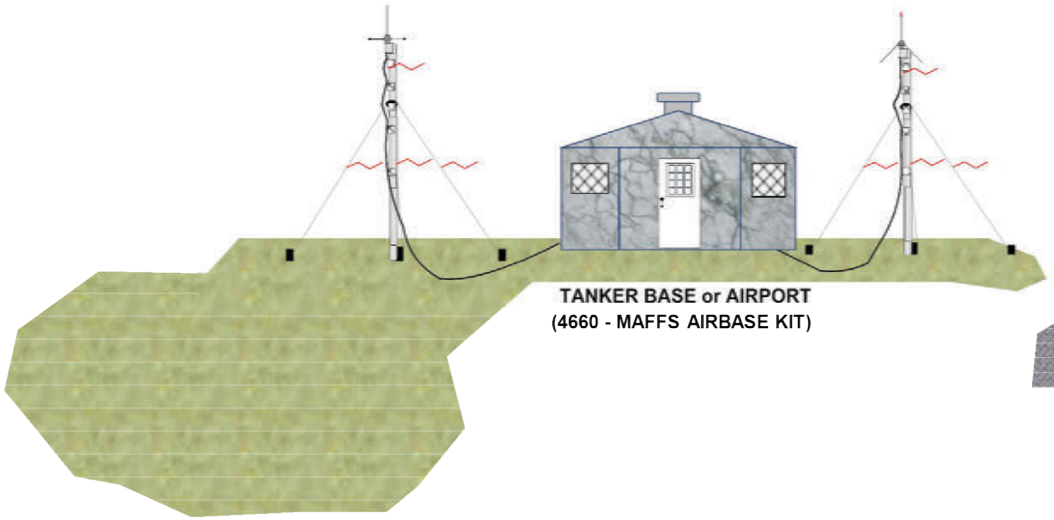
1 EACH 4660 AIRBASE KIT
(INCLUDES 10 EA ICOM AM HANDHELD RADIOS)

OPTIONAL:
1 EACH 4240 AIRBASE ACCESSORIES KIT
(INCLUDED 5 EA ICOM AM HANDHELD RADIOS)

1 EACH TACTICAL RADIO KIT
(INCLUDES 6 EA BK VHF FM RADIOS)

VHF-FM
(SIMPLEX)

VHF-AM
(SIMPLEX)



TANKER BASE or AIRPORT
(4660 - MAFFS AIRBASE KIT)

DRAWING 11

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NIRSC EQUIPMENT

INSTALLATION

INSTRUCTIONS

004080 - SOLAR PANEL KIT SETUP PROCEDURE

The Solar Panel Kit is recommended for use with the following NIRSC equipment:

- **004312 - Command Repeater/Link**
- **004248 - Logistics Repeater**
- **004370 - Ground Aircraft Link**

1. The solar panel kit contains a sealed lead acid (SLA) battery that will provide 2 to 3 days of backup power in the event there is no sunlight.
For additional backup power, purchase another battery at the incident. The spare must be a 12 Volt SLA (preferably a gel cell or AGM deep cycle marine battery). A battery of at least 75 Amp-Hr is recommended.

Note: These batteries weigh 50 lbs. Battery voltage will vary between 14 Volts and 10 Volts. The battery is nearly depleted if the voltage falls below 10.5 Volts with the repeater keyed.

2. Orient the solar panel to get the most sunlight throughout the day. Keep it away from the shade.

3. Hammer the tent stakes at a 45 degree angle and secure the ropes to each eyelet of the solar panel.

4. Connect the components as shown on the cable block diagram. ***(See Figure 1)***

- Cable 120: Connects from the solar panel Kit "**REP**" output directly to the equipment polarized interconnect plug.
- Cable 100: Connects from the Solar Panel Kit "**SOL**" input directly to the solar panel adapter.
- Cable 110: Connects from the Solar Panel Kit "**BAT**" input/output to a deep cycle marine battery. (Optional)

5. If there is sunlight, observe the charging light on the charge controller. It turns on when the battery is charging and off when it is fully charged.

6. Recycle any spare batteries locally.

Note: When repacking the solar kit ensure there is no loose metal that can shift and short the battery terminals while in transport.

CAUTION: Do not use the solar panel in conjunction with the disposable alkaline batteries that come with repeaters. Alkaline's are not rechargeable.

Note: NIRSC recommends utilizing the Solar Panel Kit on all equipment containing the Voice Board.

The Voice Board (installed on some of the NIRSC equipment) performs two functions:

1. It reads the battery voltage and temperature over the air via DTMF tones.
2. It allows the repeater to run using the following power sources:
   A. Only alkaline batteries.
   B. Only the solar panel kit.
   C. Both the alkaline batteries and the solar panel kit.

Note: If using both solar and alkaline, the voice board monitors the solar voltage and will automatically switch to alkaline power when the solar voltage falls below 10 Volts. When the solar voltage rises above 12 Volts, it will switch back to solar power. This conserves the alkaline batteries, allowing the equipment to run off one set of batteries for extended periods of time without the need to change them.

(See Appendix A for more information on the Voice Board)

If any questions arise during installation, please call the CDO at (208)387-5644

004080 - SOLAR PANEL KIT SETUP PROCEDURE
OVERHEAD VIEW

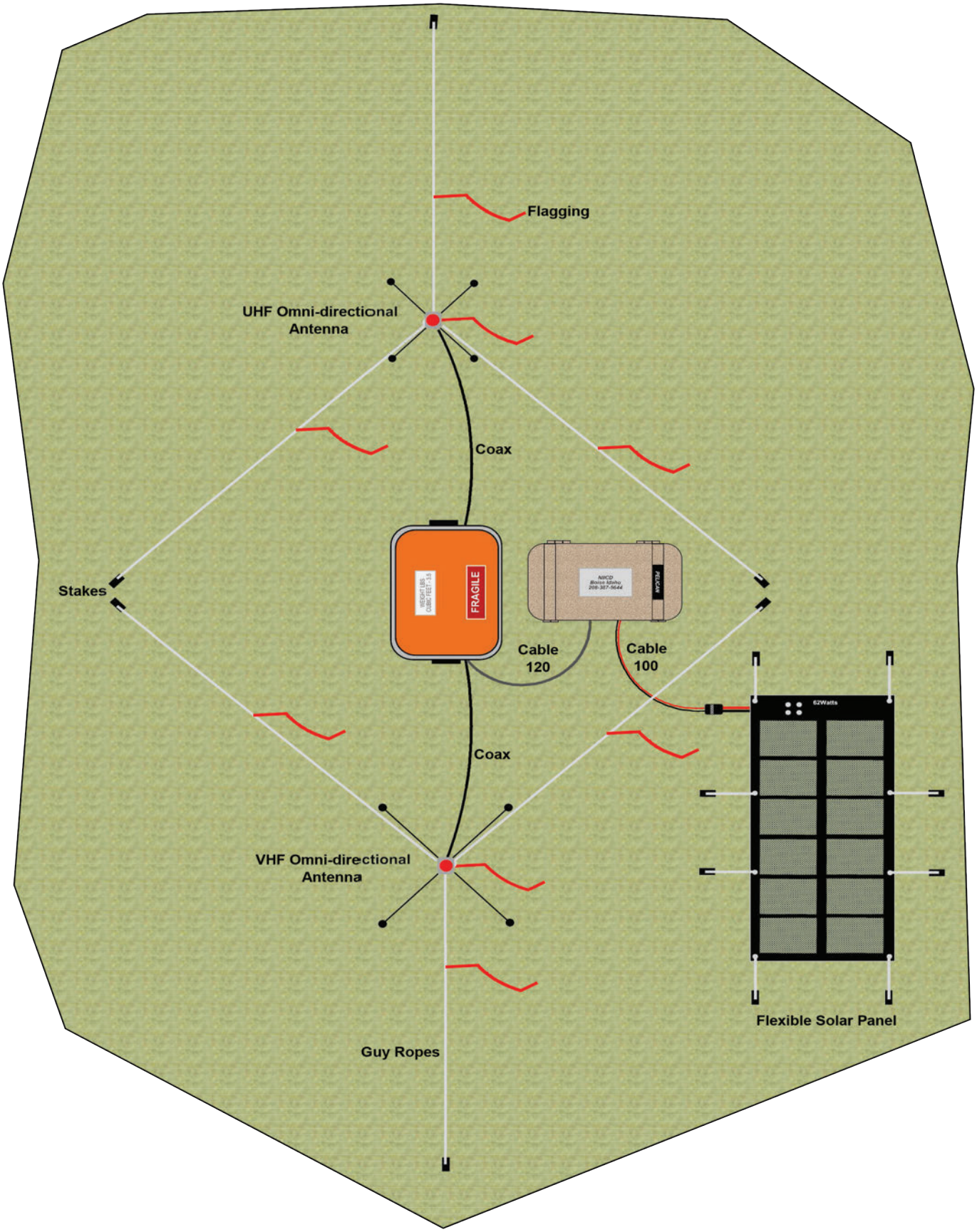


Figure 1: Solar Panel Installation (Overhead View)

004248 UHF REPEATER SETUP PROCEDURE

1. **Battery Supply** ***(See Figure 1)***
   The battery is configured with a **POLARIZED** interconnect plug. If it becomes necessary to replace batteries, follow the 15 volt battery configuration figure on the following page. ***(See Figure 1)***
   Turn the main power switch located on the **SYSTEM MONITOR** Module, to the "**ON**" position.
   Note: Reversing polarity will result in an inoperative repeater. The repeater kits are shipped with the polarized plug disconnected and it should be connected before the repeater is turned on.

2. **Antenna Installation** ***(See Figure 2)***
   Assemble the 3 mast sections. Wrap the flared end of the upper section with 5 wraps of filament tape to keep the collar from sliding down the mast. Install the guy collar. Install the antenna base onto the mast, raise the radial elements to the set holes and insert white plastic locks into the holes. Install high-gain antenna provided in the repeater kit to the antenna base. Connect one end of the coax cable to antenna base and secure the coax to the mast at 3 places with filament tape: 12 inches below the antenna base and 12 inches above and below the guy collar. Install flagging below the antenna base. Erect the mast and secure with the 3 provided stakes and guy ropes.
   Note: For detailed antenna installation instructions see the "Antenna Installation Instructions" included in Appendix C.

3. **Coaxial Cable** ***(See Figure 2)***
   DO NOT leave the coaxial cable coiled. Attach the coaxial cable through the hole provided in the side of the fiberglass box to the appropriate port on the UHF duplexer, using a 90 degree UHF connector (NFES # 4180). The kit box access ports are marked to facilitate proper installation.

4. **Tone Selection** ***(See the Switch Settings Diagram in Appendix D for more details)***
   The UHF Repeater (4248) has no tone capability. Both Switch A and Switch B rotary select switches on the **REPEATER CONTROL MODULE** have been disabled. ***(See Figure 3)***

5. **Switch Settings and Testing** ***(See the Switch Settings Diagram in Appendix D for more details)***
   Ensure that the **UHF TRANSMITTER** and **RECEIVER** Module switches on the 4248 are in the correct "**NORM**" position as per the "**4248 Switch Settings Diagrams**" in Appendix D.

   After installation is complete, test the repeater using the appropriate portable radios. Back away from the repeater box a minimum of 25 feet before testing.

6. **Final Test**
   Close the lid tightly to prevent weather and rodent damage to the equipment. Tape coax to repeater box handle (if possible) in order to create a drip loop, provide strain relief and prevent chafing. Put tape over the hole where the coax comes through the box to prevent weather and rodents from entering.
   Test one FINAL time before leaving the site, to make sure the switches have not been accidentally moved.
   Note: A whole system test is preferred, if possible.

If any questions arise during installation, please call the CDO at (208)387-5644

004248 UHF REPEATER SETUP PROCEDURE

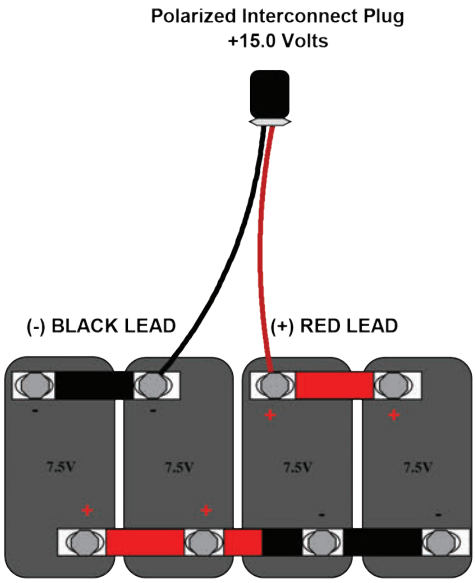


Figure 1:
15 VOLT BATTERY CONFIGURATION
(NFES # 1023)

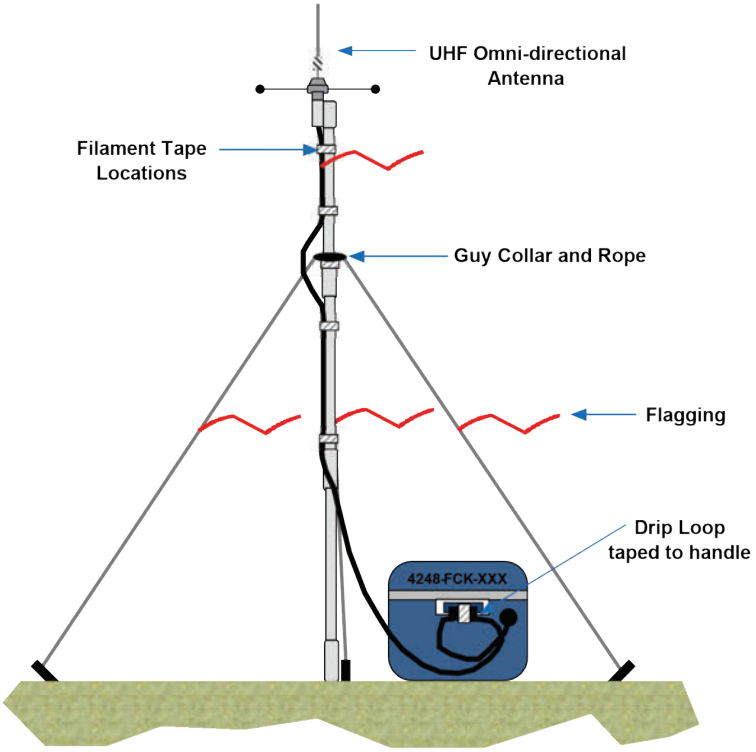


Figure 2:
4248 - UHF REPEATER ANTENNA SETUP

Switch A & B - Disabled

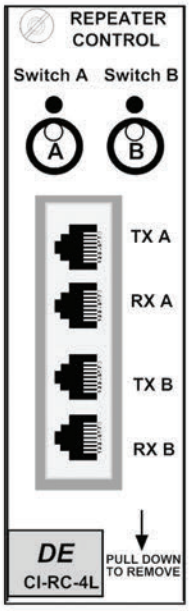


Figure 3:
4248 - UHF REPEATER
REPEATER CONTROL MODULE

004312 VHF COMMAND REPEATER/LINK SETUP PROCEDURE STAND-ALONE CONFIGURATION

1. **Battery Supply**
   The battery is configured with a **POLARIZED** interconnect plug. If it becomes necessary to replace batteries, follow the 15 volt battery configuration figure on the following page. ***(See Figure 1)***
   Turn the main power switch located on the **SYSTEM MONITOR** Module, to the "**ON**" position.
   Note: Reversing polarity will result in an inoperative repeater. The repeater kits are shipped with the polarized plug disconnected and it should be connected before the repeater is turned on.

2. **Antenna Installation** ***(See Figure 2)***
   Assemble the 3 mast sections. Wrap the flared end of the upper section with 5 wraps of filament tape to keep the collar from sliding down the mast. Install the guy collar. Install the antenna base onto the mast, raise the radial elements to the set holes and insert the white plastic locks into the holes. Install high-gain antenna provided in the repeater kit to the antenna base. Connect one end of the coax cable to antenna base and secure the coax to the mast at 3 places with filament tape: 12 inches below the antenna base and 12 inches above and below the guy collar. Install flagging below the antenna base. Erect the mast and secure with the 3 provided stakes and guy ropes.
   Note: For detailed antenna installation instructions see the "Antenna Installation Instructions" in Appendix C. Both a Yagi and an Omni-directional UHF antenna are provided for linking in each 4312 kit.

3. **Coaxial Cable** ***(See Figure 2)***
   DO NOT leave the coaxial cable coiled. Attach the coaxial cable through the hole provided in the side of the fiberglass box, to the appropriate port on the VHF duplexer, using a 90 degree UHF connector (NFES # 4180). The kit box access ports are marked to facilitate proper installation.

4. **Tone Selection** ***(See the Switch Settings Diagram in Appendix D for more details)***
   Contact the CDO for an appropriate tone. **All tones are assigned by the CDO or COMC**.
   Tones are selected for the **VHF TRANSMITTER** and **VHF RECEIVER** modules by selecting the proper position using the "**Switch A**" 16 - position rotary select switch on the **REPEATER CONTROL MODULE**. The rotary switch changes **BOTH** the transmit and receive tone on each VHF module.
   See the Tone Selection List provided. "Straight UP" is Position 1. ***(See Figure 3)***

5. **Switch Settings and Testing** ***(See the Switch Settings Diagram in Appendix D for more details)***
   Ensure that the **VHF TRANSMITTER** and **RECEIVER** Module switches on the 4312 are in the correct "**NORM**" position as per the "**4312 - Repeater Switch Settings Diagrams**" in Appendix D. While in stand alone configuration, ensure that the **UHF TRANSMITTER** and **UHF RECEIVER** Module switches on the 4312 are in the "**OFF**" position as per the "**4312 - Switch Settings Diagrams**" in Appendix D.

   After installation is complete, test the repeater using the appropriate portable radios. Back away from the repeater box a minimum of 25 feet before testing.

6. **Final Test**
   Close the lid tightly to prevent weather and rodent damage to the equipment. Tape coax to repeater box handle (if possible) in order to create a drip loop, provide strain relief and prevent chafing. Put tape over the hole where the coax comes through the box to prevent weather and rodents from entering.
   Test one FINAL time before leaving the site, to make sure the switches have not been accidentally moved.
   Note: A whole system test is preferred if, possible.

If any questions arise during installation, please call the CDO at (208)387-5644

004312 VHF COMMAND REPEATER/LINK SETUP PROCEDURE STAND-ALONE CONFIGURATION

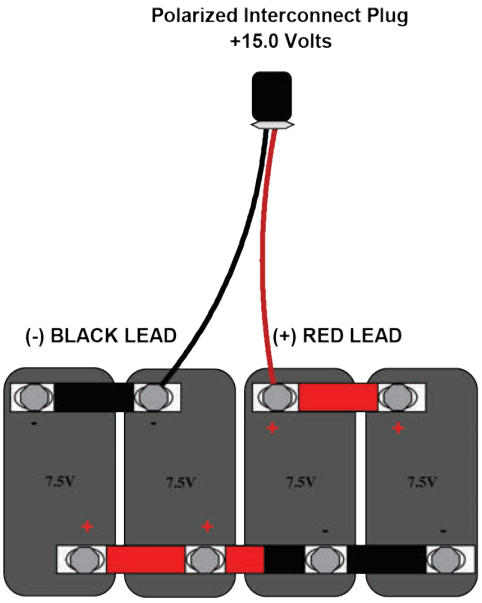


Figure 1:
15 VOLT BATTERY CONFIGURATION
(NFES # 1023)

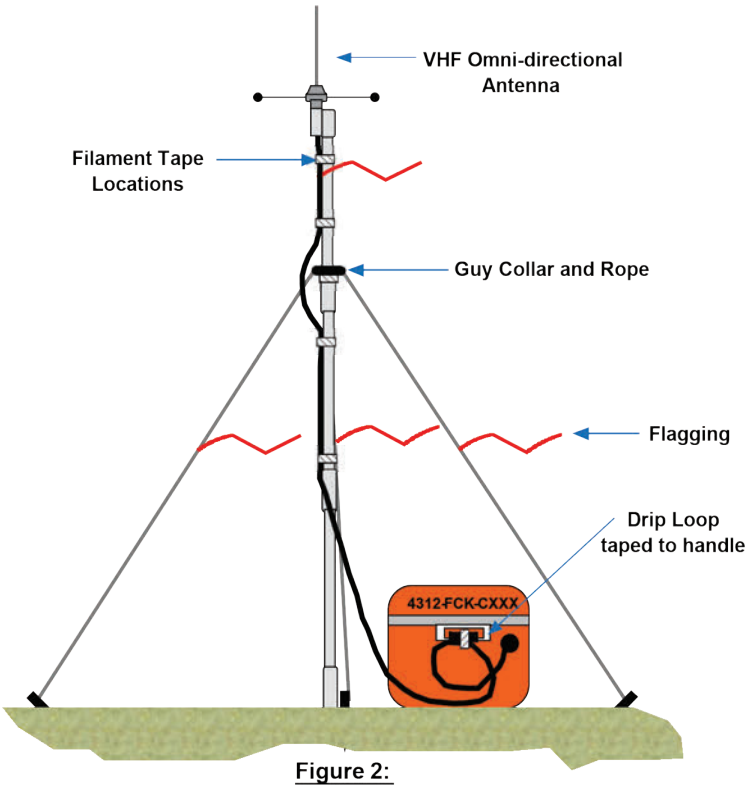
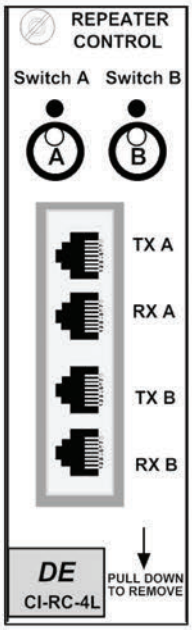


Figure 2:
4312 - VHF REPEATER ANTENNA SETUP
STAND-ALONE CONFIGURATION

Switch A - Tone Selection List

Position 1 - Tone 1 - 110.9
Position 2 - Tone 2 - 123.0
Position 3 - Tone 3 - 131.8
Position 4 - Tone 4 - 136.5
Position 5 - Tone 5 - 146.2
Position 6 - Tone 6 - 156.7
Position 7 - Tone 7 - 167.9
Position 8 - Tone 8 - 103.5
Position 9 - Tone 9 - 100.0
Position 10 - Tone 10 - 107.2
Position 11 - Tone 11 - 114.8
Position 12 - Tone 12 - 127.3
Position 13 - Tone 13 - 141.3
Position 14 - Tone 14 - 151.4
Position 15 - Tone 15 - 162.2
Position 16 - No Tone



Close Up View
Switch A, Switch B
Repeater Control Module

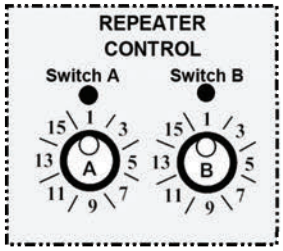


Figure 3:
4312 - VHF COMMAND REPEATER/LINK
REPEATER CONTROL MODULE

004312 VHF COMMAND REPEATER/LINK SETUP PROCEDURE
LINK CONFIGURATION

1. **Battery Supply**
   The battery is configured with a **POLARIZED** interconnect plug. If it becomes necessary to replace batteries, follow the 15 volt battery configuration figure on the previous page. ***(See Figure 1 on previous page)***
   Turn the main power switch located on the **SYSTEM MONITOR** Module, to the "**ON**" position.
   Note: Reversing polarity will result in an inoperative repeater. The repeater kits are shipped with the polarized plug disconnected and it should be connected before the repeater is turned on.

2. **Antenna Installation** ***(See Figure 4)***
   Erect the UHF Link Antenna (Yagi or Omni) according to the Repeater/Link Antenna Setup drawing, using the same technique as in step 2 of the Stand-alone Repeater Antenna Installation instructions. Attach the coaxial cable, through the hole provided in the side of the fiberglass box, to the Link port on the system monitor, using a 90 degree UHF connector (NFES # 4180) at the port.
   Note: For detailed antenna installation instructions see the "Antenna Installation Instructions" in Appendix C.
   Both a Yagi and Omni-directional UHF antenna are provided for linking in each 4312 kit.
   If more than two VHF repeaters are linked together, NIRSC recommends using the Omni-directional antenna on the UHF links.

3. **Coaxial Cable** ***(See Figure 4)***
   DO NOT leave the coaxial cable coiled. Attach the link coaxial cable through the hole provided in the side of the fiberglass box to the appropriate UHF link port on the system monitor, using a 90 degree UHF connector (NFES # 4180) at each port. If done properly, the VHF and UHF coax cables will exit on opposite sides of the repeater kit box. The kit box access ports are marked to facilitate proper installation. Do not feed both the VHF and UHF coax cables out of the same access port!

4. **Tone Selection** ***(See the Switch Settings Diagram in Appendix D for more details)***
   Contact the CDO for an appropriate tone: **All tones are assigned by the CDO or COMC**.
   Tones are selected for the **VHF TRANSMITTER** and **VHF RECEIVER** modules by selecting the proper position using the "**Switch A**" 16 - position rotary select switch on the **REPEATER CONTROL MODULE**. The rotary switch changes **BOTH** the transmit and receive tone on each VHF module.
   See the Tone Selection List provided. "Straight UP" is Position 1. ***(See Figure 5)***

5. **Switch Settings and Testing** ***(See the Switch Settings Diagram in Appendix D for more details)***
   Contact the CDO for an appropriate UHF Link frequency. **All link frequencies are assigned by the CDO or COMC**.
   Ensure that the **UHF Transmitter** and **UHF Receiver** Module switches are in the correct, "**NORM**" position as per the "**4312 Repeater Switch Settings Diagrams**" in Appendix D. The **UHF TX** and **UHF RX** frequencies are set by selecting the proper position using the "**Switch B**" 16 - position rotary select switch on the **REPEATER CONTROL MODULE**. The switch changes **BOTH** the transmit and receive **UHF** frequencies on each UHF module.
   See the UHF Frequency Selection List provided. "Straight UP" is Position 1. ***(See Figures 5 & 6)***

   After installation is complete, test the repeater using the appropriate portable radio. Back away from the repeater box a minimum of 25 feet before testing.

6. **Final Test**
   Close the lid tightly to prevent weather and rodent damage to the equipment. Tape coax to repeater box handle (if possible) in order to create a drip loop, provide strain relief and prevent chafing. Put tape over the hole where the coax comes through the box to prevent weather and rodents from entering.
   Test one FINAL time before leaving the site, to make sure switches were not accidentally moved.
   Note: A whole system test is preferred, if possible.

If any questions arise during installation, please call the CDO at: (208)387-5644

004312 VHF COMMAND REPEATER/LINK SETUP PROCEDURE
LINK CONFIGURATION

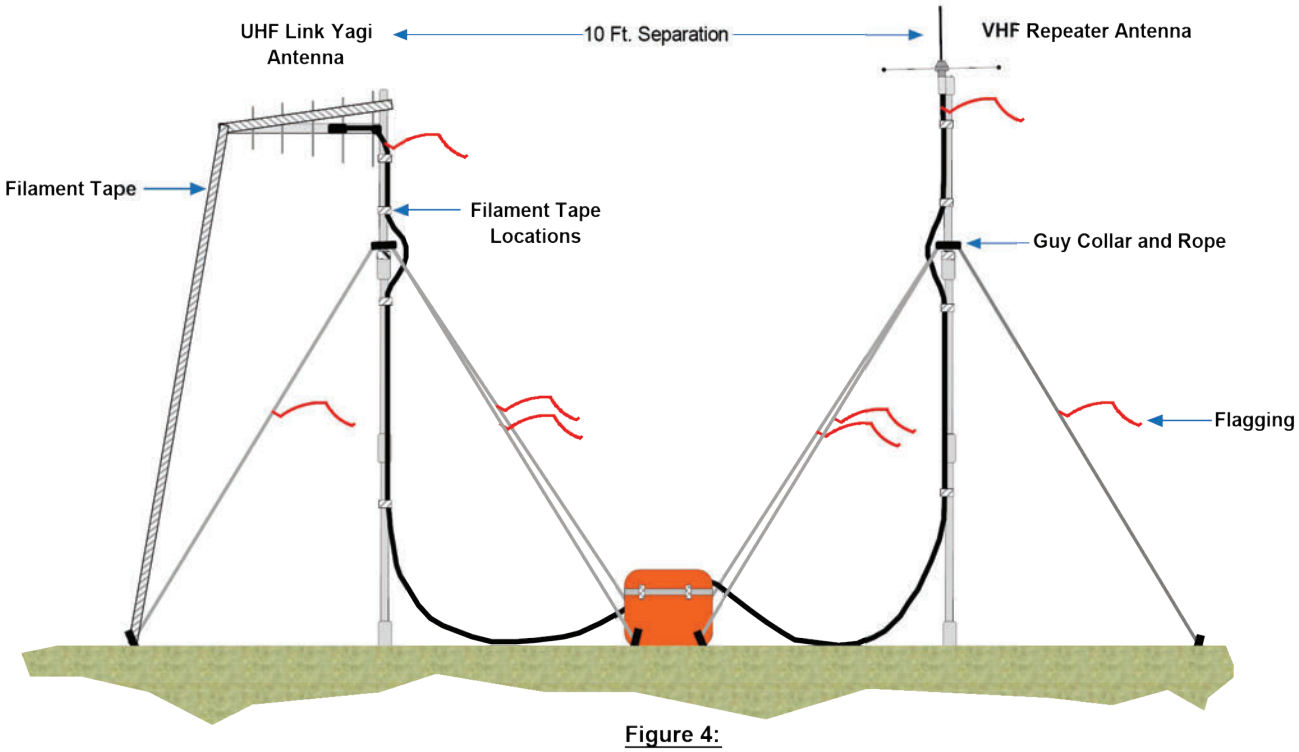
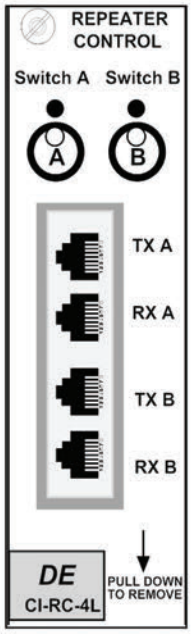


Figure 4:
4312 - VHF COMMAND REPEATER/LINK ANTENNA SETUP
LINK CONFIGURATION

NOTE: A UHF Yagi antenna for the UHF Link is recommended only when less than two (2) VHF repeaters are linked together using a UHF simplex frequency. If more than three (3) VHF repeaters are linked together via a UHF simplex frequency, NIRSC recommends using an Omni-Directional antenna on the UHF Link side of each repeater.

Switch A - Tone Selection List
Position 1 - Tone 1 - 110.9
Position 2 - Tone 2 - 123.0
Position 3 - Tone 3 - 131.8
Position 4 - Tone 4 - 136.5
Position 5 - Tone 5 - 146.2
Position 6 - Tone 6 - 156.7
Position 7 - Tone 7 - 167.9
Position 8 - Tone 8 - 103.5
Position 9 - Tone 9 - 100.0
Position 10 - Tone 10 - 107.2
Position 11 - Tone 11 - 114.8
Position 12 - Tone 12 - 127.3
Position 13 - Tone 13 - 141.3
Position 14 - Tone 14 - 151.4
Position 15 - Tone 15 - 162.2
Position 16 - No Tone



Switch B - UHF Frequency Selection List
Position 1 - L1 RPTR
Position 2 - L2 RPTR
Position 3 - L3 RPTR
Position 4 - L4 RPTR
Position 5 - L5 RPTR
Position 6 - L6 RPTR
Position 7 - L7 RPTR
Position 8 - L1 RX SIMPLEX
Position 9 - L2 RX SIMPLEX
Position 10 - L3 RX SIMPLEX
Position 11 - L4 RX SIMPLEX
Position 12 - L5 RX SIMPLEX
Position 13 - L6 RX SIMPLEX
Position 14 - L7 RX SIMPLEX
Position 15 - Special Use, SIMPLEX
Position 16 - Special Use, SIMPLEX

Figure 5:
4312 - VHF COMMAND REPEATER/LINK
REPEATER CONTROL MODULE

Close Up View
Switch A, Switch B
Repeater Control Module

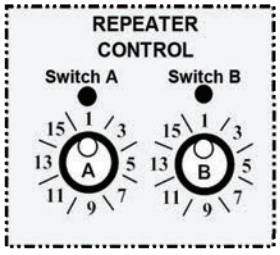


Figure 6:
REPEATER CONTROL MODULE
CLOSE UP VIEW

004300 GROUND VHF-AM BASE STATION SETUP PROCEDURE

1. **ANTENNA SETUP:** ***(See Figure 2)***
   Connect one end of the antenna cable to the base station antenna. Erect the base station antenna and mast using guy ropes and stakes. Connect the other end of antenna cable to the TBS-150 Ground VHF-AM Base Station.
   Note: For detailed antenna installation instructions, see the "Antenna Installation Instructions" in Appendix C.

2. **VOLTAGE SELECTION:** ***(See Figure 1)***
   The TBS-150 can operate on 115 Volt AC or external 13 Volt DC.
   Note: Never connect both 115 Volt AC and 13 Volt DC at the same time.

   For 115 Volt AC:
   - Connect AC power cord to the TBS-150 and 115 Volt AC outlet.
   - Turn the TBS-150 AC "**ON/OFF**" switch to "**ON**"
   - Turn the 91-DE Power "**ON/OFF**" switch to "**ON**"

   For external power/cigarette lighter operation:
   - Connect the 3 pin/cigarette lighter DC power cable into the TBS-150 and to the supplied batteries or cigarette lighter.
   - Turn the 91-DE power "**ON/OFF**" switch to "**ON**"

   Note: The TBS-150 "AC ON/OFF" switch only operates when 115 Volt AC is used.

3. **MICROPHONE CONNECTION:** ***(See Figure 1)***
   Connect the hand mic's 3-pin connector to the 91-DE MIC connector.
   PTT operation is from the hand mic.
   Note: DO NOT transmit without the antenna connected.

4. **91-DE RADIO USE:** ***(See Figure 1)***
   The 91-DE radio is a 760 channel VHF-AM transceiver capable of 10 preset channels plus scanning.
   Frequency selection is via the keypad.
   Set volume knob to mid-range.
   Adjust the squelch knob until squelch just quiets.
   Note: See Operating Instruction book included with the kit for more information.

5. **OTHER INFORMATION:** The TBS-150 has 4 fuses:
   - The 91-DE's fuse is a standard 5 AMP.
   - The TBS-150's fuse is a 2.5 AMP MDL.
   - THE TBS-150 DC fuse is a mini 5 AMP
   - The DC power cord fuse is an overrated 10 AMP fuse and is basically unused, with the TBS-150 relying on the mini 5 A fuse for DC protection.

6. **Remote Operation**
   A standard tone remote desk set (not included) will operate the TBS-150.

   Note: This kit is designed for base station use only and shall not be operated in aircraft.

Figure 1:
Technisonic TBS-150 Base Station

04300 GROUND VHF-AM BASE STATION SETUP PROCEDURE

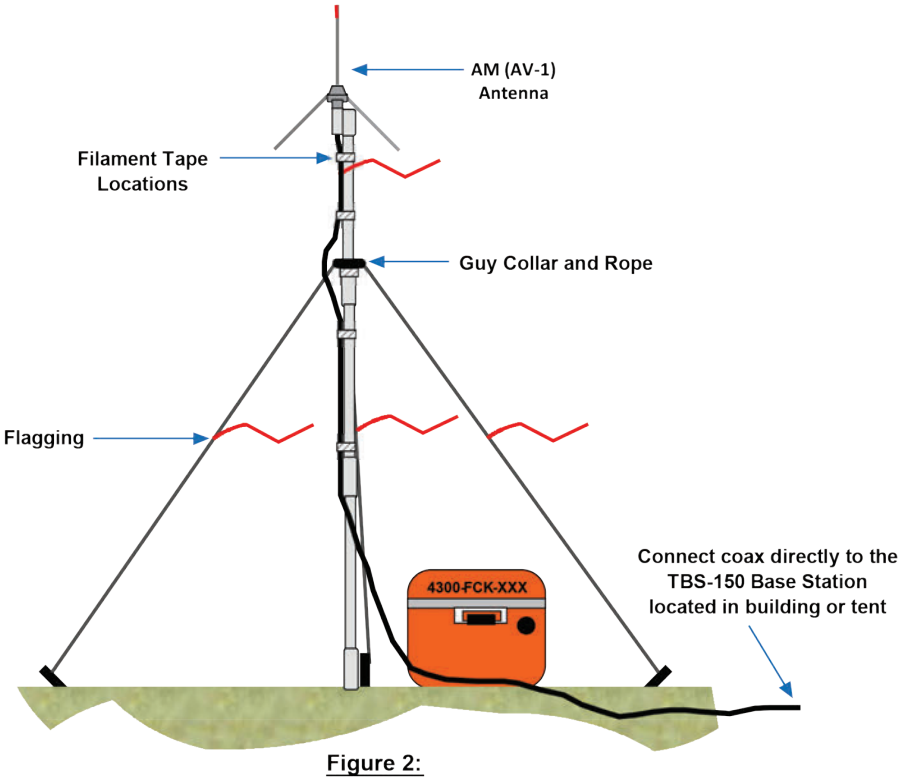


Figure 2:
4300 - GROUND VHF-AM BASE STATION ANTENNA SETUP

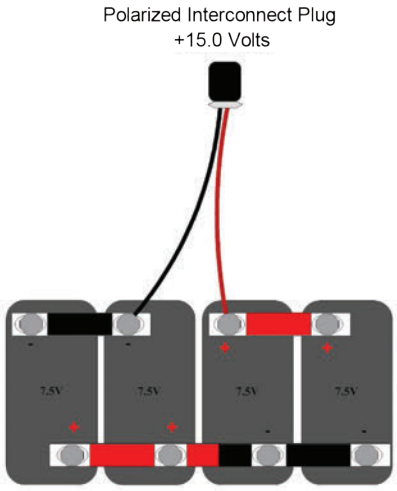


Figure 4:
15 VOLT BATTERY CONFIGURATION (NFES # 1023)

Figure 3:
4300 - GROUND VHF-AM BASE STATION INVENTORY

004330 - REMOTE KIT SETUP PROCEDURE 4330X2 AND 4330MD

1. Remove the CPI remote desk set from the fiberglass box, along with 2 each 7.5 Volt batteries (NFES# 1023). If AC power is not available, connect the batteries to the CPI remote desk set using the provided wire assembly (**Fused DC 5 AMP, 2-Prong Cable**). If AC power is available, use the provided AC-DC Transformer to power the CPI remote desk set.

   Note: An external speaker is provided for better audio quality. Connect the speaker directly to the side audio jack of the CPI remote desk set, if desired.

   CAUTION: Observe correct polarity when using batteries. The CPI remote desk set operates on + 12.0 V and up to +15.0 Volts. ***(See Figure 6)***

2. Remove the grey metal remote chassis enclosure. Select an installation location common to desired service areas, within range of available communications field wire supplied in the kit (**1/4 mile reels**).
   Note: The antenna and grey metal remote chassis enclosure must be placed within line-of-sight of an operational VHF or UHF repeater.

3. Erect the appropriate antenna (UHF omni, VHF omni, or UHF Yagi) and attach the provided coax cable from the antenna to the coax connector on the outside of the grey metal remote chassis enclosure. Add proper flagging, tape, and drip loops on the coax. ***(See Figure 1 or 2)***
   Note: For detailed antenna installation instructions, see the "Antenna Installation Instructions" in Appendix C.

4. Connect the CPI remote end of the communications field wire pair to the remote chassis terminal lugs on the outside of the grey metal chassis enclosure. (**Not Polarity Dependent**)

5. Open the grey metal remote chassis enclosure and determine if the correct radio is pre-mounted (UHF or VHF). If not, connect the appropriate radio and strap it into place on top of the black DC Termination Panel with the provided straps. Connect the male BNC side of the radio RF adapter cable to the female BNC side mount. Connect the male MIL spec connector to the corresponding female side mount.

6. Connect power to the radio in the remote chassis enclosure by using either the provided 7.5 V batteries (NFES# 1023) or an external battery source. ***(See Figures 3 and 5)***
   Note: A fused DC 5 AMP, 2-Prong cable is provided for external power. This cable connects directly to the outside of the enclosure. All NIRSC VHF or UHF radios used in the remotes require +10.0 volts to +15.0 volts to operate.

7. After power up, select the correct group and channel that will be used for the incident. Ensure the radio volume knob is set to the **pre-designated mark** on the top of the radio, and adjust the squelch to desired level Always use the lowest transmit power setting, this conserves batteries and minimizes self-heating of the radio.

8. String the communications field wire back to the site of the remote desk set. Attach the wires directly to the bindings on the back on the CPI remote desk set (**not polarity dependent**). ***(See Figures 4 and 6)***

9. Test and verify proper operation of the remote.
   Note: The grey metal remote chassis enclosure can be placed either outside or inside the fiberglass box. It is preferred to keep the enclosure inside the fiberglass box during normal operation to further protect the enclosure from the elements.

If questions arise during installation, please contact the CDO at: (208)387-5644

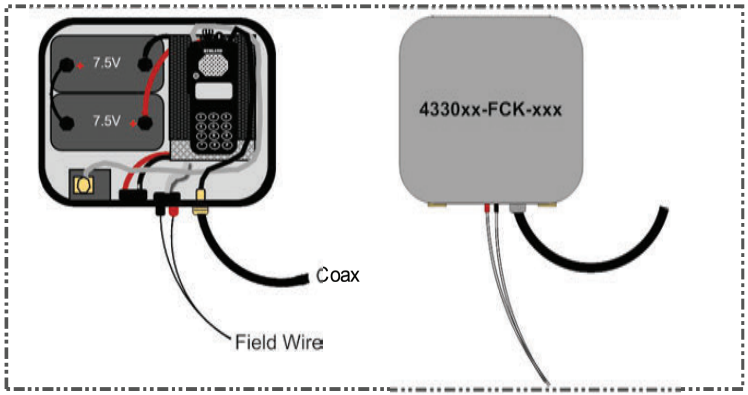


Figure 3:
Remote Chassis and Termination Panel Located inside Fiberglass Box

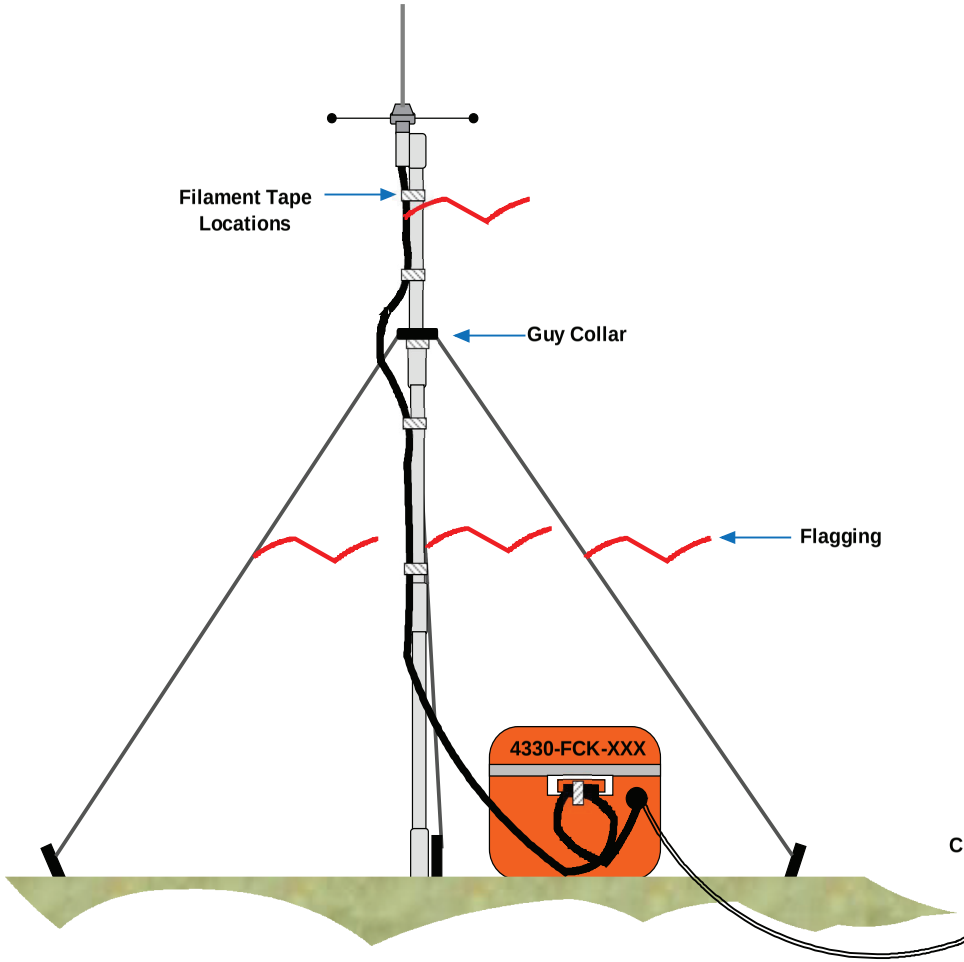


Figure 4:
4330 - Complete Remote Setup

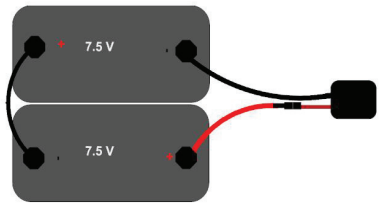


Figure 5:
Two 7.5 Volt Batteries in Series

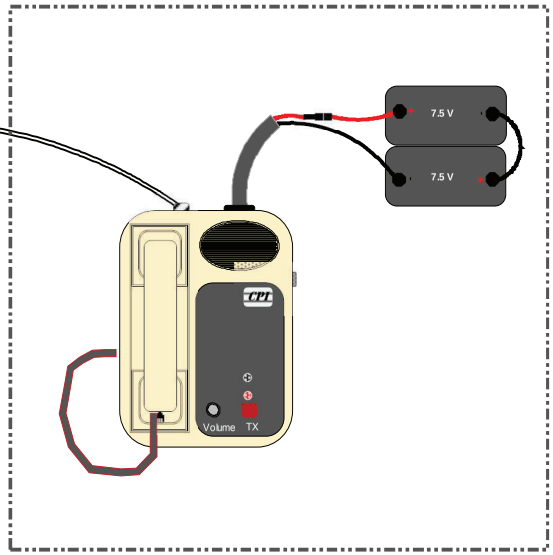


Figure 6:
CPI DC Remote Connections Located in COMM Operating on DC Power

004370 - GROUND AIRCRAFT RADIO/LINK KIT SETUP PROCEDURE BASE CONFIGURATION

1. Erect the AV-1 (**AM**) aircraft antenna according to the illustration. ***(See Figure 1)***
   Note: For detailed antenna installation instructions see the "Antenna Installation Instructions" in Appendix C.

2. Attach the coaxial cable through the hole provided in the left side of the fiberglass box, to the "**Antenna A**" (**AM Port**) on the **System Monitor Module**, using the 90° UHF connector (NFES# 4180) at the port.

3. The battery is configured with a **POLARIZED** interconnect plug. Connect the battery leads according to the illustration and connect to the fused power cable coming from the unit's sub-rack. ***(See Figure 2)***
   Note: Reversing polarity will result in an inoperative kit. The Ground Aircraft Radio Link Kits are shipped with the polarized plug disconnected and it should be connected before the unit is turned on. There is no master power switch. Once the power cable is connected, all modules are receiving voltage but each module needs to be individually turned "ON" to operate.

4. Keep both **CTCSS** switches located on the **Audio Control Module** in the "**OFF**" (***down***) position.

5. Keep the power switches on both the **TX A** and **RX A** in "**NORM**" position.

6. Keep the power switches on both the **TX B** and **RX B** in "**OFF**" position.

7. Keep the **Audio Select Switch** on the **System Monitor Module** in the "**A"** position to activate the internal speaker and place the rotary switch on the **System Monitor to position # 1**.
   Note: The External Speaker may be used by connecting the speaker leads to the System Monitor "METER" jacks. Observe correct polarity. Place the rotary switch on the System Monitor to position #1 for External Speaker ONLY, and turn the System Monitor rotary volume knob to desired level.

8. Select the authorized assigned **AM** frequency for **TX A** and **RX A** using the 16-position rotary **Switch A** (top rotary switch) on the **Audio Control Module**. ***(See Figure 3)***
   Note: For special AM frequencies, select channel 16 on rotary Switch A (top rotary switch) to manually program the AM TX and RX modules via the front panel.

9. Connect the microphone to the "**MIC**" jack on the **AM TX A**.

Manual AM Programming:

Note: Program only authorized special AM frequencies into Channel 16.
The Communications Duty Officer (CDO) will assign the authorized FAA-issed AM Frequency.

1. Turn rotary **Switch A** (*top 16-position rotary switch*) on the **Audio Control Module** to Channel 16.

2. Unlock each unit by pressing the **" * "** button and, before the "**Locked**" display goes blank, press the " **DOWN**" arrow button. The display should now show "**Unlocked**".

3. Wait for the display to go blank, then press either the "**UP**" or "**DOWN**" arrow button to display the current programmed frequency.

4. While the display is showing the frequency, press and hold either the "**UP**" or "**DOWN**" arrow button until the desired frequency is reached.
   Note: The longer the "UP" and "DOWN" arrow buttons are held, the faster the unit will scroll through the frequencies.

5. Lock each unit by pressing the **" * "** button, and before the "**Unlocked**" display goes blank, press the "**UP**" arrow button. The display should now show "**Locked**".
   Note: The AM transmitter and receiver modules must each be individually programmed.

6. Test and verify proper operation of the equipment before leaving the site. Step at least 40-50 feet away from the unit while performing the test.

If questions arise during installation, please contact the CDO at: (208)387-5644

004370 - GROUND AIRCRAFT RADIO/LINK KIT SETUP PROCEDURE BASE CONFIGURATION

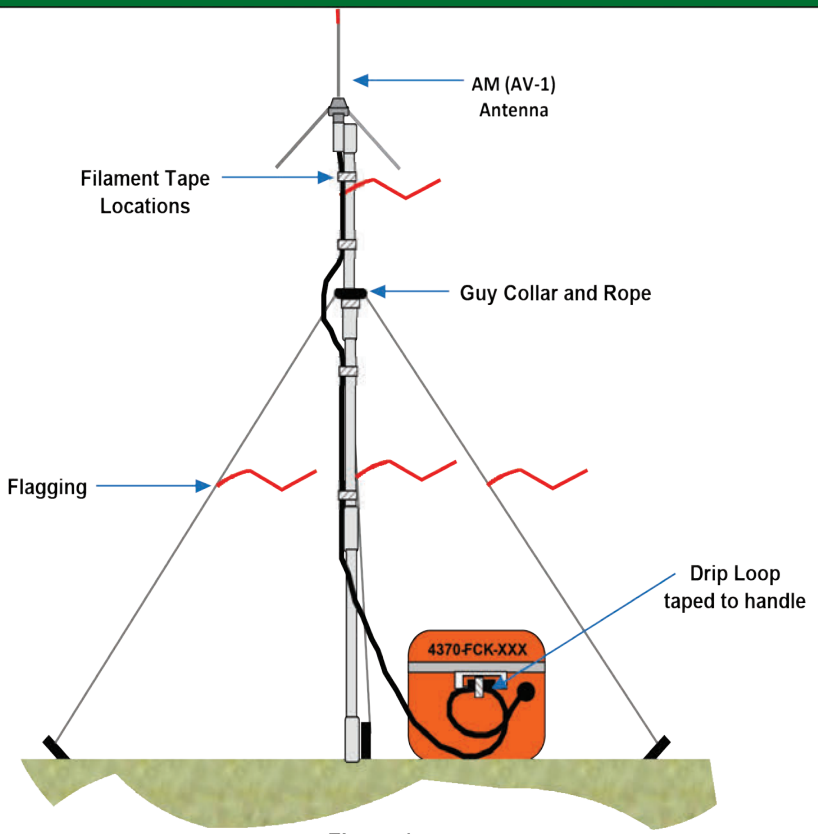


Figure 1:
4370 GROUND AIRCRAFT RADIO/LINK AM ANTENNA SETUP
BASE CONFIGURATION

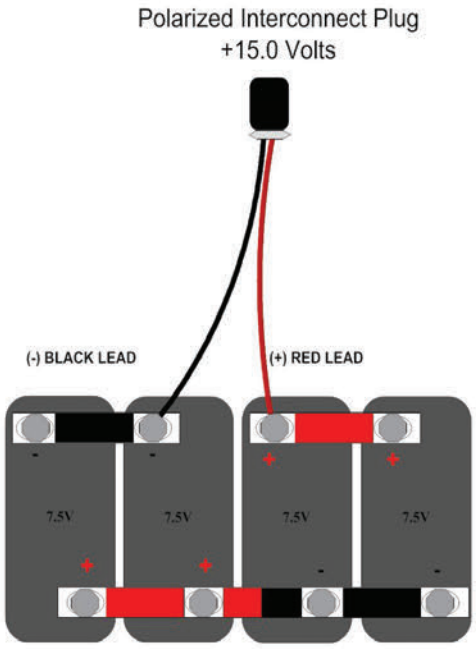


Figure 2:
15 VOLT BATTERY CONFIGURATION
(NFES # 1023)

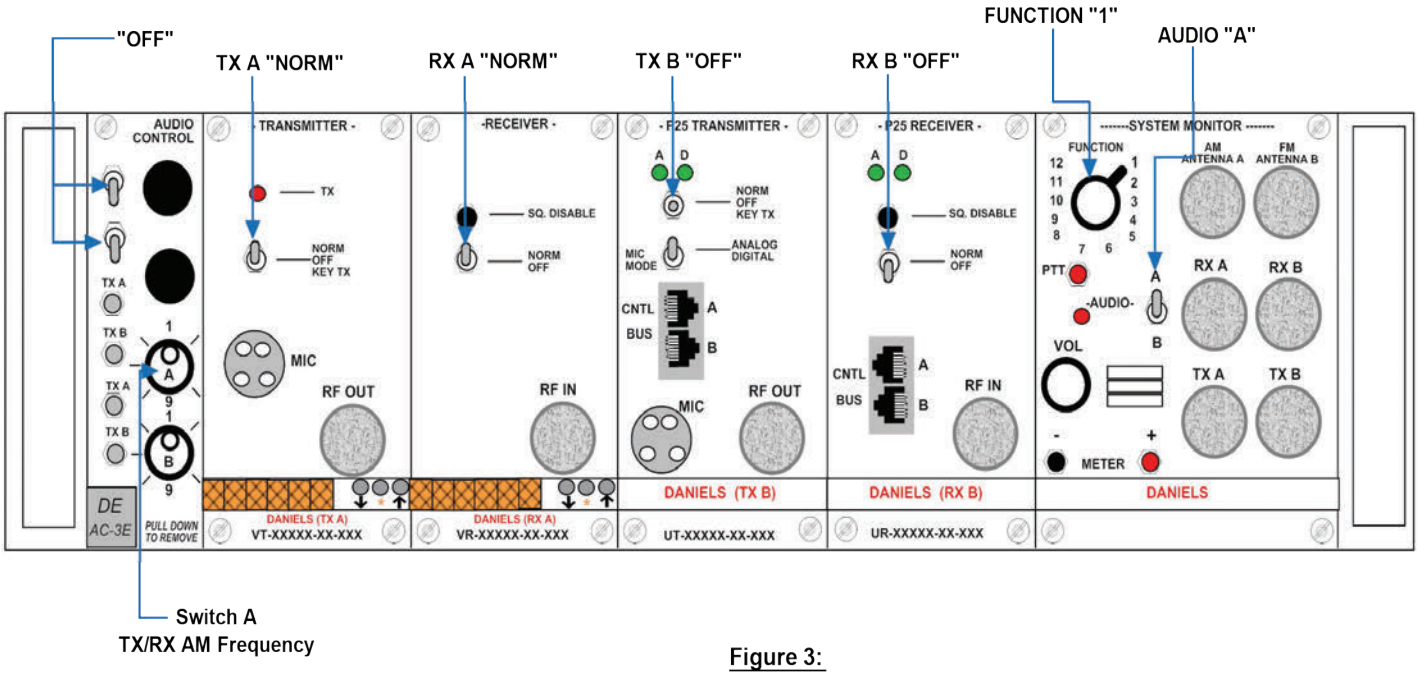


Figure 3:
4370 GROUND AIRCRAFT RADIO/LINK SWITCH SETTINGS
BASE CONFIGURATION

004370 - GROUND AIRCRAFT RADIO/LINK KIT SETUP PROCEDURE LINK CONFIGURATION

1. Erect the AM AV-1 aircraft antenna according to the illustration. ***(See Figure 4)***
   Attach the coaxial cable through the hole provided in the left side of the fiberglass box to the "**Antenna A**" (**AM Port**) on the **System Monitor Module**, using the 90° UHF connector (NFES# 4180) at the port.
   Note: For detailed antenna installation instructions see the "Antenna Installation Instructions" in Appendix C.

2. Erect the UHF omni-directional antenna according to the illustration. ***(See Figure 4)***
   Attach the coaxial cable through the hole provided in the right side of the fiberglass box to the "**Antenna B**" (**FM Port**) on the **System Monitor** module, using the 90° UHF connector (NFES# 4180) at the port.

3. The battery is configured with a **POLARIZED** interconnect plug. Connect the battery leads according to the illustration and connect to the fused power cable coming from the unit's sub-rack. ***(See Figure 2)***
   Note: Reversing polarity will result in an inoperative kit. The Ground Aircraft Radio Link Kits are shipped with the polarized plug disconnected and it should be connected before the unit is turned on. There is no master power switch. Once the power cable is connected, all modules are receiving voltage but each module needs to be individually turned "ON" to operate.

4. Keep both the **CTCSS** switches located on the **Audio Control Module** in the "**OFF**" (***down***) position.

5. Keep the power switches on the **TX A**, **RX A**, **TX B**, and **RX B** in the "**NORM**" position.

6. Keep the **MIC MODE** on the **TX B** in the "**ANALOG"** position.

7. Keep the **A/B Audio** Select Switch on the **System Monitor Module** at the center position.

8. Select an authorized assigned **AM frequency** for both the **TX A** and **RX A** using the 16-position rotary **Switch A** (top rotary switch) on the **Audio Control Module**. ***(See Figure 5)***
   Note: For special AM frequencies, select channel 16 on rotary Switch A (top rotary switch) to program the AM TX and RX modules.

9. Select the authorized assigned **FM UHF Link frequency** for both the **TX B** and **RX B** using the 16-position rotary **Switch B** (bottom rotary switch) on the **Audio Control Module**. ***(See Figure 5)***
   Note: The Communications Duty Officer (CDO) will assign the appropriate AM and FM UHF link frequency. See the frequency chart for corresponding AM and UHF channel locations, included in the kit.

Manual AM Programming:

Note: Manually program only authorized AM frequencies into Channel 16.
The Communications Duty Officer (CDO) will assign the authorized FAA-issued AM Frequency.

1. Turn rotary **Switch A** (*top 16-position rotary switch*) on the **Audio Control Module** to Channel 16.

2. Unlock each unit by pressing the **" * "** button and, before the "**Locked**" display goes blank, press the "**DOWN**" arrow button. The display should now show "**Unlocked**".

3. Wait for the display to go blank, then press either the "**UP**" or "**DOWN**" arrow button to display the current programmed frequency.

4. While the display is showing the frequency, press and hold either the "**UP**" or "**DOWN**" arrow button until the desired frequency is reached.

5. Lock each unit by pressing the **" * "** button and before the "**Unlocked**" display goes blank, press the "**UP**" arrow button.
   Note: The AM transmitter and receiver modules must be individually programmed.

6. Test and verify proper operation of the equipment before leaving the site. Step at least 40-50 feet away from the unit while performing the test.

If questions arise during installation, please contact the CDO at: (208)387-5644

004370 - GROUND AIRCRAFT RADIO/LINK KIT PROCEDURE
LINK CONFIGURATION

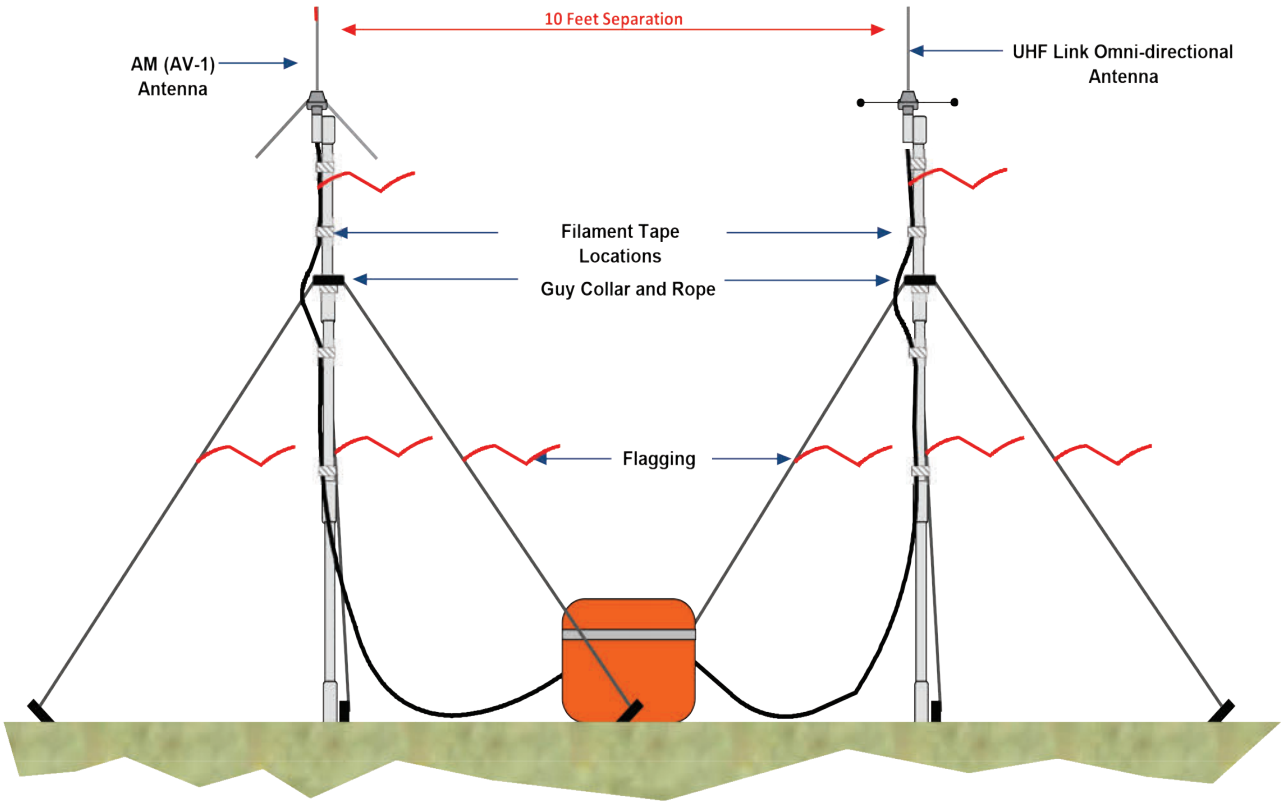


Figure 4:
4370 GROUND AIRCRAFT RADIO/LINK ANTENNA SETUP
LINK CONFIGURATION

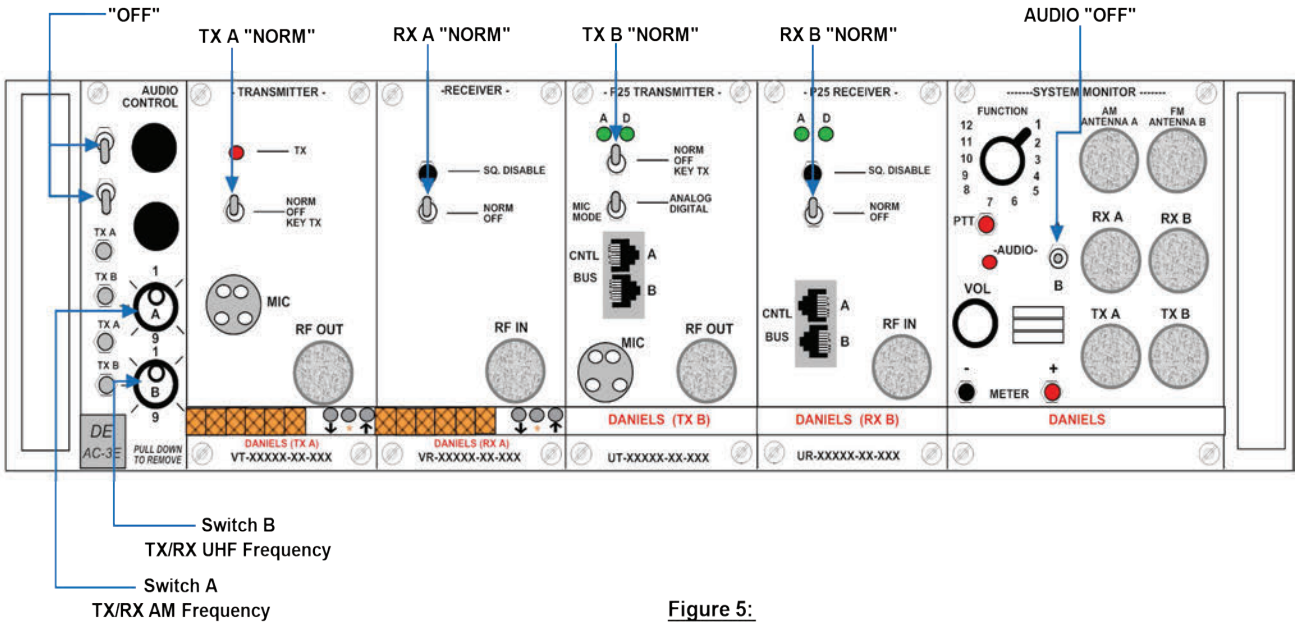


Figure 5:
4370 GROUND AIRCRAFT RADIO/LINK SWITCH SETTINGS
LINK CONFIGURATION

004410 PUBLIC ADDRESS KIT SETUP PROCEDURE

Primary Amplifier Only:

1. Power
   - Use **EITHER** AC power supply **OR** 10 D Cell batteries for power.

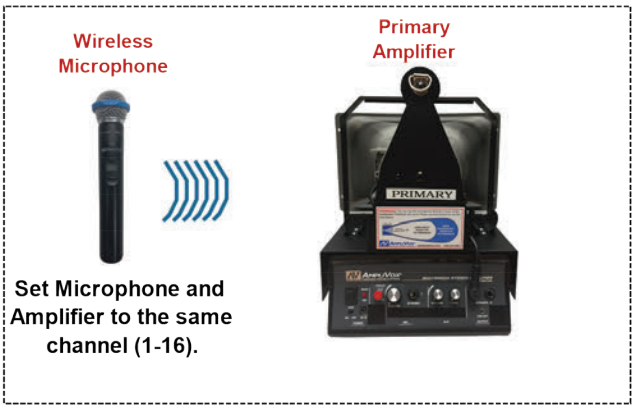
   *Note: Fore AC power supply, plug cable into the "**DC IN**" port on the Primary Amplifier.*

2. Wireless Option ***(See Figure 1)***
   - Set UHF WIRELESS RECEIVER on Primary Amplifier and Microphone to the same channel.

     Note: The channel selector for the UHF WIRELESS RECEIVER is located on the side of the Primary Amplifier.
   - Move Primary Amplifier "**AUX**" switch to the "**ON**" position.
   - On wireless microphone, press and hold "**POWER/MUTE**" button to turn ON or OFF.

     *Note: To change channels on the wireless microphone, remove the battery cover, press and hold "**SELECT**" button until "CHANNEL" is selected on the display, and then press "SELECT" button to select channel. Once the desired channel is selected, wait a few second for the display to stop blinking.*
   - Adjust "**MIC VOLUME**" to desired level while voice testing.

3. Wired microphone option ***(See Figure 2)***
   - Plug wired microphone cable into the "**DYNAMIC**" port.
   - Move Primary Amplifier "AUX" switch to the "ON" position.
   - Adjust "**MIC VOLUME**" to desired level while voice testing.



OR

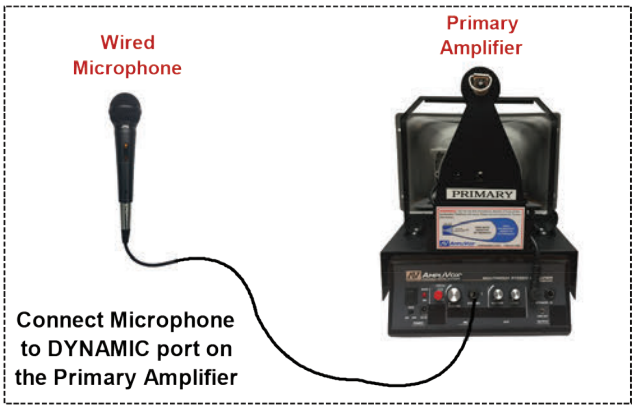


Figure 1
Primary Amplifier Using Wireless Microphone

Figure 2
Primary Amplifier Using Wired Microphone

Adding A Secondary Amplifier

1. Power
   - Use **EITHER** AC power supply **OR** 10 D Cell batteries for power on each Primary and Secondary Amplifier.

     *Note: Fore AC power supply, plug cable into the "**DC IN**" port on each Amplifier.*

2. Wireless Option ***(See Fegure 3)***
   - Connect the UHF Speaker Transmitter to the "**LINE OUT**" on the Primary Amplifier using the 40' cable
   - Set the UHF Speaker Transmitter and Secondary Amplifier to the same channel (1-14), and switch both units on.

     Note: The switches for the Secondary Amplifier's UHF WIRELESS RECEIVER are located on the side of the unit.
   - Move Secondary Amplifier "**AUX**" switch to the "**ON**" position.
   - Adjust the "**MIC VOLUME**" on the Secondary Amplifier to desired level while voice testing

3. Wired microphone option ***(See Figure 3)***
   - Connect Primary Amplifier "**LINE OUT**" to Secondary Amplifier "**LINE IN**" using the 40' cable.
   - Move Secondary Amplifier "**AUX**" switch to the "**OFF**" position.
   - Adjust the "**AUX VOLUME**" and "**TONE**" on the Secondary Amplifier to desired levels while voice testing.

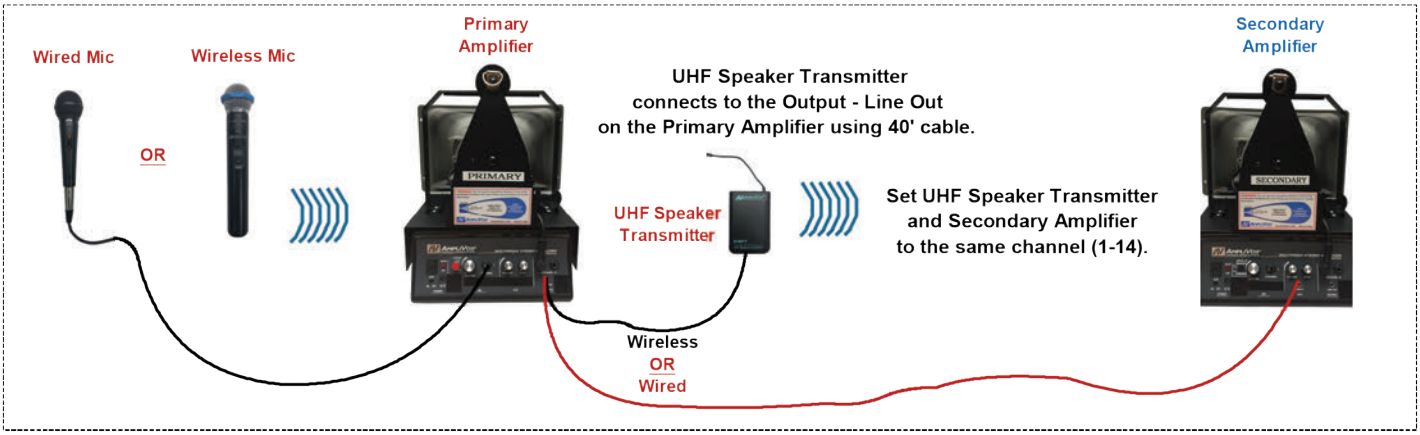


Figure 3
Adding a Wireless or Wired Secondary Amplifier

Using Both Amplifiers Independently

1. Power
   - Use EITHER AC power supply OR 10 D Cell batteries for each Amplifier.
     Note: For AC power supply, plug cable in "DC IN" on the Primary and Secondary Amplifier.

2 Primary Amplifier with wireless microphone ***(See Figure 4)***
   - Set UHF WIRELESS RECEIVER on Primary Amplifier and Microphone to the same channel.
     Note: The channel selector for the UHF WIRELESS RECEIVER is located on the side of the Primary Amplifier.
   - Move Primary Amplifier "**AUX**" switch to the "**ON**" position.
   - On wireless microphone, press and hold "**POWER/MUTE**" button to turn ON or OFF.
     *Note: To change channels on the wireless microphone, remove the battery cover, press and hold "**SELECT**" button until "CHANNEL" is selected on the display, and then press "SELECT" button to select channel. Once the desired channel is selected, wait a few second for the display to stop blinking.*
   - Adjust "**MIC VOLUME**" to desired level while voice testing.

3. Secondary Amplifier with wired microphone ***(See Figure 5)***
   - Plug wired microphone into the "**DYNAMIC**" port on Secondary Amplifier
   - Move Secondary Amplifier "**AUX**" switch to the "**OFF**" position.
   - Adjust the Secondary Amplifier "**MIC VOLUME**" to desired level while voice testing

Figure 4
Independently Primary Amplifier with Wireless Microphone

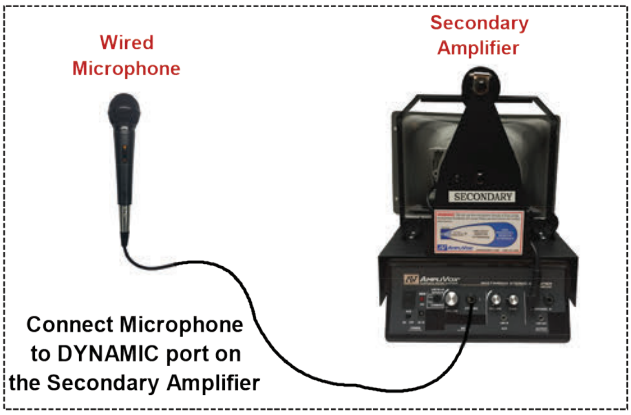


Figure 5
Independently Secondary Amplifier with Wired Microphone

004499 - AIR ATTACK KIT SETUP PROCEDURE

The NFES# 004499 Air Attack Kit is compact slip-in radio kit providing multiple VHF-FM radios for missions ranging from simple reconnaissance to complex Air Attack. The kit has two VHF-FM radios, two AUX-FM connections, and supports up to four operators. The kit operates on either 14 Volts DC or 28 Volts DC. Storage compartments in the kit hold no equipment.

1. **Kit Security:**
   The NFES# 004499 Air Attack Kit must be secured for safe flight using the kit's two silver "**D**" handles and the supplied adjustable straps. Secure the kit to any rigid structure in the cockpit (using common sense and keeping safety in mind).

2. **Voltage Selection:**
   The NFES# 004499 Air Attack Kit has automatic voltage selection for 14 Volts DC or 28 Volts DC. Automatic voltage selection is dependent upon the aircraft's power connector supplying the correct voltage to the Air Attack Kit.

3. **Aircraft Power and Audio Connections:**
   Aircraft must have an MS3112E12-3S (female) power connector (ground on pin B, and 14 Volts on pin C or 28 Volts on pin A). Only 14 or 28 Volts DC need be wired in the aircraft, **never wire both**. Attach power jumper cable from kit to MS3112E12-3S power connector in aircraft. Attach audio/mic jumper cable from kit to pilot's audio and mic jacks. **Aircraft mic jack must have PTT capability.**

4. **Antenna Connections:**
   Aircraft must have a minimum of two broadband VHF-FM aviation antennas installed (Comant type CI 177-1 or equivalent), using RG-58 A/U or better coax cable terminated with male BNC connectors. Connect the first two aircraft VHF-FM antenna cables to the kit's RADIO 1 ANT and RADIO 2 ANT connectors. A third or fourth aircraft VHF-FM antenna(s) connected to the AUX1 and AUX2 connections.

5. **TDFM-136 Radio Use:**
   Operation and programming instructions are provided with the kit. Visit NIICD's website for up-to-date radio instructions at: ***http://www.nifc.gov/NIICD/documents.html***

   Note: FM 1 MAIN/GUARD (upper radio) and FM 2 MAIN (lower radio) may be reprogrammed to suit user needs. FM 2 GUARD preset is locked out and must never be reprogrammed. FM 2 GUARD is dedicated to Air Guard operation (168.6250 - the emergency frequency).

6. **AUX-FM Connections:**
   Two AUX-FM connectors are located at the rear of the kit.

   Note: These connectors allow handheld radios to be operated through the kits's audio selector panels as AUX1 and AUX2. The user must supply a handheld radio and matching AUX-FM adapter cable. Use the supplied female BNC barrel connectors to mate the AUX-FM radio adapter to aircraft antenna cable for AUX-FM operation. Any type handheld radio using any frequency band may be used (dependent upon the installed aircraft antenna's frequency band capability).

7. **Audio Selector Panel:**
   The TAC-250 is a dual audio selector panel for the pilot (left) and ATGS (right). Two observer positions operate off the ATGS's audio selector panel. Attach observer headset adapter cord assemblies at the rear of the kit. Observer positions have the same radio receive, transmit, and VOX capability as selected by the ATGS's audio selector panel.

004499 - AIR ATTACK KIT SETUP PROCEDURE

7. Audio Selector Panel Continued:

Transmitter Radio Selections:

1. **COM** uses the aircraft's audio control system selector via the kit's audio/mic jumper cable
2. **FM1** is for upper VHF-FM radio (beside the TAC-250)
3. **FM2** is for the lower VHF-FM radio
4. **AUX1** is for the AUX-FM 1 connector
5. **AUX2** is for the AUX-FM 2 connector
6. **SC** is simulcast transmissions using **COM** and **FM1** radios. SC transmits on both radios simultaneously.

Note: The pilots' audio selector panel has transmit priority over the ATGS's audio selector panel when they both have the same radio selected on their respective transmitter selector switches. Keep in mind there are three transmitter selector switches:

(1) TAC-250 transmitter selector knob;
(2) TDFM-136 radio MAIN & GUARD switch; and
(3) the aircraft's audio control selector panel switch.

Receiver Audio Selections:

1. **COM** uses the aircraft's audio control system selector via the kit's audio/mic jumper cable
2. **FM1** is for upper VHF-FM radio (beside the TAC-250)
3. **FM2** is for the lower VHF-FM radio
4. **AUX1** is for the AUX-FM 1 connector
5. **AUX2** has no receiver selector (transmitter selector must be set on AUX2 to hear AUX2 audio)
6. **SC** "simulcast" receives both **COM** and **FM1** simultaneously at a reduced audio level

Audio Level:

A receiver is automatically selected when its companion transmitter is selected on the audio selector panel. Receive (RX) volume is the inner knob, with VOX volume level being the outer knob.

VOX (Voice Activated Intercom):

For no intercom, rotate the VOX knob fully CCW. Rotating vox knob CW adjusts VOX activation level accordingly. VOX volume level is the outer, knob with RX volume level being the inner knob.

NORMAL / EM / ISOL Switch:

1. **NORMAL** provides normal operation of VOX and amplified radio audio to all headset positions.
2. **EM** is emergency. The EM position operates in the same manner as the NORMAL position.
3. **ISOL** isolates the pilot's audio from the ATGS and both observers. The pilot will not be able to hear the ATGS or observers; however, the ATGS and observers will be able to hear the pilot and have normal intercom among themselves.

8. Other Information:

- Radio programming "D" connectors are located in the front of the kit.
- Both pilot and ATGS MICS jacks have PTT capability using supplied PT-300 adapters.
- 28 Volts DC power input uses the 7.5 amp circuit breaker and normally draws 3 amps while transmitting.
- 14 Volts DC power input uses the 15 amp circuit breaker and normally draws 8 amps while transmitting.

004670 - IRIDIUM SATELLITE PHONE KIT SETUP PROCEDURE

Note: To get adequate reception from the satellite phone, it must be operated in an open area with no overhead obstructions blocking the phone's line-of-sight communications with the satellite. The antenna must be fully extended while receiving and placing phone calls.

1. Power the unit on by pressing the "Power" soft key on the lower left corner of the keypad.
   The unit will display "**Enter PIN:**" after it boots up.

2. Enter the PIN number, **1111**, via the keypad and press the "**OK**" soft key.
   Wait about 10-15 seconds for phone to register with the satellite.
   Once the phone is registered with the satellite it will display "**Iridium**".
   At this time the phone is ready to receive and place phone calls.

3. **To place a phone call From the Satellite Phone To a Land Line or Cell Phone:**
   Press and hold the " **0+** " soft key until the " **+** " icon appears in the upper corner of the display.
   Dial 1, and the area code and number. ***(Example: 1-208-387-5644)***
   Press the "**OK**" soft key to connect the call.
   Note: When finished with the call, pressing the "OK" soft key ends the call.

4. **To place a phone call From the Satellite Phone To Another Satellite Phone:**
   Dial the 12-digit satellite phone number. ***(Example: 8816-414-89079)***
   Press the "**OK**" soft key to connect the call.

5. **To place a phone call To the Satellite Phone from a Land Line or Cell Phone:**
   Dial 011 and the 12-digit satellite phone number (located on the side of the box and on the phone).
   (Example: 011-8816-414-89078)

   Note: The end user must have the international access option enabled on their Land Line or Cell Phone to call the satellite number.

6. **Two-Stage Dialing To the Satellite Phone From a Land Line or Cell Phone <u>without</u> International Access enabled:**
   Dial 1-480-768-2500.
   When prompted, enter the 12-digit Iridium phone number and wait to be connected. ***(Example: 8816-414-89078)***

Note: Satellite Phones will be charged $1.65 per minute.

<u>If questions arise during setup, please call the CDO at: (208)387-5644</u>

Figure 1: 4670 Motorola Iridium Satellite Phone (Front View)

NIRSC EQUIPMENT

KIT INVENTORIES

004080 SOLAR PANEL KIT INVENTORY LIST

KIT WEIGHT	CU FT	DIMENSIONS (INCHES)
50 LBS	1.7	23 x 14 x 9

KIT COMPONENTS AND INVENTORY			
NFES#	**DESCRIPTION**	**QTY ISSUED**	**QTY RETURNED**
000825	Stakes, 8” Pin Panel	8 ea.	
004132	Charger Controller, 12Volt, 8Amp, ASC12/8A	1 ea.	
004133	Battery, Sealed Lead Acid, 35 Amp Hr, PS-12350	1 ea.	
004184	Solar Panel, Flexible 60 Watt, P3-62	1 ea.	
004807	Case, Pelican 1510NF	1 ea.	
	Rope, 1/4”, Low-Stretch Polyester, 10ft	8 ea.	
	Cable Assembly, NIRSC-CAB100	1 ea.	
	Cable Assembly, NIRSC-CAB110	1 ea.	
	Cable Assembly, NIRSC-CAB120	1 ea.	
	Fuses, Mini ATC, 10Amp	3 ea.	
	Installation Instructions	1 ea.	
	Sand Bags	8 ea.	
	Sand Bag Holder	2 ea.	
	Lead Box Seals	2 ea.	
	Kit, Inventory Worksheet	3 ea	

004240 AIRBASE ACCESSORIES KIT INVENTORY LIST

KIT WEIGHT	CU FT	DIMENSIONS (INCHES)
32 LBS	3.6	25 X 20 X 9

KIT COMPONENTS AND INVENTORY			
NFES#	**DESCRIPTION**	**QTY ISSUED**	**QTY RETURNED**
001086	Harness, Chest, Radio	5 ea.	
004059	Adapter, Headset to Radio, Icom, OPC-499	5 ea.	
004061	Headset, Aviation, David Clark, H10-21	5 ea.	
004062	Adapter, Helmet, U-92A/U to M642/5-1 & M642/4-1	5 ea.	
004138	PTT Switch. Remote, Icom, PTT SW	5 ea.	
004321	Radio, Aviation Handheld, Icom, IC-A6	5 ea.	
004405	Speaker Mic, Icom, HM-173	2 ea.	
004491	Holder, Battery, AA, Icom, BP-208N	5 ea.	
004492	Antenna, Icom, FA-B02AR	6 ea.	
004830	Battery, AA	60 ea.	
005088	Case, Pelican-1600	1 ea.	
004147	Belt Clip	5 ea	
	Radio Quick Reference Card, Icom, IC-A6	5 ea.	
	Frequency Sheet, Icom	2 ea.	
	T-Cards, Radio Tracking	25 ea.	
	Pads, Alcohol, Headset Cleaning	15 ea.	
	Lead Box Seals	2 ea.	

4244X2 UHF RADIO KIT INVENTORY LIST (MOTOROLA XTS 2500)

KIT WEIGHT	CU FT	DIMENSIONS (INCHES)
75 LBS	3.5	20 X 21 X 15

KIT COMPONENTS AND INVENTORY			
NFES#	**DESCRIPTION**	**QTY ISSUED**	**QTY RETURNED**
004306	Liner, foam, radio kit	1 ea	
004309	Box, fiberglass, (radio & rptr)	1 ea	
004355	Antenna, mobile mag,UHF	4 ea	
004535	Radio,Motorola,UHF, XTS-2500 (capitalized)	16 ea	
004537	Holder, battery, AA, XTS-2500	16 ea	
004540	Antenna, UHF, XTS-2500	19 ea	
004542	Case, radio, XTS-2500	16 ea	
004543	Speaker/mic, XTS-2500	4 ea	
004544	Cable, cloning, XTS-2500	4 ea	
004830	Batteries, AA	384 ea	
	T-cards, radio tracking	32 ea	
	Kit inventory worksheets	3 ea	
	Lead box seals	2 ea	
	Radio tracking sheets	3 ea	
	Frequency sheets	3 ea	
004242	Adapter - Mobile Mag	4 ea	
	Radio Programming Guide	1 ea	

4244MD UHF RADIO KIT INVENTORY LIST (MIDLAND)

KIT WEIGHT	CU FT	DIMENSIONS (INCHES)
75 LBS	3.5	20 X 21 X 15

KIT COMPONENTS AND INVENTORY			
NFES#	**DESCRIPTION**	**QTY ISSUED**	**QTY RETURNED**
004075	Case, radio, Midland	16 ea	
004076	Antenna, UHF, Midland	19 ea	
004077	Holder, battery, AA, Midland	16 ea	
004078	Speaker/mic, Midland	4 ea	
004079	Cloning Cable, Midland	1 ea	
004169	Radio, Midland, (capitalized)	16 ea	
004306	Liner, foam, radio kit	1 ea	
004309	Box, fiberglass, (radio & rptr)	1 ea	
004355	Antenna, mobile mag.	4 ea	
004830	Batteries, AA	192 ea	
	T-cards, radio tracking	32 ea	
	Kit inventory worksheets	3 ea	
	Lead box seals	2 ea	
	Radio tracking sheets	3 ea	
	Frequency sheets	3 ea	
004130	Adapter - Mobile Mag	4 ea	
	Radio Programming Guide	1 ea	

004248 UHF REPEATER KIT INVENTORY LIST

WEIGHTS	CU FT	DIMENSIONS (INCHES)	TOTAL WEIGHT & CU FT
(KIT) 80 LBS (MAST) 9 LBS	(KIT) 3.5 (MAST) 0.3	(KIT) 20 X 21 X 15 (MAST) 60 X 3 X 3	89 LBS 3.8 CU FT

KIT COMPONENTS AND INVENTORY			
NFES#	**DESCRIPTION**	**QTY ISSUED**	**QTY RETURNED**
000825	Tent stakes	3 ea	
001023	Batteries, 7.5 Volt	4 ea	
004171	Screwdriver, 6” straight slot	1 ea	
004180	Connector, 90 degree, UHF	1 ea	
004297	Duplexer, UHF	1 ea	
004303	Hammer, 4 lb	1 ea	
004304	Antenna, UHF, whip, w/po-UHF load	1 ea	
004305	Masts, antenna, 5 ft. sect.	3 ea	
004308	Guy assembly, antenna	1 ea	
004309	Box, fiberglass, (radio & rptr)	1 ea	
004326	Cable, coaxial w/2 ea 4327 (pl-259)	1 ea	
004333	Wire assembly, fused	1 ea	
004339	Adapter, barrel connector	1 ea	
004489	Base antenna, UHF w/gnd planes	1 ea	
004648	Card, Audio Control, 4L-10	1 ea	
004651	Subrack	1 ea	
004652	System monitor	1 ea	
004659	Microphone, Daniels	1 ea	
004677	Cable, UHF duplexer to radio	2 ea	
004682	Transmitter, UHF, P25	1 ea	
004683	Receiver, UHF, P25	1 ea	
004690	Screwdriver, Daniels	1 ea	
	Power cord, w/ female cinch connector	1 ea	
	Battery straps, 15 volt	3 ea	
	Fuses, 3 ag 5 amp	1 bx	
	Battery jumpers, 4-red, 4-black	8 ea	
	Garbage bag	1 ea	
	Filament tape	1 ro	
	Flagging tape	1 ro	
	Allen wrench	1 ea	
	Kit inventory worksheets	3 ea	
	Switch setting diagram (laminated)	1 ea	
	Battery & antenna set-up sheets	3 ea	
	Lead box seal	2 ea	
	Double Battery Setup (Laminated Card)	1 ea	

004250 MAFFS TACTICAL RADIO KIT INVENTORY LIST

KIT WEIGHT	CU FT	DIMENSIONS (INCHES)
29 LBS	3.5	20 X 21 X 15

KIT COMPONENTS AND INVENTORY			
NFES#	**DESCRIPTION**	**QTY ISSUED**	**QTY RETURNED**
004601	Antenna, VHF, King	10 ea.	
004603	Radio, King, DPHx (capitalized)	6 ea.	
004609	Box, Fiberglass, Small, Grey	1 ea.	
004830	Batteries, AA	108 ea.	
005330	Speaker/Mic, King	2 ea.	
005331	Case, Radio, King	6 ea.	
	Kit inventory worksheets	3 ea	
	Lead box seals	2 ea	
	Radio tracking sheets	3 ea	
	Frequency sheets	3 ea	
	T-Cards, Radio Tracking	12 ea	

004260 MAFFS LAPTOP KIT

TOTAL WEIGHT (KIT)	CU FT	DIMENSIONS (INCHES)
32 LBS	3.5	25 X 20 X 12

KIT COMPONENTS AND INVENTORY			
NFES#	**DESCRIPTION**	**QTY ISSUED**	**QTY RETURNED**
004136	Ethernet Cable, 25 ft.	1 ea.	
004233	USB Drive, 16 GB	1 ea.	
004522	Mouse, Cordless	1 ea.	
004649	Cell Phone, LG Cosmos 3 (Controlled) w/case	1 ea.	
004812	Case, Pelican 1610	1 ea.	
009449	Laptop, HP 8470p (Controlled)	1 ea.	
	Power Adapter, Laptop HP 8470p	1 ea.	
	Power Cord, AC, Laptop HP 8470p	1 ea.	
	Power Cord, Cell Phone, AC	1 ea.	
	Power Cord, Cell Phone, DC	1 ea.	
	Instruction Binder	1 ea.	
	Lead Box Seals	2 ea.	
	Kit Inventory Worksheets	3 ea	

004300 GROUND VHF-AM BASE STATION KIT

WEIGHTS	CU FT	DIMENSIONS INCHES	TOTAL WEIGHTS AND CU FT
(KIT) 80 LBS (MAST) 18 LBS	(KIT) 3.5 (MAST) 0.6	(KIT) 20 X 21 X 15 (MAST) 2 each @ 60 X 3 X 3	98 LBS 4.1 CU FT

KIT COMPONENTS AND INVENTORY			
NFES #	**DESCRIPTION**	**QTY ISSUED**	**QTY RETURNED**
000332	Wrench, adjustable, 6”	1 ea	
000825	Tent stakes	3 ea	
001023	Battery, 7.5 volt	4 ea	
004171	Screwdriver, 6” straight slot	1 ea	
004147	Belt Clip, Icom, IC-A6	4 ea	
004303	Hammer, 4 lb	1 ea	
004305	Masts, antenna, 5 ft section	3 ea	
004307	Liner, a/c 5-pocket	1 ea	
004308	Guy assembly, antenna	1 ea	
004309	Box, fiberglass, (radio & rptr)	1 ea	
004326	Cable, coaxial, w/2 ea 4327 (pl-259)	2 ea	
004339	Adapter, barrel connector	2 ea	
004343	Antenna, VHF-AM, AV-1	1 ea	
004321	Radio,Icom,IC-A6(capitalized)	4 ea	
004476	Base Station, VHF-AM, #TBS-150	1 ea	
004830	Battery, AA	48 ea	
005066	Mic. (Telex) w/three pin male connector	1 ea	
004492	Antenna, Icom, FA B02AR	5 ea	
004491	Holder, Battery, AA, Icom	4 ea	
	N. male to UHF female adapter (rfn-1035-1)	1 ea	
	120 volt ac power cord (TBS-150)	1 ea	
	Battery jumpers, 4-red, 4-black	8 ea	
	Battery straps, 15-volt	3 ea	
	Fuses, 2AG, 5 amp mini (1 box)	5 ea	
	Fuses, 3AG, 5 amp (1 box)	5 ea	
	Fuses MDL, 2.5 amp (1 box)	5 ea	
	Kit inventory worksheets	3 ea	
	Battery & antenna set-up sheets	3 ea	
	Installation instruction sheets	3 ea	
	Frequency sheets for Icoms	4 ea	
	Lead box seal	2 ea	
	Garbage bag	1 ea	
	Filament tape	1 ro	
	Flagging tape	1 ro	
	Instruction manual (TBS-150)	1 ea	
	Operating booklet, Icom	1 ea	
	T-cards, radio tracking	8 ea	

004312 VHF COMMAND REPEATER/LINK

WEIGHT	CU FT	DIMENSIONS (INCHES)	TOTAL WEIGHTS AND CU FT
(KIT) 95 LBS (MAST) 18 LBS	(KIT) 3.5 (MAST) 0.6	(KIT) 20 X 21 X 15 2 EACH @ 60 X 3 X 3	113 LBS 4.1 CU FT

KIT COMPONENTS AND INVENTORY			
NFES #	**DESCRIPTION**	**QTY ISSUED**	**QTY RETURNED**
000825	Tent stakes	6 ea	
000968	User's Guide	1 ea	
001023	Batteries, 7.5 Volt	4 ea	
004171	Screwdriver, 6" straight slot	1 ea	
004180	Connector, 90 degree, UHF	2 ea	
004303	Hammer, 4 lb	1 ea	
004304	Antenna, UHF whip, with PO-UHF load	1 ea	
004305	Masts, antenna, 5 ft. section	6 ea	
004308	Guy assembly, antenna	2 ea	
004309	Box, fiberglass, (radio & rptr)	1 ea	
004326	Cable, coaxial w/2 ea 4327 (pl-259)	2 ea	
004333	Wire assembly, fused	1 ea	
004339	Adapter, barrel connector	2 ea	
004342	Duplexer, VHF	1 ea	
004464	Antenna, VHF whip, with PO-150 load	1 ea	
004489	Base antenna, w/grnd planes(1-VHF 1-UHF)	2 ea	
004648	Card, Audio Control, 4L-10	1 ea	
004651	Subrack	1 ea	
004652	System monitor	1 ea	
004659	Microphone, Daniels	1 ea	
004676	Cable, VHF duplexer to radio	2 ea	
004678	Cable, UHF transmitter to monitor	1 ea	
004679	Cable, UHF receiver to monitor	1 ea	
004682	Transmitter, UHF, P25	1 ea	
004683	Receiver, UHF, P25	1 ea	
004684	Transmitter, VHF, P25	1 ea	
004685	Receiver, VHF, P25	1 ea	
004690	Screwdriver, Daniels	1 ea	
005208	Antenna, Yagi, w/ u-bolt, clamp, nuts	1 ea	
	Power cord w/female cinch connector	1 ea	
	Battery straps, 15 volt	3 ea	
	Fuses, 3 ag 5 amp	1 bx	
	Battery jumpers, 4-red, 4-black	8 ea	
	Garbage bag	1 ea	
	Filament tape	1 ro	
	Flagging tape	1 ro	
	Allen wrench	1 ea	

004312 COMMAND REPEATER/LINK (CONTINUED)

KIT COMPONENTS AND INVENTORY			
NFES #	**DESCRIPTION**	**QTY ISSUED**	**QTY RETURNED**
	Kit inventory worksheets	3 ea	
	Switch setting diagrams (laminated)	2 ea	
	Battery & antenna set-up sheets	3 ea	
	Frequency sheets for UHF link	3 ea	
	Lead box seal	2 ea	
	Double Battery Set-up (Laminated Cards)	**1 ea**	

004320 COML KIT

TOTAL WEIGHT (KIT)	CU FT	DIMENSIONS (INCHES)
30 LBS	1.63	20.62 X 16.87 X 8.12

KIT COMPONENTS AND INVENTORY			
NFES #	**DESCRIPTION**	**QTY ISSUED**	**QTY RETURNED**
001034	Holder - Radio Battery	1 ea	
004146	Holder - Radio Battery, AA, KNG	1 ea	
004239	Radio - King KNG - VHF, P150s	1 ea	
04235	Radio - Midland - VHF	1 ea	
004247	Cable - Cloning, King-KNG/Legacy	1 ea	
004169	Radio - Midland, UHF	1 ea	
004077	Holder - Battery, Midland	2 ea	
004079	Cable - Cloning, Midland, P/N ACC-2305G	1 ea	
004535	Radio-Motorola XTS2500, MD1III, UHF	1 ea	
004537	Holder - Battery, AA, For Motorola XTS2500	1 ea	
004541	Holder - Battery, AA, Motorola Xts300 (Datron)	1 ea	
004544	Cable-Cloning, Motorola Radio, P/N RKN4108	1 ea	
004602	Cable - Cloning, King DPH, P/N E/GCC	1 ea	
004603	Radio - King, VHF, Digital, DPHX	1 ea	
004830	Battery, AA	82 ea	
005085	Case, Pelican, 1550	1 ea	
	Programming/Cloning Instructions For King DPHX	1 ea	
	Programming/Cloning Instructions For Motorola XTS2500	1 ea	
	Programming/Cloning Instructions For King KNG	1 ea	
	Programming/Cloning Instructions For Midland	1 ea	
	Kit Inventory Worksheets	3 ea	
	Lead Seals	2 ea	

4330MD MIDLAND REMOTE KIT

WEIGHT	CU FT	DIMENSIONS (INCHES)	TOTAL WEIGHT AND CU FT
(KIT) 98 LBS (MAST) 9 LBS	(KIT) 3.5 (MAST) 0.3	(KIT) 20 X 21 X 15 (MAST) 60 X 3 X 3	104 LBS 3.8 CU FT

KIT COMPONENTS AND INVENTORY			
NFES #	**DESCRIPTION**	**QTY ISSUED**	**QTY RETURNED**
000325	Pliers, lineman	1 ea	
000825	Tent stakes	3 ea	
001023	Battery, 7.5 volt	4 ea	
004169	Radio, Midland, UHF (capitalized)	1 ea	
004171	Screwdriver, 6” straight slot	1 ea	
004180	Connector, 90 degree, UHF	1 ea	
004234	Battery eliminator, Midland	1 ea	
004235	Radio, Midland, VHF (capitalized)	1 ea	
004236	Cable/connector assy, Midland	1 ea	
004274	Ac/dc transformer	1 ea	
004302	Wire assembly, fused, dc/1 amp 3-hole	1 ea	
004303	Hammer, 4 lb	1 ea	
004304	Antenna, UHF whip w/ po-UHF load	1 ea	
004305	Masts, antenna, 5 ft section	3 ea	
004308	Guy assembly, antenna	1 ea	
004309	Box, fiberglass (radio & rptr)	1 ea	
004326	Cable, coaxial w/ 2 ea 4327 (PL-259)	1 ea	
004332	Wire, field telephone, ¼ mile reel	1 ro	
004339	Adapter, barrel connector	1 ea	
004409	Speaker, external, 8-ohm	1 ea	
004464	Antenna, VHF whip w/ po-150 load	1 ea	
004471	Gray box for remote chassis	1 ea	
004473	Desk set, CPI, Mod. DR-10	1 ea	
004489	Base antenna, w/ grnd planes - VHF	1 ea	
004489	Base antenna, w/ grnd planes – UHF	1 ea	
005208	Antenna, Yagi, w/u-bolt, clamp, nuts	1 ea	
005338	Box, aluminum – (5 ¾ x 3 ¾ x 2)	1 ea	
005342	Panel termination	1 ea	
004333	External power cord w/2-prong plug/dc	1 ea	
	Kit inventory worksheets	3 ea	
	Frequency sheet (VHF/ UHF)	1 ea	
	Battery & Antenna set-up (Laminated Sheet)	1 ea	
	Allen wrench	1 ea	
	Lead box seal	2 ea	
	Garbage bag	1 ea	
	Fuses 1 amp (for telephone only)	1 bx	
	Wire nuts	6 ea	

4330MD MIDLAND REMOTE KIT (CONTINUED)

KIT COMPONENTS AND INVENTORY			
NFES #	**DESCRIPTION**	**QTY ISSUED**	**QTY RETURNED**
	Battery jumpers, 3 Red, 3 Black	6 ea	
	Filament tape	1 ro	
	Flagging tape	1 ro	
	Fuse, 5 amp (for chassis only)	1 ea	
	Midland Programming Guide	1 ea	

4330X2 MOTOROLA REMOTE KIT

WEIGHTS	CU FT	DIMENSIONS (INCHES)	TOTAL WEIGHT AND CU FT
(KIT) 95 LBS (MAST) 9 LBS	(KIT) 3.5 (MAST) 0.3	20 X 21 X 15 60 X 3 X 3	104 LBS 3.8 CU FT

KIT COMPONENTS AND INVENTORY			
NFES #	**DESCRIPTION**	**QTY ISSUED**	**QTY RETURNED**
000325	Pliers, lineman	1 ea	
000825	Tent stakes	3 ea	
001023	Battery, 7.5 volt	4 ea	
004171	Screwdriver, 6” straight slot	1 ea	
004180	Connector, 90 degree, UHF	1 ea	
004274	Ac/dc transformer	1 ea	
004302	Wire assembly, fused, dc/1 amp 3-hole	1 ea	
004303	Hammer, 4 lb	1 ea	
004304	Antenna, UHF whip w/ po-UHF load	1 ea	
004305	Masts, antenna, 5 ft section	3 ea	
004308	Guy assembly, antenna	1 ea	
004309	Box, fiberglass (radio & rptr)	1 ea	
004326	Cable, coaxial w/ 2 ea 4327 (PL-259)	1 ea	
004332	Wire, field telephone, ¼ mile reel	1 ro	
004339	Adapter, barrel connector	1 ea	
004409	Speaker, external, 8-ohm	1 ea	
004464	Antenna, VHF whip w / po-150 load	1 ea	
004466	Motorola Radio, VHF, XTS5000 (capitalized)	1 ea	
004471	Gray box for remote chassis	1 ea	
004480	Dc Handset w/ DTMF Keypad	1 ea	
004489	Base antenna, w/ grnd planes - VHF	1 ea	
004489	Base antenna, w/ grnd planes - UHF	1 ea	
004535	Motorola Radio, UHF, XTS2500 (capitalized)	1 ea	
005208	Antenna, yagi, w/u-bolt, clamp, nuts	1 ea	
005338	Box, aluminum – (5 ¾ x 3 ¾ x 2)	1 ea	
005341	Cable / connector assy, Motorola	1 ea	
005342	Panel, termination	1 ea	
005344	Battery eliminator, Motorola XTS5000	1 ea	
005346	Battery eliminator, Motorola XTS2500	1 ea	
004333	External power cord w/2- prong plug/dc	1 ea	
	Kit inventory worksheets	3 ea	
	Frequency sheet (VHF/UHF)	1 ea	
	Battery & antenna set-up (Laminated Sheet)	1 ea	
	Allen wrench	1 ea	
	Lead box seal	2 ea	
	Garbage bag	1 ea	
	Fuses 1 amp (for telephone only)	1 bx	

4330X2 MOTOROLA REMOTE KIT (CONTINUED)

KIT COMPONENTS AND INVENTORY			
NFES #	**DESCRIPTION**	**QTY ISSUED**	**QTY RETURNED**
	Wire nuts	6 ea	
	Battery jumpers, 3 Red, 3 Black	6 ea	
	Filament tape	1 ro	
	Flagging tape	1 ro	
	Fuse, 5 amp (for chassis only)	1 ea	
	Motorola XTS 2500 & XTS 5000 Programming Guide	1 ea	

004370 GROUND AIRCRAFT RADIO/LINK KIT (BOX 1 OF 2)

WEIGHTS	CU FT	DIMENSIONS (INCHES)	TOTAL WEIGHT AND CU FT
(BOX 1) 69 LBS (BOX 2) 26 LBS (MAST) 18 LBS	(BOX 1) 3.5 (BOX 2) 2.0 (MAST) 0.6	(BOX 1) 20 X 21 X 15 (BOX 2) 21 X 17 X 8 (MAST) 2 each @ 60 X 3 X 3	113 LBS 6.1 CU FT

KIT COMPONENTS AND INVENTORY			
NFES #	**DESCRIPTION**	**QTY ISSUED**	**QTY RETURNED**
001023	Battery, 7.5 volt	4 ea	
004180	Connector, 90 degree, UHF	2 ea	
004304	Antenna, UHF whip, with Po-UHF load	1 ea	
004305	Masts, Antenna, 5 ft. section	6 ea	
004307	Liner, foam 5 pocket	1 ea	
004309	Box, Fiberglass, (radio & rptr)	1 ea	
004326	Cable, Coaxial w/2 ea 4327 (pl-259)	2 ea	
004339	Adapter, barrel connector	2 ea	
004343	Antenna, VHF/AM, AV-1	1 ea	
004321	Radio,Icom,IC-A6	4 ea	
004409	Speaker, external, 8-ohm	1 ea	
004489	Base antenna, UHF w/gnd planes	1 ea	
004651	Sub-rack, with motherboard, SR39-1	1 ea	
004659	Microphone, Daniels	1 ea	
004665	Monitor, System	1 ea	
004666	Transmitter, syn. VHF-AM	1 ea	
004667	Receiver, syn. VHF-AM	1 ea	
004668	Cable, receiver, A-side	1 ea	
004669	Cable, transmitter, A-side	1 ea	
004675	Card, control, audio(AC-3E)	1 ea	
004678	Cable, co-ax, B-side transmit	1 ea	
004679	Cable, co-ax, B-side receive	1 ea	
004682	Transmitter, UHF	1 ea	
004683	Receiver, UHF	1 ea	
004492	Antenna, Icom FA - B02AR	5 ea	
004491	Holder, battery, AA, Icom, BP208N	4 ea	
004243	Case, Leather, Icom A-6	4 ea	
004333	Power cord with female cinch connector	1 ea	
	Power cord (female cinch conn. to alligator clip)	1 ea	
	Battery straps, 15 volt	3 ea	
	Battery jumpers, 4-red, 4-black	8 ea	
	Fuses, 3AG-5 AMP (5 each)	1 bx	
	Allen wrench	1 ea	
	Lead box seal	2 ea	
	Operating booklet, Icom	1 ea	
	Frequency sheet for Icoms	4 ea	
	Frequency sheet, UHF	3 ea	

004370 GROUND AIRCRAFT RADIO/LINK KIT (BOX 1 OF 2) CONT.

KIT COMPONENTS AND INVENTORY			
NFES #	**DESCRIPTION**	**QTY ISSUED**	**QTY RETURNED**
	Battery & antenna set-up sheets	3 ea	
	Kit inventory worksheet	3 ea	
	T-card, radio tracking	8 ea	
	Installation Instruction sheet	3 ea	
	Switch setting diagrams, base/link laminated	2 ea	

004370 GROUND AIRCRAFT RADIO/LINK KIT (BOX 2 OF 2)

KIT COMPONENTS AND INVENTORY			
NFES #	**DESCRIPTION**	**QTY ISSUED**	**QTY RETURNED**
000332	Wrench, Adjustable, 6 in.	1 ea.	
000825	Tent Stakes	6 ea.	
004171	Screwdriver, 6” Straight Slot	1 ea.	
004303	Hammer, 4 lb.	1 ea.	
004308	Guy Assembly	2 ea.	
004690	Screwdriver, Daniels	1 ea.	
004830	Battery, AA	80 ea	
005085	Pelican Box,Black	1 ea.	
	Filament Tape	1 ro.	
	Flagging Tape	1 ro.	
	Garbage bag	1 ea.	

004381KD KING DPHX COMMAND/TACTICAL RADIO KIT

TOTAL WEIGHT (KIT)	CU FT	DIMENSIONS (INCHES)
85 LBS	3.5	20 X 21 X 15

KIT COMPONENTS AND INVENTORY			
NFES #	**DESCRIPTION**	**QTY ISSUED**	**QTY RETURNED**
001034	Holder, battery, AA, King	16 ea	
004306	Liner, foam, radio kit	1 ea	
004309	Box, fiberglass, (radio & rptr)	1 ea	
004355	Antenna, mobile mag	4 ea	
004601	Antenna, VHF, King	19 ea	
004602	Cloning Cable, King DPHx	1 ea	
004603	Radio King, DPHx (capitalized)	16 ea	
004830	Batteries, AA	288 ea	
005330	Speaker/mic, King	4 ea	
005331	Case, radio, King	16 ea	
005350	Antenna adapter, mobile mag, King	4 ea	
	T-cards, radio tracking	32 ea	
	Kit inventory worksheets	3 ea	
	Lead box seals	2 ea	
	Radio tracking sheets	3 ea	
	Frequency sheets	3 ea	

004381KP KING KNG COMMAND/TACTICAL RADIO KIT

TOTAL WEIGHT (KIT)	CU FT	DIMENSIONS (INCHES)
85 LBS	3.5	20 X 21 X 15

KIT COMPONENTS AND INVENTORY			
NFES #	**DESCRIPTION**	**QTY ISSUED**	**QTY RETURNED**
004145	Antenna, VHF, KNG	19 ea	
004239	Radio, King-KNG, P150s	16 ea	
004187	Case, radio, KNG	16 ea	
004146	Holder, Battery, AA, KNG	16 ea	
004241	Speaker Mic, KNG	16 ea	
004238	Cloning Cable, King KNG P150s	1 ea	
004306	Liner, foam, radio kit	1 ea	
004309	Box, Fiberglass	1 ea	
004355	Antenna, mobile mag	4 ea	
004830	Batteries, AA	320 ea	
004130	Adapter, Mobile Mag SMA (m) to UHF (f)	4 ea	
	T-cards, radio tracking	32 ea	
	Kit inventory worksheets	3 ea	
	Lead box seals	2 ea	
	Radio tracking sheets	3 ea	
	Frequency sheets	3 ea	

004390 STARTER SYSTEM

WEIGHT	CU FT	DIMENSIONS (INCHES)	TOTAL WEIGHT AND CU FT
(KITS) 783 LBS (MAST) 63 LBS	(KITS) 32.8 (PELICAN) 1.7 (MASTS) 2.1	9 EACH @ 20 X 21 X 15 1 EACH @ 21 X 17 X 18 7 EACH @ 60 X 3 X 3	846 LBS 36.6 CU FT

KIT COMPONENTS AND INVENTORY			
NFES #	**DESCRIPTION**	**QTY ISSUED**	**QTY RETURNED**
004244	LOGISTICS RADIO KIT	1 ea	
004248	LOGISTICS REPEATER	1 ea	
004305	MASTS, ANTENNA 5 FT SECTIONS	21 ea	
004312	COMMAND REPEATER/LINK	1 ea	
004330	REMOTE KIT	2 ea	
004370	GROUND AIRCRAFT RADIO/LINK KIT	1 ea	
004381	CMD/TAC RADIOS	3 ea	

004410 PUBLIC ADDRESS KIT

TOTAL WEIGHT (KIT)	CU FT	DIMENSIONS (INCHES)
22 LBS	3.5	20 X 21 X 15

KIT COMPONENTS AND INVENTORY			
NFES #	**DESCRIPTION**	**QTY ISSUED**	**QTY RETURNED**
000033	Battery, D	2 PKG	
004170	Transmitter, Wireless (S1600T)	1 ea	
004176	Cable, PA 40 ft (C200-0025)	1 ea	
004177	AC Adapter (S1460)	2 ea	
004178	Battery Pack/Holder, D Cell (A550-0005)	2 ea	
004181	PA, Wireless Amp w/horn and wireless receiver (SW615A)	1 ea	
004182	PA, Wireless, Secondary w/horn (S1244-70)	1 ea	
004183	Microphone, Wireless (S1605)	1 ea	
004309	Box, Fiberglass	1 ea	
004830	Battery, AA	6 ea	
004313	Microphone, Wired	1 ea	
	Garbage Bag	1 ea	
	Filament Tape	1 ea	
	Flagging Tape	1 ea	
	Kit Inventory Worksheets	3 ea	
	Lead Box Seal	2 ea	
	Installation Instructions	1 ea	

004420 MAFFS PRINTER NETWORK KIT (BOX 1 OF 2)

WEIGHT	CU FT	DIMENSIONS (INCHES)	TOTAL WEIGHT AND CU FT
(BOX 1) 76 LBS (BOX 2) 41 LBS	(BOX 1) 6.52 (BOX 2) 2.56	33.36 X 28.44 X 18.23 24.64 X 19.39 X 13.78	117 LBS 9.08 CU FT

KIT COMPONENTS AND INVENTORY			
NFES #	**DESCRIPTION**	**QTY ISSUED**	**QTY RETURNED**
004523	Wi-Fi, Verizon AC791L(accountable)	1 ea.	
004340	Printer, HP, Officejet Pro 8600	1 ea.	
004808	Case, Pelican, 1690	1 ea.	
	Kit Instruction Binder (includes)	1 ea.	
	Driver CD, HP Officejet Pro 8600	1 ea.	
	Inventory Sheet	2 ea.	
	Lead Box Seal	2 ea.	
	Hotspot (includes the following items)	1 ea.	
	Case, Pelican, 1060, Yellow	1 ea.	
	Power Adapter, AC/DC, Verizon Wi-Fi	1 ea.	
	Cable, Micro USB	1 ea.	
	Power Cord, Printer	1 ea.	

004420 MAFFS PRINTER NETWORK KIT (BOX 2 OF 2)

004185	Extension Cord, 16 AWG/3, 25 ft.	1 ea.	
004233	USB Drive, 16 GB	1 ea.	
004254	Ink Cartridge, HP, Black, 950XL	2 ea.	
004255	Ink Cartridge, HP, Cyan, 951XL	2 ea.	
004256	Ink Cartridge, HP, Magenta, 951XL	2 ea.	
004257	Ink Cartridge, HP, Yellow, 951XL	2 ea.	
004809	Case, Pelican, 1620	1 ea.	
	Paper Ream, Letter	2 ea.	
	Telephone Cord, 8 ft.	1 ea.	
	Telephone Cord, 6 ft.	1 ea.	
	Inventory Sheet	2 ea.	
	Lead Box Seal	2 ea.	
	Power Adapter, 3 Way	**1 ea.**	

004499 AIR ATTACK KIT

TOTAL WEIGHT (KIT)	CU FT	DIMENSIONS (INCHES)
35 LBS	3.35	24.5 X 14 X 17

KIT COMPONENTS AND INVENTORY			
NFES #	**DESCRIPTION**	**QTY ISSUED**	**QTY RETURNED**
004339	Connector, Barrel, BNC	2 ea	
004066	Radio, TDFM-136, or TDFM136B, P25	2 ea	
004479	Chassis, Air Attack (Model TAK 100)	1 ea	
004490	Strap, Tie Down	2 ea	
005086	Pelican Case, Tan	1 ea	
	Adapter, PTT, PT-300	2 ea	
	Cable, Power	1 ea	
	Cable, Audio/Mic	1 ea	
	Adapter, Headset, 6 Pin	2 ea	
	Operator's Guide,TDFM-136 or TDFM-136B	1 ea	
	Information Sheet, Air Attack	2 ea	
	Information Sheet, TDFM-136 or TDFM-136B Quick Ref. Guide	2 ea	

004604 AIR ATTACK TRAINING KIT

TOTAL WEIGHT (KIT)	CU FT	DIMENSIONS (INCHES)
55 LBS	4.5	20 X 32 X 12

KIT COMPONENTS AND INVENTORY			
NFES #	**DESCRIPTION**	**QTY ISSUED**	**QTY RETURNED**
004059	Radio Adapter, IC-A3, OPC-449	1 ea.	
004060	Headset, Aviation, Dual Impedance, David Clark, H10-66	1 ea.	
004062	Adapter, Helmet, U-92A/U to M642/5-1 & M642/4-1	2 ea.	
004180	BNC 90 Degree Adapter, BNC	1 ea.	
004228	Power Supply, 12VDC/20 Amp, Astron	1 ea.	
004339	BNC Barrel Adapter	1 ea.	
005086	Pelican Case, Black	1 ea.	
005328	Headset Adapter, King	1 ea.	
004061	Headset, David Clark, H10-21	**1 ea.**	
	Antenna, VHF, BNC	2 ea.	
	Cable, RF, 12 inch	1 ea	
	Cable, RF, 6 inch, RG-174	2 ea.	
	Dummy Load, 25 Watt	2 ea.	
	Instruction Booklet	1 ea.	

004660 AIRBASE KIT (IC-A6 RADIOS) BOX 1 0F 2

WEIGHT	CU FT	DIMENSIONS (INCHES)	TOTAL WEIGHT AND CU FT
(BOX 1) 51 LBS (BOX 2 35 LBS (MAST) 18 LBS	(BOX 1) 3.5 (BOX 2) 3.5 (MAST) 0.6	33.36 X 28.44 X 18.23 24.64 X 19.39 X 13.78 2 each @ 60 X 3 X 3	104 LBS 7.6 CU FT

KIT COMPONENTS AND INVENTORY			
NFES #	**DESCRIPTION**	**QTY ISSUED**	**QTY RETURNED**
001086	Harness, Chest, Radio	8 ea.	
004059	Adapter, Headset to Radio, Icom, OPC-499	8 ea.	
004060	Headset, Aviation, Dual Impedance, David Clark, H10-66	4 ea.	
004061	Headset, Aviation, David Clark, H10-21	4 ea.	
004062	Adapter, Helmet, U-92A/U to M642/5-1 & M642/4-1	8 ea.	
004138	PTT Switch. Remote, Icom, PTT SW	8 ea.	
004306	Liner, Foam, Radio Kit	1 ea.	
004309	Box, Fiberglass	1 ea.	
004321	Radio, Aviation Handheld, Icom, IC-A6	10 ea.	
004405	Speaker Mic, Icom, HM-173	2 ea.	
004491	Holder, Battery, AA, Icom, BP-208N	10 ea.	
004492	Antenna, Icom, FA-B02AR	11 ea.	
004830	Battery, AA	120 ea.	
	Radio Quick Reference Card, Icom, IC-A6	10 ea.	
	T-Cards, Radio Tracking	25 ea.	
	Pads, Alcohol, Headset Cleaning	24 ea.	
	Lead Box Seal	2 ea.	
004147	Belt Clip, ICOM	10 ea.	

004660 AIRBASE KIT (TAF-550) BOX 2 OF 2

WEIGHT	CU FT	DIMENSIONS (INCHES)	TOTAL WEIGHT AND CU FT
(BOX 1) 51 LBS (BOX 2 35 LBS (MAST) 18 LBS	(BOX 1) 3.5 (BOX 2) 3.5 (MAST) 0.6	33.36 X 28.44 X 18.23 24.64 X 19.39 X 13.78 2 each @ 60 X 3 X 3	104 LBS 7.6 CU FT

KIT COMPONENTS AND INVENTORY			
NFES #	**DESCRIPTION**	**QTY ISSUED**	**QTY RETURNED**
000825	Tent Stakes	6 ea.	
004066	Radio, Aviation, TDFM-136B (capitalized)	1 ea.	
004134	Headset, Single Dome, David Clark, Modified H34-92	1 ea.	
004303	Hammer, 4 Lb.	1 ea.	
004305	Mast, Antenna, 5 Ft. Section	6 ea.	
004308	Guy Assembly, Antenna	2 ea.	
004309	Box, Fiberglass	1 ea.	
004323	Radio, Airbase VHF-FM/AM, TAF-550 (capitalized)	1 ea.	
004326	Cable, Coaxial, w/2 ea 4327 (PL-259)	4 ea.	
004339	Adapter, Barrel Connector, UHF	3 ea.	
004343	Antenna, VHF/AM, AV-1	1 ea.	
004464	Antenna, VHF Whip, W/PO-150 Load	1 ea.	
004477	Adapter, UHF-F to BNC-M	2 ea.	
004489	Base Antenna, VHF W/ Grnd Planes	1 ea.	
	Adapter, N-F to BNC-M	2 ea.	
	Information Sheet, TDFM-136B, Quick Reference Guide	1 ea.	
	Information Booklet, TAF-550	1 ea.	
	Flagging tape	1 ro.	
	Filament tape	1 ro.	
	Allen wrench	1 ea.	
	Garbage bag	1 ea.	
	Fuse, 5A-AGC (in rear of TAF-550)	1 ea.	
	Fuse, 7.5A-MDL (in rear of TAF-550)	1 ea.	
	Fuse, 3A-MDL (in rear of TAF-550)	1 ea.	
	Fuse, 2A-MDL (in rear of TAF-550)	1 ea.	
	115VAC power cable (in rear of TAF-550)	1 ea.	
	Microphone, handheld (in rear of TAF-550)	1 ea.	

004670 SATELLITE PHONE KIT (MOTOROLA)

TOTAL WEIGHT (KIT)	CU FT	DIMENSIONS (INCHES)
4.80	0.32	10 X 11 X 5

KIT COMPONENT AND INVENTORY			
NFES #	**DESCRIPTION**	**QTY ISSUED**	**QTY RETURNED**
004072	Motorola, 9505A, Sat. Phone	1 ea.	
004172	Adapter, Cigarette Lighter	1 ea.	
004173	Charger, a/c-d/c Adapter	1 ea.	
004175	Battery, Li-Ion, Iridium, 3.7V	1 ea.	
004611	Antenna, Extendable, Iridium	1 ea.	
004612	Antenna, Mobile Mag.	1 ea.	
004613	Antenna, Adapter	1 ea.	
004614	Holster, Sat. Phone	1 ea.	
005087	Box, Pelican, 11”x10”x5”	1 ea.	
	Earphones	1 ea.	
	Instruction Sheet	1 ea.	
	Unblock Info Sheet	1 ea.	

APPENDIX A

VOICE BOARD OPERATING INSTRUCTIONS

Note: These operating instructions are also located inside each kit that has a voice board installed.

VOICE BOARD OPERATING INSTRUCTIONS

The Voice Board (installed on some of the NIRSC equipment) performs two functions:

1. It reads the battery voltage and temperature over the air via DTMF tones.
2. It allows the repeater to run using the following power sources:
   - A. Only alkaline batteries.
   - B. Only the solar panel kit.
   - C. Both the alkaline batteries and the solar panel kit.

Note: If using both solar and alkaline, the voice board monitors the solar voltage and will automatically switch to alkaline power when the solar voltage falls below 10 Volts. When the solar voltage rises above 12 Volts, it will switch back to solar power. This conserves the alkaline batteries, allowing the equipment to run off one set of batteries for extended periods of time without the need to change them.

The Voice Board is activated by a 4-digit DTMF pin and a 1-digit DTMF command. The first DTMF digit of the pin corresponds to the equipment type:

1 - Command Repeaters (004312)
2 - Logistics Repeaters (004248)
3 - Aircraft Links (004370)
4 - Cross-Band Links (004281)

The remaining 3 DTMF digits of the pin are associated with the equipment "**ID**" number.

- For example: The pin number for a 4312-FCK-C112 would be **1-1-1-2**

The available voice board commands are:

1 - Battery voltage
2 - Temperature

Note: If an incorrect DTMF and command code are entered, there is no need to unkey the equipment before re-entering the correct code.

To hear the **equipment's battery voltage** over the air, follow the following steps. ***(Example for 4312-FCK-C112)***

1. Ensure the handheld is on the correct frequency and that DTMF tones are enabled.
2. Key the handheld, and using the DTMF keypad, enter the following pin: 1 - 1 - 1 - 2 - 1
3. Unkey the handheld.

The repeater will key and respond with "***Powered from solar 13.2 Volts; open circuit alkaline 14.5 Volts***". This indicates the repeater is being powered by the solar panel and the alkaline is currently disconnected from the circuit. When the solar voltage falls below the switch-point, the alkaline battery will automatically switch in and when the repeater is again keyed up with the pin, the message will indicate the repeater is being powered from alkaline and solar is open circuit.

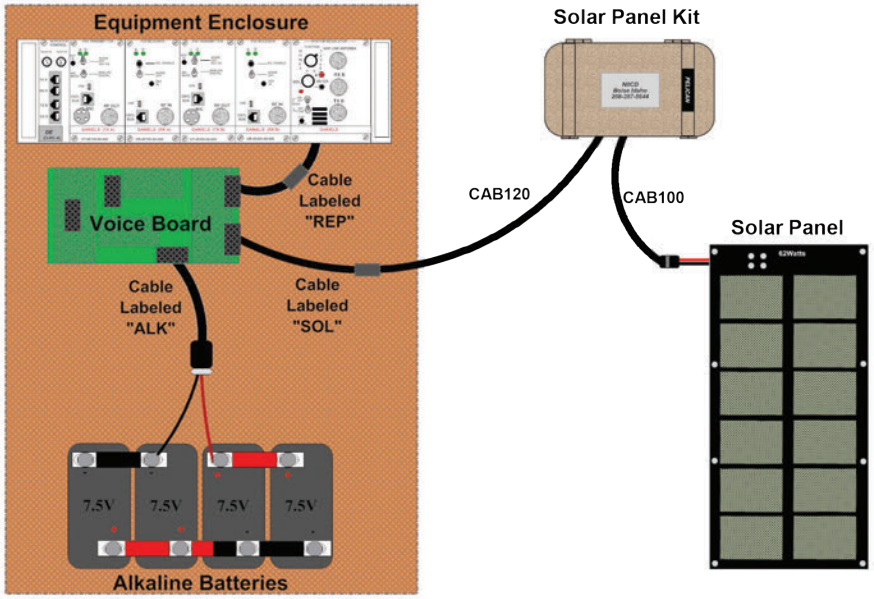


Figure 1: ***Voice Board Block Diagram***
Note: Voice Board is physically attached to the back of the equipment.

APPENDIX B

BATTERY INFORMATION AND MATRIX

GENERAL RADIO BATTERY INFORMATION

When ordering batteries, round the order to the next full STANDARD PACK. (See Standard Pack entry in the Radio and Equipment Kit Battery Matrix or see listing in the GENERAL SECTION of the NFES Catalog, under Battery, Radio.)

All of the radio batteries utilized in the NIRSC are of alkaline technology. Alkaline batteries should have a shelf life of two years with only about 10% degradation in power. The batteries used in NIICD equipment and applications can probably be stored for four years, however the life will be noticeably shorter.

Battery life with the clamshell-type battery holder will depend upon the AA cells installed, type of radio used, whether the radio is in "scan" mode, and the power output setting on the radio. P25 radios drain batteries more quickly than analog radios. ***(See Radio and Equipment Battery Matrix)***

Using a voltmeter to determine the state of an alkaline battery can yield very inconsistent results. A battery that no longer works on a repeater and which has not had a load placed on it for a few days may read "good" on a voltmeter (a voltmeter does not apply the proper current load). To correctly test the batteries in a repeater with a voltmeter, put the repeater in transmit condition to apply a load to the batteries. ***(See Figure 1)***

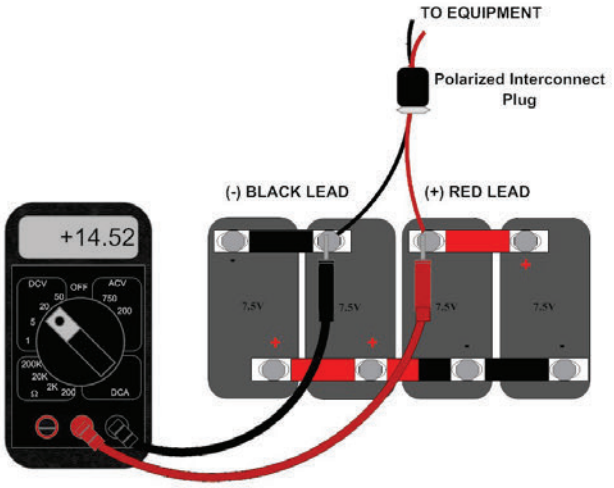


Figure 1: Sample Voltmeter Test with Equipment Under Transmit Load

Repeaters: Replace batteries if the voltage is at 10.5 volts with the transmitter keyed up. Starting voltage is about 15 volts with the transmitter operating. Repeater batteries should last 5-7 days under heavy usage. ***(See Radio and Equipment Battery Matrix)***

Note: NIRSC recommends testing the polarity of each battery before installation.
Some batteries have been known to come labeled incorrectly from the manufacture.

RADIOS: The transmit LED is the best indicator of battery life. If the light holds bright for 3 seconds while transmitting on high power, the battery should be in good shape. Don't rely on the battery gauge on any radio since they are designed for use with rechargeable batteries. Radio batteries should easily last a shift (usually 12 hours). ***(See Radio and Equipment Battery Matrix)***

Note: Alkaline batteries are not considered hazardous waste, except in California. These batteries should be disposed of at the incident to save on shipping costs.
Remove battery straps from the batteries prior to disposal and return them with the kits.

RADIO AND EQUIPMENT BATTERY MATRIX

BATTERY TYPES				
NFES#	**000030**	**000033**	**001023**	**001241**
VOLTAGES	1.5Volts (AA)	1.5Volts (D)	7.5Volts	9Volts
STANDARD CACHE PACKAGE	24/PG	12/PG	4/BX	24/BX

RADIO CLAMSHELL BATTERY REQUIREMENTS					
RADIO TYPE	**000030 (AA)**	**000033 (D)**	**001023 (7.5 V)**	**001241 (9 V)**	**Replacement Cycle**
4381KD (KING VHF)	*9				**Every 12 Hours Max
4381KP (KING KNG)	*8				**Every 8 to 12 Hours Max
4244X2 (MOTOROLA UHF)	*12				**Every 8 to 12 Hours Max
4244MD (MIDLAND UHF)	*6				**Every 8 to 12 Hours Max
ICOM IC-A6 (AM)	*6				**Every 12 Hours Max
** Note: Numbers reflect batteries required per clamshell.* *** Note: Replacement Cycle is under ideal normal usage and is only a NIRSC recommendation.* *Battery consumption is directly dependant on channels scanned, priority mode, light operation, digital mode, and (PTT) Push-To-Talk cycles and duration.*					

KIT BATTERY REQUIREMENTS					
EQUIPMENT TYPE	**000030 (AA)**	**000033 (D)**	**001023 (7.5 V)**	**001241 (9 V)**	**Replacement Cycle**
4248 - UHF REPEATER			*4		** Every 5 Days Max
4312 - VHF REPEATER			*4		** Every 5 Days Max
4300 - AM BASE STATION	*40		*4		** Every 5 Days Max
4370 - GROUND A/C	*40		*4		** Every 5 Days Max
4330 - REMOTE			*4		** Every 5 Days Max
4410 - PA SYSTEM	*3	*48			
** Note: Numbers reflect batteries required per equipment kit .* *** Note: Replacement Cycle is under heavy usage and is only a NIRSC recommendation.*					

4390 STARTER SYSTEM BATTERY REQUIREMENTS		
SYSTEM TYPE	**000030 (AA - 1.5 Volts)**	**001023 (7.5 Volts)**
4390 w/DPHX/Motorola Radios	*664 (28 Standard Packages)	**20 (5 Standard Boxes)
4390 w/DPHX/Midland Radios	*568 (24 Standard Packages)	**20 (5 Standard Boxes)
** Note: AA Battery requirements are per Replacement Cycle of one (1) per shift.* *** Note: 7.5 Volt Battery requirements are per Replacement Cycle of 5 days max*		

BATTERY CONFIGURATIONS

In situations when there is heavy voice traffic on the system or where access to the site is limited, NIRSC recommends a double-battery system to avoid power failure during the incident. Even with a double battery system, voltage should be checked or batteries replaced every 7 days. ***(See Figure 2)***
Solar Panel Kits (NFES# 004080) are available from NIRSC and are recommended for use at sites with limited access. Contact the CDO for Solar Panel Kit availability before ordering.

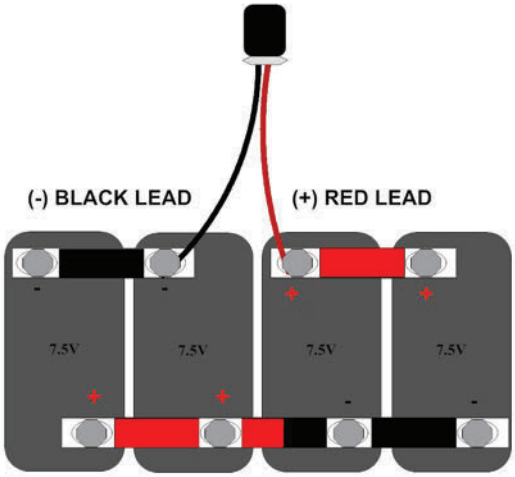


Figure 1:
+15 VOLT Standard Battery Configuration
Series/Parallel configuration requires two (1) set of 7.5 Volt Batteries (NFES # 1023)

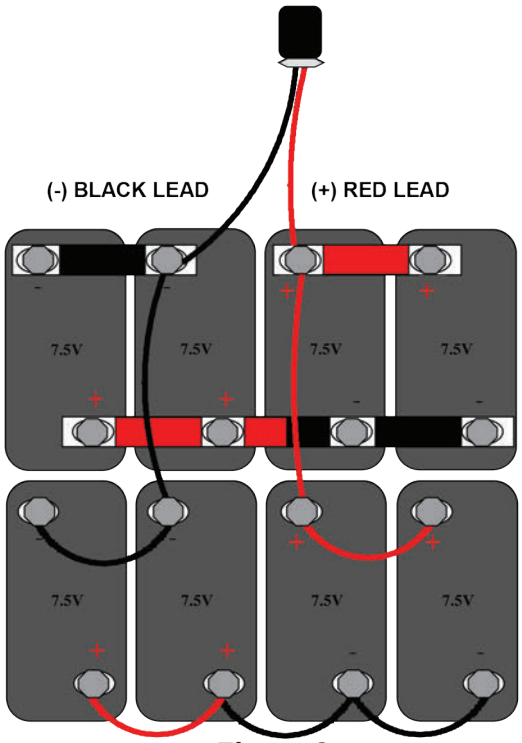


Figure 2:
+15 VOLT Double Battery Configuration
Series/Parallel configuration requires two (2) sets of 7.5 Volt Batteries (NFES # 1023)

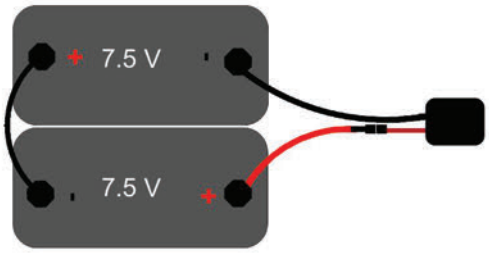


Figure 3:
+15 VOLT Series Battery Configuration
Series configuration requires two (2) each of 7.5 Volt Batteries

Note: NIICD recommends that a deep cycle RV/marine battery and charger be purchased and utilized once three or more sets of batteries are needed at the site.

APPENDIX C

ANTENNA INSTALLATION INSTRUCTIONS

These diagrams are also available for download online at:

http://www.nifc.gov/NIICD/documents.html

ANTENNA INSTALLATION INSTRUCTIONS

Note: If setting up a linked system, NIRSC recommends starting with the Link antenna first.
For easy removal of filament tape from mast and antenna parts, fold 1/4" to 1/2" of the end of the tape back onto itself. This provides a tab for pulling the tape off.

1. Place the equipment/box at the desired antenna location.
2. Assemble the two (2) mast sections first. Then wrap the tapered end of the upper section with 10-15 wraps of filament tape. This will prevent the guy collar from slipping down when tightening the guy ropes. ***(See Figure A)***
   Note: Some poles will require more or less wraps of filament tape to keep the guy collar from sliding down, depending on the diameter of the guy collar. NIRSC recommends wrapping each mast together with filament tape to keep them together during installation.
3. Place the guy collar on the end of the second mast before assembling the third mast section.

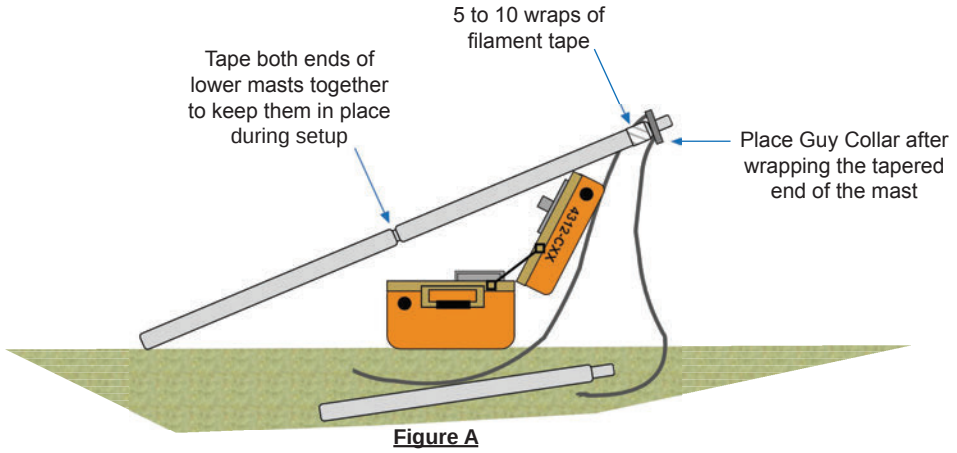


Figure A

4. Lay the assembled mast on the opened lid of the equipment/box with half of the 3rd section of the mast protruding beyond the lid of the equipment box. ***(See Figure B)***
5. Install the antenna base onto the mast. Raise all radial elements to the set holes and insert the white plastic locks in the holes.
6. Wrap filament tape around the plastic locks to keep them from sliding out during high winds. ***(See Figure B.1)***
7. Connect the coax to the antenna base and secure the coax to the mast at four (4) places with filament tape, 12 inches below the top of the mast and 12 inches above and below the guy collar, with a loop around the guy collar to prevent chafing the coax. ***(See Figure B)***
8. Install the appropriate antenna whip (UHF or VHF) onto the antenna base. Some bases might require filament tape to keep them secure on the mast.
9. Tear off a 2-3ft. long piece of flagging and tie it around the coax just below the antenna base.

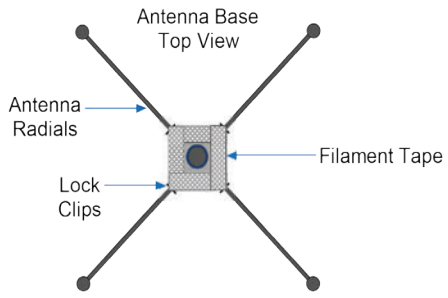


Figure B.1

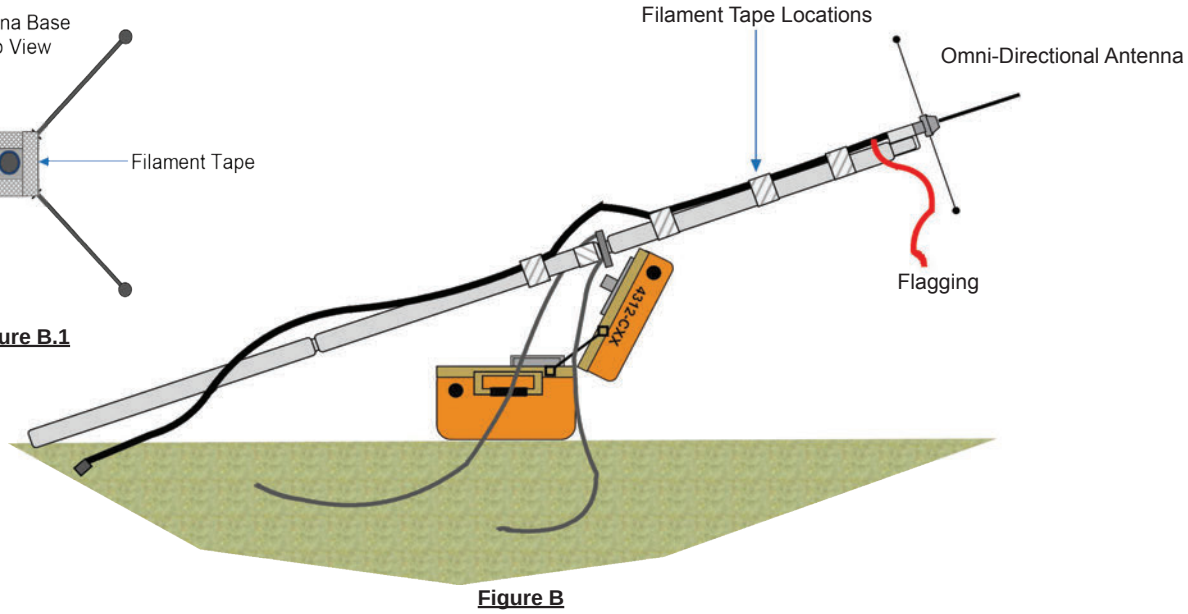


Figure B

10. Place two steel tent stakes, each 9 ft. (3 normal paces) perpendicular from the base of the antenna mast.
    Note: Drive the tent stakes in at an angle, with top end sloping away from the area where the equipment box and the antenna base will be located. Don't drive the tent stakes all the way down until all the guy ropes are secure in the following steps.
11. Securely tie the ropes from the guy collar to each of the two tent stakes with either a trucker's hitch or a taut line hitch, leaving enough slack in the rope to raise the antenna vertically.
    Note: Use a knot that you are most comfortable with.

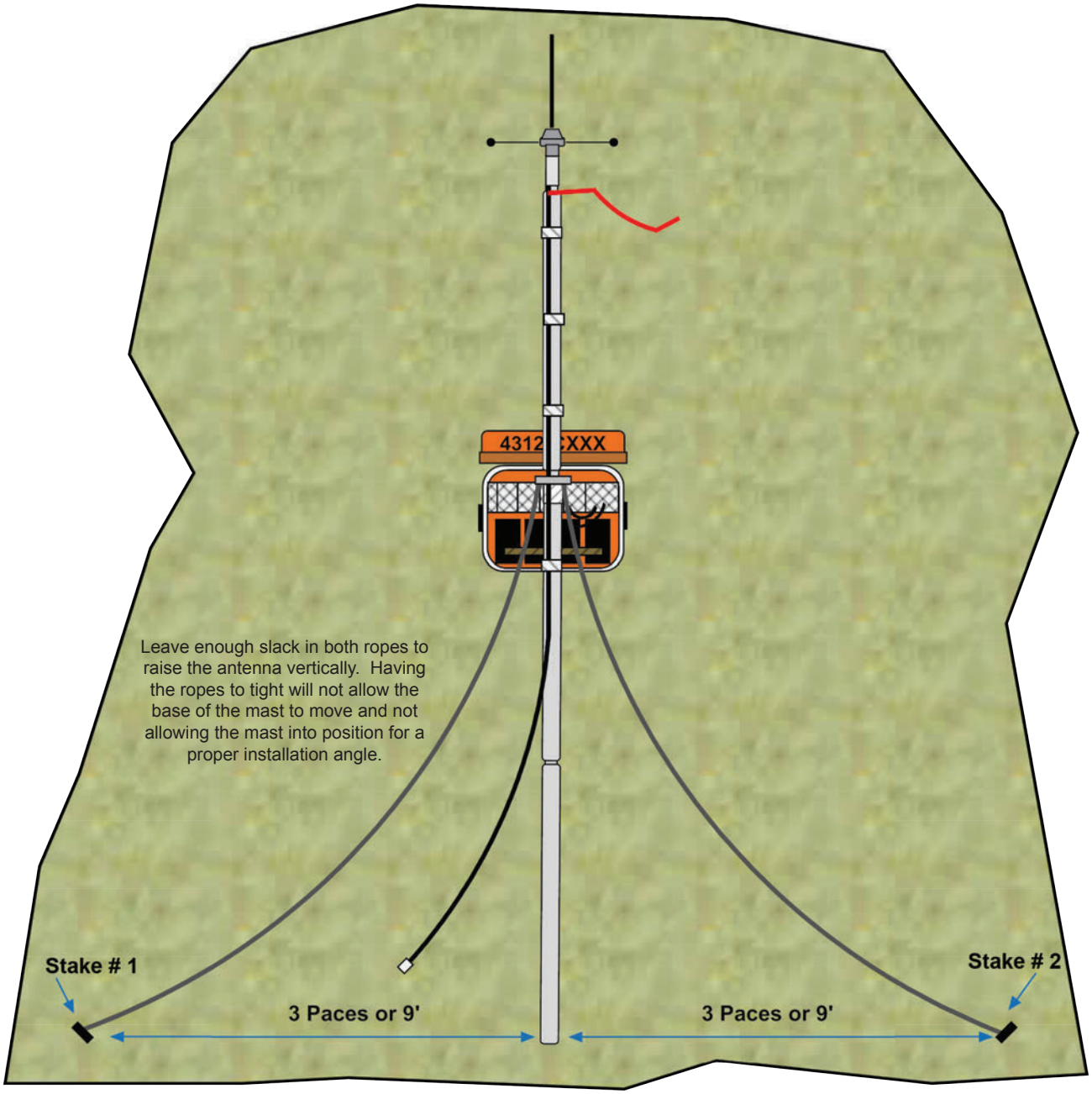


Figure C

12. Stand the antenna up to nearly vertical by picking up the base of the mast and dragging it towards the equipment box. The antenna should stand alone which allows the installer to finish the install without the help of another individual. ***(See Figure D)***

    Note: In high wind situations, make sure the antenna is leaning away from the wind and not into the wind.
13. Straight down from the guy collar, walk out 3 paces or 9 feet to find the placement of the 3rd tent stake. Place the 3rd tent stake at a location equidistant from the other two tent stakes and drive it in at an angle away from the antenna base.
14. Tie the remaining rope from the guy collar to the 3rd tent stake using either a trucker's hitch or taut line hitch. Leave enough slack in the rope of the 3rd stake to allow the antenna mast to be raised vertically.

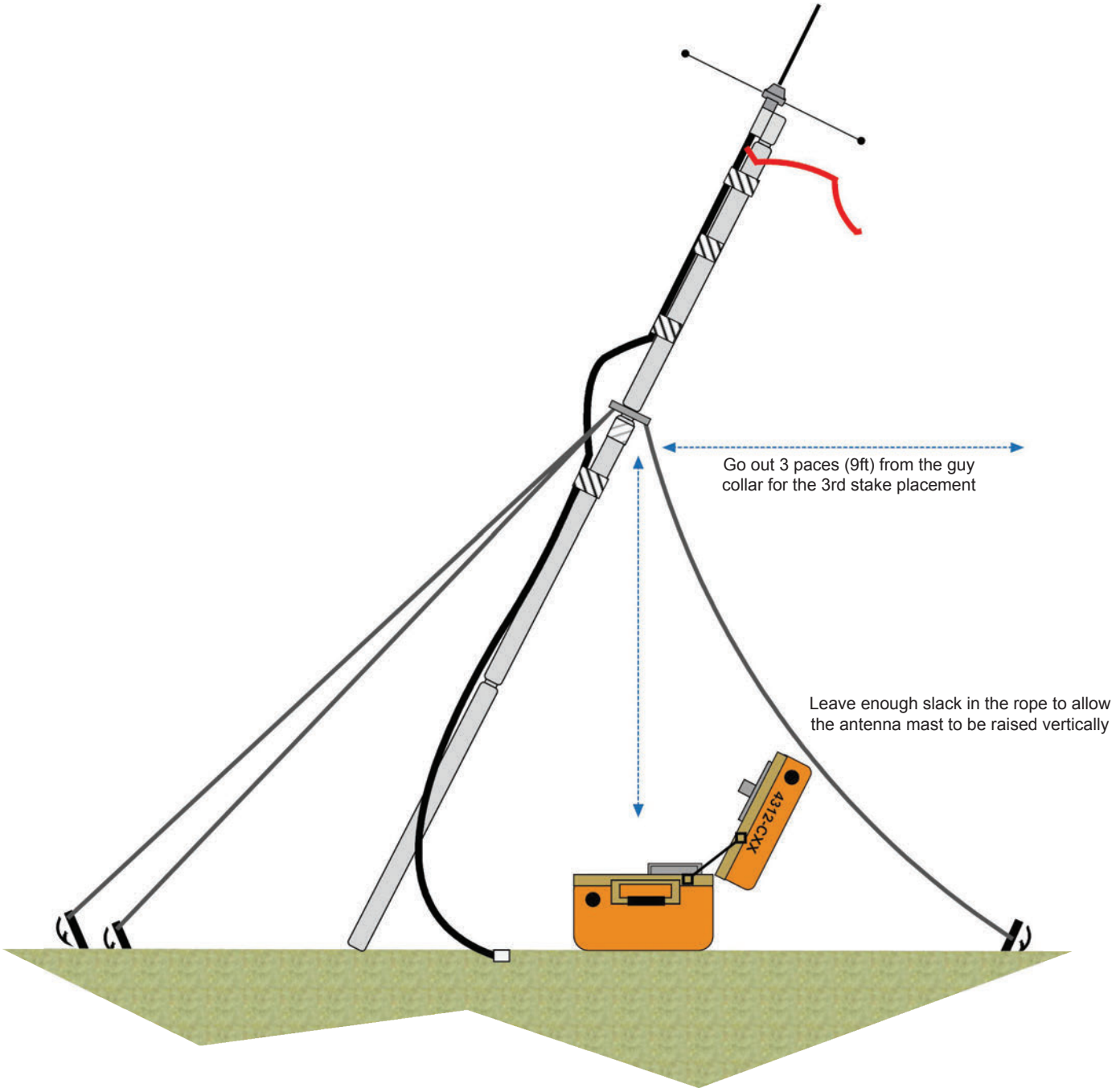


Figure D

15. Stand the antenna vertically and tighten all three guy ropes if necessary. ***(See Figure E)***
    Note: Rope tension may need to be slightly eased in order to stand the antenna vertically.
16. Hammer the 3 tent stakes down until the hook is flush with the ground.
17. Install at least 1, 2-3ft. long strip of flagging at eye level on each guy rope.
18. Route the coax cable through the designated hole in the equipment box and connect to the corresponding connector on the equipment.
19. Tape the remaining bottom portion of the coax to the mast.
20. Tape the coax cable to the box handle in order to create a drip loop, provide strain relief, and prevent chafing.
21. Secure the box by taping all uncovered box holes to prevent moisture and rodents from entering.

Note: The antenna may be lowered by slightly lifting up the base and moving it towards the perimeter.

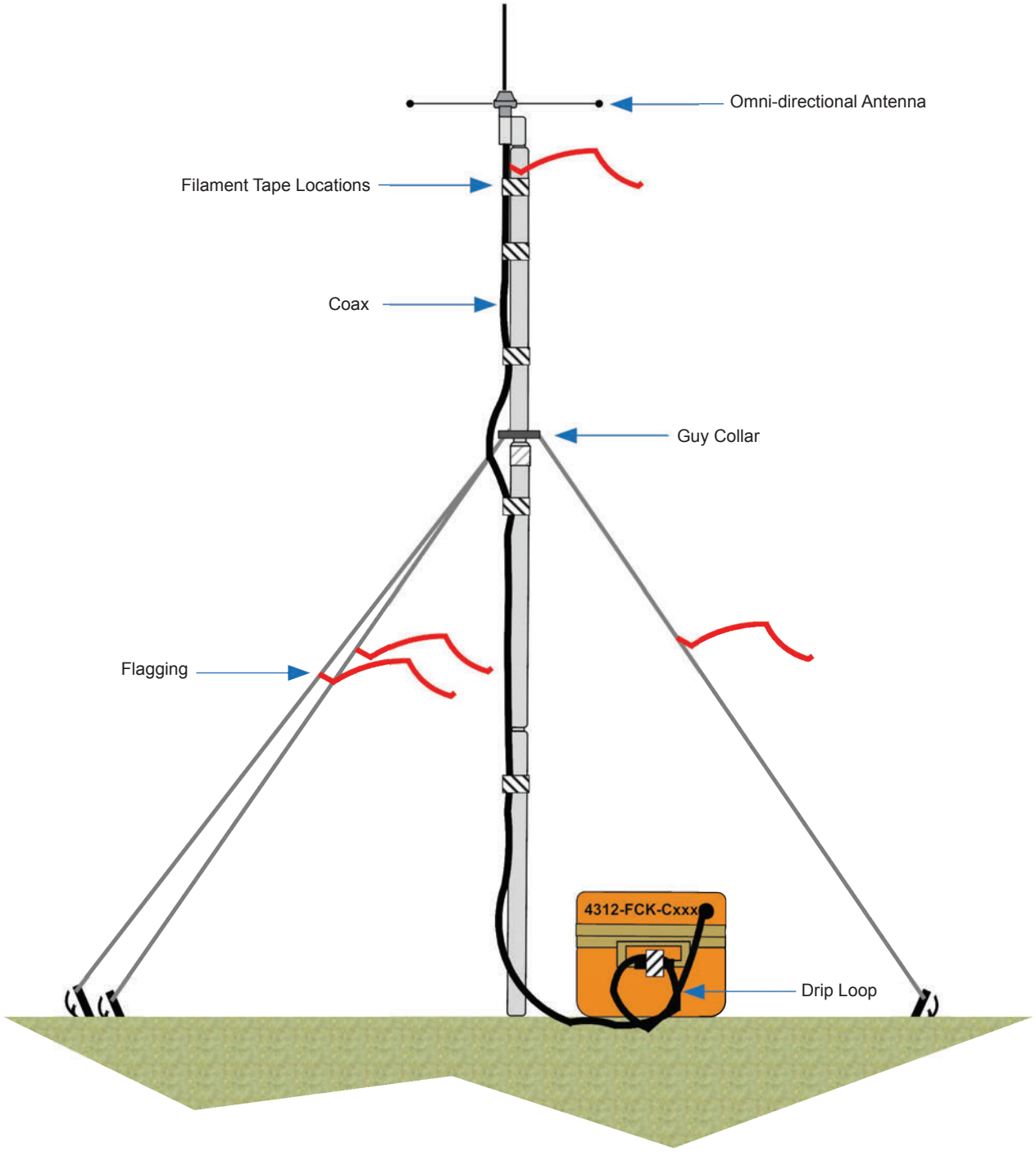


Figure E

LINK ANTENNA INSTALLATION INSTRUCTIONS

Note: The Link Antenna Installation Instructions are assuming that the Omni-directional Antenna has been previously installed at the site.

1. Move the equipment box as far as possible in the direction of the target area without straining the coax.
   Note: The drip loop may need removing to create enough slack in the coax cable.
2. Rotate the equipment box and open the lid so that the opened lid will accommodate placing the mast in line with the desired target, and in line with the two other tent stakes placed earlier in the first antenna setup.
3. Assemble the two (2) mast sections first, then wrap the tapered end of the upper section with 10-15 wraps of filament tape. This will prevent the guy collar from slipping down when tightening the guy ropes.

Note: Some poles will require more or less wraps of filament tape to keep the guy collar from sliding down, depending on the diameter of the guy collar. NIRSC recommends wrapping each mast together with filament tape to keep them together during installation.

4. Place the guy collar on the end of the second mast before assembling the third mast section.
5. Lay the assembled mast on the opened lid of the equipment/box with half of the third section of the mast protruding beyond the lid of the equipment box.
6. Install the appropriate antenna on the mast. If an omni-directional antenna is being used, be sure to match the proper antenna base and to raise and tape the radials. If a Yagi is being used, clamp the antenna at least 12 inches below the top of the mast. Add filament tape from the end of the Yagi to the mast to keep the antenna from tilting down.
7. Connect the coax to the selected antenna base or Yagi.
8. Secure the coax to the antenna mast at four places with filament tape, 12 inches below the antenna base and 12 inches above and below the guy collar, with a loop around the guy collar to prevent chafing the coax.
   Note: When a Yagi antenna is being used, the proper orientation can be maintained by tying the end of the Yagi down to the tent stake, a rock, or small tree with filament tape.

9. Tear off a 2-3ft piece of flagging and tie it around the coax just below the antenna base.

Figure F.1

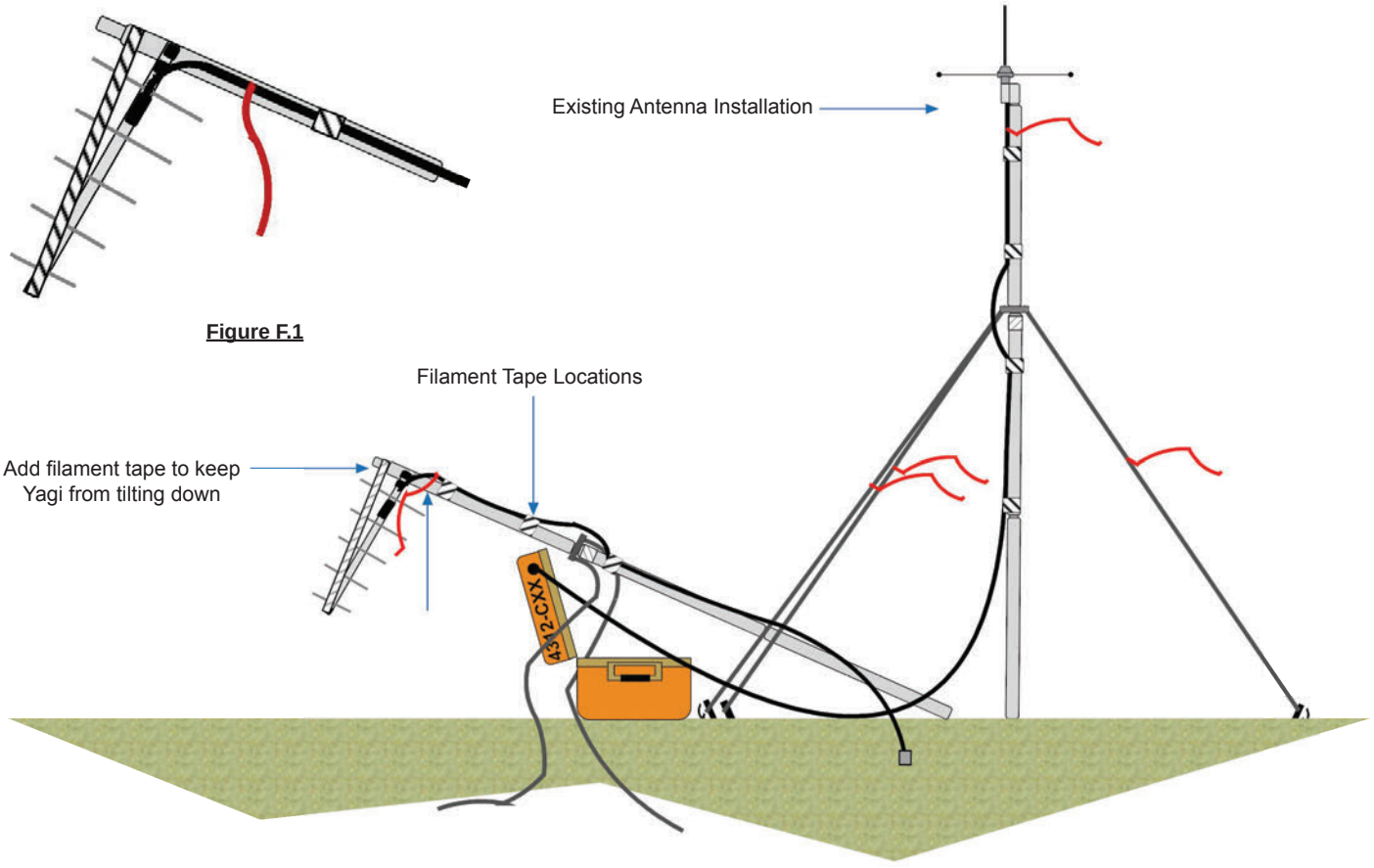


Figure F

10. Place two tent stakes in-line with the existing two antenna stakes. ***(See Figure G)***
    Note: Drive the tent stakes in at an angle, with stake topes sloping away from the area where the equipment box and the antenna base will be located. Don't drive the tent stakes all the way down until all the guy ropes are secured in the following steps.
11. Securely tie the ropes from the guy collar to each of the two tent stakes with either a trucker's hitch or a taut line hitch, leaving enough slack in the ropes to raise the antenna vertically.
    Note: Use a knot that you are most comfortable with.
12. Tent stake #3 should be in line with the end of the antenna whip and should be marked at this time.

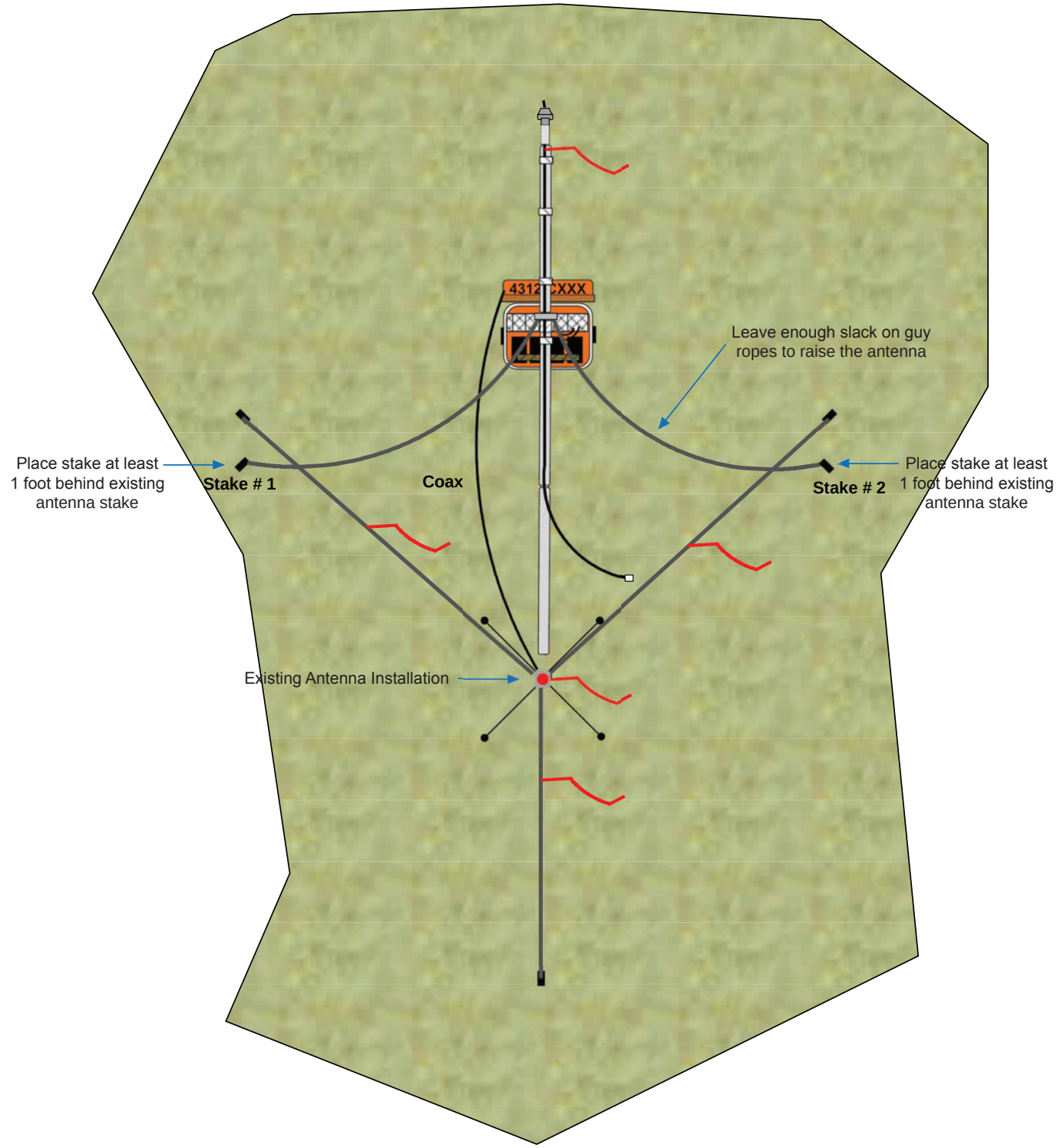


Figure G

13. Stand the antenna up to nearly vertical by picking up the base of the mast and dragging it towards the equipment box. The antenna should stand alone which allows the installer to finish the install without the help of another individual. (***See figure D on previous page for reference)***
14. Straight down from the guy collar, walk out 3 paces or 9 feet to find the placement of the 3 tent stake. Place the 3rd tent stake at a location equidistant from the other two tent stakes and drive it in at an angle away from the antenna base. (***See figure D on previous page for reference)***
15. Tie the remaining rope from the guy collar to the 3rd tent stake using either a trucker's hitch or a taut line hitch.
16. Stand the antenna vertically, and tighten any loose ropes. ***(See Figure H)***
17. Install at least 1, 2-3ft long strip of flagging at eye level on each guy rope.
18. Route the coax through the appropriate marked hole on the equipment box and connect to the corresponding connector on the equipment.
    Note: The coax cable might not be long enough to create a drip loop. If necessary have the coax cable drop down on the ground to provide a drip loop.
19. Close the equipment box and secure the box by covering any holes with filament tape to prevent moisture and rodents from entering.
    Note: The antenna may be lowered by slightly lifting up the base and moving it towards the perimeter. It may be desirable to put flagging around the perimeter of the stakes or around the entire area. Be sure to pick up all flagging, tape, and other debris when removing the equipment.

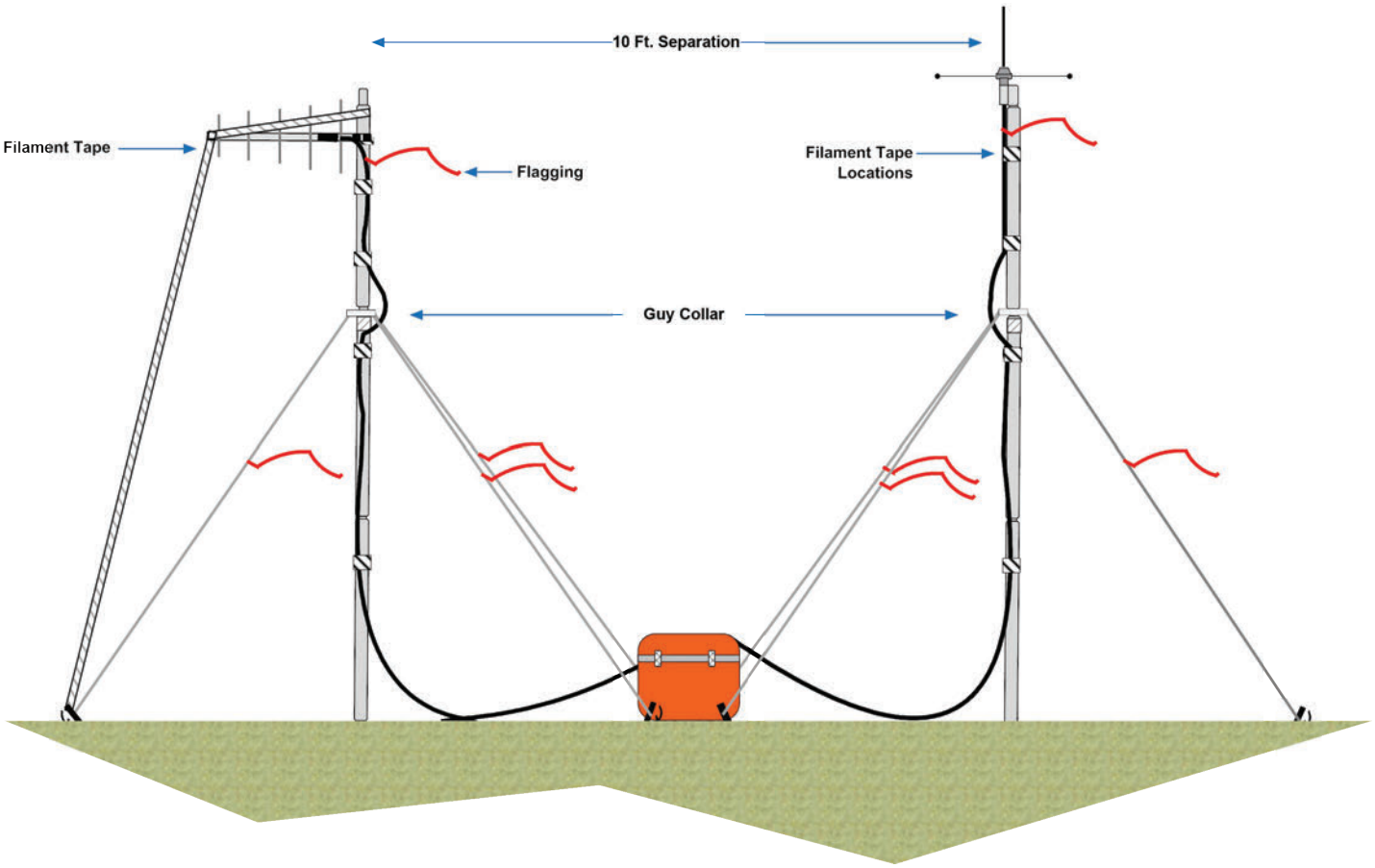


Figure H

ONE MAST LINK ANTENNA INSTALLATION INSTRUCTIONS

Due to terrain or other limitations, it might necessary to place both VHF and UHF Yagi antennas on one set of mast.

1. Place the equipment/box at the desired antenna location. Open the equipment lid and point it in the desired location in which the UHF signal will travel.
2. Assemble the two (2) mast sections first. Then wrap the tapered end of the upper section with 10-15 wraps of filament tape. This will prevent the guy collar from slipping down when tightening the guy ropes. ***(See Figure A)***
   Note: Some poles will require more or less wraps of filament tape to keep the guy collar from sliding down, depending on the diameter of the guy collar. NIRSC recommends wrapping each mast together with filament tape to keep them together during installation.
3. Place the guy collar on the end of the second mast before assembling the third mast section.

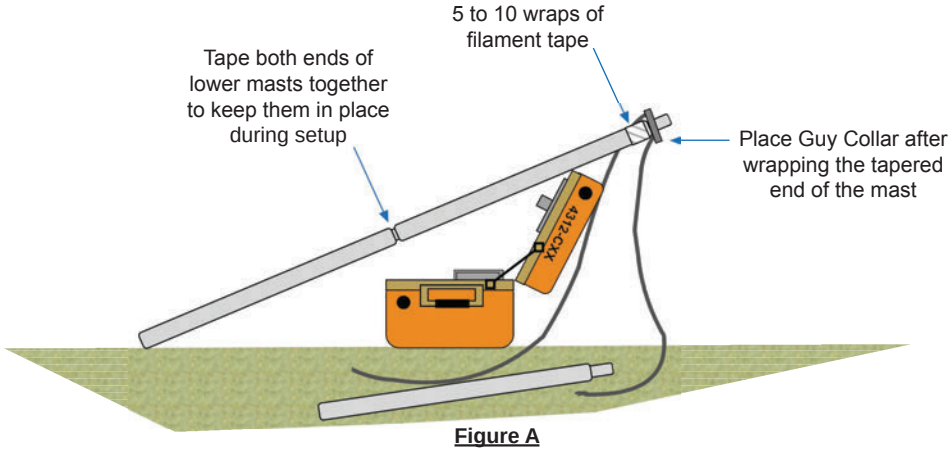


Figure A

4. Lay the assembled mast on the opened lid of the equipment/box with half of the 3rd section of the mast protruding beyond the lid of the equipment box.
5. Assemble the Yagi antenna and install it half way down the 3rd mast section. Add filament tape from the end of the Yagi to the mast to keep the antenna from tilting down. ***(See Figure B)***
6. Install the VHF antenna base with the appropriate VHF whip onto the mast. Raise and tape all radial elements to the set holes after inserting the white plastic locks in the holes.
7. Connect the coax to the VHF antenna Base. Connect the second coax to the Yagi antenna. Secure both coax cables to the mast at four places with filament tape with a loop around the guy collar to prevent chafing the coax cables.

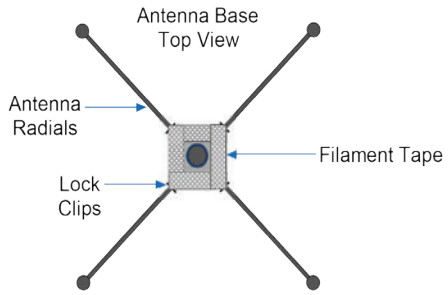


Figure B.1

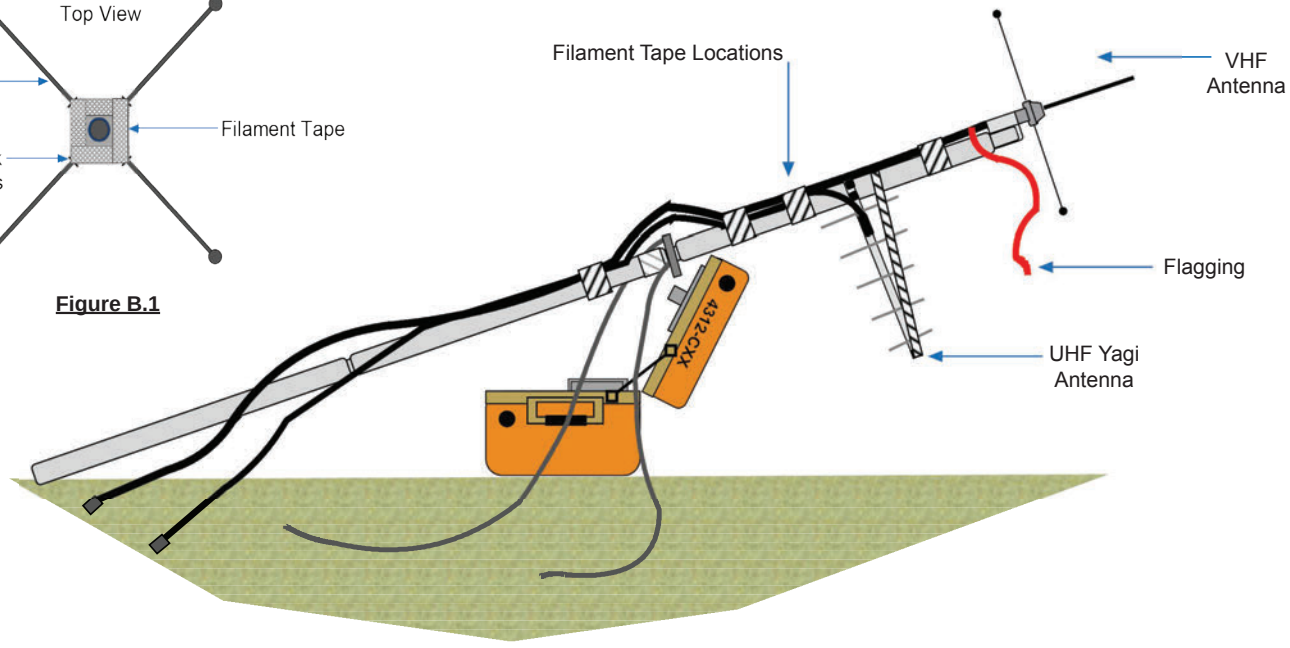


Figure B

8. Place two steel tent stakes, each 9 ft. (3 normal paces) perpendicular from the base of the antenna mast.
   Note: Drive the tent stakes in at an angle, with top end sloping away from the area where the equipment box and the antenna base will be located. Don't drive the tent stakes all the way down until all the guy ropes are secure in the following steps.
9. Securely tie the ropes from the guy collar to each of the two tent stakes with either a trucker's hitch or a taut line hitch, leaving enough slack in the rope to raise the antenna vertically. *Note: Use a knot that you are most comfortable with.*
10. Wrap the end of the Yagi antenna with filament tape and string out about 15 feet of tape to allow securing the Yagi to one of the tent stakes.
10. Stand the antenna up to nearly vertical by picking up the base of the mast and dragging it towards the equipment box. The antenna should stand alone which allows the installer to finish the install without the help of another individual. ***(See Figure D from previous pages)***
    Note: In high wind situations, make sure the antenna is leaning away from the wind and not into the wind.
11. Straight down from the guy collar, walk out 3 paces or 9 feet to find the placement of the 3rd tent stake. Place the 3rd tent stake at a location equidistant from the other two tent stakes and drive it in at an angle away from the antenna base. ***(See Figure D from previous pages)***
12. Tie the remaining rope from the guy collar to the 3rd tent stake using either a trucker's hitch or taut line hitch. Leave enough slack in the rope of the 3rd stake to allow the antenna mast to be raised vertically.
13. Stand the antenna vertically and tighten all three guy ropes if necessary. ***(See Figure C)***
14. Secure with filament tape front end section of the Yagi to one of the tent stakes to keep from shifting off target.
15. Hammer the 3 tent stakes down until the hook is flush with the ground.
16. Install at least 1, 2-3ft. long strip of flagging at eye level on each guy rope.
17. Route the coax cables through the designated holes in the equipment box and connect to the corresponding connectors on the equipment, leaving a drip loop to prevent moisture to enter the equipment box.
18. Tape the remaining bottom portion of the coax cables to the mast.
19. Secure the box by taping all uncovered box holes to prevent moisture and rodents from entering.

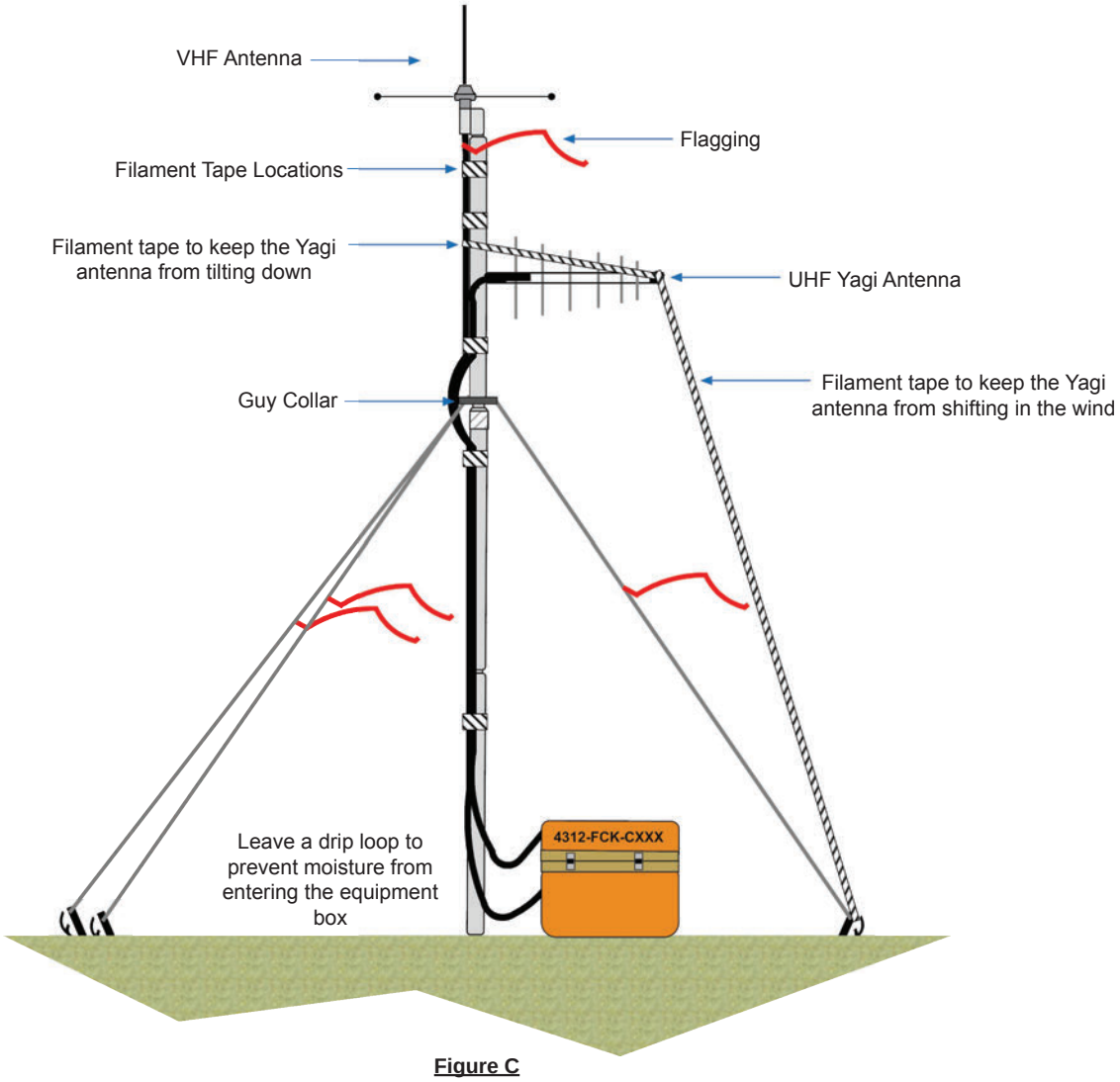


Figure C

APPENDIX D

DANIELS SWITCH SETTINGS

These diagrams are also available for download online at:

http://www.nifc.gov/NIICD/documents.html

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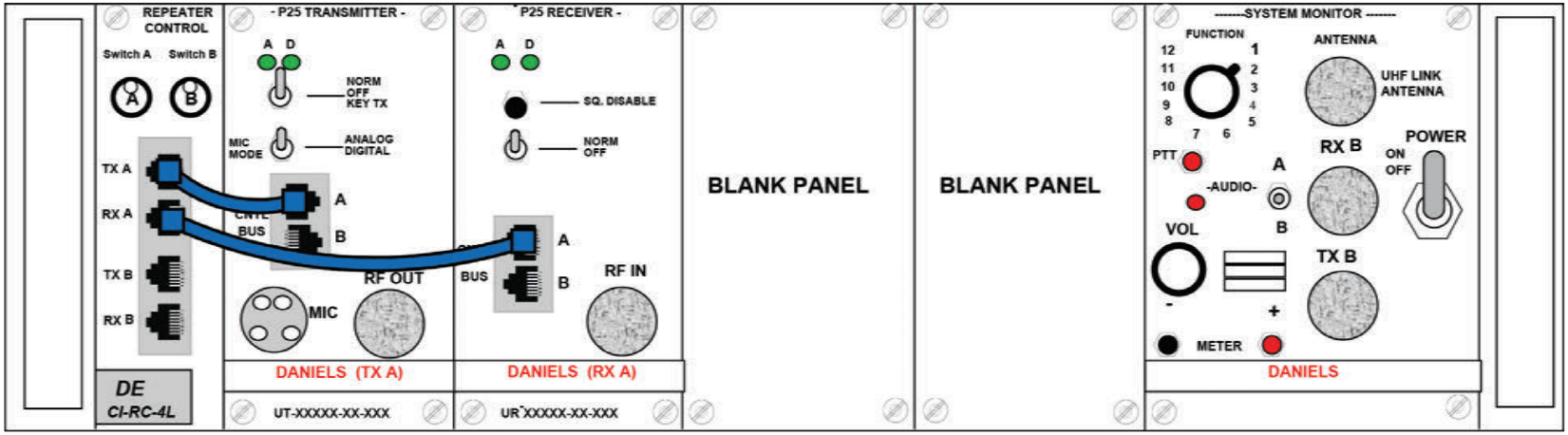
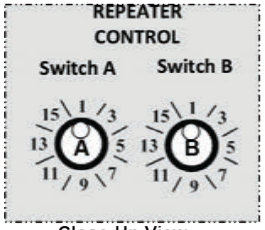
4248 - UHF REPEATER SWITCH SETTINGS



4248 - UHF REPEATER CONFIGURATION:

1. Connect the power cable to the batteries using the provided **POLARIZED** fused cable.
2. Turn the **Power** Switch to the "**ON**" position on the **System Monitor Module**.
3. Keep the power switches on both the **TX A** and **RX A** modules in "**NORM**" position.
4. Keep the **Mic Mode** on the **TX A** in the "**ANALOG**" position.
5. Keep the **A/B Audio Select** Switch on the **System Monitor Module** at the center position "**OFF**".

Note:
No tones are available on the NIRSC UHF Repeaters unless specified by the field and programmed by NIRSC.
The Function Switches on the System Monitor Module are only for shop testing and used in conjunction with the meter leads.

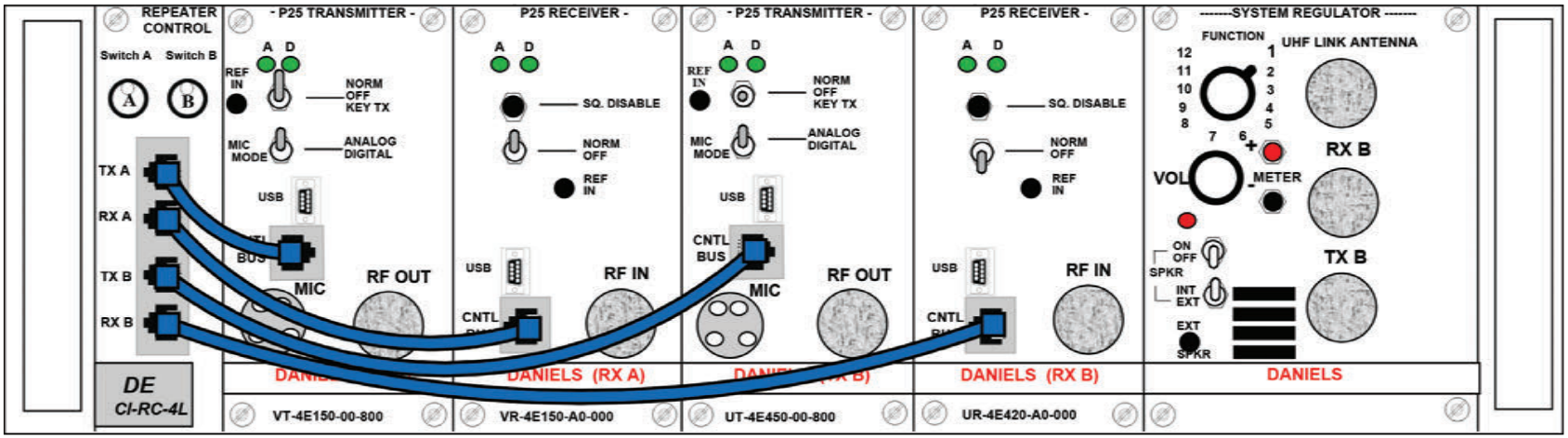


Close-Up View
Switch A, Switch B
Repeater Control Module

System Monitor Switch Functions	
1	+13.8 V (Supply Voltage)
2	+9.5 V Regulated
3-12	NIRSC Technician Testing

NIRSC/NIICD UHF Repeater Switch Settings *(4248- UHF Repeater Configuration)*	
Revised	December, 2016

4312 - VHF REPEATER SWITCH SETTINGS
(E MODELS ONLY)



4312 - VHF REPEATER CONFIGURATION: (E-MODELS ONLY)

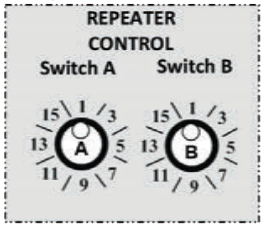
1. Connect the power cable to the batteries using the provided **POLARIZED** fused cable. Once power cable is connected, all modules are active. *(No master power switch)*
2. Keep the power switches on both the **TX A** and **RX A** in the "**NORM**" position.
3. Keep the power switches on both the **TX B** and **RX B** in the "**OFF**" position. *(Stand-alone Repeater Configuration - No Linking)*
4. Keep the **MIC MODE** switch on both the **TX A** and **TX B** in the "**ANALOG**" position.
5. Keep the speaker audio off by switching the **Speaker** Switch on the System Regulator to the "**OFF**" position.
6. Select the assigned tone by turning **Switch A** knob, located on the top portion of the **Repeater Control Module**, to associated position. *(Switch A - Tone Selection)*

Note: Selecting a tone will enable the tone on both the TX A and RX A modules. The Communications Duty Officer (CDO) will assign the appropriate tone for each incident.
(This is a 16 Position Knob. Position 1 is straight up)
The Function Switches on the System Monitor Module are only for shop testing and used in conjunction with the meter leads.

Switch A - Tone Selection List

Position 1 - Tone 1 - 110.9
Position 2 - Tone 2 - 123.0
Position 3 - Tone 3 - 131.8
Position 4 - Tone 4 - 136.5
Position 5 - Tone 5 - 146.2
Position 6 - Tone 6 - 156.7
Position 7 - Tone 7 - 167.9
Position 8 - Tone 8 - 103.5
Position 9 - Tone 9 - 100.0
Position 10 - Tone 10 - 107.2
Position 11 - Tone 11 - 114.8
Position 12 - Tone 12 - 127.3
Position 13 - Tone 13 - 141.3
Position 14 - Tone 14 - 151.4
Position 15 - Tone 15 - 162.2
Position 16 - No Tone

Close Up View
Switch A, Switch B
Repeater Control Module



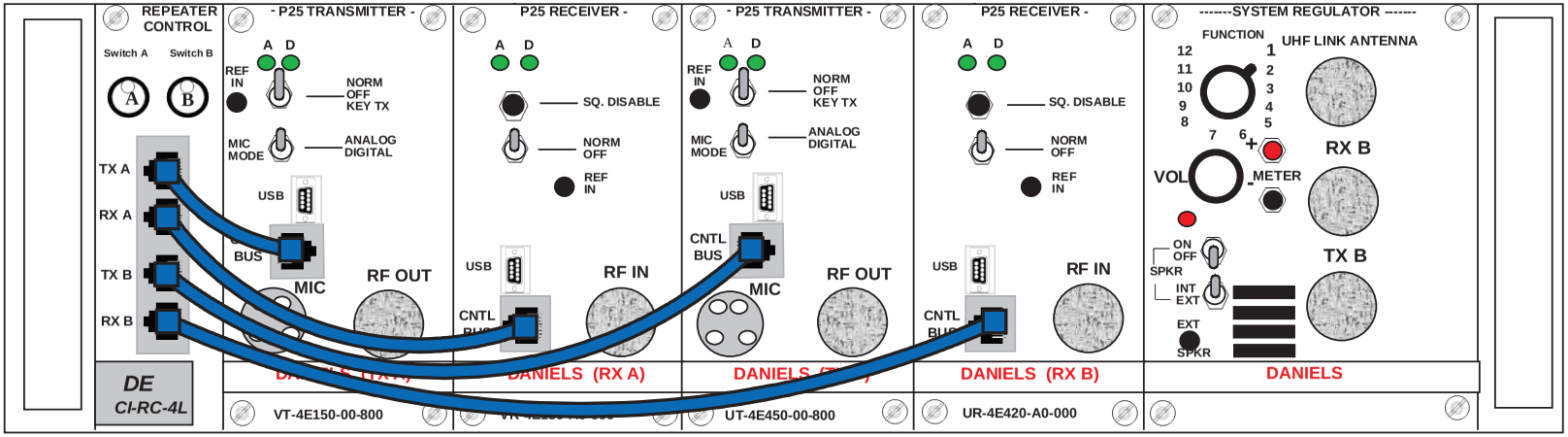
System Monitor Switch Functions	
1	+13.8 V (Supply Voltage)
2	+9.5 V Regulated
3-12	NIRSC Technician Testing

To Enable Audio to Internal Speaker for Troubleshooting:

1. Enable the speaker by switching the Speaker switch located on the System Regulator Module, to the "**ON**" position.
2. Select the desired receiver audio, A or B, by turning the Function Switch located on the System Regulator, to position 3 for RX Audio A or position 5 for RX audio B.
   Note: Select "INT" on the System Regulator Module to enable the audio to the external speaker.

NIRSC/NIICD VHF Repeater Switch Settings *(4312- VHF Repeater Configuration E-Models)*	
Revised:	December, 2016

4312 - VHF REPEATER/LINK SWITCH SETTINGS
(E MODELS ONLY)



4312 - VHF REPEATER/LINK CONFIGURATION ***(E-MODELS ONLY)***

1. Connect the power cable to the batteries using provided **POLARIZED** fused cable. Once the power cable is connected, all modules are active. ***(No master power switch)***
2. Turn each module "**ON**" by keeping the switches on the **TX A, RX A, TXB, and RXB** in the "**NORM**" position.
3. Keep the speaker audio off by switching the **Speaker** Switch on the **System Regulator Module** to the "**OFF**" position.
4. Keep the **MIC MODE** switch on both the **TX A** and **TX B** in the **ANALOG** position.
5. Select assigned tone by turning the **Switch A** knob, located on the top portion of the **Repeater Control Module**, to associated position. ***(Switch A - Tone Selection)***
6. Select assigned UHF frequency by turning the **Switch B** knob to associated position. ***(Switch B - UHF Link Frequency Selection List)***

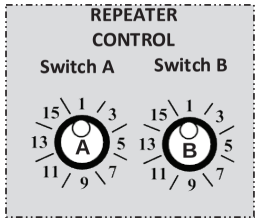
Note: Selecting a tone will enable the tone on both TX A and RX A modules. The Communications Duty Officer (CDO) will assign the appropriate tone and UHF frequency for each incident.
Both Switch A and Switch B is a 16 position rotary switch, with Position 1 being straight up.
The Function Switches on the System Monitor Module are only for shop testing and used in conjunction with the meter leads.

Switch A - Tone Selection List

Position 1 - Tone 1 - 110.9
Position 2 - Tone 2 - 123
Position 3 - Tone 3 - 131.8
Position 4 - Tone 4 - 136.5
Position 5 - Tone 5 - 146.2
Position 6 - Tone 6 - 156.7
Position 7 - Tone 7 - 167.9
Position 8 - Tone 8 - 103.5
Position 9 - Tone 9 - 100.0
Position 10 - Tone 10 - 107.2
Position 11 - Tone 11 - 114.8
Position 12 - Tone 12 - 127.3
Position 13 - Tone 13 - 141.3
Position 14 - Tone 14 - 151.4
Position 15 - Tone 15 - 162.2
Position 16 - No Tone

Switch B - UHF Link Frequency Selection List

Position 1 - L1 RPTR
Position 2 - L2 RPTR
Position 3 - L3 RPTR
Position 4 - L4 RPTR
Position 5 - L5 RPTR
Position 6 - L6 RPTR
Position 7 - L7 RPTR
Position 8 - L1 RX SIMPLEX
Position 9 - L2 RX SIMPLEX
Position 10 - L3 RX SIMPLEX
Position 11 - L4 RX SIMPLEX
Position 12 - L5 RX SIMPLEX
Position 13 - L6 RX SIMPLEX
Position 14 - L7 RX SIMPLEX
Position 15 - Special Use, SIMPLEX
Position 16 - Special Use, SIMPLEX



Close-Up View
Switch A, Switch B
Repeater Control Module

System Monitor Switch Functions	
1	+13.8 V (Supply Voltage)
2	+9.5 V Regulated
3-12	NIRSC Technician Testing

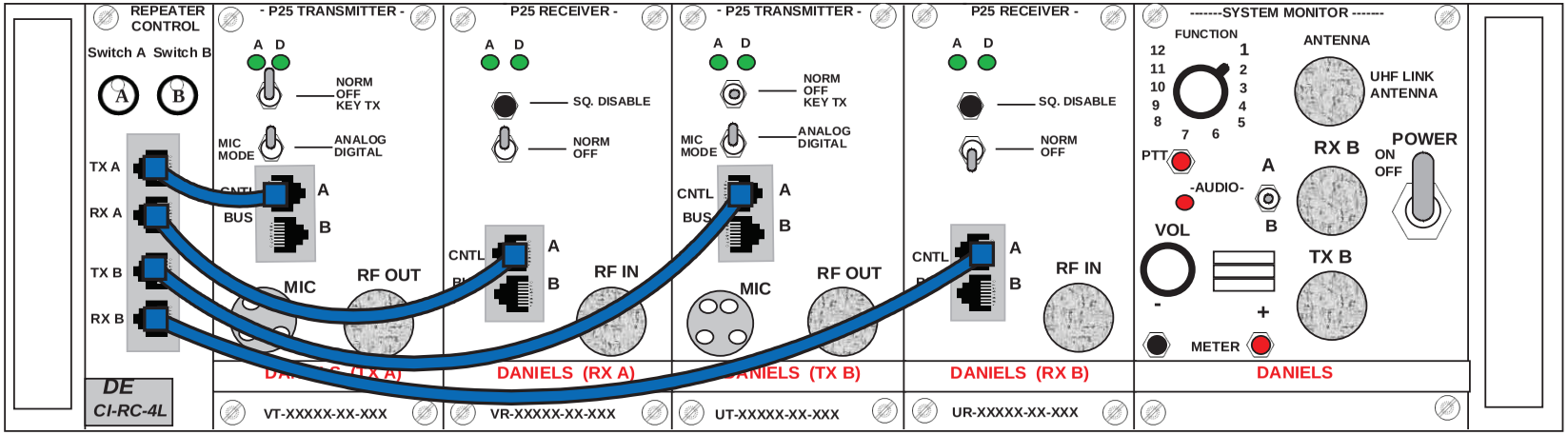
To Enable Audio to Internal Speaker for Troubleshooting:

1. Enable the speaker by switching the Speaker switch located on the System Regulator Module, to the "**ON**" position.
2. Select the desired receiver audio, A or B, by turning the Function Switch located on the System Regulator, to position 3 for RX Audio A or position 5 for RX audio B.

Note: Select "INT" on the System Regulator Module to enable the audio to the external speaker.

NIRSC/NIICD VHF Repeater/Link Switch Settings *(4312 - VHF Repeater/Link Configuration E-Models)*	
Revised:	December, 2016

4312 - VHF REPEATER SWITCH SETTINGS



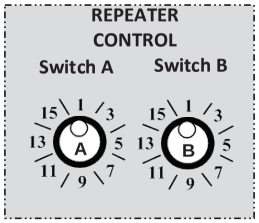
4312 - VHF REPEATER CONFIGURATION:

1. Connect the power cable to the batteries using the provided **POLARIZED** fused cable.
2. Turn the **Power** Switch to the "**ON**" position on the System Monitor Module.
3. Keep the power switches on both the **TX A** and **RX A** in the "**NORM**" position.
4. Keep the power switches on both the **TX B** and **RX B** in the "**OFF**" position. ***(Stand-alone Repeater Configuration- No Linking)***
5. Keep the **MIC MODE** switch on both **TX A** and **TX B** in the "**ANALOG**" position.
6. Keep the **A/B Audio Select** Switch on the System Monitor Module at the center position.
7. Select the assigned tone by turning the **Switch A** knob, located on the top portion of the **Repeater Control Module**, to the associated position. ***(Switch A - Tone Selection)***

Note: Selecting a tone will enable the tone on both the TX A and RX A modules. The Communications Duty Officer (CDO) will assign the appropriate tone for each incident.
(This is a 16 Position Knob. Position 1 is straight up)
The Function Switches on the System Monitor Module are only for shop testing and used in conjunction with the meter leads.

Switch A - Tone Selection List

Position 1 - Tone 1 - 110.9
Position 2 - Tone 2 - 123.0
Position 3 - Tone 3 - 131.8
Position 4 - Tone 4 - 136.5
Position 5 - Tone 5 - 146.2
Position 6 - Tone 6 - 156.7
Position 7 - Tone 7 - 167.9
Position 8 - Tone 8 - 103.5
Position 9 - Tone 9 - 100.0
Position 10 - Tone 10 - 107.2
Position 11 - Tone 11 - 114.8
Position 12 - Tone 12 - 127.3
Position 13 - Tone 13 - 141.3
Position 14 - Tone 14 - 151.4
Position 15 - Tone 15 - 162.2
Position 16 - No Tone

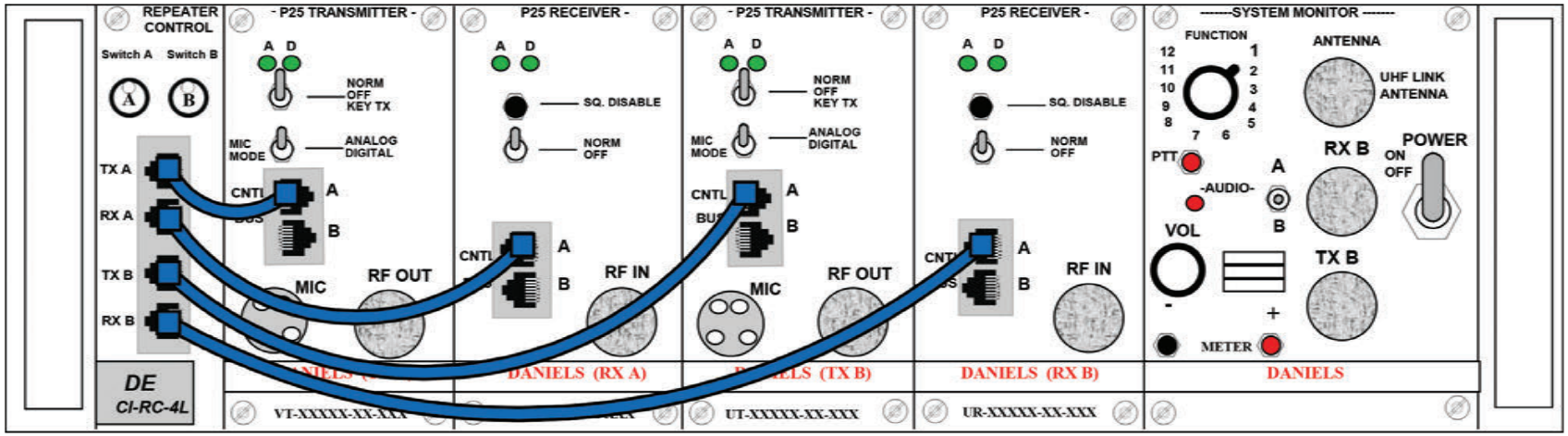


Close-Up View
Switch A, Switch B
Repeater Control Module

System Monitor Switch Functions	
1	+13.8 V (Supply Voltage)
2	+9.5 V Regulated
3-12	NIRSC Technician Testing

NIRSC/NIICD VHF Repeater Switch Settings *(4312- VHF Repeater Configuration)*	
Revised:	December, 2016

4312 - VHF REPEATER/LINK SWITCH SETTINGS



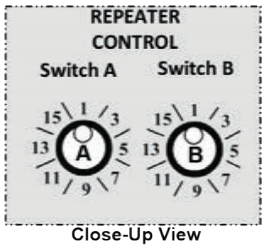
4312 - VHF REPEATER/LINK CONFIGURATION:

1. Connect the power cable to the batteries using the provided fused **POLARIZED** cable.
2. Turn the **Power** Switch to the "**ON**" position on the System Monitor.
3. Keep the power switches on the **TX A, RX A, TX B, and RX B** in the "**NORM**" position.
4. Keep the **A/B Audio Select** Switch on the **System Monitor Module** at the center position.
5. Keep the **MIC MODE** switch on both the **TX A** and **TX B** in the **ANALOG** position.
6. Select the assigned tone by turning the **Switch A** knob, located on the top portion of the **Repeater Control Module**, to the associated position. *(Switch A - Tone Selection)*
7. Select the assigned UHF link frequency by turning the **Switch B** knob to the associated position. *(Switch B - UHF Link Frequency Selection)*

Note: Selecting a tone will enable the tone on both the TX A and RX A modules. The Communications Duty Officer (CDO) will assign the appropriate tone and UHF frequency.
Both Switch A and Switch B are a 16 position rotary switch with position 1 being straight up.
The Function Switches on the System Monitor Module are only for shop testing and used in conjunction with the meter leads.

Switch A - Tone Selection List
Position 1 - Tone 1 - 110.9
Position 2 - Tone 2 - 123
Position 3 - Tone 3 - 131.8
Position 4 - Tone 4 - 136.5
Position 5 - Tone 5 - 146.2
Position 6 - Tone 6 - 156.7
Position 7 - Tone 7 - 167.9
Position 8 - Tone 8 - 103.5
Position 9 - Tone 9 - 100.0
Position 10 - Tone 10 - 107.2
Position 11 - Tone 11 - 114.8
Position 12 - Tone 12 - 127.3
Position 13 - Tone 13 - 141.3
Position 14 - Tone 14 - 151.4
Position 15 - Tone 15 - 162.2
Position 16 - No Tone

Switch B - UHF Link Frequency Selection List
Position 1 - L1 RPTR
Position 2 - L2 RPTR
Position 3 - L3 RPTR
Position 4 - L4 RPTR
Position 5 - L5 RPTR
Position 6 - L6 RPTR
Position 7 - L7 RPTR
Position 8 - L1 RX SIMPLEX
Position 9 - L2 RX SIMPLEX
Position 10 - L3 RX SIMPLEX
Position 11 - L4 RX SIMPLEX
Position 12 - L5 RX SIMPLEX
Position 13 - L6 RX SIMPLEX
Position 14 - L7 RX SIMPLEX
Position 15 - Special Use, SIMPLEX
Position 16 - Special Use, SIMPLEX

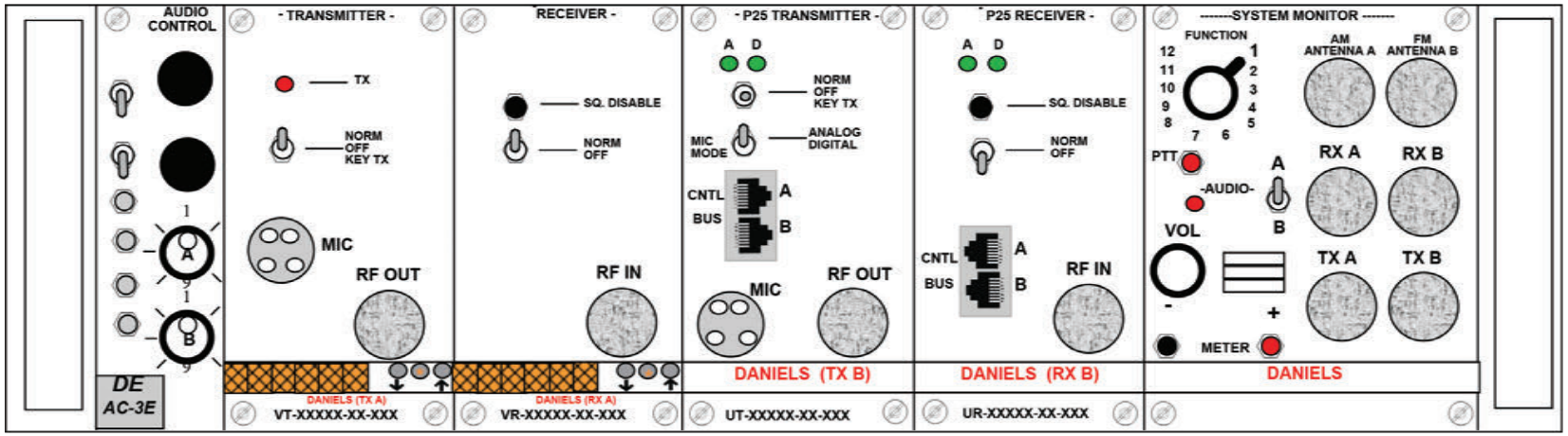


Close-Up View
Switch A, Switch B
Repeater Control Module

System Monitor Switch Functions	
1	+13.8 V (Supply Voltage)
2	+9.5 V Regulated
3-12	NIRSC Technician Testing

NIRSC/NIICD VHF Repeater/UHF Link Switch Settings *(4312 - VHF Repeater/Link Configuration)*	
Revised:	December, 2016

4370 - AIRCRAFT RADIO/LINK SWITCH SETTINGS
(BASE CONFIGURATION)



4370 - AIRCRAFT RADIO/LINK (BASE CONFIGURATION):

1. Keep both **CTCSS** switches located on the **Audio Control Module**, in the "**OFF**" (down) position.
2. Keep the power switches on both the **TX A** and **RX A** in "**NORM**" position.
3. Keep the power switches on both the **TX B** and **RX B** in "**OFF**" position.
4. Keep the **Audio Select** Switch on the **System Monitor Module** in the **"A"** position to activate the internal speaker, and place the rotary switch on the **System Monitor Module** to **Position # 1**.
5. Select the assigned **AM** frequency for the **TX A** and **RX A** using the 16-position rotary **Switch A** on the **Audio Control Module**. *(Switch A - AM Frequency Selection)*

Note: For programmable issued FAA AM frequencies, select Channel 16 on the rotary Switch A to manually program the AM TX and RX modules via the front panel.

6. Connect the microphone to the "**MIC**" jack on the **AM TX A Module**.

Note: An EXTERNAL Speaker may be used by connecting the speaker leads to the System Monitor "METER" jacks. Observe correct polarity.
Place rotary switch on the System Monitor to position #1 for EXTERNAL Speaker ONLY.

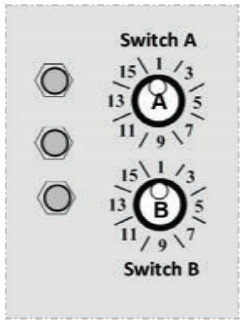
Manual AM Programming:

Note: Program an Authorized FAA AM frequency into Channel 16 only.
The Communications Duty Officer (CDO) will assign the appropriate FAA-issued AM Frequency.

1. Turn the rotary **Switch A** (top rotary switch) on the **Audio Control Module** to Channel 16.
2. Unlock the unit by pressing the **" * "** button and, before the "**Locked**" display goes blank, press the "**down** " button. The display should now show "**Unlocked**".
3. Wait for the display to blank, then press either the "**up**" or "**down**" button to display the current programmed frequency.
4. While the display is showing the frequency, press and hold either the "**up**" or "**down**" until the assigned frequency is reached.
5. Lock each unit by pressing the **" * "** button, and before the "**Unlocked**" display goes blank, press the "**up**" button. The display should now show "**Locked**".

Note: Both the AM transmitter and receiver modules must be individually programmed.

The unit is now ready for base station operation.

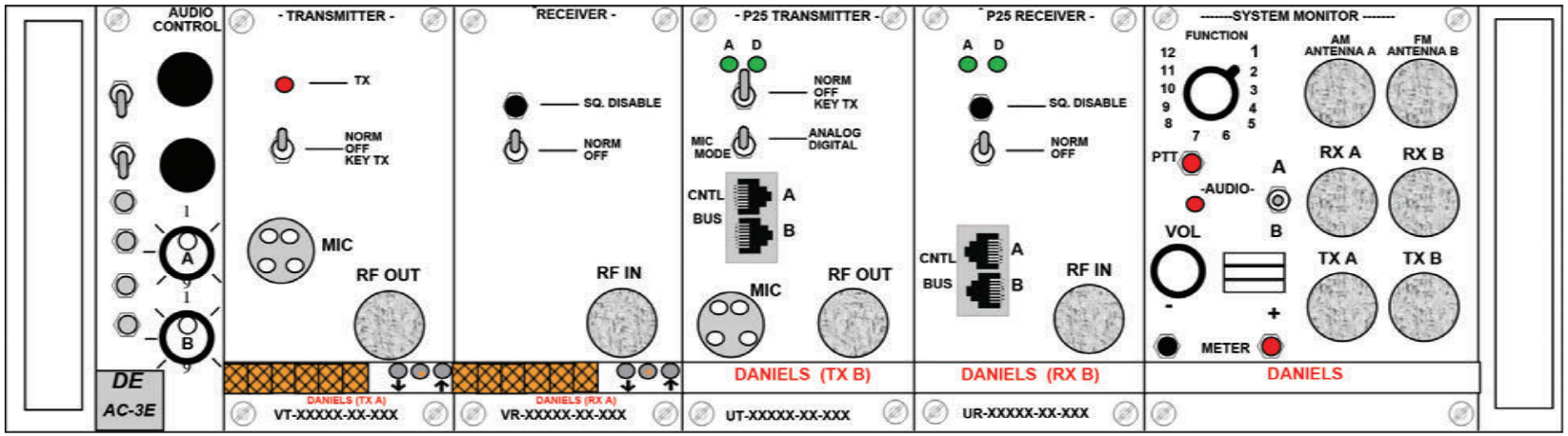


Close-Up View of Switch A and Switch B on the Audio Control Module

System Monitor Switch Functions	
1	External Speaker
2	+9.5 V Regulated
3-12	NIRSC Technician Testing

NIRSC/NIICD Aircraft Link Switch Settings *(4370 - Aircraft Radio/Link - Base Configuration)*	
Revised:	December, 2016

4370 - AIRCRAFT RADIO/LINK SWITCH SETTINGS
(LINK CONFIGURATION)



4370 - AIRCRAFT RADIO/LINK: (LINK CONFIGURATION)

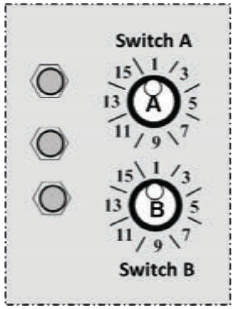
1. Keep both **CTCSS** switches, located on the **Audio Control Module** in the "**OFF**" position.
2. Keep the power switches on the **TX A**, **RX A**, **TX B**, and **RX B** in the "**NORM**" position.
3. Keep the **MIC MODE** on the **TX B** in the **ANALOG** position.
4. Keep the **A/B Audio** Select Switch on the **System Monitor Module** at the center position.
5. Select the assigned **AM frequency** for both **TX A** and **RX A** using the 16-position rotary **Switch A** on the **Audio Control Module**. *(Switch A - AM Frequency Selection)*
   Note: For programmable issued FAA AM frequencies, select Channel 16 on the rotary Switch A to manually program both the AM TX and RX modules.
6. Select the assigned **FM UHF link frequency** for both the **TX B** and **RX B** using the 16-position rotary **Switch B** on the **Audio Control Module**. *(Switch B - UHF Link Frequency Selection)*
   Note: The Communications Duty Officer (CDO) will assign the FM UHF Link frequency.

Manual AM Programming:

Note: Program an authorized FAA AM frequency into Channel 16 only. The Communications Duty Officer (CDO) will assign the appropriate FAA-issued AM Frequency.

1. Turn the rotary **Switch A** (**top rotary switch**) on the **Audio Control Module** to Channel 16.
2. Unlock the unit by pressing the **" * "** button and, before the "**Locked**" display goes blank, press the "**down**" button. The display should now show "**Unlocked**".
3. Wait for the display to blank, then press either the "**up**" or "**down**" button to display the current programmed frequency.
4. While the display is showing the frequency, press and hold either the "**up**" or "**down**" until the desired frequency is reached.
5. Lock each unit by pressing the **" * "** button and before the "**Unlocked**" display goes blank, press the "up" button.
   Note: The AM transmitter and AM receiver modules must be individually programmed.

The unit is now ready for link operation.



Close-Up View of Switch A and Switch B on the Audio Control Module

Switch B - UHF Frequency List *(The CDO will assign UHF Link Frequency)*

Position 1 - A/C 1 Simplex	**Position 9 - A/C 9 (L8 Simplex)**
Position 2 - A/C 2 Simplex	**Position 10 - A/C 9 (L8 RPTR)**
Position 3 - A/C 3 Simplex	**Position 11 - A/C 10 (L9 Simplex)**
Position 4 - A/C 4 Simplex	**Position 12 - A/C 11 (L9 RPTR)**
Position 5 - A/C 5 Simplex	**Position 13 - A/C 12 (L10 Simplex)**
Position 6 - A/C 6 Simplex	**Position 14 - A/C 13 (L10 RPTR)**
Position 7 - A/C 7 Simplex	**Position 15 - A/C 14 (L11 Simplex)**
Position 8 - A/C 8 Simplex	**Position 16 - A/C 16 (L11 RPTR)**

System Monitor Switch Functions	
1	External Speaker
2	+9.5 V Regulated
3-12	NIRSC Technician Testing

NIRSC/NIICD Aircraft Link Switch Settings *(4370 - Aircraft Radio/Link - Link Configuration)*	
Revised:	December, 2015

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APPENDIX E

RADIO PROGRAMMING GUIDES

These diagrams are also available for download online at:

http://www.nifc.gov/NIICD/documents.html

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ICOM IC-A6


ICOM
123.450
ANL
WX-ALERT
SQL
PWR
1
2
3
F
4
5
6
DEL
CLR
7
8BEEP
9TAG
SCAN
ANL
ENTWX
0BANK
MRMW
121.5
VHF AIR BAND TRANSCEIVER IC-A6

ICOM IC-A6 AM PORTABLE RADIO BASIC OPERATION & CONTROLS

1. Press and Hold the " PWR "softkey for 3 seconds to turn power "**ON**".
2. Select a valid AM frequency form one of the memory locations or direct enter a valid AM frequency via the keypad.
3. Adjust the volume by turning the Volume Knob to desired level.
4. Adjust the Squelch by pushing the " SQL " softkey, then rotate the tuning dial to desired squelch level (00 - 24). ***(See Figure 1)***
   Note: ***"SQL -- 0" is open squelch and "SQL -- 24" is tight squelch.***
   If the Squelch control is set too high, squelch may not open for weak signals.

Figure 1

5. Push the " ANL " softkey to reduce pulse noise caused by engine ignitions or other outside interference.

The radio is ready to operate on the current frequency.

6. To Transmit, press and hold the Push-To-Talk (**PTT**).
   Note: ***The display will indicate the radio is transmitting by displaying a "TX" icon on the top portion of the LCD.***
   (See Figure 2)

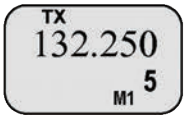

Figure 2

7. Pause 1 second and talk in a normal voice into the microphone.
   Note: ***Try to shield the microphone from wind and other loud background noises for clearer transmissions.***

8. Release the PTT to stop transmitting and receive incoming transmissions.
   Note: ***The display will indicate the radio is receiving by displaying a "RX" icon on the top portion of the LCD.***
   (See Figure 3)

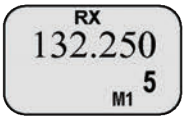

Figure 3

Figure 4: ICOM A-6 Front View

ICOM IC-A6 PORTABLE AM RADIO PROGRAMMING & OPTIONS GUIDE

MANUAL FREQUENCY ENTRY USING THE KEYPAD

1. Press and Hold the " PWR " softkey for 3 seconds until the power turns ON.
2. Push the " CLR " softkey to select frequency mode.
3. Enter a valid 5 digit AM frequency and press the " ENT " key. ***(118.000 through 136.975)***
   Display will indicate the current selected frequency. *(See Figure 1)*
   Note: Pushing the " ENT " key enters consecutive zero digits.
   Only "2", '5", "7", and "0" can be entered as the 5th and final digit.

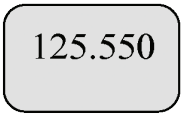

Figure 1

MANUAL FREQUENCY ENTRY USING THE TUNING DIAL

1. Press and Hold the " PWR " softkey for 3 seconds until the power turns "**ON**".
2. Push the " CLR " softkey to select frequency mode.
3. Rotate the tuning dial to set the desired frequency. *(See Figure 1)*
   Note: To select 1Mhz tuning step, press the " F " softkey once, Push the " F " softkey again to return to normal tuning.

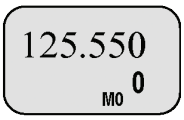

Figure 2

PROGRAMMING A MEMORY CHANNEL

1. Set the desired frequency using the keypad, the radio must be in frequency mode to enter new frequency.
2. Press the " F "soft key, followed by the " MR " softkeykey
   The LCD will flash the "**Mx XX**" in the lower display. *(See Figure 2)*
3. Select a memory bank (**0-9**) to program by pressing the " F " softkey followed by the " 0 " softkey, then selecting a desired Bank using the tuning dial. Press the " ENT " softkey once the desired bank is located. ***Note: Default is Bank-0*** *(See Figure 3)*
4. Select a memory channel (**00-19**) to be programmed using the tuning dial.
5. Press the " ENT " key to enter that frequency into the memory location. *(See Figure 4)* ***(125.550 is saved in Bank 2, Channel 5)***

Figure 3

MEMORY CHANNEL SELECTION

1. Push the " MR " key to select memory mode.
2. Select the desired memory location by rotating the tuning dial to desired memory channel and press the " ENT ".
   Display will indicate the corresponding frequency of the memory location including bank location. *(See Figure 4)*
   Note: To CLEAR the memory contents, select the memory channel to be cleared. Press the " F " softkey, then push and hold the " CLR " softkey for 2 seconds.

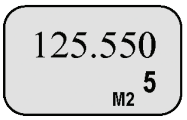

Figure 4

SELECTING A BANK

1. Press the " F " softkey, followed by the " 0 " softkey.
2. Select the desired bank (**0-9**) using the top tuning dial.
3. Press the " ENT " softkey to make that bank active.

RECALL FUNCTION

Recall stores the last 10 frequencies used in the radio.

1. **To recall a used frequency**, press the " ◄► " softkeys to find the desired used frequency. *(See Figure 5)*
   Note: To CLEAR the recall contents, select the recall channel to be cleared. Press the " F " softkey, then push and hold the " CLR " softkey for 2 seconds.

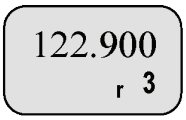

Figure 5

KEYPAD LOCK FUNCTION

1. **To Enable Key Lock**, press the " F " key, then press the " 7 " key (**Key Lock**) to turn ON the function. *(See Figure 6)*
   Display indicates that the key Lock functions is enabled by displaying the " 🔑 " icon in the upper part of the LCD.
2. **To Disable Key Lock**, repeat the process.
   Note: The lock function prevents accidental frequency changes & accidental function activation.

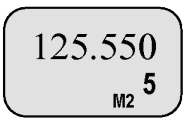

Figure 6

AUTOMATIC NOISE LIMITER (ANL) FUNCTION

1. **To Enable ANL**, press the " ANL " softkey.
   Display indicates that the ANL function is enabled by displaying "**ANL**" icon in the lower part of the LCD. *(See Figure 7)*
2. **To Disable ANL**, press the " ANL " softkey.
   Note: The ANL function reduces pulse noise such as ignition noise, computer, lights and other outside interference.

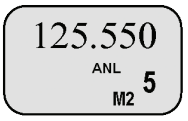

Figure 7

BACK LIGHT FUNCTION

1. **To Enable the LCD Back Light**, press the Light side button. ***(Bottom side button)***
2. **To Disable the LCD Back Light**, Press the Light side button.
   Note: The Light button turns on the LCD back light and the keypad lighting.
   The light will stay on until it is disabled.

SETTING SQUELCH LEVEL

1. Push the " SQL " softkey, then rotate the tuning dial to desired squelch level (00 - 24). *(See Figure 8)*
   Note: "SQL -- 0" is open squelch and "SQL -- 24" is tight squelch. (NIICD suggested level is 20)

Figure 8

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KING DPH/PHx

KING DPH/DPHx PORTABLE RADIO BASIC OPERATION & RADIO CONTROLS

1. Turn power **ON** by turning the ON/OFF Volume Knob clockwise.
   A beep indicates the radio is operational. The LCD will briefly indicate the current group before indicating the current channel.
2. Select a group number by pressing the " **#**" key and entering a 2-digit number followed by the " **ENT**" key.
3. Select a channel by turning the Channel Select Knob to one of the 16 available positions.
4. Adjust the volume by turning the Squelch Knob clockwise to open the squelch and set the volume to desired level.
5. Adjust the Squelch by turning the Squelch Knob counterclockwise until the squelch closes.
   Note: This is the Threshold Squelch Setting.
   Turn the squelch Knob fully counterclockwise into the detent position to place the RX in Code Guard. RX must have a tone programmed in order for RX Code Guard to function properly. Putting the RX in Code Guard, will enable the RX not to open squelch unless the it receives the correct tone.

The radio is now ready to RECEIVE on the current group and channel.

6. To transmit, press and hold the Push-To-Talk (**PTT**) button on the side of the radio.
   Note: The Transmit Indicator Light should glow red while transmitting. If not, the battery may be low or the channel is RX only or busy.

7. Pause 1 second and talk in a normal voice into the microphone.
   Note: Try to shield the microphone from wind and other loud background noises for clearer transmissions.

8. Release the PTT to stop transmitting and receive incoming transmissions.

Figure 1: DPH/DPHx Front View

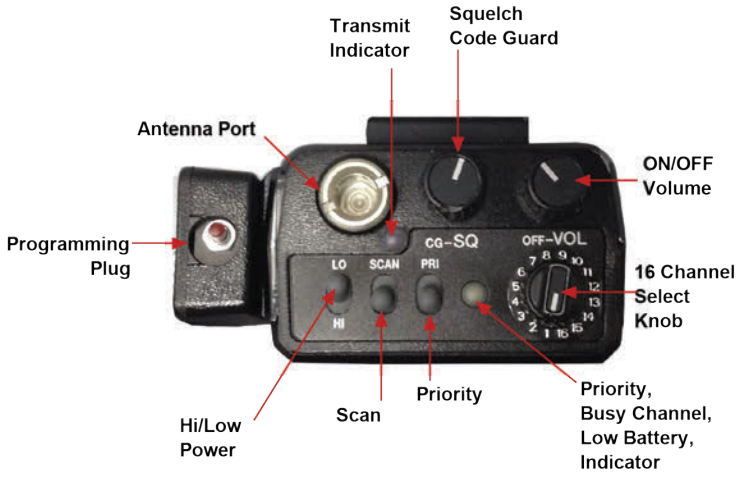

Figure 2: DPH/DPHx Top View

KING DPH/DPHx PORTABLE RADIO SETTINGS/OPTIONS

ADD/REMOVE CHANNELS FROM SCAN LIST

1. To **ADD channel to Scan List**, select a channel to scan with the channel select knob and press the " **ENT**" key. LCD will display "**SCN**" in the upper section, indicating that the current displayed channel is in the scan list. *(See Figure 1)*
2. **To REMOVE channel from Scan List**, select the channel to remove with the channel select knob and press the " **CLR**" key. "**SCN**" will be removed from the upper section of the LCD.

Note: Scan must be disabled in order to add or remove channels from the scan list, by toggling the "SCAN" and "PRI" toggle switches in the down position. (Toward the front of the radio)

Figure 1

ADD PRIORITY SCAN CHANNEL

1. **To select a channel as a Priority Scan Channel,** select a channel and press the " **PRI**" key. *(See Figure 2)* LCD will display "**PR**" in the upper section, indicating that the current displayed channel is now the Priority 1 Channel.

Note: Scan must be disabled in order to add or remove the Priority 1 Channel, by toggling the "SCAN" and "PRI" toggle switches in the down position. (Toward the front of the radio)
Priority 2 Channel can only be changed in the "CH 00" parameters. (See "CH 00" Settings)

Note: Enabling PRI Scan will only scan the Priority Channel(s). In order to scan the scan list channels and the Priority Channel(s), both the Scan and PRI Toggle switches must be enabled.

NIICD default is set to all PRI off.

Figure 2

ENABLE/DISABLE SCAN/PRIORITY SCAN

1. **Enable Scan,** by toggling the Scan Toggle Switch to the up position. ***(Toward the back of the radio)*** LCD will indicate scan is enabled by flashing " -- --" in the right side of the display if alphanumeric mode in disabled. *(See Figure 3)*

or

LCD will indicate scan is enabled by flashing " **SCN**" in the upper part of the display if alphanumeric mode is enabled.

2. **Disable Scan,** by toggling the Scan Toggle Switch to the down position. ***(Toward the front of the radio)***
3. **Enable Priority Scan,** by toggling the PRI Toggle Switch to the up position. ***(Toward the back of the radio)*** LCD will indicate Priority Scan is enabled by flashing " -- --" in the right side of the display and with a " **PR**" icon in the top portion of the display if alphanumeric mode is disabled. *(See Figure 4)*

or

LCD will indicate Priority Scan is enabled by flashing " **SCN**" in the upper part of the display if alphanumeric mode is enabled.

4. **Disable Priority Scan**, by toggling the PRI Toggle Switch to the down position. ***(Toward the front of the radio)***

Note: Depending on what type of Priority Scan Mode is enabled, the LCD will display and operate differently for each priority mode. Check the priority mode in the "CH 00" Group Settings.
NIICD Default is set to Priority Mode A.

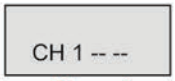

Figure 3

Figure 4

CHANGING GROUPS

1. Press the "**#**" key followed with the 2-digit number of the desired group and press " **ENT**" or wait 3 seconds. *(See Figure 5)*

Note: All DPH/DPHx NIICD model radios have a 25 group capacity.
Groups 1-4 contain the Standard NIICD Frequencies.

Figure 5

TX USER SELECTABLE TONES

1. **To Enable Selectable Tone**, press one of number keys (1-9) to select a preprogrammed TX User Selectable Tone. Display will indicate a TX User Selectable Tone is enabled by displaying the " **CG**" icon in the top portion of the LCD. If Alphanumeric Mode is Disabled, display will also indicate the selected TX User Tone. *(See Figure 6)*
2. **To Disable Selectable Tone**, press the "**0**" key on the keypad.

Note: NIICD default is TX User Selectable Tones Disabled. Tones can be enabled through the "CH 00" functions.

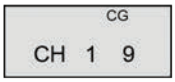

Figure 6

HI/LOW POWER SETTINGS

1. **Select Low Power** by toggling the LO/HI Toggle Switch to the up position. ***(Toward the back of the radio)***
2. **Select High Power** by toggling the LO/HI Toggle Switch to the down position. ***(Toward the front of the radio)***

Note: NIICD Low Power setting is set to 2.0 Watts, High Power setting is set to 5.0 Watts. (Current draw dependent)

ENABLE/DISABLE KEYPAD

1. **To Disable keypad**, press and hold the " **FNC**" key until the LCD displays " **LOCKED**". *(See Figure 7)*
2. **To Enable keypad**, press and hold the " **FNC**" key until the LCD displays " **UNLOCKED**". *(See Figure 8)*

Figure 7

Figure 8

1. Turn on radio and select a group and channel you wish to program
- Select a group number by pressing the " **#**" key and entering a 2-digit number followed by the " **ENT**" key.
- Select a channel number by turning the Channel Select Knob to one of the 16 available positions.

2. **Access Program Mode** *(See Figures 1 and 2)*
- Insert a programming plug into the side connector of the radio.
- Press and hold the red Master Switch on the programming plug.
- Simultaneously Press and hold the " **FCN**" key for approximately three seconds until the LCD displays " **-- -- -- ID**".
- Enter a valid password. ***NIICD default password is set to "000000"***
- Press the "**ENT**" key to proceed into the programming mode.
- If the correct password was entered, the LCD displays " **CH00**".

3. Once in Program Mode, select a 2-digit channel number (**01-16**) to program using the keypad.
Note: Once a channel is entered, pressing the " FNC" key will scroll through that particular channel settings.

4. Once the desired channel is entered and displayed, the **Bandwidth Setting** can be set.
Press the "**#**" key to toggle between Wide-Band and Narrow-Band. *(See Figure 3)*
Note: The "N" indicates that the channel is set for Narrow-Band operation, No indication for Wide-Band operation.

5. Once the Bandwidth is set, press the " **FCN**" key to scroll to the next programming parameter.
The LCD will display "PRG RX **162.5500**" for programming the **RX Frequency**. *(See Figure 4)*
Press the "**CLR**" key to clear the current frequency and enter a valid VHF RX frequency and press the " **ENT**" key.

6. The LCD will display "PRG RX **MODE-A**" for programming the RX Mode. *(See Figure 5)*
Press the "**PRI**" key to toggle between " **A**", "**D**", or "**M**". Select "**A**" press the "**ENT**" key.
Note: A=Analog Channel, D=Digital Channel, and M=Mixed Mode Channel

7. The LCD will display "PRG RX CG **000.0**" for programming the **RX Code Guard**. *(See Figure 6)*
Press the "**CLR**" key to clear the tone and enter a valid tone using the keypad and press the " **ENT**" key.
Note: Enter "000.0" for no tone.

8. LCD will display "PRG RX IDCG **NAC0659**" for programming the **RX Network Access Code**.
This is a Digital Channel Function, press the " **ENT**" key to skip to the next programming parameter.

9. The LCD will display "PRG RX ID **SQL--NRM**" for programming the Squelch Setting. *(See Figure 7)*
Press the "**PRI**" key to toggle between " **NRM**", or "**SEL**". Select "**NRM**" and press the "**ENT**" key.
Note: "SEL" is used only in Digital or Mixed Mode to use Talk Groups or Individual Call Functions.

10. LCD will display "PRG TX **168.05000**" for programming the **TX Frequency**. *(See Figure 8)*
Press the "**CLR**" key to clear the current frequency and enter a valid VHF TX frequency and press the " **ENT**" key.

11. LCD will Display "PRG TX **MODE-A**" for programming the **TX Mode**. *(See Figure 9)*
Press the "**PRI**" key to toggle between " **A**", "**D**", or "**M**". Select "**A**" and press the "**ENT**" key.
Note: A=Analog Channel, D=Digital Channel, and M=Mixed Mode Channel

12. LCD will display "PRG TX CG **110.9**" for programming **TX Code Guard**. *(See Figure 10)*
Press the "**CLR**" key to clear the current tone and enter a valid tone using the keypad and press the " **ENT**" key.
Note: Enter "000.0" for no tone.

13. LCD will display "PRG TX IDCG **NAC0659**" for programming the **TX Network Access Code**.
This is a Digital Channel Function, press the " **ENT**" key to skip to the next programming parameter.

14. LCD will display the "PRG ID **TG00001**" for programming the **TX Talk Group ID**.
This is a Digital Channel Function, press the " **ENT**" key to skip to the next programming parameter.

15. LCD will display the channel name/label, press the " **ENT**" key to keep name/label and finish programing the channel or press the "**CLR**" key to change the name/label for that channel. *(See figure 11)*

16. **Changing Channel Label**
- Press the "**CLR**" key to clear the label.
- Press the "**PRI**" key to scroll through available Alphanumeric Characters.
- Press the "**FCN**" key to enter a character and shift to the left for the next character.
- Repeat the process until desired name/label is entered and press the " **ENT**" key.
Note: LCD is an 8 character display. NIICD default is set to display the numeric characters only in the "CH 00" parameters.

17. Once the label is entered, the program will bring the first channel parameter up, channel programming is complete.
At this point the user may select another channel to program by starting on step 3 or exit the program mode by cycling power to the radio.

Figure 1

Figure 2

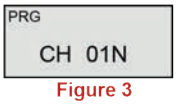

Figure 3

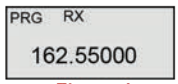

Figure 4

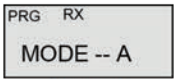

Figure 5

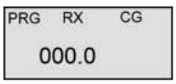

Figure 6

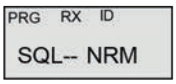

Figure 7

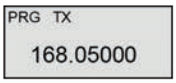

Figure 8

Figure 9

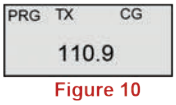

Figure 10

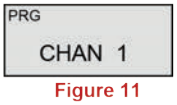

Figure 11

CLONING RADIO SETTINGS *(See Figure 5)*

1. Assure that both radios are off and attach the Master end of the cloning cable to the side connector of the Master radio. Attach the Clone/Slave end of the cloning cable to the side connector of the radio being cloned to.

2. Turn both radios on.
   Assure each radio is in the corresponding group before continuing with the cloning process.

3. Put the Master radio in programming mode by holding down the Master Switch and simultaneously pressing the " **FCN**" key on the radio until the LCD displays (**-- -- -- ID**). *(See Figure 1)*

4. Enter a valid password, if requested, and press the " **ENT**" key. ***(NIICD default Password is set to "000000")***
   The LCD will display "**CH 00**" if the correct password was entered. *(See Figure 2)*

5. Press the "*****" key on the Master radio.
   The LCD will flash "**PROG**", indicating that the radio is ready to download. *(See Figure 3)*

6. Press the "**FCN**" key to download to clone/slave radio.
   If the clone was successful, the Master radio will resume flashing " **PROG**" on the display.
   If the clone was not successful, the Master radio will flash " **FAIL**" followed by continuous beeps. *(See Figure 4)*
   Note: To stop "FAIL" mode, press the "CLR" key, turn off the radios, and start the cloning process again.
   When the Master radio downloads to a clone, the Scan List and Priority Channel designations are also downloaded to the clone radio.
   Group Password are also downloaded between DPH and GPH Model radios, NIICD recommends not modifying the Group Password when programming radios.

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5: King DPH Cloning Connections

KING DPH/DPHx PORTABLE RADIO "CH 00" SETTINGS

1. Select a group you wish to program.
2. Access the Program Mode to enter the " **CH 00**" Settings. *(See Figure 1)* ***(See Access Program Mode on page 1)***
3. Once "**CH 00**" is displayed, press the "**FNC**" key to scroll to the fist "**CH 00**" parameter.

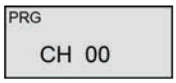

Figure 1

4. The display will indicate "PRG **P000000**" for the **Group Password**. *(See Figure 2)*
   Press the "**ENT**" if no change is required and advance to the next programming parameter
   Note: NIICD does not recommend changing the group password. Default password is set to "P000000"

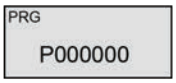

Figure 2

5. The display will indicate "PRG ID **0000000**" for the **Group Automatic Numeric Identification** parameter (**ANI**). *(See Figure 3)*
   This is used as either a radio management number or transmitted as a DTMF tone. Press the "**ENT**" or "**FNC**" key to advance to the next field. ***(NIICD default is set to "0000000")***

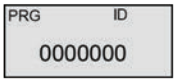

Figure 3

5. The display will indicate "PRG TX **160 SEC**" for the **Transmit Tim-Out Timer** (**TOT**) duration. *(See Figure 4)*
   To change the TOT, press the "**PRI**" key to increase the TOT duration and press the " **ENT**" to store value and advance to the next field. ***(NIICD default is set to "120 SEC") A TOT value of 0.0 Seconds, disables the TOT.***

Figure 4

6. The display will indicate "PRG SCN **2.0 SEC**" for the **Scan Delay Time**. *(See Figure 5)*
   To change the Scan Delay Time, press the " **PRI**" key to increase the duration and press the " **ENT**" key to store and advance to the next field. ***(NIICD default is set to "2.0 SEC")***

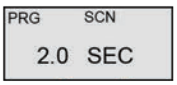

Figure 5

7. The display will indicate "PRG **PR1 OFF**" for programming a **Priority 1 Channel**. *(See Figure 6)*
   To change the Priority 1 Channel, press the " **PRI**" key to select a channel or turn OFF the function and press the " **ENT**" key to store and advance to the next field. ***NIFC Default is set to "OFF"***
   Note: Priority 1 Channel can be programmed as a fixed channel, selected by the channel select knob, or OFF. If the PRI 1 is set as fixed, it can be changed through the front keypad by pressing the "PRI" key.

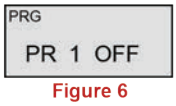

Figure 6

8. The display will indicate "PRG **PR2 OFF**" for programming the **Priority 2 Channel**. *(See Figure 7)*
   To change the Priority 2 Channel, press the " **PRI**" key to select a channel or turn OFF the function and press the " **ENT**" key to store and advance to the next field. ***NIFC Default is set to "OFF"***
   Note: Priority 2 Channel can only be changed via the "CH 00" parameters.

Figure 7

7. The display will indicate "PRG **1--12345**" for the **Group 1 Functions**. *(See Figure 8)*
   The group functions can be enabled or disabled by pressing the number key corresponding to that function.

Figure 8

CH 00 Group 1 Functions **NIICD default is "1-12345"** *(See Figure 8)*

- 1-**1**2345.....**Battery Saver Inhibit** (Disables the Battery Saver Function for current drain on battery life.)
- 1-1**2**345.....**Group Scan** (Enables the current group to be scanned while in Group Scan Mode.)
- 1-12**3**45.....**TX on PRI 1** Enables transmission on PRI 1 when PRI Scan is Enabled.)
- 1-123**4**5.....**Priority 1 Lock** (Enables the Lock out of the "PRI" key, so user can not change the Priority 1 Channel.)
- 1-1234**5**.....**Scan List Lock** (Enables the Scan List Lock out, so user can not add/remove channels from the scan list.)

CH 00 Group 2 Functions **NIICD default is "2-12345"** *(See Figure 9)*

- 2-**1**2345.....**User CH Code Guard** (Enables keypad to independently select a Channel Code Guard value from programmed channels.)
- 2-12**3**45.....**Busy Channel Indicator** (Yellow LED illuminates when signal is received on selected channel.)
- 2-123**4**5.....**Busy Channel Lockout** (Yellow LED illuminates and PTT is disabled when a signal is received on selected channel.)
- 2-12**3**45.....**Busy Channel Lockout/Over-ride** (Same as Busy Channel Lockout, but PTT can be activating the Squelch Code Guard.)
- 2-1234**5**.....**ANI** (Enables the ANI ID number to be transmitted with each press of the PTT as a DTMF tone.)
- 2-1234**5**.....**Manual DTMF Encoder** (Enables keypad for manual DTMF operation.)
- 2-123**45**.....**Manual DTMF/ANI Encoder** (Enables the ANI ID number to be transmitted only after the "ENT" key is pressed during TX.)

Figure 9

CH 00 Group 3 Functions **NIICD default is "3-12345"** *(See Figure 10)*

- 3-**1**2345.....**Reserved**
- 3-1**2**345.....**Reserved**
- 3-12**3**45.....**LCD Back light ON Display Change** (LCD back light will illuminate each time the display receives an input.)
- 3-123**4**5.....**LCD Back light ON Key Press** (LCD back light will illuminate each time a key is pressed.)
- 3-1234**5**.....**Alphanumeric Mode** (LCD will display Alphanumeric Characters.)

Figure 10

10. After "**CH 00**" Group 3 Functions, the display will indicate "PRG **LITE OFF**" for the **LCD Back light Duration Setting**.
    To change the back light duration, press the " **PRI**" key to select an available setting and press the " **ENT**" key to store and advance to the next field. ***(NIICD default is "OFF")*** *(See Figure 11)*

Figure 11

11. The display will indicate the current **group label**. *(See Figure 12)*
    Press the "**ENT**" key to advance back to the " **CH 00**" starting point.
    At this point, pressing the "**FNC**" key repeatedly will scroll down each value of the " **CH 00**" settings for that channel.
    If no changes are needed, exit the program mode by cycling power to the radio or continue with channel programming.

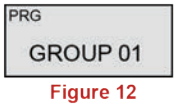

Figure 12

KING KNG-P150s

KNG P150S VHF PORTABLE RADIO BASIC OPERATION AND RADIO CONTROLS

1. Turn the power **ON** by turning the "**VOL**" Knob clockwise.
   The LCD will indicate the current Zone and Channel label.

2. Select a zone number by pressing the "***Zone***" softkey. Enter the zone number via the key pad and press the "**OK**" softkey.
   OR
   Press the "**Zone**" softkey. Press the UP/Down soft keys to highlight desired zone and press the "**OK**" softkey.

3. Select a channel by turning the Channel Select Knob to one of the 16 available positions.

4. Adjust the volume by pressing the "**Monitor**" button once to open the squelch and set the volume to desired level, press the "**Monitor**" key once more to close Squelch.

The radio is now ready to operate on the current group and channel.

6. To transmit, press and hold the Push-To-Talk (**PTT**) button on the side of the radio.
   Note: The Transmit Indicator Light should glow red while transmitting.
   If not, the battery may be low or the channel is RX only or busy.

7. Pause 1 second and talk in a normal voice into the microphone.
   Note: Try to shield the microphone from wind and other loud background noises for clearer transmissions.

8. Release the PTT to stop transmitting and receive incoming transmissions.

Figure 1: Front View KNG

Figure 2: Top View KNG

KNG-P150S VHF PORTABLE RADIO SETTINGS/OPTIONS GUIDE

CHANGING ZONES

To change groups, press the "**Zone**" softkey. Enter the zone number via the key pad and press the "**ENT**" softkey. *(See Figure 1 & 2)*

OR

Press the "**Zone**" softkey. Press the UP/Down keypad keys to desired zone and press the "**ENT**" softkey. *(See Figure 1 & 2)*

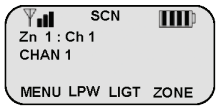

Figure 1

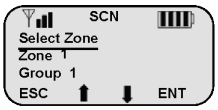

Figure 2

ENABLING/DISABLING SCAN

To Enable Scan - Toggle the "**Scan Toggle**" switch towards the front of the radio. The display will indicate the radio is in Scan Mode by displaying a flashing "**SCN**" icon on the LCD. *(See Figure 1)*

To Disable Scan - Toggle the "**Scan Toggle**" switch towards the back of the radio.

ENABLING/DISABLING PRIORITY SCAN

To Enable Priority Scan - Toggle the "**PRI Toggle**" switch towards the front of the radio. The display will indicate the radio is in Priority Scan Mode by displaying a flashing "**SCN**" icon on the LCD.

To Disable Priority Scan - Toggle the "**PRI Toggle**" switch towards the back of the radio.

ADD/REMOVE CHANNEL FROM SCAN LIST

To Add a Channel - Press the "**Menu**" softkey, scroll down to "**Scan List**" using the up/down softkeys and press the "**ENT**" softkey. Select the channel to scan using the up/down softkeys, then press the "+/-" softkey to add or delete the channel from the scan list.

Note: An "+" next to the select channel indicates the Channel is in the Scan List. *(See Figure 3)*

Press the "**ESC**" softkey twice to return to normal operation.

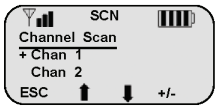

Figure 3

To Remove a Channel - Repeat the process and select "-".

TX POWER SELECTION

Low Power - Press the "**LPW**" softkey to enable low power setting. Once enabled, a black background around the "**LPW**" display will be outlined. *(See Figure 4)*

High Power - Press the "**LPW**" softkey to disable low power setting. *(See Figure 5)*

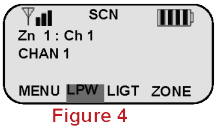

Figure 4

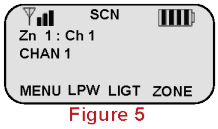

Figure 5

LOCKING KEYPAD

To Lock Keypad - Turn the top bezel button located on the top of the radio to the "Ø" position. If any keys on the front panel are pushing while the keypad is locked, the LCD will display the following "**Keys Locked**" message. *(See Figure 6)*

To Unlock the Keypad - Turn the top bezel button to the "O" position.

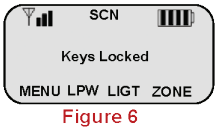

Figure 6

1. Turn on the radio.

2. Access the Program Mode *(See Figure 1 and 2)*
- Press the "**Menu**" softkey.
- Scroll down using the Up/Down softkeys to highlight "**Keypad Prog**" and press the "**ENT**" softkey.
- Highlight "**Keypad Prog**" and the press the "**ENT**" softkey.
- Enter the 7-digit NIICD password and press the "**ENT**" softkey. ***NIICD default password is set to "0000000"***

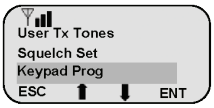

Figure 1

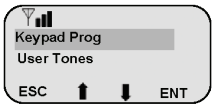

Figure 2

3. Once in Program Mode, scroll up/down to highlight "**Channels**" and press "**ENT**".
4. Scroll to the desired Zone/Group using the up/down softkeys and press "**ENT**".
5. Scroll to the desired Channel using the up/down softkeys and press "**ENT**".

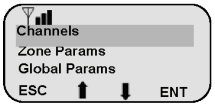

Figure 3

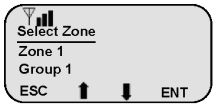

Figure 4

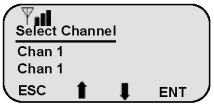

Figure 5

6. Highlight "**Rx Freq**" and press "**ENT**". *(See Figure 6)*
- Press the "**CLR**" softkey and enter a valid RX Frequency and press "**ENT**".

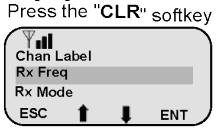

Figure 6

7. Highlight "**Rx Mode**" and press "**ENT**", highlight "**Analog**" and press "**ENT**". *(See Figure 7)*
8. Highlight "**Rx Guard**" and press "**ENT**". (See Figure 8)
- Press the "**CLR**" softkey and enter a valid RX Tone and press "**ENT**".

Note: "RX NAC" is a Digital function and should be skipped while programming an Analog channel.
Note: "Squelch Mode" can not be changed while programming an Analog Channel.

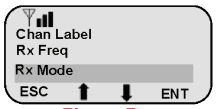

Figure 7

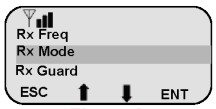

Figure 8

9. Highlight "**Tx Freq**" using the up/down softkeys and press "**ENT**". *(See Figure 9)*
- Press the "**CLR**" softkey and enter a valid TX Frequency and press "**ENT**".

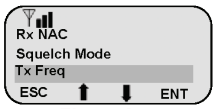

Figure 9

10. Highlight "**Tx Mode**" and press "**ENT**", highlight "**Analog**" and press "**ENT**". *(See Figure 10)*
11. Highlight "**Bandwidth**" and press "**ENT**", highlight "**12.5 Khz**" for Narrowband and press "**ENT**". *(See Figure 11)*
12. Highlight "**Tx Guard**" and press "**ENT**". *(See Figure 12)*
- Press the "**CLR**" softkey and enter a valid TX Tone and press "**ENT**".

Note: "TX NAC" is a Digital function and should be skipped while programming an Analog channel.
"TGID" is a Digital function and should be skipped while programming an Analog channel.

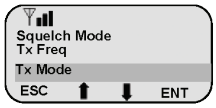

Figure 10

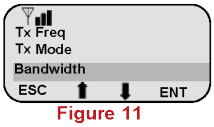

Figure 11

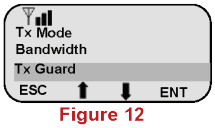

Figure 12

13. Highlight "**Secure Mode**" and press "**ENT**", highlight "**Clear**" and press "**ENT**". *(See Figure 13)*

Note: "Key" and "Key Lock" options or for Encryption only, and should be skipped while programming an Analog Channel.

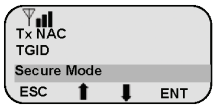

Figure 13

14. Highlight "**Low Pow Lock**" and press "**ENT**", highligt "**OFF**" and press "**ENT**". *(See Figure 14)*

Note: Selecting "ON" will enable low power at all times for that particular channel.

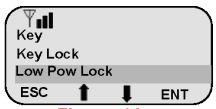

Figure 14

15. Highlight "**Plist Disable**" using the up/down softkey and press "**ENT**", select "**OFF**" and press "**ENT**".

16. Press "**ESC**" once and select anther channel to program repeat steps 6 through 15, or press "**ESC**" several times to exit the programming mode.

KNG P150S VHF PORTABLE RADIO CLONING INSTRUCTIONS

1. Assure that both radios are off and attach the cloning cable to both the Source and Target radios.

2. Turn both radios on.

Note: Determine which group needs to be coned from the Source radio, and to which group on the target radio will be cloned.

3. Place the Master radio in Cloning Mode by pressing the "**Menu**" softkey, highlight "**Cloning**" and press "**ENT**". ***(See Figure 1)***

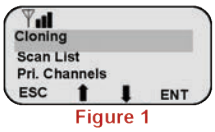

Figure 1

4. Select the type of clone to be preformed by the Master radio. ***(See Figure 2)***

- Active Zone - Information from the current selected zone in the source radio will be sent to the current active zone on the target radio.
- Zone-to-Zone - User selects the source and target zones to be cloned.
- Entire Radio - All information from the Source radio will be cloned.

Note: Radios programmed with blocked zones will not receive cloning information when a Entire Radio clone is selected. Entire radio cloning transfers all radio information except the following:
-Radio Serial Number
-P25 Identification Number
-Encryption Keys
-Passwords

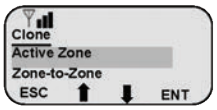

Figure 2

4A. Active Zone: ***(See Figure 2)***

- Highlight "**Active Zone**" and press "**ENT**".

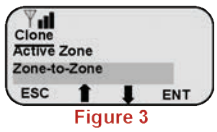

Figure 3

4B. Zone-to-Zone: ***(See Figure 3)***

- Highlight "**Zone-to-Zone**" and press "**ENT**".
- Scroll and select the "**Source Zone**" and press "**ENT**".
- Scroll and select the "**Destination Zone**" and press "**ENT**".

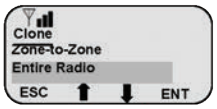

Figure 4

4C. Entire Radio: ***(See Figure 4)***

- Highlight "**Entire Radio**" and press "**ENT**".

5. Once the cloning is complete press "**ESC**" on the Source radio for normal operation.

Note: If cloned failed, its possible that the Target zone is blocked from accepting any incoming clone. (See Figure 6)

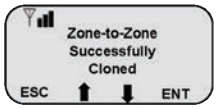

Figure 5

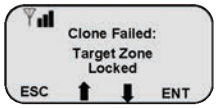

Figure 6

Figure 8: KNG Cloning Connections

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MIDLAND

MIDLAND VHF/UHF PORTABLE RADIO BASIC OPERATION AND RADIO CONTROLS

1. Turn power **ON** by turning the ON/OFF Volume Knob clockwise.
   The LCD will indicate the current channel label.

2. Select a zone number by pressing the appropriate the "***Zone***" softkey. Enter the zone number via the key pad and press the "**OK**" softkey.
   OR
   Press the "**Zone**" softkey. Press the UP/Down keypad keys to desired zone and press the "**OK**" softkey.

3. Select a channel by turning the Channel Select Knob to one of the 16 available positions.

4. Adjust the volume by pressing the "**F2 Squelch**" button once to open the squelch and set the volume to desired level, press the "**F2 Squelch**" key once more to close Squelch. The radio will display "**CHANNEL MONITOR ON** or **OFF**". To exit, press the "**Exit**" softkey or wait 3 seconds and the radio will return to it's default operating display. **The radio is now ready to operate on the current group and channel.**

   Note: Holding down the "F2 Squelch" button will open the "Squelch Adjust" parameter of the radio. This setting allows the user to adjust the squelch setting for each individual channel. To exit, press the "Exit" softkey or wait 3 seconds and the radio will return to it's default operating display. (See Radio Settings for more detail)

6. To transmit, press and hold the Push-To-Talk (**PTT**) button on the side of the radio.
   Note: The Transmit Indicator Light should glow red while transmitting. If not, the battery may be low or the channel is RX only or busy.

7. Pause 1 second and talk in a normal voice into the microphone.
   Note: Try to shield the microphone from wind and other loud background noises for clearer transmissions.

8. Release the PTT to stop transmitting and receive incoming transmissions.

Figure 1: Front View Midland

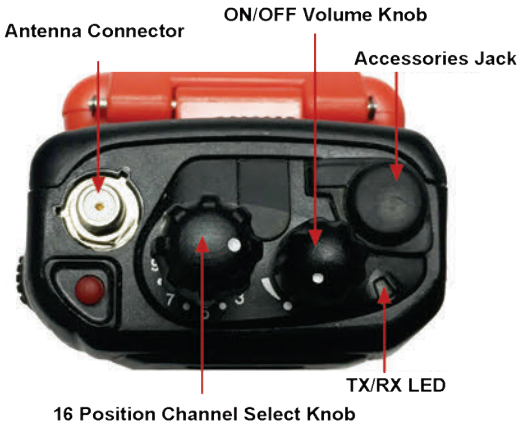

Figure 2: Top View Midland

CHANGING ZONES

To change groups, press the " **Zone**" softkey. Enter the zone number via the key pad and press the " **OK**" softkey. *(See Figure 1)*

OR

Press the "**Zone**" softkey. Press the UP/Down keypad keys to desired zone and press the " **OK**" softkey. *(See Figure 2)*

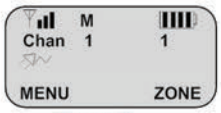

Figure 1

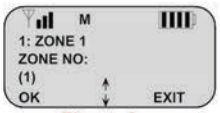

Figure 2

ENABLING/DISABLING SCAN

To Enable Scan - Press the " C " softkey. The display will indicate the radio is scanning by a " ZJ icon in the upper right corner.
To Disable Scan - Press the " C " softkey.
Note: Pressing the "Menu" softkey while scanning will also disable scan.
If no channels are in the scan list, the user will get the following error "Enter Scan List" on the display.

ADD/REMOVE CHANNEL FROM SCAN LIST

To Add a Channel - Press the "**Menu**" softkey, scroll down to " **Channel Parameter**" using the up/down softkeys and press the " **Select**" softkey.
Scroll to "**Channel Scan**" and press the "**Select**" softkey.
Scroll down/up to desired channel and press the " **Select**" softkey. Scroll to " **Add to List**", "**1st Priority**" or "**2nd Priority**" and press the "**OK**" softkey.
Press the "**Exit**" softkey, and continue adding more channels to the scan list.
Once complete, press " **Exit**" twice to close scan edit list.

To Remove a Channel - Repeat the process and select " **Remove**".

Note: Holding down the "#" key will also bring up the Edit Scan List menu.

TX POWER SELECTION

Press the "**F1**" side button to cycle between
HI/MID/LOW power settings.
Note: H= HI Power/ M=Medium Power/ L=Low Power (See Figures 3, 4 and 5)

Figure 3

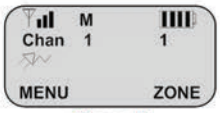

Figure 4

Figure 5

LOCKING KEYPAD

Press the " ' softkey once to lock key pad.
Press the " ' softkey once more then press the " **Unlock**" softkey to unlock keypad.

SQUELCH ADJUSTMENT

Press and hold the " **F2 Sqluech**" button to open the " **Squelch Adjust**" parameter. *(See Figure 6)*
Adjust the squelch setting by using the up/down softkeys and press the " **OK**" softkey.

Note: Setting squelch to the far left, completely opens the squelch sensitivity setting (Open Squelch). (See Figure 7)

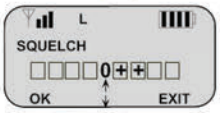

Figure 6

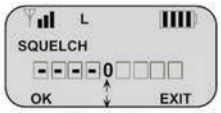

Figure 7

1. Select the group and channel you wish to program *(See Figure 1)*
   Note: To change groups, press the "Zone" softkey. Enter the zone number via the key pad and press the "OK" softkey.
   OR
   Press the "Zone" softkey. Press the UP/Down keypad keys to desired zone and press the "OK" softkey.

Figure 1

2. Select the "**Menu**" softkey, scroll down/up to " **Channel Paramaters**" and press the "**Select**" softkey. *(See Figure 2)*

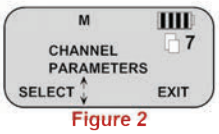

Figure 2

3. Scroll down/up to "**Channel**" and press the "**Select**" softkey to enter channel programming mode.

4. Enter a 5-Digit Password and press the " **OK**" softkey. ***NIICD Password is "00000"*** *(See Figure 3)*

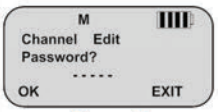

Figure 3

5. Scroll up/down to desired channel and press the " **Select**" sofkey to enter channel parameters. *(See Figure 4)*

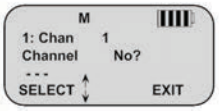

Figure 4

Channel Parameters

6. **Channel Mode: Default is set to "Analog".** *(See Figure 5)*
   To change setting, press the " **Edit**" softkey and scroll up/down to select " **Analog, Digital, or Multi**" and press the "**OK**" softkey.

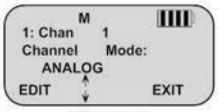

Figure 5

7. **RX Frequency:** Press the "**Edit**" softkey to edit the RX Frequency. Press the " C " ley several times to clear the frequency and enter the new RX Frequency and press the " **OK**' softkey. *(See Figure 6)*

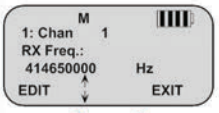

Figure 6

8. **TX Frequency:** Press the "**Edit**" softkey to edit the TX Frequency. Press the "" C " ley several times to clear the frequency and enter the new TX Frequency and press the " **OK**' softkey. *(See Figure 7)*

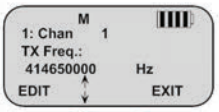

Figure 7

9. **TX Power:Default is set to Medium (2 Watts).**
   To change setting, press the " **Edit**" softkey and scroll up/down to select " **Low, Medium", or "High**" Power and press the "**OK**" softkey.

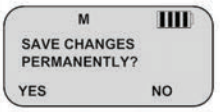

Figure 8

10. **Channel Name:**
    To change the channel name, press the " **Edit**" softkey and press the " C " ley several time to clear the channel name.
    Enter a new channel name via the numeric key pad and press the " **OK**" softkey.

11. **TX Timeout: Default is set to "Yes". Timer is set to 120 seconds.**
    To change setting, press the " **Edit**" softkey and scroll up/down to select " **No or Yes**" and press the "**OK**" softkey.

12. **RX Tone Type: Default is set to "CCS".**
    To change setting, press the " **Edit**" softkey and scroll up/down to select " **CCS" or "DCS**" and press the "**OK**" softkey.

13. **RX Tone: Default is set to "None".**
    To change setting, press the " **Edit**" softkey and scroll up/down to select desired tone from list and press the " **OK**" softkey.

14. **TX Tone Type: Default is set to "CCS".**
    To change setting, press the " **Edit**" softkey and scroll up/down to select " **CCS" or "DCS**" and press the "**OK**" softkey.

15. **TX Tone: Default is set to "None".**
    To change setting, press the " **Edit**" softkey and scroll up/down to select desired tone from list and press the " **OK**" softkey.

16. **Chan. Spacing: Default is set to "12.5Khz". Narrowband**
    To change setting, press the " **Edit**" softkey and scroll up/down to select either " **12.5Khz" or "15Khz**" and press the "**OK**" softkey.

17. **ANI Type: Default is set to "None".**
    To change setting, press the " **Edit**" softkey and scroll up/down to select either " **None, "5-Tone", or "DTMF**" and press the "**OK**" softkey.

18. **Selcall Type: Default is set to "None".**
    To change settins, press the "**Edit**" softkey and scroll up/down to select " **None", "2-Tone", or "5-Tone**" and press the "**OK**" softkey.

19. Once all parameters are entered, press the " **Exit**" softkey. *(See Figure 8)*
    Display will show "**Save Changes Permanently**?", press the "**Yes**" softkey key to save all the entered channel parameters.

MIDLAND VHF/UHF PORTABLE RADIO CLONING INSTRUCTIONS

1. Turn both radios ON.

2. Attach each end of the cloning cable to each Accessories Jack on top of the radio. *(See Figure 8)*
   There is no master or slave connections on the cloning cable.
   Note: The Master radio will clone from it's current group into the Slaves current group, verify the Master and the Slave radios are in the appropriate groups before cloning.

3. On the Master radio, select " **Menu**" using the left radio softkey. ***(See Figure 1)***
   Scroll down to "**Channel Parameters**" via the up/down arrow softkeys and press the " **Select**" softkey. *(See Figure 2)*
   Scroll down to "**Cloner**" and press the "**Select**" softkey. *(See Figure 3)*
   Select "**Single Zone**" via the up/down arrow softkeys and press the " **Select**" softkey. *(See Figure 4)*
   Press the "**Prog**" softkey to send the clone over to the Slave radio. *(See Figure 5)*
   The Master radio will communicate with the slave radio and write the cloned group. *(See Figure 6)*

4. Once the cloning is successful, press the "**Exit**" softkey three times to exit out of the programming/cloning mode. *(See Figure 7)*

Figure 8: Midland Cloning Connections

Figure 1

Figure 2

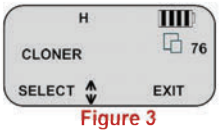

Figure 3

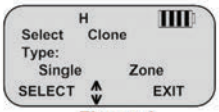

Figure 4

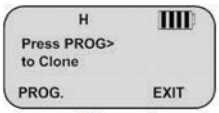

Figure 5

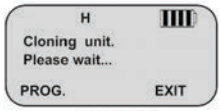

Figure 6

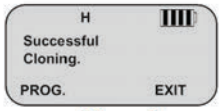

Figure 7

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MOTOROLA XTS 2500 and XTS 5000

MOTOROLA XTS 2500 PORTABLE RADIO BASIC OPERATION & CONTROLS

1. Turn power **ON** by turning the ON/OFF Volume Knob clockwise.
   The LCD will indicate the current group and channel label.
2. Select a zone number by pressing the appropriate Menu Select soft key labeled " **ZONE**", then select a zone by pressing the 4-Way Navigation switch to the right or left; or direct enter a 2 digit group/zone number via the keypad and press the " **Home**" key when finished.
3. Select a channel by turning the Channel Select Knob to one of the 16 available positions.
4. Adjust the volume by pressing/hold the " **Monitor**" key until it beeps and set the volume to desired level, press the " **Monitor**" key once more to close Squelch. **The radio is now ready to RECEIVE on the current group and channel.**

6. To transmit, press and hold the Push-To-Talk (**PTT**) button on the side of the radio.
   Note: The Transmit Indicator Light should glow red while transmitting.
   If not, the battery may be low or the channel is RX only or busy.

7. Pause 1 second and talk in a normal voice into the microphone.
   Note: Try to shield the microphone from wind and other loud background noises for clearer transmissions.

8. Release the PTT to stop transmitting and receive incoming transmissions.

Figure 1: Front View XTS 2500

Figure 3: Top View XTS 2500

Figure 2: Side View XTS 2500

MOTOROLA XTS 5000 PORTABLE RADIO BASIC OPERATION & RADIO CONTROLS

1. Turn power **ON** by turning the ON/OFF Volume Knob clockwise.
   The LCD will indicate the current group and channel label.
2. Select a zone number by pressing the appropriate Menu Select soft key labeled " **ZONE**", then select a zone by pressing the 4-Way Navigation switch to the right or left; or direct enter a 2 digit group/zone number via the keypad and press the " **Home**" key when finished.
3. Select a channel by turning the Channel Select Knob to one of the 16 available positions.
4. Adjust the volume by pressing/hold the " **Monitor**" key until it beeps and set the volume to desired level, press the " **Monitor**" key once more to close Squelch. **The radio is now ready to RECEIVE on the current group and channel.**

6. To transmit, press and hold the Push-To-Talk (**PTT**) button on the side of the radio.
   Note: The Transmit Indicator Light should glow red while transmitting.
   If not, the battery may be low or the channel is RX only or busy.

7. Pause 1 second and talk in a normal voice into the microphone.
   Note: Try to shield the microphone from wind and other loud background noises for clearer transmissions.

8. Release the PTT to stop transmitting and receive incoming transmissions.

Figure 1: Front View XTS 5000

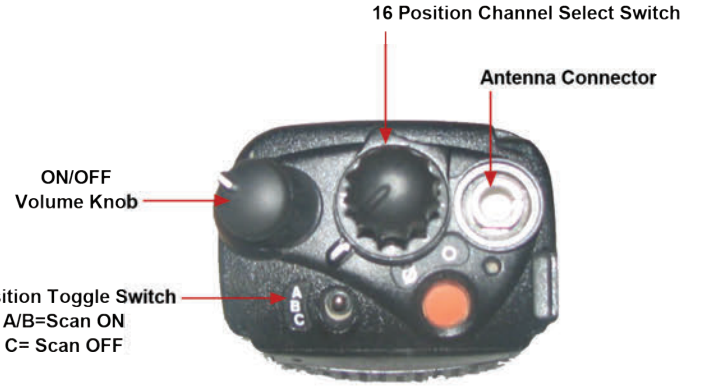

Figure 3: Top View XTS 5000

Figure 2: Side View XTS 5000

MOTOROLA XTS 2500/5000 PORTABLE RADIO SETTINGS/OPTIONS

CHANGING ZONES/GROUPS

1. To change zones/groups, press the " **ZONE**" softkey from the default screen/display. *(See Figure 1)*
2. Select the desired zone/group by scrolling right/left with the 4-Way Navigation Switch. *(See Figure 2)*
   (or direct enter a 2 digit zone/group number via the key)
3. Once a desired zone/group is selected, press the " **HOME**" button to make that zone/group active.

Figure 1

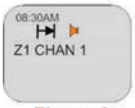

Figure 2

ENABLE/DISABLE SCAN/PRIORITY SCAN

1. **To Enable Scan**, turn the 3-Position Rotary/Toggle Switch to the " **B**" or "**C**" position.
   LCD will indicate the radio is in scan mode, by displaying an ( ) on on the upper part of the LCD. *(See Figure 3)*
2. **To Disable Scan**, turn the 3-Position Rotary/Toggle Switch to the " **A**" position.

Note: If no channels are in the Scan List, the radio will beep and indicate empty scan list on the LCD when scan is enabled.

Figure 3

ADD/REMOVE CHANNELS FROM SCAN/PRIORITY LIST

1. To add a channel to the Scan List, press the " **PROG**" softkey from the default screen/display. *(See Figure 4)*
2. Press the "**SCAN**" softkey to enter into the scan list. *(See Figure 5)*
3. Select the desired channel to scan with the top 16 Channel Select Knob.
4. Press the "**SEL**" softkey once to enter that selected channel in the scan list. *(See Figure 6)*
   LCD will indicate the channel is in the scan list, by displaying an ( ) on on the upper part of the LCD.
5. Press the "**SEL**" softkey once more to enter that selected channel as the scan priority 1 channel.
   LCD will indicate the radio is PRI 1 by displaying an (. icon on the upper part of the LCD.
6. Press the "**SEL**" softkey once more to enter that selected channel as the scan priority 2 channel.
   LCD will indicate the radio is PRI 2 by displaying an (. icon on the upper part of the LCD. *(Note Flashing DOT on end)*
7. Press the "**SEL**" softkey once more to remove the channel from the scan list completely.
   Or press the "**DEL**" softkey to remove the channel from the scan list.
8. Press the "**HOME**" button to return to the main screen.

Figure 4

Figure 5

Figure 6

1. Turn radio ON and select a Zone/Group you wish to program.

2. Press the 4-Way Navigation key to the right once or until the " **FPP**" softkey is visible on the display. *(See figure 1)*
   Press the "**FPP**" softkey to proceed into programming mode.
   Radio will indicate or ask for programming password, press the " **OK**" softkey to enter program mode. *(See Figure 2)*
   Radio will display active zone, select the desired zone by pressing the 4-Way Navigation key left or right. *(See Figure 3)*
   Once the desired zone is reached, press the " **VIEW**" softkey to change the channel programming information. *(See Figure 4)*

3. Select the desired channel to program, by pressing the 4-Way Navigation key left or right.
   Once the desired channel is reached, press the " **VIEW**" softkey to change that particular channel programming information.

4. The display will indicate " **TX:xxx.xxxxxx**", press the "**EDIT**" softkey to change the TX frequency. *(See Figure 5)*
   Enter the desired TX frequency and press the " **OK**" softkey, then press the 4-Way Navigation key to the right to enter the RX frequency.

5. The display will indicate " **RX:xxx.xxxxxx**", press the "**EDIT**" softkey to change the RX frequency. *(See Figure 6)*
   Enter the desired RX frequency and press the " **OK**" softkey, then press the 4-Way Navigation key to the right to enter the TX tone.

6. The display will indicate " **TX PL: 0 CSQ**", press the "**EDIT**" softkey to change the TX tone. *(See Figure 7)*
   Enter a valid TX tone via the keypad and press the " **OK**" softkey, **or**
   Press the 4-Way Navigation key up or down and select the desired tone and press the " **OK**" softkey.
   Press the 4-Way Navigation key to the right to enter the RX tone.
   Note: If an invalid tone is entered, radio will default to the closest valid tone.
   "0 CSQ" is default for NO TONE.

7. The display will indicate " **RX PL: 0 CSQ**", press the "**EDIT**" softkey to change the RX tone. *(See Figure 8)*
   Enter a valid RX tone via the keypad and press the " **OK**" softkey, **or**
   Press the 4-Way Navigation Key up or down and select the desired tone and press the " **OK**" softkey.
   Press the 4-way Navigation key to the right to enter the TX DPL.
   Note: If an invalid tone is entered, radio will default to the closest valid tone.
   "0 CSQ" is default for NO TONE.

9. The display will indicate " **TX DPL: 0 CSQ**", do not change, press the 4-Way Navigation Key to the right to enter the RX DPL.
10. The display will indicate " **RX DPL: 0 CSQ**", do not change, press the 4-Way Navigation Key to the right to enter the TX NAC.
11. The display will indicate " **TX NAC: $293**", no not change, press the 4-Way Navigation Key to the right to enter the RX NAC.
12. The display will indicate " **RX NAC: $293**", do not change, press the 4-Way Navigation key to the right to enter the RX Type.
    Note: Do not change TX/RX DPL, or TX/RX NAC for analog channels, these parameters are used for digital channels only.
    TX/RX DPL and TX/RX NAC will display analog equivalent information.

13. The display will indicate " **RX Type: ANALOG**", press the "**EDIT**" softkey to change the RX type. *(See Figure 9)*
    Toggle between " **ANALOG**", "**MIXED**", or "**DIGITAL**" by pressing the 4-Way Navigation Switch up or down.
    For Analog channels, select " **ANALOG**" and press the "**OK**" softkey, then press the 4-Way Key to the right to enter TX Type.

14. The display will indicate " **TX Type: ANALOG**". *(See Figure 10)*
    Note: If the "RX Type" is set to ANALOG or DIGITAL, the TX MODE can not be changed, it will default to the RX setting.
    Press the 4-way Navigation Key to the right to enter the Bandwith.

15. The display will indicate " **Bandwidth: 12.5 Khz**", press the "**EDIT**" softkey to change the channel bandwidth. *(See Figure 11)*
    Toggle between either " **12.5 Khz**" for Narrowband or " **25.0 Khz**" for Wideband by pressing the 4- Way Navigation Switch up or down and press the "**OK**" key. Press the 4-Way Navigation Key to the right to enter the Channel Name.
    Note: UHF models are capable of selecting "20.0 Khz" for bandwidth, DO NOT SELECT THIS OPTION.

16. The display will indicate " **Chan Name: CHAN 1** ", press the "**EDIT**" softkey to change the Channel Name.
    Enter the desired channel name using the alpha numeric keypad and press the " **OK**" softkey when done.
    Press the 4-Way Navigation Key to the right, to enter the Zone Name.
    Note: For Space Character, press the 4-Way Navigation Switch to the Right.

17. The display will indicate " **Zone Name: Z1**", press the "**EDIT**" softkey to change the Zone Name.
    Enter the desired Zone Name using the alpha numeric keypad and press the " **OK**" softkey when done.
    Note: NIICD does not recommend changing the Zone Name.

18. Once the Zone Name is edited, pressing the 4-way Navigation Switch to the right will bring up the TX Frequency option.

19. Once all the programming parameters have been entered for that channel press the " **DONE**" softkey and select another channel to program or press the " **HOME**" Button to exit programming mode.

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

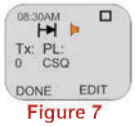

Figure 7

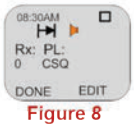

Figure 8

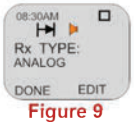

Figure 9

Figure 10

Figure 11

MOTOROLA XTS 2500/5000 PORTABLE RADIO CLONING INSTRUCTIONS

1. Connect the cloning cable to both the Master and Slave radios. *(See Figure 7)*

2. Turn both radios on.

3. On the MASTER RADIO, press the "**CLON**" softkey from the default screen to bring up the cloning menu. *(See Figure 1)*
   Note: The Master radio will momentarily display " **TARGET RADIO CONNECTED**" if a slave radio is connected correctly.
   The Slave radio will display " **CLONE MODE**" on the LCD.

4. Select a desired zone/group by pressing the 4-Way Navigation Key to the left or right. *(See Figure 2)*

5. Once a zone is selected, press the " **SEL**" softkey to enable that zone to be sent over to the slave radio.
   The display will indicate the zone is enabled by an " **C**" icon on the right side of the LCD. *(See Figure 3)*

6. Press the "**DONE**" softkey to select a target zone/group. *(See Figure 4)*

7. The display will indicate " **Target: Zx:**", select a desired group/zone that the Master radio will write/clone over the Slave radio.
   Press the "**SEL**" softkey when desired target group/zone is selected.
   The display will indicate the target zone is enabled by an " **C**" icon on the right side of the LCD. *(See Figure 4)*

8. Press the "**OK**" softkey to begin cloning.
   Display on Master will indicate " **Wait: Cloning.....**".
   Display on Master will indicate " **CLONE SUCCESSFUL**" once clone is complete. *(See Figure 6)*

9. Press the "**EXIT**" softkey to exit clone mode and return to default screen.

Figure 7: Motorola XTS2500/5000 Cloning Connections

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

REMOVING CLAMSHELL FROM MOTOROLA XTS 2500 PORTABLE RADIO

Figure 1

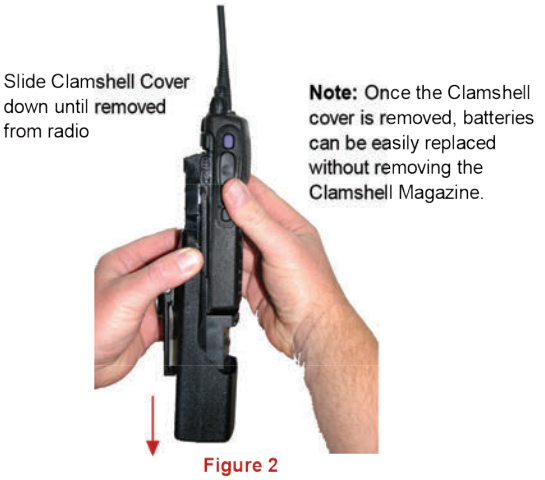

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

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APPENDIX F

NIICD RADIO SYSTEM DIAGRAMS

These diagrams are also available for download online at:

http://www.nifc.gov/NIICD/documents.html

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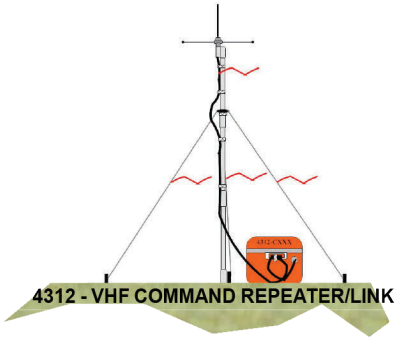
VHF COMMAND REPEATER WITH REMOTE KIT



RX RPTR FREQ: _____ RX TONE/NAC: _____

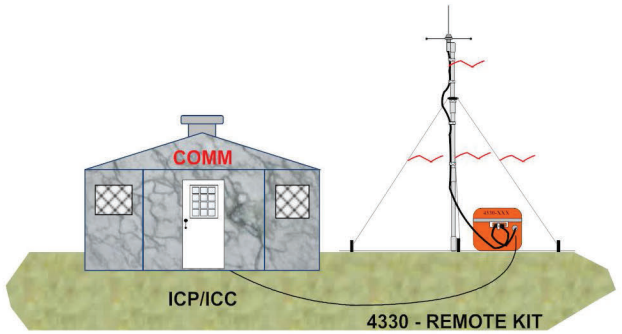
TX RPTR FREQ: _____ TX TONE/ NAC: _____

KIT#: _____ RPTR ID: _____

LOCATION: _____

LAT.: _____ LONG.: _____

REMARKS: _____



RX FREQ: _____ RX TONE/NAC: _____

TX FREQ: _____ TX TONE/ NAC: _____

GROUP #: _____ CHANNEL #: _____

KIT #: _____

LOCATION: _____

LAT.: _____ LONG.: _____

REMARKS: _____

DRAWING 1

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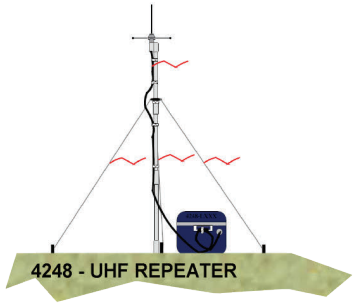
UHF REPEATER WITH TWO REMOTE KITS



RX RPTR FREQ: _____ RX TONE/NAC: _____

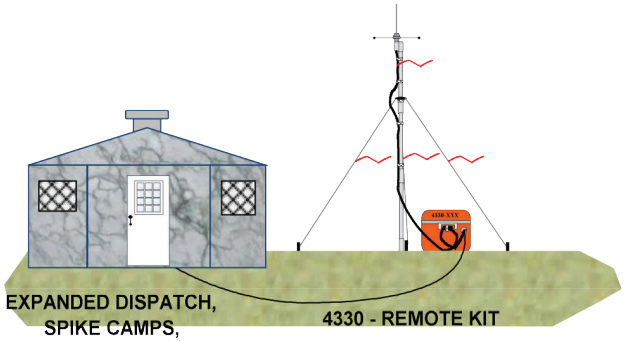
TX RPTR FREQ: _____ TX TONE/NAC: _____

KIT#: _____ RPTR ID: _____

LOCATION: _____

LAT.: _____ LONG.: _____

REMARKS: _____



RX FREQ: _____ RX TONE/NAC: _____

TX FREQ: _____ TX TONE/NAC: _____

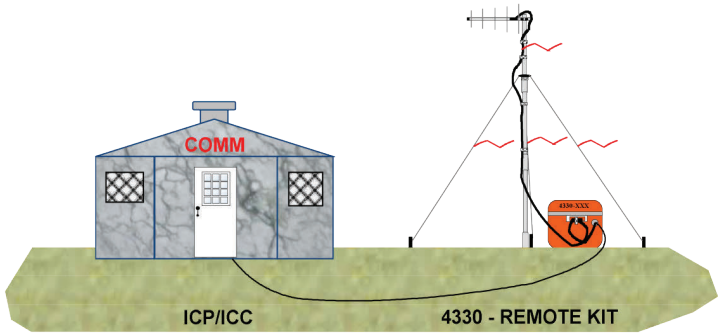
GROUP #: _____ CHANNEL #: _____

KIT #: _____

LOCATION: _____

LAT.: _____ LONG.: _____

REMARKS: _____



RX FREQ: _____ RX TONE/NAC: _____

TX FREQ: _____ TX TONE/NAC: _____

GROUP #: _____ CHANNEL #: _____

KIT #: _____

LOCATION: _____

LAT.: _____ LONG.: _____

REMARKS: _____

DRAWING 2

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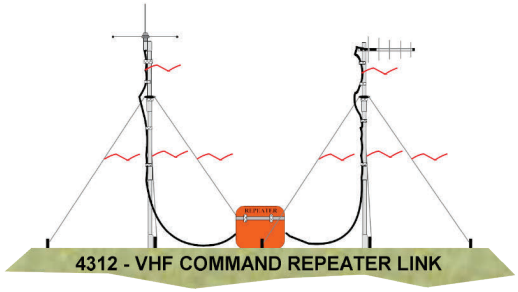
VHF COMMAND REPEATER LINKED THROUGH UHF REPEATER HUB



RX RPTR FREQ: _____ RX LINK FREQ: _____

RX TONE/NAC: _____ TX LINK FREQ: _____

TX RPTR FREQ: _____ UHF LINK CH #: _____

TX TONE/NAC: _____

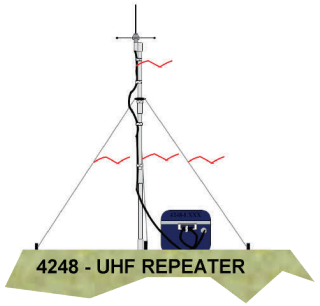
KIT#: _____ RPTR ID: _____

LOCATION: _____

LAT.: _____ LONG.: _____

REMARKS: _____

UHF



RX RPTR FREQ: _____ RX TONE/NAC: _____

TX RPTR FREQ: _____ TX TONE/NAC: _____

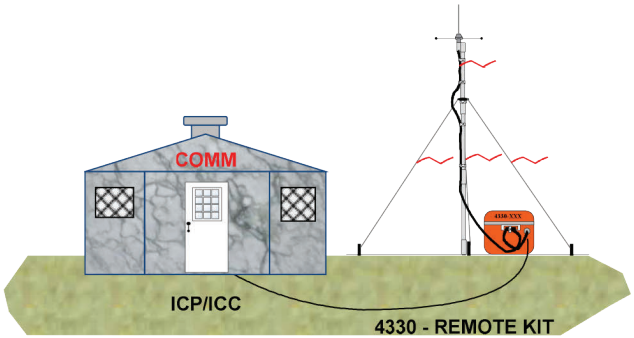
KIT#: _____ RPTR ID: _____

LOCATION: _____

LAT.: _____ LONG.: _____

REMARKS: _____

UHF



RX FREQ: _____ RX TONE/NAC: _____

TX FREQ: _____ TX TONE/NAC: _____

GROUP #: _____ CHANNEL #: _____

KIT #: _____

LOCATION: _____

LAT.: _____ LONG.: _____

REMARKS: _____

DRAWING 3 **INCIDENT:**

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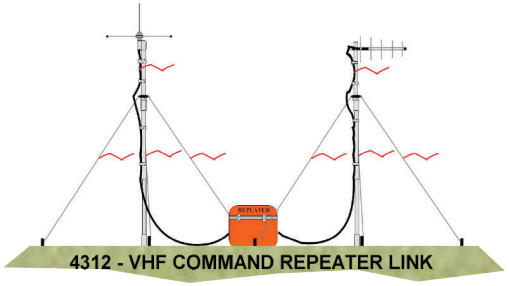
TWO (2) VHF COMMAND REPEATERS LINKED VIA UHF SIMPLEX



RX RPTR FREQ: _____ RX LINK FREQ: _____

RX TONE/NAC: _____ TX LINK FREQ: _____

TX RPTR FREQ: _____ UHF LINK CH #: _____

TX TONE/NAC: _____

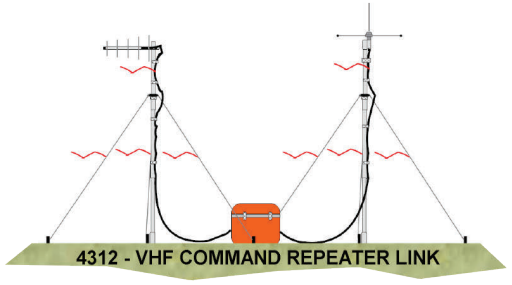
KIT#: _____ RPTR ID: _____

LOCATION: _____

LAT.: _____ LONG.: _____

REMARKS: _____

UHF



RX LINK FREQ: _____ RX RPTR FREQ: _____

TX LINK FREQ: _____ RX TONE/NAC: _____

UHF LINK CH #: _____ TX RPTR FREQ: _____

TX TONE/NAC: _____

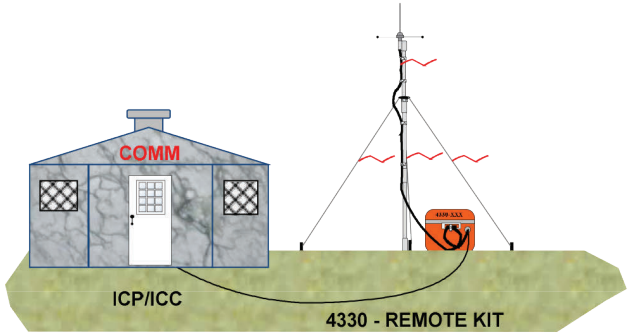
KIT#: _____ RPTR ID: _____

LOCATION: _____

LAT.: _____ LONG.: _____

REMARKS: _____

VHF



RX FREQ: _____ RX TONE/NAC: _____

TX FREQ: _____ TX TONE/NAC: _____

GROUP #: _____ CHANNEL #: _____

KIT #: _____

LOCATION: _____

LAT.: _____ LONG.: _____

REMARKS: _____

DRAWING 4

INCIDENT:

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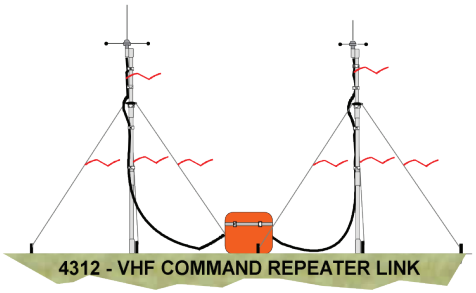
THREE (3) VHF COMMAND REPEATERS LINKED VIA UHF SIMPLEX

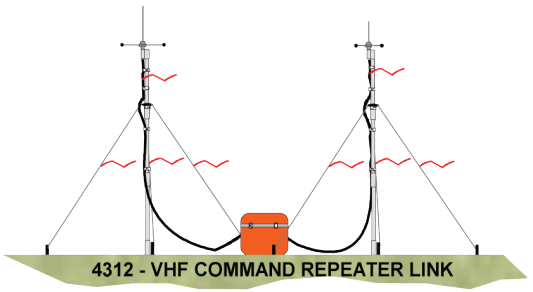


RX RPTR FREQ: _____ RX LINK FREQ: _____
RX TONE/NAC: _____ TX LINK FREQ: _____
TX RPTR FREQ: _____ UHF LINK CH #: _____
TX TONE/NAC: _____
KIT#: _____ RPTR ID: _____
LOCATION: _____
LAT.: _____ LONG.: _____
REMARKS: _____

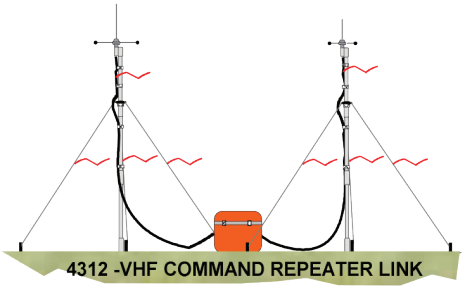
UHF

UHF

UHF

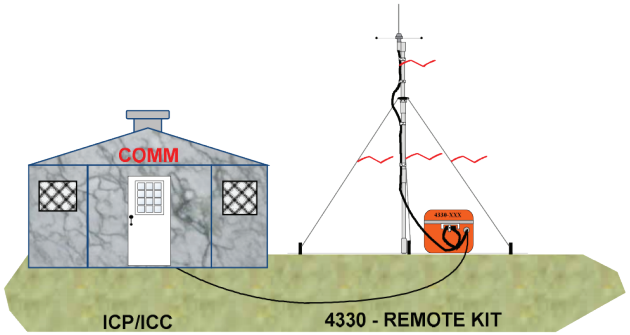


RX RPTR FREQ: _____ RX LINK FREQ: _____
RX TONE/NAC: _____ TX LINK FREQ: _____
TX RPTR FREQ: _____ UHF LINK CH #: _____
TX TONE/NAC: _____
KIT#: _____ RPTR ID: _____
LOCATION: _____
LAT.: _____ LONG.: _____
REMARKS: _____



RX RPTR FREQ: _____ RX LINK FREQ: _____
RX TONE/NAC: _____ TX LINK FREQ: _____
TX RPTR FREQ: _____ UHF LINK CH #: _____
TX TONE/NAC: _____
KIT#: _____ RPTR ID: _____
LOCATION: _____
LAT.: _____ LONG.: _____
REMARKS: _____

VHF



RX FREQ: _____ RX TONE/NAC: _____
TX FREQ: _____ TX TONE/NAC: _____
GROUP #: _____ CHANNEL #: _____
KIT #: _____
LOCATION: _____
LAT.: _____ LONG.: _____
REMARKS: _____

DRAWING 5

INCIDENT:

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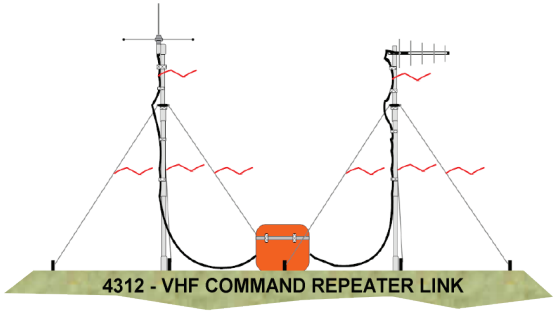
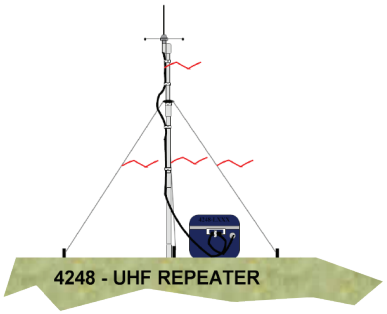
TWO (2) VHF COMMAND REPEATERS LINKED THROUGH UHF REPEATER HUB



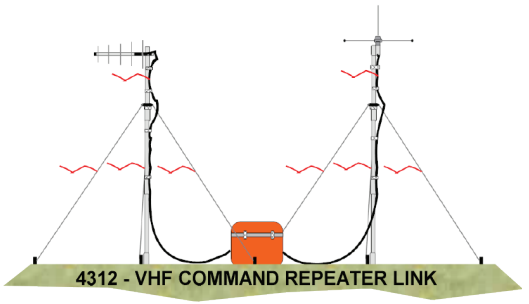
RX RPTR FREQ: _____ RX LINK FREQ: _____
RX TONE/NAC: _____ TX LINK FREQ: _____
TX RPTR FREQ: _____ UHF LINK CH #: _____
TX TONE/NAC: _____
KIT#: _____ RPTR ID: _____
LOCATION: _____
LAT.: _____ LONG.: _____
REMARKS: _____

UHF



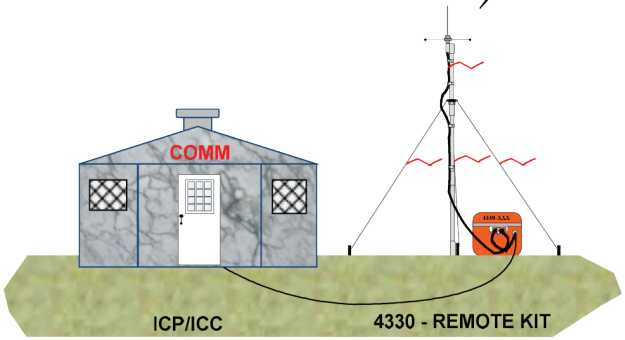
RX RPTR FREQ: _____ RX TONE/NAC: _____
TX RPTR FREQ: _____ TX TONE/NAC: _____
KIT#: _____ RPTR ID: _____
LOCATION: _____
LAT.: _____ LONG.: _____
REMARKS: _____

UHF



RX LINK FREQ: _____ RX RPTR FREQ: _____
TX LINK FREQ: _____ RX TONE/NAC: _____
UHF LINK CH #: _____ TX RPTR FREQ: _____
TX TONE/NAC: _____
KIT#: _____ RPTR ID: _____
LOCATION: _____
LAT.: _____ LONG.: _____
REMARKS: _____

UHF



RX FREQ: _____ RX TONE/NAC: _____
TX FREQ: _____ TX TONE/NAC: _____
GROUP #: _____ CHANNEL #: _____
KIT #: _____
LOCATION: _____
LAT.: _____ LONG.: _____
REMARKS: _____

DRAWING 6

INCIDENT:

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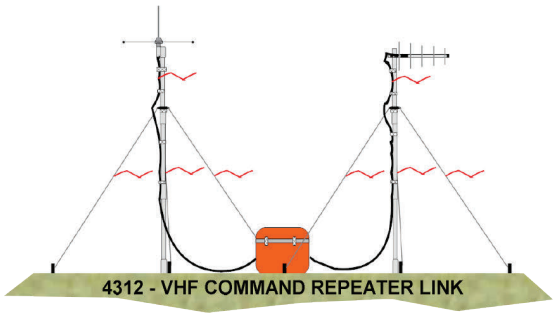
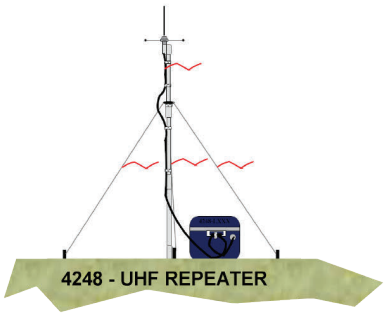
THREE (3) VHF COMMAND REPEATERS LINKED THROUGH UHF REPEATER HUB



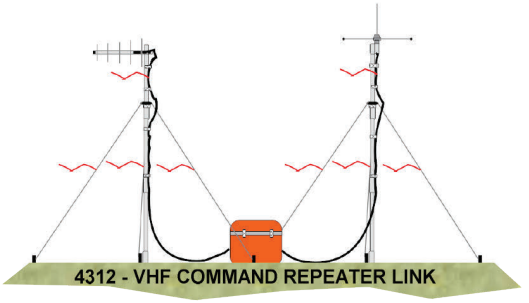
RX RPTR FREQ: _____ RX LINK FREQ: _____
RX TONE/NAC: _____ TX LINK FREQ: _____
TX RPTR FREQ: _____ UHF LINK CH #: _____
TX TONE/NAC: _____
KIT#: _____ RPTR ID: _____
LOCATION: _____
LAT.: _____ LONG.: _____
REMARKS: _____

UHF



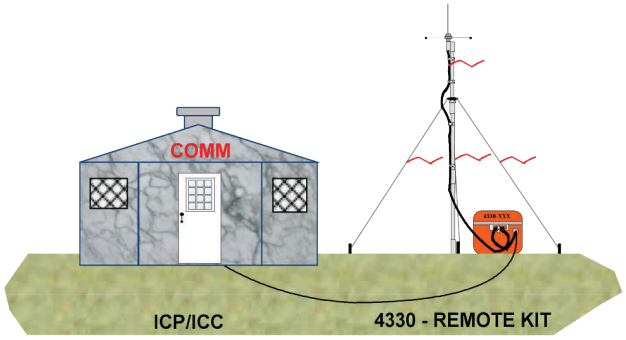
RX RPTR FREQ: _____ RX TONE/NAC: _____
TX RPTR FREQ: _____ TX TONE/NAC: _____
KIT#: _____ RPTR ID: _____
LOCATION: _____
LAT.: _____ LONG.: _____
REMARKS: _____

UHF



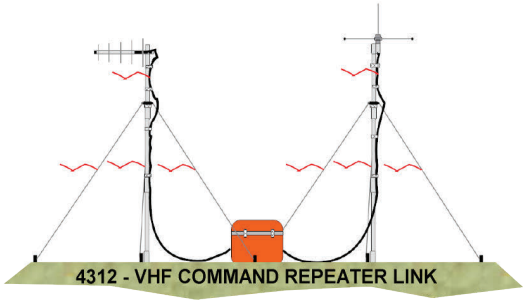
RX LINK FREQ: _____ RX RPTR FREQ: _____
TX LINK FREQ: _____ RX TONE/NAC: _____
UHF LINK CH #: _____ TX RPTR FREQ: _____
TX TONE/NAC: _____
KIT#: _____ RPTR ID: _____
LOCATION: _____
LAT.: _____ LONG.: _____
REMARKS: _____

UHF



RX FREQ: _____ RX TONE/NAC: _____
TX FREQ: _____ TX TONE/NAC: _____
GROUP #: _____ CHANNEL #: _____
KIT #: _____
LOCATION: _____
LAT.: _____ LONG.: _____
REMARKS: _____

UHF



RX LINK FREQ: _____ RX RPTR FREQ: _____
TX LINK FREQ: _____ RX TONE/NAC: _____
UHF LINK CH #: _____ TX RPTR FREQ: _____
TX TONE/NAC: _____
KIT#: _____ RPTR ID: _____
LOCATION: _____
LAT.: _____ LONG.: _____
REMARKS: _____

DRAWING 7

INCIDENT:

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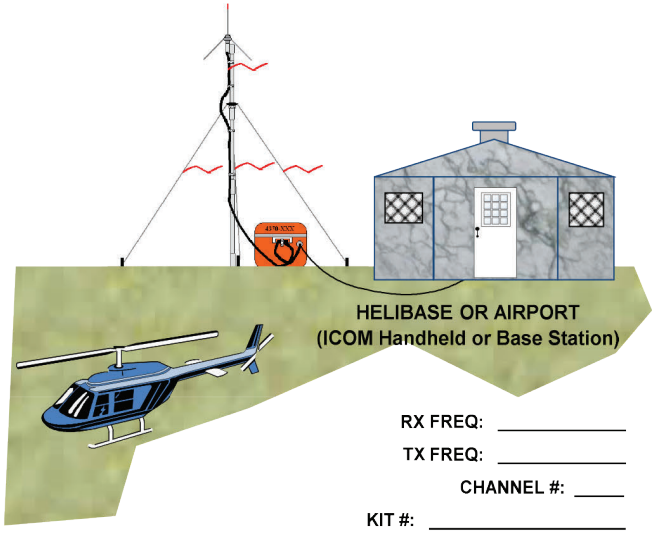
AIRCRAFT LINK SYSTEM (BASE CONFIGURATION) GROUND TO AIRCRAFT COMMUNICATIONS

RX AM FREQ: _____

TX AM FREQ: _____

VHF- AM
(SIMPLEX)



RX FREQ: _____

TX FREQ: _____

CHANNEL #: ____

KIT #: _____

LOCATION: _____

LAT.: _____ LONG.: _____

REMARKS: _____

DRAWING 8

INCIDENT:

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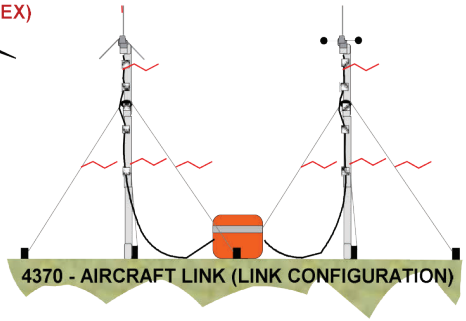
AIRCRAFT LINK SYSTEM (LINK CONFIGURATION) WITH REMOTE AT HELIBASE

RX AM FREQ: _____

TX AM FREQ: _____

VHF- AM
(SIMPLEX)



UHF
(SIMPLEX)

RX AM FREQ: _____ RX UHF FREQ: _____

TX AM FREQ: _____ TX UHF FREQ: _____

AM CHANNEL #: _____ FM UHF CHANNEL #: _____

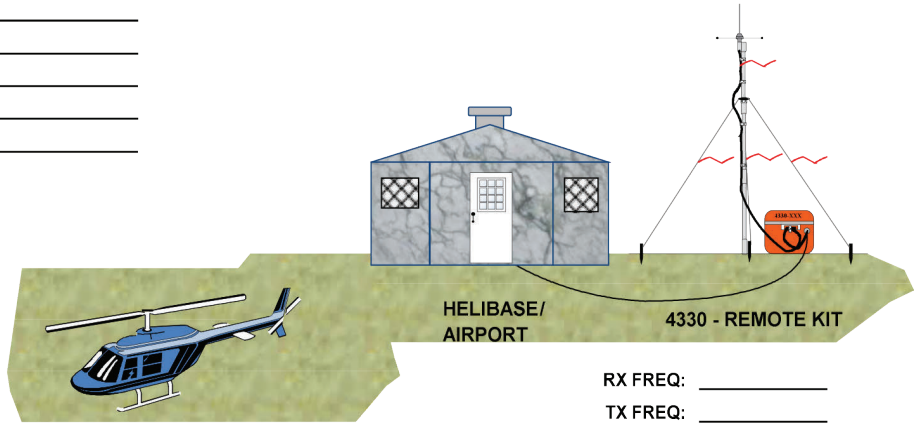
KIT #: _____

LOCATION: _____

LAT.: _____

LONG.: _____

REMARKS: _____



RX FREQ: _____

TX FREQ: _____

CHANNEL #: _____

KIT #: _____

LOCATION: _____

LAT.: _____ LONG.: _____

REMARKS: _____

DRAWING 9

INCIDENT:

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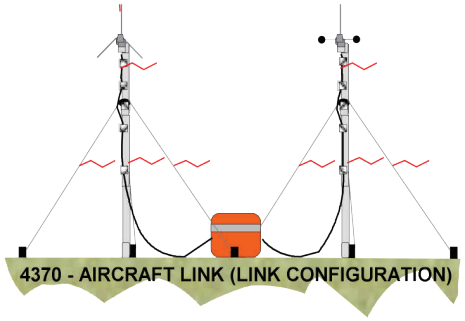
AIRCRAFT LINK SYSTEM (LINK CONFIGURATION) LINKED THROUGH UHF REPEATER HUB

RX AM FREQ: _____

TX AM FREQ: _____

VHF- AM
(SIMPLEX)



RX AM FREQ: _____ RX UHF FREQ: _____

TX AM FREQ: _____ TX UHF FREQ: _____

AM CHANNEL #: _____ FM UHF CHANNEL #: _____

KIT #: _____

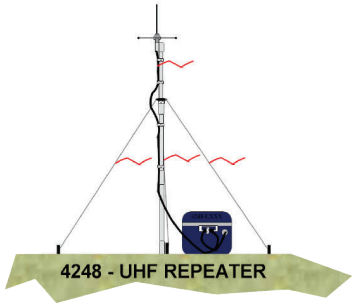
LOCATION: _____

LAT.: _____

LONG.: _____

REMARKS: _____

UHF



RX RPTR FREQ: _____ RX TONE/NAC: _____

TX RPTR FREQ: _____ TX TONE/NAC: _____

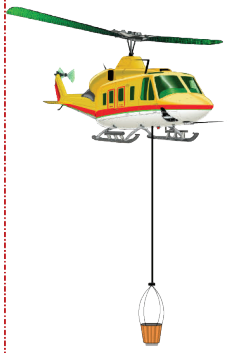
KIT#: _____ RPTR ID: _____

LOCATION: _____

LAT.: _____ LONG.: _____

REMARKS: _____

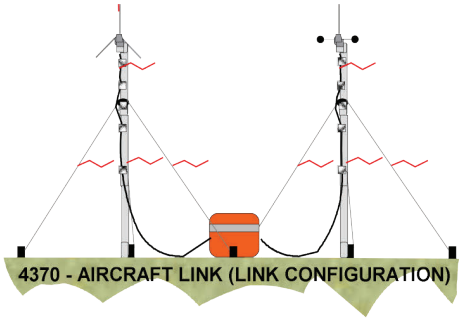
SECONDARY EXPANDED A/C LINK SYSTEM



RX AM FREQ: _____

TX AM FREQ: _____

VHF- AM
(SIMPLEX)



RX AM FREQ: _____ RX UHF FREQ: _____

TX AM FREQ: _____ TX UHF FREQ: _____

AM CHANNEL #: _____ FM UHF CHANNEL #: _____

KIT #: _____

LOCATION: _____

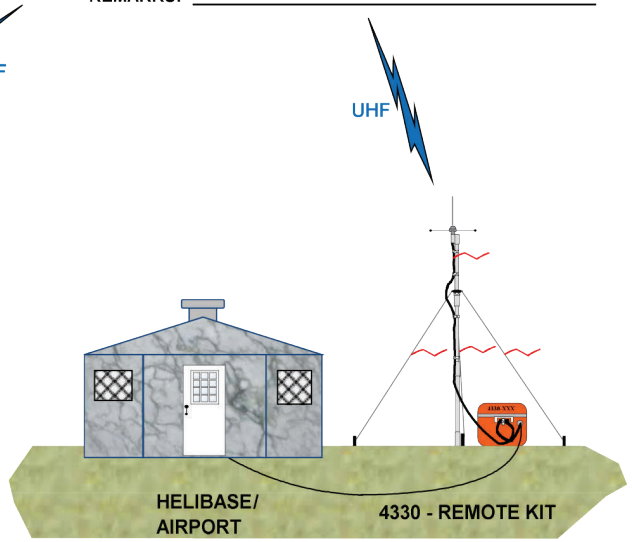
LAT.: _____

LONG.: _____

REMARKS: _____

UHF

UHF



RX FREQ: _____

TX FREQ: _____

CHANNEL #: _____

KIT #: _____

LOCATION: _____

LAT.: _____ LONG.: _____

REMARKS: _____

DRAWING 10

INCIDENT:

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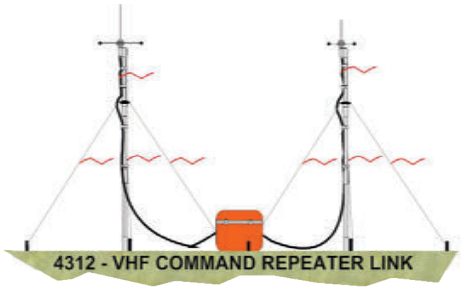
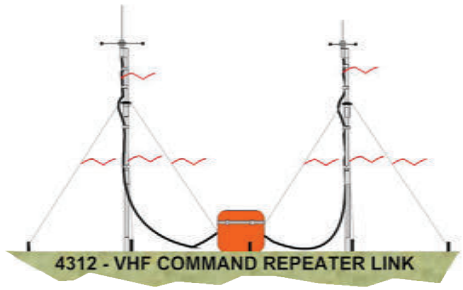
FOUR (4) VHF COMMAND REPEATERS LINKED VIA UHF SIMPLEX



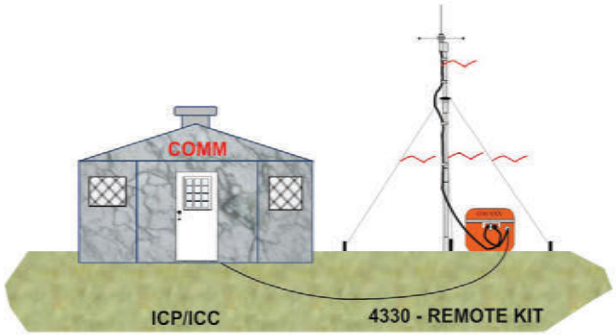
RX RPTR FREQ: _____ RX LINK FREQ: _____
RX TONE/NAC: _____ TX LINK FREQ: _____
TX RPTR FREQ: _____ UHF LINK CH #: _____
TX TONE/NAC: _____
KIT#: _____ RPTR ID: _____
LOCATION: _____
LAT.: _____ LONG.: _____
REMARKS: _____

UHF



RX RPTR FREQ: _____ RX LINK FREQ: _____
RX TONE/NAC: _____ TX LINK FREQ: _____
TX RPTR FREQ: _____ UHF LINK CH #: _____
TX TONE/NAC: _____
KIT#: _____ RPTR ID: _____
LOCATION: _____
LAT.: _____ LONG.: _____
REMARKS: _____

VHF



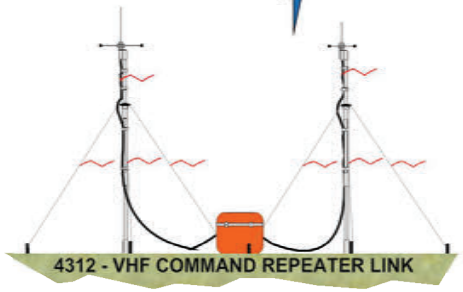
RX FREQ: _____ RX TONE/NAC: _____
TX FREQ: _____ TX TONE/ NAC: _____
GROUP #: _____ CHANNEL #: _____
KIT #: _____
LOCATION: _____
LAT.: _____ LONG.: _____
REMARKS: _____

UHF

UHF

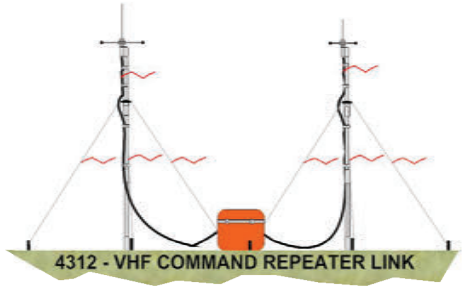
UHF

UHF



RX RPTR FREQ: _____ RX LINK FREQ: _____
RX TONE/NAC: _____ TX LINK FREQ: _____
TX RPTR FREQ: _____ UHF LINK CH #: _____
TX TONE/NAC: _____
KIT#: _____ RPTR ID: _____
LOCATION: _____
LAT.: _____ LONG.: _____
REMARKS: _____

UHF



RX RPTR FREQ: _____ RX LINK FREQ: _____
RX TONE/NAC: _____ TX LINK FREQ: _____
TX RPTR FREQ: _____ UHF LINK CH #: _____
TX TONE/NAC: _____
KIT#: _____ RPTR ID: _____
LOCATION: _____
LAT.: _____ LONG.: _____
REMARKS: _____

DRAWING 11

INCIDENT:

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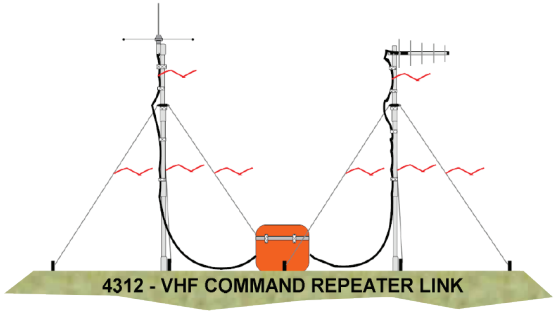
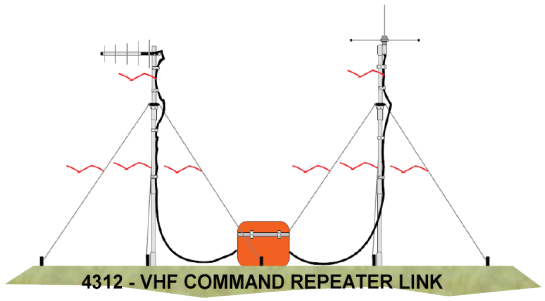
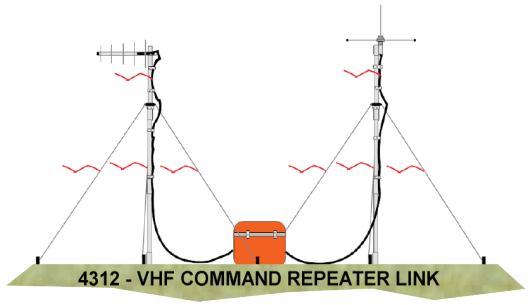
FOUR (4) VHF COMMAND REPEATERS LINKED THROUGH UHF REPEATER HUB



RX RPTR FREQ: _____ RX LINK FREQ: _____
RX TONE/NAC: _____ TX LINK FREQ: _____
TX RPTR FREQ: _____ UHF LINK CH #: _____
TX TONE/NAC: _____
KIT#: _____ RPTR ID: _____
LOCATION: _____
LAT.: _____ LONG.: _____
REMARKS: _____



RX LINK FREQ: _____ RX RPTR FREQ: _____
TX LINK FREQ: _____ RX TONE/NAC: _____
UHF LINK CH #: _____ TX RPTR FREQ: _____
TX TONE/NAC: _____
KIT#: _____ RPTR ID: _____
LOCATION: _____
LAT.: _____ LONG.: _____
REMARKS: _____



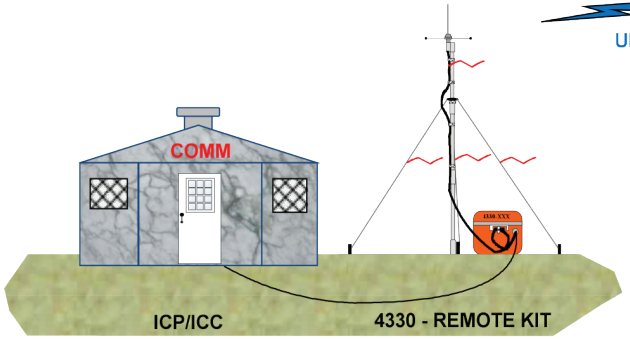
RX LINK FREQ: _____ RX RPTR FREQ: _____
TX LINK FREQ: _____ RX TONE/NAC: _____
UHF LINK CH #: _____ TX RPTR FREQ: _____
TX TONE/NAC: _____
KIT#: _____ RPTR ID: _____
LOCATION: _____
LAT.: _____ LONG.: _____
REMARKS: _____

UHF

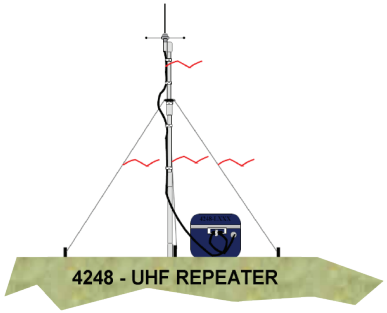
UHF

UHF

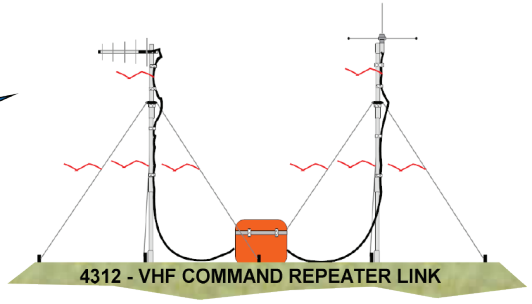
UHF



RX FREQ: _____ RX TONE/NAC: _____
TX FREQ: _____ TX TONE/NAC: _____
GROUP #: _____ CHANNEL #: _____
KIT #: _____
LOCATION: _____
LAT.: _____ LONG.: _____
REMARKS: _____



RX RPTR FREQ: _____ RX TONE/NAC: _____
TX RPTR FREQ: _____ TX TONE/NAC: _____
KIT#: _____ RPTR ID: _____
LOCATION: _____
LAT.: _____ LONG.: _____
REMARKS: _____



RX LINK FREQ: _____ RX RPTR FREQ: _____
TX LINK FREQ: _____ RX TONE/NAC: _____
UHF LINK CH #: _____ TX RPTR FREQ: _____
TX TONE/NAC: _____
KIT#: _____ RPTR ID: _____
LOCATION: _____
LAT.: _____ LONG.: _____
REMARKS: _____

DRAWING 12

INCIDENT:

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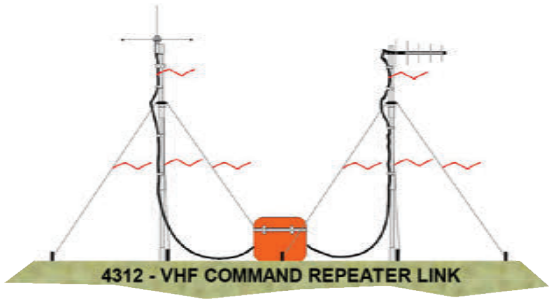
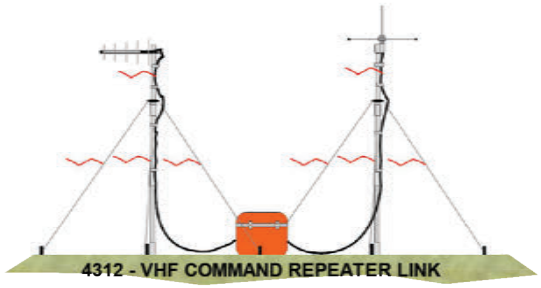
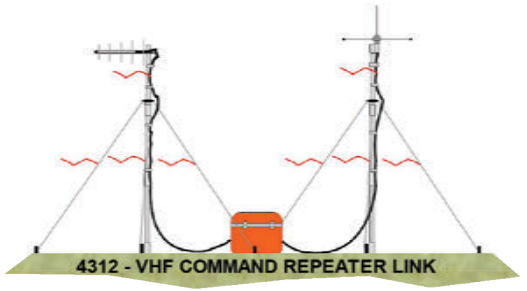
FIVE (5) VHF COMMAND REPEATERS LINKED THROUGH UHF REPEATER HUB



RX RPTR FREQ: _____ RX LINK FREQ: _____
RX TONE/NAC: _____ TX LINK FREQ: _____
TX RPTR FREQ: _____ UHF LINK CH #: _____
TX TONE/NAC: _____
KIT#: _____ RPTR ID: _____
LOCATION: _____
LAT.: _____ LONG.: _____
REMARKS: _____



RX LINK FREQ: _____ RX RPTR FREQ: _____
TX LINK FREQ: _____ RX TONE/NAC: _____
UHF LINK CH #: _____ TX RPTR FREQ: _____
TX TONE/ NAC: _____
KIT#: _____ RPTR ID: _____
LOCATION: _____
LAT.: _____ LONG.: _____
REMARKS: _____



RX LINK FREQ: _____ RX RPTR FREQ: _____
TX LINK FREQ: _____ RX TONE/NAC: _____
UHF LINK CH #: _____ TX RPTR FREQ: _____
TX TONE/ NAC: _____
KIT#: _____ RPTR ID: _____
LOCATION: _____
LAT.: _____ LONG.: _____
REMARKS: _____

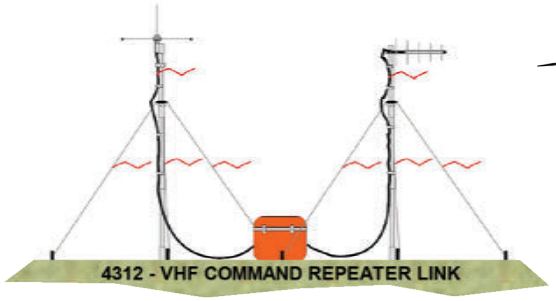
UHF

UHF

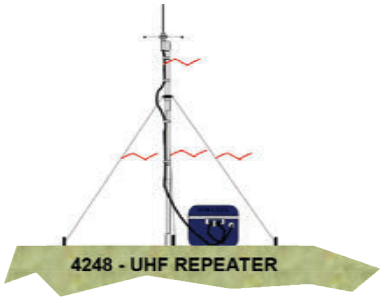
UHF

UHF

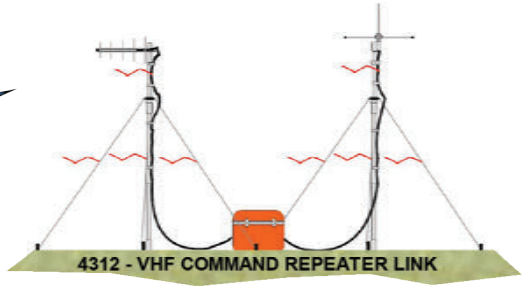
UHF



RX RPTR FREQ: _____ RX LINK FREQ: _____
RX TONE/NAC: _____ TX LINK FREQ: _____
TX RPTR FREQ: _____ UHF LINK CH #: _____
TX TONE/NAC: _____
KIT#: _____ RPTR ID: _____
LOCATION: _____
LAT.: _____ LONG.: _____
REMARKS: _____



RX RPTR FREQ: _____ RX TONE/NAC: _____
TX RPTR FREQ: _____ TX TONE/ NAC: _____
KIT#: _____ RPTR ID: _____
LOCATION: _____
LAT.: _____ LONG.: _____
REMARKS: _____



RX LINK FREQ: _____ RX RPTR FREQ: _____
TX LINK FREQ: _____ RX TONE/NAC: _____
UHF LINK CH #: _____ TX RPTR FREQ: _____
TX TONE/ NAC: _____
KIT#: _____ RPTR ID: _____
LOCATION: _____
LAT.: _____ LONG.: _____
REMARKS: _____

DRAWING 13

INCIDENT:_____

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APPENDIX G

COML/COMT CHECKLIST
ICS-205 RADIO COMMUNICATIONS PLAN

COML/COMT CHECKLIST

1. ***Contact the CDO: (208)387-5644 CDO E-mail: nifccdo@fs.fed.us***
   - ☐ Equipment assignments
   - ☐ Frequency assignments (repeaters, links, aircraft, tactical, tones)
   - ☐ Status of orders (pre-orders)
   - ☐ Adjacent incident information (interoperability issues, frequency assignments, locations, COML)
   - ☐ Equipment availability (pre-positioned, cache locations, shortages)
   - ☐ Is a Communications Coordinator (COMC) assigned?
   - ☐ Exchange contact information with CDO or COMC

2. ***Attend Agency Administrator Briefing***
   - ☐ Identify local contact for finding possible repeater sites
   - ☐ Local communications personnel
   - ☐ Is local Admin/Fire Net available for traffic routes/emergency contact?
   - ☐ Name/contact for local phone company
   - ☐ Are phone sets available from the local sponsoring unit?

3. ***Meet with Operations and Determine Their Needs***
   - ☐ How many divisions for tactical channels?
   - ☐ Area of operations (coverage)
   - ☐ Is team responsible for Initial Attack? What areas?
   - ☐ Interoperability issues
   - ☐ If communicating with other agencies, will their frequencies be programmed in NIRSC radios?

4. ***Meet with Air Operations and Determine Their Needs***
   - ☐ How many Air-to-Air AM frequencies are required?
   - ☐ Will fixed wing and rotor wing be on separate frequencies?
   - ☐ Has a Heli-base been established?
   - ☐ Will an Aircraft Link be needed for incident flight following?
   - ☐ How many Air-to-Ground FM frequencies are required?
   - ☐ How many Air-to-Air FM frequencies are required? (mostly in California)
   - ☐ Is there a need for Heli-base Deck Frequency?
   - ☐ Is there a need for Heli-base Takeoff and Landing Control Frequency (TOLC)?

5. ***Meet with the Logistics Chief***
   - ☐ Teams policy and Incident Objectives
   - ☐ Will a night shift be required?
   - ☐ Where will the ICC be located? (Check with Facilities, locate at quiet location close to medical)
   - ☐ Will a staging area be established? What are their needs? (radio, phone, internet)
   - ☐ Who will need telephones, fax service and internet? Determine priorities for lines.
   - ☐ Crew phones?
   - ☐ Will a spike camp be established? What are their needs? (radio, phone, internet)
   - ☐ Will a Public Address system be needed for briefings?
   - ☐ Field ordering process, tie in with supply. Will Communications Unit take all orders?
   - ☐ Meeting schedule.
   - ☐ Have any communications personnel been ordered?
   - ☐ Have any equipment, frequencies or services been ordered?

6. Design the Communications System

- ☐ Check map for possible repeater locations
- ☐ Order radio equipment if needed
- ☐ Order communications personnel if needed (RADO, INCM, COMT)
- ☐ Order supplies (batteries, telephone/internet service, forms)
- ☐ Build ICS-205 (Communications Plan)
- ☐ Fill out incident diagrams
- ☐ Prepare incident and cell phone list
- ☐ If needed, coordinate with CDO or COMC.
- ☐ Send ICS-205, ICS-220 and incident diagrams to CDO or COMC.

7. Install Radio System

- ☐ Test (voice check) equipment in camp.
- ☐ Determine means of transportation and arrange.
- ☐ Technicians assigned?
- ☐ Is land use agreement required?
- ☐ Install and voice test.
- ☐ Voice check complete system
- ☐ Document locations
- ☐ Adhere to safety standards
- ☐ Develop battery replacement/maintenance plan
- ☐ Clone radios

8. Taking Over an Existing Incident

- ☐ Current IAP
- ☐ Current ICS-205 (Communications Plan)
- ☐ Current System Diagram
- ☐ Current ICS-220 (Aviation Summary)
- ☐ Equipment inventory and locations
- ☐ Battery inventory
- ☐ Radio site locations and means of travel
- ☐ Current personnel and status
- ☐ Adjacent incident information
- ☐ Local contact (Radio Tech)
- ☐ Contact information

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INCIDENT RADIO COMMUNICATIONS PLAN	1. Incident Name	2. Date Time Prepared	3. Operational Period Date/Time

4. Basic Radio Channel Utilization

Mode: W= Wideband, N= Narrowband, D= Digital, M= Mixed

CH #	Function	Frequency		Tone/NAC	Mode	TGID	Assignment	Remarks
1		RX:						
		TX:						
2		RX:						
		TX:						
3		RX:						
		TX:						
4		RX:						
		TX:						
5		RX:						
		TX:						
6		RX:						
		TX:						
7		RX:						
		TX:						
8		RX:						
		TX:						
9		RX:						
		TX:						
10		RX:						
		TX:						
11		RX:						
		TX:						
12		RX:						
		TX:						
13		RX:						
		TX:						
14		RX:						
		TX:						
15		RX:						
		TX:						
16		RX:						
		TX:						

5. Prepared by (Communications Unit)

Note: This is not a standard NWCG ICS205 Form

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NOTES

NOTES

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2017 NIRSC User's Guide